
**VOLUME 11 SECTION 3 PART 5
LANDSCAPE EFFECTS**

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1. INTRODUCTION

1.1 Landscape is an important national resource. The UK has a wide range of landscape character derived from the underlying geology, natural processes and human activity on the land over the centuries. This has led to an outstanding natural and cultural inheritance which is widely appreciated for its aesthetic beauty and its important contribution to regional identity and sense of place. Whilst it is subject to evolution and change the landscape is recognised as a resource of value to future generations.

1.2 This part of the Advice Note gives guidance on the assessment of both a road scheme's impact on the landscape and on its visual impact on local people. The two types of assessment are closely related, use similar approaches and, where possible, the Design Organisation should employ the same landscape architect to carry out both assessments during each assessment stage. Together, these assessments should comprise a full consideration of a scheme's likely impact, not just on the views which people experience now and in the immediate future, but on the landscape as an entity in its own right and as a resource for future generations.

1.3 It should be noted that all references in this part to the relevant statutory body refer to the Countryside Commission (CC) in England, the Countryside Council for Wales (CCW) in Wales and Scottish Natural Heritage (SNH) in Scotland unless otherwise stated. In Northern Ireland DOE(NI) should be consulted.

2. LANDSCAPE ASSESSMENT AND VISUAL IMPACT ASSESSMENT

2.1 Landscape assessment in relation to road proposals consists initially of the collection of baseline data relating to the components, character and quality of the landscape of the study area, followed by an assessment of the likely effects of the proposals and of the significance of these effects.

visual or other importance. In addition landscapes that are not of a quality to warrant national or regional designation may be of great local value. This applies particularly to natural features and semi-natural vegetation in urban areas.

The following should be taken into consideration in making the assessment and describing the study area:

(a) The experience of landscape is not only a visual experience but as stated by the Countryside Commission in their publication "Landscape Assessment a Countryside Commission Approach" 1987, (currently being revised) "Perception itself is not simply a matter of seeing with the eye. All of the five senses are involved in an appreciation of landscape beauty."

(b) The data relating to components of the landscape which affect its character and quality will include that dealt with in other parts of this volume eg PART 2, Cultural Heritage. The Wildlife And Countryside Act 1981 states "references to the conservation of the natural beauty of any land shall be construed as including references to the conservation of its flora, fauna and geographical and physiographical features", in other words these are essential components of the visual landscape and effects on them are likely to affect its character or quality.

(c) The value placed on an area of landscape will not only depend on its quality but on its situation and rarity. Wildness and inaccessibility may increase the value of an area as may a relative lack of development and disturbance in a developed or heavily used locality.

(d) Historical and cultural associations may contribute to the value placed on landscapes not generally considered to be of

2.2 In addition to an assessment of the impact of the proposals on the landscape an assessment should be made of the visual impact on local people in their homes, at work or when using community facilities. A methodology for conducting a visual impact assessment is set out below (CHAPTER 4). The visual impact assessment should always be integrated as far as possible with the landscape assessment, as information from one assessment can often be used in the other.

2.3 A landscape assessment should be undertaken by a landscape architect commissioned by the Design Organisation, using the methodology described below. This method is based broadly on the approach adopted by the CC as outlined in its publications 'Landscape Assessment: A Countryside Commission Approach', (1987), CCD 18 (under review) and 'Environmental Assessment: The Treatment of Landscape and Countryside Recreation Issues' CCP 326, (1991). Landscape Assessment : Principles and Practice (1991) a report by Land Use Consultants for the Countryside Commission for Scotland adopts a similar approach.

2.4 The methods of landscape and visual impact assessment detailed in CHAPTERS 3 and 4 can be used in a wide variety of situations. However, some variations will be required for urban schemes (townscape assessment) and for widening schemes.

3. LANDSCAPE ASSESSMENT METHODOLOGY

3.1 The main steps to be taken in carrying out landscape assessment are as follows:

- (i) Data collection, primarily in the field but also through desk studies from statutory consultees and other appropriate bodies;
- (ii) description of the baseline landscape;
- (iii) landscape classification;
- (iv) identification of the potential positive and negative impacts of the scheme;
- (v) assessment of the significance of the impacts identified.

Broadly the same information is required at each stage but the level of detail will increase as the scheme progresses.

Baseline Studies, Data Collection and Landscape Description

3.2 Data should be collected on the physical elements of the landscape, including the physical, biological, historical and cultural components which contribute to its character and value. Information should also be collected relating to any assessments of the scenic value or quality of landscapes within the study area or of their components, which may already have been made, for instance planning designations and any studies which may exist relating to particular areas or landscapes. Data should be collected relating to any special value placed on the landscape at international, national, regional or local level because of its particular qualities or historical or cultural associations whether this results in a formal designation such as World Heritage Site or is a general recognition of the interest of an area eg 'The Shakespeare Country'.

3.3 Landscape evaluation includes the assessment, where appropriate of the importance or value of landscape components and features and the classification of the landscape into broadly homogeneous units of character and broadly homogeneous units of value. These are assessed separately and may not necessarily coincide.

Data collection

3.4 Data collected is used initially to describe the baseline landscape before corridors or routes are identified and is augmented as necessary for the requirements of each design stage. Sufficient data should be collected to describe the landscape, to identify constraints, assess their importance and to identify potentially significant impacts and mitigation. Trends in landscape change should be taken into account where they may be significant in relation to the proposal. The degree of detail necessary to assist in the development of the scheme at each stage is set out in CHAPTER 8.

Landscape Classification

3.5 Where appropriate analysis of the data collected should include ranking according to the visual importance or scenic value of the landscape features noted and the clear mapping of the data. Where ranking is inappropriate the importance of a feature or reason why it is valued should be noted. Analysis of data will involve subjective judgement of the value and significance of features taking into account both positive and negative elements in the landscape as well as providing factual information.

3.6 An analysis should be made of those components of the landscape that are important in determining its regional and local character and which provide a sense of place as one passes through it. These include such elements as distinctive topography, vegetation type and typical species, features of the built landscape such as use of local stone and typical, often traditional, features of the farmed landscape such as hedgerow form and drystone walling.

Assessment of Landscape Character

3.7 The impacts of a scheme on individual landscape features may affect the character or the quality of the landscape of an area or of a landscape that is perceived as a whole. The landscape should therefore be classified into broadly homogenous units of character and units of quality based on assessments carried out by the Design Organisation. These should take into account any assessments or value designations that may have previously been made for instance by local authorities, the

Countryside Commission or similar bodies and any evidence of particular value placed on an area by local people or other users.

3.8 Landscapes are more than merely the sum of their component parts. The description of the existing environment needs to indicate how the various parts relate to each other. Classifying the landscape into broadly homogeneous units or landscape types is likely to be the most appropriate way of doing this. Within each of the landscape types identified, visual similarities will be a reflection of the fact that the physical characteristics - the landform, vegetation and settlement pattern which go to make up the landscape character - will also be similar. Visual attractiveness, remoteness, degree of tranquillity or intensive use or dereliction should also be noted where they are important aspects of character.

Assessment of Landscape Quality

3.9 The Design Organisation should also make an assessment of landscape quality. A five point scale will generally be appropriate (ie highest quality, very attractive, good landscape, ordinary landscape, and poor landscape). Parkland should be noted separately. Areas of particular quality may not always coincide with character areas. The relative value placed on a landscape or feature may relate to its location, rarity or particular attributes. Thus a landscape which may not seem particularly attractive using general criteria could be important in the context of an unattractive surrounding area.

3.10 The capacity of the landscape to accept change of the type and scale proposed should be assessed based on its vulnerability to degradation through the introduction of new features or the loss of existing components. The report should note any landscape considered to be particularly vulnerable in this way or particularly able to accept change.

3.11 Information relating to landscape character and quality, provided and assessed, where appropriate, should include the following:-

- (a) Landform - Important visual characteristics related to landform and underlying structure, geology, drainage pattern, surface water features, important ridge lines contributing to visual containment. A topographical map should be included.
- (b) Vegetation - Any existing vegetation of landscape significance should be noted.

This will include vegetation that makes a significant contribution to the screening or framing of views and vegetation that is an important component of landscape character. Such vegetation may also be of importance for nature conservation eg heathland, ancient woodland or of landscape importance eg trees subject to TPOs and components of designed landscapes. Because of the interrelationship between many of these elements it is often useful to map areas of landscape importance together with those of biological importance (see PART 4).

(c) Historical and Cultural Components - Elements of areas cultural heritage can form important visual elements in the landscape eg earthworks, important buildings and structures, greenlanes, ancient hedgerows, industrial remains, vegetation and built features of designed landscapes. Landscapes or features remaining from past farming and land management systems or past settlement patterns may be important in this context. Modern patterns of settlement and communication are important aspects of landscape character and quality.

3.12 Certain landscapes may have particular value and importance because of historical or cultural associations eg the settings of important historical events and landscapes associated with the lives of important historical figures, writers, artists or composers or their works. Others are important as the settings of historic towns, listed buildings and conservation areas or because they are designed landscapes.

3.13 Modern buildings, structures and landscapes of interest should not be ignored.

3.14 Where whole landscapes comprising natural and manmade features are of cultural or historical importance the advice of English Heritage or in Scotland SNH, Wales Cadw and Northern Ireland DOE(NI), should be sought in determining their value.

4. VISUAL IMPACT ASSESSMENT METHODOLOGY

4.1 The visual impact assessment should be commissioned by the Design Organisation from a landscape architect. It should generally use the material produced for the landscape assessment at Stage 2 and be carried out in parallel with the Stage 3 landscape assessment. This approach will facilitate the evaluation of existing landscape or townscape quality for the area through which the scheme may run. Forming a mental picture of the scheme superimposed on this scene, the Design Organisation's landscape architect will then assess how that landscape or townscape would be affected from all residential properties, public buildings including work places and recreational buildings and outdoor locations to which the public has access within the visual envelope (for a definition of the visual envelope see ANNEX 3). A similar assessment will be carried out of the effects on the settings of listed buildings and structures, registered parks and gardens, scheduled ancient monuments and conservation areas. These locations will sometimes be included in the previous survey but views of them from other locations, and which include elements of the scheme, may also be important.

4.2 Although the process of assessing visual impacts is essentially site based, before going out on site it is advisable to mark the line of the route(s) on a suitable plan, indicating in particular lengths of cutting 4m or more in depth. This is done on the basis that most lorries would be out of sight in these situations other than from overlooking positions or from oblique views into the mouth of a cutting. The plans to be used in the visual impact assessment survey should be contoured 1:10,000 to 1:2,500 scale in the case of rural schemes and approximately 1:1,250 scale in urban areas.

4.3 In many cases, the visual impact assessment will best be made by surveying the view from the centreline of the road to sites within the visual envelope. This approach has the further advantage that it avoids difficulties of access to properties. Where the alternative method of looking toward the proposed road is adopted, the assessment should be made from as near to the potentially affected building or viewpoint as possible, without trespassing on private land. A thorough on-site survey can often be achieved by walking the local roads and footpaths. However, if, after careful consideration, it is deemed necessary to assess the view from private land or

buildings in order for the survey to be sufficiently thorough, powers of entry are available under s 289 of the Highways Act, 1980 (England and Wales) or in Scotland s140 of the Roads (Scotland) Act 1984.

4.4 Sometimes it may be difficult to form a clear impression on site, particularly where buildings will be demolished as a result of construction, making it difficult to visualise what will be revealed behind. It may be preferable to defer consideration of that area until a number of cross-sections from key locations have been plotted. These cross-sections should establish clear lines of sight so that interpolation between them, allowing for the changes in relationship between observer and proposed road, can be made with more confidence.

4.5 Two assessments of visual impacts should be made, using different assumptions. The first should consider the impact on a winter day in the year the scheme would open to traffic. The second should be based on the road's impact in the winter and summer of the fifteenth year after opening, and should take account of all proposed planting except off-site planting. Where special measures are to be taken to ensure the early development of planting plans this should be noted in the assessment.

4.6 The assessment of visual impact should compare the quality of the scene which would pertain without the scheme (allowing for any developments which have received planning permission, but which have not been built) with that which would result if the scheme were constructed, and then state the degree of change. A road scheme can cause either a deterioration in visual amenity, or an improvement. The Design Organisation's landscape architect should therefore categorise visual change according to the following scale:-

Substantial adverse or beneficial impact - where the scheme would cause a significant deterioration (or improvement) in the existing view;

Moderate adverse or beneficial impact - where the scheme would cause a noticeable deterioration (or improvement) in the existing view;

Slight adverse or beneficial impact - where the scheme would cause a barely perceptible deterioration

(or improvement) in the existing view;

No change - no discernable deterioration or improvement in the existing view.

4.7 The visual impact survey should be based on a Visual Impact Schedule (VIS) and a Visual Impact Drawing (VID). The VID should show buildings and important outdoor locations (viewpoints, footpaths, etc) affected by visual impacts. Locations should be numbered in geographical order from one end of the scheme to the other, references on the VIS being prefixed by the number of the drawing on which they appear. The date on which the survey was undertaken should appear on both documents.

4.8 The Visual Impact Drawing should indicate major visual barriers such as ridge lines, tree belts, woodlands, intervening buildings or structures and other visual barriers, cuttings and embankments, noting sections of road in more than 4m of cut. The Drawing will help in the definition of arcs of view which should be shown and is an important step in the assessment of the degree of visual impact. Once the VIS has been completed for a particular location, the assessment of the degree of visual impact should be recorded on the drawing.

4.9 Locations affected by visual impact should be identified as viewing positions. The following information should be recorded in the Visual Impact Schedule for each location.

A. VIEWING POSITION

4.10 For buildings, the following information should be noted:-

- (i) The name of the village, town or suburb in which buildings suffering visual intrusion are located;
- (ii) the specific address of the building by name/number and street;
- (iii) the type of building, for example - a detached or semi detached house, a bungalow, a fifth floor flat, a school or hospital;
- (iv) the distance of the building from the centre-line of the nearest visible section of the road;
- (v) the level of visual impact and whether positive or negative.

4.11 In addition, any footpaths, bridleways, common land, parks and other recreational areas suffering visual intrusion should be recorded stating their numbers, location and length or area, the range of distances from the centreline of the visible section of the road, and with the degree of impact.

B. COMPONENTS OF THE VIEW

4.12 The following characteristics of the existing view should be noted to explain the level of impact assessment:-

- (i) whether there is a view of the existing local road(s);
- (ii) whether any such view is open or interrupted by buildings, vegetation or landform;
- (iii) whether the view is obtained from other than the ground floor, or in addition to the ground floor or perhaps from the garden in the case of buildings, or other than natural ground level in outdoor viewing positions;
- (iv) whether the view is, for example, towards open countryside, urban open-space, a village or town, an industrial area or mineral workings.

4.13 State the nature of the change to the view, the extent to which elements of the present view will no longer be seen and to which new elements will be visible including any parts of the new road structures, embankments, lighting columns, gantries, road signs and artificial light at night. State whether the proposed route or associated elements will be:

- (i) wholly or partially concealed by cutting;
- (ii) at ground level;
- (iii) on an embankment visible over a wide or narrow arc.

4.14 Finally, state whether the traffic on the proposed route will be:

- (i) partially or wholly concealed by a cutting;
- (ii) at existing ground level;
- (iii) on an embankment visible over a

wide or narrow arc.

THE ASSESSMENT OF ROAD LIGHTING

4.15 For any scheme the extent to which significant additional light will be visible in the night landscape should be taken into account. For example light from direction and message signs and from the lights of vehicles and in particular from overhead lighting proposed for any part of the scheme. The daytime impact of lighting columns will also need to be assessed.

4.16 The introduction of road lighting may affect the character of the landscape and of individual views in the same way as any other element of the scheme, however the impact on night time views may be more significant than the daytime impact depending on the present night time character of the area.

4.17 Where a lighting scheme is proposed it will usually be easier to deal with lighting impacts under a separate heading and to prepare plans dealing specifically with this issue. However, the description and assessment of the significance of the effects of lighting on individual properties and views should be included with the overall visual impact assessment for these locations. The nature and significance of these effects should then be taken into account in assessing the overall significance of the effects of the lighting on the landscape.

4.18 The potential effects of lighting associated with the road should be considered both at Stage 1 and at Stage 2 of the assessment process. Impacts and possible mitigation can then be taken into account in selecting routes and alignments.

4.19 In order to assess the effects of any lighting arising or proposed it will be necessary to assess the extent and nature of any lighting visible in the baseline landscape, taking into account its contribution to the character and quality of that landscape. The daytime effects of existing lighting structures also need to be taken into account.

4.20 Methods of assessment, the methodology described in 4.1 to 4.14 will apply equally to the effects of lighting but assessments will also need to be made of the effects during the hours of darkness.

PLANS AND ILLUSTRATIONS

4.21 The daytime impact of lighting columns, signal gantries and signs will be included in the assessment of other daytime visual effects and on the

Visual Impact Drawing. Where there are properties, and important outdoor locations, outside the daytime visual envelope which are affected at night, these, and the degree of impact on them, should be identified on this drawing. Where the night time effects of lighting are significant or extensive it may be helpful to provide a visual effects drawing for the hours of darkness including a night time visual envelope; this may be helpful in demonstrating the difference between day and night envelopes, or between those for existing and proposed lighting schemes. It can be difficult to assess the area from which lighting would be visible with absolute accuracy. It should therefore be stated that the map shows an estimate of the area of visual impact which includes areas of slight as well as moderate and substantial impact.

MITIGATION

4.22 For advice on the effects of lighting and on mitigation of adverse effects through lighting design refer to 'Road lighting and the Environment' DOT 1993.

5. THE POTENTIAL LANDSCAPE AND VISUAL IMPACTS OF A ROAD

5.1 The significance of an impact may be a matter of judgement or subjective opinion based on experience.

5.2 It is important that the methodology used in assessing the degree and significance of impacts is clearly set out, including any assumptions made.

5.3 Although potential impacts will be identified at Stage 1 the main assessment will be made at Stage 2 and refined at Stage 3 as the scheme is progressed.

5.4 In assessing how a route would affect the existing landscape the following factors should be considered:-

- (i) The extent to which the road will be visible in the landscape;
- (ii) the character of the landscape and its capacity to accept changes of the type and scale proposed;
- (iii) The extent to which impacts can be mitigated and the road can be integrated into the landscape.

An attractive and valued landscape will not necessarily be adversely affected if the road can be comfortably set into the topography and mitigation in keeping with the landscape character can be used to integrate the road into the landscape. Conversely in a less attractive or less valued landscape there can be significant adverse impact because mitigation and integration are difficult.

5.5 In assessing how a route affects the existing landscape, the impact on the following aspects of the landscape should be assessed, taking into account the likely or proposed landscape design:-

- (a) Landform - how does the route affect the appearance of the underlying structure of the landscape? For example, does it follow the contours or run across the grain of the land?
- (b) Visual assessments should take seasonal differences into account. Changes as vegetation develops and matures should also be taken into account, for example, is

the route damaging to existing vegetation or can it use the cover provided by strong belts of trees to good effect? Is there a lack of vegetation which would make any planting to mitigate the impact of the route a conspicuous and intrusive feature in its own right?

(c) Pattern of Settlement - for example, would the route detract from existing attractive man-made features, or would it follow existing roads, railways, power lines, etc., and perhaps minimise new intrusion?

(d) Noteworthy Landscape Elements and Features - would the route affect the settings of any noteworthy buildings, monuments, structures, ruins, earthworks or important trees, including the settings of listed buildings and structures and scheduled ancient monuments?

(e) Cultural and Historic Associations - for example, how does the route affect an historic park, garden or conservation area or its setting? Does the route intrude in an historic landscape? Views from historic gardens, buildings or locations may be important to their historical or cultural associations or to the design of a building or its surroundings. This can include the addition of noise, smell, movement, light and changes in the scale of existing features including existing roads.

(f) Landscape character - It may be affected by the addition of uncharacteristic elements, the removal of elements that are important constituents of the character or changes in scale. Significant changes can arise from secondary effects eg effects of farm severance such as changes in field pattern and land use. It is important that detail such as planting, walls, fences etc reflects local native species and construction methods and materials, to preserve local character and sense of place and to help integrate the road with local landscape.

5.6 When considering the potential visibility of the scheme, the following features should be taken into account:

- the level of the road relative to the existing ground level (including mounds, bunds, cuttings, false cuttings);
- the road itself, including any side roads, junctions or structures;
- gantries and road signs;
- lighting, both as a permanent visual feature of the road during the day, and as an intrusive element at night. Lighting can have a major impact, especially on sensitive rural areas at night and on people living close to the road. Daytime impact arises from the height and spacing of light fittings, together with the design of columns and lanterns. Impact from night time lighting comes from glare, spillage and light reflection from the road surface. Such visual intrusions can cause the existing character of an area and its surroundings to change.
- traffic on the road, taking into account fluctuations between peak and off-peak times. Vehicle headlight glare should be recorded for properties which have windows square to the road and at such a level that they would have headlights shining into them.
- loss of trees, buildings, etc, which stand between the observer and the scheme, or which otherwise affect the landscape (for example, loss of open space).
- the relationships of scale and materials;

5.7 Having considered these individual aspects of a scheme's potential impact, in the light of the importance of the affected landscape, the Design Organisation's landscape architect should reach an overall judgement on the impact of each section of the route, allowing for likely or proposed mitigation. It is important that the reasoning behind the conclusion is clearly presented.

6. LANDSCAPE MITIGATION

6.1 Assessment and design are parts of an iterative process which together suggest potential mitigation measures which can be adopted. The incorporation of specific landscape mitigation measures into a scheme should not be assumed in subsequent assessments without the agreement of the Overseeing Department's Project Manager. At each Stage, assumptions about mitigation measures should be stated in the factual reports on assessment.

6.2 Advice on good practice in landscape design is given in DMRB 10. Additional references are listed in Chapter 10.

6.3 The choice of route options avoiding potential adverse impacts and with good fit in the landscape is fundamental to reduction in impact. Examples of possible mitigation techniques are listed below:-

(a) The design of the horizontal and vertical alignment for the main line, side roads and junctions

- to get the best fit with the contours
- to retain and make the best use of existing vegetation
- to optimise protection for nearby houses through the use of cuttings, existing features or range
- to avoid loss or damage to landscape features eg hedges, water features or field systems

(b) The use of specific landscape mitigation measures

- on and offsite planting
- mounding
- earth shaping
- new water features
- careful consideration of the form and finish of structures
- the alignment and appearance of roadside ditches and fences
- the appearance of other features such as street signs and gantries

6.4 Reducing the impact of a road on the landscape is just one of the factors to be considered in route choice and design, and conflicts can exist. For example, a balance must be struck between taking land for landscape mitigation and retaining it in its existing use. In addition to fulfilling the intended purpose any mitigation measures must perform to an acceptable level in traffic, road safety and economic terms.

7. VARIATIONS FOR WIDENING SCHEMES

7.1 The landscape, townscape and visual impact methodologies described in the preceding chapters are generally applicable to road widening schemes. The main differences which should be noted are:-

- the existing landscape will include the road which it is proposed to widen and its associated mitigation measures. This should be taken into account in the assessment of existing landscape quality;
- the scheme will be the widening and in some cases slight route variations to mitigate impact and the re-routing of local roads. It is important to differentiate the impact of the scheme from that caused by the existing road;
- it will not generally be possible to conduct the visual impact assessment from the centreline. Assessment from the edge of the existing road or from affected properties should be undertaken in these cases. The visual impact of the existing road shall be assessed before assessing the visual impact of the proposed options.

8. VARIATIONS FOR URBAN SCHEMES

8.1 In general the data collection and landscape and visual impact assessment methodology described in the preceding chapters are applicable to urban schemes. The main areas of difference are of emphasis related to features of townscape rather than open landscape, and to the often large number of people living and working in close proximity to the route.

8.2 Assessment of the character and quality of the townscape should take the following into account:-

- The physical structure of the area, the sequence of spaces and built forms, harmonious compositions of spaces and built forms either accidental or designed and taking into account the effects of planned future development.
- Urban Conservation areas.
- The settings of individual buildings and groups or buildings.
- Important monuments or buildings and areas of townscape.
- The enhanced importance of open green spaces and of vegetation in urban areas. The value of individual trees.
- Open space may be of greater than local value eg Metropolitan Open Land in London.
- Detail of local building materials and styles, pavings and street furniture, statuary etc that are important components of local character. Materials worthy of salvage should be noted.
- The fact that an area has become run down may not reduce its quality or value in townscape terms. Areas capable of improvement should be noted.

8.3 The assessment of potential impacts on townscape should take into account the following:-

- Impacts on townscape quality resulting from a road cutting across the urban fabric, from the severance of visually and architecturally harmonious or homogenous areas or

buildings and from the disruption of spaces designed to be seen in sequence.

- The obstruction of well known or locally important views by structures or the intervention of traffic in a view.
- The opening of views through building demolition. This may be beneficial but can also expose views that were never intended to be seen, such as the backs of buildings, service areas, industry etc that were previously screened by buildings and facades designed to be seen.
- the effects of severance on terraces, the removal of one of a pair of semi detached houses or one side of a square.
- Re-routing of traffic away from areas of valued townscape enabling them to be used and appreciated once more.
- The creation of new open spaces and the provision of better quality detailing.

8.4 Assessment of the potential impacts on local people living in or using the area should include the following:-

- The effects of the opening up of protected areas to visual intrusion and the visual effects of moving traffic.
- The closing off of open spaces by structures and reduction in light levels.
- Reduction of available light within buildings.
- Loss of privacy due to the proximity of traffic and pedestrians to dwellings. The effects of high level roads close to upper level windows and flats should be taken into account.
- The impacts of headlight glare from elevated structures.

8.5 Impacts on properties will often include those on the residents and users of tall buildings and should take into account the reduction in impact with height as the view becomes wider and the road less significant within it. These impacts may need to be

assessed by visiting the building concerned.

8.6 In an urban context the following plans and illustrations will be found useful:-

- A land use plan.
- A plan showing the study area broken into recognisable units of townscape and visual enclosure and their inter-relationships. Important elements, trees etc should be shown.
- Annotated ground level and aerial photographs, if available, particularly obliques, can be useful in illustrating the serial appreciation of spaces and the complexity of the relationships between buildings and spaces which contributes to local character and townscape value.

9. STAGES IN LANDSCAPE AND VISUAL IMPACT ASSESSMENT

9.1 Landscape and visual impact assessments complement one another and should be undertaken by the same person wherever possible. Together they should become increasingly detailed as a scheme develops, and in accordance with the importance of the landscape affected and the number of people subject to adverse visual impacts. It is also important that, as the assessments become more detailed, they both inform and take account of the development of mitigation measures. Assessment and design are part of an iterative process.

9.2 The following levels of detail will generally be appropriate at the key stages, although more or earlier assessment might be needed in certain cases.

Stage 1

9.3 The objective at this stage is to undertake sufficient assessment to identify the landscape constraints associated with particular broadly defined routes, or corridors as developed by the Design Organisation and agreed with the Overseeing Department's Project Manager. This initial assessment should begin with a desk top study of the corridor by a landscape architect. In most cases, a site visit will be necessary.

9.4 The steps to take are:-

(i) contact the relevant statutory body and local planning authority to obtain information on the location and nature of all designated areas of landscape importance;

(ii) using maps of the area, information on designated landscape areas and any personal knowledge, form an initial judgement about the existing landscape character quality and identify any sensitive areas which may act as constraints;

(iii) where the desk study shows that areas of valuable landscape could be affected, or that significant numbers of properties or important community facilities would suffer adverse visual impacts, undertake a site visit to provide a better appreciation of the likely landscape and visual impact consequences. Broad areas of landscape character and quality and

significant individual features should be noted;

(iv) mark on a 1/25,000 or 1/10,000 scale map of all designated landscape areas, and nondesignated areas identified as being of importance;

(v) using maps and, where applicable, information collected on the site visit, indicate for each possible route corridor how villages and larger settlements may experience changes in visual impact, and the potential magnitude of the change. This assessment will be based on an evaluation of how 'exposed' a settlement is to changes in the view.

In summary information gathered at this stage will include the following:

- topography
- major ridge lines
- areas of designated landscape importance or value
- landscape character areas
- areas of significant landscape value
- vegetation of significant value
- areas or important features of historical, cultural or local importance
- settlements and communications
- other features of particular landscape significance
- any major landscape constraints or areas of constraint
- any particular areas of poor quality landscape and visual detractors
- indicate areas of direction of open views and note any areas of potentially adverse visual impact.

9.5 The result of the Stage 1 assessment, to be described in the Stage 1 Report, should consist of:

- (a) a map of the overall route corridors should consist of: showing all designated areas and all nondesignated areas which the landscape architect considers are also of landscape importance. The map should also identify villages or larger centres of population which may be adversely affected by possible routes and information on the landscape character;
- (b) a statement on the quality of the baseline landscape and an assessment of potential landscape and visual impacts associated with route corridors. The report should also set out any areas within the study area which should be considered as constraints and any agreed proposed mitigation measures.

Stage 2

9.6 The objective at this stage is to undertake sufficient assessment to identify the landscape and visual factors and the effects upon them to be taken into account by the Design Organisation in developing and refining route options in agreement with the Overseeing Department's Project Manager.

9.7 The steps to be taken are:-

- (i) conduct a landscape assessment of the area which would be affected by possible route options using the methodology described in CHAPTER 3 above;
- (ii) check with the relevant statutory body and local planning authority that no new landscape areas have been designated;
- (iii) from information gathered during the landscape assessment, and by using maps, estimate in broad terms the number of properties which are likely to experience visual changes, employing the categories substantial, moderate and slight visual deterioration or improvement. A full on-site visual impact assessment survey will not generally be required at this stage.

9.8 The results of the Stage 2 landscape and visual assessment, to be included in the Stage 2 Report, should consist of:

- (a) a statement on the landscape impacts of route options. The statement should include:-

- a description of the area being studied and an analysis of the physical elements of the landscape, including its historic and cultural associations. Figures should be used to illustrate the topography and also the distribution of vegetation and other features (woodland, hedgerows, dry stone walls, etc.). Aerial photographs, if available, as well as ones of important views at ground level may also be helpful for illustration. Annotation might be helpful in some cases.
- a classification of the landscape into broadly homogeneous units and an assessment of their landscape quality. In some cases, it may be possible to use one figure to show both the classification into homogeneous units and the categorisation by landscape quality (for example, 'very attractive rolling countryside', or 'poor urban fringe landscape', 'small scale farmland which provides a setting for the village'). Where there is a divergence between the two, however, separate figures should be used.
- a description of each route option and an assessment of the significance of its impact on the landscape. Each route should be illustrated using a figure which shows where the route is likely to be on embankment or in cutting, and the location of existing vegetation, significant ridgelines, agreed mitigating features, and areas of major impacts (differentiated between high and low, where necessary). In some cases, it may be helpful to annotate the figure, or to superimpose the information above the map showing areas of different landscape quality. Other illustrations may also be useful in certain cases and the need for these should be agreed in advance with the Overseeing Department's Project Manager. Advice on visual envelope maps and photomontages is contained in ANNEXES III and IV respectively.
- (b) a statement on the estimated visual impact of route options, illustrated by a suitable map showing the location of affected properties and the degree to which their visual amenity might change. It is very important that the statement and map both state that the assessment is only indicative and that further on-site survey work to look specifically at visual impacts on property will take place following the selection of a preferred route.

Stage 3

9.9 The objective at this stage is to assess the landscape effects of the preferred route. The following steps should be taken:

(i) refine the earlier landscape assessment in the light of any changes in the alignment of the preferred route since Stage 2 and to take account of further scheme design. A further check should also be made with the relevant statutory body and the local planning authority that no new landscape areas have been designated in the vicinity of the preferred route;

(ii) conduct a visual impact assessment using the methodology described in CHAPTER 4.

9.10 The result of the landscape and visual impact assessment at Stage 3, to be included in the Environmental Statement should consist of:

(a) an illustrated statement on the impact of the preferred route on the landscape character and quality of the area, following the approach (and using much of the material) of the Stage 2 landscape assessment. The statement should include a description of the methodology used to assess character and the criteria to determine quality;

(b) an illustrated description of the visual impact of the preferred route on properties and locations to which the public has access. The description should include:-

- an introduction which describes the objective of the assessment and the methodology used;
- a list of all properties and locations surveyed with the corresponding evaluation of how their visual amenity would be affected by the scheme;
- a map showing the preferred route and, for all properties and locations surveyed, an indication of the change in their visual amenity. As with the landscape assessment report, other illustrations may also be useful in certain cases and the

need for these should be agreed in advance with the Overseeing Department's Project Manager. Advice on visual envelope maps and photomontages is contained in ANNEXES III and IV respectively.

9.11 Whilst it is not necessary to include them in the visual impact assessment statement, the working notes and drawings made on-site by the Design Organisation's landscape architect should be retained in case they are subsequently needed to verify aspects of the assessment.

10. FURTHER READING

- 10.1 Design Manual for Roads and Bridges DMRB
Vol 10
- 10.2 Landscape Assessment : A Countryside
Commission Approach (Countryside Commission 1987)
- 10.3 Environmental Assessment : The Treatment of
Landscape and Countryside Recreation Issues
(Countryside Commission 1991)
- 10.4 Policy for Roads in England 1987 (London,
HMSO 1987 Cmd 125 I and II)
- 10.5 Fit for the Future : A Statement by the
Government on Policies for the National Parks
(Department of the Environment 1992)
- 10.6 Roads in Upland Areas : A Design Guide
(Welsh Office, HMSO 1991)
- 10.7 Planning Policy Guidance Note No 2, January
1988 (Department of the Environment, 1988)
- 10.8 DoE Circular 12/72 (Department of the
Environment, 1972)
- 10.9 Roads, Bridges and Traffic in the Countryside
(Scottish Office, 1992)
- 10.10 Landscape Assessment : Principles and Practice
(Countryside Commission for Scotland, 1991)
- 10.11 SDD Circular No 24/85. Development in the
Countryside and Greenbelts
- 10.12 Roads in Lowland Areas - A Design Guide
(WO 1993)
- 10.13 Road Lighting and the Environment
(Department of Transport, 1993).

DESIGNATED LANDSCAPE AREAS

National Designations

National Parks (England and Wales)

1. National Parks in England are designated by the CC, subject to confirmation by the Secretary of State for the Environment. In Wales National Parks are designated by the Countryside Council for Wales (CCW) subject to confirmation by the Secretary of State for Wales. National Parks are extensive tracts of country considered to be of national importance in terms of their natural beauty and the opportunities they provide for open-air recreation. Development within National Parks is closely controlled. The Government's objective is that major development should not take place in the National Parks save in exceptional circumstances. Each Park is administered by a National Park Authority which, in addition to its responsibility for development control, is statutorily required to prepare and publish a management plan (known as a National Park Plan) setting out its policy for the exercise of its functions in respect of the Park for which it is responsible.

2. The Government is committed to ensuring that no new trunk route will be constructed through a National Park, or existing road up-graded, unless there is a compelling need which would not be met by any reasonable alternative means (1987 Roads White Paper, para. 5.1).

3. In Northern Ireland the Environment Service can designate National Parks. There are currently no National Parks in Northern Ireland.

Information from: CC
CCW
National Park Authority

Statutory designation: National Park

The Norfolk and Suffolk Broads (England)

4. The Norfolk and Suffolk Broads enjoy equivalent status and protection to National Parks, but with powers tailored to suit their special circumstances. The area is administered by the Broads Authority which publishes a management plan similar to that produced by the National Parks Authorities. The Broads Authority has additional responsibilities for navigation.

Information from: The Broads Authority

The New Forest Heritage Area (England)

5. The core area of the New Forest is protected and defined by the New Forest Acts. However, it has been recognised that the wider New Forest area should be protected through the planning system as if it were a National Park (i.e. an area to which PPG7 applies).

The New Forest Heritage Area, which encompasses this wider area, is in the process of being defined through the adoption of local plans.

Information from: Local Authorities

Areas of Outstanding Natural Beauty (AONB)

6. Like National Parks, AONBs in England are designated by the CC, subject to confirmation by the Secretary of State for the Environment. In Wales AONBs are designated by the CCW and confirmed by the Secretary of State for Wales. In Northern Ireland AONBs are designated by the Northern Ireland Environment Service. Whilst AONBs lack the extensive areas of open countryside suitable for recreation, and hence National Park status, they are nevertheless of such fine landscape quality as to warrant protection and are of national as well as local importance.

7. Wherever possible roads will be kept away from AONBs. Where there is a risk that a proposed scheme will affect such an area it should be examined with particular care to establish that a new road is needed and that the route is being designed, or has been chosen, to do as little damage to the environment as practicable (1987 Roads White Paper, para. 5.1).

Information from: CC
CCW
SNH

Statutory designation: Area of Outstanding Natural Beauty

Heritage Coasts

8. Heritage Coasts are stretches of coast of particular scenic quality which are recommended for special attention by the CC (or CCW in Wales).

Although not subject to a separate statutory designation, DOE Circular 12/72 recommends that safeguarding the undeveloped coast must be a high priority. Most of the Heritage Coasts are within, or largely within, National Parks or Areas of Outstanding National Beauty.

Information from: CC
CCW

Statutory designation: None

Parks and Gardens of Special Historic Interest

9. English Heritage (EH) (and Cadw which is the statutory body for cultural heritage in Wales) compile a non-statutory Register of Parks and Gardens of Special Historic Interest. Inclusion on the Register does not involve any new restrictions on development, nor does it affect the statutory listing or planning controls on any Listed Building within a registered park or garden. The grading symbols employed for Listed Buildings are also used for parks and gardens:-

Grade I - parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them of exceptional interest;

Grade II* - parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them, if not of exceptional interest, nevertheless of great quality;

Grade II - parks and gardens which by reason of their historic layout, features and architectural ornaments considered together make them of special interest.

Information from: EH.
Cadw

Statutory designation: None

National Trust Property

10. The National Trust was set up to promote the permanent preservation of lands and tenements of beauty or historic interest and, in the case of lands, for the preservation of their natural aspects, features and animal and plant life. Much Trust Land has been declared inalienable and is held for the benefit of the Nation. This land is specially protected and cannot be disposed of or acquired without the National Trust's consent except by Special Parliamentary Procedure.

The Government pays special attention to the effects of new roads on inalienable Trust land (1987 Roads White Paper, 5.1).

Information from: National Trust

Statutory designation: Inalienable land enjoys statutory protection

Limestone Pavement Orders (LPOs)

11. LPOs protect areas of limestone pavement under Section 34 of the Wildlife and Countryside Act 1981. They do not provide protection to the flora within the area. They are notified either by English Nature or the Countryside Commission and then authorised by the local authority or the Secretary of State.

Information from: Local planning authority

Natural Heritage Areas

12. Under Section 6 of the Natural Heritage (Scotland) Act 1991 Scottish Natural Heritage may recommend to the Secretary of State for Scotland that an area which is of outstanding value to the natural heritage and for which special protection measures are appropriate be designated as an Actual Heritage Area.

Information from: Scottish Natural Heritage

Statutory Designation: Natural Heritage Area

National Scenic Areas

13. National Scenic Areas are designated by the Secretary of State for Scotland on the advice of Scottish Natural Heritage (SNH). They give special protection to the landscapes of areas of outstanding scenic quality through a requirement on local authorities to consult SNH on certain types of planning developments.

Information: Scottish Natural Heritage

Statutory Designation: National Scenic Areas

Other Landscape Designations

Green Belts

14. A Green Belt is an area of land, near to and sometimes surrounding a town, which is kept open by permanent and severe restrictions on building. Its main purpose may be to limit the expansion of a town or to prevent neighbouring towns, or groups of towns, merging into a solid urban mass.

Guidance on Green Belts is set out in the DoE Planning Policy Guidance Note No.2, January 1988.

Greenbelts have been at the core of Scottish planning policy in the urban fringe since the 1940s and are now included in structure plan submissions to the Secretary of State for Scotland prepared by Regional Councils. Glasgow, Edinburgh and Aberdeen are surrounded by greenbelts, as are Falkirk and Ayr. They are areas where there is a presumption against development.

Information from: DoE, SNH

Statutory designation: None

Regional Parks

Regional Parks may be designated by Regional Councils under the Countryside (Scotland) Act 1981, subject to confirmation by the Secretary of State for Scotland in any case where an objection is raised. The aim of a Regional Park is to allow integrated management by local authorities of extensive areas of land, with an emphasis on the provision of recreational facilities. There are currently four Regional Parks in Scotland. These are Pentland, Fife (Lomond Hills), Loch Lomond and Clyde Muirshiel.

Information from: Regional Council

Statutory Designation: Regional Parks

Areas of Great Landscape Value

15. Many Structure Plans identify Areas of Great Landscape Value (AGLV's) designated by local authorities for planning purposes. In some counties, an additional designation - Special Areas of Great Landscape Value - is used as well as AGLV. This indicates areas which the local authority fears to be on the borderline of being nationally important.

Information from: Local planning authority

Statutory designation: None

Country Parks

16. In England and Wales a local authority or private individual may establish an area of land as a Country Park under the Countryside Act 1968. The Countryside Commission may provide grant aid for Country Parks under the provisions of Section 9 of the Local Government Act 1974.

In Scotland Country Parks are generally designated by District Councils under the Countryside (Scotland) Act 1967. They are designed to provide facilities for public recreation in areas accessible to population centres. The land is normally, but not always, in public authority ownership.

Information from: Local planning authorities in England and Wales; District Councils in Scotland.

Statutory designation: Country Park

Other Designations

17. These may include other local authority designations for planning purposes such as landscape conservation areas, landscape protection areas, landscape enhancement areas, etc.

Regional Scenic Areas (Scotland)

18. Local authorities in Scotland designate a range of areas of scenic importance. They have a variety of titles including "Landscape Areas of Regional Importance" (Fife), "Regional Scenic Areas" (Strathclyde) and "Areas of Great Landscape Value".

19. It is important to remember that areas which have been designated primarily for their heritage, nature conservation or physiographical value may also be of considerable landscape value. Examples of this include Stonehenge and Ironbridge Gorge which have been designated as World Heritage Sites (see SECTION 3, PART 2, CHAPTER 9).

Tree Preservation Orders

20. Local authorities have powers under section 198 of the Town and Country Planning Act 1990 to protect trees of special importance by making tree preservation orders. Consent is required to carry out any work to a protected tree although there are general exceptions where the work is required to comply with obligations imposed by an Act of Parliament and, for Highway Authorities, to deal with trees which dangerously overhang highways or obstruct the views of drivers.

THE ROLE OF THE STATUTORY BODIES

1. The Countryside Commission, Scottish Natural Heritage and the Countryside Council for Wales work to protect and improve the landscape and provide new and improved opportunities for countryside access and recreation in England, Scotland and Wales respectively. They are funded by Government and are its statutory advisers on these matters. The Countryside Commission and the Countryside Council for Wales has a statutory opportunity to express an opinion about any Environmental Statement produced under section 105A of the Highways Act 1980, where a scheme would be in, or within 100m of, a National Park. A similar opportunity is provided for Scottish Natural Heritage under section 20A and 55A of the Roads (Scotland) Act 1984. The three bodies also have a statutory duty to provide information on nationally designated landscape areas to those undertaking an environmental assessment. In practice, the three statutory bodies may also, to a limited extent advise on which other bodies, statutory and voluntary, should be consulted. The Countryside Commission may also comment on the landscape implications of schemes which do not lie in or within 100m of a National Park.

2. Where the Countryside Commission, Scottish Natural Heritage and the Countryside Council for Wales have an interest, it is essential that the appropriate body is consulted from the earliest stage of a scheme's development, and especially at Stage 2 and during the preparation of an Environmental Statement. The statutory bodies should be the first point of contact with external organisations on all landscape matters.

THE VISUAL ENVELOPE MAP

1. A visual envelope map (VEM) outlines the area of land from which there is a view of any part of the proposed road, its structures, or the traffic which will use it. Therefore all changes in visual impact must occur within these areas. The production of VEMs requires some skill and experience in assessing visibility and it is recommended that they should be prepared either by a landscape architect or in liaison with one.

2. Although the VEM is intended primarily as a working tool for the designer in his or her assessment of the visual effects of alternative designs it can also be of use as an indication for the public of areas of land affected by the scheme. However, a VEM may be misinterpreted as in some cases the visual envelope may extend for some miles whilst the route is barely perceptible and any adverse impact very slight. If this is the case, the VEM should clearly state that it covers all impacts however slight.

3. If a suitable digital terrain model (DTM) is available, a computer-generated Zone of Visual Influence (ZVI) can be readily produced. In other cases, the entirely manual methodology for producing a VEM which is described below can be used. In both cases, on-site checks are needed to ensure that the final VEM is as accurate as possible.

4. Two basic assumptions for the preparation of VEMs are:-

- a. that the observer height is 1.8 m - the assumed eye level of a person on foot; and
- b. that visual intrusion is occasioned by traffic on the road as well as by the road itself. A height 4 m above the carriageway should be taken to represent the top of the average commercial vehicle but where road lighting is proposed it may be more relevant to work to the lantern height.

5. Before a VEM can be prepared, it is necessary to have a contoured topographical map of the area traversed by the different routes. This can be based on either an Ordnance Survey map or aerial photography. OS maps are easily available but give little indication of the height of buildings or tree cover. A scale of 1/10,000 is suitable. Where aerial surveys have been carried out they are likely to be

plotted to a 1/2,500 scale with contours at 2 m intervals and provide a more accurate representation of the scene than do the OS maps. VEMs are difficult to produce directly from maps for urban areas since comprehensive information about building heights is not readily available. More extensive site inspection will thus be necessary in urban areas.

6. One method of proceeding is as follows:-

- a. On the topographical plans colour the areas between the height contours to distinguish between high ground (darker) and low ground (lighter colour).
- b. Mark the line of the proposed road and show diagrammatically those lengths which are in cutting of depth 4 m or more. This is done on the basis that most lorries would be out of sight in these situations other than from overlooking positions or from oblique views into the mouth of a cutting. Where there is an appreciable ground slope across the route it will be necessary to mark the 2 sides of the route independently. On the remainder of the road, add levels every 100 m, to represent the viewed object height (eg grade level plus 4 m for tops of vehicles).
- c. Mark the position of any earth bunds proposed.
- d. Draw an outline around any significant built-up areas or tree cover. This is particularly important if they occur within a few hundred metres of the road where their visual shielding effect is much greater.

7. By studying the ground contours and their shapes, 'ridges' can be marked and joined up to form an horizon contour beyond which it would be impossible to see the road. In the absence of screens this horizon would form the visual contour. Good local knowledge is necessary if an accurate contour is to be determined and while the establishment of the horizon is relatively straightforward in undulating or hilly countryside it becomes progressively more difficult as the terrain becomes flatter. In such areas, where it becomes impracticable to determine the horizon from the desk study a cut-off line should be marked on the plan at a distance of 1,000 m from the line of the road and more detailed fixing of the visual contour left to the site inspection. Adverse visual

impacts in flat areas at more than 1,000 m from the road are unlikely to be significant but where such a limit forms part of the final VEM an appropriate note should be added.

8. The limits of visibility can be greatly affected by screening due to groups of trees and houses. Areas of low ground will be screened by higher ground nearer the new road. Where a view of the proposed road will be obstructed by 'higher' ground lying nearer to the road, this may not be evident from the contours and it will be necessary sometimes to plot a section along the line of view in order to establish the extent of the screening. In urban areas, the first line of buildings usually forms the principle block to visibility and views beyond that may be fragmentary.

9. Once an adequate draft plan has been plotted, it will normally be necessary to walk along the line of the road to check the horizon contour and to inspect sensitive parts of the visual contour on the ground. It is not easy to visualise the precise horizontal and vertical alignment of the proposed road and it is essential that the site visit be carried out by a landscape architect with sufficient knowledge of the scheme and experience of visual assessment.

10. It should be appreciated that VEMs are not accurate indicators and that it is not normally possible to assign a tolerance to them. A statement in bold lettering should be marked on the final map to the effect that the information given is an approximation.

11. The VEM should be checked periodically to see that account has been taken of any changes in tree cover or the presence of buildings that have occurred since its preparation.

PHOTOMONTAGES AND SKETCHES

1. Photomontage is the superimposition of views of a proposed new road or structure on a photograph of the existing scene. The production of a good photomontage requires close liaison between engineer, landscape architect and professional photographer/artist. This annex gives only a general description of the technique and is not a specification.

2. It has been shown that opinions of the relative attractiveness of landscapes derived from photographs correlate well with the opinions of people looking at actual landscapes. Photomontage is, therefore, a good method of representing the likely visual effects of a new road to the public.

3. Photomontages are usually produced to illustrate special features of the scheme, or where the road is passing through Areas of Outstanding Natural Beauty, or National Parks, or National Scenic Areas in Scotland.

4. A site selected for presentation by photomontage must meet two criteria. First, there must be viewpoints available which a reasonable observer would agree gave a fair representation of the impact of a scheme. Second, it must be possible to survey the immediate area. A field survey is required to determine the Easting, Northing and height AOD of the camera and the field marker positions which appear in the site photographs as a reference for matching perspective drawings and of the route at a later date. The focal length of the camera lens should also be noted.

5. The site colour photographs should all be enlarged to exactly the same scale, and the co-ordinates of the exact centre and axis determined. The area represented by the photographs and the positions of the field targets relative to the axis should also be obtained.

6. The next step is the production of a perspective drawing of the proposed scheme in relation to the surrounding topography. All hidden detail of the proposed scheme is suppressed and the field targets appear diagrammatically on the output plots for matching with the site photographs. Options to plot lines to describe signs, structures etc are available. If the designer has access to a Computer Aided Design suite, facilities should be available to provide general perspective views with optional hidden line removal, road user perspectives for highway models, perspectives of bridges, road signs etc, ground level

and aerial photomontage.

7. The final step is for an artist to match the perspective plots onto the site photograph either by painting in the road structure, planting (as it would appear both on opening and in the summer 15 years after opening), and traffic, or, if a suitable photograph of an existing road can be provided, by inserting a carefully shaped section of it. This latter alternative can greatly increase the realism of the final product. The photomontage is then re-photographed to blend the artists work with the site photograph. The final photomontage should always be in colour and of a size not less than 25cm x 20cm for hand held material. For exhibition in a hall, much larger sizes are needed.

8. In urban areas, simple "working" sketches of the route superimposed on photographs can be an excellent aid in the assessment of visual intrusion. These sketches may only show the main lines without any attempt to portray landscape treatment but they do give a good basis for judgement. This type of working montage can also be useful for inter-urban schemes and may be produced by superimposing a tape on a photographic base.

9. The advantage of the sketches over photomontage is that they can be quickly and cheaply produced for a large number of sites. They can be useful for the public prior to the stage when more detailed montages of the preferred route might be available.