

Electoral pilot scheme evaluation

Swindon Borough Council

August 2007



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Tel: 020 7271 0500

Email: publications@electoralcommission.org.uk

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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, Swindon Borough Council submitted an application to pilot a series of innovations, including:

- remote internet voting
- interactive voice response remote voting (telephone voting)
- advance electronic voting from five supervised locations prior to polling day
- 64 electronic polling stations available only on polling day supplying a 'vote anywhere' environment

Conclusions and findings

On the whole, the pilot scheme facilitated and encouraged voting. The scheme gave electors in Swindon more choice over voting methods. However, delays to the commencement of the advance voting period and a range of technical problems experienced in the period leading up to and on polling day itself did cause inconvenience and frustration for some electors.

The pilot scheme did not facilitate the counting of votes. The counting of votes took two hours longer than expected. This was because the Council anticipated a significantly greater percentage of the electorate voting electronically than actually did, resulting in the employment of fewer count staff. Despite this, the results of the elections were declared approximately one hour earlier than would have normally been the case for a similar sized, entirely paper-based count.

The pilot scheme had a negligible effect on the turnout of voters. Overall turnout at the May 2007 elections in Swindon was 35.1%, as compared with 34.2% in 2006. Public opinion research suggests that 25% of remote internet voters would have been otherwise unlikely to vote had the online facility been unavailable. However, given the very small increase in turnout on 2006 (0.9%), and the multiple determinants of turnout, it is not possible to conclude that the pilot scheme had a significant impact on turnout.

On the whole, voters found procedures easy to follow. Public opinion research suggests that the majority of internet and telephone voters (98% and 100%) found voting processes easy to use, although one in 10 and one in five of these voters respectively experienced some form of technical problem. All of those who voted using a laptop at a polling station found the process generally straightforward, although 13% reported technical problems in using the laptops.

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.

The pilot scheme led to an overall increase in expenditure by the Council.

Overall, the provisional cost of the pilot scheme, taking into account both local authority and supplier costs, was £1,185,423.27. The Council realised modest savings of £3,600 as a result of employing 50 fewer count staff than at a traditional paper-based election. The average cost of the 2007 pilot scheme per elector was £8.33, compared with £2.30 for a conventional election, while the cost per electronic vote cast was £102.50.

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 Affairs¹ 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 Swindon Borough 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

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. ICM Research interviewed 301 voters in Swindon between 4 May and 13 May 2007. It conducted 272 further interviews with voters and non-voters using a questionnaire standardised across all pilot schemes. It also interviewed two candidates and one agent from within the borough.
- An evaluation of technical elements of the pilot by Actica Consulting.
- 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 Swindon Borough 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 unitary authority of Swindon is situated in the South West region in the county of Wiltshire.² It is located with direct access to London, the west of England and South Wales via motorway and rail. Swindon has a population of 181,000 and is growing at one of the fastest rates in England, with the population projected to reach 208,000 by 2011. The majority (87%) live in the town of Swindon, which occupies one-quarter of the borough's area of around 23,000 hectares, with the remainder living in the surrounding rural areas.

2.2 Around 9% of Swindon's population in 2001 could be classified as 'other than white British', which was below the national average of 13%. There are established Polish, Italian and Irish communities in Swindon, and there has been recent immigration from the Balkans and the Middle East.

2.3 Historically a railway town, Swindon has over the past 20 years diversified from its traditional manufacturing base and has increasingly become a centre for new industries in the fields of technology, finance and engineering. Approximately 80% of local employment is now in the service sector.

2.4 Unemployment stands at around 2%, which is below the national average. With respect to deprivation, Swindon ranks 171 out of 354 council areas of England on the 2004 indices of deprivation (with 1 being the most deprived).³

The Council

2.5 Swindon Borough Council has 22 wards, comprising a mix of single- and multi-member wards, and 59 elected councillors. These councillors are elected by thirds. Twenty borough wards had elections in 2007. Two of these wards – Highworth and Stratton St Margaret – also held parish council elections. A total of 142,317 electors representing 95.8% of the Council's 148,603 electors were able to participate at the May 2007 elections. Prior to these elections, the political composition of the Council was 42 Conservative, 12 Labour, three Liberal Democrat and two others. Following the May 2007 elections, the newly elected Council comprised 43 Conservative, 13 Labour and three Liberal Democrat councillors.

2.6 At Parliamentary level, Swindon is represented by Michael Wills MP (North Swindon) and Anne Snelgrove MP (South Swindon), both from the Labour Party.

² Demographic information in this section was obtained from Audit Commission, *Corporate Assessment: Swindon Borough Council* (2006).

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, Swindon Borough Council (hereafter referred to as 'the Council') submitted an application to pilot a series of innovations and changes to electoral procedures, including:

- remote internet voting
- interactive voice response (IVR) remote voting (telephone voting)
- advance electronic voting (e-voting) from five supervised locations prior to polling day
- 64 electronic polling stations available only on polling day supplying a 'vote anywhere' environment

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, Swindon Borough Council (Electronic and Advance Voting) Pilot Order 2007, was made on 26 March 2007 and came into force on the same day.⁵

Pilot scheme summary

3.4 The pilot scheme involved the testing of several e-voting innovations. The e-voting solutions employed by the Council were provided by the TCS Consortium, comprising Tata Consultancy Services, Everyone Counts (E1C) and 21c Consultancy, which, together with the Council, also delivered related activities such as project management, technical support, outreach and training.

Remote internet and telephone voting

3.5 The Council intended to make available remote internet and telephone voting to its electors from 7am on 26 April until close of poll (10pm) on 3 May. This would enable electors to vote in an unsupervised environment such as at home or at work.

3.6 As with the other four e-voting pilot schemes that took place at the May 2007 elections, all Swindon electors wishing to use these facilities were required to register in advance. Once registered, prospective remote e-voters could switch back to polling station voting and were dealt with in a similar manner to other polling station voters. In addition, pre-registered e-voters had the option of changing to a postal vote. Proxy voters were not eligible to use e-voting.

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 The Council sent a letter and registration form between 19 March and 21 March to all electors inviting them to register to vote remotely by internet or telephone. The registration form required electors to provide two personal identifiers (date of birth and an unique personal identification number (PIN)) to be used during the authentication process when they logged on to vote. Electors were also required to sign and date the pre-registration form and return it to the council offices by 5pm on 18 April. Once the forms had been returned and checked for completeness, electors were entered onto the pre-registered voters database and then sent an acknowledgement letter by the Council. Each elector was then subsequently notified of their unique 10-digit ballot code in a secure mailer that also served as the official poll card. In order to vote remotely by internet or telephone, pre-registered electors were required to input their date of birth, self-generated PIN and ballot code.

Advance e-voting at supervised locations

3.8 The Council also piloted advance e-voting at five supervised locations (local libraries) from 9am on 26 April until 6pm on 2 May. This facility was designed to offer electors the choice of voting electronically at any of the five locations in advance of polling day in a secure, supervised environment. Unlike remote internet and telephone voting, the facility did not require pre-registration or the use of specific credentials. As for traditional paper-based polling station voting, electors were required to provide their name and address at the supervised location before they could vote electronically.

Electronic polling stations

3.9 The pilot scheme further encompassed all of Swindon's 64 traditional polling stations set up with broadband or wireless internet access, and enabled by a networked register, to provide a supervised electronic 'vote anywhere' environment on 3 May. The pilot scheme's 'vote anywhere' element meant that electors had the option of voting electronically at any of the Council's 64 polling stations. Electors who chose to vote at the polling station assigned to their polling district had the option of either voting electronically or traditionally by means of a paper ballot. However, electors choosing to vote at a different polling station than the one designated to them could only do so electronically and were not given the option of a paper ballot. Electors who opted to 'vote anywhere' at a polling station of their choice were not required to pre-register, but were asked to provide their name and address before being permitted to vote.

Features of the e-voting system

3.10 Once electors had accessed their chosen e-voting system, they were directed to make their selection, confirm (or change) and then cast their vote. Electors had a choice of viewing the instructions and information in four different languages (English, Bengali, Konkani and Portuguese) and could also view or hear information about each of the candidates on the internet voting channel. However, candidate information was not available through the telephone voting channel. All e-voting channels allowed over-voting and a blank vote but warned the voter that this would be counted as a spoilt vote.

3.11 After voting electronically on the remote internet channel, or at a supervised location, voters were given the option of creating a receipt, which they could then use after the close of poll to check that their vote had been accurately received and recorded. This facility was not available through the telephone voting channel.

3.12 An elections helpline was established to assist electors who required help with voting or who had questions about the available voting processes at the elections.

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 proposed innovations aimed to:

- test the effect on turnout of providing an extended voting period and providing facilities to make it easier to vote
- test the security and operation of remote and supervised e-voting
- evaluate any problems associated with operating both remote voting and polling stations simultaneously
- test what effect, if any, providing online candidate information has on turnout
- evaluate feedback from voters on the various voting channels and options and the effect these had on their decision to vote
- test the impact of providing a 'voter receipt' on voter trust and confidence
- test the scalability of a shared service model by sharing costs of call centres, printing, evaluation and analysis with other local authorities
- build a comprehensive analysis model by testing the impact of pre-registration for remote voting on take-up and compare this with take-up in previous electronic pilots without pre-registration

3.15 The Council anticipated that the pilot scheme would produce the following outcomes and benefits:

- increased turnout through choice of voting channel, advance voting period and through enhanced voter awareness
- a framework for future secure, cost-effective and scalable delivery of remote 'vote anywhere' facilities
- accurate, well-documented and properly managed evaluation of social impact, processes and technologies arising from the pilot scheme
- development of a scalable and repeatable framework for addressing accessibility issues in future pilots
- addressing the digital divide by providing supervised remote advance 'vote anywhere' facilities

3.16 Commenting on pilot scheme applications, the Commission noted that the Swindon application provided evidence of effective project management and risk analysis and that the Council had experience of successfully delivering complex pilot schemes in previous years. In addition, the Commission felt confident in the Council's ability to manage the suppliers effectively. The Commission considered that the Swindon pilot scheme application, together with those submitted by Rushmoor Borough Council and Sheffield City Council, provided a good mix of elements that would enable it to undertake a detailed assessment of a number of key factors, including patterns of usage and take-up, accessibility, security and confidence in e-voting.⁶

3.17 The background paper attached to the approval provided by the Secretary of State noted the Government's view that Swindon's pilot scheme would be particularly valuable in strategic terms, providing evidence about how electors view the different elements of the scheme.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 The Council anticipated that e-voting would facilitate voting by increasing the choice of voting methods available to the Swindon electorate. The Council wished to make voting more accessible to its electorate by providing a range of voting methods that dovetailed with different electors' lifestyles. The Council noted that there was some support among electors for e-voting – for example, in 2006, 37% of voters surveyed by the Council said that they wished to use e-voting at future elections.

3.20 The Council also considered it important to determine the extent to which electors made use of the sources of information provided about candidates and whether this had any effect on their decision to vote. In its application, the Council noted that many electors in Swindon had commented that they do not vote because they have insufficient information about candidates.

3.21 The Council's dedicated election microsite – www.myelection.co.uk/Swindon – provided information to electors about the new voting methods together with details of how, when and where they could vote and the candidates standing in the various wards. The microsite also provided an 'easy reference' section of frequently asked questions about the pilot scheme and the different voting channels. In addition, electors could, through the Council's microsite, sign up to an 'election alarm clock' facility, which sent reminders to electors via text messages or email about registration and other electoral deadlines.

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.

3.22 The Council hoped that up to 40% of people who voted would do so electronically and staffed the polling stations and count accordingly.

Facilitating the counting of votes

3.23 It was not expected that the pilot scheme would have any significant impact on the counting of votes. However, the Council hoped that it would be able to begin declaring the results approximately three hours earlier than was usual for local government elections (3am) as a result of having to count significantly fewer paper ballots. Shortly after the close of poll, electronically cast votes would be transferred into a spreadsheet and added to paper ballot votes for each ward and parish before announcing the results.

Turnout

3.24 Following a trend at previous local government elections, the Council anticipated that the pilot scheme would result in an increase in turnout to around 35%. It was hoped that this would be achieved by providing electors with a greater choice of voting channels, extending the voting period, providing more information about candidates and implementing a voter engagement plan targeted at groups considered most likely to benefit from e-voting.

Security and confidence

3.25 As previously noted in paragraph 3.14, it was expected that the pilot scheme would test the security and operation of remote and supervised e-voting. The Council stated that it would establish a comprehensive testing process with its partners to test the integrity and security of their systems based on experience gained from previous pilot schemes. These processes would be fully documented and open for inspection and verification by external stakeholders and others who were interested in the e-voting process.

3.26 The pilot scheme enabled voters, by offering them the opportunity to create and receive a receipt, to check that their vote had been received by the Returning Officer and accurately recorded. The receipt checking service would remain operational until 24 May, after which date the servers were cleansed of all data and signed off by the Council. It was hoped that this would have a positive impact on levels of voter confidence.

Efficiency

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. It was expected that the majority of these costs would be met by the Ministry of Justice (MoJ).

3.28 The Council anticipated some small savings in the traditional costs of running elections, particularly in relation to the counting of votes. However, this would depend on the number of e-votes that were cast, but these savings were not expected to exceed £5,000.

4 Evaluation

Efficiency

Project management

4.1 The Borough Council and parish council elections were the overall responsibility of the Returning Officer, who delegated day-to-day responsibility to the Deputy Returning Officer, who in turn acted as the Senior Responsible Officer. In addition, one member of the Council's Electoral Services team worked full time with the Deputy Returning Officer on the pilot scheme. The other three members of the Electoral Services team concentrated their efforts on running the traditional aspects of the election process alongside the pilot scheme.

4.2 However, the Council needed a partner to deliver the e-voting systems and expertise. To deliver technical pilot solutions in England and Wales, the MoJ had established a framework agreement following a rigorous procurement exercise of suitable suppliers to support pilots that utilised electronic services. The Council therefore selected the TCS Consortium (hereafter referred to as 'the Consortium') from the framework of MoJ-approved suppliers, which had been selected following a mini-competition exercise in line with European Union procurement guidelines.

4.3 A full-time Programme Manager was appointed by the Consortium whose role was to keep a high-level watch over the project. The Programme Manager assumed responsibility for directing all aspects of the pilot project, including those areas to be provided by the Council. The Programme Manager chaired the weekly project review meetings, which were attended by representatives from the Council, including the Deputy Returning Officer, and each of the Consortium members.

4.4 A Project Manager, also appointed by the Consortium, was tasked with running the project on behalf of the Programme Manager within the constraints given to her. The Deputy Returning Officer and his staff managed the planning, administration and logistics for the elections as a whole, including pre-registration, postal voting, polling station selection, staffing and the count.

4.5 A Technical Manager from the Consortium worked closely with the Project Manager in order to scope, provide specifications and build the solution for the project. The Technical Manager was also responsible for handling the client (Council) data and for co-ordinating the testing processes.

4.6 A support office, consisting of a pool of skilled resources and experts, was established to assist the project, provide advice and guidance and provide continuity of standards.

4.7 A joint project initiation document, project plan and risk register for the pilot were compiled. The project initiation document was comprehensive in its coverage of the key issues and provided a good outline of the pilot objectives and design, the roles and responsibilities of each of the suppliers and the work packages forming the project. Target dates for the key deliverables were identified, the project organisation and reporting procedures defined and the initial risk and issues log were included in the project initiation document.

4.8 A separate, more detailed, risk register provided a comprehensive statement of risks and issues and was updated periodically throughout the project. Timescale pressures were identified as the single greatest risk to the successful delivery of the project. Once the pilot scheme had been approved by the Secretary of State and the Council had selected the Consortium from the framework of MoJ-approved suppliers, 91 days remained until the designated 26 April 'go live' date. Anecdotal evidence from suppliers suggests that six to seven months would have been more realistic for a project of this level of ambition and complexity.

4.9 The Commission's overall assessment is that the project management provided by the supplier was satisfactory given the time constraints imposed on the parties involved. Time constraints meant that best practice could not always be followed, but a strong and pragmatic working relationship between suppliers and the Council enabled the risks to be managed and most key milestones to be met according to plan.

Training

4.10 The Council considered that a sufficient information technology (IT) skills base among advance voting station and polling station staff would be a key factor in the pilot's success or failure. Therefore, prior to the start of the election period, a questionnaire was sent to prospective Presiding Officers and Poll Clerks in order to determine their level of IT literacy. This resulted in several applications being rejected. Despite this screening exercise, the Council after the elections reported that some polling stations were staffed by Presiding Officers and Poll Clerks who were clearly not technically proficient, which caused a few setup challenges and problems in running polling stations on polling day. They considered that the recruitment process needed to be more rigorous to ensure the technical competency of advance voting station and polling station staff and suggested that a more effective model in future might involve the pairing of experienced Presiding Officers with at least one IT-literate Poll Clerk, who would be confident in setting up the laptops and operating the electronic register and voting systems.

4.11 Training for appointed Presiding Officers and Poll Clerks was developed jointly by the Council and suppliers within the Consortium. The principal training covered all 64 Presiding Officers and 166 Poll Clerks together with 10 'runners' whose job was to provide technical support as necessary to polling station staff on 3 May. The main training sessions took place during the week commencing 16 April and covered traditional Presiding Officer and Poll Clerk duties (delivered by Council staff) and explanations of the electronic system (delivered by 21c Consultancy). A manual consisting of PowerPoint slides and screenshots was produced and

distributed to participants. The training sessions enabled participants to practise setting up the laptops. In addition, voting tables and privacy screens were displayed and their setup was explained by the trainers. The elector search function and online registers were developed relatively late in the day, which meant that they could only be demonstrated by the trainers by means of PowerPoint slides and screenshots at the main training sessions, which was less than ideal. While advance voting station and polling station staff were given the opportunity to try out these essential features for the two days before going live, the lateness of the training did increase the risk of operational issues arising at the five supervised advance voting locations and at polling stations on 3 May.

4.12 Feedback received by the Council suggested that advance voting station and polling station staff who participated in the training two days prior to going live did find the systems to be easy to use and the training very helpful. However, it was suggested that the live system should have been provided at the general training session two weeks before polling and repeated two days before polling in order to give advance voting station and polling station staff an added sense of confidence through familiarity with the systems.

4.13 The Council had also invited all Presiding Officers to visit one of the advance voting locations in five libraries across the borough and a number who did take up this opportunity seemed to be better equipped to resolve issues and provide advice on polling day.

4.14 On polling day, the Consortium provided a locally operated helpdesk or 'War Room', whose principal aim was to provide support to the 64 polling stations and their staff. As mentioned earlier, 10 'runners' were located throughout the borough in order to minimise travelling times to polling stations requiring technical support.

4.15 Training was also provided for all staff at the call centre, which was based in Sheffield. A technical training manual had also been developed for this purpose.

4.16 The pilot scheme included a two-tier system of support for electors. The first tier consisted of the call centre, which fielded calls relating to both the Swindon and Sheffield pilot schemes. The majority of queries were resolved at this initial point-of-contact level. The second tier consisted of support from Council staff or the Consortium.

Supplier management

4.17 The supplier selected by the Council to help manage the pilot was the TCS Consortium. The Consortium consisted of the following members:

- Tata Consultancy Services was the prime contractor and provided the programme management services.
- Nera, a sub-contractor of Swindon Borough Council, provided the electronic polling station infrastructure.

- E1C provided the e-voting technical services, software, hosting and infrastructure. E1C has experience in providing internet and telephone elections in Australia and North and South America. In addition, in 2003, E1C worked with Stratford-on-Avon District Council on its e-voting pilot scheme.
- 21c Consultancy provided the voter engagement and consultancy services, project management and training. 21c had previously worked with seven English local authorities, including Swindon, on electoral pilot schemes.

4.18 The Consortium's organisational structure was designed to bring together a range of relevant skill sets, information and communication technologies and election experience that would help deliver the pilot scheme. However, during the early stages of the project it became apparent that many of the supplier staff needed coaching in the fundamentals of UK electoral law and practice and management from the Council's Electoral Services team.

4.19 Nevertheless, the Council was able to build up and maintain a constructive and strong working relationship with the Consortium during the three-month period leading up to polling day. The relationship appeared to be characterised by a high degree of trust and a collective desire to deliver the pilot successfully despite significant time constraints.

4.20 However, some tensions did begin to surface among some of the Consortium members during the later stages of the project, which meant that more time had to be spent on relationship management than was desirable at a critical phase in the project.

Use of technology

4.21 This section of the report summarises the technology used to deliver the e-voting pilot scheme and the testing and quality assurance processes prior to use. It also summarises the key issues that arose in relation to the implementation and use of the e-voting solutions. A more detailed discussion may be found in the separate reports provided by the Commission's technical contractors.

Pre-registration

4.22 Electors wishing to vote remotely, either via the internet or by telephone, were required to pre-register with the Council. Electors who wished to vote electronically at any of the five advance voting locations or at any of the 64 electronic polling stations on polling day were not required to pre-register.

4.23 The Council posted an application form to every registered elector in the borough. Electors who wished to pre-register for remote e-voting were required to select a six-digit PIN and their date of birth. A tear-off slip was provided for the elector to record their PIN and the elector was required to sign the application form.

4.24 Some issues emerged in relation to the transferring of electoral registration information from the Council's electoral registration software into the election management system, as the EML 330 schema⁸ was not supported by the software used even though it was a requirement for the pilot scheme. Electoral registration data therefore had to be downloaded into Excel and merged with the pre-registration information provided by the electors. This proved to be a very time-consuming process requiring substantial and unbudgeted additional technical support.

4.25 Once pre-registration had closed and the spreadsheets were updated, the list of pre-registrants, including details of PINs and dates of birth, was uploaded into the e-voting solution (eLect). The supplier created a unique 10-digit ballot code for each elector and used the registration details as the basis for the online register to be used for verification purposes during the voting process.

4.26 An additional 850,000 ballot codes, PINs, and date of birth combinations were created and added to the application server database. These excess credentials allowed the application server to obfuscate the live credentials it hosted, providing a very high level of fraud prevention. By putting additional ballot codes into the database, but not issuing them to any real electors, none of the additional ballot codes could be used. If any of them were to be used, they would be detected and excluded at the decryption stage. It would also show that someone was either attempting to guess ballot codes or that the ballot code database was compromised. Such an approach is a well-known security design called a 'Honey Pot', designed to attract and so help detect fraud. The chance of an ordinary voter accidentally keying in one of these dummy codes is extremely low, but a hacker with access to the database picking ballot codes at random would have a 90% chance of successfully picking a dummy code and triggering the alert.

4.27 Each elector was notified of their unique ballot code by post in a secure mailer that also served as the official poll card. However, 1,320 poll cards had to be re-issued when it was discovered that the ballot codes had been printed without leading zeros. The printing company's spreadsheet for holding the original 10-digit number (the ballot code), split into two number strings of six digits and four digits, discarded one or more leading zeros from the second number string. This resulted in printed ballot codes being only seven and nine digits in length. The Council rectified the situation through its printers and new cards were issued within 24 hours. In addition, a representative of the Council appeared on the local BBC radio station on the morning of 27 April to explain what had happened and how the Council was resolving the issue.

Electronic voting

4.28 The solution developed by the Consortium enabled electors to vote remotely over the internet or by telephone, electronically at five supervised advance voting locations in libraries or by using laptops on polling day from the 64 electronic polling stations in the borough.

⁸ EML 330 schema refers to a standard for the structured interchange of data among hardware, software and service providers who engage in any aspect of providing election or voter services to public or private organisations.

4.29 After entering the necessary credentials, the elector was connected to the network and able to vote. When the vote was completed, the voter’s selection was stored in the supplier’s resilient servers hosted in two data centres in the UK.

4.30 The connectivity to the five advance voting locations and 64 polling stations in Swindon used either a secure wireless internet access solution using Wimax or, in the case of 12 sites, a broadband connection. These links provided connectivity to the data centres where the servers were hosted.

4.31 Table 1 summarises the stages voters had to follow to use the remote internet voting, supervised e-voting and telephone voting interfaces.

Table 1: Summary of stages for remote internet, telephone and supervised e-voting in Swindon

Remote internet voting	Telephone voting	Supervised e-voting at advance voting station or polling station
1. Log on to internet address provided on official poll card or follow hyperlink on Council website.	1. Call freephone number provided on official poll card or the Council website using a touch tone telephone and follow instructions.	1. Report to the Presiding Officer desk and confirm name and address.
2. Enter ballot code provided on official poll card, together with date of birth and PIN previously selected.	2. Press star key and select preferred language – English, Bengali, Konkani or Portuguese.	2. Presiding Officer searches online register for voter and confirms name and address details. Presiding Officer marks voter as having voted.
3. Choose language using mouse – English, Bengali, Konkani or Portuguese.	3. Enter date of birth as a six-digit number.	3. Presiding Officer offers voter either electronic ballot or paper ballot and clicks the screen (note: e-voting was the only option at advance voting locations).
4. If entitled to vote in both Borough Council and parish council elections, a selection screen is displayed. Select election using mouse.	4. Enter PIN.	4. System assigns voter to a specific voting machine (laptop).

Table 1 (cont.): Summary of stages for remote internet, telephone and supervised e-voting in Swindon

Remote internet voting	Telephone voting	Supervised e-voting at advance voting station or polling station
<p>5. Select candidates from on-screen ballot paper using mouse. View candidate statements if required. The system allows over-voting and a null vote but in both cases warns the voter that this will be counted as a spoilt vote.</p>	<p>5. Enter ballot code.</p>	<p>5. Once at that voting machine, voter invited to choose one of the four language options – English, Bengali, Konkani or Portuguese – by using mouse.</p>
<p>6. Once satisfied that selection has been recorded correctly, cast vote. The selection cannot be changed after this point.</p>	<p>6. System checks to see if the voter has already voted and issues an instruction accordingly. This completes the authentication process.</p>	<p>6. If voter has not previously voted, a screen of voting instructions is displayed; otherwise a message to that effect is displayed.</p>
<p>7. Choose to view and print a receipt to confirm that vote has been successfully recorded by the system in the electronic ballot box. Receipt does not provide details of whom the vote was cast for.</p>	<p>7. Voter invited to vote in relevant Borough Council and/or parish council elections. A series of help messages provides information on the candidate's name and party if required.</p>	<p>7. If voter is entitled to vote in both Borough Council and parish council elections, a selection screen is displayed and the election selected using the mouse.</p>
	<p>8. Input two-digit candidate code printed on poll card and confirm choice. Options are provided for over-voting or submitting a blank ballot.</p>	<p>8. Select candidates from on-screen ballot paper using mouse. View candidate statements if required. System allows over-voting and a null vote but in both cases warns the voter that this would be counted as a spoilt vote.</p>
	<p>9. Repeat process for each election, confirm and cast vote. Hang up.</p>	<p>9. Once satisfied that selection has been recorded correctly, cast vote. The selection cannot be changed after this point.</p>

Table 1 (cont.): Summary of stages for remote internet, telephone and supervised e-voting in Swindon

Remote internet voting	Telephone voting	Supervised e-voting at advance voting station or polling station
		<p>10. Voter may request a receipt, by inputting a password and writing down, on a form provided by the voting machine, the ballot code and receipt code displayed on the screen. This could be used to access the receipting software through the Council website after the close of poll.</p> <p>11. Voter clicks on 'Finish' button or, if voting at a second election, has the option of repeating steps 7 to 10.</p>

4.32 Once cast, all votes were encrypted. Votes were encrypted throughout the process from the voter's personal computer (PC) or telephone, to the staging servers and on to the Returning Officer's PC at the count. A toolkit installed on a 'clean' PC was used for the creation of ballot codes, PINs and cryptographic keys. A public/private key pair was generated on the standalone 'clean' PC for the elections. The public key was used during the elections to encrypt votes; the private key was required to decrypt the votes at the count. Once the key pair had been generated, the private key was only accessible when a quorum of password holders was present. This ensured that no single person – including Consortium staff – had sole access to decrypted votes.

Testing

4.33 Testing on the e-voting solutions was carried out by the suppliers, by the Council, and by the MoJ and its contractors. However, the tight timescale for implementation of e-voting at these elections may have adversely affected the quality of the testing that took place. This was particularly apparent in communications infrastructure, which could only be tested in segments, with the full connectivity to the entire electronic polling station network being available only on the morning of polling day itself. Thus there was no end-to-end testing of the application and communications capability across the network of all 64 polling stations. This exposed the election process on polling day to an unwarranted level of risk.

4.34 The application software had been subjected to rigorous system tests before each release. Council staff undertook user acceptance tests on each modified release and on each occasion staff entered a significant number of votes covering a wide range of voter options and circumstances and compared the results from the system with their expected outcomes. The results were always confirmed as expected.

4.35 The Consortium engaged an external penetration testing company to verify that the application provided a secure platform for the conduct of the elections. It found some relatively minor issues that were fixed by the supplier.

4.36 An independent penetration test of the system was completed by the MoJ, which identified a number of weaknesses. Although the Consortium stated that it had updated the system to address a number of the weaknesses identified through this penetration testing, these were not considered acceptable by the MoJ, which therefore issued further instructions, based on the results of its penetration testing, to the Council and supplier on the evening prior to the start of the advance voting period. This left too little time for proper development and testing. Making the necessary improvements also led to a delay in the finalisation of the electronic registers, with the consequence that the advance voting service was delayed by half a day. Further details of the MoJ requirements are included in the Commission's technical evaluation report.

4.37 The boot disks created for the booting of laptops used at the polling stations and at supervised advance voting locations were late in being created and were not fully tested. As explained in paragraph 4.42, this did cause some problems during the advance voting period and on polling day. All laptops were tested to ensure that they booted up, had wireless connectivity and that they were 'clean' before they were placed into sealed laptop bags prior to handover to Presiding Officers.

Remote internet and telephone voting

4.38 Remote internet and telephone voting were due to go live at 7am on 26 April. However, the Consortium was directed by the MoJ on the evening prior to going live to address security requirements identified through its penetration testing, which had not been met, and this caused a delay to the extent that the remote voting system was not up and running until 1.41pm on 26 April and, even then, in one language only – English. This delay was in spite of assurances given by the Consortium that implementing the changes would not have a knock-on impact on launching at 7am on 26 April.

4.39 The three additional languages were available as of 30 April. The delay was caused by the late delivery of the translations and the translations being delivered in the wrong technical format.

4.40 Once up and running, the remote internet voting service worked well, with few technical problems. Most of the incidents on the remote internet channel arose from the incorrect entry of credentials by electors, which were resolved by helpline

staff, or home broadband issues. However, some electors experienced difficulties in using the telephone voting service. The main causes were identified as:

- Electors entering their credentials incorrectly, a problem affecting 1,734 remote internet voters. They were able to vote once these data issues had been resolved by the Council or the helpline.
- Electors entering their PIN and date of birth and being told that there were not enough digits on the PIN or date of birth. This was an intermittent fault that affected 1,300 electors, including people trying more than once, but the cause was unclear. Electors experiencing this problem were advised to vote on the internet or from supervised advance voting locations. In both of the above cases, some of the problems were caused by the data as entered by the elector on their pre-registration form being transcribed incorrectly in the pre-registration database. This was usually caused by incorrect interpretation of the elector's handwriting. All data entered from applications was read back from the original application form and checked against the database to minimise any input errors.
- Electors not being able to complete their vote, as the IVR was timing out after three minutes. This was caused by the telephone system configuration. As soon as this was fixed, incidents on the IVR system reduced significantly and the timing out cleared.

Advance e-voting at supervised locations

4.41 Like remote internet and telephone voting, advance e-voting at five supervised locations (local libraries) was due to go live at 7am on 26 April, but, as a result of addressing the MoJ's security requirements, combined with problems with boot disks and the searchable electoral register, the service was not available until 5pm on 26 April, by which time advance voting location staff had left the libraries. This was despite the Consortium giving the MoJ assurances that the security requirements would be implemented by the scheduled go live time.

4.42 A range of technical problems were reported by the Presiding Officers and the project team at various stages during the advance voting period in one or more of the libraries. The main issues included:

- The search for elector function on the Presiding Officer's laptop intermittently required more than one search to find an elector. In one or two cases it was not possible to find electors on the database, resulting in electors being advised to return later or on another day, or to visit another location. This problem was caused by the incorrect configuration of boot disks. Once these had been replaced on the first day of advance voting, the search function worked effectively for the rest of the advance voting period.
- The elector number search on the Presiding Officer's laptop did not work. This was caused by the elector number generated by the electoral registration software and printed on the official poll card not being in EML format, which the E1C solution required. Consequently, the Council issued a memorandum to all advance voting location staff explaining how to convert the elector number as printed on the poll card into EML format for entry into the search screen on the electronic register.

- Presiding Officers reporting frozen screens. In some cases it was necessary to replace the laptop(s) to resolve this problem.
- Lost wireless connectivity in one of the libraries was reported on one of the advance voting days. This was caused by a power outage the night before, causing problems with the Wimax router.

4.43 It should be noted, however, that most issues reported in the supervised advance voting locations were resolved and, in most cases, did not disrupt the voting experience for voters.

Electronic polling stations

4.44 Each of the 64 electronic polling stations on polling day was equipped with between three and 10 laptops. One or two of these, dependent on the size of the electorate in the particular polling district, were designated as Presiding Officers' laptops and were used to access and manage an online register of electors which was updated in real time. The remainder were used for the casting of votes electronically. As mentioned in paragraph 4.11, 10 'runners' from the Consortium were deployed on polling day to provide technical support to Presiding Officers.

4.45 The laptops were delivered 'clean' with no software loaded and were placed in a security sealed bag for issue to the Presiding Officers. Two boot disks were allocated to each electronic polling station – one for the Presiding Officer's laptop and one for the voting machines. Back-up boot disks were held by the support staff assigned to particular electronic polling stations.

4.46 Presiding Officers were responsible for the collection and transportation of the traditional ballot box, together with e-voting equipment and election stationery allocated to their electronic polling station. Upon arriving at the electronic polling station, each of the laptops had to be removed from its security sealed bag, placed in position, connected to the mains supply and booted using the supplied disks.

4.47 The setting up of electronic polling stations caused some problems on polling day. In particular, the partitions or privacy screens between voting booths proved very difficult to erect and, in many cases, this preoccupied Presiding Officers, which in turn led to a delay in the completion of the laptop booting process. Consequently, several electronic polling stations were not operational by 7am. A few electronic polling stations experienced boot disk failure or problems in connecting to the Wimax network, which also delayed the commencement of voting.

4.48 As already noted in paragraph 4.33, end-to-end testing of the electronic polling station network was not possible prior to polling day and, in the preceding days, tests were limited to segments of the network. Most tests were carried out using aerials external to the electronic polling stations owing to limited access. The absence of proper pre-election end-to-end testing undoubtedly contributed to the emergence of technical difficulties on polling day. All of these were logged and monitored in real time in order to ensure that they could be dealt with as swiftly as possible.

4.49 The incident management log, updated by the Project Manager, combined with observation on polling day, show that a significant number of electronic polling stations experienced technical problems at some time or another between 7am and 10pm. The most commonly reported problems were:

- problems connecting to the server
- laptops 'dead' on delivery
- problems loading boot disks
- frozen screens

4.50 Eight electronic polling stations reported connectivity problems that could not be repaired in less than one hour, the worst case being seven hours. These connectivity problems accounted for a total of 28 hours' downtime on polling day (3% out of a total of 960 voting hours) during which contingency plans for the use of a paper register and ballot papers had to be invoked.

4.51 A post-election analysis undertaken by the suppliers established that, in a few cases, the problems with boot disks were caused by mis-configuration or damage of the disks in transit. The solution in the case of 'dead' laptops was to deliver replacements as soon as possible. In other cases, resetting the wireless routers appeared to resolve connectivity problems. However, the suppliers' analysis concluded that the root cause of many of the incidents that occurred on polling day was unclear and that given that they did not have a chance to test the whole solution, including the wireless connectivity and the new application, on all polling stations with 374 laptops, it was not surprising that they experienced some difficulties in making the solution work at all polling stations.

4.52 The suppliers reported that end-to-end testing was not possible owing to the difficulties in gaining simultaneous internal access to the 64 electronic polling station sites prior to polling day. This meant that the viability of the wireless connectivity and application solutions could not be tested in advance of going live, increasing the risk of problems occurring.

Voting

Public awareness and feedback

4.53 The Council's project documentation envisaged a range of communications activities to inform local electors about the pilot scheme and to promote the e-voting options.

4.54 The principal communications channel to encourage take-up of e-voting was the letter and registration form dated 16 March 2007 sent to all electors in the borough.

4.55 Additional methods used to promote the pilot scheme, usually under the slogan 'easy voting', included:

- leaflets, postcards, beer mats and posters with 'easy voting' branding distributed and/or displayed at strategic points across Swindon
- promotion of the pilot on the Council's website via the www.myelection.co.uk/Swindon microsite
- pre-election press releases issued to the local media, generating coverage in the local press and media interviews with Council staff
- presentations to local stakeholder groups, including disability groups and citizen focus groups

4.56 The voter engagement plan placed a particular focus on outreach to hard-to-reach groups, including older people, disabled electors and individuals with learning disabilities. The campaign specifically targeted and reached out to the following community groups:

- Living Options
- Swindon Coalition of Disabled People
- Swindon Racial Equality Council
- MS Society of Swindon
- Ten Pin Bowling Association for the Blind
- Bengali mother and toddler group
- Millen Advice Point
- Wiltshire Blind Association
- training providers who specialise in training for disabled people

4.57 All of these groups were updated about the election pilot either via telephone or personal visits, and specifically asked to inform their membership about the project. In order to achieve maximum exposure, these groups were sent voter engagement material, including text for use in their newsletters, and asked to cascade information to their network of members and contacts. Throughout the voting period, the above groups were also regularly updated about the status of the elections (e.g. being notified about delays and when multi-language voting was available). Certain members of these groups were included in focus group work for the pre-registration letter and initial stages of the voting process.

4.58 Candidates and agents were informed of the e-voting processes prior to the elections through the briefing held for candidates and agents on 5 April. However, this was poorly attended.

4.59 Public opinion research undertaken by ICM Research in Swindon found that awareness of the pilot scheme was overwhelmingly driven by council communications strategies, with 77% of respondents citing leaflets from the Council highlighting the arrangements.

4.60 The same research found that nearly three-quarters (73%) were aware that the Council was piloting new electoral arrangements. This is a higher proportion, by far, than that observed in any other 2007 pilot scheme area. When prompted, almost everyone (93%) knew that one or other new arrangement was being employed in Swindon. Members of the public were most aware of remote internet voting

(85%), advance voting (67%) at supervised locations, telephone voting (66%) and then voting electronically at polling stations (55%).⁹ The public opinion research demonstrated that the level of awareness among voters was higher than non-voters.

Impact on voting

4.61 The total number of electors choosing to pre-register for remote e-voting was 13,234, compared with 11,265 electors requesting a postal vote. Of those who pre-registered for e-voting, 7,647 cast their vote remotely using either the internet or telephone, representing 57.8% of those who pre-registered. By contrast, 7,915 postal votes were returned, representing 70.3% of the total number issued.

4.62 More than 5,500 electors who pre-registered for remote e-voting therefore did not utilise the service. Early survey results and feedback based on calls received suggest that many people may have pre-registered without realising that this was for remote e-voting only or may have been deterred from using the channels as a result of having to input a total of 22 digits in order to access the e-voting system.

4.63 In total, 24.1% of voters (11,565 people) at the May 2007 elections cast their vote for a Borough Council or parish council election electronically. Of the 11,565 people voting electronically, 6,740 (58.28%) did so remotely via the internet (by far the most popular e-voting channel), 296 (2.56%) at an advance voting location, 3,106 (26.86%) at a polling station and 1,423 (12.3%) by telephone. Table 2 provides a more detailed breakdown of the e-voting channels used and the days on which individuals voted.

4.64 Polling day proved the most popular day for casting votes across the advance voting channels, with 45% of e-voters casting their vote. This was followed by 2 May, which saw 11% of e-voters voting and 26 April (the day that advance voting went live), which saw 10%. The weekend before polling day was the least popular time for casting e-votes, with 6% (Saturday 28 April) and 4% (Sunday 29 April) casting their e-votes.

4.65 The wards that recorded the most e-votes were Shaw & Nine Elms (925), Abbey Meads (835) and Freshbrook & Grange Park (747), all of which have fairly young and affluent electorates. The fewest number of e-votes were cast in Penhill (210) and Parks (279), Swindon's most deprived wards.

⁹ Figures based upon main survey across all pilot areas.

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

Day of e-voting period	Telephone votes	Remote internet votes	Supervised e-votes (advance voting location)	Supervised e-votes (polling station)	Total votes
26 April	45	1,155	0	N/A	1,200
27 April	88	750	68	N/A	906
28 April	107	476	64	N/A	647
29 April	104	361	16*	N/A	481
30 April	208	685	39**	N/A	932
1 May	163	702	75	N/A	940
2 May	208	1,010	34	N/A	1,252
3 May	500	1,601	N/A	3,106	5,207
Total	1,423	6,740	296	3,106	11,565

Notes: *Four of the five locations were closed on Sunday 29 April.

**Two of the five locations were closed on Monday 30 April.

Voter experiences and attitudes

4.66 Turning to voter experiences and attitudes, public opinion research conducted by ICM Research found that satisfaction with the actual process of voting stood at 80%. All Swindon telephone and internet voters said that they were satisfied, compared with 93% of e-voters at polling stations, 90% of paper ballot voters and 81% of postal voters.

4.67 Of those who chose to vote electronically at a polling station, 35% did so largely because they found it convenient, with 39% voting this way simply because the method was offered to them. One in six (17%) said it was because they liked to try new things and a similar number did so because it was quicker and seemingly more efficient.

4.68 Every electronic polling station voter that ICM Research spoke to found the information given on how to use e-voting easy to understand (61% claimed it was 'very easy', 39% 'fairly easy') with identical numbers also saying they found the e-voting process generally easy to use. All found the laptop computers easy to use. However, 13% of polling station e-voters reported that they experienced technical problems in using the laptops.

4.69 One striking finding of ICM Research's survey was that the opportunity to 'vote anywhere' via an electronic polling station was hardly utilised at all. ICM Research was not able to locate a single voter who said they had done so. Of those polling station voters who returned the Council's post-election questionnaire, 39 confirmed that they had 'voted anywhere', representing just 0.74% of survey respondents.

4.70 The introduction of telephone voting was better received in Swindon than in any other pilot area, with six in 10 (59%) saying it should be rolled out across all elections. Two main reasons explained the use of telephone voting: half of telephone voters (45%) said they could not easily get to their polling station, while one in three (36%) thought it was easier than using a ballot paper.

4.71 The ICM Research survey showed that all telephone voters (100%) found it easy to vote by this channel, although one in five (18%) said they encountered some form of technical problem. Four in five (82%) would have voted anyway even if telephone voting was unavailable. Seven in 10 (69%) thought that more people would vote by telephone if the pre-registration process was not required.

4.72 Of those who voted remotely via the internet, half (50%) said that it was easier than using a ballot paper while one in four (27%) stated that they liked to use modern technology. Nearly all of them (98%) found it easy to vote remotely via the internet, with only one in 10 (11%) experiencing a technical problem. The internet appears to be slightly more likely to convert non-voters than the telephone, with 25% of internet voters saying they would have been otherwise unlikely to vote had the facility been unavailable.

4.73 Nearly two-thirds (65%) of survey respondents believed that internet voting should be available at all elections. This figure rose to 93% among remote internet voters. Six in 10 (58%) respondents were confident that internet voting was secure, with nearly all internet voters (93%) saying so.

4.74 Non-voters in Swindon largely lay the blame for their failure to participate on a lack of time (21% said they were too busy). One in 10 (10%) forgot, while 8% cited a lack of information about the candidates or the elections as their reason for not participating.

Accessibility

4.75 Among the objectives of the pilot scheme were to provide facilities to make it easier for electors to vote and to examine the impact of different voting methods on accessibility issues with a view to identifying key learning points for any future pilots.

4.76 The Council and suppliers considered that the range of voting channels offered through the pilot scheme would enable all electors, including disabled people, time-pressured people, older people and people with high support needs, to cast their votes independently in their own time and on their own terms. In addition, providing e-voting options in the three languages most widely used in the borough after English (Bengali, Konkani and Portuguese) would help to ensure equal access to the elections in Swindon. The Council and suppliers developed a comprehensive voter engagement plan, which included plans to:

- focus outreach activity on key target audiences most likely to benefit from e-voting and/or special outreach
- work with credible third parties – such as accessibility advocates – to demonstrate the benefits of different voting options

- emphasise accessibility, elector choice and security
- encourage pre-registration and translate pre-registration into voter take-up of new pilot options

4.77 The voter engagement plan stated that in order to maximise resources and ensure that the full value of e-voting was realised, particular attention would be paid to groups most likely to benefit from and/or need e-voting. These were:

- young people
- older people
- disabled people
- time-pressured people
- people from black and minority ethnic communities

4.78 A number of venues were identified in the voter engagement plan – including care and retirement homes, public libraries, job centres, voluntary organisations, supermarkets, shopping centres and railway and bus stations – which would be targeted in an effort to enhance accessibility and awareness among specific groups of electors.

4.79 Street teams armed with leaflets, posters and balloons delivered information to public buildings (libraries, council offices, museums, railway and bus stations, leisure centres), as well as local businesses and shops. The street teams also handed out material on the street to passers-by to encourage awareness of the new voting channels.

4.80 Examples of the areas covered by the street teams included:

- Queens Park, Town Gardens, Lydiard Park
- Central, North Swindon, West Swindon and Wroughton libraries
- Budgens, Highworth
- Ellendune Community Centre, Wroughton
- Barret Way Health Centre, Wroughton
- Oasis Leisure Centre
- Fitness First, West Swindon
- Dorcan Recreation Complex
- Coleview Community Centre
- Wyvern Theatre
- Cineworld Multiplex
- Greenbridge Retail and Leisure Park
- West Swindon Shopping Centre

4.81 Billboard-style posters were displayed at the railway station and on the side of several Swindon buses. Similarly styled adverts were placed in free local papers and various community newsletters and a radio campaign supplemented the voter engagement plan.

Accessibility of pre-registration process

4.82 With respect to pre-registration, and as noted elsewhere in this report, more than 5,500 electors who pre-registered did not in the end use the internet or telephone voting service. Feedback suggested that some electors may not have found the requirement to input 22 digits particularly accessible or straightforward; others did not realise that by completing the form they were registering for remote e-voting. This suggests that more should be done in future to ensure that the process is as clear and straightforward as possible to electors. Indeed, this is a conclusion shared by the Commission's accessibility contractors, which stated that 'Many visually impaired people can use the Internet but pre-registration material came in print form with no indication of the availability of alternative formats.'¹⁰

4.83 However, the Council had proposed an online pre-registration process, but this was not considered acceptable by the MoJ. The pre-registration literature did include an email address and a minicom telephone number.

Accessibility of e-voting application used for internet, supervised advance voting locations and electronic polling stations

4.84 Two different user interfaces were used, which provided the means by which electors interacted with the e-voting application. A Java application known as the STE (Shared Trust Election) site was used by people voting remotely using PCs with Java installed. This was similar in design to the application that was used in the 64 polling stations. An SSL (Single Socket Layer, or typical banking security) application (known as the fallover) was used by people voting remotely using PCs without Java.

4.85 These applications were significantly different in both functionality and layout. The Council consulted accessibility experts, The Pollen Shop, at the start of the development period in January, who produced a number of documents outlining suggested amendments to the STE site, many of which were deemed critical. The Pollen Shop also provided advice to the Council on the SSL site reaching Web Content Accessibility Guidelines 1.0 (WCAG 1.0) Double-A conformance,¹¹ which was a key requirement set out in the MoJ contract with suppliers. This advice was not adopted in full and the site did not reach conformance to this level.

4.86 Throughout March and April, The Pollen Shop was in contact with the Council and suppliers providing advice on accessibility issues, including reviewing documentation and the IVR script.

4.87 The development of the user interface for the e-voting application also took account of the views of local groups, including people from black and minority ethnic communities and a disability organisation focus group, as well as requirements that had been developed in a number of pilots during the previous few years.

¹⁰ *Accessibility report on Swindon pilot scheme* (PA Consulting, Equal Ability CIC, Churchill, Minty & Friend, for the Electoral Commission, August 2007).

¹¹ 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.

4.88 This resulted in user interface screens that were deemed acceptable to the Council, the suppliers and the focus groups. However, further changes were suggested by the MoJ's accessibility contractors as well as The Pollen Shop just prior to going live, which resulted in the application having to be substantially amended at a very late stage.

4.89 The general view held by stakeholders was that screen layouts were not particularly intuitive and, in the case of the STE application, there was criticism of the fact that screens had to be scrolled up or down to find the button for the next step. The Pollen Shop had raised this as a concern because it considered that, in the version it commented on, the elector could very easily miss additional unseen candidates at the bottom of the ballot paper. As a consequence, some electors found the STE application especially difficult to use, particularly when using the laptops at polling stations.

4.90 The user interface screens did not include high-contrast, clearly labelled buttons. Because the on-screen buttons were not always clearly labelled and were not colour coded as in previous pilots, they could easily be used in error. Even the Council staff involved in the user acceptance testing found themselves clicking the wrong button as this seemed to be the intuitive way to proceed.

4.91 The voter interface also seemed to contain several more steps than the equivalent manual voting process and took an average of three minutes compared with 30 seconds for manual voting. Some of the additional steps connected with the mandatory display of instructions and the receipting process seemed to be superfluous.

4.92 The Council's view is that the accessibility requirements seem to have outweighed the e-voting application's usability and caused some confusion for voters. However, The Pollen Shop argued that usability is core to delivering accessibility and does not accept that there is a conflict between making a single site usable and making it accessible.

4.93 To avoid these issues recurring in the future, all stakeholders should be asked to sign off the accessibility designs before development commences.

Accessibility of telephone voting application

4.94 The Commission's accessibility contractors were unable to test the telephone voting system as the project team was not given access to the system in time. Nevertheless, notwithstanding some technical problems, referred to in the section below, which created access issues for some, the feedback that both ICM Research and the Council obtained from voters suggested that most found the telephone voting system easy to use.

Impact of technical issues on accessibility

4.95 As discussed elsewhere in this report, a number of technical issues arose at various stages during the e-voting period. These issues – including elector number errors on 1,320 poll cards (see paragraph 4.27), the delayed going live time for advance voting (see paragraph 4.38), connectivity issues at advance voting locations (see paragraph 4.42) and at polling stations on polling day (see paragraphs 4.47 and 4.50) and timing out problems on the telephone voting system (see paragraph 4.40) – will have reduced access to the e-voting channels for limited periods and to varying degrees during the election period.

Campaigning

4.96 Anecdotal 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. However, the provision of two remote voting channels and supervised advance voting meant that some activists began campaigning earlier in April in order to reach these electors before they cast their ballot.

Impact on counting

4.97 Following the close of poll, the encrypted votes were downloaded from the application server to a 'clean' PC at the council offices. The contents were checked for duplicate votes using de-duplication software by one of the supplier staff, but none was found. The encrypted votes were then copied to a DVD-R and transported under escort to the count centre.

4.98 A 'clean' PC, also delivered to the count under escort, was booted and the decryption software invoked. This required the input of unique passwords by three out of a total of six Council staff before the software could be used. The DVD-R was inserted and the electronic votes decrypted. The decryption and counting process took 11 minutes. Votes were transferred into an Excel spreadsheet to which were added the paper ballot votes (once the results of the manual count had been announced) for each ward and parish.

4.99 The counting of votes, and consequently the declaration of results, took longer than expected. It was hoped that the first results would have been declared by 12 midnight, but these were not announced until 2am. The Council had reduced the number of manual count staff by approximately 50 people, employing 12 teams compared with the usual 20, as it had anticipated a significantly greater percentage of the electorate voting electronically than actually did. However, the Council explained that the results of a traditional election counting 20 wards and two parishes would usually have begun to be declared at around 3am. In this context, the Council stressed that e-voting did not cause delays to the count and declaration of results.

Turnout

4.100 The overall aggregate turnout for the May 2007 elections to the Borough Council was 35.1%. This compared to 34.2% in 2006. Turnout in individual wards ranged from 26.8% in Abbey Meads to 43.8% in Old Town & Lawn.

4.101 Turnout at the two parish council elections was 40.6% in Highworth and 32.3% in Stratton St Margaret.

4.102 As noted in paragraph 4.63 of this report, 24.1% of voters (11,565 people) cast their vote electronically. This amounted to just over 8% of the electorate in Swindon. Of those who voted electronically, 58.28% used the remote internet voting channel, 2.56% voted at an advance voting location, 26.86% voted at a polling station and 12.3% used the telephone to cast their vote.

4.103 Turnout among pre-registered e-voters was 57.8% (7,647 people out of 13,234). This was lower than anticipated – the Council expected that the turnout would have been in a similar range to postal voters (around 70%). This was partly attributed by the Council to the perceived difficulties electors experienced in understanding the pre-registration form sent to them. For example, the Council's post-election survey of voters found that 4% of pre-registered electors who did not vote remotely had not understood that they had registered to vote in this way.

4.104 Public opinion research conducted in the Swindon area by ICM Research found that nearly all (96%) e-voters at polling stations would have voted even if they could not have done so via this electronic method – as such there is no evidence to link e-voting at polling stations with a rise in turnout. The same research found that four in five telephone voters (82%) would have voted anyway even if telephone voting was unavailable. Remote internet voting appears to be slightly more likely to convert non-voters than the telephone, however, with 25% of remote internet voters saying they would have been otherwise unlikely to vote had the online facility been unavailable. The Council's own post-election survey of voters found that 31% of all e-voters said that the ability to vote electronically had influenced their decision to actually vote at the elections.

Security and confidence

Security

4.105 The Consortium performed a security risk assessment and a risk management and accreditation document set was provided. The latter included details of security responsibilities, the threats to and vulnerabilities of the system, countermeasures, residual risks, the security procedures, the results of security testing and plans for further testing. The system was also reviewed by the MoJ quality assurance auditors (Security and Standards) who concluded that the major risks to security had been identified and controls put in place. The Consortium engaged an external penetration testing company to verify that the application provided a secure platform for the conduct of the elections. It found some relatively minor issues that were fixed by the supplier.

4.106 These stages were followed by further external validation of the application by MWR InfoSecurity (a subcontractor of Security and Standards) commissioned by the MoJ. This consisted of black box penetration testing, which highlighted a number of security concerns that had to be overcome prior to going live. The Consortium made changes which were then tested by MWR InfoSecurity on behalf of the MoJ. The results of this showed that the issues identified by MWR InfoSecurity in the first penetration test were not fully rectified by the Consortium's changes and more improvements were requested. On the evening before the e-voting system was due to go live, the MoJ was given an assurance by the Consortium that these requested changes would have no knock-on impacts on launching at 7am on 26 April. However, as reported in paragraph 4.38 of this report, making the necessary changes resulted in a delay of half a day to the launch of the advance voting service.

4.107 The Commission considers that there may have been some exposure to unnecessary physical security risks at the count. The DVD-R containing encrypted votes was placed in a normal CD-type clear plastic case which was carried in a shoulder bag. The terminals used for the decryption and vote-tallying processes were left unattended several times during the evening. However, the Council explained that all terminals had time-outs and password protected log-ons known only to senior members of the Electoral Services team present at the count. In addition, the decryption terminal was only activated when the DVD-R containing the results was delivered to the count venue.

4.108 The cabling linking these terminals was exposed. It was taped to the floor under tables in the centre of the counting area and could have been open to attack. Although the terminals were in full view of everyone at the count, there were many staff and reporters in close proximity and it would have been prudent to have had an 'exclusion' area surrounding the central tables.

4.109 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 within which a prosecution can be launched is one year, and so such evidence may still come to light.

User confidence

4.110 With respect to remote internet voting, ICM Research's public opinion survey found that 93% of those who voted in this way believed it to be secure compared with 58% of all voters. In relation to telephone voting, a sizeable chunk of the electorate retained concerns about the security of the process, with 38% not confident, although just over half (52%) were confident. According to the Council's own survey of voters, only 26.7% of remote e-voters created a receipt for their electronic ballot, perhaps reflecting the relatively high level of confidence among users in Swindon in the security of e-voting, particularly remote internet voting. Of these, only 33.5% actually compared their ballot code with the receipt code shown on the voting website.

4.111 Among those who voted electronically at a polling station, only half (50%) were confident about the security of the system, with 42% saying they were unconfident. Despite this, according the Council's own survey of voters, only 6.2% of e-voters at polling stations created a receipt and only 20.4% of those subsequently compared their receipt code after the close of poll.

4.112 On the basis of observation and anecdotal evidence collected on polling day, the Commission believes that the layout of some electronic polling stations may have undermined user confidence among some voters in the secrecy and security of the voting process. Some voters commented that the voting terminals were outward facing, meaning that they were directly overlooked either by other voters or by polling station staff.

4.113 The Council's own survey of voters found that 95.2% of all e-voters were confident that their vote was secure and would not be altered or misused.

Stakeholder confidence

4.114 The Commission's evaluator sought feedback from a number of candidates and agents at the count. In addition to this, ICM Research conducted some in-depth interviews with candidates and agents. Comments from candidates were also quoted in the local media. The general view on the basis of comments received was that the pilot scheme had been very ambitious and concerns were raised about the technical problems experienced in some areas, such as long queues, value for money, confidentiality at polling stations and the length of time it took to declare the results:

I think a lot of people did enjoy the benefit of being able to vote at home, but a lot of things went wrong with voting at the polling stations including laptop computers going down.

Liberal Democrat candidate, *Swindon Advertiser*, 4 May 2007

I am not happy about the situation. We were told it would be finished by midnight. We were promised the process would be quicker this year and we were promised it was secure.

Labour candidate, *Swindon Advertiser*, 4 May 2007

Voters were... sitting next to each other working through the technology. The system was too convoluted and it could mean that voters were potentially influencing each other at the time of the vote.

Labour candidate, ICM Research

Electronic voting has got to be something that we pursue, but once the paper vote is done we just want to know what the result is.

Conservative candidate, *Swindon Advertiser*, 4 May 2007

Only one person in a ward of 7,000 took the option to vote at an alternative location to their locally designated polling station. If you can vote by post, why bother with this?

Conservative candidate, ICM Research

Cost and value for money

4.115 The Council sought additional funding from the MoJ to run its pilot scheme. The costs associated with the pilot scheme are listed in Table 3, although it should be noted that these are provisional.

Table 3: Provisional costs of the Council's 2007 pilot scheme

Category	Description	Cost (£)
Supplier		
Tata Consortium	<ul style="list-style-type: none"> • Electronic voting technical services, including multi-channel voting engine, cryptography, telecoms, system administration, testing, hosting and infrastructure • Project management • Training materials • Call centre • Promotion 	849,925.00
Wimax	<ul style="list-style-type: none"> • Wireless connectivity to 64 polling stations and 5 advance voting locations 	213,392.88
Laptops	<ul style="list-style-type: none"> • 374 laptops 	63,318.64
Sub-total		1,126,636.52
Council		
Pre-registration	<ul style="list-style-type: none"> • Stationery • Printing • Postage • Processing costs 	62,386.75
Savings	<ul style="list-style-type: none"> • 50 fewer count staff 	(3,600.00)
Provisional total 2007 pilot costs		1,185,423.27

4.116 The Council realised modest savings of £3,600 as a result of employing 50 fewer count staff than at a traditional paper-based election.

4.117 The provisional total cost of the 2007 e-voting pilot was £1,185,423.27. This compares to £589,648 for Swindon's e-voting pilot in 2003 (which provided four e-voting channels: internet, telephone, interactive digital television and kiosk voting) and £42,000 for its e-voting pilot in 2002, which delivered remote internet and telephone voting. The Council attributed the significant increase on previous years to heightened programme and project management costs.

4.118 The average cost of the 2007 pilot scheme per elector was £8.33, compared with £2.30 for a conventional election, while the cost per e-vote cast was £102.50.

4.119 The provisional cost of the pilot was undeniably high, which reflected the considerable cost of the technical, programme and project management elements. However, it is clear that almost one-quarter of Swindon's voters used an e-voting channel in order to cast their vote. Public opinion research suggests that remote internet voters may have found the service particularly convenient, with one-quarter of those saying that they would have been otherwise unlikely to vote had the facility not been available. Having said that, given the negligible impact on turnout, the very limited take-up of the 'vote anywhere' facilities at polling stations and the technical problems associated with the e-voting channels during the voting period, it is questionable whether the pilot scheme represented good value for money.

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 Swindon are as follows.

5.2 **On the whole, the pilot scheme facilitated and encouraged voting.** The scheme gave electors in Swindon more choice over voting methods. However, delays to the commencement of the advance voting period and a range of technical problems experienced in the period leading up to and on polling day itself did cause inconvenience and frustration for some electors. The 'vote anywhere' facility was hardly utilised at all and therefore could not be said to have facilitated or encouraged voting. Almost one-quarter of voters (24.1%) voted electronically either remotely using the internet or telephone, or in a supervised location on or in advance of polling day. This amounted to just over 8% of the electorate in Swindon.

5.3 **The pilot scheme did not facilitate the counting of votes.** The counting of votes took two hours longer than expected. This was because the Council anticipated a significantly greater percentage of the electorate voting electronically than actually did, resulting in the employment of fewer count staff. Despite this, the results of the elections were declared approximately one hour earlier than would have normally been the case for a similar sized, entirely paper-based count.

5.4 **The pilot scheme had a negligible effect on the turnout of voters.** Overall turnout at the May 2007 elections in Swindon was 35.1%, as compared with 34.2% in 2006. Public opinion research suggests that 25% of remote internet voters would have been otherwise unlikely to vote had the online facility been unavailable. However, given the very small increase in turnout on 2006 (0.9%), and the multiple determinants of turnout, it is not possible to conclude that the pilot scheme had a significant impact on turnout.

5.5 **On the whole voters found procedures easy to follow.** Public opinion research suggests that the majority of internet and telephone voters (98% and 100%) found voting processes easy to use, although one in 10 and one in five of these voters respectively experienced some form of technical problem. All of those who voted using a laptop at a polling station found the process generally straightforward, although 13% reported technical problems in using the laptops.

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

5.7 **The pilot scheme led to an overall increase in expenditure by the Council.** Overall the provisional cost of the pilot scheme, taking into account both local authority and supplier costs, was £1,185,423.27. The Council realised modest

savings of £3,600 as a result of employing 50 fewer count staff than at a traditional paper-based election. The average cost of the 2007 pilot scheme per elector was £8.33, compared with £2.30 for a conventional election, while the cost per e-vote cast was £102.50.

Learning

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

Pre-registration

- Greater consideration should be given to resolving the difficulty of transferring electoral registration information into the EML 330 schema (see paragraph 4.24 of this report), which in this pilot scheme proved to be a very time-consuming process requiring substantial and unbudgeted additional technical support.
- Greater efforts should be made to ensure the compatibility of Council and printing company spreadsheet software in order to minimise the risk of misprinting pre-registration ballot codes.

Accessibility of e-voting application

- Future electronic pilot schemes should focus more time and attention on developing an e-voting application that is as accessible, straightforward, efficient and user-friendly as possible.

Remote internet and telephone voting

- Electors entering their credentials incorrectly is one of the most common problems associated with remote internet and telephone voting. This suggests that more attention should be focused, through public awareness initiatives, on explaining to electors the importance of inputting credentials correctly and on providing good support mechanisms, such as helplines, to assist electors experiencing difficulties.

Advance voting in supervised locations

- Advance voting in the five supervised locations was by far the least popular of the e-voting channels offered to electors. Further consideration should be given to exploring what could be done to promote these services more widely were they to be used in future.

Electronic polling stations

- The electronic 'vote anywhere' facility was hardly used at all in Swindon at these elections. Given the substantial cost of providing this service for electors at polling stations, and the technical risks associated with establishing the necessary infrastructure, it is questionable whether such a service should be pursued for future electoral pilot schemes.

Issues

5.9 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.

5.10 With additional time, it would also have been possible for the Council to give greater consideration to issues such as acceptance testing, end-to-end testing of processes and accessibility.

5.11 Many of the technical problems that emerged during the e-voting pilot scheme in Swindon could have been avoided had sufficient time been built into the implementation timescale.

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