

The Management of Building Projects at English Higher Education Institutions



This report has been prepared under Section 6 of the National Audit Act 1983 for presentation to the House of Commons in accordance with Section 9 of the Act.

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Executive summary

Introduction

1 The doubling of the number of students in higher education over the past decade, and the drive by institutions to improve facilities so that they are better able to compete for students, has led to an extensive programme of major building works in the sector. Over the period 1993 to 1996 some 239 major building projects were initiated within the sector at a cost of approximately £1.6 billion. This represents a significant level of expenditure for the sector, which has a total annual income of £8.9 billion.

2 For each higher education institution, building projects represent a major investment of money, time and management effort. They also represent a potential risk to the financial health and operational effectiveness of the institution in the event of serious cost or time overruns.

3 The National Audit Office examined the way in which higher education institutions plan, manage and implement their building projects, focusing on ten major academic building projects from institutions of differing sizes and backgrounds. The examination covered:

- appraisal of the project (Part 2);
- the various stages of project implementation (Part 3); and
- the involvement of institutions' governors at each stage (Part 4).

4 For the ten projects examined, the National Audit Office found that the majority of buildings were completed broadly to time and within budget, and with a reasonable degree of involvement from governors. Nevertheless, they found that improvements were possible at each stage of the process, particularly in the appraisal of projects.

Project appraisal

5 The National Audit Office found that, whilst institutions had made some formal assessment of the need for the projects examined, more could be done to demonstrate a clear need for new facilities. In particular, few of the institutions

visited undertook regular and detailed examination of the actual intensity of use of their existing estate, and there was little assessment of qualitative factors such as the impact of an institution's estate on the recruitment of students and staff.

6 For those projects examined by the National Audit Office, option appraisal was an area of weakness. The number of options identified and assessed was, in general, limited. The appraisals reviewed also included some technical errors, misleading assumptions, and limited risk analysis, although the nature of these errors make it unlikely that their correction would have led to a decision not to proceed with the project. Several of the institutions visited questioned the relevance of the standard public sector investment appraisal methodology to the higher education sector, and there was little evidence that such appraisals formed an integral part of their internal decision-making. The Higher Education Funding Council for England are currently revising their guidance on option appraisal, which they expect to publish in early 1998.

7 All ten of the institutions visited by the National Audit Office had undertaken some form of short to medium term financial planning to determine whether the building project under review was affordable from internal resources, or whether borrowing would be required. Significant levels of borrowing were used to fund the projects examined, a reflection of the importance to the sector as a whole of private sector finance in major building projects. The National Audit Office found that institutions had developed many of the skills required to identify and evaluate loan finance, but that there were some weaknesses in the competitive processes used in tendering for loans. In particular, none of the institutions visited had set evaluation criteria prior to inviting lenders to propose terms.

Recommendations on project appraisal

8 The National Audit Office recommend that institutions should:

- a) ensure that their assessment of the need for new building projects includes quantitative assessment of how intensively existing space is being utilised, and assessment of the full range of benefits which improved accommodation can bring;
- b) ensure that a full range of options are identified and rigorously assessed, and that appraisals include a comprehensive assessment of risk; and
- c) ensure that loan finance is selected following a rigorous process of competitive tender, and that the selection process is based on clearly expressed evaluation criteria established in advance.

The National Audit Office also recommend that the Funding Council should:

- d) ensure that their revised guidance on option appraisal incorporates a methodology tailored to the specific needs of those involved in investment decision-making within the higher education sector.

Project implementation

9 The National Audit Office found that, in general, the institutions visited had satisfactory arrangements in place for managing their projects, and that the majority of projects were delivered broadly to time and within budget. However, few project plans covered the early stages of the project to allow for the required approvals from the institution's governing body and the Funding Council. A general failure to specify the roles and responsibilities of all parties as part of the project management plan also provided scope for confusion.

10 The choice of contractual structure through which the design and construction of a building is organised (the procurement strategy) depends on an institution's priorities, as different strategies involve trade-offs between cost, time, quality and risk. The National Audit Office found that in planning projects there was insufficient consideration by institutions of the procurement strategy which would best meet their objectives, and little involvement of governing bodies in this decision.

11 The process of arriving at a design for projects which met user requirements within funding or other constraints was in general managed successfully by the institutions visited. However, in only a few cases was there consideration of the relationship between initial capital costs and running costs over the whole life of the building. Nor was the technique of value engineering, which takes into account factors such as whole-life costs and the trade-off between quality and cost, widely applied to the design process. The full scope for savings in this area was therefore not realised.

12 The National Audit Office found that most of the institutions visited had followed a satisfactory competitive process in appointing consultants and construction contractors, but that in some cases had not met the requirements of European Community competition directives. Where institutions had purchasing officers, they were not generally involved in the procurement of either consultants or construction contractors.

13 Satisfactory arrangements were in place for monitoring project progress at most of the institutions visited by the National Audit Office, although problems arose at two institutions through infrequent cost reports and fragmentation of cost reporting mechanisms. Project completion was generally handled in a systematic and controlled manner, although there was evidence in a number of cases of time pressures arising in the later stages of projects, leaving the risk that faults may go unnoticed at hand-over of the building to the institution. There had been little evaluation by institutions of their overall handling of the project, or of their success in meeting the project's objectives.

Recommendations on project implementation

14 The National Audit Office recommend that institutions should:

- e) produce a project management plan which covers all stages from approval of the project in principle through to completion, and which sets out the specific responsibilities, accountabilities and delegated authorities of all parties involved in the project;
- f) identify the most appropriate procurement strategy given their key objectives and priorities, and ensure that their governing body supports the chosen method;
- g) ensure that the use of more sophisticated techniques such as whole-life costing and value engineering are incorporated into project design;
- h) re-examine their tendering procedures, and ensure that they comply with European Community legislation and accepted best practice;
- i) consider making use of the skills of purchasing officers in the procurement of buildings and related services;
- j) ensure that their reporting arrangements provide senior managers and governors with regular information on progress against time and budget, and that when cost control is divided between different parties, reporting mechanisms are in place which allow the total cost of the project to be monitored;
- k) allow sufficient time for management of the completion arrangements, and ensure that time pressures do not lead to acceptance of projects before the necessary checks have been undertaken; and
- l) ensure that procedures for post-implementation review of projects are implemented.

Governance

15 The National Audit Office found that more could be done by the institutions visited to comply with good practice on governance, particularly in the handling of potential conflicts of interest. With regard to governors' specific involvement in major building projects, the National Audit Office found that most of the institutions visited had maintained a close interest in the projects examined, but that none had formal regulations covering the involvement of governors in such projects.

Recommendations on governance

16 The National Audit Office recommend that institutions should:

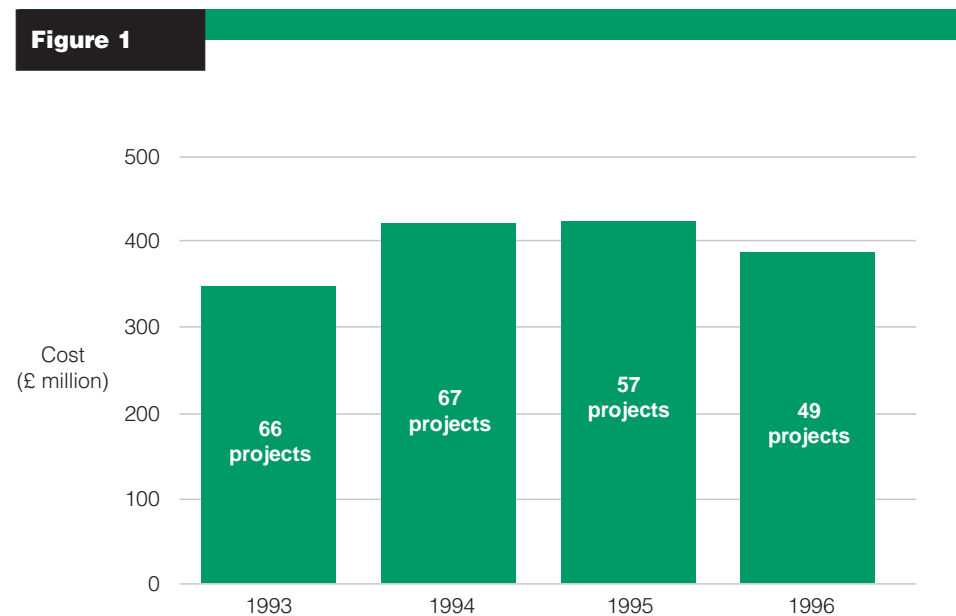
- m)** review their handling of declarations of interest to ensure that governors with a potential conflict of interest declare all relevant interests, take no part in discussions or decision-making relating to that conflict, and leave the meeting during such discussion and decision-making; and
- n)** review the regulations covering the role of their governing body and delegated committees in major capital projects to ensure that they incorporate the key actions required by governors.

Part 1: Introduction

1.1 The number of students in higher education has broadly doubled over the past decade. In addition, the creation of a new higher education sector following the abolition in 1993 of the binary line separating universities from the former polytechnics and colleges of higher education has led to a drive by institutions to improve their facilities so that they are better able to compete for students. As a consequence, there has been an extensive programme of major building works in the higher education sector.

1.2 The National Audit Office undertook a survey to identify the full extent of building projects undertaken by higher education institutions in England over the four year period 1993 to 1996. During that period some 239 major building projects were initiated with a total cost of approximately £1.6 billion (Figure 1). These projects encompassed both new buildings and refurbishment of existing accommodation, the scale of individual building projects varying from a single building costing several million pounds, to major campus re-developments costing tens of millions of pounds.

Major building projects in the English higher education sector, 1993 to 1996



Source: National Audit Office survey of English higher education institutions

Figure 1 shows that, over the four year period 1993 to 1996, some £350 million - £450 million was committed each year on major building projects in the English higher education sector.

1.3 Higher education institutions are independent corporate institutions, with executive governing bodies responsible for ensuring the effective management of the institution and for planning its future development. This includes management of an institution's estate. The 139 institutions within the English higher education sector receive funds from a number of sources, the most significant being grants from the Higher Education Funding Council for England (the Funding Council) and tuition fees (Figure 2). Institutions take decisions on the allocation of this income in accordance with their strategic priorities, which may include the need for new building. Further details of the role of the Funding Council and the general responsibilities and accountabilities within higher education are given in Appendix 1.

**Sources of income for
English higher education
institutions, 1996-97**

Figure 2

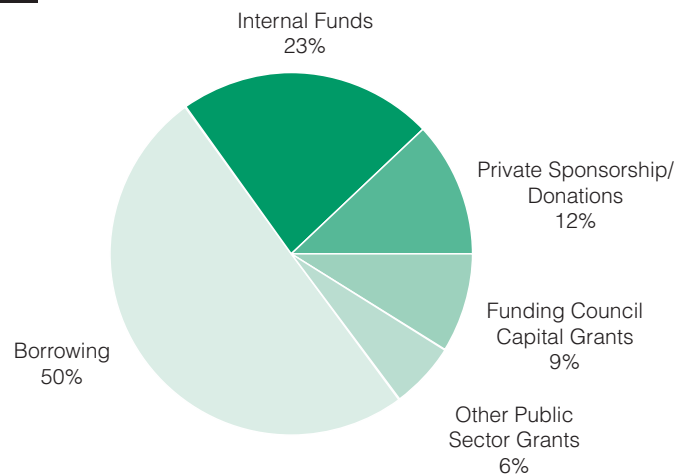
Sources of Income	£ billion
Funding Council Grants	3.47
Tuition Fees and Support Grants	2.30
Research Grants	1.36
Other Operating Income	1.57
Endowment Income and Interest Receivable	0.19
Total	8.89

Source: Higher Education
Funding Council for England

1.4 Capital grants from the Funding Council were a significant source of funding for building projects initiated during the early 1990s. However, since 1994-95, the Funding Council have ceased to allocate specific capital grants for new building development or refurbishment, except in defined circumstances to support certain types of development (there are, for example, current initiatives to support institutions with poor estates, and those requiring laboratory refurbishments). Institutions have therefore increasingly funded building projects through a variety of sources, including general income, reserves and borrowing (Figure 3). Public-private partnerships (the successor to the Private Finance Initiative) are also expected to play an increasing role in future capital developments within the sector, although given the considerable success to date of the higher education sector in attracting conventional private sector investment such partnerships are not yet well developed.

Sources of funding for major building projects in the English higher education sector, 1993 to 1996

Figure 3



Source: National Audit Office survey of English higher education institutions

Figure 3 shows that, between 1993 and 1996, borrowing accounted for half of the funding for major building projects in the English higher education sector.

1.5 In January 1997, comprehensive guidance on the procurement of building and engineering projects ('Procurement Guidelines for Higher Education: Building and Engineering Projects') was published by the Joint Procurement Policy and Strategy Group of the Committee of Vice-Chancellors and Principals (CVCP), in collaboration with the Funding Council, the Association of University Directors of Estates, and the Standing Conference of Principals. This is designed to be read in conjunction with the particular requirements of the Funding Councils for the United Kingdom, which are listed in an appendix to the Procurement Guidelines.

1.6 A major building development can represent one of the most significant investment decisions that a higher education institution can make. The National Audit Office reported in 1994 on *The Financial Health of Higher Education Institutions in England (HC 13/94-95)*. It was apparent from this review that new building projects were being funded to an increasing degree from internal funds (recurrent grant and reserves) or from borrowing. The report made the point that the use of borrowing implied risks for assets pledged as security and, potentially, for the overall financial health of institutions, given the commitment to repay potentially significant levels of debt over a number of years. Such projects also involve higher education institutions in significant risks to their operational performance, for example from late delivery or failure to meet user requirements. These risks are potentially greater where the project is for core academic facilities such as laboratories for which there is no alternative use. Other facilities, such as student residences, could be more readily adapted for alternative use if the institution failed to recruit the projected number of students.

1.7 In addition to representing a key aspect of the financial health of higher education institutions, building projects also require a range of skills and procedures to be in place if they are to be implemented successfully. Such skills and procedures have been addressed in other reports by the National Audit Office on the higher education sector. These include a report in 1996 on The Management of Space in Higher Education Institutions in Wales (HC 458/95-96) which found that institutions needed to improve further the extent to which the academic estate is utilised and, in particular, to measure the way space is used more systematically and so inform the application of techniques to improve utilisation. An earlier report on University Purchasing in England (HC 635/92-93) also showed that there was scope for improvement in procurement practices within the sector.

Scope of the National Audit Office examination

1.8 The National Audit Office examined the way in which higher education institutions plan, manage and implement their building projects. This examination focused on a sample of ten building projects with primarily academic functions, and which were financed fully or partially by borrowing (Figure 4). The conclusions drawn from this examination are, however, of general applicability to the range of building projects across the higher education sector.

1.9 The specific objectives of the study were to consider whether:

- the governing bodies and senior management of institutions have been appropriately involved in the approval and management of building projects within the context of a proper framework for corporate governance;
- building developments have been financed, specified, managed and monitored in a way that achieves value for money, and does not subject the institution to risks which may endanger the operating capability of the institution, and ultimately its financial health; and
- procurement practices within institutions help to ensure propriety and value for money in relation to placing contracts for the construction and fitting-out of new academic buildings.

Figure 4

Key features of the ten major building projects examined by the National Audit Office

Institution	Income (£m) ¹	Project	Project Cost (£m)	Borrowing Level (£m)	Internal Approval Date	Completion Date
University of Bath	63.6	South Building (School of Biology and Biochemistry)	5.5	25.0 ²	Nov '94	Oct '95
Bolton Institute of Higher Education	17.9	Eagle Mill (Teaching and Learning Resources)	7.3	1.0	June '91	Sept '96
Cheltenham and Gloucester College of Higher Education	29.9 ³	Central Complex (Teaching Facilities)	7.5	6.9	Jan '91	Sept '94
University of Leeds	201.6	Biological Sciences Building	9.3		Feb '91	Nov '96
" "	" "	Centre for Biomolecular Sciences	3.8	20.0 ²	March '95	April '97
University of North London	47.7	Glass Building (Learning Resources Centre)	9.0	4.4	Sept '93	Nov '94
Royal Northern College of Music	6.6	Oxford Road (Teaching, Rehearsal and Learning Resources Centre)	4.3	1.5	Nov '93	March '97
Sheffield Hallam University	93.5	Business Information Technology Centre	12.3	5.0	Jan '95	June '97
University of Sunderland	36.3	St Peter's Phase 1 (Teaching and Research Facilities)	19.3	6.6	July '92	Oct '94
	54.5	St Peter's Phase 2 (" ")	17.4	7.0	Jun '94	Sept '96
University College, London	185.2	Phillips House (Teaching and Research Facilities)	17.2	14.0	Apr '94	Sept '95
University of Westminster	61.1	Harrow Phase 1 (Teaching, Research and Learning Resources Centre)	33.5	25.0	Oct '92	Oct '95

- Notes: 1. Income relates to the year of project approval
 2. Borrowing not solely related to the project
 3. 16 month accounting period

Source: National Audit Office and Higher Education Statistics Agency



1. Business Information Technology Centre, Sheffield Hallam University.
2. St. Peter's Campus, University of Sunderland.
3. Harrow Campus Phase 1, University of Westminster.

1.10 Details of the methodology used in the study are given in Appendix 2, the results of the examination being set out as follows in the remainder of this report:

- Part 2: Project Appraisal
- Part 3: Project Implementation
- Part 4: Governance

1.11 This study required the active co-operation of finance, estates and other personnel in the institutions examined, and the National Audit Office are grateful for this co-operation. They are also grateful for the assistance provided by their specialist consultant, Allan Dodd, and by a number of other outside bodies. A full list of all participants is given in Appendix 2. This included steering and focus groups comprised primarily of representatives from a wide range of higher education institutions, who contributed sector expertise at various stages of the examination. Their views have been incorporated where appropriate into the report. A summary of the results of the National Audit Office survey of building projects in the English higher education sector is at Appendix 3.

Part 2: Project appraisal

2.1 Building projects represent a substantial amount of expenditure for the higher education sector as a whole, and each individual project represents a significant investment decision for the institution concerned. It is therefore important that building projects should only be undertaken following a thorough analysis by the institution concerned to satisfy itself that: there is a proven requirement for the facility; that all options have been rigorously assessed against clearly stated objectives, and that the best option has been selected; that the financial implications have been considered; and that the investment is affordable. The National Audit Office therefore reviewed the way in which institutions:

- determined their requirement for new buildings;
- appraised different options for meeting their objectives; and
- assessed the financial impact of projects and selected the most appropriate form of finance to fund them.

2.2 Prior to April 1996, the Funding Council required institutions to seek their approval for building projects where the institution proposed to use Exchequer funded assets as security for loan finance to fund the project, or where projects were not self-financing. In such cases, the Funding Council reviewed the institution's proposals, including supporting information such as investment appraisals. All of the projects examined by the National Audit Office were approved prior to 1996.

2.3 Since April 1996, revisions to the Financial Memorandum between the Funding Council and institutions have given institutions greater freedom to undertake projects and to seek loan finance without Funding Council approval. The Funding Council's role in approving projects is now restricted to those occasions where the Funding Council are providing a capital contribution to a project, where Exchequer funded assets are to be transferred to third parties, or where the institution proposes to enter into either long-term or short-term borrowing which involves them in exceeding the thresholds set by the Funding Council. These changes reflect the Council's reduced role in the direct funding of projects and the increasing use by institutions of long term finance to cover a variety of requirements.

2.4 As part of the Funding Council's role to promote value for money and the effective use of resources, they have produced guidance for institutions on strategic estates management, estates procedures and on appraising property options (the latter is currently being revised). Where the Funding Council are providing a capital contribution to a project, they require the relevant options to be considered in detail by institutions, and that investment appraisals be produced for these options in accordance with HM Treasury guidelines. In such cases, institutional applications for Funding Council funding, together with supporting investment appraisals, are reviewed by the Funding Council prior to approval.

Assessing need

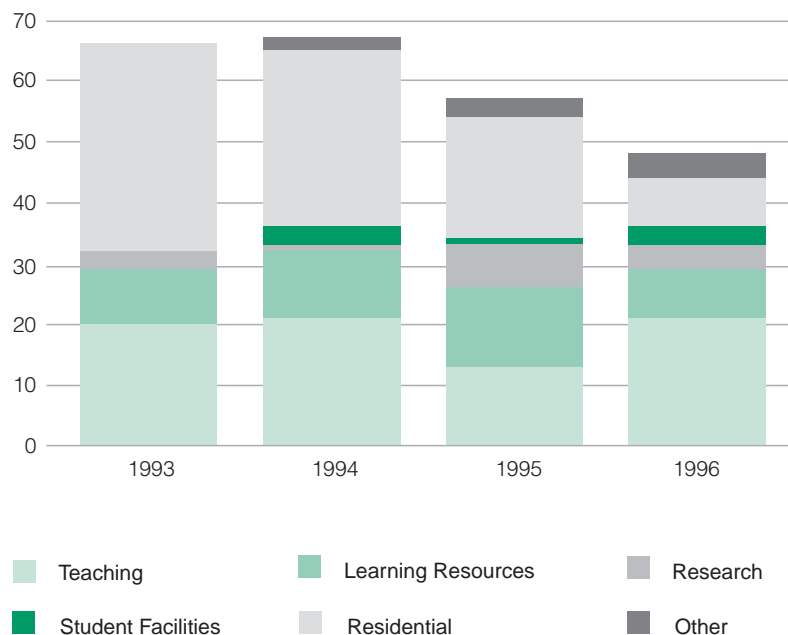
2.5 The demand within higher education institutions for new or refurbished accommodation may be driven by a wide range of factors, including:

- growth in student numbers, which was a major issue in the late 1980s and early 1990s;
- changes in approaches to teaching and research, such as greater emphasis on learning techniques and more extensive use of technology;
- obsolescence of existing facilities, particularly in science and technology subject areas;
- different patterns of growth in different subject areas;
- competition for both students and research funding, leading to the need to invest in facilities as a route to income generation; and
- qualitative factors such as the impact of the estate on the perceived image of the institution.

Figure 5 shows the type of facilities in which institutions have invested.

Analysis of major building projects by type, 1993 to 1996

Figure 5



Source: National Audit Office survey of English higher education institutions

Figure 5 shows the different types of accommodation invested in by English higher education institutions between 1993 and 1996.

2.6 In determining the need for new facilities it is important that these and other factors are assessed, and that priorities are determined. The National Audit Office found that the way in which the institutions visited had assessed this need varied for the ten building projects examined:

- four of the ten institutions had prepared wide-ranging strategies with the objectives of rationalising disparate estates, improving the quality of their building stock, and accommodating growth. In these institutions, the building projects examined by the National Audit Office formed part of the institution’s estates strategy, and the need for the project had been justified in terms of the contribution to its strategy;
- for three of the ten institutions the projects were opportunistic, with buildings becoming available as a result of previous occupants going into receivership or re-locating. However, in each case the institution concerned had already been developing strategies for expansion, or had been

conscious of the need for additional space, and the assessment of the need for new building was linked to the institution's objectives for growth and rationalisation;

- for two of the institutions, reviews of academic facilities had indicated that improved facilities were required for the academic departments involved. The need for the projects examined by the National Audit Office was therefore justified on the basis that these facilities were becoming out-dated and that teaching and research would suffer if they were not modernised; and
- for one institution, the National Audit Office concluded that, although the project had been under discussion for some time, there was no formal evidence of specific approval for the project or of a case demonstrating that the project undertaken was the best option available.

The role of estates strategies

2.7 As a means of ensuring that an institution's accommodation needs are receiving active senior management attention, the Funding Council have, since 1993, required all higher education institutions to assess their estates requirements and to produce a formal estates strategy which sets out the overall space requirements of the institution and its key development priorities. All building projects now undertaken should therefore be consistent with an institution's estates strategy, and appear among the proposals for change contained within that strategy.

2.8 Eight of the projects examined by the National Audit Office were planned and approved before the Funding Council introduced the requirement to produce an estates strategy. Nonetheless, four of the institutions visited had comprehensive estates strategies at the time the project examined by the National Audit Office was approved. These strategies were detailed and comprehensive, and formed the basis of multi-million pound development programmes (Example 1). In other cases, strategies did exist for the development of institutions' estates, but were less well developed. The building projects reviewed by the National Audit Office therefore tended to emerge out of specific concerns about the quality of accommodation occupied by individual departments, or as the result of opportunities for acquisition coinciding with a perceived need to increase the estate to accommodate growth in student numbers.

Example 1 A former polytechnic inherited an estate from its local authority which consisted of over thirty buildings, of varying quality, and spread over a number of locations. It developed an accommodation strategy which was closely integrated with overall institutional needs, including consideration of identity, competitiveness, growth, wider participation, impact on the local economy and financial strength. It has pursued this strategy systematically over a period of six years, undertaken major new development and rationalisation, and has emerged with an estate of higher quality, which is more efficient and cheaper to operate.

Quantification of space requirement

2.9 An important element in the assessment of an institution's need for new or refurbished accommodation is the quantification of the overall space requirement. This should take account of the size of the existing estate, the efficiency with which that estate is being used, and the demand for new space.

2.10 Six of the ten institutions visited by the National Audit Office had attempted to quantify their overall space requirement. These institutions had generally made use of the standard measures (known as space norms) originally developed by the funding bodies responsible for higher education in the 1960s, which sought to establish standard space requirements for different academic disciplines. In the absence of any more up to date benchmarks, which have proved difficult to establish, these measures were used as a starting point for quantifying the overall space requirements of the institutions concerned, rather than as a basis for undertaking detailed planning of the space needs of individual departments.

2.11 The National Audit Office found that three of the ten institutions visited had undertaken regular monitoring of the utilisation of their accommodation space through surveys (Example 2). This is a valuable tool for allocating existing space to meet teaching and other requirements, and also as a basis for determining the need for additional space by revealing unused capacity in the existing building stock.

Example 2 One institution was in the process of reducing the size of its overall estate by some 13,000 square metres as a result of a strategy involving new build, disposal of older and less efficient buildings, and the application of space management techniques such as space charging, centralised allocation of general teaching space, and regular monitoring of actual space use.

2.12 The report by the National Audit Office on the Management of Space at Higher Education Institutions in Wales (paragraph 1.7) included the results of detailed surveys of space utilisation at three Welsh higher education institutions (Figure 6 shows the definitions used). These surveys indicated that actual use was often less than time-tabled use, and that the average utilisation rate was in the range of 19 to 22 per cent. Available figures in England suggest a wider variation in performance. Nevertheless, it is clear that monitoring the usage of available space can raise fundamental questions about the real need for additional space, and that such techniques should be more widely developed.

Definition of space utilisation

Figure 6

Space utilisation is defined as:

$$\frac{\% \text{ frequency} \times \% \text{ occupancy}}{100} = \text{space utilisation rate}$$

where frequency is the number of hours a room is in use as a proportion of the total available time, and occupancy is the average group size as a proportion of the total capacity of the room.

Source: National Audit Office

Qualitative factors

2.13 Most of the institutions visited by the National Audit Office made the point that quantified measures of accommodation needs had to be supported by other more subjective assessments, for example the contribution of a higher quality of estate to the institution's image and therefore to its marketing and development effort. This was supported by the views of the National Audit Office's steering group and focus groups. The quality of the institution's accommodation was felt to be significant in attracting students, and in some cases attracting quality staff and research funding. At the institutions visited by the National Audit Office, however, the evidence for these benefits was essentially anecdotal, and there was no attempt to quantify the impact of investing in their estate on matters such as student and staff recruitment.

Key Points

Most of the building projects examined by the National Audit Office pre-dated the Funding Council's requirement that institutions produce an estates strategy. Consequently only four of the ten institutions had comprehensive strategies to justify the new building, although other institutions had begun to develop such strategies. Few of the institutions visited had quantified their space requirements, or assessed actual space use through surveys. There was also a lack of formal assessment of some of the qualitative factors affecting investment decisions. Institutions should therefore ensure that an overall assessment of the need for new building projects is undertaken:

- following quantification of the overall space requirement using existing norms or other benchmarks developed for the purpose;
- following quantitative assessment of how intensively existing space is currently being utilised; and
- following assessment of the full range of benefits which improved accommodation can bring.

Option appraisal

2.14 Once a need for new facilities or refurbishment of existing accommodation has been assessed, higher education institutions should undertake a rigorous analysis of the options available to select the option that best meets their objectives. The options available might range from taking no action, to a public-private partnership in which the partner's contribution involves not only the construction of a facility, but also its ownership, management and operation. Appendix 4 provides details of the use of such partnerships in the higher education sector.

2.15 The form of analysis most appropriate for this purpose is option appraisal, which involves assessment of the costs and benefits of the project, and discounting of the cash-flows associated with it (typically the investment required to undertake the project, and the subsequent changes to operating costs and revenues arising from undertaking the investment) in order to calculate the net present value. This enables options with different costs and benefits to be compared on an equivalent basis.

2.16 The Funding Council require those projects submitted to them for approval (paragraphs 2.2-2.4) to include an option appraisal. All the building projects examined by the National Audit Office had been submitted to the Funding Council (or a predecessor body, the Polytechnics and Colleges Funding Council) for

approval, and the institutions concerned had therefore included an option appraisal among the information provided. The form of appraisal specified for higher education institutions is outlined in Funding Council guidance (Circular 44/93 - 'Draft estates procedures, Appraising property options: guidance on techniques'), which is based on HM Treasury guidelines. This follows a structured approach which involves:

- definition of objectives;
- consideration of options;
- identification and quantification of costs, benefits and uncertainties;
- valuation in money terms of costs and benefits, putting these on a comparable basis by discounting the cash flows at a 6 per cent discount rate;
- weighing up of uncertainties;
- assessing the balance between the options; and
- presentation of the results.

Quality of appraisals

2.17 In general the appraisals undertaken by those institutions examined by the National Audit Office followed the approach required by the Funding Council, but they fell short of good practice in some areas. The weaknesses identified by the National Audit Office included:

- failure to distinguish between the cash-flows associated with the funding of the project (for example loans and interest payments) and those associated with costs and benefits;
- limited evaluation of non-financial costs and benefits;
- a general failure to consider a wide range of options, including in some cases the 'do nothing' option;
- incorrect computation of the residual values of assets; and

- inconsistent treatment of the effects of inflation.

2.18 There were also a number of cases in which the assumptions relating to the project costs and benefits were misleading. These included:

- failure to include the costs of the initial fitting out of new buildings;
- under-estimation of the likely level of tenders for construction contracts;
- incorporation of capital receipts from disposals which had not been achieved;
- income from growth in student numbers after higher education sector growth had been capped, and from growth not generated by the project; and
- unproven reductions in operating costs.

2.19 Where the option appraisals included technical weaknesses and misleading assumptions, these were, in general, repeated for all of the options considered by the institution. Corrections of the errors, or changes in the assumptions, may not therefore have changed the order of preferences for the options under review, or led institutions to undertake an alternative option to that which was actually selected. However, where errors of any kind are made, there is a risk that incorrect investment decisions could occur.

Assessing the risks

2.20 The risk of failure to meet cost forecasts, to complete to time, and to realise the benefits of major construction projects, can be significant. These risks should therefore be assessed to ensure that adverse changes to key assumptions would not eliminate the fundamental viability of the project. The standard technique for making this assessment is sensitivity testing, which involves subjecting the key assumptions on which projects are based to rigorous analysis and quantifying the financial or other impact of adverse variances. For seven of the ten institutions visited by the National Audit Office, the rigour of the risk assessment and of the testing of the sensitivity of key assumptions to adverse change was inadequate. Common weaknesses included failure to identify the full range of risks associated with different aspects of the project and to quantify those risks, with sensitivity tests tending to be based on arbitrary variances (Example 3). In one case there was no evidence of quantification of the sensitivity analysis, and in another case just one sensitivity test was applied.

Example 3

One institution tested the sensitivity of the project to adverse 5 per cent variances in each of construction costs, residual value, sale proceeds, running costs and benefits. However, this was not based on any assessment of risk. No assessment was made of the potential likelihood and scale of the risks involved with the project, and therefore the sensitivity tests used were arbitrary. In the event the institution experienced a cost increase of some 25 per cent (partly attributable to increasing the size of the project), indicating the scale of sensitivity test which could have been applied had the risk of over-run in capital costs been rigorously assessed.

Institutional decision-making

2.21 Only one of the institutions visited by the National Audit Office had established a requirement to undertake option appraisal as part of their internal decision-making processes, suggesting that, if not required to do so by the Funding Council, other institutions might not undertake such analysis. Several of the institutions visited questioned the value of the standard public sector appraisal methodology to the higher education sector, as it required them to exclude transfer payments (on the basis that this was money which simply passes from one part of the public sector to another), and financing costs such as interest payments (on the basis that financing costs are implicit in the discount rate used in the net present value calculation).

2.22 For higher education institutions, transfer payments such as student fees and VAT represent real receipts and payments, and their exclusion therefore makes the analysis unrealistic from the institution's perspective. Similarly, use of a standard discount rate which does not reflect the institution's own financing costs reduces the realism of the analysis. Consequently, institutions were not convinced that the methodology they were required to use was completely relevant to their current circumstances. The study steering group also took the view that the methodology, while appropriate for investment projects using public sector funds, was not well suited to the appraisal of a project in a higher education institution, where a significant proportion of income is derived from other sources, and where the specific funding for the project may involve substantial private sector borrowing. The Funding Council are currently reviewing their guidance on option appraisal, which they expect to publish in early 1998.

Key Points

For the institutions visited by the National Audit Office, option appraisal was an area of weakness. The number of options identified and assessed was, in general, limited. The appraisals reviewed also included some technical errors, misleading assumptions and limited risk analysis, although it is unlikely that the correction of errors or changes to questionable assumptions would have led institutions to choose an alternative option to that which was actually selected. Moreover, there was little evidence that the appraisals formed an integral part of internal decision-making processes, which may be because the institutions were unconvinced of the benefits of using the standard public sector methodology. There is therefore a need for the Funding Council to:

- ensure that their revised guidance on option appraisal incorporates a methodology tailored to the specific needs of those involved in investment decision-making within the higher education sector.

And for institutions to:

- incorporate option appraisals into their internal decision-making processes, supplementing Funding Council requirements where appropriate with any further analysis which they regard as appropriate in strengthening internal decision-making;
- ensure that a full range of possible options are identified and rigorously assessed; and
- ensure that their appraisals include a comprehensive assessment of risk.

Project financing

2.23 Building projects in the higher education sector are funded from a variety of sources (as shown in Figure 3). For most of the institutions visited by the National Audit Office, private sector borrowing formed the largest single element of funding for the projects examined. The Private Finance Initiative (since succeeded by public-private partnerships) had not been established at the time that most of the projects examined were approved, and was not used for any of the ten projects. The National Audit Office therefore focused on the selection and evaluation of loan financing.

Financial forecasts

2.24 All institutions visited by the National Audit Office had undertaken some form of short to medium term financial planning to determine whether the project under review was affordable from internal resources, or whether, and if so how much, borrowing would be required. The range and rigour of analysis varied, but

in all cases institutions had considered the impact of the project on their financial position, and had produced financial forecasts to demonstrate that impact (Example 4).

Example 4

One institution produced a detailed and comprehensive analysis to demonstrate the impact of the project on the institution's overall financial position. This incorporated ten year projections of income and expenditure, cash flow (with month by month forecasts for the first three years), student numbers, the balance sheet, the capital expenditure required to fulfil the estates strategy, the funding available for capital expenditure, and the overall position in relation to the Funding Council's borrowing threshold.

2.25

Financial forecasts were used by the institutions visited for both internal and external purposes: to satisfy the relevant internal committees (typically the Finance Committee of the institution's governing body) that the project was affordable; to demonstrate to the Funding Council that the institution's financial position was sound; and to convince lenders that the loan would be secure and that interest payments could be met. The National Audit Office's consultation with other finance directors in the sector, through the study steering group and focus group, confirmed that it is normal practice to consider the funding of projects in the context of the overall financial position of the institution.

2.26

In most cases the focus of the analysis was on short to medium term cash flow. That is, forecasts of the level of surplus cash generated from operations over a three to five year period, compared with the additional burden of interest payments on capital borrowed to finance the project. Some of the more comprehensive analyses extended over longer time periods, and also included forecasts of the institution's income and expenditure account, of the institutional balance sheet, and of future capital expenditure requirements. These analyses also highlighted key financial indicators such as interest cover, gearing (the relationship between the overall level of borrowing and net worth), and the institution's position with regard to the Funding Council's borrowing threshold (that interest payments should not exceed four per cent of total income) as prescribed in the financial memorandum with institutions.

Loan finance

2.27

In the majority of cases examined by the National Audit Office, the institution assessed the market and conducted a tendering procedure in which a number of financial institutions offering different products competed for the institution's business (Example 5). However, in two cases the institution approached its existing bank and took what was offered. This approach may have been a product of the

relative lack of awareness of both the higher education sector and the financial services sector of each other in the late 1980s and early 1990s. At that time, borrowing by higher education institutions was relatively uncommon and, consequently, the sector was not seen as a market for loan finance by banks and other institutions. As a result, institutions, especially those which were smaller or less financially strong, may have found it difficult to attract the interest of lenders other than those with which they already had a relationship - typically the clearing bank which held the account.

Example 5 One institution seeking funding of some £14 million conducted an extremely thorough process of evaluating options, consisting of:

- inviting four leading financial institutions to bid;
 - modelling the costs of the various proposals;
 - modelling the impact of the project on the overall financial position;
 - refining the proposals through discussion and negotiation;
 - testing critical issues as they arose with professional advisors including financial consultants, solicitors and tax counsel specialising in tax and VAT issues, and the institution's auditors;
 - presentation of options to the finance committee; and
 - selection of the preferred option.
-

2.28 The National Audit Office's discussions with financial institutions who are now active in the higher education sector have indicated that lenders are now highly aware of the business opportunities in the higher education sector, and fully expect to find themselves in competition with other lenders. They also indicated that the presence of competition is likely to lead to improved rates for the borrower, particularly in the case of retail banks either defending an existing customer relationship, or identifying the possibility of developing a new relationship. Any institution which fails to use a competitive tender process for the acquisition of loan finance is therefore unlikely to achieve the best possible value for money.

2.29 For those institutions which did select from competing offers, cost was the most common selection criterion, although other factors were considered. For example, some institutions consciously avoided options which might have offered low cost funding on the grounds that they did not wish to take out funding which relied on tax breaks, and which might therefore be challenged subsequently by the Inland Revenue, or rendered invalid by subsequent changes in legislation. Other institutions did not select the cheapest finance available because the offer carried

onerous security requirements or restrictive covenants which would limit future flexibility. However, none of the institutions had set evaluation criteria prior to inviting lenders to propose terms. Thus, in selecting a particular offer, the basis on which they weighed cost against, for example, the lender's security requirements, was not always clear.

2.30 It is essential to ensure that the funding package is in place prior to making a commitment to the project. This was not generally a cause for concern at the institutions visited, although one institution did experience some difficulty in securing funding part way through a major project (Example 6).

Example 6

For one of the projects examined, the financial package consisted of two separate loans from different lenders. Part way through the project, having fully used the first loan, the institution sought to draw down funds from the second loan, only to run into legal difficulties over the acceptability of the security for the loan. For a period, until the issue was resolved, the institution was forced to finance the continuing work out of internal funds, something which it could not afford to do for very long. This was a potentially serious situation as the sums involved were significant (£10 million). As the institution concerned had found it difficult to arrange its funding in the first instance, the identification of alternative sources of finance could have been both protracted and expensive, and could have led to major financial problems for the institution as a whole.

2.31 Eight of the institutions examined by the National Audit Office had used professional advisors to assist with the arranging of loan finance. Such advisors included financial consultants specialising in the arrangement of lending packages, solicitors and accountants specialising in VAT issues, tax counsel, management consultants, and auditors. The level of fee for such assistance varied between 0.1 per cent and 3.6 per cent of the total cost of the projects examined. This reflected the amount of work done by the advisors, which in some cases was restricted to specific advice about particular aspects of the funding arrangements, but in others involved a wide-ranging search for the best source of funding. The National Audit Office's survey of the sector as a whole showed that advisors' fees averaged 2.2 per cent of the project cost where financial advisors had been used.

2.32 The National Audit Office did not undertake a detailed review of the fee arrangements for the projects concerned, but it is clear that the costs incurred on financial advice were consistent with sector norms. It was also apparent that, without the assistance of external advisors, some of the institutions concerned would have found it difficult to identify potential lenders, particularly where they were not accustomed to the use of borrowing to fund capital investment. In this respect, and in cases where new or innovative forms of finance are being considered, external advisors have an important role to play. This view was

supported by the finance directors participating in the National Audit Office's focus groups. Institutions should ensure, however, that advisors' costs are properly controlled, and that the costs are commensurate with the benefits received.

2.33 For most of the institutions visited the loan finance used was specific to the project for which it was acquired. In such cases the overall institutional debt portfolio therefore comprised the sum of the loans arranged on a project by project basis. In only one case had an institution re-financed any of its debts. Two institutions had taken out non-specific loans which were drawn down as required to meet their capital funding requirements. As institutions continue to use loan finance for capital investment purposes, it is likely that they will move away from borrowing, to loans which are used to re-finance earlier debt, and to achieve an optimum overall level and cost of borrowing.

2.34 There has been some attempt within the higher education sector to explore more innovative forms of funding through the use of capital markets, although this has so far met with limited success. It may have been that the readiness in recent years of financial institutions to lend to higher education institutions at reasonable terms had rendered a direct approach to the capital markets unnecessary. However, a number of institutions are now considering bond issues.

2.35 The recent report by the National Committee of Inquiry into Higher Education (Higher Education in the Learning Society, July 1997) observed that experience since 1992 and in the United States suggests that innovative approaches such as bonds are at best long term options, and then initially only for institutions in a very strong financial position. Furthermore, such approaches carry high risks if all the financial consequences are not fully assessed at the outset.

2.36 This was borne out by the experience of an additional institution visited by the National Audit Office during the course of the study. The institution sought to finance a major capital development programme by issuing a debenture. Although the issuing of the debenture was itself handled successfully, the institution subsequently experienced a cash-flow deficiency resulting in a substantial unplanned bank overdraft. The institution's financial information and forecasting procedures were the primary cause of this problem, for example, they failed to properly take account of the substantial annual payments that had to be made into a capital redemption fund throughout the life of the debenture. However, the relatively high initial costs (of around £1 million) of arranging the debenture, an overrun in building costs and the institution's decision to finance a significant proportion of the capital programme from operational surpluses, leaving little margin for error, were among the contributing factors.

2.37 The lessons from this institution reinforce many of the messages about the successful management of capital projects set out elsewhere in the report, but do not by themselves indicate that institutions would be unwise to obtain finance direct from the capital markets. Nor is it evident that the institution obtained worse value for money than if it had adopted a more conventional financing solution, particularly given the certainty of debt servicing and repayment costs inherent in this type of financing. The institution could have done more, however, to provide its governing body with information on the financial implications of bond issues, and to assess the sensitivity of the chosen course of action to changing circumstances. Such analyses were eventually provided to the Funding Council, at their insistence, some four months after the governing body had decided to proceed with the bond issue. The Funding Council are satisfied that the institution have now taken or set in hand appropriate actions to address the problems encountered.

Key Points

The National Audit Office found that all ten of the institutions visited had undertaken some form of short to medium term financial planning to determine whether the project under review was affordable from internal resources, or whether borrowing would be required. The National Audit Office also found that institutions had developed many of the skills required to identify, evaluate and utilise loan finance over the relatively short period in which they had been active users of such funds, although there was scope for further improvement. In particular, weaknesses in the competitive processes used in tendering for loans were identified, and not all institutions had considered borrowing in the context of their overall debt portfolio. Institutions therefore need to:

- ensure that loan finance is selected following a rigorous process of competitive tender;
 - ensure that evaluation criteria are clearly established in advance and that the selection process is based upon them; and
 - review their overall level and cost of borrowing, and ensure that new loans are consistent with an overall borrowing strategy.
-

Part 3: Project Implementation

3.1 This part of the report deals with the process of implementing a building project: the initial planning; the design phase; the procurement of consultants and contractors; and the management of the construction and fitting-out of the building. The key test of successful implementation is whether projects are delivered to time and budget. Of the projects examined by the National Audit Office, the majority were delivered broadly to time and budgeted cost. However, the National Audit Office identified a number of areas in which improvements could be made.

3.2 There are a number of factors which influence success in project implementation, with the key elements being:

- sound planning which allows sufficient time for all stages of the process and puts into place management structures which facilitate strong oversight of the project;
- a design which responds to users' needs within the constraints of available space, cost and technical feasibility;
- procurement processes which ensure fair competition, and selection against clear criteria of cost, time and quality;
- regular and detailed review of progress against plan, with timely corrective action where problems have been identified; and
- a systematic and controlled process of project completion, followed by a review of the lessons learnt and the objectives achieved.

3.3 There is a considerable body of good practice guidance in this area. The Procurement Guidelines issued by the Committee of Vice-Chancellors and Principals (CVCP) in January 1997 (paragraph 1.5) represent the latest guidance targeted specifically at the higher education sector, and include a comprehensive list of guidance available within the sector and more generally (for example, publications by the Central Unit on Procurement and the Construction Industry Board). The National Audit Office reviewed the practice observed at institutions

against the guidance available at the time of their visits to institutions in 1996, as well as considering more generally whether projects had encountered difficulties, and whether they had achieved their objectives.

Planning the project

3.4 The projects examined by the National Audit Office all had plans against which the progress of the project was measured. However, in most cases the detailed project plan covered only the design and construction phases, rather than the entire time period from the initial planning to completion and hand-over. Coverage of the early stages of the process is particularly important in the context of a higher education institution, where: the decision-making body (the governing body or a nominated sub-committee thereof) tends to meet relatively infrequently; Funding Council approval may be required; and the delivery date for projects tends to be an immovable point (typically the beginning of the academic year). New buildings also invariably involve the securing of planning consent from the local authority. This means that the necessary approvals must be carefully planned if they are to be received on time, and if the later stages of the project are not to be subject to excessive time pressure.

Management structures

3.5 The CVCP Procurement Guidelines indicate that, once a project has been approved in principle, the institution must put in place a strategy for implementation, and an appropriate team to achieve this. Although differences of approach are clearly possible, there are a number of key roles which have to be fulfilled:

- **a project steering group:** the body responsible for overall project control, for bringing together the various participants in the project and the interest groups in the institution, for receiving progress and cost reports, and for providing the conduit between the day-to-day project management team and the institution's management and governance structures (Example 7);
- **the project sponsor:** the representative of the client interest, carrying ultimate responsibility for ensuring that the product which the institution is buying meets institutional objectives, fulfils user requirements, and is delivered on time and to budget. The project sponsor will typically be a senior, non-technical manager in the institution; and

- **the project manager:** the day-to-day manager with responsibility for delivering the project, as specified, to time and budget, and for ensuring that external consultants and the construction contractor fulfil their contracted responsibilities. The project manager will typically be a technical specialist from the property or construction industries, or a specialist project manager.

Example 7

One institution established a project group which initially considered the feasibility of funding the project, and subsequently took responsibility for monitoring and control. The group included both governors and staff, with the governor representatives supplying specific expertise in project evaluation and monitoring.

3.6

For the projects examined by the National Audit Office, these key roles had been established in almost every case, albeit with variations in terminology and their precise brief. The role of project sponsor was given either to a senior manager without specialist building expertise, or a senior technical manager (usually the Director of Estates).

3.7

For eight of the ten projects examined, the project manager role was undertaken by contracted external professionals. This is an appropriate approach to staffing a relatively short-term and highly skilled role. For smaller institutions, who do not have large in-house teams of estates specialists, there is no other realistic approach to providing the project management skills than to acquire them under contract in this way, but this approach is equally relevant to larger institutions. In one larger institution, where a longer term programme of estates development was envisaged, the institution employed a member of staff with extensive project management experience in other industries on a three year contract to project manage the entire estates development programme. This too is a sensible approach. A number of other issues were encountered, however, in relation to the use of external professionals, and are outlined below.

Client and contractor roles

3.8

It is critical that the appropriate distinction is made between client and contractor roles in order to ensure that decision-making remains with the client, and to prevent conflict of interest where contractors undertake multiple roles. For one of the projects examined by the National Audit Office (Example 8) there was insufficient distinction between the role of the client and contractor, which could have given rise to a conflict of interest.

Example 8 In one institution, where there was no relevant in-house expertise, an external consultant was appointed to assist in development of the accommodation strategy. Subsequently, for the project examined by the National Audit Office, the consultant acted as professional advisor on the design and execution of the project, provided day-to-day project management of the construction programme, and his firm was appointed to undertake the role of quantity surveyor. In this situation, where an

Delegated authority

3.9 All projects involve situations in which the project manager must take quick decisions which may involve issues of timing and cost (for example, where a particular aspect of the proposed design is found to be problematic, and a change is therefore proposed part way through the construction phase). If institutions are to ensure that control over decision-making is not lost, it is critical that the levels of delegated authority for project management staff are clearly set out at the commencement of the work. Project managers need to be given delegated authority to take such decisions, if progress on projects is not to be delayed. But it is equally important that an appropriate limit be placed on such decisions, above which authority is required from the project sponsor, the project steering group, or the appropriate committee of the institution's management or governing body. The National Audit Office found that, for two of the projects examined, no formal level of delegated authority had been set.

Procurement strategy

3.10 The contractual structure through which design and construction of a building is organised (the procurement strategy) should be determined at an early stage, as this influences the choice of consultants (architects, consulting engineers and other professionals), who in turn need to be appointed sufficiently early to prepare the way for selecting the construction contractors. The key procurement strategies are set out in Part 3 of the CVCP Procurement Guidelines, and are as follows:

- **traditional:** the client engages consultants to prepare designs and specifications for works that are then constructed by a contractor who is engaged separately;
- **management contracting:** the contractor is paid a fee to manage the construction with works being undertaken by specialist contractors sub-contracted to the management contractor. The design is undertaken by consultants contracted to the client;

- **construction management:** this is similar to management contracting, although with the specialist contractors being contracted directly to the client; and
- **design and build:** the contractor takes responsibility for both design and construction.

3.11 Different procurement strategies will be appropriate in different circumstances, and should reflect the priorities of an institution in relation to factors such as project duration, cost, design quality and risk transfer. The choice of procurement strategy therefore involves consideration by institutions of the relative priority of these elements, and of the trade-offs between them (Figure 7).

**The appropriateness of
procurement strategies in
meeting project
objectives**

Figure 7

Aspect	Objectives	Traditional	Management Contracting	Construction Management	Design and Build
Timing	Early competition	X	✓	✓	✓
Cost	Price certainty before start of construction	✓	X	X	✓
Quality	Prestige of design and construction	✓	✓	✓	X
Complexity	Technically advanced or highly complex building	✓	✓	✓	X
Responsibility	Single contractual link for design and construction	X	X	X	✓
Design development	Client control over design development	✓	✓	✓	X
Risk avoidance	Desire to transfer complete financial risk	X	X	X	✓
Damage recovery	Ability to recover construction costs direct from a main contractor	✓	✓	X	✓
Buildability	Contractor input to economic construction to benefit the department	X	✓	✓	X

✓ Appropriate X Not generally appropriate

Note: This figure is for general guidance only. In practice, the appropriateness of each contract strategy is not so clear cut. The project sponsor should take advice from the project manager on the circumstances of each individual project.

Source: National Audit Office

3.12 The issues to be considered when choosing a procurement strategy may affect the overall financial health and operational performance of an institution, as they involve different degrees of certainty over the price to be paid for the building and the likelihood of completion to time. Such issues are therefore of sufficient importance to justify not only careful consideration by the institution's managers, with advice from the project manager, but also the involvement of the governing body (or a sub-committee with appropriate delegated powers) in the decision-making process (issues of governance are covered in more detail in Part 4 of this report). Five of the institutions visited by the National Audit Office had not given due consideration to the procurement route (Example 9), while a further two institutions had not shared their thinking with their governing body.

Example 9

One institution accepted the advice of its building consultant to follow the design and build route, whereby a fixed price contract would be established with the contractor, therefore reducing the risk of cost increases during the project. However, as the building was of a specialist nature and involved a demanding technical specification, the resulting tender prices exceeded expectation by 63 per cent. Consideration was then given to changing the procurement route, but time constraints and the additional costs involved ruled this out and forced the institution to proceed, albeit with a significantly reduced specification. Although the procurement route had been discussed by the design team, the advantages and disadvantages of different procurement options had never been set out in detail, and the institution was unaware of the implications of the strategy it had selected.

Key Points

The National Audit Office found that for all the projects examined institutions had plans against which progress on building projects was measured, and in general had in place appropriate project management structures. However, few plans covered the early stages of the project, or specified clearly the roles, responsibilities and delegated authorities of all parties involved in the project. Furthermore, there was little consideration of the procurement strategy which would best meet the institution's objectives. When planning building projects, institutions should therefore:

- develop plans which take them from approval in principle through to completion, taking into account the approvals which will be required from the Funding Council and the institution's governing body;
- incorporate project management arrangements as a specific part of the overall planning process, and produce a project management plan which sets out the overall structure and the specific responsibilities and accountabilities of all parties involved in the project;
- ensure that an appropriate structure of delegation is established and made clear to all parties; and
- assess their key objectives and priorities, identify the most appropriate procurement strategy, and ensure that their governing body supports the chosen method.

Design

3.13 An important factor in the success of building projects is the development of a clear project brief for the design team, indicating the institution's requirements, but without restricting their scope to produce optimum solutions. An effective process for securing user involvement in preparing the brief is an essential part of the design process if the end product is to match users' requirements. However, users may have a tendency to over-specify in order to achieve the highest possible quality, and institutions therefore need to balance user expectations with the practical constraints of cost, time and the feasibility of implementation.

3.14 In six of the ten cases examined by the National Audit Office there was a strong emphasis on user involvement, and a number of examples of good practice, including the formal signing-off of designs by users (Examples 10 and 11). The signing-off of designs is a particularly important control, as it restricts the potential for users to request alterations to the design at a late stage in the development of the project. Such alterations tend to add both cost and time to the project.

Example 10

At two institutions visited, the institutions concerned were developing generic requirements for (in one case) different sorts of accommodation and (in another) different items such as lighting, cladding and windows. The advantages of this approach are that it enables the institutions to provide an element of standardisation in the provision of accommodation. While not precluding input from the immediate user, this avoids time and money being spent on unnecessarily repetitive design work.

Example 11

One project involved consultation of users at three distinct stages:

- at the design stage, when users were invited to state their requirements and then to sign-off the architect's drawing as confirmation that the requirements had been met;
 - during the construction phase, whenever variations from the accepted design were proposed; and
 - prior to finalisation of decoration proposals, when they were invited to choose between alternative colour schemes and other decoration details.
-

Whole-life costing and value engineering

3.15 Good practice indicates that buildings should be designed with whole-life costs in mind. That is, with the objective of minimising the costs of the building over its whole life, rather than simply minimising the costs of construction (Example 12). This implies consideration of the relationship between initial capital costs and running costs over the life of the building. This approach was adopted to varying degrees for the projects examined, but was not an integral part of the design process in most cases.

Example 12 The National Audit Office visited the recent Ministry of Defence development at Abbey Wood. There, whole-life costings were used to inform design considerations in a wide range of areas including energy use, glazing and shading, roofing materials, ventilation, intelligent lighting and partitioning. A full range of costs and operational issues were evaluated including capital investment, energy consumption, other running costs, ease of maintenance, and flexibility. Although a project life of 50 years was assumed, pay-back of additional investment was generally justified on a 5-10 year projection.

3.16 Failure to give appropriate consideration to whole-life costing may have resulted from institutions allocating insufficient time to the design stage to permit consideration of the relationships between capital and running costs. Consultation with the study's focus group of estates directors on this issue confirmed the importance of considering the long term cost implications of alternative design solutions, and in particular the trade-off between capital and operating costs. The onus for ensuring that this analysis is undertaken lies clearly with the client, as contractors and consultants have no long term interest in the building. The Funding Council are currently conducting a study on whole-life costing which should provide useful guidance for institutions.

3.17 A further technique for improving value for money is value engineering. This involves subjecting the design proposals to systematic review at each stage of the design process (the concept stage, scheme design, and detailed design) to ensure that the final design meets user requirements, without over-specification, at the lowest possible cost. This should take account of issues such as whole-life costs and the trade-off between quality and cost, and be a collaborative process involving both client and consultants. Example 12 shows how this approach can form an integral part of the design process.

3.18 Four of the projects examined by the National Audit Office had incorporated a form of value engineering, although this had generally been prompted by receipt of tenders for the construction contract which were in excess of budget, and was therefore fundamentally a cost cutting exercise. Nonetheless, these institutions followed value engineering principles, and all found that they were able to reduce costs significantly, without loss of functionality, and without significant reductions in quality (Example 13). This suggests that the application of value engineering principles is beneficial, even when financial pressures do not dictate that it is essential. Further guidance on value engineering is available in the CVCP Procurement Guidelines and in other specialist publications listed in the Guidelines.

Example 13 One institution re-appraised a number of design aspects including the relationship between usable space and circulation areas, the materials to be used for roofing and cladding, the requirement for air conditioning in the foyer of the building, and the design of staircases and balustrade. The result was a reduction in the costs of the design of over £400,000 or 7 per cent.

Key Points

For a number of the projects examined the National Audit Office found that there was a strong emphasis on user involvement in the design process, although this was not apparent in every case. While some institutions had considered factors such as whole-life costs and the trade-off between quality and cost, these were not widely applied to the design process, meaning that the full scope for savings in this area was not realised. Institutions should therefore ensure that:

- user involvement is maximised in every case; and
 - the use of more sophisticated techniques such as whole-life costing and value engineering are incorporated into project design.
-

Procurement

3.19 Building projects involve higher education institutions in procuring a range of different supplies and services:

- consultants such as architects, consulting engineers, quantity surveyors and project managers;
- contractors, particularly the main contractor responsible for the construction of the building;
- furniture and equipment for fitting-out; and
- continuing services such as security, cleaning, heating and lighting.

3.20 The procedures which should be followed for procuring such supplies and services are well established, and involve:

- developing criteria for selection;
- identification of potential suppliers;

project, consultants were employed at an hourly rate, giving similar potential problems of cost control. It was therefore encouraging to note that, for six of the projects examined, fixed fees were used for the majority of consultants employed. Incentive-based fee structures for consultants were not widely used at the institutions visited by the National Audit Office, although in one case the fees of the chartered surveyors involved in a building purchase were dependent on them bettering an agreed price target. They failed to do so and received no fee.

3.23 The National Audit Office's survey showed that, for the sector as a whole, consultants' fees averaged eight per cent of total project costs, with the large majority of projects being in the range five per cent to 15 per cent. The fee costs for the ten projects examined varied between 5.1 per cent and 11.9 per cent (excluding two projects for which the costs incurred were untypically low, as they related to the acquisition of a building rather than its construction), and were therefore within the expected range, and consistent with the sector average.

3.24 Cost is not the only factor in selecting consultants. Factors such as familiarity with the institution, a track record on previous projects, and the capability of individuals, clearly also play an important part in the competitive process. In recognition of the potential benefits of establishing long term relationships with consultants, one institution visited by the National Audit Office was considering establishing partnering arrangements for the services of a range of consultants over a five year period (Example 15). Although such partnering arrangements may become more common, and therefore reduce the need for competitive tendering on a project by project basis, they do not preclude the use of competition. The partnering arrangement should itself be the result of a competitive process, and during the life of the arrangement the performance and price-competitiveness of the appointed consultants should continue to be reviewed.

Example 15

One institution was considering tendering for the services of quantity surveyors, service engineers and structural engineers for a five year period, to partner the institution on all future projects both large and small. Appointments were to be based on an indicative programme of work, but without commitment. The institution would therefore benefit from using external expertise, at a known cost, over a long time period, during which the external provider would have the opportunity to develop a close understanding of the institution's needs.

Procurement of the construction contractor

3.25 In selecting construction companies to undertake the main building contract the institutions visited by the National Audit Office generally followed the basic principles of accepted good practice. Some of the projects were models of good tendering procedures, and a number of institutions incorporated and gave

appropriate weighting to important issues other than price, such as the personnel to be deployed by the contractor, and the contractor's financial viability. Financial viability was particularly relevant for the projects examined by the National Audit Office, given that at that time the construction industry was in recession, and that there were doubts about the stability of a number of firms for most of the period under review.

3.26 Although there was much good practice to be found among the institutions visited, some weaknesses were identified, including:

- the absence of formal tendering procedures to control the opening and recording of tenders;
- a lack of formal tender evaluation criteria and procedures;
- the absence of post-tender negotiation as a means of achieving price reduction or other desired changes; and
- failure in one case to meet the requirements of the relevant European Community competition directives by not advertising the project in the Official Journal of the European Community.

3.27 Six of the ten institutions visited by the National Audit Office had purchasing officers to co-ordinate the purchase of the institution's goods and services. These officers were not usually involved in the procurement of either consultants or construction contractors. The general view of the focus group of estates directors consulted by the National Audit Office was that purchasing officers do not have skills which readily transfer to the procurement of buildings and related services. However, experienced purchasing officers will often have generic skills relating to tendering, evaluation of suppliers, risk assessment, contracting, and in particular knowledge of procurement legislation including compliance with European Community directives. Given the procurement issues identified by this study, there is therefore scope for greater use of such professionals in this area (Example 16).

Example 16

The National Audit Office visited British Airways' facilities purchasing unit. This consists of a mixed team of property and purchasing professionals working together to procure both capital projects and revenue items. There was some scepticism in British Airways when purchasing professionals were initially deployed in this area, but their contribution in providing a strategic overview of procurement practice and in ensuring compliance with corporate requirements is now considered to add value to property procurement.

Fitting-out and services

3.28 The procurement of equipment, furniture, and other items required to fit-out new buildings is an area where purchasing officers have traditionally been involved in building projects. The extent to which the institutions visited by the National Audit Office deployed purchasing skills in this area varied according to the availability of such expertise, and the contractual arrangements for the project. In some cases the responsibility for all or part of the fitting-out expenditure fell to the contractor or the external project manager. In such cases the fee structure was generally based on a percentage of the value of goods purchased, and the fee therefore rose in proportion to the value of the goods purchased. These arrangements did not, therefore, provide an incentive to ensure that contractors were motivated to obtain the best available prices on behalf of the institution. Moreover, it was not clear in these cases what special skills the contractors brought to this area of purchasing, and whether they were therefore able to add value to the process. At one institution, however, it was clear that real benefits were achieved in terms of lower cost and value for money through use of the specialist skills of a purchasing consultant (Example 17).

Example 17

One institution, having negotiated what it regarded to be the best available price on furnishings, then invited its purchasing consultant to see if he could better the price. An additional discount of over ten per cent was achieved.

3.29 For most of the projects examined by the National Audit Office, the approach to providing services for new buildings (such as cleaning, security and maintenance) was to maintain the current arrangements, which were typically to use in-house staff. The extent to which such services had been, or were to be, market tested, varied. In general, however, in-house provision continued without full consideration of the alternatives. Two institutions were considering the possibility of an overall facilities management contract, but little progress had been made on this at the time the National Audit Office visited. A further institution had attempted to provide catering facilities through a form of private finance arrangement, but without success. The National Audit Office identified one example of good practice, however, at an additional institution they visited (Example 18).

Example 18

One institution engaged a facilities management company to help introduce efficiencies in its estates department, including the contracting-out of services where this offered cost savings. The result is a 'mixed economy' in which some services are undertaken in-house, some have been contracted to external suppliers, and some have elements of both in-house and external provision.

Key Points

The National Audit Office found that in most cases the institutions visited had followed a satisfactory competitive process in appointing consultants and construction contractors for the projects examined, although some weaknesses were identified, including a failure in two cases to meet the requirements of European Community competition directives. Purchasing officers were not generally involved in this part of the procurement process, although they had more involvement in the fitting-out of the project. Institutions also generally extended to their new facilities the existing arrangements for the provision of services such as catering and cleaning. Institutions are therefore encouraged to:

- re-examine their tendering procedures, and ensure that they comply with European Community legislation and accepted best practice;
- consider making use of the skills of purchasing officers in the procurement of buildings and related services; and
- use opportunities such as the commissioning of new buildings to consider alternatives to existing approaches to service provision.

Monitoring progress

3.30 A key part of project management is the effective reporting of progress against time and cost. This is usually the responsibility of the project manager. To be effective, and in particular to be readily comprehensible to non-technical managers and to governors, it is essential that such progress reports show performance against clear targets. For most of the projects examined by the National Audit Office, the institutions produced detailed monthly reports showing progress against key targets and against budget. However, in one project the reporting process was usually verbal, and detailed financial reports were produced on only four occasions over a 15 month period. In another case the frequency of reporting was every two months. This frequency of monitoring is insufficient to permit the necessary level of control as, typically, significant sums are spent and a number of major decisions arise over the two month period of a major project. Although the former project was delivered to time and budget, the latter was both late and over budget.

3.31 It is also important that the management structures incorporate formal regular reporting both to the project steering group and to the relevant committees of the governing body (such as those responsible for estates and financial matters), and that there is clarity over the frequency and extent of that reporting. In general, non-technical committees should receive exception reports which incorporate relatively little detail, but which summarise risks to completion dates, out-turn

costs, achievements of projected benefits, or other impacts on institutional objectives. Where external professionals are involved in key roles on the project, their participation in relevant committee meetings should be considered.

3.32 The most obvious threat to meeting the project cost budget are changes to the design which have to be authorised during the course of the project as unforeseen problems emerge. Close control of such changes is required and, in particular, it is essential that no change is authorised until the full cost implications have been established. This remains true even if project budgets include contingency sums to allow for unforeseen costs (Example 19). The majority of the projects examined by the National Audit Office demonstrated good control in this area, but in two projects a large number of changes were authorised. For one of these projects this was due to the construction phase having commenced with provisional sums (estimated costs of work not yet specified in detail) of £1.3 million, which resulted from allowing insufficient time at the design stage to achieve a comprehensive design before commencement of the construction phase. In the other, the volume and extent of the changes meant that the quantity surveyor found it necessary to re-measure the works in full in order to provide a reliable cost statement.

Example 19

In one institution the Finance Director refused to permit the inclusion of contingencies in project budgets, as previous experience elsewhere had indicated that, once allocated, contingencies tended to be spent. He therefore established a funding limit for the overall estates strategy (which involved numerous projects) which included a general contingency. This contingency could only be called upon in exceptional circumstances, and only with the specific approval of the Finance Director. As a result, the large majority of variations were accommodated within the original project budget.

3.33 It is clearly important that, where different control arrangements exist for different parts of the project, reporting mechanisms are in place which allow spend to date and forecast outturn for the project as a whole to be monitored. One of the projects examined by the National Audit Office demonstrated the problems that can occur when cost reporting mechanisms are fragmented (Example 20).

Example 20

For one project, cost reporting was divided into two elements - the construction contract and the fit-out costs - each controlled by different parties. Although the Project Sponsor had overall responsibility for the project, and the Project Steering Group received cost reports for both elements, no single cost report was produced until a relatively late stage in the project. Reporting systems were therefore insufficiently transparent, in the temporary absence of the Project Sponsor, to prevent concerns arising of the possibility of a significant overspend on the project. Although this did not occur, the fragmentation of cost reporting mechanisms contributed to uncertainty over the actual and forecast level of expenditure.

Key Points

The National Audit Office found that the majority of institutions had adequate arrangements for monitoring the progress of the projects examined. However, problems arose at two institutions where cost reports were either insufficiently frequent, or where cost reporting mechanisms were fragmented. Institutions therefore need to ensure that:

- the reporting arrangements provide governors and senior managers with regular information on progress against time and budget; and
- when cost control is divided between different parties, reporting mechanisms are in place which allow the total cost of the project to be monitored.

Project completion

3.34 Project completion involves the hand-over of the building to the institution, ‘snagging’ (the rectification of minor faults) and formal acceptance. Fitting-out then follows. For most of the projects examined by the National Audit Office this was handled in a systematic and controlled manner, although in a number of cases there was clear evidence of time pressures arising in the later stages of the project, in two cases leading to overlap of the final stages of construction and fit-out. Apart from the short-term disruption involved, there is a risk of acceptance by the institution without rigorous checking to ensure that the project is delivered to specification.

3.35 In order that institutions can evaluate their overall handling of projects, with a view to learning lessons for the future, and to ensuring that projects have met their objectives, it is important that the completion process involves a post-implementation review. Some of the institutions visited had procedures for undertaking such a review, but none had yet done so, although at the time of our examination a number of projects were not yet complete, or had only been completed for a short period of time. One institution had undertaken a review between phases of its project, which revealed problems with planning arrangements, user consultation on design changes, and their understanding of the fundamental implications of design changes. Procedures were changed as a consequence, which proved valuable in the management of later phases of the project. This could usefully be emulated elsewhere, particularly in multi-phase projects, or where institutions are involved in estates rationalisation involving a number of projects undertaken successively. At another institution visited by the National Audit Office, a post-implementation review process at various stages following completion of the project was being developed (Example 21).

Example 21

At one institution a three stage process for post-implementation review was being developed. This involves review of the construction quality at the end of the first year default liability period. Further reviews will be undertaken after two and five years to ensure that the building has met its business objectives and to determine what lessons can be learned.

Key Points

For most of the projects examined by the National Audit Office, completion was handled in a systematic and controlled manner, although in a number of cases there was evidence of time pressures arising in the later stages of the project. There had been little evaluation by institutions, however, of their overall handling of the project, and of their success in meeting the project's objectives. Institutions should therefore ensure that:

- sufficient time is left to manage the completion arrangements;
 - time pressures do not lead them into acceptance of projects before the necessary checks have been undertaken; and
 - procedures for post-implementation review of building projects are implemented.
-

Part 4: Governance

4.1 The governing bodies of higher education institutions are usually comprised of external lay members, senior managers, and representatives of the staff and student bodies. They are responsible for ensuring that the institution is effectively managed and for planning its future development, and have ultimate responsibility for all the affairs of the institution. Governing bodies meet three to four times a year and deal with a wide range of issues involving strategic direction and overall control. They can delegate business to sub-committees with narrower functional responsibilities, such as finance, estates, personnel and audit. The Vice-Chancellor (or equivalent) of the Institution, supported by a senior management team, is responsible for the day-to-day operational and financial management of the institution.

4.2 Given the implications of major building projects for the financial health of institutions and their future development, the role of governing bodies is significant, and should encompass all the key stages of a project. In order that governing bodies can fulfil their responsibilities with regard to major projects it is essential that they are properly constituted, and that they have appropriate procedures in place. The National Audit Office therefore undertook a high level review of general arrangements for governance at the institutions visited, before undertaking a more detailed examination of the involvement of governors in building projects.

General governance arrangements

4.3 The size, structure and terminology used for the governing bodies in the ten institutions visited by the National Audit Office varied, but there were two broad types of governance structures, reflecting the typical structures of the 'old' universities, and the former polytechnics and colleges sector respectively:

- the Court/Council structure in which the executive (or governing) body is the Council - comprising lay, academic, staff and student members. The size of Councils in the institutions visited by the National Audit Office varied between 33 and 54 members. The Court has a wider representative role, and does not take part in the day-to-day oversight of the institution's affairs. In the institutions visited, the Court was a body of some 200 strong, drawn from a wide range of different bodies; and

- a structure based on a single, smaller governing body, typically known as the Board of Governors - comprising lay, academic, staff and student members. The size of such governing bodies in the institutions visited by the National Audit Office varied between 17 and 25 members.

4.4 The National Audit Office examined a range of governance arrangements at the institutions visited including:

- the composition of the governing body and arrangements for appointing new members;
- the structure and remit of sub-committees of the governing body;
- the management of governing body business;
- the role of the Clerk to the governors;
- arrangements for registering governors' external interests and for declaring potential conflicts of interest; and
- decisions taken by the Chairman outside the normal committee process ('Chairman's action').

This involved the review of key documents such as articles of government and committee minutes, and interviews with the Chairman and Clerk of the governing body.

4.5 The National Audit Office identified a number of arrangements which did not comply with best practice. In particular, they had some concerns about the arrangements for the establishment of registers of interest and the proper handling of potential conflicts of interest. A number of institutions had not yet established registers of interest when visited by the National Audit Office, although all have now done so, or propose to do so.

4.6 Furthermore, the regulations of a number of institutions were unspecific about the circumstances in which members of governing bodies should abstain from debate and continue to participate in meetings following the declaration of an interest. The Committee of University Chairmen's guidance ('Guide for Members of Governing Bodies of Universities and Colleges in England and Wales', June 1995) on this matter indicates that members who have a pecuniary, family or other personal interest in a matter under discussion should disclose the fact, and

withdraw from that part of the meeting. At some of the institutions visited by the National Audit Office, governors were expected to leave the meeting following a declaration of interest, while in others they were required simply to abstain from the related discussion. In one case no records were found of a declaration of interest, of withdrawal from the meeting, or of abstention from the discussion, by a governor who was a director of the construction company appointed to undertake a major contract.

4.7 The National Audit Office also made a number of recommendations to the institutions visited on their general arrangements for governance, including the need to:

- undertake periodic reviews of the arrangements for governance and the structure and membership of the sub-committees of the governing body;
- undertake a review of the role of the Clerk to the governing body; and
- establish clear guidelines specifying which items of business are reserved for the governing body and which may be delegated to appropriate sub-committees.

Key Points

The National Audit Office found that the institutions visited needed to do more to comply with good practice in certain areas of governance. In particular, they identified weaknesses relating to the handling of potential conflicts of interest. Institutions should therefore ensure that they:

- follow the Committee of University Chairmen's guidance on the establishment of registers of interest for members of governing bodies; and
 - review their handling of declarations of interest to ensure that governors with a potential conflict of interest declare all relevant interests, take no part in discussion or decision-making related to that conflict, and leave the meeting during such discussion and decision-making.
-

Governor involvement in building projects

4.8 The precise nature of governor involvement in the projects examined varied significantly between institutions. This is inevitable given the large variation in size of institutions, and their different constitutional frameworks. Structural differences should not, however, prevent the roles of governors and executive managers from being clearly delineated, or the appropriate level of delegation from being in place, a view which was endorsed by the National Audit Office's steering group. None of the institutions visited by the National Audit Office had formal regulations covering governor involvement in capital projects, other than general procurement regulations requiring that expenditure over a given level must be authorised by the governing body or by the appropriate sub-committee. Notwithstanding this, the National Audit Office noted that the projects examined received considerable attention by their governing bodies.

Project approval

4.9 Governing body approval of the building projects examined by the National Audit Office was typically based on a business case setting out the costs and benefits of the project, and any implications for the institution. The criteria used included: affordability; the contribution to be made by the project to academic or estates priorities; the impact of the project on the overall financial position; and the rate of return to be earned. The affordability of the project is critical to the institution's financial health, and should therefore be a fundamental issue for the governing body.

4.10 Governing body involvement in the projects examined by the National Audit Office varied, but generally followed the main stages of project approval, particularly those stages of the process involving the institution in major commercial commitments. These stages included:

- approval of an overall estates strategy;
- acceptance of the need for the project and authorisation to commence the planning and initial design;
- approval of project budgets in the context of financial forecasts demonstrating their affordability;
- approval of any submission to the Funding Council for grant funding and approval;
- approval of the procurement strategy;

- acceptance of tenders from the successful contractor (for high value contracts); and
- approval of the proposed funding of projects, and specifically of any loan funding involved.

4.11 In most cases examined by the National Audit Office, the institution had allowed sufficient scope for governing body involvement, although at two institutions, managers left their governing bodies with little choice but to approve their recommended course of action. At one institution managers presented a project for governing body approval which had already been submitted to the Funding Council, received their approval, and been awarded partial grant funding. At the other institution managers recommended acceptance of tenders by contractors who were already on site and incurring significant expenditure under a letter of intent. Some institutions argued that this compression of procedure is inevitable, given the conflict between the relative infrequency of meetings of governing bodies, and the need for rapid decision-making on projects. Other institutions visited by the National Audit Office have managed these constraints, however, whilst maintaining the full involvement of their governing body (Example 22).

Example 22 At one institution an unforeseen but attractive opportunity to acquire a building adjacent to its main site arose during the summer vacation, at a time when it was impossible to call a special meeting of the governing body or the relevant committee. As the opportunity involved planned expenditure of some £6.6 million, officers contacted all governors by letter to let them know what action they proposed, and then formed a small group of officers and governors to take the project forward under the chairmanship of the Chair of the Board of Governors. As a result, the opportunity was secured and governor involvement was maintained at an appropriate level.

Monitoring progress

4.12 Following approval of a project and commitment to the expenditure involved, the main concern of the governing body is to ensure that the project is delivered to time and budget. As a minimum institutions should ensure, through appropriate project reporting mechanisms, that governors are kept informed of progress, and are aware of any important issues such as potential overspends or time overruns. Given that the governing body of an institution typically meets only three to four times a year and has a wide range of business to deal with, it would be usual for such responsibility to be delegated to a sub-committee of the governing body, supported by the project steering group and the project management team.

4.13 For all of the projects examined by the National Audit Office, this broad structure was in place, although the level of delegation, and the point at which project managers were required to refer matters to governors for decisions, was not always clear (Example 23). Although this may not necessarily lead to an adverse outcome, and did not do so in the example given, appropriate and clearly defined delegation of responsibility is necessary if governors are to maintain control. This is particularly important for major projects in which decisions involving significant sums may arise during the course of the works.

Example 23

In one institution, where the project management role was undertaken by an external consultant, no formal financial limit was imposed with regard to the authorisation of variations. Consequently, the institution had, effectively, given complete financial authority to an external party, and was therefore unable to exercise proper financial control.

4.14

The specific committee structure used by governing bodies to monitor projects varied. In some cases, the existing committee structure was used, with the finance or estates committee typically taking the main responsibility. For such cases, committees received reports from officers who carried day-to-day responsibility for project management. For other projects, special project monitoring groups were established, which involved governors in a more 'hands-on' role. Such groups reported to a sub-committee of the governing body. In one case, where the project formed part of a wider estates development programme, a single committee was responsible for monitoring the whole programme, including the specific project examined.

4.15 The different approaches adopted by institutions reflected their management styles, the expertise of their officers, and the particular skills of members of the governing body. It is clear that, whatever the approach adopted, governing bodies must maintain a reasonable balance between high level control and excessive intervention. This was generally achieved.

Post-implementation review

4.16 Independent governors have an important role to play in checking that major investments have generated the returns on which they were originally justified. One Chairman of Governors stated that, following completion of the project undertaken by his institution, proposed benefits of £3 million had not yet been realised. In general, however, the National Audit Office found that post-implementation reviews had not yet been undertaken for the projects examined (paragraph 3.35). Governors should therefore encourage executive management to make post-implementation reviews an integral part of all major

building projects, and to report to them on the results of such reviews. This report should set out the benefits generated by the project in such a way as to permit comparison with the benefits claimed in the business case submitted at the approval stage.

Key Points

Given the commitments represented by a major building project, and the potential risks involved, it is important that governors are involved at a number of key stages. In general, governing bodies had maintained a close interest in the projects examined by the National Audit Office, although none had formal regulations covering the involvement of governors at all relevant stages of such projects. Institutions should therefore review the regulations covering the role of their governing body and delegated committees in major capital projects to ensure that they incorporate the following key actions:

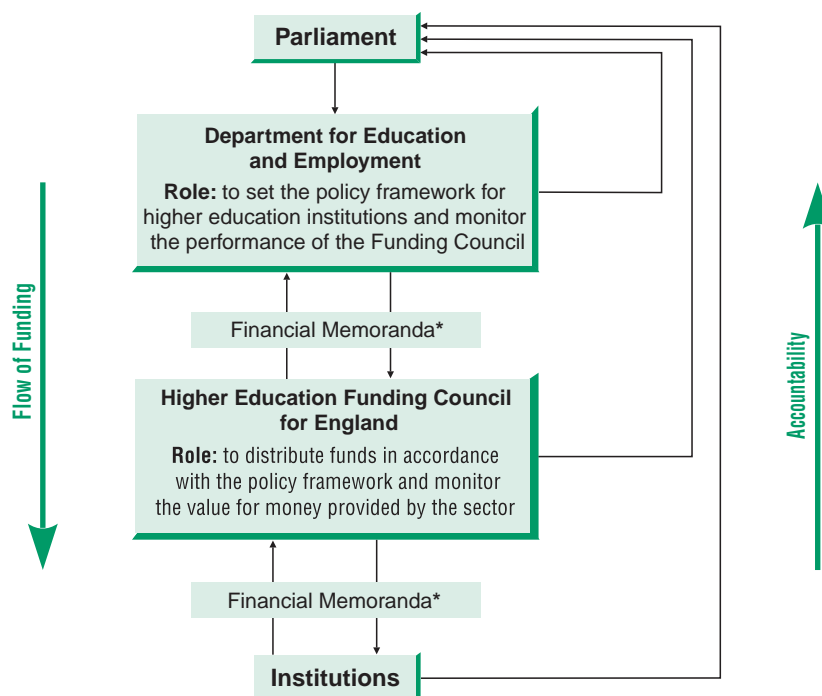
- initial approval of the project;
 - consideration of the implications of alternative procurement routes;
 - review and approval of the results of the tender process for major contractors;
 - review and approval of the results of the tender process for funding;
 - authorisation of a project budget and timetable;
 - high level progress monitoring and consideration of action proposed to correct significant departures from forecast outcomes; and
 - consideration of post-implementation reviews to establish whether objectives have been met and the relevant lessons learnt.
-

Appendix 1

Responsibilities and accountabilities in higher education

The Further and Higher Education Act 1992 abolished the binary line dividing universities from other higher education institutions in England, in parallel with similar changes in Scotland and Wales. It established the Higher Education Funding Council for England (the Funding Council) to assume from 1 April 1993 responsibilities for funding, oversight and quality assessment in these institutions. The Funding Council are accountable to the Department for Education and Employment for the expenditure of grants they receive under the terms of a financial memorandum between the two bodies. They make grants to institutions in accordance with a financial memorandum with the governing body. At each institution the day-to-day accountability for management is delegated to the designated officer of each institution, commonly the Vice-Chancellor.

Responsibilities and accountabilities in higher education



* Financial Memoranda govern the financial relationships between the body making the grant and the recipient. They specify the terms and conditions of funding. They require recipients to have in place sound systems of financial control. Each funding body monitors compliance with the memoranda.

Appendix 2

Study methodology

The key elements of the study methodology are set out below.

- A review of published good practice already available in the sector and more generally. This included drafts of the CVCP Procurement Guidelines, the Funding Council's guidance on appraising property options, and other relevant publications produced by the higher education sector and by construction industry bodies.
- A comprehensive survey of the higher education sector to establish the full extent of capital expenditure on major building projects. Analysis of the results of the survey is shown at Appendix 3, with figures being included within the text of the report where appropriate.
- Examination of ten projects at different higher education institutions.

University of Bath	Royal Northern College of Music
Bolton Institute of Higher Education	Sheffield Hallam University
Cheltenham and Gloucester College of Higher Education	University of Sunderland
University of Leeds	University College London
University of North London	University of Westminster

The projects were selected to reflect the varying sizes of institutions and projects, and to include both old universities and institutions from the former polytechnics and colleges sector. Each institution was provided with a management report which identified good practice, and made recommendations on any practices and procedures in need of further review.

- Additional visits to higher education institutions and other organisations to consider particular aspects of good practice in the management of building projects.

University of Brighton	Imperial College, London
Cranfield University	University of Plymouth
University of Edinburgh	British Airways
Glasgow Caledonian University	Ministry of Defence - Abbey Wood
University of Greenwich	

- Discussions with representatives of banks and other financial institutions active in lending to the higher education sector.

Barclays Bank plc	National Westminster Bank plc
Co-operative Bank plc	Royal Bank of Scotland plc
Halifax plc	Varsity Funding
Midland Bank plc	

- Consultation with two focus groups consisting of finance and estates professionals working in the sector, to discuss specific issues and receive feedback on provisional conclusions.

Estates Directors' Focus Group

Ian Caldwell	Imperial College, London
Richard Goodall	University of East Anglia
Peter Higgins	University of Sunderland
Tony Smith	University of Central Lancashire
John Watkin	University of Wales, Swansea

Finance Directors' Focus Group

Richard Aveling	Nene College of Higher Education
Allan Bickerstaffe	Liverpool John Moores University
Jim Bradshaw	Oxford Brookes University
Martin Briggs	Buckinghamshire College of Higher Education
David Coyle	University of Strathclyde
Gilbert Jones	Surrey Institute of Art and Design
Roger Sales	Kent Institute of Art and Design

Colin Showell
David Soutter

University of Southampton
Cheltenham and Gloucester College
of Higher Education

- Consultation on scope, methodology and overall findings with a steering group drawn from higher education institution administrators, finance directors and estates directors, and representatives of the Funding Council and the Committee of Vice-Chancellors and Principals.

Steering Group

David Adamson
Julian Axe
Andrew Bain

Bursar, University of Bristol
Secretary, Imperial College, London
Professor of Economics, University of
Glasgow

Tony Bruce

Director of Policy Development,
Committee of Vice-Chancellors and
Principals

Mike Goodwin

Head of Estates, North East Wales
Institute

Ian Lewis

Head of Finance, Higher Education
Funding Council for England

John McWilliam

Deputy Vice-Chancellor, University of
Greenwich

Geoffrey Piper

Bursar, University College London

John Sandbach

Director of Finance, University of
Liverpool

Michael Shattock

Registrar, University of Warwick

Appendix 3

Summary of the results of the National Audit Office survey of building projects in the English higher education sector

Scope of the survey

1 The survey sought to capture all relevant data relating to major building projects in the English higher education sector. A major project was defined as one which involved a significant commitment of financial and managerial resources, and one which therefore involved the institution in a potentially high level of risk. For this reason a two-fold definition was established, to take account of the considerable range of size of institution in the sector:

- for institutions with an annual total income of £60 million or above, a major project was defined as being over £3 million (excluding VAT); and
- for institutions with an annual income of less than £60 million, a major project was defined as being of at least five per cent of total income with a minimum level of £1 million.

2 All institutions were surveyed and asked to give details of any project which met the above criteria and which had incurred substantial expenditure (more than 25 per cent) since 1 April 1993 or which would incur substantial expenditure before 1 April 1998.

Data collected

3 The following data was collected:

- name of the project;
- type of building (within the following categories: teaching; research; commercial; learning resources; administration; student residences; student facilities; and 'other');
- date of approval and date of hand-over;

- procurement strategy;
- sources of funding (within the following categories: borrowing; Funding Council; other public sector grants; private sponsor; and internal funds);
- type of borrowing (if applicable);
- project cost (analysed into: site cost; construction cost; fitting-out; professional fees; and the costs of arranging finance);
- occupation costs (the expected annual running costs); and
- the gross floor area of the project and the net additional space provided by the project (the gross space less any space released or replaced).

Results of the survey

4 This appendix summarises the details provided by institutions of the major building projects initiated between the years 1993 to 1996.

Number, value and
average value of projects
by year

Table 1

Year	Number of Projects	Total Value of Projects (£ million)	Average Project Value (£ million)
1993	66	347	5.3
1994	67	421	6.3
1995	57	423	7.4
1996	49	387	7.9
Total	239	1,578	6.6

The number of projects undertaken within the sector has declined following the initiatives undertaken by institutions to accommodate the significant increase in student numbers in the late 1980s and early 1990s. Conversely, the average value of projects has increased, reflecting a reduction in the number of residential projects which tend to be of lower value (see Tables 3 and 5 below).

Total and average size of
projects by year

Table 2

Year	Number of Projects	Total Area (‘000 m ²)	Average Project Size (‘000 m ²)
1993	66	377	5.7
1994	67	399	6.0
1995	57	316	5.5
1996	49	299	6.1
Total	239	1,391	5.8

Although the average size of project was consistent for the four year period, the year on year reduction in the volume of new space matches the decline in the number of projects.

Type of projects by year of
approval

Table 3

Year	Teaching	Residential	Learning Resources	Research	Student Facilities	Other	Total
1993	20	34	9	3	0	0	66
1994	21	29	11	1	3	2	67
1995	13	20	13	7	1	3	57
1996	21	9	8	4	3	4	49
Total	75	92	41	15	7	9	239

Projects for teaching, residential and learning resources accommodation represent 87 per cent of the total number of projects. Residential projects form the largest single category overall of projects, but have declined significantly in number since the expansion in such facilities to accommodate student growth in the late 1980s and early 1990s.

**Analysis of procurement
strategy used**

Table 4

Procurement Strategy	%
Traditional approach	53
Design and build	22
Combination of traditional and other approaches	10
Management contracting	7
Construction management	2
Private Finance Initiative	1
Other	5

The traditional procurement strategy was the most common approach adopted, particularly for academic projects (teaching, learning resources and research projects). For residential projects the design and build strategy was more common.

**Average unit cost of
projects by type (£ per m²)
for the period 1993 to
1996**

Table 5

Teaching	Residential	Learning Resources	Research	Student Facilities	Other	Total
1,290	926	1,063	1,969	1,543	1,297	1,134

There are marked differences in the unit costs of different types of project. Research projects and student facilities, although relatively few in number, were consistently the most expensive. Conversely, residential projects were consistently the cheapest, probably reflecting the standardised approach which designers and construction companies can adopt for such accommodation.

Average unit costs of
projects (£ per m²) for
the period 1993 to 1996

Table 6

	1993	1994	1995	1996	Total
cost per m² (£)	920	1,055	1,339	1,294	1,134

Unit costs have shown an upward trend, reflecting the very competitive construction costs at the beginning of this period, and the change in mix of projects over the period. In particular, the decrease in the number of residential projects has had an impact on average costs, given that the unit costs of such projects are lower than the average for all projects.

Sources of project
funding (% breakdown)
for the period 1993 to
1996

Table 7

Internal Funds	Borrowing	Funding Council Capital Grants	Private Sponsorship /Donations	Other Public Sector Grants
22.6	49.8	9.1	12.5	6.0

Analysis of the
component costs of
building projects

Table 8

Cost Component	Value (£ million)	%
Purchase of site or building	129.9	8.2
Construction	1,203.0	76.2
Fitting-out	105.6	6.7
Professional fees	127.0	8.1
Arranging finance	13.1	0.8
Total	1,578.6	100.0

Construction costs form the most significant element of project costs. All projects also included costs for fitting out and for professional fees, although the costs of purchasing a site/building, and of arranging finance, were only relevant to some projects.

Appendix 4

The use of public-private partnerships to meet accommodation needs within English higher education

1 The Private Finance Initiative (PFI), which was launched by the Government in 1992, sought to increase the level of commercial involvement in the delivery of public services, particularly for projects requiring capital investment. These principles have been adopted by the new Government, although with the emphasis being on a wide range of public-private partnerships.

2 The higher education sector has already had considerable success in attracting conventional private sector investment, meaning that the take-up of PFI by the sector has been limited, although there are examples of partnership schemes (see case study below). In March 1995, the Higher Education Funding Council for England, in conjunction with the Scottish and Welsh Funding Councils, the Committee of Vice-Chancellors and Principals and the Standing Conference of Principals, organised a conference to bring together the academic community, the finance sector and commercial and professional organisations to discuss the potential benefits of PFI to all concerned.

Pathfinder projects

3 Since then the Funding Council have initiated twelve 'pathfinder' projects as one of the means of promoting PFI in the higher education sector. These are projects which have been identified as having potential for a PFI solution and which are to be promoted and tested in the market. Not all of the pathfinder schemes will necessarily prove to be suitable for a PFI solution, but they have been selected to explore fully the possibilities offered by a PFI approach to procurement.

4 The Funding Council have provided a budget of £2.5 million for pathfinder projects. For each project the Council will provide up to 50 per cent of the cost of professional fees incurred up to the point of signing the contract with the preferred partner. It is a condition of funding that these fees are capped.

5 As evidence of its commitment to this initiative, one of the Funding Council's Key Performance Indicators for 1997-98 is to continue support for at least 15 pathfinder projects and to disseminate experience and good practice by publishing at least four case studies and through regional conferences.

Case study

The National Audit Office visited the University of Brighton to consider the University's approach to the use of partnership schemes for capital projects. The University is involved in three such projects:

- ❑ student residences providing 469 units: the capital costs of £8.5 million were met by a housing association and the University leases the accommodation on a 75 year lease with a 20 year break clause. The housing association is responsible for the operational management of the residences under a facilities management agreement;
- ❑ a bookshop and coffee-shop which is operated by a private sector company. The company met 25 per cent of the capital costs, and after a two year rent-free period, pays a rental to the University proportionate to turn-over; and
- ❑ a leisure centre to be operated by a private sector leisure management company. The company will pay a capital sum plus an annual rent linked to turnover, in exchange for a 99 year lease. The University also receives significant non-financial benefits in terms of a usage agreement and infrastructure works.

The University's judgement on the suitability of a PFI or other form of partnership arrangement was based on its objectives expressed in terms of the services required. For example, the University sought to obtain the use of student residences, and considered the potential to use a partnership arrangement for any or all of the stages involved in meeting this objective - site acquisition, construction, funding and facilities management.

In evaluating a partnership solution to some or all of a new development, the University also looked at the balance of risk. In a conventional building development an institution carries the risk associated with completing to time and budget, and managing the subsequent operation effectively so as to make a return on the investment. In the case of the University's residential project those risks are eliminated, and the main risks are those associated with meeting its lease

payments to the housing association through the rents collected from students, and with the adequacy of the performance of the housing association in facilities management.

In summary, if the partnership solution met the University's objectives at least as well as the alternatives, had a favourable balance of risk, and could be achieved without additional borrowing, then it was likely to be the preferred solution.

The University has not found the costs of such partnership arrangements to be excessive, but recognises that the long-term contractual arrangements involved imply the need for high quality legal advice and for genuine partnerships with the operators of the facility.