



National Audit Office

A REVIEW BY THE  
PRIVATE FINANCE  
PRACTICE

OCTOBER 2009

# Performance of PFI Construction



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OCTOBER 2009

Construction performance is central to achieving the Government's delivery of capital projects. This report examines how PFI, one of the procurement options available to public officials, performs to contracted timetable and to price.

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## Foreword

One of the core areas of debate around the use of the Private Finance Initiative (PFI) concerns the performance of PFI construction projects, and in particular whether they deliver to the expected time, price and quality.

The National Audit Office has, ever since the inception of the PFI, been at the forefront of objective, independent analysis of the circumstances in which PFI projects offer value for money to taxpayers. In addition to reports focused on individual contracts, and those focused on the performance of private finance in specific sectors, we have, from time to time, reported on issues of cross-cutting interest. One of our cross-cutting reports in 2003 examined the evidence surrounding the delivery of Private Finance construction programmes to the time and price expected by the public sector in the contract. This report attracted debate and has subsequently been extensively quoted in a range of official, academic and media publications.

This paper updates the 2003 work. It considers new survey evidence on the performance of PFI contracts in 2008 and also weighs up evidence on the performance of non-PFI contracts.

We hope that these updated figures will represent a contribution to a broader public policy debate on construction performance. However, the figures should be treated with caution for reasons of data availability and comparability which are explained in the paper.

In particular, we recognise that in collecting information from project managers there is the risk of bias. Some project managers might be reluctant to report problems with their projects. Whilst recognising this risk we nevertheless considered the project managers to be the most appropriate people to approach for information on construction performance.

The world of PFI attracts an almost religious fervour with passionate advocates and equally vociferous detractors. Given the caveats about the data we debated the wisdom of releasing this paper because we feared that the results could be misused by proponents and opponents alike.

On balance, we have concluded that it is better for us to disclose our results, together with a heavy health warning about the data, since we believe it is our role to provide impartial information to enrich public debate. In this spirit of encouraging debate we believe that this paper points out some tentative hypotheses for us and others to explore further:

- neither PFI nor non-PFI sectors are homogenous. It makes little sense to argue that one sector is superior inherently to another – there are variations of performance in each sector;



- the factors perceived as critical to the successful PFI contracts, such as thorough due diligence, clear output specifications, and skilled contract management, may be transferable to non-PFI contracts. Good practice can flow in both directions between PFI and non-PFI;
- that ongoing data collection, with further information on non-PFI performance, will be helpful to government's understanding of construction performance through different procurement routes.

We look forward to exploring the hypotheses suggested above with interested parties, and we would of course welcome any views on the tentative findings or other aspects of this position paper.

Construction performance is just one aspect of delivering PFI projects. Other issues, including those relating to contract management, have been dealt with in our various private finance reports. Our long-held view on PFI is that it is neither always good value for money, nor always poor value for money. It has the potential to deliver benefits but not at any price or in any circumstances. In practice its value is contingent on a wide range of contract, sector and market specific factors.

We hope the evidence reported here will be of interest and may point the way to further questions. For our part, we will continue to analyse whether PFI and non-PFI projects in different sectors are demonstrating value for money.

National Audit Office  
October 2009

# Summary

## **PFI is one of a range of procurement options available for public service investment**

**1** A range of procurement options for public services is available to Government, and the Private Finance Initiative (PFI) is one of these. Some projects may not be suitable for PFI. An example is where there is uncertainty over the requirements at the outset. The Government provides advice and guidance on which projects are suitable for PFI. For others, alternative procurement options exist which need to be assessed taking account of value for money and project circumstances.

**2** Private Finance accounts for a small but significant amount of Government net investment, mainly in the Education, Health, Transport and Defence sectors. The capital value of forthcoming PFI deals is expected to be £13 billion<sup>1</sup> so the performance of PFI projects during the construction phase is an important issue. However, this report, in focusing on PFI construction performance, does not assess or seek to evaluate the value for money of PFI as a whole, nor make comparison with the construction performance of other methods of procurement.

## **This report provides an update on the performance of PFI construction**

**3** This report extends the information published in our 2003 report *PFI: Construction Performance*<sup>2</sup>, which also provided data on the construction performance of non-PFI projects. The results of this work have been quoted extensively, but since 2003, there has been a significant increase in the number and range of PFI construction projects (**Figure 1**). It is therefore timely to update our previous work.

**4** Primary evidence for this report comes from two surveys that we conducted in 2008 of public sector construction projects with a capital cost of over £20 million, completed between 2003 and 2008 in England. A sample of 17 survey respondents was selected and interviewed in-depth to provide a greater level of detail. The report also draws on secondary data from third parties, such as the Office of Government Commerce, on public sector construction projects.

**5** All the statistics presented in this report are from surveys, rather than in-depth audit. For a number of reasons, such as sectoral mix, size and differing response rates, direct comparisons should not be made between the sources.

<sup>1</sup> The Treasury's 2009 Budget – [http://www.hm-treasury.gov.uk/bud\\_bud09\\_index.htm](http://www.hm-treasury.gov.uk/bud_bud09_index.htm)

<sup>2</sup> NAO Report. *PFI: Construction Performance*, (HC 371, 2002-03).

**Figure 1**

Sectoral mix of projects in the 2003 and 2008 PFI survey samples

Type of building	2008	2003
Schools (Grouped)	51	0
Hospitals	34	11
Office buildings	8	2
Waste treatment facilities	4	0
MOD buildings	3	5
Housing	3	0
Magistrates' courts	2	1
Laboratory	1	1
Prisons	1	7
Secure training centres	1	3
Roads	0	7
Other	6	0
<b>Number of Projects</b>	<b>114</b>	<b>37</b>

Source: National Audit Office (see Appendix 1 for further details)

**NOTES**

- 1 Other includes a DEFRA joint housing and office project, two community centres, two libraries and a transport project.
- 2 In 2003 a census of all 38 Central Government projects was undertaken, and 37 questionnaires were completed. In 2008 a population of 153 projects was surveyed, and 114 questionnaires were completed.

## PFI construction projects were delivered to timetable in over two thirds of cases and to price in around two thirds

**6** Our 2003 report found that around three quarters of PFI projects had delivered to contracted timetable and contracted price. The large majority of PFI projects completed between 2003 and 2008 and responding to our survey were still being delivered on or close to contracted timetable, though prices, for a range of reasons, were more likely to have increased than in the 2003 survey. Sixty nine per cent of PFI projects reported delivering to the contracted timetable in 2008 (not a statistically different change compared with the 2003 results) and 65 per cent to contracted price.

**7** Public sector project teams reported that a combination of actions, rather than one single measure, had assisted project teams to deliver good performance to time. Factors contributing to good performance to time included the nature of the PFI contract with its emphasis on clear output specifications and deferment of payment until completion; and good project management such as clear communications between partners to the contract. Where timetables had slipped, the financial difficulties experienced by Jarvis plc was one factor, though a range of project management issues, the majority of which were at the private sector's risk, were also responsible. Nearly half (43 per cent) of delayed projects also incurred price increases.

### **Non-PFI construction projects are delivering to timetable in around two thirds of cases and to price in around half**

**8** Our 2008 survey indicates that 63 per cent of non-PFI projects reported delivering to timetable, and 54 per cent to contracted price. Of those projects that were delivered late, two thirds also incurred price increases.

**9** There are difficulties in obtaining truly representative data on non-PFI projects because there is no central list of all non-PFI projects. This contrasts with PFI projects for which the Treasury maintains a database of contracts which have been let. Our 2008 survey of non-PFI projects was drawn from a list of projects supplied by Glenigan, which collects project information from planning applications.

**10** The data for non-PFI projects in our 2003 report were derived from a third party survey undertaken in 1998 and are now too dated to allow meaningful comparisons with our 2008 results, which also have wider sectoral coverage and are likely to be more informative. Data on non-PFI performance after 2003 are available from a number of other sources, though they are not fully comparable with each other or with our 2008 findings in terms of methodology or sectoral coverage. While caution is needed in interpreting the data, these other sources do, however, indicate a similar timetable and price performance to our 2008 non-PFI construction survey results.

### **PFI projects have a good record in user consultation and good quality ratings are more common than in 2003**

**11** A large majority of PFI projects received good quality ratings from project teams and key users. Fifty three per cent of project teams gave very good quality ratings to completed projects, comparing to 22 per cent in 2003, and in neither year were poor ratings given. Almost all projects consulted users during design and operational phases, and two thirds of projects undertook environmental assessments, generally achieving required standards.

### **Experienced project teams were identified as best practice but less than half of project teams had PFI experience**

**12** The feedback from project teams in our survey and interviews confirmed that constant dialogue and experienced project teams with high staff continuity remain good practice goals. We found, however, that less than half of PFI project teams were led by someone with previous PFI project experience.

# Performance of PFI projects to the originally contracted timetable

*A large majority of PFI projects were still being delivered on or close to time. There was, however, some increase in the proportion of projects delivered over two months late, since the 2003 study.*

## PFI results against timetable are broadly the same as reported in 2003

**13** Sixty nine per cent of the PFI projects responding to our 2008 survey were completed and available for use either by the time specified in the contract or within one month (**Figure 2**). Although the remaining 31 per cent of projects were delivered more than one month late, the public sector is likely to have paid less due to the payment mechanism, under which payment does not commence until an asset is available for use.

**14** PFI project completion to time remained broadly the same as projects reported on in 2003. In 2003 we reported 76 per cent of projects surveyed were completed and available for use by the time specified in the contract, with 24 per cent delivered late (Figure 2). The 2008 survey results are not statistically different from the 2003 results. Appendix 1 sets out further explanation of the statistical analysis.

### Figure 2

PFI construction time delivery compared with contract

Year of survey	On time		Delayed	
	2008 %	2003 %	2008 %	2003 %
Results	69	76	31	24
Range this percentage is likely to lie within	60-78		22-40	

Source: National Audit Office

#### NOTES

- 1 Statistics are based on 108 respondents in 2008 and 37 respondents in 2003 (six additional 2008 respondents were unable to provide these data).
- 2 'On time' in the survey was defined as within one month of that stated in the contract. The 69 per cent of PFI projects in the 2008 survey shown as 'on time' includes five projects (five per cent of the respondents) delivered ahead of time.
- 3 A range of values has been presented as those who responded to our survey were only a sample of the total population, and therefore we cannot be certain the figures obtained are exactly those we would have obtained if every project responded. This is not relevant for the 2003 results as a census was conducted. See Appendix 1 for full details.

**15** Of those completed to time, nine per cent experienced delays in at least one of the project phases (individual hospital buildings or schools for example) prior to completion. Delays to these individual phases were made up later in the project, to ensure the project as a whole was completed to the contracted timetable.

### **Some PFI projects have been delivered early but there has been a reduction in early deliveries since the 2003 study**

**16** PFI project companies only start to receive income from the public sector when a building is ready for use. There is some evidence that this provides a powerful incentive to complete PFI projects on time or early. In 2003, 12 projects reported an early finish (32 per cent). In 2008, just five projects (five per cent) reported construction finishing early, which is a statistically significant change. The public sector is not obliged to occupy or pay for early buildings, but early completion clearly provides the public sector with greater flexibility.

**17** The 2003 study reported that all roads were completed early and all prisons on time or early. No roads and just one prison are included in the 2008 sample, which may partially explain the reduction in the proportion of projects reporting early completion.

### **Survey respondents reported a combination of factors were important in delivering to timetable**

**18** To get an indication of the contributing factors to delivering on time, our survey asked the 75 projects that were delivered on time to rate potential factors from very important to not at all important.

**19** Project managers cited a range of factors that were important to successful delivery. These factors can be classified either as those seen as good practice in project management, or those intrinsic to the nature of the PFI contract.

**20** Project teams reported factors such as the quality of private and public sector management, good relationships and a clear understanding of the project as contributing to delivery to timetable. Interview participants also stressed the importance of clear communications between partners, coupled with clarity over the ultimate aims of the project to assist a timely completion. The NAO has reported on these elements of best practice in previous reports, both on PFI and conventionally funded projects.

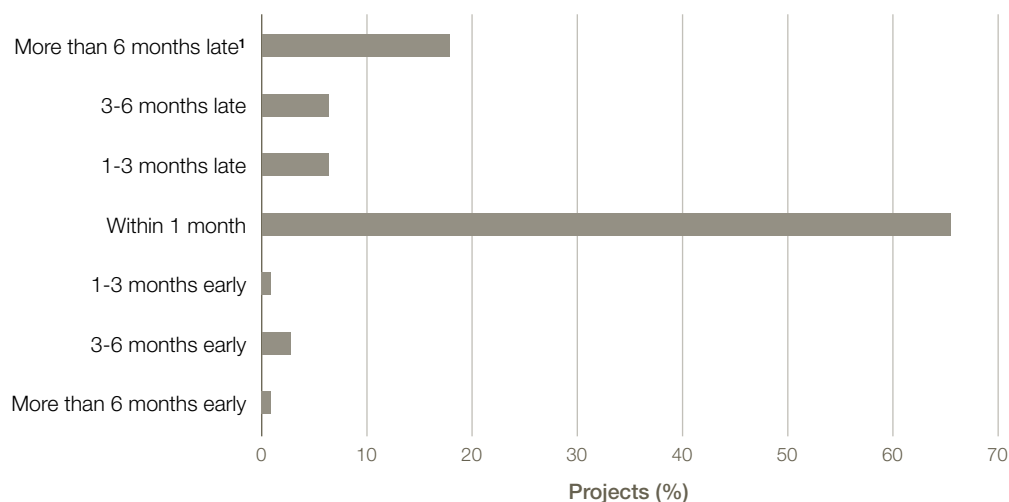
**21** Equally important to delivering to timetable were factors such as clear output specifications, deferment of the unitary charge until completion, and good forward planning in the procurement phase. Because of the nature of the contract and the due diligence needed to write it and assign risks, PFI is likely to encourage thorough planning during the procurement phase. Early risk assessment should also encourage realistic plans to be agreed upon. Deferment of the unitary charge is intended to be the main incentive for successful delivery to timetable. Project teams do believe this to be important, but no more important than other factors.

### There has been an increase in the proportion of projects delivered over two months late

**22** Although the majority of PFI projects in the 2008 survey (69 per cent) were completed within a month of the date set out in the contract (the definition of 'on time' in Figure 2), 13 per cent were completed one to six months late, and a further 18 per cent were delayed by more than six months (Figure 3). This includes two projects where the building had yet to be completed and construction completion was over six months late. These two projects suffered planning permission issues unique to their sector, a problem which is not PFI-specific.

**Figure 3**

Timing of delivery of PFI projects in 2008 survey



Source: National Audit Office

#### NOTES

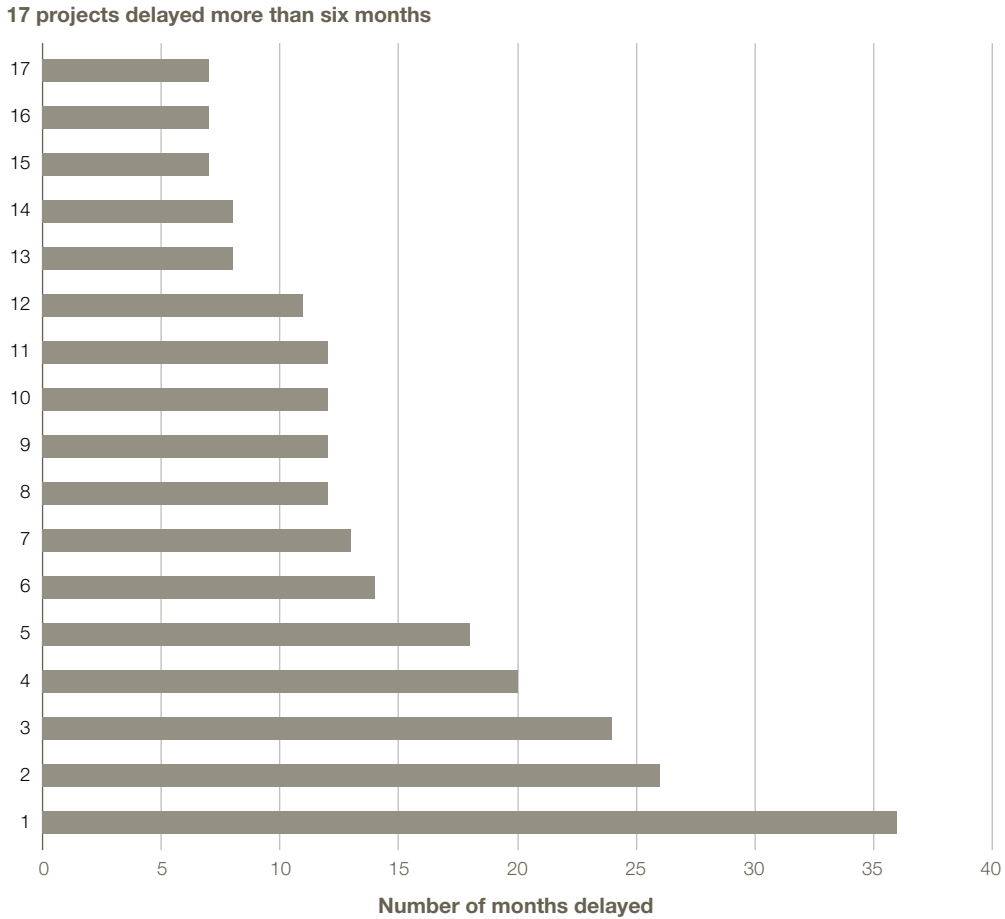
- 1 More than six months late<sup>1</sup> includes two waste projects that were incomplete at the time of the survey (held up due to planning permission issues).
- 2 Statistics are based on 108 respondents (six additional 2008 respondents were unable to provide these data).

**23** In 2003 just three projects (eight per cent) reported delays of two months or more, two of which had yet to be completed. A further six were delayed by less than two months (16 per cent).

**A number of projects experienced delays of over six months**

**24** Seventeen completed projects in the 2008 survey experienced delays of more than six months. These delays ranged from seven to 36 months (**Figure 4**).

**Figure 4**  
Extent of delays in PFI projects with delays over six months



Source: National Audit Office



## The reasons for delays

### The changing sectoral mix of PFI projects

**25** The sectoral mix of projects in the 2003 census and 2008 survey are not directly comparable. Whereas the 2003 sample was dominated by hospitals, prisons and roads, the 2008 survey is predominantly accounted for by hospitals and groups of schools (Figure 1).

**26** The 2008 survey results showed that 84 per cent of schools projects were completed on time or early. September term dates were thought by interview participants to be an additional incentive in completing to time. One project manager commented “We have not had a late school project, time is of the essence, we want a school for September not Christmas. So that’s a strong message”.

**27** In addition to the 16 per cent of schools delivered late, 17 per cent of the ‘on time’ schools projects experienced late phases. This is important as these delays relate to the delivery of individual schools, which were part of a grouped project. In each case, however, the group of schools and hence the contract was delivered on time. There were no schools in the 2003 population for a comparison.

**28** Fifty three per cent of hospitals reported completing to contracted time in 2008, compared to 82 per cent in 2003. Whereas schools have very set timetables, hospitals generally do not, which partially explains the sectoral difference in performance.

### The financial difficulties experienced by Jarvis plc

**29** Jarvis plc, a construction company involved in many PFI projects, suffered a number of years of financial difficulties during the surveyed period. Five per cent of our sample identified themselves as being affected by the financial difficulties of the contractor, which represents 15 per cent of delayed projects. These projects experienced delays ranging from one to 36 months.

### Other reasons for delays

**30** To get an indication of the causes of delays, our survey asked those 33 projects reporting time overruns to rate potential causes from very important to not at all important.

**31** The respondents reported diverse reasons for project delays. They often attributed them to ‘unforeseen events’ or ‘other factors’ where the private sector owned the risk. In these circumstances, the private sector received financial penalties for the delays. Respondents also included subcontractor underperformance, poor project management as well as the financial difficulties experienced by Jarvis plc as factors. Unforeseen events are difficult to allow for in contracts and can result in unavoidable delays. One project manager commented “You have a lot of latent defects issues in old buildings,

which even if we've got a fairly watertight contract, which we think we have, it can still cause problems". These problems are not unique to PFI projects. The PFI contracts provide financial compensation for delays but the consequence of the delay to the public sector is not something that can be transferred.

### Private sector project management and other issues

**32** We followed up with project teams responding to the survey on reasons for delays to gain a more detailed clarification of why they had arisen. **Figure 5** sets out, for all delayed projects, including those incomplete at the time of the survey, the most important reason project teams highlighted for their delays. Many projects did, however, report a range of reasons for the overall delays.

**33** Private sector project management issues were the most often stated reason for delays by public sector PFI project managers. Issues relating to project management which were at the private sector's risk accounted for 42 per cent of delayed projects. This includes issues such as contractors under-resourcing, poor management of subcontractors, lengthy negotiations with third parties and general poor performance. In some cases, project managers could not tell us exactly what the issue had been, but said there had been problems with project management which was a private sector risk.

### Figure 5

Most important cause of project delays

Important contributing factors to delay	Risk ownership	Percentage of delayed projects %
Private sector project management issues such as subcontractor underperformance, under-resourcing and negotiations with third parties	Private	42
The financial difficulties experienced by Jarvis plc	Private	15
Issues where the public sector retained the risk, such as asbestos	Public	12
Other issues where the private sector retained the risks, such as weather conditions, fire and subcontractor financial failure	Private	9
Public sector initiated changes	Public	6
Planning permission problems	Shared	6
Dispute between parties	Shared	6
Don't know	n/a	4
		<b>100</b>

Source: National Audit Office

#### NOTE

1 Statistics are based on responses from 33 delayed and incomplete delayed projects.

**34** Private sector project management failure is not unique to PFI, as a project manager from a non-PFI project we interviewed described: “We were fairly sure that it was going to overrun, but the information we were getting from the contractors was ‘no, no we’ll pull time back, we’ll pull time back’. And it didn’t and then it became a big rush at the end for them to complete things and they weren’t completed to a standard that we were prepared to accept”.

**35** Other causes of delay arose from risks retained by the private sector, and risks retained by the public sector. The contract sets out which party manages each risk and pays for the subsequent delay of such a risk arising. The private sector retained risks causing delays included bad weather conditions, subcontractor financial failure and fire. Risks retained by the public sector that caused delays included problems with the purchase of land and discovery of asbestos.

**36** Less commonly stated reasons for delay were issues in obtaining planning permission, public sector initiated changes, and disputes which held up completion dates. These disputes were about interpretation of the contract.

**37** Detailed clarification was sought from the 17 completed projects experiencing more than six months of delay. As well as the delays caused by Jarvis’s difficulties, private sector project management was again stated as the most common cause of major delay in these cases (**Figure 6**). Other reasons were in line with the reasons for delays in the sample as a whole.

### Figure 6

Most important causes of project delays greater than six months

Important contributing factors to delay	Risk ownership	Percentage of delayed projects %
Private sector project management issues	Private	40
The financial difficulties experienced by Jarvis plc	Private	24
Issues where the public sector retained the risk, such as asbestos	Public	18
Other issues where the private sector retained the risks, such as weather conditions, fire and subcontractor financial failure	Private	6
Public sector initiated changes	Public	6
Dispute between parties	Shared	6
		<b>100</b>

Source: National Audit Office

#### NOTE

1 Statistics are based on responses from 17 delayed but completed projects.

**38** In addition to the 17 projects more than six months late, two waste projects remained incomplete at the time of the survey completion, both of which had been held up by issues in obtaining planning permission. Service delivery was reported to be continuing at existing facilities, though the expected benefits of the new facilities, such as the ability to recycle a greater range of waste, had yet to be realised. Planning permission can often be a problem for waste projects, and this is not PFI specific.

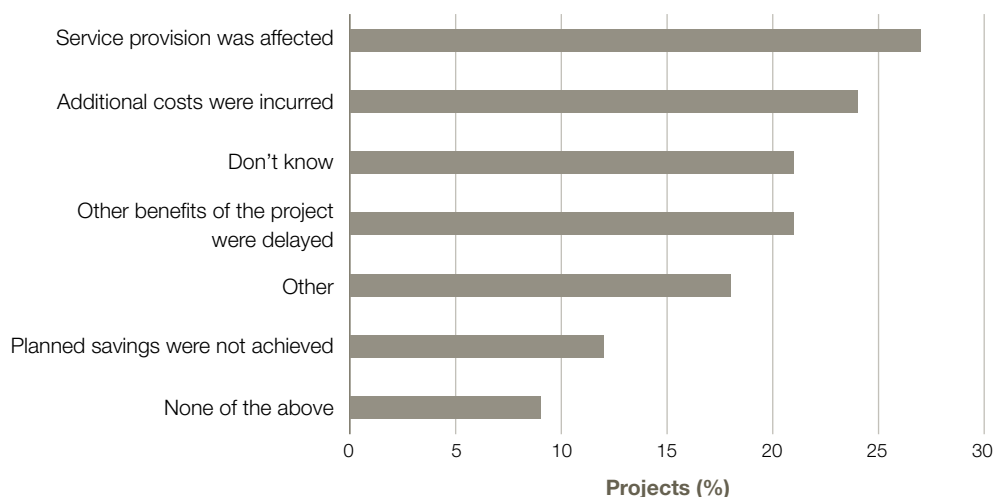
**Project delay has had an adverse impact on service provision in many cases**

**39** To get an indication of the impacts of project delays, our survey asked those 33 projects reporting time overruns to indicate any adverse consequences.

**Figure 7** shows that service provision was adversely affected in just under 30 per cent of cases, and that additional costs were also common. Other impacts included projects experiencing shorter commissioning periods, uncertain finish dates making planning difficult for moving, and adverse impacts on reputation and staff morale.

**40** The 16 per cent of schools delivered late reported relatively few minor adverse impacts on service provision though in some cases additional costs were incurred. Of the 47 per cent of hospitals delivered late, some reported additional costs, and some adverse impacts on service provision. Others remained in existing facilities for longer, delaying receiving the benefits of the new building.

**Figure 7**  
Impact of delays on the public sector’s business



Source: National Audit Office

**NOTE**

1 Statistics are based on 33 respondents. Twenty one per cent of these reported they did not know the impact of their project’s delays. The percentage of projects totals to more than 100 per cent because some projects experienced more than one consequence of delays (although some delayed projects did not indicate any impact).

## Delivery of PFI infrastructure to originally contracted price

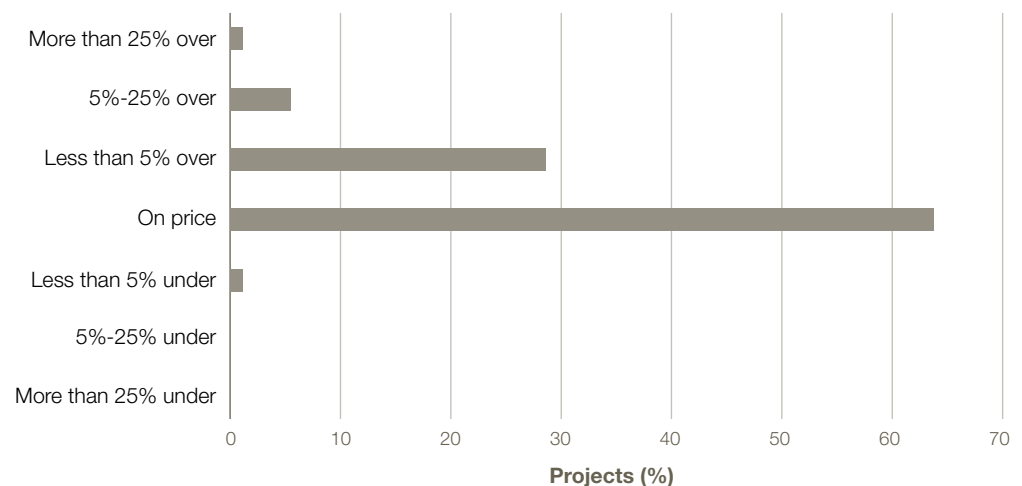
The results of our survey showed that departments obtained price certainty in the majority of projects. There has, however, been a statistically significant decrease as a result of public sector initiated changes to scope, since our 2003 report.

### The majority of PFI projects have been delivered on or close to price

41 Ninety four per cent of projects responding to our 2008 survey were reported to have been delivered on, or less than five per cent over, price. The remaining six per cent reported price increases of five per cent and over. One project reported delivery at less than the contracted price, which was because of public sector initiated changes which reduced the price (Figure 8).

**Figure 8**

Price to public sector compared to PFI contract



Source: National Audit Office

**NOTE**

1 Statistics are based on 91 respondents (23 additional 2008 respondents were unable to provide these data).

## The number of projects that delivered exactly to the originally contracted price has declined due largely to public sector changes

**42** Sixty five per cent of the projects surveyed were completed to the price as set out in the contract. The remaining 35 per cent of projects were delivered for a price higher than that set out in the original contract (**Figure 9**). The 2008 delivery to price statistic of 65 per cent is statistically significantly different from the 2003 statistic of 78 per cent. Appendix 1 sets out further explanation of the statistical analysis.

**43** However, in the 2008 survey projects largely attributed price increases to public sector initiated changes post contract signature, most of which enlarged project scope and deliverables, subsequently increasing the cost of the project as the original design had been changed. Our earlier NAO reports concluded that project changes in the absence of competitive tension are a risk to value for money<sup>3</sup>.

**44** In 25 per cent of projects there had been a price increase from the contracted price which was only attributed to public sector or third party initiated changes. Adding these projects to those that were delivered on price, results in a figure of 90 per cent that experienced no price increase or price increases only for public sector and third party initiated changes (Figure 9).

### Figure 9

PFI price delivery compared with contract

Year of survey	On price		Over price	
	2008 %	2003 %	2008 %	2003 %
No price increase after contract letting	<b>65</b>	78	<b>35</b>	22
Range this percentage is likely to lie within	(55-75)		(25-45)	
No price increase or price increase for public sector and third party initiated changes	<b>90</b>			
Range this percentage is likely to lie within	(84-96)			

Source: National Audit Office

#### NOTES

- 1 Statistics are based on 91 respondents in 2008 and 37 respondents in 2003 (23 additional 2008 respondents were unable to provide these data).
- 2 A range of values has been presented as those who responded to our survey were only a sample of the total population, and therefore we cannot be certain the figures obtained are exactly those we would have obtained if every project responded. This is not relevant for the 2003 results as a census was conducted. See Appendix 1 for full details.
- 3 In 2003 it was reported that price changes only occurred where the public sector had made changes. In the 2008 survey the nature of such changes has been investigated further, therefore it has not been considered appropriate to present a comparative statistic to the 90 per cent shown for 2008.

3 NAO report. *Making Changes in Operational PFI Projects*, (HC 205, 2007-08).

**45** Twenty per cent of survey respondents were unable to tell us how much the construction element of their PFI construction projects had cost the public sector. This was partially attributable to project teams moving on over time with consequences for corporate memory. In addition, by the very nature of PFI, cost structures are complicated as they include whole-life costs. They are also paid over a long term, as an annual charge for thirty years or more. Operational project teams may not, therefore, have sight of the specific construction elements included in the price paid.

### **Survey respondents reported contractual incentives and clear output specifications to be the most important element in delivering to contracted price**

**46** To get an indication of the contributing factors to delivering to contracted price, our survey asked those 59 projects reporting delivery to contracted price to rate potential factors from very important to not at all important. **Figure 10** overleaf shows the percentage of respondents stating those factors which were very important.

**47** The most commonly stated reasons for projects delivering to price were ‘the fixed price nature of the PFI contract’ and ‘clear output specifications’. As with the reasons for delivering on time, many project managers cited a range of factors as important to successful delivery. This suggests the benefits of PFI, such as a detailed planning stage and contractual incentives, were being realised in a majority of cases, complementing good practice in project management.

**48** There is limited evidence of authorities reducing the scope of projects (known as de-scoping) to achieve delivery to contracted price. Four respondents (from 56 respondents) reported some de-scoping for affordability reasons after the contract had been signed. One of these projects de-scoped the asset but stated this did not adversely affect service delivery. The others reported de-scoping the support services, two of which had small adverse affects on service provision. We were unable to determine whether these were the only projects where de-scoping occurred. There was a high proportion of respondents (26 per cent) who did not know whether or not there had been any de-scoping. As with other aspects of construction experience, there seems to be a lack of corporate memory as in many cases staff involved with construction have left the project.

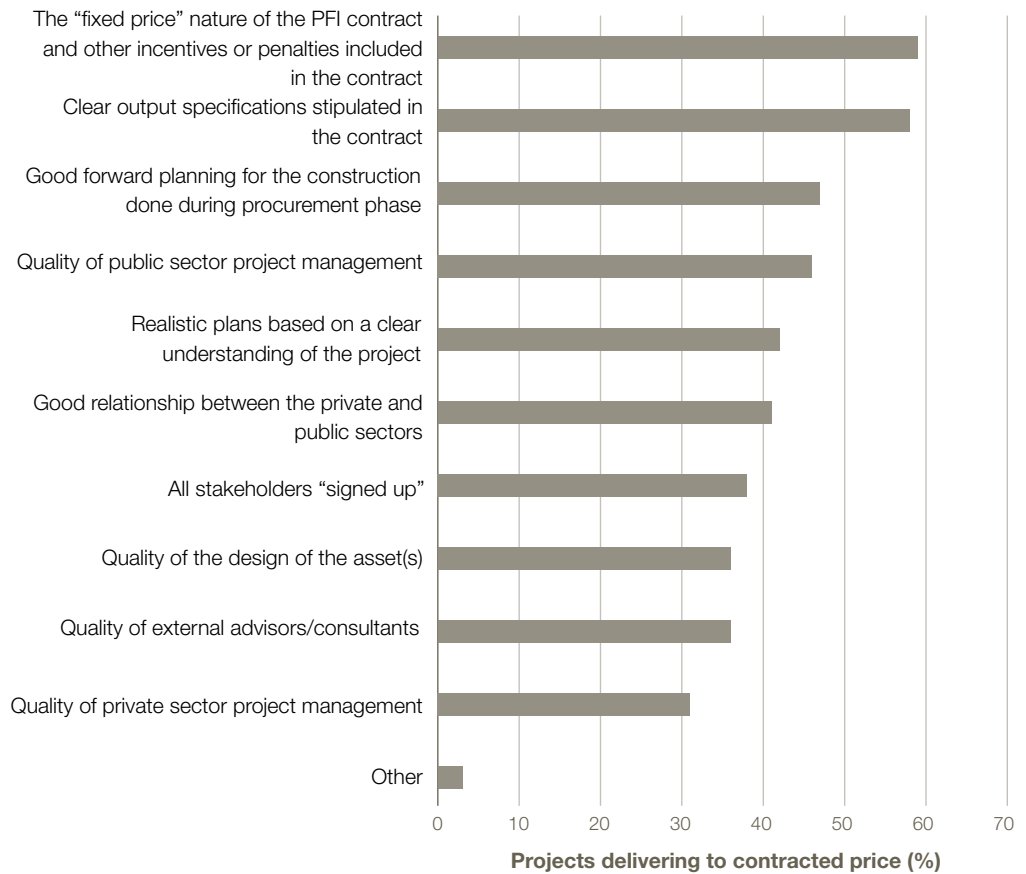
### **The financial difficulties of Jarvis plc did not have an effect on the delivery to contracted price of the projects in our sample**

**49** All projects affected by the financial difficulties experienced by Jarvis plc were reported to be delivered to the contracted price, despite experiencing delays. This is evidence of the intended risk transfer working. One affected PFI project commented “Given the difficulties the contractor got into, PFI did protect us from the consequences...the key message is the benefit in risk transfer”.

### Time delays and price increases are not highly correlated

**50** Of those projects delayed by more than six months, 35 per cent also experienced price increases. Of all the projects experiencing delays, 43 per cent were delivered over the originally contracted price and 57 per cent were completed to the contracted price. This suggests that in many cases, there is some evidence that the intended risk transfer is working. In the cases where delay has only been as a result of those risks retained by the private sector, the public sector has not seen the price of their project increase, as a result of the delay.

**Figure 10**  
Reasons for delivery to contracted price



Source: National Audit Office

**NOTE**

1 Statistics are based on 59 respondents.



**51** One project manager commented: “So PFI, from a purely financial point of view, worked very well delivering the assets because the risks on all these projects lies with the private sector, or in terms of it being managed better, that was the private sector’s risk again... we got the facilities we wanted for the money quoted ultimately”.

**52** For delayed projects that have seen prices increase, this has either been because the risks causing delays were borne by the public sector, or there were a range of factors causing the delay holding both parties responsible for price increases.

### **Survey results show public sector and third party initiated changes as the most commonly reported cause of price increases**

**53** To get an indication of the causes of price increases, our survey asked those 32 projects reporting price increases to rate potential causes from very important to not at all important.

**54** The most commonly stated reasons for price increases were construction changes initiated by the public sector and as a result of third party decisions, some of which enlarged not only project scope and deliverables but also cost. Our earlier work<sup>4</sup> has concluded that project changes in the absence of competitive tension are a risk to value for money, and therefore should be kept to a minimum. We therefore conducted more detailed analysis of projects reporting price increases.

### **Not all changes were due to unavoidable circumstances**

**55** We followed up survey responses to obtain more details about price increases (**Figure 11** overleaf). Public sector and third party initiated changes were confirmed as the largest contributing factors to price increases, being the sole reason for price increases in 72 per cent of these projects. The changes ranged from improving design functionality and adding a helipad to a hospital, to changing fixtures and fittings in a school because of a curriculum change. For some of these changes there is limited evidence as to why they were not included in the original specification. Others, however, appear unavoidable due to changing circumstances.

**56** There were no projects that experienced price changes originating from the private sector alone. This finding is in line with the 2003 report.

**57** This work also identified that risks retained by the public sector, such as discovery of asbestos, drove price as well as time overruns, which is to be expected. Finally, claims by the private sector affected a minority of projects in this population. Claims were said to be in regards to project delays in works for which the public sector held the risk for, and interpretation of, the contract.

<sup>4</sup> NAO report. *Making Changes in Operational PFI Projects* (HC 205, 2007-08).

**Figure 11**

## Detailed reasons for construction price changes

<b>Important factors contributing to price increases</b>	<b>Risk ownership</b>	<b>Percentage of projects over price %</b>
Public sector and third party changes	Public	72
Public sector changes and asbestos	Public	6
Asbestos	Public	6
Claims by the private sector	Shared	6
Public sector, third party and private sector changes	Shared	3
Public sector and private sector changes, and a claim by the private sector	Shared	3
Don't know	n/a	4
		<b>100</b>

Source: National Audit Office

**NOTE**

1 Statistics are based on 32 respondents.

# Alternative procurement routes delivering to timetable and price

*Non-PFI public sector construction projects have delivered to timetable in around two thirds of cases and to price in around half, though performance data on such projects is limited and difficult to collect, and should not be compared to PFI data.*

## **Performance data on alternative procurement routes is limited, but it can provide an indication of non-PFI performance**

**58** This section presents the latest information available on the construction performance of public sector projects that were not constructed under PFI. The NAO found the availability of these data very limited and not easy to collect from primary sources. We have therefore included the latest data from all available sources, which should provide an indication of construction performance in the public sector outside of PFI. These do not provide a comparator for our PFI performance statistics, but they do add some context to the PFI results and are a starting point for further investigation.

**59** This section includes data collected through an NAO survey of the non-PFI population and additional evidence on public sector construction draws on data provided by Construction Excellence's KPI Zone data, OGC's Achieving Excellence data and Audit Scotland's Major Capital Projects data. All sources include data on performance to contracted timetable and price.

## **NAO survey respondents report two thirds of non-PFI projects were delivered to timetable and around half were completed to contracted price**

**60** The NAO undertook a survey of the non-PFI population of public sector construction projects in England with a capital value of £20 million and above, to get an indication of the performance of construction outside of the PFI sector. While identifying the population of non-PFI projects and correct contact details for these projects proved challenging, the NAO did achieve a response rate of approximately 22 per cent from the total population of 225. This population is much larger than the PFI population over the same period of 2003 to 2008.

**61** Results from our survey show 63 per cent<sup>5</sup> of non-PFI projects delivered to timetable and 54<sup>6</sup> per cent to contracted price. These figures are not directly comparable with our PFI performance statistics for a number of reasons:

- The sectoral mix is not directly comparable among the two samples, as set out in Appendix 1;
- The distribution of projects over the six years whilst fairly even in the PFI sample is heavily weighted towards the later three years in the non-PFI sample; very few projects have responded that completed in 2003 to 2005;
- The level of detail received from non-PFI projects does not allow us to draw such strong or detailed conclusions; and
- The lower response rate for the non-PFI survey increases the chances of a misrepresentative sample; therefore wider confidence intervals are reported within the statistics.

**62** Of those projects that were delivered later than contracted, 67 per cent were also delivered over the contracted price.

### **OGC data show over half of non-PFI projects were delivered to timetable and contracted price**

**63** The Office of Government Commerce (OGC) maintains a database of central government public sector construction projects, with information on key performance statistics updated biannually. The sectoral mix and project size are not directly comparable to our non-PFI data, however, PFI projects can be excluded to provide general performance statistics for public sector construction and show trends over time.

**64** We have analysed OGC non-PFI data over the period of 2004 to 2008, in which time over 400 non-PFI projects were completed, 95 per cent of which had a capital value of under £20 million.

**65** OGC data shows 60 per cent of public sector construction projects were delivered to timetable and 54 per cent to price between 2004 and 2008 (**Figure 12**). These statistics are in line with the NAO's non-PFI survey results to price though performance to timetable is lower in the OGC figures. The OGC data do not show any clear trend in the price statistics, but there is a downward trend in performance to timetable.

**66** Twenty projects from this dataset had a capital value of £20 million and above. These projects delivered to timetable in 55 per cent of cases and to, or under, the contracted price in 50 per cent. This is in line with the OGC statistics for all projects and not dissimilar to the NAO non-PFI survey results, though performance to timetable is lower for these projects.

<sup>5</sup> Range this percentage is likely to lie within: 51-75 per cent. A range of values has been presented as those who responded to our survey were only a sample of the total population, therefore we cannot be certain the figures obtained are exactly those we would have obtained if every project responded. See Appendix 1 for full details.

<sup>6</sup> Range this percentage is likely to lie within: 42-66 per cent.

**Figure 12**  
OGC Achieving Excellence Data

	2004 %	2005 %	2006 %	2007 %	2008 %	Weighted Average <sup>1</sup> %
To timetable	65	62	61	59	53	60
To price	41	58	62	42	54	54

Source: Office for Government Commerce

**NOTE**

<sup>1</sup> A weighted average has been calculated for 509 projects with time performance data, and 408 with price performance data, as the number of projects completed was spread unevenly over the five year period.

### Audit Scotland data show less than half of Scottish non-PFI projects delivered to timetable, while over half delivered to contracted price

**67** Audit Scotland published a *Review of major capital projects in Scotland* in 2008, which reported on the performance of all major capital projects completed between 2002 and 2007. The study surveyed all 43<sup>7</sup> major capital projects over £5 million in capital value completed in the study period across sectors (transport, justice, environment, health, education). PFI projects were excluded.

**68** Audit Scotland reported 41 per cent of major capital projects delivered to the contracted timetable and 58 per cent to contracted price. This performance to price is not dissimilar to the NAO's non-PFI results; however, the proportion delivering to timetable is much lower. Overly optimistic forecast delivery dates are stated as an important factor in poor performance to contracted timetables.

### Constructing Excellence's data show almost two thirds of the construction industry's projects delivered to timetable and around a half to price

**69** KPI Zone is an annually updated database on key performance indicators reported by construction projects. It covers the whole construction industry in the United Kingdom, including public and private sector projects, many of which are under the £20 million threshold we used for our PFI population.

<sup>7</sup> Audit Scotland received 39 complete responses for the questions regarding performance to timetable, and 38 complete responses for the questions regarding performance to contracted price.

**70** KPI Zone data show 58 to 65 percent of all industry construction projects were completed to timetable and 44 to 52 per cent to price between 2003 and 2008 (**Figure 13**). These statistics are in line with results from the NAO's non-PFI survey. Performance data over time from 2004 to 2008 do not show a clear trend to timetable or price.

**71** Though the four UK sources presented in this section are not directly comparable to one another, as they are drawn from different populations, they do indicate that non-PFI public sector construction projects are delivering to timetable in around two thirds of cases and to price in around half.

**72** We also contacted a number of international audit offices with the aim of gaining an international comparator. The only similar study we received was a report on PFI and non-PFI performance in Australia by The Allen Consulting Group<sup>8</sup>. We reviewed this report as a potential international comparator, but we found that the statistics were not defined in a comparable way so as to be useful to this study.

**Figure 13**  
KPI Zone All Construction Index

	2003 %	2004 %	2005 %	2006 %	2007 %	2008 %	2003-2008 Range %
To timetable	59	60	62	60	65	58	58-65
To price	52	49	48	44	49	48	44-52

Source: *Constructing Excellence*

<sup>8</sup> The Allen Consulting Group (2007), *Performance of PPPs and Traditional procurement in Australia*, issued 30 November 2007.

## The quality of PFI construction and design

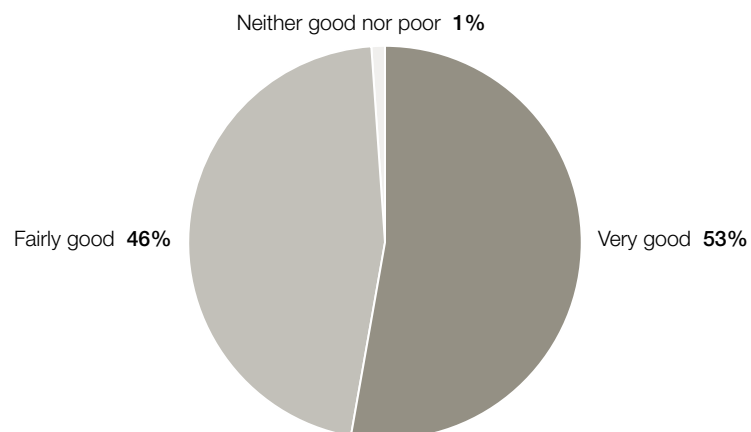
*PFI projects had a good record in user consultation, and good quality ratings were more common than in 2003. Environmental evaluations are also becoming more routine.*

### A large majority of PFI projects received good quality ratings from project teams and key users

**73** PFI projects generally received very high quality ratings from those who worked on them. Ninety nine per cent of respondents reported project teams gave good quality ratings to completed projects and nearly half rated them as very good (**Figure 14**). It must be noted that a number of survey respondents did not provide an answer to questions about quality and environmental ratings, and therefore we cannot be sure the answers presented here are representative of the entire sample.

**74** In 2003, all the project teams rated the design quality and construction quality as adequate or better. Seventy two per cent (of 32 respondents) rated the design quality to be good or very good. Sixty nine per cent rating the construction quality to be good or very good, with 22 per cent rating it as very good. Project teams in 2008 therefore appear to be as satisfied, if not more so, with the quality of their buildings than they were in 2003.

**Figure 14**  
Quality ratings by project teams



Source: National Audit Office

**NOTE**

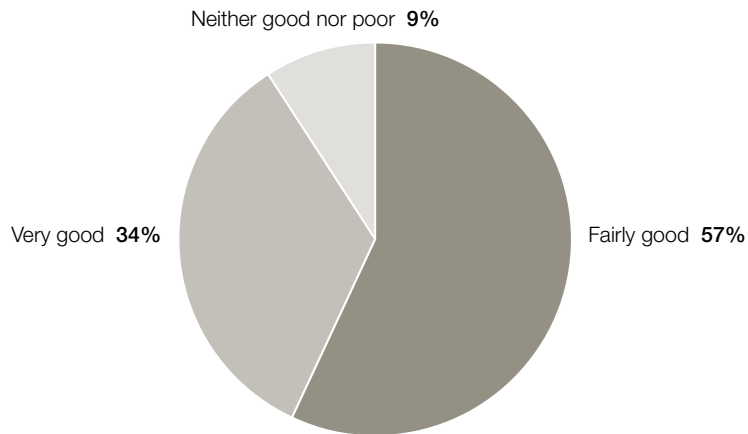
<sup>1</sup> Statistics are based on 70 respondents (44 additional 2008 respondents were unable to provide these data).

**75** Some interviewees from projects undertaken in the early years of PFI mentioned that post completion quality reviews were rather informal in nature. They stated that since this time, the importance of ensuring quality has been recognised and is consequently taken very seriously now. Project managers from the schools sector felt that it was because of this commitment to quality that Buildings Schools for the Future has incorporated the need to ensure that buildings are transformational and make a difference to the standards of service provision.

**76** Several of the in-depth interviews with project teams indicated that there were sometimes issues with minor defects that did not substantially affect building use but needed attention. While projects were often completed and became operational on time, some of these issues took years to resolve satisfactorily. One project manager commented: “We did identify a number of snags<sup>9</sup> ...part of that is because although you have a performance mechanism, that’s more about the delivery of the services rather than anything that’s outstanding from the construction phase. I’m not talking about major snags, relatively minor ones but a lot of them, and it took three years before we substantially knocked off most of the snags”.

**77** Ninety one per cent of PFI projects were rated as very or fairly good by the key users. No projects were rated as poor (**Figure 15**).

**Figure 15**  
Quality ratings by key users



Source: National Audit Office

**NOTE**

1 Statistics are based on 58 respondents (56 additional 2008 respondents were unable to provide these data).

<sup>9</sup> The term 'snags' refers to minor defects that did not substantially affect building use but needed attention.



### **Almost all projects consulted users during design and operational phases**

**78** Almost all PFI projects (99 per cent of 67 respondents) reported that end users were consulted during the design phase. This is important as interview participants highlighted user consultation as a crucial factor in attaining good quality ratings as it helped to ensure the private sector understood the needs of those using the service. One project manager commented: “Involving the head teachers and governors from the two existing schools in some of the progress meetings and the design meetings, actually incorporating them and embodying them very much as part of the core project team worked very, very well”.

**79** The most common method of user assessment during a project’s operational phase is obtaining feedback from a Facilities Maintenance (FM) helpdesk. Forty eight projects reported using this as a tool to assess feedback. This is usually a part of the contractual payment mechanism that exists to receive maintenance jobs and notification of service failures from users. This is generally collected and reported on by the private sector, requiring little effort from the public sector. Analysing complaints is the second most common tool, used by 29 projects, and just 22 projects reported conducting user satisfaction surveys.

**80** Those stating they use ‘other’ forms of user assessment typically mentioned ongoing evaluation of user satisfaction, either in formal meetings with users or informal feedback from key senior users, such as head teachers.

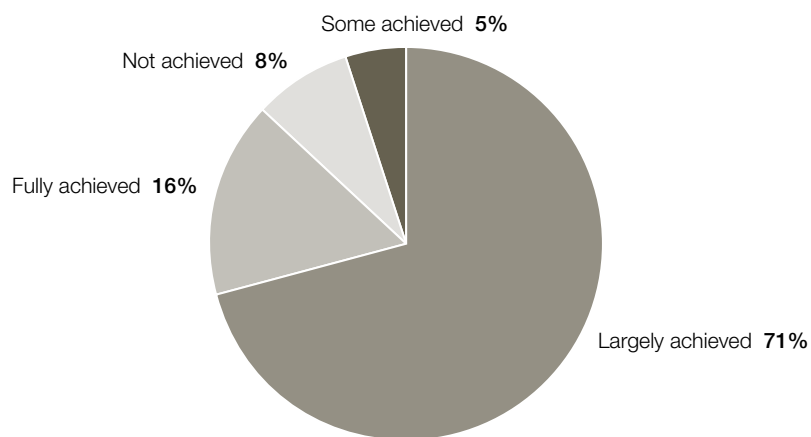
### **Two thirds of projects undertook environmental assessments and generally achieved required standards**

**81** Sixty five per cent of the projects (out of 57 respondents) had had environmental evaluations carried out. Reports from interview participants suggested that more stringent environmental considerations are becoming increasingly commonplace and that achieving a satisfactory rating in these is now essential for any construction project.

**82** The large majority (86 per cent) of those that have had these evaluations largely or fully achieved the required standard with regards to environmental evaluations (**Figure 16** overleaf).

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**Figure 16**  
Environmental evaluation results



Source: National Audit Office

**NOTE**

1 Statistics are based on 37 respondents (77 additional 2008 respondents were unable to provide these data).

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## Managing PFI Projects

*Constant dialogue and experienced, consistent project teams were identified as best practice in managing PFI contracts. Often, however, experience was found lacking in these public sector roles.*

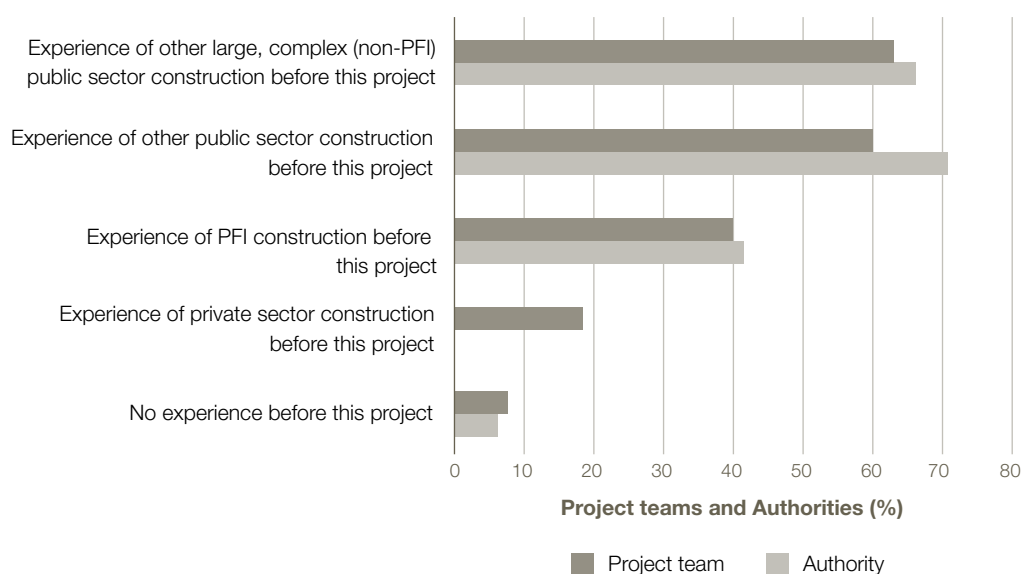
### Less than half of project teams had PFI experience

**83** Forty per cent of project teams had experience of managing a PFI project before the one in question and just 34 per cent at the time of the survey had gone on to manage another (**Figure 17**).

**84** More project teams had prior experience of construction more generally, with 60 per cent of project teams having experience of public sector construction and 63 per cent with prior experience of a large, complex, non-PFI project. Eighteen per cent had prior construction experience in the private sector. The prior experience of the Authorities responsible for these projects is similar to that of the project teams themselves (Figure 17).

**Figure 17**

Construction experience of the public sector project team and responsible Authority



Source: National Audit Office

**NOTE**

1 Statistics are based on 65 respondents (49 additional 2008 respondents were unable to provide these data).

**85** Of the project teams that reported prior PFI experience, 73 per cent of their projects were on time or early, which is only a marginally better performance than the sample as a whole. The same group reported delivering to contracted price in 60 per cent of cases, which is a marginally worse performance than the sample as a whole.

## Best practice in managing PFI projects

*Survey respondents and interview participants highlighted a range of issues that were thought to be good practice.*

### An experienced and consistent team

**86** Prior experience was said to be an important factor by interview participants in ensuring the smooth running of a project, and in helping the construction phase deliver to timetable and contracted price. Accumulating PFI experience in teams was also thought to lead to better value for money in the long term; for example project managers would know what they needed from their contractors, could write better tender documents, and therefore attract better quality bids.

**87** Many contract managers stressed the importance of maintaining a consistent team throughout a project. The loss of team members, with the experience and knowledge they can bring to the project, often meant that projects did not run as smoothly as they might otherwise have done. Thus, keeping a team together throughout the procurement and construction phase was often recommended.

**88** Similarly, high staff turnover among project teams and the subsequent loss of 'corporate memory' was highlighted as a contributory factor in poor project management in some cases. Indeed, some of the project managers spoke of how, in the early years of PFI, after the contract was agreed many of the team involved in the procurement would leave to do other work (often, for instance, they were just on secondment from somewhere else, for example, the Local Authority). Given that the contracts were so complex, this lack of knowledge transfer was sometimes problematic.

**89** These issues have also been identified in past NAO reports. In response to our report on *Improving the PFI tendering process*<sup>10</sup>, the PAC concluded that there was a continuing lack of PFI experience and skills within public procurement teams across the public sector. Staff continuity has also been identified as an issue in a number of our case study reports. For example:

- *Allocation and management of risk in Ministry of Defence PFI projects*<sup>11</sup> found that there was a lack of staff continuity in some of the case study projects the NAO examined.

<sup>10</sup> NAO Report. *Improving the PFI tendering process*, (HC 149, 2006-07).

<sup>11</sup> NAO Report. *Allocation and management of risk in Ministry of Defence PFI projects*, (HC 343, 2007-08).

- *PFI: The STEPS Deal*<sup>12</sup> and its associated PAC report<sup>13</sup> recommended that departments should avoid moving contract managers unnecessarily.

**90** The importance of strong project management and teamwork was raised consistently as being a key determinant of whether a project was delivered to timetable and to the contracted price. The issue of the need for strong project management is not just restricted to PFI. In our report on *Estimating and monitoring the costs of building roads in England*<sup>14</sup>, we highlighted the need for increased numbers of skilled project managers and commercial staff in the Highways Agency.

### Clear expectations and constant dialogue

**91** Respondents emphasised clarity over what was expected from the PFI project as crucial to ensuring satisfactory delivery of the final asset, and maintaining clear communications between the public sector and the contractor was felt to be a vital factor. All projects which delivered to timetable and contracted price, referred to good communications. In many cases, detailed chains of communication were established so that all partners were aware of what was happening.

**92** Not only was close collaboration and communication between partners felt to be essential to the smooth and successful running of a project, it helped facilitate value for money. One project manager commented: “We brought people who traditionally might have been called clerks of works but we re-skilled them, we retrained them and got them to work in partnership with our contractors and helped them interpret our output specification in a way which didn’t cost them more money but gave them better outcomes”.

**93** Interviews also highlighted the importance of maintaining open dialogue, which was perceived to help prevent miscommunication and misunderstanding between the public sector and the contractor. While PFI contracts were said to offer protection from financial risk, an over-reliance on contractual detail was thought to inhibit effective communication between partners at times.

**94** In our interviews, the consequences of poor communications were clear. A lack of open and honest dialogue could lead to delays, highlighting the importance of this aspect of project management. Generally, however, relations between the main contractor and the public sector were felt to be cordial, with 85 per cent of survey respondents (65 excluding don’t know responses) rating this as fairly and very good.

**95** Many of these issues were identified in our report *Managing the relationship to secure a successful partnership in PFI projects*.<sup>15</sup> In particular this report identified factors such as open communication and a partnership approach to working as key factors to a successful outcome.

<sup>12</sup> NAO Report. *PFI: The STEPS Deal*, (HC 530, 2003-04).

<sup>13</sup> PFI: The STEPS deal. Committee of Public Accounts, (20th report 2003-2004, HC 553).

<sup>14</sup> NAO Report. *Estimating and monitoring the costs of building roads in England*, (HC 321, 2006-07).

<sup>15</sup> NAO Report. *Managing the relationship to secure a successful partnership in PFI projects*, (HC 375, 2001-02).

# Methodology

**1** Outlined below are the main elements of the methodology used to produce this report.

## Survey of PFI construction projects

**2** Ipsos MORI conducted an online survey of PFI project teams across England, between 1 November 2008 and 31 March 2009. The survey was used to collect information on the key study questions:

- Have PFI construction projects been completed to the contracted timetable?
- Have PFI construction projects been completed to the contracted price?
- Have PFI construction projects received good quality ratings?

**3** The survey was sent to all projects identified as being within the defined population. Our PFI population was defined as all English PFI construction projects which were due to be complete between 1 January 2003 and 31 August 2008, with a capital value of £20 million or above. PFI projects were identified from databases maintained by the Treasury<sup>16</sup> and PUK<sup>17</sup> and were included if either one of the databases identified a project as being valued at £20 million or more. The resulting population totalled 153 projects.

**4** The survey was completed by 114 respondents. The majority of these were completed online, though a number of projects recorded key information on a shorter Word version of the survey. This represents a 75 per cent response rate from the defined population. The number of respondents varies between questions (identified below each chart) as the number of respondents stating 'don't know' to questions varies.

**5** A range of values has been presented for key statistics on time and price, as those who responded to our survey were only a sample of the total population. We cannot therefore be certain the figures obtained are exactly those we would have obtained if every project responded. In 2003 this was not necessary as a census was conducted; the whole population (except one project) responded to the census, rather than just a sample of the population as in 2008.

<sup>16</sup> PUK Projects Database <http://www.partnershipsuk.org.uk/PUK-Projects-Database.aspx>

<sup>17</sup> The Treasury's database of PFI projects [http://www.hm-treasury.gov.uk/ppp\\_pfi\\_stats.htm](http://www.hm-treasury.gov.uk/ppp_pfi_stats.htm)

**6** A 95 per cent confidence level has been utilised for the confidence intervals stated in this report. That is, for each percentage stated, there is a 95 per cent chance that the 'true' percentage falls within the specified range. Confidence intervals stated in this report are wider than those used for finite samples, to take account of the fact that 153 may not be the exact number in the population. It must also be noted that confidence intervals require random sampling of a population which may not be the case in this instance due to the self-selection of survey respondents. For this reason, confidence intervals should be used as a guide only.

**7** A number of projects were subject to a validation exercise which was performed after survey responses were received. While not all questions were validated, the key questions referring to time and price performance, and the reasons for these, were followed up for a majority of projects reporting poor time or price performance. A random sample of respondents reporting delivery to timetable and price were also validated. This was performed by phoning projects and talking to project teams about their experiences in more detail. The NAO did not take this analysis any further. More work would need to be undertaken to get a comprehensive picture of PFI construction performance.

### Survey of non-PFI construction projects

**8** Ipsos MORI conducted an online survey of non-PFI construction project teams across England, between 1 November 2008 and 31 March 2009. The survey was used to collect information on the performance of non-PFI construction projects to timetable and price.

**9** The survey was sent to all projects identified as being within the defined non-PFI population. Our non-PFI population was defined as all English public sector construction projects, excluding PFI, which were due to be completed between 1 January 2003 and 31 August 2008, with a capital value of £20 million. Public sector construction projects were identified from a list of projects supplied by Glenigan, which collects project information from planning applications. The resulting population included 225 projects.

**10** The survey was completed by 50 respondents. Around half of these were completed online, and the remainder completed a shorter telephone survey. This mixed method approach was used due to a poor response rate to the initial online survey. The NAO experienced difficulty in identifying project team contact details and therefore MORI's in-house telephone interviewers were employed to identify the correct contacts and interview them by telephone.

**11** The number of respondents varies between questions as the number of respondents stating 'don't know' to the key questions varies. In particular, just 49 were able to provide information on delivery to timetable and 41 for delivery to price. This represents response rates of 22 and 18 per cent which is taken into account in the wide confidence intervals presented with statistics.

**12** Survey respondents covered a variety of sectors, though educational facilities and housing projects dominate (**Figure 18** overleaf).

### Interviews with PFI and Non-PFI project teams

**13** Ipsos MORI conducted in-depth interviews with project teams to gain a deeper understanding of the challenges and successes of construction projects procured under PFI and by conventional methods. Twelve PFI and five non-PFI project teams were randomly sampled from survey respondents and interviewed for around 30 minutes each. It must be noted that the statements quoted in this report from interview participants are viewpoints of individuals. As they hold these viewpoints to be true they have been reported as such.

### Use of existing data

**14** Secondary data reviewed for this study includes:

- Construction Excellence’s ‘KPI Zone’ data;<sup>18</sup>
- OGC’s ‘Achieving Excellence’ data;<sup>19</sup>
- Audit Scotland’s Major Capital Projects report;<sup>20</sup> and
- Audit Australia’s Performance of PPPs and Traditional procurement in Australia report.<sup>21</sup>

Where these datasets have not been provided in a comparative format to our own data, analysis has been performed to bring them in line where possible.

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### Figure 18

Sectoral mix of projects in the NAO non-PFI survey sample

Type of building	2008
University/College buildings	13
Schools (Grouped)	9
Housing	8
Student accommodation	6
Hospitals/Health	5
Office buildings	2
Laboratories	1
Other	6
<b>Number of Projects</b>	<b>50</b>

Source: National Audit Office

#### NOTE

- 1 Other includes a museum, an arena, a shopping centre and three leisure centres.

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18 Constructing Excellence’s UK Construction Industry Key Performance Indicators <http://www.kpizone.com/>  
 19 Office of Government Commerce’s Achieving Excellence data [http://www.ogc.gov.uk/guidance\\_achieving\\_excellence\\_in\\_construction\\_4440.asp](http://www.ogc.gov.uk/guidance_achieving_excellence_in_construction_4440.asp)  
 20 Audit Scotland (2008) *Review of major capital projects in Scotland*.  
 21 The Allen Consulting Group (2007), *Performance of PPPs and Traditional procurement in Australia*, issued 30 November 2007.