CRISP Consultancy Commission 00-23

An Action Plan for the Economic and Social Research Council

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Executive summary

During 1999 the Construction Research and Innovation Strategy Panel (CRISP) worked on selected topic areas from its Strategic Priorities 1999. Task Groups were formed and reports were prepared. All contained recommendations about the industry's research needs. The recommendations were then drawn together into a series of five topic-based Action Plans. These covered:

- Meeting Customers' Needs,
- Design,
- Sustainable Construction,
- Motivation & Communication,
- the Construction Research Base.

An additional (sixth) source of recommendations on sustainable construction was a report prepared for CRISP entitled 'Construction for Sustainable Development: research and innovation needs', CRISP Commission 99/15. Further topics have yet to be addressed by CRISP – these include the construction process, components, technology and performance.

This report takes the recommended actions from these six sources, maps them onto the ESRC's Thematic Priorities 2000, and analyses the results of the mapping exercise. Equivalent reports have been prepared for the Department of Environment, Transport and the Regions, the Engineering and Physical Sciences Research Council, and the Highways Agency. Table 5.1 summarises the construction-related research areas supported by these bodies, and table 5.2 lists all CRISP 1999/2000 Task Group recommendations and maps them against the research priorities of each funding body.

As Table 3.1 on page 10 shows, a total of 125 recommendations were made by the six sources used for this report. 44 (just over one-third) are relevant to ESRC, of which 6 are general recommendations while a further 38 map directly onto the ESRC Thematic Priorities. The remaining 81 do not map onto the Thematic Priorities.

In terms of the relevance of each Task Group's recommendations to ESRC (again as shown in table 3.1), the percentage of recommendations that map onto the Thematic Priorities is as follows (in decreasing order):

CRISP 99/15 report	84%
Construction Research Base	60%
Sustainable Construction	33%
Meeting customers' needs	30%
Motivation and communication	16%
Design	8%

In terms of the thematic priorities which attract the most recommendations, these are as follows (in decreasing order):

Theme 2 Environment and human behaviour	23
Theme 7 Work and organisations	6
Theme 1 Economic performance and development	3
Theme 4 Knowledge, communication and learning	3
Theme 5 Lifecourse, lifestyles and health	3
Theme 3 Governance and citizenship	0
Theme 6 Social stability and exclusion	0

Six general recommendations made by the Task Groups are relevant to ESRC. These fall into three categories:

The importance of interdisciplinarity

Here the detailed recommendation is:

- Encourage EPSRC/ESRC and other key research sponsors to communicate more widely their current support for interdisciplinary research teams, since such teams are necessary to capture answers to interdisciplinary problems.

The importance of effective dissemination of research

Here the detailed recommendations are:

- Provide support for communicating research efforts to all stakeholders.
- Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.

- Provide funds for the synthesis of research outputs and highlight issues from range of sources into a form usable by the construction industry.
- Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.

Sustainability as a general criterion for research support

Here the detailed recommendation is:

- Develop appropriate sustainability tests for assessing priorities and research projects. Focus on developing issues and research issues of interest to business, that impact on the triple bottom line.

As the recommendations arising from CRISP Task Groups demonstrate, the sector's research needs range from scientific and engineering research in support of the construction industry to economic and social research about how buildings are used over time. The construction and use of buildings both impact on the environment, and improved design, construction and management methods are vitally important to the achievement of sustainable development. As this research mapping exercise shows, much of the research which is required to support and improve our construction of, management of, and interaction with, the built environment is relevant to the thematic priorities of the ESRC. The ESRC is accordingly invited to note the findings of this report, and to review its themes and priority areas accordingly.

1 Overview and sources of the recommended actions

During 1999 CRISP worked on selected topic areas from its Strategic Priorities 1999. This resulted in a series of task group and other reports and recommendations being taken to CRISP's Awayday 2000. The Awayday broadly endorsed these reports and CRISP collected together the various recommendations in a series of five topic-based Action Plans. These addressed: Meeting Customers' Needs, Design, Sustainable Construction, Motivation & Communication, and the Construction Research Base. An additional (sixth) source of recommendations on sustainable construction was a report prepared for CRISP entitled 'Construction for Sustainable Development: research and innovation needs, CRISP Commission 99/15, that was not available at the Awayday. All of the six reports are available on the CRISP web site: www.crisp-uk.org.uk.

This report 'maps' the recommended actions from the six existing CRISP sources onto the ESRC's Thematic Priorities 2000 taken from the Council's booklet of the same title.

It should be noted that, at the time of writing (December 2000), other topic areas are being addressed by CRISP, but these have yet to result in action plans and recommendations. Once they do so, and as the ESRC's programmes evolve, this mapping exercise will need to be updated to reflect both sets of changes. It may also be possible to add other industry recommended actions for research arising from, for example, the Construction Associate Programme and/or Built Environment & Transport programmes of Foresight; and perhaps those of the EPSRC-funded university Built Environment Research Network which has conducted its own Foresight-style exercise.

It is an unfortunate consequence of the way in which this report has had to 'map' both the Thematic Priorities and the recommended actions of CRISP Task Groups, that it appears to place topics into isolated 'silos' or boxes This is certainly not the intention of this report, but no feasible alternative way to carry out the analysis has been identified.

A brief description of the CRISP Action Plans follows in the rest of this section, while section 2 of the report describes the mapping exercise. Section 3 provides an analysis of the findings from the mapping exercise. The 'maps' themselves are given in Section 4 of the report. Section 5 lists the Task Groups' recommendations that do not map onto ESRC's priorities.

1.1 Meeting Customers' Needs Action Plan

This CRISP Topic Area Action Plan was based on a Construction Clients' Forum workshop held in January 2000 in collaboration with CRISP. Its aim was to identify key research and innovation actions to deliver customers' needs; to develop specific research and innovation projects; and to identify appropriate mechanisms to take these forward. At the workshop, each discussion group worked on one of the five priority areas set out in the CCF's Research and Innovation Strategy:

- Construction as a Product
- Re-integrating the Team
- Barriers to Innovation
- Costs of Ownership
- Right First Time, Every Time

to which was added the needs of Small and Occasional Clients. Actions arising are summarised in the table below. The total number of these is 23.

In terms of implementation, the CCF workshop did not identify mechanisms or people for taking its recommendations forward. Nor did it assign priorities to the actions it recommended.

Meeting Customers' Needs: summary recommended actions
1. Define the overall process of 'construction', from formulation of business need best met by construction activity through to successful operation [9 detailed actions]
2. Improve client awareness of existing research, with measures to improve up-take and application [4 detailed actions]
3. Re-assess balance of research spend between 'generating new knowledge' and 'application of new knowledge' [3 detailed actions]
4. Investigate role of insurance, e.g. for latent defects, against perceived risks of innovation [3 detailed actions]
5. Redefine role of 'professional advisors' to clients [2 detailed actions]
6. Investigate increasing need for up-dating of professional skills [2 detailed actions]

1.2 Design Task Group Action Plan

This CRISP Topic Area Action Plan was based on the work of its Design Task. CRISP identified that research into design had received relatively little attention in recent industry initiatives. Over a six month period of intensive discussion, the Task Group developed a wide strategy, fuelled by members' papers, and a specially commissioned research review of the field. The Task Group concluded with a delegate workshop to test its propositions. This led to an extended set of 39 recommended actions, which are summarised in the table below.

Design Task Group: summary recommended actions
1. Raise the quality of the built environment by placing occupancy criteria centre-field [10 detailed actions]
2. Establish sectoral frameworks for design quality supported by evidence-based research [7 detailed actions]
3. Initiate quick response project-linked research suited to the needs of industry and occasional clients [3 detailed actions]
4. Encourage widespread educational reform to support greater quality in the built environment [8 detailed actions]
5. Develop a shared language for design, releasing widest value contribution from all industry and society stakeholders [11 detailed actions]

1.3 Sustainable Construction Theme Group Action Plan

The CRISP Sustainable Construction Theme Group has been in place for some two years or so. It encourages research and innovation (R&I) to support improvements in the sustainable performance of the UK construction industry. The ultimate aim of this R&I, in the longer term, must be to maximise the industry's contribution towards global sustainable development. The phrase "Think globally, act locally" provides a succinct guide. The Group's task is to translate this into practical actions for the construction industry; acting locally here implies not only individual or company-based action, but collective sectoral action to achieve transformation of the construction market place.

The Group has commissioned a number of reports to help CRISP support this task and respond to the changing industry environment, in particular through the Egan '*Rethinking Construction*' agenda. The group seeks to promote the knowledge in the reports not just to key decision makers in leading industry-related research programmes, but also to those who have influence and interest in providing a more sustainable, effective industry and thereby a more sustainable global environment. Among these, the group has promoted and would wish to promote further its work to groups like the Movement for Innovation (M^4I) and the Laing Focus Group, in addition to other CRISP groups.

In its *Strategic Priorities* published in April 1999, CRISP identified issues relating to sustainable construction as follows:

> 'Sustainability is an issue of increasing national and global concern and, therefore, a key area for research and innovation. CRISP will continue to work to identify those areas where research could contribute quickly and most effectively and support the aims of industry improvement.'

The Theme Group sought, and is continuing to seek, to identify actions that need to be taken forward and to provide output which is as useful as possible to those who will benefit. In the CRISP Topic Area Action Plan for sustainable construction there were four summary actions shown in the table below, and a total of 15 detailed actions.

Sustainable Construction Task Group: summary recommended actions	
1.	Identify and promote research to develop the tools for greater sustainability and help the business case for sustainability [4 detailed actions].
2.	To co-ordinate the efforts of the research funders to include Sustainable Construction research and innovation at an appropriate level in their programmes. This is to support the construction industry and others achieve greater sustainability [4 detailed actions].
3.	To influence the development and promotion of a research and innovation database related to Sustainable Construction to help co-ordinate the efforts of the research funders [3 detailed actions].
4.	To contribute to the work of other CRISP theme and task groups to ensure that Sustainability is integrated with other aspects of the work of CRISP [4 detailed actions].

1.4 CRISP Commission 99/15: 'Construction for Sustainable Development - Research and Innovation (R&I) Needs'

This study on the research and innovation (R&I) needs for sustainable construction develops and builds on the results of the CRISP-funded report 'Sustainable Construction: Future R&I Requirements, Analysis of Current Position' (March 1999). Its aims were twofold:

1. To develop the findings of a previous study for CRISP entitled 'Sustainable Construction: Future Research and Innovation Requirements, Analysis of Current Position' (March 1999), specifically to enable research funders, the construction industry and other stakeholders to identify sustainable construction R&I needs.
2. To identify methods by which sustainability principles can be embedded within generic construction research rather than treated as a stand-alone topic.

The study was conducted through consultation with the industry, including:
- Development of a questionnaire designed to identify priority areas for research and innovation;
- A consultation workshop to further define priority areas;
- A meeting with key funders designed to develop R&I actions to support these priority areas.

Three main barriers to adopting a more sustainable approach were identified as:
- Lack of awareness of the issues;
- Financial pressures;
- Industry culture.

Eight objectives for research and innovation were identified, shown in the summary table below, further subdivided into 19 themes or items.

The report states that in order to achieve the R&I Objectives, and overcome the identified barriers, a mixture of new research and more effective dissemination of existing research is proposed. Sustainable construction research needs to be interdisciplinary and collaborative with end users. More critically sufficient attention must be paid to the communication of research or innovation findings. This is to allow construction practitioners take pragmatic business decisions that reflect the current best practice understanding of how the industry can contribute to sustainable development.

CRISP Commission 99/15 Construction for Sustainable Deveopment: research and innovation needs
1. Increase the effectiveness of communication and dissemination of best practice and research outputs [expanded as 2 themes]
2. Prove and inform the business case for the construction industry to contribute to the aims of sustainable development [expanded as 4 themes]
3. Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach [expanded as 3 themes]
4. Understand cultural barriers in the construction industry and what the most effective drivers are for moving the Construction Industry towards Sustainable Construction [expanded as 2 themes]
5. Develop and interpret Whole Life Costing (WLC) techniques [expanded as 1 theme]
6. Develop techniques and strategies to effectively manage the existing built environment and infrastructure into the future [expanded as 4 themes]
7. Understand and use Supply Chain Management to promote the construction industry's contribution to sustainable development [expanded as 1 theme]
8. Inform and influence decision-making processes of construction industry's Small Medium Sized Enterprises (SME's) [expanded as 2 themes]

1.5 Motivation and Communication Task Group Action Plan

Working from workshops and research material, the Motivation and Communication Task Group has developed a strategy for improved communications and research uptake for CRISP and its stakeholders. The strategy leads to the set of recommended action summarised in the table below. Each summary action is further subdivided into more detailed sets of sub-actions, of which there are 24 in total. The organisations identified as responsible for implementation are listed against each action.

Motivation and Communication Task Group: summary recommended actions	Importance	Timing	Owners
1. Increase learning and knowledge creation and sharing by developing a learning company approach in construction [6 detailed actions]	1st	This year on long term programme	New CIB and others
2. Improve communication activities by better targeting and specific funding [4 detailed actions]	2nd=	This year	CIB, CIC, CRISP, DETR, EPSRC, ESRC
3. Increase the use of intermediaries in communicating research results [3 detailed actions]	2nd=	This year	CIB, CIC, CRISP, DETR
4. Improve the (usefulness of) interaction of people in academia and industry [3 detailed actions]	4th	This year	CIB, CIC, CRISP, DETR, M^4I
5. Develop and implement a CRISP marketing strategy and communications plan [5 detailed actions]	5th	This year	CRISP
6. Compare other industries' and countries experience [2 detailed actions]	6th	Medium term	CRISP, DTI, Universities, Research Councils
7. Develop networks between key stakeholders in construction research and innovation [1 detailed action]	7th	Medium term	CRISP, DETR, DTI, M^4I, Universities, Research Associations, Research Councils

1.6 Construction research base

This CRISP Topic Area Action Plan is based on the work of its Construction Research Base Task Group. The Task Group was established to review the condition of the construction research base and to make recommendations to the CRISP Awayday in March 2000. The construction research base is the national capacity to undertake research relevant to construction. It covers a wide range of disciplines but the primary focus below is on the main construction professions, i.e. civil engineering, architecture, and building etc. Statistics in this area are unreliable and recent accurate data is unavailable. DETR figures (1996) suggest an R & D income in 1994 of £148m: £54m in academia, £75m in RTOs, and £19m in construction businesses, including consultants.

The Group believes that the manifest misunderstanding between industry and the research base is part of a wider issue - there appears to be no organisation responsible for the health of the research base. It identified the need for a champion to speak both for and to the research base and for a simple document describing it and its achievements. The Group's set of recommended actions are summarised below.

The Task Group's over-arching recommendations are that there should be a champion for the research base and that CRISP should take responsibility for that role. While other recommendations can be taken up individually, it would be desirable that they are part of an integrated whole, co-ordinated by the champion. The Task Group looks to the CRISP Executive to determine how best to communicate these recommendations to the research base and the industry and to ensure their implementation.

Summary recommended actions	Priority	Timing	Actors
1. Develop, agree, and oversee the role of a champion for the research base	1st	This year	CIB/CRISP*****, CIC Research College
2. Improve the quality, relevance and accessibility of statistical data on the research base	3rd	This year	DETR
3. Explore desirability and feasibility of developing a set of KPIs for research organisations	4th	Medium term	CRISP, M^4I
4. Encourage companies to develop and focus more beneficial contact with the research base by appointment, for example, of a Director of Innovation	5th	Medium term	CRISP
5. Produce and widely distribute a simple description of the nature, role, activities and achievements of the research base	2nd	This year	CRISP, EPSRC

***** Subject to consultation on new CIB.

2 How the detailed recommendations have been mapped in this document

Section 4 of this report comprises a table or 'map' of the Thematic Priorities identified in the ESRC's Thematic Priorities 2000 publication. Wherever a recommendation from the CRISP Topic Area Action Plans and the CRISP 99/15 report (the six source reports for this report) clearly fits into one of the thematic priorities, it is 'mapped' against that priority in the table. The intention is to present CRISP recommendations in a form to suit the planning needs of the ESRC.

Six general recommendations from CRISP Action Plans relevant to ESRC's support for research have also been mapped as falling within ESRC's remit, and are tabulated accordingly.

In the tables in part 4:

- Column 1 describes the ESRC Thematic Priority under which the Research Council supports research.
- Column 2 lists the source of information of column 1 entries – in this case the ESRC Thematic Priorities 2000 publication.
- Column 3 contains the CRISP topic area Action Plan recommendation.

- Column 4 contains the CRISP topic area Action Plan reference – so the source of each recommendation can be identified
- Column 5 indicates priorities among the recommended actions. 1 = high priority, 2 = medium priority.

For information, the remaining recommendations from CRISP Action Plans are listed in part 5 of the report. These do not map onto ESRC's priority areas.

3 Analysis of CRISP recommendations against ESRC Thematic Priorities

Table 3.1 (shown at the end of this section) presents an analysis of the CRISP recommendations showing how many of them map on to each of the ESRC Thematic Priorities.

3.1 Findings and conclusions from table 3.1

First, two caveats. In interpreting table 3.1, it should be remembered that CRISP has dealt with only certain topic areas; and some areas which may be relevant to ESRC have yet to be addressed. So the present set of CRISP recommendations are skewed towards those Themes that lie within the CRISP topic areas addressed thus far. Second, simply counting recommendations in the way undertaken here, gives each of them equal weight. It therefore gives more weight to those Task Groups that made more recommendations. An additional point is that allocating recommendations to Themes is a subjective activity which might be undertaken differently by a different author. For all these reasons, the findings and conclusions presented here should be viewed with some caution.

The findings of the analysis are as follows:

1. Of the total number of 125 recommendations made by the six sources, 44 (just over one-third) are relevant to the ESRC.
2. Of the 44 recommendations relevant to ESRC, 6 are general recommendations while a further 38 map directly on to the Thematic Priorities.
3. The remaining 81 recommendations do not map onto ESRC priorities.
4. In terms of the thematic priorities which attract the most recommendations, these are as follows (in decreasing order):

Theme 2 Environment and human behaviour	23
Theme 7 Work and organisations	6
Theme 1 Economic performance and development	3
Theme 4 Knowledge, communication and learning	3
Theme 5 Lifecourse, lifestyles and health	3
Theme 3 Governance and citizenship	0
Theme 6 Social stability and exclusion	0

5. Environment and human behaviour appears to attract to the most recommendations because of its inclusion of sustainability as a topic – both the CRISP 99/15 report and the Sustainable Construction Task Group made recommendations about the importance of research into the issues surrounding sustainable development.
6. In terms of the relevance of each Task Group's recommendations to ESRC (again as shown in table 3.1), the percentage of recommendations that map onto the Thematic Priorities is as follows (in decreasing order):

CRISP 99/15 report	84%
Construction Research Base	60%
Sustainable Construction	33%
Meeting customers' needs	30%
Motivation and communication	17%
Design	8%

7. For the same reason as noted under 5. above, the emphasis on sustainable development in the CRISP 99/15 report resulted in most of its recommendations mapping on to ESRC Theme 2 on 'Environment and human behaviour'.
8. Six general recommendations made by the Task Groups are relevant to ESRC. These fall into three categories:

The importance of interdisciplinarity

Here the detailed recommendation is:

- Encourage EPSRC/ESRC and other key research sponsors to communicate more widely their current support for interdisciplinary research teams, since such teams are necessary to capture answers to interdisciplinary problems.

The importance of effective dissemination of research

Here the detailed recommendations are:

- Provide support for communicating research efforts to all stakeholders.
- Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.
- Provide funds for the synthesis of research outputs and highlight issues from range of sources into a form usable by the construction industry.
- Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.

Sustainability as a general criterion for research support

Here the detailed recommendation is:

- Develop appropriate sustainability tests for assessing priorities and research projects. Focus on developing issues and research issues of interest to business, that impact on the triple bottom line.

The built environment is a vital, though sometimes overlooked, element of modern life, with wide implications for both people and the environment. As the recommendations arising from CRISP Task Groups demonstrate, the sector's research needs cover a broad spectrum of topics, ranging from scientific and engineering research in support of the construction industry to economic and social research about how people use and interpret buildings. The construction and use of the built environment have substantial impacts on the environment, and improved construction and management methods are of vital importance to the drive towards sustainable development. As this research mapping exercise shows, much of the research which is required to support and improve our construction, management and interaction with the built environment is relevant to the thematic priorities of the ESRC.

Table 3.1 Summary of number of recommendations against ESRC thematic priorities

	Total number of recommen-dations from the Task Group	General recommen-dations applicable to ESRC	Theme 1 Economic performance and development	Theme 2 Environment and human behaviour	Theme 3 Governance and citizenship	Theme 4 Knowledge, communi-cation and learning	Theme 5 Lifecourse, lifestyles and health	Theme 6 Social stability and exclusion	Theme 7 Work and organisations	TOTAL MAPPING ON TO ESRC THEMATIC PRIORITIES	% OF TASK GROUP TOTALS MAPPING ON TO THEMATIC PRIORITIES
Meeting clients' needs	23	0	0	2	0	0	0	0	5	7	30%
Design	39	2	0	1	0	0	2	0	0	3	8%
Sustainable construction	15	1	0	5	0	0	0	0	0	5	33%
CRISP 99/15 Report	19	1	0	15	0	0	1	0	0	16	84%
Motivation & communi-cation	24	2	0	0	0	3	0	0	1	4	17%
Construction Research Base	5	0	3	0	0	0	0	0	0	3	60%
TOTAL	125	6	3	23	0	3	3	0	6	38	-

4 The tables

See Section 2 (above) for how the tables were compiled.

ESRC in general

CRISP Task Group recommendation	Task Group reference	Priority
Provide support for communicating research efforts to all stakeholders.	Design 5/1	1
Encourage EPSRC/ESRC and other key research sponsors to communicate more widely their current support for interdisciplinary research teams, since such teams are necessary to capture answers to interdisciplinary problems.	Design 5/9	
Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.	Motivation 2/2	1
Provide funds for the synthesis of research outputs and highlight issues from range of sources into a form usable by the construction industry.	Motivation 2/3	1
Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.	CRISP 99/15 Objective 1, item 1	1
Develop appropriate sustainability tests for assessing priorities and research projects. Focus on developing issues and research issues of interest to business, that impact on the triple bottom line.	Sustainable construction 2/3	1

ESRC Thematic Priorities 2000

Thematic priority	CRISP Task Group recommendation	Task group reference	Prio-rity
Theme 1 Economic Performance and Development			
PURPOSE			
To understand the forces that influence economic performance and development in an international and comparative context			
RATIONALE			
Economic performance provides a vital research area for social science that links to major social, cultural and political issues.			
Economic performance underpins wealth creation, and people's quality of life and well-being. It is essential to understand the complex and wide-ranging factors that promote a successful economy, which increasingly need to be set in a European and international context, including that of developing countries. This theme promotes new theoretical and empirical research into economic growth and stability, focusing			

on such issues as the role of risk and trust in market transactions and people's behaviour, and how such concepts are introduced into economic analysis. Public policy in economic matters is an important research area which raises issues concerning intergenerational equity, the distribution of wealth, and the boundaries between the state, the economy and the private sector. At the international level there are important questions about the ability of national governments to control emerging global events, including stability of financial and currency markets. The issues covered by this theme are of major public concern challenging the social sciences to address the impact of both domestic and global economic activity on social and cultural aspects of our lives, as these in turn influence the growth and stability of economies.			
RESEARCH ISSUES			
Economic Growth			
What are the factors that promote or inhibit economic growth and productivity?			
How can economic growth, and the creation of value and wealth, be encouraged at the micro or macro level?			
What economic and other factors underlie international growth?			
How effective is investment in R&D in different sectors?	Improve the quality, relevance and accessibility of statistical data on the research base.	Construction Research Base 2	2
	Explore desirability and feasibility of developing a set of KPIs for research organisations.	Construction Research Base 3	2
	Encourage companies to develop and focus more beneficial contact with the research base by appointment, for example, of a Director of Innovation.	Construction Research Base 4	2
What is the impact of spatial and network dynamics on growth and innovation?			
Public Policy and the Organisation of Economic Activity			
What are the effects of tax harmonisation and fiscal federalism within Europe?			
What is the role of budgetary policy on intergenerational equity?			
What are the boundaries and responsibilities of the state in areas such as pensions and insurance?			
What is the role of incentives and performance criteria in non-market activity?			
Economic Stability, Risk and Equity			
How can the economic environment be more accurately predicted?			
What is the relation to stability in currency and financial markets?			
What are the links between economic stability and growth and the distribution of wealth within and between countries?			
What role do risk and trust play in market transactions?			
What social and psychological factors govern economic behaviour?			
How can monetary and fiscal policy promote macroeconomic stability, and how is this influenced by global economic integration?			
International Development and Globalisation			
What is the impact of global economic integration and the functioning of international trade and markets and their regulation on developed and developing countries?			
What is the impact of information technology on the world economy?			
What new economic groupings are emerging and what will be the consequences for			

the UK and Europe?			
What impact do international financial institutions have on developing countries?			
Theme 2 Environment and Human Behaviour			
PURPOSE			
To promote research into the complex interaction between people and the environment			
RATIONALE			
The impact of human activities on the climate, and on factors such as rising sea levels and reduced biodiversity, raises vital questions about the social and economic causes and consequences of environmental change. The relationship between people, their use of resources and technology, and the built and natural environment continues to be a major challenge for social science research. This theme connects human activities and developments in economic sectors such as transport, energy, agriculture and construction with the impact of policy intervention, corporate behaviour, consumer demand, and people's behaviour and attitudes regarding the environment. The changing nature of environmental governance, both in this country - for instance, through devolution - and worldwide through international agreements and institutions, is a central issue in this theme, raising questions about international trade, environmental equity and evaluation, and public participation and trust in environmental decision making. Public concern over the environmental impact of human activities, and in turn the impact on people in terms of health and quality of life, needs to be addressed through the further study of risk and of private and public values in decision making at the government, corporate and individual levels. Interdisciplinary research, particularly between social and natural scientists, together with research that has an international as well as a UK and European focus, are key factors in addressing the issues in this theme.	Embed sustainability within the core remit of research funders and develop a more effective taxonomy of industry structure to inform decisions about the applicability of sustainability research.	Sustainable construction 2/1	1
RESEARCH ISSUES			
Human Activities and Technologies			
What are the implications of the changing patterns of social and economic consumption, and of the use of technologies, for the nature and scope of environmental change?	Develop objective methods to assess the social impacts of the construction process.	CRISP 99/15 Objective 1, item 2	2
	Understand the impact of domestic construction activities on the UK environment.	CRISP 99/15 Objective 8, item 1	1
How do human perceptions of environmental risk, threat and opportunity translate into actions and beliefs?	Promote adoption of whole life costing as basis of procurement decisions.	Meeting customers' needs 1/4	2
	Develop standard system for preparation and presentation of Whole Life Cost data	Meeting customers' needs 1/5	2
What are the implications for society as we move towards a post-hydrocarbon era?			
What contribution can technology make to minimising adverse impacts on the environment, and how can innovation contributing to sustainable development be fostered?	Investigate flexibility of building uses, to encourage sustainable design through time, to develop a rating system accessible to owners, users and planners.	Design 1/4	1
	Prove and inform the business case for the construction industry to contribute to the aims of sustainable development – through improved understanding of the business benefits of sustainable construction practices, and industry's financial concerns and	CRISP 99/15 Objective 2, item 1	1

	motivations.		
	Develop a framework of economic & business assessment methods to assess costs and benefits of sustainable construction practices.	CRISP 99/15 Objective 2, item 2	1
	Understanding the key features of the construction industry and how these enable/prevent sustainable construction	CRISP 99/15 Objective 2, item 3	1
	Prove and inform the business case for sustainable development – devise funding arrangements to promote innovative technologies.	CRISP 99/15 Objective 2, item 4	1
	Develop risk management techniques for sustainable construction.	CRISP 99/15 Objective 3, item 3	1
	Understand cultural barriers in construction industry and what the most effective drivers for moving construction industry to sustainable construction – cultural characteristics of the construction industry	CRISP 99/15 Objective 4, item 1	1
	Materials management – assess the sustainability costs and benefits of off-site assembly, trial standard specifications for recycled materials.	CRISP 99/15 Objective 6, item 2	2
	Inform and influence the decision making processes of construction industry's SMEs towards sustainable construction.	CRISP 99/15 Objective 8, item 2	1
	Disseminate convincing evidence of the business (the business and triple bottom line) benefits of environmental good practice throughout construction industry, recognising the nature of SMEs in meeting customers' needs.	Sustainable construction 1/1	1
	Develop tools to implement environmental good practice throughout construction industry including Learning by Doing and the application of Whole Life Costing	Sustainable construction 1/2	2
	Develop explanation of 'what is' sustainable construction.	Sustainable construction 1/3	1
	Provide information on who is taking effective action with a more effective network of players including champions – examine interaction between the construction industry and key players (planners, utilities, regulators, etc.)	Sustainable construction 1/4	2
Mobility and Transport			
Do increasing requirements and expectations for spatial and social mobility conflict with environmental protection?			
How can the various human pressures on the demands for land be reconciled with protection of biodiversity and the environment?			
How does the changing urban-rural boundaries interact with environmental issues?			
Are technological developments affecting the nature and rate of change in patterns of mobility and transport?			
Is the development of an integrated transport policy a viable route to environmental protection, and if so, how can it be delivered?			
Environmental Policy and Decision Making			
What are the options to improve tools and techniques for environmental impact assessment, management and decision making, and to develop scenarios of current and future risk to humans?	Understanding the role of legislation and market forces to promote change (towards sustainable construction)	CRISP 99/15 Objective 4, item 2	2
	Develop and interpret whole life costing techniques.	CRISP 99/15 Objective 5, item 1	1
How will the tensions within and between local, regional, national and international governance on environmental issues be reconciled with economic growth and trade liberalisation?			

How can environmental policy instruments be improved through empirical and comparative evidence, development of credible future scenarios and public participation?			
Environmental Equity			
How can business work together with others to reduce the environmental impact of production and consumption?	Improved management of the existing built environment and infrastructure into the future – through a mixture of building and infrastructure re-use and refurbishment, including impact assessment of refurbishment on sustainable urban development.	CRISP 99/15 Objective 6, item 1	1
	Use of innovative technologies to minimise resource use.	CRISP 99/15 Objective 6, item 3	2
	Understand and use supply chain management to promote the construction industry's contribution to sustainable development.	CRISP 99/15 Objective 7, item 1	1
What are the social, political and economic risks arising from uneven distribution of environmental resources and damages, how can risks and damages be addressed and which groups or communities are most affected?			
Are there trade-offs between present and future generations, and between and within nations?			
How can liberty and choice at the individual level be reconciled with protecting the environment?			
Theme 3 Governance and Citizenship			
RATIONALE			
To understand the nature of governance in a changing world			
PURPOSE			
In the UK, constitutional reform and devolved government are changing the relationship between local, regional and national government. Thus, the nature of governance provides a highly important and continuing intellectual challenge for social science research. People's participation and sense of identity is a major issue, not only in the UK, but also at wider European and international levels. This theme therefore covers the UK, EU and worldwide perspectives, and is also concerned with establishing knowledge about specific areas of the world in terms of governance, conflict and security. The theme focuses on the distribution of power and balance of responsibilities between people and governments. It covers local communities to international institutions, and embraces issues of culture, trust, new information technologies and public management and administration. The changing boundaries between public and private agencies, and changing instruments of regulation and accountability, raise important questions about governance and the responsibilities and rights of people - such as shareholders, consumers, or members of the public.			
RESEARCH ISSUES			
Structure, Governance and Constitutional Change			
What is the social and cultural impact of devolution and constitutional change in the UK, and how is it changing the nature of governance and participation in civil society?			
What are the nature and effects of constitutional change?			
What are the relationships to and within the European Union, and how do these			

relate to the wider world?			
How are British concepts of identity changing in the context of devolution?			
Participation and Accountability			
How do democracies evolve and how are information and communication technologies affecting democratic practice and			
participation?			
What is the relation between state and individual, and how is it initiated by institutions such as political parties or			
campaigning groups?			
What are the new forms of formal and informal participation and how are they linked to new and emerging technologies?			
Global Governance and Security			
Have the causes and consequences of regional and international conflict changed in the light of globalisation?			
What roles do international institutions play in global governance and security? How are relationships between countries and regions changing, covering areas such as South Asia, Latin America, the former USSR, the Middle East, Africa and the Balkans?			
What new regional groupings are emerging? What is the relation between migration and governance and security?			
Identity and Culture			
How are identities changing as boundaries in political and economic relationships change between countries?			
Are supranational identities emerging, and if so, around what forces?			
How are identities related to ethnicity and religion?			
How do identities and cultures develop and change at community, regional and national levels?			
How does a sense of identity contribute to social stability?			
Theme 4 Knowledge, Communication and Learning			
RATIONALE			
To understand how knowledge is acquired, valued, communicated and applied			
PURPOSE			
Knowledge and communication provide the basis of our ability, (and that of communities, organisations and society generally), to perform effectively. As information and media technologies develop and become widespread, people's ability to communicate and share information increases, and does so on a global scale. The role of knowledge, and of information technology, as resources in a successful business and economy is increasingly being recognised. They are having a major impact on our daily lives, on our social and professional relationships, on society, and on the production and exploitation of knowledge. Knowledge, communication and learning will remain vital areas for social science study, and providing effective learning for children and adults over their lifecourse is a major goal to which such research can contribute. People's understanding and acceptance			

of applications of knowledge produced by science are a subject of continuing national debate, raising issues of trust, risk perception and public participation in the process of science policymaking. The subject is also raising interesting questions about how access to information can affect personal quality of life. This theme promotes research which addresses such issues in this fast-changing and important area.			
RESEARCH ISSUES			
Knowledge and Understanding			
What are the different forms and structures of knowledge?			
What are the influences of cognitive processes such as memory and learning on the nature of knowledge?			
What are the contexts (including cultural) within which learning takes place?			
What is the relationship between cognitive processes and other determinants of performance such as motivation, creativity, emotion and fun?			
How do people evaluate complex knowledge, such as scientific knowledge, and act on it?			
How is knowledge acquired and what is the impact of information and communication technologies on this process?			
Communication, Information and Media Technologies			
How are new media technologies changing the nature of communication and what is the impact on social and personal skills (such as language, literacy and numeracy)?			
What is the impact of new technologies on domestic, leisure and professional relationships especially across interest or ethnic groups?			
How can human factors be introduced into the design process for new technologies, and what are the limiting factors?			
How do we interpret and communicate about our world through language and non-verbal communication?			
How are literacy, knowledge and new media technologies related to exclusion and inclusion in society?			
Learning and Teaching			
How does understanding of the learning process translate into effective teaching?			
How is learning affected by different learning contexts such as school, work or home, and how does it change and evolve over the lifecourse?			
What is the nature of lifelong learning, is it being delivered and how does it relate to acquisition of new and flexible skills?			
How can motivation and engagement in the learning process be increased?			
Exploitation of Knowledge			
How do formal controls over knowledge - such as intellectual property - affect its exploitation?			
How is knowledge exploited at a business, organisational and personal level?	Promote general awareness of the importance and benefits of learning and knowledge creation and sharing.	Motivation 1/2	1
	Promote the idea of a strategic approach to knowledge and understanding that knowledge is value.	Motivation 1/3	2
	Deepen understanding of how to capture and use project-based knowledge.	Motivation 1/5	2

What is the relationship between exploitation of knowledge and people's trust, risk perception and participation in science and technology?			
What is the nature of the knowledge society or economy?			
What are the critical constituents of the knowledge society or economy, and how can their dynamic interactions be characterised?			
Theme 5 Lifecourse, Lifestyles and Health			
RATIONALE			
To understand people's lifetime experiences.			
PURPOSE			
Understanding the immense changes in patterns of social, individual and community life continues to be one of the major roles and challenges for social science research, and essential to our future well-being. People's lives and how they unfold over the lifecourse in relation to education, employment, leisure, consumption and health are a topic of major national interest. Demographic changes such as an increasing proportion of older people in the population (and a reducing retirement age) raise issues not only concerning social policy and employment, but also about participation, independence, and trust and responsibility between generations. People's mental and physical health and their experience of health services are intimately related to social and lifestyle factors, and to expectations and aspirations over the lifecourse. Social science research in this theme includes longitudinal surveys which provide a national resource of great value to users in public policy as well as industry, and to academics engaged in social analysis. The continued development of such methods and the capacity in social science for research in this area is central to this theme.			
RESEARCH ISSUES			
Lifecourse, Family and Generations			
How is the composition of households changing and how are relations between family members and generations changing? What are people's personal and social experiences as they move through life, and how might these experiences change in the future?			
What are the consequences for individuals and society of a changing population, and what does it mean to be growing older today?			
How do early experiences influence lifetime social and cognitive abilities, health and behaviour?			
Lifestyles and Consumption			
How do lifestyle and consumption patterns vary with age, ethnicity, social structure or gender?			
What is the relation between lifestyle choices and health?			
What is the effect of increasing choice and diversity in consumption on quality of life and well-being?			
How do people make consumer choices and what will be the impact of electronic shopping?			
What is the role of leisure and tourism in lifestyle choices?			

To what extent are lifestyles and consumption patterns sources of conflict and cohesion between individuals and generations?			
Health and Well-being			
What is well-being and its determinants, and how is it related to physical and mental health and to public and social interventions?			
What are the major causes and consequences of inequalities of health?			
How do physical, social, family and work environments promote or damage well-being and health?	Conduct longitudinal research into building performance over time, including historical and contemporary post-occupancy analysis.	Design 1/8	2
	Establish appropriate and new ways of approaching post-occupancy assessment	Design 1/10	2
What is the social and individual impact of innovative health technologies such as genetic screening and therapies?			
How does people's health affect society at large?			
What are the social and economic consequences of people living longer and more healthily?	Understand impact of IT and societal and organisational changes on building requirements, construction industry practices, and design and construction of buildings and infrastructure ('City of Tomorrow').	CRISP 99/15 Objective 6, item 4	1
Theme 6 Social Stability and Exclusion			
RATIONALE			
To understand the forces shaping society and the implications for social stability			
PURPOSE			
Understanding social change, and the forces that strengthen and divide societies, is at the centre of the challenge before social science research and its contribution to a successful society. The rapid and far-reaching changes that are happening have immense implications for how individuals view their place in society, and the extent to which people are included and excluded in the political, cultural and social life of their communities. Inequalities, poverty, employment, ethnicity and crime are all key issues for this theme. The development, delivery and impact of public policy in these and other fields - such as transport, housing and immigration - are also major subjects for social research, offering wide scope for developing methods to ensure that the insights and evidence of research are properly exploited. More generally, this theme promotes the further development of methods for complex social analysis which will enhance our ability to understand society and how it is changing. Of importance here is the role of comparative research which compares communities and social groups within as well as between countries.			
RESEARCH ISSUES			
Social Trust and Cohesion			
What is the nature of social trust and how does it relate to cohesion in society?			
How and why do intergenerational and intragenerational perspectives vary with regard to social structure, social policy and welfare provision?			
What is the relation between social values and divisions in society and does diversity necessarily mean divisiveness?			
Does exposure to multicultural experiences contribute to, or damage, social stability?			
What processes act to promote or reduce cohesion?			
What mechanisms mediate conflict in society and facilitate social stability?			

Social Exclusion			
What are the theoretical and empirical bases for the concept of social exclusion?			
Who are excluded and how does it affect them and society?			
To what extent are access to economic and financial resources, work, transport, education, housing and new technologies factors in social exclusion?			
What is the impact of spatial factors - such as urban or rural location - on inequality and social exclusion?			
How far does social exclusion explain causes of crime and antisocial behaviour?			
How do gender, race, ethnicity and political affiliation relate to social exclusion?			
Evidence and Social Analysis			
How might social scientists further develop and exploit quantitative and qualitative methodologies for multidimensional and complex social analysis?			
What methodologies can be developed and adopted to facilitate evidence-based approaches to policy and practice?			
What methods and approaches can be developed for evaluation of relevance of research findings and for their dissemination into a wider social domain?			
What are credible scenarios of future social and economic trends, and what are their implications for social stability and cohesion in the future?			
What are the strengths and weaknesses across policy instruments for social and welfare provision?			
Scenario Setting and Policy Interventions			
What is the empirical evidence from historical and contemporary comparative research for the effectiveness and equity of policy interventions?			
What empirical and theoretical tools and techniques can social science provide to assist society and policymakers with the development and evaluation of effective policies?			
Theme 7 Work and Organisations			
RATIONALE			
To understand the nature of work, and the factors that underlie the success of businesses and organisations			
PURPOSE			
Increasing competition, globalisation and the drive for market share in the private sector, allied to cost cutting and best-value imperatives in all sectors, have led organisations to implement different approaches to achieve productivity gains and reduce costs. The ability of organisations to identify and accommodate change that improves their performance is of crucial importance to the delivery of services and goods in the public, private and voluntary sectors. New technological developments in terms of both production systems and organisational infrastructure are the tools to implement such changes, with the increase in e-traffic having major implications for organisations and individuals alike. Such changes inevitably affect the nature and scope of employment patterns and working practices, with consequences for employees in terms of job security, working hours, multi-tasking and multi-skilling. Understanding the dynamics and processes of these issues is essential, and the			

purpose of this theme is to promote research from the perspective of both employers and employees, identifying factors that lead to successful and sustainable performance and innovation in organisations.			
RESEARCH ISSUES			
Organisations and Technologies			
What are the opportunities, threats and pressures that are arising from both mature and new technologies and confronting businesses, workers and other organisations?	Investigate barriers to the uptake and application of existing research knowledge, particularly management and human factors.	Meeting customers' needs 3/1	1
What is the role of new technology as both a driver of change and a means to respond to change?	Examine the impact of ICTs and object modelling on the structure of project teams.	Meeting customers' needs 6/2	2
How does new technology improve organisational performance?			
What are the consequences of new technology for spatial organisation within and between organisations and sectors?			
To what extent and at what rate is e-commerce emerging as a strategic influence on corporate behaviour?			
Organisational Innovation and Change			
What are the factors influencing success, decline or failure of organisations?	Examine incentives for providing innovative high quality design.	Meeting customers' needs 2/3	2
	Promote work to understand how firms can be changed into learning organisations.	Motivation 1/4	2
What are the processes and factors influencing innovation by both organisations and individuals?	Investigate the management of cultural and personnel issues within procurement teams.	Meeting customers' needs 6/1	1
Do regional variances in skills affect the ability of organisations to innovate?			
What is the role of trust and networks, both inside and between organisations, in enhancing organisational innovation?			
Do strategic networks and customer focus enhance performance?			
What scenarios are there for future changes in organisations?			
What, if any, is the link between attitudes to risk and entrepreneurial spirit and innovation?	Examine the impact of risk management and risk transfer policies on integration.	Meeting customers' needs 4/2	1
Corporate Governance and Ownership			
What are the forms and consequences of different models of corporate management and ownership, especially the rise of transnational corporations?			
What are the implications for corporate governance arising from changes in relative power between shareholders and other stakeholders?			
Does the regulatory environment for private and public organisations encourage investment and innovative technological development?			
How do companies view and manage corporate accountability to external constituencies, especially national and regional governmental structures and local communities?			
Work and Workers			
How is the nature of paid and unpaid work changing and what are the consequences for employers, employees, self-employed, unemployed and labour relations both now and in the future?			
How are attitudes towards work, pay, and job satisfaction changing in response to changing nature of work?			
What are the relationships between flexibility, insecurity and productivity?			
What is the impact of employment law and EU directives on both employers and			

employees?			
Which human resource management approaches and practices have the greatest sustained impact on organisations and employees, and why?			

5 Other recommended actions arising from CRISP Task Groups 1999-2000

The table 5.1 summarises the construction-related research programmes of DETR, EPSRC, ESRC and the Highways Agency. Table 5.2 then lists all the CRISP Task Group recommendations from 1999/2000, and maps them against the research programmes of these four funding bodies.

Table 5.1 Research funding bodies and their programmes

	FUNDING BODY AND PROGRAMMES			
	DETR Themes	**EPSRC Programme Landscapes**	**ESRC Thematic Priorities**	**Highways Agency Research Areas**
Source of information about programmes	DETR Construction Research & Innovation Programme: Prospectus 2000	EPSRC Programme Landscapes 2000-2001. Also the IMI Construction as a Manufacturing Process call for proposals, October 2000, and the LINK MCNS Call for Proposals, October 2000.	ESRC Thematic Priorities 2000	Highways Agency Research Strategy 1998-2001 (from HA web-site), plus internal HA report on HA research objectives and priorities, dated November 2000
Programmes, priority areas, themes or research areas:	• New and improved technologies and techniques • Codes and Standards • Business improvement • Promoting innovation and culture change • Construction process • Social impacts • Also: Fast Track	• General Engineering Programme • Engineering for Manufacture Programme • Engineering for Infrastructure, the Environment and Healthcare Programme • Innovative Manufacturing Initiative – Construction as a Manufacturing Process • LINK Meeting Client's Needs through Standardisation	• Economic Performance and Development • Environment and Human Behaviour • Governance and Citizenship • Knowledge, Communication and Learning • Lifecourse, Lifestyles and Health • Social Stability and Exclusion • Work and Organisations	• Asset Management • Traffic Management • Customer & Market Research

Table 5.2 Recommended actions arising from CRISP Task Groups 1999-2000 as they map onto the priority areas of DETR, EPSRC, ESRC and HA

	CRISP recommended action	DETR Themes	EPSRC Programme Landscapes	ESRC Thematic Priorities	Highways Agency Research Areas	CRISP reference	Prio-rity
1.	Develop, agree, and oversee the role of a champion for the research base: mobilise sufficient resources for making appropriate and convincing cases for research funding to funding bodies; collect informed opinion on significant trends and issues in research base; monitor effectiveness of mechanisms to maintain and develop research base; identify and promote opportunities for construction industry to benefit from the contribution of the research base.					Construction Research Base 1	1
2.	Improve the quality, relevance and accessibility of statistical data on the research base.			Economic Performance and Development		Construction Research Base 2	2
3.	Explore desirability and feasibility of developing a set of KPIs for research organisations.			Economic Performance and Development		Construction Research Base 3	2
4.	Encourage companies to develop and focus more beneficial contact with the research base by appointment, for example, of a Director of Innovation.			Economic Performance and Development		Construction Research Base 4	2
5.	Produce and widely distribute a simple description of the nature, role activities and achievements of the research base.		General Engineering			Construction Research Base 5	1
6.	Examine effectiveness of establishing a networking exchange on buildings in use for all stakeholders.	Construction process				Design 1/1	1
7.	Commission scoping studies into existing methodologies for assessing value in buildings.	Social impacts				Design 1/2	2
8.	Examine current cost-in-use studies in practice, their limitations and areas requiring refinement.	Business improvement				Design 1/3	1
9.	Investigate flexibility of building uses, to encourage sustainable design through time, to develop a rating system accessible to owners, users and planners.	Construction process		Environment and Human Behaviour		Design 1/4	1
10.	Test methods for improving industry's capacity to express its needs – in particular workshops, dialogue, deepening understanding between estranged parties.					Design 1/5	2
11.	Conduct research into how can understanding of cost, value and worth be improved throughout the project team.	Construction process				Design 1/6	1
12.	Invite proposals to research and establish Design KPI's from all (construction) sectors.	Social impacts				Design 1/7	2
13.	Conduct longitudinal research into building performance over time, including historical and contemporary post-occupancy analysis.		Engineering for Infrastructure, the Environment and Healthcare	Lifecourse, Lifestyles and Health		Design 1/8	2
14.	Integrate building economics into parameters for change on terms understood by all	Business				Design 1/9	2

	stakeholders.	improvement					
15.	Establish appropriate and new ways of approaching post-occupancy assessment			Lifecourse, Lifestyles and Health		Design 1/10	2
16.	Conduct research into sectoral initiatives to establish design value, with systematic ordering of criteria to assist comparison and respect differences	Business improvement				Design 2/1	1
17.	Investigate successes and failures at a design level of the PFI initiatives commissioned by government to date, by sector.		Construction as a Manufacturing Process (IMI)		Asset Management	Design 2/2	2
18.	Integrate urban design into the emerging matrix of building studies.					Design 2/3	2
19.	Encourage dialogue between sectors to learn from each other's evaluation systems.	Business improvement			GENERAL	Design 2/4	2
20.	Commission international scoping comparison of design assessment methods in practice including cultural identifiers (Japan, Holland, Scandanavia)	Business improvement				Design 2/5	2
21.	Commission scoping review how professional institutes in other countries contribute to design awareness and value definition. [also in IMI]	Business improvement				Design 2/6	1
22.	Conduct research into the effective communication of complex processes with trans-sectoral comparisons.					Design 2/7	2
23.	Conduct research into the design values of the demonstration projects offered by industry, including conception, development, construction and post-occupancy stages.	Business improvement				Design 3/1	1
24.	Establish 'Quick Response' funding for sectoral project-based research, allowing 'up-front' innovation support on a project by project basis: inception research: design experiment with operational testing.	Fast Track			GENERAL	Design 3/2	1
25.	Establish connecting feedback loops so studies take effect and are seen to do so.	Promoting innovation and culture change				Design 3/3	2
26.	Raise the profile of Built Environment design within National Curriculum to equal the enthusiasm accorded to the Natural Environment.					Design 4/1	1
27.	Provide public educational support through regional architecture centres as crucibles for change, debate and visualisation.					Design 4/2	1
28.	Commission international survey of educational institutes' initiatives at developing common design language – at primary, secondary and tertiary levels.					Design 4/3	2
29.	Promote education of design professionals in production management with cross-industry placements to fertilise the construction field.		Engineering for Manufacture			Design 4/4	2
30.	Expand education of design professionals to include methods of thinking, ethics, social context, communication, as fundamental		Engineering for Manufacture			Design 4/5	2
31.	Conduct research into obstacles to raising profile and status of Building Services as a career; sustainability champions.					Design 4/6	2
32.	Re-integrate architectural research into the demand led improvement of building quality, usefulness and delight; building types, symbolic and aesthetic contribution of architecture are all valuable and sought after.					Design 4/7	2
33.	Educate current players, encouraging continuing professional education for change and feedback, using trans-disciplinary events and seminars providing specific merit					Design 4/8	2

	awards.						
34.	Provide support for communicating research efforts to all stakeholders.	Promoting innovation and culture change		GENERAL	GENERAL	Design 5/1	1
35.	Investigate inhibitors to team working training during design professionals; 'whole-life' education and illustrate successful initiatives that break this mould.		Engineering for Manufacture			Design 5/2	1
36.	Assess effectiveness of 'learned society' model for inter-specialist tasks and interdisciplinary challenges.					Design 5/3	2
37.	Investigate and monitor institutional (City) inhibitors to client-centred improvement and demonstrate positive alternatives.					Design 5/4	2
38.	Encourage cross-disciplinary learning from other sectors (medicine, manufacturing, psychology)		Engineering for Manufacture			Design 5/5	2
39.	Establish best practice for briefing languages and value-systems by means of successful examples/case studies.	Construction process				Design 5/6	1
40.	Conduct research into effectiveness of establishing a think-tank for industry wide research into design, embracing all disciplines across the asset/revenue divide.					Design 5/7	2
41.	Extend government sponsorship of design champions in the field of the built environment linking CABE, Design Council and regional initiatives.					Design 5/8	1
42.	Encourage EPSRC/ESRC and other key research sponsors to communicate more widely their current support for interdisciplinary research teams, since such teams are necessary to capture answers to interdisciplinary problems.		GENERAL	GENERAL		Design 5/9	1
43.	Encourage research sponsors to develop specific policies for design research to guide and invite the issues raised [by the Design Task Group].		GENERAL			Design 5/10	1
44.	Encourage research sponsors to call for 'outside the box' research into interdisciplinary design issues, with experimental funding outside the conventional research review time cycle, to underpin longitudinal research, encourage short penetrative research commissions that publish and be damned. The industry can provide a wealth of committed individuals prepared to offer valuable support in kind provided their contribution is time limited.	Fast track				Design 5/11	1
45.	Examining point of entry to construction process relative to client satisfaction.	Construction process				Meeting customers' needs 1/1	2
46.	Investigate the influence of supply chain integration on costs of ownership.	Construction process			Asset Management	Meeting customers' needs 1/2	2
47.	Study potential impact of greater standardisation and factory/off-site fabrication on image and appeal of industry, especially to new entrants.					Meeting customers' needs 1/3	2
48.	Promote adoption of whole life costing as basis of procurement decisions.	Business improvement		Environment and Human Behaviour	Asset Management	Meeting customers' needs 1/4	2
49.	Develop standard system for preparation and presentation of Whole Life Cost data	Business improvement		Environment and Human Behaviour	Asset Management	Meeting customers' needs 1/5	2
50.	Increase awareness of manufacturers of the need to demonstrate the reliability of whole life costs and performance predictors in relation to international standards.	Business improvement			Asset Management	Meeting customers' needs 1/6	2
51.	Expand coverage of existing databases of whole life costs and performance information.	Business improvement				Meeting customers' needs 1/7	2
52.	Research and map sources of [building] defects.	Construction				Meeting customers' needs 1/8	2

		process					
53.	Research application of Business Excellence Model to construction to achieve zero defects.	Business improvement				Meeting customers' needs 1/9	2
54.	Improve definition and benchmarking of client skills.					Meeting customers' needs 2/1	1
55.	Promote the development of defining client requirements.	Construction process				Meeting customers' needs 2/2	1
56.	Examine incentives for providing innovative high quality design.	Promoting innovation and culture change		Work and Organisations		Meeting customers' needs 2/3	2
57.	Investigate the feasibility of establishing a 'virtual learning organisation' to identify clients' dissatisfaction using post occupancy satisfaction evaluation.	Promoting innovation and culture change				Meeting customers' needs 2/4	2
58.	Investigate barriers to the uptake and application of existing research knowledge, particularly management and human factors.	Promoting innovation and culture change		Work and Organisations		Meeting customers' needs 3/1	1
59.	Integrate existing information and assistance sources to provide 'one stop shop' access.	Promoting innovation and culture change				Meeting customers' needs 3/2	2
60.	Investigate the feasibility of establishing a small and occasional client-friendly access route to best practice information.	Promoting innovation and culture change				Meeting customers' needs 3/3	2
61.	Investigate insurance and project funding barriers to the adoption of innovative approaches.	Promoting innovation and culture change				Meeting customers' needs 4/1	2
62.	Examine the impact of risk management and risk transfer policies on integration.		Construction as a Manufacturing Process (IMI)	Work and Organisations		Meeting customers' needs 4/2	1
63.	Conduct scoping study of the barriers to adopting voluntary latent defects insurance for contractors.					Meeting customers' needs 4/3	2
64.	Review, with professional institutions, the function of clients' advisers and changing duties towards clients.	Construction process				Meeting customers' needs 5/1	1
65.	Ensure training and education encourage and support innovation.	Promoting innovation and culture change				Meeting customers' needs 5/2	1
66.	Investigate the management of cultural and personnel issues within procurement teams.			Work and Organisations		Meeting customers' needs 6/1	1
67.	Examine the impact of ICTs and object modelling on the structure of project teams.	Construction process		Work and Organisations		Meeting customers' needs 6/2	2
68.	Commission scoping study to provide more detail about real issues and generate understanding of what is needed for SMEs and others and identify 'owners' who will deliver different approaches. Study best practice in learning and knowledge sharing (including the use of case studies) and promote appropriately.	Promoting innovation and culture change				Motivation 1/1	1
69.	Promote general awareness of the importance and benefits of learning and knowledge creation and sharing.	Promoting innovation and		Knowledge, Communication		Motivation 1/2	1

		culture change		and Learning			
70.	Promote the idea of a strategic approach to knowledge and understanding that knowledge is value.	Promoting innovation and culture change		Knowledge, Communication and Learning		Motivation 1/3	2
71.	Promote work to understand how firms can be changed into learning organisations.	Promoting innovation and culture change		Work and Organisations		Motivation 1/4	2
72.	Deepen understanding of how to capture and use project-based knowledge.	Promoting innovation and culture change		Knowledge, Communication and Learning		Motivation 1/5	2
73.	Develop the wider use of independent post-occupancy reviews.	Business improvement				Motivation 1/6	2
74.	Change research assessment process in line with Royal Academy of Engineering recommendations.					Motivation 2/1	1
75.	Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.	GENERAL	GENERAL	GENERAL	GENERAL	Motivation 2/2	1
76.	Provide funds for the synthesis of research outputs and highlight issues from range of sources into a form usable by the construction industry.	Promoting innovation and culture change		GENERAL		Motivation 2/3	1
77.	Commission guidance on how to communicate research findings to meet the needs of industry to demonstrate the benefits and develop new criteria for successful communications.	Promoting innovation and culture change				Motivation 2/4	1
78.	Fund intermediaries to undertake 'user friendly' communication.	Promoting innovation and culture change				Motivation 3/1	1
79.	Co-ordinate more active communication by professional institutions.	Promoting innovation and culture change				Motivation 3/2	1
80.	Develop merchants and DIY stores and channels of communication.	Promoting innovation and culture change				Motivation 3/3	2
81.	Produce case studies of successful interactions.	Promoting innovation and culture change				Motivation 4/1	1
82.	Unbiased research on which types of transfer work best and highlighting success and benefits.	Promoting innovation and culture change				Motivation 4/2	1
83.	Encourage development of networks.	Promoting innovation and culture change				Motivation 4/3	2
84.	Raise awareness and profile of CRISP in industry					Motivation 5/1	1
85.	Act as a facilitator to capture vision of future construction industry and the research required to deliver it.					Motivation 5/2	1

86.	Develop 'learning toolkit' from [vision-of-future research] and promote to firms (CEO, Human Resource managers) and individuals (through professional institutions and journals), thus moving CRISP from being an industry follower to a leader.	Promoting innovation and culture change				Motivation 5/3	2
87.	Repackage to add more business emphasis to CRISP topics and papers.					Motivation 5/4	2
88.	Demonstrate the benefits of research in a business context and compile a clear roadmap of industry research needs.	Promoting innovation and culture change			GENERAL	Motivation 5/5	1
89.	Compare other industries and countries experience.	Business improvement			GENERAL	Motivation 6/1	2
90.	Investigate US PAIR (Partnership for the Advancement of Infrastructure and its Renewal) as a catalyst for implementing innovation in practice.	Business improvement			GENERAL	Motivation 6/2	2
91.	Investigate a broker body to negotiate between researchers and industry (cf US National Science Foundation).	Business improvement				Motivation 6/3	2
92.	Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.	Promoting innovation and culture change		GENERAL		CRISP 99/15 Objective 1, item 1	1
93.	Develop objective methods to assess the social impacts of the construction process.	Social impacts	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	GENERAL	CRISP 99/15 Objective 1, item 2	2
94.	Prove and inform the business case for the construction industry to contribute to the aims of sustainable development – through improved understanding of the business benefits of sustainable construction practices, and industry's financial concerns and motivations.	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	GENERAL	CRISP 99/15 Objective 2, item 1	1
95.	Develop a framework of economic & business assessment methods to assess costs and benefits of sustainable construction practices.	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 2, item 2	1
96.	Understanding the key features of the construction industry and how these enable/prevent sustainable construction	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	GENERAL	CRISP 99/15 Objective 2, item 3	1
97.	Prove and inform the business case for sustainable development – devise funding arrangements to promote innovative technologies.	New and improved technologies and techniques		Environment and Human Behaviour	GENERAL	CRISP 99/15 Objective 2, item 4	1
98.	Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through improved stakeholder communications.	Promoting innovation and culture change				CRISP 99/15 Objective 3, item 1	1
99.	Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through quantified targets/indicators.	Business improvement			Customer & Market Research	CRISP 99/15 Objective 3, item 2	1
100.	Develop risk management techniques for sustainable construction.	Business improvement	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	Customer & Market Research	CRISP 99/15 Objective 3, item 3	1

101.	Understand cultural barriers in construction industry and what the most effective drivers for moving construction industry to sustainable construction – cultural characteristics of the construction industry	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 4, item 1	1
102.	Understanding the role of legislation and market forces to promote change (towards sustainable construction)	Codes and standards		Environment and Human Behaviour		CRISP 99/15 Objective 4, item 2	2
103.	Develop and interpret whole life costing techniques.	Business improvement	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	Asset Management	CRISP 99/15 Objective 5, item 1	1
104.	Improved management of the existing built environment and infrastructure into the future – through a mixture of building and infrastructure re-use and refurbishment, including impact assessment of refurbishment on sustainable urban development.	New and improved technologies and techniques	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 6, item 1	1
105.	Materials management – assess the sustainability costs and benefits of off-site assembly, trial standard specifications for recycled materials.	New and improved technologies and techniques	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 6, item 2	2
106.	Use of innovative technologies to minimise resource use.	New and improved technologies and techniques	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour	Asset Management	CRISP 99/15 Objective 6, item 3	2
107.	Understand impact of IT and societal and organisational changes on building requirements, construction industry practices, and design and construction of buildings and infrastructure ('City of Tomorrow').		Engineering for Infrastructure, the Environment and Healthcare	Lifecourse, Lifestyles and Health		CRISP 99/15 Objective 6, item 4	1
108.	Understand and use supply chain management to promote the construction industry's contribution to sustainable development.	Construction process	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 7, item 1	1
109.	Understand the impact of domestic construction activities on the UK environment.	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 8, item 1	1
110.	Inform and influence the decision making processes of construction industry's SMEs towards sustainable construction.	Promoting innovation and culture change	Engineering for Infrastructure, the Environment and Healthcare	Environment and Human Behaviour		CRISP 99/15 Objective 8, item 2	1
111.	Disseminate convincing evidence of the business (the business and triple bottom line) benefits of environmental good practice throughout construction industry, recognising the nature of SMEs in meeting customers' needs.	Promoting innovation and culture change		Environment and Human Behaviour		Sustainable construction 1/1	1
112.	Develop tools to implement environmental good practice throughout construction industry including Learning by Doing and the application of Whole Life Costing	Business improvement		Environment and Human Behaviour	Asset Management	Sustainable construction 1/2	2
113.	Develop explanation of 'what is' sustainable construction.	Business improvement		Environment and Human Behaviour		Sustainable construction 1/3	1

114.	Provide information on who is taking effective action with a more effective network of players including champions – examine interaction between the construction industry and key players (planners, utilities, regulators, etc.)	Business improvement		Environment and Human Behaviour		Sustainable construction 1/4	2
115.	Embed sustainability within the core remit of research funders and develop a more effective taxonomy of industry structure to inform decisions about the applicability of sustainability research.	Business improvement	GENERAL	Environment and Human Behaviour		Sustainable construction 2/1	1
116.	Investigate how to achieve maximum leverage within industry to achieve best diffusion of R&D through sector, especially SMEs with housing, repair, maintenance and refurbishment, respect for people and land use planning.	Promoting innovation and culture change				Sustainable construction 2/2	1
117.	Develop appropriate sustainability tests for assessing priorities and research projects. Focus on developing issues and research issues of interest to business, that impact on the triple bottom line.			GENERAL		Sustainable construction 2/3	1
118.	M4I to operationalise and demonstrate the work done by Theme Group and not 'go it alone'	Business improvement				Sustainable construction 2/4	1
119.	Develop and adopt mechanisms for keeping in touch with global developments in sustainable construction and wider sustainability issues.	Business improvement			GENERAL	Sustainable construction 3/1	1
120.	Set up email discussion group and linked web pages.	Promoting innovation and culture change				Sustainable construction 3/2	2
121.	Develop appropriate sustainability tests for assessing priorities and research projects.	Business improvement	GENERAL			Sustainable construction 3/3	1
122.	Develop appropriate sustainability tests for assessing priorities and research projects and develop sustainability index and criteria covering all drivers relevant to all CRISP key priorities and themes. Make sustainability an intrinsic driver behind each priority.	Business improvement				Sustainable construction 4/1	1
123.	Place theme group member on each of the Groups					Sustainable construction 4/2	1
124.	Identify champions for the sustainability agenda.					Sustainable construction 4/3	1
125.	Create new themes on: industry positioning; globalisation and industry structures; respect for people focusing on diversity, equality and quality of life issues for construction staff/employees, end users, and wider communities; regulatory codes; financial/fiscal theme.					Sustainable construction 4/4	2
	TOTAL NUMBER APPLICABLE TO EACH FUNDING BODY	84	27	44	17		