



Highways England Strategic  
Design Panel progress report





A3 Hindhead Tunnel, Surrey

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# Foreword



When at their best, roads can deliver the safe mobility we desire, enhance the environment, provide views, frame landscapes and, occasionally, structures that inspire. In short, roads that respond to the people they serve and the places they form part of.

As we embark on the biggest programme of investment in England's Strategic Road Network for a generation we were challenged by the Minister John Hayes MP to ensure that as well as being safe, efficient and affordable our roads are also beautiful.

I share this aspiration and I do not underestimate its challenge. It will require a cultural change within both Highways England and the wider roads sector. It is for these reasons that we have established our Strategic Design Panel.

Its role will be to help us to develop a culture where good design is at the heart of everything we do. I am delighted that one of its first outputs is a recommended set of principles of good road design that will guide the work of our teams.

The Panel's members are drawn from a wide range of organisations. They represent a passionate and knowledgeable resource that is committed to helping Highways England become a better, design led organisation that is equipped to be a more demanding client. It is the embodiment of a new long term strategic partnership between Highways England, road users, designers, architects, the construction industry, and environmental organisations who all share a desire for better, safer, beautiful roads.

We have great engineers and designers and there is no doubt in my mind that, with the support of the Strategic Design Panel, our teams and those within the wider industry are up for the challenge.

A handwritten signature in black ink that reads "Mike Wilson".

**Mike Wilson**

Chief Highway Engineer and chair of the Highways England Strategic Design Panel

## Design vision

“ We aim to put people at the heart of our work by designing an inclusive, resilient and sustainable road network; admired for its functional elegance and usefulness, reflecting in its design the beauty of the natural and built environment through which it passes, and enhancing it where possible. ”

# 10

## Principles of good road design

Good road design:

- 1** makes roads safe and useful
- 2** is inclusive
- 3** makes roads understandable
- 4** fits in context
- 5** is restrained
- 6** is thorough
- 7** is environmentally sustainable
- 8** is innovative
- 9** is long-lasting
- 10** is a collaborative process



## Executive summary

This is the first report of the Highways England Strategic Design Panel, which is tasked with supporting Highways England to make a step change in the design quality of England's Strategic Road Network.

With members from across a range of disciplines and representing stakeholders who have a strong and passionate interest in the design of the Strategic Road Network, the report sets out some of the key advice and recommendations made by the Panel since its inception.

The Highways England Road Investment Strategy (RIS) outlines how Highways England will invest £15.2bn in 112 major motorway and all-purpose trunk roads between 2015/16 and 2020/21. The RIS includes the government's vision to "...see the Strategic Road Network working more harmoniously with its surroundings, impacting less on local communities and the environment."

In response to this the Panel has developed a design vision and a set of principles of good road design, by which the success of a scheme is assessed during its design development, implementation and when in use.

### Independent design review panel

The Strategic Design panel's focus is on strategic input rather than scheme specific details, targeting where its expertise, insight and guidance will have most positive impact and wider benefit, such as standards, procurement and evaluation.

The Panel has identified that independent review of scheme specific design would be beneficial to broaden thinking and provide constructive challenge to scheme specific design. It has therefore recommended the establishment of dedicated Design Review Panel (DRP) for this purpose. DRP would be procured by Highways England, with the oversight of the Strategic Design Panel, and would help project managers and design teams ensure that the design vision and principles are applied to individual road schemes or specific programmes. It is recommended that the involvement of the DRP is in line with the design stages set out in Highways England's Project Control Framework.

## Strategic issues

Whilst not undertaking design review of specific schemes, the Panel has discussed a number of individual schemes at meetings and has identified some key strategic design issues that are common to schemes and emerging design standards e.g. for Expressways.

Consequently, it has identified some key aspirations that it considers would help to raise the standard of design:

- Clear and consistent consideration of design at the earliest stage of scheme development.
- Building in greater flexibility to later stages of scheme design, within the constraints of the consenting process.
- Emerging schemes to learn lessons from completed schemes and other parts of built environment sector.
- Post-opening review to consider design principles.
- Importance of inter-disciplinary design.
- Aspiring for more than mitigation.
- Landscape-scale vision and early engagement of landscape professionals.
- Better quality design of essential features.
- Opportunities for incorporating so called 'green and blue infrastructure'.
- More inclusive engagement with local communities and users.
- Better planning for non-motorised users.
- Inspiring innovation through design competitions.

## Key recommendations

During the reporting period, the Panel has made the following key recommendations:

1. Highways England should publish the design vision and principles recommended by the Panel and should work to develop a Good Design Guide.
2. Highways England should ensure that its design vision and principles are implemented effectively and that the Good Design Guide becomes a practical tool across its projects and wider operations.
3. Highways England should establish a specific objective aimed at ensuring that a design led approach, as set out in the design vision and principles, is at the heart of the review of the DMRB.

## Looking ahead

Looking ahead, the Panel will develop a forward programme of prioritised activities for the next year aimed at supporting the delivery of these recommendations.

This will aim to:

- Ensure the Panel is fulfilling its remit as set out in the terms of reference and report back on progress.
- Embed good design into Highways England guidance and processes by:
  - Supporting the implementation of the design vision and principles and development of a Good Design Guide.
  - Supporting Highways England in establishing design led objectives for the review of the DMRB and advising on revisions to the DMRB.
  - Trialling independent design reviews of a selection of proposed new road schemes in sensitive locations through a Design Review Panel.
  - Supporting a review of the design outcomes and opportunities associated with the vegetation within the highway.
  - Identify an objective means of measuring improvement.
- Learn from good practice in place-responsive design, specifically but not exclusively drawing on:
  - Experience of other design panels, such as HS2.
  - Case studies of good road design from Europe and beyond.
  - Experience of linear asset, owners and other parts of the built environment sector in designing and managing new and existing infrastructure in a way that is place-responsive.





M6, West Midlands

## Purpose and governance

The Highways England Strategic Design Panel (herein referred to as the Panel) is tasked with supporting Highways England to make a step change in the design quality of England's Strategic Road Network.

This means ensuring that design excellence in the landscape, engineering and built environment is at the heart of all aspects of Highways England projects and in particular becomes the starting point for determining what a successful road scheme looks like. The Panel therefore seeks to ensure the Strategic Road Network displays design quality through being safe, functional and effective, responding positively and sensitively to landscape character, cultural heritage and communities, whilst also conforming to the principles of sustainable development.

Whilst the Panel is advisory, Highways England will seek, and act on, advice from the Panel on:

- Embedding a design led approach as an important part of the development of road infrastructure.
- The design of road improvement, network management and operations.
- The development of relevant design standards and advice.
- At any other time where required by the Secretary of State.

Its role will be to independently advise Highways England and whilst the Panel does not have any statutory function in its own right, its advice and guidance will be available to inform the statutory consent processes. It takes an interdisciplinary approach that sees design as a way to add value and avoiding design being seen as simply a mitigation tool.

The work of the Panel takes place in the context of the government's wider Road Investment Strategy (RIS). The Panel is not expected to address wider questions of need or strategic choice but rather to help implement Highways England's projects and day to day operations in a way that best addresses the opportunities and impacts.





M25, Kent

Because of the scale of Highways England's investment programme it is not possible for the Panel to comment in detail on every scheme. However, the Panel applies its advisory powers:

- To review and provide advice on Highways England standards and processes including reviewing the Design Manual for Roads and Bridges (DMRB) and other advice or guidance issued by Highways England to its staff and contractors.
- To recommend and support Highways England staff in the development of new standards and guidance e.g. the new Highways England Design Principles.
- To request an overview and to comment on strategic and recurrent themes and issues associated with the design and procurement of road schemes.
- To request the establishment of scheme specific Design Review Panel to support the delivery of high quality design on the ground.
- To request greater involvement in the design of specific scheme elements where it is felt there are particular sensitivities and/or where the Panel's involvement would aid their wider role in embedding best practice across Highways England.
- To ensure that the lessons learnt from new or trial design approaches, such as those tested through the designated funds, are incorporated as standard into the design of new schemes.

Panel members will conduct themselves in accordance with the Nolan Principles for public service. All Panel members are aware of their responsibilities and conduct when carrying out their duties. Chatham House Rule applies to the Panel meetings.



## Membership

The Panel's members are drawn from a wide range of organisations which have expertise in the delivery of a well-designed road network. The Panel's main focus is on challenging and supporting senior Highways England staff in driving through a step change in the design standard of England's Strategic Road Network. As such membership brings together individuals and organisations that can provide a broad perspective on design including architects and designers, road users and stakeholders. Membership will be kept under review as the work of the Panel progresses.

### Chair Mike Wilson, Chief Highway Engineer, Highways England

The Chair is responsible for ensuring effective and efficient operation of the Panel and ensuring that its recommendations are implemented as far and as quickly as possible within Highways England.

<b>Richard Bourne</b>	Campaign for Better Transport
<b>Victor Callister</b>	Design Council/Commission for Architecture and the Built Environment
<b>Phil Carey</b>	Transport Focus
<b>Colin Davis</b>	Chartered Institute of Highways and Transportation
<b>Roland Diffey</b>	Institution of Civil Engineers
<b>Noel Farrer</b>	Landscape Institute
<b>Katharine Fletcher</b>	Historic England
<b>Michael Harris</b>	The Prince's Foundation
<b>Wolf Mangelsdorf</b>	Institution of Structural Engineers
<b>Selina Mason</b>	Royal Institute of British Architects
<b>Ralph Smyth</b>	Campaign to Protect Rural England
<b>Clare Warburton</b>	Natural England
<b>Ian Wilson</b>	National Trust

**Current panel membership**  
Biographies of panel members can be seen at Appendix A



## Embedding a design led culture in Highways England

As part of the RIS to enhance, renew and transform the Strategic Road Network, the government outlined how it will invest £15.2bn in 112 major motorway and all-purpose trunk roads between 2015/16 and 2020/21. This significant investment will be used to complete current road schemes, begin construction of previously-announced road schemes and also take 69 new road schemes into construction by 2020/21. It will also include asset renewal and maintenance.

The RIS includes the government's vision to

“...see the Strategic Road Network working more harmoniously with its surroundings, impacting less on local communities and the environment.”

To ensure that this vision is at the centre of the development and delivery of road schemes requires a design led culture to be developed in Highways England and the project teams that deliver individual projects. A starting point for this is the adoption of a design vision and of a set of design principles, by which the success of a scheme is assessed during its design development, implementation and when in use. It is therefore recommended that Highways England adopt the following vision statement and 10 principles of good design.



## Recommended design vision

“We aim to put people at the heart of our work by designing an inclusive, resilient and sustainable road network; admired for its functional elegance and usefulness, reflecting in its design to the beauty of the natural and built environment through which it passes, and enhancing it where possible”.

### 1: Good road design makes roads safe and useful

Safety is fundamental to good road design; it is integral to both the usefulness of its function and the positive experience for the road user. Safe roads should support and link to wider economic, environmental and social imperatives, both nationally and locally. And good roads are fundamentally useful, meeting the users' need for mobility effectively.

### 2: Good road design is inclusive

Inclusive environments facilitate dignified and equal use by all and are the result of an inter-disciplinary design process which places people and their needs at its heart. This means including people, communities and businesses early and in every stage of the design process, in a manner that reduces barriers to access and participation and which considers these needs both in design and ongoing use. This should ensure that all users are considered, with a focus on the most vulnerable.

### 3: Good road design makes roads understandable

Design must make usage of the road intuitive and avoid unnecessary and confusing clutter. Good road design demonstrates sensitivity to the landscape, heritage and local stories of the places that it affects, whilst being clear about its function.

### 4: Good road design fits in context

Roads constitute a key infrastructure legacy, so it is essential that their design responds to the places through which they pass. Good road design makes an important contribution to the conservation and enhancement of the natural and cultural environment. It seeks to enhance those places, whilst being honest about structural necessities.

### 5: Good road design is restrained

Good road design should be functional responding positively and even elegantly to its natural and cultural setting, allowing the identity of the places through which they pass to come through.

### 6: Good road design is thorough

Good road design is the result of robust design processes that create a continuous cycle of improvement, which is open to learning from best practice across the world. Nothing must be arbitrary or left to chance. Care and accuracy in the design process shows respect towards the road users and the people and communities that live with road infrastructure.

### 7: Good road design is environmentally sustainable

It seeks to design for net environmental gain at the earliest stage and wherever possible. It is resilient and sustainable, demonstrating an awareness of the need to allow for future adaptation and technical requirements using materials sustainably and contributing to the circular economy.

### 8: Good road design is innovative

Technological development is always offering new opportunities for innovative design. Good road design will always be responsive to change and capture opportunities for betterment and should develop in tandem with innovative technology.

### 9: Good road design is long-lasting

Good road design lasts many years. The process of good design also requires sufficient time for challenges to be resolved before delivery and should anticipate adaptation to future needs and technologies as part of the commitment to whole-life operation, management and maintenance.

### 10: Good road design is a collaborative process

Good design practice is central to developing a smoother, smarter, more sustainable road network that is useful to and accepted by the society it serves. This is established through a rigorous evidence based project development framework that recognises dependencies and facilitates opportunities for collaboration, whilst concentrating on the benefits and enhancements that road building seeks to deliver.



## Adding value to Highways England design guidance and processes

The Panel's role is to support and advise on the design quality of road construction and renewal schemes delivered through the RIS. To add real value to Highways England design guidance and processes, the Panel will focus on strategic input rather than scheme specific details.

In line with its design quality remit the Panel is seeking to strategically target where its expertise, insight and guidance will have most positive impact and wider benefit, such as standards, procurement and evaluation. In order to achieve this, the Panel wishes to see independent expert design review of individual schemes carried out through the establishment of dedicated Design Review Panel (DRP) that will review individual schemes under the Strategic Design Panel's oversight.

It also wishes to see the establishment of individual working groups drawn from the Panel's membership to provide strategic input to the development of design policy and guidance material being prepared by Highways England, particularly with regard to new programmes and standards.



Through its operation the Panel is therefore seeking to enhance design quality and place responsiveness by embedding the Principles. The Panel will do this through:

- Promoting the design vision and principles across the business.
- Engaging at a strategic level on future highways schemes to enshrine the principles at the earliest possible stage.
- Putting forward individual schemes for consideration by DRP to assess whether they are meeting the design vision and principles and to broaden thinking and provide constructive challenge to designs.
- Having strategic oversight of the independent DRP process, and monitoring its effectiveness.
- Annually reporting on general trends in implementing the Principles in Highways England strategies and schemes, and making these reports available to Highways England senior management, regulators and ministers as appropriate.
- Ensuring policy and scheme requirements given to potential contractors at the tendering phase of projects appropriately reference the principles.
- Providing strategic input to technical guidance (DMRB) relating to the principles.

Currently the Panel's key recommendations are logged by Highways England in the action tracker and reviewed at quarterly Panel meetings. Looking forward, the group will develop an internal working guide.

## Design Review Panel and the Project Control Framework

Design Review Panel (DRP) should be procured by Highways England, with the oversight of the Strategic Design Panel to help project managers and design teams ensure that the design principles are applied to specific road schemes.

Highways England has a strong process control system – the Project Control Framework (PCF), and well established technical requirements and guidelines, necessary to provide consistency and risk management across the large number of schemes being delivered. It is essential that proposals for design review sit comfortably with these documents and it is recommended that the involvement of the DRP is in line with the design stages set out in the PCF as set out overleaf.

## PCF stage

## Actions for project team

### Stage 0

Review and document place responsive design guidance/ requirements from Route Strategy or Feasibility Study.

Assess and map existing place making features in line with requirements of DMRB Vol 10 section 0 (NB these are currently partly covered under “visual amenity” but the review needs to include wider placemaking issues as well as visual).

### Stage 1

Carry out environmental assessment scoping for place related impacts.

A simple design review is indicated where it is unlikely that there will be any significant place related impacts or challenges in meeting user needs, or where there is minor existing degradation which could be improved by the scheme.

A detailed design review is indicated in other circumstances.

A scoping report indicating a simple review requirement should be checked and conclusions agreed by the Highways England Environment Group.

If a simple design review is required, this is carried out by the Environmental Assessment experts supporting the design team to identify potential impacts from different scheme options and the means designed to prevent them.

If a detailed design review is indicated by the scoping, an independent DRP is convened.

### Stage 2

Simple review: environmental assessment updated as required by project team.

Detailed review: workshop(s) with DRP to support design team in developing preferred option following public consultation

### Stage 3

Simple review: environmental assessment updated as required to show mitigation and enhancement of visual impact accorded by scheme.

Detailed review: formal design review by DRP to support design team in optimising preliminary design.

### Stage 7

DRP representatives to review scheme ‘in situ’ with Highways England Environment Group to ascertain lessons learned and prepare case study if appropriate.

## Advice on specific schemes

The RIS schemes seen so far by the Panel have been referred by the Chief Highways Engineer from the key programmes:

### **Regional Investment Programme**

A programme that works to deliver improvements both safely and quickly, working collaboratively with supply chain partners and the value chain to encourage innovation. Responsible for delivering 74 schemes that span the length of England.

### **Complex Infrastructure Programme (CIP)**

A programme established to bring Highways England's largest schemes under a single leadership. This will increase capability of the organisation to manage and deliver each project, plus create efficiencies in delivery by sharing learning and resources between each scheme. The CIP currently comprises: A14 Cambridge to Huntingdon, Lower Thames Crossing and A303 Amesbury to Berwick Down (Stonehenge).

This year the Panel has had the opportunity to discuss all three CIP schemes, plus the A1 in Northumberland and the A27 Arundel Bypass.

It has not been possible for the Strategic Design Panel to comment in detail on every scheme, rather the Panel has focused its discussions on identifying strategic challenges that are common across schemes and to flag up process and policy gaps and issues.

The Panel has also considered the full list of major schemes across all programmes and highlighted to Highways England schemes in sensitive landscapes, around National Parks, Areas of Outstanding Natural Beauty, and urban areas that are priorities for consideration by the Panel.

As a result of these ongoing activities, the Panel identified the following strategic issues, some of which have now been woven into the principles, and others of which would need incorporating into a Good Design Guide or the updated DMRB. Over the following year we will record progress on these strategic issues through the action tracker.



### **Clear and consistent consideration of design at the earliest stage of scheme development**

In order to have an open clear assessment and ownership of options, the review of all current as well as historic options for schemes should be through a codified and consistent process. This needs to be conducted at the earliest stage of scheme development, and involve assessment against current best practice and contemporary measures of impact and opportunity. This process should start prior to option development in order to identify critical design issues that could affect the choice of corridor, route or alignment, rather than simply engaging with the design of the preferred route.

### **Building in greater flexibility to later stages of scheme design**

The Development Consent Order (DCO) process is compliance-driven, therefore in order to not be unnecessarily constrained by the DCO, consideration of allowances of innovation both before and after the DCO approval is necessary. In defining the scheme limits for the DCO greater consideration and allowances need to be made for the ability to achieve the design quality in the later stages of scheme design development and in achieving and protecting a sense of place and local identity through integration quality. This will often be more successful by not limiting the ability to add more physically and temporally to allow for more place responsive design when integrating a scheme.

### **Emerging schemes to learn lessons from completed schemes and other parts of the built environment sector**

There should be a continuous improvement cycle that allows lessons learnt to be embedded into emerging schemes, informed by Highways England's post-opening monitoring and evaluation of completed schemes against modelled outcomes and strategic objectives. Given the sometimes lengthy gestation period for schemes in the current programme, it is recommended that survey work for completed schemes should be carried out at appropriate intervals over 20 years. Training and learning from comparative studies of successful and established processes used in other parts of the built environment sector is essential to achieve change and improvement.

### **Post-opening review to consider design principles**

Given the lasting impact of highways infrastructure on the landscape, the post-opening review should specifically examine how the scheme delivered against the design principles and any scheme-specific design aspirations proposed by the Design Panel or its working groups, learning from both failures and successes.

### **Importance of inter-disciplinary design**

To fully realise the benefits of investment in the Strategic Road Network a change in understanding of the design process is needed, particularly relating to interdisciplinary design that is embedded in other industries and strategic infrastructure programmes.



### **Aspiring for more than mitigation**

Currently the approach to quality and place responsive design in projects is often referred to as 'mitigation' in documents and presentations prepared by project teams. This sets minimal ambition and expectations with regard to the objective of the Strategic Road Network working more harmoniously with its surroundings and impacting less on local communities and the environment. There needs to be more consideration and discussion of the wider vision for the areas where roads are planned, and the opportunities they could release in terms of change and development.

### **Landscape-scale vision and early engagement of landscape professionals**

Given the scale of road interventions they need to be considered as landscape schemes and not just as road schemes. The involvement of landscape professions needs to be much earlier in the scheme design and development process, and should be seen having the potential to deliver positive integration and wider place-making benefits.

### **Better quality design of essential features**

The design of road infrastructure such as gantries, noise attenuation barriers, retaining structures, lighting and other smaller installations necessary to the effective and safe operation of the road network is often inconsistent and of poor design quality. For some schemes the use of gantries and associated infrastructure will define the design and place experience for users, and in others they will be features in sensitive landscapes and places. Better quality design for these elements of road design is essential and following standard quality product design development and procurement for these features is recommended.

### **Opportunities for incorporating so called green and blue infrastructure**

There are considerable opportunities to incorporate 'green and blue infrastructure' (natural and semi-natural features, landscape planting, ponds and ditches) within road design from early stages, with greater recognition of the goods and services it can deliver for people and nature over its lifetime. There are opportunities for innovative greening of grey infrastructure, (eg green bridges, roofs and walls), particularly where this can deliver multiple benefits. The principle of 'no net loss', moving towards 'net gain' need to be embedded early and have clear measurement mechanisms.

### **More inclusive engagement with local communities and users**

It is important that Highways England continues to invest in improving consultation with communities and with users. To make greater use of this effort and resource, more could be done to consider how this can be more inclusive, focusing on groups that may be less engaged in traditional consultation processes.

### **Better planning for non-motorised users**

Non-motorised user provision should be an important consideration in scheme development. This should take place within the context and opportunities of the surrounding networks for these users, not just in addressing their needs to travel along or across the road itself. The quality of environment and user experience is critical for successful take-up and needs to be given greater priority in scheme development. The impact of traffic noise and the experience of being in close proximity to the Strategic Road Network should be considered within the context of a whole route experience and designed accordingly.

### **Inspiring innovation through design competitions**

The development of design briefs could involve the use of design competitions to inspire innovation.



## Advice on Expressways

The Panel was asked to advise on the extent to which the emerging thinking on the new draft Expressways Interim Advice Note (IAN) has aligned its approach to good design.

Overall, the Panel felt that the IAN should seek to be more aspirational, using positive aims and objectives that allow for creative thinking and challenge standard approaches. The IAN should prompt further discussion around innovation and establish greater aspirations for the typology, as setting minimum standards will not deliver the design vision or principles. It was noted that a number of good ideas in some sections were not followed through in the document. There could be stronger links, not repetition, with the wider DMRB guidance.

Specific comments that relate to the principles of good road design were picked up, and are attached in Appendix C. It should be noted that comments were provided before finalisation of the principles so the analysis does not cover them all.



## Wider championing of good design in roads in England

The Strategic Road Network managed by Highways England represents around 2% of the road network in England. Local Highway Authorities manage the remaining road network. There is considerable scope for a two-way process of learning from good practice and embedding good design across the whole network, particularly where it can be shown to deliver value for money, enhanced resilience to climate change and reduced whole life costs.

Work undertaken by the Panel could help to raise the bar in terms of good design of roads across England and we will look for opportunities in the coming year to engage with the wider roads community, and also with other linear asset owners, to share lessons learnt and embed good practice.

The Panel will actively reach out, working with and through its member bodies and their partners. It will facilitate new and innovative thinking on good road design, and the embedding of the design vision and principles within Highways England and beyond. It will seek to champion key messages across the sector and its supply chains.



A68, Northumberland  
(Northumberland County Council)



## Key recommendations and forward planning

During the reporting period, the Panel has made the following key recommendations:

- Highways England should publish the design vision and principles recommended by the Panel and should work to develop a Good Design Guide.
- Highways England should ensure that its design vision and principles are implemented effectively and that the Good Design Guide becomes a practical tool across its projects and wider operations.
- Highways England should establish a specific objective aimed at ensuring that a design led approach, as set out in the design vision and principles, is at the heart of the review of the DMRB.

Other more detailed recommendations related to specific topics are presented in Appendix B.

Looking ahead, the Panel will develop a forward programme of prioritised activities for the next year aimed at supporting the delivery of these recommendations.

This will aim to:

- Ensure the Panel is fulfilling its remit as set out in the Terms of Reference, and report back on progress.
- Embed good design into Highways England guidance and processes by:
  - Supporting the implementation of the design vision and principles and development of a Good Design Guide.
  - Supporting Highways England in establishing design-led objectives for the review of the DMRB and advising on revisions to the DMRB.
  - Trialling independent design reviews of a selection of proposed new road schemes in sensitive locations through a Design Review Panel.
  - Supporting a review of the design outcomes and opportunities associated with the planting within the highway.
  - Identify an objective means of measuring improvement.
- Learn from good practice in place-responsive design, specifically but not exclusively drawing on:
  - Experience of other design panels, such as HS2.
  - Case studies of good road design from Europe and beyond.
  - Experience of linear asset owners and other parts of the built environment sector in designing and managing new and existing infrastructure in a way that is place-responsive.

## Appendix A: Panel biographies

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### Richard Bourn

#### Campaign for Better Transport

Richard worked for Campaign for Better Transport from 2001 until his retirement in 2014, first as the London Campaigner and later mainly writing reports on a range of transport related topics including transport and social inclusion, planning and urban design. He represented Campaign for Better Transport, then called Transport 2000, at the Public Inquiry which resulted in the Inspector's recommendation that permission be refused for Transport for London's proposal for the Thames Gateway Bridge carrying a new six lane road crossing over the river.

### Victor Callister

#### Design Council / Commission for Architecture and the Built Environment (CABE)

Victor's professional career has been at the City of London, and is a very experienced Built Environment Practitioner with experience in development management, urban design, environmental enhancement and capital projects delivery. As Deputy Director of Architecture and Built Environment, Victor is responsible for overseeing the development of Cabe's highly valued Design Review and design support programmes, which seek to promote and support the highest standards of design to improve people's lives. At the City Victor has been part of the senior team considering development proposals with a national profile, in a complex planning and political environment. As the City's lead officer on delivering environmental enhancement, Victor has a track record of developing change strategies through in depth consultation, including those for the Barbican and Bank districts and overseeing the City's public realm transformation through their delivery.

### Phil Carey

#### Transport Focus

Phil Carey is an independent consultant specialising in roads strategy challenges. He advises Transport Focus on roads policy issues, in its role as statutory consumer representative for users of the Strategic Road Network in England; and, with David Quarmby, co-authored the Rees Jeffreys Road Fund report in Autumn 2016 which has formed the basis for the Major Road Network proposals now being taken forward by Government. He is also Chair of the Transport Associates Network. In a series of Deputy Director roles in DfT and elsewhere in the Civil Service to 2011, he led projects ranging from ports policy to the road pricing research programme. He has led a Cabinet Office review of transport strategy, and more recently the cross-cutting transport security and contingencies team.

### Colin Davis

#### Chartered Institute of Highways & Transportation

Colin was trained and has practiced both as an architect and town planner. He is a member of both The Royal Institute of British Architects (RIBA) and The Royal Town Planning Institute (RTPI). For ten years he directed both the architectural and town planning services at a London borough council. In 1990 he set up a multi-disciplinary consultancy focused on the interaction of highway engineering and urban design. He is a founding director of the Public Realm Information and Advice Network – PRIAN an organisation that conducts mid-career training courses on the wider aspects of street design. The publication Street Design for All, produced in 2014 with the Department for Transport, the CIHT, Civic Voice and PRIAN, brings together current thinking on the "place"



## Appendix A: Panel biographies

and “movement” function of streets.

Colin is strongly of the belief that the “place” function of the strategic network of roads and highways is important to the economic wellbeing of the nation as a whole and to the general wellbeing of those who travel.

### Roland Diffey

#### The Institution of Civil Engineers

Roland is Head of Highways for WSP | Parsons Brinckerhoff in the UK. He has more than 35 years' experience of the planning, development, design and implementation of major highways and highway structures in the UK, Ireland and overseas. Roland has been a Chartered Engineer (CEng), since 1985 and a Chartered Environmentalist (CEnv) with the Society for the Environment, since 2005. He has been a Fellow of the Institution of Civil Engineers (FICE) and the Chartered Institute of Highways and Transportation (FCIHT) since 1998. Roland is responsible for all WSP | Parsons Brinckerhoff technical delivery of major Highway works to the Highways England Design Manual for Roads and Bridges in England and the equivalent documentation throughout the UK.

### Noel Farrer

#### Landscape Institute

Noel is a landscape architect and urban designer who has run his own award winning practice for 19 years. He is Past President of the Landscape Institute where he campaigns for landscape led place making. He sits on the Government's design advisory panel for housing, DC CABI's infrastructure and design panels as well as other regional panels. Noel is a regular columnist and visiting lecturer on landscape architecture. He designs for clients including GPE, Cathedral Group, Peabody Trust and the public sector on projects ranging from residential, education, parks and public realm.

### Katharine Fletcher

#### Historic England

Katharine is a chartered town planner, with over 25 years' experience working for Historic England (previously English Heritage) and is currently based in London. She holds post graduate qualifications in planning and architectural conservation. Katharine worked for 15 years in the East of England where she advised on the landscape and townscape impacts of several major road schemes. These included proposals for bypasses within the sensitive landscape settings of historic cities and market towns. Katharine has previously been a member of the East of England Sustainable Development Round Table and Environment Forum.

### Michael Harris

#### Princes Foundation

Michael is highly experienced in the design and project coordination of residential architecture and commercial towers. As the Associate Director of Projects at the Prince's Foundation, Michael is responsible for managing and delivering a number of architecture and urban design projects throughout the UK. He previously led the architecture practice at Phoenix Prime Development, where he acted as lead designer on a 200,000 ft<sup>2</sup> residential development in Phang Nga, Thailand. Michael worked for classical architects Gil Schafer, Stanhope Gate, and Pier Carlo Bontempi before engaging with contemporary practices like 1508 London designing the Four Seasons Branded Residences in Goa, and the Pritzker Prize winning architect Zaha Hadid on high profile commercial commissions. Trained in the classical idiom with a Bachelor of Architecture at the University of Notre Dame, he went on to earn a Master in Architecture from Harvard University.

### Clare Warburton

#### Natural England

Clare is the Transport Senior Specialist in Natural England's Sustainable Development Team. She has over 20 years' experience in the environment sector and has worked for both public and private organisations. Clare is an expert on the interrelationships between transport and the natural environment. She has recently project managed Natural England research on: green bridges; how transport's soft estate has enhanced green infrastructure, ecosystem services and resilience in EU; and air quality impacts of road transport on nature conservation sites. She was also a steering group member for Defra's bats and linear infrastructure research project. Clare is Natural England's account manager for Highways England and Network Rail, and works closely with these and other transport organisations, such as HS2 and Office of Rail and Road (ORR), to secure environmental outcomes.

### Wolf Mangelsdorf

#### Institution of Structural Engineers

Wolf was born and grew up in Germany. He studied Architecture and Civil Engineering at Karlsruhe University, where he also worked for an architectural practice after graduation. After a research stay at Kyoto University he moved to the United Kingdom in 1997 and became a design engineer at Anthony Hunt Associates, working in their Cirencester and London offices. A chartered structural engineer and member of the Institution of Structural Engineers, Wolf has been with BuroHappold Engineering since 2002. He is a Director, Partner and global head of Structural Engineering, looking after a diverse project portfolio both in London and internationally. Having a very clear approach to design led engineering integration, he works with many leading architects. His involvement with academia and

research has been focussed on design and technology which, complements his project work. He has been closely working with the Emergent Technologies Group at the Architectural Association and is working as part of a number of research activities in Robotics and Computational Design in the UK and internationally.

### Selina Mason

#### Royal Institute of British Architects

Selina is a master planner and Architect and Board Director at LDA Design which she joined in 2014. She has a wealth of experience in commissioning and delivery of complex urban masterplans having led the design and delivery of London's post Games Transformation masterplan for the Olympic Delivery Authority and then the London Legacy Development Corporation. She has significant experience in leading large consultant teams of masterplanners, architects, engineers, landscape architects, sustainability and planning consultants, and achieving high quality, deliverable results. Selina has also been leading the consultancy's Cities programme, which is focusing LDA design on urban and regeneration masterplans; for example she is leading LDA Design's UCL East Olympicopolis masterplan of the QEOP. Before joining the ODA in 2007, Selina was Director of Design Review at CABI (Commission for Architecture & the Built Environment). As a member of CABI's Senior Management Team she provided leadership on matters relating to planning, urban design and architecture. Selina also sits on the Design Review Panel for HS2.

## Appendix A: Panel biographies

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### Ralph Smyth

#### Campaign To Protect Rural England

Ralph led CPRE's infrastructure team and specialises in transport - from making country roads safer for walking and cycling to national infrastructure like High Speed 2 and road-building. Previously, Ralph worked full-time as a barrister and is accustomed to making complicated issues easy to understand for a wider audience. Specialist areas: all aspects of transport, as well as energy and digital infrastructure (including open data) plus legal issues in planning.

### Ian Wilson

#### National Trust

Ian is National Trust Assistant Director in the South West. He leads on the South West Strategic Road Programme including the major project to remove the A303 from the World Heritage Site at Stonehenge. Prior to this Ian held a number of other post including Area Manager for London and Assistant Director External Affairs. He has led the Trust's work

on High Speed 2 and on Heathrow Expansion. Ian was a member of the working group brought together by Terry Farrell to create a vision for the Thames Gateway and also led English Heritage's policy work on urban regeneration.

### Mike Wilson

#### Highways England

Mike began his career at the Highways Agency and has played a central role in the development of Smart Motorways. He was the Senior Responsible Officer overseeing the development of all lane running prior to becoming Highways England's Chief Engineer in September 2013. His responsibilities include the development of technical standards for all aspects of highway maintenance, operation and improvement. This development activity is underpinned by an innovation programme that includes work on safety, intelligent mobility and asset management.

## Appendix B: Maintaining an understanding of wider Highways England work and external best practice

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The Panel recognises that best practice in design, engineering and environmental practices are under constant development and we do not have all the answers.

There is an important role for the Panel in drawing in this best practice and advising on how it can be translated in the work of Highways England.

Over the past year the Panel have received presentations and made recommendations on the following:

#### Historic England 'Carscape-The Heritage of Roads'

The Panel are acutely aware that Highways England is not starting with a blank canvass. Much of their work is associated with the upgrading of historic routes and often decisions made many decades earlier either provide opportunities or constraints to good modern design. Whilst much of our road architecture is not currently considered to be of historic or design value this is not exclusively the case and there are lessons to be learned from historically significant and often well designed infrastructure. This means that an understanding of the history of UK road design and associated heritage is valuable and Historic England provided a useful introduction to this subject.

Historic England observed that how road users are engaged in thinking about the transport heritage around them could be better. They also noted that segregation between different road user groups is diminishing in some cases and this appears to encourage better driving and can also provide opportunities for improved design and

reduced impact on the historic environment. Historic England noted that it was very hard to protect old layouts, traffic signs and street furniture that are in active use, however some old signs have been listed and others are preserved in museums.

#### Design Council CABE 'A design-led approach to infrastructure' (Design Council, November 2012)

This presentation demonstrated how design can be put at the heart of infrastructure development. The approach set out 10 Design Principles which the Panel discussed and which led to the development of a new overarching set of Design Principles which will be adopted by Highways England.

The Panel noted that all too often design principles miss the historic element. Whilst much of the Strategic Road Network is based around historic routes few design principles relate to this.

Whilst many people think of our Strategic Road Network passing through the countryside in fact much of it sits alongside or links critical urban areas where there are particular design challenges and any guidance should specifically reflect the urban environment. Additionally, guidance needs to take into account the impact of technical innovation i.e. electric vehicles, communication and satellite navigation, etc.

The principle of health and safety cannot be ignored. That is, a health and safety design principle will be a necessary part of any design guide that the Panel may influence. At both Crossrail and the Olympic Delivery Authority health and safety was integral to good design.



## Appendix B: Maintaining an understanding of wider Highways England work and external best practice

The Panel recommended:

- Highways England develops a high level guide to good design, which would take account of good practice across a range of linear infrastructure assets in England, Europe and beyond.
- Highways England investigate the HS2 Landscape Design Approach which is dealing with many of the same issues that Highways England will face e.g. different landscape character areas across one route demanding several different design strategies.

### The Chartered Institute of Highways & Transportation presented (November 2015) 'Street Design for All'

This presentation emphasised that roads are actual places in themselves and not just somewhere to move through. The Manual for Streets doesn't apply to trunk roads and arguably it should. The presentation also noted that road signs could be a more regular form, the roadside should be less cluttered, motorway service areas should be better designed and there should be further continued development training for designers and contractors.

The Panel supported the thoughts and noted that many motorway service areas are also very poorly designed which could be attributed to the fact that many have never been rebuilt or have developed in a very ad hoc manner. The Panel have identified this as an area of future work and have asked for a further discussion with the Highways England Estate's team who are responsible for the management of in hand and tenanted service areas.

Similarly the issue of the maturing 'soft estate' and the value of green and blue infrastructure were raised.

The Panel recommended:

- Highways England should establish an objective of auditing and removal of road clutter in conjunction with any resurfacing works.
- A review of the design outcomes and opportunities associated with the soft estate including tenanted services areas.

### Highways England - lighting technology and lighting operation

Road lighting is one of the key elements of road design. It is important in terms of road safety but can also play a significant role in how well a road sits within the landscape and the impact that it has on surrounding communities, wildlife and road users. It also uses considerable amounts of energy and improvements could play a significant role in carbon reduction. The Panel were very supportive of Highways England's project to implement new technology in this area. The Panel supported the principle of challenging whether lighting was required, the introduction of smart dimmable lighting, the introduction of light-emitting diodes into lighting as existing lighting comes to life end as well as all new lighting schemes.

### CPRE 'Night Blight'

CPRE has recently released a report and map of light pollution across England. This is a dataset that could feed into planning for RIS2.

CPRE and other partners have an aspiration to increase the number of dark sky areas which can enhance the environment in rural areas but can also play an important part in providing dark areas near our conurbations. They are also important for wildlife and often a highly lit road can be the most obtrusive feature in what is otherwise a dark sky area.

In terms of international best practice it was noted that the Netherlands is aiming for its road and water infrastructure to be energy neutral by 2030. The future of autonomous vehicles could reduce the need for roads to be lit as they can rely on technologies such as radar to avoid each other.

Discussions were had over light pollution from up lit buildings and how much reflected from the ground/buildings. This would depend on the power of the light and the road surface/building material. Airports have lower level of lighting, and Highways England noted that research is being done to enable the review of the DMRB.

The Panel also discussed the need to improve the design of lighting structures and that flexible standards are required in order to respond effectively to specific circumstances and landscapes as well as the different standards that might be required for NMU's.

The Panel recommended:

- Highways England consider how to set and deliver this kind of challenge through the review of the DMRB and how to set clear expectations in terms of future schemes.
- Highways England consider speeding up the replacement of lighting focussing on environmentally sensitive areas through making environmental designations a driver/focus for switch-off initiatives.

## Appendix C: Panel comments on Expressways

### Good road design is:

#### Innovative

- A high technology, low impact philosophy would suggest that loops might be less intrusive than radar columns.
- Greater thought and mention is needed of the future potential impact of autonomous vehicles and adaptability for the future of travel is needed.
- The Panel suggested that Highways England use design competitions to foster new and innovative approaches to the design of Expressways.

#### Inclusive

- The Panel were keen to see distinct proposals on designing for non-motorised users and communities and that the 2+1 design should not be discounted as a design solution where appropriate. Greater consideration for cycling and walking in expressway design development is essential.
- Highways England were encouraged to seek community input and speak to local community organisations to get their input and insight on this road typology.
- As well as the limited mention of non-motorised users, it was noted by the Panel that the Expressway technical requirements made no mention of the impact on those communities alongside. This impact relates to noise, design and that the severance of traditional routes could severely affect local communities.

#### Makes roads safe and useful

- The Panel focussed on the function and features of the Expressway emergency refuge area, highlighting irregularities and clutter, and drew attention to the need for careful consideration of rest area provision.
- The design of emergency refuge areas was seen to be very prescriptive and detailed compared to the simple instructions for grade separated junctions.
- Concern was also raised about the length of emergency refuge areas, as currently they cannot accommodate a broken down HGV and the recovery vehicle and there is concern over the apparent lack of flexibility to respond to sensitive (specific) locations.
- More performance based standards recommended.

#### Visually responsive & makes roads understandable and responds to their context

- The impact on landscape character of straightening out roads needs to be considered and there is a need to reflect the local landscape and especially sensitive landscapes.
- Not all Expressways will be rural and therefore thought should be given to urban and semi-urban interventions, with links with public transport provision and linkages with existing structures such as shops, petrol stations etc. needing to be considered.
- The way in which roads of Expressway standard are to be used needs to be intuitive and should not rely on branding.

#### Environmentally sustainable

- The Expressways guide was considered a good opportunity for the Panel to give greater priority to the environment/sustainability. The Panel felt the Expressways draft guidance to be light, particularly regarding environmental design, and that more guidance is needed, emphasising the ambition for environmental net gain in the principles.
- It was felt that the consideration of design features was too highway orientated with little consideration of wider issues e.g. impact of drainage, lighting and noise. Quieter surfacing was recommended, as was the omission of the solid concrete median barrier, which is regarded as being less permeable for both water and wildlife, but the benefits of a low maintenance central median were recognised.
- The soft estate was not well enough explored and more could be done to root Expressways locally, with better access requirements for maintenance and biomass harvesting.
- Links to the key performance indicators, particularly biodiversity, need to be stronger. Engineering and place based, multi-functional 'green infrastructure' warranted inclusion. The aesthetic contribution could have a higher profile and there should be consideration for how to maintain the soft estate so it is still visually attractive in 20 or more years time.



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