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NATIONAL AUDIT OFFICE

Improving Public Services through better construction

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL | HC 364-I Session 2004-2005 | 15 March 2005

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14 March 2005

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Photographs courtesy of case study organisations and other departments featured in the report, Alamy.com, Imagestate and Jon Barlow.

FOREWORD

Sir Michael Latham, DL

I was delighted to be able to write a foreword to the National Audit Office's excellent report "Modernising Construction" when it was published four years ago. I was also able to listen to the public hearing of the Committee of Public Accounts on the findings of that report. It is, therefore, a particular pleasure to welcome this further report by the National Audit Office, which traces the considerable progress made by some departments and agencies of central government in construction procurement practice, following valuable guidance from the Committee of Public Accounts, the National Audit Office itself and from the Office of Government Commerce.

For small and occasional clients, construction procurement can seem a complex and daunting project, but it need not be so if they have the benefit of proper advice before embarking upon it. Best practice starts from the basic principle that the client and its business needs should be at the core of the construction process. When I first made that sentiment a basic theme of "Constructing the Team" in 1994, I was surprised to discover that some industry people regarded it as a controversial recommendation. They did not think that the client should be at the core of the process. Indeed, some saw clients as "a nuisance", a word which was actually used at one meeting. Fortunately, following the Egan Report "Rethinking Construction" in 1998 and further procurement guidance from the Strategic Forum for Construction, in which Ministers have played a strong part, wiser counsels have prevailed. The role of the supply side is now seen as being there to understand, develop and deliver the wishes and intentions of the construction client, and to do so in a way which allows for high quality design and site performance through an efficient and cost effective process. That allows taxpayers, as the ultimate paymasters of public sector projects, to ensure that their money is all used on the construction projects themselves, rather than to finance litigation or disputes during or after the project, as has too often been the case in the past. In that regard, high quality guidance from the Office of Government Commerce, the Committee of Public Accounts and the National Audit Office, will be very valuable for infrequent clients and will give them added confidence and reassurance to go down the best practice route.

Best practice is about partnering, collaborative working and stripping out of the equation at the earliest possible stage those costs which add no value. To achieve that, it is vital to involve the whole supply chain. It is not enough for the partnering to be solely between the client and the first tier contractor, though that is a significant step forward. The vast majority of the work on site will be undertaken by specialist contractors. They also need to be involved on a partnering basis, particularly as many of them have significant detailed design responsibilities. The consultant and the contracting teams, including the manufacturing and component sectors, should be fully integrated from the earliest conceptual design stage, to ensure that the client's requirements are understood through an effective and iterative briefing process and that all are committed to the whole project, not just to their part of it. That also ensures that proper attention is given to sustainability and life cycle costing, and that facilities management planning is heavily involved at design stage, to avoid wasteful and abortive long-term expenditure on maintenance.

There is still a long way to go, and no room for complacency. Unfortunately, some poor practice does persist in both public and private sector construction projects. However, there is now a growing volume of evidence – including the encouraging findings of this National Audit Office report – that best practice delivers real value for all involved in the project. Effective leadership by Government and strong and authoritative procurement guidance from the Office of Government Commerce, supported by the critical and expert analysis of the Committee of Public Accounts and the National Audit Office, can ensure that this construction reform process continues to gain momentum throughout the public and private sectors, to the ultimate benefit of society as a whole. That is the fundamental message of this report, and indeed of the whole Egan process and the work of the Strategic Forum for Construction.

Sir Michael Latham was the author of "Constructing the Team" in 1994, Chairman of the Government's Review of the Construction Act 2004, and was a member of the Committee of Public Accounts from 1983 to 1992.

EXECUTIVE SUMMARY

1 UK construction activity makes a considerable contribution to the national economy and accounts for over 8 per cent of national gross domestic product. The value of built assets in the central government sector alone is estimated at just under £161 billion.[1] UK annual public sector construction output has grown by over a third between 1999 and 2003 from just under £24 billion per year to around £33.5 billion and capital investment is set to continue expanding over the next three years in key sectors such as schools, hospitals, roads and social housing.

2 Well managed and successfully delivered public sector construction provides departments and agencies with the opportunity to improve service delivery and efficiency. The quality of construction and the built environment shape the lives of UK citizens through their impact on (1) the delivery of improved public services such as health, education and transport (2) social cohesion; and (3) standards of living and the natural environment. It is essential therefore that departments and other public sector organisations achieve value for money through efficient construction processes that deliver buildings to time, cost and quality, that are cost effective to run over their whole operational life, and lead to better quality services and sustainable communities.

3 There are other pressures on departments to improve their construction performance. Departments are required to deliver 2.5 per cent annual improvements in efficiency from 2005-06 onwards, and will need to demonstrate that they can deliver construction cost efficiently, as well as ensuring that new infrastructure contributes to efficient public services. UK construction activity also has a major part to play in the achievement of the Government's Sustainable Development Strategy. Increasingly departments will need to demonstrate how their construction activity is addressing social and environmental concerns and encourage their suppliers to help the Government achieve its aims and targets for sustainable development, for example, in reducing carbon dioxide emissions.

4 Our 2001 report[2] set out how successive independent reviews of UK construction performance had identified the need to tackle the adversarial and inefficient working practices that have characterised the UK construction industry. Our report, and the report of the Committee of Public Accounts[3], emphasised the need for further action to improve departments' construction performance and the scope for significant financial savings and wider value for money benefits.

1 Aggregate figures for buildings and infrastructure assets (excluding railways) from departments' published resource accounts for 2002-03 based on current replacement value.
2 *Modernising Construction*, (HC 87, 2000-01).
3 Improving Construction Performance, Committee of Public Accounts, (HC 337, 2001-02).

5 Since 2001 the Office of Government Commerce has implemented a range of construction improvement initiatives and support services. Some of these are aimed specifically at improving the construction delivery capability of departments, sometimes in conjunction with other government bodies, or as part of wider initiatives to improve departments' programme and project delivery capability.

6 The Government has, from April 2005, extended the remit of the Office of Government Commerce, to include working with client organisations across the wider public sector covering, amongst others, local government and the National Health Service to help them improve their procurement capabilities. The Office has been given no extra resources for these activities emphasising the need for it to target its future efforts where they will have most impact.

7 In February 2003, The Chief Secretary to the Treasury launched two strategic targets to improve the cost and time predictability and quality of construction projects and reduce average timescales for procurement **(Figure 1)**. Responsibility for delivery of the targets rests with departments. The Office of Government Commerce has defined how the targets are to be measured and is responsible for monitoring and reporting overall progress.

1 The Achieving Excellence in Construction strategic targets

1 By March 2005, 70%, by volume, of construction projects reaching the benefits evaluation stage (Gate 5 of the Gateway Review process) in the period 1 April 2003 – 31 March 2005 to be delivered:

- On time
- Within budget
- To exceed customer and stakeholder expectations
- With zero defects

2 By March 2005, for each key sector to reduce the average time period from start of procurement (Gate 2) to award of contract (Gate 3) by 25% for construction projects taking over a year between Gates 2 and 3, and 15% for all other construction projects

8 This report assesses the progress that departments and their agencies have made in improving their construction delivery performance since our 2001 report, in part by examining data on 142 construction projects[4] delivered between April 2003 and December 2004, as well as the impact of relevant Office of Government Commerce initiatives. The report is intended to be forward looking by highlighting good construction practice drawn from across public and private clients and projects which other organisations can learn from. A separate volume published with the report sets out in more detail examples of good construction practice. We also commissioned George Martin, Director of Sustainability, Buildings Research Establishment, to produce a paper to analyse the issues involved in achieving whole life value and sustainability in construction.

Findings

9 On progress towards improved cost and time predictability and the value for money savings from improved performance. Completing projects within budget and on time avoids the need to divert funding towards paying for overruns, reduces the risk of adversarial situations and behaviours, and creates stability in the whole planning and delivery cycle. While departments still have some way to go to meet the Achieving Excellence targets of 70 per cent of central government construction projects to be delivered to time and budget by March 2005, performance has improved considerably compared with the 1999 baseline for the 142 projects included in our analysis:

- **55 per cent were delivered to budget compared with 25 per cent of projects in 1999**. If the level of cost overruns reported in 1999 had continued (6.5 per cent on average), this would have led to an estimated overspend of £77 million on the 142 central government construction projects completed between April 2003 and December 2004 (total budget of just under £1.2 billion). The actual overspend on the 89 projects in this time period was, however, only 4.1 per cent. If this improvement in the average overspend is scaled over the £33.5 billion[5] spent on public sector construction in 2003, then we estimate that the post contract cost overruns which have been avoided when compared to the price expected at the time the contract was let would be in the order of £800 million.

4 The 142 construction projects had a combined budget of just under £1.2 billion, but exclude data on projects in the wider NHS, the schools sector and the Ministry of Defence.

5 Annual expenditure on central and local government construction (Department of Trade and Industry Annual Construction Statistics, 2004). The figure excludes expenditure on the construction elements of Private Finance Deals.

- **63 per cent were delivered to time compared with 34 per cent in 1999**. The more that departments can deliver projects on time, the greater the confidence of those making funding decisions will be in providing funding for longer-term programmes. In turn this should enable better planning, streamlined procurement and suppliers' investment in capacity.

The reasons for improved performance are varied, but it is clear from our examination that the guidance and support provided by the Office of Government Commerce under the Achieving Excellence in Construction initiative has made a considerable contribution.

10 On the further value for money savings that can be achieved through the continued implementation of the principles of Achieving Excellence in Construction. A range of value for money gains from partnering and the early development of integrated project teams are beginning to emerge from the improvement programmes of the case study organisations included in our 2001 report.[6] These include streamlined procurement processes, innovative solutions to the design and delivery of construction projects, fewer legal claims, reduced environmental impacts, safer working and improved whole life costs and value as a result of more open and integrated team working between departments and contractors.

Terms commonly used throughout the report

An integrated project team

Comprises the client's team and the suppliers' teams, for example, consultants, contractors and specialist suppliers, including those involved in design. The integrated project team is often located together, shares the same management information systems and often jointly benefits from beating cost targets.

Integrated supply chains

A supply chain is made up of all the parties responsible for delivering a product or service. An integrated supply chain is responsible for delivering the whole project, and sometimes a whole programme of projects. Integrated supply chains often stay together from project to project, retaining learning, know-how, and mutual understanding, to the benefit of the client.

Collaborative working

Involves clients and integrated supply chains working closely together often under long-term framework arrangements using non-adversarial approaches and contract conditions to meet the project or programme objectives. A wide range of approaches can be adopted in collaborative working such as using project accounts, project-wide insurance, two-stage tendering, combined planning, joint risk assessments, early contractor involvement and integrated project teams.

Partnering

A structured management approach designed to promote collaborative working between contracting parties. The objective is to align and unite all the parties with a shared goal of completing the scope of the work in a cost-effective manner which is mutually beneficial. It can apply to a single construction project (project partnering) or it can be used by clients working together with suppliers on a series of construction projects with the aim of promoting continuous improvement by deliberately applying the lessons from one project to the next (strategic partnering). One risk of partnering is that the absence of competitive and commercial tension results in the department not achieving a fair price. Where organisations adopt a partnering approach they will typically:

- work in a positive no blame whole team environment;
- provide early warning to each other of any matters that could affect the achievement of the project objectives;
- use common information systems and work on an open book basis including showing the elements of contingency and risk allowances added to costs, prices and timing of all future work; and
- have incentives for delivery based around pain/gain share arrangements.

Whole life costs

The whole life costs of a built asset facility include (1) the acquisition costs, including consultancy, design, construction and equipment, (2) the operating costs including utilities, renovation, and repairs and maintenance through to disposal, and (3) internal resources and overheads, risk allowances, predicted alterations for known changes in business requirements, refurbishment costs and the costs associated with sustainability and health and safety aspects.

Whole life value

The benefits and costs associated with a built asset over its whole life taking account of the interests of all stakeholders affected by its construction and existence, and its wider economic, social and environmental impact. There will be trade-offs between the various short term project constraints (such as time, costs and quality) and the conflicts in stakeholders' longer term interests and objectives.

6 Defence Estates, Environment Agency, Highways Agency and NHS Estates.

11 Despite the generally positive progress that is being made there are still many projects across the public sector as a whole which do not fully employ the good construction practice identified in this report and supporting case study volume. If these benefits, and those achieved through the good practices of leading public and private sector organisations, can be applied more widely then considerable value for money gains and service delivery improvements could be achieved in future public sector construction projects. Recognising that public sector bodies are already making improvements, but that others are not, we estimate that just under ten per cent of annual public sector construction capital costs and five per cent of building operating costs could be saved if these benefits were realised. On the basis of the simple extrapolation in **Figure 2**, further value for money savings of up to £2.6 billion in annual construction expenditure may be possible if good practice was applied across all of the public sector. Even the more conservative assumption that just 20 per cent of these improvements are practicable would still release some £500 million to be reinvested in frontline public services or higher quality built assets to deliver better services. There may be circumstances where relatively small increases in the capital costs of construction will deliver significantly greater whole life value for example, through reduced energy costs and lower carbon dioxide emissions.

12 On the impact of the Office of Government Commerce's initiatives to improve departments' performance. The Office has achieved a considerable amount since its inception in 2000, by promulgating good practice procurement and construction project management techniques, continuing to develop PFI procurement policy (until 2003 when this was transferred to HM Treasury), putting in place toolkits and support mechanisms for departments, and applying the Gateway Review scrutiny process to construction programmes and projects. Gateway Reviews in particular, have generally assisted clients and their professional advisers in identifying and addressing the risks to, and opportunities for, successful delivery.

2 The potential for further value for money savings from wider application of good practice including partnering and the early development of an integrated project team

Opportunity	Examples illustrating the potential savings, from the case studies, workshops and bi-lateral meetings covered by the NAO examination	Potential value for money savings if this performance is repeatable across public sector construction expenditure	
		Central Government	Local Government
Improved productivity based on more effective programmes and streamlined procurement	Streamlining planning and procurement work, and starting sooner on site (up to 12 months) reduces administration effort and avoids inflation. Completing projects faster (by 3 months) cuts suppliers' management costs and avoids inflation. Off-site fabrication reduces defects, improves the quality of work and cuts snagging time, reduces waste, and improves site safety and working conditions. Bundling work into larger programmes gives suppliers better work continuity, leading to savings. Reduced supplier numbers working on larger, more coherent programmes leads to savings. Better planning enables the use and management of built assets to be more closely aligned with the service improvement priorities, while also allowing surplus property to be identified and released. *One or more of these points are illustrated in the following case examples in Parts 2 and 3 of the report: NHS ProCure21, Environment Agency, Royal Mail Property Group, BAA, and Stanhope.*		
	This equates to a saving in capital costs of 4% per year (extrapolated against annual capital expenditure on new build in 2003).	**£220m**	**£500m**

2 The potential for further value for money savings from wider application of good practice including partnering and the early development of an integrated project team *(continued)*

Opportunity	Examples illustrating the potential savings, from the case studies, workshops and bi-lateral meetings covered by the NAO examination	Potential value for money savings if this performance is repeatable across public sector construction expenditure	
		Central Government	Local Government
Collaborative working approaches	Integrated teams comprising clients, designers, contractors and specialist suppliers, co-located and with aligned objectives. Use of non-adversarial forms of contact such as the Engineering Construction Contract, embedding good project management practice and minimising claims or disputes. Earlier contractor involvement, either through long-term collaborative relationships or through two stage tendering; leading to practical simplifications and cost reductions. Project-wide insurance, to gain buying power and avoid divisive protective behaviour about faults and no claims records. Use of project accounts to ensure smooth supplier cash-flow arrangements. *One or more of these points are illustrated in the following case examples in Parts 2 and 3 of the report: Environment Agency, BAA, Defence Logistics Organisation Offices, Thames Water.* **This equates to a saving in capital of 6% per year (extrapolated against annual capital expenditure on new build in 2003).**	**£325m**	**£760m**
Savings in the whole life costs of built assets	Reduced energy, cleaning security, repairs, maintenance, replacement costs. Greater user satisfaction, productivity and staff retention rates. Better environmental sustainability, with policies and processes in place to encourage and measure achievement of the Government Sustainable Development Strategy through, for example, reduced carbon dioxide emissions. *One or more of these points are illustrated in the following case examples in Parts 2 and 3 of the report: the Environment Agency, HM Treasury refurbishment, University of Cambridge, Dunston Innovation Centre, Kingsmead Primary School.* **This equates to a potentially significant saving of operating costs, conservatively put as 5% per annum (extrapolated against central and local government repairs and maintenance expenditure in 2003).**		**£770m**
Total Savings			**£2.6 billion**

Source: National Audit Office examination

13 The impact on departments of the Office of Government Commerce's initiatives, or departments' engagement with the Office has, however, been variable. The guidance issued by the Office of Government Commerce is generally regarded as valuable and clear. It is, however, not always followed, in part because many public organisations do not have the appropriate skills and experience to implement it effectively, and many remain unaware of, or choose not to use, the support and advice that the Office can provide. For example, not all departments and their agencies conduct independent and complete Gateway Reviews of their significant construction activities. In particular, by not engaging with the Office early in the programme or project cycle or at the stage of evaluating whether the intended benefits to efficiency and improved public services have been delivered. The Office is starting to address these concerns through early intervention in high value and impact projects via its Centres of Excellence initiative.

14 Given the size and diversity of the construction industry it is unsurprising that there are a wide range of improvement initiatives underway or available to clients. Our workshops, for example, were able to identify at least 70 significant construction improvement initiatives. The Office of Government Commerce and Constructing Excellence[7] have made progress in rationalising some of these initiatives but there remains scope to improve the ease with which users can navigate through the initiatives and some of the initiatives could be targeted more effectively at those clients they are intended to benefit. To address these issues leadership and co-ordination of public sector construction needs to be strengthened in three respects:

- There should be a means for departments and agencies involved in construction to discuss at a senior (board) level strategies and standards, and to co-ordinate programmes. No forum currently exists to meet these needs although the Supervisory Board of the Office of Government Commerce does provide an opportunity for the sharing and discussion of key supplier information at senior level.
- There should be greater clarity about preferred ways of engaging with suppliers. Departments procure and manage construction through a variety of approaches including PFI/PPP and bespoke framework agreements with limited numbers of strategic partners in defence, flood protection, road construction and maintenance and the NHS. Suppliers find the different approaches confusing, which they consider increases their management and other overhead costs, for which departments ultimately pay.
- There should be improved co-ordination between those departments and agencies with lead responsibility for cross-government aspects of construction, ranging from training, health and safety[8] to employment policy and design, to reduce unnecessary bureaucracy and improve efficiency. At least ten departments and agencies are involved and clients and suppliers have to monitor and interpret sometimes contradictory policies and regulations from a wide range of sources, all of which consumes time and resources.

15 What more departments need to do to make further progress. We identified six main aspects of construction performance which departments need to focus their efforts on improving. To help them to do this and realise the potential for significant financial value for money savings we have highlighted the good practice most likely to achieve better performance **(Figure 3)**.

7 An industry-led and Department of Trade and Industry sponsored initiative which aims to deliver reform through combining the Re-thinking Construction agenda and the Construction Best Practice programme.

8 The National Audit Office reported on health and safety in the construction industry in May 2004, "Health and Safety Executive: improving health and safety in the construction industry" (HC 531, 2003-04).

3 Actions which departments need to take to improve their construction delivery performance further

Areas where departments need to make more progress	How departments can make progress	Examples of where this has been achieved
Reduce the volatility and uncertainty in work flow and funding. A major concern of the construction industry is the inability of public sector clients to provide the market with sufficiently early warning and confidence about future construction programmes and greater certainty about the flow of work and funding.	**Departments need to establish effective construction programmes which will require them to:** (i) plan and manage construction projects and programmes across the organisation as a whole (ii) produce timely and robust information on the value, condition and fitness for purpose of existing built assets (iii) provide certainty and stability in the profiling of work and funding (iv) provide certainty of payment from the department to all in the supply chain.	The Royal Mail Group has brought the management of its estate and facilities management under the control of a single in-house organisation which can now plan and deliver a programme of work focused on the priorities and targets of the Group as a whole. **The savings of some £81.5 million (13 per cent) on an annual expenditure on property and facilities of £650 million achieved by the Royal Mail Group as a result of doing this provides an indication of the level of savings that departments could expect to make by adopting a similar approach.**
Improve construction project management capability. Many public sector clients have insufficient skills and expertise to manage construction projects, for example in determining what sustainable construction should involve, and the industry wide shortage of suitably skilled and experienced people (exacerbated by the upturn in construction demand) is hampering the ability of departments to improve their construction performance.	**Departments need to develop and support well focused and capable public sector construction clients involving:** (i) 'intelligent' central support especially where they do not deliver construction projects on a regular basis (ii) management boards that understand the role of construction projects as vehicles for improved public services, understand where and how the Government's sustainable construction strategy fits, have relevant commercial skills and provide commercial and professional leadership for project managers and effective and consistent leadership throughout the course of construction projects (iii) use or create 'best in class' teams, familiar and experienced with the required work and with a track record of successful delivery.	The establishment of the National Capital Project Management Service by the Environment Agency provides commercial leadership and a clear focus for the implementation of good construction practice throughout the entire Agency and its strategic partners. Through ProCure21 NHS Trusts are able to access previously competitively tendered supply chains allowing them to move more speedily to the start of construction incurring only low procurement costs, knowing they will not have to pay more than a guaranteed maximum price for the work. **Value for money gains of around ten per cent against the costs of projects have been achieved using ProCure21 compared to the costs for conventionally procured schemes.**
Introduce sufficient independent challenge to conceptual thinking and business cases, and overcome practical difficulties in procuring construction on the basis of sustainable whole life value. The lack of sufficiently rigorous challenge to departments and agencies in the early stages of projects could result in built assets that are not needed or that quickly become redundant. Departments are also finding it hard to design and procure construction on the basis of whole life value.	**Departments need to design and make decisions based on whole life value by:** (i) investing more time and resources in the early planning phase of construction (ii) developing business cases that assess whether the running costs of the proposed built asset are affordable over its whole life (iii) assessing the wider economic, social and environmental impact of the proposed built asset.	Dunston Innovation Centre was designed by Chesterfield Borough Council to achieve low running costs, minimal environmental impact and secure future flexibility of use. **A geothermal heating and cooling system was installed for the Centre which uses around a quarter of the energy compared to a typical air conditioned office building, and releases only around 40% of the carbon dioxide. It costs about £10,000 to run per year, compared to around £43,000 for similar sized air conditioned offices.**

3 Actions which departments need to take to improve their construction delivery performance further *(continued)*

Areas where departments need to make more progress	How departments can make progress	Examples of where this has been achieved
Maximise the benefits from good practice in construction procurement and contracting strategies and in managing project risks, opportunities and performance incentives. Departments do not make the best use of their commercial leverage in terms of driving behaviour change in the industry towards Achieving Excellence principles. Departments are also poor at putting risk management at the heart of their construction programmes and identifying the opportunities for improved performance and whole life value.	**Departments need to use the most appropriate procurement and contracting strategies which requires:** (i) a clear understanding about which procurement route best fits their circumstances, capabilities and the programme or project risk profile (ii) the use of their considerable leverage and influence to select only suppliers who have a proven track record in, and commitment to, collaborative working, health and safety and sustainable development (iii) clear communication from the outset of the tender evaluation criteria and relative weightings (iv) the use of contracts that support collaborative working (v) a well developed capability to identify and manage the construction project risks.	**On transparent tender evaluation criteria:** the University of Cambridge, to maximise their chances of engaging a contractor who will deliver the required service delivery improvements and efficiency savings, communicates the criteria for tender evaluation from the outset setting out the relative weights it assigns to financial, whole life costs, user-impact and time criteria. **On risk management:** BAA has taken the view that, regardless of how contracts are set up with suppliers, it bears the risk of the project failing and it is therefore the only party that is positioned to take the ownership of the risk. BAA therefore uses a reimbursable form of contract, supported by a large, well resourced and highly skilled internal team. Through ProCure21 NHS Trusts use the Design and Risk Tool, holding workshops with the contractor at the beginning of the project. This encourages all parties to identify risks and allocate each one to be managed by those best placed to do so rather than contractors being asked to price for risks outside of their control. **On performance incentives:** A gain-share mechanism used by successful commercial organisations such as Thames Water, where suppliers get to keep a percentage of any cost savings, provides an important stimulus to innovation for suppliers as it becomes the main route for them to generate valid and transparent increases in their profits.
Ensure that supply chains are appointed at the earliest opportunity, fully integrated and that there is sufficient competitive tension in framework agreements. Departments have yet to integrate supply chain teams to include specialist contractors as fully and early as they should. There may be a disconnect between those responsible for taking decisions on, for example, design, and the labourers and crafts people responsible for delivery of quality workmanship. Departments also need to involve those who will maintain or can advise on maintenance aspects at the earliest stage of the project. The main risk of longer-term framework contracts and partnering arrangements is that the absence of competitive and commercial tension means that the department may not achieve a fair price.	**Departments need to work collaboratively through fully integrated teams which requires:** (i) a cultural change to be embedded across the whole of their organisation and the entire supply chain (ii) contractor and specialist supplier involvement at the earliest stages of projects, preferably appointed as an integrated team from the outset (iii) the maintenance of an element of competitive tension in partnering arrangements.	The Environment Agency implemented a cultural change programme jointly involving their staff and contractors to embed the partnering approach. Contractors' early involvement in projects is driving value management savings, while competitive tension is maintained through measurement of key performance indicators (including environmental impacts) with more contracts awarded to the better performers. Defence Estates used a single project account on the Andover North project which allowed the entire supply chain to own the project monies, rather than the main contractor. This provided greater certainty of payment to specialist suppliers and provided a strong incentive for improved performance and investment in innovation and building capacity.

3 Actions which departments need to take to improve their construction delivery performance further *(continued)*

Areas where departments need to make more progress	How departments can make progress	Examples of where this has been achieved
Evaluate performance and embed project learning. Departments do not always establish the right measures to allow them to assess longer term impacts of built assets including improvements to service delivery and wider social and environmental impacts such as reductions in carbon dioxide emissions. Departments have not engaged in Gateway Five evaluations of whether construction projects have delivered the intended benefits to service delivery and efficiency so departments are not routinely capturing learning from completed projects.	**Departments need to evaluate performance and embed project learning by:** (i) establishing the appropriate measures and targets for improvements in whole life value from the outset of the construction project (ii) undertaking repeat evaluations of the achievement of all the key targets and benefits including the lessons from what has and has not worked well (iii) assessing the level of performance that was delivered by all parties during the project.	Stanhope places great store on the learning it achieves at the end of each project, and makes sure that not only is it written down, but that the teams share the knowledge actively. BAA adopts a similar approach, involving members of its own team and supplier teams in assessing the learning points. In both instances the lessons are used to drive through continuous improvements in performance on the next project, and every effort is made to keep successful teams together to maximise the opportunity for concentrated learning and the application of lessons.

Source: National Audit Office examination

RECOMMENDATIONS

16 Part 3 of this report and the supporting volume of case studies set out examples of good practice which have enabled organisations in both the public and private sectors to improve their construction delivery performance. The good construction practices have allowed completed projects to be delivered on time and to cost and have helped to improve the quality of the final built asset. Where projects are on-going, such as BAA's construction of Terminal 5, the good practice has placed organisations in a strong position to meet their time, cost and quality targets. We encourage all public sector organisations to adopt the good practice set out in this report and the supporting volume.

17 In addition, we make the following recommendations. Departments need to:

a **Create more certainty in the market, with longer-term funding and programme planning.** Greater certainty of work and funding enable economies of scale, streamlined processes and early integrated team working. On major construction programmes, three-year planning horizons are rarely sufficient. Five year programmes represent good practice. Where departments have reduced volatility in demand and supply through longer-term arrangements, they should avoid abrupt changes in funding patterns as these undermine the entire approach. However, departments should also retain sufficient flexibility within programmes so that should change become necessary, for example in response to the Gershon efficiency and Lyons relocation reviews, programmes can be quickly reformulated and communicated to the market. Departments should also engage with the Office of Government Commerce's 'Kelly programme' which is seeking to manage the construction market at a pan-government level including providing greater workflow certainty and visibility to the construction industry.

b **Strengthen their leadership of construction programmes and projects and put in place strategies for developing construction project management capabilities.** Departments have made progress since 2001 in building in-house capability but staff continuity, executive leadership, and clarity of roles are lacking or weak on many construction projects. Departments with longer on-going building or significant maintenance programmes should allocate responsibility for property management and construction to a Management Board member with appropriate commercial skills and experience. They should also ensure that project roles and decision-making processes are clear and consistent, and develop comprehensive joint training strategies for their own staff and those of their key partners; including improving awareness and management capability in issues of sustainability. Wherever possible departments should ensure that programmes are run and managed by experienced teams, familiar with the work in hand. Departments should also strengthen the support given to their smaller agencies and non-departmental public bodies that only commission construction projects infrequently. Departments can do this by providing access to pre-tendered chains of suppliers (similar to the NHS ProCure21 arrangement), to expert advice and support, and to cost benchmarking data. Where appropriate, departments should also provide support in contract negotiations and in managing risks that arise during the course of the project.

c **Engage fully with the Gateway process and obtain independent advice and challenge at the concept and business case stages when considering potential construction projects.** Departments, through their Centres of Excellence, should make sure that a robust challenge mechanism applies to all projects from the outset. Departments' Centres of Excellence should track risk assessments and Gateway performance for their entire portfolios and ensure they are monitoring all construction activities, including those of their agencies and non-departmental public bodies. It is very important that the design brief is clear, has the appropriate level of detail, and lends itself to efficient construction practices. Where suppliers are involved at an early stage the quality of designs is better, leading to efficient and higher quality construction that delivers lower whole life costs and the required service delivery outcomes. Departments should involve construction suppliers early on in the design process, where appropriate paying for their time on a fee basis.

d **Consider the development of a sustainability action plan to cover all aspects of their construction activity.** It is vitally important for client departments and agencies to take the lead in considering how all aspects of their construction activity can create built assets that contribute to the Government's objectives for sustainable development. The use of a sustainability action plan, where organisations consider from the outset with their suppliers how all aspects of their construction activity can be more sustainable and contribute to any wider strategy and targets for sustainability, may be a useful approach. As part of this departments should develop appropriate project specific key performance indicators (for example, reduced carbon dioxide emissions and reduced waste to landfill) and monitor their achievement. Where departments and agencies already have sustainability action plans in place they should review and build on progress by taking account of the Department for Environment, Food and Rural Affairs Framework for Sustainable Development on the Government Estate to assist in covering all aspects of their construction activity.

e **Make decisions about construction projects based on sustainable whole life value.** Although departments understand and appreciate the importance of making construction decisions on the basis of the implications for all costs over the full operational life of the building, they have difficulty in converting theory into practice when making trade-offs between capital costs and other factors such as complex running costs, social impacts and environmental considerations. All public sector construction clients need to use a structured and defensible decision making process from the outset, making full use of the various practical tools that exist, such as Design Quality Indicators and the Building Research Establishment's Environmental Assessment Method. This will demonstrate they have considered and understand the issues of whole life value involved in a construction project and the opportunities they have to maximise its economic, social and environmental impact.

f **Make more transparent to suppliers the criteria for tender evaluation and make the most of their funding and purchasing power to influence suppliers' behaviour.** If Departments are not clear from the outset of procurement about their whole life value criteria for awarding a contract and the performance they expect of suppliers, they risk receiving poorly-focused proposals. In deciding on their criteria for awarding contracts departments should be clear about their requirements and through a combination of their buying power, and appropriate incentives, seek to secure the commitment of suppliers to collaborative working, innovative methods of construction, high standards of health and safety and construction that is sustainable in the long term.

g **Keep competitive tension in framework and partnering arrangements to provide greater assurance that construction costs represent fair value, and improve the effectiveness of contract strategies to manage better risk and maximise the opportunities for improved performance.** While partnering is important to the delivery of better construction performance there is a risk that partnering arrangements, through the absence of competition, other than at the outset when they are established, can lead to reduced commercial pressure to achieve savings and improve performance in terms of, for example, better services or reductions in carbon dioxide emissions. Poor performers should always face the risk of dropping out of a framework altogether. Thames Water maintains both the benefits of partnering and competitive tension by having two tiers of suppliers in each of its four operational areas which, by introducing the possibility of work passing to another contractor, brings commercial pressure into the whole process. Other approaches to maintaining the performance of single suppliers include using benchmarks to identify target costs, monitoring key performance indicators and introducing continuous improvement programmes. Departments should also ensure that their contract strategies align fully with the programme and project risks and opportunities, making sure that these are managed by those best placed to do so.

h **Encourage collaborative working through collaborative forms of contract and fair payment practices, and seek opportunities to pursue the case for project-wide insurance where appropriate and in agreement with their suppliers:**

- Departments should use forms of contract that embed the principles of collaborative working and good project management. For example, the Engineering and Construction Contract is being widely used in many successful partnership arrangements in both the private and public sectors.
- Unfair payment practices such as unduly prolonged or inappropriate cash retention undermine the principle of integrated team working and the ability and motivation of specialist suppliers to invest in innovation and capacity. Departments should have the appropriate visibility of the entire supply chain. Understanding how specialist contractors, and particularly small and medium sized enterprises, are engaged, evaluated and managed can contribute considerably to the achievement of value for money. For example, Departments should ensure they have in place effective and fair payment mechanisms, such as project accounts[9], to provide more certainty to suppliers' payments dependent on delivery to time, cost and quality.
- Departments should recognise that a new market may emerge in project-wide insurance. Where appropriate, and in agreement with their suppliers, they should consider the case for taking on insurance responsibilities for all parties working on the construction project, to encourage integrated team behaviour and realise bulk purchasing opportunities.

i **Evaluate the post completion and occupancy performance of projects in terms of the Achieving Excellence strategic targets, whole life value, including the financial performance and the delivery of better services and sustainable development, and embed the lessons in future activity.** Many departments are losing learning opportunities by not capturing performance information and not for example, engaging in Gate Five reviews of the benefits delivered by projects. This should not be limited to financial and economic performance but include assessment of the social and environmental impacts (such as energy use, carbon dioxide emissions, waste, water usage, and workforce well-being). Departments should consider linking some of their suppliers' contract incentives to the delivery of improvements after the built asset has been occupied and in use. Departments should enforce knowledge capture and dissemination and always carry out post-project completion reviews of whether the built assets have delivered the intended improvements to efficiency, services and sustainability. Such reviews need to be repeated over the life of the asset.

9 The approach of using a single bank account for the entire construction project ensures the timely payment of all parties and mitigates the risk of the main contractor unfairly withholding payments from suppliers further down the supply chain.

j In support of the Government's Sustainable Development Strategy and the commitments made in the Government's White Paper "Energy Efficiency: The Government's Plan for Action" (Department for Environment, Food and Rural Affairs, April 2004, Cm 6168), relevant departments and authorities should consider developing quantifiable cross-government strategic targets focused on sustainable construction.

18 To assist the Office of Government Commerce in targeting its advisory and support activities so that these have maximum benefit in improving construction capability and delivery performance across all public sector organisations we make the following recommendations. The Office of Government Commerce should:

k **Provide co-ordination and leadership of public sector construction activities so that good practice is clearly identified and the momentum for improvement is sustained.** The fragmented responsibility for construction across a number of departments, combined with the lack of a single senior level forum for department as clients of the construction industry is a significant issue. The Office should take the lead in establishing and supporting a single departmental forum at senior management level to strengthen the leadership and co-ordination of public sector construction activity. A key priority should be a review of current approaches to collaborative working to determine the best generic approaches and whether existing procurement and funding practices support these new integrated ways of working.

l **Review the support available to organisations which only undertake construction projects infrequently.** For such organisations it is neither cost effective nor practicable to retain in-house skills in construction procurement. It is important, however, that when needed they can quickly access reliable support and advice. The Office needs to make sure that such support is easily available including for example, working closely with departments' Centres of Excellence to raise awareness about good practice, such as the Gateway process, and providing access to pre-tendered supply chains, and to independent cost advisors and other consultants such as expert advisers in sustainability. The Office should also work to strengthen and enlarge the pool of experienced and expert construction programme and project advisors it has available to support departments and agencies.

m **Assist departments to find the most appropriate tools and support to improve decision-making based on whole life value and to deliver sustainable construction and development.** The Office should encourage greater collaboration between the appropriate bodies developing advice and practical decision-making tools in this area, and co-ordinate their efforts in developing a practical tool that is sufficiently flexible for use by public sector clients on different types and sizes of projects. Such a tool is unlikely to be effective without also having a pool of expertise provided by the Office on which clients can draw during the design, key decision-making and evaluative stages of projects.

n **Make better use of the available information on generic lessons and good practice on projects by sharing this effectively across the wider public sector and take a lead in setting performance benchmarks.** The Office should do more to identify and disseminate project performance data together with the lessons from what has both worked well or not so well, and information gained from Gateway Reviews so that this can be shared more widely for the benefit of all public sector organisations. In particular this should cover the final repeatable gate which is intended to identify whether the construction project has achieved all its planned benefits and the extent to which performance and value for money has been maintained or improved. The Office should make more readily available case example projects setting out the lessons from what has worked well as well as approaches that have failed to deliver.

19 In the Annex to this summary, we set out a self-assessment tool in the form of a 'maturity grid', which public sector clients can use to assess their own, or their agencies' and non-departmental public bodies', readiness and capability to tackle construction requirements from inception to delivery of the intended benefits and to target areas for improvement. An electronic version of the maturity grid is available on the NAO website at www.nao.org.uk.

ANNEX

Maturity Grid for departments to use to gauge their construction management capability

The maturity grid below distils the most significant points covered in this study and ranks them. The right hand column of the grid represents characteristics of competent client organisations that demonstrate a mature capability in managing construction programmes and projects to successful delivery. The three preceding columns represent stages in progressing towards that level of maturity.

The contents of the grid were developed over the course of this study, reflecting both the issues and progress evident in the workshop discussions, the case studies, and the discussions with wider stakeholders. The grid is offered as a useful self-assessment tool for departments. Departments scoring "1" or perhaps "2" may decide to review their arrangements and decide whether any action is required. Departments and other public sector bodies who fund others to deliver construction may wish to use the grid to assess the capability of their delivery partners as part of the process of approving businesses cases. The grid is available at www.nao.org.uk.

We asked our workshop participants to assess the overall maturity of their organisations or those they worked with or fund. The average of their responses is shown in the grid to provide a broad benchmark for departments to asses their own progress maturity in managing construction projects. The statements in bold show the category with the most frequent responses.

The path to continuous improvement

		Level 1
Defining objectives	Programme objectives are…	Defined in broad terms,
Defining benefits	Programme benefits are defined …	At a high level
Setting budgets	Programme budgets are…	Based on benchmarks or comparable projects,
Whole life costs	Whole life costs …	Are not considered, or
Planning programmes	Investment in planning time is carried out…	In an unstructured way by people in their "day job", or
Managing programmes	Programmes, and their projects, are managed …	On a project by project basis
Managing benefits	Programme benefits are managed…	Reactively at project level, triggered by risks or issues,
Challenging the objectives	Independent reviews (such as Gateway) are …	Never carried out
Building teams	Programme teams are selected…	Based on internal availability
Managing resources	Project resources are managed…	Within the bounds of the project
Team experience	The client's project team …	Is inexperienced in construction, or
Committing funds	Funding commitment matches …	The annual cycle only, or
Programme controls	Cost, time, changes, and risk controls are…..	Partly in place, or
Procuring effectively	The procurement strategy…	Involves a traditional tender and selecting the least price
Collaborative working	The extent to which contracts encourage collaborative working…	Least price contracts are later followed by claims, or
Incentivising behaviours	Incentives within the contract mechanism …	Incentives are not considered at the start of the project.
Reporting effectively	Reporting arrangements…	"Upward only" reporting,
Managing risk	Risk and contingency approaches…	Risk assessment is carried out and documented at the start,
Managing stakeholders	Stakeholder management and involvement…	Stakeholders are involved at the inception of a project
Leading projects	Client leadership…	Sponsor and Board involved at the start of the programme
External learning	The team learns from other projects…	**In an ad-hoc unstructured way,**
Internal learning	Learning from within the project itself…	Feedback and learning processes are absent, or
Developing people	Training in relation to the programme's needs is …	Confined to a few members of the client team,
Sustainable delivery	Sustainability's profile in the programme is…	Low - by not including sustainability objectives
Involving communities	The impact on the local and wider community…	The project meets its own needs, and
Using standards	Standard specifications, designs, contracts are…	Infrequently used, or
Constructing safely	Health and Safety….	Legal requirements are met

Level 2	Level 3	Level 4
and by costs, benefits, time and performance outcomes	and are linked to related projects and sub-projects,	with trade-off criteria explicit between the objectives.
and at a detailed level	and linked to benefit-yielding projects and sub-projects	that are prioritised clearly from the outset.
are validated by independent external third parties,	and based on robust business cases	that are reviewed at intervals during the programme.
are considered in principle, but not calculated, or	**are calculated, and used to inform the design**	and form part of the evaluation criteria, published in advance.
in a structured way by people in their "day job", or	by project planning teams, or	by a programme-wide planning team.
with some understanding of the effects of other projects	with full understanding of the effects of other projects	with regular prioritisation between projects.
and on a proactive basis, using project forecasts,	in an integrated way over the whole programme	with actions to preserve or enhance the programme benefits.
sometimes carried out, or are started mid-project	often carried out, including at the early Gates	always carried out, and at all Gates.
with a capability assessment, with criteria set for the project	and on external resource availability	and with an understanding of the impact on related projects.
with awareness of the resource impacts on other projects	**prioritising the highest benefit-yielding projects**	within a structured programme-wide approach.
has broad construction experience	has some directly relevant construction experience	has highly relevant construction experience.
50% of the programme, or	75% of a programme, or	the whole programme.
fully in place, but lag the project's events and activities,	**and keep up to date with the project's events and activities**	and cover all the projects in the programme.
and sometimes concludes by not selecting the least price	and often concludes by not selecting the least price,	**with price being only one of many wider criteria.**
contracts are bid in a regular supplier pool	**and long-term frameworks align objectives and enable earlier supplier input**	with collaboration reinforced in special vehicle companies, or PPPs.
the form of contract itself is an incentivising force,	and main supplier and client staff have incentives,	and so does the whole supply chain.
with management actions taken as required	**and reported within a programme**	with management actions taken in a coherent way across the programme.
and a clear process links risks with contingency funds,	**which are managed actively through the project**	and across the programme as a whole.
and when there is a major issue to resolve	**and intermittently, determined by the project team,**	regularly via briefing papers and update presentations.
and reactively throughout the programme.	and offers ad-hoc proactive support	**and is regularly involved throughout the project.**
and by published guidance notes and case studies	and by exchanges with other project teams	and by commissioning research or innovation work.
the processes are in place, but not seen as central, or	**the processes are in place and seen as central,**	and are measured in the performance process.
and to all needing this support in the client team	and including the main suppliers	and the specialist suppliers.
moderate - meeting general guidelines or targets	Good - it "aims high", with clear criteria and targets	Excellent - and is an exemplar demonstrating real benefits.
considers its impacts at the planning stage	using a consultation process to solicit views and opinions	with continuing community involvement during and after completion of the project.
frequently used	and their costs reviewed in-house and with suppliers,	balancing speed, economy, effectiveness, efficiency, flexibility and innovation.
and the client ensures that appropriate resources and organisation are in place	and H&S reports routinely inform the project board	**and the client leads from the front, embedding the policies through the organisation.**

PART ONE

Why well managed construction is important

1.1 UK construction activity makes a considerable contribution to the national economy. It accounts for over 8 per cent of national GDP, and involves nearly 250,000 firms employing over two million people, ranging from major multi-national construction companies to small specialist contractors and suppliers.[10] The construction industry has a finite capacity and it is essential that scarce resources are managed efficiently otherwise this can lead to inflation in construction prices and in turn the national economy.

1.2 The end product of construction activity is the built environment, made up of the national infrastructure, and residential, commercial, industrial and public buildings, which is estimated to account for some 70 per cent of current UK manufactured wealth.[11] The value of built assets in the central government sector alone is estimated at just under £161 billion.[12] Besides being key drivers of economic performance, construction and the built environment shape the lives of UK citizens through their impact on:

- the delivery of improved public services such as health, education and transport at good value;
- social cohesion and stability, such as the effect of rundown environments on crime, poverty and health;
- the natural environment through, for example, the growing risks associated with carbon dioxide emissions **(Figure 4)**.

4 Some key statistics on the environmental impact of construction and the built environment

The built environment is responsible for:

- 45% of UK energy use and between 30 to 50% of all UK CO_2 emissions

Construction activity is responsible for:

- 40% of total world flows of raw materials such as sand, gravel and clay
- 16% of waste to landfill generated in the UK, and 21% of UK hazardous waste

Sources: Sustainable Construction Task Group report 'Reputation, Risk and Reward' (Building Research Establishment, 2001); Environment Agency

In addition, where construction firms operate sound procurement practices combined with good training and employment practices they have the opportunity to impact positively on the health and welfare of their employees.

1.3 Public sector construction activity has grown significantly in recent years and is set to expand further in key sectors such as schools, hospitals and social housing. If well managed, construction activity provides a major opportunity for government clients and the construction industry to deliver improved public services, revitalised communities, and economic and other benefits to all UK citizens.

1.4 The risks to value for money, however, from inefficiency, poor on-site safety, waste (human, materials and time), environmental and social degradation and failure to deliver the desired quality to time and cost are considerable. Health and safety, for example, is a vital issue for the construction industry. The National Audit Office's report Improving Health and Safety in the Construction Industry (HC 531, 2003-04) noted that across all industries, in addition to the cost to human life, poor health and safety costs an estimated £18.1 billion a year (2.6 per cent of gross domestic product), and that the rate of four fatal injuries per 100,000 employees in construction is five times the average for all industries.

1.5 This part of the report demonstrates the importance of well managed construction by setting out:

- the nature of and trends in public sector construction;
- how well managed construction is integral to improved efficiency and service delivery;
- the action taken to improve public sector construction performance since 2001;
- current responsibilities for public sector construction;
- the National Audit Office's examination.

10 Figures are based on a wide definition of construction activity encompassing firms involved directly in construction and maintenance, but also firms in, for example, construction-related professional services and the production of construction raw materials (Source: Annual Business Inquiry, Office of National Statistics).

11 'The Social and Economic Value of Construction: the Construction Industry's Contribution to Sustainable Development 2003'. A report for the Construction Industry Research and Innovation Strategy Panel by Professor David Pearce, OBE.

12 Aggregate figures for buildings and infrastructure assets (excluding railways) based on current replacement value from departments' published resource accounts for 2002-03.

Trends in public sector construction

The nature of public sector construction activity and clients

1.6 Public sector construction encompasses a wide range of activities including multi-million pound infrastructure and civil engineering projects, major building programmes in sectors such as prisons, hospitals, schools, courts and social housing, individual one-off flagship projects through to varying scales of refurbishment and maintenance activity. Invariably all government bodies are involved at some time in construction activity, but the extent and nature of this involvement varies. For some departments and agencies construction is part of their core business, for example the Highways Agency, with their activity delivered on an ongoing and often repeat basis. At the other end of the spectrum many government bodies will only be involved in a significant construction project perhaps once every 20 to 30 years, though most will have ongoing repair and maintenance programmes **(Figure 5)**.

1.7 Many departments do not directly deliver construction projects but instead fund or commission construction indirectly through grants to organisations at the end of complex public sector delivery chains (Figure 5). While some frontline organisations may themselves be major repeat clients, for example, Network Rail or the larger local authorities, or have experienced in-house construction procurement capability such as the Department of Trade and Industry, they are more

5 How public sector bodies are involved in construction

Source: National Audit Office

likely to be infrequent clients and therefore relatively inexperienced in managing construction projects. It is also true that even where a client is involved in repeat work it does not mean that the team doing the next project is experienced and skilled in managing construction.

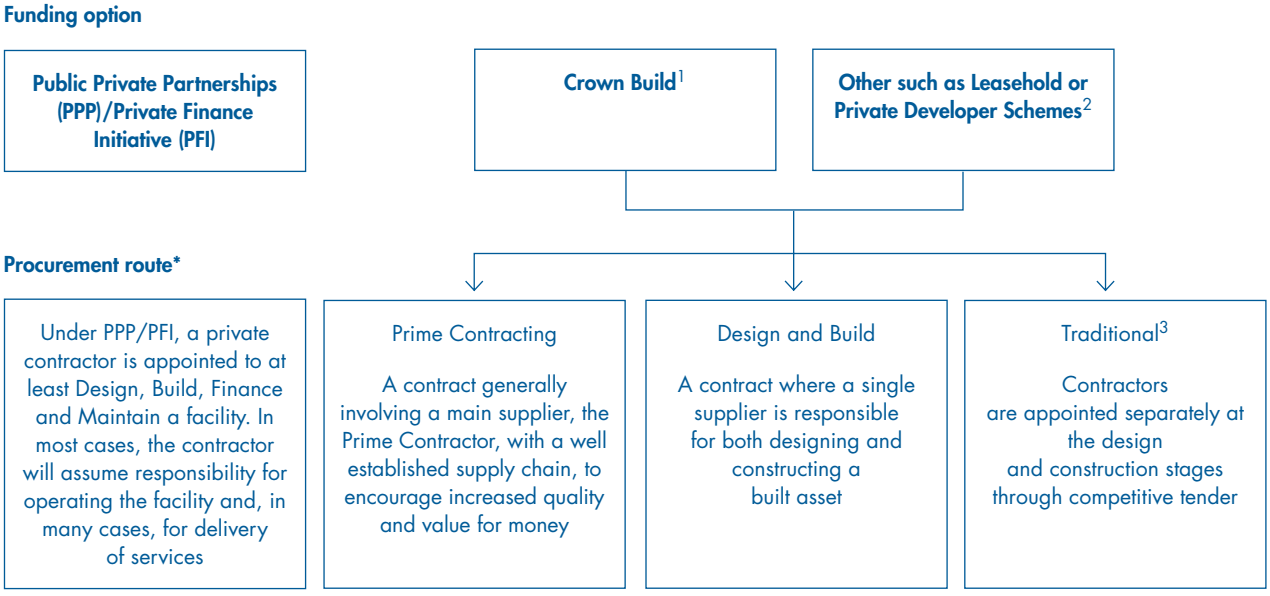
Methods of construction procurement and funding

1.8 The way in which government clients fund and procure construction varies. The Office of Government Commerce[13] recommends that departments and agencies focus on one of three main construction procurement routes as they consider these approaches are more likely to encourage integrated working than traditional forms of procurement where each element of the project is separately and competitively tendered **(Figure 6)**:

- **Design and Build:** the contractor is appointed through competition to design as well as construct the building and is normally paid a combined fixed price for both. The risk of the design not working is mainly borne by the contractor and is reflected in the price paid by the client.
- **Prime Contracting:** the prime contractor is responsible for integrating the supply chain into the design process, and co-ordinating and project managing design, construction and the initial phases of operation. Prime contracting often involves a target price developed and agreed through the design stage involving (i) cost which all in the supply chain seek to reduce and (ii) profit which increases as a result of improved efficiency and innovation. The prime contractor is required to demonstrate that

6 The main public sector construction funding and procurement routes

*PFI is one of the three methods recommended by the Office of Government Commerce for government construction procurement. The other two are Prime Contracting and Design and Build



Source: National Audit Office

NOTES

1 Crown Build is new build or refurbishment funded directly by the client via its capital expenditure budget, with asset ownership (freehold) remaining with the client.

2 Under 'leasehold' the client occupies a facility but does not own it and is charged on a rental basis. 'Private Developer Schemes' involve pre-letting/purchase of a space that would not otherwise be constructed in the absence of a forward commitment to lease or purchase.

3 Departments are recommended not to use traditional forms of procurement unless it can be demonstrated that it will provide better value for money.

13 The Office of Government Commerce is an independent Office of the Treasury reporting to the Chief Secretary of the Treasury. It is responsible for a wide-ranging programme which focuses on improving the efficiency and effectiveness of central civil procurement.

during the initial phases of operation that cost and performance parameters can be met in accordance with the pre-agreed cost and performance model.

- **Private Finance Initiative:** where the public sector client contracts via competition to purchase services, with defined quality outputs, from a private sector company or consortium on a long term basis, including maintaining or constructing any necessary infrastructure or buildings and managing the delivery of related services. Funding for the construction is provided from private finance with ongoing payment from the public sector for, and income generated from, the provision of services going to the contractor. The essential differences over design and build and prime contracting are the use of private finance and the ongoing involvement of the contractor in at least running and maintaining the constructed asset. Under PFI the contractor has a clear interest in reducing whole life operating costs.

Departments often use one or more of the three methods across their construction programmes. For example, the Highways Agency and the Environment Agency both use both prime contracting and the PFI. Defence Estates uses all three methods of procurement and the NHS Estates' ProCure21 approach, covering the majority of health non-PFI construction, incorporates best practice from both Design and Build and Prime Contracting. Appendix 2 sets out how the key roles in construction projects vary in the nature and intensity of involvement under these three procurement routes.

1.9 'Construction management' and 'reimbursable contracts' are two other approaches used in the construction industry.[14] While both approaches can have considerable benefits in certain circumstances they are not generally recommended by the Office of Government Commerce for government clients because they tend to suit experienced clients, who can manage the inherently higher levels of risk and uncertainty they involve. For example, 'reimbursable contracts' suit expert and well resourced clients who carry out complex, business critical projects where quality is the absolute priority, who recognise that the transfer of risk to third parties is impractical and who can operate robust cost management systems and controls in a less structured and fast-changing environment. Such contracts are used in the nuclear industry, and are being used by BAA in developing Terminal 5.

1.10 Since our 2001 report there have been a number of developments in the ways in which departments are using two of the three recommended procurement routes. Despite the increasing use of PFI, prime contracting has continued to develop as the main procurement route for many departments and agencies directly responsible for major repeat construction activity, such as the Ministry of Defence, Highways Agency and Environment Agency. Their approaches differ in detail and maturity, but each has involved progress towards streamlined procurement processes and longer-term partnering through national framework agreements with fewer supply chain partners. The majority of central government capital expenditure (other than PFI which is privately financed) is now delivered through this form of procurement.

1.11 The Private Finance Initiative, while seen as additional to, and not a replacement for 'conventional' crown funded capital projects, is increasingly the preferred funding and procurement route in key sectors of government construction activity such as schools, hospitals and prisons. In September 2002 the Prime Minister stated "PFI has a central role to play in modernising the infrastructure of the NHS – but as an addition, not an alternative, to the public sector capital programme". On the basis of current departmental plans, the Treasury expects PFI projects with a total capital value of £25.7 billion to be signed from 2005-06 to 2007-08, a substantial proportion of which will include significant construction elements, with PFI investment typically representing about 10–15 per cent of total government capital investment in any year. Related developments in PFI include:

- **New forms of Private Public Partnerships in the NHS primary care and schools sectors.** For example, Local Improvement Finance Trusts[15] bring the benefit of PFI-style solutions to the construction of smaller health facilities within Primary Care Trusts which, by virtue of their size, would not normally benefit from this type of solution. It enables Primary Care Trusts to combine and integrate dispersed local health services (for example doctors'

14 Under a *reimbursable contract* the client pays for all of the work, plus a profit margin to the supplier. The client takes full responsibility for organising and directing the work and for managing the programme. Under a *construction management* approach, the client employs a construction manager who works for a fee which is applied to the value of the work. The project is delivered in small 'packages', thus allowing the construction work to start on some packages before the design has finished on the later ones.

15 NHS Local Improvement Finance Trusts is a new form of Public Private Partnership first announced in the NHS Plan 2000 with the objective of improving Primary Care health services in deprived areas. The Department of Health expect that some £1 billion of investment will be provided from the private sector over the next ten years in 42 selected areas of England.

surgeries, dentists and pharmacists), and to deliver a programme of improvements to premises through one local combined funding and delivery vehicle in partnership with private sector organisations such as a major construction firm. Similar approaches are being developed and implemented by the Department for Education and Skills for the 'Building Schools for the Future' programme.

- The transfer of ownership and management of departmental estates to the private sector under PFI type arrangements. The two most significant examples of outsourcing deals are the Department for Work and Pensions PRIME deal (1997) and the Inland Revenue and HM Customs and Excise STEPS deal (2001). These deals have enabled departments to reduce their own estates and property management functions and provided them with greater flexibility of use by transferring the costs of vacating or purchasing property to the private sector. Contractors are also responsible for new building and maintenance projects.

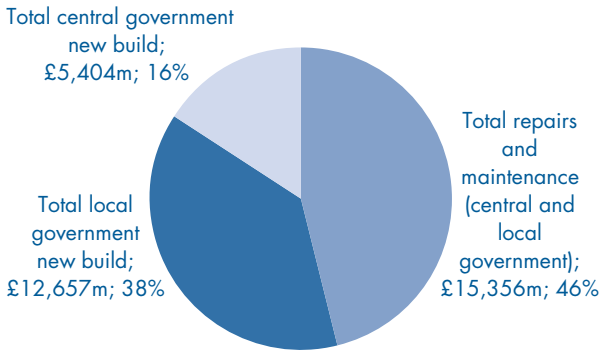
The growth in public sector construction activity and expenditure

1.12 The public sector share of annual UK construction output has remained steady at around 37 per cent between 1999 and 2003. However, in line with total UK construction output (defined as amounts invoiced by contractors and suppliers), it has grown by over a third in this period from just under £24 billion to around £33.5 billion, of which 16 per cent (£5.4 billion) was accounted for by central government new build **(Figure 7)**.

1.13 As announced in Spending Review 2004, Government total capital investment (including construction and other capital items such as IT) is set to expand rapidly over the next three years from £21.3 billion in 2002-03 to a planned £34.9 billion in 2007-08 (a 64 per cent increase). It is difficult for departments to define precisely how much of their capital budget will be spent on construction, in part because accounting policies and HM Treasury do not separately require the collection of information on construction, but also because departments have not yet decided in detail how they will spend the capital funds allocated to them. However, the following departments have all been allocated substantial increases in capital funds in Spending Review 2004, a major portion of which will be spent on programmes with major construction elements:

- Department for Education and Skills. Rebuilding, refurbishment and repair of around 23,000 primary and secondary schools: a total of £24.1 billion from 2002-03 to 2007-08 (an increase of 141% over the period). The programme definitely includes £2.2 billion in 2005-06, when the 'Building Schools for the Future' programme, (targeted at re-building secondary schools in certain key areas), will be implemented.
- Department for Transport. The Government's 10 Year Plan published in 2001 indicated that the total expenditure on maintaining, improving and operating the strategic road network would be nearly £22 billion over the 10 year period.
- Office of the Deputy Prime Minister. A total of £13.3 billion in the period 2002-03 to 2007-08 (an increase of 69% over the period) including £3.3 billion allocated to the Housing Corporation to deliver 67,000 affordable new homes from 2004-05 to 2005-06, with the remainder mainly for local authority construction programmes.
- Department of Health. A total of £24.7 billion from 2002-03 to 2007-08 (an increase of 174% over the period). Includes non–PFI healthcare capital improvement of hospitals with construction schemes totalling £3.5 billion already underway.

7 UK public sector construction output 2003



Source: Department of Trade and Industry Annual Construction Statistics 2004.

NOTE

Figures for public sector construction output exclude expenditure on construction activity under Private Finance Initiative contracts which are counted as private sector construction output.

These figures exclude annual revenue expenditure on, for example, the considerable future running and maintenance costs that will be incurred in managing new assets.

1.14 Given the scale of increased Government investment in construction there is considerable onus on departments to achieve value for money in terms of efficient construction processes, the quality of the buildings and infrastructure delivered, and their impact in delivering improved public services and generating positive social and environmental impacts. They also face other pressures to achieve well managed construction:

- Under Spending Review 2004 departments are required to deliver 2.5 per cent annual improvements in efficiency each year. Departments will need to justify strongly any new construction and therefore capital expenditure. They will need to show how they can improve the efficiency with which they deliver construction activities, as well as how the outputs of construction activity will contribute to improved efficiency in the delivery of public services.
- The Office of Government Commerce is examining what further steps can be taken to increase competition, long-term planning and capacity in markets where the government possesses significant purchasing power.[16] The construction market is the first to be considered, in part because of concerns about significant inflation in construction prices (which may add 10 per cent to the capital costs of projects) driven by lack of co-ordination of departments' escalating construction activity. Departments will need to develop effective construction programmes and improve the information they provide to the market in order to take forward this agenda.
- Sir Michael Lyons, in two separate reviews has examined how departments can relocate at least 20,000 civil service jobs from London[17], and how government assets can be rationalised with the aim of selling £30 billion of government assets by 2010.[18] Both reviews may have significant implications for the construction and property management strategies of departments, with again particularly strong emphasis on the need for departments to demonstrate very good business cases for the purchase of new assets such as buildings, and also how they can make effective use of their existing workspace.
- Sustainable construction and sustainable development are important Government agendas that affect the way in which all public and private sector organisations construct and manage built assets. The Government's 1999 White Paper on sustainable development states that 'UK construction activity has a major part to play in the achievement of the Government's Sustainable Development Strategy by building and maintaining sustainable communities and, in so doing, minimising waste, resource usage, and energy consumption'.[19] For example, climate change and reducing carbon dioxide emissions is a major policy issue with two related Government targets, the first a 20 per cent reduction in emissions by 2010 and the second a longer term target of a 60 per cent reduction by 2050.[20] This will be further driven by the EU Energy Performance of Buildings Directive due to come into force in January 2006, and possibly by the new 'Code for Sustainable Buildings'[21] which may also come into place in 2006. Departments are required to maintain indicators of their contributions to high level targets for sustainable development and will need to demonstrate how their planned construction activity, including the work of their suppliers, is addressing both environmental and social concerns.

16 Following on from the OGC's report 'Increasing Competition and Improving Long-Term Planning in the Government Market Place' (Sir Christopher Kelly, December 2003) commissioned by the Chancellor of the Exchequer.
17 The Lyons Review of Public Sector Relocation (March 2004) commissioned by the Chancellor of the Exchequer.
18 The Chancellor of the Exchequer in Spending Review 2004 announced a review of all public sector assets across both central and local government (including built assets) to be undertaken by Sir Michael Lyons.
19 The Government's White Paper 'A better quality of life: the UK Government Sustainable Development Strategy' 1999, which sets out its aim of bringing the environment, social progress and the economy alongside one another at the heart of policy making and decision making.
20 Source: Department for Environment, Food and Rural Affairs - all targets for reductions in carbon dioxide emissions are made from a base level of emissions measured in 1990.
21 The new Code for Sustainable Building is being jointly sponsored by the Office of the Deputy Prime Minister, the Department for Environment, Food and Rural Affairs, the Office of Government Commerce and the Department of Trade and Industry.

How well managed construction is integral to improved efficiency and service delivery

1.15 Well managed and successfully delivered construction projects and programmes provide public and private sector organisations with the opportunity to improve the efficiency and effectiveness with which they deliver their business or services. For example, over the 20 year life of an office building the cost of ownership and operation, including finance and rent, utility costs, repair and maintenance may be five times the original capital cost of the building and the employment costs of the staff working in the building 200 times its original capital cost - the '1:5:200 ratio' first put forward by the Royal Academy of Engineering. The cost of design and management to create the building is estimated to be in the ratio of 0.1 in relation to its original capital cost. The exact ratios are debatable and different models exist, but the point is clear; that the construction cost is small, and design costs even smaller, in relation to all the other costs. If whole life value is designed in from the outset it can reduce significantly business operating costs and improve efficiency.

1.16 Well managed construction is not, however just about reduced costs and efficiency. Buildings that are designed well will have improved functionality and lower whole life costs and will deliver beneficial environmental and social impacts and, more aspirationally, may inspire users, strengthen local identity and contribute to civic pride. There is, for example, a growing body of evidence that indicates that the way in which schools and hospitals have been designed and constructed can affect educational and healthcare outcomes. Well designed schools can have lower truancy rates and improved pupil performance compared to poorly designed schools.[22] Well designed hospitals can contribute to better patient outcomes and improved throughput, and help to retain skilled staff resources[23], and recent research on accident and emergency environments by NHS Estates indicates that hospital patients feel calmer, more respected and better cared for when their surroundings are pleasant and welcoming.[24] In previous reports we have also demonstrated that increasing space and removing blind corners and stairwells reduces the risk of violence and aggression against NHS staff by patients or other users of hospital facilities.[25] Increasingly, commercial organisations are coming to recognise that well designed offices and work environments are important factors in successful recruitment and retention of highly skilled staff in competitive recruitment markets.

1.17 The 'client' is at the heart of well managed construction. **Figure 8** sets out the main characteristics of successful construction clients, along with examples of the improvements to efficiency and service delivery that their approach has achieved.

The action being taken to improve public sector construction performance since 2001

1.18 Our 2001 report set out how successive independent reviews of UK construction performance had identified the need to tackle the adversarial and inefficient working practices that have characterised the UK construction industry **(Figure 9)**. Our report, and the report of the Committee of Public Accounts, went on to identify the need for further action to improve departments' construction performance and the scope for significant financial savings and wider value for money benefits, and made a series of recommendations to achieve:

- better co-ordination of industry improvement initiatives by sponsoring departments, including the development of more sophisticated performance measurement and benchmarking arrangements for firms and clients;
- better dissemination of good practice by the then newly formed Office of Government Commerce, not only for the large purchasers of construction in central government but also for government bodies either indirectly funding construction or with less experience of delivering construction projects;

22 Department for Education and Skills and PriceWaterhouseCoopers: 'Building Performance – An empirical assessment of the relationship between schools capital investment and pupil performance' (January 2001).
23 Commission for Architecture and the Built Environment: The Value of Good Design – How buildings and spaces create economic and social value (October 2002).
24 'Modernising A&E environments' NHS Estates (March 2004).
25 Comptroller and Auditor General's report 'A safer place to work: protecting NHS hospital and ambulance staff from violence and aggression', (HC 527, Session 2002-03).

8 Successful construction can improve both service delivery and efficiency

The characteristics of successful construction clients	Benefits to service delivery and efficiency	Example
The creation of effective construction programmes based on a sound understanding of the value and fitness for purpose of existing built assets.	Decisions on capital spending reflect the existing condition of assets and can be matched more closely to the service delivery priorities and targets of the organisation as a whole.	To improve the way in which capital resources are invested in schools the Department for Education and Skills required local education authorities to prepare Asset Management Plans assessing the condition and fitness-for-purpose of their schools. The plans provide the basis for assessing future needs and better informed decisions on local educational spending priorities and the most efficient use of capital resources. The decision making process is also more transparent, and the fairness of decisions can be assessed by all those involved. The information will help local education authorities and potential private sector partners to judge in which circumstances longer term public private partnerships are likely to be appropriate.
The adoption of longer-term planning and provide their suppliers with greater certainty and stability in work and funding.	Suppliers have greater confidence to enter into longer-term partnership arrangements and to invest in skills and innovation which in turn can reduce costs and improve quality.	The Government's 10 Year Plan published in 2001 indicated that the total expenditure on maintaining, improving and operating the strategic road network would be nearly £22 billion over the 10 year period. The 10 Year Plan provides a long term indication of the investment levels and committed expenditure covers a 3 year period. Longer contracts for maintenance and improvements are put in place based on the expectation that funding will be continued, but they could be amended or terminated if necessary. Longer contracts have in turn encouraged contractors to invest in training and developing its workforce and in new technology in road building.
The direct and continuous involvement and leadership of senior management throughout the project life. They clearly understand the contribution that construction can make to improved business effectiveness and service delivery, and recognise the capacity and skills needed for successful delivery.	Closer alignment between the end product and the needs of the business or service, including reinforcing any desired change in working practices and culture such as open plan and cross team working, or improved interfaces between staff and citizens.	The HM Treasury refurbishment successfully removed over seven miles of internal walls, increased useable space by 25 per cent, and brought the 1,200 Treasury and Central Support staff together for the first time into one modern and more environmentally sustainable office. According to the project developers, the active and leading role taken by the Permanent Secretary during the entire project kept the integrated team clearly focused on how the building could deliver the required changes in culture and working practices.
The use of a well structured design and decision-making process subject to independent challenge that involves key stakeholders and demonstrates an appreciation of the whole life value of the project, not just in terms of whole life running costs but the wider social, economic and environmental impacts.	Delivery of built assets with low whole life running costs while delivering sustainable, flexible and long lived assets that: ■ maximise staff productivity and improve the way in which services are delivered, for example through greater accessibility for citizens; ■ minimise harmful and avoidable environmental impacts in their use;	Dunston Innovation Centre, built by Chesterfield Borough Council, was deliberately designed to reduce the building's whole life costs, minimise its environmental impact and secure future flexibility of use by providing serviced office space and other support for new IT based enterprises. One of its features is a geothermal heating system which minimises energy costs (75 per cent more efficient than similar buildings) and the Centre's reliance on carbon based fuels. Poundbury, the urban extension of Dorchester, is being deliberately planned and developed as a challenge to current conventions of town planning and development.

8 Successful construction can improve both service delivery and efficiency (continued)

The characteristics of successful construction clients	Benefits to service delivery and efficiency	Example
	■ can accommodate changes in use and technological advances in, for example, energy efficiency or IT; ■ make a positive contribution to its immediate neighbourhood and improve communal facilities.	It is an attempt to demonstrate that high density mixed residential (both private and social) and commercial development can be delivered using environmentally and economically sustainable approaches resulting in a community with a high degree of civic pride and social well being. Phase One has already started to demonstrate that a high quality built urban environment that, for example, puts people and not cars first, can deliver both sustainable communities and a commercially viable development.
Understanding which procurement route is best suited to their circumstances and using contracting arrangements that encourage good practice and collaborative working, maintain competitive pressure, involve target costs and performance incentives (over the life of the asset) agreed with the entire delivery chain, and secure payment for all specialist suppliers.	Reducing project costs through efficient procurement and project management processes and minimising or eliminating the risks of cost and time overruns associated with claims from contractors and suppliers.	A key factor in the successful delivery of Defence Estates' Andover North project was a decision by the entire integrated team to share the risks and rewards involved in the whole project. This was underpinned by an agreed cost target, the ring fencing of profit margins and an incentive scheme that distributed cost savings to both the client and the contractors and suppliers whilst safeguarding the client against meeting any cost overruns.
Secure the early and continued involvement of the main contractors and key specialist suppliers in the design of the project, the active management and tackling of risks to safety and delivery.	Greater certainty and control over delivery to time, cost and quality, particularly where the project is critical to service delivery or business performance and viability, but also reducing project costs and improving quality by: ■ creating an environment for innovation in, for example, waste reduction, and maximising the benefits from value engineering; ■ greater commitment to safe construction reducing the financial and human costs associated with accidents.	The Terminal 5 project, one of the largest in the UK in recent years, is a business critical project for BAA where failure could affect their future viability. They have recognised that successful delivery is dependent on drawing in the entire integrated supply chain right from the outset of the project. They work on the principle that the client always bears the risk, but have introduced innovative methods to incentivise the entire team to manage collectively the identified risks. Initial analysis by BAA indicated without this radical approach the project would have been delivered two years late and £1.2 billion over budget. The project is currently on schedule and budget.
Evaluating on an ongoing basis whether the project has been delivered to time, cost and stakeholder expectations, and delivered the target running costs and desired outcomes (including environmental and social impacts such as carbon dioxide emissions) by involving all those involved in delivery, embedding the lessons for future projects and sharing these with other client organisations.	Costly mistakes are not repeated and the opportunities for improved performance on future projects are realised. Demonstrating the case for greater investment in design and quality at the start of projects.	Stanhope, a leading private sector developer, has a track record of efficient delivery of high quality award winning buildings to time and cost (bettering industry averages) that exceed stakeholders expectations. Two of the key factors to which they attribute their success are: ■ repeated evaluations of the outcomes delivered by their projects and the reasons for what could have been done better and what works well, combined with an ongoing research programme into the lessons from other projects, and the use of this information to seek continuous improvements in performance; ■ keeping successful teams together wherever possible so that the lessons learned from one project can be swiftly and effectively implemented on the next.

Source: National Audit Office identification of good practice

- better performance measurement by line departments, with particular emphasis on the achievement of financial savings, and the training and development of skills in procuring and managing construction projects;
- greater use of innovation by the whole supply chain in improving the quality and cost-effectiveness of public sector buildings.

1.19 Since 2001, amongst a wide array of initiatives, there have been two further developments of particular significance to public sector clients and which feature in both our assessment of progress since 2001 and what more needs to be done to improve performance. Both were undertaken to refocus improvement agendas, and secure a higher degree of consistency in approach across all sectors:

- **Rethinking Construction - Accelerating Change (2002):** The Strategic Forum for Construction[26] conducted a review of progress against the recommendations of the Egan report. Its report reduced the number of recommendations and targets for the industry and assigned clear responsibility for their delivery, predominately to **Constructing Excellence** a DTI and industry sponsored body. Constructing Excellence brought together various initiatives in a more streamlined approach to the delivery of industry reform, including good practice demonstration projects across England and Wales. It also assumed oversight of the performance improvement work of other bodies and groupings such as the Local Government Task Force and the Housing Forum. Unlike the original Rethinking Construction report, Accelerating Change highlighted the need for radical improvements in construction sustainability and the responsibility of the entire industry for delivering this.

9 Four of the most significant construction reviews and performance improvement initiatives prior to 2001

'Constructing the Team' – a report by Sir Michael Latham (1994); commissioned by the then Secretary of State for the Environment, the report proposed a clear action plan for improvement, asserting that implementation must begin with the client and made ten main recommendations including that the Government commit itself to becoming a good practice client. A number of bodies were formed as a result of the report and Government decisions in conjunction with the industry to facilitate improved dialogue between the industry and clients:

- The Construction Industry Board, which became the Strategic Forum for Construction in 2002;
- The Construction Clients Forum, which became the Confederation of Construction Clients until losing sponsorship and momentum in 2002. It has now been replaced by the Construction Clients Group.

'The Levene Efficiency Scrutiny into Construction Procurement by Government' (1996); concluded that Government bodies were partly to blame for the poor performance of the industry and made recommendations to improve the structure and management of construction projects, including more realistic budgets and timetables, and the skill level of Government clients. In 1997 HM Treasury established the **Central Government Construction Taskforce** to improve Government client performance and to provide a single collective voice for Government construction clients on cross-departmental aspects of procurement. One of their key aims was to develop and apply management practices so that the leading departments and agencies become and remain good practice construction clients.

'Rethinking Construction' – a report by Sir John Egan (1998); Sir John Egan was appointed to lead the Construction Task Force in advising the Deputy Prime Minister from the client's perspective on the opportunities to improve the efficiency and the quality of delivery of UK construction. The task force's report made a number of detailed recommendations aimed at the industry as a whole, and established quantified targets for improvement in, for example, construction costs, delivery times and defects.

'Achieving Excellence in Construction' initiative (1999); launched by HM Treasury in response to the Egan report, set out an action plan and targets for implementation and achievement of the Egan recommendations across Government. The basic principles of Achieving Excellence require Government clients to enter into collaborative relationships with their suppliers so that all parties work in an open and mutually productive environment and to ensure the full involvement of an integrated supply chain. These principles are consistent with those of both 'Constructing the Team' and 'Rethinking Construction'. Achieving Excellence applies across the whole of central government and includes the Ministry of Defence and the Department of Health.

Source: National Audit Office

26 The Strategic Forum for Construction is a DTI sponsored body with strategic responsibility on behalf of the industry to deliver change in line with the Rethinking Construction report.

- **'Building on Success' conference (2003) and the launch of the Achieving Excellence strategic targets:** organised by the Office of Government Commerce and launched by the Chief Secretary to the Treasury in February 2003. It reviewed progress against the original three year Achieving Excellence action plan and announced a future strategy which took account of previous key reviews, including those of the Committee of Public Accounts and the National Audit Office.

1.20 The key feature of 'Building on Success' was the launch of two quantifiable strategic targets designed to improve the cost and time predictability and quality of construction projects and reduce average timescales for procurement by March 2005 **(Figure 10)**. Responsibility for delivery of the targets[27] rests with departments with the Office of Government Commerce responsible for defining how the targets are to be measured and for monitoring and reporting progress. The aim of the targets is to build on progress, focus departments' efforts more clearly and establish a continuing programme to embed the Achieving Excellence principles.

Current responsibilities for public sector construction

1.21 The Office of Government Commerce continues to work with departments across government to help them achieve best value for money in commercial activities and in the delivery of major acquisition programmes and projects in areas such as routine procurement and IT, as well as property and construction. This includes responsibility for delivery of the Government's Achieving Excellence in Construction initiative. It has no authority to direct departments, but encourages them to achieve value for money through its activities and initiatives. It is also only one of ten departments, agencies or non-departmental public bodies with cross-cutting responsibilities for construction in central government **(Figure 11)**.

10 Achieving Excellence in Construction: Strategic targets for departments

The targets apply to any construction project over £1 million in value and containing an element of new work, refurbishment or maintenance, including the construction elements of Private Finance Initiative managed service procurements:

By March 2005, 70% (by volume) of construction projects reaching Gate 5 of the Gateway Process[1] in the period 1 April 2003 – 31 March 2005 to be delivered:

- On time
- Within budget
- To exceed customer and stakeholder expectations
- With zero defects

By March 2005, for each key sector to reduce the average time period from start of procurement (Gate 2) to award of contract (Gate 3) by 25% for construction projects taking over a year between Gates 2 and 3, and 15% for all other construction projects.

Source: Office of Government Commerce

NOTE

1 The 'Gateway Process' was introduced by the Office of Government Commerce in February 2001 to subject all major central civil Government programmes or projects (including construction projects) to external scrutiny. It involves independent examination of a programme or project at six critical stages of its lifecycle to provide assurance it can progress to the next stage. The targets refer to Gates 2, 3 and 5:

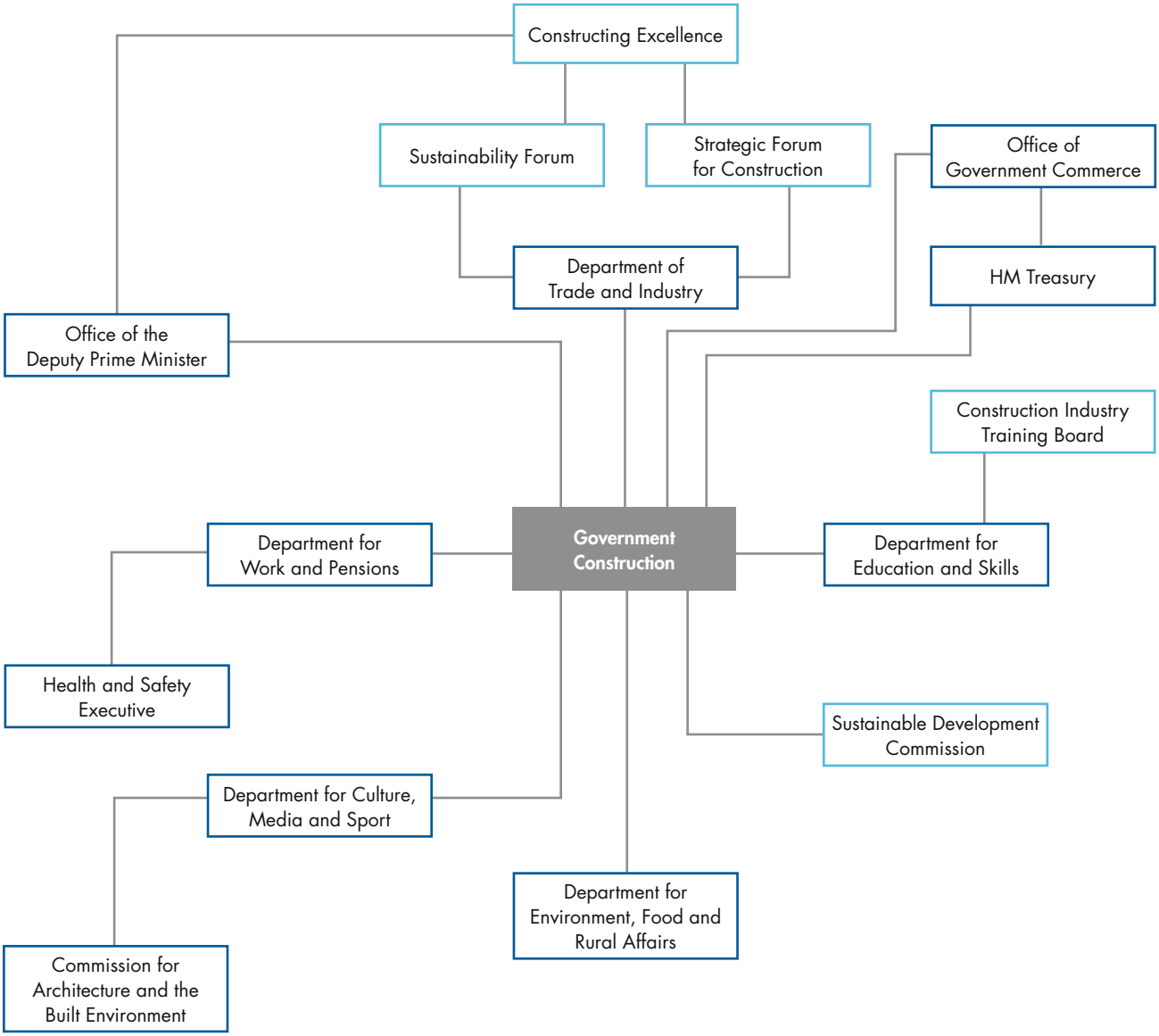
Gate 2: prior to implementation of the proposed tendering strategy;

Gate 3: after the tendering process but before any contract has been implemented;

Gate 5: after completion of the project and when the planned benefits are expected to have started being delivered.

27 The targets apply to any construction project containing an element of new work, refurbishment or maintenance, including the construction elements of Private Finance Initiative managed service procurements.

11 Departmental responsibilities for construction



Source: National Audit Office

Commission for Arhcitecture and the Built Environment:
Co-funded by DCMS and ODPM. Seeks to promote the importance of a high quality built environment to enhancing quality of life and productivity.

Constructing Excellence:
An industry-led initiative which aims to deliver reform through combining the "Re-thinking Construction" agenda and the Construction Best Practice programme. Its role includes development and collation of construction Key Performance Indicators; overseeing the work of the Local Government Task Force (funded by ODPM) which seeks to encourage local authorities to use partnering arrangements to develop integrated supply chains and also the Housing Forum which seeks to improve housing construction, building on the Rethinking Construction agenda.

Construction Industry Training Board:
Trains and develops workers in the construction industry.

Department for Culture Media and Sport:
Has responsibility for architectural design and supports the Prime Minister's Better Public Buildings Initiative.

Department for Environment Food and Rural Affairs:
Leads on cross-government sustainability issues.

Department of Trade and Industry:
Construction Sector Unit leads in maintaining and developing relationships with construction sector.
Collates annual statistics on the scale of the industry,
funds Constructing Excellence and other industry bodies and initiatives and has an overarching policy role.

Health and Safety Executive:
Regulates health and safety for the construction industry, and provides a range of information to mitigate health and safety risks.

HM Treasury:
Requires departments to prepare Departmental Investment Strategies.
Provides a central focus and guidance for PFI / PPP initiatives.
Drives other initiatives which determine departmental construction priorities.

Office of the Deputy Prime Minister:
Delivers local government initiatives and
National Procurement Strategy for local government
Provides guidance on building regulations
Issues planning guidance via Planning Directorate
Building sustainable communities and provision of affordable housing via the Housing Corporation
Drives the urban policy agenda to improve towns and cities
Leads development of the new code for sustainable buildings.

Office of Government Commerce:
Works with departments to improve construction procurement and project/programme management.
Works with suppliers to make the government construction marketplace more efficient and attractive to business.

Strategic Forum for Construction: Advises on strategies to accelerate change in the industry.

Sustainable Development Commission:
The Government's independent advisory body on sustainable development. Provides independent advice to Government and companies on sustainable development issues.

Sustainability Forum:
Advises on sustainability issues.

1.22 Since 2001 the Office of Government Commerce has implemented a range of construction improvement initiatives and support services. Some of these are aimed specifically at improving the construction delivery capability of departments, sometimes in conjunction with other government bodies, or as part of wider initiatives to improve the programme and project delivery capability of departments **(Figure 12)**. The Office has a Public Service Agreement target to deliver £3 billion in value for money gains through its procurement activities in central civil government in the period ending March 2006. Its construction improvement activities are expected to make a contribution towards delivery of the target.

1.23 Spending Review 2004 announced an increase in the remit of the Office of Government Commerce. From April 2005 it will have responsibility for improving procurement capabilities across the wider public sector, including local government and the National Health Service. This is a considerable increase in the number of organisations with which it will need to work. It has also been assigned lead responsibility for co-ordinating the delivery of the Government wide efficiency drive. It has been given no extra resources for these activities, emphasising the need for it to target its future efforts where they will have most impact.

The National Audit Office's examination

1.24 We assessed: (i) the progress of departments and their agencies in improving their construction delivery performance since 2001, including the impact of relevant Office of Government Commerce initiatives; and (ii) what more needs to be done by departments and the Office of Government Commerce to improve performance and realise the full benefits of the new ways of working currently being implemented across the public sector. Our detailed methodology is set out in Appendix 1.

1.25 Part 3 of this report and the supporting volume of case studies sets out examples of good practice which organisations in both the public and private sector have adopted to improve their construction delivery performance.

12 The main actions taken by OGC to improve the construction delivery capability of departments and agencies

Construction specific*

The Achieving Excellence procurement guidance	A suite of guidance that is specifically designed to underpin the Achieving Excellence in Construction initiative. It currently contains 11 guides that steer government clients through the issues they need to consider over the entire project life cycle, the latest of which provides advice on how the government client needs to address sustainability issues.
Consultancy	A range of services at all stages in a project's lifecycle, to assist in the delivery of high commercial value public sector projects. Services are either provided by OGC staff or contracted out to private sector experts.
Project sponsor support	OGC provides a pool of expert project sponsors to support departmental staff to manage the interests of the construction customer and represent these to the industry. This is especially suitable for smaller organisations and occasional customers but also provides a pool of expertise for larger departments to draw on.
Property and Construction Best Practice Division	The development of additional guidance and publications, contribution to the development of policies across government that impact on construction, and the delivery or co-ordination of cross-government development activities aimed at embedding best practice in construction. For example, 'Improving Standards of Design in the Procurement of Public Buildings', a jointly published Commission for Architecture and the Built Environment and Office of Government Commerce report setting out recommendations for departments with the emphasis on recognising that good design is integral to value for money. They have also published details of the first of a number of exemplar projects to demonstrate the lessons and benefits of successful projects (HM Treasury's refurbishment of their main building).

Source: National Audit Office

* The Office's Coordination Division has responsibility for co-ordination of the civil estate and the management of civil property disposals and residual estate management.

As part of wider initiatives

The Gateway Review Process	Introduced in February 2001 to subject all major central civil Government programmes or projects (including construction projects) to external scrutiny. It involves independent examination of a programme or project at six critical stages of its lifecycle to provide assurance it can progress to the next stage. An independent Gateway Review process is mandatory for all programmes and projects across central civil government that score above a defined threshold using the Office of Government Commerce's (OGC) Risk Assessment guidance. The review is then conducted by a team of trained Gateway Reviewers who prepare reports for the programme or project Senior Responsible Owner at each stage. In 2004 the OGC reviewed the Gateway Process; the new guidance pack now clearly identifies construction specific issues for reviewers and provides links to all the relevant good practice guidance. Gateway reviews, including of major construction projects, are expected to deliver half of the OGC £3 billion value for money gains target.
Centres of Excellence	Departments are required to establish Centres of Excellence covering all their programmes and projects and including their agencies and non-departmental public bodies Their aim is to achieve significant improvement to central government capability and capacity to deliver successful programmes and projects, including construction, by providing a co-ordinating function, coherent upward reporting to Permanent Secretaries and Ministers, strategic oversight, scrutiny and challenge, and networking.
The 'Kelly programme'	A programme of work derived from the OGC report *Increasing Competition and Improving Long-Term Capacity Planning* in the Government Market Place, published with the Pre-Budget Report in December 2003. The aim is achieving a more systematic and strategic approach to stimulating and managing major markets and providing industry with clearer information on public sector demand and sharing market intelligence. The construction market is the first market to have been selected. The OGC is currently analyzing departments' spending plans and liaising with suppliers, and will make recommendations on smoothing demand and stimulating supply in March 2005.
Successful delivery toolkit	An IT enabled single source of proven good practice in programme and project delivery. It is designed to help public sector clients to answer critical questions about their capability and project delivery, and provides practical advice on how to improve organisational ability to commission successfully and manage programmes and projects.
Successful Skills Delivery Programme and the Programme and Project Management specialism	Developed in conjunction with the Office of Public Services Reform in the Cabinet Office. The programme has a number of elements that combine to offer commercial practitioners involved in the delivery of major, novel or complex projects the opportunity to improve their skills in an organised manner. It provides a benchmark level for each common project management role against which the potential project team members can be assessed. The programme was complemented in 2003 by the introduction of a Programme and Project Management specialism, jointly sponsored by the OGC and the Cabinet Office Corporate Development Group which is designed to provide help, advice and support for programme and project management practitioners, thereby raising the standard of commercial skills throughout the civil service.
Better Regulation Task Force national projects	An ongoing programme of work designed to encourage Small and Medium Enterprises (SMEs) into the government market place including (1) training for procurers promoting the benefits of working with SMEs (2) simplified tendering documentation (3) web based technology to advertise the availability of low value tender opportunities and (4) guidance, training and processes aimed at making supply chains more transparent and to encourage better supply chain management across the public sector. The work is currently at national implementation stage.

PART TWO

Progress in improving departments' construction performance

2.1 This part of the report considers the progress that departments have made in improving their construction performance concentrating on:

- progress towards delivering construction projects to budget and on time;
- the value for money savings from improved cost predictability and reductions in costs;
- progress towards shorter construction procurement times;
- progress of the 2001 case study organisations in realising the benefits of partnering and integrated working;
- the impact of the Office of Government Commerce's initiatives to improve departments' performance;
- areas where departments need to make more progress.

2.2 Progress against the recommendations made by the Committee of Public Accounts in 2001 is summarised in Appendix 2 where, in addition to the main focus of our examination on departments' performance, we also assess progress against the Committee's wider recommendations on improving industry performance and the skills of the construction workforce.

Our findings are based on:

- analysis of performance data from 142 construction projects of £1 million or more in value completed between April 2003 and December 2004*, plus other central data on construction performance held by the Office of Government Commerce, (including the results of Gateway reviews) the Department of Trade and Industry and Constructing Excellence;
- follow-up examination with the four 2001 case study bodies (Defence Estates, Environment Agency, Highways Agency and NHS Estates);
- case study examination of four public sector clients and four private sector clients and projects;
- seven one day workshops held with over 70 senior managers involved in construction from departments, agencies, and the suppliers of construction services as well as wider stakeholders and experts from professional institutions, academia and industry;
- interviews with leading stakeholders and practitioners in both the private and public sector.

NOTE

* The Office of Government Commerce launched a data capture exercise in early 2004 to monitor progress against the Achieving Excellence in Construction strategic targets. In light of this, and to minimise the burden on departments, we did not launch a separate data capture exercise but contributed to the design of the data collection tool.

Progress towards delivering construction projects to budget and on time

2.3 One of the critical success factors for construction clients is assurance that there will be no negative cost surprises or time overruns. Failure to control budgets can increase the risk of adversarial behaviour and deplete resources targeted for other service delivery activities. Failure to hit target deadlines can also severely disrupt the planned delivery of services as well as increase costs. Independent research commissioned by HM Treasury in 1999 identified that some three quarters of public sector construction projects exceeded their budget by up to 50 per cent and just under two thirds their original completion date.[28] We use these baseline figures to assess departments' progress in improving the cost and time predictability of their construction projects.

2.4 Project performance data from central government departments and agencies shows improved cost and time certainty across central government against the 1999 baseline **(Figure 13)**. This indicates that performance in central government is exceeding the average performance for cost and time predictability on private and public construction projects **(Figure 14)**. While promising progress has been made towards meeting the Achieving Excellence targets of 70 per cent time and cost predictability by 31 March 2005 there remains no room for complacency on the part of departments.[29] Caution is also required in interpreting the precise extent of progress, for example, given the limited supply of data in key sectors such as health, education and defence, the absence of data on projects completed in the last three months of 2004-05, and ongoing validation work by the Office of Government Commerce are not yet included. A clear trend, however, of improving performance is emerging. [30]

13 Cost and time predictability on construction projects across central government has improved since 1999

Indicator	Baseline performance 1999	Achieving Excellence strategic target	Interim performance as at December 2004
Cost predictability	25% of projects delivered within budget (with the remaining 75% exceeding their budget by up to 50%)	70% of projects reaching Gate 5 between April 2003 and March 2005 to be delivered within budget	55% of projects delivered within budget or better
Time predictability	34% of projects delivered on time	70% of projects reaching Gate 5 between April 2003 and March 2005 to be delivered on time	63% of projects delivered on time

Source: Analysis of departments' data on project time and cost performance

NOTE

Based on data for 142 construction projects with a combined budget of just under £1.2 billion, but excluding data on projects in: the wider NHS; the schools sector (the Department for Education and Skills has implemented a performance measurement regime to capture this information as part of the schools capital investment programme implemented from 2004 onwards); the Ministry of Defence.

28 'Benchmarking the Government Client (Stage 2)', University of Bath 1999.
29 Targets set on the basis of the average performance achieved across good practice demonstration projects as at 2003.
30 Data set includes projects started before many of improvement initiatives had begun (for example, prior to issue of the Achieving Excellence in Construction guidance in March 2003).

14 Performance for cost and time predictability in central civil government exceeds the average performance on all private and public construction projects

Key Performance Indicator	Trend in performance			
	Baseline		Latest performance	
	All public and private 2000	Central Government 1999	All public and private 2004	Central Government April 2003 to December 2004
Percentage delivered to budget	50%	25%	50%	55%
Percentage delivered on time	28%	34%	44%	63%

Source: Construction Key Performance Indicators and analysis of departments' data on project time and cost performance

NOTE

The improvement in central government performance is drawn from a relatively small number of projects (142) which would not be expected to affect materially the general performance across all sectors.

2.5 It is difficult to be precise about how different factors have contributed to improved performance in central government projects. There has been, for example, a wide array of improvement initiatives and an increase by departments and agencies in the use of different construction procurement routes such as PFI which has demonstrated a good delivery record in central government building projects.[31] It is, however, very likely that one other significant factor that has led to improved performance is the move towards implementation of the principles of good construction practice set out under Achieving Excellence and Constructing Excellence. This was confirmed by many of our workshop participants and the performance of the Constructing Excellence demonstration projects. The demonstration projects use one or more recommended good practice approaches to construction delivery, and consistently outperform industry averages on time and cost predictability **(Figure 15 overleaf).**[32]

2.6 In our 2001 report we set out in detail the range of improvement initiatives that the four 2001 case study organisations were planning to, or had, launched to improve their construction performance. While not statistically significant, we found that they were able to demonstrate for a small number of projects completed under their new framework agreements and improvement initiatives, that cost and time predictability is on average better than for other projects where new ways of working have not been used **(Figure 16 overleaf)**.

The value for money savings from improved cost predictability and reductions in costs

2.7 Our analysis of the 142 projects completed between April 2003 and December 2004 shows that since 1999 the average level of overspend on projects has decreased from 6.5 per cent to 4.1 per cent. If the same level of cost overruns in 1999 had been repeated on the 142 projects, cost overruns of some £77 million would have been incurred. If this level of performance improvement is applied to annual central and local government expenditure on construction in 2003, it is not unreasonable to assume that as a result of improved cost predictability, overspends in the order of £800 million have been avoided **(Figure 17 on page 41)**.

31 Our report *PFI: Construction Performance* in 2003 showed that over 75 per cent of the construction elements of PFI contracts were delivered to time and budget. PFI Construction Performance, (HC 371, 2002-03).

32 Following a recommendation in Sir John Egan's report 'Rethinking Construction' a series of projects were identified in the public and private sector to demonstrate the benefits of implementing the principles of best construction practice as a means of persuading clients and the industry of the need for change. Constructing Excellence is currently responsible for the demonstration project programme. As at March 2004 there 414 demonstration projects with 151 currently active.

15 The 'Constructing Excellence' demonstration projects consistently outperform industry averages on cost and time certainty

Main KPI	Industry Performance 2004	Demonstration projects 2003-04
Predictability cost - design	62%	69%
Predictability cost - construction	49%	60%
Predictability time - design	55%	62%
Predictability time - construction	60%	69%

Source: Construction Industry Key Performance Indicators

16 Improvement initiatives have been successful in securing better cost and time predictability

Organisation	Time predictability pre-improvement initiative projects	Time predictability on post-improvement initiative projects	Cost predictability pre-improvement initiative projects	Cost predictability on post-improvement initiative projects
Defence Estates	Data not available for pre-improvement initiative projects.	One project delivered to time, and two projects forecast to be delivered on time.	Data not available for pre-improvement initiative projects.	One project delivered £1.5 million (3%) under budget. Two projects forecast to be delivered for £0.6 m (3%) and £1.1 million (4%) more than the approved cost at contract.
Environment Agency[1]	Average delivery time was historically 5 to 6 years and 2.9 years under the accelerated programme.	60% of projects are now delivered on time. Average delivery time 2.5 years.	34% were delivered to cost. +8% variance on budget of £81 million.	77% now delivered to cost. +6.6% variance on budget of £27 million (19 projects).
Highways Agency	Average time taken from decision to proceed with scheme to start of construction 10 years and more.	Target to reduce average time to between 3.5 years and 5 years. For 18 schemes analysis shows that project milestones have been achieved and that target reductions are likely to be achieved.	Data not available for pre-improvement initiative projects.	Projects started under the Agency's improvement programmes have not yet been completed, but are on track for delivery to budget.
NHS Estates	28% of projects delivered on time. For those with a time overrun, the average was 8%.	An improving trend: of the 8 completed 3 were over time with the agreement of the client and at no extra cost.	26% of projects were completed to budget or better. For those with a cost overrun, the average was 7%.	An improving trend with 100% of projects completed to budget or better (8 projects).

Source: National Audit Office follow-up examination of the 2001 case study organisations

NOTE

1 Since the major flooding of 2000 the Environment Agency has been involved in an accelerated programme of delivery, completing projects in less than three years against a historic average of over five years. The acceleration of project timescales requires a shortened and overlapping feasibility and design phase without complete and robust information on ground conditions, planning requirements and land purchase and compensation matters. This increases the risk of changes in project scope and cost overruns. The budgets initially set on accelerated projects (despite having higher contingencies than historically) have proved inadequate resulting in an overall cost overrun on all projects of over 8 per cent (net of inflation adjustments) in 2003-04. Based on these experiences new risk management and contingency planning arrangements have been put in place and the Agency expects these to improve outturn results for new projects.

17 The value for money savings from improved cost predictability

The percentage overspend in the 1999 baseline projects:[1]
6.5 per cent on a total budget of £500 million

The percentage overspend on projects as at December 2004:[2]
4.1 per cent on a total budget of £1.19 billion

If the level of overspend in 1999 had occurred on the 142 projects on which OGC has data in 2004 then the £1.19 billion budget would have been overspent by some £77 million.

If this performance had occurred in total public sector construction expenditure then the post contract cost overruns which have been avoided when compared to the price expected at the time the contract was let would be in the order of magnitude of £800 million based on public sector construction output of £33.5 billion in 2003.

Source: NAO estimate of the potential value for money savings from improved cost predictability on construction projects

NOTES

1 Figures based on increases from the agreed budget post-contract award to final outturn.

2 142 construction projects completed between April 2003 and December 2004.

2.8 Departments' project costs are now more predictable. This sheds little light, however, on whether departments have been successful in reducing the costs of construction and in obtaining a fair price. It is not possible, for example, to compare the costs achieved using the previous approach, where lowest cost tender strategies were often accompanied by subsequent aggressive legal claims from suppliers, with the modern collaborative and negotiated procedures that major repeat government clients are now adopting. It is also very challenging to establish accurate unit cost databases and track statistically significant changes over time especially when unit costs can be highly variable year on year. For example:

- some projects are entirely or in part unique and it will not be possible to gauge accurately what the costs should be by reference to previous projects;
- the rapidly changing legislative environment, for example, changes in the Building Regulations, and recent legislation in areas such as disabled access and environmental protection have considerably increased construction standards and therefore the unit costs of construction (though of course increased capital costs in these areas are likely to have greatly improved the whole life value of projects);
- analysis of unit costs does not enable identification of areas where clients have consciously invested more in upfront construction costs, for example, in higher quality materials, to achieve reductions in the whole life running costs of the built asset.

2.9 For these reasons, and because of the relatively short elapsed time and the small number of projects completed under their new arrangements, the 2001 case study organisations could not report any progress against their cost reduction targets as set out in our 2001 report **(Figure 18 overleaf)**. They consider the extent of the cost reductions set out in the 2001 report are still achievable as their improvement initiatives are rolled out across more of their projects. They have also established historic unit cost baselines and are capturing unit cost data, along with other measures (such as environmental indicators) to allow them to measure the impact of improvements on capital and whole life costs and value. As we recommended in 2001, it is essential, if cost reductions and improved whole life value are to be achieved, that departments and agencies have reliable systems in place for monitoring and measuring cost and performance covering all aspects of whole life value.

Progress towards shorter construction procurement times

2.10 The second of the two Achieving Excellence strategic targets requires departments by March 2005 to reduce the average time period they take from the start of procurement to contract award by:

- 25 per cent for construction projects taking over a year between these stages;
- 15 per cent for all other construction projects.

18 Progress of the 2001 case study organisations in measuring reductions in construction costs

Organisation and cost reduction target in 2001	Progress to date
Defence Estates 30% reduction in the cost of constructing and running buildings by 2005 (estimate £250-300m).	The 2001 cost reduction target was based on the roll out of the prime contracting strategy. To date only five projects have been let under the prime contracting arrangements, three of which have been completed. It has not been possible as yet to measure progress towards the target. Defence Estates' key target in its 2004-09 corporate plans is to deliver 30% through-life value for money efficiencies through the introduction of prime contracting, with interim targets for efficiencies of 3 per cent in 2005-06 rising to 30 per cent by 2009-10. It is currently testing a measurement model and establishing baseline information across its prime contracts during the course of 2004-05 for roll out by the end of 2004-05. It expects to deliver output efficiencies of £54 million a year by 2008-09 based on the application of the model against the expected value of the five regional prime contracts that will be in place by October 2005.
Environment Agency 10 year cost saving targets to 2008-09 of £35.5m on engineering work of £121m 15% saving in 5 years from April 2000.	The implementation of the Agency's New Procurement Strategy was delayed from the original 1998-99 target and progressively introduced between October 2000 and April 2002. The cost saving target of 3% per year was similarly rescheduled. The Agency has now established a database of unit costs on all their engineering projects from 2002-03 onwards. It is not yet able to determine whether the construction improvement initiatives have resulted in cost savings on engineering work. One of the main reasons is that the nature of Flood Defence projects is highly variable and it is difficult, for example, to take into account changes over time arising from new regulations on habitat protection and land purchase. A large data set is required to produce statistically valid conclusions on cost trends. It expects to have statistically valid data by the end of 2005-06. The Agency is, however, expected through its Flood Defence Efficiency Programme to contribute efficiency savings of 2 per cent in 2004-05 rising to 4 per cent in 2007-08. In the interim it monitors efficiency on a project by project basis through 'value management' records, with realised savings in 2004-05 amounting to £4.4 million to date.
Highways Agency No quantified cost reduction target.	The Agency has been developing its work in this area where historically it has not been particularly strong. Its procurement strategy published in 2001 identified the need to measure and to reimburse on the basis of actual costs with incentives for suppliers to deliver within the target. As a result the Agency is now in a better position through its contractual arrangements to allow it to analyse more accurately the actual costs of construction. The Agency is required to deliver annual 2.5% efficiency gains and will be discussing with the Office of Government Commerce how this will be measured through its new framework of key performance indicators.
NHS Estates 10% reduction in construction costs across the NHS as a whole.	All contracts awarded under ProCure21 are below pre-existing Departmental Cost Allowance Guide levels due to the initial NHS Estates framework competitive tender action. It is expected that lower costs will be achieved with the continued roll-out of ProCure21, but it is expected that savings will be directly re-invested into improved quality on each project while remaining below or at benchmark costs. In the meantime, around 10 per cent cost reductions have been delivered on completed projects through streamlined procurement and improved construction processes, although this figure is not cumulative year on year across all NHS ProCure21 projects. (Figure 19 on page 44).

Source: National Audit Office follow-up examination of the four case study bodies

2.11 Although the Office of Government Commerce is collecting data on construction procurement times it is still working to identify a suitable baseline against which to assess departments' progress in reducing procurement times. It is therefore not possible to gauge the extent to which departments have improved their performance. We found, however, two main themes on procurement times:

- The framework agreements put in place by the 2001 case study organisations are leading to quicker procurement times. Once the framework has been competitively let and is in place clients are able to select ready made supply chains without lengthy tendering processes. For example, data obtained by NHS Estates demonstrates that projects undertaken through the NHS ProCure21 initiative are taking up to 12 months less than conventionally procured projects from inception to the start of building on site.
- PFI deals are larger and more complex arrangements[33]; longer procurement times reflect the scale of financial commitments and long-term timeframes. A consistent theme, which emerged from our workshops and case study examinations, was the concern expressed by both clients and suppliers about the time and costs involved in bidding for PFI contracts.

Progress of the 2001 case study organisations in realising the benefits of partnering and integrated working

2.12 As identified in our 2001 report partnering and collaborative working offer the opportunity for departments to achieve value for money gains in a number of areas including:

- streamlined procurement, through better aggregation of work and the use of framework arrangements, leading to improved productivity on the part of both clients and suppliers;
- reduced construction costs and improved whole life value through the early involvement of integrated supply side teams, including those involved in design, who can deliver, for example, more innovative and cost-effective solutions through value engineering, and implement more efficient construction processes that, for example, minimise waste, and deliver buildings with low energy requirements and carbon dioxide emissions;
- reduced legal claims from suppliers against clients, eliminating the costs of the claims as well as the associated legal costs plus staff time involved in defending the claim and its effect in delaying programme delivery;
- improved health and safety.

2.13 In our 2001 report we set out how each of the four case study organisations were planning to make a long term commitment to embedding the principles of partnering within their organisations and how they intended to achieve this. The four 2001 case study organisations have made progress towards embedding partnering and integrated team working but, with the exception of NHS Estates, have not made as much progress as they envisaged at the time of the 2001 report **(Figure 19 overleaf)**. Besides the lead-time required for tender and award of the framework contracts and to pilot the radically different approaches, the organisations have underestimated:

- The extent of, and time needed for, re-organisation of both project delivery teams and 'internal clients', and the implementation of supporting management information systems;
- The time needed to train both in-house and suppliers' staff in the new ways of working and to introduce a culture of openness and integrated team working. This is an ongoing process. All the case study organisations recognise that there are weaknesses in project management experience and skills in the new ways of working, in-house, amongst wider stakeholders and throughout the supply chain;
- The impact of external factors and shifting priorities elsewhere in the department resulting in reduced funding or re-allocation of resources. For example, the Environment Agency had to respond to the heightened political pressure to deliver accelerated flood protection which meant that it adopted a more cautious and manageable phased approach to the introduction of the national framework contracts.

33 HM Treasury's "PFI: Meeting the Investment Challenge" (2003) sets out the various steps it proposes to take to make PFI procurement more efficient.

19 Progress towards partnering and integrated working by the four 2001 case study organisations

Key actions since 2001

Defence Estates was re-launched as a new Agency in April 2003 to fulfil the requirements of Project Alexander which led to separation of supply and demand functions of estate delivery within the MoD to improve the effectiveness and efficiency of management of the defence estate in line with acknowledged good practice. Two out of the planned five Regional Prime Contracts have been placed in Scotland and SW England to be followed by contract awards for the remaining programme – South East, Central and East England – by October 2005. All contracts have a life of seven years, with an option to extend to ten years. The total value of all contracts when placed is expected to be in region of £350m per year. Five projects have been undertaken so far under the first two Regional Prime Contracts, two of which are complete with one close to completion. In addition Defence Estates has also placed a functional Prime Contract for the Single Living Accommodation Modernisation (SLAM) and has signed all three parts of the PFI contract for Aquatrine, a project to provide strategic management of water and sewerage services across the defence estate.

The Environment Agency has rolled out the New Procurement Strategy across the Agency and established key supporting management information systems including a contract (supplier) management information system. The first national framework (Engineering and Environmental Consultancy Agreement) was signed in October 2000 with four firms selected from 156 applicants. Some £40m per year is being spent through this contract. The three remaining national frameworks have all been established:

- Cost Consultancy Framework (January 2001) – three consultants appointed, with expenditure of around £2 million per year;
- Site Investigation Framework (July 2001) – four consultants appointed, with expenditure of over £2 million per year;
- National Contractors Framework (April 2002) – seven contractors appointed (two regional and five national), with expenditure of £50 million per year expected to rise to £80 million in 2005-06.

Total number of suppliers reduced from 120 to 18. As at September 2004 13 projects had been completed under the full framework arrangements and using integrated team working.

The Highways Agency now has greater involvement with the supply chain through early creation of integrated teams which allows the Agency and contractor to identify innovative ways to build and maintain projects more quickly, cheaply and safely. The approach involves contracts with robust performance measurement information and continual improvement targets. It has also developed a Capability Assessment Tool (CAT) to measure the corporate capability of contractors, including their approach to partnering and integrated working, with which the Agency could work and this, combined with past performance data allows the Agency to draw up its tender list. The Early Contractor Involvement initiative was piloted in 2002, with the final model launched formally in 2004.

NHS Estates launched NHS ProCure21 in two geographical pilot regions, the North West and West Midlands in 2001, triggering rapid take-up of NHS ProCure21 by NHS Trusts in these regions who were under pressure to deliver their service delivery targets and needed, for example, to have their new Treatment Centres for minor surgical interventions up and running. NHS ProCure21 was launched nationally in October 2003 following the appointment of 12 Principal Supply Chain Partners in a five year framework agreement with the Secretary of State for Health with an estimated capital procurement of up to around £1.4 billion per annum. As at October 2004, 189 active schemes (at all stages) are registered through NHS ProCure21 with a total value of just under £2 billion. Eight schemes with a total contract value of £44 million have been completed to date.

Source: National Audit Office follow-up examination of the 2001 case study organisations

2.14 Despite their improvement initiatives being at an early stage of implementation, we found that the case study organisations are already able to demonstrate examples of quantifiable value for money improvements from partnering and integrated working over and above improved cost and time predictability **(Figure 20)**. For example, promoting health and safety within the construction industry is being taken forward in the new procurement processes being implemented as part of construction improvement initiatives. A key criterion used by the Ministry of Defence for selecting contractors is how they address health and safety issues and Defence Estates will incorporate safety as one element of its value for money model when it measures the improvements delivered by its prime contracts. As a result of its approach to health and safety the Environment Agency has reduced its accident rate by 70 per cent since 2000-01 to 340 reportable incidents per 100,000 employees a year.

2.15 As part of the Department of Health's review of its arm's length bodies NHS Estates is to be abolished, with a small core estates team being brought into either the wider department or the wider NHS. The review states that current expertise in NHS Estates used for advising the NHS on the application of guidance will be transferred to the NHS to strengthen local capacity to handle devolved delivery. While the future of NHS ProCure21 has not been announced there are, however, concerns amongst a range of stakeholders that these changes will constitute a significant loss of central expertise and support for infrequent NHS clients.

20 Improvements in value for money through partnering and collaborative working that can already be demonstrated by the 2001 case study organisations

Organisation	Quantifiable benefits to VFM
Defence Estates	**Improved programme delivery:** The new practices of partnering and collaborative working and related processes are being embedded across the Ministry of Defence, including Defence Estates and the impact of these will be measured against value for money targets. The benefits delivered by procurement projects will be monitored through post project evaluation of their achievements, compared with those envisaged within the respective business cases. The use of customer satisfaction surveys will be an integral factor. In due course, the use of a value for money model, will be used to measure improvement on all prime contracts. The proposed value for money model comprises the following elements: ■ **Target condition** (a grading of the physical condition of assets using objective criteria linked to their functional importance and asset type); ■ **Delivery efficiency** (identified through an analysis of the effect of prime contracting on both input costs and through life value for money efficiencies); ■ **Customer satisfaction** (the success achieved in meeting the agreed level of customer requirement as set out in customer supplier agreements); ■ **Programme effectiveness** (the variation from planned time and cost at the points of approval to proceed to contract award, the award of the contract and customer acceptance); ■ **Safety** (the number of reportable incidents per 100,000 employees with a proposed target of 10 per cent below the construction sector's national average); ■ **Sustainability** (this will focus on reducing energy consumption across the defence estate).
Environment Agency	**Improved programme delivery:** since 1999-00 the value of the programme has increased by over 80% (to £150m) and has been 100% delivered, including a large programme of accelerated work following the major flooding of 2000. **Improved productivity:** Small increase in project management resources in the National Capital Programme Management Service despite major growth of the capital programme. This equates to a 30% improvement in productivity or an estimated saving of £1.9m in reduced manpower in 2003-04 and total savings over four years of £4.5m. Savings are mainly attributed to streamlined procurement and reduced effort in dealing with claims from contractors. **Improved health and safety:** by 2003-04 the accident rate had reduced by 70% (340 reportable incidents per 100,000 employees per year) compared with 2000-01, with the Agency currently performing at half the UK construction industry average. **Environmental key performance indicators:** the Agency has established six indicators: (1) all projects to have an environmental impact assessment at approval stage; (2) at least 60% of aggregates by weight must be secondary or recycled; (3) zero pollution incidents; (4) 400 tonnes of waste to landfill per £1 million construction spend; (5) benchmark tonnage of waste per £1 million construction spend (to be set); and (6) 100% use of timber from certified sustainable sources. All targets have been exceeded in 2003-04 with the exception of a low number (five) of minor pollution incidents. **Cost reductions and improved quality through collaborative working:** by bringing the main consultants and contractors together at an early stage on projects the Agency has achieved a number of notable successes where it has: (1) reduced the planned capital costs of the scheme; (2) achieved more efficient construction processes that are less disruptive during construction for local residents; and (3) delivered flood protection schemes that are at least as effective in protecting homes but more environmentally sustainable. The Agency's monitoring of value management savings indicates: ■ 2003-04: savings of £1.3 million (1.3% of total programme costs); ■ In the first nine months of 2004-05: savings of just under £4 million (4% of total programme). **The reduction of costs associated with claims from contractors:** during the 1990s before the implementation of the new procurement strategy the Agency faced claims in excess of £50 million against capital programmes of some £80 million per year (with 14 of the largest claims exceeding £41 million). The estimated legal and staff costs of defending these claims was between £6-8 million, with staff diverted away from the delivery of core flood protection work. By comparison the Agency has not faced a single claim against work let under the new procurement strategy. It attributes this to working collaboratively with a smaller number of integrated teams of main contractors and specialist engineers.

20 Improvements in value for money through partnering and collaborative working that can already be demonstrated by the 2001 case study organisations *(continued)*

Highways Agency	**Cost reductions and improved quality through collaborative working:** Unnecessary layers of supervision and duplication of effort removed by combining the roles of the contractor and consultant into one organisation as a single point of responsibility for service delivery. Tenders received since 2001 have been lower than the forecast cost of providing the service which amount to savings of some £31m per annum for routine maintenance works, but as these are long term contracts the Agency cannot yet compare final out-turn costs. Continual improvement in service delivery is being demonstrated by standard Area Performance Indicators.
	Value for money improvements: The Agency has reported to the Office of Government Commerce in excess of £67 million during the period 2001-04.
	The reduction of costs associated with claims from contractors: New forms of contracts have been introduced and although the Agency still receives claims from contractors these tend to be very specific in their nature, are resolved much more quickly and are much more modest in value than was historically the case. Claims received under the new forms of contract are typically less than £1 million where previously they may have been up to £30 million.
NHS Estates	**Streamlined procurement:** ProCure21 is delivering significant time savings for those schemes that would otherwise have to be procured via the Official Journal of the European Communities. Time savings of around nine months, equating to a saving of 3 per cent on project costs can be identified for the relatively small number of projects completed to date.
	Reduced contract construction periods due to a range of factors, including early involvement of integrated supply chains and the benefits this brings such as improved design and construction process solutions, savings in construction costs of 1-4 per cent are being delivered. For example, the conventional construction period for projects over £11 million has been reduced from 32 to 19 months. This can be worth a saving of up to over 3.5 per cent on construction costs, and means that schemes are delivered sooner.
	The specialist VAT recovery service offered to NHS clients by the ProCure21 team has saved NHS clients around £0.7m to date in consultancy fees that would otherwise have been payable.
	Improved Health & Safety: Latest data indicates that ProCure21 schemes have an improved mean average accident rate (approximately 0.07 accidents/£m capital cost) compared to the rate on previous non-ProCure21 projects (0.16 accidents/£m).
	The reduction of costs associated with claims from contractors: Litigation has been non-existent on the schemes completed to date, indicating a 3% saving of project costs based on previous data.

Source: National Audit Office follow-up examination of the 2001 case study organisations

The impact of the Office of Government Commerce's initiatives to improve departments' performance

2.16 The Office of Government Commerce has achieved a considerable amount since 2001 by summarising and publishing expert views on good practice procurement and project management techniques, putting in place toolkits and support mechanisms for government clients, and applying the Gateway Review to construction projects. Through our workshops we found that many departments and agencies view the Office's guidance and support to be of high quality and beneficial in terms of successful delivery. The impact on departments and their agencies of these initiatives, or departments' engagement with the Office has, however, been variable.

2.17 We found that guidance and support mechanisms do not always reach the client groups which need them most. Infrequent clients in particular have experienced difficulties in knowing how to identify and then put into practice the most effective expertise, support and advice from the wide range that is available. The National Audit Office's report Improving Procurement[34] found that 59 (69 per cent) of 86 departments and agencies surveyed had not used the Office of Government Commerce's Achieving Excellence in Construction guidance. In many cases there may be good reasons for this, for example, some smaller departments and agencies may not have been involved in construction projects since the publication of the guidance. It was, however, apparent from our workshops that some, particularly in the wider public sector, are simply unaware of the Office's guidance and client support services, particularly those further down delivery chains.

34 Improving Procurement, (HC 361-1, 2003-04).

2.18 Despite the Office of Government Commerce providing a focus for construction guidance and support activities, many public sector project managers still find it challenging to keep track of the large volume of wider construction initiatives and sources of information, making it difficult for them to prioritise and navigate effectively through it. Confusion partly arises from the fact that responsibility for construction rests with at least ten departments and agencies. Guidance is regularly issued on health and safety, the environment, building regulations, planning and procurement and as a result the industry finds it hard to keep track and adapt to changing requirements.

2.19 The Office of Government Commerce's Gateway programme is mandatory for all central government construction programmes and projects that score as medium or high risk against the Office's assessment criteria.[35] On any individual project reviews are undertaken at five key decision making points or 'Gates' **(Figure 21)** together with a repeatable review on the overarching programme. The Office, in line with its advisory role, does not enforce the Gateway Review process and instead, through its Centres of Excellence programme, oversees close scrutiny, challenge and support functions over departments' key programmes and projects. From February 2001 to September 2004, there have been a total of 113 reviews on 78 property and construction programmes and projects. Our workshops, both with clients and suppliers

The volume of construction initiatives and the difficulties this can cause departments - extract from the workshops

The workshop participants discussed at least 70 initiatives influencing their approach to construction. This extract from one of the workshops indicates the scale of the issue: *"Although there are many bodies developing good quality thinking, the sheer volume and lack of cohesion across the bodies creates overlap and confusion, and hinders the ability of both the construction industry and clients to make best or most appropriate use of the advice and the schemes available".*

21 The Office of Government Commerce Gateway Process

Gateway Stage	Purpose	Description
Gateway Review 0[1] Strategic Assessment	**Establish business need**	Asks how the proposed programme meets the business need that lies behind it. Assesses the capability of those who are responsible for the project, and the support of users and stakeholders.
Gateway Review 1 Business justification	**Develop business case**	Asks whether the end project is feasible, affordable, and likely to achieve value for money. Also whether the high-level plans for establishing it are clear and realistic.
Gateway Review 2 Procurement strategy	**Develop procurement strategy**	Asks whether the tendering strategy sufficiently reflects business requirements, awareness of the market, good practice in procurement, and changes to business need. Asks whether funding is available for the whole project, and with adequate financial controls in place.
Gateway Review 3 Investment decision	**Competitive procurement**	Asks whether the tendering process has met its objectives and followed good practice, and whether the prospective contractor is likely to deliver on time, within budget and achieve value for money. Assesses readiness of the business to implement the contract.
Gateway Review 4 Readiness for service	**Award and implement contract**	Assesses whether project plans are up to date, and adapted to working successfully with the contractor. Asks whether implementation of the project is going to plan, with any lessons for the future being recorded.
Gateway Review 5 Benefits evaluation (repeated as required)	**Closure**	Assesses whether expected benefits are being delivered, and what is being done to pursue continued improvements. Asks what contingency plans there are for the future.

Source: Construction Industry Key Performance Indicators

NOTE

1 From January 2004, Gateway 0 reviews only apply to programmes. Programmes are about change management, and are flexible and allow changing circumstances to be adopted. Projects, which may or may not fall within programmes, have definite start and finish dates and a clearly defined output, and are first assessed at Gate one.

35 A project or programme is assessed on its risk by completing a risk potential assessment form, comprising a series of questions on the key risks facing the project, covering areas including the project's strategic context, business issues including costs, and property and construction including issues of, for example, site access. The responses to the questions generate a numerical score for the project, with a score of up to 30 points giving the project a "low risk" status, 31 to 40 points giving the project a "medium risk" status, and a score of 41 or more points giving the project a "high risk" status.

identified that Gateway Reviews can add considerable value to projects by assisting clients and their professional advisors in identifying and addressing risks to, and opportunities for, successful delivery. It is the opportunity for early and external independent challenge and review that is of particular value.

2.20 In June 2002, the Office of Government Commerce introduced 'Red Amber Green' (RAG) ratings[36] for all Gateway Reviews. As at September 2004, of the 93 property and construction reviews receiving a RAG rating, 29 (31 per cent) were red. To date one project had received 2 consecutive red reviews, triggering a letter from the OGC's Chief Executive to the Department's Permanent Secretary, highlighting in particular the importance of addressing the identified risks to successful delivery at the earliest possible stage. This system provides a mechanism to alert departments at the most senior level of significant risks to construction projects requiring immediate action.

2.21 Despite being mandatory there are gaps in departments' use of the Gateway Process on construction projects. This reflects, in part, that some departments and their agencies have no projects suitable for a Gateway Review or have not been involved in construction activity since its introduction in February 2001. Until 2004 the Ministry of Defence fell outside the scope of the Gateway programme. Other departments and their agencies, have agreed a selective approach with the Office of Government Commerce. For example, the Highways Agency applies the Gateway Review process to selected projects within a programme, rather than all similar projects, but with the lessons applied across the programme as a whole. The inconsistent use of Gateway Reviews, however, also indicates that some departments and their agencies appear to be more convinced of its merits than others. A minority of organisations reported in our workshops that review teams do not always possess the requisite skills and experience, for example in civil engineering, to add real value. Our workshops also revealed that below departmental level some agencies, non-departmental public bodies and others involved in delivering government funded construction projects, including major suppliers, are unaware of the Gateway Process. The Office itself is concerned that in some circumstances departments or agencies do not correctly assess the risks, in particular to service delivery, associated with the project and therefore do not subject the project to external review. The Office is starting to address these concerns through early intervention in high value and impact projects via its Centres of Excellence initiative.

2.22 Both the Office of Government Commerce and the Department of Trade and Industry provide a significant co-ordinating role across the construction industry as a whole. The Office brings focus to the procurement process, and has more recently assumed responsibility for co-ordinating the drive for efficiency in procurement across Government and for taking forward the Kelly agenda by improving long-term planning in key Government markets such as IT and construction. The Supervisory Board of the Office also provides an opportunity for the sharing and discussion of key supplier information at senior level. The Department performs a similar role in relation to sponsorship of the construction industry and policy development, for example, through the Construction Industry Policy and European Regulation Group.[37] Nevertheless, our workshops and meetings with key stakeholders revealed significant high level co-ordination and sponsorship issues across government construction departments, and concerns that construction is receiving a lower profile in the general government agenda. Three main themes emerged:

- There is no longer a "single voice" representing government clients. With the cessation of the HM Treasury chaired Central Government Construction Taskforce and the Government Construction Clients Panel there is no longer a forum for government clients to discuss policies and standards, co-ordinate their programmes, and formulate combined views about, for example, best practice.
- Departments and agencies, in particular the major central government construction clients, have embarked on a series of major process and culture change programmes in the way they procure and manage construction. These are all different in extent and nature but there is no view as to what constitutes the best approach regarding these new ways of working.
- At least ten departments, agencies and non-departmental bodies, including the Office of Government Commerce, have lead responsibility for various cross-government aspects of construction. Clients and suppliers have to monitor and interpret policies, standards, and regulations from a wide range of sources, some of which overlap or contradict each other. For example, the Office of the Deputy Prime Minister's Building Regulations calls for 'air tightness', while the Department for Environment, Food and Rural Affairs Climate Change initiative calls for 'natural ventilation'.

36 'Red Amber Green' reporting shows the relative urgency of any recommendations made by the Gateway Review team. 'Red' issues must be addressed as a matter of urgency, 'Amber' issues should be addressed before the next Gateway Review, and 'Green' issues, which need to be addressed but in an unspecified timeframe. If any identified issue is 'Red', then the whole project receives a 'Red' classification.

37 The Construction Industry Policy and European Regulation Group (CIPER) is a forum enabling the construction industry to engage in early pre-consultation on the development of regulations that will affect the industry with policy officers from the wide range of government departments and agencies responsible for developing such regulations.

The scale of the structural co-ordination problem – extract from the workshops

There was a sense from the workshops of "what next?" The need for leadership and sponsorship in major projects is clear; but the feeling from the workshops was that the biggest project of them all, the one changing the face of the construction industry, is now flagging and is in need of greater cohesion, focus, sponsorship and leadership itself.

The funding of construction programmes – extract from the workshops

Many of the workshop participants described how the programmes often only have funding for the first few years. The programmes thus become "shallow promises". In effect they contain a series of rolling break options aligned with the length of the funding. The mismatch between the length of the programme and the funding commitment undermines the purpose of the collaborative working relationship.

Areas where departments need to make more progress

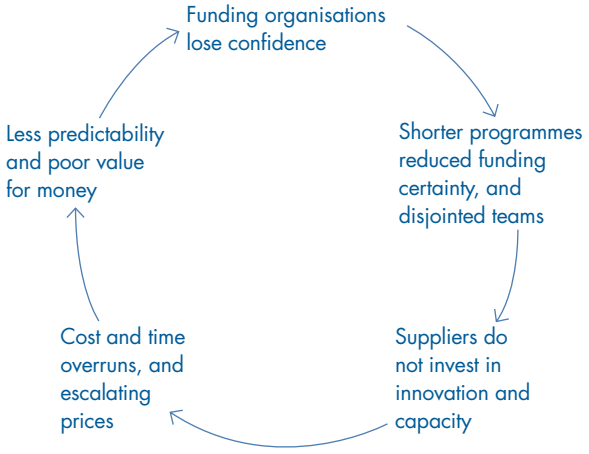
2.23 We identified six areas where departments need to make more progress in improving their performance in delivery of successful construction programmes and projects.

Volatility and uncertainty in work flow and funding.

2.24 An attraction of PFI/PPP is the long-term certainty it offers to both the client and the successful contractor, not least because of the legal obligation of the client to fund the programme. For non-PFI/PPP work, however, a major concern emerging from our workshops and follow-up examinations has been the ability of clients to provide the market with sufficiently early warning and confidence about future construction programmes and greater certainty about the flow of work and funding. These findings reflect the concerns set out in OGC's 'Increasing Competition and Improving Long-Term Planning in the Government Market Place' (Sir Christopher Kelly, December 2003). They are also reflected in Gateway Reviews, where around a quarter of projects have received a 'Red' status report because work was going to proceed without sufficient committed funding. The workshops discussed why departments have difficulty in establishing long term programmes of work and guaranteeing funding. A variety of reasons are behind this, for example, some programmes have more than one source of funding and it can be challenging to align the parties' interests. In other cases, information on asset conditions is weak and programmes take on shorter term focus.

2.25 If suppliers, particularly those engaged in longer-term framework and partnering arrangements, are not confident about the ability of clients to provide a predictable work profile and funding certainty, then they will be less confident about investing in their own capability and capacity. Volatility in funding diminishes suppliers' ability to deliver economies of scale or reduce costs through improved efficiency. In effect, the opportunity and incentives for improved performance offered by long-term and collaborative arrangements are severely reduced and the associated benefits become difficult to achieve (**Figure 22**).

22 The value for money implications of uncertainty in funding



Source: National Audit Office

2.26 In some cases those responsible for establishing longer-term partnering arrangements with suppliers, or for funding others to deliver construction activity, are constrained by factors beyond their control such as unforeseen changes in departmental priorities or their lack of delegated authority to carry forward unspent budgets into future years **(Figure 23)**.

23 How short-term or disrupted funding for construction can delay or reduce the benefits to service delivery and efficiency

Defence Estates: is responsible for the delivery of the Armed Forces' replacement residential quarters programme (Single Living Accommodation Modernisation Project to fulfil a Ministerial commitment to improve the living conditions for service personnel). Based on agreed funding from Ministry of Defence budget holders, Defence Estates provided the contractor with a committed level of funding and work. Shifting budget holder priorities and centrally imposed funding reductions resulted in funding for the Modernisation Project being reduced for 2005-06. Defence Estates has been able to shift funding from rescheduled work elsewhere to cover the programme for one year with no detrimental effect, but is looking for greater certainty of funding in future years so that it will be in a stronger position to realise the potential benefits from longer-term partnering and economies of scale.

Housing Corporation: To support the development of longer-term partnering arrangements between registered social landlords and private house developers, Ministers have agreed the Corporation can increase the period of grant funding from one to two years. Registered social landlords have, however, asked the Housing Corporation for longer periods of guaranteed subsidy so that they can offer greater funding certainty to national house building firms. They consider that this will enable them to create more effective packages of house building work, encouraging investment and innovation in capability and capacity allowing them to exceed the efficiency targets set for social housing.

Highways Agency: To maximise the benefits from longer-term partnerships with their road building contractors the Department for Transport and the Agency need to provide stability and certainty in programmes of road building work. This includes the requirements for accurate estimation of scheme costs, and appropriate contingencies, so that the overall programme remains affordable within the Department's long term spending plans. Otherwise priorities have to be revisited, injecting disruption and uncertainty which can impact on specific projects and programmes and undermine contractors' ability to plan their resources to deliver road schemes efficiently.

Lack of construction management capability

2.27 Many public sector clients have insufficient skill and expertise to sponsor and manage construction activities and their impact on their business. A key theme emerging from our workshops with both clients and suppliers is the shortage of suitably skilled and experienced people at all levels both within clients and the entire supply chain, which is hampering the ability of departments to improve their construction performance. For example, in line with current and projected growth in construction activity it is estimated that the industry needs some 80,000 new recruits, from labourers and crafts people through to project managers and professionals, every year for the next five years.[38]

2.28 Many project sponsors and senior responsible owners do not always fully appreciate their roles, are rotated across projects for career progression, do not have the appropriate executive authority or have received limited project management training. For example:

- The uptake of the Certificate of Competence in Construction Project Sponsorship course run by the Civil Service College has slowed down with only 29 delegates completing one or more of the three modules during 2004 compared to an average of around 60 during the first five years of the course. Even where project sponsors and senior responsible owners do have the appropriate experience, skills and authority, they are often allocated to other tasks, either mid-project or after the project is completed, creating a lack of continuity.
- 75 per cent of all construction Gateway Reviews make reference to concerns in project governance, and the lack of precise definition of roles, responsibilities and interactions of project managers, and how they interface with the rest of the department or agency.
- Our workshops highlighted the need for (1) greater understanding and awareness of the issues around sustainable development and whole life value across the entire industry, including clients and (2) improved capability and capacity in this regard. The wide range of initiatives and fragmented government responsibility are seen as significant barriers to this.

38 Construction Skills Foresight Report 2003', Construction Industry Training Board - Construction Skills.

2.29 Without sufficient external assessment of capability there is an increased risk that those organisations in receipt of the funding will fail to make the most effective use of the resources they receive. In addition, despite all departments' formal commitment to embedding the principles of Achieving Excellence as a matter of Government policy, public funding for construction is not always conditional or does not contain the right incentives to embed the principles of Achieving Excellence. Funding organisations such as the Housing Corporation, however, in response to escalating demand and the need for increased efficiency, are refining their investment strategies to introduce incentives and conditionality to drive through more efficient and effective construction approaches such as partnering **(Case example 1)**.

Limited independent challenge of departments' construction designs and business cases, and practical difficulties in procuring construction on the basis of sustainable whole life value

2.30 The acquisition of built assets involves considerable investment of public funds and departments are required to consider whether the need is fully justified and to have fully assessed all other feasible options. Participants in our workshops, however, highlighted the lack of sufficiently rigorous challenge to departments and agencies in the early stages of projects about, for example, whether a built asset is actually the most effective solution to improve service delivery. They also indicated that departments do not always

CASE EXAMPLE 1

Embedding construction good practice through conditionality attached to funding

The Housing Corporation is a non-departmental public body sponsored by the Office of the Deputy Prime Minister. It is responsible for investing public money in housing associations and other registered social landlords (RSLs) to deliver high quality social housing. The Corporation is to invest some £3.3 billion in 2004-05 and 2005-06 to fund around 67,000 new homes, mainly to address shortages in the South East, and meet an increasing demand for housing. However, resources are limited with further pressure to drive efficiency savings (8-10 per cent efficiency savings in social housing in the period covered by Spending Review 2004), and with a finite capacity in the house building sector.

To deliver this agenda, the Corporation is targeting funding at fewer, more capable RSLs and encouraging them to (1) embrace *Constructing Excellence* principles such as developing larger programmes and working in longer-term partnerships with the major house building companies to yield greater economies of scale, improve quality, and reduce construction time and costs; and (2) to use modern construction techniques such as off-site pre-fabrication. To achieve this, the Corporation has:

- From 2003-04, made the funding of all larger RSLs with regular development programmes conditional on their having 'Clients' Charter' status, achieved through an accreditation scheme supported by *Constructing Excellence*. An RSL submits to the scheme a statement of its position against 37 criteria (relating to principles of good construction practice, for example, on client leadership, risk management and minimising defects), and a plan for delivering progress against the criteria. Once approved, Clients' Charter status is awarded for 2 years, and is reviewed annually. Other, smaller RSLs with occasional programmes must undergo accreditation through a 'Mini Charter' with fewer criteria, subject to regular review.
- Encouraged RSLs to submit schemes for funding by the Corporation that contribute towards achieving the Corporation's target that at least 25 per cent of the programme will be delivered using modern methods of construction. Although the granting of funds is not conditional upon this, it is made clear that its inclusion will influence the success of the bid, and therefore acts as an appropriate incentive.
- Shifted the focus of investment away from total scheme cost limits to a system based upon the grant awarded. The Corporation aims to reduce the grant awarded in the future, while continuing to deliver the same number of, or more units, to the same quality standards. They envisage that RSLs, in knowing this, will adopt partnering and modern methods of construction as the means by which they can achieve improved efficiency.

Since its introduction, the strategy has resulted in a streamlining of the investment and procurement process, such that 70 RSLs now receive 80% of all funding, as opposed to 347 RSLs previously. The approach is also encouraging partnerships between RSLs, developing links between those that, for example may be asset rich but poor at development, with those who have expertise in development but may be asset poor. The focus is increasingly upon those RSLs with a track record of quality and delivery of new build. Innovative construction methods are being encouraged, with 49 per cent of new build homes incorporating one or more new building techniques. The approach has also encouraged greater involvement from the largest private sector housing developers, who are beginning to partner with the biggest RSLs to develop social housing schemes.

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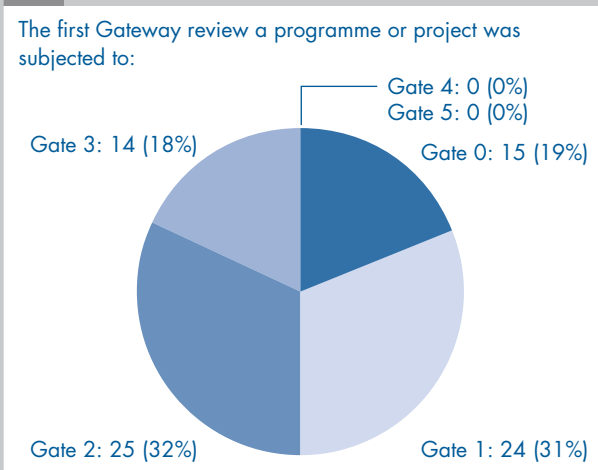
Source: National Audit Office examination of the Housing Corporation

produce effective briefs. A consistent message from the large and medium suppliers is that clearer, better thought through briefs would reduce many of the subsequent problems on projects during their design and construction. This appears to be corroborated by the relatively low numbers of departments who have subjected their construction programmes and projects to a Gate Zero or One review, where their early thinking and business cases for construction projects are independently reviewed and challenged **(Figure 24)**. Evidence from Gateway Reviews also indicates that in 70 per cent of reports, concerns are expressed about whether departments and agencies are appropriately involving stakeholders, particularly in managing their expectations and engaging them in the development of the project.

2.31 Without early, independent expert challenge, departments could, in the worst scenario, acquire built assets they do not need or that quickly become redundant as service delivery priorities change. The Office of Government Commerce considers that Gates Zero and One are the points at which they can add most value in addressing this risk and avoiding investment decisions that lead to poor value for money. For example, a department may be thinking about constructing a new asset to improve its services. However, early exposure of its thinking to independent external advice may identify more effective alternatives such as better use of existing space or more innovative and flexible solutions that avoid the need to create an expensive asset that will need to be managed in the longer term.

2.32 Departments and their agencies recognise the need to procure on the basis of value for money. In practice, however, they are finding it harder to design and procure construction on the wider basis of whole life value. Barriers to progress include the lack of clarity and understanding of whole life value; and the absence of suitable tools from the design phase onwards to assist clients in understanding and evaluating the inter-relationships between costs (including whole life costs), time, quality, the wider social, environmental and economic impacts, and the wider benefits to improved service delivery. Further, in most sectors there is an absence of robust, historic benchmark data on the costs of running and maintaining built assets, and little quantifiable evidence (including from demonstration projects) of the benefits of adopting a whole life value approach. Without tangible evidence of the benefits many clients and their suppliers see investing time and resources in delivering sustainable solutions as inherently risky.

24 The point at which construction programmes and projects have entered the Gateway Process



Source: National Audit Office examination of aggregate Gateway data

NOTE

Construction projects and programmes are entering the Gateway process relatively late. Of the 78 projects or programmes in the process, only 15 (19 per cent) entered at Gate 0. Half (50 per cent) of all projects entered the Gateway process at either Gates 2 or 3. From January 2004, Gate 0 applies only to programmes, with Gate 1 being the first Gateway for projects, and no projects will be subjected to a first review at Gate 3 or later.

Maximising the benefits from good practice in construction procurement and contracting strategies, and managing project risks and performance incentives

2.33 The forms of contract involved in Design and Build and Prime Contracting enable departments to cap the risk of cost increases using either a lump sum or a guaranteed maximum price arrangement. The approach of risk allocation and cost capping, however, does not always produce the best outcome. First, suppliers naturally include a cost allowance for the risk transfer – which may turn out to be unnecessary. Second, suppliers may compromise on quality in order to maintain margins. Third, suppliers may seek to enhance profits if the client does not maintain strict control over changes in scope.

2.34 What departments are also less good at is in putting risk management at the heart of a programme. Poor risk management, in terms of actively managing and addressing identified risks, is consistently one of the main weaknesses identified in projects subject to the Gateway Process, where it is cited as a concern in around 75 per cent of all Gateway Reviews. Through our workshops we identified that many clients viewed risk management as an enforced burdensome process, rather than an essential way of working, with the emphasis on allocating risks to suppliers rather than on genuine mitigation. Further, clients focus too much on avoiding risks, and not the active management of the positive opportunities for innovation and improved performance.

2.35 The recently revised chapter 30 of Government Accounting sets out how departments should undertake a cost-benefit analysis in considering insurance to encourage more robust analysis of insurance options. In practice, however, most departments make their suppliers take out insurance policies covering their own work. Construction suppliers take out public liability cover, and insurance against defective work. Advisors take out professional indemnity insurance. The client ultimately bears this insurance cost, either explicitly through the contract cost elements or indirectly through the suppliers' overhead recovery. Departments do not often consider or take out project-wide insurance on behalf of the suppliers. This is partly because the insurance industry has not in the past offered or encouraged this approach, although a new market may emerge in this area. A company-specific insurance approach is not only wasteful, with overlapping cover and loss of buying power; it also produces behaviour that works against integrated teamwork and collaboration. When a problem emerges, the parties concentrate on blame avoidance in order to protect their no-claims record.

2.36 Several departments use incentives to enhance the prospects of project success. The use of liquidated and ascertained damages is common, and is designed to deter failure by compensating for delay. Some departments use positive incentives to encourage success, rather than penalty approaches to deter failure. However, this is not common, and suppliers' main incentives come from their desire to avoid damages. Those departments not considering incentive arrangements as part of their procurement strategy and risk mitigation approach may be missing the opportunity to enhance the chances of success in meeting project or programme objectives. The Office of Government Commerce good practice guidance does not cover the subject of gain-share mechanisms.

2.37 Most departments are aware of the considerable commercial leverage they have with the supply chain. Suppliers appreciate the "blue chip" status knowing the risk of payment default is minimal. The workshop discussions revealed that departments do not make the most of the situation in terms of driving in behaviour change towards Achieving Excellence throughout the supply chain by, for example, encouraging suppliers to develop the skills of their workforce and improve the quality of the training they provide. The workshops, particularly with suppliers, also indicated there were concerns about the lack of clarity in the criteria used to evaluate tenders. Suppliers are often unclear about the evaluation criteria, and about the weightings used in the assessment process. Departments are missing opportunities to obtain clearly focused responses from the market.

A lack of competitive tension in framework agreements and partially integrated supply chains

2.38 Longer-term framework contracts and partnering arrangements are competitively tendered from the outset, but thereafter projects are often let to contractors in the framework pool on a non-competitive basis. The department negotiates the price for the work with the supplier, referring to the rates from the initial competition. This streamlined procurement process brings obvious efficiency benefits for both client and contractors and facilitates collaborative working. The risk for departments, however, in the absence of competitive and commercial tension, is whether they achieve a fair price for individual projects.

2.39 When the nature of the work in a particular project corresponds closely to comparative costs obtained in the initial competitive evaluation, departments gain reassurance that the project price is fair. However, where the nature of the work is different, for example, in complex or site-specific situations, departments find it harder to assess the fair value for the work. At that point, the department's risk exposure can be significant. For example, the prices obtained at the start of the framework agreement for foundation excavation may not apply to difficult conditions of dealing with certain soil types. In such circumstances, without relevant comparative data, the departments face a cost risk. Departments employ a variety of techniques to shrink this risk exposure, for example by using external cost experts to provide an independent cost estimate, and by referring to experience within the departmental cost records where they are

available. For example, the NHS ProCure21 approach uses both routes to obtain reassurance that the price represents fair value. In the private sector, clients maintain an element of competitive tension by seeking quotes from more than one supplier in the framework arrangement. They may also use benchmarks to identify target costs, monitor performance against key indicators and introduce continuous improvement programmes.

2.40 While good progress has been made towards collaborative working, departments and agencies have yet to establish fully integrated supply chain teams and to realise all the benefits of improved investment in capacity and innovation. For example, our follow-up examination with the 2001 case study organisations showed they are increasingly working in an integrated way with their main contractors and consultants. There is, however, less evidence that departments and agencies are involving specialist suppliers, such as mechanical and electrical engineers, as fully and early as they might despite the fact that these suppliers are often critical to the delivery of successful construction projects. These concerns were reflected in our workshop with small and medium sized construction suppliers and in bilateral interviews with industry representative bodies. For example, the Specialist Engineering Contractors Group informed us that much remains to be done by government clients in treating all suppliers in a fair and consistent manner by, for example, ensuring the financial benefits of good performance are passed down through the entire supply chain.

2.41 The lack, as yet, of fully integrated supply chain teams throughout the public sector in part reflects the time it is taking to familiarise specialist contractors with the new ways of working and the benefits they can obtain. There are, however, practical barriers to full integration. In particular, the failure on the part of many clients and main contractors to operate fair payment practices for their specialist suppliers. Where specialist suppliers do not have certainty that they will be paid fairly and in a timely manner they have little incentive to invest in capacity or to innovate. Following a review by Sir Michael Latham, the Department of Trade and Industry will be publishing a consultation paper during 2005 on how to improve the payment and adjudication provisions of the Housing Grants, Construction and Regeneration Act 1996. The Office of Government Commerce also established in 2004 a 'Fair Payment Task Group' to review existing payment mechanisms and innovative practices that reinforce integrated team working arrangements, and identify exemplar practices that can be applied more widely across government construction.

Failing to evaluate whether construction projects have delivered the desired business and service delivery benefits, and using the lessons to drive through improvements in future projects

2.42 Our workshops indicated that in many public sector construction projects there are significant weaknesses to evaluate robustly the performance of construction projects and the delivery of the intended benefits. The evidence from Gateway Reviews supports this. While two construction specific Gate 5 reviews have been undertaken to determine whether the projects delivered the intended benefits to service delivery and efficiency, the risk that departments are not routinely evaluating and capturing learning from completed projects remains. Whilst post-completion reviews are challenging to enforce, such behaviour contrasts significantly with that of leading private sector client and supplier behaviour, where great emphasis is placed on the learning achieved at the end of each project and the active use of lessons in delivering continuous performance improvement.

2.43 Departments are increasingly aware of developments in construction through their Centres of Excellence but to enhance further the impact of Gateway Reviews, they should provide advice to senior responsible owners on good practice guidance relevant to Gateway Review recommendations and share Gateway reports with them. Centres of Excellence provide for the first time a central point to embed guidance within departments and to develop programme and project management skills to promote successful delivery. Departments need to ensure that Centres of Excellence align their tools and guidance with that of the Office of Government Commerce, and that these are disseminated to project teams.

2.44 In addition to delivery to time and budget there are other indicators of improved value for money and quality, such as stakeholder satisfaction, reduction in defects, and improvements in health and safety. While the Office of Government Commerce is collecting data on stakeholder satisfaction and defects as parts of its monitoring of progress against the strategic targets, as well as on health and safety, it does not yet have sufficient robust data to assess progress against these measures. Some departments, however, have not undertaken user satisfaction reviews, and where they have there is inconsistency or shortcomings in their approach. On defects some departments have misinterpreted the Office's definition and assessed defects too broadly leading to over

reporting.[39] On construction health and safety there is not yet sufficient data to draw any meaningful conclusions. Of those departments who have reported, the Department for Work and Pensions has adopted a 'zero tolerance' approach to health and safety and has reported only four reportable incidents per 100,000 employees.

2.45 More generally across the private and public sectors there has been a general improvement in these key performance indicators between 2000-01 to 2003-04, with the demonstration projects, where the Achieving Excellence and Constructing Excellence principles have been applied, out-performing industry averages **(Figure 25)**.

2.46 More recently, the Government's agenda has widened to consider sustainability in construction and development (for example the target to reduce all carbon dioxide emissions by 20 per cent from 1990 levels by 2010[40]) and departments will increasingly need to demonstrate how their construction activity addresses social and environmental concerns. It is, however, difficult to form a comprehensive view as to whether public sector construction is delivering sustainable benefits such as minimising harmful environmental impacts as such information is not yet routinely and regularly measured across all projects. There is, however, recognition of the need to develop appropriate measures and targets in these areas. The Environment Agency, for example, has made good progress in developing and using key performance indicators covering the environmental effects of its construction activities **(Case example 2)**.

2.47 In Part 3 of this report we highlight the practices in both public and private sector organisations that might help departments and agencies tackle these and related construction performance issues.

25 The 'Constructing Excellence' demonstration projects consistently outperform industry averages on other indicators of value for money

Main KPI	Industry Performance[1]		Demonstration projects 2003-04
	2000-01	2003-04	
Client satisfaction - product	72%	80%	90%
Client satisfaction - service	63%	74%	94%
Defects	53%	68%	75%
Health and Safety - annual accident incidence rate[2]	1,318	1,172	435

Source: Construction Key Performance Indicators and Constructing Excellence demonstration projects

NOTES

1 Performance is generally quoted as the percentage of projects scoring 8/10 or better.

2 Reportable accidents per 100,000 people employed.

CASE EXAMPLE 2

Environment Agency - measuring the environmental impact of construction activities

The Environment Agency sets clear targets for reducing the environmental impact of its construction programme and measures achievement through a suite of Key Performance Indicators, covering the re-use of materials (mainly aggregates), waste minimisation, pollution incidents and timber sourcing. These are directly related via a balanced scorecard to its Corporate Plan targets which in turn align with Departmental and Government targets.

The establishment of long-term relationships with contractors has enabled these targets to be embedded as principles of good project planning and management across all of the Agency's construction activities. Contractors' environmental performance is monitored via the performance indicators and lessons identified are shared in good practice forums. One of the Agency's strategic partners acknowledges that its partnership with the Agency has transformed its approach to environmental management and as a result, strengthened its position in the construction marketplace.

39 The Office of Government Commerce defines defects as deficiencies or faults in the completed project affecting its function in a way that adversely affects normal standards of operations. Minor cosmetic faults and adjustments to ventilation and air conditioning systems after occupation are not classified as defects.

40 "Climate Change: United Kingdom Third National Communication", Department for Environment, Food and Rural Affairs – October 2001.

PART THREE

What departments need to do to improve their construction performance further

3.1 Drawing on good practice in the public and private sector this part sets out six key areas in which departments and agencies should continue to improve their construction delivery performance:

- Establish effective construction programmes;
- Develop and support well focused and capable clients;
- Base design and decision making on "whole life value";
- Use the appropriate procurement and contracting strategies;
- Work collaboratively through fully integrated teams;
- Evaluate performance and embed project learning.

Establishing effective construction programmes

An effective construction programme requires:

- **Planning and managing construction projects and programmes across the organisation as a whole - to streamline processes by using a single coherent project management approach and deliver economies of scale in procurement.**
- **Timely and robust information on the value, condition and fitness for purpose of existing built assets - so that capital investment decisions are clearly focused on targets and priorities for service delivery.**
- **Certainty and stability in the profiling of work and funding - to underpin longer-term collaborative relationships with the entire supply chain and encourage industry partners to invest in capacity and innovation.**

3.2 Managing the programme as a whole. Departments need to understand the total scale, value and nature of their current and planned construction requirements across their whole asset base. With this information they will be in a position to package and profile work in an efficient manner, for example, by grouping similar work into one contract to reduce procurement costs and increase their purchasing power. Many commercial organisations recognise the efficiency savings and improved business performance benefits that better co-ordination and management of construction demand can bring and have reorganised their programmes of work and in-house teams accordingly **(Case example 3).**

CASE EXAMPLE 3

Royal Mail Property Group – establishing an effective construction and property management programme

Royal Mail Group Property (Property Holdings) delivers construction and property management to the Royal Mail Group. Historically, Property Holdings, had managed the capital investment and estate of the Royal Mail Group while the individual businesses provided their own facilities management. As a result of this approach:

- planning construction projects and managing property across the whole of its estate was fragmented and a major challenge;
- there were inconsistencies in the management of the estate and its facilities;
- demand management was weak and ineffective;
- a culture of spending budgets up to their limits had developed;
- buying power in the market had been diluted.

What the Royal Mail Group did to tackle the problems it faced

Royal Mail Group brought together the management of the estate and the provision of facilities management into one organisation, Property Holdings, and put in place effective demand management and portfolio planning processes.

What the new approach has achieved

The planning of the property portfolio is now carried out in a balanced and transparent way in the interests of the Group as a whole and the capital and maintenance programmes match the plans for the entire portfolio. By bringing the management of the estate and the provision of facilities management under the control of a single organisation Royal Mail Group can now obtain fit for purpose property and facilities delivered at agreed service levels which meet the agreed operational needs of the businesses at least cost. Savings of some £81.5m per annum, made up of a combination of bottom line savings and avoided costs have been achieved against a 1996 - 1997 cost baseline of about £650m per annum as a result of the new approach.

Source: National Audit Office case study examination of Royal Mail Property Group (more detail is provided in the case study volume)

3.3 It is essential that all parts of an organisation adopt a single and well understood programme and project management process, preferably based around the Gateway Process. Many of the larger repeat clients in Government, such as the Environment Agency, recognise the importance of communicating the overall programme of work with the industry in a co-ordinated and consistent way. The Agency restructured itself by establishing a "client" side that is responsible for Flood Risk Management and created a new National Capital Programme Management Service to support the client side by developing a programme of work based on national rather than regional priorities. The Service, working in co-operation with the Agency's Procurement Department, co-ordinates the procurement and project management of capital projects; acts as a centre of excellence in procurement and construction, and provides improved consistency in communication, processes and relationships with suppliers **(Case example 4).**

CASE EXAMPLE 4

The Environment Agency's National Capital Programme Management Service

To support the development of an effective construction programme of flood protection and the implementation of a new national procurement strategy based on national frameworks and longer-term partnering with contractors, the Environment Agency created the National Capital Programme Management Service. The Service has introduced a streamlined and nationally consistent approach to programme and project management which is closely aligned with the OGC Gateway Process. It provides, in co-operation with the Agency's Procurement Department, clarity and consistency in approach for contractors and raised the overall quality of progamme and project management across the Agency. It also acts as a centre of excellence in flood protection construction providing a focus for:

- better quality information on the condition, fitness for purpose and whole life running costs of the Agency's existing flood protection assets;
- commercial leadership and interaction with the construction industry;
- project management professionalism as well as training and career development.

Source: National Audit Office follow-up examination of the Environment Agency

3.4 Timely and robust information on the value, condition and fitness for purpose of existing built assets. Construction programmes and projects need to be underpinned by effective asset management plans that identify the value, condition and fitness for purpose of the existing estate. Departments need these plans to make best use of their resources. Where departments have good quality asset management plans they are able to use them as the basis for making decisions on the most efficient use of capital resources and as a means to deliver business objectives. Sound asset management plans are particularly important for those departments which do not deliver services directly but instead work through complex delivery chains and may not have first hand access to timely and accurate asset information, for example the Department for Education and Skills **(Case example 5).**

3.5 Certainty and stability in the profiling of work and funding. Departments are increasingly aware of the need to provide a stable, well managed profile of work and certainty of funding to their suppliers. Departments have benefited to some extent from the move from one year to three year resource budgets, a change introduced by HM Treasury to promote greater stability in financial planning and longer-term investment. The Private Finance Initiative has also injected long-term stability into the funding of programmes of work. The Office of Government Commerce is also, through the 'Kelly programme', aiming to improve construction workflow visibility and certainty at a pan-government level for the construction industry.

3.6 The Department for Environment, Food and Rural Affairs is from 2003-04 onwards providing the Environment Agency with a single Flood Defence Grant-in-Aid, as opposed to previous arrangements where funding was dependent on local authority contributions. This is in part recognition of the improvements in construction delivery capability demonstrated by the Agency since 2001. Greater control over a dedicated source of capital is enabling the Agency to: (1) improve the matching of funding against strategic priorities; (2) streamline the project approval process; (3) integrate capital and operating budgets to ensure the most efficient mix in delivering the overall flood protection strategies; and (4) be more flexible in packaging and programming the work, providing greater certainty to industry partners as well as more flexibility in being able to respond to emerging new priorities.

CASE EXAMPLE 5

Department for Education and Skills' school asset management strategy

The schools estate is large, containing over 23,000 schools located throughout the country with a value of some £100 billion. As part of the drive to help raise educational standards the Department has introduced a capital investment programme to refurbish or replace the entire school stock, improve maintenance and make better use of school premises. The Department needed information that would allow it to make the most efficient use of its capital resources and which would be sufficiently transparent so that the fairness of its decisions could be assessed by all those involved.

The Department considered that local education authorities should be in the best position to provide information on the condition and suitability of the estate as they should have, as a matter of good practice, rigorous asset management strategies in place. As an incentive for local education authorities to produce high quality asset management strategies the Department based 40 per cent of its modernisation funding on the quality of strategies with the remainder based on student numbers. The Department introduced Asset Management Plans (AMPs) which were to be prepared by local education authorities in partnership with schools. The Department appraised the data provided to it by local education authorities, supported by an independent audit of a sample of responses to check the methods and processes that had been applied.

The main objectives of AMPs are:

- **to provide an agreed basis for local decisions on spending priorities and to link with other local authority plans**. The AMP planning processes and the underlying data provide the basis for making decisions on spending priorities. AMPs are intended to reflect the needs of other plans which authorities are developing for example, on school organisation and class sizes, and wherever those plans have consequences for capital spending there is a cross-reference to AMPs so that all the different needs for capital investment can be brought together and co-ordinated;
- **to help governors and head teachers in developing plans for individual schools by making fair and transparent the process of decision making on funding priorities across the authority**. Decision making processes are intended to be sufficiently transparent to governors and head teachers so that the local education authorities can demonstrate fairness of treatment between different categories of schools;
- **to help the development of partnership projects**. The information from AMPs is intended to help local education authorities and schools to judge in which circumstances public private partnerships are likely to be an appropriate method of procurement, and allow potential private sector partners to form a view about opportunities for partnership projects;
- **to provide assurance to stakeholders that capital projects represent good value for money**. AMP information underpins allocation of capital support, both for traditionally procured projects and for public/private partnerships and gives assurance that such allocations are soundly based and represent good value for money. The Department is in a better position to target and concentrate funding into areas of real need where the provision of new or refurbished schools will have the greatest impact on educational outcomes.

Source: National Audit Office examination of the Department for Education and Skills

3.7 The larger the guaranteed size of the work programme and the more certainty that can be provided about the flow of work over time and funding, the more confident industry partners feel about investing in capacity and innovation, and the easier it becomes for them to organise their work more efficiently, to the benefit of the client. Stanhope, a leading private sector developer, consciously tries to identify a flow of development opportunities and large blocks of work and communicate their existence to its suppliers. It finds that in these circumstances suppliers may even invest in new facilities for producing innovative prefabricated building components, innovation and making best use of modern building techniques. These are two key factors that allow Stanhope to improve on previous construction performances and remain competitive.

3.8 While greater certainty and realising the opportunities for improved aggregation are important, departments need to consider three important issues:

- Change is inevitable during the lifetime of a construction programme. Departments should therefore retain sufficient flexibility in the contract mechanisms so that, should change be required, the programme can be adjusted. For example, it is now crucial that departments quickly re-plan their programmes in the light of the Gershon efficiency and the Lyons relocation and asset disposal reviews, and communicate the new requirements to the market, in order to minimise disruption and maximise certainty.
- The aggregation of construction requirements needs to make sound business sense. Poorly thought through aggregation can increase complexity and the risk of non-delivery, for example, by placing over-reliance on one supplier, and it can unduly reduce competition and lead to poor value for money. It may make more sense, for example, to aggregate work on a regional basis allowing more suppliers to be involved, and for these suppliers to develop an improved understanding of local circumstances.
- Care needs to be taken to create opportunities for small and medium enterprises to participate in the programmes of work, as they are often best placed to provide innovation, flexibility and innovation.

Develop and support well focused and capable public sector construction clients

If clients are to be well focused and capable they need:

- **'Intelligent' central support especially where they do not deliver construction projects on a regular basis**
- **Boards that understand the role of construction projects as vehicles for improved public services, have relevant commercial skills and provide commercial and professional leadership for project managers and effective and consistent leadership throughout the course of construction projects.**

3.9 "Intelligent" central support for infrequent clients. Public sector organisations that are only involved in construction projects on an infrequent basis require active and appropriately resourced support and advice. Support may take the form of placing executive responsibility with a designated body within the organisation to act as an intelligent interface between the client and the construction industry. This approach has been successfully implemented by Cambridge University's Estates Management and Building Services, who provide the intelligent client support for the academic departments and colleges **(Case example 6)**. A key element of its approach is to support the client in developing design and business cases, and then to exert rigorous change management control over the project to minimise the risks of cost and time overruns.

CASE EXAMPLE 6

Cambridge University Estates Management and Building Services – executive support for infrequent sponsor departments:

The University has a £600 million construction programme involving the largest expansion in its 800 year history. Its construction programme provides a useful model for infrequent sponsor departments to guide successful construction procurement as it has established clearly defined roles for the University governance bodies, academic end users and client representatives. This includes Estates Management and Building Services who have the responsibility for acting as an intelligent and expert client by providing support for the sponsor department within the University by:

- providing advice on the indicative construction and whole life costs;
- identifying building options, providing the outline design and construction programme and a maintenance and environmental analysis;
- developing the procurement, design and construction strategy and discounted cash flow analysis;
- providing project management supplemented by bought in expertise;
- undertaking a post occupancy evaluation and a user satisfaction survey.

Source: National Audit Office examination of the University of Cambridge (more detail is provided in the case study volume)

3.10 A considerable proportion of public sector bodies, however, are infrequent clients with limited scope for developing their own in-house estates team. In these circumstances departments need to consider the development of facilitative intelligent central support, such as the model implemented by NHS Estates to clients at Trust level through its NHS ProCure21 initiative **(Case example 7).** By registering their construction project as a ProCure21 project the Trusts are able to access previously competitively tendered supply chains as well as the support and delivery toolkits provided by NHS Estates. The benefits are the speed with which they can move to a start date, the relatively low procurement costs, and the ability to set a guaranteed maximum price for the work. All costs and budgets are on an open book basis, transparent to all parties.

CASE EXAMPLE 7

NHS Estates and ProCure21 – facilitative support for inexperienced and infrequent clients

The NHS has a range of building types and sizes, including hospital developments, primary care centres, and diagnostic and treatment centres. The NHS is a large procurer in absolute terms, but individual NHS Trusts typically procure on an infrequent basis. As such, many NHS Trusts are inexperienced clients.

In response, NHS Estates developed ProCure21, an initiative to help NHS Trusts deliver better buildings, on time, at lower costs, more rapidly and more safely than before. The initiative seeks to improve the construction process through the creation and support of long-term supplier relationships and integrated teamwork, and provides the client, who may be inexperienced at construction, with support to deliver a successful project. The main features of the ProCure21 approach are:

- Creation of 12 principal supply chain partners: the supply chain partners have been chosen following a thorough selection process, fully compliant with EU rules and based on an economic test. This test will be used throughout the life of the framework to determine one aspect of value for money. The client chooses from this pre-selected list of supply chains, which precludes the need for procurement and accelerates the pre-construction phase.
- Encouragement of a partnering approach: the client and supply chain agree a guaranteed maximum price, working to agreed margins with full open book accounting procedures in place, which builds trust, helps to overcome the adversarial approach to construction and leads to rapid conflict resolution.
- Regional policy advisers: who meet with the client at the earliest stages in procurement to influence and develop their thinking; assess their expertise and to provide training and support throughout the process.
- Accredited project directors: all ProCure21 projects have a project director who provides clear leadership to the scheme and possesses the strategic and project management skills to create the "expert client". NHS Estates has developed a training programme to ensure project directors are suitably equipped to manage a ProCure21 project and to help build capacity throughout the NHS. A register of accredited Project Directors has been established.
- Design champions: at the NHS Trust and Primary Care Trust level to ensure design issues are considered throughout the procurement process. Each supply chain has a nominated Design champion whose responsibility is to ensure that good, appropriate design is delivered to the client.
- Equipping the team: provision of the Building on Partnering Toolkit. This comprises the Achieving Excellence in Design Toolkit and a Diagnostic and Risk Tool. They help the client determine and specify their design objectives to develop a full business case; to identify and mitigate construction risks, and to ensure that high quality design and whole life costs are considered.

Source: National Audit Office follow-up examination of NHS Estates

3.11 Boards that understand the contribution that construction can make to delivering improved business performance and management objectives. Increasingly, public sector clients are recognising the contribution of well managed construction to the delivery of their service delivery objectives. The more successful clients, according to contractors and suppliers in particular, are those who:

- Give the responsibility for delivering the construction project to a member of its senior board. The board member develops corporate relationships with commercial partners; provides a focal point and advocacy for programme and project management professionalism throughout the organisation, recognises the capacity and capability needed for the successful delivery of construction projects and applies a sound commercial awareness and understanding of sustainability to evaluate effectively all the available options for procuring construction based decisions on whole life value.
- Appoint an experienced and well trained Senior Responsible Owner on every project, ideally with executive authority, who remains in post for the whole of the project's life. For example, a key factor in the successful delivery of the Milton Keynes Treatment Centre was a project director who was also on the Trust's Executive Board, with executive authority to apply rapid and effective decision making at key points in the project.
- Publish clear roles and responsibilities for project delivery, including board level accountability which are well understood by staff and contractors alike.
- Recognise the need for training and development in programme and project delivery, including sustainability awareness training, at all levels within the organisation including senior managers at board level. They also seek to improve the recruitment and retention of skilled project managers with experience and a track record in the successful delivery of construction projects, by creating defined career paths and paying competitive salaries.

Some of the smaller and infrequent public sector clients in our workshops highlighted the benefit they had obtained from having a "non-executive director" experienced in the delivery of construction projects to support them on major one-off projects.

3.12 Many successful construction projects have been characterised by the direct involvement and leadership of senior members of management boards **(Case example 8)**. This success has been particularly apparent where there has been continuity in senior management involvement from the outset of the project to its conclusion. For example, the client and major contractors on the Blyth Community College construction project identified the vision that the head of the school had in identifying the impact that a well designed school would be able to have not just on improving educational attainment and reducing truancy rates but also in helping to regenerate the local area.

CASE EXAMPLE 8

Department for International Development - Using construction to improve business effectiveness

The Department for International Development (the Department) relocated its headquarters to a newly refurbished building located at 1, Palace Street, previously occupied by the Foreign and Commonwealth Office. The working culture of the Department needed to change as the focus of its work was shifting from providing aid for specific projects to influencing the policies of governments and other major players around the world. As a result the Department would need to bring together staff with relevant expertise and experience from different sections of its organisation to work more collaboratively with multi-disciplinary teams on both short and longer term projects. The Department required the design of its new headquarters to facilitate this change in its working culture for example, by introducing open-plan office spaces.

Members of the Department's senior management had an understanding of how the new building could facilitate the change in the working culture they required and recognised that the refurbishment would provide them with an opportunity to get more from staff resources. Senior management provided support for the building project during its lifetime and communicated to staff how the building would contribute to making their daily working practices more effective.

By consulting widely with its own staff the Department also identified how it could improve the design of the building so that it would be better able to meet the needs of those working there. The consultation process identified for example, the need for the building to incorporate meeting rooms and up to 40 quiet thinking spaces. The open plan workspace now allows, for example, the Department to operate more flexibly when it has to form teams made up of individuals with different skills and experiences from around the organisation. The new building also provides better communication links such as video-conferencing and for the first time provides a worldwide communications system to its overseas offices.

Source: National Audit Office examination of the Department for International Development

Design and decision-making based on 'whole life value'

Design and decision making based on whole life value requires:

- **Investing more time and resources in the design phase of the process - before the key decisions are made and involving all the key stakeholders and subjecting proposals to independent challenge.**
- **Business cases that assess whether the running costs of the proposed built asset are affordable over its whole life.**
- **A broader assessment of the wider economic, social and environmental impact of the proposed built asset – to develop the move towards sustainable procurement in construction.**

3.13 Investing more time and resources in the design phase of the process. The design of public buildings has a key role in improving the quality of public services and in increasing the business efficiency of departments.[43] The ultimate aim of a construction project is to deliver an asset that is capable of meeting the requirements of the business and all stakeholders, particularly end users. Tools and guidance are available for departments to address this issue, for example the Design Quality Indicator is an online tool (www.dqi.org.uk) that has been specifically developed to facilitate stakeholder involvement and the Office of Government Commerce's Achieving Excellence Procurement Guide 9 deals specifically with design quality. By placing significant investment in design quality at the outset of a construction project departments will be in a stronger position to deliver services more efficiently. More innovative approaches to the construction project and potential solutions to problems can also be identified at this stage by for example, developing a detailed brief for the project that describes the product, scope, nature and quality levels that are to be delivered so that the value of the final construction project is increased **(Case example 9)**. Departments must also ensure that they subject their initial thinking about the need for construction, and any subsequent design to sufficient external and independent challenge about, for example, whether better use of existing built assets would meet their requirements.

CASE EXAMPLE 9

Stanhope's focus on 'Creating the Value' at the design stage of projects

Stanhope is a private developer specialising in complex, mixed-use developments, major urban regeneration schemes and commercial offices. It is engaged by public and private clients, some of whom have limited experience in designing and delivering major construction projects to act on their behalf and interface with the construction industry. Stanhope considers that greater value can be created and added to the final product through well managed design and typically allocates an allowance of 0.25% of the total project cost on research. This allows Stanhope to enhance its understanding of:

- customer's requirements and how their business is likely to change and evolve over time;
- the marketplace and the opportunities that exist in relation to property trends and potential sites;
- current and future developments in both the occupier's needs and technology advances within the construction industry;
- benchmarking data to establish appropriate build rates and unit costs for future projects;
- learn lessons from past projects to improve on performance (both from Stanhope's and its partners' experiences in the UK and abroad)

Stanhope also places an emphasis on ensuring the value created at the design stages is ultimately delivered. This is partly achieved by introducing 'hold points' which are similar in concept to the Office of Government Commerce's Gateway Review process, but focused more on getting the design correct. The 'hold point' will involve peer challenge of the project design by Stanhope directors, often in parallel with senior representatives of the customer. Key issues and risks must be resolved within the overall project time and cost constraints.

Source: National Audit Office case study examination of the Stanhope Group (more detail is provided in the Case Study volume)

43 "Getting Value for Money from Construction Projects through Design: How Auditors Can Help". Joint publication by the National Audit Office; Commission for Architecture and the Built Environment; the Office of Government Commerce and the Audit Commission (2003).

3.14 Business cases that assess whether the running costs of the proposed built asset are affordable over its whole life. In line with Government policy public bodies need to focus on achieving value for money in terms of reducing the whole life costs of a building rather than securing the lowest tender price. In broad terms the whole life costs of a facility will include the costs of acquiring it, the costs of operating it and the costs of maintaining it over its whole life through to its disposal. Without sound business cases departments face the risk of not maximising the full benefits that a building could deliver over the course of its whole life, and increase the risk of project cost and time overruns.

3.15 Through effective cost management departments should be able to estimate, control and report all cost related aspects of the construction from project initiation to operation and maintenance and ultimately disposal. Whole life costs can be reduced most significantly if the department puts them at the heart of their thinking at the design stage of the construction process **(Case example 10)**. For example, organisations using innovative building design and heating methods can reduce their energy costs by 75 per cent and minimise their environmental impact **(Case example 11)**

CASE EXAMPLE 10

University of Cambridge Gates Computer Centre

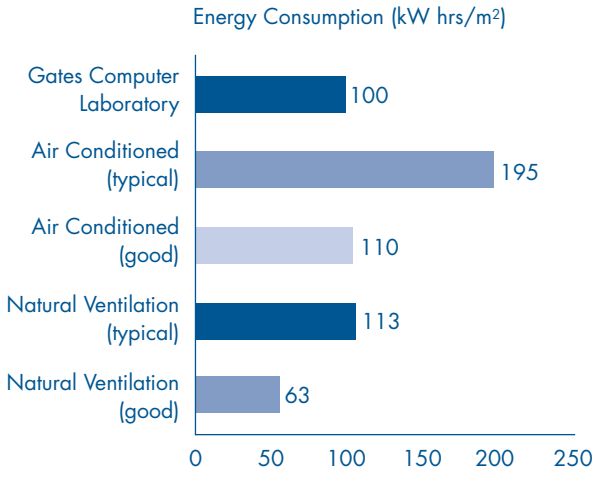
The William Gates Building is the first standard-setting development at the University's new West Cambridge campus. Key to the project's success was delivering a building where whole life costs were minimized. The University therefore sought a building that would be sustainable, based upon an energy efficient design, with highly adaptable work space and one which took account of its environment.

The design of the building aims to increase energy efficiency and reduce whole life running costs by:

- The extensive use of natural rather than mechanical ventilation and the recycling of surplus heat generated by computers as heating during cooler periods;
- Using insulation in excess of current building regulations and making the building "airtight";
- A flexible internal design allowing the layout to be changed easily. Ceilings are high, permitting easy installation of further services and the floors are designed to allow up to a 200 per cent expansion of data cabling to allow the building to be adapted should the department's requirements change in the future.

As the first building on the West Cambridge site, the University has given careful consideration to the interaction between the building and its environment and users. A sustainable transport strategy has been implemented to reduce car movements by limiting car parking and providing cycle and pedestrian routes, introducing the first "park and cycle" scheme and providing affordable housing close to the site allowing people to commute without a car.

The following graph and table show how the annual running costs of the Gates Laboratory compares with other computer laboratory space in more conventional buildings based on the first three years of its operation.



	Cost per m² (net useable area)	
	Gates Laboratory average/£	University average/£
Utilities	10.50	15.20
Maintenance	2.40	23.60
Total	**12.90**	**38.80**

Source: National Audit Office examination of the University of Cambridge Gates Computer Centre (more detail is provided in the case study volume)

NOTES

The graph shows that compared to a typical air-conditioned computer laboratory, the Gates Building uses about half the energy per square metre. On a cost per square basis, the table shows that the Gates building compares favorably to the wider University estate. The efficiencies have been gained through the building's design.

CASE EXAMPLE 11

Dunston Innovation Centre – Designing in low whole life costs

Chesterfield Borough Council is committed to sustainable construction practices, where both environmental and social responsibilities are met, while also delivering buildings that are fully fit for purpose. Dunston Innovation Centre, built by the Council to provide serviced office space and other support for new IT based enterprises, was opened in 2001. It is a Constructing Excellence demonstration project, with sustainability as its main theme. The Centre has a total floor area of 3,300m^2, with 35 offices, conference and meeting rooms.

The Centre was designed to reduce the building's whole life costs, minimise its environmental impact and secure future flexibility of use by:

- using a geothermal heat source to control the building's climate. The system, using a network of pipes holding water laid below ground near the building, concentrates the natural heat in the ground through a heat exchanger to provide energy for the building. This minimises the building's reliance on carbon based fuels;
- using high-specification materials and high construction standards to reduce maintenance costs;
- creating a range of office sizes to appeal to a broad range of current and future IT tenants.

Benefits Delivered

The Centre uses around a quarter of the energy compared to a typical air conditioned office building, and releases only around 40% of the carbon dioxide. It costs about £10,000 to run per year, compared to approximately £43,000 for similar sized air conditioned offices, a saving of around £33,000, based on energy costs of 4.5p per kWh. Because of the performance of the building, tenants are exempted from paying the climate change levy.

Source: Sustainability Forum

3.16 A broader assessment of the wider economic, social and environmental impact of the proposed built asset. Departments should also focus on the long term value delivered by the built asset in meeting the needs of its users over the course of its life and place greater emphasis on designing from the outset to deliver whole life value. This may mean that while the initial construction cost exceeds that of similar projects its design features will increase its whole life value, for example, by locating the project to optimise its potential contribution to regenerating disadvantaged areas and minimising its impact on sprawl and traffic congestion. Key decisions taken by all parties at the design stage can reflect the whole life value that the new building is expected to deliver in terms of, for example, operating to high environmental standards and providing a high quality environment for end users **(Case example 12 overleaf)**. It is essential to involve all stakeholders through a structured approach during the design phase so the wider economic, social, and environmental impacts and objectives can be identified and the trade-offs between them and other aspects such as cost and time can be identified and appraised.

3.17 Identifying the whole life value of a built asset is a challenging and relatively new discipline for departments and agencies. There is a need for all those involved in construction, including clients, to take practical responsibility for the delivery of whole life value and sustainability in construction. For example, Carillion, a national support services and construction firm, has met this need by developing a 'Sustainability Action Plan' based on a detailed assessment of how the company can contribute to sustainable development through its business activities. Carillion works with clients and its trade partners and supply chains to apply the approach during the design and construction phases of the work and may spend more on construction if this reduces whole life costs. For example, Carillion applied this approach on a recently completed major PFI hospital re-location project delivering significant financial savings and social and environmental benefits **(Case example 13 overleaf)**. Departments have since June 2000 been required to develop sustainability action plans.[44] It is, however, unclear to the Office of Government Commerce the extent to which this has been taken forward, and whether departments have taken full account of recent developments such as the Department for Environment, Food and Rural Affairs' Framework for Sustainable Development on the Government Estate.

44 'Constructing the Best Government Client: Achieving sustainability in construction procurement - Sustainability Action Plan' (June 2000). Produced by the Government Construction Clients Panel and endorsed by the Office of Government Commerce.

CASE EXAMPLE 12

Kingsmead Primary School

Cheshire County Council and its delivery partners made its key decisions during the design and construction of Kingsmead Primary School based on whole life value in terms of operating to the highest environmental standards and providing a high quality teaching and learning environment. Although the costs of constructing the school exceed those of other similar sized primary schools its sustainable features were designed and constructed to reduce utility and maintenance costs to half of those of conventional new school buildings.

Examples of how whole life costs will be reduced include:

- the north facing orientation of the school ensures that classrooms receive consistent and high light levels and avoids having to manage unwanted heat gain during the summer;
- the use of high levels of insulation within the building fabric and an efficient gas condensing boiler reduces running costs so that more money can be spent on books, computer equipment and other teaching materials;
- the use of a "V" shaped roof so that all rainwater that falls on the roof can be collected and used to flush toilets and urinals, reducing the demand for mains water;
- the use of sustainable materials and construction techniques to minimize the amount of energy used in its construction and at the end of its life when it is dismantled and recycled.

Examples of how the design and building of the school has delivered a flexible working teaching space in which conditions have been created to optimise the performance of pupils and staff include:

- the building is fitted with internal and external sensors to detect temperature, humidity, sunshine, rain and air movement. These are connected to a building management system which automatically opens and closes windows, sky lights and blinds, allowing fresh air to flow through the building and providing shade for pupils where necessary;
- all classrooms are square in plan and have loose desks and chairs, which can be arranged for any class size or mode of teaching. In IT classes all the laptops and personal computers supplied to pupils can connect wirelessly to the internet through the school's IT network;
- four of the classrooms are paired on either side of a folding acoustic wall, which offers high sound insulation when locked into position but can be folded away on an overhead track to encourage classes of different ages to mix.

Source: National Audit Office examination of Kingsmead Primary School (more detail is provided in the case study volume)

3.18 There are a number of practical tools available to departments and agencies to help them in assessing the whole life value of projects at the design stage. These include Design Quality Indicators[45] and the Building Research Establishment's Environmental Assessment Method (BREEAM).[46] Design Quality Indicators can be used to gauge the design quality of buildings by assessing their functionality, build quality and impact including for example, the engineering performance of the building such as its structural stability and the quality of its finishes and fittings, and the ability of the building to have a positive effect on the local community and environment. The BREEAM assesses the performance of a building in terms of its overall management policy; its energy use; internal and external issues affecting health and well being; and the environmental impact of pollution; transport; land use and ecology; materials and water consumption. This tool encourages developers and designers to consider these issues at the earliest opportunity to maximise their chances of achieving a high BREEAM rating. It is mandatory, for example, that all Department for Work and Pensions' construction projects are designed to achieve a 'very good' BREEAM rating. This forms part of the Department's 'Sustainable Development Strategy'.

45 The Design Quality Indicators were developed by the Construction Industry Council, with sponsorship from the Department of Trade and Industry, Commission for Architecture and the Built Environment, Constructing Excellence and the Strategic Forum for Construction.

46 There are now a family of BREEAM toolkits specific to different sectors such as hospitals, offices, schools and housing, some of which have been developed jointly with departments and agencies.

CASE EXAMPLE 13

Whole life benefits delivered through a 'Sustainability Action Plan' applied to a construction project

Carillion based its approach to a major PFI Hospital relocation project around the principles of a sustainable action plan. Prior to the commencement of the work on site, Tarmac Building Special Projects, (which became Carillion Building Special Projects after the Tarmac Group's de-merger) engaged with the Natural Step (TNS)[1] to develop a Sustainability Action Plan (SAP). A workshop programme was also designed to explore the more general applications of the TNS framework to the company's overall policies and practices. The SAP, one of the programme's specific outcomes, focused on the hospital project, which involved relocating an existing hospital into a new building, and identified a diverse range of possible actions which could be taken to improve the sustainability of the project.

The NHS Trust client and the company's supply chains were actively engaged in seeking design solutions that maximised community interaction with the project, reduced the impacts of transportation and considered how to optimise the impacts on wildlife, energy use, materials and waste management, local labour markets, food production and distribution, health and safety and employment for minority and underprivileged groups.

Typical savings and impacts included:

- **Energy efficient design features:** such as solar glazing and doubling the roofing insulation using a recycled rubber membrane (roof insulation at an extra one-off extra cost of £24,000 but resulting in fewer radiant panels at a saving of £26,000). This will help to reduce heating bills with a potential saving of £250,000 over the operational life of the PFI contract. The combined energy savings are projected to reduce associated emissions of carbon dioxide (2,838 tonnes), nitrogen oxide (8 tonnes) and sulphur dioxide (17 tonnes).[2]
- **Innovative waste minimisation solutions:** for example, the company worked with its plasterboard manufacturer to reduce the thickness and specification of plasterboard required. This saved some £285,000 in raw materials, labour and paint. They also devised improved delivery procedures reducing waste to landfill and avoiding landfill taxes and disposal costs of £19,800. Savings in lifetime maintenance costs are estimated at around £129,000 with reduced waste to landfill (up to 20 per cent) and 717 tonnes of waste recycled.
- **Durable and recyclable flooring:** the savings associated with less frequent replacement are estimated at £1.15 million over the PFI contract, with associated but unquantified reductions in waste to landfill.
- **Installation of an onsite 'balancing' pond for the duration of the life of the hospital:** to minimise the impact of toxic sediment run-off from the site, to control floodwater, avoid fines from water pollution prosecutions, and provide wildlife habitats and an amenity for hospital users and staff.

Source: Research carried out for the National Audit Office by the Building Research Establishment

NOTES

1 The Natural Step is a process for achieving consensus on the fundamental issues and principles which underpin sustainability. It combines the three factors of effective economic performance, environmental protection and social responsibility into a tool that enables organisations to develop a vision of a sustainable future and then plan activities to meet that vision.

2 Source of gas emissions data: 'Sustainability Accounting in the Construction Industry', Casella Stanger, Forum for the Future (2002). Published by the Construction Industry Research and Information Association on behalf of Casella Stanger.

Use the appropriate procurement and contracting strategies

Effective procurement and contracting strategies require:

- A clear understanding on the part of the client about which procurement route best fits their circumstances and capabilities.
- Clients to use their considerable leverage and influence to only select suppliers who have a proven track record in, and commitment to, developing the skills of their workforce, collaborative working, health and safety and sustainable development.
- Communicating clearly from the outset the tender evaluation criteria and relative weightings - so that potential suppliers know and understand clearly what is required.
- The use of contracts that support collaborative working – for the client and the entire integrated team.
- A well developed capability to identify and manage the construction project risks.

3.19 A clear understanding which procurement route best fits the client's circumstances and capabilities. The various procurement routes ranging from the Private Finance Initiative through to Prime Contracting and to Design and Build, described in Part 1 of this report, are usually options open to departments when selecting a procurement strategy. The choice of a procurement route depends on a number of factors. The guiding principle is that departments should select a route that aligns risks and opportunities with the parties best able to manage them. The Auditor General for Scotland's report into the delays and cost overruns in the construction of the Scottish Parliament building[47] identified a number of relevant lessons for future public sector construction projects (consistent with good practices already promulgated by the Office of Government Commerce). A key lesson was that the form of contracting must always be chosen carefully with a sound appreciation of the risks and benefits of each of the available procurement options. A comprehensive, realistic risk assessment at the outset is therefore crucial. Often, the risk is best retained and managed by the department itself, resulting in the need for a strong in-house programme management capability.

3.20 Departments should also maximise opportunities for gaining buying power, and should seek to involve contractors as early as possible in the process. Departments with substantial programmes of work should consider procuring their projects using collaborative working arrangements with their supplier partners. Several of the case studies in this report show how collaboration and integrated team working reduces costs and improves performance. Whether carrying out single projects or large programmes, departments should consider a two-stage procurement technique, to bring contactors into the design process at an early stage. Paying the contactor on a fee basis during the design stage enables the contractor to offer practical advice and simplify the construction method, maximising the chances of delivery to time, cost and quality (as illustrated in the University of Cambridge case study).

3.21 Departments can make better use of their considerable leverage by selecting contractors with a proven track record of, and commitment to, delivery, collaborative working, provision of high quality training for their workforce, health and safety, and sustainable development (including compliance with International Organization for Standardization 14000 family of standards on environmental management[48]). With planned construction expenditure of some £22 billion over 10 years the Highways Agency is a large client with the ability to influence behaviour in the supply chain. The Agency made it clear to the industry that in the future it would work with fewer and better suppliers and that it expects suppliers to adopt the principles of collaborative working. The Agency gauges the ability of potential partners to work with it by using a transparent process of assessment **(Case example 14)**. This approach has resulted in a positive change in the attitude of many suppliers who now understand and implement the principles of collaborative working. As the process is transparent, those suppliers that have not been successful in getting onto tender lists to work with the Agency have the opportunity to modify their approach and behaviour to improve the chances of their being accepted as suppliers in the future.

CASE EXAMPLE 14

Highways Agency 'Capability Assessment Tool'

The Highways Agency has a procurement strategy that is underpinned by the early creation of integrated teams and partnership working with key suppliers in long-term relationships. By adopting this approach the Agency faces the risk of engaging with suppliers who are actually unwilling or unable to work in a true partnering relationship. To help mitigate this risk the Agency has developed a cultural assessment toolkit to identify whether the sets of behaviour exhibited by a potential supplier would be conducive to a partnering relationship with the Agency.

Suppliers assess themselves against a series of criteria and the Agency then sends in a team for three days to validate the assessment through interviewing a broad range of staff from within the organisation. This results in a score that represents the Agency's view on that organisation's capability to enter into an effective partnering relationship. The Agency will use its scores from assessments, in combination with past performance data and information on market share and capacity, to form its tender list.

Source: National Audit Office follow-up examination of the Highways Agency

47 "Management of the Holyrood building project", Audit Scotland, June 2004.

48 ISO 14000 is a set of practical standards on how organisations develop and implement Environmental Management Systems to help them meet their environmental policies, objectives and targets and minimise the impact of any harmful effects from their business activities. Organisations can only be certified as ISO 14000 after an audit by an externally accredited certification body.

3.22 Communicating clearly from the outset the evaluation criteria and their relative weightings. The European Union procurement guidelines encourage clients to be clear with potential suppliers about their tender evaluation criteria. Departments that are clear from the outset about their criteria for taking decisions enhance their chances of procuring the most suitable suppliers to work on projects. Departments already understand the need to provide suppliers with a clear brief, but do not always include the evaluation criteria when seeking suppliers competitively. They should also communicate clearly with potential suppliers not only the evaluation criteria, but also the relative weightings in order to reduce wasted effort and elicit more relevant responses. For example, the University of Cambridge communicates the criteria for evaluation from the outset, setting out the relative weights for capital, whole life costs, user impact and time criteria. In this way they maximise their chances of engaging a contractor who will deliver the required service delivery improvements and efficiency savings.

3.23 The use of contracts that support collaborative working. Modern forms of contract can support clients in developing closer, more collaborative, longer-term working relationships with suppliers. The Engineering and Construction Contract (formerly the New Engineering Contract and published by the Institution of Civil Engineers) is one example of a contract written in plain English that embeds the principles of good project management in its procedures, and promotes role clarity. It encourages early issue resolution, and contains options as to the choice of procurement route. It is non-adversarial in its tone and spirit, and as such, many clients have adopted it for use in long-term collaborative working arrangements. Three of the four 2001 case study organisations now use the Engineering and Construction Contract within their framework arrangements. More recently Collaborating for the Built Environment (Be)[49] has developed a collaborative form of contract. This has widespread support from the industry and is now starting to be used on projects in the UK. Other forms of contract exist, and departments should consider each on its merits in relation to the programme or project procurement strategy. Some contracts are still written in the traditional, more adversarial approach and are not suitable for modern collaborative ways of working. The Office of Government Commerce is currently working to reduce the number of standard forms of contract being used in the public sector.

3.24 In the private sector, clients with large construction programmes know the value of effective contract incentive arrangements in stimulating good performance. For example, Thames Water uses in-house cost databases and external cost information to set a target cost for projects. If a project's costs are lower than its target, the difference is shared on a 50:50 basis. With the move by many clients towards "open book" cost control there is less scope for a supplier to generate additional profits through the contract mechanisms. A 50:50 gain-share mechanism provides an important stimulus to innovation as it becomes the main route for contractors to generate valid and transparent increases in their profits. The Highways Agency, through its Early Contractor Involvement contract has established three incentive mechanisms for contractors to deliver cost savings based on bonuses awarded for designing a scheme lower than the original budget, delivering the scheme for less than target cost and finally for delivering a saving across the whole programme of schemes against the contract budget.

3.25 A well developed capability to identify and manage construction project risks. Departments need to be more adept at identifying and considering the potential strategic impact of risks to the success of a construction project at its outset and how the risks should best be managed. In the commercial sector, BAA has taken the view that regardless of how contracts are set up with suppliers, it bears the risk of the project failing **(Case example 15 overleaf)**. This insight has strongly influenced BAA's choice of contract strategy, which is largely on a reimbursable form of contract; and is behind its decision to build a highly capable large in-house team. We have identified three areas where departments should consider taking action by:

- Focusing not only on risks but also on opportunities by putting in place supporting management processes that shrink risk and maximise the prospects of success;
- Carrying out realistic, frequent and purposeful risk assessments and placing the actions with the parties best able to mitigate the risk;
- Seek opportunities to pursue the case for project-wide insurance, not only to reduce costs through bulk buying, but also to align behaviours with the principles of integrated team working. Departments should, however, assess the costs and benefits of such approaches and whether they have sufficient capability to manage the associated risks.

49 An independent body established by industry, clients and academics to deliver research, innovation and practical demonstrations of integrated solutions that add value to the end users of built facilities and provide a sustainable built environment.

CASE EXAMPLE 15

BAA approach to risk and insurance

Based on their experience of major recent projects, for example, the Heathrow Expressway, BAA's view is that, no matter how the risk appears to be placed under different forms of contractual regime, the end result is the same: the client still pays for and bears the risk.

The objectives of team leaders and project directors are set out in their personal performance plans and their remuneration tied to success. This approach encourages them to assess the risks of not achieving their own performance plans. As such, the data in the system tends to be meaningful and purposeful and, after a process of aggregation and internal evaluation and challenge, the risks facing each team and the whole project become clear. The process identifies the root cause of each risk, enabling the risk to be managed in the most effective way.

As BAA identified that it was bearing the risk of the failure of its Terminal 5 construction project, it took out project-wide insurance covering loss or damage to property, injury or death and also covering professional indemnity. Bulk-buying reduced the costs of its insurance and avoided wasted effort and duplication on behalf of all its partners. Crucially, it placed the responsibility with BAA, who is best placed to manage the risk in the first place.

Source: National Audit Office examination of BAA (more detail is provided in the Case study volume)

Work collaboratively through fully integrated teams

Working collaboratively through fully integrated teams requires:

- **The cultural change required for new ways of working to be embedded across the client organisation and the entire supply chain.**
- **Early contractor and specialist supplier involvement at the earliest stages of projects, including those involved in design – to maximise the opportunities for, and benefits of, value management and innovation.**
- **Maintaining an element of competitive tension in partnering arrangements: to maintain commercial pressure for reduced costs and improved quality.**
- **Certainty of payment from the client to all in the supply chain – so that all in the supply chain can be confident to invest in capacity and innovation.**
- **Managing the risk of failure at the handover phase of the construction project - in an integrated and planned way.**

3.26 The cultural change required for new ways of working is embedded across the client organisation and the entire supply chain. All of the 2001 case study organisations have found that shifting the attitudes of those used to working in traditional and often more adversarial environments on construction projects, on both the client and contractor side, has taken longer than they expected. High quality joint training has proved valuable, involving all client teams and where appropriate main contractors at all levels, in project management, new procurement approaches and developing and embedding cultural change from adversarial to collaborative working. On ProCure21 projects NHS Estates encourage the Trust team and the selected Principal Supply Chain team to have an away day together before the commencement of the project to discuss working methods and to understand better the other parties' objectives for the project.

3.27 Where the client is able to work with the integrated project team at the earliest stages of the project they are better able to identify, articulate and share the objectives of the project. During the very early stages of the construction projects for Kingsmead Primary School and Blyth Community College there was a very clear understanding on the part of the clients and the key suppliers that the schools should not just be regarded as buildings but as environments that would provide excellent teaching and learning environments, and act as a means to improve educational attainment and contribute to the wider community. Once all parties were able to share these objectives they were better able to invest resources in identifying together the most cost-effective design solutions over the lives of the buildings; decide how the design and construction would impact on costs and health and safety during the construction and how operational efficiency could be maximised when completed.

3.28 Partnering differs from the traditional client and contractor relationship by forming a co-operative project team comprising the client, designer, main contractor and specialist contractor who each have the shared objective of achieving the best possible outcome for the eventual user of the construction project. There is much innovative thinking on collaborative working in the commercial sector from which departments can draw useful lessons:

- Where BAA has been successful in adopting a collaborative approach it has recognised the importance of supporting cultural change by setting up framework agreements with partners and paying attention to softer issues such as the training and support that is required to enable staff to adapt the approach **(Case example 16)**.

CASE EXAMPLE 16

BAA's approach to collaborative working

BAA's aim is to establish one common team, comprising people from BAA and different partner businesses, working to a common set of objectives. To achieve this BAA:

- Set up framework agreements with partners to provide a mechanism to bring talented people into the project. The framework agreements do not specify the work required, nor offer a commitment to a given level of work. They are simply a statement of capability and capacity from the partner organisations. They enable BAA to assemble project teams from expertise within the partner firms in a way that is compliant with EU legislation.
- Introduced an organisation structure based on the delivery of products, not on the constituent partner companies. The products themselves are seen as operational facilities, not construction outcomes and BAA considers it is creating an operating terminal, not just a set of buildings.
- Aims to pick the best people to suit the particular project needs, irrespective of their parent organisation. This is a highly sophisticated approach, requiring both judgement and experience of the "intelligent client". In selecting people to be in the core project team, BAA seeks highly experienced and capable individuals, on the basis of merit, from significant UK and international projects both from the construction industry and from other disciplines.
- Uses collaborative project software to make available important information such as the timetable, the risk reports, and the work scope to the integrated project team. The aim is to communicate openly in a timely way, and so reduce misunderstanding and delays.

Culture change is seen as a vital, ongoing element of the entire project. Recognising that in the UK clients and contractors are not necessarily used to working in an open collaborative way, the project employs some 30 "change managers" to offer training and support in collaboration techniques and in team-work, and to offer facilitation support when teams face particular challenges.

Source: National Audit Office examination of BAA (more detail is provided in the Case study volume)

- Stanhope continues to work collaboratively with a number of selected specialist suppliers using contracts specifically evolved for this purpose. Packages of work are not tendered; instead prices are negotiated based on benchmarked data and previous work. This approach allows Stanhope to bring in suppliers early to add value, utilising their expertise and experience from past projects. Early negotiation in this way ensures that Stanhope gains a better understanding of the suppliers' expertise and capacity. Suppliers are also aware of Stanhope's expectations and approach so there is no lost time through steep learning curves at the start of projects.

3.29 Contractor and specialist supplier involvement at the earliest stages of projects. Where the client is able to work with the integrated project team at the earliest stages of the project they are better able to identify the most cost-effective design solutions over the life of the built asset, advise on how the design will affect costs and health and safety during construction and its operational efficiency and environmental and other impacts when completed. The Environment Agency has, for example, realised over £4.4 million in avoided capital costs (3.1 per cent of programme costs) and identified a further £5.8 million of possible additional savings in the first nine months of 2004 simply from innovative value engineering arrived at by integrated teams working together at the early stages of projects to reconsider proposed flood defence schemes. It also has a number of other notable successes in earlier periods **(Case example 17 overleaf)**.

CASE EXAMPLE 17

Rother Tidal Flood Defences and Fishmarket – early integrated team involvement to deliver a cost-effective and environmentally sustainable solution

The Environment Agency had established firm proposals for the replacement of erosion control systems and the raising of flood defence systems on the River Rother (East Sussex). The estimated construction cost was £9 million and involved the use of sheet piling.

The Agency brought together a collaborative team consisting of the main contractor, consultants and specialist engineers all of whom had been contracted under the new longer-term framework agreements to reconsider the scheme. With the Agency they were encouraged to work together, including sharing a joint project premise, and developing a lower cost solution.
The team identified:

- An alternative solution over part of the project, using an innovative 'soft engineering approach' which involved using a grid of hardwood posts in-filled with willow frames that would allow re-growth of natural vegetation which in turn would catch silt. The solution was tested and the first phase implemented delivering savings of £170,000 with other phases projecting similar savings in capital costs of up to £300,000;
- Original designs included the installation of tie rods to retain the new walls. Despite very poor ground conditions the team pursued ground anchors trials that proved their capability. This in conjunction with other efficiencies enabled a reduction in capital costs of £450,000;
- The scope for more efficient on-site construction by sharing resources and equipment with another nearby project site in which integrated team members were involved, saving a further £200,000.

The Agency considers it obtained a better engineering solution that will last up to 20 years longer than the initial design, which also has significant environmental benefits at a saving of £1,120,000 (12%) on the construction cost of the original solution. The contractors and consultants considered that without the early joint working approach the solution and savings would otherwise not have been identified.

Source: National Audit Office follow-up examination of the Environment Agency

3.30 By adopting the ProCure21 approach Milton Keynes NHS Trust was able to mobilise very quickly the design and construction teams for the project to build its treatment centre. This approach allowed the Trust to work with the constructor and installers to simplify the construction of the centre and to contain its cost risk. The combined team effort brought the forecast cost down by £3 million from its initial level of £15 million to within the set budget without compromising the users' requirements **(Case example 18)**.

3.31 Maintaining an element of competitive tension in partnering arrangements. Unless clients have very good information on historic costs and are able to assess the value of work very accurately there is a risk that partnering arrangements, through the absence of competition other than at the outset, can lead to reduced commercial pressure to minimise costs and improve performance. This risk can be exacerbated if the number of suppliers engaged under framework arrangements falls during the framework term. For example, this may occur if some suppliers decide to exit the framework because they are not winning work, or the volume of work falls below expected levels.

3.32 Thames Water has recognised the benefits of long term relationships and collaboration with its supply chain but is also aware of the need to maintain an element of competitive tension throughout the process. It has achieved this by having two tiers of suppliers in each of its four operational areas with a tier one supplier operating in one area being a tier two supplier in another area. Cost consultants estimate the price for a project based on historical benchmark data tailored to the circumstances of the project. Thames Water then offers the work at that price to a first tier supplier and if the supplier does not want to take that price Thames Water will offer the work to one from another area. The risk of work passing to another contractor acts brings commercial pressure into the whole process. To inject a further competitive element Thames Water tenders around 10 per cent of its work in the open market rather than procuring it through the framework arrangement.

3.33 Certainty of payment from the client to all in the supply chain. Departments need to provide specialist small and medium sized suppliers with greater certainty that they will be paid on time to reinforce the trust that should exist between all parties for collaborative working to operate effectively. If this trust does not exist in the supply chain then specialist suppliers, who can

CASE EXAMPLE 18

Milton Keynes Treatment Centre – Early involvement of principal supply chain partners to reduce the cost of construction

The Government's stated policy of reducing waiting lists, combined with an expansion in the population of approximately 3,000 people per year within the Trust's catchment area required its further rapid expansion. The Trust Board decided to build a 60 bed Treatment Centre at the hospital, as a matter of priority. The Board faced two main challenges (1) meeting the deadline of completing the facility by December 2004, twenty four months after its start in December 2002 and (2) ensuring that good value was obtained, by not paying over the odds for a project that was, by necessity, time-driven.

A larger PFI solution with construction costs of approximately £20 million was initially developed. However, the Trust concluded that a PFI approach would not provide a solution in the time available. Further, alternative procurement routes such as Design and Build, Prime Contracting and Construction Management were felt to be too risky from a cost and time perspective. The Trust therefore decided to adopt the ProCure21 approach in order to mobilise the design and construction teams very quickly, while at the same time enabling the Trust to contain its cost risk.

With the supply chain appointed, the Trust worked with Norwest Holst and the rest of its principal supply chain partners to develop a solution that would not exceed a budget of £12 million. For three months, the principal supply chain partner worked on a fee basis, developing options for the hospital to consider. At that point, the design solution was sufficiently stable, and acceptable to the Trust, to enable the principal supply chain partner to enter into a guaranteed maximum price contract. The combined team effort brought the forecast cost down from its initial level of £15 million to £12 million without compromising the users' requirements and the Centre was delivered to time and budget.

Source: National Audit Office examination of Milton Keynes Treatment Centre (more detail is provided in the case study volume)

CASE EXAMPLE 19

The use of 'project accounts' to provide greater certainty of payment to specialist contractors and suppliers in the supply chain

The Defence Logistics Organisation Offices at Andover North was the first major capital prime contract to be let by Defence Estates. Key to the success of the project and achieving the required financial performance was the development of effective collaborative working between those responsible for the project.

Defence Estates was concerned to ensure the timely payment of all parties working in the supply chain to manage the risk that the prime contractor might unfairly withhold payments from subcontractors. A project bank account was set up in trust for the whole supply chain and payments from it needed the authorisation of the client and the prime contractor. Defence Estates also had the ability to audit the account. Interim applications for payment were put together by the supply chain and interim payment was certified by Defence Estates and the allocation of payment was agreed on the basis of principles which had been agreed by all those involved in the supply chain. The payment schedule was then certified by the client and prime contractor. Once Defence Estates had advised its finance department of the amount to be paid into the project bank account a signed payment breakdown analysis was forwarded to the bank and the bank would then distribute monies to the supply chain without delay.

Not only did the use of a single project bank account help to ensure the timely payment of all parties in the supply chain, it also protected Defence Estates against unforeseen circumstances. CITEX, the main contractor on the project, went into administration and the funds within the bank account were claimed by the administrators as a CITEX asset. Had the funds from the project bank account been taken by the administrators there would have been no funds to pay the supply chain and the success of the project would have been placed in jeopardy. The legal position was, however, a clear one. The project bank account had been set up in trust for the supply chain of which CITEX was only one member. The account could not therefore be claimed as a CITEX asset and it continued to be operated for the benefit of those working on the project by Bucknall Austin, the successor organisation to CITEX.

Source: National Audit Office examination of Defence Estates (more detail is provided in the Case Study volume)

significantly influence the value for money obtained on a project, will have little incentive to innovate. Considerable losses can also be incurred over payment disputes which will ultimately feed their way back into the costs for the client. The use of a single project account is one way to provide greater certainty of payment to specialist contractors and suppliers further down the supply chain from the main contractor. During the construction project to deliver the Defence Logistics Organisation Offices at Andover North, Defence Estates used a single project bank account to ensure that all parties working in the supply chain were paid on time and to avoid the risk of the main contractor withholding payment from other suppliers **(Case example 19)**. NHS Estates has set up liaison arrangements enabling specialist suppliers to raise concerns direct with them about any problems in payment practices or other behaviours on the part of the main contractor contrary to collaborative working. It has also established an independent review panel with representatives from the National Federation of Builders and the Specialist Engineering Contractors Group to review contractual arrangements and report any issues.

3.34 Managing the risk of failure at the handover phase of the construction project. Traditionally, the handover phase of projects is one of high risk to clients. As deadlines approach and budgets are used up, contractors' motivation declines, corners can be cut on quality, commitment to health and safety can lapse and often cost and time overruns can be incurred. The client may end up with a building with serious defects and little experience in how to resolve them. One of the main benefits of the Private Finance Initiative is that the contractor remains involved at the very least in the maintenance of the built asset, and is therefore more likely to design in, for example, low operating costs and easy to maintain quality build finishes.

3.35 Even for non-PFI projects, by ensuring that the construction team remains together and involved in running projects after their completion departments are better able to ensure that the building is fit for purpose, that its expectations have been met and that its own facilities management team will have a chance to learn the new operating systems. Where problems in the design and construction have become apparent the department can involve the supplier in identifying solutions. One particular approach that departments might consider is "Soft Landings" where the supplier provides an extended period of commitment after the building is completed. By adopting a similar approach Defence Estates is able to work with the supplier to assess together how effectively the design of the Defence Logistics Organisation Offices was working. Where technical problems were identified Defence Estates had a single point of responsibility to identify potential solutions **(Figure 26)**.

26 The benefits of involving contractors in running the built asset post-handover

Soft Landings: Usually, on payment of the final account the contractor team hands over the completed building to the client who then occupies the building. With this approach, there is a risk that useability and quality issues with the building can become genuine sources of contention that may escalate to the extent that the client's expectations for the project are not met. Additionally, regulation, particularly with regard to environmental performance, is adding to the pressure to deliver a more predictable building. These issues are driving an agenda which seeks to encourage those responsible for a building's design and construction to work more closely with the client after it is completed, to deliver a product that achieves a closer match between the expectations of the client and users, and the predictions of the design team. The 'Soft Landings' initiative seeks to point the 'contractor side' to more involvement with the users, and to make a better assessment of future building performance.

A 'Soft Landings' team, typically the mechanical and electrical contractor, the architect and the main contractor, occupy the building in the move-in period, allowing emerging issues to be dealt with effectively, and further encouraging the new users to interact with them. The 'Soft Landings' team's role then becomes one of monitoring the building's use and performance during the first three years of occupation, fine tuning the buildings' systems if needed. After the first 18 months, there is an independent post-occupancy evaluation, which is integrated into the 'Soft Landings' approach.

'Soft Landings' is a new initiative. Early indications from users (including the University of Cambridge) adopting it are that it helps to deliver buildings that perform according to their initial design. As use of the approach becomes more widespread, further quantifiable benefits of improved user satisfaction and better environmental performance will be delivered.

University of Cambridge: The University, an original supporter and fund raiser for 'Soft Landings' research, now applies 'Soft Landings' principles on all projects, and it is included formally on contracts over £5 million. Under the approach, key members of the design team, for example the mechanical and electrical engineers, the architects, the contractors and the mechanical and electrical sub-contractors, occupy the building for a period after formal hand over, facilitating the handover process by carefully commissioning the building, setting performance targets, and developing good briefing guides for users. The University may incorporate financial incentives for the contractor team to meet building performance targets. The post handover occupation period can vary from a few months to a number of years depending on the contract. The approach fosters long term commitment between the University and contractors, bringing with it the potential to yield further improvements on future collaborative projects. The University notes that 'Soft Landings' helps to focus the designer's mind on how people use the building; it encourages the users to interact with the designers and contractors, and helps to build trust between them.

Defence Estates: By having the prime contractor responsible for maintaining the building fabric and engineering services for seven years after the completion of the Defence Logistics Organisation Offices there was a smooth transfer from the construction phase to its occupancy and use. There was an opportunity for the client and prime contractor to assess together how effectively the design of the building was working and, where there were technical problems, there was a single point of responsibility to identify potential solutions.

Source: National Audit Office

Evaluate performance and embed project learning

A rigorous approach to evaluating and embedding project learning requires:

- **Establishing the appropriate measures and targets for improvement from the outset – with responsibility for monitoring and external reporting of performance resting with a department's 'centre for excellence'.**
- **Repeat evaluations of the achievement of all the key targets and benefits – including targets for cost and time predictability, whole life costs, business operating costs, service improvements and other economic, social and environmental benefits that have been delivered by the construction project.**
- **An honest assessment of the level of performance that was delivered by all parties during the course of the project - capturing and sharing the lessons they have identified within the department and across government.**

3.36 Establishing appropriate measures. Departments should be able to show the extent to which there have been continuous improvements in their own construction performance and in the performance of their suppliers. Departments should establish measures, such as Constructing Excellence's Key Performance Indicators, that reflect their progress in a range of areas, not just in the delivery of construction projects to time, cost and quality. The Environment Agency has, for example, in addition to its targets for unit costs, time predictability and cost certainty, targets relating to pollution and waste. The responsibility for reporting performance against targets and measures should rest with a department's centre of excellence.

3.37 Repeat evaluations. Although the construction project may meet its targets for being delivered to time and cost there are other issues relating to its whole life costs and whole life value that can only be assessed through repeat evaluations. Such an approach will enable departments for example, to identify the impact of particular design features or approaches to construction on the whole life costs of the building such as where maintenance and utility costs have been reduced. Repeat evaluations will allow the department to gauge the extent to which improved construction has contributed to improving service delivery and providing social benefits, for example where a well designed school has helped to reduce truancy rates and improve educational attainment.

3.38 Assessing the level of performance of all those involved. After a project is complete there is significant value in the department investing resources in evaluating how well the project was delivered and assessing the level of performance of all the parties involved. Shortly after the Department for International Development moved into its new headquarters it held a Post Project Review Workshop to review the completed project through its various stages from inception to completion and to identify both the successful and less successful aspects of the process. The exercise identified, for example, that the partnering approach had worked particularly well and recommended that it should be used on future projects.

3.39 In the private sector Stanhope places great importance on evaluating and measuring the success of its projects and adding information to its database of performance. It is also active in using these lessons and benchmarks to drive further improvements in performance on future projects and it will also typically seek to keep the same integrated team together wherever possible **(Case example 20)**.

CASE EXAMPLE 20

Stanhope's approach to evaluating performance and embedding project learning

Stanhope and its clients recognise the value of measuring the success of a construction project after its completion. The "aftercare" stage of its construction process involves the benchmarking of project data and a review of performance against the targets that were set up for the project at its start. Stanhope also obtains feedback from the occupiers of the building to gauge satisfaction and to identify where improvements could be made in the future. By capturing and sharing the lessons learnt from each project, Stanhope is then in a strong position to identify the future areas of research it needs to commission in order to improve the quality of its future construction projects.

Source: National Audit Office examination of Stanhope (more detail is provided in the Case Study volume)

GLOSSARY

Claims	A request for financial compensation for delay, disruption or change in scope to a project. This may take place either using existing mechanisms within a contract or on an *ex gratia* basis.
Design Quality Indicator	A method of assessing the design quality of buildings, developed by the Construction Industry Council, which assesses a building in terms of its functionality, build quality and its impact on the community and the environment.
Engineering Construction Contract	A more recent version of the New Engineering Contract (see below).
Guaranteed maximum price	A form of contract where the client and contractor agree a maximum price for the project. The contractor is responsible for costing all elements of the project (including any sub-contracts), overheads, and a commercial margin. Apart from changes instructed by the client, and any specific exceptions for which the client bears the risk, any costs incurred beyond the guaranteed maximum price are borne by the contractor.
Main contractor or supplier	The principal contractor engaged by the client to complete the built asset(s).
New Engineering Contract	A family of standard commercially available contracts that embrace the concept of partnering to encourage employers, designers, contractors and project managers to work together, through both a management tool and a legal framework to facilitate all aspects of the creation of construction projects.
Pre-fabrication	The manufacture of substantial components of a built asset (for example roof sections) away from the construction site before they are brought to site and installed.
Private Public Partnerships	A formal agreement between a public sector client and one or more private sector companies to deliver a service or services.
Project Sponsor	The Project Sponsor is the client representative who acts as a single focal point of contact with the project manager representing the interests of the client organisation, in particular the end users of the built asset.
Reimbursable contracts	A form of contract in which the contractor's costs for labour, plant and materials are reimbursed at cost by the client, and in which the contractor earns a pre-defined profit margin.

Retentions	A sum of money held back (typically five per cent) by the client as a safeguard against faulty work by the contractor(s).
Senior Responsible Owner (SRO)	The Senior Responsible Owner is the individual responsible for ensuring that a project or programme of change meets its objectives and delivers the projected benefits.
Specialist contractor or supplier	A contractor engaged by the main contractor to deliver specialist elements or skills (for example the installation of air conditioning) as part of the construction process.
Standardisation	The use of components which are made to a general manufactured specification rather than an individual project specification.
Target cost or price	A target cost for the completed project agreed between the client and the contractor which is used as a basis for calculating a bonus or penalty.
Two-stage contracting	A contractors' services are procured in two stages, to provide a vehicle for early contractor involvement. In the first stage, the contractors' input is procured on a fee basis. In the second stage, the contractors' input is governed by the chosen procurement strategy.
Value management or engineering	An approach which seeks to identify a series of desired outcomes; the benefits that will lead to those outcomes and the most cost-effective way of delivering them.

APPENDIX 1

Methodology

Our methodology consisted of:

Data Analysis

We analysed 142 projects of £1 million or more in value completed between April 2003 and December 2004 to assess progress towards their Achieving Excellence targets on cost and time predictability as well as on other aspects of construction performance held centrally by:

- the Office of Government Commerce;
- the Department of Trade and Industry for construction output and manpower; and Constructing Excellence for construction Key Performance Indicator information including on its demonstration projects.

Follow up examination

We assessed the impact of improvement initiatives on construction performance of the four case study departments which featured in our 2001 report (Defence Estates, Environment Agency, Highways Agency and NHS Estates).

Workshops

We held seven workshops to obtain the views of a wide range of stakeholders on the extent to which departments and agencies have improved their construction delivery performance and what more needs to be done to improve performance further.

The workshops involved over 70 participants covering:

- Academics and experts;
- Major construction suppliers;
- Major repeat government clients (for example Defence Estates and the Environment Agency);
- Downstream public sector clients (for example local education authorities and county councils);
- Infrequent clients (for example the Competition Commission and English Heritage);
- Funding organisations (for example the Housing Corporation and the Learning and Skills Council);
- Small and medium sized enterprises.

Case studies

On the basis of interviews and visits to public and private sector clients and projects we identified ten case examples where organisations had implemented principles of good practice which had resulted in their being able to improve their construction delivery performance. The case examples are shown in the associated volume to this report:

- BAA;
- Blyth Community College;
- University of Cambridge;
- Defence Logistics Organisation Offices;
- Department for International Development;
- Kingsmead Primary School;
- NHS ProCure21 and Milton Keynes Treatment Centre;
- Royal Mail Property Group;
- Stanhope;
- Thames Water.

Expert analysis

We engaged independent consultant Matthew Symes (Concerto Consulting Ltd), a construction programme and project management expert, to run our workshops, accompany the NAO team on case study examinations and provide advice to the team throughout the study.

We commissioned George Martin, Director of Sustainability at the Building Research Establishment to produce a report setting out how construction decisions can affect the achievement of whole life value and sustainability.

APPENDIX 2

The main roles in construction projects and how these vary under different procurement routes

All three procurement routes are considered to foster integrated team approaches.

		PPP/PFI	Prime Contracting	Design and Build
		Suits larger scale and duration projects. Includes on-going maintenance and operation provided by private sector as part of the service being procured.	Applies to a wide range of projects. Greater scope for repeatable integrated teamwork between the client and supplier.	Can be used on complex projects, but is often used on simpler ones. Comparatively less scope for integrated teamwork.
Main role		**Nature and intensity of involvement**		
Senior Responsible Owner (SRO) *also referred to as "sponsor" in local government and often in the private sector*	Senior leadership and direction. Scope definition. Outcome accountability, and link to programme organisation.	Intense, during business justification and procurement, with strong discipline required over change control during delivery and operation of the asset.	Less intense once contract is established, but more sustained through delivery of the asset. SRO particularly important in fostering strong team-working culture on this procurement route.	Input required at key procurement and concept design stages, but the extent may vary depending on the design 'freedom' given to the contractor.
Project Sponsor *also referred to as "client manager" in local government or "senior user" in the private sector*	Business knowledge, and interpretation of requirements. Decisions about use and function.	Intense, especially during business justification and procurement and at delivery/launch.	Less intense once contract is established, but continued input required during design and at delivery of asset and associated services.	Continued input required throughout.
Project Manager	Day to day leadership and management. Identification, co-ordination and integration of the team.	Intense, especially during business justification and procurement stages. Strong change control discipline during delivery but low/nil operational role.	Less intense, but more sustained through delivery.	Main input is in procurement, monitoring and handover. Strong change control and management of quality likely to be required in delivery.

APPENDIX 3

Progress against recommendations made by the Committee of Public Accounts in 2001

Improving Construction Performance, Second Report 2001-02 (HC337, 2001-2002)

Conclusion/Recommendation	Achievement	NAO's assessment
On improving value for money in departments		
(i) We welcome recent initiatives to improve construction performance. There have been, however, numerous previous initiatives over many years which have failed to secure improvements. If the current drive is to succeed it is essential that all departments and their agencies promote change in the industry by improving their management of construction projects through practices such as clear project sponsorship and robust project management (paragraph 17).	The Office of Government Commerce and the Office for Public Services Reform launched jointly in 2002 "Improving Programme and Project Delivery" to tackle weaknesses in project and programme management. The initiative provides high level practical guidance on programme management tools. It draws on and links to more detailed guidance and a full version of the framework has been incorporated into the Office of Government Commerce toolkit.	Momentum in the overall movement for change needs to be regained. The Office of Government Commerce's main mandate is to guide. This, however, limits its impact and there is no forum across departments for co-ordinating opinion, policy and programme resources. A new forum for senior departmental managers should be formed to consider construction planning and approaches, supported by the Office of Government Commerce as secretariat.
(ii) Ensuring that departments improve their performance in managing construction projects requires reliable information so that progress can be monitored and corrective action taken where necessary. The Office of Government Commerce should monitor what benefits are being achieved by departments against the baseline established in 1999, should spread examples of good practice, and should encourage departments to use this information to improve their performance (paragraph 18).	The Office of Government Commerce is monitoring performance against the baseline established by the University of Bath in 1999 as part of monitoring the Achieving Excellence Strategic Targets. Our analysis of data from 142 projects found that 55 per cent were delivered to budget between April 2003 and December 2004 compared to just 25 per cent in 1999. Some 63 per cent were delivered to time compared to 34 per cent in 1999. The Office of Government Commerce will continue to support Constructing Excellence by disseminating examples of good practice through its Demonstration Projects programme and encourage departments to take part in the programme.	The guidance and support provided by the Office of Government Commerce has been an important factor in achieving these improvements. In spite of this progress, however, it is unlikely that the Government's target for 70 per cent of all construction projects to be delivered on time and budget by Mach 2005 will be met. There is still a lack of standard data collected centrally on the number of construction projects that are under way to allow an assessment of how well they are performing. More needs to be done to gather and collate performance information, categorise, interpret and present it.

Conclusion/Recommendation	Achievement	NAO's assessment
(iii) Much of the effort by the Office of Government Commerce to improve the performance of construction projects is directed at the large spending departments. Smaller departments and agencies individually may spend less but collectively have a substantial construction programme. The Office of Government Commerce has started discussions with smaller departments on how they can better their construction performance. The Office should secure the adoption of the same rigorous project management and controls and principles of achieving long-term value for money (paragraph 19).	The Office of Government Commerce has reviewed and updated its Construction Procurement Guidance. It has published good practice guidance on value for money in complex procurements and contract management; its Achieving Excellence guidance and Information Notes, incorporating lessons learnt from Gateways and demonstration projects. Its Centres of Excellence have an ongoing programme of meetings with departments to discuss how best to improve value for money on construction projects.	There is now ample generic procurement guidance available to departments and agencies but more needs to be done to promote the information and guidance. The main shortfall is in guidance on collaborative working techniques, and in the culture change associated with the new way of workings. The Office of Government Commerce is far more successful in reaching out to the largest spending departments. Much less progress has been made in reaching the smaller or infrequent client departments. This is where the Office of Government Commerce needs to focus its future efforts. Several departments do not follow the Office of Government Commerce's processes or advice and there is a lack of guidance pulling together good practice on structures and programme management practices.
On improving industry performance		
(iv) Given the size of the construction industry, there is likely to be a role for a variety of organisations in promoting good practice. The current range of advice on offer carries the risk that people in the industry may find it difficult to identify the source of assistance most appropriate to their circumstances and where best to devote their efforts to bring improvements in the industry's performance. The Department of the Environment, Transport and the Regions working with the Construction Industry Board, should develop a clearer marketing plan for the various improvement initiatives with better signposting for potential users so that they can find the most appropriate source of advice (paragraph 28).	Since the first report, the responsibility for performance of the construction industry has transferred to the Department of Trade and Industry. The Construction Industry Board has ceased to exist. The Department has accepted the need to improve the clarity on where potential users can access support and advice.	Many clients still seem very confused by the number of initiatives and advisory groups. In part this is caused by the fragmentation of lead responsibilities for construction across ten departments and agencies. Information, particularly for the infrequent clients, is hard to find and navigate. More needs to be done to improve this, and to co-ordinate the information and initiatives run by the Department of Trade and Industry and the Office of Government Commerce.

Conclusion/Recommendation	Achievement	NAO's assessment
(v) Demonstration projects which reflect good practice in construction performance are an important means of disseminating lessons. As at May 2000, however, only 31 of the 71 demonstration projects submitted by the Industry since November 1998 had been accepted as demonstrating benefits which could be transferred to other projects. The Department of the Environment, Transport and the Regions assured the Committee that the criteria to qualify as a demonstration project are now better defined. The Department should nevertheless work with the Movement for Innovation to develop a more robust method for measuring the performance of these projects and sharing the lessons with the industry (paragraph 29).	An independent review of the demonstration project programme made recommendations about the application process and monitoring which have been taken on board. A strategy panel now identifies the type of demonstration projects needed to develop the knowledge base. Demonstration projects have shown a substantial enhancement in performance when compared to all industry average key performance indicator data results. Over 330 case studies and reports on individual projects have been published and results are built into case studies and disseminated by Constructing Excellence through its website, workshops and other events.	The objective stated has been achieved. More now needs to be done to publicise and disseminate the information.
(vi) The Construction Good practice Programme was established in February 1998 to raise awareness across the construction industry of the need to improve, to identify good practice, and to disseminate that good practice to companies. It is however estimated that the programme has reached only 9 per cent of those working in the industry. That figure admittedly represents over 170,000 people; and difficulties also exist in communicating within an industry which has many different characteristics. The Department of Environment, Transport and the Regions should nevertheless explore ways in which the programme can be better presented so that it reaches a higher proportion of the industry's workforce (paragraph 30).	The Department of Trade and industry consolidated a variety of Government initiatives, including the Movement for Innovation and its demonstration projects, within Constructing Excellence which is now focused on delivering targets from the 1998 Rethinking Construction and 2002 Accelerating Change reports. Constructing Excellence is building links with industry organisations to enable companies to have access to advice and support. The Strategic Forum for Construction provides strategic direction for the improvement agenda and comprises representatives from across the industry, clients and observers from departments. It links strategic groups tackling different issues in the industry such as research, sustainability and insurance.	Whilst progress has been made, the consolidation of initiatives by the Department of Trade and Industry and the Office of Government Commerce to refocus improvement agendas needs to continue so that departments and agencies are not confused or overloaded.
(vii) The drive to improve the performance of construction projects depends on public and private sector clients improving their performance in their purchasing and management of construction and also on the industry delivering better quality services. The Department of Environment, Transport and the Regions are seeking to work with those in the industry who are committed to these changes. The Department should convince all sectors of the construction industry of the benefits to both suppliers and clients of achieving long-term improvements in the performance of construction projects, and should secure the commitment of all sectors of the industry to achieving that goal (paragraph 31).	The Achieving Excellence Future Strategy includes help for departments to implement its recommendations and the Office of Government Commerce continues to demonstrate programme requirements and its impact in delivering value for money. The Accelerating Change report identified key targets for issues that will deliver industry improvement. The report led to the formation of the Strategic Forum for Construction to provide an industry lead to the agenda. All industry sectors and clients are represented and government organisations have observer status. It monitors delivery of targets in Accelerating Change and encourages improvement in the industry.	Significant progress has been made in establishing longer-term collaborative working arrangements. There is now a clearer recognition among departments and agencies of the importance of improving construction delivery performance and the contribution that good construction can make to increasing business effectiveness and improving the quality of service delivery. The issue is the rate of culture change and there remains much scope, however, for departments, agencies and the industry to improve further their performance.

Conclusion/Recommendation	Achievement	NAO's assessment
On new forms of contracting		
(viii) There is scope for benefits in terms of quality, faster construction times and financial savings through contractors and their clients working more closely together in longer-term relationships (partnering). Subject to appropriate safeguards, such productive relationships deserve to be promoted in public sector construction. The safeguards include the appointment of partners through competition; periodically re-tendering; agreeing clear, measurable targets for continuous improvements in quality, delivery time and cost reductions; establishing payment arrangements to give contractors incentives to be innovative and cost effective; and securing reasonable access to contractors' financial records and cost information to check that agreed improvements in efficiency and performance are being achieved (paragraph 34)	The practical implementation of measures relating to partnering and integrated teams is now in place through initiatives such as NHS ProCure21, MOD Prime Contracting, the Highways Agency "Early Contractor Involvement" programme and the Environment Agency's new procurement strategy. An industry group under the Strategic Forum for Construction developed a toolkit to enhance understanding of what "integrated working" involves and the infrastructure needed to make it successful. Constructing Excellence provides small and medium size enterprises with information and benchmarking services through industry trade associations.	The main departments have all made progress in establishing longer-term collaborative ways of working with their suppliers. Early results show reduced procurement times, reduced procurement costs, less adversarial relationships, and in most cases no financial claims. Most departments use non-adversarial forms of contract such as the New Engineering Contract and the Engineering Construction Contract which embody partnering and good project management. Further, the infrequent client departments have not been able to establish longer-term collaborative relationships with suppliers. More needs to be done to embed collaborative working approaches through to smaller suppliers. Models such as NHS Procure 21 could be used on a more generic basis to support infrequent clients.
On the skills of the construction workforce		
(ix) The Committee welcomes the commitment made by the Confederation of Construction Clients and major contractors to work to achieving a fully qualified workforce by the end of 2003. The Department of Environment, Transport and the Regions should work closely with the industry to develop and monitor plans to improve technical and professional skills so that it can recruit, train and retain a skilled workforce (paragraph 39).	Targets set by the major contractors for a fully qualified workforce by end 2003 were not realised, although very significant progress was made. Construction Skills Certification Scheme (CSCS) registrations have passed the 600,000 mark. The Office of Government Commerce issued guidance in 2003 on the need for those working on site to show they have the necessary skills to work competently and safely. The Strategic Forum for Construction Target Monitoring Group oversees the progress towards Accelerating Change targets, and those covering recruitment and graduate applications are on track.	Despite the progress, this is still an issue. There are skills shortages at all levels. More needs to be done to increase the numbers of qualified people in the industry. While partnering is delivering improved cost and time predictability more needs to be done to inject competitive tension into partnering arrangements, to maximise the benefits of performance incentive arrangements, secure fair payment practices for specialist suppliers and develop unit cost databases to track improvements in efficiency.

Note: all recommendations for the former Department for the Environment, Transport and the Regions became the responsibility of the Department for Trade and Industry.