The
Electoral
Commission

Electoral pilot scheme evaluation

South Bucks District Council

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Contents

Summary

In response to a prospectus issued to local authorities in England inviting applications for electoral pilot schemes at the May 2007 local government elections, South Bucks District Council submitted an application to pilot a series of innovations, including:

- remote electronic voting using the internet and touch tone telephone in the two weeks prior to polling day
- electronic counting

Conclusions and findings

The pilot scheme facilitated and encouraged voting. By offering new voting channels, electronic voting gave electors more convenient voting options. A total of 16.3% of voters (2,276 people) voted using the internet and telephone voting channels. Approximately three-quarters of those electronic voters (76%) used the internet. While qualitative and quantitative feedback from users was generally positive, this should be placed in the context of a number of barriers to participation reported by the Electoral Commission's accessibility contractors.

The pilot scheme did not facilitate the counting of votes. Technical difficulties resulted in the suspension of the electronic count, which had to be completed the following day and took 13 hours from beginning to end. Had this not occurred, the scanning process would have resulted in estimated time savings of 1.5 hours compared with a manual count.

There is some evidence to suggest that the pilot scheme had a slight impact on turnout. Overall turnout for the May 2007 elections in South Bucks was 34.8%, almost five percentage points higher than the last comparable elections in 2003. Based on opinion research conducted with electronic voters there is some limited evidence to suggest that around one-third of users (29%) would not have voted had the pilot scheme not been taking place. However, it seems unlikely that electronic voting was the only cause of the increase in turnout, given the small overall number of electronic voters and the fact that the majority appear to have been predisposed to vote in any case.

The pilot scheme provided electronic voting services that were generally easy to use. Opinion research suggests that the majority of internet and telephone voters (87% and 67%) found voting processes easy to use. Almost all (86%) were generally comfortable with the pre-registration process. However, this finding should be placed in the context of a number of barriers to participation reported by the Electoral Commission's accessibility contractors and other interested parties, particularly in relation to telephone voting.

The pilot scheme does not appear to have led to any increase in personation or other offences or malpractice.

The pilot scheme led to a increase in expenditure for the Council. However, the majority of these costs related to the supplier and were subsequently met by the Ministry of Justice. The overall cost of the pilot scheme, taking into account both local authority and supplier costs, was £778,108. This can be separated out into £595,220 for electronic voting (or £12.41 per elector), for £63,855 for electronic counting (or £1.33 per elector) and £119,033 for miscellaneous costs.

The cost per elector who registered to vote electronically (5,261) was £113.14, and the cost per e-voter in either the District Council or the parish council elections (2,488) was £239.24. The cost per ballot scanned electronically was £2.91.

1   Introduction

1.1   Under the Representation of the People Act (RPA) 2000, any local authority in England and Wales can submit proposals to the Secretary of State for Justice (prior to 9 May 2007, the Secretary of State for Constitutional Affairs) to carry out an electoral pilot scheme. Electoral pilot schemes can involve changes to when, where and how voting at local government elections is to take place, how the votes cast at the elections are to be counted, or candidates sending election communications free of postage charges. The Electoral Commission has a statutory duty to evaluate and report on any pilot scheme approved by the Secretary of State.

1.2   A total of 312 local authorities in England held elections in May 2007. In October 2006, the Department for Constitutional Affairs[1] and the Commission issued a joint prospectus to local authorities inviting applications for electoral pilot schemes at the May 2007 elections. Fourteen applications were received in response to the prospectus, and in January 2007 the Secretary of State for Constitutional Affairs announced that he had approved 12 pilot schemes in a total of 13 local authority areas. A full list of all the authorities that held pilot schemes in May 2007 is available on the Commission's website at www.electoralcommission.org.uk.

1.3   This report presents the Commission's evaluation of the electoral pilot scheme carried out by South Bucks District Council at the elections on 3 May 2007. The evaluation includes a description of the pilot scheme and an assessment as to:

- the scheme's success or otherwise in facilitating voting or the counting of votes, or in encouraging voting or enabling voters to make informed choices at the elections
- whether the turnout of voters was higher than it would have been if the scheme had not applied
- whether voters found the procedures provided for their assistance by the scheme easy to use
- whether the procedures provided for by the scheme led to any increase in personation or other electoral offences, or in any other malpractice in connection with elections
- whether those procedures led to any increase in expenditure, or to any savings, by the authority

1.4   In addition to these statutory requirements, the Commission's evaluation also considers, where appropriate:

- the extent to which the pilot scheme facilitated or otherwise encouraged participation among particular communities, including young people, people from minority ethnic communities and disabled people
- overall levels of user awareness and comprehension of the voting method being tested, including an assessment of the effectiveness of any literature or other materials used in the promotion of the pilot scheme

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[1] Hereafter referred to as the Ministry of Justice following the machinery of government changes on 9 May 2007.

- the attitudes and opinions of key stakeholders, including voters, with a view to determining overall levels of confidence in the voting method being tested
- whether the pilot scheme resulted in measurable improvements, or had any adverse impact, with respect to the provision of more efficient and effective service delivery to voters
- whether the pilot scheme resulted in measurable improvements to, or had any adverse impact on, the existing system of electoral administration
- whether the pilot scheme represented good 'value for money'

1.5   Where appropriate, the Commission may also make recommendations as to whether changes should be made to electoral arrangements more generally through roll-out of the pilot scheme procedures.

1.6   The Commission is required to submit its evaluation report to the Secretary of State and any of the local authorities involved in the pilot scheme, and those local authorities are required to publish the evaluation report within three months of the elections. The Commission has also published this report on its website, together with a copy of the Statutory Order that allowed the pilot scheme to take place.

1.7   In preparing this report, the Commission has drawn on its own observations and assessment of the pilot scheme, as well as on the views expressed to it by a number of other stakeholders. The report also incorporates findings from work undertaken by the following contractors:

- public opinion research carried out by ICM Research
- an evaluation of technical elements of the pilot by Actica Consulting and Ovum
- an accessibility evaluation of the pilot by PA Consulting, Equal Ability CIC and Churchill, Minty & Friend Ltd

1.8   Copies of the reports produced by the Commission's contractors are available from its website, and in other formats on request.

1.9   The Commission would particularly like to thank the Returning Officer and the Electoral Services department of South Bucks District Council for their assistance in undertaking this evaluation and for supplying it with the information and data to support the evaluation.

2 Context

The area

2.1 The district of South Bucks comprises the southernmost part of the county of Buckinghamshire, adjoining Greater London, the county of Surrey and the unitary authorities of Slough and Windsor and Maidenhead.

2.2 The district covers approximately 14,250 hectares and is principally rural, with 87% of the district designated as part of the Metropolitan Green Belt. Its main settlements are Beaconsfield, Burnham, Gerrards Cross, Farnham Common, Iver and Stoke Poges.

2.3 South Bucks' population was 61,945 at the time of the last census in 2001, representing a population density of 4.4 people per hectare. Black and minority ethnic communities account for 6.6% of the population (Census 2001), against a national average of 9.1%.[2]

2.4 The district is relatively prosperous, ranking 327 out of 354 council areas on the 2004 indices of deprivation (with the first being the most deprived).[3]

The Council

2.5 South Bucks District Council is represented by 40 councillors, elected once every four years. At the May 2007 elections the electorate of the district was 47,925. However, since not all wards were contested, only 14 of 19 wards held elections in 2007. The eligible electorate for the District Council elections was therefore 40,087.

2.6 The district also includes 12 parish and town councils divided into a total of 27 wards. Only 14 parish and town council wards were contested at the May 2007 elections.

2.7 The political composition of the Council prior to the 2007 elections was 32 Conservatives, five Independents, one Liberal Democrat, one non-affiliated member and one vacancy. The local MP is Dominic Grieve, Conservative Member of Parliament for Beaconsfield. The district is in the South East of England electoral region for elections to the European Parliament.

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[2] Except where otherwise stated, all demographic information was obtained from the census carried out in 2001 by the Office for National Statistics.

[3] Office of the Deputy Prime Minister, *The English Indices of Deprivation 2004 (revised)* (2004), www.communities.gov.uk/index.asp?id=1128440.

3   Pilot scheme description

The pilot scheme application

3.1   In response to the October 2006 electoral pilot scheme prospectus, South Bucks District Council (hereafter known as 'the Council') submitted an application to pilot a series of innovations and changes to electoral procedures, including:

- remote electronic voting (e-voting) using the internet and touch tone telephone in the two weeks prior to polling day
- electronic counting (e-counting)

3.2   In a Written Ministerial Statement on 29 January 2007, the Secretary of State for Constitutional Affairs announced that the Government had given approval for the Council to pilot all of the above innovations.[4]

3.3   The final Pilot Order, South Bucks District Council (Electronic Voting and Counting) Pilot Order 2007, was made on 26 March 2007 and came into force on the same day.[5]

Pilot scheme summary

Electronic voting

3.4   The Council made remote internet and touch tone telephone voting available to its electors from 7am on 21 April until close of poll (10pm) on 3 May. The system employed by the Council was provided by Election Systems & Software (ES&S), supported by three subcontractors (Intelivote Systems, Scytl and Firstserv Hosting Solutions).

3.5   As with the other four e-voting pilot schemes that took place at the May 2007 elections, all South Bucks electors wishing to vote by internet or telephone were required to register for the service in advance. Once registered, prospective e-voters could not then switch back to a traditional channel such as polling station or postal voting. Electronic proxy voting was not permitted.

3.6   Accordingly, the Council sent a letter and a registration form on 12 March to all electors inviting them to register to vote electronically. The registration form required electors to provide their name and address, date of birth, a five-digit passcode and a signature. The final date to register to vote electronically, aligned with the final date for proxy vote applications, was 25 April. Once the forms had been returned to the Council, registered e-voters were subsequently sent a secure poll card containing a unique voter identification number (VIN). Elector queries about the e-voting process were addressed by a call centre operated by ES&S and Council staff.

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[4] Official Record (House of Lords), 29 January 2007, Column WS1.
[5] The Commission's response to all Pilot Orders can be found on the Commission website at www.electoralcommission.org.uk/files/dms/AllResponses_25780-19142_E_N_S_W_.pdf.

3.7 Once registered, electors could then vote using the website address or a freephone telephone number provided in the secure poll card to access the voting system. Having entered their passcode and VIN in order to obtain access to the e-voting system, electors were directed to cast their vote, confirm (or change) their selection and then exit the system. A receipt was provided to internet voters to confirm that the ballot had been successfully recorded; however, the receipt did not show how the voter had voted. The system would not allow over-voting or the ability to cast a blank or spoilt vote.

3.8 Ballots cast using the e-voting system were stored in encrypted form, with the keys required to decrypt the data held by Council staff. The decryption process took place at the count, with the subtotals from the e-votes then being provided to the results calculation program for combination with the totals from the e-counting of paper ballots.

3.9 These processes are discussed in more detail in Chapter 4, 'Evaluation', with further technical information available in the reports produced by the Commission's contractors.

Electronic counting

3.10 The e-counting solution employed by the Council was provided by ES&S. This was the first time that ES&S had carried out e-counting in the UK, although it has substantial experience of providing similar services in other countries.

3.11 ES&S used standard commercial scanners in conjunction with its own image recognition software, rather than using its own proprietary scanners. This decision reflected the Ministry of Justice's (MoJ's) preference for e-counting pilot schemes that investigated the feasibility of using commercially available hardware. A number of changes to the ballot paper design were made to facilitate the e-counting process.

3.12 The e-counting process took place on the night of 3 May in Pinewood Studios in Iver Heath, South Bucks, although in the event, due to technical difficulties, it was not completed until the morning of 4 May. After the close of poll all ballot boxes were transported to Pinewood Studios, where a full e-counting system was provided to scan all returned ballot papers in the presence of candidates, agents and observers; to adjudicate doubtful votes; and to produce results (incorporating the votes from the e-voting system). This was the first time that South Bucks had conducted the count at a single location; in the past, two separate locations had been used.

3.13 These processes are discussed in more detail in Chapter 4, 'Evaluation', with further technical information available in the Commission's technical report.

Objectives of the pilot scheme

3.14 In its pilot scheme application, the Council stated that the pilot scheme aimed to:

- offer additional voting channels, aimed specifically (but not exclusively) at commuters and electors who worked outside the local authority, thereby broadening choice and increasing participation
- assess the security of and public confidence in e-voting
- improve efficiencies for counting ballots
- reduce the number of staff required at the count

3.15 Commenting on pilot scheme applications, the Commission stated that a small number of further e-voting pilots would enable a detailed assessment of patterns of usage and take-up, accessibility, security and confidence in e-voting. It supported the view expressed in the electoral pilot scheme prospectus (October 2006) that further e-counting trials at English local government elections should investigate the feasibility of using standard commercial hardware for e-counting and establish whether such systems can provide a cost-effective alternative to manual counting at a local level.

3.16 However, the Commission also expressed concern that the initial application from South Bucks did not provide sufficient evidence of risk management for e-voting and learning for e-counting.[6] These issues were the subject of subsequent negotiations between the Council and the MoJ prior to the acceptance of the pilot.

3.17 The background paper attached to the Secretary of State's Written Ministerial Statement announcing approval of the May 2007 pilot schemes noted the Government's view that providing remote internet and touch tone telephone voting would build on the evidence available from pilot schemes undertaken in 2003, facilitating the assessment of the issues proposed by the Commission. The paper also stated that e-counting pilot schemes would provide further evidence about the benefits of automation and investigate the use of standard commercial hardware.[7]

3.18 The following section outlines the key objectives of the pilot scheme, as they relate to the statutory evaluation criteria specified in Chapter 1, 'Introduction'.

Facilitating voting and ease of use

3.19 It was expected by the Council that e-voting would facilitate voting by increasing the choice of voting methods available to the South Bucks electorate. The application set out a target of between 20% and 25% of votes being cast via the internet or the telephone.

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[6] Comments by the Commission on pilot scheme applications under Section 10, RPA 2000, December 2006, www.electoralcommission.org.uk/templates/search/document.cfm/17797
[7] Official Record (House of Commons), 29 January 2007, Column 3WS.

3.20 As previously stated, it was expected that the pilot scheme evaluation would provide a detailed assessment of patterns of take-up and usage. This was to be achieved through the collection of e-voting statistics from the Council and the use of opinion and accessibility research. The Council considered that it would be important to evaluate the impact of the pilot on the large number of electors who worked outside the district whom it expected would benefit from being able to vote electronically where they chose. It cited existing local support for electronic access to local services.

3.21 The electoral pilot scheme prospectus noted that e-voting pilot schemes provided a further opportunity to assess demand among those aged 18–24. The prospectus also identified likely learning on how barriers to accessibility might be reduced through remote e-voting and related instructions provided to electors.

Facilitating the counting of votes

3.22 The main anticipated effect of e-counting was an improvement in the efficiency and accuracy of the counting of votes. Although estimates were difficult because the last comparable elections were held in 2003, it was expected by the Council that e-counting would provide a one-hour time saving compared with a manual count. It was also expected to facilitate greater accuracy in the counting of ballot papers with more than one vacancy to be filled, such as at parish council elections.

Turnout

3.23 The Council hoped that the provision of e-voting at the elections would result in an increase in turnout, although this was not a key objective of the pilot scheme. The application set out an aspirational target of an increase in turnout of between eight and 10 percentage points, although once the pilot was under way Council officials regarded an increase of two percentage points as being more realistic.

Security and confidence

3.24 As noted in paragraph 3.15, it was expected that the pilot scheme evaluation would provide a detailed assessment of security and user confidence in relation to e-voting. As well as any technical measures undertaken to secure the e-voting system, such a security assessment would include the effectiveness of the paper-based pre-registration process, the management of e-voting processes and results and the extent to which they were auditable or transparent, and any efforts to strengthen the secrecy of the remote electronic ballot. Similar issues around technical security, process management and transparency applied to the e-counting element of the pilot scheme.

Efficiency

3.25 It was anticipated that efficiencies would be provided through the use of an e-counting solution by a reduction in the number of staff required and the time taken to complete the count. In previous local government elections, the Returning Officer had drawn on some 120 people to manage and administer the count but experienced difficulties in recruitment, exacerbated by the fact that the Council (the usual source of count staff) only employs around 150 people.

3.26 As previously noted, the pilot also enabled consideration of the impact of using standard commercial hardware on the e-counting process and on the overall cost of providing the service to a single local authority.

3.27 The main impact of e-voting on the overall efficiency of the elections was expected to be the additional costs incurred through the provision of hardware and software and printing costs for the pre-registration process. For this pilot the majority of these costs were met by the MoJ. However, there is also the need to consider the no less tangible impact of managing pilot scheme processes on the time required by the Returning Officer and his staff to manage and administer the remainder of the elections.

4 Evaluation

Efficiency

Project management

4.1   The pilot scheme was managed on behalf of the Council by the Electoral Services Officer (one of two Deputy Returning Officers). The Council's Electoral Services team comprised one full-time member of staff and one experienced temporary member of staff.

4.2   However, the Council needed a partner to deliver the e-voting and e-counting systems and expertise. To deliver technical solutions for pilot schemes in England and Wales, the MoJ had established a framework agreement following a procurement exercise of suitable suppliers to support pilots that utilised electronic services. The Council therefore selected ES&S from the framework of MoJ-approved suppliers following a mini competition with other suppliers appointed to the framework.

4.3   The ES&S Project Manager worked with the Electoral Services Officer on the delivery and operation of the technical solution, and managed several subcontractors. He was also Project Manager for an internet voting pilot in the borough of Rushmoor. Having been in regular contact with the Council from December, and having made a number of visits, he was based in the UK from mid-April onwards.

4.4   The Project Board established to oversee the pilot scheme met or teleconferenced weekly from February onwards. The Board was chaired by the Returning Officer (the Council's Chief Executive). Its membership comprised the Council and ES&S Project Leads together with the Council's other Deputy Returning Officer (the Head of Democratic Services), the Council's Heads of IT and Communications as well as other supplier staff. The print company (PJR Print Systems) contracted to produce ballot papers and postal ballot packs was also invited to attend.

4.5   The Council maintained an overarching project plan for the pilot scheme which included key milestones. ES&S separately maintained a detailed project plan and a risk/issue register for the technical elements of the pilot scheme. A document further clarifying Council and supplier responsibilities was added during the MoJ security audit process in late April.

4.6   A significant factor affecting the management of the project was the time allotted to its implementation. Once the pilot scheme had been approved by the Secretary of State, and the Council had selected ES&S from the framework of MoJ-approved suppliers, less than three months remained until the elections on 3 May.

4.7   These time constraints meant that both the Council and the supplier prioritised those tasks that were seen as critical to the implementation of the e-voting system. The success of this approach was facilitated by the strong collaborative project

management style adopted by both parties. In particular, the involvement of the Returning Officer and other senior Council staff in decision-making through the Project Board is to be commended, and was particularly important given the lack of prior experience the Council had in running pilot schemes.

4.8   However, the short implementation timescales inevitably had an adverse effect on overall project risk, impacting on the capacity of the supplier consortium to provide comprehensive risk management and security documentation and undertake testing and quality assurance. For its part, the Council had to learn very quickly to take meaningful ownership of the outputs from the technical process, although it believes the experience that it has acquired would enable it to take a more active role in managing this area in future. All of these issues contributed to the technical difficulties with the count server and the subsequent delay in the completion of the count, and are discussed in more detail later in this chapter.

Training

Electronic voting

4.9   To support the e-voting trial, ES&S delivered training in three areas. The Electoral Services team, to whom most electoral (as opposed to technical) queries were referred from the ES&S e-voting call centre, received training in the procedure to follow when an elector had forgotten their passcode.

4.10 Authorised Council personnel (the Returning Officer and Deputy Returning Officers) were shown how to view the number of votes cast in each contest while the system was operational; this did not reveal how those votes were cast because individual ballots remained encrypted. They were also shown how to unlock the electronic ballot box to allow the e-votes to be counted after the close of poll.

4.11 Finally, another Council officer was trained in the use of the 'Audit Voter' function, which allowed dummy votes to be cast in order to test the correct operation of the system. Feedback from Council staff on all of the above training was positive – the system was found to be easy to operate and the trainer was on site for the first three days of the e-voting period.

Electronic counting

4.12 Since the scanner operators were provided by ES&S, the only training required for count staff was in the operation of the adjudication terminals.

Polling station staff

4.13 Information was provided regarding the pilot schemes at a pre-election briefing by the Electoral Services Officer to Presiding Officers and Poll Clerks. They were asked to encourage voters not to fold their ballot papers, so as to facilitate the scanning process at the count. In the event that registered e-voters attempted to vote in person, polling station staff were instructed not to issue them with a ballot paper and to direct them to contact the helpline number provided on the poll card.

Supplier management

4.14 The key supplier relationship for the Council was with ES&S, which was responsible for the delivery and operation of the technical solution and managed its e-voting subcontractors. In addition to involvement in pilot schemes at English local government elections in 2003 and 2006, ES&S has experience in delivering electronic election services in the US and a number of other countries, including France and Canada. This was the first time that it had worked with the Council on an electoral pilot scheme.

4.15 In addition to its project management role (as previously discussed), ES&S provided:

- the e-counting solution
- the results collection application that consolidated the results from e-voting and e-counting
- training of Council staff where required
- an e-voting call centre

4.16 For the e-voting element of the pilot scheme, ES&S also managed three subcontractors:

- **Intelivote Systems** provided the internet and touch tone telephone user interfaces and the back office processes (e.g. details of registered e-voters) for e-voting.
- **Scytl** provided the electronic ballot box application that stored the e-votes cast.
- **Firstserv Hosting Systems** hosted the e-voting system.

4.17 The implementation of the pilot scheme appears to have been facilitated by the strong working relationship between the Council and ES&S and between the Project Leads in both organisations. No issues were identified concerning relationships within the contractor consortium.

4.18 For e-counting, the principal contractor in addition to ES&S was PJR Print Systems, which subcontracted the printing of ballot papers to a third party. Subsequently, concerns arose over print quality. ES&S therefore worked with the printers to ensure that the ballot papers were readable by effectively scanning every ballot on-site at the printers to ensure that they were acceptable to the scanner. While effective in preventing some of the problems with ballot paper quality encountered in other e-counting pilots this year, this was a time-consuming activity which could have been avoided through more effective management of subcontractors.

Use of technology

4.19 This section of the report briefly summarises the technology used to deliver the e-voting and e-counting pilot scheme and the testing and quality assurance processes undertaken prior to use. A more detailed discussion can be found in the separate reports provided by the Commission's technical contractors.

Electronic voting

4.20 The e-voting system consisted of four functional components, all of which (except the telephone interface) were shared with the Rushmoor internet voting pilot scheme:

- an internet voting interface
- a corresponding telephone voting interface
- the ballot presentation application, which held the data to ensure that each elector was presented with the relevant ballot paper
- the electronic ballot box, which stored the e-votes cast until they were counted

4.21 ES&S stated that it would usually scale an e-voting solution to support double the expected scale of the elections. However, the relatively small number of voters expected to use the system in South Bucks and Rushmoor meant that the capacity of the system provided far exceeded requirements.

4.22 Table 1 summarises the steps voters had to follow to use the internet and telephone voting interfaces.

Table 1: Summary of the process for internet and telephone voting

Step	Internet voting	Telephone voting
1	Log on to internet address provided on e-voting poll card	Call freephone telephone number provided on e-voting poll card
2	Enter graphical security code displayed on screen or audio alternative	N/A
3	Enter VIN and passcode	Enter VIN and passcode
4	Read information on voting	Listen to information on voting
5	Select candidates from on-screen ballot paper using mouse	Select candidates from audio ballot paper by entering two-digit code
6	Confirm selection or return to step 5	Confirm selection or return to step 5
7	Repeat steps 5 and 6 for parish council elections if taking place and choosing to vote	Repeat steps 5 and 6 for parish council elections if taking place and choosing to vote
8	Receive unique receipt number confirming that ballot was successfully recorded	No unique receipt number given, although confirmation could be provided by e-voting call centre

4.23 Once the voter had cast their vote, it was encrypted by an applet on the client personal computer (PC) and sent to the ballot presentation application, which then passed it to the electronic ballot box for storage. The electronic ballot box provided storage of cast ballots from the point at which they were recorded by the system until they were required for counting at the close of poll.

4.24 The ballot presentation application encrypted ballots using the public half of an encryption key, which had been generated at the start of the e-voting period. The other, private half of the encryption key was stored on three smartcards held by the Returning Officer and the two Deputy Returning Officers, at least two of whom were required to decrypt the ballots after the close of poll. There were different keys for the District Council and parish council elections. The decryption process also caused the mixing of the receipts that provided a link between the ballot and the VIN to ensure that the integrity of the ballot was maintained.

4.25 Testing on the e-voting solution was carried out by the suppliers, the Council, and the MoJ and its contractors. A proportion of this consisted of security testing, which is considered alongside related issues later in this report.

4.26 The supplier consortium conducted unit and integration testing remotely before installing the system in the UK. Following installation, supplier representatives then carried out integration, regression and acceptance testing. Testing logs were produced by ES&S to record bugs found in the software during testing and the action taken to resolve them.

4.27 However, the Commission and its contractors did not receive evidence that pre-production and factory acceptance testing had fully verified:

- the operation of the e-voting system in a simulated live environment
- that the system met the specified requirement
- that the system was correctly recording the votes cast

4.28 A contributory factor was the tight timescale for implementation of e-voting at these elections, which adversely affected the quality of the testing that took place.

4.29 At the conclusion of supplier testing, the Council formally accepted the solution as fit for purpose, demonstrating its intent to manage the work of the supplier and take ownership of the e-voting system effectively. No difficulties were subsequently reported with the overall performance of the system during the e-voting period.

4.30 However, the Commission's technical contractors expressed concern that the Council did not undertake a rigorous technical evaluation of the e-voting solution. In particular, they noted that the test script against which acceptance testing was completed was not sufficiently detailed to confirm whether it provided officers with a comprehensive assessment that the system was functioning as they required.

4.31 The e-voting system also provided an 'Audit Voter' function whereby an authorised Council official could test the availability and robustness of the system by casting dummy votes. ES&S stated that votes cast using these dummy identifiers were automatically tagged by the system and excluded from entry into the electronic ballot box. A record of the dummy votes was kept and passed to Intelivote Systems, which confirmed to the Council that they had not been counted. No issues were reported by the Council Staff acting as 'Audit Voter'. This function was useful, and again demonstrates the involvement of the Council in overseeing the work of the suppliers. Nevertheless, it should not be considered a substitute for formal testing

of the system prior to going live or automated monitoring of system availability and performance during operation.

Electronic counting

4.32 The e-counting system consisted of two functional components: scanning and adjudication, and results consolidation.

4.33 The equipment used to carry out scanning and adjudication consisted of:

- three commercial scanners supplied and operated by ES&S and used in conjunction with ES&S image recognition software
- a central server containing the main database and counting system, which was managed and operated by ES&S staff
- nine PCs used by Council staff to register ballot batches on the system, to reconcile totals after scanning and to adjudicate doubtful ballot papers

4.34 One of the nine PCs was equipped with a monitor for the operator and a large screen facing candidates, agents and observers. This was used for the display of general information on e-counting and later for ballot paper adjudication by the Returning Officer.

4.35 The scanning and adjudication process may be summarised as follows. The progress of each ballot box through the e-count began with a manual stage during which the Returning Officer's staff assigned a batch header sheet to each box and then removed the ballots from the box in view of count attendees. The batch header sheet included the number of ballots in the box for each contest based on information provided by the Presiding Officer.

4.36 Both the ballots and the batch header sheet were then transferred to a batch box and taken to ES&S staff to be logged into the e-counting system and allocated to one of the three scanners. The box was then placed on a rack (one for each scanner) prior to being scanned.

4.37 ES&S scanner operators took the batch box off the rack and scanned the ballots in the box, checking that the total scanned (plus any unscannable ballots) matched back to the expected total. Unscannable ballots (or those that required re-scanning) were sorted by the scanner into a separate output tray on the scanner. Those that could not be scanned were placed in a plastic folder in the batch box so that they could be manually entered.

4.38 The ballot papers scanned were either A5 or A4 in size depending on the number of candidates in each contest. Although they were essentially similar to conventional ballot papers, a number of minor changes were made to facilitate the e-counting process:

- a unique barcode on the rear of the ballot paper, containing details of the contest, the polling station and the sequence number of the ballot paper, which was checked as part of the scanning process

- a diagonal grey mark serving as the official mark, situated in the top left-hand corner of the front of the ballot paper, which was checked as part of the scanning process
- two black circles on the front of the ballot paper to facilitate scanner alignment

4.39 Following a second check by ES&S staff that the number of ballots scanned plus the number requiring manual entry matched the expected total, the batch was released for adjudication and manual entry. If the totals did not match, the batches could be re-scanned.

4.40 Once released, batch boxes were placed on racks to await adjudication, which was carried out by the Returning Officer's staff, and subsequently by the Returning Officer if required. The Returning Officer's staff also processed any ballots that required manual entry.

4.41 Results consolidation was carried out by ES&S staff on a standalone laptop with no connection to the scanning and adjudication system. This laptop received a CD-Rom containing EML files from both the e-voting system and the e-counting system and merged the results to create the final results of the elections. The results were then printed out and handed to the Returning Officer for announcement.

4.42 The Council did not undertake a rigorous technical evaluation of the e-counting solution. The system itself was only seen by the Council for the first time at the acceptance test, which involved the processing of 12,000 test ballot papers of the same design as those used in the elections. While the test was completed successfully, the server to be used in the actual count arrived later than expected, three days before polling day. This meant that there was no time for live testing beforehand, which might have detected the server issue that subsequently caused the delayed completion of the count.

Voting

Public awareness and feedback

4.43 The Council's project documentation envisaged a range of communications activities to inform electors about the pilot scheme and to promote the option of e-voting. The principal communications channel to encourage take-up of e-voting was the letter and registration form on 12 March, which was sent to all electors in the district.

4.44 Additional methods used to promote the pilot scheme under the slogan 'Voting made easy' included:

- issuing five pre-election press releases between 13 March and 23 April, which received favourable coverage in the local media
- leaflets and posters with the 'Voting made easy' branding
- promotion on the Council's website
- the inclusion of an article in the spring edition of the Council's magazine, which is sent to all households in the district

4.45 Leaflets and posters were also displayed in local businesses and leisure facilities. According to the Council, requests to display information generally received a positive response.

4.46 The Council's publicity campaign was particularly innovative in targeting commuters, a group which it had identified as potentially particularly receptive to e-voting. Council staff visited the four railway stations in March to hand out leaflets to commuters returning from work. However, a post-election visit by the Commission's accessibility contractors to two stations to interview commuters found no one who had used e-voting and a general distrust of remote e-voting channels. While this is only anecdotal evidence, and should not be overemphasised, further research into the voting preferences of commuters may therefore be required.

4.47 Opinion research conducted by ICM Research found that half of the South Bucks public (50%) were aware that their local authority was piloting new electoral arrangements. The opinion research indicates that awareness was overwhelmingly driven by Council communications strategies, with 64% of the public citing communications from the Council highlighting the arrangement. This is close to the highest score (69%) for this measure across all the pilot areas. The impact of Council publicity is confirmed by the internet and telephone voters themselves, with eight in 10 (80%) saying they had initially become aware of the e-voting pilots as a result of the letters and leaflets highlighting the new arrangements.

4.48 When prompted, three-quarters (75%) of respondents to opinion research knew that new forms of voting were being employed in South Bucks. Members of the public were most aware of the availability of internet voting (67%).

4.49 Candidates and agents were informed of the e-counting and e-voting processes prior to the elections through the briefing held for agents and sitting councillors on 12 March.

Impact on voting

4.50 In total, 16.3% of voters (2,276 people) cast their ballot at the District Council elections using touch tone telephone or the internet. However, this was only 43% of the 5,261 people who registered to vote electronically and 5.7% of the total eligible electorate. No difficulties were reported with the overall performance of the system during the e-voting period.

4.51 Table 2 provides a breakdown of the channels used and the days on which individuals voted.

4.52 Table 2 shows that internet voting was the most popular e-voting channel, with 76% of votes cast. In only one district ward contest did telephone voting comprise more than one-third of e-votes cast.

Table 2: Take-up of e-voting by day and by channel

Day of e-voting period	Telephone votes	Internet votes	Total votes
21 April	28	98	126
22 April	10	66	76
23 April	61	157	218
24 April	25	96	121
25 April	37	86	123
26 April	26	76	102
27 April	21	83	104
28 April	21	64	85
29 April	19	118	137
30 April	49	139	188
1 May	42	130	172
2 May	62	211	273
3 May	142	409	551
Total	**543**	**1,733**	**2,276**

4.53 The most popular day for e-voting was polling day (3 May) itself, on which 24% of e-voters cast their ballot in the District Council elections. Just over half (52%) of e-voters voted in election week (30 April onwards). These trends were also broadly reflected in individual district contests, although in four of 14 elections sustained polling the week before the elections meant that slightly less than half of e-voters voted from 30 April to 3 May.

4.54 Just over half of e-voters (53%) voted in the District Council elections during conventional office hours, between 9am and 5pm. Of the remainder, the majority (a further 39%) voted in the hours between 5pm and 12 midnight. Unsurprisingly, time and date statistics for voting in parish council elections, in which 78% of e-voters used the internet to cast their ballot, were not significantly different from those for the District Council elections.

4.55 ICM Research's opinion research found that internet voters had two primary motivations – they were most likely to consider internet voting to be easier than using a ballot paper (54%) and/or to express a liking for modern technology (53%).[8] Internet voters were as comfortable (86%) with pre-registration for e-voting as telephone voters. However, they were very much more likely (86%) than telephone voters (62%) to find the information given to them on how to vote online easy to understand, and they were also statistically significantly more likely (87% versus 67%) to find the voting process itself easy.

4.56 The research indicates that e-voting has largely been used by people who tend most often to vote, rather than people who tend not to. ICM Research suggests that this may reflect the fact that the onus in this pilot scheme was on electors to opt in to e-voting through pre-registration, rather than on the local authority to provide a service to all electors.

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[8] Respondents could give more than one explanation for why they used internet voting.

4.57 According to the profile of the respondents who voted, almost two-thirds (64%) of telephone voters were retired, as were 37% of internet voters. The proportion working full time were 24% and 44% respectively. Men (64%) were much more likely than women (36%) to have voted online, but the reverse was true of telephone voting (women 59%; men 41%).

4.58 Non-voters at these elections mostly blamed circumstantial reasons for not turning out to vote, with one in four (26%) saying they were too busy, 10% saying they were away at the time and a similar number (12%) saying they simply forgot.

4.59 Other than the minor changes made to the ballot paper to facilitate e-counting, postal voters in South Bucks did not experience any differences in the process. Feedback from polling station staff suggests that those voting in person raised very few queries about the redesigned ballot paper, but had to be regularly asked not to fold their ballot paper despite reminder notices to that effect.

4.60 The Commission has received anecdotal evidence from Presiding Officers, candidates and electoral observers from the Open Rights Group of cases where electors who had registered to vote electronically tried to vote at their local polling station. Presiding Officers had been instructed not to issue a ballot paper to these electors but to ask them to contact the Council's e-voting call centre for assistance, since electors could not change their voting channel once registered.

Accessibility

4.61 Due to the tight time constraints, it was difficult for the Council to engage with disability organisations or the representatives of other hard-to-reach groups in the design and implementation of the e-voting pilot scheme. As part of its overall communications strategy, the Council did write to organisations representing hard-to-reach groups in March to inform them of the e-voting pilot scheme. It also enclosed leaflets and posters enabling them to promote the pilot scheme, although it did not promote the availability of information in alternative formats or languages other than English. However, when the Commission's accessibility contractors used the same list to facilitate their evaluation of the pilot, they discovered that many of the contact details were out of date.

4.62 It appears that the process of logging in posed greater barriers to participation than the process of voting itself. The query log recorded by the e-voting call centre showed that 58% of callers (an estimated 178 of 307 enquiries)[9] contacted the call centre for assistance with their passcode, many apparently having forgotten it entirely. The call centre was able to assist many registered e-voters who had forgotten their passcode if they were able to confirm their personal details, by giving them the first digit of the passcode as a reminder. Anecdotal evidence suggests that callers found the call centre service very helpful.

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[9] A number of electors called several times about the same issue.

4.63 However, the records of attempted access to the e-voting system showed that a significantly larger number of users (325, or 6% of the 5,261 registered to vote electronically) failed to enter their passcode correctly and did not vote. It is unclear at the present time whether all these attempts represented genuine efforts to access the system. Further investigation in this area may be beneficial.

Internet voting

4.64 Once the internet voting system had been accessed, feedback from voters obtained by the Commission's accessibility contractors was generally positive regarding both of the voting processes. There is also evidence that some groups in particular (e.g. deaf and hard of hearing voters) benefited from the availability of e-voting.

4.65 Nonetheless, while the accessibility assessment found that the website was generally user-friendly, it also identified a number of issues:

- Absolute text sizing was used, meaning that users were not able to change the text size to suit their needs. This also posed display issues for different access devices.
- Not all tasks could be carried out without using a mouse or equivalent device.
- The graphical security code posed accessibility issues for users with a visual impairment due to the complexity of the image and the low colour contrast. There was an audio alternative to this, although it was often difficult to understand.
- The e-voting call centre number was embedded in the top banner graphic and was not repeated in the ALT tag, making it inaccessible to users relying on screen readers.
- The button sizes and button text (including case and font size) were not consistent from screen to screen.

4.66 The Commission's accessibilty contractors assessed the e-voting website as meeting Web Content Accessibility Guidelines 1.0 (WCAG 1.0) conformance level A.[10] However, the MoJ's statement of requirement for its e-voting supplier framework required such sites to meet a higher accessibility standard, namely WCAG 1.0 conformance level Double-A.

Telephone voting

4.67 While telephone voting increased the accessibility of the voting process by increasing the number of remote e-voting channels available, there is evidence that some voters may have found the process overly complicated. This may have been an issue in particular at some parish council elections at which users could vote for over 10 candidates, where a candidate code would have to be entered each time.

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[10] Web Content Accessibility Guidelines (WCAG) are a recognised standard in website accessibility developed by the World Wide Web Consortium (W3C). See www.accessibility101.org.uk/index.htm for further details.

4.68 Other issues logged by the e-voting call centre or picked up in usability testing by the Commission's accessibility contractors included:

- the comprehensibility of the recorded voice
- a lack of familiarity with the hash (#) key, which had to be pressed to confirm the voter's choice of candidates for an election
- the expectation that users would be telephoning an operator, not an automated service

4.69 Feedback from candidates and agents and electoral observers from the Open Rights Group to the Commission also suggests that some older voters may have had difficulty hearing or understanding the instructions properly and entering candidate codes within the time available.

Campaigning

4.70 Feedback from candidates and agents at the count and the subsequent return of evaluation questionnaires suggest that internet and telephone voting had no distinct impact on local campaigning, except for influencing when it began. The provision of two new remote e-voting channels alongside postal and proxy voting was felt to have increased the pressure on activists to begin campaigning earlier in April in order to reach electors who were intending to vote electronically before they cast their ballots.

4.71 While some parties used the internet as a campaign tool by providing information on candidates and policies, no direct link was made with the internet voting service.

Impact on counting

Technical problems

4.72 Due to a technical difficulty with the calculation of results, the count suffered substantial delays, beginning at 10.25pm on 3 May and concluding at 11.30am on 4 May, approximately 13 hours later. It is important to note that the e-counting process did eventually fulfil its central purpose by delivering a complete set of election results.

4.73 While all ballot papers had been scanned by 3am, and all ballots referred for adjudication had by 3.15am either been resolved or passed to the Returning Officer, no results were able to be calculated on the night. Consequently, candidates and agents were sent home and invited to return at 10am. The Returning Officer and his staff worked overnight with ES&S staff to ensure that the problem was fixed, with the contingency of reverting to a manual count if necessary.

4.74 The delay in the calculation of results was caused by an inability to successfully merge the results from the e-count with those from the e-voting system on the results consolidation PC. Rather than being transferred directly, for security reasons the results were transferred to the PC via a single EML language file on a CD-Rom. However, an version incompatibility in the server configuration meant that

the merger of the results into the single EML file produced a corrupted and therefore unusable file, preventing the calculation of results. This error had gone undetected prior to the count because, as previously noted, the server used had not been subject to live testing, having been delivered late and set up only in the week prior to 3 May.

4.75 The server configuration issue came to light as a result of an attempt by ES&S technical staff to resolve another issue. It became apparent that the customary preference for the production of results on a rolling basis as individual contests were fully counted and adjudicated had not been communicated effectively to ES&S. Rather, the system had been set up for the count on the assumption that results would only be calculated once counting and adjudication had been fully completed. In the process of trying to provide rolling results, ES&S staff discovered the server configuration problem.

4.76 The ES&S Project Manager did not arrive at Pinewood Studios from the Rushmoor count until around 3am. In his absence, it appeared that neither the server problem nor the secondary technical issue with the results consolidation system was communicated effectively by technical staff to the Returning Officer. This in turn hindered effective decision-making and delayed the suspension of the count.

4.77 Following the suspension of the count, the suppliers were able to resolve the server problem, requiring approximately three hours' work to do so. The count resumed at 10am; the Returning Officer's adjudications and the automated calculation of results were completed without further technical difficulties.

4.78 It is noted that the Statutory Order for the pilot scheme made provision for a functioning e-count or a reversion to a manual count, but neither the Order nor supporting guidance clarified procedure in the event of suspension of a count due to technical difficulties. The Returning Officer, his team and the suppliers are therefore to be commended for the professional manner in which they dealt with a high-risk situation without a clear procedure or precedent to follow.

4.79 In the event that the automatic calculation of results had not been possible upon the resumption of the count, the provisional results (pending adjudications) had been printed out and securely stored by the Returning Officer before the resumption of the count. Advice had been sought from the Commission on this contingency plan. This meant that in the event of further technical difficulties the ballots to be adjudicated could have been manually added to the paper record of the votes already counted. One provisional result had been checked by the Returning Officer and his staff to ensure that the total number of votes counted for that contest (plus adjudications) matched the number received prior to scanning.

Efficiency

4.80 As previously noted, three commercial scanners were used in conjunction with ES&S image recognition software, each operated by two ES&S personnel. The scanners had processed all 21,955 ballot papers by 3am, in approximately five

hours. This is equivalent to a mean scanning rate of 24.39 ballots per minute per machine. The peak scanning rates were 120 ballots per minute for A4 ballots and 125 ballots per minute for A5 ballots.

4.81 Assuming that the count could have then been concluded by 4am had technical difficulties not resulted in delays, the estimated time taken (six hours) would have compared favourably with the last local government elections in 2003, which took 7.5 hours to count manually.

4.82 However, it is estimated that greater efficiencies in count management and scanning procedure had the potential to reduce scanning time by more than two hours. Only two of the three scanners were used throughout; one had broken down and, while it could be repaired reasonably quickly, there was no spare machine to take its place.

4.83 Further delays were caused by the inclusion of A4 and A5 ballot papers for different contests in the same batch for scanning. While the scanning equipment included 'joggers' to shake batches so that ballot papers would align with each other, the ES&S scanner operators decided to sort the papers manually to stop them jamming the scanner. While observation suggests that better use could have been made of the 'jogger' to prevent jamming occurring, in the event manual sorting created a bottleneck at this point in the process.

4.84 Like the results consolidation system, the count processes as a whole were not designed to facilitate the production of rolling results as expected by the Returning Officer and his staff as well as candidates and agents. Ballot batches were not allocated to scanners in an order that would enable this to be done, and some batches also included ballots for different contests.

Accuracy

4.85 As previously noted, despite the technical difficulties experienced, the e-counting process delivered a set of election results that candidates and agents accepted. No requests for an electronic or manual recount were made by candidates or agents.

4.86 A total of 11.8% of ballots were passed to the standard adjudication queue, only 6.6% of which (0.8% of all ballots cast) were passed to the Returning Officer queue, resulting in 242 rejections. Nearly all (213) of the rejected ballots were either blank ballots or ballots where the voter intent was unable to be determined.

4.87 Analysis of adjudications from the standard adjudication queue on a ward-by-ward basis shows that there were most issues in reading ballots from parish council elections where the paper was yellow and especially in those where the ballot paper was A4 and listed more than nine candidates.

4.88 A slight process issue was that all ballot batches were placed on the adjudication racks irrespective of whether there were any adjudications or manual entries required. This made the apparent scale of the adjudication process look much greater than it really was.

Transparency

4.89 Between 3am and 10am on 4 May there were no candidates or agents present at the count while the Returning Officer oversaw modifications to the e-counting server by ES&S. This decision was agreed to by count attendees. Commission representatives and electoral observers from the Open Rights Group remained to monitor the process. The absence of candidates and agents during this period may be an issue that requires further consideration if developing guidance for future e-counts.

4.90 In addition, no announcement was made to agents that the e-count of electronic votes was about to be carried out about half an hour after the commencement of the count or, subsequently, that this had taken place. The decryption of the electronic ballot box was carried out by the subcontractor Scytl, and it is arguable that the perception of transparency would have been enhanced if it had been undertaken by Council staff.

4.91 Representations received by the Commission from candidates, agents and the Open Rights Group, as well as the observations of its own evaluation team, suggest that there were other barriers that candidates and agents faced in engaging with the process compared with a manual count. The layout of the e-count did not lend itself to scrutiny by candidates, agents and observers. While the electronic ballot boxes were opened in close proximity to the observers, the sorting and scanning of the ballot papers was completed at the back of the room at considerable distance. Council officers have stated that they would redesign the count layout to facilitate scrutiny in the event of any further e-counting.

4.92 There was little communication of the technical difficulties with the calculation of results until candidates and agents began to demand an explanation. This was exacerbated by the fact that little information was being provided on the progress of the count. There was no public address (PA) system, and while there was a display screen, it provided basic details of the elections and the e-counting system rather than any real-time progress information. Council officers have indicated that with the benefit of hindsight a PA system would have been useful. It has also been suggested that it would have been easier to track the progress of batches for specific wards if they had been clearly labelled for the benefit of observers.

4.93 Feedback received from candidates and agents suggests that they were generally content with the process for the Returning Officer's adjudication stage, although some felt the display screen could have been larger. However, due to the suspension of the count many were unable to return at 10am on 4 May to attend this stage of the count and the subsequent declarations of results.

Turnout

4.94 The overall aggregate turnout for the May 2007 elections to the District Council was 34.8% (34.2% at the parish council elections). This is approximately six percentage points higher than at the last comparable local government elections in 2003 (28.9%). Turnout in individual district wards at the May 2007 elections ranged from 29.3% to 42.0%, and was higher in all but one ward (Iver Heath) than in 2003.

4.95 As noted earlier in this report, a total of 16.3% of voters (2,276 people) cast their ballot for the District Council elections using the telephone or the internet. Public opinion research conducted in the South Bucks area by ICM Research found that seven in 10 e-voters (71%) polled claimed they would have voted in any case. ICM Research suggests this may reflect the fact that the onus in this pilot scheme was on electors to opt in to e-voting through pre-registration, rather than on the local authority to provide a service to all electors.

4.96 However, one-third (29%) stated that they would not have been likely to vote had e-voting not been provided. While allowing for the small size and self-selecting nature of this sample, it is therefore possible that e-voting had a small but positive impact on turnout, as predicted by Council officers. Nonetheless, it seems unlikely that it was the only or primary cause of the increase, given that the majority of users appear to have been predisposed to vote in any case.

4.97 Candidates, agents and party activists were undecided as to whether e-voting had had a positive impact on turnout. In opinion research interviews and evaluation questionnaires, some expressed the view that it had encouraged younger age groups and housebound electors to vote. Some questionnaire responses correlated the increased convenience of voting with an increased propensity to vote. Others considered that the system as implemented retained barriers to participation (e.g. issues with the telephone user interface), which in turn had reduced the benefits provided.

Security and confidence

Security

4.98 The Commission has not been made aware of any allegations of fraud or malpractice arising from the pilot scheme at these elections. At present, therefore, there is no substantiated evidence to suggest that the procedures provided by the pilot scheme led to any increase in electoral offences, or in any other malpractice in connection with elections. The Commission notes that the period in which a prosecution can be launched is one year, and so such evidence may still come to light.

Electronic voting

4.99 As previously noted, prospective e-voters were required to provide their name and address, date of birth, a five-digit passcode and a signature when registering. Council staff confirmed that returned electronic registration forms were from registered electors. When voting electronically, e-voters then had to provide their passcode and a VIN, which they had received on a secure poll card. No reports of false registrations or intercepted poll cards were received by the Council.

4.100 The design of the e-voting user interface included a number of further security features. Internet voters were required to enter a randomly generated code displayed on the screen or an audio alternative in order to prevent automated attempts to access the e-voting system. All e-voters were locked out of the system if their passcode was entered incorrectly five times. They could then only unlock their account by contacting the call centre.

4.101 The risk of unauthorised access to the e-voting system leading to vote tampering was also addressed by the storage of ballots cast in encrypted format in the electronic ballot box application. The ballots could only be decrypted by the use of two of three smartcards held by the Returning Officer and the two Deputy Returning Officers. Unauthorised access to the e-voting server was prevented by physical security measures undertaken by Firstserv Hosting Solutions, the hosting service provider.

4.102 ES&S completed a high-level assessment of the potential security risks based on its experience of similar e-voting solutions. The independent quality assurance process commissioned by the MoJ which took place in April found that some expected security measures were already in place. The quality assurance auditor established that the remaining measures were due to be implemented, which became the subject of an agreed resolution between the quality assurance auditor, the Council and the supplier.

4.103 However, the supplier consortium did not provide a risk management and accreditation document set (RMADS) as required by the MoJ supplier framework. It is the view of the Commission's technical contractors that without a RMADS to provide evidence that an acceptable set of security measures was in place, and to form the basis of an independent security audit, there was a significant risk that the e-voting solution could have had security weaknesses, although none was reported during the pilot. It is possible that the RMADS was not provided due to the tight timetable associated with the implementation of the pilot scheme.

4.104 An independent penetration test of the system was completed by the MoJ contractors, albeit over a limited period of time, which nonetheless identified a number of weaknesses. Although ES&S stated that it had updated the system to address a number of the weaknesses found, it was not able to respond to all concerns due to the fact that some changes would have required a reinstallation of the system and there was limited time before the start of the e-voting period.

Electronic counting
4.105 The e-counting system was standalone and isolated, with no connections to external networks. There was no need for an internet connection because e-vote data had been downloaded from the electronic ballot box to a CD-Rom and physically brought to the count for decryption.

4.106 The independent quality assurance process commissioned by the MoJ considered the security of the e-counting solution. The quality assurance auditor made recommendations regarding the physical layout of the count (e.g. secure placement of servers, controlling access to the count area). While effective, there is some concern that these recommendations contributed to the issues candidates and agents encountered in engaging with the e-counting process, as previously discussed.

4.107 Scanner and adjudicator operators had to log on with unique user identifications and passwords. All equipment used on the night for the handling of data was either created specifically for the occasion and/or had undergone a full and extensive virus check prior to the elections and count night.

4.108 After the count, relevant vote data, having been recorded onto CD-Rom and passed to the Council for secure storage for the prescribed period, was removed by the suppliers from the PCs used. This took place in the presence of Council staff.

User confidence

4.109 As expressed in opinion research carried out by ICM Research, the confidence of e-voters in South Bucks differed according to the channel used. Two in three internet voters (68%) thought this method was secure compared with 71% of telephone voters. Internet voters were more likely than telephone voters to be on their own when casting their vote, presumably to avoid others discovering their voting preference by looking at the screen.

4.110 They were also statistically significantly more likely than telephone voters to say the method of voting they used should be rolled out across all elections (87% as opposed to 70%). However, among non-e-voters, the equivalent scores are significantly lower (among all voters, 48%; among non-e-voters, 64%).

Stakeholder confidence

4.111 The pre-registration process used for e-voting during the pilot scheme was generally considered by candidates and agents to have been sufficiently secure. Their confidence in the security of the elections had not been adversely affected by the use of e-voting. However, there remained a general concern about the reliability and vulnerability to fraud of e-voting systems.

4.112 Given the technical difficulties and transparency issues summarised in this report, it is unsurprising that most of the feedback received by the Commission from candidates and agents on the e-counting process has been negative. It was generally considered that the pilot had adversely affected their confidence in e-counting, some to the point where they felt they would not support further trials of this technology. The majority considered that any future use of e-counting had to ensure not only that the technology was reliable, but that the processes were clearly communicated to count attendees and transparent for scrutiny purposes.

Cost and value for money

4.113 The overall cost of the pilot scheme, taking into account both local authority and supplier costs, was £778,108. The total cost of the pilot per elector[11] (both e-counting and e-voting) was approximately £16.24. As noted in paragraph 3.27, the majority of these costs were met by the MoJ rather than the local authority.

4.114 A breakdown of e-voting and e-counting costs is provided separately in Tables 3 and 4. It should be noted that £104,033 of supplier costs and £15,000 of local authority costs (a total of £119,033) reflect cross-cutting costs in areas such as pilot design and project and quality management. As such, they have not been allocated in the cost breakdown that follows, although it is assumed that the majority relate to e-voting, given its greater complexity.

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[11] All 'per elector' calculations in this section are based on the total May 2007 electorate of 47,925, as opposed to the electorate for the contested district elections at this election, which was 40,087.

4.115 The Commission's technical contractors have noted that these costs reflect the nature of the pilot as a one-off trial in a single district. In a non-pilot scenario, management and implementation costs could conceivably be reduced, while greater economies of scale could also be possible.

Electronic voting

4.116 Table 3 shows that the total cost of the e-voting trial was £595,220, or £12.41 per elector. The single largest cost for e-voting related to the provision of hardware and software, at an estimated £300,550. The cost per elector who registered to vote electronically (5,261) was £113.14, and the cost per e-voter in either the District Council or the parish council elections (2,488) was £239.24.

Table 3: Summary of costs for e-voting

Category	Cost (£)
Development and configuration	39,020
Installation	77,635
Testing	25,095
Supplier support	38,435
Training	955
Helpdesk	14,630
Software/hardware	300,550
Hosting environment	75,000
Postage	5,000
Printing	18,300
Call centre accommodation	600
Total	**595,220**

Electronic counting

4.117 Table 4 shows that the total cost of the e-voting trial was £63,855. This equates to £1.33 per elector and £2.91 for each of the 21,955 ballots scanned for the District Council and parish council elections.

4.118 The single largest cost for e-voting related to the provision of scanners and adjudication software, at an estimated £40,650. It is worth noting that the Council estimates that it achieved savings of £2,940 by reducing the number of staff it required to attend the count.

Table 4: Summary of costs for e-counting

Category	Cost (£)
Digital central scanner (includes scanner, start-up kit, dust cover and adjudication software)	40,650
Ballot joggers	320
Installation of digital central scanner	3,600
PCs	6,650
Servers	2,400
Generation of results and statistics	8,515
Ballot boxes	1,720
Total	**63,855**

5 Conclusions and findings

Statutory criteria

5.1 In terms of the five statutory evaluation criteria, the Commission's conclusions in relation to the electoral pilot scheme in South Bucks are as follows.

5.2 **The pilot scheme facilitated and encouraged voting.** By offering new voting channels, e-voting gave electors more convenient voting options. A total of 16.3% of voters (2,276 people), or 5.7% of the eligible electorate, voted using the internet and telephone voting channels. Approximately three-quarters of those e-voters (76%) used the internet. While qualitative and quantitative feedback from users was generally positive, this should be placed in the context of a number of barriers to participation reported by the Commission's accessibility contractors.

5.3 The pilot scheme had no discernible negative impact on the ability of voters to make an informed choice at the elections.

5.4 **The pilot scheme did not facilitate the counting of votes.** Technical difficulties resulted in the suspension of the e-count, which had to be completed the following day and took 13 hours from beginning to end. A complete set of election results was nonetheless delivered. Had this not occurred, the scanning process would have resulted in estimated time savings of 1.5 hours compared with a manual count.

5.5 **There is some evidence to suggest that the pilot scheme had a slight impact on turnout.** Overall turnout for the May 2007 elections in South Bucks was 34.8%, almost five percentage points higher than the last comparable election in 2003. Based on opinion research conducted with e-voters there is some limited evidence to suggest that around one-third of users (29%) would not have voted had the pilot scheme not been taking place. However, it seems unlikely that e-voting was the only cause of the increase in turnout, given the small overall number of e-voters and the fact that the majority appear to have been predisposed to vote in any case.

5.6 **The pilot scheme provided e-voting services that were generally easy to use.** Opinion research suggests that the majority of internet and telephone voters (87% and 67%) found voting processes easy to use. Almost all (86%) were generally comfortable with the pre-registration process. However, this finding should be placed in the context of a number of barriers to participation reported by the Commission's accessibility contractors and other interested parties, particularly in relation to telephone voting.

5.7 **The pilot scheme does not appear to have led to any increase in personation or other offences or malpractice.** There were no complaints to the Council or the police regarding the pilot procedures or regarding potential fraud or security breaches.

5.8 **The pilot scheme led to a increase in expenditure for the Council. However, the majority of these costs related to the supplier and were subsequently met by the MoJ.** The overall cost of the pilot scheme, taking into account both local authority and supplier costs, was £778,108. This can be separated out into £595,220 for e-voting (or £12.41 per elector), £63,855 for e-counting (or £1.33 per elector) and £119,033 for miscellaneous costs.

5.9 The cost per elector who registered to vote electronically (5,261) was £113.14, and the cost per e-voter in either the District Council or the parish council elections (2,488) was £239.24. The cost per ballot scanned electronically was £2.91.

Learning

5.10 The Commission's evaluation of this pilot scheme has identified the following key learning points.

Electronic voting

- The Council is to be commended for identifying a target group for its e-voting pilot scheme (commuters) and devising an innovative communications strategy that focused on reaching this group.
- While pre-registration processes were implemented by the Council without difficulty, only 45% of those registered subsequently voted. Evidence received by the Commission suggests that a number of electors experienced difficulties in remembering their VIN and passcode, or (particularly for telephone voting) encountered further accessibility issues having entered the system.
- The most popular day for electronic voting was polling day and more than a half of e-voters (52%) cast their ballot between 30 April and 3 May. This suggests that there is value in e-voting channels remaining open up until the close of poll.
- Approximately two-thirds of e-voters surveyed (68% of internet voters and 71% of telephone voters) considered the e-voting processes used in South Bucks to have been secure, a point reflected in additional feedback from candidates and agents.

Electronic counting

- An effective e-count requires a dedicated manager for technical processes working to (and communicating clearly with) the Returning Officer.
- Electronic counting systems for local government elections should be implemented in such a way as to facilitate the production of results for contests as and when counted, as is customary manual count practice.
- Improvements to ballot paper throughput could have been made through the availability of spare scanners and by avoiding the manual sorting of A4 and A5 ballot papers in the same batch (whether through prior separation or the improved use of technology).

Issues

5.11 The following issues will need to be considered further in relation to any future pilot schemes or wider implementation of the processes trialled by the Council.

Electronic voting

- In light of anecdotal evidence from the accessibility contractors that commuters had not wholly engaged with the Council's e-voting communications strategy, it may be that further work is required if such groups are to be effectively targeted as part of any future e-voting trials.
- Consideration should be given to the possible involvement of disability organisations and other hard-to-reach groups in the design and implementation of voter-facing pilot schemes to address the accessibility issues identified.
- Consideration should be given to a secure and effective mechanism enabling electors who have registered to vote electronically to switch to voting in person on polling day.
- Conclusions about the generally high level of confidence in e-voting as implemented in South Bucks do need to be seen in the context of wider concerns expressed by candidates, agents and electoral observers about the reliability, vulnerability and transparency of e-voting processes.
- Consideration should be given to clarifying procedure for the counting of e-votes, particularly in relation to providing an appropriate level of transparency to agents and electoral observers.

Electronic counting

- It is likely that the technical difficulties experienced at the count would not have arisen had a longer timescale been available for implementation and testing of the e-counting solution.
- Consideration should be given to clarifying procedure in the event of an e-count being suspended due to temporary technical difficulties.
- Further consideration should be given as to how candidates, agents, counting agents and electoral observers can be provided with a level of information and an ability to scrutinise the process which as near as possible approximates a manual count.

General

- The short implementation timescale had an adverse impact on overall project risk. It impacted on the time available to the supplier for the production of technical documentation as well as for testing and quality assurance processes.
- With additional time, it would also have been possible for the Council to give greater consideration to issues such as acceptance testing, accessibility and count design.
- Feedback from Council officers suggests that additional central support for first-time pilot authorities would be welcomed, particularly for complex pilot schemes.

5.12 Further recommendations can be found in the technical reports by the Commission's contractors.