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Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Proposed National Roads - Standard

PE-ENV-01102
December 2020

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TII Publications



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Figure 1 National road in the Irish landscape (M8, Co. Cork. Photo; Brady Shipman Martin)

1. Introduction

Transport Infrastructure Ireland (TII) was established through a merger of the National Roads Authority and the Railway Procurement Agency under the Roads Act 2015. The TII's primary function is to provide an integrated approach to the future development and operation of the national roads network and light rail infrastructure to provide high quality transport infrastructure and services, delivering a better quality of life and supporting economic growth throughout Ireland. In this role, TII produces and manages a wide range of standards and technical documentation related to its areas of responsibility. These, and other publications, are available to users through the TII Publications system website:

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1.1 Purpose of this Standard

This standard is to be used on proposed national road development to assess the likely landscape and visual impact of the development.

1.2 Using this Standard

This Standards Document (SD) **PE-ENV-01102**, sets out the methodology for the analysis and the production of documents and deliverables in terms of

- Landscape Character Assessment (LCA) in the establishment of the landscape baseline for proposed national roads
- Landscape and Visual Impact Assessment (LVIA) of proposed routes and projects

as they relate to National Roads and associated infrastructure. Subject to the overriding requirements in Section 1.8 Implementation, this standard shall be used on all projects in relation to national roads development and motorways (including motorway service areas and toll schemes) and any associated infrastructure.

The methodology outlined in this standard and the theory of Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) are presented in an “*Overarching Technical Document*” (OTD) **PE-ENV-01101** and this standard shall be read in conjunction with same.

The OTD, provides guidance on best practice methodology and processes for Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects and for the use of Landscape Character Assessment (LCA) in the establishment of the landscape baseline. Specified projects include road and motorway projects, as well as light railway, metro railway, bus rapid transit (BRT), and cycleways. A comprehensive glossary of terms, abbreviations and acronyms, supporting information sources and guidelines is also available in the OTD.

The documents are **intended for use by suitably qualified professionals** with appropriate **landscape skills** (as defined in section 1.7 of this document and Appendix A of the OTD) carrying out landscape character assessment and landscape and visual impact assessments of national road projects in Ireland, including new construction, road improvements, and, maintenance projects.

The documents will also be used by project managers, environmental co-ordinators, designers, and contractors when interacting with landscape and visual assessments.

The purpose of this Standard is the following:

- Outline the application of LVIA during the planning, assessment and design stages for proposed national road projects, motorway service areas toll schemes, and any associated infrastructure.
- Outline the review process of existing LCAs within the proposed study areas when available, and the application and implementation of LCA in order to ensure appropriate evaluation and analysis of the baseline or receiving landscape within which a national road project is being planned.
- Apply LCA and LVIA in a manner that is proportionate to the complexity, scale, and likely significance of landscape and visual effects of a national road project.
- Provide consistency to the consideration of LCA and LVIA during the planning, selection, design, assessment, and delivery phases of a national road project as set out in TII's Project Management Guidelines (PMG), Project Manager's Manual for Major National Roads (PMM) and Project Appraisal Guidelines (PAG).
- Assist proposed national road projects achieve good assessment, design, and construction regardless of legislative requirements, with ecological fit, enhancement of the landscape, and experience of the road user.

The Standard expands on the advice set out in TII Project Management Guidelines (PMGs) and Project Manager's Manual (PMM), which shall be read in conjunction with these Standards.

1.2.1 The Role of the TII Project Archaeologist

Under the specific terms of the *Code of Practice for Archaeology agreed between the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and Transport Infrastructure Ireland* (Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs and Transport Infrastructure Ireland, 2017), TII will assign a Project Archaeologist to inter alia: oversee the archaeological elements of each TII project from inception to completion; to ensure that any preparatory archaeological work undertaken (including desk-top and field studies) is in keeping with guidelines and best practice; and to be the main point of contact (on cultural heritage matters) with the Department. In the context of this Standards Document, the TII Project Archaeologist shall, therefore, be considered one of the 'relevant project professionals' referenced at a number of locations below.

1.3 Background and Legislative Framework



Figure 2 National roads at edge of urban area (N11, County Wicklow. Photo; Brady Shipman Martin)

Landscape is a broad term. It is the supporting fabric for all natural life and biological organisms including human life and human activity. Landscape is influenced by natural processes: by soils and geology; by climate action and weathering; by the water cycle; by biodiversity, as well as by human intervention, including development and land use, cultural and social associations, and above all by human inhabitation. Human intervention is so prevalent in Ireland that all of our landscapes are subject to human influence.

TII's approach to national roads development aims to provide high quality transport infrastructure and services, delivering a better quality of life and supporting economic growth. Landscape and visual effects need to be considered with many other aspects including engineering constraints, costs, ecology, cultural heritage, recreation, agriculture, forestry, etc.

For the purposes of this Standard, landscape is considered as one of the environmental factors assessed as part of the planning and development of national roads, including motorway service areas. As an environmental factor under Environmental Impact Assessment (EIA), landscape comprises the physical and visual fabric of the landscape resource which may be subject to changes or effects due to proposed developments.

Road infrastructure has been part of the Irish landscape for millennia connecting people and places, and can have a significant impact on the landscape, both positive and negative.

Project Appraisal

The Department of Transport publication which is referred to as the Common Appraisal Framework (CAF) (DoT) provides specific guidelines for the appraisal of transport projects and programmes. All projects must be appraised against the CAF criteria, examining aspects such as economy, safety, accessibility and social inclusion, physical activity, integration and environment. The environment objectives aim to protect the built and natural environment, including reducing the direct and indirect effects of transport projects (and their use) on the environment, including landscape.

Environmental Impact Assessment (EIA)

For the purposes of this Standard, **landscape is considered as one of the environmental factors** assessed as part of the planning and development of national roads, including motorway service areas. As an environmental factor **under Environmental Impact Assessment (EIA)**, landscape comprises the physical and visual fabric of the landscape resource which may be subject to changes or effects due to proposed developments. Landscape will also be considered for national road developments which do not require EIA.

The nature and scale of national roads development requires that **effects on landscape character and visual environment**, positive as well as negative, **are assessed**, and considered during the project development process. Public acceptance of a national roads development is frequently influenced by the extent and significance of its landscape and visual effects. Anticipating and responding appropriately to potentially significant effects informs good planning and design and helps avoid unnecessary delay in delivering these projects. The routing and development of new road developments can be a complex process and can have significant effects on the landscape and visual environment. It requires a balance between a number of issues including; ensuring a functional, safe, and direct road network; adapting to physical and land use constraints; consideration of environmental protection; meeting compliance with engineering and other technical requirements; and, working within expected costs.

Network Design and Landscape Planning

Internationally, there is an increasing recognition of the value of an integrated approach to road design, e.g. *'The road to good design'*, sets out a vision whereby the road network is designed to be inclusive, resilient and to reflect the beauty of the natural, built and historic environment through which it passes while also enhancing such environments where possible (Highways England, 2018).

An appreciation of the landscape character is gained from analysing *'what is significant and what is important'* and is *'fundamental to good landscape planning and management'* (Scottish National Heritage (SNH), 2018). Techniques such as Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) inform planning for sustainable development, inform the management of landscape change, and help ensure the delivery of good design. The consistent use of these techniques aims to facilitate greater consideration, protection, management, and planning of our landscapes with overlaps in cultural heritage, habitats and ecosystem functions and services.

The following Figure 3 is a simplified workflow diagram and how the LCA and LVIA processes interact. The diagram outlines the interaction between the LCA process and the development of the proposed national road and this may occur as part of the design team's iteration of options selection during the concept development.

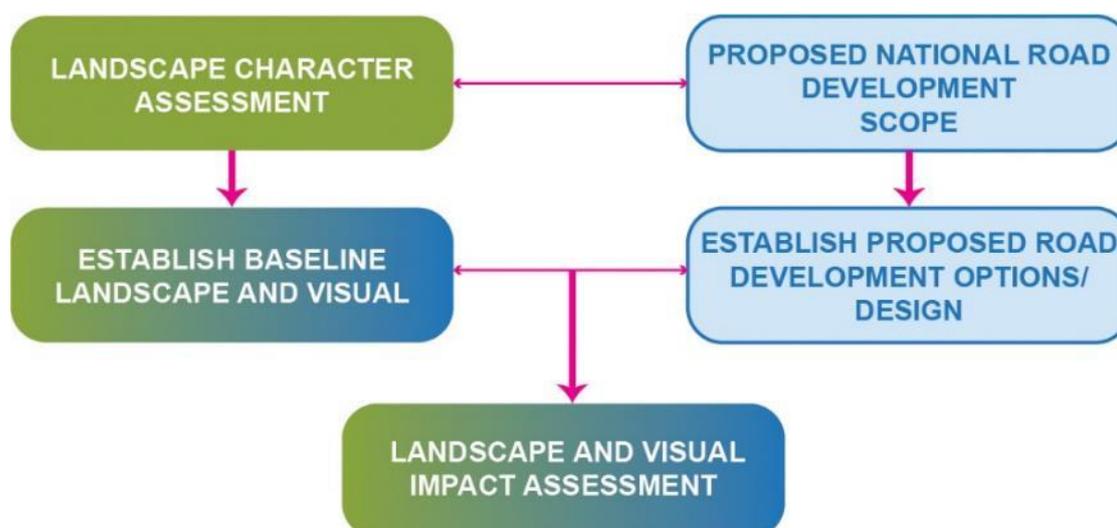


Figure 3 Summary of interactions of LCA, LVIA, and National Road Development

The procedures followed by TII and local authorities in the planning, design, implementation, and management of proposed national road developments are specified in:

- Roads Act, 1993, as amended;
- TII’s Project Management Guidelines (PMGs) (TII);
- TII’s Project Manager’s Manual for Major National Roads (TII);
- TII’s Project Appraisal Guidelines (PAGs) (TII); and,
- As referred to in other standards and guidelines.

The Standards are based on an extensive literature review and analysis of best practice throughout Europe and internationally, which serves to provide the theory behind LCA and LVIA. The Literature Review is available separately at:

- **RE-ENV-01106** - Summary of Literature Review relating to Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of specified infrastructure projects
- **RE-ENV-01107** - Literature Review relating to Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of specified infrastructure projects.

1.4 Terms and Definitions

The following verbal forms are used:

- ‘shall’ or ‘will’ indicates a requirement;
- ‘should’ indicates a recommendation;
- ‘may’ indicates a permission;
- ‘can’ indicates a possibility or a capability.

Information marked as “Note” is for guidance in understanding or clarifying the associated requirement.

Other key definitions include:

Landscape: is 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. (ELC, 2000)

Landscape Character: may be defined as a 'distinct, recognisable, and consistent pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse'. (Natural England, 2012).

Landscape Character Types: are 'distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historic land use and settlement pattern'. (Natural England, 2018). Examples include 'drumlin farmland', or 'upland heath'.

Landscape Character Areas: are 'single unique areas which are the discrete geographical areas of the particular landscape type. Each has its own individual character and identity, even though it shares the same generic characteristics with other areas of the same type'. (Natural England, 2018). Examples include 'Tulla Drumlin Farmland' in County Clare or 'Lough Derg Uplands' in County Donegal.

The general characteristics of a particular landscape are described for a **landscape character type**, with more unique distinctive features of a particular landscape informing the description of the **landscape character areas**.

Landscape Character Assessment (LCA): is the 'process of identifying and describing variation in the character of the landscape. It seeks to identify and explain the unique combination of elements and features (characteristics) that make landscapes distinctive. This process results in the production of a Landscape Character Assessment' (LI/IEMA, 2013) (Natural England, 2018). It includes **cultural** landscapes 'where human interaction with natural systems have over a long period formed a distinctive landscape'. (UNESCO, 2008)

Landscape considerations also include terms such as 'Townscape' and 'Seascape' (see Figure 2 in Section 13 of the *Overarching Technical Document PE-ENV-01101*), and the separate but related term 'Historic Landscape Characterisation'.

Townscape is a subset of landscape and comprises 'landscape within the built-up urban area, including the buildings, the relationship between them, the different types of urban open spaces, including green spaces and the relationship between buildings and open spaces' (LI/IEMA, 2013) (LI, 2018). Throughout this document the term 'landscape' is also used to include 'townscape'.

Seascape is a subset of landscape and comprises / means 'an area of sea, coastline, and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors' (Natural England, 2012). Throughout this document the term 'landscape' may also be used to include 'seascape'.

Historic Landscape Characterisation (HLC) identifies the contribution of the past to the landscape. It looks at the time depth of the existing landscape and applies to all landscape areas, not just particular sites, or monuments. It complements and contributes to LCA by enhancing the historic consideration of historic aspects of the landscape. *'It is a method of recognising the historic character, interest or value or widely different places and environments (rural, urban, coastal, or marine)'*. The Heritage Council has produced a guidance document on Historic Landscape Characterisation (HLC) in Ireland: Policy and Best Practice Guidance (2010). Where applicable to a project, this shall be undertaken by a cultural heritage professional, with input from the landscape professional.

Landscape and Visual Impact Assessment (LVIA): is a tool used to 'identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on (people's) view and visual amenity' (LI/IEMA, 2013).

Landscape effect vs. landscape impact: the terms 'effect' and 'impact' should be clearly defined and used consistently in environmental assessments. 'Impact' is defined as the action been taken, whilst 'effect' is defined as result (change or changes) of that action, e.g. the 'impact' of the project on the woodland has a significant 'effect' on the character of the landscape (LI/IEMA, 2013).

Landscape Impact Assessment (LIA): is the process of evaluating changes to landscape as a resource arising from a proposed development. Society as a whole has an interest in this and it is recognised as one of the key dimensions of environmental interest, alongside matters such as biodiversity, or cultural heritage. It is concerned with issues like protected landscapes, the contribution of landscape character to sense of place and quality of life for all, and the way that change may affect individual components of the landscape.

Visual Impact Assessment (VIA): is the process of evaluating how people's way of experiencing the qualities of a place in visual terms may be specifically affected by change arising from the proposed development, i.e. how the views of individuals or groups of people may be specifically affected by change in the landscape. This means assessing changes at specific viewing locations and in the general visual amenity experienced by particular individuals or groups of people in particular places.

Landscape Sensitivity: The extent to which the inherent character and visual amenity of a landscape are vulnerable to change due to a particular type of development activity. The term is applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor. (LI/IEMA, 2013)

Landscape Capacity: The degree to which 'a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed.' (SNH/NE, 2013)

1.5 Regulatory/Policy Framework

In 2000, the European Landscape Convention (ELC) was produced by the Council of Europe, the aims of which are '*to promote landscape protection, management, and planning, and to organise European co-operation on landscape issues*'. This was the first international convention to focus specifically on landscape. Ireland signed, ratified, and brought this into effect on 1 March 2004 (DFA, 2004). For further discussion on the ELC, refer Chapter 2 of the OTD.

Proposed road and railway infrastructure development is defined under the Roads Act 1993 (as amended), and under the Transport (Railway Infrastructure) Act 2001 (as amended) as requiring an Environmental Impact Assessment. Other relevant legislative and statutory guidance and key influencing documents relevant to the landscape and visual impact assessment is summarised in Figure 4 below.

For further discussion on the regulatory/policy framework refer to Chapter 2 of the OTD and section 2.3 in particular.

LVIA will be carried out either formally or informally as:

- Formally, as part of the preparation of an Environmental Impact Assessment Report (EIAR) (formerly called an Environmental Impact Statement - EIS) for developments above a certain threshold, or sub-threshold if deemed necessary during the screening process where the characteristics, location of the proposed development or characteristics of the potential impacts are determined by the consenting authority are likely to be significant.
- Informally, as a contribution to the assessment of development proposals and consent applications (e.g. Part 8 project). LVIA is a primary tool in landscape assessment and design and will be carried out on sub-threshold/minor projects where may adversely affect the landscape and visual environment.

Each national road development must be assessed in terms of possible effects and even a small change in the geometry of a curve or widening of a road may have significant negative effects. When a proposed national road development, which is not considered EIA development, but which has the potential to have significant effects on landscape assets or features, a landscape assessment shall be carried out. This will need to be screened by the project developer with personnel who have a competency in considering landscape issues related to road projects.

When undertaking such an assessment landscape professionals shall follow these Standards. The format of such an appraisal may not need to satisfy the formal requirements of an EIA, however, it shall as a minimum set out any effects on the landscape and views, and proposed mitigation in a rational and proportional way so that this can be fully considered through the planning, design and construction processes.

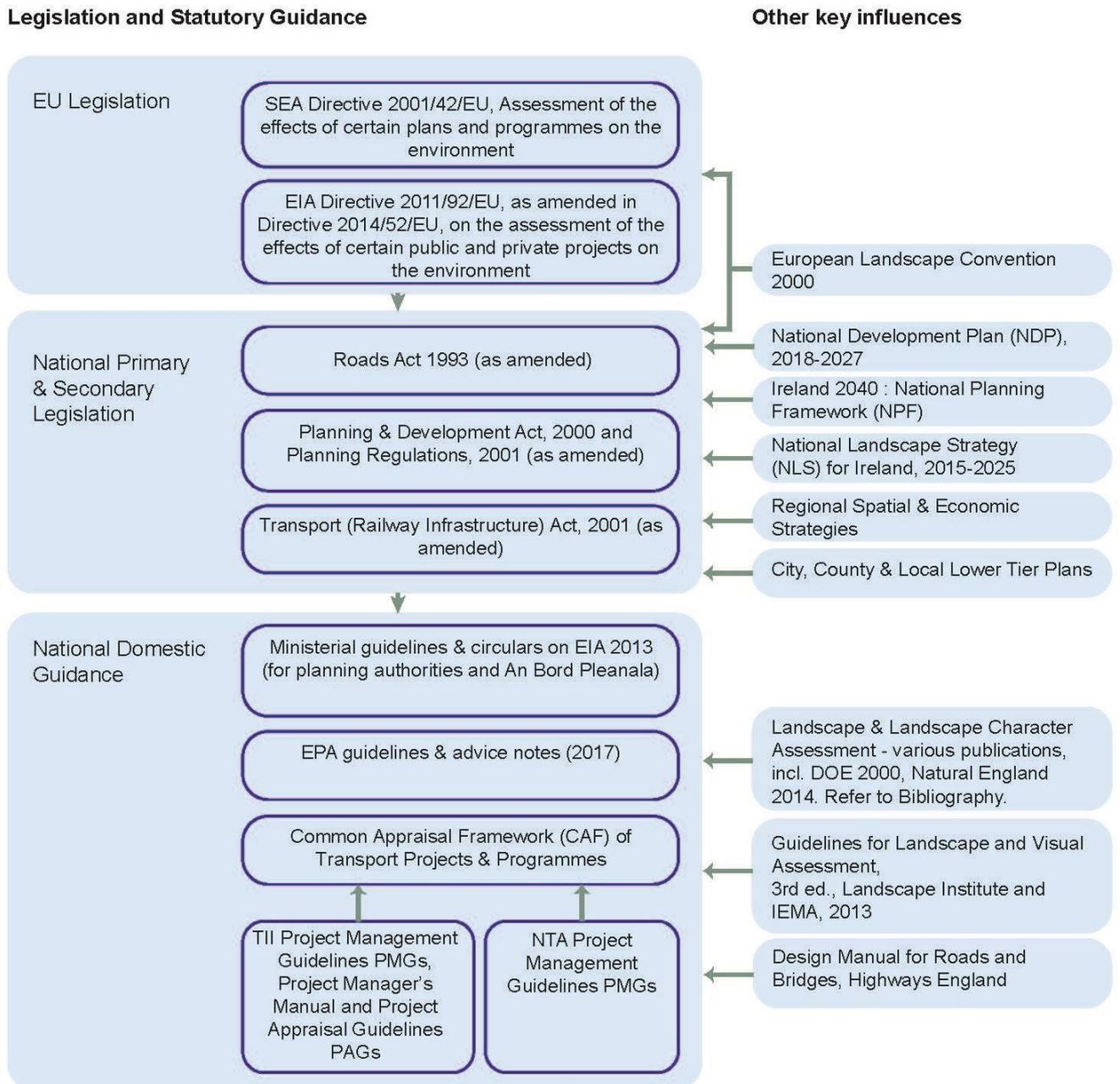


Figure 4 Legislation, statutory guidance and other key influence to LCA/LVIA for roads

Many parts of Ireland are included in statutory and non-statutory landscape specific designations. In particular, landscapes such as National Parks, Natura 2000 sites and Areas of Special Amenity are protected by statutory legislation. Other non-statutory landscapes of importance in Ireland include World Heritage Sites and their wider setting (e.g. Brú na Bóinne) (DCHG, 2017), Geoparks (e.g. Burren and Cliffs of Moher Geopark) (GSI, 2017), Tourism Routes (e.g. Wild Atlantic Way) and Dark Sky Reserves (e.g. Kerry, Mayo). Separately, the Heritage Council is working with the EPA in the preparation of landscape indicators as part of the Strategic Environmental Assessment (SEA) process, as it applies to Plans or Programmes including roads projects, and which will be published in the near future.

Local planning authorities also designate landscapes in Development and Local Area Plans and hold information on regional and local landscapes to which policies apply, and which shall be consulted.

This may include landscape character assessments, designated scenic routes and viewpoints, visually sensitive landscapes, protected landscape features, amenity routes, historic structures/landscapes, objectives for transport, green infrastructure etc.

1.5.1 Environmental Impact Assessment Report (EIAR)

General guidance on the scope and detail of an environmental impact assessment report, including landscape and visual assessment, is available in *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017).

TII also prepared *Environmental Impact Assessment of National Road Schemes – A Practical Guide*, which helps to interpret earlier EIA guidance in the context of road projects (TII). A summary of the process of scoping/screening, baseline assessment, impact assessment for construction and operational stages, and mitigation for an EIAR for a road project and demonstrating how the landscape and visual aspects input to the overall process is provided Figure 5 below. For further details on the requirements of the EIAR, refer to Section 2.7 of the OTD.

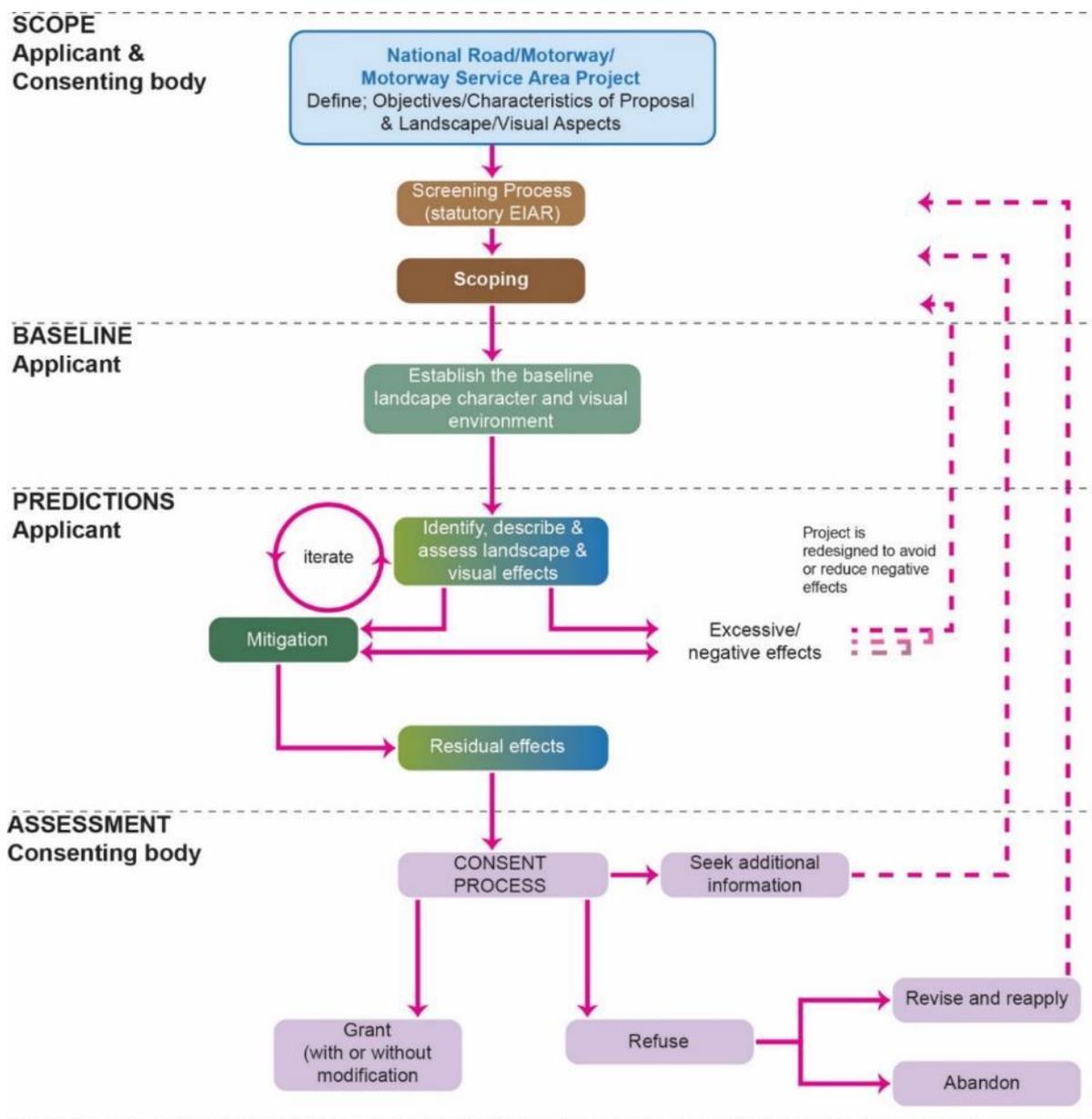


Figure 5 Outline of EIA (including LCA/LVIA) process

1.5.2 Overlaps and Interactions with Other Subjects

Landscapes, whilst visually defined by variations in landscape character, include more than ‘the view’; they are also places and distinct areas, and also provide a wide range of essential services and benefits (also called ecosystem services), including biodiversity, food, drinking water, minerals and construction materials, flood management and climate regulation. They are also *‘reflect and embody our cultural values and our shared natural heritage and contributes to the well-being of our society, environment, and economy. We have an obligation to ourselves and to future generations to promote its sustainable protection, management and planning’* (DCHG, 2015).

Some other topics within an environmental assessment may touch on landscape issues or use landscape data, and care must be taken to co-ordinate the assessment process. This will require liaison and/or workshops between the various specialists at an early stage in order to understand particular sensitivities, identify gaps, eliminate overlaps and co-ordinate mitigation, see Figure 6 below.

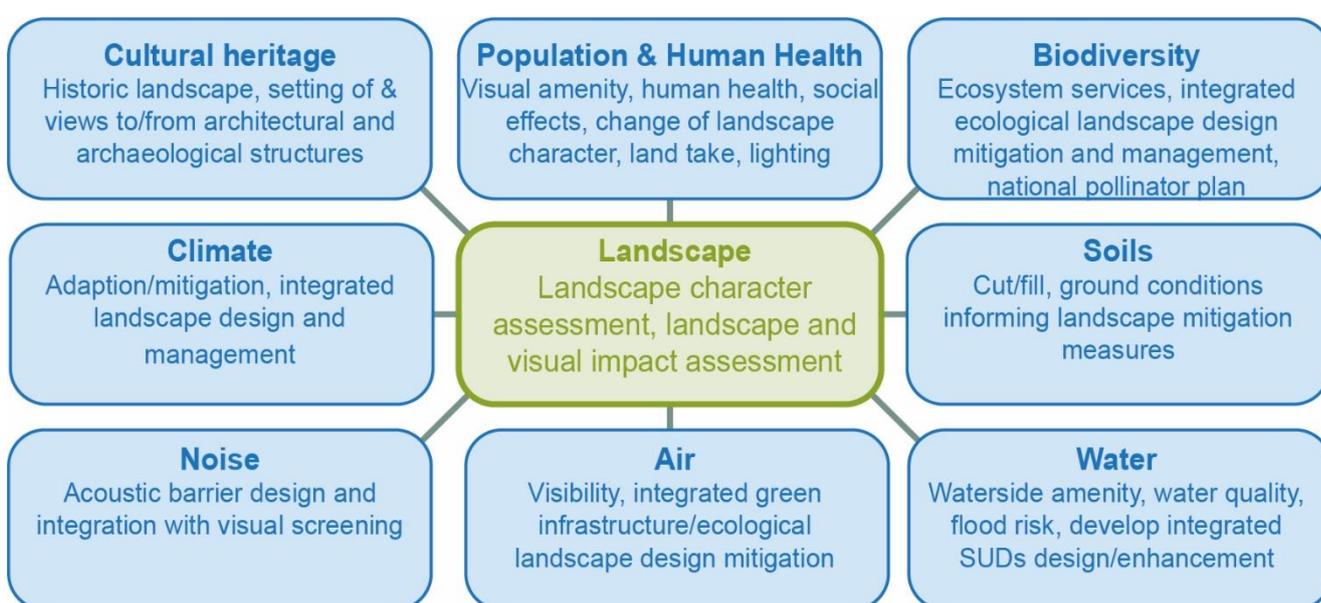


Figure 6 Landscape interactions and overlap with other environmental aspects

This is particularly relevant for Biodiversity assessment, since landscape provides the context for habitats and species, and the potential loss of landscape features and/or land severance/fragmentation will also affect biodiversity.

Another area of potential overlap is the landscape sub-topic within the Cultural Heritage assessment, where the combination of historic landscape evidence and change in the setting of, or views from historic monuments and landscapes, will need to be considered. It is to be noted that cultural landscape assessment differs from Historic Landscape Characterisation (HLC).

Social and community issues may also overlap with the landscape topic (i.e. the way the landscape is used and valued by the local community, e.g. effects on amenity or recreation features).

It is also important to be aware of project mitigation proposals that may affect other topic areas, such as the installation of noise screening that would also have visual implications. Conversely, landscape requirements, such as screen planting, may, for example, disturb archaeological remains, conflict with wildlife considerations, block sightlines, or encroach within ‘forgiving roadside zones’ or ‘clear zones’ required for road safety. Mitigation proposals or measures will be subjected to Design Risk Assessment and co-ordinated with other disciplines and proposals for the development.

A list of reference documents for consideration is provided in OTD document, **PE-ENV-01101**.

During construction and operation stages of a national road project, there may be in-combination, cumulative effects experienced. For example, effects that may arise from the proposed development in combination with other plans and projects proposed/consented but not yet built and operational. This may include noise, air quality, severance, light pollution, water quality, adverse changes to landscape character and visual amenity, which need to be assessed as necessary in the 'Interaction of Effects' Chapter of the EIAR.

1.6 Common Landscape and Visual Effects arising from National Road Developments

National road developments can have a wide range of effects on the landscape and visual environment.

Direct effects can include:

- Loss of landscape elements, including permanent land loss, vegetation loss, severance, loss of built elements such as heritage features (which are part of the existing landscape or townscape fabric).
- Changes in topography resulting from the introduction of earthworks embankments or cuttings.
- Improved access, connectivity, and sense of place.
- Visible, physical changes arising from the introduction of new structures into the receiving landscape or townscape.

Indirect or secondary effects can include:

- Change to the character of a local landscape arising from the visibility of the national road project – visual intrusion
- Awareness of new element within the landscape/townscape.
- Light pollution, noise etc.

A non-exhaustive list of common issues associated with national road projects during construction and operational stages is provided in Table 1 below. This will vary depending on the location, scale, and size of the proposed development, as well as on the existing receiving landscape and visual environment.

Figure 7-10 below illustrate and summarise many of the key features of national road projects in Ireland, together with their relationship to the landscape, seascape, and/or townscape.

Table 1 Impacting features of national road projects on landscape and visual environment

Construction stage effects	Operational stage effects
<p>Construction stage impacts are generally temporary in nature. Depending on the project type, size and location, the construction phase may involve:</p> <ul style="list-style-type: none"> • The movement of machinery and goods, enclosure of temporary works and temporary vehicular and pedestrian traffic management • Land take • Removal of boundaries and vegetation (hedges, scrub, trees etc.) • Severance of landscape/ extinguishment of rights of way • Removal of existing trees and plantings, removal of street furniture, street lighting and paving, and the re-positioning of certain elements/features in the road or streetscape earthworks • Soil stripping, which may be through a number of soil types, which may influence existing vegetation patterns and landscape mitigation measures • Blasting and other excavations (causing high levels of noise and vibration) • Demolition operations • Elevated noise and nuisance • The presence of construction compounds and associated works including trenches and excavated material, building materials, site fencing/hoarding, temporary traffic signs and warning signage, plant and machinery and construction traffic. For larger road projects, there may be a number of these along the route. • Provision of the new carriageways and associated infrastructure, signage etc. • Construction of structures, cranes etc. • Construction of barriers such as berms, fences, median barriers • Construction site drainage • Air pollution and dust deposition • Work associated with site compounds and storage areas • Temporary access routes/haul roads • Site compound, works and vehicle lighting • Movement of plant and vehicles 	<p>Operational impacts are generally considered to have permanent/enduring changes / effects on the landscape or townscape environment.</p> <p>The impacts can include changes to the physical fabric of the landscape, seascape or townscape and visual impacts that arise from changes that affect a particular view or views.</p> <p>National road development and motorways</p> <ul style="list-style-type: none"> • Road cuttings and road embankments • Junctions/roundabouts (at grade/grade separated) • Tunnel portals • Elevated structures (road, rail, waterway bridges/viaducts including earthen embankments and earth retaining / structural walls) • Re-alignments of existing national, regional and local county roads • Positive contribution to landscape or views e.g. feature bridge of aesthetic merit at an appropriate location, creation of new vista to surrounding landscape/landscape feature. • Sense of severance • Perceived diminishment of rural setting • Realignment/reconfiguration of utilities (e.g. overhead powerlines, communications masts) • Lighting (of road and vehicle lighting) • Boundary treatments, fencing, noise and safety barriers/road restraint systems • Signage (gantry, roadside, active digital signage etc.) • Attenuation ponds and other drainage infrastructure • Moving traffic, elevated noise levels • Maintenance depots, compounds, lay-bys • Landscape/ecological mitigation measures <p>Motorway Services Areas</p> <ul style="list-style-type: none"> • Earthworks • Slip roads and parking (car, bus and truck) • Buildings and structures • Fuel forecourts and canopies

Construction stage effects	Operational stage effects
<ul style="list-style-type: none"> • Disturbance associated with the presence of construction staff • Environmental incidents and accidents • Diversion of underground utility services • Widening of roads and streets • Re-allocation of carriageway between different modes of transport, including footpath and cycleway • Removal of kerbs and street furniture, the replacement of kerbs and street furniture (salvaged and new). <p>The construction element of all of these works are generally temporary or short-term impacts, some are intermittent, and should be controlled as part of the overall site management.</p>	<ul style="list-style-type: none"> • Boundary treatments, berms, landscape mitigation planting, noise and safety barriers/road restraint systems • Site furnishings (lighting and signage from forecourt, parking, building and vehicle lighting) <p>Toll Schemes</p> <ul style="list-style-type: none"> • Earthworks • Buildings, toll booths, canopies, service area (staff access, staff parking, storage etc.) • Widened pavement • Lighting (signage, building/toll booth, road and vehicles) • Boundary treatments, berms, landscape mitigation planting, noise and safety barriers/road restraint systems

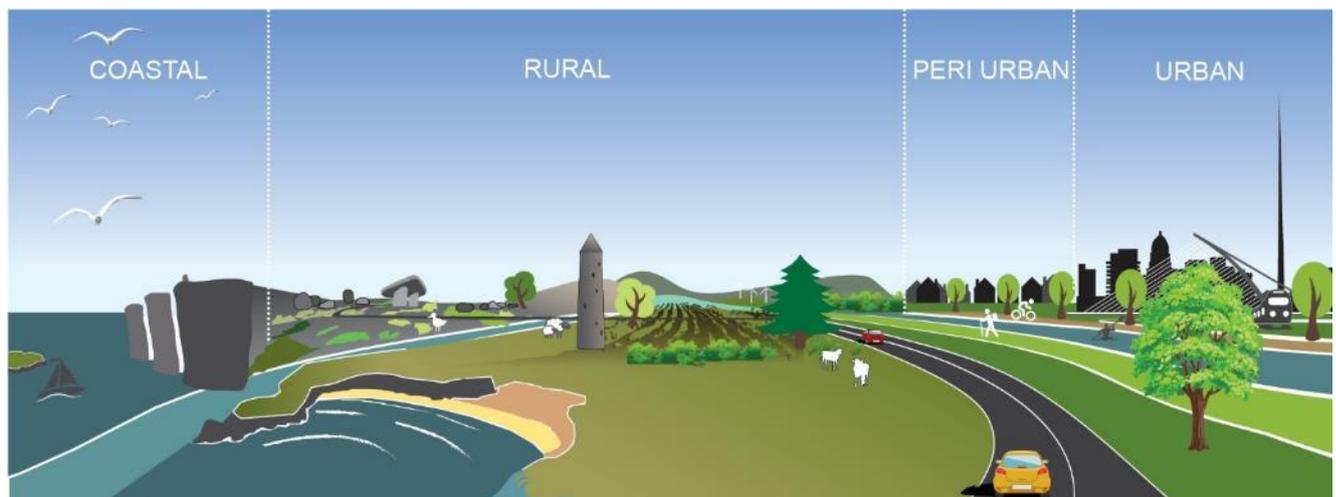


Figure 7 Wide range of landscape types in Ireland

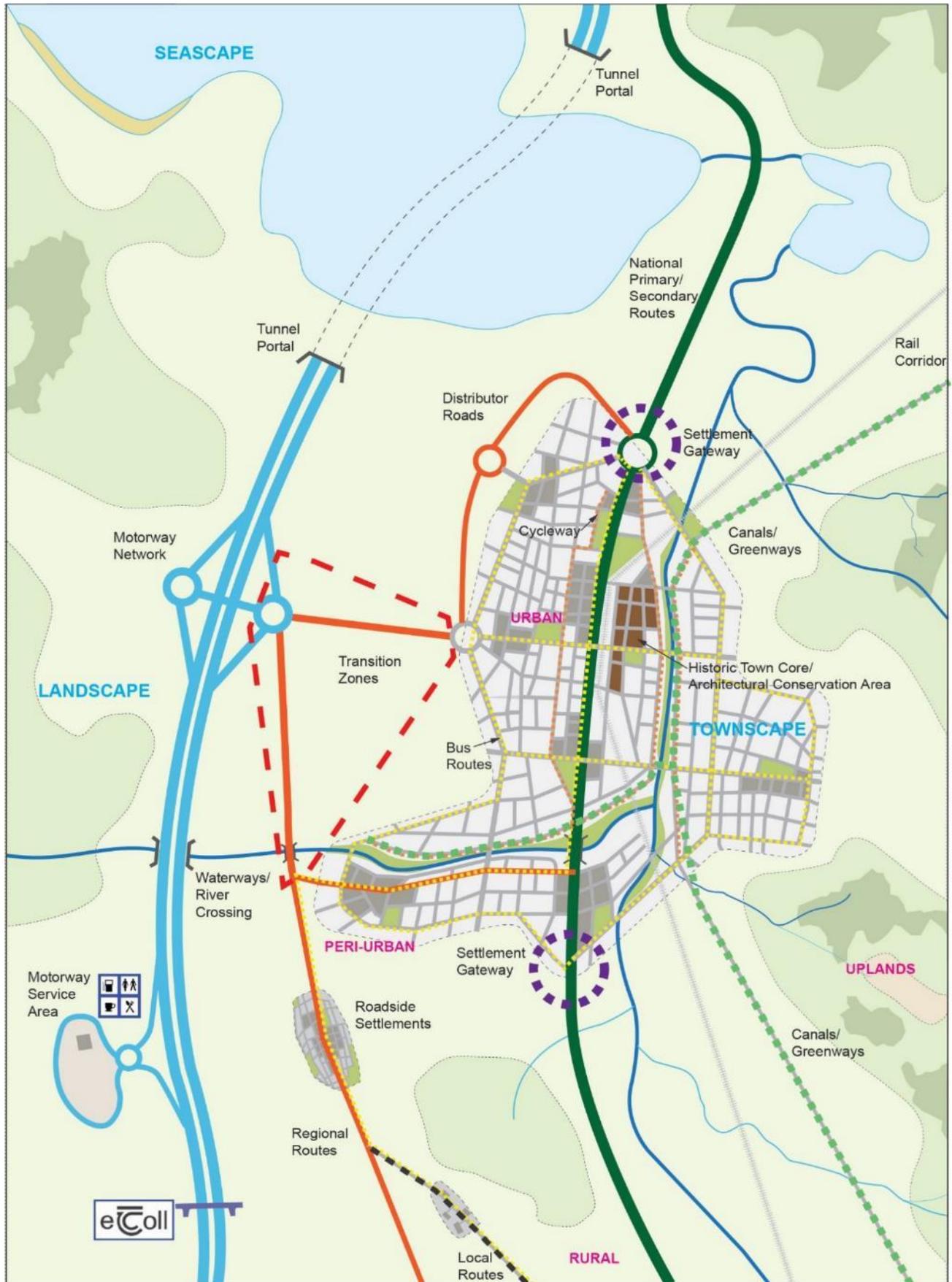


Figure 8 Types of transport infrastructure in the landscape



Figure 9 A bridge can be a significant landscape element (N25, Waterford. Photo; Brady Shipman Martin)



Figure 10 Transport corridor interfaces (M50/N4, Dublin. Photo; Brady Shipman Martin)

1.7 Requirements of Landscape Professional

Directive 2011/92/EU, as amended by Directive 2014/52/EU, stipulates that the EIAR and assessments must be carried out by competent experts. Where required for national road projects, the Landscape and Visual Impact Assessment (LVIA) for Project Phases 2-4 will be carried by a suitably qualified and competent landscape professional who has a previous experience in this field.

Roads are an important element of the landscape, so it is essential that their design responds to the landscape through which they pass, making an important contribution to the conservation and enhancement of the natural and cultural environment. Opportunities to incorporate 'green and blue infrastructure' (natural and semi-natural features, planting, water, ecology) within road design will be considered from early stages, with recognition of the goods and services it can deliver for people and nature over its lifetime.

The involvement of landscape professionals early in the design and evaluation process will deliver positive integration and wider place-making benefits.

Where Part 8 projects are proposed by local authorities for a national road project, which are likely to significantly affect landscape assets or features, the Council's officials (road engineer/heritage/planning/architectural officers) shall seek additional landscape expertise early in the project development, assessment, and design process.

The specific requirements of the Landscape Professional in the EIA process are outlined in **Appendix A** of these Standards, and Section 1.3 and Appendix A of the OTD for further details.

1.8 Implementation

This Standard shall be used forthwith in the planning, design and construction of national road projects that:

- require approval under Section 51 of the Roads Act, 1993, as amended (proposed road development subject to Environmental Impact Assessment);
- require approval under Section 177AE of the Planning and Development Act, 2000, as amended (certain local authority development subject to Appropriate Assessment); or
- are subject to the procedure established under Section 179 of the Planning and Development Act, 2000, as amended, and Part 8 of the Planning and Development Regulations, 2001, as amended (known as the 'Part 8' procedure).

In relation to the:

- the planning, design and construction of all other national road projects; and,
- the maintenance of national roads,

the contents of this Standard shall be:

- treated as advice and guidance;
- employed to the greatest extent reasonably practicable; and,
- applied in a proportionate manner, having regard to the characteristics and location of the project/maintenance works and the type and characteristics of potential impacts.

It is appropriate and necessary that this Standard is applied in a transitional manner. Where projects requiring approval under Section 51, Section 177AE or Part 8 have, at the date of publication of this Standard, commenced planning and design and, in particular, where technical advisor contracts have been executed, this Standard should also be:

- treated as advice and guidance;
- employed to the greatest extent reasonably practicable; and,
- applied in a proportionate manner, having regard to the characteristics and location of the project/maintenance works and the type and characteristics of potential impacts.

2. Overview of LCA/LVIA Processes

Proposed national road developments can have significant effects on the landscape character and visual environment along their length. LCA and LVIA are key tools in understanding, assessing and mitigating these effects. While there are strong links between LCA and LVIA, they are separate tools of assessment.

In brief:

- LCA provides a baseline study of the existing landscape character;
- LVIA assesses the significance of effects of change resulting from a particular proposed development on that receiving landscape character and the visual environment.

Within LVIA there is a clear distinction between effects on the landscape character and effects on the visual environment. An iterative relationship exists with regard to the applications of LCA and LVIA for a proposed project, with the outputs of LCA providing criteria for judgements carried out as part of LVIA.

Objectives of the LCA/LVIA assessment process are to:

- Avoid or reduce the negative impacts of the final road option on the landscape character and visual environment,
- Accommodate the road project and associated infrastructure within the landscape context sensitively and in keeping with the landform and the built, natural and community environments through which it passes,
- Contribute to the quality of the landscape, public space and the road-user experience, where possible.

TII's **Project Management Guidelines** (PMGs) (TII), **Project Manager's Manual** (TII), and associated **Project Appraisal Guidelines** (PAGs) (TII) provide a framework for a phased and structured approach to the management of the planning, design, development and delivery of National Road and Public Transport Capital Projects. The landscape and visual assessment will follow these guidelines.

Refer to the Overarching Technical Document **PE-ENV-01101** for further detail on the application of LCA (Section 4) and LVIA (Section 5).

2.1 Key Principles and Deliverables of the LCA/LVIA Assessment Process

The LCA and LVIA processes will:

- Be carried out where there may be potential to be likely significant landscape and visual effects.
- Be proportional to the nature and scale of the project as it relates to the receiving landscape.
- Be carried out by a landscape professional with competence and relevant experience as outlined in *Section 1.7*.
- Understand the scale, nature, and characteristics of the proposal.
- Provide input to the road design and decision making process as part of the iterative process during options selection, design development, and preparation of contract requirements.
- Identify data, opportunities, and constraints within the landscape study area and adjacent areas if there are possible intervisibility or distant effects.
- Describe the methodology used in the LCA and/or LVIA including the citing of key references and sources. Explain the facts, assumptions and basis of the assessment in order to ensure a transparent process and provide a rationale for conclusions and decisions.
- Analyse and document the nature of the landscape, its character, and visual sensitivities, through;
 - Baseline landscape appraisal through the LCA process or through the analysis of existing LCAs is available and are considered 'fit for purpose'
 - Baseline visual appraisal of the landscape visual environment and the potential viewers.
 - Understand, document and assess the condition, value, and sensitivity of the landscape character, landscape features, and visual aspects as they relate to the proposed development.
- Compare options, selecting the option with least impact or for which the most significant mitigation is possible. Potentially modify the location, alignment, layout, design etc. of all options to achieve best environmental fit.
- Prepare strategies to avoid or reduce significant negative effects and ensure opportunities for landscape improvements are utilised.
- Identify Landscape and Visual effects and the range of possible interactions between aspects of the proposed development and the baseline landscape and visual environment.
- Provide clear, rational, systematic, impartial and objective recording and analysis of the receiving landscape and visual environment and assessment of the likely significant effects and opportunities, at opening year and 15 years after screen planting has established.
- Ensure that detailed and equal consideration are given to both effects on the landscape as a resource and effects on views and visual amenity as experienced by people.

- Provide guidance and details on the mitigation measures proposed. Develop mitigation measures, including:
 - Landscape masterplan, sections, details (as appropriate).
 - Schedule of specific landscape measures that are required for mitigation of expected impacts and provide performance specifications, appropriate to the landscape mitigation measures proposed.
 - Consideration of life cycle costs associated with landscape mitigation strategies and proposals, including aftercare, maintenance and suggested monitoring regime.
- Use good quality photography, graphics and mapping illustrations. See *Visual Representation of Development Proposals* (LI, 2019).

2.1.1 Avoidance and Mitigation of Landscape and Visual Effects

When impacts on the landscape are unavoidable, a variety of mitigation measures can be introduced to avoid, reduce, or remedy these impacts.

An iterative design approach with LVIA is required to ensure a coordinated approach to the assessments. Analysis of landscape and visual character of a project, and its context and approaches to routing/siting and design, can minimise possible landscape and visual effects early in the process. It can also offer opportunities for enhancement of the landscape and road user experience, e.g. opportunities for new vistas or introduction of positive focal point features within the landscape.

Mitigation measures will be developed throughout the TII PMG process to avoid reduce, remedy or compensate to address likely significant negative effects on the landscape and visual environment, including:

- **Primary mitigation measures**, developed through an iterative design process through avoidance and prevention, minimising/education and offsetting, which have become integrated mainstream components of the project design.
- **Standard construction practices** for avoiding and minimising landscape and visual effects.
- **Measures** designed to **address any adverse effects** remaining after primary measures and standard construction practices have been incorporated into the national road project, e.g. screening, repairing through mounding, ecological landscape planting etc.
- **Compensation and enhancement.** Roads are an important element of the landscape, so it is essential that their design responds to the landscape through which they pass, making an important contribution to the conservation and enhancement of the natural and cultural environment. The involvement of landscape professionals early in the design and evaluation process will deliver positive integration and wider place-making benefits. Opportunities to incorporate 'green and blue infrastructure' (natural and semi-natural features, planting, water, ecology) within road design shall be considered from early stages, with recognition of the goods and services it can deliver for people and nature over its lifetime.

These will be considered in all of the PMG Project Stages – see guidance in Figure 11 below. It is important to be able to demonstrate that measures to mitigate negative landscape and visual effects and any enhancement measures are deliverable, safe, and manageable in practice.

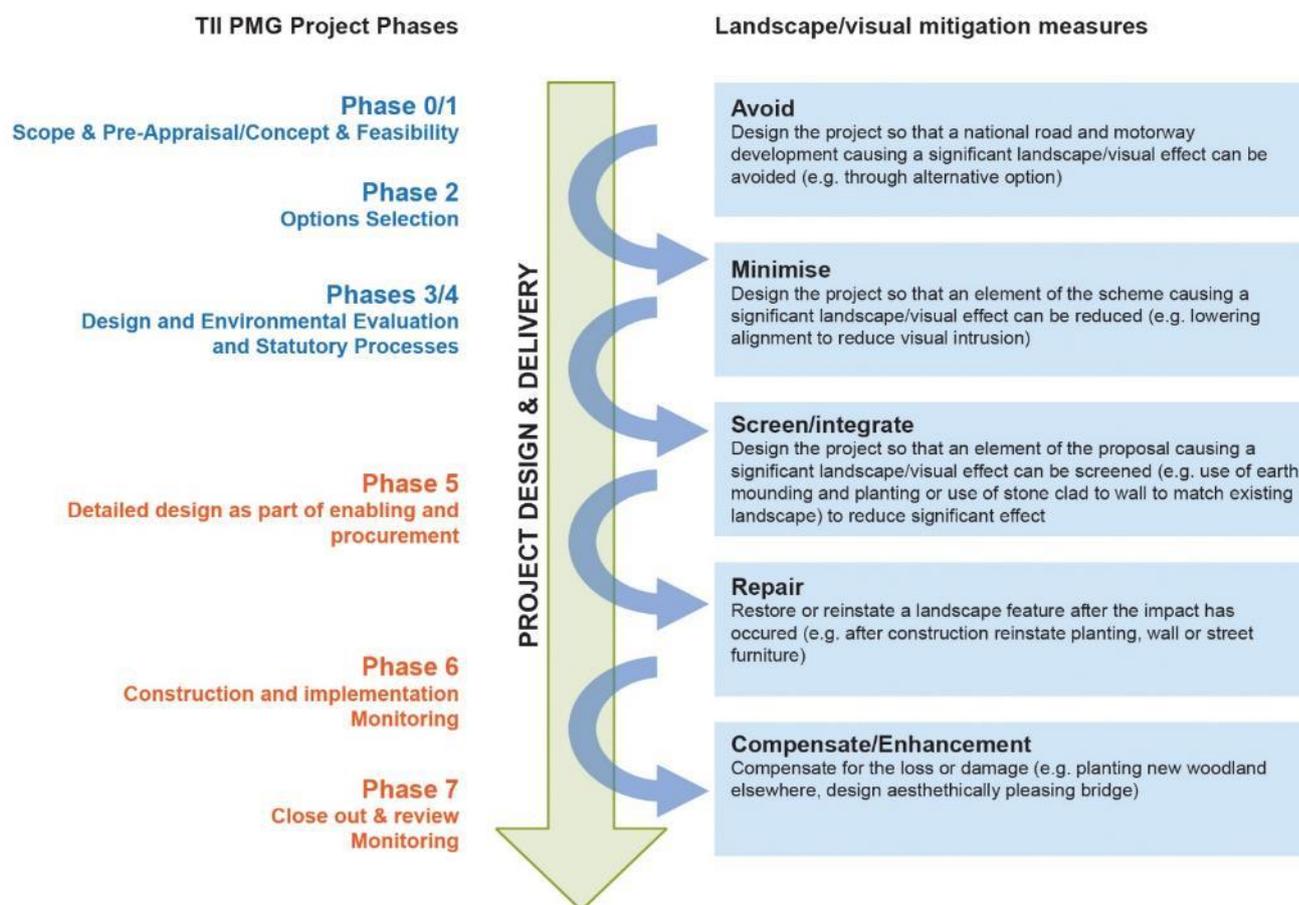


Figure 11 Landscape and visual mitigation measures through Design/Assessment Process

The principles and general guidance to landscape design mitigation, compensation, enhancement and management promote the use of an ‘ecological landscape design approach’ on national road developments (where appropriate), which is available in supporting TII landscape guidance documents **GE-ENV-01102** (TII) and **GE-ENV-01103** (TII).

2.2 Project Management Guidelines (PMG), Project Manager’s Manuals for Major and Minor National Roads Projects (PMMs) and Project Appraisal Guidelines (PAG)

The TII PMGs, PMMs and PAGs are applicable to all Projects which are funded through Transport Infrastructure Ireland (TII) and/or TII as the Sanctioning Authority, and are used by Project Managers and those responsible for the delivery of such projects.

A key objective of the TII PMG and PAGs is to ensure the efficient delivery of the national roads programme in a manner which minimises adverse human and environmental effects while maximising the benefits of the new road infrastructure and respecting all applicable legislation. The PMGs and PMMs follow a consistent, structured, and standardised phased process from an initial Phase 0 Scoping Report through to Phase 1 Concept & Feasibility, Phase 2 Options Selection, Phase 3 Environmental Evaluation and subsequent construction and implementation Phases 5 to 7 – see Figure 12 below.

PAGs provide specific guidance and tools on the appraisal of projects (minor to major projects, motorway service areas etc.).

The PMGs, PMMs, and PAGs also outline the various environmental processes required for various scales of project ranging from minor to major projects, including landscape and visual aspects. Public consultation and engagement are key steps which are outlined in Phases 2, 3 and 4 (in accordance with TII Strategy, PMGs, and Aarhus Convention).

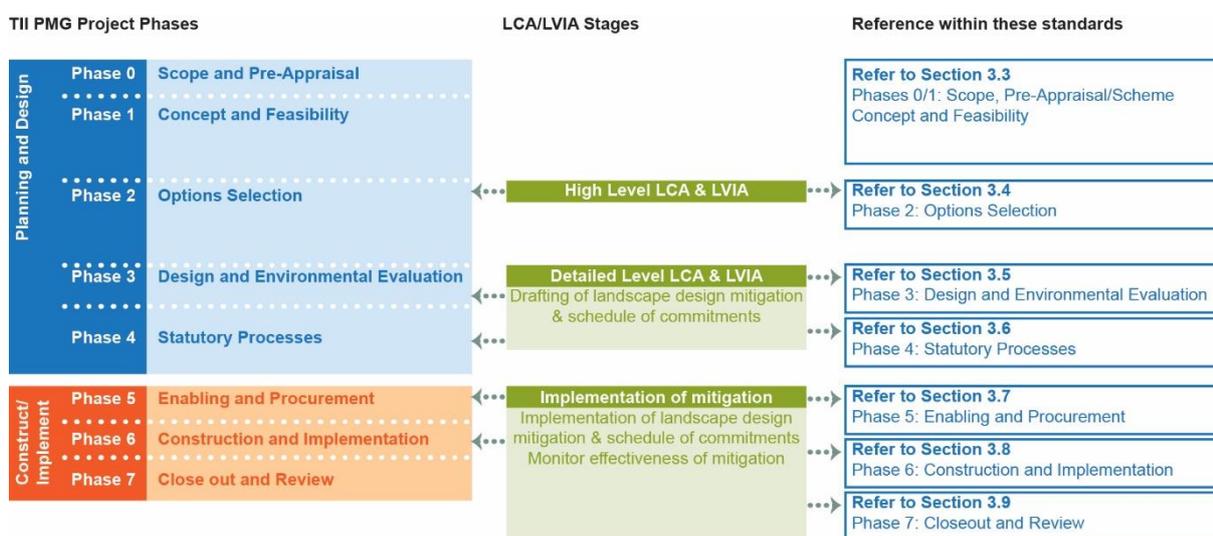


Figure 12 TII PMG Phases and LCA/LVIA inputs/outputs

Landscape and visual impact assessment will follow TII PMGs, PMMs and PAGs objectives, processes, and outputs.

Phases 0-7 are outlined in the Project Management Guidelines (TII).

The initial **Phases 0 (Scope and Pre-Appraisal) and 1 (Concept and Feasibility)** – see *Section 3.4*, are carried out by the Project Manager.

As part of **Phase 2 (Options selection)** – see *Section 3.5*, the following will be carried out by the Landscape Professional:

- Baseline (high level) landscape character and visual appraisal.
- An appraisal of the existing landscape and visual constraints, which when combined with other environmental or project objectives, will provide for the selection of a preferred option which best fits the environment and project objectives.

This phase of comparatively evaluating different options can be very useful as a means to encouraging public participation and engagement with the national road project, as set out in *Project Management Guidelines PE-PMG-02041* and *Project Manager's Manual for Major National Roads PE-PMG-02042*.

For minor projects, which may be sub-threshold in relation to the EIA thresholds, this high level landscape appraisal allows for an informed design response to the proposed national road and assists in helping to integrate the project into the landscape and minimise project delivery risks.

For major projects (value >€20m), a variety of options will be assessed using a multiple criteria analysis (MCA) process (see *Section 3.4*), with the objective of selecting a preferred option.

This is carried out in order to ensure that the process of identifying mitigation measures is carried out thus avoiding significant effects where possible, and where not, identifying and integrating reduction, and/or remedial measures into the preferred project. These are then considered in further detail in the next design and evaluation phase.

During **Phase 3, (Design and Evaluation)** – see *Section 3.5*, the project enters a more detailed design stage. The Roads Act 1993, as amended, requires the mandatory preparation of an EIAR in respect of certain projects above a prescribed threshold, e.g. a motorway.

All other 'proposed road development' must be screened for EIA. A **subthreshold project** may have significant effects upon a sensitive landscape characteristic or visual receptors and require assessment. The LCA/LVIA assessment report shall be divided between landscape and visual effects with distinct sections covering baseline, description and significance of effects. The report shall be illustrated with figure maps to show any designated areas, landscape constraints and principal features. Key viewpoints and villages or larger centres of population which may experience potential visual effects will also be shown. The proposed project will be illustrated highlighting those elements (where known) which would result in changes to the landscape, such as cuttings, embankments, junctions and the alignment of any new roads and lighting, gantries, signs and other road infrastructure.

During Phase 3 technical, environmental design and evaluation of the project are prepared to a sufficient level of detail that allows for:

- the establishment of land-take/footprint requirements, and,
- a detailed LVIA chapter/report.

The LVIA will assess the significant likely effects on the landscape and visual environment arising from the construction and operation of the proposed national road project. Regardless of the size of the project, the methodology for LVIA will be the same. The LVIA will be proportionate to the size and scale of the project, and sensitivity of the receiving landscape or series of landscapes through which the road will pass through.

The baseline landscape and visual aspects in the area of the proposed national road project are described and mapped, based on information provided by consultees, background sources of information, and the results of field surveys carried out.

Significant effects on the landscape and visual environment arising from the national road project will be identified and assessed for their significance of impacts, which depends on:

- the type of impact;
- the magnitude or scale of the impact;
- duration whether it is a permanent or temporary impact;
- the importance of the receptor as a landscape component (or the number of people affected, what they are doing and the context of the view).

It should be remembered that impacts can be positive as well as negative.

Design mitigation measures to avoid, reduce, or remedy these effects are integrated into the national road design with any expected residual effects being further assessed in order to assure impacts are reduced to a minimum level. Mitigation measures may include detailed horizontal and vertical alignment, landform/grading, screen planting etc., to avoid, minimise, screen/integrate impacts and compensate/enhance the landscape and visual environment.

Screen planting can be expected to take a number of years to establish, mature, and become effective. The amending Directive 2014/52/EU requires that the EIAR contain a description of '*any proposed monitoring arrangements (for example the preparation of a post-project analysis).*' For landscape remedial measures, this shall include a statement on how the monitoring of screen planting will be undertaken, for example:

- in the first year after opening (opening year), to ensure the achievement of the design intent (outlined in landscape mitigation strategy and landscape masterplan); and,
- at year 3 (or more frequent if necessary) to ensure the planting has sufficiently established and maturing as required by mitigation requirement.

Phase 4 (Statutory process) - see *Section 3.6*, is when the proposed national road design and related assessments are published, considered and decided upon by the relevant planning authority through various means (including Part 8 of the Planning Regulations 2001), or statutory planning process which includes an oral hearing and public consultation. Depending the outcome of the statutory process, other specific mitigation measures, and conditions of consent may need to be incorporated into the design and schedule of mitigation commitments.

While the carrying out of LCAs and LVIAs occurs in TII's Phases 1-4, the implementation/ monitoring of mitigation measures occur in Phases 5 to 7.

TII plan to create more detailed landscape standards in the future to specifically address these latter phases of development.

3. Application of LCA/LVIA to TII Road Projects

3.1 TII Project Thresholds

TII projects are classified as either Minor or Major Projects by project threshold value. Projects are assessed and delivered through various Phases (see *PE-PAG-02009 Unit 1.0*). This chapter outlines the Project Thresholds and Phases, and the LCA and LVIA outputs required for each.

In general the full extent of these Standards do not apply to TII Projects of less than €5 million. There are other Road pavement and Safety Schemes which are not considered under TII PMGs. LCA/LVIA will only need to be carried where there may be the potential to have significant effects on the landscape character or characteristics, and/or visual receptors. This will need to be screened by the project developer with personnel who have a competency in considering landscape issues related to road projects. The assessment will be a proportionate LCA/LVIA during the project planning and design phases to ensure minimal impact on the receiving landscape.

The complexity of Projects between €5 and €20 million can vary considerably. The upgrading of a section of a National Road will most likely not require the same level of landscape character assessment or of landscape and visual assessment as a new bypass of a town or a new urban relief road. Therefore, **the level of landscape character assessment and of landscape and visual impact assessment should be proportionate to the sensitivity of the baseline landscape and visual environment and to the nature and scale of the Project.**

TII projects are classified into three main categories, each requiring a different and proportionate level of appraisal, as defined in PAG Unit 1.0, and are summarised below.

3.1.1.1 Major Projects (>€20m)

Major projects are those defined as costing in excess of €20m. Major projects typically involve improvements to significant lengths of the national road network be they on line or off line upgrades, large scale junction improvements, structures/bridges or tunnels.

Motorway Service Areas also generally fall under the definition of major projects but are subject to a bespoke appraisal technique as outlined in *PAG Unit 6.8: Appraisal of Motorway Service Areas*.

These Standards will apply in full to all major national road projects.

3.1.1.2 Minor Projects (€5m to €20m)

Minor Projects (€5m to €20m) are those national road projects which are less complex in nature and typically involve lengths of improvement to the national road network, junction/bridge improvements, or combination of road and junction improvements.

Minor Projects (€5m to €20m) need to be appraised in accordance with *PAG Unit 12.0 – Minor Projects (€5m to €20m)*.

The complexity of Projects between €5 and €20 million can vary considerably. The upgrading of a section of an existing National Road may not require the same level of landscape character assessment or of landscape and visual assessment as a new bypass of a town or motorway project. Therefore, the level of landscape character assessment and of landscape and visual impact assessment should be proportionate to the sensitivity of the baseline landscape and visual environment and to the nature and scale of the Project. The level of detail in the assessment will vary and will be based on the judgement of the landscape professional, with the basis of assessment and rationale clearly documented, and will follow these Standards to provide consistency of assessment.

A high level LCA/LVIA to assess the significance of effects may be adequate. For more complex projects where there are likely to be many significant effects, or where there are high/high sensitive receptors likely to be impacted, a comprehensive and detailed landscape and visual assessment will be required. Minor road projects may have significant effects on the environment (e.g. high sensitive landscapes) and thus assessment should not be based solely on the costs of the project. How this is carried out will be recorded in TII's Project Execution Plan (PEP) for that particular Project.

3.1.1.3 Minor Projects (€0.5m to €5m)

The second category of Minor Projects encompasses national road projects falling within the value of €0.5m to €5m.

In general the full extent of these Standards do not apply to TII Projects of less than €5 million, unless EIA is required, or where there may be potential for likely significant landscape and visual effects. For example, at the project scoping stage of a Minor Improvement Scheme (e.g. removal of a sub-standard bend), a strategic level appraisal will be made. A small scale project in a location of particular landscape sensitivity or rare landscape element/feature may require further landscape analysis, assessment, mitigation/enhancement measures developed with the project, and the Project Manager shall seek advice from a Landscape Professional, as required.

3.2 Overview: Incorporating Landscape and Visual Considerations into TII PMG Phases, relative to PAG Thresholds

Project Management Guidelines (PMGs) and **Project Manager's Manual (PMM)** provide a framework for, and a phased approach to, the development, management, and delivery of transport projects.

Project Appraisal Guidelines (PAGs) provide guidance on project threshold values, appraisal of Minor Projects to ensure proportionality of appraisal, guidance for specific topics such as Motorway Service Areas, and use of Multi-Criteria Analysis.

Multi-Criteria Analysis (MCA) are generally used in the ranking of options at options assessment stage. MCAs comprise three criteria: Engineering, Environment, and Economy with landscape and visual outputs recorded under 'Environment'.

The Project Appraisal Guidelines (PAG) deliverables are required to be reviewed as the project moves through the various project PMG phases, and revised and updated as more data and information becomes available.

The focus of this Standard is on the Planning and Design (PMG Phases 2-4) and TII will be developing Construction and Commissioning (CC), Asset Management and Maintenance (AM) Standards (PMG Phases 5-7) in the future.

Minor Projects and Major Projects with objectives, processes, and deliverables within each phase of a Project are outlined in Sections 0 to 3.6 below.

By including Phases 5-7, it is not the intent of this Standards Document to merge the LVIA and landscape design processes, or infer that the LVIA professional must also be the landscape designer for the project. Very often these will be carried out by different landscape professionals at different times – it is therefore important that key landscape mitigation strategies, objectives, and specific measures are clearly documented.

On completion of all projects, the delivery of mitigation strategies shall be recorded in CAD/GIS format as the 'as-built' landscape files which are then used as the baseline for development of the maintenance strategy to achieve the design intent. Refer to TII's **CC-CMG-04001** '*Preparation and Delivery Requirements for As-Built Records*'.

A colour code is used to distinguish between **Planning and Design** for Phase 0-4 and **Construction/Implementation** for Phase 5-7 activities.

3.2.1 TII Project Phases, LCA and LVIA Outputs - Summary

Table 2-4 below illustrate where these Standards apply across the Project Thresholds and the Project Phases, together with the outputs of the LCA/LVIA process.

Table 2 TII Major Projects, Phases, Processes, Interaction with LCA / LVIA and Outputs

TII Project Threshold Major Projects Greater than €20 million: PE-PMG-02041				
PMG Project Phase	Project Phase Stages & Process	Output Ref.	LCA / LVIA Output (See PE-ENV-01102 for national roads projects) proportionate to the nature and scale of the project, by Landscape Professional	
Phase 2: Option Selection (Selection of Preferred Option through a narrowing of options)	Stage 1 – Preliminary Options Assessment (For all feasible options)	2.1a	Landscape and visual constraints. LCA Mapping and Report (see Section 4 of the Overarching Technical Document (PE-ENV-01101) and description relevant to the identified options.	
		2.1b	LVIA reporting (using baseline LCA) as part of Stage 1 of Options Assessment Report.	
		2.1c	LVIA input under Environment to MCA / Project Appraisal Deliverables.	
	Stage 2 – Project Appraisal Matrix (Assessment of a reduced number of options)	2.2a	LVIA reporting (using LCA) as part of Stage 2 of Options Assessment Report.	
		2.2b	LVIA input under Environment to MCA / Project Appraisal Deliverables.	
	Stage 3 – Preferred Option (Select preferred option for scheme)	2.3a	Summarise LVIA of Preferred Option for Stage 3 of Options Assessment Report.	
		2.3b	LVIA input to Project Appraisal Deliverables.	
	Phase 3: Design and Environmental Evaluation	Project design development (taking account of technical and environmental inputs) Progress Project towards publication for Statutory Process Phase.	3.4a	Detailed LVIA for Preferred Option (based on LCA); including description of baseline; assessment of landscape and visual effects, interactions, cumulative effects; detailing of mitigation measures, etc. either as standalone LVIA Report, or where required, as Chapter of EIA Report (EIAR).
			3.5a	Landscape Strategy Report and Landscape Mitigation Plan/input to Schedule of Commitments.
3.5b			LVIA input to Project Appraisal Deliverables, where required.	
Phase 4: Statutory Process	Approval Process (respond to any requests from consenting authority; prepare for and participate in oral hearing, if required; review approval and conditions)	4.6a	Respond to LCA/LVIA queries and submissions, where required.	
		4.6b	Draft Statement of Evidence for LVIA.	
		4.6c	Finalise Statement of Evidence for LVIA.	
		4.6d	Present Statement and respond to questions at Oral Hearing, where required.	
		4.6e	Review LVIA aspects of approval, where required.	

Table 3 TII Minor Projects (€5-€20m), Phases, Processes, Interaction with LCA / LVIA and Outputs

TII Minor Projects €5 to €20 million: PAG Unit 12 (PE-PAG-02035)			
PMG Project Phase	Project Phase Stages & Process	Output Ref.	LCA / LVIA Output (See PE-ENV-01102 for national roads projects), will be proportionate to the nature and scale of the project, scoped by Landscape Professional
Phase 2: Option Selection (Selection of Preferred Option through a narrowing of options) Depending on Project Characteristics options selection may be amalgamated.	Stage 1 – Preliminary Options Assessment (for a number of feasible options)	2.1a	Landscape and visual constraints. LCA Mapping and Report (see Section 4 of the Overarching Technical Document (PE-ENV-01101) and description relevant to the identified options.
		2.1b	LVIA reporting (using baseline LCA) as part of Stage 1 of Options Assessment Report.
		2.1c	LVIA input under Environment to MCA / Project Appraisal Deliverables.
	Stage 2 – Project Appraisal Matrix (Assessment of a reduced number of options)	2.2a	LVIA reporting (using LCA) as part of Stage 2 of Options Assessment Report.
		2.2b	LVIA input under Environment to MCA / Project Appraisal Deliverables.
	Stage 3 – Preferred Option (Select preferred option for scheme)	2.3a	Summarise LVIA of Preferred Option for Stage 3 of Options Assessment Report.
	2.3b	LVIA input to Project Appraisal Deliverables.	
Phase 3: Design and Environmental Evaluation	Project Design Development (taking account of technical and environmental inputs) Progress Project towards publication for Statutory Process Phase.	3.4a	Detailed LVIA for Preferred Option (based on LCA); including description of baseline; assessment of landscape and visual effects, interactions, cumulative effects; detailing of mitigation measures, etc. either as standalone LVIA Report, or where required as Chapter of EIA Report (EIAR). Separate not-technical summary where EIAR required.
		3.5a	Landscape Strategy Report and Landscape Mitigation Plan/input to schedule of commitments.
		3.5b	LVIA input to Project Appraisal Deliverables, where required.
Phase 4: Statutory Process	Approval Process (If required: respond to any requests from consenting authority; prepare for and participate in oral hearing; review approval and conditions)	4.6a	Detailed response to LCA/LVIA queries and submissions, where appropriate.
		4.6b	Draft Statement of Evidence for LVIA
		4.6c	Finalise Statement of Evidence for LVIA, where required.
		4.6d	Present and respond to questions at Oral Hearing, where required.
		4.6e	Review LVIA aspects of approval, where required.

Table 4 TII Minor Projects (€0.5-€5m), Phases, Processes, Interaction with LCA / LVIA and Outputs

TII Minor Projects €0.5 to €5 million: PAG Unit 12 (PE-PAG-02037)			
PMG Project Phase	Project Phase Stages & Process	Output Ref.	If required, LCA / LVIA Output (See PE-ENV-01102 for national roads projects) will be proportionate to the nature and scale of the project, scoped by Landscape Professional
Phase 2: Option Selection (Selection of Preferred Option) Depending on Project Characteristics it is likely that options selection will be amalgamated.	Option Selection (Select preferred option for scheme). Refer to Table 14.1 of PE-PAG-02037.	2.1c	Landscape and visual constraints. Map Key baseline Landscape and Visual Elements/Features and prepare brief/succinct Landscape Report. LVIA input to Project Appraisal Deliverables, where required For each option, outline: <ul style="list-style-type: none"> - Objective for Key Landscape and Visual Element/Feature. - Qualitative Statement and Indicators for impact, if any. - Description of Performance (effect on landscape element). LVIA input into Project Appraisal Deliverables, where required.
Phase 3: Design and Environmental Evaluation	Project Design Development Progress Project towards publication for Statutory Process Phase.	3.4b 3.4c	LVIA input to Project Appraisal Deliverables, where required. Landscape strategy report and Landscape mitigation plan/input to schedule of commitments.
Phase 4: Statutory Process	Approval Process	4.6f 4.6g	Respond to LCA / LVIA queries and submissions, where required. LVIA input to an Oral Hearing may or may not apply

3.3 Phase 0/1: Scope, Pre-Appraisal/Scheme Concept and Feasibility

As set out in the **Project Management Guidelines** (TII) and **Project Manager's Manual** (TII) these initial phases are carried out by the Project Manager to:

1. Ensure that the project is aligned with current Sanctioning Authority strategic programmes and plans.
2. Develop and investigate in further detail the feasibility of the project and to implement the project management structure.

This will not require the input of a landscape professional.

3.4 Phase 2: Options Selection

3.4.1 Objective:

- The Options Selection phase will identify a Preferred Option through a structured, comparative appraisal of alternative options, or ‘narrowing of options’, to provide a best fit with the environment and other criteria (economy, safety, integration, cost etc.). The process is split into three distinct stages within the TII *Project Management Guidelines* and *Project Manager’s Manual*, each requiring a greater level of assessment and appraisal.
- This Phase will review/refine the study area within which the landscape and visual change is likely to occur.
- This Phase will:
 - **Identify, document and map the significant existing baseline landscape and visual features**, i.e. the international, national, regional, county, transboundary and local landscape and visual issues that must be taken into account when planning and designing the national road project (See Sections 4 and 6 of the *Overarching Technical Document PE-ENV-01101*).
 - **Review existing statutory LCAs** within the study area and identify the main landscape features, elements, and characteristics within these LCAs.
 - Assist in **identifying the main landscape and visual constraints** that should be avoided or that could affect or enhance the design, delay progress or influence the costs of the national road project. Transboundary issues may relate to county, regional, or national (Northern Ireland) borders. These will be incorporated into the **Constraints Study**.
- This Phase will:
 - **Take consideration of other developments** within the study area relevant to the landscape and visual environment, such as Development Plan objectives, other future road alignment, etc.
 - Record the findings in the receiving environment/baseline section of the Evaluation of Environmental Constraints, which forms part of the Options Selection Report.
- The landscape and visual aspects of the options selection process will be evaluated and documented through Multi-Criteria Assessment (Project Appraisal Guidelines, **PE-PAG-02031**), which aims to provide a structured, consistent, quantitative and qualitative, comparative assessment of each potential option, with a preferred option selected at the end of the process.
- Feasible options/sites can be designed to avoid these constraints (where possible), as well as identifying opportunities to integrate mitigation measures into the design. These options could include do-minimum, do-nothing, variety of options (e.g. alternative alignments/sites, tunnel/bridge etc.).
- This Phase will be informed by engagement with stakeholders (this would primarily be with the statutory planning authority, led by the Project Manager/Project Co-ordinator. In some situations, it may require engagement with the Development Applications Unit, Fáilte Ireland etc.), tailored to the specific circumstances to ensure the appraisal approach is proportional to the scale and complexity of the national road project.
- This Phase will include public consultation on appraised options prior to final selection and implementation.

The public consultation requirements for each stage of the assessment process are outlined in Section 2 (Option Selection) of TII's *Project Management Guidelines*.

For some projects, it may be possible to 'scope out' landscape/visual related criteria, for example where potential impacts will be negligible for all options (e.g. for online or junction improvement works) thereby simplifying assessment. Where this approach is adopted, there will be a clear outline of the rationale for this approach as part of the Phase 2 Options Selection Report.

3.4.2 Process/Methodology:

- Prior to commencing the Option Selection Process, it will be necessary to identify and document the nature and extent of landscape and visual constraints for inclusion in the Constraints Study, at an appropriate level of detail, within the study area. These constraints will be documented and mapped such that options under consideration can be designed taking cognisance of such constraints.
- For Minor Projects, the process and outputs are outlined in Tables 3 and 4 above.
- For Major Projects, Phase 2 has a three stage process which includes:
 - Stage 1 – Preliminary Options Assessment
 - Stage 2 – Project Appraisal Matrix
 - Stage 3 – Preferred Option

3.4.2.1 Phase 2, Stage 1 - Preliminary Options Assessment

Stage 1 is a comparative assessment of the potential impacts of the options, and their relative success in achieving the project objectives, under the headings of engineering, environment, and economy, with landscape and visual included under environment heading.

This stage will review, and refine if necessary, the Phase 2 Route Options Study Area boundary. For most roads, the Phase 2 Study Area will be more than adequate, however there may instances where sensitive landscape characteristics or views which may need to be considered outside the Route Options boundary (e.g. view from distant elevated designated/sensitive viewpoint). It will identify, document and map within the study area:

- The existing LCAs, where available; and,
- Significant landscape and visual characteristics, features and elements.

The process is summarised below in Figure 13 and Figure 14 below.

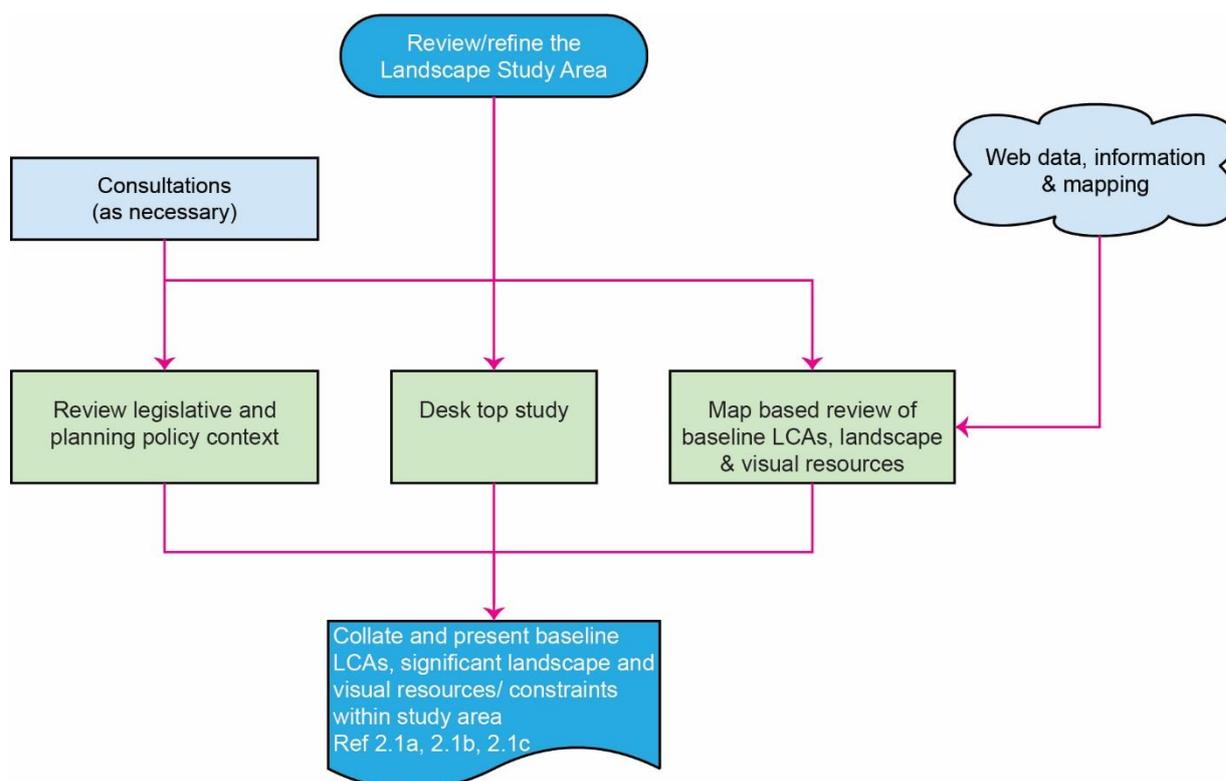


Figure 13 Identification of significant landscape and visual for constraints study

This stage will:

- Review the project description, purpose and need statements, scoping documents, and any other special studies for a general understanding of the landscape and visual character of the study area.
- Review (and refine if necessary), the Phase 2 study area for Route Options, based on Ordnance Survey Ireland vector/raster mapping.
- Review and document statutory and non-statutory information in relation to landscape within the study area (e.g. existing development plans, existing landscape character assessments, designated views, etc.).
- Provide and document an overview of the key existing landscape and visual resources within the study area, including topography and landscape features, the main land uses, designated landscape areas and features, and primary visual receptors. It will identify, document and map significant and sensitive characteristics/features/elements of the landscape and visual separately. Some examples of typical landscape and visual features, elements, characteristics and receptors in the Irish landscape are outlined in Section 13, Example Landscape/Visual Survey Notes, in the *Overarching Technical Document PE-ENV-01101*. Note these will vary depending on the study area.
- Resources shall be recorded quantitatively and qualitatively. It is primarily a desk exercise that comprises a search for available information, or information that can be readily obtained.
- Document the baseline of the landscape character to an appropriate scale and detail through LCA. This will review the existing statutory LCA (DOELG, 2000).

It will then identify, in a value free process, the key landscape features, elements, and characteristics that define a particular landscape character area(s) within the study area. This may require a more detailed level of study, identification and assessment of the landscape characteristics that make one area distinctive from another, and provide assessment of the frequency of these characteristics within the landscape character area (unique, rare, common, abundant). It will examine landscape sensitivity and capacity for change in relation to the proposed road project. For further detail on the LCA process, see Section 4.3 of TII's *Overarching Technical Document PE-ENV-01101*.

- Document the baseline visual character to appropriate scale through examination of extent and nature of existing views, and nature and characteristics of the visual amenity of receptors.
- Provide a statement within the document of how the evaluation was prepared, including data and information sources, consultations with relevant agencies, methods and dates of any field surveys and how the landscape and visual resources have been valued. Any limitations in the methodology or in the approach adopted will be highlighted.

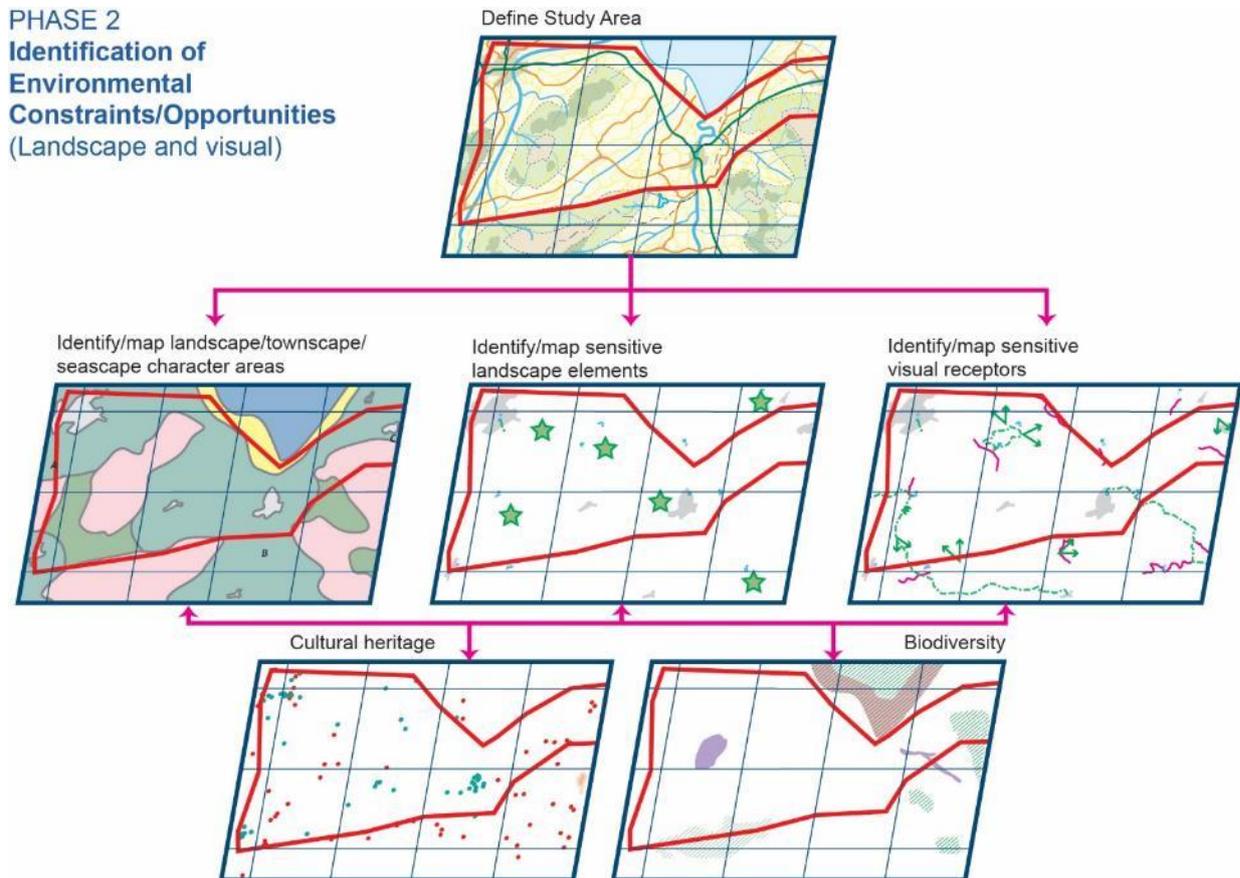


Figure 14 Phase 2, Stage 1 - Constraints study mapping (ref. 2.1a, 2.1b, 2.1c)

Depending on the nature of the project and receiving environment, there may be a requirement to work with other competent professionals on other overlapping topics such as cultural heritage (e.g. designed landscapes, historic landscape characterisation), biodiversity etc. An assessment team workshop meeting (s) should be undertaken to ensure all assessments understand and address constraints and opportunities.

The evaluation of the baseline landscape and visual environment will consider and provide summary details, or schedule of, the following landscape non-exhaustive characteristics (refined to suit the particular project and its landscape context as applicable).

Refer to Section 4 of the OTD for the theory and methodology of LCA and LVIA. The information below is for illustrative purposes only.

Section 6.2.1.2 of TII's *Overarching Technical Document PE-ENV-01101* outlines how Stage 1 has specific outputs. The following sample outputs / deliverables are presented as examples of the standard required. The output will vary depending on the specific project and the scale of the analysis and development.

3.4.2.1.1 Identification of Landscape Character (Landscape Character Assessment (LCA))

The outputs of this phase will include:

- A documented review of existing landscape/townscape character assessments (including transboundary LCAs), in schedule format (see example Table 5 below) and mapping (see Figure 15 below). It should be noted that existing Local Authority LCAs may be too large a scale for the purposes of meaningful impact assessment. In such circumstances, more granular landscape character types and landscape character areas can be devised within the overarching LCA designations – see Section 4.3 of TII's *Overarching Technical Document PE-ENV-01101*.
- Judgements about landscape character related to value and sensitivity in order to ensure that key elements are identified which are important or valued.

Table 5 Landscape character schedule (County level example)

Landscape character type	Landscape character area	Landscape sensitivity
LCT6a: Broad fertile lowland valleys	LCA no. 8 Blarney. (Wooded Valley of low hills and scattered settlement clusters)	High
LCT10b: Fissured Fertile Middle ground	LCA no. 4 Donoughmore/Watergrasshil (Fissured patchwork middle ground)	High

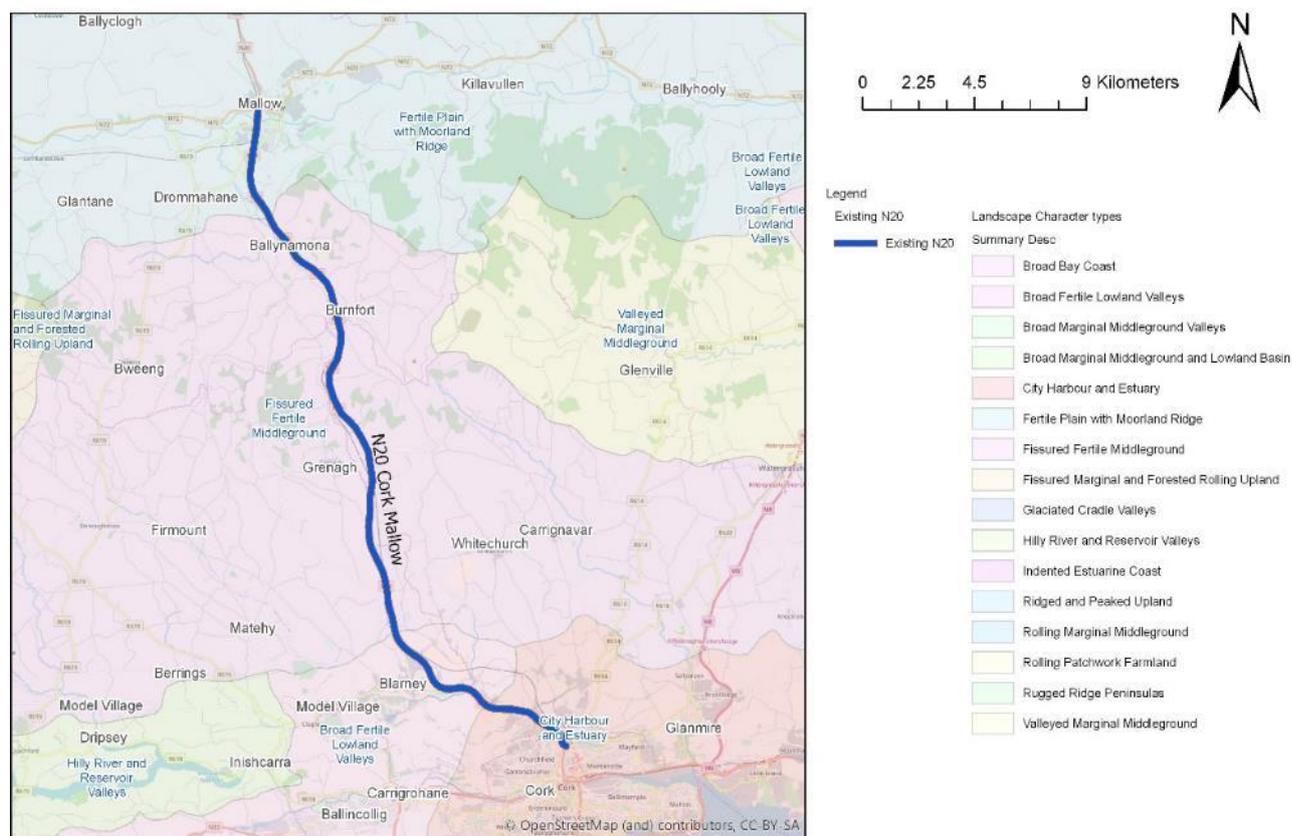


Figure 15 Sample LCA map for landscape character types (ref 2.1a)

The LCA will document and include:

- **Natural features** – general overview of main natural features/elements (geology, landform, hydrology, landcover/vegetation, field pattern, boundary types etc.).
- **Cultural/social features** – general overview of main social and cultural aspects of landscape including, land use (agriculture, forestry, urban areas, amenity, recreation, tourism, etc.), movement within landscape, cultural heritage aspects or other landscape or visual related land uses are noted.
- **Aesthetic/perceptual features** – general overview, e.g. open landscapes where a landscape which by nature of its landform, aspect, elevation or lack of vegetation, is considered visually open, where it is likely to facilitate extensive or expansive viewing.

3.4.2.1.2 Identification of Sensitive Landscape Elements

- **Landscape elements** - particular elements or **combination of landscape elements** which may be impacted by any proposed route option and an assessment of the susceptibility/value/sensitivity of such elements in terms of their representativeness or rarity in the context of the study area, e.g. presence and extent of woodlands, trees and hedgerows, tree preservation orders (TPOs), and any other related elements.
- **Valued/designated landscapes** – areas within the study area that have received specific designations for their landscape quality or character, including designations made at national, regional, county and local level, e.g. National Parks, areas of importance to tourism etc.

- **Historical and Cultural landscapes** – Human influence through history and cultural heritage strongly influence the visual elements in the landscape, the form and appearance of which has been noticeably influenced by man, or a feature of cultural or built heritage significance such as a World Heritage Site (WHS), historic town/village core, town square, architectural conservation areas (ACAs) earthworks, designed landscapes/garden, castle, fort, high cross etc. Landscapes or features remaining from past farming and land management systems or past settlement patterns may also be important. Modern patterns of settlement and communication are important aspects of landscape character and quality. With regard to Historic Gardens and Designed Landscapes, which are listed in the National Inventory of Architectural Heritage, it may be appropriate to list or assess an historic feature richness index (FRI) (DAHG, 2017) which may assist in identifying qualitative constraints. This requires overlap and coordination with the cultural heritage constraints study.

3.4.2.1.3 Identification of Sensitive Visual Receptors

- **Viewers** – viewers of the landscape will be identified in terms of settlement patterns, specific density, or prominence of residential properties, tourist routes, designated trails etc.
- **Views / Significant (or Sensitive) viewing points** - Amenity and recreation areas – walks, trails, sports pitches, fishing, golf etc.
- Designated views and routes – as per development and local area plans, designated tourism routes etc.
- Views to/from architectural/archaeological heritage.

A sample list of the wide range of landscape and visual features, characteristics and receptors that may be found in Ireland is provided in Section 13 of the *Overarching Technical Document PE-ENV-01101*. These are not exhaustive and shall be reviewed/modified for each project.

These landscape character areas, landscape elements and visual receptors will be tabulated for ease of identification and assessment, e.g. see Table 6 and Table 7 below.

A list of information sources cited in the text shall be included.

Figures to accompany the landscape and visual impact report will include a map (scale 1:50,000 or larger for rural landscapes; or 1:5,000 or for larger for urban townscapes) of the study area boundaries, landscape character areas and features within and in close proximity to the study area (with identifying reference codes, names or numbers), the main landscape referred to in the text and the location of the main visual receptors (e.g. designated scenic views, location of main towns, amenities etc.) – see Table 6 and Table 7.

The use of CAD/GIS mapping software for mapping constraints shall be used to allow for overlay on OSI maps and ease of sharing of information between the assessment team, designers and stakeholders – see Figure 14. Constraints will be mapped in ITM format. The use of GIS allows other digital information to be used in survey process, e.g. OSI <https://www.geohive.ie/>, www.heritagemaps.ie etc.

Other figures should be included where necessary, e.g. to clarify and separate landscape and visual aspects.

Table 6 Example of landscape constraints and opportunities schedule

County level LCA	Ref. no.	Name	Description
LCA no. 4 Donoughmore/Watergrasshil	L20	Forest Park	Broadleaved woodland and designed landscape with extensive trail network used as walking by locals and visitors
LCA no. 7 Greater Cork Harbour	L21	Harbour landscape character area	Landscape of the harbour area comprises a mix of rural and urban areas, industrial and port areas, combined with a large expansive harbour used extensively for land and water based recreation.
LCA no. 8 Blarney	L22	Street trees in town square	Large number of semi-mature and mature street trees which help to positively define character of an urban area.

Table 7 Example of visual constraints and opportunities schedule

County level LCA	Ref. no.	Name	Description
LCA no. 4 Donoughmore/Watergrasshil	V10	SR22, County Development Plan	Designated view towards Mountains
LCA no. 8 Blarney	V11	Vista from Demesne	Designed view from regionally important protected structure, over designed parkland landscape to surrounding agricultural landscape.
LCA no. 8 Blarney	V12	Residential properties in village	Variety of old and new residential properties with uninterrupted open views over surrounding landscape.

3.4.2.2 Phase 2, Stage 2 - Project Appraisal Matrix

The options advanced from Stage 1 (Preliminary Options Assessment) of the Option Selection Process will be evaluated by undertaking a multi criteria analysis of the quantifiable and non-quantifiable impacts of these options in accordance with PAG Unit: 7.0: Multi Criteria Analysis (MCA). For the landscape and visual aspects of the Environment section of the MCA, it will evaluate the options on landscape character, topography, vegetation, natural features, views, and obstructions.

The landscape and visual impacts for each of the options will be identified so that those with unacceptably high levels of impact can be avoided to the extent feasible as part of the overall options assessment process. The process is outlined in Figure 16 below.

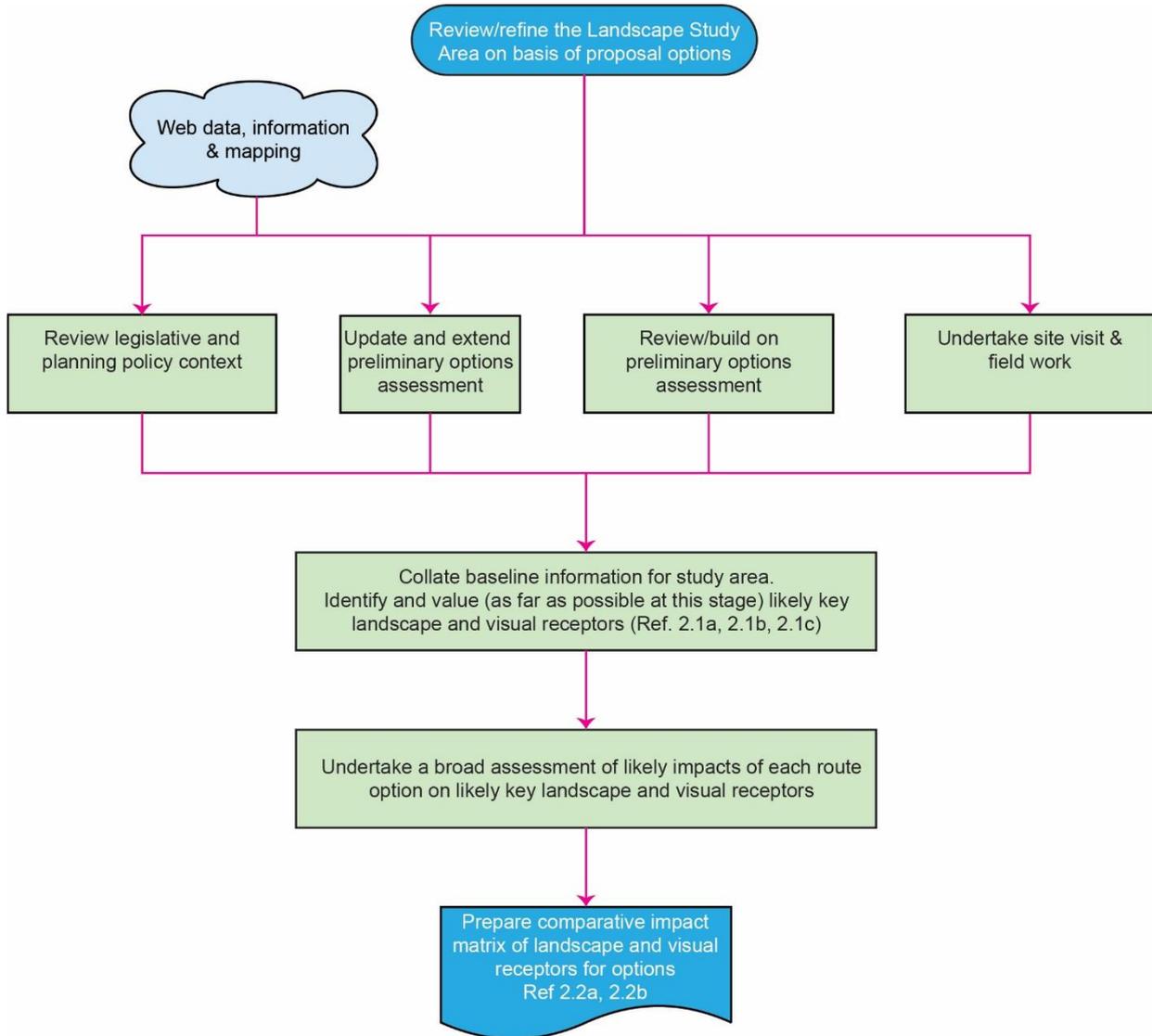


Figure 16 Outline of option selection process

Each option selection process will have unique landscape and visual features and the resulting constraints, sensitivities, and effects will vary. The assessment will provide a quantitative and qualitative assessment in the form of a preliminary options assessment performance matrix (see table 7.1.2 of **PE-PAG-02031**).

Certain landscape designations may warrant avoidance measures. These requirements must be continually considered as route options are being identified. A detailed analysis that quantifies all of the potential environmental effects, including landscape, and the costs of avoidance or mitigation may be needed before the alignment is adjusted or other refinements are made to minimise adverse impacts. As the options advance from the conceptual stage to the final detailed description in project planning, the landscape and visual, together with other environmental issues, will be considered in refining the options at a level of detail commensurate with the detail of the options.

Note if the same landscape character area crosses a statutory boundary but its character / sensitivity is defined differently in each one (e.g. between adjoining Counties), where the proposed infrastructure could have an impact across the boundary then the highest level of sensitivity should apply in both areas as a precautionary principle.

The optimum option from a landscape or visual perspective may not be the overall optimum option when other impacts and considerations are evaluated.

3.4.2.2.1 Methodology

(i) Baseline Landscape and Visual Environment

This baseline assessment will provide a **brief overview of landscape and visual environment within the study area** (which should encompass all route options and their respective zones of influence), along with an update of the relevant information presented in the 'Evaluation of Environmental Constraints' section of the Options Selection Report (Landscape and visual chapter).

In the context of the landscape and visual assessment, the baseline assessment will outline:

1. An overview of proposed options and study area.
2. An assessment of relevant planning policies and objectives related to landscape and visual aspects.
3. Definition/refinement of area of assessment for each option.
4. An outline of the baseline receiving landscape and visual environment:
 - Study area and option corridors – general description of landscape and visual environment. The landscape and visual environment will be reviewed taking account of:
 - Topography (likely extent of earthworks)
 - Settlement density (likely degree of visual amenity effect)
 - Extent of vegetation (trees, hedgerows, scrub etc. and likely degree of screening)
 - Land use complexity (degree of human intervention in the landscape)
 - Landscape value, landscape character, sensitivity and visual sensitivity
 - Landscape – review of;
 - Landscape context
 - Key landscape receptors
 - Landscape character areas, landscape features or elements
 - Sensitivity and capacity for change as per section 4.5
 - Where possible, include quantitative and qualitative indexes, e.g. for historic feature richness index (FRI) (DAHG, 2017) for Historic Gardens and Designed Landscapes; quantity of landscape features in distance bands from centreline of option alignment (e.g. 0-50m, 50-100m, 100-150m, 150-200m etc.).
 - Visual – identification of;
 - Visual context
 - Key visual receptors – these may include people who live there, people who work there, people who travel through there (walk, cycle, rail, road), people visiting promoted landscapes or attractions, and people engaged in recreation of different types (LI/IEMA, 2013)
 - Viewer sensitivity and capacity for change in the context of the proposed development.

View sensitivity may be determined by statutory designation (e.g. scenic routes/views) and by assessment of the nature, composition and characteristics of views (proximity/distance of viewer; number of viewers – sparse/dense; duration – open/filtered/sporadic/sequential; scale/proportion – open/vista/framed/panoramic/closed; key visual foci)

- Elements such as landform, buildings, and/or vegetation, which may interrupt, filter or influence views.
- Views from land to sea/lake/river and vice versa, views along coastline/lakeshore etc.

3.4.2.2.2 Assessment of Effects

A broad assessment will be undertaken of the likely effects for each of the options on the key landscape and visual receptors.

The quantitative statement for the landscape and visual section will include separate assessments of the significance of effects on a landscape receptors and visual receptors, positively or negatively, based on its sensitivity and the magnitude of change. This will include an evaluation of the receptors' sensitivity weighting criteria. These will vary from Very High, High, Medium, Low, Very Low and include both landscape and townscape sensitivity criteria.

The assessment of effects will be carried out through a multi-criteria assessment process for both key landscape and visual receptors with an indication as to which, if any, of these are likely to be significant, and at what scale (i.e. local level or over wide area of landscape). A notional 'Option A' is provided below in Table 8, Example Landscape Receptors and Table 9, Example Visual Receptors. Significance of effect definitions are outlined in further in Section 3.5.2.3 below.

Table 8 Example of some landscape receptors (designated and non-designated), from the constraints & opportunities Study, which would be affected by a notional option alignment

Ref. no.	Name	Description	Sensitivity	Potential Significance of Effect
L20	Forest Park	Broadleaved woodland and designed landscape with extensive trail network used as walking by locals and visitors	High	Locally, significant negative
L21	Harbour landscape character area	Landscape of harbour area with open views, comprises a mix of rural and urban areas, industrial and port areas, combined with a large expansive harbour used extensively for land and water based recreation.	High	Significant negative over a wide area
L22	Street trees within towns and villages	Large number of semi-mature and mature street trees which help to positively define character of urban area.	Medium	Locally significant negative

Table 9 Example of some visual receptors (designated and non-designated), from the constraints & opportunities study, which would be affected by a notional option alignment

Ref. no.	Name	Description	Sensitivity	Potential Significance of Effect
V10	SR22, County Development Plan	Designated view towards Mountains	High	Locally, significant negative with sequential views of road and traffic
V11	Vista from Demesne	Designed view from regionally important protected structure, over designed parkland landscape to surrounding agricultural landscape.	Very high	Significant negative with expansive open views of road embankments and cuttings
V12	Residential properties in village	Variety of old and new residential properties with uninterrupted open views over surrounding landscape.	High	Locally significant negative with open views of road and traffic

Based on this assessment, this is further summarised and can be quantified with the number of key significant effects on landscape and visual effects for each option.

This allows for the creation of a ranked order of preference of the options from a landscape and visual perspective. In those cases where multiple options would all involve significant impacts on one or more receptors valued at the same geographic level, it is not appropriate simply to assign an order of preference on the basis of the number affected. Instead, it will be necessary to characterise the impacts upon them and to apply professional judgement with accompanying basis of assessment, as appropriate.

The assessment carried out in Stage 2 will feed into further detailed analysis of a preferred option in Stage 3. The assessment shall provide a qualitative and quantitative assessment of the potential effects, (construction & operational, nature of effects) on both landscape as a resource and on visual receptors. Supporting mapping will be required, e.g. see Figure 17 below.

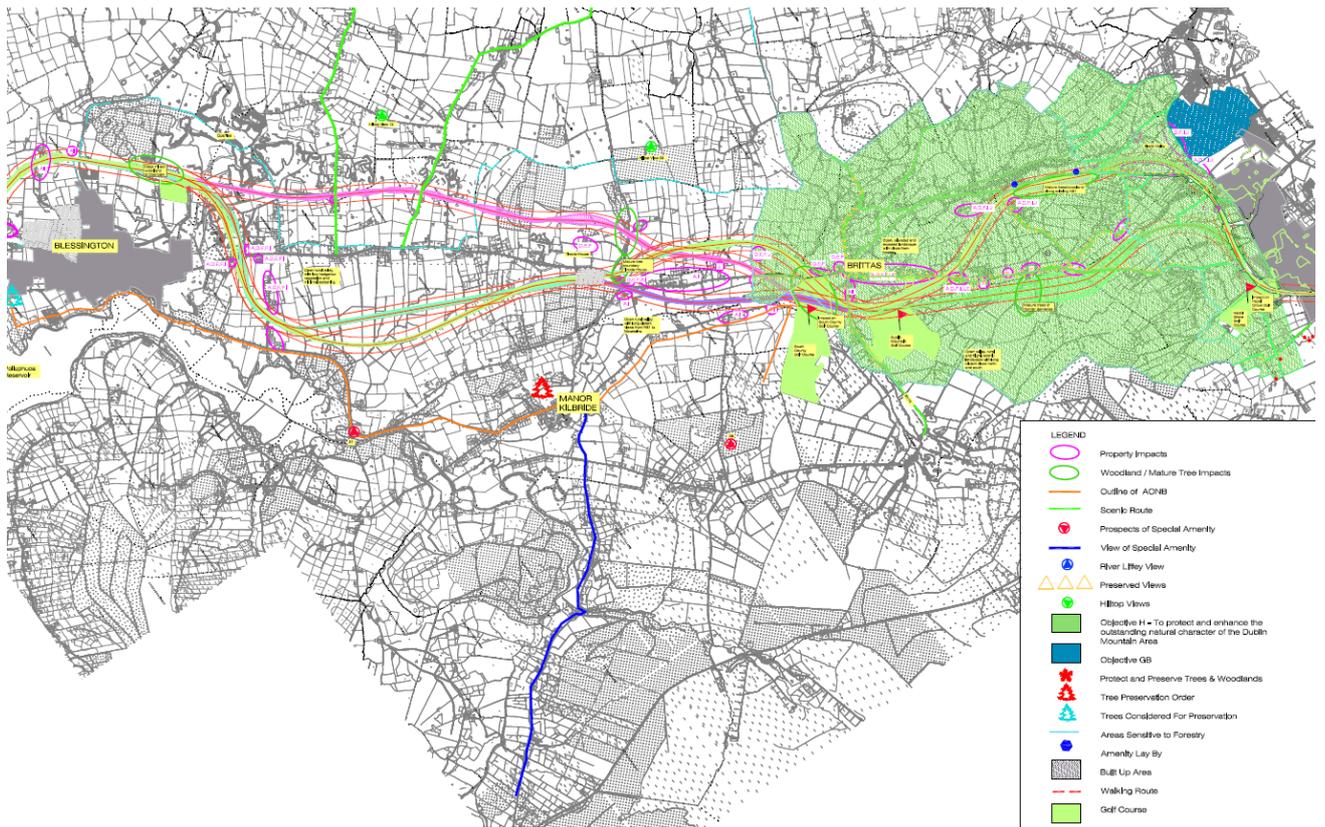


Figure 17 Example constraints map with various option alignments

In the examples given in Table 10, below, the number of significant impacts on features of graded importance, associated with notional route option A, is compared with the number of corresponding impacts associated with each of two other illustrative options (notionally B & C for this example), providing an emerging preferred option and final selection on basis of landscape and visual assessment. See Figure 18 below.

Table 10 Option Selection Ranking for Landscape Receptors

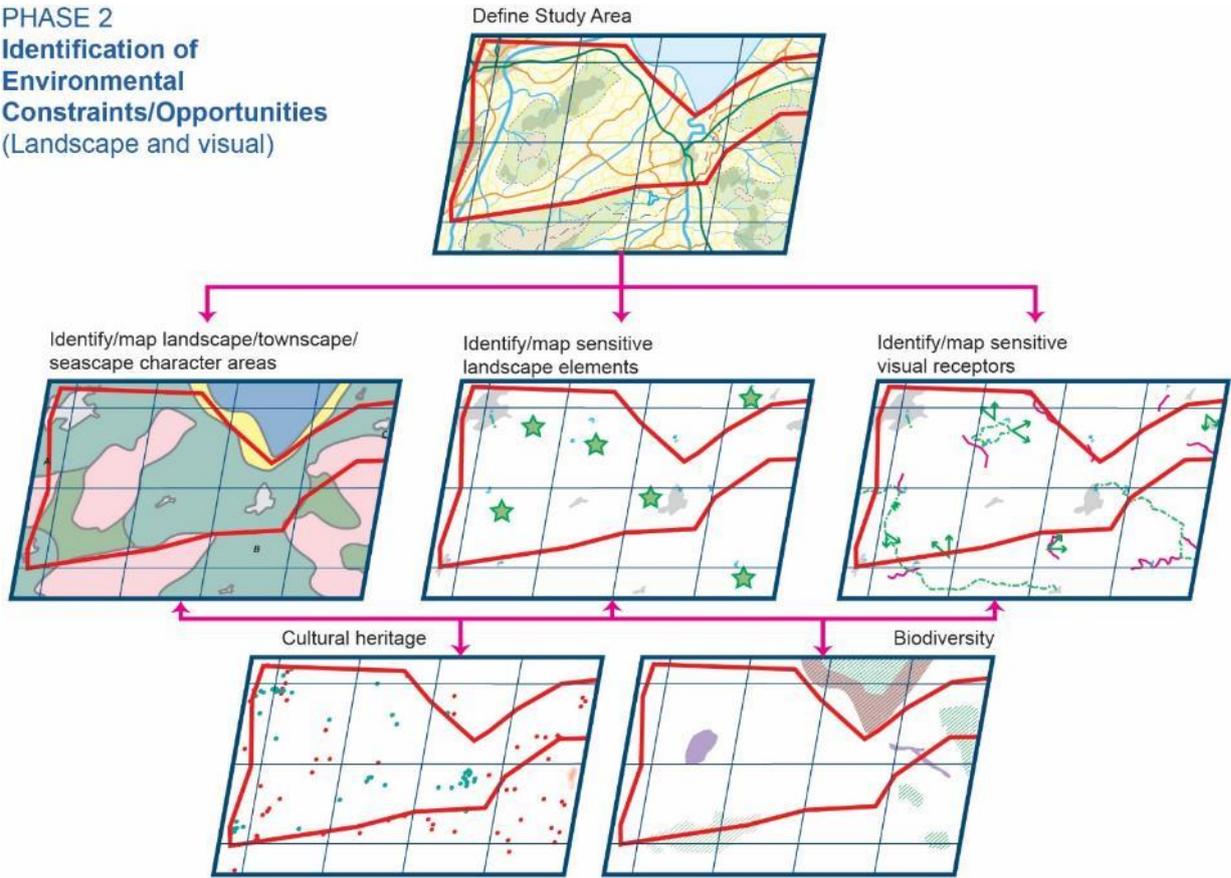
Potential Significant Impact on Landscape Receptors of graded importance	Options (notional)		
	Option A	Option B	Option C
Significant impact on feature of national importance	1	0	0
Significant impact on feature of regional importance	0	1	0
Significant impact on feature of county importance	1	1	1
Significant impact on feature of local importance	1	6	1
Ranked order of preference for Landscape	3 rd	2 nd	1 st

Table 11 Option selection ranking for visual receptors

Potential Significant Impact on Visual Receptors of graded importance	Options (notional)		
	Option A	Option B	Option C
Significant impact on feature of national importance	0	1	0
Significant impact on feature of regional importance	1	0	0
Significant impact on feature of county importance	1	1	1
Significant impact on feature of local importance	1	4	2
Ranked order of preference for Landscape	3 rd	2 nd	1 st

The levels of impact assigned to particular options should assume that general landscape mitigation measures (e.g. avoidance/minimise effects and/or screening/integration) will be implemented and this clearly stated. Site-specific mitigation measures are normally excluded in the assessment of impacts of the national road project at this stage.

PHASE 2
Identification of Environmental Constraints/Opportunities
(Landscape and visual)



PHASE 2
Options Assessment Selection Study
(Landscape and visual)

Preliminary Options Assessment
Input to project appraisal matrix/MCA
Preferred Option

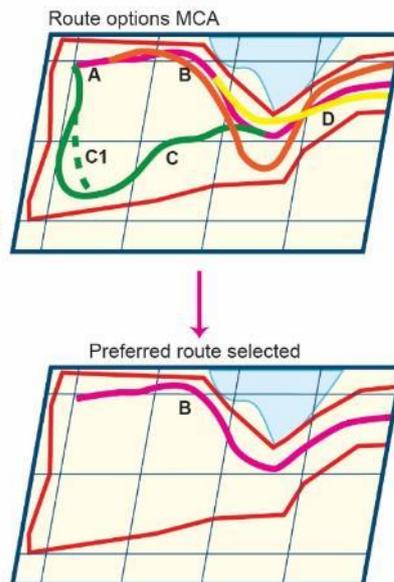


Figure 18 Outline of constraints and option selection studies (Ref 2.2a, 2.2b, 2.3a and 2.3b)

3.4.2.3 Phase 2, Stage 3 - Preferred Option

After the completion of Stage 2 (Project Appraisal Matrix), a preferred option for the Project will be selected based on the MCA. Stage 3 will provide a summary landscape and visual impact assessment of the Preferred Option for inclusion as a chapter in the Options Assessment Report.

3.4.3 Deliverables/Outputs:

For major projects (>€20m) and minor projects (€5m to €20m), the following outputs will generally be provided, unless otherwise specified by the Project Manager. A summary checklist is provided in Table 12 below. Refer also to Section 6.2.1.2, 6.2.2.2 and 6.2.3.2 of the OTD.

- Phase 2, Stage 1: LVIA Report referencing each of the identified options to be included in the Stage 1 Options Selection Report, which shall require—
 - Refinement/definition of Landscape Study Area
 - LCA mapping and description: Identification of significant landscape and visual elements/features and receptors to assist in identification of options, with supporting mapping, e.g. see Figure 19 below.
 - Identification of highly sensitive landscapes or ‘hotspots’ within the zone of influence of the national road project which need to be considered within the study area, e.g. nationally designated landscape.
 - Identification of potential route options having considered likely landscape and visual effects
 - Comparative ranking (MCA) of the identified options relative to their landscape and visual effects

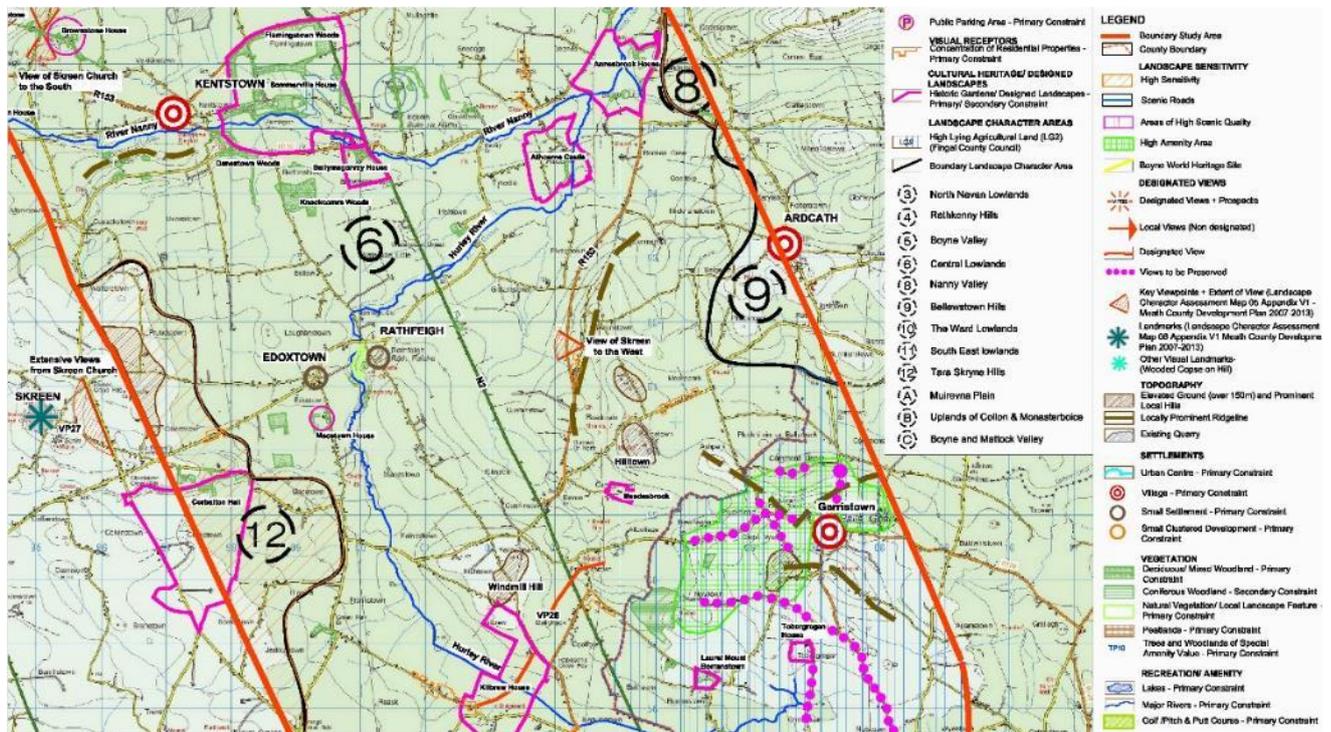


Figure 19 Landscape Constraints Analysis (N2)

- Phase 2, Stage 2: LVIA Report referencing each of the identified options to be included in the Stage 2 Options Selection Report, which shall require—

- Refinement of LCA mapping and description, where appropriate, relevant and scaled to the identified options
 - High level appraisal of existing LCA, identification of key landscape and visual features/element/characteristics and receptors, and LVIA of national road project options.
 - LVIA input to MCA for route options.
 - Selection of preferred option on basis of landscape and visual aspects (using qualitative and quantitative data and collated into format for inclusion into **PE-PAG-0232**).
 - Figures (to accompany the report) that shall include a map (scale 1:50,000 or larger) of the study area boundaries, significant landscape features within and in close proximity to the study area (with identifying labelling/reference coding as necessary).
- Phase 2, Stage 3: LVIA Report referencing each of the identified options to be included in the Stage 3 Preferred Option Selection Report, which shall require—
 - Refinement of LCA mapping and description, where appropriate, relevant to the preferred option
 - High-level identification, description and assessment of likely significant landscape and visual effects of the preferred route option
 - Identify measures to be considered to mitigate significant effects or to have the preferred route option perform better in the LVIA

For minor projects (€0.5 to €5m), depending on the context of the project and its receiving environment, a constraints study may be sufficient for input to the MCA and Options Selection Report to inform the project designer of the need to address specific landscape/visual receptors, and/or integrate mitigation measures appropriate and sensitive to the receiving landscape and visual environment, e.g. to retain/protect a very high value line of trees in an urban street, or utilise indigenous native planting in a rural landscape appropriate to its context.

As noted in 3.4.1 above, for some projects it may be possible to ‘scope out’ landscape/visual, for example where potential impacts will be negligible for all options (e.g. for online or junction improvement works), thereby simplifying the assessment.

Table 12 Summary Checklist of Phase 2 LCA / LVIA Deliverables/Outputs

Activities	Project greater than 20M	Minor Projects 5M to 20M	Minor Projects 0.5M to 5M	Minor Projects less than 0.5M
Phase 2 – Option Selection (Selection of Preferred Option through a narrowing of options)	Table 2 Output Ref. 2.1, 2.1b, 2.1c	Table 3 Output Ref. 2.1, 2.1b, 2.1c	Table 4 Output Ref. 2.1c	Use Output Ref. 2.1c
Stage 1 – Preliminary Options Assessment (For all feasible options)	Baseline LCA Mapping and Report. Stage 1 LVIA report (using baseline LCA) as	Baseline LCA Mapping and Report. Stage 1 LVIA report (using LCA) as part of Stage 1	Map Key baseline Landscape and Visual Elements/Features and prepare short Landscape Report.	Map Key baseline Landscape and Visual Elements/Features and prepare short Landscape Report.

Activities	Project greater than 20M	Minor Projects 5M to 20M	Minor Projects 0.5M to 5M	Minor Projects less than 0.5M
<p>Stage 2 – Project Appraisal Matrix (Assessment of a reduced number of options)</p> <p>Stage 3 – Preferred Option (Select preferred option for scheme)</p>	<p>part of Stage 1 of Options Assessment Report.</p> <p>Table 2 Output Ref. 2.2a, 2.2b</p> <p>LVIA input under Environment to MCA / Project Appraisal Deliverables.</p> <p>Table 2 Output Ref. 2.3a</p> <p>Summarise LVIA of Preferred Option for Stage 3 of Options Assessment Report.</p> <p>Table 2 Output Ref. 2.3b</p> <p>LVIA input to Project Appraisal Deliverables</p>	<p>of Options Assessment Report.</p> <p>Table 3 Output Ref. 2.2a, 2.2b</p> <p>LVIA input under Environment to MCA / Project Appraisal Deliverables.</p> <p>Table 3 Output Ref. 2.3a</p> <p>Summarise LVIA of Preferred Option for Stage 3 of Options Assessment Report.</p> <p>Table 3 Output Ref. 2.3b</p> <p>LVIA input to Project Appraisal Deliverables</p>	<p>Table 4 Output Ref. 2.1c</p> <p>Select preferred option for scheme. Depending on Project Characteristics it is likely that options selection will be amalgamated. Refer to Table 14.1 of PE-PAG-02037.</p> <p>For each option, outline:</p> <ul style="list-style-type: none"> - Objective for Key Landscape and Visual Element/Feature. - Qualitative Statement and Indicators for impact, if any. -Description of Performance (effect on landscape element). <p>LVIA input into Project Appraisal Deliverables.</p>	<p>LVIA input to Project Appraisal Deliverables.</p>

Liaison with the Project Manager and the other relevant project professionals is required for each stage of Phase 2 Options Selection. For each stage, a record shall be kept to demonstrate that receipt of the required Outputs has been acknowledged by the Project Manager. The Project Manager may do any of the following: Acknowledge, Acknowledge with comments, or Reject any submitted output. All comments by the Project Manager shall be addressed and the output re-presented to the Project Manager for acknowledgement.

Note: the relevant project professionals to be liaised with should be agreed with the Project Manager.

3.4.4 Relevant TII PMGs/PAGs/Standards/Guidelines

- **PE-PMG-02041** – Project Management Guidelines
- **PE-PMG-02042** – Project Manager’s Manual for Major National Road Projects
- **PE-PAG-02012** – Project Brief
- **PE-PAG-02013** – Consideration of Alternatives and Options
- **PE-PAG-02027** – Project Appraisal Guidelines for National Roads Unit 6.8 – Appraisal of Motorway Service Areas (TII)
- **PE-PAG-02031** – Multi Criteria Analysis
- **PE-PAG-02032** – Project Appraisal Guidelines for National Roads
 - Unit 7.1 - Project Appraisal Balance Sheet (PABS) (Major Projects >€20m)
 - Unit 12.0 - Project Appraisal Balance Sheet (PABS) (Minor Projects 5-20m)
 - Unit 14.0 - Project Appraisal Balance Sheet (PABS) (Minor Projects 0.5-5m)
- **PE-ENV-01101** - Landscape character assessment (LCA), landscape impact and visual impact assessment (LVIA) for specified linear infrastructure – Overarching Technical Document
- **DN-GEO-03028** – Location and Layout of On-Line Service Areas

3.5 Phase 3: Design and Environmental Evaluation

3.5.1 Objective:

The objective of the design and environmental evaluation phases is to undertake sufficient assessment to identify and quantify any significant effects on the landscape and visual environment likely to arise from construction and operation of the project.

The baseline landscape (townscape/seascape) character and visual environment in the area of influence of the proposed road project are described, based on desktop studies, site visits, information provided by consultees, background sources of information and the results of Phase 2 (Options Selection).

These studies inform the preparation of the landscape section of the EIAR or Environmental Report.

3.5.2 Process:

Phase 3 Design and Environmental Evaluation Process requires a landscape and visual impact assessment of the proposed road development by the landscape professional, as set out below and in the accompanying Overarching Technical Document (**PE-ENV-01101**).

The landscape and visual assessment process can be summarised as follows:

1. Review, update, and establish scope.
2. Description of the proposed development and consideration of alternatives.
3. Refinement and updating of baseline studies, i.e. receiving environment for landscape (landscape character areas, landscape features/elements, designations/development plans) and visual aspects (viewers and viewpoints), condition, value, sensitivity/capacity for change.
4. Identification and description of effects.
5. Assess the significance of effects.

- 6. Mitigation.
- 7. Residual effects.

A sample, non-prescriptive list of chapter headings is provided in Section 12 of the *Overarching Technical Document PE-ENV-01101*.

In parallel to the assessment of the effects, there shall be a clear focus on the identification of landscape mitigation and enhancement measures.

A summary of the overall process is illustrated in Figure 20 below, with flow chart for landscape impact assessment - Figure 21, and visual impact assessment - Figure 22.

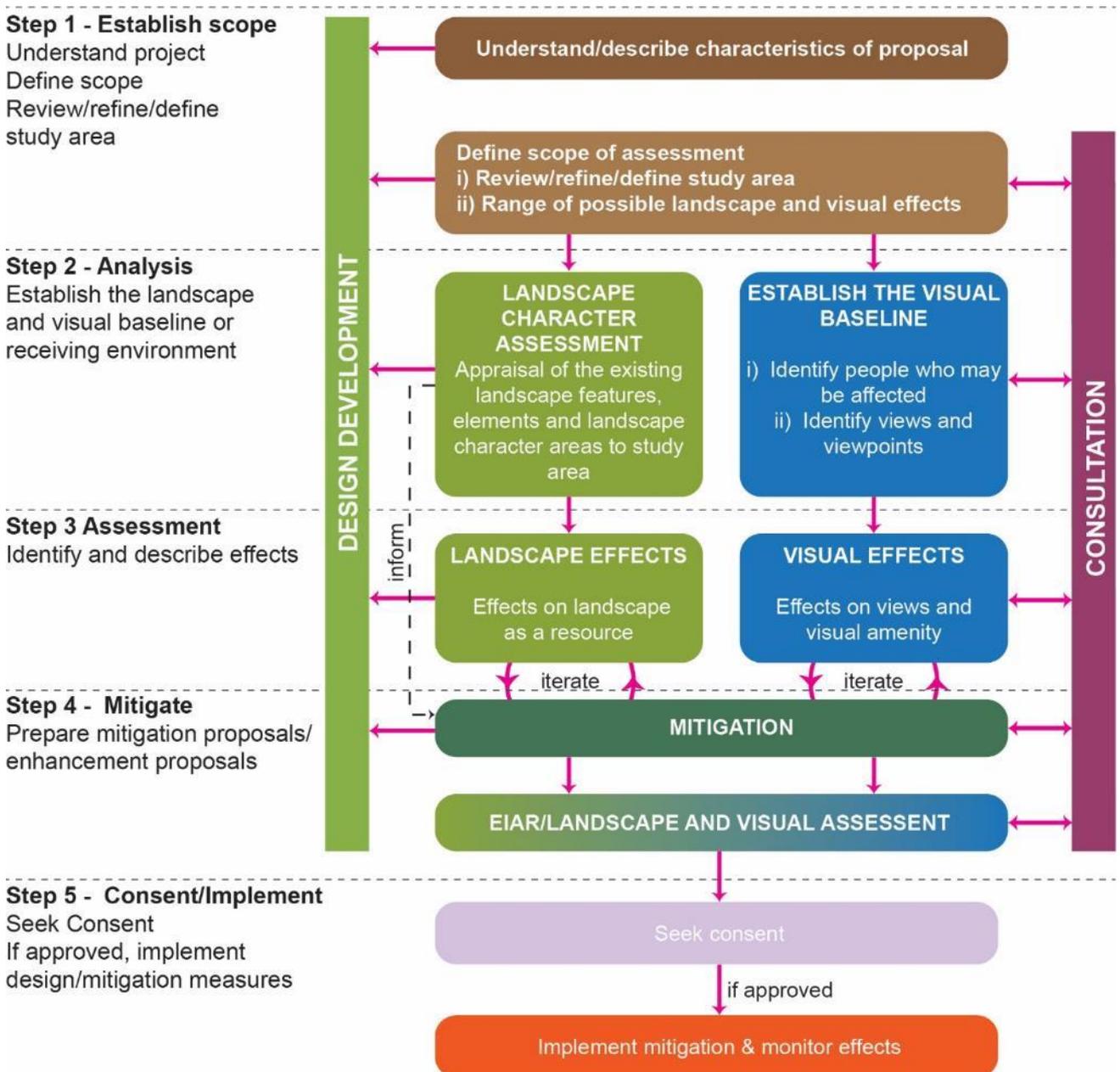


Figure 20 Summary of LVIA process

The landscape professional will review (in conjunction with the Project Manager) the width of the proposed study corridor in a manner that would allow detailed assessment of any significant impacts on the landscape and visual arising from the construction and operation of the new national road.

This will vary considerably for each project, depending on the nature of the receiving landscape and nature of the proposed national road project. For example in flat rural areas, as a general rule of thumb, this might be up to 500 metres either side of the centre line of the new road, however there may be sensitive receptors outside this area which may be affected, e.g. views from higher ground.

ZTV mapping can help in defining this, together with on-site field assessment. In urban areas, the study area may be defined by the width of the road corridor defined by building façades. The landscape professional shall use professional judgment in deciding where the study corridor should be extended in respect of the chosen option to take into account other landscape elements or features beyond the study area, e.g. view from archaeological site or historic demesnes, or from designated viewpoint.

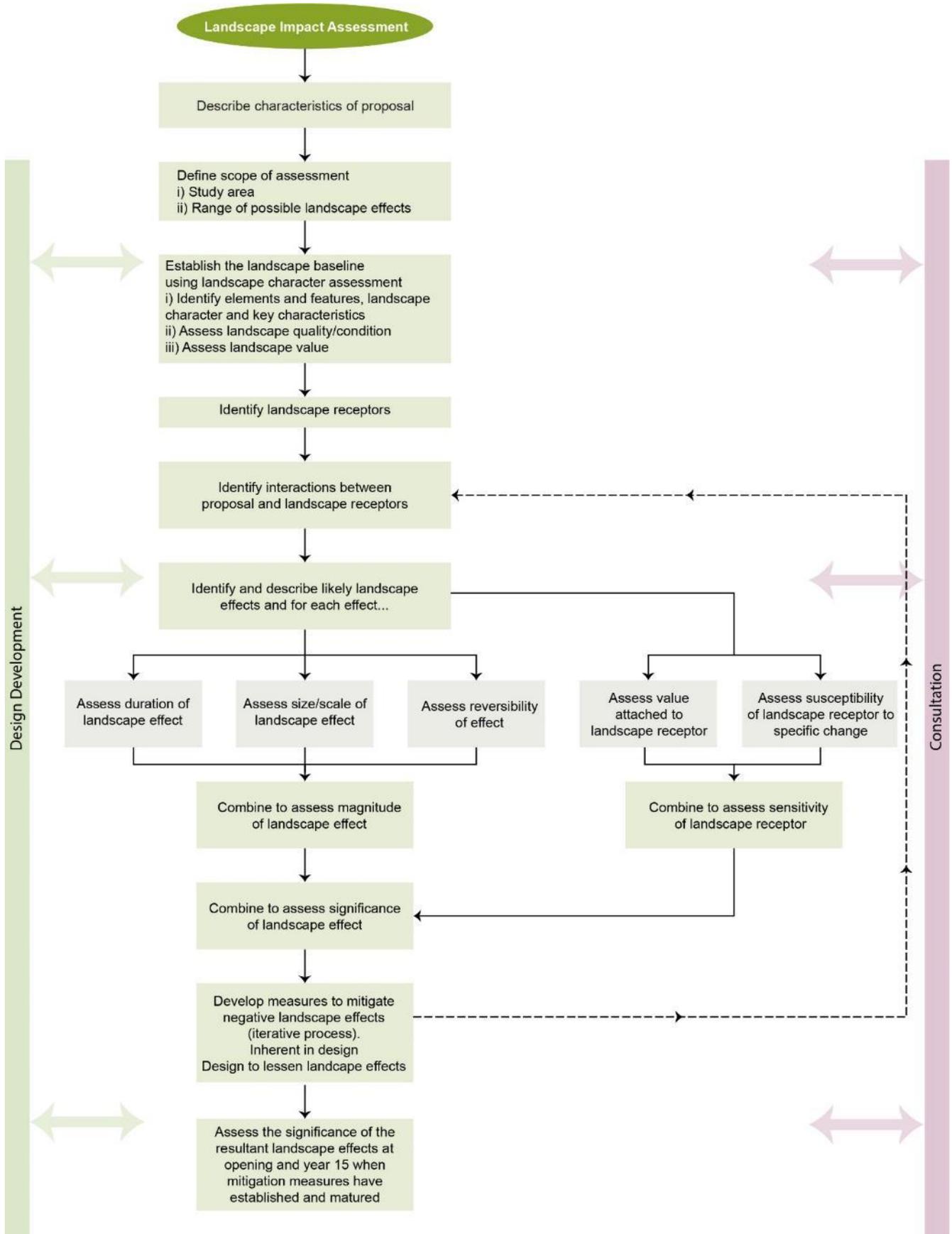


Figure 21 Assessment of landscape effects

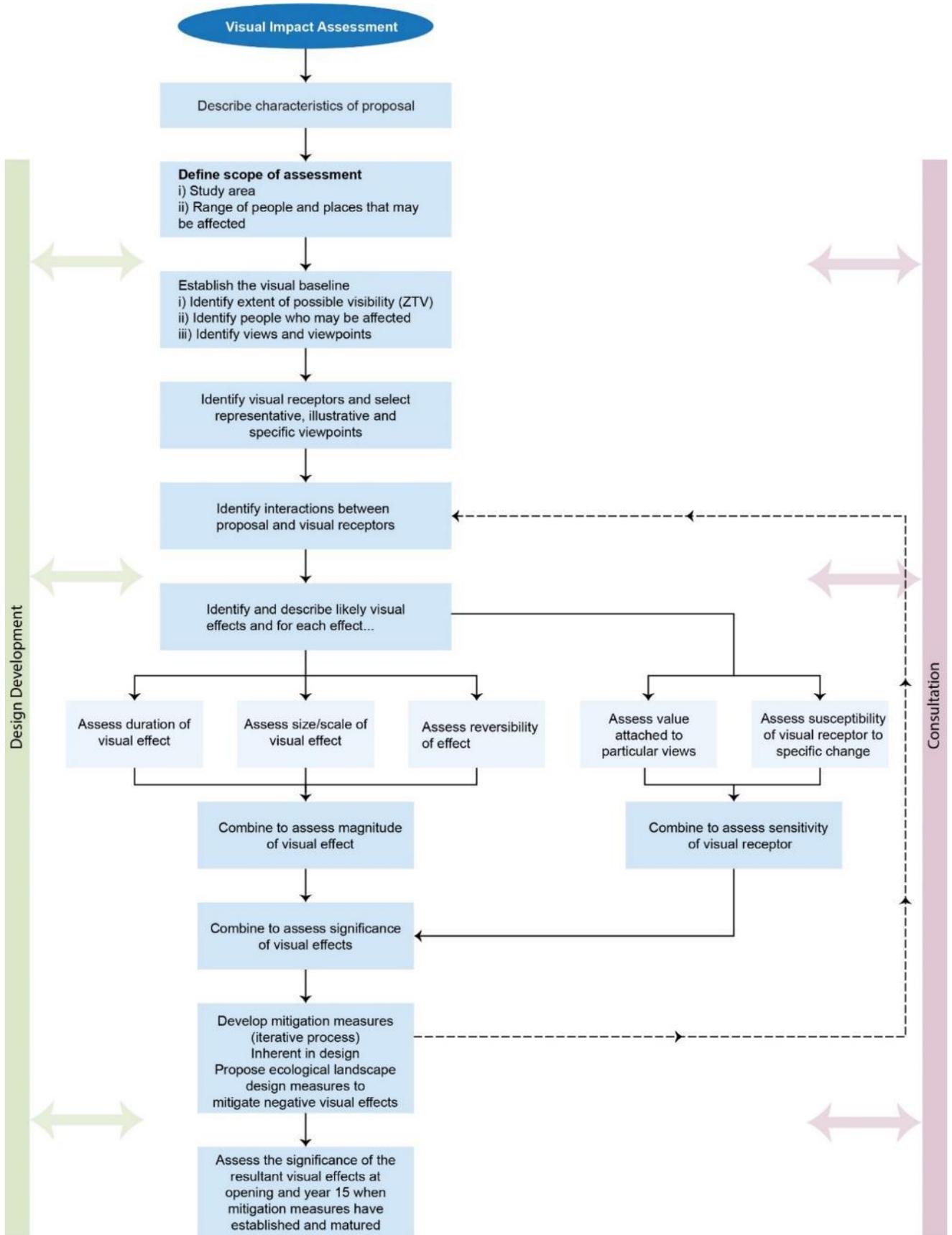


Figure 22 Assessment of visual effects

3.5.2.1 Establish Scope

The scoping will identify the issues that need to be covered in the assessment and will usually include the following:

- The extent of the study area to be used for the assessment of landscape and visual effects – either the Zone of Theoretical Visibility and or Landscape Character Areas/Landscape Character Types likely to be significantly affected directly or indirectly. For a landscape and visual appraisal report detailed ZTVs will not be required.
- Identification of the main sources of relevant landscape and visual information and data (aerial photography, historic mapping, GIS mapping such as www.geohive.ie, www.heritagemaps.ie, other online mapping etc.)
- Identification of the nature and range of possible landscape and visual effects and especially those deemed most likely to occur and be significant
- Identification of the main receptors of the potential landscape and visual effects that need to be addressed in the full assessment including viewpoints that shall be assessed.
- Extent and appropriate level of detail for baseline studies from Phase 2 reviewed and updated as necessary.
- Methods to be used in assessing the likely significance of the effects that may be identified.
- Requirements with respect to the assessment of likely significant cumulative landscape and visual effects.
- The likely relative interactions between other topics such as biodiversity and cultural heritage that need to be assessed.
- The effects at the scoping stage shall be reviewed in light of any additional information obtained through consultation, baseline study and the iterative development of the national road project.
- Description of the Proposed Development and Consideration of alternatives. A general description of the siting, layout, and characteristics of the proposed development will be provided as a separate chapter. The project description within the LVIA section shall describe only the aspects of the national road project that will give rise to effects on the landscape/townscape and visual amenity. Include a description of the development at each stage of the project lifecycle (including landscape planting), namely construction, operation, monitoring and decommissioning/restoration, if applicable.

3.5.2.2 Establish and Analyse Landscape and Visual Baseline

Review, updates and establish baseline landscape and visual conditions from Phase 2 High Level Analysis to Detailed Analysis to form the basis for the identification and description of changes. Include review of existing statutory development plan(s) and landscape character assessments.

For the **landscape baseline**, the aim is to provide an understanding of the landscape in the area that may be affected – its constituent elements, character, geographic extent, history (with input/coordination with Cultural Heritage specialist), and its condition, the way it is experienced and the value attached to it.

This involves:

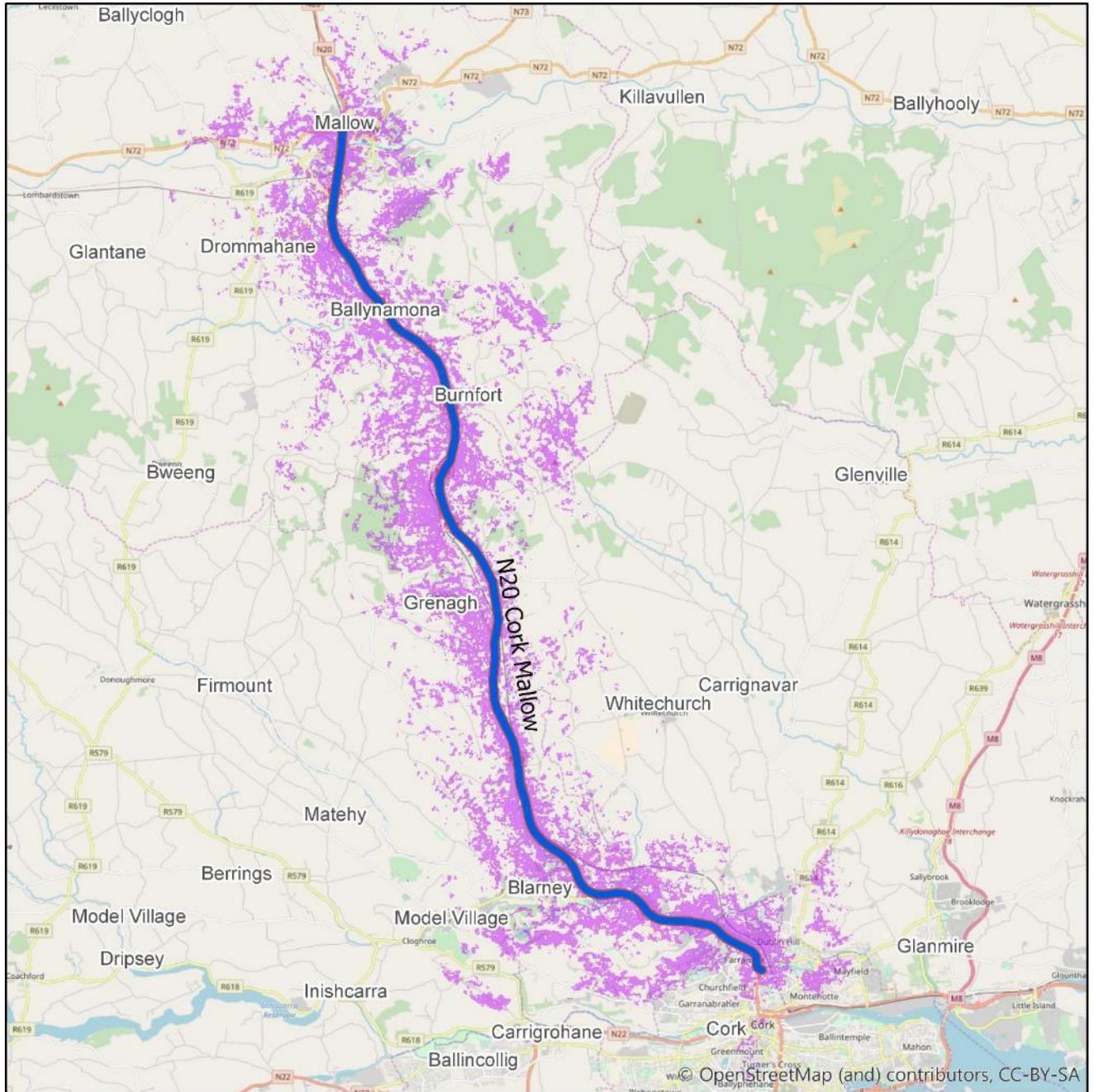
- i. Review existing LCA/LCTs. In a value free process, identify the key features, elements, and characteristics of the landscape/townscape areas potentially affected by the proposed development, to appropriate scale proportionate to the project.
- ii. Make judgements about landscape character related to sensitivity and value. Note key elements that are important or valued.
- iii. Record the landscape/ townscape through photographic record and field survey sheet.

A high level landscape/townscape baseline analysis will have been carried out during the earlier stages of the project Phase 2 – Options Selection. Depending on the level of detail required and the nature of the project it may be necessary to review this information and carry out a more detailed assessment involving a field survey - the assessor will use professional judgement informed by their expertise and experience to consider this. This may for example be applicable in an urban project where a more detailed survey of the interface between the project and existing environment will be required to complete the townscape assessment. It is assumed that the desk top survey information will have been collated during Phase 2. Detailed research will only be necessary where there are potentially significant impacts on landscape or visual receptor. In the majority of cases, information on the landscape and visual aspects gathered at the earlier Constraints Study and Options Selection Study Phases from Phase 2 will be adequate for the assessment of impacts at the EIA Phase. They shall however be checked and verified that they are up to date.

For the **visual baseline**, the aim will be to establish the area in which the development may be visible, different groups of visual receptors who may experience views of the development, places where they will be affected, nature of views and visual amenity at those locations:

- Map the Zone of Theoretical Visibility (ZTV) and extent of study area. The study area will include the project itself and full extent of the wider landscape around which the development may influence in a significant way. The study area will be based on the extent of the area from which the development is potentially visible, known as Zone of Theoretical Visibility (ZTV) – see Figure 23. The study area will vary depending on context, e.g. for a rural landscape, it may extend to number of kilometres from the development, whereas in townscape/urban development it may be the width of a street (building façade to façade). The study area will change during the various project phases, as the design progresses. A zone of theoretical visibility diagram (ZTV) illustrates the area of the landscape from which a viewer can theoretically see the proposed development. This is a desk-based technique and provides a framework and structure for understanding the potential extent of effects within the landscape. This kind of information can be roughly/manually derived from analysis of contour maps and aerial photography, however computer software is increasingly being used to provide this information. It should be noted that this is indicative only and needs to be refined through site visits and more detailed analysis in later in Phase 3 when the proposed national road is designed. Further detail and methodology on the process is outlined in *Chapter 6, GLVIA3 (LI/EMA, 2013)*.
- Carry out/update desktop study for Study area.
- Carry out site/field survey – record viewpoints and photograph (see Section 13, *Overarching Technical Document PE-ENV-01101* for sample notes)
- Prepare cross sections and /or visualisations, as necessary.
- Establish sensitive visual receptors (viewers and views, including designated views/prospects) and distinguish between static and moving views. If the receptor is static (for example the occupier of a residential property) then the effected view will be static and greater emphasis will be placed upon it.

However, if the receptor is moving (for example along an amenity walk or along the existing road network), then the view will be constantly changing and the proposed road development may only be visible for part of the time. These types of views may be temporary/permanent, sequential, intermittent, and/or filtered.



Legend

- Existing N20
- Existing N20 Value
- Not visible
- Visible



Figure 23 Sample ZTV map of existing N20

3.5.2.3 Assessment – Identification, Description and Significance of Effects

Establish and record (through report, schedules, mapping, photography, drawings/sketches) the range of potential separate landscape and visual effects against the baseline situation. For each aspect:

- Identify the sources of effects throughout the project life cycle (construction, operation at opening year and 15 years when planting has established and matured).
- Identify the nature of the effects: **direct** (because of the development, including lighting), **indirect** or secondary (because of an associated development secondary to the main development), and **cumulative** (because of the addition of many small effects, including cumulative effects of other projects, to create larger, more significant effects).
- Identify the **landscape effects** in relation to the sensitivity of the landscape/ townscape; determine the scale and magnitude of change, as set out below.
- Identify the **visual effects** in relation to the sensitivity of the visual receptors; determine the scale and magnitude of change, as set out below.
- Identify the **significance** of landscape/ townscape and visual effects (e.g. slight, moderate, significant etc., as per EPA Guidelines).
- Separately assess landscape and visual effects, noting the interaction/closely related aspects of each.
- Establish the **duration** of the effects, whether they be short, medium or permanent/enduring or temporary, noting seasonal differences, day/night effects as appropriate.
- Identify effects as **positive** (beneficial), **negative** (adverse or detrimental) or **neutral**.

The landscape and visual assessment shall take a step by step approach to making judgements about significance combining judgements about the nature of the receptor (**sensitivity**), and the nature of the effect (**magnitude**).

It is important to distinguish clearly between significant and non-significant effects.

Whether effects are deemed significant is dependent on consideration of the criteria and Table 13 below;

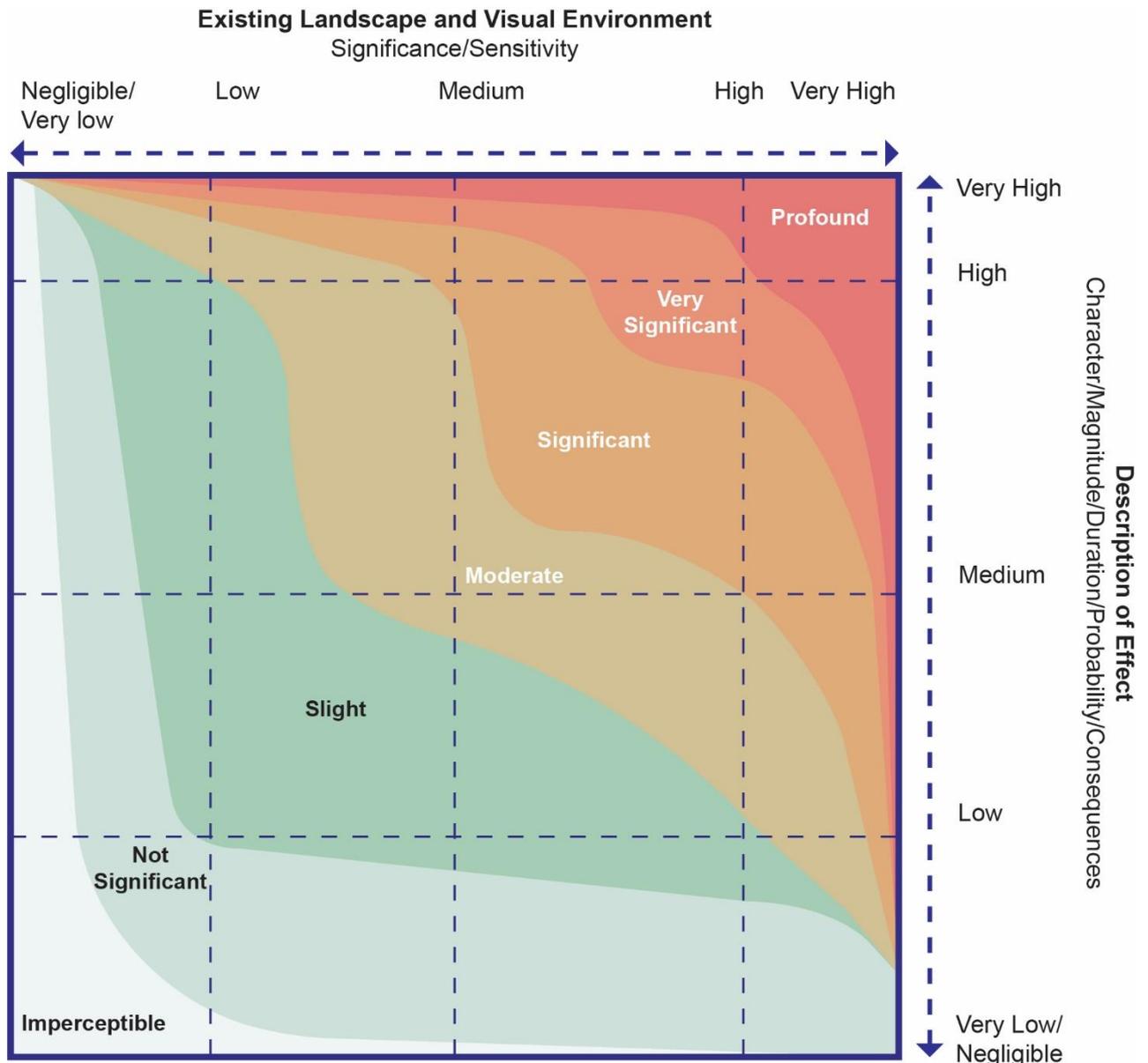
- The **nature** of the receptors:
 - The value of the receptor
 - The susceptibility of the receptor to the type of change or development being proposed.
- The **magnitude** of the change:
 - The size and scale of the effect (complete loss of a landscape element or a minor change).
 - The geographical extent of the area which will be influenced by the change
 - The duration of the effect and its reversibility.

The significance of effects will be rated in accordance with the criteria provided in the draft *Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports* (EPA, 2017), and as set out in Table 13 below.

Table 13 **Significance of landscape and visual effects**

Significance of effect	Typical Descriptors of Effect
Profound	An effect that obliterates sensitive characteristics within the landscape and/or visual environment.
Very significant	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the landscape and/or visual environment.
Significant	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the landscape and/or visual environment.
Moderate	An effect that alters the landscape in a manner that is consistent with existing and emerging baseline trends.
Slight	An effect which causes noticeable changes in the landscape and/or visual environment without affecting its sensitivities.
Not significant	An effect which causes noticeable changes in the landscape and/or visual environment but without significant landscape and/or visual consequences.
Imperceptible	An effect capable of measurement but without significant landscape and/or visual consequences.

The significance of the effect is determined by considering the magnitude of the effect and the quality of the baseline environment affected by the proposed development. The sensitivity of visual resources can vary from 'very low' to 'high', and likewise, magnitude of effect can vary from 'very low' to 'very high'.



Adapted from EPA Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports, August 2017

Figure 24 Basis for consideration of significance of effects

To classify the significance of effects, the magnitude of change is measured against the sensitivity of the landscape/visual receptor using the illustrative guidance in Figure 24 above. The figure is for guidance only, as it is not possible to set out a precise formula for the determination of the significance of effect as every case is different. The assessor will also use professional judgement informed by their expertise and experience to arrive at a classification of significance that is reasonable and justifiable. It is important that the significance level determined is supported by reasoned justification in the form of a written explanation (supported by photographs and other illustrations as appropriate), so that the basis for the assessment is clear.

This is particularly important where a choice of categories is given in the figure (e.g. where a highly sensitive receptor experiences a medium magnitude of impact, justification for the assessment of either a moderate or larger degree of significance shall be given).

3.5.2.3.1 Residential Visual Amenity Assessment (RVAA)

For some proposed road developments, where residential properties experience a high magnitude of visual change, and which are in close proximity to the development, a Residential Visual Amenity Assessment may be required. This will be scoped early in the assessment process.

RVAA assesses the visual component of residential amenity as experienced at local residential properties. Guidance on the approach to RVAA is provided by the Landscape Institute draft *Residential Visual Amenity Assessment* (LI, 2018). Landscape and visual effects shall be clearly and succinctly presented in tables, mapping and supporting text as required, for example in a Visual Effects Schedule (VES), see Table 14 and Visual Effects Drawing (VED), see Figure 25.

Table 14 Example of visual effects schedule

Property Ref	Location	Approx. distance from road centre line (m)	Notes	Construction Impact	Pre-establishment Impact	Post-establishment Impact
PR/01	Chainage 1500. Slip road from roundabout	45	East bound slip from removing portions of existing roadside screen vegetation.	Significant	Significant, negative	Moderate, negative.
PR/02	Chainage 1600. Northeast of interchange	90	Group of residential properties, with existing mature screen planting blocking views of road.	Moderate	Slight, neutral	Slight, neutral

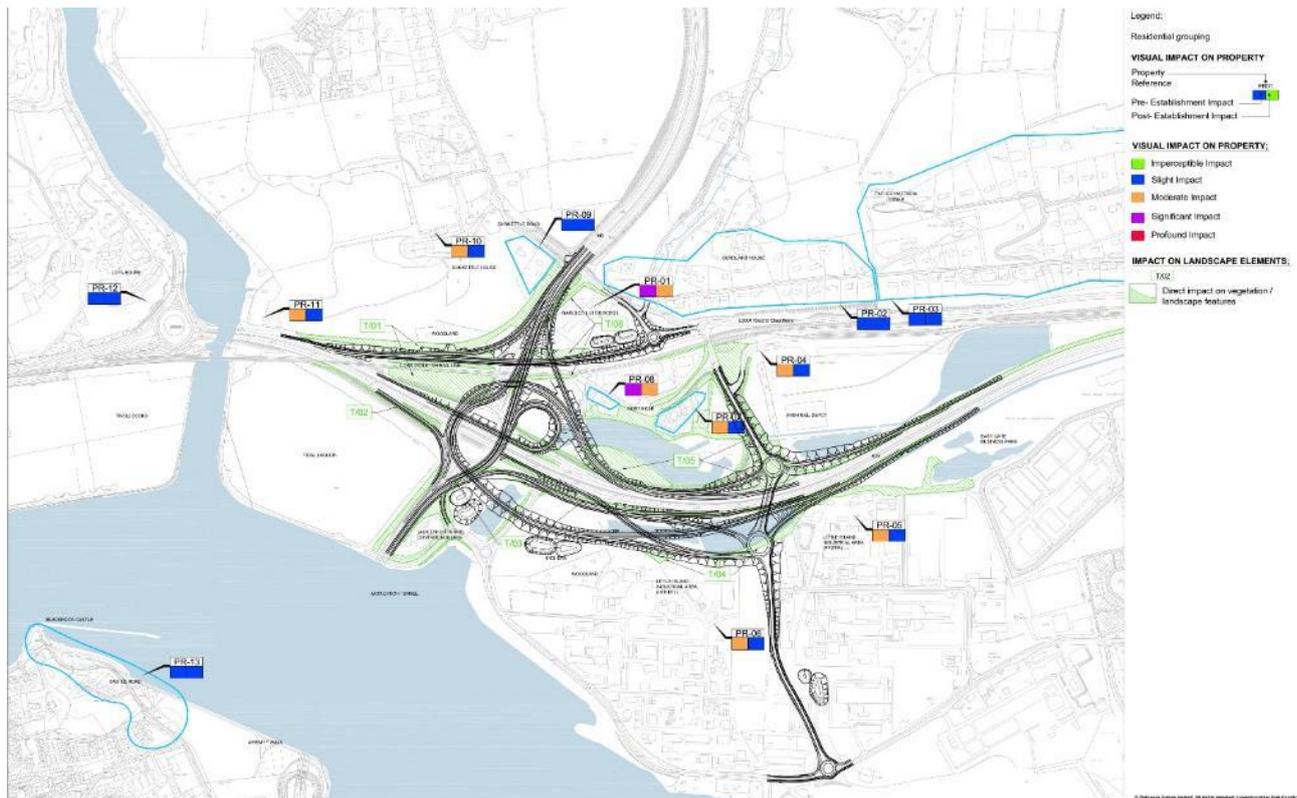


Figure 25 Example map illustrating visual impact

In reporting on significant effects it is important that the key issues are identified including any scope for reducing negative/ adverse effects in the mitigation measures.

3.5.2.3.2 Cumulative Landscape and Visual Effects

The assessment of cumulative effects is required by the EIA Directive and must be considered as part of the LVIA. Cumulative effects are described as “*The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects*”. (EPA Draft Guidelines 2017). The scope of cumulative landscape and visual effects needs to be agreed at the outset of the project during the scoping stage and the EIA co-ordinator will need to ensure a consistent approach is adopted across the different topic areas.

The baseline for assessing cumulative landscape and visual effects include the national road project considered within the LVIA and proposed developments with planning permission that occur within the study area which are likely to give rise to significant landscape and visual effects.

The assessment of cumulative landscape and visual effects will be carried out EIA and non-EIA projects.

3.5.2.3.3 Worst Case Scenario

The assessment will describe the worst case for the landscape and visual environment if all mitigation measures fail, considering the impact of the development on the overall landscape character of the area, landscape and visual receptors.

3.5.2.4 Mitigation

The iterative design approach to EIA is now common and its value recognised. The objective will be to develop mitigation measures to avoid reduce, remedy, or compensate for landscape and visual impacts and will be considered at all stages of the project life cycle.

Landscape mitigation is concerned with the reduction and remediation of cultural, social, and ecological impacts on landscape quality which arise from the interactions between roads and the existing landscape. In providing mitigation of and compensation for impacts, landscape treatments have the potential to make a significant and valuable contribution to biodiversity conservation, environmental aesthetics and to the retention of regional identity, landscape character and diversity, along with visually attractive conditions for the road user.

Analysis of landscape and visual character of a national road project, its context, and approaches to routing/siting and design, will minimise possible landscape and visual effects early in the process. The assessment of landscape effects will be closely linked with the landscape design and mitigation measures, and used in an iterative design and assessment process, with the analysis of the landscape character guiding the design of a particular national road project.

It is important to be able to demonstrate that measures to mitigate negative landscape and visual effects and any enhancement measures are deliverable, safe, and manageable in practice. Landscape and visual mitigation should be considered in isolation, noting that certain landscape/visual mitigation measures may not be feasible due to other design and environmental constraints. A landscape design strategy will be prepared to address the key objectives, function and outcomes required of the landscape mitigation proposed.

Landscape mitigation will entail:

- Primary mitigation measures which are developed through the iterative design/environmental assessment process, such as the avoidance of developments in particularly sensitive landscape character areas or landscape features, and which become integrated within the proposed development;
- Standard construction and operational management practices for avoiding and reducing landscape effects, e.g. Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior To, During the Construction of National Roads (TII).

3.5.2.4.1 Mitigation Measures to Address Landscape Effects

Primary mitigation measures to address landscape effects might include (and is not limited to):

- A landscape context sensitive and place based approach to mitigation, e.g. use of appropriate and sensitive form, detailed design, plant species, materials and finishes, informed by the landscape character assessment process to assist with the integration of the national road project into the landscape;
- Alterations or use of landforms, including use of earth mounding, together with structural, ecological landscape planting to provide screening;
- Landscape mitigation measures specific to proposed road development e.g. hedgerow connectivity, circulation, views, screening, gateway treatments, sense of place,
- Adjustment to horizontal and vertical alignment or site levels;
- Avoiding or reducing obstructive lighting – lighting for safety may be unavoidable and may give rise to significant, negative effects; in such cases, consideration shall be given to different ways to minimise light pollution and reference made to the appropriate guidance, such as *Reduction of Obtrusive Light* (Institute of Lighting Professionals, 2011) and TII's **DN-LHT-03038** *Design of Road Lighting for the National Road Network* (TII).

3.5.2.4.2 Mitigation Measures to Address Visual Effects

Primary mitigation measures to address visual effects, including the reduction of visual intrusiveness or visibility of the development might include (and is not limited to):

- Primary mitigation measures which are developed through the iterative design/environmental assessment process, such as the avoidance of developments in particularly sensitive or visually prominent areas, and which have become integrated within the proposed development;
- Use of appropriate and sensitive form, detailed design, materials and finishes to assist with the integration of the national road project into the visual environment;
- Alterations or use of landforms, including use of earth mounding, together with structural, ecological landscape planting to provide visual screening.
- Standard construction and operational management practices for avoiding and reducing landscape effects, e.g. *Guidelines For The Protection And Preservation Of Trees, Hedgerows And Scrub Prior To, During The Construction Of National Roads* (TII).

The use of planting to mitigate landscape effects will be carried out in accordance with:

- **GE-ENV-01102** A Guide to Landscape Treatments for National Road Schemes in Ireland (TII),
- **GE-ENV-01103** Guidelines in the Implementation of Landscape Treatments on National Roads Schemes in Ireland (TII) and,
- **GE-TBU-01019** *NRA TB 11 NRA TD 19 and Forgiving Roadsides* (NRA).

Specific mitigation measures to address particular effects shall be recorded and documented within a compendium or schedule of environmental commitments, with a clear rationale/objectives for the mitigation measure.

Screen planting can be expected to take a number of years to establish, mature, and become effective. The updated and amended Directive 2014/52/EU requires that the EIAR contain a description of ‘*any proposed monitoring arrangements (for example the preparation of a post-project analysis)*.’ For landscape remedial measures, this shall include a statement on how the monitoring of screen planting will be undertaken, e.g.:

- in the first year after opening (opening year), to ensure the achievement of the design intent (outlined in landscape mitigation strategy and landscape masterplan); and,
- at year 3 (or more frequent if necessary) to ensure the planting has sufficiently established and matured.

The mitigation measures will take into account resilience of the proposals to climate change and full life cycle costs. The full life cycle costs associated with the landscape mitigation measures will include consideration of slope treatments, surplus land disposal, maintenance access considerations, maintenance of tree/hedge/shrub layer planting, mowing of grass/meadow areas, risks such as pest/vandalism, and replacement costs will inform the design process at this point.

The mitigation measures shall be linked to suitable clear performance standards, covering the establishment, design function, management, and maintenance and monitoring of the new landscape planting features. They will set out what is required for landscape mitigation to be carried through to the next project phases.



Figure 26 Sample landscape mitigation strategy plan

3.5.2.5 Residual Effects

The residual effects are the final or intended effects which occur after the proposed mitigation measures have been implemented. It will not always be possible or practical to mitigate all adverse effects. The effects that remain after all assessment and mitigation are referred to as ‘Residual Effects’.

The assessment of the residual visual effects of the project shall take account of any mitigation measures proposed, after 15 years when planting has established and matured. Photomontages illustrated the anticipated height of mitigation planting can be very useful in demonstrating residual effects.

3.5.2.6 Non-Technical Summary

The non-technical summary is a condensed version of the LVIA chapter which describes the project effects and mitigation. The language used should be clear and easily understood by the general public with avoidance of the use of technical jargon. All likely significant landscape and visual effects shall be included.

3.5.3 Deliverables/Outputs

3.5.3.1 Landscape and Visual Assessment Report

Landscape (townscape/seascape) and visual impact report, illustrated with photographs and mapping (where necessary landscape context, character, key views etc.). Ref 3.4a

Presenting the landscape and visual assessment report will follow the Standards Document whether the assessment is part of an EIAR or a “standalone” appraisal report. A well-structured report will include details of the scope of assessment, methodology, baseline description, key landscape and visual issues, identified significant landscape and visual effects, cumulative landscape and visual effects, mitigation, and any difficulties encountered in compiling the report. In an EIAR the reporting will be consistent across all chapters and the structure will be provided by the EIAR co-ordinator. A logical structure using comprehensive, concise, and impartial text shall be supported by illustrations and tables to summarise the narrative text.

A separate Non-Technical Summary (NTS) of the LVIA report shall be submitted, where an EIA is required.

3.5.3.2 Maps

These will be at a suitable scale and level of detail to reflect the information required to illustrate the principal landscape and visual effects. Maps will be produced digitally using desktop graphic software packages and/or CAD.

Data can also be presented in the form of Geographical Information Systems (GIS) for landscape character assessments. The information can be collated and used for analysing the relationships and interactions between topics such as topography, soils, hydrology, vegetation, habitats, settlement patterns, land use, historical and cultural features. GIS data mapping will be in ITM format and in accordance with the OSi Prime2 dataset (OSi, 2014) and INSPIRE Directive (EU, 2007).

The maps will typically illustrate the landscape baseline defining landscape/ townscape character areas/ types and planning context, key views, the location of principal visual receptors. The level of detail will be proportional to the project.

3.5.3.3 Photographs

Photographs are useful for illustrating the existing landscape/townscape character in supporting the description of the landscape/ visual baseline. Historic photographic archives and materials can be used as necessary in conjunction with contemporary photographic material.

They should be representative of a range of landscape/ townscape character types for large study areas.

They should be used to illustrate existing views and visual amenity from agreed viewpoints. The selected viewpoints identified should be representative of a range of locations where there will be significant visual effects. For each photograph the following information should be recorded;

- Location of photograph shown on a map
- Lens type and focal length
- Date and time

For further information refer to the UK Landscape Institute Technical Notes (LI, 2019).

3.5.3.4 Photomontages

Photomontages are a necessary tool for demonstrating the landscape and visual impact of a development by showing the “before” and “after” scenario when mitigation measures are in place and established.

The selected viewpoints will be representative of the range of likely effects, viewing experiences and viewers, ensuring that none are under- or over-represented.

To meet the requirements of a statutory consenting application, it is essential that the photomontages are accurate and verifiable – see *LI Technical Guidance Note 06/19 – Visual representation of development proposals* (LI, 2019). Key requirements include:

- Selected viewpoints are representative of the view and character of the location and a rationale for selection of the viewpoints shall be provided within the methodology of the LVIA. Consideration of vegetative cover (winter vs. summer views) will be addressed/assessed.

- Appropriate viewpoint locations will provide a balanced representation of the range of likely effects, viewing experiences and viewers.
- The photomontages will show all the components of the development that will be visible and will show future changes that are proposed and have planning permission but not currently constructed. For example a photomontage illustrating a new urban road located within a degraded landscape which is set to change will also illustrate the proposal within the proposed future context.
- Selecting only viewpoints close to the proposed development, where the greatest effects are anticipated, is unlikely to provide a balanced representation of visual effects. Photomontage views with screening that obscures the proposed development will also be avoided (unless that is the most representative view).
- Public viewpoints will be selected as they are more readily accessible and are likely to be witnessed by a greater number of people.
- The baseline photography should be taken during good weather (wherever possible) with good visibility.
- The field of view and image size should be selected to provide a realistic view of how the landscape will appear when the image is held at the correct specified viewing distance from the eye (between 300-500mm at 1.6m high). For accuracy, full frame digital cameras shall be used, will be levelled and viewpoints surveyed to calibration and verification within 3D CAD/rendering software.
- The photomontages will show the proposal post construction in year 1 (opening year) and year 15 (where screen planting has been used to mitigate the project). The time of year when the photography is taken will be dependent on the project timescale. In particularly sensitive viewpoints, winter and summer views may need to be shown but this may not be feasible.
- Particular projects may require night time views to illustrate proposed illumination levels at for example interchanges, Toll Schemes, Motorway Service Areas. In areas of existing low levels of illumination night time photomontages should be an integral part of the assessment.
- Where appropriate and applicable, they will also include significant cumulative effects arising from other significant projects.

3.5.3.5 Landscape Strategy Report and Landscape Mitigation Plan

A description and mapping of the landscape strategy will be prepared and form part of the mitigation section of the LVIA report, Ref 3.5a. This will outline the background, objectives, function for the proposed landscape treatment and specific mitigation measures that have been developed through the LCA and LVIA process, which will influence and consider future maintenance operations (in the later Phases 5 and 6, and in future motorway maintenance and renewals contracts (MMaRC)).

The strategy will identify the location (e.g. road chainage) and objective of the mitigation proposal, e.g.:

- Define where planting will be used as visual screening
- Retain/protect existing trees/hedgerows
- Reconnecting severed hedgerows or foraging corridors
- Requirements for maintenance access etc.
- Use of cut and cover tunnels, green bridges etc.

- Enhance views for road users by allowing/framing views of the surrounding landscape from the proposed road.
- Formal planting to create gateway at settlement
- Where new boundaries are proposed a boundary strategy will be included.
- Screen planting integrated and designed to reduce visual clutter from signage, lighting, noise barriers etc., but not reducing the effectiveness of these necessary elements of road infrastructure.
- Improve public realm, incorporation/protection of historic paving, street furniture etc.

It will clearly outline the function of the landscape mitigation measures so this can be used as part of future maintenance contracts, as well as providing a schedule of commitments to accompany the EIAR.

The detailed landscape mitigation plans, details and performance specification will be linked, informed, and cross-referenced with the landscape strategy. The landscape mitigation plan will illustrate, at an appropriate scale, the proposed national road project and design measures included to reduce adverse landscape and visual effects and integrate the development.

The landscape mitigation plan shall clearly illustrate:

- Existing planting/ vegetation/ trees/ tree lines, as per *Guide to Habitats in Ireland* (Fossitt, 2000) being retained and/or removed.
- Visual screening - Proposed landforms and new planting areas/planting types (woodland, specimen trees, hedgerows, shrubs, groundcover, maintained grass, and meadow). A list of proposed plant species shall be included on the plan.
- Treatment of cut slopes/embankments with proposed grades.
- Treatment of detention ponds/ SUDS features.
- Boundary proposals.
- Materials and finishes that help to integrate the design into the existing visual context.
- Location of key features of proposed road development such as motorway service areas, tolls, earthworks, junctions, slip roads, bridges, abutments, underpass, viaducts, noise barriers, restraint barriers, kerbs, carriageway, sightlines, accommodation tracks, depots, attenuation ponds, CPO boundary, chainage.
- Location of lighting, signage, and road gantries.
- Where applicable, the incorporation of 'green and blue infrastructure' within the road design.
- Sections and detailed plans as required for key sensitive locations/receptors, with provision of sections at 5, 10, 15, 20 years (if significant/appropriate), e.g. urban/town gateways, sensitive landscape areas, etc.

Good design mitigation practice needs to reflect the landscape character of each area (which is the result of a long interaction between topography, human activity, and natural processes). It is made up of numerous, complex combinations of simple elements - woodland, hedgerows, fields, local roads, and settlements - each of which needs to be studied and understood by the design team.

In the landscape strategy, working with the wider project team, the landscape professional will confirm that screen planting mitigation measures are within CPO/Land take boundary, as appropriate.

Landscape planting mitigation will follow, where appropriate, the ecological landscape design approach outlined in TII's other guides and documents in relation to Landscape outlined below. The landscape mitigation plans will consider:

- **GE-ENV-01102** – A Guide to Landscape Treatments for National Road Schemes in Ireland (TII)
- **GE-ENV-01103** – Guidelines on the Implementation of Landscape Treatment on National Road Schemes in Ireland (TII)
- **GE-TBU-01019** - NRA TB 11 NRA TD 19 and Forging Roadsides (NRA)
- Road safety sightlines and lighting layouts during the design process
- Ecological and cultural heritage mitigation requirements
- Planting proposals planting will take account of the objectives of the *All-Ireland Pollinator Plan (2015-2020)* (<http://www.biodiversityireland.ie/projects/irish-pollinator-initiative/all-ireland-pollinator-plan/>) and *Pollinator-friendly management of Transport Corridors* (National Biodiversity Data Centre, 2019)
- Functional requirements of planting will also inform maintenance regimes (e.g. maintain visual screening/hedge to sensitive receptor).
- Mitigation strategies will be subjected to whole life costing and financial impacts of alternative strategies particularly with regard to maintenance. The increased utilisation of BIM technology for public works projects will assist with this analysis (GCCC, 2017)
- Where applicable, *Design Manual for Urban Streets and Roads (DMURS)*, (DTTAS (now DoT)/DHPLG, 2013)

Planting of other non-native, non-invasive species which have an ecological value may be more appropriate in urban areas, where resilience, form, management, and aesthetic considerations will be important.

The use of native species is an objective of national and international policy including the *National Biodiversity Plan (2002)*, *All-Ireland Pollinator Plan 2015-2020* and the *UN Convention on Biological Diversity (1992)* and contributes to Ireland's commitments under the EU Habitats Directive, 92/43/EEC and *EU Strategy for Supporting the Implementation of Green Infrastructure* (European Commission, 2005).

Table 15 Summary Checklist of Phase 3 LCA / LVIA Deliverables/Outputs

Activities	Project greater than 20M	Minor Projects 5M to 20M	Minor Projects 0.5M to 5M*	Minor Projects less than 0.5M*
Phase 3: Design and Environmental Evaluation Project design development (taking account of technical and environmental inputs) Progress Project towards publication	Table 2 Output Ref. 3.4a Refined LCA mapping and description, where appropriate, relevant to the selected option. Detailed LVIA for Project (based on LCA); including description of	Table 3 Output Ref. 3.4a Refined LCA mapping and description, where appropriate, relevant to the selected option. Detailed LVIA for Project (based on LCA); including description of	Table 4 Output Ref. 3.4b LVIA input to Project Appraisal Deliverables. Table 4 Output Ref. 3.4c Landscape strategy report and Landscape mitigation plan/input to	Use Output Ref. 3.4b LVIA input to Project Appraisal Deliverables.

Activities	Project greater than 20M	Minor Projects 5M to 20M	Minor Projects 0.5M to 5M*	Minor Projects less than 0.5M*
for Statutory Process Phase.	<p>baseline; assessment of landscape and visual effects, interactions, cumulative effects; detailing of mitigation measures, etc. either as standalone LVIA Report, or where required, as Chapter of EIA Report (EIAR).</p> <p>A separate Non-Technical Summary (NTS) of the LVIA.</p> <p>Table 2 Output Ref. 3.5a</p> <p>Landscape strategy report and Landscape mitigation plan /input to schedule of commitments.</p> <p>Table 2 Output Ref. 3.5b</p> <p>LVIA input to Project Appraisal Deliverables, where required.</p>	<p>baseline; assessment of landscape and visual effects, interactions, cumulative effects; detailing of mitigation measures, etc. either as standalone LVIA Report, or where required as Chapter of EIA Report (EIAR).</p> <p>Compilation of above information into the formal LVIA Chapter of the EIA Report where EIA is required, or into the project specific environmental report or standalone LVIA report where EIA is not required.</p> <p>A separate Non-Technical Summary (NTS) of the LVIA, where EIAR required.</p> <p>Table 3 Output Ref. 3.5a</p> <p>Landscape strategy report and Landscape mitigation plan/input to schedule of commitments.</p> <p>Table 3 Output Ref. 3.5b</p> <p>LVIA input to Project Appraisal Deliverables, where required.</p>	<p>schedule of commitments.</p>	

* As noted in 3.4.1 above, for some smaller projects it may be possible to 'scope out' landscape/visual aspects, for example where potential impacts will be negligible for all options (e.g. for online or junction improvement works), thereby simplifying assessment.

Liaison with the Project Manager and the other relevant project professionals is required in the preparation of each output of Phase 3. A record shall be kept to demonstrate that receipt of each Phase 3 outputs has been acknowledged by the Project Manager. With respect to a submitted output, the Project Manager may do any of the following: Acknowledge, Acknowledge with comments, or Reject. All comments by the Project Manager shall be addressed and the output re-presented to the Project Manager for acknowledgement.

Note: the relevant project professionals to be liaised with should be agreed with the Project Manager.

3.5.4 Relevant TII PMGs/PAGs/Standards/Guidelines

- **PE-PMG-02041** – Project Management Guidelines
- **PE-PMG-02042** – Project Manager’s Manual for Major National Road Projects
- **PE-PAG-02012** – Project Brief
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA)
- **GE-ENV-01102** - A Guide to Landscape Treatments for National Road Schemes in Ireland (TII)
- **GE-ENV-01103** - Guidelines on the Implementation of Landscape Treatments on National Road Schemes in Ireland (TII)
- Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post Construction of National Road Schemes (TII)
- Guidelines for Assessment of Ecological Impacts on National Road Schemes (NRA)
- **PE-ARC-02007** - Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (TII)
- **PE-ARC-02006** - Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (TII)
- Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (NRA)
- **DN-GEO-03028** – Location and Layout of On-Line Service Areas (TII)
- **PE-PAG-02027** – Project Appraisal Guidelines for National Roads Unit 6.8 – Appraisal of Motorway Service Areas (TII)
- **DN-LHT-03038** - Design of Road Lighting for the National Road Network (TII)

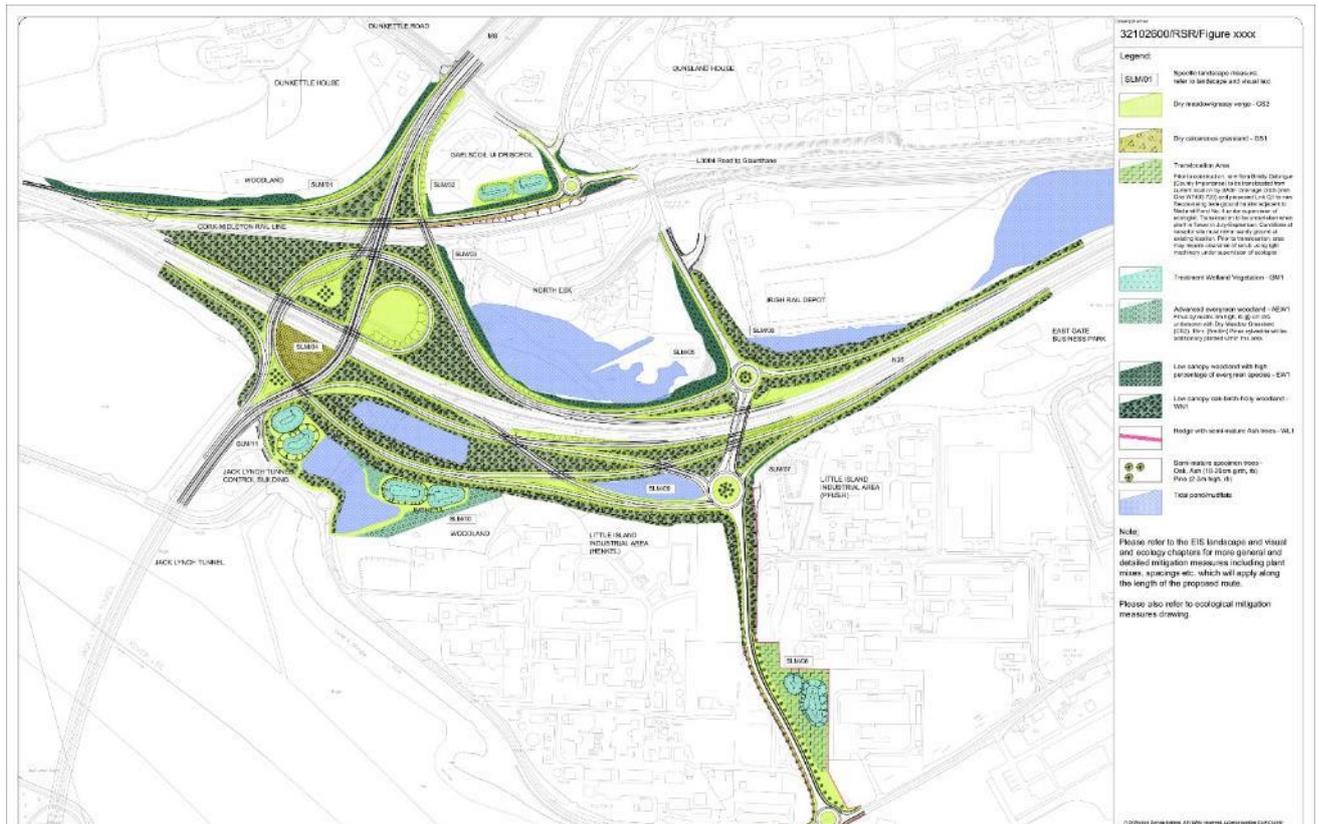


Figure 27 Example landscape mitigation plan (Dunkettle Interchange, Cork)

3.6 Phase 4: Statutory Processes

3.6.1 Objective:

This is the consenting process, where the statutory and non-statutory stakeholders, can provide submission/observations/objections to the proposed road development, which need to be considered by the consenting authority (An Bord Pleanála or Planning Authority, as appropriate). This is applicable for EIA and non-EIA projects.

A proposed road development/project requiring an EIA will be submitted to An Bord Pleanála pursuant to Section 51 of the Roads Act, 1993, as amended. A project requiring an Appropriate Assessment, but not an EIA, will be submitted to the Board pursuant to Section 177AE of the Planning and Development Act, 2000, as amended. A project requiring a Part 8 will be subject to the requirements of, inter alia, Section 179 of the Planning and Development Act, 2000, as amended, and Part 8 of the Planning and Development Regulations, 2001, as amended. 'Sub-threshold' proposed national road development (i.e. sub the threshold for automatically requiring an EIA) needs to be screened for EIA on case-by-case basis.

During the statutory process, the landscape professional will respond to third party submissions where pertinent/required, and participate in oral hearing(s) as required by the statutory processes, to ensure that the proposed Project is developed in accordance with planning and environmental legislation.

3.6.2 Process:

Review statutory and non-statutory submissions and observations submitted during the consenting process. It can be useful for the lead consultant to prepare a summary matrix table of statutory and non-statutory submissions, observations, organised by reference code, geographic area and topics/concerns raised.

For landscape and visual items, the landscape professional will review the relevant concerns and comment and provide a brief summary response with mitigation measures, referencing the proposed road project documentation/EIAR where possible.

At oral hearings, the presentation of photomontages and landscape mitigation plans in large size (A1) high quality prints can be very helpful in helping to visually communicate the nature and extent of the proposals.

For projects where an oral hearing is to be held, it may be required to prepare a brief of evidence. Typically, this will include;

- Background of assessor
 - name, practice, years' experience in assessment
 - education qualifications and membership of professional bodies
 - role on the project
- Very high level overview of the assessment process, referencing EIAR
- Summary of impact assessment – very high overview, referencing EIAR
 - Baseline assessment
 - Impact assessment (direct, indirect, operational, construction, cumulative)
 - Landscape
 - Visual
 - Key mitigation measures
 - Residual impacts
- Response to third party submissions
 - Address third party submissions by topic or location, referencing the EIAR where possible.
- Errata
 - Include details on any errors within original EIAR
- Prepare final updated schedule of commitments, which include additional specific mitigation measures which may have arisen during the process. This is a key document in the later PMG Phases of Enabling and Procurement; and Construction and Implementation.

3.6.3 Deliverables/Outputs:

- Summary matrix table of statutory and non-statutory submissions, observations, organised by reference code, geographic area, topics/concerns raised and brief summary response referencing the EIAR where possible (Ref. 4.6a)
- Use, as appropriate, large size outputs of photomontages and landscape mitigation plans
- Landscape and visual brief of evidence (Ref 4.6b)
- Updated schedule of commitments, which are very important in the next Phase.

Table 16 Summary Checklist of Phase 4 LCA / LVIA Deliverables/Outputs

Activities	Project greater than 20M	Minor Projects 5M to 20M	Minor Projects 0.5M to 5M	Minor Projects less than 0.5M
Approval Process (If required: respond to any requests from consenting authority; prepare for and participate in oral hearing; review approval and conditions)	Table 2 Output Ref. 4.6a Respond to LCA/LVIA queries and submissions, where required.	Table 3 Output Ref. 4.6a Respond to LCA/LVIA queries and submissions, where appropriate.	Table 4 Output Ref. 4.6f Respond to LCA / LVIA queries and submissions, where required.	Ref. 4.6f Respond to LCA / LVIA queries and submissions, where required.
	Table 2 Output Ref. 4.6b Draft Statement of Evidence for LVIA.	Table 3 Output Ref. 4.6b Draft Statement of Evidence for LVIA.	Table 3 Output Ref. 4.6g LVIA input to an Oral Hearing may or may not apply (unlikely)	Ref. 4.6g LVIA input to an Oral Hearing may or may not apply (unlikely)
	Table 2 Output Ref. 4.6c Finalise Statement of Evidence or LVIA.	Table 3 Output Ref. 4.6c Finalise Statement of Evidence or LVIA.		
	Table 2 Output Ref. 4.6d Present Statement and respond to questions at Oral Hearing, where required. Update to schedule of commitments if required.	Table 3 Output Ref. 4.6d Present Statement and respond to questions at Oral Hearing, where required. Update to schedule of commitments if required.		
	Table 2 Output Ref 4.6e Review LVIA aspects of approval, where required.	Table 3 Output Ref 4.6e Review LVIA aspects of approval, where required.		

Liaison with the Project Manager and the other relevant project professionals is required in the preparation of each output of Phase 4. A record shall be kept to demonstrate that receipt of each Phase 4 outputs has been acknowledged by the Project Manager. With respect to a submitted output, the Project Manager may do any of the following: Acknowledge, Acknowledge with comments, or Reject. All comments by the Project Manager shall be addressed and the output re-presented to the Project Manager for acknowledgement.

Note: the relevant project professionals to be liaised with should be agreed with the Project Manager.

3.6.4 Relevant TII PMGs/PAGs/Standards/Guidelines

- **PE-PMG-02041** – Project Management Guidelines
- **PE-PMG-02042** – Project Manager’s Manual for Major National Road Projects
- **PE-PAG-02012** – Project Brief

3.7 Phase 5: Enabling and Procurement

This will depend the project's procurement process:

- For 'Employer Designed' projects (normally smaller scale projects) the detailed design will be done at Phase 5 as below.
- For 'Contractor Designed' or 'Design and Build' (D&B) projects (normally larger scale projects), the Contractor (with specialist landscape professional) develops the landscape design in accordance with the EIAR requirements and consent conditions at Phase 6.

3.7.1 Objective:

Develop landscape mitigation design from the consented/permitted design, and if applicable, Schedule of Commitments. Working from the landscape strategy document prepared in Phase 3, the Schedule of Commitments (Phases 3 and 4), responses to further information and specific planning conditions from the consenting authority, develop clearly defined statement of the functions of the landscape mitigation to aid future landscape management/maintenance of the road project.

Compile tender documentation to allow for the appointment of a Contractor to execute the Main Contract and undertake enabling works to facilitate the works.

These will be in accordance with;

- **GE-ENV-01102** - A Guide to Landscape Treatments for National Road Treatments in Ireland (TII)
- **GE-ENV-01103** - Guidelines on the Implementation of Landscape Treatments on National Road Schemes in Ireland (TII)
- Office of Public Procurement's Capital Works Management Framework (CWMF) (Office of Government Procurement, 2018)
- TII's Construction Management Guidance Series, and in particular;
 - Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of National Road Schemes (TII)
 - Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road (NRA)
 - Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA)
- For motorway service areas, TII's design document, **DN-GEO-03028** *Location and layout of service areas* sets out a number of landscape related requirements, specifically for these types of development (TII), including mounding, planting, and treatment of external amenity/picnic areas.
- TII's Standards Series (Activities DN & CC and Streams - SCD, SPW, STY, RMP, GSW, GMP, DNG, LHT etc.), as appropriate.

3.7.2 Process:

Review of consenting authority's decision, incorporation of conditions and schedule of commitments, if any, into design.

Completion of landscape design incorporating relevant landscape mitigation measures from the schedule of commitments and planning conditions.

The design will include all necessary plans, schedules and specifications outlining planting (species, size, density, quality, and quantity) and seeding requirements, as well as performance specification for the works, to clearly define the Contractor's commitments. A landscape strategy statement/document will be prepared, building on the earlier of Phases 3 and 4 and will summarise the objective and function of the landscape mitigation measures. A landscape specification shall set out standard performance requirements of the landscape planting and seeding measures.

The process will require review, co-ordination and design input with the projects designers, ecologists, cultural heritage and noise specialists to ensure that the detailed design addresses their particular concerns. Consideration will be given to road safety requirements including clear sightline requirements, 'forgiving' clear zones, signage, lighting, headlight glare, speed awareness, and visual interest.

Note, landscape mitigation is often implemented at the end of a capital project, with pressure on resources and funding which can compromise the overall outcome. By setting minimum works standards and performance requirements, the contractor will need to place more emphasis on the quality of their work and maintenance through the defects and maintenance period to ensure the planting establishes and matures as intended, to reduce significant effects arising from the national road project.

Consideration of the long-term landscape maintenance requirements of the road will be required to ensure consistent, cost-effective, and adaptable design and management practices are achieved.

3.7.3 Deliverables/Outputs (for 'Employer Designed' Projects):

- Detailed landscape mitigation plans, schedules and specifications, incorporating planning conditions, schedule of commitments from Phases 3 and 4, and incorporating ecological and cultural heritage requirements as part of landscape mitigation, e.g. see Figure 28 below.
- Landscape mitigation plans in accordance with TII Guidelines, Construction Guidance Series, and Capital Works Management Framework requirements.
- Schedule of key landscape performance criteria and dates which need to be delivered upon by the Contractor.
- Landscape maintenance plan/schedule to assist TII in managing the landscape resource.
- These shall be in ITM format, in a consistent defined data format, to allow for integration with TII's management information systems (see TII Publication **CC-CMG-04001**)

- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA)
- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA)
- TII's Specification for Works (SPW) and Standard Construction Details (SCD)
- Pollinator-friendly management of Transport Corridors (National Biodiversity Data Centre, 2019)
- Other useful reference guidance;
 - *Landscape Design LA 117* (Highways England, 2019)
 - *Landscape Elements, DMRB, Vol. 10, HA 88/01*
 - New roads, DMRB, Vol. 10, Section 1
 - *Landform and Alignment, HA 55/92* (Highways England, 2001)
 - *Planting, Vegetation and Soils, HA 56/92* (Highways England, 1992)
 - *Integration with Rural Landscapes, HA 57/92* (Anon., 2001)
 - *The Road Corridor, HA 58/92* (Highways England, 1997)
 - *Heritage, HA 60/92* (Highways England, 1992)
 - *Improving Existing Roads, DMRB, Vol 10, Section 2*
 - *Road Improvement within Limited Land Take, HA 85/01* (Highways England, 2001)
 - *Improving Existing Roads Improvement Techniques, HA 63/92* (Highways England, 2001)
 - *Landscape Management DMRB, Vol 10, Section 3*
 - *Wildflower Handbook, HA 67/93* (Highways England, 1993)
 - *Landscape Management Handbook, DMRB, Vol. 10, HA108/84* (Highways England, 2004)
 - *Establishment of an Herbaceous Plant Layer in Roadside Woodland* (Highways England, 2005)
 - *Environmental Barriers, DMRB, Vol. 10, Section 5*
 - *Design for Environmental Barriers, HA 65/94* (Highways England, 2001)

3.8 Phase 6: Construction and Implementation

3.8.1 Objective:

Administration and execution of the Main Contract in accordance with the design, specification, relevant standards, and legislation.

For 'Employer Designed' projects (normally smaller scale projects), this will be carried out by the Employer's Representative (specialist landscape professional) to perform any duties required by the specification.

For 'Contractor Designed' or 'Design and Build' (D&B) projects (normally larger scale projects), this will be carried out by the Contractor's specialist landscape professional, with monitoring from the Employers Representative specialist, if/as required.

3.8.2 Process:

This will include ensuring that the works will be carried out to the intended design, specification, schedule of commitments and planning conditions, as well as relevant best practice standards and legislation.

Site visits at intervals appropriate to the Contractor's programmed activities, at a frequency agreed with the Client, should be carried out to perform any duties required by the specification, to inspect the progress and quality of the works, and to facilitate administration of the contract.

Landscape treatments take time to establish and mature. A consistent and proactive approach to monitoring the progress of the landscape works, maintenance, and the remedy of defects is required as landscape mitigation can fail if neglected. Landscape needs to be monitored and continually maintained to aid the establishment process. When executed correctly landscape maintenance should decrease in frequency as planting matures. Maintenance during the early establishment period of planting is therefore vital so that the landscape treatments can be self-reliant and handed over in a quality state at the end of the project.

Monitoring of the works by a Landscape Professional will ensure that any landscape defects or omissions are captured and followed up to ensure that the mitigation measures identified are implemented.

Ongoing or corrective maintenance may also be required and will be progressively rectified throughout the defects liability and maintenance period.

3.8.3 Deliverables/Outputs

- Site inspection reports during the construction process monitoring soils, plant materials, workmanship, and defects to be made good.
- Handover
 - Landscape maintenance/management report, as part of Operations and Management Manual, drawing attention to all landscape mitigation features which are part of the design and which require specific maintenance to continue to be effective in delivering the intended design mitigation in the long-term. This may include crossover and co-ordination with other disciplines (engineering, ecology), e.g. maintenance of SUDS/attenuation areas, green engineered slopes, hedgerows etc. The report will be based on the overall Landscape Strategy Report delivered as part of Phase 3. It will ensure that the original design intent and function of the landscape mitigation proposals are carried through to the Maintenance/Management report, together with specific landscape management and/or monitoring requirements over a set period of time stated. Significant design changes during the construction phase will be noted and reflected in the management report by the Contractor's specialist landscape professional for D&B projects or Employer's specialist for Employer's Design projects.
 - As built, landscape drawings ITM format in a consistent defined data format, to allow for integration with TII's management information systems (see TII Publication **CC-CMG-04001**)
 - Plan drawings, showing at a minimum, the location and extent of planting and grass seeding areas, including function and type of planting and seeding, species, numbers and sizes as appropriate;
 - Plan showing access points for landscape maintenance
 - Plan drawings showing the location and extent of hard landscaping including type of material as appropriate;

- Accompanying schedule of materials and suppliers, e.g. paving, street furniture, grass reinforced area etc.;
- Landscape compliance report by Contractor's/Employer's specialist landscape professional (as applicable to D&B or Employer's design projects) confirming that all landscape mitigation measures have been completed and defects remedied.
- The appointed project landscape professional shall produce an opinion of compliance for the landscape mitigation measures confirming that the contract works have been undertaken in accordance with the plans and specifications. This needs to be coordinated with TII maintenance handover and programming.

Liaison with the Project Manager and the other relevant project professionals is required in the preparation of each output of Phase 6. A record shall be kept to demonstrate that receipt of each Phase 6 outputs has been acknowledged by the Project Manager. With respect to a submitted output, the Project Manager may do any of the following: Acknowledge, Acknowledge with comments, or Reject. All comments by the Project Manager shall be addressed and the output re-presented to the Project Manager for acknowledgement.

Note: the relevant project professionals to be liaised with should be agreed with the Project Manager.

3.8.4 Relevant TII PMGs/PAGs/Standards/Guidelines

- **PE-PMG-02041** - Project Management Guidelines
- **PE-PMG-02042** – Project Manager's Manual for Major National Road Projects
- **GE-ENV-01102** - A Guide to Landscape Treatments for National Road Treatments in Ireland (TII)
- **GE-ENV-01103** - Guidelines on the Implementation of Landscape Treatments on National Road Schemes in Ireland (TII)
- **CC-CMG-04001** - Preparation and Delivery Requirements of As-Built Records (TII)
- Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of National Road Schemes (TII)
- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA)

3.9 Phase 7: Closeout and Review

3.9.1 Objective:

At the completion of any major project, it is a requirement of the TII *Project Management Guidelines* (PMG) that a Post Project Review be carried out.

This may include 'Lessons learned' for the landscape and visual aspects, for example;

- Did the landscape mitigation measures deliver the required outcomes set out in the EIAR? Did they deliver more than envisaged?
- Were the planned outcomes the appropriate responses to actual public needs?
- Are there conclusions or lessons learned that can be drawn and applicable to other projects, to the ongoing management of the landscape, or to associated TII policies and guidelines?

3.9.2 Deliverables/Outputs:

- Summary project close-out report of landscape and visual aspects.

Liaison with the Project Manager and the other relevant project professionals is required in the preparation of Phase 7 output. A record shall be kept to demonstrate that receipt of each Phase 7 output has been acknowledged by the Project Manager. With respect to a submitted output, the Project Manager may do any of the following: Acknowledge, Acknowledge with comments, or Reject. All comments by the Project Manager shall be addressed and the output re-presented to the Project Manager for acknowledgement.

Note: the relevant project professionals to be liaised with should be agreed with the Project Manager.

3.9.3 Relevant TII PMGs/PAGs/Standards/Guidelines

- **PE-PAG-02034** - Post Project Review

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Appendix A:

Requirements of Landscape
Professional for carrying out
LCA/LVIA

Recital 33 of the Preamble to Directive 2011/92/EU, as amended by Directive 2014/52/EU, states, *inter alia*, 'Experts involved in the preparation of environmental impact assessment reports should be qualified and competent.' Article 5(3)(a) of the amended EIA Directive states 'the developer shall ensure that the environmental impact assessment report is prepared by competent experts'. It is therefore reasonable to surmise that Landscape Professionals who carry out LCA/LVIA on TII projects (which require EIA) must be expert, qualified and competent. Furthermore, it is the responsibility of the developer (e.g. the road authority) to ensure that this is the case. To assist developers in meeting this responsibility, the following recommendations are made.

It is recommended that Landscape Professionals involved in the preparation of environmental impact assessment reports and/or the carrying out of LCA/LVIA in respect of TII projects have the following qualifications as a minimum:

- an honours degree (National Framework of Qualifications (NFQ) Level 8 (or equivalent level)) in landscape architecture (or equivalent discipline); and/or, a master's degree (NFQ Level 9 (or equivalent level)) in landscape architecture (or equivalent discipline).

It is also recommended that such Landscape Professionals hold:

- full corporate membership of the Irish Landscape Institute (ILI); or,
- full membership of an equivalent professional body that:
 - represents landscape professionals; and,
 - is a member of the International Federation of Landscape Architects¹.

Furthermore, it is recommended that the Landscape Professionals have at least 10 years' relevant post-graduate experience as a landscape architect. It is important to note that the minimum number of years' relevant post-graduate experience may change (upwards or downwards) depending on the size, nature, complexity, etc., of the project in question. Furthermore, it is essential to carefully lay down further criteria defining what post-graduate experience is considered relevant in the context of the project at hand.

The developer must document the criteria (along with the underlying rationale) it has devised to ensure that its Landscape Professionals are qualified, competent and expert. The developer shall also document how these criteria have been applied in the selection of its Landscape Professionals.

Again, it is essential to note that it is the developer's responsibility to ensure that its Landscape Professionals, who carry out LCA/LVIA on TII projects (which require EIA), are qualified, competent and expert.

¹ <http://iflaonline.org/members/>



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