National Audit Office

REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL

HC 959
SESSION 2008–2009

16 OCTOBER 2009

Highways Agency

Contracting for Highways Maintenance

Our vision is to help the nation spend wisely.

We promote the highest standards in financial management and reporting, the proper conduct of public business and beneficial change in the provision of public services.

The National Audit Office scrutinises public spending on behalf of Parliament. The Comptroller and Auditor General, Amyas Morse, is an Officer of the House of Commons. He is the head of the National Audit Office which employs some 900 staff. He and the National Audit Office are totally independent of Government. He certifies the accounts of all Government departments and a wide range of other public sector bodies; and he has statutory authority to report to Parliament on the economy, efficiency and effectiveness with which departments and other bodies have used their resources. Our work leads to savings and other efficiency gains worth many millions of pounds: at least £9 for every £1 spent running the Office.

Report by the Comptroller and Auditor General

Highways Agency
Contracting for Highways Maintenance

HC 959 Session 2008-2009

ISBN 978 0 10 296317 5

CORRECTION

Page 9, paragraph 1.2

Text reads:

1.2 The Highways Agency, an Executive Agency of the Department for Transport, maintains England's motorways and trunk roads. Its Network Operations Directorate does this through contracts in each of 14 geographic Areas within seven regions (Appendix 1). During 2008-09 the Agency spent £926 million on maintenance representing £29,000 per lane kilometre. This compares with £828 million representing £22,000 per lane kilometre in 2002-03 (2008-09 prices). In November 2008 the Secretary of State announced £400 million of 'fiscal stimulus' funding to support the Agency's 2009-10 budget, some of which is available for maintenance.

Text should read:

1.2 The Highways Agency, an Executive Agency of the Department for Transport, maintains England's motorways and trunk roads. Its Network Operations Directorate does this through contracts in each of 14 geographic Areas within seven regions (Appendix 1). During 2008-09 the Agency spent £926 million on maintenance representing £29,000 per lane kilometre. This compares with £884 million representing £25,000 per lane kilometre in 2002-03 (2008-09 prices). In November 2008 the Secretary of State announced £400 million of 'fiscal stimulus' funding to support the Agency's 2009-10 budget, some of which is available for maintenance.

October 2009
LONDON: The Stationery Office

National Audit Office

Highways Agency

Contracting for Highways Maintenance

Ordered by the House of Commons
to be printed on 14 October 2009

Report by the Comptroller and Auditor General
HC 959 Session 2008–2009
16 October 2009

London: The Stationery Office
£14.35

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

Amyas Morse

Comptroller and Auditor General

National Audit Office

13 October 2009

The Highways Agency, an Executive Agency of the Department for Transport, maintains England's motorways and trunk roads. Its Network Operations directorate does this through contracts in each of 14 geographic areas within seven regions.

Printed in the UK for the Stationery Office Limited
on behalf of the Controller of Her Majesty's Stationery Office
P002326939 10/09 7333

Contents

Summary **4**

Part One
Letting contracts for highways maintenance **9**

Part Two
Managing MAC contracts **16**

Part Three
Outcomes for users and taxpayers **27**

Appendix One
Map showing Highways Agency Areas **36**

Appendix Two
Methodology **37**

The National Audit Office study team consisted of:

David Howes, Ken Foreman, Peter Jones, Annie Ko, David Powell, Jemma Dunne and Samiul Chowdhury, under the direction of Geraldine Barker

This report can be found on the National Audit Office website at www.nao.org.uk

For further information about the National Audit Office please contact:

National Audit Office
Press Office
157-197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400

Email: enquiries@nao.gsi.gov.uk

Summary

1 England's network of 36,000 lane kilometres of motorways and trunk roads is a key component in the strategic transport network, heavily used for business and leisure travel and for the transport of freight. In 2007, it supported 138 billion vehicle kilometres of travel, around 31 per cent of total road travel. Maintaining it effectively and efficiently in a safe and serviceable condition is essential.

2 The Highways Agency's Network Operations Directorate maintains this network, spending £926 million in 2008-09. Maintenance work is largely carried out through Managing Agent Contractor (MAC) contracts, in each of the Agency's 14 geographic Areas (Appendix 1), whereby a single contractor is responsible for the design and delivery of maintenance work over four or five years with the option to extend up to seven years. We examine how well the Agency has designed and managed these contracts, and whether they are providing value for money for taxpayers and road users. Our methodology is described in Appendix 2.

Key Findings

3 **The MAC contract form largely follows best practice and contains the mechanisms necessary to allow the Agency to manage risks and deliver efficiencies over time**. These include: three different payment mechanisms (lump sum, target pricing and cost reimbursable) so that the Agency can allocate risks appropriately between itself and the contractor; largely output based specifications; good visibility of costs; and by limiting price increases to the Retail Price Index it provides some protection against traditionally higher inflation in the road maintenance sector.

4 **Since the introduction of the contract in 2001, there have been some improvements in quality and in delivery to budget**.

- Based on a sample of planned maintenance schemes:
    - the average overspend compared with budget has fallen from 27 per cent in 2002 to 12 per cent. In some Areas however, the contractor consistently undershoots the target costs, which suggests that they may not be sufficiently challenging;
    - fifty eight per cent of planned maintenance schemes are now delivered within the planned number of days.
- Road users' overall satisfaction with the Agency has increased, but more users are reporting delays, and around 40 per cent of these are attributing those delays to roadworks. More than half of those encountering lane closures at roadworks reported no obvious work being carried out at the time.

- The overall condition of the road network has remained the same.
- Journey time reliability has improved, and the timing suggests Agency interventions have contributed to this improvement.
- Over the last five years safety at roadworks for both road users and road workers has not changed much.

5 But costs have increased. The cost of routine maintenance has risen by 11 per cent above inflation between 2002-03 and 2008-09 even though bids in contractors' tenders were lower. This is in part due to changes in the Agency's specification, for example requiring faster response times to incidents on the road network. Expenditure on planned maintenance has increased by 5.5 per cent above general price inflation in the same period, with spending on planned maintenance of roads per square metre resurfaced rising by 70 per cent over the same period. This figure includes spending on items such as barriers, lighting and drainage which do not yield a resurfaced area and the Agency says this type of spending has represented an increasing proportion of the total. The Agency's own estimate of spending on resurfacing per square metre treated indicates an increase of 17 per cent above general price inflation between 2004-05 and 2008-09 but we have not been able to fully validate this estimate. The true increase between 2002-03 and 2008-09 is likely to lie somewhere between the two figures.

6 There are shortcomings in the Agency's management of MAC contracts. The Agency's quality control mechanisms have focused on checking compliance with contract requirements, rather than on the costs or quality of the work done. The Agency is only now beginning to exploit the good visibility of costs within the contracts, for example, to establish the unit costs of items within jobs so that it can challenge contractors' costings and establish benchmarks for continuous improvement. We found considerable variations between Areas in the unit costs of surfacing, white lining and traffic management. The average costs of resurfacing jobs ranged from £17 to £36 per square metre, and the cost of thin surfacing materials ranged from £63 to £101 per tonne (September 2008 prices). The Agency has not yet performed a robust evaluation of the costs and benefits of introducing MAC contracts.

7 The contracts could be improved further. There is a risk that contractors can move costs from activities which are paid for by lump sums, where they bear the risk of cost increases, to cost reimbursable activities where the Agency bears the risk. Payments on a cost reimbursable basis have risen sharply since contracts were awarded.

8 The Agency's Directorate responsible for maintenance had only four quantity surveyors at the time of our review and has lost over 50 engineering staff in recent years, despite the importance of their skills in managing MAC contracts. It needs staff with strong client skills in engineering and commercial management to make proper use of the mechanisms available to manage risks and costs, to challenge the contractors' specifications, and manage their performance.

9 The Agency's principal objective in value for money terms is to maintain the network in a safe and serviceable condition at minimum cost but it does not pursue minimum whole life cost as strongly as it might.

- It has a well developed process for identifying projects with the lowest whole life costs for road pavement schemes, but only applies it to schemes over £100,000 (£250,000 from 2009-10). In the schemes we examined where it was applied, the option chosen was often not that with the lowest whole life cost.
- The whole life cost approach is not so well developed for other planned maintenance work such as safety fencing, drainage, embankments or structures, where the Agency has gaps in the information about the condition and/or deterioration paths of some of these assets. It is developing an Integrated Asset Management System to provide this information.
- There is no direct incentive for contractors to minimise whole life costs.

10 The contract form is mature, well understood by the market and has attracted strong competition, but effective price competition is becoming more limited as fewer bidders pass the Agency's quality test, and the contracts offer the Agency limited flexibility in procurement options once let. The Agency has used MAC contracts for eight years, and has refined them over that time. Five bids were received for each of the past 11 competitions. But the supplier base is starting to get smaller and companies are finding it more difficult to pass the Agency's quality test, with more than half the bids failing that test in the latest round. The contract does not normally allow the Agency to put planned maintenance jobs below £500,000 out to tender, or award larger jobs to the MAC without competition.

Conclusion on value for money

11 The MAC contracts offer the potential to secure value for money by providing visibility of costs and the ability to allocate risk appropriately, and since their introduction there has been greater certainty over delivery of maintenance schemes within budgets, and improvements in journey time reliability. But costs have increased, for both routine and planned maintenance. The Agency has few quantity surveyors and has lost engineers whose skills are needed for effective contract management. It still lacks some of the information on its assets necessary to minimise whole life costs. Going forward, the prospect of a potentially smaller supplier base presents an increased risk to value for money. As currently operated, the Agency is not achieving the best value for money that it could from these contracts.

Recommendations

Letting MAC contracts

12 The Highways Agency should:

- align the incentives in the MAC contracts with its principal value for money objective of minimising the whole life cost of maintaining the network in safe and serviceable condition;
- review the standards documents underpinning MAC contracts to ensure they are outcome based as far as possible;
- set a cap on the fee rate paid for subcontracted work;
- engage sufficiently with potential suppliers so that they fully understand its quality requirements, and so that those requirements do not deter capable and competent providers from bidding; and
- build greater procurement flexibility into its contracts so that it can fully exploit the efficiency potential of MACs without surrendering its ability to go to the market directly, and without choking off the supply of work to contractors outside the MAC community who help maintain price competition.

Managing MAC contracts

13 The Highways Agency should:

- use the cost information it already holds to benchmark unit costs of planned maintenance;
- conduct business reviews of contracts to ascertain that costs are being properly charged, compare cost and payment profiles with those expected at contract award, and consider action where there is significant divergence from client expectations;
- provide Area staff with sufficient visibility of payments through the different strands of MAC contracts so that they can manage those contracts effectively;
- strengthen the engineering, quantity surveying and commercial skills in its Area teams;
- benchmark performance between Areas; and look at the scope for benchmarking with Scotland and Wales, and the road maintenance industry more generally;

- rebalance its quality assurance of MAC contractors' work towards outcomes and performance relative to external benchmarks rather than just processes;
- adopt a more active role in the design of the planned maintenance programme, through its own whole life cost analysis;
- give a higher priority to develop and implement its Integrated Asset Management System and take steps to extend whole life costing methods to its non-pavement network assets;
- keep up to date the data on costs and the durability of different treatments used in its whole life cost models; and
- challenge the quantities of materials and costs more generally in target cost schemes for reasonableness.

Outputs

14 The Highways Agency should check modelled journey delays for roadworks against actual delays when those roadworks are in place, and adjust its model accordingly, so that the contribution of maintenance to journey time reliability can be more accurately gauged.

Part One

Letting contracts for highways maintenance

1.1 This part outlines the types of maintenance the Highways Agency commissions and the maintenance contracts it uses. It focuses on the Managing Agent Contractor or MAC contract, commenting on its strengths and weaknesses and on the market's response to the Agency's competitions for contracts.

The Highways Agency's role

1.2 The Highways Agency, an Executive Agency of the Department for Transport, maintains England's motorways and trunk roads. Its Network Operations Directorate does this through contracts in each of 14 geographic Areas within seven regions (Appendix 1). During 2008-09 the Agency spent £926 million on maintenance representing £29,000 per lane kilometre. This compares with £828 million representing £22,000 per lane kilometre in 2002-03 (2008-09 prices). In November 2008 the Secretary of State announced £400 million of 'fiscal stimulus' funding to support the Agency's 2009-10 budget, some of which is available for maintenance.

Types of maintenance

1.3 The Highways Agency commissions four main types of maintenance and in 2008-09 spent:

- £493.4 million on **planned maintenance** which includes road resurfacing, strengthening or replacement of structures such as tunnels and bridges;
- £327.6 million on **routine maintenance** which covers pothole repairs or street light outages; response and repairs following collisions or spillages; cyclical tasks such as cutting grass verges, periodic inspections of the condition of road surfaces and structures; and identifying the need for maintenance.
- £40.6 million on **winter maintenance** including gritting of roads, snow clearance and maintenance of the equipment used for those tasks.
- £64.5 million on **technology maintenance** such as emergency phone systems, road sensors, CCTV and communications systems for regional control centres.

1.4 This study covers planned, routine and winter maintenance which account for over 90 per cent of maintenance expenditure.

Types of contract

1.5 Since its establishment in 1994, the Highways Agency has performed all maintenance work through third party suppliers, initially local authorities and since 1997 private contractors. The Agency's staff procure and manage the contracts. Initially it appointed one organisation to design and manage maintenance work (the Managing Agent), and another to perform the work (the Term Maintenance Contractor). It currently uses three forms of contract for its planned, routine and winter maintenance work.

- Managing Agent Contractor (MAC) contracts where the contractor designs and delivers all routine and planned maintenance up to a ceiling of £500,000. The Agency has used these for all new term maintenance contracts[1] awarded since March 2002, with the aim of eliminating duplication between Managing Agents and Term Contractors, realising efficiencies and delivering a more integrated service. Each contract covers one of the Agency's 14 Areas for four or five years, with an option to extend the contract up to a total of seven years. The MAC contractor acts both as:
    - consultant – identifying, designing and supervising all routine and winter maintenance, together with all planned maintenance schemes; and
    - works contractor – delivering all routine and winter maintenance, and planned maintenance schemes up to £500,000.
- Managed Works Contracts: The Agency enters into separate contracts with suppliers for individual planned maintenance jobs over £500,000. The MAC identifies, designs and supervises the work (using a contractor under an existing framework contract or by a tendering process). Unless the Agency agrees, the MACs and their associated companies may not tender for these contracts.
- Framework Contracts, which, at the end of July 2009, were used in nine Areas instead of having competitions for each Managed Works Contract, cover work arising over four to seven years. During that period, work within planned maintenance schemes over £500,000 will generally be awarded to one of the relevant framework contractors. There were two types of framework contract operating in July 2009:
    - seven Areas appointed one lead contractor; and
    - two Areas appointed a different framework contractor for each particular specialism required, such as surfacing or waterproofing.

1.6 MACs have the same design and management role for work irrespective of whether it is carried out by them, or as Managed Works undertaken through a Framework Contract or by means of a separate discrete contract. Thus, even where MACs do not perform work themselves, they have an important role in advising the Agency on what work needs to be done, and designing and managing that work, hence our focus on the MAC contracts.

1 Term contracts cover work arising during a period – usually a number of years – rather than specific projects.

1.7 The Agency also uses Design, Build, Finance and Operate contracts for some parts of its network. These contracts include elements of new construction plus maintenance of both the new road and some existing roads.

Strengths and weaknesses of the MAC contract form

1.8 We assessed whether the contracts followed good practice, for example, in allocation of risk and alignment of incentives and identified certain risks inherent in the MAC contract.

Risk allocation

1.9 The mix of payment mechanisms allows for a balanced allocation of risk between the Agency and its contractors, according to who is best placed to manage it. The latest form of MAC contract has three payment mechanisms.

- **Lump sum payment** is used for most routine and winter maintenance work. The contractor receives a monthly lump sum for performing the requirement set out in a Routine and Winter Service Code. The amount is based on the sum submitted in the contractor's tender and is increased annually in line with the retail price index. The Agency and the contractor can negotiate changes to the lump sum if there are changes to the service requirement which impact on the cost. The contractor bears the risk of: costs exceeding the level that they assumed when they submitted their tender or after agreeing an adjustment; and of undertaking accident repair work under £5,000 the costs of which they reclaim from third parties, and price that risk within the lump sum.

- **Target cost** is used for the works cost of planned maintenance jobs undertaken by the MAC. When jobs arise during the contract a target price is developed using rates and quantities within sample schemes the MAC priced with its tender where possible. These are uprated in line with the retail price index. The Agency and MAC may agree to vary the agreed target price if the Agency changes its requirements, or costs change due to circumstances which the MAC could not have anticipated. The Agency and the MAC share under or overspends relative to the target price, thus sharing the risk.

- **Cost reimbursement** is used for design work and for supervision and management of work performed under Managed Works or Construction Management Framework contracts. It is also used for specialist incident response work, accident repair work where the MAC is not responsible for recovering the cost from a third party, work on the Agency's strategies and the Agency's own and reserve fleets of winter maintenance vehicles, and certain technical services. The Agency bears the whole risk of cost escalation on cost reimbursable work.

Contractors also claim fee percentages included in their tender on all target cost and cost reimbursable work.

Cost migration

1.10 The mix of payment mechanisms carries the risk that contractors might move costs from the lump sum category where costs are capped, to the cost reimbursable category where there is no such cap. Where contractors might reasonably charge costs of work to either a lump sum or a cost reimbursable activity, they can maximise profit or minimise loss by charging it to the latter activity. A number of the contractors we spoke to commented that this would not be in their long-term interests and would not be condoned. Nevertheless, it is a risk which the Agency should mitigate itself, rather than rely on the enlightened self-interest of contractors taking a long-term view. We found no direct evidence of costs being inappropriately charged to cost reimbursable activities, but in Part 2 we note how payments for cost reimbursable activities have tended to rise sharply after contract award.

Alignment of incentives

1.11 The Agency's principal objective in value for money terms is to minimise the whole life cost – including the costs of user delays and accidents – of keeping its network in a safe and serviceable condition, yet it does not incentivise MAC contractors to contribute to this objective. On the contrary, the payment of fee percentages on target cost and cost reimbursable work encourages them to maximise the value of that work. While the Agency requires the contractor to follow processes designed to select the maintenance options which minimise whole life costs, there is no financial reward for doing so more rather than less effectively. Some contractors argued that they already adopt a rigorous whole life cost approach to underpin their long-term presence in the market and their standard of service delivery. Others believed that the market would respond well to more direct commercial incentives.

Fee regime

1.12 The Agency pays effective fee rates of up to 25 per cent after allowing for subcontractors' fees. MACs add their own fees to the costs of planned maintenance work which is subcontracted. In 2007 the Agency allowed MAC bidders to offer a different fee rate for the work that they subcontract compared to that for work they perform themselves. This could have reduced the cost to the Agency of paying both a MAC fee and a subcontractor's fee on subcontracted work and created an incentive for MACs to perform work themselves. But winning bids since the change have offered no differential. For the schemes that we reviewed, MACs subcontracted 90 per cent of the value of the planned maintenance work they performed. Where subcontractors' fee rates were explicit within their prices the effective overall rate when combined with the MAC's fee ranged from ten per cent to 25 per cent.

Inflation

1.13 The MAC contract limits price increases to the retail price index (RPI) for lump sum activities and the target costs of planned maintenance items within sample schemes. This gives some protection against the higher rates of inflation which have been prevalent in the road construction and maintenance sector. But during the course of the contract new work may be introduced into lump sum activities, and planned maintenance work items which were not priced within sample schemes may arise. Prices for these will not be index linked to a tendered base price. And since pain/gain sharing is in place for planned maintenance work under the target cost regime, the Agency has to bear a share of the pain if actual costs exceed target due to inflationary pressure above RPI. Moreover, this inflation protection does not apply to the same extent to Managed Works contracts, where prices prevailing when the scheme is tendered will apply to the initial target cost, or framework contracts where road maintenance price indices or other evidence of cost increases for specific items may be used to justify price increases above RPI.

Output specifications

1.14 In line with current contracting practice, the MAC contract usually specifies the outputs required rather than itemising the jobs to be performed. This allows the Agency to stand back from the detail of specification and inspection of individual jobs, and focus more on outcomes for its assets and their users. The Agency still needs to review however, some aspects of the detailed guidance and manuals underpinning the MAC contracts to conform with this approach, and to encourage innovation from contractors. One part of the Manual of Contract Documents for Highways Works specifies road marking requirements referring to an output-based European Standard based on luminance, visibility, skid resistance and durability. But another part prescribes the gap between the edge of a road sign and its mounting pole, and the need for nylon washers between signs and retaining nuts.

Flexibility

1.15 The contract forms provide the Agency with limited flexibility in its procurement strategy during the course of the contract. The Agency may allow the MAC contractor to tender for planned maintenance schemes with a value over £500,000, but it cannot award that work without competition. MAC contractors felt this restricted their ability to realise fully the efficiencies of offering an integrated service and wished to see a higher threshold. Conversely, the contract does not normally allow the Agency to put work below £500,000 out to competition. An upper limit above which work must be separately tendered, coupled with a lower limit below which it must be awarded to the MAC as of right, would offer greater flexibility. Moreover, the contract does not allow the Agency to procure any part of the service directly, for example materials, while allowing or requiring the MAC or a Managed Works contractor to make use of that Agency contract to perform its work.

Procurement

1.16 The Agency tenders the MAC contracts for each Area competitively. It advertises the competitions in tranches of two to four Areas in any one year using the same form of contract which is then reviewed and amended before the start of the next tranche. The competition requires the tenderers to pass a quality threshold before they can enter the price competition. The financial bid is mainly based on a lump sum payment for routine and winter maintenance and a quantity and a price for each element of a set of sample schemes issued with the invitation to tender. A sample surfacing job might require the specification of hourly prices for surfacing labour, and for a specific piece of surfacing plant, and the number of hours of each required. Tenderers also have to specify the fee percentages they will charge on these planned maintenance jobs. From the information provided by each tenderer, the Agency also calculates an amount for cost reimbursable work over the contract period.

Market response

1.17 The MAC contract is a mature contract form which the Agency has developed over the past eight years and whose basic components are well understood by the market as they are based on features of standard contract forms used widely throughout civil engineering and construction industries. This helps to maintain market interest and to secure compliant bids. MAC contracts are attractive to a number of major engineering or construction companies as they offer a stable revenue stream over a four to seven year period and provide work for their core business. The Agency is a high profile client and a leader in the maintenance and management of heavily trafficked roads, giving MAC contractors a strong base for bidding for local authority or other work.

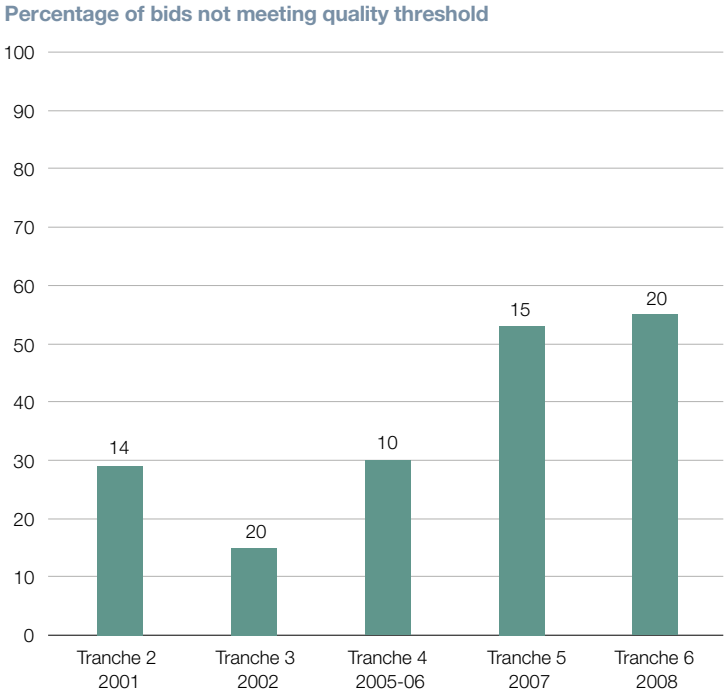
1.18 The Agency is seeking to encourage competition in the MAC suppliers' market. Between 2002 and 2008, 33 different companies were involved in bids,[2] mainly as joint ventures between two or more partners, though some have bid alone, two successfully since 2002. The current list of incumbents is not long however, and by October 2009, only 11 companies will hold contracts either alone or as part of a joint venture compared to 12 in June 2009. Following legal advice the Agency is limiting the number of MAC contracts which a single contractor may hold. It is also working with current and prospective bidders to encourage more bids. It engages with current MACs through a Maintenance Community network and offers seminars and presentations on its procurement approach to prospective bidders. Contractors generally commended the Agency for conducting clear and transparent competitions with clear feedback to winners and losers.

2 Two of these have subsequently merged with, or been taken over, by one of the others.

1.19 The Agency has received a good number of bids for recent competitions but an increasing proportion of bidders have failed to meet the quality threshold, limiting the extent of the price competition. Eleven Areas each received five bids for the last rounds of competitions. The proportion of bids failing to meet the quality threshold has increased over the last four rounds (**Figure 1**) with 11 of the 20 bids failing in the latest round. For one Area in the last round, only one bid met the quality threshold.

Figure 1

Percentage of bids not passing the quality threshold for each tranche of current contracts (year is when tenders were submitted)



Source: National Audit Office analysis of Highways Agency data

NOTE

Number at top of each bar is the total number of bids in that Tranche.

Part Two

Managing MAC contracts

2.1 In this part, we examine how the Agency decides what maintenance work needs to be done, its skills base for contract management, its control of the costs and times of schemes, its handling of quality control, and its use of management information. We draw upon visits to six Agency Areas:

- Area 1: Cornwall and Devon
- Area 4: East Sussex, Kent, Surrey, West Sussex
- Area 6: Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk
- Area 10: Greater Manchester, Cheshire, Merseyside and parts of Lancashire
- Area 13: Cumbria and Lancashire
- Area 14: Durham, Northumberland, North Yorkshire, Tyne and Wear

Deciding what needs to be done

2.2 The Agency's principal objective in value for money terms is to maintain the network in safe and serviceable condition at minimum whole life cost. To develop an optimal programme of planned maintenance to achieve this, it needs to know the current condition and likely rate of deterioration of its assets, including road pavements and sub-surfaces, safety barriers, embankments and cuttings, bridges, viaducts and tunnels. It also needs to estimate with reasonable accuracy the whole life costs of alternative treatments to extend an asset's serviceable life at different times, including the costs to road users of delays caused by maintenance work. Whole life costs are generally estimated over a 60 year period based on Treasury guidance.

2.3 The Agency has inadequate information to develop such a programme itself across all its assets, or to monitor the effectiveness of its contractors in developing it. It has made considerable efforts to capture condition data on its assets which contractors often hold, including data from bi-annual general inspections of structures. But access to this information at national level remains incomplete especially for drainage and geotechnical assets, and the sub-surface condition of pavements. While its modelling of deterioration paths and costs of alternative treatments at different times is relatively well developed for road pavement schemes, it is less well developed for other assets. The Agency is addressing this through:

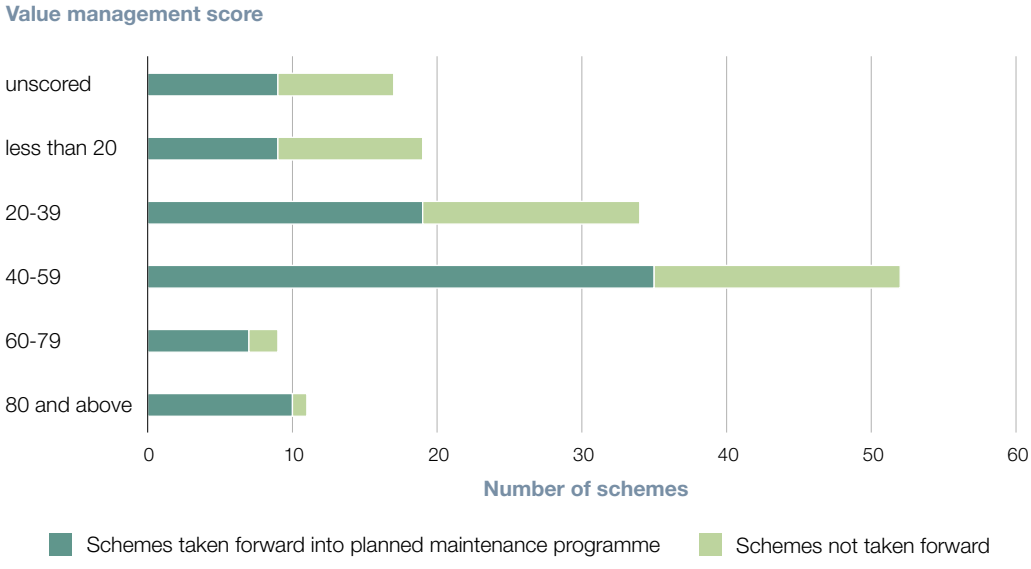
- its Integrated Asset Management project improving asset inventory data, capturing condition data and linking it to intervention options. The project includes more extensive use of formal analysis for appraising alternative structures, geotechnical and drainage schemes to ensure that the right projects go forward at the right time. The Agency plans to run this enhanced formal appraisal in parallel with existing mechanisms until 2011, and use it as the principal programme design mechanism from 2012; and
- initiating a new annual survey of lanes one and two of its whole network to provide data on the sub-surface to supplement existing surveys of surface condition.

2.4 Formal whole life costing is only applied to a minority of the planned maintenance programme. The Agency has an appraisal system for planned maintenance schemes above £100,000 called value management. This threshold will rise to £250,000 for schemes proposed for the 2009-10 work programme. But because of limits on information, formal whole life costing is only applied to flexible pavement renewal schemes within this value management system. Other elements of value management are applied to other planned maintenance schemes. These score schemes against safety, value for money, reduction of disruption to road users and environmental impact, but are not informed by quantified whole life costings. Of the overall 2008-09 renewals budget of £152.3 million in the six Areas we visited, only £89 million (58 per cent) had been subject to this value management process, and only the flexible pavements schemes (£33 million or 22 per cent) had been subject to formal whole life costing.

2.5 Even where whole life costing or value management is used, it does not appear to drive programme design. We reviewed the whole-life cost analysis of options for 35 pavement schemes above £100,000[3] and found that in 13 cases the treatment option chosen had the lowest whole life cost. In the remaining 22 cases the lowest whole life cost option was not chosen, and 17 of these had the highest cost during the programme period. There are good reasons why engineering judgements and local knowledge should override computer-generated option comparisons. But the extent to which this is happening suggests that either the whole life cost model is inadequate or considerations other than minimum whole life cost are prevailing. We also reviewed the value management scores of planned maintenance schemes considered for the 2007-08 and 2008-09 forward programmes of work for the six Areas. While schemes included in these programmes typically scored higher than those not included, some low scoring, or unscored schemes were also included, while some high scoring schemes were not (**Figure 2**).

Figure 2

Agency funding of proposed planned maintenance schemes between April 2007 and March 2009



Source: National Audit Office analysis of Highways Agency data

3 In 2008-09, the Agency budgeted to fund 417 renewal of road schemes. The 35 schemes examined represents eight per cent of this total.

2.6 The Agency has been unable to develop a top-down approach to designing its maintenance programme based on network condition, which fits within historic funding boundaries. For the 2007 Comprehensive Spending Review the Agency attempted to identify its funding requirements based on the current condition of structures and pavements, but this produced a figure well in excess of historic funding levels and so it submitted a bid, based on known commitments, adjusted for construction industry inflation and efficiency gains. The resulting regional allocations for planned maintenance (**Figure 3**) broadly reflect network usage as measured by traffic levels, and provide some assurance that the Agency's approach has not led to any one region suffering particularly poor road surface condition. This is not to say however, that more targeted interventions based on whole life cost could not deliver efficiencies.

The Agency's skills base

2.7 The MAC contracts are complex and based on partnership principles of co-operative and non-adversarial working practices, and managing them requires a high level of commercial quantity surveying and engineering skills. For example, deriving target prices is quite complex and Agency staff have to scrutinise and challenge the introduction of new rates from other schemes or subcontractor quotations, as well as estimation of quantities. They must also scrutinise proposals for variations in costs to lump sum activities, and oversee the MAC's work in supervising Managed Works and Construction Management Frameworks. Finally, they need strong client skills to ensure that the Agency's priorities drive planned maintenance.

Figure 3
Regions' indicative funding allocations for planned maintenance in 2008-09

Region	Renewals budget 2008-09 (£)	Lane km 2008-09	£/lane km	Million vehicle km 2008	£/million vehicle km	Percentage of road network in good condition (Sept 2008)
East	59,500,000	4,900	12,200	16,900	3,500	95.2
E Midlands	19,000,000	1,600	11,700	5,800	3,300	96.4
NW	60,000,000	5,200	11,500	18,300	3,300	97.9
SE	116,000,000	7,700	15,000	33,400	3,500	96.3
SW	52,500,000	3,900	13,600	10,800	4,900	96.4
W Midlands	79,000,000	4,600	17,100	18,200	4,300	97.1
Yorks & NE	55,500,000	4,000	14,000	13,200	4,200	96.3
England	**441,500,000**	**31,900**	**13,800**	**116,600**	**3,800**	**96.1**

Source: National Audit Office analysis of Highways Agency figures – excludes roads managed under DBFO contracts

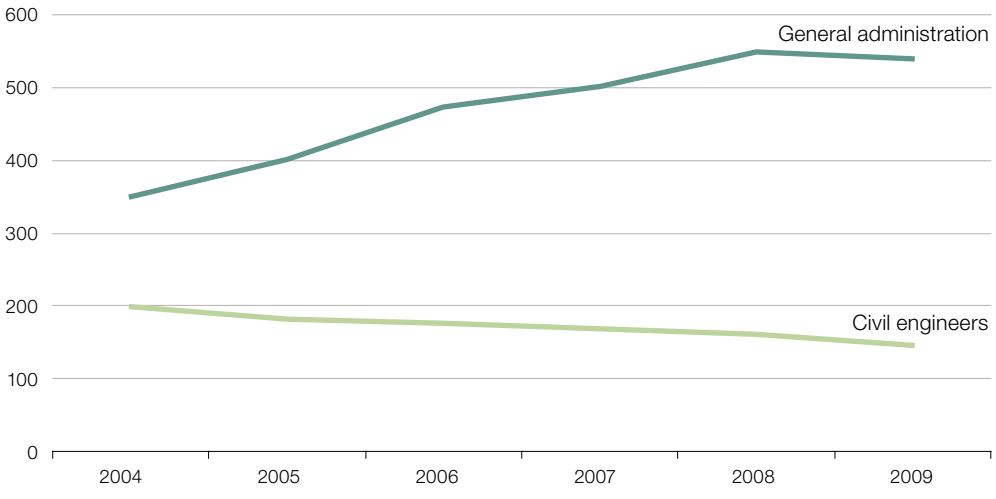
2.8 The Agency has few quantity surveyors however, and its engineering capability has diminished. Between 2002 and 2007, it employed only seven quantity surveyors and that number reduced to six thereafter, with only four in the Network Operations Directorate at the time of our review in 2009. Since 2004, the Agency's Directorates responsible for maintenance work have lost more than 50 qualified chartered engineers (27 per cent) but gained around 190 general administration staff (54 per cent) (**Figure 4**) while the total number of staff in those Directorates increased by 22 per cent. While the broad categorisation of administrative staff may include those with commercial skills or qualifications, this overall picture does not suggest a tightening focus on programme design and contract management. The Agency told us that much of the increase in administrative staff was to support its Traffic Officer Service created from 2004, comprising 1,200 uniformed staff who patrol roads to help deal with incidents and monitor traffic. They also said that they have recruited more specialist programme and project managers who would be recorded as 'general administrative staff'.

Cost control

Planned maintenance

2.9 **Figure 5** shows that for planned maintenance schemes MACs asked for increases over the initial target cost less frequently, and the level of increase, where it did arise, was relatively small compared with the levels for schemes carried out under Managed Works and Construction Management Frameworks. It cannot be assumed however, that allowing MACs to perform higher value work would inevitably reduce the level of increases, as such work bears greater risks and the amounts at stake through potential claims are higher, and so may drive different behaviour.

Figure 4
Number of civil engineers and general administration staff in the Directorates responsible for maintenance work



Source: National Audit Office analysis of Highways Agency data

2.10 In 2003, when we last reported on highways maintenance[4], we found an average overspend of 27 per cent on planned maintenance projects compared to the estimate made when the scheme entered the programme, which meant that the Agency delayed new projects to keep spending within in-year budgets. Our latest analysis, covering 70 planned maintenance schemes showed an average overspend of 12 per cent. **Figure 6** shows that in most Areas there was a broad balance of over and underspends, although there were some significant variances for individual projects. The outcomes indicate the Agency is now better placed to deliver its planned programme by trading overspends on some projects against underspends on others, rather than deferring work.

Figure 5

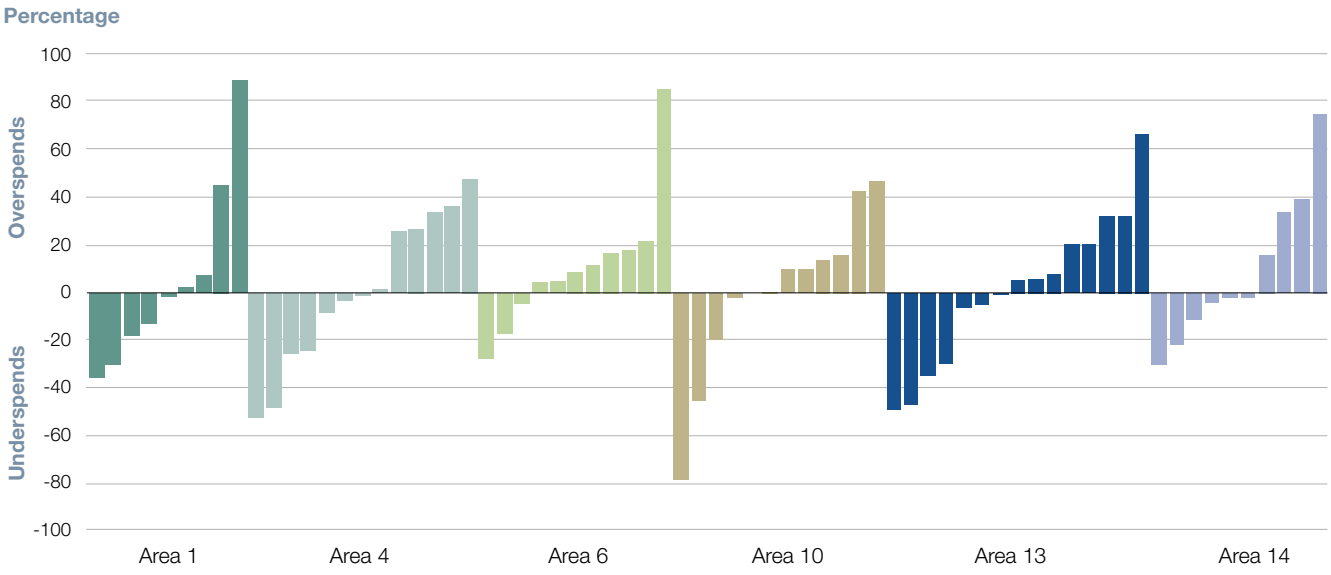
Final target cost of planned maintenance schemes compared with initial target cost

Type of planned maintenance contract	Number of schemes examined	Number of schemes where final target cost exceeded initial target cost	Average percentage addition to initial target cost where it exceeded initial target cost
Managed Works Schemes	10	9	24.2
Construction Management Framework Contracts	5	4	18.2
MAC Providers' Works Schemes	47	6	9.7

Source: National Audit Office analysis of sample of planned maintenance schemes

Figure 6

Actual cost of schemes compared with the initial estimate



Source: National Audit Office analysis of sample of planned maintenance schemes

4 *Maintaining England's Motorways and Trunk Roads* National Audit Office March 2003.

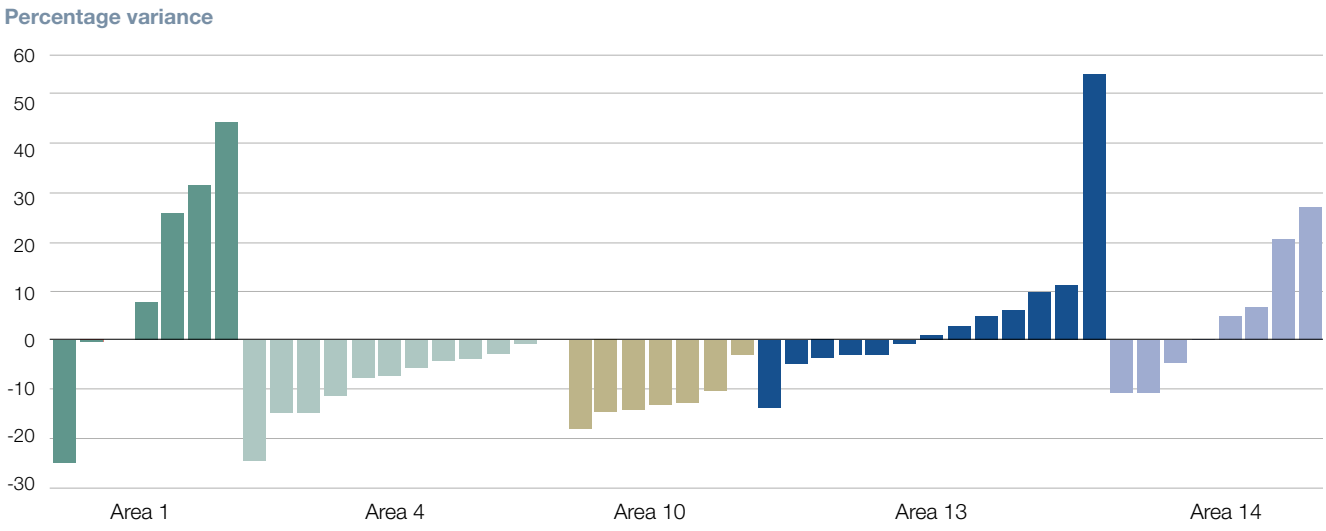
2.11 Once target costs are set for programmed schemes, some contractors are experiencing pain as much as gain on the target cost regime, but others experience many more gains. **Figure 7** shows that the MAC contractors in Areas 1, 13 and 14 experienced both pains and gains on the planned maintenance schemes we reviewed. Actual and potential suppliers told us that this was what they would expect from the target cost regime. By contrast the schemes we reviewed in Areas 4 and 10 yielded only gains for the MAC contractors since they were all delivered for less than target cost. No pain/gain figures were available for Area 6 since it had only recently converted to a MAC contract.

2.12 Payments for cost reimbursable activities have risen sharply since MAC contracts were awarded. Of the six Areas we visited, one had only recently started its MAC contract. In four of the five remaining Areas, the amount paid for cost reimbursable activities had increased significantly since the first year of the contract (**Figure 8**).

Routine maintenance

2.13 In theory, the costs of lump sum routine maintenance are fixed at the time of tender, with only an inflation increase being added for each following year, but we found that variations in requirements after tender award have added significantly to tendered sums (**Figure 9**). These include the enhanced provision of Incident Support Units, specially equipped vehicles to work with the emergency services and Highways Agency Traffic Officers in clearing incidents occurring on the network.

Figure 7
Actual cost of schemes compared with final Target Cost

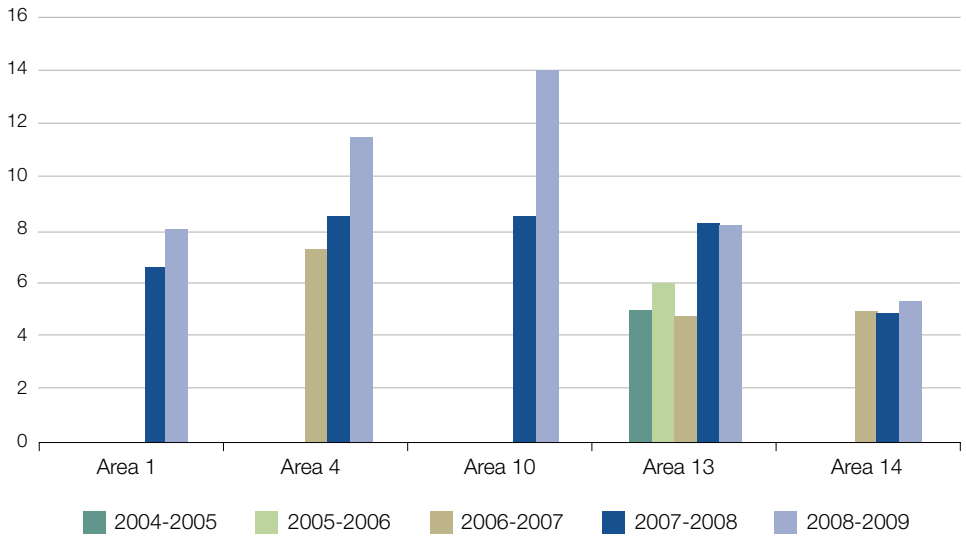


Source: National Audit Office analysis of sample of planned maintenance schemes

Figure 8

Changes in reimbursable costs over the life of current MAC contracts

Cost reimbursable payments to MACs at 2008-09 prices (£m)

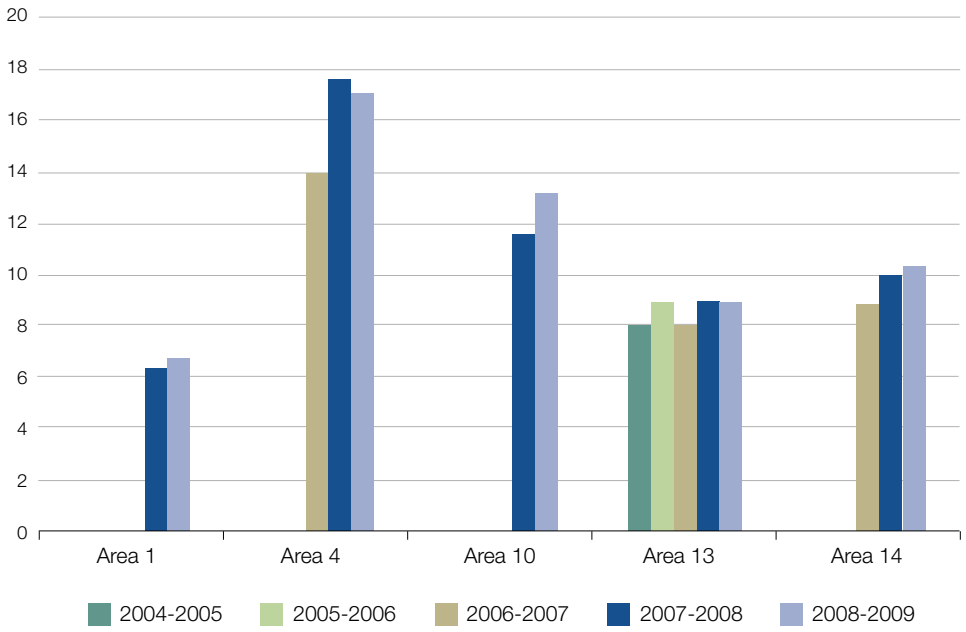


Source: Highways Agency data. Area 6 is excluded as the contract had been in place for less than a year

Figure 9

Changes in lump sum costs over the life of the current MAC contracts

Lump sum costs at 2008-09 prices (£m)



Source: Highways Agency data. Area 6 is excluded as the contract had been in place for less than a year

Schedule control

2.14 The majority of planned maintenance schemes are delivered within the planned number of days, although there are some significant overruns. We obtained data for the planned and actual duration of 55 planned maintenance schemes: 32 were completed within the planned number of days, including 23 which took less time; 12 schemes overran by more than ten days (**Figure 10**).

Quality control

2.15 Quality assurance focuses on processes rather than outcomes. Bidders must submit a quality statement and operate a quality management system compliant with ISO 9000. The latest contracts require an annual Agency audit of MAC quality management systems at head office, and six-monthly audits at depots, local offices and on site. A single audit may cover more than one location. Until May 2009 the emphasis was on procedural compliance, although site visits might identify some operational divergence from agreed standards. For example, a September 2008 audit of Area 1 made 40 findings, only five of which related to operational matters identified at a site visit. Four of these related to the safety of equipment, plant or operating practices, while one related to a small error in the marking of the depth to which a short length of road was to be resurfaced. Since May 2009 the Agency has undertaken some audits of the charging of time to design, other cost reimbursable, and lump sum activities but these are not comprehensive business reviews.

Figure 10
Actual compared with planned duration of schemes

Source: National Audit Office analysis of sample of planned maintenance schemes

Management information and review

2.16 The Agency tracks spending against routine, winter and planned maintenance budgets at Area, Region and national level. It can track spending on individual planned maintenance jobs or block allocations for small works on a monthly basis and management reports are available shortly after the end of the month to which they relate. But it has no separate or feeder systems to track the values of work going through the various forms of contract, or the amounts being paid under the different payment strands for MACs, even though the MACs' invoices distinguish between payments for lump sum, cost reimbursable and target cost work. The lack of such systems hinders the Agency's understanding of how different MACs are working. For example, it cannot easily monitor design costs as a percentage of works costs, or compare levels of cost reimbursable activity between different MACs. It is also difficult for individual Area teams to identify features or trends in the way their MAC is working which might require client intervention.

2.17 The MAC contract gives the Agency good visibility of costs, and the Agency has improved this visibility over time. The target cost regime allows the Agency to see both what unit rates are being offered for planned maintenance at the point of tender and what unit rates are actually being paid when MACs submit their final accounts. This provides a potentially rich source of evidence for benchmarking performance between MACs and over time. Recent contracts require MACs to show how much they have actually spent on each routine and winter maintenance activity, so costs are not hidden behind lump sum payments.

2.18 The Agency is only now beginning to tap into this wealth of cost information. The only analysis of unit costs which it had performed prior to 2007-08 was a survey of Managing Agents to establish the extent to which they believed their cost base had increased since rates in the Agency's cost models were set, to inform the Agency's bid for funding under the 2007 Comprehensive Spending Review. The Agency did not directly interrogate the cost information itself. It performed some preliminary unit cost analysis for lump sum activities for 2007-08. It is capturing target and actual cost and quantity data for planned maintenance schemes, and plans to develop its analysis of this data.

2.19 The Agency's approach to continual improvement has been to allow MAC contractors to propose new ways of working to achieve efficiency savings which they would then share with the Agency, but no proposals have yet been agreed. If contractors do not submit proposals under the contract's continual improvement clause but nevertheless make savings, they can keep all savings realised on lump sum activities, and keep their share of those realised on target cost jobs. A rigorous and evidence-based benchmarking of unit costs would provide a more robust basis for driving efficiency improvements.

2.20 The Agency has not performed any robust evaluation of the impact of MAC contracts on maintenance efficiency. In response to the Public Accounts Committee hearing on our last maintenance report the Agency provided a supplementary memorandum which stated:

> *It was not possible to provide firm estimates of projected savings for the combined MAC against the previous MA/TMC model. A direct comparison is complex because so many changes took place besides the form of contract. One comparison the Agency was able to make was between the pre-tender estimates for routine and winter maintenance and the actual tendered price for three contracts in the second tranche of new contracts. This showed that the new contracts achieved value for money savings of up to £13 million. A more detailed study was commissioned in January this year to consider what further comparisons are feasible and it will report in the summer. The MA/TMC approach was retained in some Areas, which will provide a means of managing the overall risks and will act as a benchmark with the MAC approach.*

The Agency has been unable to provide a copy of the more detailed study referred to in this memorandum or any evidence of benchmarking between MAC and MA/TMC approaches.

Part Three

Outcomes for users and taxpayers

3.1 In this part we examine cost, network condition, road user satisfaction, journey time reliability and safety.

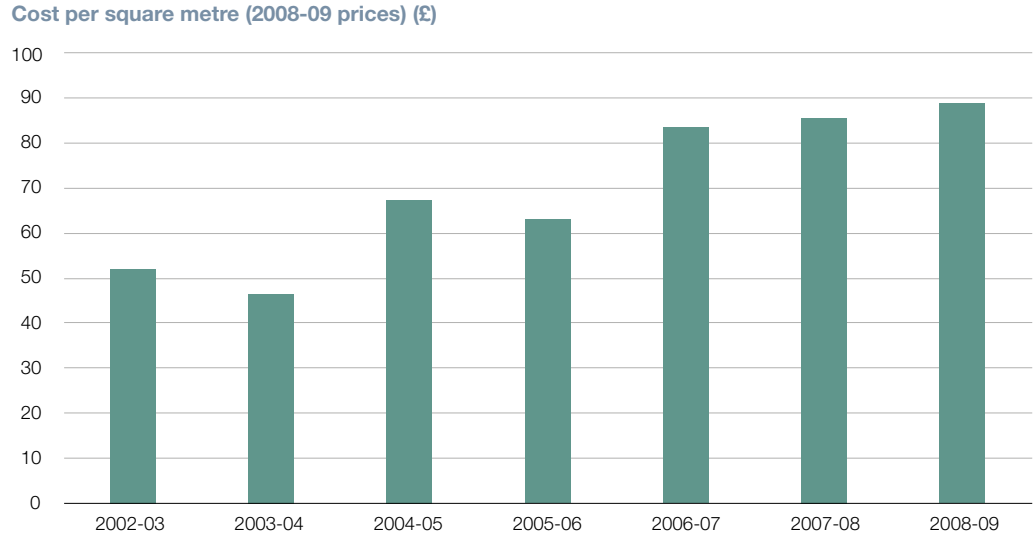
Costs

Trends in planned maintenance costs – roads

3.2 Expenditure on all planned maintenance has risen by 5.5 per cent above inflation between 2002-03 and 2008-09. Within this, expenditure on planned maintenance of roads (which includes resurfacing, repair and replacement of drainage, street lighting systems, earthworks, fencing and barriers), has risen by 10 per cent above general price inflation. It is not possible to state the extent to which unit costs have risen because of the Agency's lack of management information. Using road renewals expenditure per square metre of road surface renewed, after adjusting for general price inflation, indicates an increase of 70 per cent from £52 per square metre treated in 2002-03 to £89 in 2008-09 (**Figure 11**). This is inexact however, as it does not take account of the impact of non-resurfacing work such as lighting and barriers, the volume of which the Agency says has increased in recent years. After allowing for this, the Agency estimates that the costs of resurfacing per square metre treated increased by 17 per cent over general price inflation between 2004-05 and 2008-09. There are problems with this estimate as for example it does not take account of schemes which have a mix of resurfacing and other work, and so we could not validate it. Also, the Agency can only estimate the increase between the years 2004-05 and 2008-09 as it does not have detailed enough data prior to 2004-05. The true increase between 2002-03 and 2008-09 is likely to lie between the two figures.

3.3 The Agency attributed increases mainly to the index of road construction industry costs rising faster than general price inflation. This index is derived from surveys across the construction industry of nationally agreed labour rates and manufacturers' recommended prices, which do not necessarily reflect actual costs incurred by contractors. The Agency also cited other factors such as: new policy requirements (for example on Health and Safety); increases in bitumen prices; increased traffic management costs (for example, more use of average speed cameras); increased night working and shorter working windows; increased labour costs; and higher set-up costs for more complicated site arrangements.

Figure 11
Total cost of road renewals activity per square metre of resurfacing adjusted for general inflation, 2002-03 to 2008-09



Source: National Audit Office analysis of Highways Agency data

Trends in routine maintenance costs

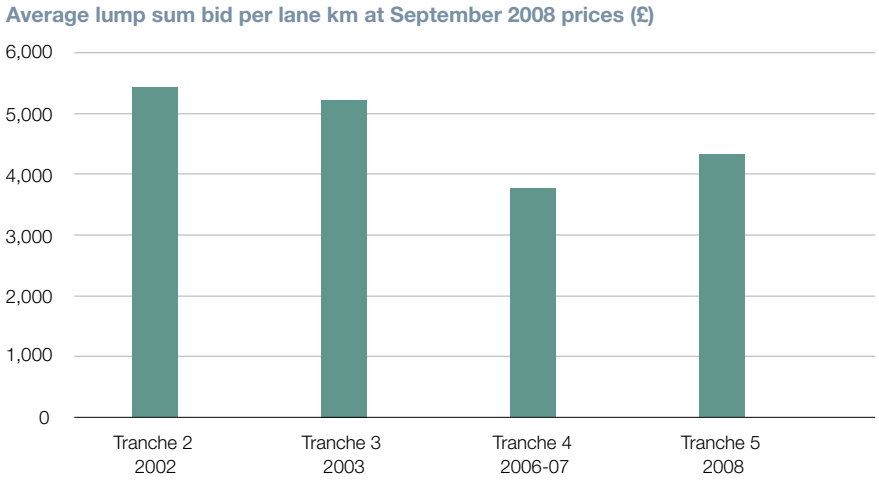
3.4 The average bid price per lane kilometre for routine and winter maintenance (the 'lump sum' activities) included in successful tenders for successive tranches of Managing Agent Contractor contracts has decreased between 2002 and 2008 (**Figure 12**). Expenditure on routine maintenance has, however, risen over this period by 11 per cent (**Figure 13**), partly due to service enhancements added to earlier contracts (see paragraph 2.13). The Agency recognised in its own Maintenance Efficiency Scrutiny in 2006 that "it is clear that the Agency does not have sufficiently refined systems or procedures for isolating and tracking the various components of this expenditure". The new cost capture arrangements for lump sum activities cited in paragraph 2.18 seek to address this.

Unit Costs of planned maintenance

3.5 The overall costs per square metre for Agency resurfacing schemes vary significantly between Areas. We obtained overall costs, including traffic management and supervision, for 36 Agency resurfacing schemes comprising primarily thin surface inlays. **Figure 14** on page 30 shows that the average cost per square metre treated ranged from £16.58 in Area 1 to £35.49 in Area 14. Some of the differentials may be attributable to the different types of recent schemes available for review, for example, in terms of depth of inlay – notably the deeper inlays in Area 14. There are also differences in the extent of night working or grade of materials used, and the Agency advised us there are geographic differences in pay rates and haulage distances for aggregates. But the scale of the differentials merit further investigation to isolate underlying differences in either the price competitiveness or the efficiency performance of different contracts.

Figure 12

Lump sum bids per lane kilometre for recent tranches of MAC contracts adjusted for retail price inflation (year is when contract started)



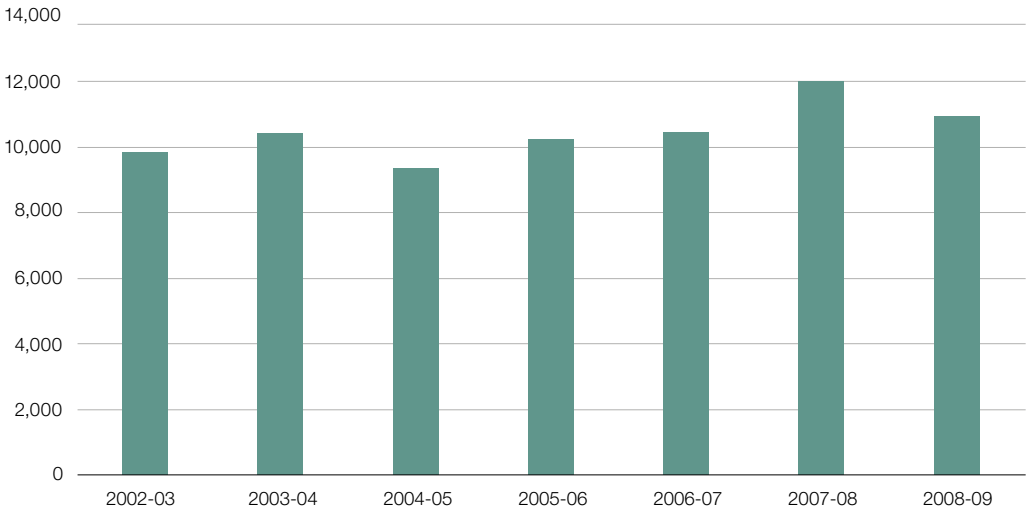
Source: National Audit Office analysis of Highways Agency data

NOTE

MAC contracts which include lump sum bids for routine maintenance schemes started in different years and months, and the bids per lane kilometre have been adjusted for the 2008-09 mid year monthly RPI to enable comparison.

Figure 13

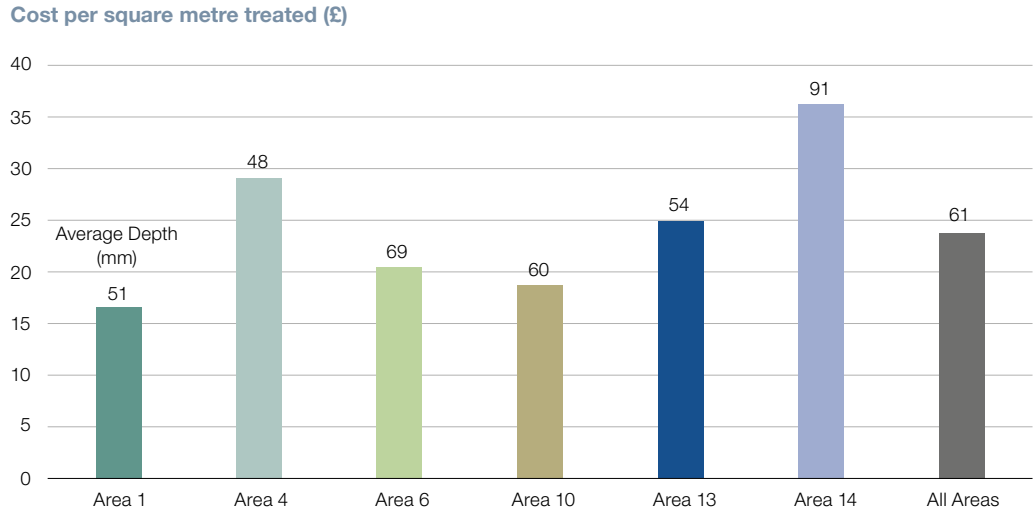
Routine maintenance expenditure per lane km adjusted for general inflation (2008-09 prices)



Source: National Audit Office analysis of Highways Agency data

Figure 14

Costs of resurfacing per square metre resurfaced – September 2008 Prices



Source: National Audit Office analysis of sample of planned maintenance schemes

NOTE

Planned maintenance schemes finish in various months and outturn scheme prices have been adjusted for the mid-year monthly RPI to enable comparison.

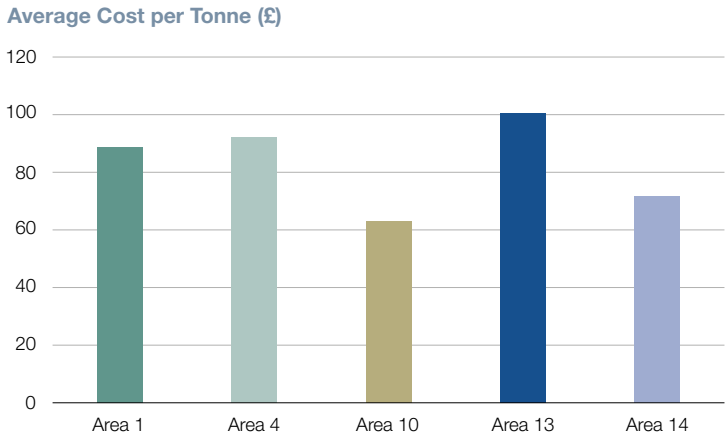
3.6 Costs for specific components of maintenance work also vary significantly between Areas. We reviewed the final accounts for 51 planned maintenance schemes in five Areas with established MACs. From these we extracted the cost per tonne for thin surface material for 27 schemes, the cost per hour of traffic management operatives who lay out, remove and maintain cones or traffic lights during road works for another 27 schemes, and the cost per square metre of ribbed white lines for 26 schemes. The rates included subcontractors' and MAC fees, and any premiums for night working or delivery. **Figure 15** shows that the average cost of thin surface materials varied from £63 in Area 10 to £101 in Area 13. This may be due in part to:

- differences in the polished stone value (or psv) of the material used. Higher psv material, which is more resistant to the polishing effect of traffic, is required on heavily trafficked sites and commands a premium of £7 to £10 per tonne;
- the extent of night working which will add to haulage and plant opening charges; and
- geographic differences in haulage costs from quarries cited by the Agency.

Nevertheless, the differences suggest that the Agency could secure better prices in some Areas. The average cost of traffic management operatives varied from £18.60 in Area 14 to £24.40 in Area 1 (**Figure 16**) and the average cost per square metre of ribbed white line varied from £11 to £23 (**Figure 17** on page 32). Again this may be partly explained by differences in the extent of night working and the premium paid for night work, or the number of small white lining jobs where minimum charges apply. But the Agency needs to build on our work to better understand its cost base if it is to actively drive forwards efficiency gains and cost control during contract terms, and demonstrate credible benchmarking to the market at the outset of competitions.

Figure 15

Average cost per tonne of thin surface material supplied (excluding laying) – September 2008 prices



Source: National Audit Office analysis of sample of planned maintenance schemes

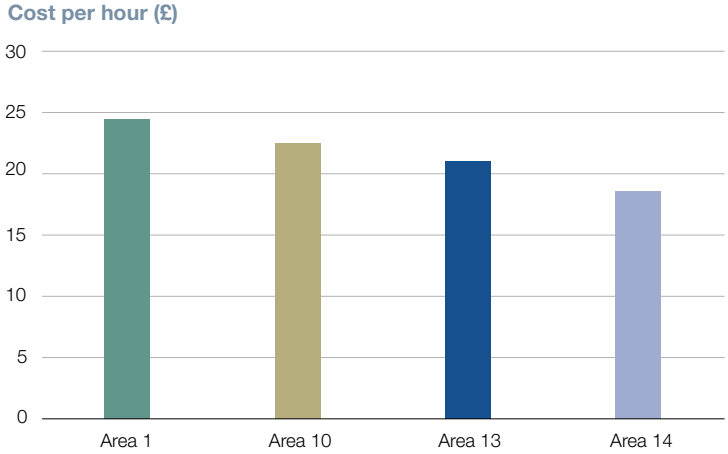
NOTES

1 Planned maintenance schemes finish in various months and outturn scheme prices have been adjusted for the mid-year monthly RPI to enable comparison.

2 Area 6 excluded since most jobs sampled were under MA/TMC arrangements and rates include both supply and laying of materials.

Figure 16

Average cost per hour of Traffic Management Operatives – September 2008 prices



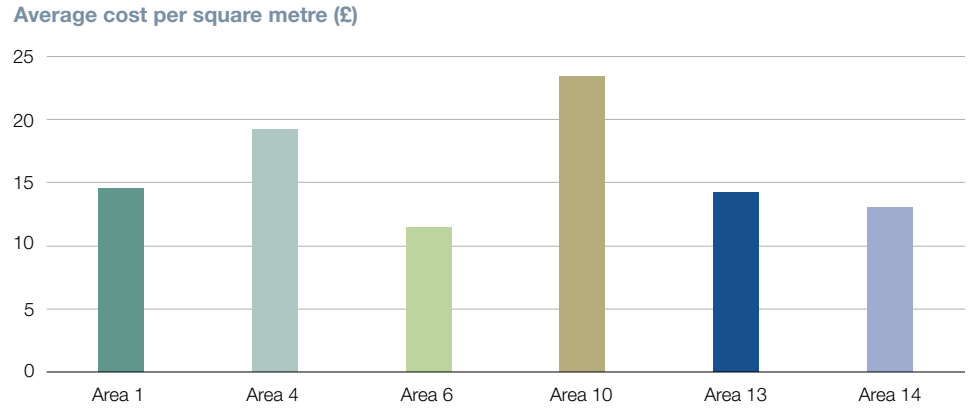
Source: National Audit Office analysis of sample of planned maintenance schemes

NOTES

1 Planned maintenance schemes finish in various months and outturn scheme prices have been adjusted for the mid-year monthly RPI to enable comparison.

2 Final accounts for Area 4 did not show hours associated with traffic management operative costs.

Figure 17
Average cost per square metre of ribbed white line – September 2008 prices



Source: National Audit Office analysis of sample of planned maintenance schemes

NOTE
Planned maintenance schemes finish in various months and outturn scheme prices have been adjusted for the mid-year monthly RPI to enable comparison.

Network condition

Road condition

3.7 The Agency assesses the percentage of the road network that is maintained in good condition, and does not exceed specified condition thresholds, to measure its performance against its Ministerial Target to maintain the network in a safe and serviceable condition. In March 2009, the percentage of the network maintained in good condition was 96.2 per cent.

3.8 Its key performance measure for road surface condition combines data on rutting, skid resistance and surface unevenness. Rutting (tracks in the road pavement made by the repeated passage of the wheels of vehicles), is the nearest indicator to residual life and, of the defects included in the key performance measure, most maintenance arises because of rutting and low skid resistance. The investigatory level for rutting depth is 11 millimetres and the threshold for immediate intervention on safety grounds is 20 millimetres. The Agency's Key Performance Measure uses a threshold halfway between these two thresholds of 15.5 millimetres.

3.9 Analysis of the rutting defect over time shows a generally steady condition of the network between 2001 and 2009 with only approximately five per cent of the network with rut depths more than 11 millimetres (**Figure 18**). This is equivalent to around 640 kilometres of the road network exceeding the investigatory level at the beginning of April 2009. Figures for 2001 and 2007 are out of trend since they were at the start of survey contracts and used new machines whose set up and calibration yielded unreliable data in their first years.

Figure 18
Percentage of the network with category of rutting since 1 April 2001

Rut Depth Threshold	Percentage of network beyond threshold on 1 April for each year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
< 6mm	76.0	69.9	72.0	70.9	73.2	71.5	64.1	71.8	68.2
⩾ 6mm	24.0	30.1	28.0	29.1	26.8	28.5	35.9	28.2	31.8
⩾ 11mm	3.3	4.5	4.4	4.8	4.3	4.8	6.2	4.3	5.0
⩾ 20mm	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.1

Source: Highways Agency

3.10 The Agency currently has no trend data on the sub-surface condition of the network as a whole, but is addressing this through new annual surveys as described in paragraph 2.3 of this report.

The assessed condition of non-pavement assets

3.11 The Agency holds up to date information about the number and condition of roadside structures such as bridges and tunnels, and geotechnical features such as embankments and cuttings. But it does not hold such good information about the number and condition of other roadside assets such as drainage systems. Furthermore, it does not have any meaningful targets or summary trend indicators for the maintenance of non-pavement assets. It has not produced any national overview reports for drains or its stock of 17,000 structures. As a consequence, it is unable to say with any certainty whether the condition of its stock of roadside assets has improved or deteriorated over time.

3.12 The Agency has carried out some work, however, as part of the Spending Review 2007, to assess the condition of a sample of its structures assets at that time. This included examining in detail the inventory and condition data it held about 750 bridges, approximately eight per cent of the Agency's bridge stock. Based on visual assessments of the condition of its bridges, the Agency rates 82.3 per cent of its bridge stock to be in a good to very good condition; and 1.8 per cent of bridges to be in a poor condition (**Figure 19** overleaf).

3.13 The Agency has around 40,000 geotechnical assets. As at December 2008, it had inspected 95 per cent, some 11,552 kilometres out of an estimated 12,130 kilometres, at least once. One per cent of this asset base is assessed to be of high or severe risk.

Figure 19
Condition of the Agency's bridges stock at October 2006

Condition category	Percentage of stock
Very good	44.5
Good	37.8
Fair	15.9
Poor	1.8
Very poor	0.0

Source: Highways Agency report, Long-Term Planning for Highway Structures

Road user satisfaction

3.14 The Agency's National Road Users' Satisfaction Surveys for 2007-08 and 2008-09 showed that:

- eighty per cent of respondents were very or quite satisfied with the Agency's performance at the end of 2008-09 compared to 76 per cent in the previous year;
- more road users are reporting delays, 30 per cent in 2008-09 compared with 23 per cent in 2007-08. Of those reporting a delay, the proportion attributing it to roadworks fell from 43 per cent in 2007-08 to 40 per cent in 2008-09; and
- in 2008-09, almost half of respondents (48 per cent) said they passed through roadworks on their most recent journey compared to 38 per cent in 2007-08; and 76 per cent of those passing roadworks said they encountered lane closures compared to 66 per cent in 2007-08. Of those encountering lane closures in 2008-09, 55 per cent reported no obvious work being carried out at the time.

Journey time reliability

3.15 The Agency measures delays on routes experiencing the worst ten per cent of journeys across its network. **Figure 20** shows that an increase in delays was reversed and delays continued to reduce over a period when traffic was steady or growing, from July 2007 to July 2008. The Agency is currently unable to attribute delays between reasons, and there is no independent evidence to support such attribution. So it is not possible to separate the contributions of speedier incident clear-up, fewer lane closures for roadworks, or active traffic management – where the Agency has a direct role – from the impact of fewer incidents on the strategic road network or changes in driver behaviour – where the Agency role is less direct. It is nevertheless likely that the Agency's maintenance regime – including incident response work undertaken by MACs – made some positive contribution to the overall picture.

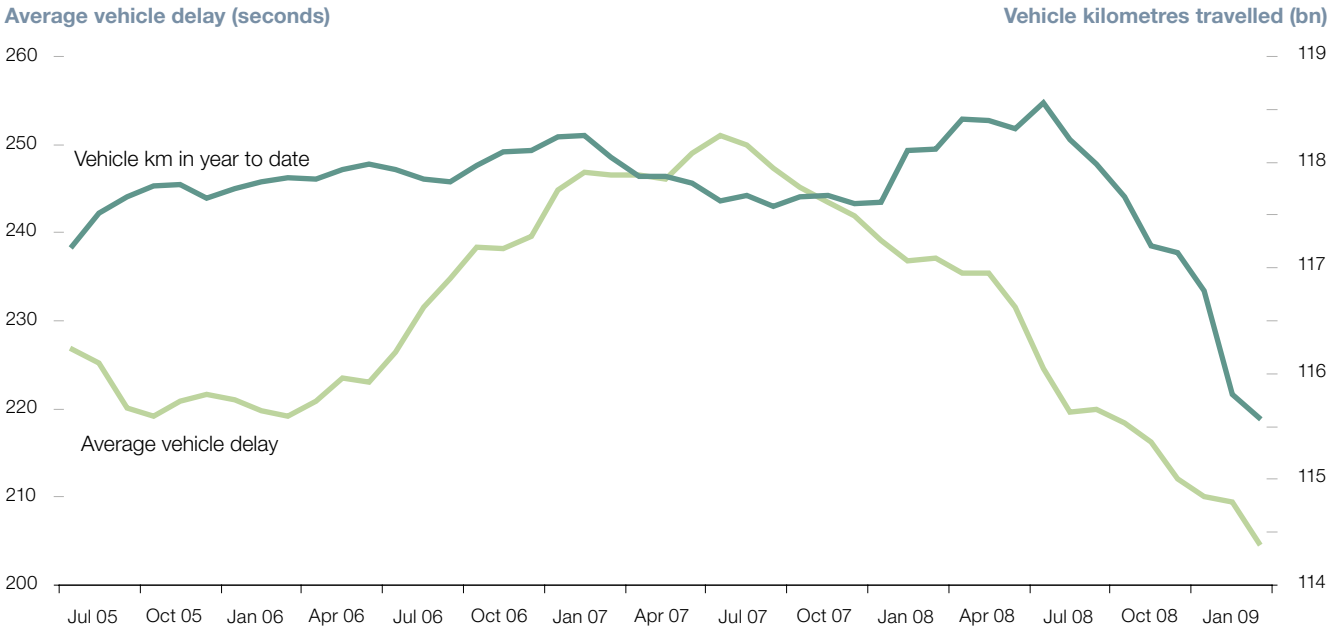
Safety

3.16 The Agency has sought to improve safety on their road network in recent years. These initiatives include:

- Driver Information Programmes which are primarily targeted at those drivers who are, statistically, most at risk on motorways and major A roads;
- Safety Buses: used at major sites to provide on-site safety and awareness training; and
- a Safety Action Plan in 2006-07 to drive a step change in road worker safety following a worrying upturn in fatalities in 2005. A revised plan for the period to 2011 is currently being developed.

3.17 Over recent years safety at roadworks for both road users and workers has not changed much. The number of casualties from accidents at roadworks on the Agency's network remained stable from 2003 to 2008 with around 900 in each of those years. Within that the number of fatal and serious casualties fell from 72 in 2003 to 55 in 2007, before rising to 78 in 2008. Between 2003 and 2006 (the latest year for which data is available) the total number of road worker injuries, as reported by the Agency's service providers, fell from 61 to 47, and within that the number of fatal and major injuries remained stable at just under 20.

Figure 20
Journey time reliability and traffic volumes on routes with the worst ten per cent of delays, July 2005 to March 2009



Source: Department for Transport (delay data); Highways Agency (traffic volume data)

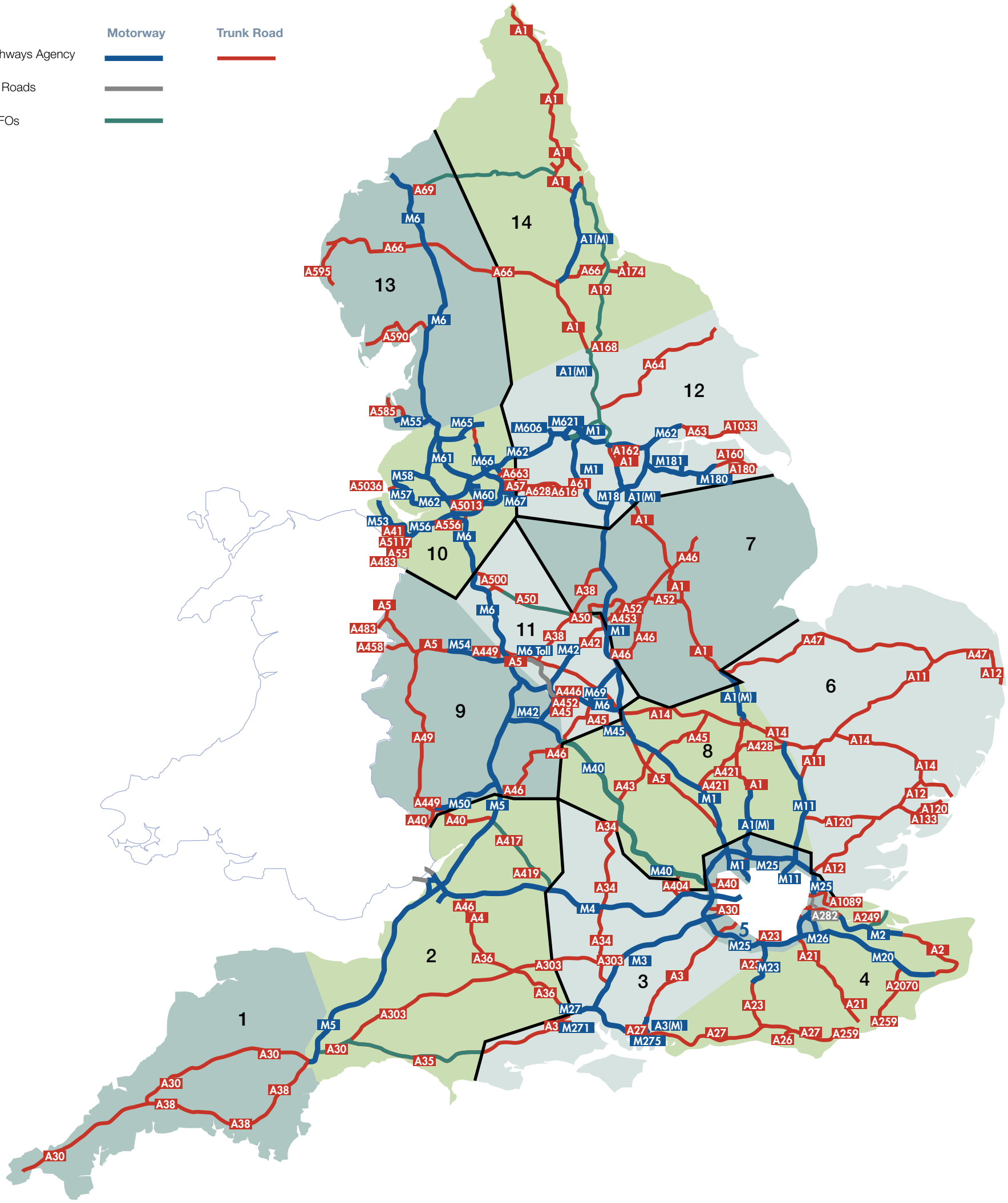
Appendix One

Map showing Highways Agency Areas

Map overleaf

Highways Agency Areas

	Motorway	Trunk Road
Highways Agency		
Toll Roads		
DBFOs		



South West Region

Area 1 Cornwall, Devon (part)

Area 2 Wiltshire, Gloucestershire (part), Avon, Somerset, Devon (part)

South East Region

Area 3 Berkshire, Buckinghamshire (part), Dorset, Hampshire, Oxfordshire, Surrey (part)

Area 4 East Sussex, Kent, Surrey (part), West Sussex

Area 5 Whole of M25

East Region

Area 6 Cambridgeshire (part), Essex (part), Norfolk, Suffolk

Area 8 Bedfordshire, Buckinghamshire (part), Cambridgeshire (part), Hertfordshire, Northamptonshire

East Midlands Region

Area 7 Cambridgeshire (part), Derbyshire, Leicestershire (part), Lincolnshire (except North), Nottinghamshire

West Midlands Region

Area 9 Gloucestershire (part), Herefordshire, Shropshire, West Midlands, Worcestershire, Warwickshire (part)

Area 11 Staffordshire, Warwickshire (part), Leicestershire (part)

North West Region

Area 10 Greater Manchester, Cheshire, Merseyside, South Lancashire

Area 13 Cumbria, North Lancashire

Yorkshire and North East Region

Area 12 Yorkshire (except North), North Lincolnshire

Area 14 Durham, Northumberland, North Yorkshire, Tyne and Wear

Source: Highways Agency

Appendix Two

Methodology

Method	Purpose
Visits to six Highways Agency Areas	We carried out semi-structured interviews with Agency Area Management Team officials and senior Managing Agent Contractor employees to establish their views on the operation of the MAC contract. We also attended two value management workshops to establish how planned maintenance work is identified and prioritised.
Quantitative analysis of the information held on a sample of planned maintenance schemes	We gathered primary data from a sample of 74 planned maintenance schemes for road renewals, involving thin road resurfacing, and renewals of safety barriers and parapets, completed in 2007-08 and 2008-09 in the six Areas visited. To enable comparison across the schemes we carried out detailed analysis of the prices and quantities that made up the total cost of each scheme to establish the unit costs and the costs for specific components of the work.
Quantitative analysis of the Agency's data on maintenance budgets and spend	To gather evidence about maintenance funding allocations and outturn spend over time.
Engagement with the roads maintenance community	To gain the perspectives of the roads maintenance community and key stakeholders, we interviewed representatives from seven firms that held MAC contracts, or had bid for such contracts.
Review of Highways Agency documents and interviews with key Agency headquarters officials	To obtain evidence about the evolution of the MAC contract; the Agency's approach to budgetary planning for maintenance and funding allocations to its Regions and Areas; and performance against targets.
Engaging consultants to provide advice during the study	We engaged Professor Martin Snaith, Emeritus Professor of Highway Engineering, University of Birmingham, and William McCoubrey, Chief Executive of the Roads Service Agency (Northern Ireland), 1996-99.

Design and Production by
NAO Marketing & Communications Team
DP Ref: 008952-001

This report has been printed on Consort 155 and contains material sourced from responsibly managed and sustainable forests certified in accordance with FSC (Forest Stewardship Council).

The wood pulp is totally recyclable and acid-free. Our printers also have full ISO 14001 environmental accreditation this ensures that they have effective procedures in place to manage waste and practices that may affect the environment.

Published by TSO (The Stationery Office) and available from:

Online
www.tsoshop.co.uk

Mail, Telephone, Fax & E-mail
TSO
PO Box 29, Norwich, NR3 1GN
Telephone orders/General enquiries: 0870 600 5522
Order through the Parliamentary Hotline
Lo-Call 0845 7 023474
Fax orders: 0870 600 5533
E-mail: customer.services@tso.co.uk
Textphone: 0870 240 3701

The Parliamentary Bookshop
12 Bridge Street, Parliament Square,
London SW1A 2JX
Telephone orders/General enquiries 020 7219 3890
Fax orders: 020 7219 3866
Email: bookshop@parliament.uk
Internet: http//www.bookshop.parliament.uk

TSO@Blackwell and other Accredited Agents
Customers can also order publications from:

TSO Ireland
16 Arthur Street, Belfast BT1 4GD
028 9023 8451 Fax 028 9023 5401

£14.35

ISBN 978-0-10-296317-5

9 780102 963175