

**Local Transport Note 1/08**

March 2008



# Traffic Management and Streetscape



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This Local Transport Note was researched and prepared by a team led by MVA Consultancy, with Urban Initiatives and Colin J Davis Associates, on behalf of the Department for Transport.

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ISBN 978 0 11 552942 9



Printed in Great Britain on paper containing at least 75% recycled fibre.

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The Department for Transport does not necessarily advocate the specific examples of traffic management practice shown in this Local Transport Note in all respects: there may be reservations about layout or conformance with regulations. The examples are, however, representative of a design approach which considered streetscape needs and led to implementation of those solutions.

This Local Transport Note has been informed by research undertaken with practitioners: relevant comments from that research appear within the text.

# 1. Introduction

## 1.1 About this Local Transport Note

**1.1.1** The intention of this Local Transport Note (LTN) is to help all those involved in the design of traffic management measures to prepare schemes that consider and care for the streetscape. It assists hands-on designers, project enablers and decision-makers alike. Specifically, it aims to enhance streetscape appearance by encouraging design teams to minimise the various traffic signs, road markings and street furniture associated with traffic management schemes. Advice on achieving this is given with reference to a series of case studies.



**1.1.2** This LTN is relevant to all schemes, of all types and scale, in urban and rural settings, but focuses particularly on the smaller, everyday schemes such as junction entry treatments. Most people may only be subconsciously aware of the detrimental impact that cluttered and poorly designed schemes have on their environment and living conditions (see Figures 1.1–1.3). The improvements that can be made to the smaller routine schemes may be subtle in design and impact (good practice in itself), but the benefits of these improvements will be substantial if widespread in application. Not only will the street look much better, but the reduced clutter and the clearer signing will benefit people with limited mobility and those who are blind or partially sighted.



Fig. 1.1 *above left* 'Turn left signs' at the exit to a one-way street – a cautious approach to design can result in the over-provision of signs.

Fig. 1.2 *above* Entrance to a traffic calming scheme – excessive guardrailling is visually intrusive.



Fig. 1.3 *left* Pelican crossing with minimal signs, markings and signal equipment.

**1.1.3** The findings and recommendations made are founded on the views and experiences of a range of practitioners throughout the country and on the progress of a number of case studies. Those case studies and local authority officer quotes included in this LTN have provided a useful insight into the design aspirations, processes, challenges and outcomes of the various projects followed.

## 1.2 Good design – principles and process

**1.2.1** This LTN also considers the general principles of good design, along with the scheme delivery process. Those design principles, described in detail elsewhere in various other documents from a wide variety of sources, include a number of key messages.

The principles of good traffic management are in line with good streetscape design – neither is helped by over-provision and clutter.

### Flexible approach

**1.2.2** Designers need to recognise and take full benefit from the flexibility within the regulations rather than preparing overly-cautious ‘belt and braces’ designs. This LTN demonstrates that good practice

can be achieved within the flexibility offered, for example, within the Traffic Signs Regulations and General Directions 2002 (TSRGD) (SI 2002 No. 3113, TSO, and later amendments). Good scheme design must satisfy regulatory requirements, meet functional objectives, provide clarity and safe movement for all road users. But it must consider and provide for the visual quality of the streetscape as well. A successful scheme achieves functional demands and high visual quality, whilst being delivered within constraints that include physical space, budget and programme.

**1.2.3** Clutter may result from designers being unaware of that flexibility or perhaps having insufficient experience to take advantage of it. Some may be unaware of the status and intended role of guidance documents and regulations, treating all as mandatory instruction. Local authorities have considerable discretion in developing local policies and standards and should apply appropriate professional judgement to bear in their application.

### The wider picture

**1.2.4** Many projects and related design advice focus on satisfying single issues such as road safety, but a practitioner needs to make balanced judgements in order to ensure that due consideration is given to all functional and aesthetic requirements – see Figure 1.4.

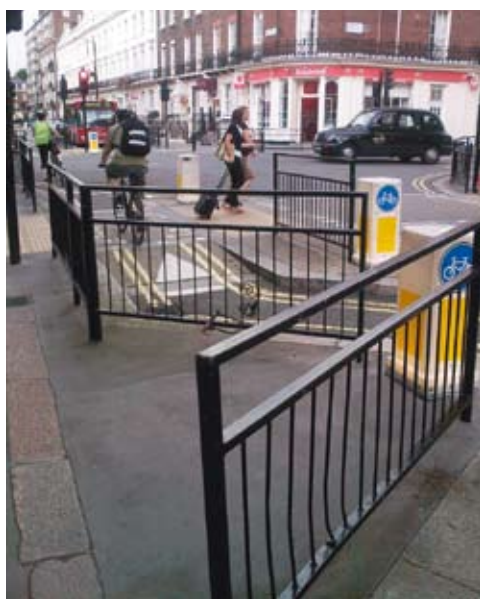


Fig. 1.4 Whilst some schemes may work well in terms of their functionality, the adverse impacts on the streetscape need to be addressed.

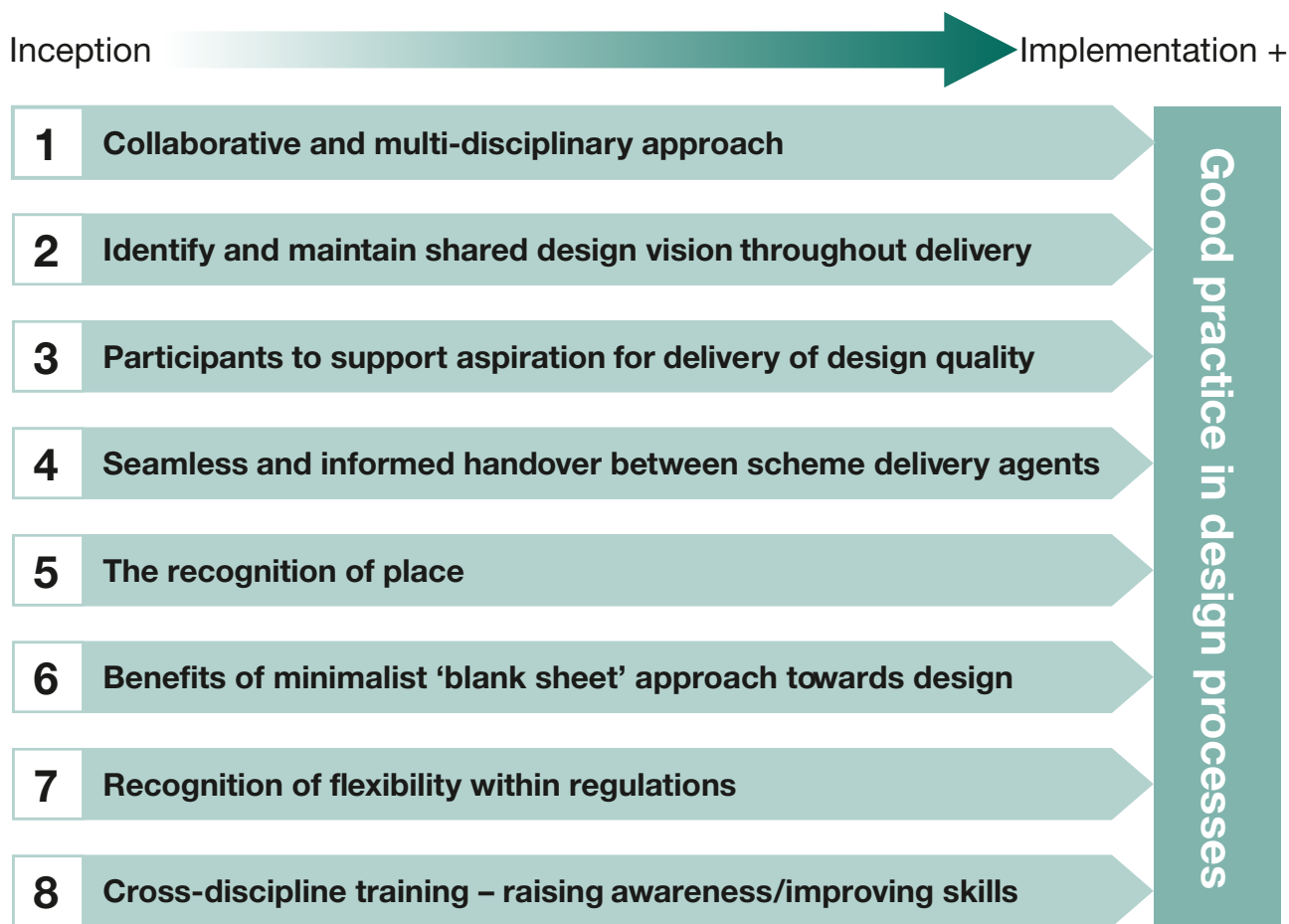


Fig. 1.5 Key themes in the design delivery process.

**1.2.5** The impact of several separate work programmes, separate budgets and separate timescales, with little cohesive long-term co-ordination or design, often results in clutter and poor scheme design.

## Collaborative working

**1.2.6** Consideration is given on how best to organise the design delivery process to foster collaborative working and preserve scheme design integrity. Much progress has been made (in recent times) in describing detailed design techniques and identifying good and poor practice, and there is little need to repeat that advice here.

## Scheme delivery

**1.2.7** Though scheme delivery is seemingly a straightforward process, the reality of delivering successful and high-quality schemes is surprisingly complex, with a multiplicity of interests, considerations

and obstacles to be negotiated. These often lead to design compromise. The process of scheme delivery has great influence over scheme outcome and, if not successfully managed, may serve to inhibit good design. Accordingly, this LTN looks closely at the business of scheme delivery, such as design brief preparation and maintenance considerations.

**1.2.8** A number of key themes run throughout this LTN, relating to the design delivery process as summarised by Figure 1.5.

**1.2.9** The guidance offered in this LTN follows the design process from scheme initiation through design preparation and implementation to monitoring and maintenance. Consideration is also given to the need for training of all those involved in the design chain, so that appropriate attention and care is given to scheme delivery.

## 1.3 The design context

**1.3.1** The context for the findings and recommendations in this LTN reflects the prevailing focus on promoting inclusive communities, sustainable travel, as well as protection and enhancement of the environment. In recent years, other issues have gained prominence too, such as access for disabled people, personal security, providing 'best value' in scheme procurement and delivery, community engagement, and the apparent unease felt by designers in preparing challenging schemes.

**1.3.2** Various guidance documents help inform designers in recognising and tackling these matters, such as *Better Streets, Better Places* (ODPM, 2003), *Paving the Way* (CABE, 2002), and *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure* (DfT, 2004a), with *Manual for Streets* (DfT, 2007) bringing together much of contemporary thought and practice on how to transform the quality of our streets.

**1.3.3** The research periods for *Manual for Streets* and this LTN overlapped, with both noting similar difficulties with the design and delivery process, an over-cautious and conservative approach, a lack of collaborative design, and the need to recognise 'place' in the design process and to prioritise pedestrians in the movement hierarchy. All of these points are relevant to this LTN, though it starts with the specific aim of addressing the streetscape and, in particular, the avoidance of clutter in the design of traffic management schemes. Though independently researched, the findings that inform this LTN and the conclusions drawn by the work are fully compatible with the *Manual for Streets* ethos of encouraging the delivery of quality schemes, which contribute to the delivery of higher-quality places. Good design and the creation of interesting spaces for people to use and enjoy should tend towards simplicity and the avoidance of clutter. 'Less' is indeed 'more' and should be a guiding principle of good scheme design, included as essential practice in local design and guidance.

## 1.4 Key points

- Good scheme design must meet functional and visual objectives.
- 'Less is more' should be a guiding principle of good scheme design.
- Practitioners need to be aware of the status and function of guidance documents and regulations.
- Good practice can be achieved within the regulations.
- It is important not to focus on single issues, look at the bigger picture.

# 2. Scheme initiation

## 2.1 Delivering successful schemes

**2.1.1** Delivering good traffic management design requires careful attention to a host of factors that may otherwise lead to design compromise, a lowering of quality, or perhaps a failure to meet the intended purpose. These factors range from organisational structure, through funding to ongoing maintenance considerations. With a planned and collaborative approach at the outset such difficulties can be minimised.

## 2.2 Scheme definition

**2.2.1** It is important to define the scale and type of the scheme at project inception, as this will affect decisions made on team structure, scheme evaluation, skill requirement and training. Essentially, there are three types of scheme:

- Type A: existing scheme – functionality acceptable, streetscape unacceptable;
- Type B: existing scheme – functionality unacceptable, streetscape unacceptable;
- Type C: new scheme – new or significantly different traffic management control/scheme.



Fig. 2.1 Functionality acceptable, streetscape unacceptable.

**2.2.2** Rectifying problems for scheme Type A (Fig. 2.1) may be relatively straightforward, perhaps addressing mainly cosmetic issues through a de-cluttering exercise, for example. For existing traffic management schemes where the functionality is considered inadequate (Type B), for example in terms of a junction capacity, there is more scope to address the project in a holistic way. A streetscape audit would be beneficial in identifying relevant issues such as the difficulties faced by disabled people in negotiating the arrangement shown in Figure 2.2. An evaluation checklist such as the one in Appendix A can be useful in assessing scheme performance and value, and, in the absence of any more rigorous methods, is a good way to provide scheme justification. For new schemes (Type C), the project's scope may be wider than for Types A and B, encouraging a 'blank sheet' approach to design. That scope and approach should always be in the context of the street and its surroundings to ensure that the scheme makes a positive contribution to the public realm and maintains local distinctiveness.

**2.2.3** It is important that streetscape issues are considered for all traffic management schemes. The weighting given will depend on the size and type of scheme and on the location, for example whether the scheme is for a highly-trafficked distributor road or for a quiet residential street. Defining the relative importance of particular streets/roads in terms of place



Fig. 2.2 Functionality unacceptable, streetscape unacceptable.



Fig. 2.3 Simple, uncluttered raised entry treatment.

and movement functions should inform subsequent design choices, and this can be determined using a place and movement matrix, reference to which has been made in *Manual for Streets* (DfT, 2007).

Streetscape issues should be considered for all traffic management schemes. The weighting given will depend on the size and type of scheme and on the location.

**2.2.4** The type and scale of the project will determine the size and composition of the design team as well as the rigour and duration of the process. However, a similar level of care and attention should

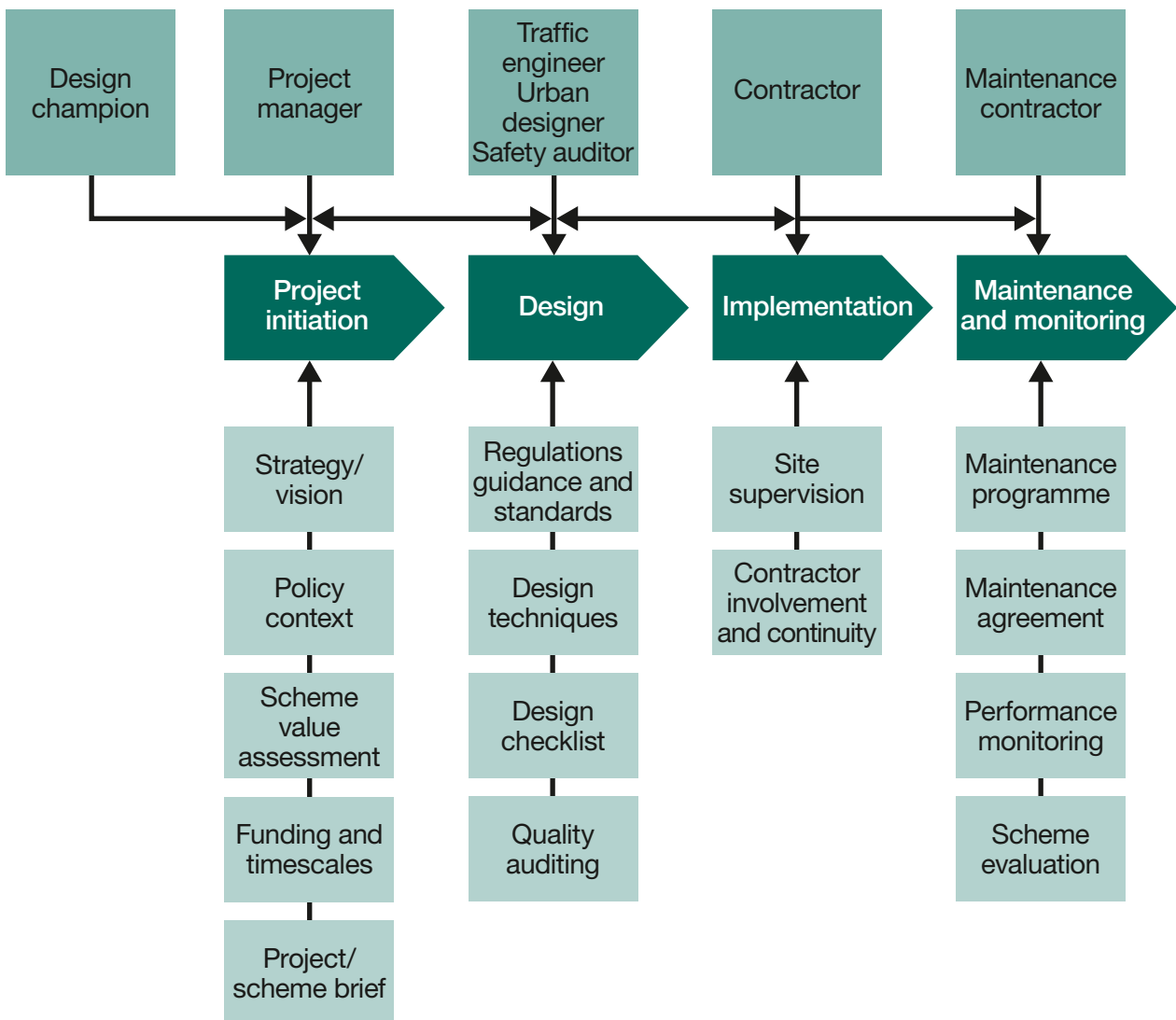


Fig. 2.4 The design process – flow, inputs and links.

## CASE STUDY

### Dorset County Council's Local Transport Plan objective

Within Dorset County Council's Local Transport Plan (LTP), one of the actions within their Strategy for Air Quality and the Environment specifically addresses the issue of designing transport schemes with the public realm in mind – “Dorset will design transport improvements to complement Dorset's high environmental quality and improve the public realm in ways that respond to the local context, and create or reinforce local distinctiveness”. Dorset's LTP states that this objective will be achieved by publishing local guidance and advice, which will emerge as part of Local Development Document processes.

be applied to schemes of all sizes, from a relatively modest road entry treatment (see Figure 2.3) as part of a wider works programme, to larger schemes. Large 'flagship' schemes should not be viewed as special cases in terms of attention to the streetscape.

**2.2.5** As shown in Figure 2.4, most elements are common to schemes of all types and scales, though they may have different scheme-specific importance weightings. In illustrating the design process flow, the diagram also indicates where the achievement of good practice may break down. The remainder of this LTN is structured in a similar order to the elements shown in the diagram.

Even for the smaller single-issue designs, e.g. access control measures, the designer is responsible for ensuring that full consideration has been given to how the scheme fits in with its environment.

## 2.3 Vision, purpose and actions

### Vision

**2.3.1** Traffic management schemes may sometimes lack a clear and defining vision describing the wider context, characteristics and what its contribution is to relevant goals. Once established, the vision may be used to guide scheme development, set the context for design decisions and benchmark progress. It may also express ambitions such as 'promoting social inclusion', or quality aspirations, perhaps aiming at a 'world class' scheme.

**2.3.2** For schemes of all scales, the vision should be linked directly to previously expressed planning policies, for example the achievement of regeneration objectives and the requirements placed on local authorities by the Disability Discrimination Act 1995 to take reasonable steps to remove, alter, or provide reasonable means of avoiding physical features that make it impossible or unreasonably difficult for disabled people to use a service. Local street design guides will need to be referenced to ensure compatibility with other local initiatives. The stronger and more demonstrable the link, the more likely the scheme is to attract sufficient resources.

“ The existence of Street Design Guides gives a more consistent quality of approach. ”

**2.3.3** Large schemes may benefit from a supplementary and specific bespoke vision. The vision for smaller schemes may be more local in expression, perhaps relating to a more general streetscape policy. In all cases, the aim should be to provide a valuable touchstone for stakeholders in developing and maintaining the scheme.

Defining a vision helps to guide scheme development and foster success.

### Purpose and actions

**2.3.4** Having identified the design vision, it is important to establish the scheme's purpose. The purpose describes precisely what effect the scheme is required to produce in contributing towards the overall vision, perhaps a scheme to benefit pedestrian flows through a town centre retail area. The actions

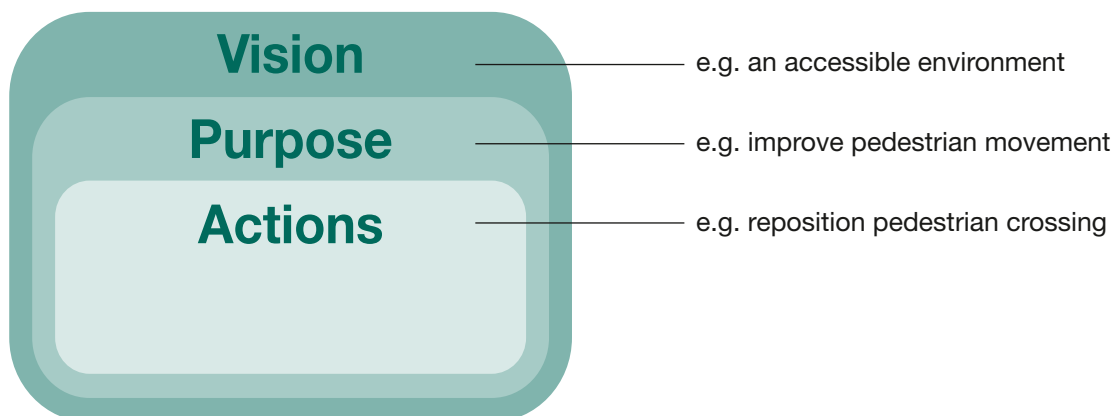


Fig. 2.5 Vision, purpose and actions

then describe the individual measures required to deliver the scheme, e.g. raised crossings and widened footways. Such definitions help to ‘badge’ the scheme, helping to persuade potential funders, assist with the consultation process and promote the scheme to stakeholders. The relationship between them is summarised in Figure 2.5.

Highway authorities may apply substantial discretion in developing and applying local policies and design standards.

## 2.4 Design integrity

**2.4.1** The promotion and maintenance of the vision throughout the life of the project from conception through to implementation and maintenance will help considerably in protecting design integrity and the achievement of the scheme purpose. However, during the development life of many schemes, the responsibility for design integrity may be unclear, with the baton of responsibility passed among several individuals and departments. For example, it may pass from the design to the implementation team, or from there to those responsible for maintenance. Though the baton may be passed confidently from holder to recipient, some of that important design integrity is often lost in the handover.

Care should be taken to ensure that the design quality does not deteriorate over the lifetime of the scheme, particularly during handover between stages (e.g. design–implementation).

**2.4.2** Establishing a ‘design champion’ will help maintain design integrity throughout the project’s life – from inception to maintenance. The design champion may perhaps be a senior and influential officer within the authority, or perhaps a council member. It is common for traffic management schemes to be led by trained engineers, but the role of design champion can be taken by any individual with the necessary desire, understanding and facility to maintain the vision. The role of the design champion is discussed in more detail later in this chapter.

Nomination of a design champion will help promote and maintain design integrity.

## 2.5 Cost and value of good design

**2.5.1** Good traffic management scheme design that respects the streetscape does not necessarily need to cost more than the more conventional approach, as illustrated by Figure 2.6. The ability to demonstrate value for money is important in securing sufficient funding for such schemes to provide the requisite design skills and materials of appropriate quality for such schemes. However, the monetary benefits of streetscape-related schemes can be more difficult to quantify than conventional traffic management schemes, which may be valued in terms of road casualty savings, for example.



Fig. 2.6 These views of two different roads demonstrate the detrimental impact that excessive guardrailling can have on the streetscape. Good design does not have to cost more.

## CASE STUDY

### Junction improvement scheme



Fig. 2.7 Original junction layout.

The local highway authority modified the junction in order to introduce staggered pedestrian crossing facilities (Figures 2.7 and 2.8). An alternative (streetscape-led) design (Figure 2.9) would provide one-stage pedestrian crossings by reducing kerb radii (reducing the crossing distance) and using a different phasing arrangement. The construction cost of the alternative scheme is likely to have been comparable to the more traditional design approach adopted, with expected reductions in ongoing maintenance costs.



Fig. 2.8 New junction layout introduced by the local highway authority.



Fig. 2.9 Alternative junction layout (computer visualisation).

Good design need not cost more, and may save money through fewer traffic signs, road markings and related equipment and street furniture.

**2.5.2** Though difficult to achieve, as identified in *Paved with Gold* (CABE, 2007a), streetscape benefits may be monetised through examining retail vacancy rate changes pre- and post-scheme implementation, for example. But, to date, no such mechanism has been developed for general use. In recognition of this need, the evaluation of the area should be treated in terms of its traffic management and streetscape performance (see Appendix A). Adopting this checklist approach and applying a suitable weighting, tuned to local priorities, will give an indication of the scheme's benefits when a monetised value is unavailable.

**2.5.3** The scheme evaluation checklist may also be used in the visual (streetscape) audit process to develop a prioritised list of traffic management schemes that would benefit from streetscape improvements. This is discussed further in Chapter 3.

Using an evaluation checklist can be a useful way of assessing scheme performance and value.

## 2.6 The project brief

**2.6.1** For large schemes, the project brief is of fundamental importance in conveying the required work and effort needed to progress the scheme, regardless of whether the design will be provided by an internal or external design team. Time spent here on careful thought and planning will be amply repaid through the course of the project.

“ Traffic management scheme briefs rarely identify streetscape considerations. ”

**2.6.2** The brief represents the opportunity to express the vision as well as describe the scheme purpose and desired outputs mentioned above. However, small schemes may sometimes not have the benefit of a brief, whilst large schemes may be described by an incomplete or inadequate document. Both may start with a single-issue focus, such as road safety, but a

wider view should be taken in the brief, including streetscape matters as well as the achievement of other objectives.

“ Any local authority brief should cross-refer to the relevant policy and procedures of that authority. ”

An informative and comprehensive brief, developed collaboratively across disciplines, will encourage a high-quality response from tenderers.

**2.6.3** Often much is taken 'as read' by the design team and/or inferred, whereas clear direction is imperative. Provision of a comprehensive list of relevant considerations and policy references, such as those relating to the public realm, will help tenderers in returning a comprehensive and well-considered response. The brief should invite the tenderer to raise additional matters that may not have been identified within the brief in the interests of clarity. Figure 2.10 illustrates the five most important features for traffic management scheme project briefs regarding effective streetscape design matters.

**2.6.4** Development of the brief should involve all related departments in the issuing authority to provide a comprehensive, targeted and informative document for tenderers. Where relevant, wider considerations such as regeneration objectives should be included and reviewed/described by the appropriate officers.

The requirement for visual streetscape audits to be completed should be included within the brief. An audit of functionality may be of benefit too.

## 2.7 Funding and timescale

**2.7.1** The level of funding and the time in which to spend those funds will have a fundamental influence on the design and progress of any scheme. Too often, inadequate scheme scoping and unrealistic timescales place too great a pressure on the design process, leading to design compromise in terms of effectiveness, quality and streetscape consideration. Both should be informed by, and fed back to, the scheme vision and objectives, with any necessary design compromises identified at an early stage and assessed against those benchmarks.

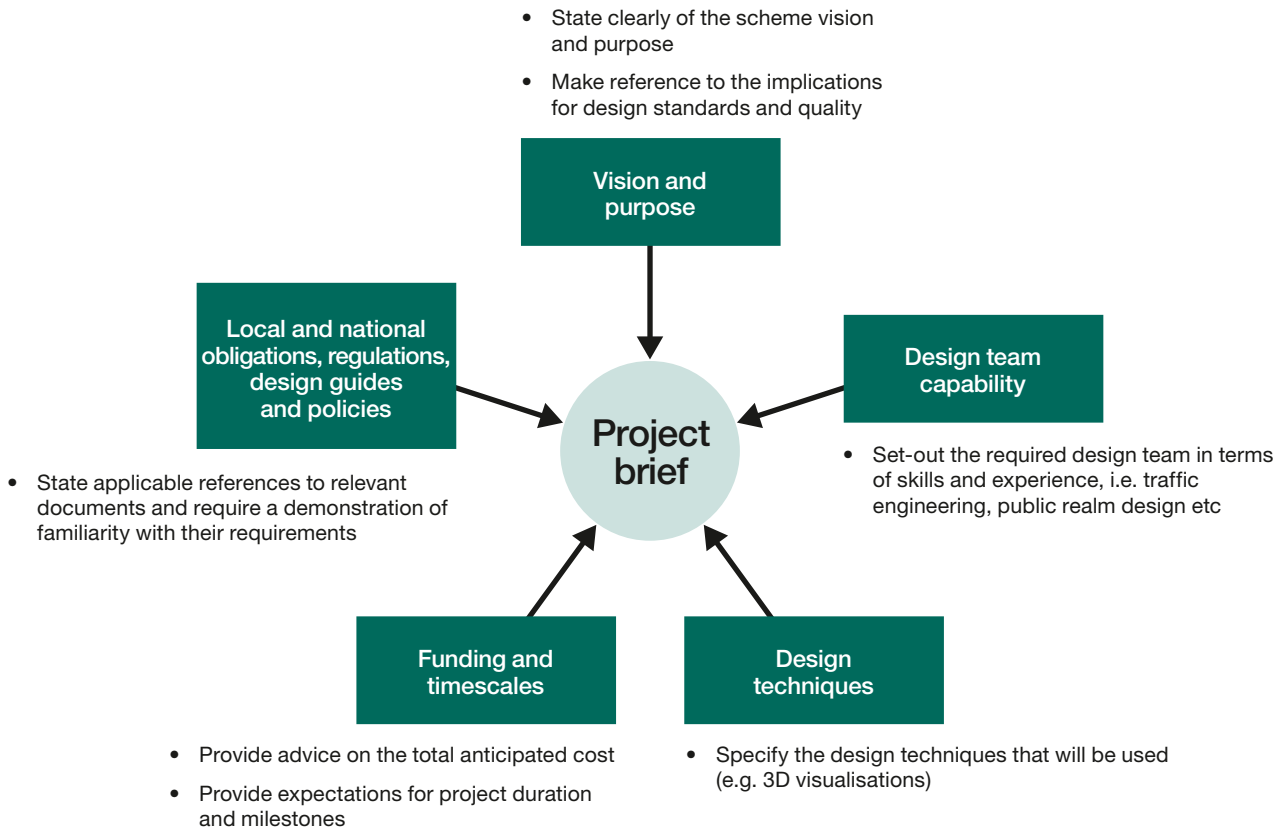


Fig. 2.10 Project brief – inputs, coverage and needs

**Planned costs need to be linked to the vision and objectives.**

**2.7.2** Funding streams for traffic management projects are often inflexible and/or too limited to allow proper consideration to be given to the streetscape. Any such specific needs must be recognised at an early stage, with efforts made to seek out supplementary funds if necessary. However, streetscape improvement action does not necessarily imply additional scheme cost. In some instances, items such as street furniture may be reduced in number and associated maintenance costs reduced.

“ Recognition of the scale of the project in terms of potential investment in regeneration or value for money over whole design life is rarely recognised. ”

**2.7.3** If insufficient funding is available to achieve the identified and desired design quality, then it may be practicable to introduce improvements incrementally as funds become available. The

design quality remains as a constant in this instance, with the compromise made in terms of scheme completion timescale rather than scheme quality.

**2.7.4** Proper consideration and treatment of streetscape issues at an early stage should avoid prolonging scheme delivery as well as avoiding the adoption of an over-cautious approach to the design and implementation process. For large projects, the brief, in including the consideration of relevant streetscape issues and needs, will require designers to plan for consideration of the streetscape and demonstrate how it will be an integral part of the design and implementation process.

**2.7.5** It is important that sufficient time is allowed for informal and statutory consultation when setting the project timescale. As with traffic management, the detail of the streetscape is very much a local matter, and those living and working in the area are well placed to tune a scheme to the needs of the locality. However, such consultation tasks need to be included in the project programme to optimise the return from the process.

## CASE STUDY

### A6 Clifton traffic calming scheme (Figures 2.11 and 2.12)

Rather than implement the planned traffic calming scheme based largely on using more signs, road markings and coloured surfacing, Cumbria County Council introduced a subtle traffic calming scheme. An integral part of the traffic calming measures was planting and landscaping features, and supplementary funding for these was provided by local charitable trusts and other local organisations.



Fig. 2.11 A6 Clifton Village – before.



Fig. 2.12 A6 Clifton Village – after. Carriageway narrowed and road centrelines removed.

## CASE STUDY

### Clapham High Street improvement scheme (Figures 2.13 and 2.14)

Initially conceived as a bus priority project, the scheme evolved to incorporate improvements for all road users. The budget was taken from the Council's bus priority funding programme, therefore there was no specific allocation for streetscape elements. However, with careful design, incorporating elements of good practice from existing schemes, and effective project management, a successful high-quality scheme was delivered.



Fig. 2.13 Clapham High Street – previous street layout (LB Lambeth).



Fig. 2.14 Clapham High Street – new street layout. The carriageway has been narrowed from three to two lanes and guardrailing has been removed.

Addressing streetscape design need not imply additional scheme costs; careful planning of funding and timescale issues at the outset will help minimise spend and maximise quality.

## 2.8 Project resourcing

**2.8.1** Ensuring the project team has the right skills, experience and approach is crucial to the success of the scheme. If the streetscape is to receive due attention, then urban design skills will be required in some measure. Each specialist, whether for example traffic engineer, town planner, contractor or urban

designer, will approach the task with a different perspective and set of priorities. The challenge is to bind the team with a common sense of purpose and objectives founded on the design vision. This sense of shared purpose is equally important for small ‘works programme’ type schemes and for large projects with a dedicated design team, whether an in-house design team or sourced through an external consultant. A team structure based around projects rather than areas of expertise will encourage this. An illustrative example of such team structuring is shown in Figures 2.15 and 2.16, with the project manager and design champion likely to be located within the grey boxes.

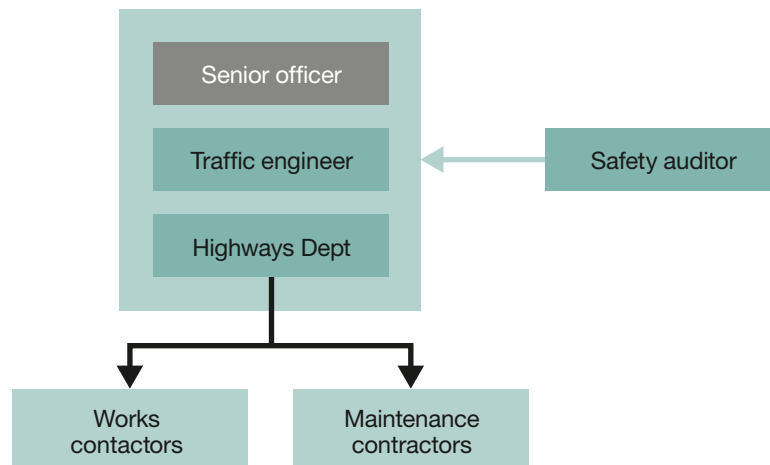


Fig. 2.15 Indicative team structure model – minor traffic management scheme.

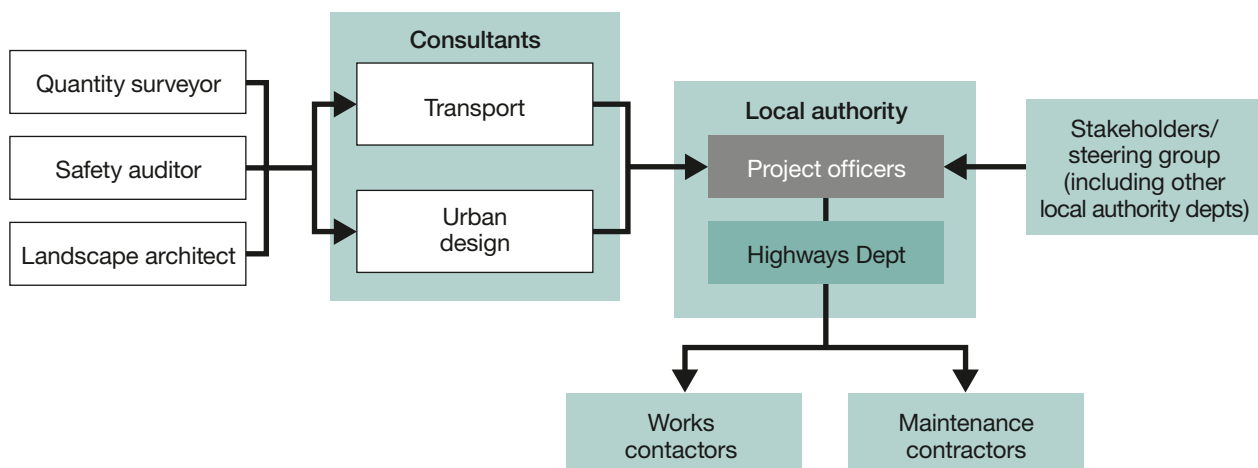


Fig. 2.16 Indicative team structure model – major traffic management scheme.

## CASE STUDY

### Dagenham Heathway High Street improvement scheme (Figures 2.17 and 2.18)

The design and implementation of this streetscape project was led by an officer from the Council's regeneration department who was responsible for keeping watch over the achievement of the overarching scheme vision and purpose. This scheme was undergoing implementation during the preparation of this LTN.



Fig. 2.17 Existing street layout (LB Barking & Dagenham).



Fig. 2.18 Artistic representation of the new scheme (LB Barking & Dagenham).

## 2.9 Project management – single schemes

**2.9.1** The project manager is key in meeting the challenge of achieving a sense of shared purpose and maintaining design integrity. For the remainder of this chapter, project management is considered as it relates to a single, large project such as a street/corridor enhancement scheme. The principle, though, can be applied to 'works programme' schemes, with an individual taking responsibility as guardian of quality in design.

**2.9.2** Typically, for traffic management schemes, that project manager will have an engineering-based background, perhaps as a traffic or civil engineer. Clearly, that person's experience and knowledge may then pre-dispose the emphasis of the work towards familiar issues such as junction operation and road safety. Other matters, such as the location of ancillary street furniture and landscaping, may be less likely to feature as priorities for attention. Great strides have been made in widening the focus of those planning our environment, but an individual's approach will naturally be guided to a significant degree by their experience.

## 2.10 Design champion

**2.10.1** The role of design champion may be taken by someone from an area of the council's activity not directly involved in the design process on a day-to-day basis. This could be an officer from an authority's regeneration department, for example. Less likely to be trained in a related design skill, and driven by policy objectives, such a person will be expected to take an even-handed view of design priorities and be well placed to evaluate progress against the design vision.

**2.10.2** CABE has been campaigning for a number of years for the appointment of design champions in local authorities and has noted a marked increase in their designation and use in local authorities in relation to the built environment in general.

**2.10.3** Many small schemes, such as gateway treatments, may be introduced as part of traffic management programmes (e.g. Controlled Parking Zones). Clearly, for such individual schemes it is unlikely that there will be a need for a design champion as described above. However, it is important that a suitably experienced officer is

identified as being responsible for ensuring that the correct level of consideration has been given to streetscape issues in the design and for maintaining the design quality throughout the project.

## 2.11 Working arrangements

**2.11.1** For large projects, the ideal is for the various specialists to be co-located so that the common purpose can be emphasised and knowledge shared on a daily basis. For more routine projects, having the various specialists located in the office by geographic area will help to foster this broader approach to scheme design.

“ Needs consultant team and client team continuity for best project management. ”

## 2.12 Whole life scheme planning

**2.12.1** Full consideration of the scheme should include its life beyond construction to safeguard against damage to scheme integrity through the use of inferior materials for subsequent repair and reinstatement as part of the maintenance process. Wherever practicable, including provision for the storage of bespoke materials will allow for their use for maintenance purposes in subsequent years. This planning should also consider street cleansing methods in order that they are appropriate to the materials used, minimising damage and prolonging their service life.

The location of the various design specialists and interested individuals will influence project communication: give careful thought to working arrangements to encourage collaborative working.

## 2.13 Key points

- The starting point is to define the type of scheme.
- Define the vision, purpose and actions.
- The vision helps to guide scheme development and foster success.
- A design champion will help to promote and maintain design integrity.
- An evaluation checklist can be used to assess problems and improvements.
- An informative and comprehensive brief, developed collaboratively across disciplines, will encourage a high-quality response from tenderers.
- Planned costs should be linked to the vision and objectives.
- Good design can lead to cost savings in the short term by minimising materials needed and in the medium to long term by reducing maintenance.
- Understand other (non-visual benefits) that an improved streetscape can provide.
- The project manager is key in the control of the vision and streetscape quality.
- It is important to foster in-house skills.
- The location of the team is important for effective communication.

# 3. Design preparation

## 3.1 Preparing for success

**3.1.1** Delivering traffic management schemes can be a surprisingly complex process requiring co-operation among a number of often disparate parties over many months. If the intention to build 'quality' streetscape is added, then it may appear to add further complication to the project through, for example, the need for additional design advice and the use of non-standard materials.

**3.1.2** However, this need not be the case; the quest for quality may serve to simplify matters through rationalising design and minimising the features required to achieve the intended traffic management function. As described in Chapter 2, with a full, motivated and informed team working to shared objectives, many of the barriers to preparing a successful scheme may be overcome.

**3.1.3** This chapter deals with design preparation, pointing to approaches that will encourage a wider view of traffic management scheme development, approaching the task from a less constrained perspective than may be the case with single-issue led schemes. Although the focus here is on good practice in terms of the design process, ultimately the aim is to deliver a well-designed, functional and uncluttered scheme (see Figures 3.1–3.4). Examples throughout the chapter demonstrate this approach and its results.

## 3.2 Design flexibility

**3.2.1** The 'less is more' approach is a good place to start in preparing traffic management schemes. Regulations and technical standards have a key role in the delivery of good design, but, if used as a starting point, they may serve to compromise the achievement of wider objectives. A standards-based template view of road junction design, for example, is inappropriate. Similarly, a 'belt and braces' approach to the provision of traffic signs and road markings contributes to street



Fig. 3.1 Pelican crossing – signal heads mounted onto existing lamp column to reduce clutter, though a second push button mounting pole is provided, adding to street clutter.



Fig. 3.2 Pedestrian facility at signalised junction – a simple, uncluttered design.



Fig. 3.3 A simple raised junction entry which uses a standard palette of relatively low-cost materials.



Fig. 3.4 A Pelican crossing where the signal heads have been mounted onto street lighting columns.

clutter. Figures 3.5 to 3.9 provide examples of schemes that could have been designed with greater sympathy for the streetscape. The accompanying descriptions identify some of the issues that should be considered at the start of the design process and can result in a simplified, less cluttered scheme.

**3.2.2** Time should be invested in examining, understanding and interrogating the applicable regulations and standards as they relate to traffic management schemes. It is important to apply professional judgement in design preparation. Available guidance is just that, guidance, and cannot be expected to cover the precise conditions and circumstances applying at the site under examination.

**‘Less is more’ is a good place to start in designing schemes.**

**Invest time to ensure differences between relevant and available regulations, standards and guidance are properly understood.**

**3.2.3** Designers of traffic management schemes have traditionally tended to over-provide traffic signs and road markings for a number of reasons, including the encouragement of road user compliance. However, these and other safety-related features may also have been provided for fear of contravening policy, design standards or guidance. This situation has worsened in recent times in the context of the perception of an increasingly litigious society. In reality, highway and planning authorities may exercise considerable



Fig. 3.5 Contra-flow cycle entry to one-way street – could the double yellow lines have been omitted?



Fig. 3.6 Pedestrian crossing – were the guardrailings put in by default?



Fig. 3.7 Ad-hoc measures to prevent parking on the footway – could the bollards and lines be reduced, or replaced with double yellow lines?



Fig. 3.8 Pedestrian refuge – was the possibility of providing a smaller sign considered?



Fig. 3.9 Cycle exit – would it have been more appropriate to have just one no-entry sign?

discretion in developing and applying their own local policies and standards. This flexibility should be tested throughout the design process and applied where appropriate. Not doing so may lead to unimaginative schemes hampered by design compromise.

**Designers are expected to use their professional judgement when designing schemes, and should not be over-reliant on guidance.**

**3.2.4** The matter of risk and liability is covered in *Manual for Streets* (DfT, 2007) which, in summary, points to the hazards of an over-cautious approach and gives a measure of comfort to designers regarding the extent of their responsibility. Reference is made in *Manual for Streets to Highways Risk and Liability Claims* (UK Roads Board, 2005) which provides useful information on this area. *Living with Risk* (CABE, 2007b) deals exclusively with the issue of risk with respect to design, and, using case studies, details how risk issues affected the design choices made. With reference to mixed-use streets the document states that “if risk is managed sensibly good quality streets can accommodate a range of uses and users”.

### 3.3 Scheme integration

**3.3.1** As discussed in Chapter 2, it is very important that all involved in the design process understand what the scheme is intending to achieve in order that all can

participate in minimising the presence of signs, lines and associated traffic management paraphernalia. If the scheme involves a road closure, then the reason for its introduction, its impact on other traffic movements and other prevailing traffic management in the surrounding area, and at different times of the day and year, all need to be taken into account. No scheme can exist in isolation and will have a geographical context affecting related traffic flow volumes, pedestrian movement, vehicle speeds and scheme user groups – for example, school children. Understanding and planning for that context is key in minimising clutter.

**The designer is responsible for ensuring that sufficient consideration has been given to how the traffic management measure will integrate into the local environment.**

## 3.4 Signs, lines and markings

**3.4.1** Traffic signs, road markings, street furniture, advertising boards and other obstacles all contribute to street clutter. Many signs and lines are simply not needed, perhaps a legacy of earlier but obsolete schemes or unnecessary duplicates provided as part of a ‘belt and braces’ approach to design – see



Fig. 3.10 Cycle crossing at signalised junction – only one primary signal head is required.



Fig. 3.11 Cycle parking – the cycle parking sign is unnecessary.



Fig. 3.12 Segregated cycle path – two signs excessive for this lightly-trafficked route.

Figures 3.10–3.12. Wherever possible, these should be identified, reviewed and removed on a regular basis as a cost-effective means of improving the streetscape.

Consider whether signs, lines and road markings are needed in your schemes, and, if so, whether they can be minimised in terms of number and size (see *Traffic Signs Regulations and General Directions 2002 (TSRGD)* for requirements, and *Traffic Signs Manual Chapters 4 and 5* for advice).

**3.4.2** For new schemes the minimalist design approach can be applied in earnest. As a starting point, there is no fundamental need to provide traffic signs or markings. They are required to inform or warn

road users and give effect to traffic regulation orders. If the scheme manages through effective design to guide traffic and promote road safety sufficiently, there may be no need for traffic regulation orders and associated signing.

**3.4.3** Some authorities, notably Suffolk County Council, have successfully used this approach to realise road safety objectives. Drivers may feel less certain of their surroundings when not given extensive signs, lines and other road markings and may temper their driving and speed reflecting that uncertainty. Examples of this low-key approach are shown in Figures 3.13 and 3.14. Naturally, as such designs rely primarily on driver behaviour, predicting those reactions to location-specific conditions is difficult to



Fig. 3.13 Village gateway treatment – subtle measures used in accordance with Suffolk’s stated policy in *The Suffolk Countryside Manual, 2003*. The hedgerow on the left was planted with the purpose of giving the impression of a narrowed carriageway.



Fig. 3.14 Village speed reduction measure – the provision of on-street parking helps to calm traffic speed.

quantify. But, as the number of instances of reduced signing and lining increases, then designers will have more information upon which to base design decisions.

**3.4.4** Suffolk County Council resolved that “as far as practical, the design of schemes will consider the environmental impact on the local distinctiveness of the countryside as well as the important issue of safety” (Suffolk Countryside Manual, 2003). This decision was based on research undertaken to produce *Traffic Advisory Leaflet 1/00*, which concluded “...scheme effectiveness in terms of speeds and accident reduction may need to be weighted against unwanted effects such as visual intrusion” (*Traffic Advisory Leaflet 1/00: Traffic Calming in Villages on Major Roads* (DETR, 2000)).

**3.4.5** Should signs be needed, the Traffic Signs Regulations and General Directions 2002 (TSRGD) (SI 2002 No.3113,TSO) detail all the prescribed traffic signs and road markings applicable in the UK. The *Traffic Signs Manual* (TSM) (DfT, 1982–2008) gives further advice on the application of those signs and road markings.

**3.4.6** Careful consideration should also be given to the size of signs and means by which they are mounted. Where appropriate, opportunities should be taken to mount signs on walls or on existing posts rather than introduce new posts on the footway. The prescribed signs have a range of sizes to meet specific circumstances. The available flexibility is given within TSRGD, and TSM identifies the appropriate conditions for such flexibility.

**3.4.7** As with the various audits associated with the Quality Audit process, a specific audit of traffic signs and road marking may prove particularly beneficial for traffic management schemes, identifying potential contributors to clutter prior to detailed design and implementation. This is an element of streetscape audits that can be rolled-out periodically as part of a programme across an authority in order to identify where improvements are needed.

Councils should consider the benefits of undertaking an audit of traffic signs and road markings.

## CASE STUDY

### Dagenham Heathway Sign Clutter Audit (Figure 3.15)

As part of a wider High Street improvement scheme, officers commissioned a sign clutter audit to identify existing features to be retained, removed, rationalised or re-provided in the new scheme’s environmentally enhanced streetscape.



Fig. 3.15 Dagenham Heathway – a sign clutter audit was completed and recommendations were made for rationalising, removing and replacing existing signs (examples of existing signs shown).

## 3.5 Evaluation checklist

**3.5.1** In order to promote the interests of quality streetscape design, it is beneficial to establish the likely benefit or value of that action beyond an intuitive assessment. Most participants in the project delivery process will acknowledge such benefits as the reduction in street furniture in general terms and the use of superior materials, though good design does not necessarily rely on such materials. However, it is desirable to evaluate the 'before' and 'after' situations to support requests for funding and resources to deliver the aspiration of quality streetscape design.

**3.5.2** One method of assessing value is to use the simple process of conducting a site-based visual evaluation of the present streetscape, noting and scoring attributes such as how the design complements adjacent streetscape characteristics. Scores are also given for negative characteristics including: unnecessary traffic signs, unco-ordinated bus stop paraphernalia, guardrailing, and 'A' boards. A checklist-based approach was developed and tested in the research for this LTN to identify whether commonly held perceptions of a scheme's overall performance could be evaluated and rated. The resulting evaluation checklist pro-forma can be found in Appendix A.

### CASE STUDY

#### Junction improvement scheme (Figures 3.16–3.18)

Modelling this example junction layout has demonstrated that, by changing its layout, an 'all red' pedestrian stage can be introduced with minimal (but acceptable) reduction in the capacity of the junction. In the proposed layout crossings are located close to pedestrian desire lines, and crossing distances have been minimised by reducing kerb radii and widening the footways. Streetscape improvements are also incorporated.



Fig. 3.16 Original junction.

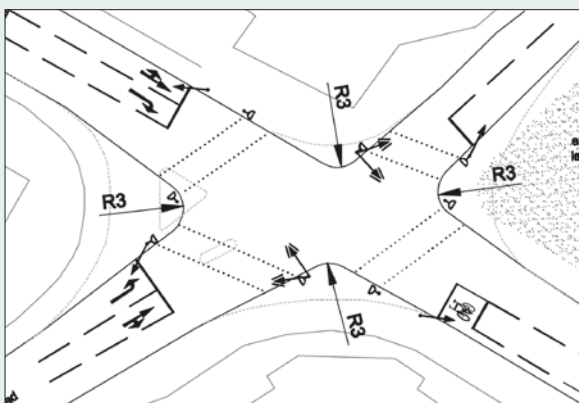


Fig. 3.17 Design plan showing alternative junction layout.

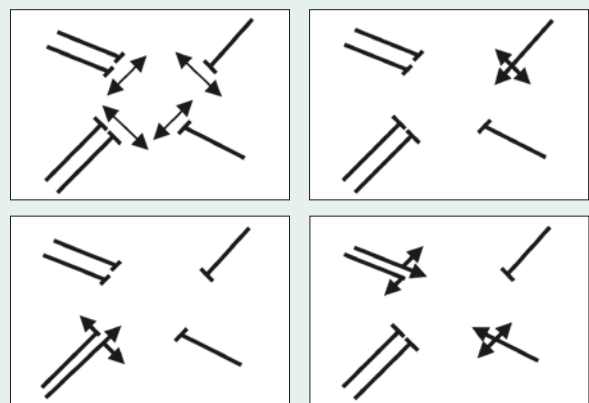


Fig. 3.18 Junction staging diagram.

**3.5.3** Used as part of the design process, the evaluation checklist may prove useful to designers, because it lists design matters beyond engineering and function. The scores produced are not absolute and are intended to serve as a relative indicator and guide to performance only, pointing to areas where efforts may best be directed.

**3.5.4** It may also prove useful to apply the evaluation checklist after the scheme has been completed in order to help assess the benefit and value of the work undertaken. This may, of course, help with the justification for similar schemes in the future. As discussed later in this chapter, evaluation checklists can be used to assist with the completion of visual (streetscape) quality audits.

**Use an evaluation checklist for the scheme before and after implementation. This will assist in assessing the need for action, identify matters to be addressed and, following scheme implementation, the relative value of scheme.**

## 3.6 Scheme operation

**3.6.1** Good streetscape design does not by definition mean impaired road network performance. Good design can benefit both road network performance and the quality of the environment. An uncluttered design that values visual amenity and recognises the wider needs of pedestrians and



Fig. 3.19 This raised junction entry and informal crossing have been designed sensitively in recognition of the historic character of their surroundings.

cyclists may perform to a similar standard as a more conventional design when measured in terms of junction delays, queues and capacity. Such traditional measures of road network performance present only part of the scheme assessment process and should be viewed and evaluated as a part of the overall picture against the defined scheme objectives.

**Incorporating streetscape elements into traffic management designs does not imply that there will be a negative effect on functionality or performance.**

## 3.7 Recognition of 'place'

**3.7.1** As recognised in *Manual for Streets* (DfT, 2007), proper consideration of the streetscape demands recognition of 'place' as well as the scheme's location and traffic management function (see Figure 3.19). The place and function hierarchy presented in *Manual for Streets* indicates how streets typically represent a more varied environment than roads, with buildings, people and a variety of uses present, compared to the predominantly road vehicle movement-based function of roads.

**We need to recognise the sense of place in all aspects of street design.**

## 3.8 Designing in 3D

**3.8.1** Traditional traffic management design may be characterised by two-dimensional drawings in plan view, showing key geometric measurements based rigidly upon published design standards. Though necessary for construction purposes, such drawings may also be prepared and used during design development. Indeed, the advent of computer aided design (CAD) has perhaps contributed to this somewhat staid presentation of traffic management schemes in encouraging template-based designs.

Traditional two-dimensional design plans are necessary for construction, but the designer may get a better sense of how the proposals fit in with their surroundings by visualising the scheme in 3D.



Fig. 3.20 Priority junction in residential street.

**3.8.2** The minimalist approach to design helps free designers from negative perceptions and influences. Starting from a blank sheet, designers may incorporate features necessary to meet the scheme's purpose in the first instance, providing additional features as needed to convey messages to users regarding required behaviour. Figures 3.21–3.24 show how design options can be developed using the blank-sheet approach.

A 'blank-sheet' approach is a useful method of achieving a clutter-free design.

**3.8.3** The concept of self-explaining roads (Kaptein and Claessens, 1998) is acknowledged and remains an important principle. Features such as pedestrian guard-rails are often incorporated where this principle has not been followed or the motivation to act contrarily to the schemes' needs is too strong. Traffic signs and road markings are necessary to provide the needed enforcement context. They should be used sparingly and sited sensitively, but in accordance with TSRGD and follow the guidance in TSM.



Fig. 3.21 'Blank sheet' – working within the highway boundary.

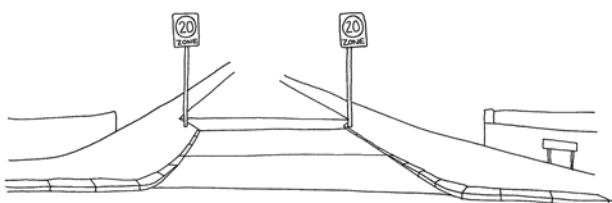


Fig. 3.22 Example of minimum traffic signs and road markings required at the entrance to a 20 mph zone with a raised junction entry.

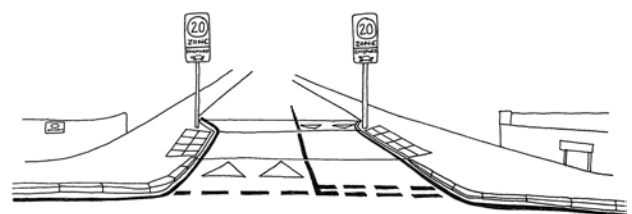


Fig. 3.23 Additional traffic signs and road markings have been added to provide clarity to the scheme's functionality.

**3.8.4** The changes effected by considerate design may be subtle and sometimes difficult to spot. Inconsiderate design may offend the eye, whereas a well-designed scheme is intended to blend in with its surroundings. The use of 3D 'before and after' images can go some way in drawing attention to the benefits of careful design, whether during design development or in later, public consultation stages.

**3.8.5** 3D designs may be represented as hand-drawn sketches or, more commonly, through computer aided visualisations (Figures 3.24 and 3.25). Naturally, a certain level of aptitude and training is required to prepare such representations, and appropriate resources will need to be set aside for such work.

**3.8.6** The images in Figures 3.24 and 3.25 are not intended as examples of good traffic management design practice. They do, though, act as examples of 3D visualisations and serve as a reminder that visualisations

must demonstrate practicable engineering solutions. Further information on designing in 3D is provided in Appendix C.

**3.8.7** The design team may normally expect to consult local people and stakeholders with a series of options prepared in preliminary detail, to identify their views on the preferred way forward for the scheme (Figure 3.26). Often, people have difficulty in interpreting 2D drawings, whereas the 3D perspective offers a more representative view of their area and how it may be affected by the proposed changes. As noted previously, the added realism of this representation is very useful in demonstrating clearly and effectively the benefits of proposals to consultees, including the wider public. The full benefits of de-cluttering are not likely to be fully realised through drawings in plan view.



Fig. 3.24 Visualisation (lower image) showing an alternative approach to providing for cyclists alongside a signalised junction.



Fig. 3.25 Computerised representation (lower image) of a less cluttered cycle lane/Toucan crossing.



Fig. 3.26 Public consultation event using 3D design visualisations.

**3.8.8** However, care should be exercised in exhibiting photo-based visualisations, since they may appear as either already built or perhaps as a ‘fait accompli’ to those viewing them. In most cases, several variants should help to dilute any wrongful impression of a foregone conclusion.

Care should be taken with 3D computer generated designs that the public does not take them as a ‘fait accompli’.

## 3.9 Quality auditing

**3.9.1** Increasingly, authorities are adopting quality auditing as part of the design process, with specific audits including: cycle, walking, access, visual quality and road safety. Such audits are entirely complementary to the goal of collaborative, inclusive and quality design promoting comprehensive and balanced scheme assessment against defined objectives. Information on quality auditing is given in *Manual for Streets* (DfT, 2007).

**3.9.2** A structured programme of audits of visual (streetscape) quality rolled out across the authority following scheme implementation could help identify traffic management schemes where the functionality of the scheme is acceptable but the streetscape is

unacceptable. As discussed earlier in this chapter, evaluation checklists can be used to ensure that visual quality audits are structured and thorough.

A quality audit system identifying topics (e.g. visual amenity, access, walking, materials etc.) should be specified at scheme outset, preferably presented as part of the initial scheme brief. Quality audit systems should be monitored throughout by the design champion to promote awareness and consistency within the design team.

**3.9.3** An established element of a quality audit is the Road Safety Audit (RSA) process. Though unintended, RSAs have tended to inhibit the preparation of forward-looking schemes through the sometimes negative reaction by design teams to the RSA process.

**3.9.4** The RSA system is intended simply as a means of identifying likely safety risks inherent to the scheme design from a position independent of the scheme designers. Recommendations are made by the auditor for design changes to address any concerns identified over road safety. The auditor’s report is then reviewed by the design team, and decisions are then made on whether to accept or reject specific RSA recommendations.

**3.9.5** As responsibility for the design remains with the design team, the design cannot pass or fail the audit, and there is no obligation to comply with the RSA recommendations. As with other areas of the quality audit process, the RSA should be viewed positively as a means by which matters can be identified, discussed and, if appropriate, addressed against a backdrop of collaboration and co-operation.

Consideration should be given to adopting a running programme of visual (streetscape) audits for traffic management schemes across the authority, revisiting areas on a periodic basis (the term being defined according to the type and size of scheme).

## 3.10 Key points

- Invest time in understanding the regulations.
- Highway authorities have discretion in developing and applying their policies and standards.
- The scheme should not be designed in isolation from the surroundings.
- Visual quality audits should be included as part of the quality audit process, and the requirements for this should be identified in the brief.
- Recognise the sense of place.
- 3D visualisations are useful for consultation.
- Good streetscape design does not necessarily mean that the performance of the road network will be impaired.
- Designs do not pass or fail a Road Safety Audit.

# 4. Implementation, monitoring and maintenance

## 4.1 Implementation

**4.1.1** After a well-designed scheme has been prepared, the next stage is to implement it on the street. Whilst the client retains overall responsibility for the scheme, there is effectively a handover from the designer to the contractor. Of all the handovers within the scheme delivery process, from initial scheme vision to maintenance, this is perhaps the most hazardous. Those hazards include:

- the unavailability of specified materials;
- inappropriate interpretation of design drawings;
- ad-hoc design changes as site ‘work-rounds’;
- sub-standard workmanship; and
- a lack of adequate site supervision.

With care, all of these can be anticipated, and to some extent planned for. As shown by Figure 4.1, without careful implementation the scheme may be severely compromised in effectiveness and appearance, regardless of the care taken in the design process.

“ It’s about establishing a strong partnership relationship with your contractor so that they understand the aims and are recognised for the quality of the work they produce. ”

**The most significant risks to maintaining design integrity are experienced at the handover stage from design to implementation.**

**4.1.2** Consistent with a key theme of this LTN, that of collaborative working, the involvement of those responsible for the construction at an early stage in the design process will contribute significantly to delivery of a successful outcome. Scheme implementation may be handled in a variety of ways, but typically an authority will have an in-house officer responsible for



Fig. 4.1 Implementation – however well co-ordinated the design process is, the quality of the end product can be compromised by poor execution of the designs.

arranging construction, whether through in-house services or, more usually, through contractors procured by means of a tendering process. Involving both of these parties in design discussions at an early stage will foster a common understanding of design intentions and priorities, as well as helping interpretation of design drawings and assisting in on-site decision making.

“ The client must agree roles with consultant and contractors and retain the final control over the quality of the work. ”

**Including the contractor early on in the design process helps to ensure that they are committed to achieving the design vision, will foster a better working relationship and will ultimately lead to a more successful outcome.**

**4.1.3** It is important that a full set of detailed design drawings is prepared and completed as a design package before implementation begins. In an increasing drive towards shorter delivery programmes, there has been a tendency towards ‘draw and go’ design, with sections of the scheme still under detailed design and materials specification whilst the remainder is built out on street. This approach compromises design integrity by pressurising the design process and the decisions made during it.

**The ‘draw and go’ approach to design and implementation can lead to uncoordinated, poor-quality schemes.**

## 4.2 Monitoring

**4.2.1** Local authorities may have standing obligations to monitor the performance of some schemes. However, other competing obligations, such as scheme delivery, can serve to compromise the achievement of effective monitoring. It is particularly important to monitor the performance and contribution made by the more substantial traffic management projects. Such schemes may require additional investments in terms of staff resources, expertise and materials and as such need enhanced monitoring to justify that expenditure and lead the case for further investment. Authorities

may have limited resources to undertake thorough monitoring for all schemes, but it is recommended that a representative sample is monitored.

**4.2.2** As with other aspects of the project delivery process, it is important that the project monitoring needs are established at project inception and, so far as is reasonable, provided for in the overall project resourcing. Monitoring may take several forms, and the two types, quantitative and qualitative, are discussed here.

**It is important to define the project monitoring requirements at the start of the project.**

### Quantitative monitoring

**4.2.3** Quantitative monitoring techniques are established and well understood, including such methods as accident/collision analysis, vehicle speed observations and pedestrian movement assessment. However, they tell only part of the story in relation to streetscape-led schemes where the impact on vehicle flows may be of a lower priority than that of visual amenity, for example.

“ We must record what went well and what did not so that lessons can be learnt. ”

### Qualitative monitoring

**4.2.4** In Chapter 3, the evaluation checklist was introduced as a means by which scheme performance may be assessed and measured against various engineering- and streetscape-related criteria. The same checklist can also be usefully applied to assess the benefit resulting from the completed scheme following an appropriate ‘settling-in’ period.

**4.2.5** Other qualitative techniques may be usefully applied, including on-street attitude surveys and focus groups. Through these means, responses can be gathered reflecting people’s views on the nature and value of the changes, whether positive or negative. For larger area-wide schemes, the collected views may be assessed against other indicators, such as ‘before and after’ retail vacancy rates, street footfall and property prices.

**4.2.6** A distinguishing feature of schemes recognising the importance of place as a key design component is that the behaviour of those affected by the scheme must be carefully considered, as scheme success relies in part upon it. For example, if efforts are made to minimise traffic signs in number and size, then it is important to record the resulting behaviour of those passing through the scheme, to satisfy the design team of its satisfactory performance.

**4.2.7** A good means of achieving this is by using video cameras to capture those movements for assessment. In this way, various relationships may be assessed, such as the effective priority between pedestrians and vehicles. Video monitoring has the added benefit of offering a readily interpreted view of performance to those outside the design team.

## Performance monitoring of consultants and contractors

**4.2.8** It is clearly beneficial to monitor, record and compare the performance of contractors and consultants in terms of providing the desired service. Research for this LTN noted a reported lack of openness in reporting the inadequacies of consultants and contractors in meeting the terms of the brief. Any failings in that service may jeopardise achievement of the scheme's objectives and may threaten the prospects for similar schemes.

“ The monitoring of consultants and contractors should be improved by having a much more open exchange of performance by all parties concerned. ”

**The evaluation of schemes and working practices is essential in order to ensure that we learn from our mistakes and continue to develop good practice.**

## 4.3 Maintenance

**4.3.1** Maintenance requirements and costs should be considered at project commencement, rather than being the last stage of the design-to-implementation process. There are many examples of well-conceived traffic management schemes, designed with skill and consideration, only to be let down post-implementation through inadequate consideration of the realities of maintenance constraints.

“ It is important to make provision for maintenance in whole-life costing. ”

**4.3.2** Maintenance is often undertaken in a piecemeal fashion, with varying degrees of skill and care in application. A scheme's integrity at completion may only be retained post-implementation if the scheme is regularly maintained using correctly specified materials skilfully applied. However, too often bespoke materials are specified without adequate stocks being retained and untrained labour is used to install specialist pavements, for example. Although not an integral part of a scheme as such, it is important that items such as advertising boards (A-boards) and other incremental street additions do not impact negatively on it.

“ Maintenance implications and requirements should be considered at an early stage. ”

**4.3.3** To minimise maintenance-related problems, a full appreciation of the maintenance constraints should be made at project inception, with guidance given within the design brief as to what those constraints comprise. Where appropriate, reference should be made to relevant local design documents to guide designers on the appropriate materials and means of installation. Regular streetscape audits and effective maintenance programmes will help in identifying and rectifying streetscape-related issues (Figure 4.2).

“ It is important that special materials are included in the street works register, as this will improve the chances of proper re-installment with the correct materials. ”

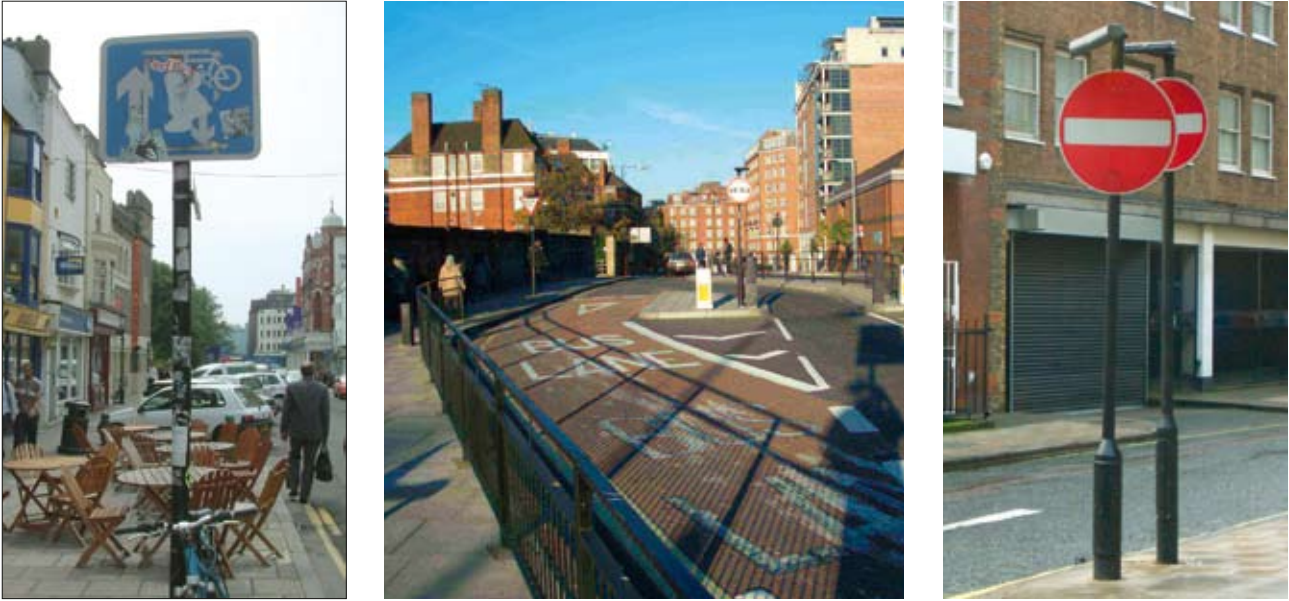


Fig. 4.2 Effective maintenance programmes and regular streetscape audits will help to identify issues such as damaged traffic signs, poor removal of road markings and duplicated signs/markings.

## 4.4 Key points

- Involve the contractors as early as possible, so they will understand the vision and a good working relationship can be developed (collaborative working).
- Avoid the 'draw and go' approach to design and construction.
- Specify the scheme performance monitoring requirements at the start of the project.
- Undertake quantitative and qualitative evaluations, but also undertake an evaluation of the performance of consultants and contractors.
- Specify the maintenance review/audit requirements.

# 5. Training

## 5.1 Narrowing the gap

**5.1.1** There is a need to raise awareness of streetscape issues in the design of traffic management schemes. Skills training presents perhaps the most substantial single contribution to be made in realising good-quality streetscape design. Given awareness of the relevant issues, along with the relevant design skills, practitioners will be able to deliver traffic management projects sensitive to the local environment whilst meeting the traffic management function.

**5.1.2** The design of traffic management schemes has traditionally been approached from two different design perspectives: the functional (engineering) and the aesthetic (architectural), with little meaningful crossover between the two. In recent years this divide has narrowed to a point where both perspectives are appreciated and valued more widely. But the challenge is to spread a wider awareness of the need for a holistic design approach to all parties involved in the design and delivery process.

“Engineering guidance does not link with other professionals’ areas of expertise.”

**5.1.3** Efficient traffic management schemes do not necessarily rely on adherence to traditional traffic engineering principles. A sensitive streetscape-aware approach to traffic management scheme design may yield similar or indeed improved performance, whether measured in terms of junction capacity or safety record. A wider view allows the designer a further opportunity to account for the influence of an individual’s behaviour, this time from the viewpoint of their reaction to the messages given by that location’s surroundings.

**By raising awareness of the importance of streetscape and by providing the required skills training, significant progress will be made in improving the quality of traffic management design.**

**5.1.4** This chapter explores the types of training relevant to sensitive traffic management design and how they may be realised in the workplace.

## 5.2 The skill set

**5.2.1** The range of skills required for each project will vary in accordance with the type, scale, location and intended function of the scheme. The skills and number of individuals required to prepare a design for a single raised road crossing would typically be rather more modest than those for an area-based environmental enhancement scheme. Traditionally, the raised crossing will have been prepared entirely by a traffic engineer and the area-based scheme led by a project manager with an architectural-based background. But care must be taken with both projects to ensure that proper recognition is made of streetscape needs and traffic management function. Training in disability awareness should also be available to local authority staff, consultants and others involved in the scheme delivery process.

**It is important to determine the skills training and level of awareness that are needed by all involved in the design process.**

## 5.3 Raising awareness

**5.3.1** The first step in successful training delivery is in raising awareness of the issues and appraising those involved in the design process of the purpose and value of the training given. It is this level of training that has perhaps the widest spread and applicability to the parties involved.

**5.3.2** The most successful schemes will tend to be those best designed and best supported, whether in terms of public acceptability, funding or political backing. Raising awareness of the streetscape design issues through training is important not only for designers, but also, as far as practicable, for all stakeholders, including council members

## CASE STUDY

### A6 Clifton village traffic calming project (Figures 5.1 and 5.2)

Council Members and officers were given a presentation providing information on good practice to inform how traffic management schemes can be designed without detriment to the streetscape. With an appreciation of the benefits that can be gained by taking a less regimented approach to the design of traffic management measures (in this case a traffic calming scheme), the members and officers gave approval to the implementation of an alternative set of proposals to achieve the specified objectives.



Fig. 5.1 A6 Clifton village **before** (Jo Cleary, Friends of the Lake District).



Fig. 5.2 A6 Clifton village **after**. Carriageway width reduced by kerb build-outs. The traffic calming effect is reinforced by the use of planters and by the removal of the road centrelines.

and contractors. This training will pay dividends in alerting designers and stakeholders to the need to give appropriate weight to streetscape issues in scheme objectives, design and implementation.

**5.3.3** Awareness raising can be achieved in many ways, including through attending conferences and seminars, through user forums, and through the distribution of current and relevant literature on good practice.

**Awareness of streetscape design aids collaborative working.**

## 5.4 Setting the scope

**5.4.1** For some, sufficient training will begin and end with awareness raising, though perhaps reinforced subsequently at appropriate intervals.

For others that awareness may lead much further towards a deeper interest in public realm design and a desire for further formal training in the subject area. It is therefore important to recognise the appropriate training scope for each individual at an early stage.

**5.4.2** The form of training should reflect the individual's likely contribution to project work. Whilst a traffic engineering focus provides an excellent platform for design, identifying geometric and operational limitations, a wider planning-based focus will consider issues such as built form. It is not reasonable to expect every individual to form an entirely balanced view of such design considerations: they will approach design challenges from varying standpoints. But awareness training will promote co-operative working towards a commonly understood goal. The relationship between scheme contributors and their typical range of awareness and skill levels relating to traffic management and

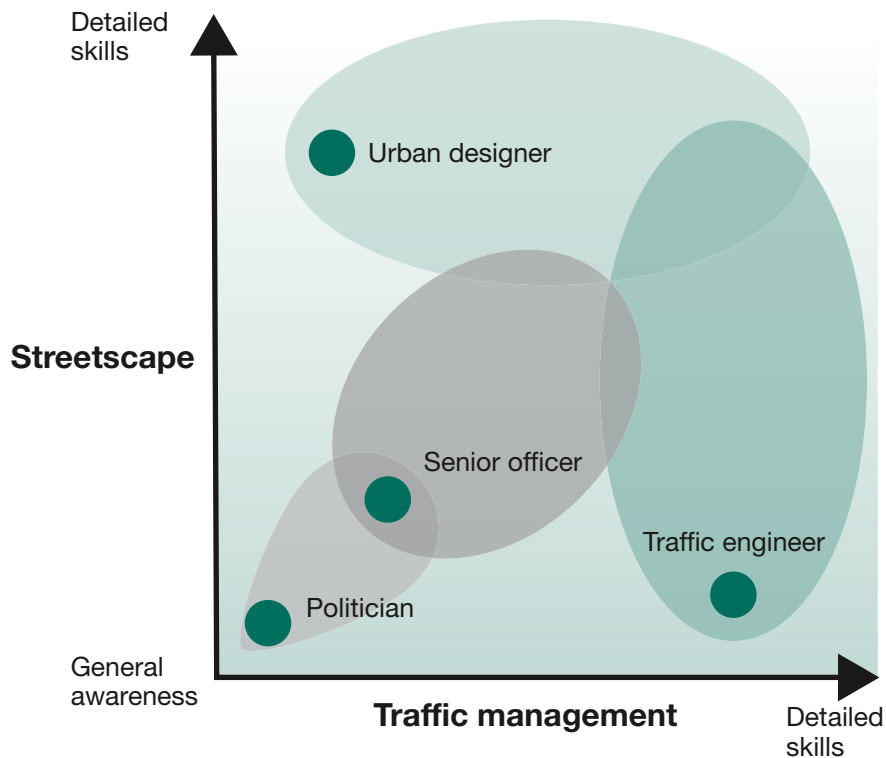


Fig. 5.3 Indicative scope of awareness and skill levels for design participants.

streetscape is indicated conceptually by Figure 5.3. Understanding how each participant contributes is beneficial in developing successful schemes.

development programmes. This will provide staff with additional encouragement and recognition in the acquisition of public realm design related skills.

## 5.5 Skills training

### Internal workplace training

**5.5.1** Given an environment supportive of good streetscape practice, then the workplace and project-based experience should represent the best and most cost-effective means of delivery for staff training. With systems in place to spread knowledge gained from attendance at external courses and conferences, and the ready supply of relevant texts and guidance from enthusiastic senior staff, all should be in place to provide a nurturing environment for good practice.

**5.5.2** Staff mentoring clearly has a role to play here, with those displaying a particular interest and/or aptitude towards streetscape matters encouraged by their mentors on a one-to-one basis. It is also appropriate to build in the recognition of relevant capabilities and skills into continuing professional

“ Mentoring and recognition of experience and CPD would be useful to ensure skills are developed and valued ”

**5.5.3** Opportunities should be taken to provide cross-discipline training for design staff. Too often, training, whether internally or externally delivered, has been provided on the basis of single-issue interest, for example road safety. A balanced view of streetscape design may only be achieved through awareness of the wider picture such as the concept of space legibility – that is, the degree to which the space may be read by users for wayfinding. Such training may be delivered through cross-team project work that avoids working in technically based ‘silos’, or perhaps through informally arranged internal seminars. Such training may yield other benefits too in aiding communication and co-operation among departments.

**Mentoring can provide the most effective way of improving skills.**

## External training

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**5.5.4** All training, whether internally or externally delivered, has a related cost, even if just measured in terms of staff time invested. External training is more visible in terms of the required time and in financial outlay. It does, though, offer the chance to gain a new perspective on good practice through the sharing of experience from other practitioners and acknowledged experts.

**5.5.5** There have been moves in recent years by organisations like the Institute of Highways and Transportation (IHT) and the Commission for Architecture and the Built Environment (CABE) to provide supplementary formal training in urban

design matters for those with a traffic engineering and/or transport background. This movement is gaining ground and attracting interest, particularly with those in the early stages of their careers. Staff may also pursue courses leading to degree-level qualifications using their engineering/transport background as a basis for course admission.

**5.5.6** This recent move towards a better understanding of urban design matters by those in the transport field is beneficial to the goal of achieving better streetscape design, helping understanding between professions and encouraging a wider view. A better understanding of road transport issues would also encourage a wider view for those with a first interest in public realm matters.

## 5.6 Key points

- Streetscape awareness is required by all, whereas skills training is only required by certain people.
- Awareness is important for the designer/engineer but also for those responsible for the approvals/review.
- Training is an important element of improving the streetscape design.
- Better communication is needed between the urban designer/architects and engineers.
- Awareness of streetscape design aids collaborative working.
- Internal mentoring, seminars and workshops are beneficial and cost-effective in helping to build understanding within the local authority.
- External training helps to ensure that you are working to the latest standards and good practice.

# References

- CABE (2002). *Paving the Way: How We Achieve Clean, Safe and Attractive Streets*. CABE.
- CABE (2007a). *Paved with Gold – The Real Value of Good Street Design*. CABE.
- CABE (2007b). *Living with Risk*. CABE.
- Department for Transport (1982, amended 2004). *Traffic Signs Manual Chapter 1: Introduction*. TSO, London.
- Department for Transport (1986). *Traffic Signs Manual Chapter 3: Regulatory Signs*. HMSO, London.  
New edition due June 2008.
- Department for Transport (2003a). *Traffic Signs Manual Chapter 5: Road Markings*. TSO, London.
- Department for Transport (2003b). *Traffic Signs Manual Chapter 7: The Design of Traffic Signs*. TSO, London.
- Department for Transport (2004a). *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. DfT, London.
- Department for Transport (2004b). *Traffic Signs Manual Chapter 4: Warning Signs*. TSO, London.
- Department for Transport (2007). *Manual for Streets*. Thomas Telford, London.
- Department of the Environment, Transport and the Regions (2000). *Traffic Advisory Leaflet 1/00: Traffic Calming in Villages on Major Roads*. DETR, London.
- Kaptein N A and Claessens F M M (1998). *Effects of Cognitive Road Classification on Driving Behaviour: A Driving Simulator Study*. MASTER, Deliverable 5, Contract no. RO-96-SC202. Soesterberg: TNO Technische Menskunde.
- Office of the Deputy Prime Minister (2003). *Better Streets, Better Places: Delivering Sustainable Residential Environments: PPG3 And Highway Adoption*. ODPM, London.
- Statutory Instrument 2002 No. 3113, The Traffic Signs Regulations and General Directions 2002. TSO, London.
- Suffolk County Council (2003). *The Suffolk Countryside Manual*. Suffolk County Council.
- The Disability Discrimination Act 1995. HMSO, London.
- UK Roads Board (2005). *Highway Risk and Liability Claims – A Practical Guide to Appendix C of The Roads Board Report 'Well Maintained Highways – Code of Practice for Highway Maintenance Management'*, 1st edn. UK Roads Board, London.

# Appendices

## Appendix A Evaluation checklist

The evaluation checklist and the accompanying scoring mechanism, developed during the research for this LTN, provide a method to examine, record and evaluate the streetscape attributes of traffic management schemes. The evaluation checklist presented here is a tool to assist designers in scheme planning and with 'before and after' evaluation studies. It should not be used to compare absolute scores between schemes, as the implicit subjective interpretation of scheme performance will vary among observers.

Using the approach set out in the checklist, the scheme's streetscape attributes are given points for positive and negative features relating to the scheme's street furniture and ground surfaces. Points for positive features may be assigned for attributes, such as where the design is considered to complement the adjacent streetscape characteristics or perhaps provides an integrated paving layout. Points may also be awarded for negative features, such as ill-considered paving materials and unnecessary traffic signs and road markings.

### Scores for positive features

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- 4 Excellent** Scheme is judged to actively complement the streetscape, minimises street furniture and demonstrates careful implementation and maintenance.
- 3 Very good** Scheme exhibits considered and comprehensive consideration of streetscape issues.
- 2 Good** Evidence of consideration of the streetscape, though perhaps lacking comprehensiveness or attention to detail regarding the streetscape.
- 1 Satisfactory** Some evidence of streetscape consideration.
- 0 Poor** No evidence of streetscape consideration.

### Scores for negative features

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- 3 Satisfactory** Would not be detrimental if all other matters were of the same standard.
- 2 Unsatisfactory** Little demonstrable consideration of the scheme's impact on the streetscape.
- 1 Poor** Negligent in terms of effect on streetscape.
- 0 Bad** Seriously detrimental to the streetscape.

### Added optional bonus points

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An added optional bonus of up to 8 points may be awarded where it is considered the street furniture and ground surfaces make a generally positive contribution to the streetscape. A maximum of 8 points may be awarded for each.

## Non-applicable features

In cases where features, such as traffic signals, do not appear, no score is given and the relevant points are deleted from the maximum possible score.

## Total score

The total score is then expressed as a percentage. This gives rise to a slight anomaly in that simple schemes are likely to gain higher scores. This has to be borne in mind. A complicated scheme with a high score represents a significant achievement.

## Evaluation checklist

Streetscape attributes	Maximum available points	Scheme maximum available points	Scheme scores	
			Before	After

Impact issues: Street furniture				
Positives				
Design complements adjacent streetscape characteristics	4			
Integrated street furniture design	4			
Design of individual items adds to quality of the scene	4			
<b>Total</b>	<b>12</b>			

Negatives				
Unnecessary traffic regulatory signs	3			
Unnecessary traffic non-regulatory signs	3			
Poorly located/fixated traffic signs	3			
Unnecessarily obtrusive surface equipment	3			
Unnecessarily obtrusive cameras	3			
Unnecessary guardrails	3			
Unco-ordinated bus shelters/bus stop signs	3			
Unco-ordinated ticket machines	3			
Unnecessary duplication of traffic signals and push buttons	3			
Unnecessary duplication of traffic signal posts	3			
<b>Total</b>	<b>30</b>			

continued...

Streetscape attributes	Maximum available points	Scheme maximum available points	Scheme scores	
			Before	After

Added optional bonus				
General contribution of street furniture to streetscape	8			
<b>Total</b>	<b>8</b>			

Impact issues: Ground surfaces				
<b>Positives</b>				
Design complements adjacent streetscape characteristics	4			
Integrated paving layouts, including tactile paving	4			
Materials suitable for purpose	4			
<b>Total</b>	<b>12</b>			

Negatives				
Ill-considered paving materials	3			
Broken slabs	3			
Unco-ordinated/poorly laid out paving slabs	3			
Poor workmanship	3			
Poorly laid out tactile paving	3			
Unnecessary changes in kerb alignment	3			
Poorly laid out dropped kerbs	3			
Unnecessary road markings	3			
Poorly executed road markings	3			
Unnecessary road colours	3			
<b>Total</b>	<b>30</b>			

Added optional bonus				
General contribution of ground surfaces to the streetscape	8			
<b>Total</b>	<b>8</b>			

<b>GRAND TOTAL</b>	<b>100</b>			
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<b>Percentage score: scheme maximum × 100/scheme score</b>				
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## Example of the use of the evaluation checklist

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### ***Maid Marion Way, Nottingham***

The scheme is a transformation of a traditional 1970s roundabout with long pedestrian underpasses to a crossing that allows pedestrians to cross in comfort at ground level (Figure A1). This also allows pedestrians to keep in view their objective and walk directly towards it, without diversion through a complicated system of subways.



Figure A1 View of Maid Marion Way, Nottingham.

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Streetscape attributes	Maximum available points	Scheme maximum available points	Scheme scores
			After

Positives			
Design complements adjacent streetscape characteristics	4	4	4
Integrated street furniture design	4	4	4
Design of individual items adds to quality of the scene	4	4	4
<b>Total</b>	<b>12</b>	<b>12</b>	<b>12</b>

Negatives			
Unnecessary traffic regulatory signs	3	3	3
Unnecessary traffic non regulatory signs	3	3	2
Poorly located/fixd traffic signs	3	3	3
Unnecessarily obtrusive surface equipment	3	3	3
Unnecessarily obtrusive cameras	3	n/a	n/a
Unnecessary guardrails	3	3	3
Unco-ordinated bus shelters/bus stop signs	3	n/a	n/a
Unco-ordinated ticket machines	3	n/a	n/a
Unnecessary duplication of traffic signals and push buttons	3	3	3
Unnecessary duplication of traffic signal posts	3	3	3
<b>Total</b>	<b>30</b>	<b>21</b>	<b>20</b>

Added optional bonus			
General contribution of street furniture to streetscape	8	8	8
<b>Total</b>	<b>8</b>	<b>8</b>	<b>8</b>

Positives			
Design complements adjacent streetscape characteristics	4	4	4
Integrated paving layouts, including tactile paving	4	4	2
Materials suitable for purpose	4	4	4
<b>Total</b>	<b>12</b>	<b>12</b>	<b>10</b>

Streetscape attributes	Maximum available points	Scheme maximum available points	Scheme scores
			After

Negatives			
Ill-considered paving materials	3	3	2
Broken slabs	3	3	3
Unco-ordinated/poorly laid out paving slabs	3	3	2
Poor workmanship	3	3	2
Poorly laid out tactile paving	3	3	2
Unnecessary changes in kerb alignment	3	3	3
Poorly laid out dropped kerbs	3	3	3
Unnecessary road markings	3	3	3
Poorly executed road markings	3	3	3
Unnecessary road colours	3	3	3
<b>Total</b>	<b>30</b>	<b>30</b>	<b>26</b>

Added optional bonus			
General contribution of ground surfaces to the streetscape	8	8	6
<b>Total</b>	<b>8</b>	<b>8</b>	<b>6</b>

<b>Grand total</b>	<b>100</b>	<b>90</b>	<b>82</b>
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<b>Percentage score: scheme maximum × 100/scheme score</b>	<b>91%</b>
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In this example the checklist has only been used after scheme implementation.

## Appendix B Design process checklist

Scheme development stage	Comments	LTN reference	Completed
<b>Scheme initiation</b>			
Scheme definition	Define scale and type of the scheme at project inception to inform subsequent team structure, scheme evaluation, skill needs and training.	2.2	
Establish scheme vision	Define a 'vision' describing wider scheme context, characteristics, guiding design principles and contribution to relevant policies and goals.  Consider scheme's position in terms of 'place' and the function hierarchy.	2.3.1 – 2.3.3  3.7.1	
Determine scheme purpose and actions	Establish scheme purpose and specific actions required to deliver it, e.g. to calm vehicle movements (purpose) through raised crossings and widened footways (actions).	2.3.4	
Design champion	For large projects, appoint a scheme-specific design champion. For small schemes, nominate relevant officer to act as design champion within the wider works programme.	2.4.1 – 2.4.2 + 2.10	
Establish available funding	Consider means to derive a monetary scheme benefit value pre- and post-evaluation.  Assess the area in terms of its traffic management and streetscape performance to assist in justifying expenditure in relation to streetscape aspects.	2.5  2.5	
Managing risk	Establish coherent lines of design responsibility giving specific consideration to corporate responsibility, seeking appropriate support for innovative schemes.	3.2.4	
Maintenance planning	Establish whole-life costs, accounting for ongoing maintenance to a standard of quality commensurate with the implemented scheme.  Consult and involve those directly responsible for maintenance at an early stage of scheme development.	2.12 + 4.3  4.1.2	
Determine monitoring arrangements	Plan for both quantitative and qualitative scheme performance monitoring and feedback.	4.2	
Consider consultation needs and programming	Plan for informal and formal scheme consultation and how it may best inform design development.  Consider visual aids for scheme consultation, e.g. 3D sketches and computer visualisation.	2.7.5  3.8.4 – 3.8.8	

Scheme development stage	Comments	LTN reference	Completed
Establish skills required	Review required and available design team skills; consider recruitment or sub-contracting design support as appropriate.	2.8	
Establish relevant team organisation and communication	Consider how best to provide for effective team communication and collaborative working in terms of leadership, structure and protocol.	2.8 – 2.11	
Risk identification	Record identified risks to scheme integrity and delivery, e.g. 'baton passing' between design and implementation teams.  Plan to manage identified risks through effective communication among team members and monitoring progress against initial scheme vision, purpose and actions.	2.4	

Design			
Establish applicable design performance goals and relevant evaluation methodology	Undertake an initial design evaluation for pre- and post-evaluation of scheme traffic management and streetscape performance.	2.2.2, 2.5 + 3.5	
Establish minimum scheme requirements	Use professional discretion to interpret and apply regulations, standards and guidance to the benefit of the scheme and the streetscape in particular.  Take 'blank sheet' approach to design: assess movement needs and the streetscape context, and then minimise provision of traffic signs, road markings and street furniture to achieve the desired traffic management function.	3.4  3.8	
Quality auditing	Prepare and implement a plan for quality auditing and related topic-specific audits, e.g. road safety, traffic signs and road markings, clutter and cycling.	3.9	
Design development – sketch	Prepare design sketches, considering use of 3D drawing and visualisation as appropriate.	3.8	
Establish performance standards for external consultants and contractors	Consider preparation of appropriate and measurable performance standards for external design and implementation sub-contractors to preserve design integrity and provide performance feedback to planning for future projects.	4.2.8	

## Appendix C Designing in 3D

This Appendix demonstrates some of the visual design techniques that can be used in the development of traffic management measures. Some of these techniques can be applied with little or no training and produced at relatively low cost. This means that they can be used in the design of the 'everyday' traffic management projects, unlike some of the more sophisticated techniques, which may be prohibitively time-consuming and expensive to produce.

In order to decide on the most appropriate technique for creating a 3D design for a traffic management project, it is important first to determine the intended audience and purpose for the design. This Appendix uses two categories for this:

- 1. Simple 3D hand-drawn sketches** – used to help visualise how the proposed traffic management measure would integrate with its surroundings.
- 2. 3D visualisations** – intended to provide a realistic representation of how the scheme will look, likely to be used in the consultation for the proposed traffic management measure with the client and the public/other stakeholders.

Presenting design in 3D is an important way of looking at engineering and urban design together. There are different techniques that can be used to produce 3D designs for each category, but the first type refers to designs that can be produced with little or no training, and largely without using computerised graphics tools. For both it is essential to visit the street to understand its context in terms of function and form in order to build up a picture of the characteristics and sensitivities of the street.

### Simple 3D hand-drawn sketches

The purpose of producing simple hand-drawn designs is to help visualise how proposals may integrate within their local environment. This can be done to test out options prior to drawing detailed design plans or as the first stage in developing more sophisticated 3D visualisations. The techniques require little or no formal training and do not necessitate the input of specialist designers.

These sketches can be produced using CAD, but the designer is likely to be more self-reliant if the designs are produced by hand. A simple 3D sketch plan may be produced as an axonometric projection (Figure A3.1) or isometric projection (Figure A3.2) using a grid as a guide and may look like Figure A3.3.

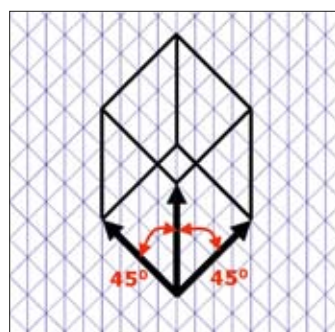


Fig. A3.1 Axonometric projection.

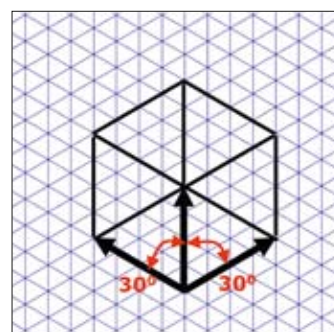


Fig. A3.2 Isometric projection.

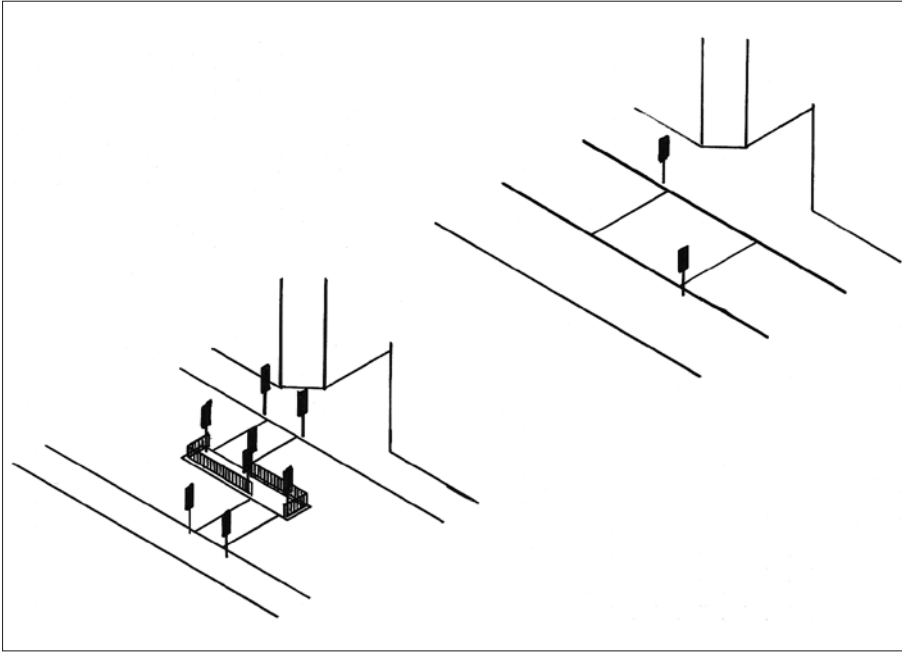


Fig. A3.3 A hand-drawn 3D sketch illustrating scheme benefits – in this example, widening footways and replacing the staggered crossing with a one-stage pedestrian crossing.

## 3D visualisations

For more substantial traffic management projects and where appropriate budget/resources and skills are available, more sophisticated 3D visualisation techniques can be applied. These include producing detailed hand-drawn designs or, more commonly, creating digital photo-realistic images. To develop design proposals requires specialist traffic engineering and urban design knowledge, and to produce the visual output requires artistic/graphic design expertise.

Whether hand-drawn or computer generated, designs are generally developed according to the following process:

- Existing scheme – obtain digital photo, or create hand-drawn image using photos;
- Blank-sheet – create by removing all signs, road markings and traffic management equipment from the image;
- Proposed scheme – add required signs, road markings and traffic management equipment, then consider if other elements should be added in order to improve the visual quality, safety or performance of the scheme.

Examples are shown in Figures A3.4–A3.6.

Visualisations in 3D are useful for developing and refining design options, but can also help with the consultation process by providing the client and the public/other stakeholders with a more realistic representation of how the scheme will look. The general public sometimes finds it difficult to interpret 2D CAD/engineering plans, and presenting designs in 3D helps to bring the proposals to life.



Fig. A3.4 Computerised visualisation showing (from top) existing situation, 'blank-sheet' image, proposed improvements.



Fig. A3.5 Existing and modified photo showing the visual impact of removing pedestrian signals, road markings and guardrailing.



Fig. A3.6 Photo-montage showing how the road would look with the introduction of a median strip with trees.

The intention of this Local Transport Note is to help all those involved in the design of traffic management measures to prepare schemes that consider and care for the streetscape. It assists hands-on designers, project enablers and decision-makers alike. Specifically, it aims to enhance streetscape appearance by encouraging design teams to minimise the various traffic signs, road markings and street furniture associated with traffic management schemes. Advice on achieving this is given with reference to case studies.

ISBN 978 0 11 552942 9

£22



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ISBN 978-0-11-552942-9

