Landscape Institute Technical Guidance Note

Visual representation of development proposals

Technical Guidance Note 02/17 (31 March 2017)

This guidance aims to help landscape architects, planning officers and other stakeholders to select types of visualisation which are appropriate in the circumstances for which they will be used. It is particularly aimed at visualisations supporting development proposals. It links to, follows and amplifies the broad principles set out in The Guidelines for Landscape Visual Impact Assessment 3rd edition (GLVIA 3). These advocate proportionate and reasonable approaches to the scope of assessments.

CONTENTS

1. About this guidance

1.1 The visual environment of the world we live in is constantly changing. New development is one of the causes of this change. When people are asked to consider the merits of new development proposals, images illustrating the appearance of the proposals are often an important aid. These 'images', hereafter referred to as "visualisations" or "visual representations", can take a variety of forms and these include:

Plans, elevations & sections;

sketches;

annotated photographs;

wirelines;

augmented reality;

photomontages; to

sophisticated 3-D simulations etc.(For a fuller list of examples see Appendix)

Some types of visualisation are more readily or quickly produced but these visualisations share a role as a form of graphic communication usually used to illustrate the key components of the proposed development or give an indication of how much will or will not be visible from a given viewpoint location.

1.2 As a general principle any visualisation should represent the proposal broadly in the way that people would perceive it in the real-world. It should also be in a form that suits users. Visualisations should assist interested parties in understanding the change and thus effects of a proposed development within its visual context. These effects are an important consideration in the design and planning process. Indeed, visualising the development within its visual context may well assist the designer or developer in the design process, and will help reduce the occurrence of inappropriate design at an early stage. It may also help reveal whether a proposal is 'in character' or not.

1.3 There has been a trend to use increasingly specialised and sophisticated techniques in the preparation of visualisations. This will often be warranted, however just because certain techniques have become available, it does not follow that they necessarily should *routinely* be applied, or that they are beneficial in *all* situations. Nor should sophisticated techniques automatically be seen as more reliable or trustworthy since defects (in accuracy) may be concealed. The law of diminishing returns can also apply. On the other hand, too often have major developments been submitted with nothing more than annotated photographs, fuelling a sense of grievance held by many that developers are dismissive of the public interest.

1.4 This document is particularly aimed at visualisations supporting planning applications. It aims to help landscape architects, planning officers and other stakeholders to select types of visualisation which are appropriate in the circumstances for which they will be used. In doing so, it links to, follows and amplifies the broad principles set out in The Guidelines for

Landscape and Visual Impact Assessment 3rd edition (GLVIA 3). These advocate proportionate and reasonable approaches to the scope of assessments. In addition to the principles in 1.1 and 1.2 above this guidance is based on the proposition that:

A different level of sophistication may be required depends on the 'purpose, use and likely audience (user)' of the visualisation in the decision making process, the magnitude of potential visual change and the sensitivity of the context.

1.5 In preparing this document it has become clear that it is important to distinguish the term sophistication from the different concepts of accuracy and precision. This guidance focuses on the choice of techniques, sophisticated or less sophisticated. Accuracy and precision are not entirely dependent on the choice of technique, more on its implementation.

1.6 This guidance is not prescriptive but provides a starting point to help identify what type of visualisation would be appropriate and will set out some further basic principles of potential visualisation techniques.

1.7 A key point, however this guidance is interpreted and applied is that a written explanation of the methodology and results will be required. This should cover the assumptions underlying the work and the limitations of the approach taken.

1.8 This guidance has been prepared on behalf of the Technical and Professional Committee of the Landscape Institute by a working group comprising the following members:

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Marc van Grieken (Chair) FLI

And is dedicated to the late Mark Turnbull FLI

1.9 The consultation process on this document included inviting comments from the wider LI membership but particular scrutiny was encouraged by:

Technical Committee

LI Members subscribed to the Visualisation discussion group on Talking Landscape

A group of members working in the public sector.

1.10 The guidance was finally approved by Technical Committee on 12 Jan 2017

2. Background

2.1 As outlined in Guidelines for Landscape & Visual Impact Assessment Edition 3 (GLVIA3), there are many ways to visually represent development proposals, ranging from hand-drawn 2D sketches to sophisticated 3D virtual models. They vary in their cost-effectiveness for different tasks. This guidance is aligned with the key principles of GLVIA3 which promote 'proportionality' and professional judgement. This means that, when identifying the need for some form of visualisation, unless there is more specific guidance, landscape architects and other stakeholders should use this guidance as the basis to discuss and agree which type of visualisation is appropriate and suitable given the particular circumstances of its use and purpose. That does not preclude subsequent preparation of other type(s) of visualisations but working this way should help to ensure that public interests are secured in a way that society, including clients and the industry, recognise as proportionate and fit for purpose.

2.2 Cost-effectiveness of visualisations is a consideration but cost alone should not be a concern. In any case, the cost of a particular approach will also depend to some extent on the capabilities of those producing visualisations. For example some practitioners may have invested in top-of-the range photographic equipment and image processing capabilities, or in the latest 3D modelling software and they may wish to maximise the use of this capability. But it does not follow that just because sophisticated solutions are available that they should be requested or used unnecessarily, nor should they automatically be regarded as more credible.

2.3 The premise of this guidance is that the factors which determine the type of visualisation appropriate in the circumstances are:

- the intended use or purpose of the visualisation; and the anticipated users;
- the sensitivity of the visual receptors including consideration of the visual context (of the affected environment) within which the development is proposed, ('susceptibility to change' or 'sensitivity')[1];
- the likely effect of the development in terms of its 'size and scale', 'geographic extent' and 'duration and reversibility' ('magnitude')[2].

2.4 It is recognised that in response to certain types of development, bespoke and specific guidance has been and will be produced which sets out the required type, detail and methodology for producing visualisations. For example in relation to wind energy developments in Scotland, Scottish Natural Heritage developed and issued guidelines for visualisations of windfarms[3]. Such guidance has a particular scope and purpose and, as recognised by the Landscape Institute, may also be helpful in other situations, but it should not be regarded as setting a minimum or recommended standard for all situations.

2.5 The relationship between the factors that may determine the type of visualisation is illustrated in diagram 1. This should be read as a graph with the arrow along each of the three

[1] GLVIA 3, para 6.31- 6.37
[2] GLVIA 3, para 6.38- 6.41
[3] Visual Representation of Windfarms version 2.2 Scottish Natural Heritage (Feb 2017)

axis indicating potential increases in the level of sophistication of any proposed visualisation. Different purpose and use(r) of the visualisation, the level of sensitivity of the receptor and magnitude of the likely visual change all combine to determine the choice of type of visualisation.

2.6 This guidance is based on the premise that the most sophisticated type of visualisation is required when 'purpose/use/user' (grey axis), 'sensitivity' (yellow axis) and 'magnitude' (blue axis) all combine at the upper reaches of each individual scale.

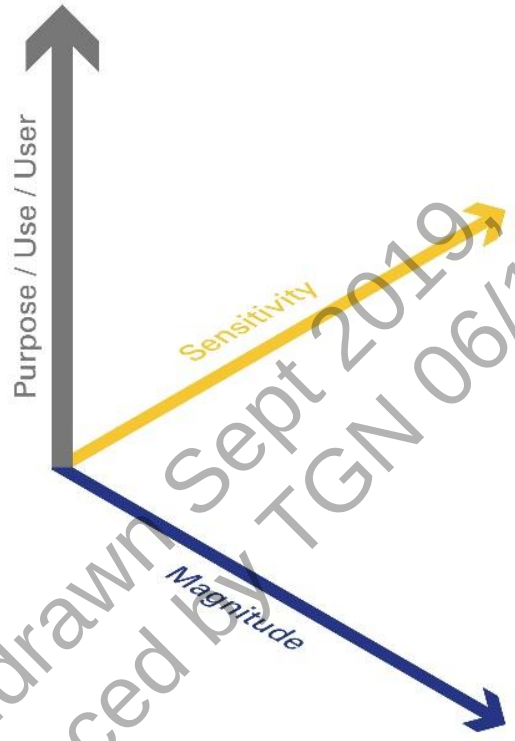

Diagram 1: the 'sophistication' level of visualisation required depends on three factors with the highest level of sophistication required at the top of all three axis.

2.7 Using this guidance therefore requires the following stages:

- Identifying the purpose and use (user) of the visualisation;
- Identifying the type and nature of the proposed development and its likely magnitude of effect;
- Identifying the context within which the development will be placed and it sensitivity; and
- Selecting type of visualisation and explaining reason for its selection.

The following sections in this Guidance Note explain this staged approach in more detail.

3. Purpose, Use and user(s)

3.1 Note that this guidance is particularly aimed at visualisations prepared for use in the decision making process. It may also be used iteratively as an initiative proceeds since different visualisations may be needed for different purposes throughout the life of a project.

3.2 The first stage in the process is to identify for what purpose the visualisation is produced and who the likely users will be.

Purpose/use/user(s)

3.3 One principal consideration is its purpose: 'what will the visualisation be used for?' E.g.:

- does it provide basic contextual information in support of a planning application?;
- does it purport to demonstrate the visual change that will be brought about if the development proceeds?; or
- is it being prepared to prove or disprove if the development is visible?

Other examples of different purposes are:

- the illustration of a project prepared for the client as the project develops;
- the illustration of a development proposal prepared to support a planning application;
- to illustrate likely change in the view that may occur as a result of the development being introduced into that view; to support a landscape appraisal or landscape and visual impact assessment, e.g. as part of an EIA and/or
- to provide 'as-built' technical evidence and/or verification etc.

Common terminology to indicate the purpose or use of a visualisation may use words such as: *illustration, indication, representation, verification, evidence*. An understanding of these terms may assist interested parties agree an appropriate type of visualisation.

Users

3.4 In addition to being clear about the purpose and use of the visualisation, it is important to understand and identify the likely (range of) anticipated users of the visualisation. Users may include:

- people potentially affected by the development who are being asked to give an early view as part of a consultation process;
- clients;
- other consultants communicating with the landscape consultant;
- those formally commenting on the planning application;
- planning officers considering the merits of an application;
- participants at public inquiry (including members of the public, expert witnesses, legal advisers, Inspectors and Reporters); and

- decision-makers (Councillors, Reporters and Inspectors, Ministers).

Different users are also likely to have varying experience with respect to how to use different types of visualisations and are likely to also have different levels of expertise with respect to understanding the technical differences and limitations between different types.

3.5 Understanding the purpose, use and user(s) of the visualisation is one of the key factors in deciding the type, and sophistication of visualisation that is appropriate in the circumstances and can be expressed as 'levels' along a 'PURPOSE' axis.

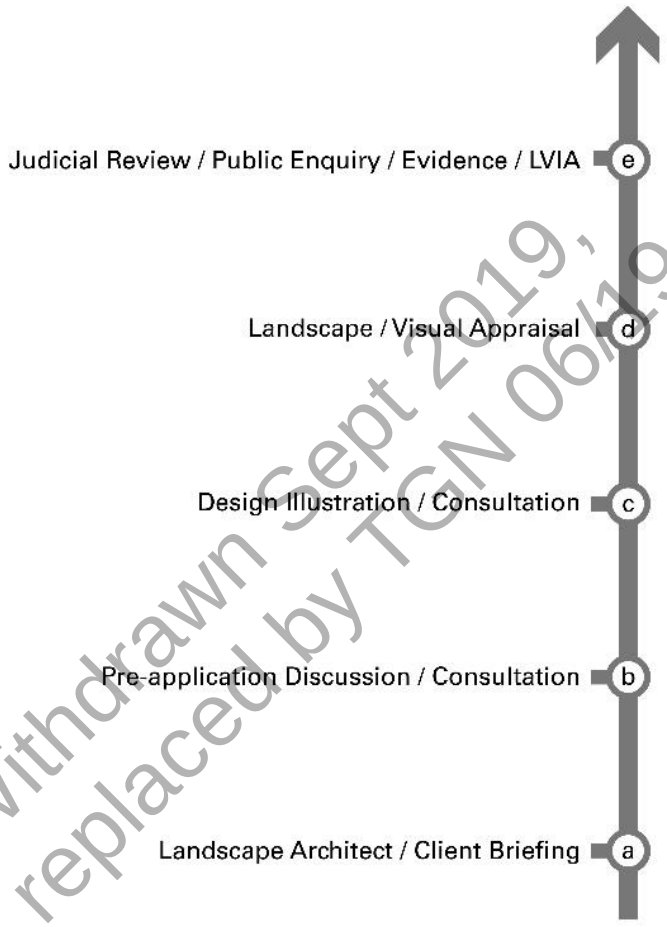

Diagram 2: illustrates the range of different purpose, uses and users of visualisations along a 'PURPOSE' axis

4. Context and likely effect

4.1 The next stage requires an understanding of the landscape and visual context within which the development may be seen, knowledge regarding the type of development proposed, its scale and size, and an understanding of the likely effect of introducing the development into the existing environment.

Context

4.2 Landscape architects need to demonstrate that they understand the landscape and visual context within which the development is proposed. This will include consideration of the planning policy context of the location and, if applicable and relevant, the type and importance of any landscape, coastal or townscape designation or of any specified views/viewpoints. For the purposes of this guidance, which focuses on 'visual representation', the context should be informed by analysis of the landscape and visual environment, either as identified through fieldwork or by reference to published information. For example, is development proposed in a conspicuous location? Does the development potentially affect an important view? Is a view culturally important or described in literature?

Development type size and scale

4.3 The type, scale and size of development are relevant in considering what type of visualisation is appropriate. The definition of development is very wide ranging and can, for example, include earth mounding over 1m in height or changes in surface materials. It also includes the erection of tall structures. These are all likely to present quite different scenarios and the development of wind turbines and tall buildings are already generating their own suites of guidance.

4.4 The type and size of development and its relative scale can also vary greatly. Some developments are of such a size and scale that they have the potential to affect a large tract of the landscape; for example opencast quarries, large urban extensions or major infrastructure projects. At the other end of the spectrum, developments may also be so small that they will hardly be noticed, such as an additional portable cabin within an already congested waste transfer station.

4.5 To inform the selection of appropriate type of visualisation, practitioners should give careful consideration to the above points. It is worth noting that a small development (in terms of type, size and scale) such as a subtle change in landform in a highly 'sensitive' visual environment could potentially justify a more detailed and sophisticated visualisation than a large scale development in a location where extensive change would not give rise to any significant effects.

4.6 The interaction between the landscape and visual environment, within which the development is placed, and the resulting potential effect of the visual change brought about by the development, is closely aligned with the assessment of effect (on visual amenity and views) as set out in GLVIA3[4]. Diagram 3 below shows how magnitude of effect (expressed in

[4] GLVIA 3, Figure 3.5

terms of negligible, small, medium or large) combined with an evaluation of the sensitivity (expressed in terms of negligible, low, medium and high) could indicate the level of sophistication of visualisation where an LVIA is required. In this diagram the numbers represent increasing sophistication of the visualisation required with number 2 for example representing modestly sophisticated visualisation (perhaps an annotated photograph) whilst number five represents fully verifiable photomontages. (It is important to note that there are no hard and fast boundaries between points on the scale.)

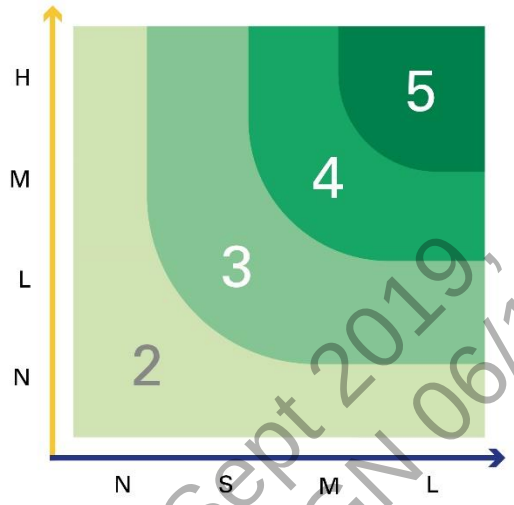

Diagram 3: this illustrates the principle that when an effect of large magnitude (x – blue axis) on a highly sensitive receptor might occur (y – yellow axis), that a more sophisticated type of visualisation may be appropriate, but in the case of effects of either negligible magnitude or negligible sensitivity lower levels of sophistication are indicated.

5. Approach

5.1 Diagram 4 illustrates how 'sensitivity', 'magnitude' and 'use/user/purpose', as understood by following earlier stages in this guidance, come together to guide the actual choice of visualisation type.

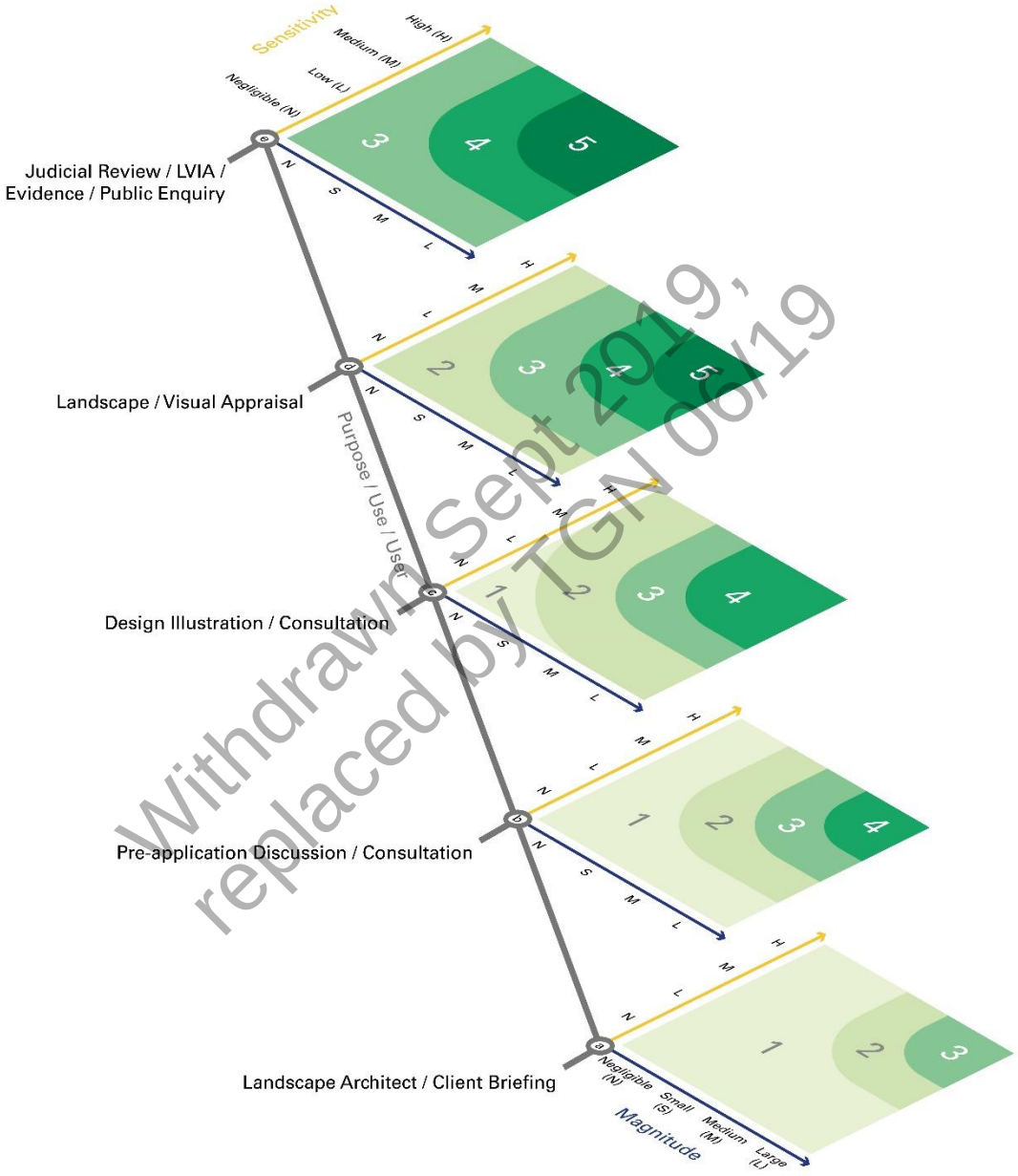

Diagram 4: General approach.

5.2 It is important to note that whilst diagram 4 sets out the general approach it does not exclude some latitude in interpretation. The following is a suggested walk-through of how to use the diagram.

5.3 It is suggested to consider purpose/use/user first by using the 'PURPOSE' axis to select a 'level' on the diagram, or a position between 'levels'. In general terms travelling up the vertical, PURPOSE, axis indicates requirements for visualisations of greater sophistication whilst descending it indicates visualisations of lesser sophistication. When between 'levels', it is necessary to consider the two levels to either side.

5.4 Once on an appropriate 'level' the interaction between 'SENSITIVITY' and likely effect, 'MAGNITUDE', will indicate the relative sophistication/complexity rating (1-5) of the appropriate type of visualisation.

5.5 The 'rating' number that is derived can then be used in Table 1 to obtain an indication of the type of visualisation that may be appropriate. Note that in Table 1, within each column, one or more suggested type(s) of visualisation is indicated. Additionally it is important to note that the columns have no hard edges; there is potentially overlap between them. For example, cross sectional drawings (sections) could either be very indicative but can also be very accurate. In any case, the landscape architect should explain the choice made.

Table 1

1	2	3	4	5
Outline Plans, sections			**Detail plans sections**	
Sketch				
	Annotated photograph			
	Outline Model	**Model**	**Detailed Model**	
		Computer wireline		
		Augmented Reality		
		Constructed perspective		
			Photowire	
			Photo montage	
			2D export from3D model	
				Verifiable photo montage

5.6 One of the key conclusions that can be drawn by using the general approach diagram is that if it indicates that type 3 visualisation (for example a computer wireline) is appropriate, a type 5 (verifiable photomontage) would also meet the requirement, however to require a type 5 visualisation would be disproportionate and unreasonable without exceptional circumstances. Likewise, if the general approach diagram suggests that verified photomontage would be appropriate, a simple annotated photograph would be inappropriate.

Using the 'Visualisation Types' diagram:

5.7 Based on the results from the 'General approach' diagram the relevant sophistication rating provides a general indication of the type of visualisation that may be appropriate. Situations vary and the guidance is not prescriptive and will need professional interpretation. In addition when making a final choice it will be important to consider:

- The magnitude and sensitivity of the development overall with that potentially experienced at particular locations and apply a proportionate and consistent approach. Occasionally more than one approach may be appropriate.
- Available technology – Several techniques are technology dependent, and not all of those preparing visualisations will have all technologies available.
- Cost of the visualisation which depends on several factors: Firstly, it depends on what readily available technologies are available to the landscape architect (e.g. Augmented Reality visualisations are low cost for those who have already invested in the technology but may be high cost otherwise). Secondly it depends on the nature (type, size and scale) of the development and thirdly on the degree of realism required. For example, photomontages of wind farms are less expensive to prepare than they are for a mixed use development or other forms of development, because wind farms consist of relatively low numbers of single objects of the same size and shape with the same surface finish.
- The particular view and how the development may be best illustrated. For example, where a development is predominantly screened, a photo-wire image may be more helpful than a photomontage as it can indicate the position of the development beyond the screening.

Types of visualisation:

5.8 It can be seen that following this guidance the following types of visualisations may be indicated:

- Plans, sections, elevations;
- Indicative sketch;
- Annotated photograph;
- Models;
- Computer generated 'wireline' image;
- Augmented reality;
- Constructed perspective sketch;
- Photo wire;
- Photomontage;
- 2D exported images from 3D model;
- Verifiable photomontage;
- 2D exported images linked to photomontages of verifiable 3D models.

These are each briefly described in the Appendix. Note that further technical guidance on some of these, e.g. photography and photomontage, is available from the LI.

Appendix – Types of visualisation

Plans, elevations and sections

Plans, elevations and sections of a proposed development, are commonly used in the early stages of a project allowing the landscape architect to discuss the proposals with the client and frequently sufficiently informative to support planning applications.

Indicative sketch

An indicative sketch may be appropriate where some level of illustration is required. Indicative sketch should convey basic form, relative scale and key features of the proposal including some basic information regarding the context.

Annotated photograph

This type of visualisation consists of a photograph of the view, usually panoramic, in order to show adequate context which has been annotated to illustrate the basic form, scale, features and location of the proposed development. Annotations can consist of arrows and labels to pick out key points; bars or shapes identifying the site; or diagrammatic sketch overlays to indicate the form, scale and location of the development.

Models

Models of development proposals can be especially useful to illustrate scale and massing of the proposed development in its setting and can provide varying levels of detail from simple block models indicating main features to fully detailed architectural or landform models.

Computer generated wireline image

This type of visualisation requires a 3D computer model of the proposed development allowing the exporting of 2D views of the model. The model normally includes some context showing topography allowing an appreciation of the local context within which the development is set.

'Fly throughs' can also be generated from 3D models. These can be helpful for broadly conveying design and for consultation and are often very popular with decision makers but they do not reflect everyday experience.

Augmented reality

Augmented Reality is an emerging digital technology and there are various types, but they commonly include a 3D model of a development presented on a digital screen (tablet, laptop, i-pad, smart-pad or phone) and georeferenced such that it can be experienced on site from any location in the vicinity of the development. Accuracy is variable because it depends on several variables including GPS data and accuracy, model data and accuracy, determination of angle and direction of view, screen resolution and proportion. Augmented Reality software normally includes the ability to capture site images and subsequent off-site editing of the site images with the 3-D model may improve accuracy.

Constructed perspective sketch

A constructed perspective sketch is likely to be based on a 3D model view or bare wireline to set up the perspective from the viewpoint, but may be constructed in other ways. Different forms of perspective may be used but when accurately drawn a constructive perspective enables form, scale and mass of the proposal to be communicated.

Photowire

A photo wire requires the creation of a 3D wireline model of the development correctly placed in its topographic context. Views of the model from the 'virtual' viewpoint within the 3D model are generated to show how the development would look from the viewpoint. There are two types:

- a matched wireline – the photograph from the viewpoint and the wireline are matched (size and position), and displayed one above the other on the page so that they can be compared.
- Photowire – the wireline is overlaid onto the photograph. These are thought to be more helpful than a matched wireline in situations where screening from intervening vegetation or other features is involved.

Photomontage

A photomontage is likely to be based on a matched wireline to correctly locate the development within the photograph, but may be constructed in other ways. A photomontage should enable form scale, location materials, and colours to be communicated.

2D views from 3D models

This technique involves the creation of a 3D model of the development correctly placed in its topographic context. Views can then be generated from virtual viewpoints within the 3D model. The degree to which materials, colour and finish are portrayed will depend on the technique being used. The technique enables form, scale, location materials, and colours to be communicated.

Verifiable photomontage

This technique generates a photo montage in such a way that all stages of the process are verifiable and represents the currently available highest level of accuracy in terms of photography, detail and accuracy of the terrain model data, detail and accuracy of the model representing the development and detail and accuracy of the production techniques. Verification is normally only required under specific circumstances.

2D exported images linked to photomontages of verifiable 3D models

This technique is essentially a subset of verifiable photomontage and is based on exporting 2D images of fully verifiable three-dimensional models.

Virtual reality and immersive technologies

These technologies are at an early stage of development for visualisation purposes.

This guidance is dedicated to the late Mark Turnbull FLI

Approved by LI Technical Committee (see paras 1.8-1.10 for details)

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Document history

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