

Effective Governance of Bridge Management: The UK Example

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Abstract

The paper describes the various levels of national and local government interest in the management of the United Kingdom's bridge stock and the governance structures that are in place to support bridge owners in achieving a consistent and cohesive approach to bridge management. The respective roles of the three key bodies, CSS Bridges Group, the UK Bridges Board and the Bridge Owners' Forum, are reviewed before identifying the basis in which they complement each other and the net benefit gained from the existing arrangement. Special attention is given to the identification and management of bridge related research to illustrate the advantages of a coordinated approach. Finally, suggestions are given for possible future improvements to ensure that the management of the UK's bridges remains as effective as possible.

Introduction

In line with most countries, the United Kingdom has many interested parties when it comes to the management of the nation's bridge stock. Owners include national government for the motorway and trunk road network, a large number of local authorities (large and small) for other primary routes and local roads and many other public and private owners. Furthermore, the day to day practical elements of bridge management are often in the hands of agents who could be either public or private sector bodies.

There is also a wide range of stakeholders with a keen interest in ensuring that the highway network remains safe, serviceable and sustainable, including the travelling public, public transport operators and freight organisations.

With the emphasis shifting from new or replacement bridges, and strengthening only through significant intervention, to more demanding but robust principles of management, monitoring and maintenance, most private sector consultants and contractors are interested in providing an holistic service as managing agents.

There is further interest from the academic sector with regard to research and development initiatives.

How, then, can all these interests be co-ordinated? How can strategy and policy be successfully promulgated to all parties? How can local issues be tested and channelled to the

appropriate body? And, how can research into theoretical analysis, materials behaviour and management systems be targeted to the requirements of bridge owners?

In the UK, this has been achieved by establishing a number of groups: the Bridges Board to deal with high level policy, strategy and funding issues; the CSS Bridges Group and a network of Area Bridge Conferences providing a forum for local authorities; and the Bridge Owners' Forum focussed on developments at practitioner level and dealing with research initiatives.

This paper will explain the background and composition of the various groups and how they communicate and interact to give a cohesive structure in which all aspects of bridge management can be optimised and effectively addressed to the net benefit of all interested parties. The views herein are those of the author and not necessarily those shared by his employer, the members of the CSS Bridges Group or the members of the UK Bridges Board.

Geography and Administration

The United Kingdom (of Great Britain and Northern Ireland) is actually four countries: England, Scotland, Wales and Northern Ireland. Occasionally we might be known as *The British Isles* but this refers to the same four nations plus an independent state, Eire. For the purposes of this paper, Eire has not been included in the areas that are being described.

The UK has a population of some 60 million people and an area of about 94,000 square miles (or 243,500 square kilometres). This gives a density of some 630 people per square mile of the land mass.

In terms of Government, all four countries are part of the monarchy of Queen Elizabeth II and are governed to a greater or lesser extent by the Parliament and the British Government based in London. For England, this is the only central administration but the other three countries have had powers devolved in recent years. Wales has a Welsh Assembly, Scotland and Northern Ireland have respective Executives although each has a slightly different legal framework and range of powers.

Each Country has effectively both a national road network and a local road network. The national network comprises all motorway and trunk roads which are predominantly strategic and high speed. These roads are owned and managed by the national governments, including the formulation of policy and the setting of budgets for both capital improvements (which includes major maintenance) and routine maintenance and management of the infrastructure. A Government Minister, or Secretary of State, manages a Department (or Ministry) with these responsibilities. For example, in England, the Secretary of State for Transport, together with a number of junior ministers runs the Department for Transport. Most of the network management responsibility, however, is discharged through the Highways Agency, a distinct body with a reasonable degree of autonomy.

There are two principal exceptions as far as the strategic network is concerned: Firstly, there are 8 DBFO Companies (Design, Build, Finance and Operate) which have long term (up to 30 years) contracts with Government for full responsibility for all management, maintenance and improvement of a specific route.

The second exception is major estuarial long span crossings which are either effectively established as Highway Authorities in their own right or, again, are privately owned and

operated. The management of such crossings is generally funded from toll revenue. These facilities include tunnels as well as bridges and an *ad hoc* support group has recently been established to cover areas of mutual interest, mostly associated with operational matters such as traffic control and toll collection systems. This group is known as the Big Bridges Group.

Local roads are owned and managed by Local Highway Authorities (also known as Transport Authorities since legislation introduced in 2000) which are the various types of unitary or first tier Councils, all of which are democratically elected bodies.

England

England has 24 County Councils, 47 Unitary Councils and 36 Metropolitan Councils. Counties retain a two tier system of Local Government, with the lower tier being District Councils which have no highway powers. Unitary Councils have all the powers and duties shared by Counties and Districts in two tier areas. Metropolitan Councils have similar powers and duties but cover densely populated cities or urban conurbations. The exception to these definitions is London, the capital city, where strategic roads are managed by the Mayor through an organisation known as Transport for London (TfL) and local roads are the responsibility of 33 London Boroughs who are also Highway Authorities.

As well as these organisations the country is split into 8 regions (excluding London) and within each region, there are 3 distinct governmental bodies:

Government Offices:	Responsible for managing central government policy and strategy at a regional level.
Regional Assemblies:	Responsible for regional planning strategy and for coordinating the network of local authorities within the region.
Regional Development Agencies:	Responsible for leading and implementing regional economic development initiatives.

Scotland

Scotland has a devolved government, the Scottish Executive, which discharges its highway functions through an agency, Transport Scotland. This body manages all of the trunk road and motorway network with local roads, including some of the Primary Route Network (PRN), being the responsibility of 33 Unitary Councils of varying size and urban/rural mix. Incidentally, Scotland has its own legal framework and, under Scottish law, there are no “Highway” Authorities but the Councils are technically “Road” Authorities.

Wales

The devolved administration in Wales is the directly elected Welsh Assembly which has powers for the strategic motorway and trunk road network. There is no “governing agency” but various lengths of road are managed through Contracts. Local Government in Wales is single tier with 22 Unitary Councils of varying size and rural/urban split.

Northern Ireland

All roads in Northern Ireland are managed by the Northern Ireland Roads Service, an Agency under the Department of Regional Development within the new devolved administration. Although none are highway or road authorities, there are presently 26 Councils in the province but plans are currently being considered to reorganise into a smaller number of between 7 and 15 Councils. A decision on the powers and duties of the new bodies is also

under review and it is possible that a smaller number could take on Highway Authority responsibilities.

Europe

The United Kingdom is a full member of the European Union and, as such, has to comply with all directives, usually leading to harmonisation across member states. Whilst it is accepted that this is a worthy intention, there is an argument that the UK tends to remain somewhat isolated in terms of benefits to be gained by further engagement in significant research programmes. This is an area in which opportunities for improved working still remain to be grasped.

Traditional Support Groups

In the decades that followed the Second World War, the United Kingdom entered into the planning and construction of major infrastructure improvements including the motorway programme and bypasses on the trunk and primary road network. This was coordinated by central government's various Transport Ministries or Departments in which a strong team was established with a high level of expertise. Detailed guidance in the form of Technical Memoranda was made available to all engineers, in both public and private sectors, engaged in the design programme. At the same time, a number of software packages (which required the use of main frame computers, usually on overnight runs) for design and analysis were developed and managed through this central team.

As the road building programme developed in the early 1970s, a number of regional Road Construction Units (RCUs) were established, normally linked to the traditional County Council Highway Departments where RCU Sub-Units were accommodated alongside Local Authority staff. This enabled the cross fertilisation of ideas and best practice all of which emanated initially from the centre.

The early 1990s saw the Government establish the Highways Agency as a delivery body for the management of the motorway and trunk road network, leaving the Department for Transport (or its equivalents) to concentrate on higher level policy and budgetary considerations. Technical advice was transferred to the Agency.

County Councils themselves had been set up as early as 1889 and the post of County Surveyor became established. Little changed in the various reorganisations of local government until 1994 when a number of unitary authorities came into being. It was at this time that financial and political pressures led to some County Councils either restructuring to combine highways, planning and other related functions or to externalise large elements of their design capacity by means of new contracts with the private sector and transferring staff. Both of these events meant that there was a tendency towards reduced or limited capacity either in smaller Unitary Councils or in those in which the majority of staff had been externalised.

CSS Bridges Group

From the outset of the introduction of the post of County Surveyor, a support group had been established: The County Surveyors' Society. This remains in place today although is now formally known by the initials, CSS. Within CSS, there are a number of committees and working groups, with one of the former being the Engineering Committee below which sits one of the latter, the CSS Bridges Group. Below Bridges Group sit 8 Area Bridge Conferences (ABCs) conterminous with the English regional bodies. ABCs are open to all

local authority bridge managers in that particular region. There are also equivalent conferences in Wales (CSS Wales) and Scotland (SCOTS), and the London Boroughs and TfL also enjoy a working group, LoBEG (or London Bridge Engineers' Group). The inter-relationship between Bridges Group and the ABCs is both "top down" with the capability to cascade information to every local authority in the Country, and "bottom up" giving the opportunity for any bridge manager to bring issues to a higher level and ultimately to challenge nationally agreed policy.

Bridges Group meets 3 times a year and arrangements are normally made for meetings to follow soon after the CSS Engineering Committee and for Area Bridge Conference meetings to be held a few weeks later to facilitate the cascading of information. The chairman of Bridges Group is a full member of CSS and a member of its Engineering Committee.

Recent Developments

For most of its early life, CSS Bridges Group was concerned with issues around bridge design and construction and meeting agendas consisted mainly of technical matters.

Things started to change in 1991 when the UK Government, in line with a European Union (EU) directive but derogated until 1999, embarked on a major programme of bridge assessment and strengthening in order to bring the bridge stock up to a European standard of 40 tonne vehicles and 11.5 tonne maximum axle load. Initially for the Primary Route Network, but later extended to local roads, the programme was funded centrally through grant allocations to local Highway Authorities against annual bids made through an individual authority's Transport Policy and Programmes (TPP) submission. It was at this time that Bridges Group opened an invitation for central government staff to attend meetings as well as developing much increased liaison through a number of specific meetings on the subject of the work in hand.

Up to the early 1990s, Bridges Group had also extended membership to central government and/or the Highways Agency and also to the largest of the private bridge owners, British Rail, and its privatised successor organisation, Railtrack (now renamed Network Rail). Bridges on disused railway lines were initially the responsibility of another body, British Rail Property Board who also attended meetings.

As far as road-over-rail bridges are concerned, the ownership is not always obvious. A rule of thumb says whichever piece of infrastructure was there first, the other party built the bridge and is therefore the owner. For bridges carrying highway loading, Railtrack also embarked on an assessment programme known as Bridgeguard 3 which was to be funded, in part, by the local highway authority but using government grant. This led to problems of prioritisation of both projects and funding.

All of above (with changes within the Devolved Administrations, the Highways Agency, Local Government, externalisation of services, privatisation of rail companies and a major investment programme) presents a picture of a professional discipline starting to fragment at a time when there was a huge need for coordination and cooperation. Rather than all parties meeting together, there was a very large number of separate meetings and information and/or decisions had to be communicated to other groups, often at second or even third hand.

As well as this predicament specifically with bridges, there was a parallel level of concern over road maintenance funding and management in the round.

The Solution – The UK Roads Liaison Group

Like solutions to many problems, the answer here was obvious: simply arrange for all appropriate parties to get together to share their perspective of the various issues and agree a plan of action. But, as in most cases, the difficult part is not the “what should happen” but the “how do we get there”.

In this case, the initiative was seized by civil servants in the Department for Transport who drew up the concept of an over arching liaison group with a number of boards concentrating on specific professional disciplines. This was the genesis of the UK Roads Liaison Group and its four Boards: Roads, Bridges, Lighting and Traffic Management. (NB It is accepted that the last of these is somewhat anomalous in that the first three are dealing with the hard infrastructure of the network whereas the fourth concerns itself predominantly with the end user, the traffic using the network. This debate is ongoing and there has been a recent move to recast this Board into one of Network Management, thereby embracing the emerging technology around intelligent transport systems etc.)

The Roads Liaison Group is chaired by a senior civil servant in the Department for Transport. The precedent has been established for specialist sub-groups to sit below Boards but, to date, this has only happened with the Roads Board. The simple structure is shown below (Figure 1):

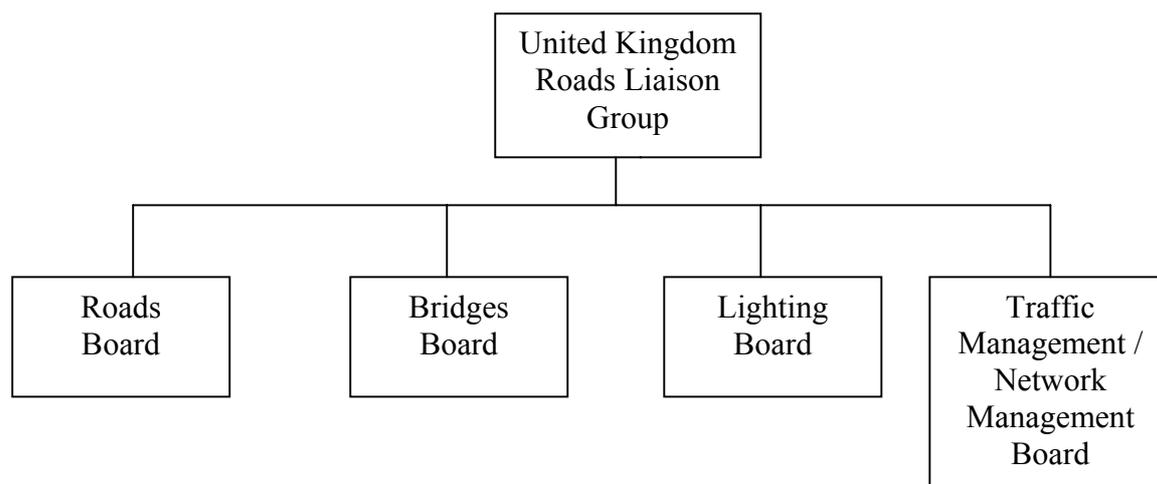


Figure 1. The UK Roads Liaison Group and Boards

The function of the secretariat, and that of administration of meetings is currently also held by the DfT.

The full membership of Bridges Board is as follows:

Department for Transport	Senior civil servants with responsibility for Road Maintenance policy and funding – the Department presently also acts as the secretariat.
Highways Agency	Senior representative
CSS	Members of the CSS Bridges Group, including a representative of the Metropolitan Authorities.

CSS Wales	Senior Bridge Engineer and Chair of Conference
SCOTS	Senior Bridge Engineer and Chair of Conference
Transport Scotland	Senior Bridge Engineer
Welsh Assembly	Senior Bridge Engineer
Northern Ireland Roads Service	Senior Bridge Engineer
Transport for London	Senior Network Manager
LoBEG	A London Borough Bridge Engineer
London Underground	Senior Bridge Manager
Network Rail	Senior Bridge Manager
British Waterways Board	Senior Bridge Manager

The Board meets 3 times a year. All representatives are empowered to act with the authority of their employer and/or parent organisation. The chairman, along with counterparts from other Boards, is also a member of the UK Roads Liaison Group thereby enabling a communication link to and from Boards to the RLG.

The Bridge Owners' Forum

Along with the CSS Bridges Group and the UK Bridges Board, the third body in the triumvirate of bridge groups is the Bridge Owners' Forum. Established in 2000 through the initiative of Professor Campbell Middleton of Cambridge University, the Forum includes most UK bridge owners, (often the same individuals who also represent their organisation on the Bridges Board), including a representative of the UK Big Bridges Group, and with Professor Middleton in the Chair, the academic sector is well represented. The Board meets two or three times a year and has 3 key strands of work not routinely covered by either CSS or UK Bridges Board:

1. To identify areas of the industry that would benefit from additional research, and to undertake preliminary appraisals of proposals.
2. To take an objective view of similar proprietary methods and/or techniques in order to arrive at impartial advice to bridge owners.
3. To act as the "radar" of the bridge profession whether in terms of newly identified problems, new initiatives, new sources of funding, or connection with international bodies.

The forum presents an annual report to the UK Bridges Board on its work and activities.

Complementary Functions

At first sight, and this is a criticism that has been made in the past, there is a risk of duplication or even triplication of roles and responsibilities between the three groups. There has also been a perception (and even an allegation) that little of value is achieved and that each meeting could end up with the same people talking about the same subject matter.

Whilst acknowledging that there is indeed a risk that this could be the outcome, the diagram below (Figure 2) demonstrates the inter-relationship between the groups.

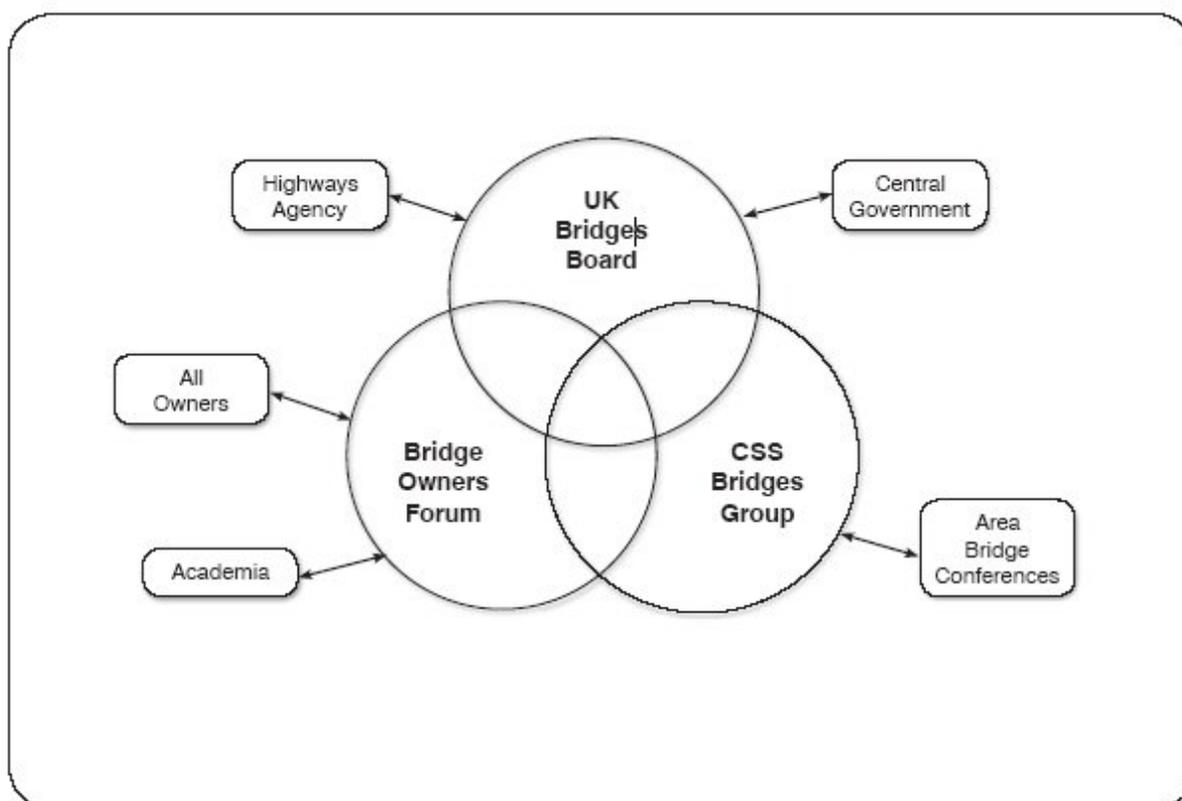


Figure 2. Inter-relationship of Bridge Groups

The UK Bridges Board concentrates on high level strategy, policy and funding issues whereas CSS Bridges Group covers the practical implementation of bridge management issues. The Bridge Owners' Forum offers a degree of independence to judge objectively emerging developments in research.

As well as the above, there are wider and softer benefits of this increased level of liaison between all relevant parties. To fully understand this position, one needs to be reminded of the degree of fragmentation and the opening schisms that were starting to take a hold in the bridge management profession in the middle of the last decade. These points, and the reasons behind them, have been described above and the net effect was one of perception of suspicion concerning the motives of the various parties at a time when closer working should have been a priority. Since 2000, that suspicion has started to be replaced by its dictionary opposite, trust. That starts with improved understanding of others' positions, the requirements of their senior managers and stakeholders, and the cultures of the respective organisations. The mechanism through which this trust is achieved and delivered is part of the role that each group should have as part of its *modus operandi*.

It is accepted that this outcome is only partly delivered at this stage and remains an aspiration of the author. It is clear, however, that this is "work in progress" and the direction of travel is positive.

Research

Bridge related research projects can be instigated by a number of different bodies and be based on many different needs. Examples might be the use of a new material or construction techniques having been developed by a private company, the development of analytical tools to enhance empirical methods of establishing structural behaviour or changes to standards of “finishings” such as joints, parapets or waterproofing.

Similarly, there are many funding streams which can be tapped into to pay for research. There are research budgets within central government through the Department for Transport and the Highways Agency in England and the devolved administrations in Scotland, Wales and Northern Ireland. The CSS has a “Research Club” funded by contributions from individual members and from this, budgets are identified for specific projects. Private bridge owners also have research funds. Maximum benefit can be gained from pooling funds and forming a partnership to promote and administer the project.

Although many research projects have been successfully delivered in this way, there is still room for improvement by structuring the process on project management principles, clearly identifying key roles and responsibilities. The various strands of work in this context are shown in the diagram below (Figure 3):

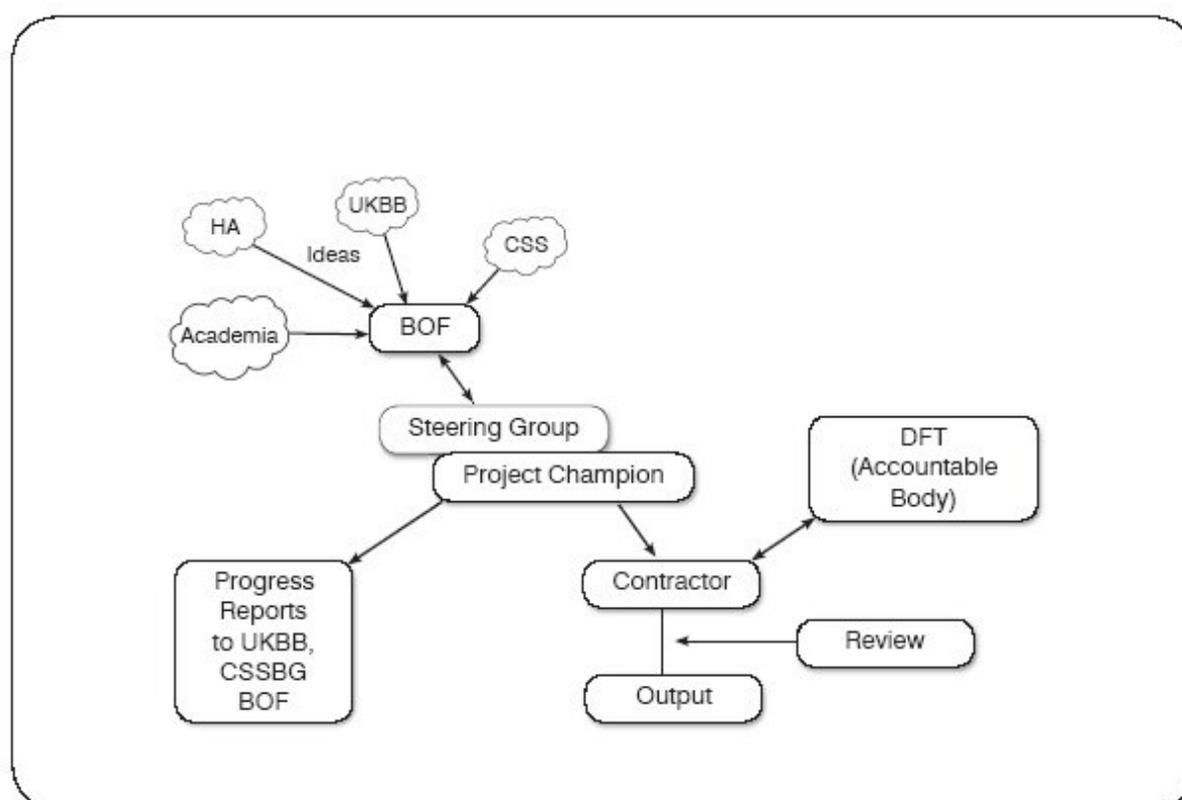


Figure 3. Model for managing bridge related research

The key to a successful research project is the definition of roles and the identification of key responsibilities. Project management principles should be employed with a project manager working for the “contractor” and a project “champion” representing the client interests. A steering group made up of all interested parties can be used to make decisions or changes or modifications to the original specification or to review early results or outputs. Other roles

are the Accountable Body which must administer funding and, in this case, the role of the Bridge Owners' Forum which should act as a filter and conduit for research proposals.

Possible Further Improvements

Whilst excellent progress has been made over the last few years, it would be wrong to assume that the present position is as good as it gets. Indeed, the DfT instigated a formal review in 2006 to see if the principles behind the establishment of the UKRLG and its Boards were being applied as intended and to insure that the output from the various bodies remains both effective and adding value to the business of infrastructure management. The review concluded that there was a benefit in continuing with the present arrangements although recognised that there was room for improvement in the methods of working, the interaction between Boards and the possible conflict of interest in having one of the key partners also responsible for the secretariat and administrative functions. Plans are being prepared to see if this function can be passed to a professional body which does not have a role in the existing arrangement.

Other areas for consideration include further work on developing an improved mutual understanding of the issues facing various bridge owners and the need to more clearly identify areas of possible duplication between groups. The fact that a number of individuals sit on, or at least regularly attend, all three groups should help this aspiration.

Perhaps due to the nature of its geography, the United Kingdom has a tendency towards insularity and not looking at opportunities at a European and international level. With some notable exceptions, this is generally true within the field of bridge management and this is another area where further opportunities need to be explored. European research funding is a source which seems to be only occasionally accessed but there are also lessons to be learned from international colleagues who are inevitably to be faced with the same sets of problems and challenges as we have to deal with in the UK.

Conclusion

Although the numbers of bridge owners and other related stakeholders in the UK may seem excessive, it is clear that some degree of liaison and cooperation is essential if the bridge stock is to be maintained and managed as effectively as possible. The arrangement of groups and supporting networks, as described in this paper, ensure that this objective is achieved, at least in part. As with most other initiatives of this type, there will always be areas in which improvements can continue to be made, particularly in the research field, and all parties engaged in bridge governance are committed to this ethos of continuous improvement.