CONTENTS

Introduction

BECTA'S PURPOSE AND STATUS

Becta exists to further the use of information and communications technology (ICT) to raise educational standards and to improve the effectiveness of educational professionals and institutions. It is a controlled, executive, non departmental public body, serving the needs of the UK as a whole. It is a company limited by guarantee with charitable status. Becta is the government's lead agency for ICT in education and is charged with developing the National Grid for Learning (NGfL).

Becta's work considers three interrelated components:

Infrastructure   The hardware, networks and services that make up the backbone of the NGfL and wider use of ICT

Content   The software, databases, information and other services available through the NGfL and elsewhere

Practice   How people and organisations use the infrastructure and the content.

Becta's previous Corporate Plans for 1999-2002 and 2000-2003 laid out the framework for Becta's work. The present plan moves this work forward to 2001-2004, taking into account changes in the educational and technological environments and the changing needs of the education system. These changes are reviewed as an addendum to this document.

This first section provides the framework for Becta's work, describing the organisation's four aims and its roles and values. The second section describes the work Becta intends to do under each aim. Each aim opens with an analysis of needs raised in the environmental review, followed by a summary of Becta's commitments for 2001-02 to meet these identified needs. A summary of key performance indicators forms the plan's final section.

AIMS

To meet its purpose and remit, Becta has four aims:

Aim 1   **Practice** To identify, develop and promote effective practice in the curriculum and management use of ICT

Aim 2   **Content** To foster the development and organisation of suitable educational ICT content in order to improve its scope, accessibility and quality for educational users

Aim 3   **Infrastructure** To develop and implement a high-quality framework of ICT infrastructure and provide advice which helps improve provision and accessibility

Aim 4   **Organisation** To be an effective and communicative organisation, evaluating its own performance, anticipating developments and being responsive to the changing needs of the education system.

BECTA'S ROLES

In carrying out its remit, Becta has five roles that define its key performance areas:

Evidence   Part of Becta's role is to gather and develop evidence on ICT and education through evaluations, surveys and other research activity. As well as collating existing evidence Becta will where necessary commission new research. Becta aims to ensure that this evidence is accurate, complete and appropriate for the user.

Advice   Becta will provide advice on ICT in education based on sound evidence and expert judgement to policy-makers, intermediaries and practitioners. Becta aims to provide advice which takes into account the context of the user and furthers the development of ICT in education but which in all other ways is impartial.

Support   Becta provides support to government departments, Local Education Authorities (LEAs), agencies and initiatives and, where appropriate, schools and colleges in developing their use of ICT. Becta aims to provide support that is systemic and strategic and maximises the development of ICT in education.

Innovation   Becta explores and implements new approaches and developments. Becta aims to be innovative and to take risks in order to provide education with exemplars and ideas for future directions.

Standards   Becta develops and sets standards in technology and education and evaluates products and services against them.   Becta aims to do this only where it improves quality, protecting the user and creating an improving baseline of provision for teachers and learners.

BECTA'S ROLE IN NORTHERN IRELAND, SCOTLAND & WALES

Within the five roles above, Becta works with the devolved administrations in Northern Ireland, Scotland and Wales as follows:

UK-wide communication	By providing two-way communication with the devolved administrations on initiatives and drawing together research evidence, aiming to ensure that experience is shared throughout the UK and to promote opportunities for collaboration
UK-wide projects	By undertaking the management of UK-wide projects on practice, content and infrastructure and, where this is appropriate, the provision of UK-wide advice to schools. In doing so, Becta will take full account of the differing needs of the education systems in Northern Ireland, Scotland and Wales.
Specific commissioned work	Becta will, from time to time, undertake work commissioned and paid for on a project basis where the organisation's unique position and expertise make it best-placed to take this on. This work will usually be commissioned by the appropriate Education department: the Department for Education in Northern Ireland (DENI), the Scottish Executive or the Welsh National Assembly Training and Education Department (NATED).

BECTA'S CUSTOMERS

The plan identifies three main customers for Becta's work:

Government	Government departments and agencies in the four UK countries
Intermediaries	LEAs, commercial providers, national and local bodies and initiatives, professional associations, press and the media.
Practitioners	Teachers, tutors, managers of schools and colleges and others who have direct involvement with learners.[1]

---

[1] Following the Learning and Skills Act, 'Further Education' is no longer a separate sector. Nevertheless, the college sector and the broader lifelong learning agenda offer a focus for Becta's work.

BECTA'S WAYS OF WORKING AND VALUES

To carry out its role and meet its aims, Becta will work in specific ways:

Government	Becta will work with government departments, agencies, and other bodies giving them advice based on accurate evidence and professional judgement. Becta recognises that ICT supports many aspects of education. It is important that our work assists other national agencies and initiatives which aim to improve standards.
Across the UK	Becta's remit is to serve the needs of the UK as a whole and it will ensure that England, Wales, Northern Ireland and Scotland benefit individually from its work and benefit from the collective sharing of information and expertise. Becta's work covers all sectors, particularly schools, FE colleges and libraries; as community grids for learning develop, it will embrace the wider community.
Partnership	Becta's expertise is best deployed by working in partnership with those who are specialists in their areas. Becta has regular meetings and joint discussions with other agencies, commercial organisations and professional associations and, where appropriate, involves them in the development and implementation of projects. Advice about the use of ICT is best disseminated through existing networks or initiatives. Becta will establish close working relationships with LEAs, professional associations and others to achieve its remit. Becta recognises that much of the momentum for ICT development will be driven by the commercial sector. It will work with commercial organisations to improve the quality and range of products.
Inclusion	Becta will ensure that its work aims towards a more inclusive approach to ICT in education, wherever possible decreasing the gap between those who do not have access to ICT and those who do. In particular, it will pay specific attention to the benefits of the effective use of ICT for learners with special educational needs, the disadvantaged and the disaffected. Becta will ensure that this commitment is embedded in all of its work.
International	Technology demands a global viewpoint. The UK is one of the leading countries in educational ICT, but it can still learn from what others are doing. Great educational benefit can come from learners and teachers communicating and collaborating with their peers overseas. Becta will continue to facilitate this process, for example by supporting the work of European Schoolnet.
Monitoring	Becta will ensure that its advice to government is based on accurate evidence by carrying out appropriate monitoring activities and by maintaining an up-to-date picture of the use of ICT in the UK and elsewhere. It will also look to future developments, both in technology and in educational practice, to inform this advice.

Evaluations	Becta will evaluate new and emerging technologies as they apply to education, and assess their usefulness to schools and colleges. It will also evaluate new ways of using the more established technologies and assess their effectiveness in raising standards. Having carried out evaluations, Becta will report to government and others.
Evidence	It is important that Becta's work is informed by reliable evidence based on educational research, inspection and professional judgement. Becta will liaise with the educational community to ensure that this is so and that the key research messages are communicated to policy-makers and practitioners.
Communication	Becta will communicate openly and clearly with all stakeholders and target audiences.

AIM 1 - PRACTICE

To identify, develop and promote effective practice in the curriculum and management use of ICT

RATIONALE

Significant efforts by government, local authorities, schools and colleges over the last few years have effected great improvements in the ICT infrastructure available to teachers and learners. Thanks to the efforts of public and commercial providers suitable content is beginning to become available in quantity. While more investment is still needed to improve infrastructure and content, ICT will only have a major impact on standards if it is used effectively. The evidence shows that while standards of attainment and quality of teaching of ICT in all sectors are improving there are substantial numbers of schools and colleges with significant weaknesses.[2] Developing effective practice in the use of ICT is the key ICT priority for the education system.

Government expects to see the use of ICT becoming routine in schools and colleges over the next five years, not only in the curriculum but also for administration and for communications between all parts of the education sector.

To turn this vision into a reality requires much hard work. Considerable progress has been made through different initiatives. These include: the NGfL Standards Fund; the National Opportunities Fund/Teacher Training Agency (NOF/TTA) training programme for school teachers and librarians; the National Learning Network (NLN) champions programme for senior managers and curriculum leaders in FE (further education) colleges; the University for Industry (UfI) and UK Online for centre tutors. All these initiatives are helping teachers and tutors positively adopt ICT as a support in their teaching. National strategies must be developed to sustain and increase this momentum. Becta can play a major role in this transformation by:

-        bringing together research evidence on ICT which, first, demonstrates that ICT enhances performance and second, identifies effective practice

-        advising government and practitioners on effective practice in the use of ICT

-        supporting government strategies in the way they use ICT and making this support available to all practitioners

-        discovering and celebrating innovative ways of using ICT

-        monitoring standards of ICT use and improving its quality.

Evidence

The practice and pedagogy of ICT is in its infancy.   Only a small proportion of schools and colleges are confident in their application of ICT and understanding is incomplete. Research evidence is patchy on the ways that ICT affects learning and the practices that increase its effectiveness.

In particular there is a need for up-to-date research that takes into account communication technologies now being used routinely in schools and colleges, and that recognises the impact of ICT between the school and college and the home. Becta will therefore continue to **manage research projects** on behalf of government to develop better evidence on ICT use. Becta will work with others to manage and evaluate a series of **planned interventions**, as specific pedagogical investigations on the educational impact of new and emerging technologies.   The pilot national project of ICT at key stage 3, which forms part of the government's wider strategy for key stage 3, will provide an opportunity to trial and evaluate teaching and training materials and approaches to teaching ICT. Becta will work with the **educational research community** and will set up an ICT Research network, holding annual conferences to stimulate relevant research

New research is needed, but the evidence base is developing quickly. Becta will continue to **draw together the research literature** on ICT matters and the wider research literature on school and teacher effectiveness in order to develop a comprehensive, indexed collection of relevant evidence linked to a searchable database. Becta is compiling a register of work in progress in universities and other research organisations, which it is hoped will expand to include other providers. The **analysis of national data** from OFSTED inspections, national tests and other data, makes it possible to identify trends and effects. Academic research of this kind needs to be married with what Becta gathers through **working with practitioners** on what constitutes effective practice. Becta will encourage practitioners to contribute to the evidential base by developing appropriate tools to help them carry out school and college-based research.

Advice

Evidence by itself can help the change process, but often policy-makers and practitioners need evidence to be turned into practical advice. In particular government needs advice on how and when to implement policies in order to develop effective practice.   Part of Becta's role is to offer government its professional judgement as appropriate, and in particular **advise government on practice issues** as the need arises. Becta will also advise government and its agencies on the need for and development of **teacher and tutor skills**,

particularly as ICT enters the lifelong learning community through initiatives such as UK Online. Teacher training for college tutors will become compulsory and the NLN partnership is working closely with the Further Education National Training Organisation (FENTO) to develop ICT teacher training standards to support this development.

Teachers and tutors also need advice based on evidence on how they can best use ICT to support learning. Becta will **advise practitioners on practice** and will work with curriculum authorities and the Qualifications and Curriculum Authority (QCA) to publish materials that **exemplify good practice** in subject areas. A positive culture is needed to support teachers and tutors striving for good practice. Managers of organisations need advice on management of ICT and on how to use Information Management Systems in order to take best advantage of government initiatives that are leading to a system-wide electronic communication and data strategy. Government itself needs advice on the development of these strategies. Becta will work with the National College of School Leadership (NCSL) and others to **advise on ICT and leadership** to all these audiences.

Support

Schools and colleges need access to a basic provision of good-quality support which must continue to develop and grow in its quality and extent. Becta will develop materials and models of support for **Key Stage 3.** Support will be available online, via the **Becta website**. Becta will provide further support for a range of **national initiatives** on the integration of ICT into teaching practice, for other **support providers** and for school and college **leaders**. There are early indications from the evaluation of the NLN that its involvement feeds into, or sometimes drives, ILT strategy in colleges.

Innovation

ICT is not only a tool that automates current methods, it allows rethinking of existing systems. In particular, there is a need for schools and colleges to begin to develop **new models** for their organisations, their staffing, their links to the community and their role within it. There is a need to celebrate the **innovative practices** developed by teachers, tutors and support providers. The development of new ways of working will be encouraged through **innovative on-line courses** for teachers.

Standards

LEAs are effective conduits of national strategies but some have found the effective planning and implementation of ICT problematic. **LEA and school ICT plans** must meet the challenge of continually changing technology and improving practice. As ILT becomes increasingly fundamental to the post-16 sector, colleges' ILT strategic plans must continue to be judged against rising standards. The curriculum for each of the UK countries provides a clear framework for ICT as a subject and there are standards for ICT teaching in curriculum subjects in schools. These provide clear objectives for teachers and for inspectors for schools and colleges. There is a need for both teaching and

inspection to be supported in interpreting these standards.

COMMITMENTS FOR 2001-02

Evidence

Manage Research Projects	Becta will continue to manage a programme of long-term research projects, including: 'Impact 2', 'Evaluation of Progress in the Pathfinder LEAs', 'The use of ICT to make links between the school, home and community' and other commissioned evaluations and report findings to funders as appropriate.
Draw together research	Becta will draw together research literature on ICT and develop a comprehensive collection of material linked to a searchable database and provide an annual report to government and the research community.
Analyse national data	Becta will collect, analyse and summarise data from school inspections and national tests and publish a report for the Department for Education and Employment (DfEE) in January each year.
Work with practitioners	Becta will carry out field work, focus groups and on-line forums to identify effective practice at LEA, college, school and classroom levels and use this to inform its advice to government and others.
Managing planned interventions	Becta will manage and evaluate a series of planned interventions including specific pedagogical investigations into the educational impact of new and emerging technologies. Becta will use the pilot national project of ICT at key stage 3 to trial and evaluate teaching and training materials and approaches to teaching ICT.
Stimulate production of relevant research.	Becta will work with the wider research community and the DfEE's ICT research centre to stimulate the production of relevant research through setting up an ICT research network, holding annual conferences.

Advice

To government	Becta will provide government and its agencies with timely, evidence-based advice on practice to inform policy
On teacher and tutor skills	Becta will advise the DfEE, the Learning and Skills Council (LSC) and the UK Online initiative on the development of teacher and tutor skills.
To practitioners	Becta will provide advice to teachers and tutors on effective practice in teaching and learning with ICT, in particular this year on 'whole class teaching' and 'how ICT can support the new SEN Code of Practice'.

Exemplify good practice	Becta will work with QCA to develop and publish subject exemplification for teachers on the use of ICT.
On management of ICT	Becta will advise headteachers and college principals on how to manage ICT effectively in their schools and colleges to support improving practice. Becta will also advise them on how to use ICT to improve management, reduce bureaucracy and increase efficiency.

Support

Key Stage 3	Becta will continue to work with DfEE and QCA to develop the ICT strand of the national strategy for Key Stage 3, providing teaching and training materials and developing a sustainable, transferable model of local support.
Becta website	Becta will develop the Becta website as the exemplar site for information, advice and dialogue on ICT including interactive on-line support, for practitioners and intermediaries.
National initiatives	Becta will support national initiatives in integrating ICT into their work.
Support providers	Becta will support ICT support providers with up-to-date and relevant material that helps them to improve the quality of their services.
Leadership	Becta will work with the NCSL leaders in schools and with the LSC to support leaders in colleges. Support will take the form of training, on-line support and other resources for the strategic planning and management of ICT including infrastructure, teacher and tutor professional development, information systems and curriculum issues.

Innovation

New models	Becta will identify and evaluate innovative models of organisational and classroom use of ICT in order to inform government policy.
Innovative practice	Becta will identify and celebrate, through award schemes, innovative practice by teachers in schools and colleges.
On-line courses	Becta will work with government to commission and manage new on-line training courses for teachers.

Standards

LEA and school ICT plans	Becta will work with the DfEE and LEAs on improving the standards of ICT plans.
College ILT strategic plans	Becta will work with the LSC on college strategic plans, and with the DfEE and NOF on the setting up and branding of UK Online centres.
Inspection	Becta will work with OFSTED and the Adult Learning Inspectorate (ALI) to improve the quality of both ICT and ILT inspection in schools and colleges and of support and training provision to inspectors.

AIM 2 - CONTENT

To foster the development and organisation of suitable educational ICT content in order to improve its scope, accessibility and quality for educational users

RATIONALE

High-quality content is fundamental to the effective use of ICT. The growth of the Internet has created a massive resource, a proportion of which has potential benefit for education. Much of it, however, is of dubious quality with the potential to harm. Uncontrolled access to the Internet does not equate to learning. The development of specific educational content and the tailoring of existing content to an educational audience is a key requirement for the success of government ICT strategies. Teachers and learners need advice, training and access to appropriate technologies if they are to make effective use of this content.

While government and its agencies cannot be, and should not be, the principal originators of educational content, they do need to maintain and develop electronic communications with schools and others. Government can also develop policies that provide an environment for the development and use of high-quality content. Initiatives such as the NGfL and the NLN provide such environments. Increasingly, content is coming from the commercial sector, which needs help both in understanding the needs of the education sector and in developing viable educational markets. In many cases the commercial world needs support in identifying how technology can be applied to learning and in developing resources to appropriately high standards. Public bodies such as broadcasting companies, museums, local authorities, schools and colleges also have a major role to play but need structures and frameworks through which to contribute their expertise.

Equally important to the creation of content is how users find it, understand it and use it. Finding resources on the Internet is a time-consuming business and one that is changing quickly as new technologies develop. Teachers and learners should not be expected to waste time continually browsing the Internet and scanning portals; search engines and annotated authoritative sites that help them reach high-quality materials are of great importance.

Both teachers and learners need guidance in using the Internet safely. There is still much work to be done on ensuring maximum safety.

Becta has an important role to play in the area of content by:

- researching users' needs and current usage

- advising government, commercial providers and others on needs and future directions

- supporting providers to develop high-quality content and make it available to users

- helping develop innovative approaches and disseminating information about high-quality initiatives

- setting and monitoring standards for safe and effective use.

Evidence

While on-line content development is a massive industry, its application to education is still in its infancy, and there is a scarcity of research on what creates a valuable on-line resource for learning. In particular, new techniques created for other areas such as business need to be evaluated for educational use. Becta will **research internet technologies**, and report on new developments. Essential development of the NGfL should proceed on the basis of research evidence of the **needs of users.** The NGfL itself provides large amounts of data on users' activity and Becta will **monitor usage of the NGfL** in order to inform its development.

Advice

Although the development of on-line content has been fast, most of it is static information. We are still at the early stages of development of on-line resources that interact with learners. Educationalists and the commercial sector are interested in developments in this area but there are few viable commercial models. Becta will **advise government on future directions** in technology that may have an impact on content development, and also **advise commercial suppliers** on the needs of the education market.

The development of a commercial market requires independent **advice to users** on the availability and scope of software, and on its appropriateness and quality. Local communities, schools and colleges are also increasingly active in developing content and local grids for learning will provide a significant contribution to the overall provision.

Support

The development of good on-line content for learners of all ages is crucial to the development of the NGfL. Much progress has been made to date in making available public sector information as a resource for teachers and learners. Both the public and the commercial sectors are extremely active in this area and are planning for future developments. Becta will **support contributors to the NGfL** to encourage scope and quality of content, and **support commercial developers** to promote the development of effective software and on-line materials.

As content proliferates, the issue of access to it will increase in importance. There is a need for further development of portals, search engines and signposting websites that **support users of the NGfL** and help them to find the best of the available resources. In particular Becta will **support teachers** through services and resources specifically

tailored to their needs.

The NLN is a network designed to cater for teachers in post-compulsory education and training. Becta will **support development of the NLN,** by working with the LSC and other contributors, and support the adoption of **newly commissioned materials** by the post-16 community. It will also support colleges in ensuring that locally produced materials adhere as much as possible to nationally approved standards and specifications.

Innovation

The Internet is a highly innovative environment with mixed business success. Some of this innovation will have an important effect on education, some of it beneficial. New technologies including digital television and hand-held devices will make new demands on, and offer new opportunities for, educational content. The introduction of projection technologies and of whiteboards to the classroom will also call for new approaches to content design and use. New techniques in searching and handling large amounts of data, in customising and personalising access will offer new opportunities and e-commerce solutions offer new ways for educational organisations to purchase services. Becta will utilise new technological developments to provide **new services on the NGfL**, and develop **innovative websites** to exemplify the best new developments.

Educational content providers are moving from providing small individual elements to complete courses. New and innovative learning models are required if these are going to be useful to teachers and learners. Becta will develop **new models** for e-courses and on-line educational services.

Standards

The increased concern for learners' safety and security on the Internet heightens the importance of the NGfL as a safe and secure environment for learners. **NGfL standards** ensure reliable conduct and content from all providers. As content users continually need to link data from different providers, **inter-operability standards** need to be established to allow this to happen easily and effectively[1]. Equally, the adoption of managed learning environments demands the use of open standards to protect long-term investment. Users with differing needs also need to be sure that content is designed to the highest **accessibility standards**. Users also need support in making effective use of software tools that improve accessibility. Britain is leading the way in setting standards for managed learning environments. Becta will continue to develop and uphold standards in these areas, and monitor content to ensure that it meets these standards.

---

[1] Inter-operability refers to processes and standards that overcome potential incompatibilities between different ICT systems which could prevent them working effectively together, due to differences in hardware, software protocols and data formats.

COMMITMENTS FOR 2001-02

Evidence

Research	Becta will research new developments in the content area and report to government to inform policy.
Monitor NGfL usage	Becta will monitor and analyse statistical information on the use of the NGfL.
Needs of users	Becta will research the needs of users through on-line communities and focus groups.

Advice

Advise government	Becta will advise government on the development of a viable content industry focused on learning materials and how this makes best use of future developments in technology and in e-commerce.
Advise commercial suppliers	Becta will advise commercial software companies on the needs of the education market and the impact of future technological developments and e-commerce.
Advise users	Becta will advise schools and colleges on the range and quality of available content.
Internet safety	Becta will advise teachers and users of the NGfL on key issues relating to Internet safety.

Support

NGfL contributors	Becta will support government departments, agencies and public and commercial bodies by helping them contribute to the NGfL.
Commercial developers	Becta will support commercial developers by helping them develop software which supports the curriculum and matches good practice and by promoting a viable market for on-line materials.
Users of the NGfL	Becta will support teachers and tutors by developing effective portals and search mechanisms, which help them find the resources they need quickly and effectively.
Teachers	Becta will support teachers by working with Teachernet and National Curricula on-line, and by developing the Virtual Teachers Centre (VTC),

to ensure inter-operability and easy navigation between them.

New materials on NLN	Becta will support the NLN partnership by procuring new ILT content materials for the lifelong learning sector and further developing Ferl as a key source of support on ILT[2].

Innovation

New models	Becta will work with government and the commercial sector to develop and promote innovative models for content development including e-courses for learners and other on-line activities including Grid Club.
Innovative websites	Becta will develop and maintain websites for government which exemplify the best of innovative approaches and which reach high standards in on-line delivery for users.
New services on NGfL	Becta will develop innovative value added services that make best use of the synergy of the NGfL.

Standards

NGfL	Becta will review and set appropriate standards for providers to the NGfL, continuously monitoring them through Gridwatch.
Inter-operability	Becta will work with key partners to develop standards for managed learning environments and for materials, to facilitate inter-operability across time and UK countries.
Accessibility	Becta will provide advice to content providers and users on accessibility issues.

---

[2] Ferl is a Becta-supported web site providing support for practitioners in post-16 education and training.

AIM 3 - INFRASTRUCTURE

To develop and implement a high-quality framework of ICT infrastructure and provide advice which helps improve provision and accessibility

RATIONALE

Developing the appropriate combination of equipment, networks and technical services for the education system is a key issue for government and others across the UK. Increased investment combined with the continuing rise in the power of the PC has led to continually improving equipment provision in schools and colleges, and the setting up of a large network of UK Online centres. Schemes to equip teachers and headteachers with their own computers are helping to develop teachers' ICT skills and giving them tools to support their professional work. The continuing fall in the cost of bandwidth is leading to better networking and the concept of a broadband network linking educational institutions. The reprocurement of the JANET core network for F/HE institutions is an example of world-leading high-speed broadband connectivity. Other technologies designed for the consumer - wireless communication, personal digital assistants, and games consoles with Internet - will also have an impact on the education system.

A key issue for ICT in education is how to sustain an infrastructure that is expanding considerably in scale and sophistication. How is such an infrastructure base to be maintained and improved? How do educational establishments plan strategically for rapidly changing technologies, prices and specifications? Managed services where one supplier provides all the elements of hardware, software, installation, networking, training and support are of interest to many educational organisations but require substantial and sustained funding. New technologies offer tremendous opportunities to the education system but it requires strong strategic action to make use of them. Becta can support this by:

-       researching new technologies and new models of use

-       advising government and school and college managers on planning, telecommunications and procurement issues.

-       supporting schools and government to develop managed services

-       promoting best-practice approaches to infrastructure deployment

-       setting technical standards for procurements and managed service.

Evidence

New technologies and systems being developed and applied in other sectors need to be evaluated for their usefulness in educational settings

and advice given to government on whether any need to be piloted in educational establishments. Becta will **research new technologies** and inform government about the applicability to the education system.

Across the education system, understanding is lacking of effective strategies for ensuring sustainable infrastructure or for coping with changing technology. Becta will **evaluate leading-edge infrastructure strategies** and disseminate lessons learnt to policy-makers at national and local levels.

Managed services are a new concept for many educational organisations. Becta will continue to **monitor the uptake of managed services** and the way they are promoted by certified suppliers.

Advice

Infrastructure is developing rapidly, both in terms of its deployment and in terms of new and potentially valuable technology. Government needs advice on how the education system is developing its use and how broadband and other developments can meet the government's needs. Becta will monitor developments and provide advice on **future technologies** and to government. In particular Becta will offer advice to government on the infrastructure requirements of **UK Online centres**.

Schools and colleges also need advice. Becta will provide advice on key issues such as **procurement** of equipment and services and on **telecommunications**. Users need information on the range of options, their cost, how this relates to their needs and advice on future sustainability. Becta will monitor developments and provide advice to schools across the UK.

Support

Government schemes on equipping headteachers, teachers and others with portable and other equipment have played a substantial part in raising the profession's confidence and capability with ICT. Becta will continue to support these schemes for **computer procurement** by testing and where appropriate, purchasing these computers.

UK Education Departments are implementing managed services for schools and other education institutions in various ways. Becta will continue to support these developments by testing and certifying **managed services** suppliers and making potential purchasers aware of their products.

Innovation

New approaches and new technologies are developing and are being constantly implemented. Becta will apply these to the **infrastructure that underpins the NGfL** to ensure that educational users gain maximum benefit from innovation. Equally, schools, colleges, LEAs and others are experimenting with new technology and Becta will identify and publish **new models** of infrastructure use.

Standards

Standards are key to implementing a workable infrastructure across an

education system where much of the purchasing and decision- making is dispersed to individual institutions. Standards protect users and purchasers. Becta will continue to work with government to set improving standards for managed services by **certifying providers** on an annual basis. Becta will set standards for government by **accrediting procurement** exercises and assuring their quality. Becta will also work with government to provide suitable standards and frameworks for the **UK Online centres**, offering advice and support to centre managers in meeting these standards.

Standards are only valuable if users are aware of them and take notice of them in their purchasing. Becta will continue to **inform users** of the standards set, their rationale, and which suppliers are meeting them.

COMMITMENTS FOR 2001-02

Evidence	
Research new technologies	Becta will manage technology research projects to provide new evidence on the role that new technologies can play in supporting education for government, LEAs and support providers.
Evaluate infrastructure strategies	Becta will identify, analyse and evaluate existing evidence for government on the effectiveness of infrastructure strategies, particularly drawing on 'pathfinder' organisations and LEAs and the regional broadband consortia.
Monitor managed services	Becta will develop and evaluate a range of managed service models to advise schools and LEAs on services appropriate to their funding allocations and pedagogical needs.

Advice	
Future technologies	Becta will advise government on telecommunications developments, broadband and other emerging technologies.
UK Online	Becta will advise NOF and DfEE on the restructuring of the UK Online Centres and other lifelong learning initiatives.
Telecommuni-cations	Becta will set up an intelligence unit advise schools and colleges on telecommunications.
Infrastructure strategy	Becta will advise managers of schools and colleges on the strategic development of infrastructure including sustainability and long-term planning.
Procurement advice	Becta will make independent procurement advice available to schools and colleges to help their decision-making.

Support	
Computer Procurement	Becta will support government schemes that equip teachers and others with personal computers.
Managed services	Becta will support the UK Education Departments in developing their managed services implementation.

Innovation

NGfL infrastructure	Becta will develop new technical infrastructure for the NGfL.
New models	Becta will identify and publish case studies of innovative models of infrastructure in schools and colleges.

Standards

Managed services certification	Becta will work with government and the commercial sector to develop and certify standards for managed services.
UK Online	Becta will work with government and NOF on improving standards for UK Online centres, and where appropriate, support the branding of them.
Informing users	Becta will provide information to users on standards for managed services and individual computers through the NGfL.
Accrediting procurement schemes	Becta will support procurement schemes which provide accreditation and assure quality. These include Computers for Teachers, Computers Within Reach, Portables for Fast Track Teachers and compliance with the Common Basic Data Set.

AIM 4 - ORGANISATION

To be an effective and communicative organisation, evaluating its own performance, anticipating developments and being responsive to the changing needs of the education system

RATIONALE

Becta has developed rapidly as an organisation since its creation three years ago. These three years have seen a dramatic increase in the activity relating to ICT and its importance to the education system, with a correspondingly steep rise in demand for Becta's services. Over this time Becta's core staffing and funding has remained constant. Becta has met increased demand by working closely with government and developing a number of short-term projects that meet specific needs.

Technology and its applications are constantly developing. Becta's role is to look across the two areas, education and technology, and ensure that the education system benefits from advances in technology. To do this Becta needs to be authoritative, independent and to have access to a wide range of expertise across all sectors. Some of this expertise will be in its core staff, some will be in short- term or seconded staff, and some will be reached by contracting outside specialists. Major investment in ICT and education had moved ICT from a marginal role to one that is central to every teacher and lecturer in the country. This has created an expertise shortage, particularly when in competition with the commercial world. To ensure that it can compete in this environment, Becta has developed a modern **pay and performance management system** designed to: support its business goals; attract, retain and reward highly skilled effective people; build a culture of continuous improvement and personal development; and take account of the *Modernising Government* agenda.

The **human resources strategy** will be continually developed and reviewed to ensure that all staff are supported and developed to meet their and Becta's objectives. The strategy will focus on developing Becta as a source of expertise.

As ICT moves to the centre of the education system, Becta's work becomes of increasing interest and value to all who work in it. While Becta's main focus has been advising and supporting government and providers, it is important that awareness of the valuable resources offered by Becta is extended to all those who need independent advice and support. Becta's **corporate communications strategy** will ensure that it reaches appropriate audiences , through its developing relationships with the press and broadcasting media and by presence

at corporate events.

In developing its organisational policies and core services, Becta is striving to take forward the agenda set out in the White Paper, *Modernising Government*. Codes of conduct for Becta's staff and Board members emphasise public sector values. Becta's services are designed to be customer-focused, and set standards for quality, probity, efficiency, effectiveness and value for money.

Within Becta organisational change and development are ever-present issues. Effective supporting systems which underpin the organisation's activity and enable it to fulfil its commitments are of crucial importance. **IT systems** provide the enabling technical infrastructure, software and services that allow the organisation to communicate internally and externally, independent of time and place with increasing effectiveness. Equally it is important that Becta's premises provide appropriate working and meeting **facilities** and that these are flexibly used to allow Becta to meet its objectives. As a government agency that works with the commercial sector Becta needs strong, transparent **finance systems** in order to meet public accountability.

The *Modernising Government* programme is a series of initiatives aimed at improving public service by using ICT more widely to facilitate efficient ways of working, inter-operability between public services and improved communication with citizens. This programme is led by the e-envoy, and spearheads developments around e-government, e-communications and e-commerce. It challenges all public sector organisations to innovate, and is endorsed by the 'Information Age Government Champions'. Becta has developed an **e-government strategy** and is committed to developing systems and expertise to enable its commitments to be met, and will work with the DfEE and other government agencies to support the wider public service strategy and government commitments.

Becta's role as the government's agency for ICT requires it to work closely with the UK Education Departments in support of policy. Its strategy should be informed by an understanding of the issues surrounding ICT and education. This **environmental analysis** includes working with government departments and agencies including inspection agencies on national data, and provides an evidential basis for Becta's strategy. This overall strategy is set out each year in the **Corporate Plan**, while progress against commitments is monitored via a **performance tracking** system.

COMMITMENTS FOR 2001-02

Human resources strategy	Becta will develop a human resources strategy that develops and sustains those skills of leadership necessary for Becta to fulfil its role as the lead agency for ICT in education.
Staff development	Becta will manage a staff development programme focusing on ensuring that Becta staff have the key skills and competencies required to be effective.
Pay and performance	Becta will implement a pay and performance management strategy (PMS) that will support the recruitment and retention of suitable staff, while encouraging and rewarding best performance by those staff. Through the PMS, Becta will focus its staff development programme to ensure that Becta has the key skills and competencies required to achieve its business goals.
Corporate communications strategy	Becta will develop its strategy for actively communicating messages, products, services and other outputs to the widening audience who need access to Becta's advice and resources. As part of this strategy Becta will exhibit Becta's messages, products and services at key educational events including BETT and the Education Show.
ICT systems	Becta will maintain and develop a modern ICT infrastructure in order to support its objectives, to exemplify best practice and enable improved communication systems.
Facilities and premises	Becta will continue to develop its use of premises and their associated facilities to best meet the objectives of the organisation.
Finance systems	Becta will continue to maintain and develop finance systems that meet appropriate levels of public accountability and transparency.
E-government	Becta will keep government informed of the requirements of e-government, and ensure that its corporate strategy and the implementation of that strategy are in line with government targets and recommendations for publicly funded bodies.
Corporate plan	Becta will publish the 2001-04 Corporate Plan, and develop its plan for 2002-4.
Environmental analysis	Becta will analyse and evaluate statistical data, reports, and other data on the environment in which it works.
Performance tracking	Becta will establish baseline measurements and targets in conjunction with UK Education Departments on all performance indicators identified in the Corporate Plan. It will continue the programme of research in order to assess its success in meeting performance targets.

PERFORMANCE INDICATORS AND MONITORING

For its Business Plan for 2001-02 Becta is developing with the DfEE and other UK Education Departments a set of robust targets and measures for Becta's work in providing evidence, advice, support, innovation and standards. Becta's work needs to be customer-focussed. Its external work is targeted at three broad customer groups, government, intermediaries and practitioners. Internal services are targeted at Becta's staff and its Board. The following framework provides a basis for this work.

Evidence

In gathering and developing evidence on ICT and education through evaluations, surveys and other research activity Becta will ensure that this evidence is accurate, complete, appropriate and useful for the following key customer groups. Measured by the development and production of high quality reports for the key audiences and judged by their usefulness, timeliness and appropriateness through the following feedback mechanisms.

Government	Intermediaries	Practitioners	Becta
Delivery of reports to time and quality specifications as laid down in Becta's Business Plan. Feedback at bilateral meetings.	Online dissemination of information and reports to time and quality specifications. Feedback through online consultation.		Delivery of reports to time and quality specifications as laid down in Service Level Agreements. Feedback through internal survey.

Advice

The quality of Becta's advice will be measured by its soundness and usefulness. Sound advice is that which is supported by evidence; useful advice is judged to be timely, practical and relevant to the concerns and decisions which customers face. Becta will ensure that its advice is useful, timely and accessible by using the following performance measures relating to its key customer groups.

Government	Intermediaries	Practitioners	Becta
Delivery of advice through reports as specified in Becta's Business Plan, involvement in key policy committees, requests for meetings and papers and feedback from customers.	Delivery of advice through on-line reports, seminars and other events, perceived usefulness of advice through evaluation forms at events and online response forms.	Delivery of advice through on-line reports, seminars and other events, perceived usefulness of advice through number of downloads made by practitioners of key web-site pages.	Delivery of advice through reports, on-line via the Intranet and in meetings as specified in service level agreements. Monitored through internal survey.

Support

Becta will support key customers as defined in its corporate and business plan. Becta will ensure that this support is useful, accessible and appropriate for the user, and overall seeks to improve the use of ICT in the education system. Becta will measure its effectiveness through the following performance measures relating to its key customer groups.			
Government	**Intermediaries**	**Practitioners**	**Becta**
Delivery of key outcomes against quality, budget and time specifications and use of satisfaction with this support by government agencies and initiatives as monitored by bilateral meetings and project reports.	Extent of take-up and use by intermediaries of Becta support networks and materials.	Take up of on-line support networks and resources and extent of practitioner contribution.	Delivery of service level agreement specifications to time, quality and budget specifications.

Innovation

Becta will develop innovative products, services and models. These will test, demonstrate and exemplify new approaches and solutions utilising ICT to enhance educational outcomes. Becta will ensure that these innovations are closely matched to user needs and make best use of technological developments through the following performance measures.			
Government	**Intermediaries**	**Practitioners**	**Becta**
Extent to which Becta is commissioned to develop and promote innovative products, services and models. Reaction of users through on-line feedback and extent of press and other coverage. Extent of take-up of new ideas and models.			Reaction of users through on-line feedback. Extent of take-up of new ideas and models.

Standards

Becta will work with others to set standards and protocols for technical infrastructure, increasing inter-operability between diverse systems to ensure minimum guaranteed levels of suitability, effectiveness, and safety and that any standards set closely meet the needs and concerns of educational practitioners. Becta will measure its effectiveness through the following performance measures relating to its key customer groups.			
Government	**Intermediaries**	**Practitioners**	**Becta**
Extent to which government asks Becta to develop, maintain and monitor standards.	Acceptance and use of standards by providers and intermediaries. Adherence to standards and Becta's perceived authority as measured by user feedback.	Usefulness and take-up of standards by practitioners as measured by on-line survey.	Provision and maintenance of useful and appropriate standards in key service areas as defined by service level agreements.

Appendix: Environmental Analysis

This section describes the significant developments of the last year which, together with Becta's own work, form the backdrop to the development of Becta's Corporate Plan for 2001-04. Each description of Becta's work is prefaced by a rationale, which explains how Becta is prioritising its work in the light of this environmental analysis.

PRACTICE

Primary ICT standards

OFSTED reports that evidence from inspections in 1999 shows that in general pupils' information technology skills have improved, but there is still substantial under-achievement in a third of schools.[3] Pupils' general confidence with ICT has continued to grow, particularly where it is being used across the curriculum. OFSTED also reports that, although 'national initiatives in information technology have provided welcome additional resources', information technology still does not feature prominently enough in the timetable and is too often seen only as a service subject for other work rather than as a subject in its own right. Schools that devote a lesson a week to teaching the subject have often seen a substantial improvement in pupils' achievement. The quality of teaching in information technology, although improving, remains the weakest of the National Curriculum subjects. The impact of the New Opportunities Fund initiative has not yet fully worked through, but the early signs are encouraging. More teachers are now more confident and proficient users of ICT, but not all have yet received the expected additional training.

Secondary ICT standards

OFSTED reports that in secondary schools 'pupils' skills in information technology have also improved'. The increased use of separate lessons for information technology alongside the effective use of ICT across the curriculum has contributed to higher achievement. Nevertheless, there is substantial under-achievement in about one-third of schools having a full inspection, many of which fail to comply with the National Curriculum. OFSTED reports that the teaching of information technology in secondary schools has improved as teachers have increased their knowledge and understanding of the subject. Having said that, there is a serious weakness at Key Stage 4, where provision is generally unsatisfactory. In a minority of schools pupils do not have designated information technology lessons and the teaching is solely through other subjects. Such provision is often poorly co-ordinated and some teachers lack the confidence to use ICT effectively and improve pupils' skills within their subjects.

Post-16 ILT

Nearly a third of colleges in England already make use of virtual learning environments to deliver on-line learning, while the remainder rely upon their Intranet to perform this function. One in six colleges report the use of the network for delivery or support of learning to be a common activity. Use of the Internet as a research tool and e-mail for communications is now firmly embedded among learners and staff.

All colleges in England have been required to submit detailed strategic plans outlining their intentions for the development of ILT in delivery and support of learning, management of learning activity and the management of the organisation. These plans reveal an increasingly sophisticated understanding of the potential for ILT in raising standards and casting the learning net ever wider. A key entry point for this is, without doubt, the increasing use within the sector of e-mail. College investment in systems has extended the reach of e-mail to four out of every five members of staff, and three out of five students.

While two-thirds of college staff are described as competent or advanced in their personal use of IT, significantly less than half are described as competent in their use of ILT with learners. Student skills, moreover, were identified as a growing constraint upon further exploitation of the Internet.[4]

Learning and Skills Council

The LSC will begin to support lifelong learning and vocational skills development for all post-16 students from April 2001. Its priorities for skills development will be set by balancing national and regional/local priorities. An important development will be the transfer of responsibility for provision for schools' sixth forms from LEAs to the LSC.

The starting point for a national focus will be the government's national targets. The LSC will also work with a range of national bodies, including employer bodies, the Small Business Service (SBS), the National Training Organisations (NTOs), local authority representative bodies and UfI. In seeking effective provision for e-learning the LSC will continue to work with the other funding bodies and the Joint Information Systems Committee (JISC) in implementing the NLN initiative which is expected to continue at least until March 2004.

Regional needs will be identified by the Regional Development Agencies (RDAs), while the local arms of the LSC will establish demand by working closely with individuals, communities, employers, providers, local authorities, Local Learning Partnerships (LLPs), the Connexions service and others. They will also establish priorities for

---

[4] Becta , *Further Education in Transition* (2001)

developing the skills of the workforce and targeted strategies for engaging and influencing employers, including small and medium-size enterprises (SMEs). These priorities and demands will have a direct impact on the resource allocations made to providers and LEAs. This will ensure that skills shortages are tackled and that a balance is struck between the different subjects and occupational areas supported by LSC funds. The national LSC will have targets to meet, set by the government, but each local LSC will also have its own priorities reflecting variations in local patterns of participation and employment. The LSC will be purchasing over £6 billion of provision.

The recent White Paper from the Department for Trade and Industry (DTI), *Opportunity for all in a world of change*, identifies new responsibilities for the LSC in supporting the e-economy.

Impact of ICT

Recent research undertaken by Becta provides evidence of the impact of ICT on standards.[5] OFSTED inspectors assessed the adequacy of schools' ICT resources. Those schools where ICT resources were assessed as 'good' or 'very good' were found to have higher average pupil attainment in core subjects at Key Stage 2 and Key Stage 3, and also showed better GCSE pass rates. For example, in July 1999 the proportion of pupils attaining Level 4 or above in Key Stage 2 English averaged 75 per cent among schools with 'very good' ICT resources, and 71 per cent among schools with 'poor' ICT resources. The same pattern was seen again for July 2000. Further investigation confirmed that this pattern could not be attributed to a 'third factor' such as social class, which might serve to boost attainment levels. Further analysis of OFSTED and QCA data by Becta revealed that the impact of ICT on pupils' attainment was considerably higher when good ICT resources were used effectively. Good use of resources is indicated by such factors as high-quality ICT teaching, a good ethos for learning in ICT and positive pupil attitudes to ICT. A small number of schools were identified where high-quality ICT resources were combined with good overall use of ICT, including good teaching, good ethos, positive pupil attitudes and high pupil skills in ICT.

Building on Success

Building on Success, a consultation paper published by the DfEE in February 2001, makes frequent reference to ICT, and recognises 'that it is changing the way schools work'. It covers many issues relating to ICT infrastructure, content and practice.

It outlines government's thinking on future directions. Two further strands of activity are essential:

-    The first is the development of software of high quality that is

---

[5] Some recent results are presented in 'Primary schools of the future - achieving today',

http://www.becta.org.uk/news/reports/primaryfuture/

directly relevant to teaching and school administration. Government itself has a direct part to play and through such developments as the Standards Site, the NGfL, the Virtual College for School Leadership and the VTC, materials and best practice are being widely disseminated. The DfEE parents' website remains a popular and valuable guide through the system. Still more important is the work the government is doing to encourage commercial organisations to provide software relevant to the National Curriculum and the challenges faced by schools. The encouraging progress of recent years can be expected to lead to a step-change in the quality and quantity of materials available in the next three or four years.

- The second is investment in training teachers and headteachers to be able to use ICT effectively in their day-to-day work. NOF teacher training and the Computers for Teachers scheme are both directed at improving teachers' confidence and skill in utilising ICT in their work.

These developments have laid the foundation for further investment in hardware, connectivity, software and training. Once schools have broadband connections, the speed and quality of Internet working will be greatly enhanced. The £10 million Classroom of The Future pilot scheme will enable schools to explore new ways of delivering education.

Government expects to see the use of ICT becoming routine in virtually all aspects of schools and colleges over the next five years. Not only will computers be used for curriculum and assessment activities, but also schools will be able to run their administrative systems electronically and integrate them with curriculum networks. All communication between schools and government will become electronic. The government expects schools at the cutting edge to advance further, and to demonstrate how ICT, when appropriately used, can change the nature of the classroom experience and the organisation of the school day.

Some predicted innovations mentioned in the Green Paper include:

- more flexible use of time during the school day with a mix of traditional teaching methods, enhanced by the better quality of presentation ICT makes possible, and more individualised and small group work

- homework being set, done and marked on-line

- teachers teaching in teams with teachers from other schools; widespread sharing between schools of lesson plans linked to Schemes of Work

- increased use of ICT-based assessment techniques

- a vast growth in international collaboration offering, for example, every pupil learning French the opportunity for regular conversation with a native speaker

- better home-school links mediated by ICT.

The paper concludes that 'the investment in ICT will therefore not only raise quality and open up new possibilities, it will also reduce the time teachers spend on lower priority activities and free them to focus on improving pupil performance.'

Numeracy

OFSTED reports that the National Numeracy Strategy (NNS) is having a profound effect on the way mathematics is taught in primary schools, but that there is more to be done if it is to achieve its full potential.[6] OFSTED judges that there are weaknesses in the teaching of at least one of the parts of the daily mathematics lesson, in around a quarter of lessons, and that there are important aspects of the teaching of mathematics with which many teachers are not yet secure.

OFSTED reports that many schools recognise the role ICT can play in the successful teaching of mathematics, but that practice is very uneven. During the first year of the strategy, infrequent use was made of ICT as schools worked to establish the three-part lesson. Many schools have now identified the use of ICT as a priority for training and development. They recognise the need to improve their provision of hardware and software and raise teachers' skills and confidence. OFSTED judges that many schools either have too little software relating to mathematics or need help to match it to strategic objectives.

In November the NNS launched *Using ICT to support mathematics in primary schools*. This pack, developed by Becta in conjunction with NNS, is central to the strategy and contains school-based professional development materials. Its purpose is to help schools incorporate ICT into the daily mathematics lesson. One copy of this pack is available to every primary school.

Literacy

OFSTED reports that the National Literacy Strategy (NLS) continues to have a major impact on the teaching of English in primary schools and on the content of initial teacher education courses. The teaching of reading in primary schools has undergone a transformation, particularly in the amount of effective whole-class work at both key stages. This has a very positive effect on standards of pupils' reading, both for girls and boys. By contrast, the impact of the NLS on writing has been much more limited.

---

[6] OFSTED *The National Numeracy Strategy: the first year* (2000)

OFSTED also reports that the use of ICT to support the teaching of literacy remains limited. Many schools recognise that ICT has the potential to contribute strongly to the teaching of literacy, and have identified it as an area for development, but few are clear as to how best to proceed. OFSTED recommends that those with national responsibility for the management of the NLS should provide guidance on how ICT can contribute to literacy teaching.

Key Stage 3

On 16 November 2000 the Secretary of State announced the Standards Fund allocation for 2001-02 to LEAs and schools for a programme designed to raise standards of teaching and learning in the early years of secondary education. Some £10 million of this will be for the continuation of the Key Stage 3 pilot programme running in 17 LEAs and 205 secondary schools. This is designed to test ways of transforming teaching and learning in Key Stage 3. Some £50 million will also be allocated for the first phase of a national implementation programme. A pilot programme in five LEAs to raise standards in ICT will begin in 2001. It will continue to be piloted in the academic year 2001-02 and be ready for national implementation in 2002-03.

The government is setting new targets for Key Stage 3 achievement in the key subjects of mathematics, science and English, and also in ICT: these are to come into operation from 2005. Key Stage 3 practice will need to develop in the intervening period to bring these targets within reach. One possible change is the increase in subject 'setting', as a replacement for mixed-ability teaching in these key subject areas.

Key Stage 4

The introduction of vocational GCSEs from 2002 will extend the range of courses and qualifications available to key stage 4 pupils. It is likely that many of these courses will include an ICT component.

Inclusion

Consultations on a draft revised Special Educational Needs (SEN) Code of Practice took place between July and October 2000. The revised code will provide practical guidance to LEAs, schools and others on their statutory duties for identifying and assessing special educational needs. The Secretary of State announced (DfEE Press Notice, 13th March 2001) £220 million under the Schools Access Initiative, to be spread over the next three financial years, to increase access to educational institutions for pupils with special educational needs or disabilities[3]. In 2002-04 there will be £172 million to improve accessibility for disabled students and adult learners in the further and higher education sectors (including LEA secured adult education and youth service provision). Targeted support for SEN under the Standards Fund has also been increased. From April 2001 new arrangements will be in place to streamline the Standards Fund and

[3] http://www.dfee.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0131

make it simpler for schools. The new Inclusion category will address special educational needs and promote social inclusion.

Curriculum

The revised National Curriculum became statutory at all key stages and in most subjects from August 2000. A new generic statutory statement on the use of ICT across the curriculum has been published for each subject. The specific ICT statements in most subject areas have been strengthened. QCA and DfEE publish National Curriculum schemes of work to help schools implement the revised programmes of study. There are schemes for ICT as well as all other subjects.

Skills shortage

In June 2000, the UK National Skills Task Force produced its final report, entitled *Skills for all: proposals for a national skills agenda*. The final report follows in the wake of three interim reports, and is also the product of an extensive consultation programme with particular sectors of industry and business, key agencies involved in the field of education and training and members of the academic research community. The current level of ICT skills in the adult population is unlikely to meet future demand. If this is not addressed, the skills shortage has the potential seriously to undermine UK competitiveness across many sectors of industry. Accurate forecasting of future IT skills needs is difficult, however, especially given the rapid speed of technical change.

Electronic communications with schools (EASEA project)

As part of the drive to introduce systems to reduce the bureaucratic burden on schools, the government announced the development of the Electronic communication with schools (EASEA Project) in April 2000. EASEA gives headteachers and others in schools access to an 'electronic in-tray', a document archiving system, and an electronic 'A to Z' of school management materials. Currently over 7,000 headteachers take new DfEE documents directly from the EASEA site.

Organisation Development

The Green Paper *Building on Success* states 'We will encourage innovation, enable schools to use Information and Communications Technology to transform teaching and learning and model the school of the future.' It goes on to say:

> The application of ICT is transforming business processes in every sector of the economy, both private and public. It is beginning to have a similar impact in education. Indeed, in some schools, the transformative power of ICT has already been unleashed. The next challenge is to extend the benefits of ICT to all schools, while creating a culture in education which encourages innovation and therefore constantly challenges inherited attitudes and approaches in the pursuit of higher standards.

All schools are required to have an ICT policy as part of the NGfL Standards Fund but this rarely approaches the kind of strategic approach envisaged by the Green Paper.

Local Education

All LEAs should have an ICT development plan and should revise it annually in accordance with NGfL Standards Fund requirements. For

Authorities

2001-02 this includes early achievement of a 'baseline' or minimum threshold of access to ICT in every school. The baseline is defined in terms of minimum computer:pupil ratios, Internet connectivity and access to ICT for management purposes. Commitment by LEAs to achievement of the baseline in all schools by August 2002 will be a condition of grant for NGfL allocations in 2001-02. LEAs are also required to have an education development plan (EDP), a strategic three-year plan which sets out how educational standards will be improved in that authority's schools. These plans will now need not only to reflect the targets for 2002 already agreed with the DfEE but also take into account the government's planned targets for 2004 and 2007. These include, by 2007, 85 per cent to achieve level 5 or above in the Key Stage 3 tests in ICT and, as a milestone towards that target, 80 per cent to achieve level 5 by 2005. The OFSTED report on LEAs concluded that although most LEAs included support for ICT in their EDP, this was only related to provision of ICT rather than improving standards.[7] Equally, on the implementation side, although LEAs were 'making great strides, many have struggled to get the infrastructure in place fast enough to satisfy schools' expectations. Good LEAs were breaking down the distinction between curriculum and administrative ICT in favour of a common infrastructure and an integrated strategy for managing information flows.' Generally, however, 'electronic information flow between schools and the LEA received one of the lowest ratings' from schools. In terms of professional development issues. OFSTED believes that LEAs could make clearer distinctions between the personal ICT skills of users, skills in using ICT for management, pedagogic skills for teaching with ICT and skills in using ICT for curriculum design.

Education Action Zones

Education Action Zones (EAZs) are part of a wider government agenda to promote high standards.[8] The partnership approach of the zones to finding innovative ways to raise standards is seen by the government as an important element in the drive to raise standards in schools. The introduction of new, smaller EAZs will focus on low performance in small clusters of schools and their feeder primary schools, where the current EAZ model of around 20 schools may be too broad. ICT is a recurring theme in many of the bids and an important element in the support promised or offered by business partners. EAZ material on the DfEE website states that ICT will be 'invaluable, both for working within the zone, and for sharing ideas beyond it on the new NGfL'. The zones are also seen as demonstrating how wider access to ICT can bring educational opportunity into local communities and homes and thereby

---

[8] http://www.standards.dfee.gov.uk/eaz/

extend greater learning opportunities to individuals. Most zones have plans to network the participating schools, often in zone-wide intranets and with the support of business partners. Others intend to speed up access to the NGfL. The importance of developing ICT skills alongside literacy and numeracy is an important element of a number of bids, in order that young people leave school 'more employable'.

Excellence in Cities

The Excellence in Cities (EiC) initiative aims to narrow the gap between the performance of schools in inner cities and urban estates and the rest of the education service.[9] Current work on EDPs and EAZs are seen as ways of providing an extra drive to raise standards. This will be combined with a package of other measures, including the doubling of Beacon Schools and the provision of 800 learning mentors to recruit an army of volunteers for schools.[10]

City Learning Centres (CLCs) are a key element in the Excellence in Cities initiative. Their purpose is to enhance the learning opportunities of pupils by providing better access to, and use of, the latest educational technology, improving attainment levels and employment prospects, increasing staying on rates and reducing truancy rates.

Technology Colleges Trust

The Technology Colleges Trust manages the specialist school programme on behalf on the DfEE. With a network of more than 900 affiliated schools, the trust has a mission 'to promote an educational culture that emphasises the specialist areas of maths/science/technology, languages/internationalism, arts and sports'. It also encourages schools to be active partners in a learning society with their local families of schools and the wider community.

There are currently 338 specialist 'technology colleges', 89 'arts colleges', 108 'language colleges' and 84 'sports colleges'. The DfEE target is to create 1,000 specialist schools by 2004.

New bodies in education - National College for School Leadership

The Prime Minister launched the National College for School Leadership (NCSL) at a national conference for new headteachers on 23 November 2000. The NCSL provides a single national focus for school leadership development and research. It aims to be a driving force for world-class leadership in schools and to be a provider and promoter of excellence and innovation. The college will use innovative approaches to teaching including on-line activities. A major role for the college will be to develop a 'virtual college' developing and maintaining a strong interactive network for school leaders. The virtual college will play a strong role in developing the competence and confidence of headteachers in their use of ICT. New headteachers will receive a

---

[9] http://www.standards.dfee.gov.uk/excellence/

[10] http://www.standards.dfee.gov.uk/beaconschools

laptop in return for their active involvement in the on-line college.

General Teaching Council

The General Teaching Council (GTC) was launched in September 2000. It is the professional body for teachers, an independent organisation set up to represent teachers' professional interests and to support all teachers in providing the best possible educational opportunities for young people. The council will seek to raise the status of teachers by speaking with authority on education matters, and will seek the views of teachers regularly through the website, surveys and consultation.

Adult Learning Inspectorate

New post-16 inspection arrangements also set out in detail the work of the Adult Learning Inspectorate (ALI) and the standards that will be expected from providers of work-based learning, and how they will be monitored and inspected against those quality standards. The publication of inspection reports on the Internet will highlight performance standards and provide an incentive for improvement. The ALI will work jointly with OFSTED on inspections of colleges where there are learners aged both under and over 19. The two inspectorates have collaborated to create a Common Inspection Framework which is published on both organisations' websites.

Individualised Learner Record

It is intended to introduce a single common Individualised Learner Record (ILR). This will be a combination of the Individualised Student Record (ISR), currently used in FE and in some aspects of Adult and Community Education, and the Start/Leaver Certificate used for work–based training for young people. The development of the ILR will be linked to the parallel initiative to establish a common basic data set for schools (see 'Inter-operability' p.43 and 'Common standards' p43). The underlying principle is to collect data about individuals and use it for a variety of purposes, rather than have different data collections for every activity. So, for example, the LSC will use data based on an ILR for planning, funding, monitoring and evaluation. The data will also be invaluable to those involved in inspection and to providers themselves who will use it for their own internal assurance systems. The LSC will establish linked learner and provider databases, widely accessible using web-based technology. LSC partners will have access to this information.

Research

The DfEE announced the creation of a new research centre to investigate the impact of new technology on society. The centre will bring together individuals to form an expert body in the development, review and use of ICT research nationally and internationally. It will carry out a programme of research, review and analysis designed to build up a comprehensive database of knowledge.

International

The RM G7 (8) Report, comparing ICT provision in schools in the leading industrial nations, was published in February 2001[4]. This, the third biennial report, shows that the UK is maintaining its five-year position as a world leader, providing equity of access to ICT resources across the country, entitlement to ICT training for 5-16-year-olds and considerable investment in teacher training. The one area of weakness in the UK is the high number of computers over five years old. The UK is still the only country to offer a statutory entitlement to discrete ICT training in primary and secondary schools. Only Canada and the USA have better pupil:computer ratios than the UK. which, however, continues to provide the widest spread of access to hardware and the Internet. The UK has a high proportion of old or less capable equipment in schools; of the UK nations, Scotland alone has published a policy objective to address this issue. The most common barrier quoted by teachers, worldwide, to the use of ICT in the classroom is time for training. Again the UK leads the way in that it has the most substantial ICT teacher-training programme in the nations studied.

---

[4] 'The RM G7(8) Report 2000: Comparing ICT provision in schools' available from http://www.rm.com/reports/

CONTENT

National Grid for
Learning

The NGfL is the government's headline initiative for improving schools' ICT provision, developing a new generation of digital learning resources and equipping teachers with the skills to make effective use of them in the drive to raise standards. It is a programme of activity underpinned by five strategic targets covering school connections to the Internet, the development of digital learning resources, teacher training in ICT, pupil competence in ICT and on-line school administration. Since its launch in 1998, the NGfL has grown from a few hundred to well over 5,000 pages of hosted content and 300,000 pages of indexed content. The NGfL includes extra funding for hardware, software and networks, as well as for training in the use of ICT in the educational context. A stated NGfL objective is that 'by 2002... general administrative communications between education bodies and government and its agencies will cease to be largely paper based.' [5]

Key features of the NGfL include the Virtual Teachers Centre (VTC) and Grid Club. The VTC provides a focus for information and resource materials for teachers, including support for professional development and classroom resources. Grid Club is a safe out-of- school club on the Internet for children to use at home or at school. This DfEE-funded project will grow over the next three years into a resource for seven to 11-year-old children, their parents, teachers and other supporting adults.

UK Online

Government is committed to getting all of its services on-line by 2005 (see e-government, below).[11] By September 2000, 33 per cent of services were on-line. The UK Online website provides a single portal for citizens for government services and was launched in September 2000.[12] The new White Paper on Communications creates a new regulator, an Office of Communications (OFCOM) to promote competition in telecommunications and broadcasting.[13] The Teachers' Portal was launched in September 2000 to provide access to government information and services that are relevant to teachers.[14]

The first 616 UK Online centres have opened, providing Internet access

---

[5] 'Open for Learning, Open for Business' The Governments National Grid for Learning challenge

http://www.dfee.gov.uk/grid/challenge/

[12] http://www.ukonline.gov.uk

[14] http://www.teachernet.gov.uk/

and computer literacy training. This number is set to grow rapidly, with a target of some 6,000 UK Online centres by 2002.

Centres will be opened in diverse locations, such as libraries, colleges, adult education centres, schools, supermarkets and mobile units. More than £350 million has been allocated to ensure these targets are met.

Digital services expansion

Providers of digital services for education continue to increase. The BBC's plans for a digital curriculum proposes a new comprehensive on-line education service starting in September 2001, which will provide a comprehensive resource for children, teachers and parents throughout the UK.[15] The plan aims to cover all aspects of education by 2007. New Key Stage 3 digital courses in mathematics, Japanese and Latin are currently available, plus 'bite-sized' revision support for Key Stage 3 and GCSE pupils.

Channel 4 and Granada are also working on developing significant digital content for education.

University for Industry

Ufl was launched in September 2000.[16] It is stimulating demand for lifelong learning among businesses and individuals, providing facilities and starting to provide content to meet those demands. It operates in England, Wales and Northern Ireland. Its stated purpose is to 'promote the availability of, and access to, relevant high quality, innovative learning opportunities, in particular through the use of Information and Communications Technology (ICT)'. Ufl's learning services are delivered through *learndirect*, the customer-facing brand identity of Ufl. A distributed regional network of learning centres has been established, which provides access to courses, over 80 per cent of them on-line. The business model is of a public/private partnership.

New Opportunities Fund digitisation project

The New Opportunities Fund (NOF), which distributes funds derived from the National Lottery, has provided £50 million for the digitisation of materials across the UK. The digitisation of educational and learning materials from libraries and museums will make information, currently only easily available to specialised or local audiences, accessible to people across the UK. By storing information in a digital format, it will be possible for children and adults to use computers at school, at home and in libraries to access information on CD-ROM and via the Internet. The NOF commitment is to 'support the digitisation of educational and learning material which will benefit the wider lifelong learning community and education in its broadest sense, and which would not otherwise be provided solely by the commercial or public sectors'.

[16] www.ufiltd.co.uk

e-commerce

Digital and on-line content has been expanded by the involvement of commercial content providers who are increasingly prepared to use ICT as an alternative or in addition to paper-based publication and distribution methods. In some cases the business model involves pay-to-use and subscription systems; in others, on-line content is provided free as a taster or introduction to traditionally published materials. Alternatively, free on-line content is paid for by advertising revenue. As commercial organisations develop reliable methods for predicting and generating income from digital content, so the provision of content will continue to expand. The wider business community has shown increasing interest in the use of e-commerce for buying and selling. This covers two main types of commercial activity: business-to-business (b2b) and business to customer (b2c). A third recent development is direct selling between private individuals (for example via eBay) or customer to customer (c2c) e-commerce. Directly resulting from this expansion of e-commerce have been an increase in digital traffic, use of Internet connectivity and a rapid expansion of web content. The UK is one of the most developed markets in the world for e-commercial activity. Be that as it may, over the past 12 months the rapid expansion of e-commerce has resulted in some commercial failures. The relatively high volume of traffic has not guaranteed the optimistic profit margins that were sometimes predicted. There is an increasing demand for realistic and reliable commercial models. The increased use of ICT to enable commercial activity also increases the significance and potential problems associated with 'the digital divide'.

Internet safety

In March 2001, the DfEE launched the Superhighway Safety website containing both background and technical information on many aspects of Internet safety.[17] Educators already use a wide range of safety measures, from 'walled gardens' and filtering software, through limited access and tracking usage, to providing a 'user contract' for students. The Superhighway Safety site provides guidance on all of these approaches. All sites linked to the NGfL conform to published ground rules and a code of conduct. Content must neither contain nor provide links to unsuitable material. In addition, the Gridwatch initiative sets out roles and responsibilities of teachers, parents and students in relation to Internet safety, and provides a reporting mechanism for unsuitable material. Other work is being done in the area of improved Internet safety and suitability. For example, Tesco SchoolNet has produced guidance for teachers on the safe use of the Internet in schools and includes ten tips for web safety.

Community Access

The NOF Community Access to Lifelong Learning (CALL) initiative is funding Community Grids for Learning – websites and services

to Lifelong Learning

providing community-based content for adult learners, relating to their locality or area of interest. In England there are strong links to the UK Online initiative. In Wales, Northern Ireland and Scotland there are parallel developments in Community Grids for Learning.

National Learning Network

The NLN's objective is to improve the further education learning environment through the use of ILT, in particular by strengthening links between FE and the higher education ICT infrastructure, and to strengthen links and co-operation between the FE and HE communities.[18] As well as a developed infrastructure it provides technical and strategic support, staff development activities, and information and guidance on ILT. The need to improve content provision is being addressed by a major programme to acquire new curriculum ILT materials as well as offering guidance to aid colleges in the successful creation of local learning materials. Key to the success of these initiatives are moves to adopt international standards as the basis for produced content and for managed learning environments. In addition to the projected £300 million being spent on ILT by colleges themselves, the initiative is backed by £74 million of government investment over three years. The initiative is supported by several agencies and other bodies, working in the post-16 education sector[6].

The NLN network is being mounted on the backbone of the HE Network (JANET) known as SuperJANET. This will be upgraded to SuperJANET4 (SJ4) from March 2001. The SJ4 procurement is being managed by UKERNA and contracted to WorldCom. Using optical links, this will connect all HE, FE and research council sites. Some £50 million has been allocated to this project through JISC. Increased bandwidth offered by the link will speed up access for all learners.

---

[18] www.nln.ac.uk

[6] Those supporting this initiative include Becta, FEDA, FEFC, JISC, NILTA and UKERNA.

e-government

The first *Modernising Government* annual report 'Citizens First' was published on 13 September 2000.[19] The Cabinet Office's *Modernising Government* initiative seeks to transform relations between citizens and government agencies through the use of new technologies ('e-government').[20] All departmental and non-departmental public bodies are required to develop and implement a strategy for making best use of new technologies to improve the quality of service offered to the public. This includes improved internal processes, improved communications with other public bodies, and improved interaction with the general public, including increasing openness, accessibility and interactivity. This involves increasing use of ICT, and development of digital content: for example through the use of on-line services, websites, and e-mail communications. The goal is to provide coherent and integrated access to government information and services. A stated *Modernising Government* objective is that 'by 2002, 25 per cent of business interactions with government [will be] electronic'. This expansion in governmental content and activity on-line increases the urgency of initiatives to address 'the digital divide' (see p. 46).

By 2005, all government services will be available on-line (and all citizens will have on-line access see p.39). Funding of £1 billion has been allocated to meet this target. As well as improving access to government, the aim is to stimulate the e-economy.

Inter-operability

The development of the infrastructure, software and protocols that enable digital connectivity has been piecemeal. This is partly because of competition between a range of commercial providers, which has limited the development of common standards. This issue has now come to the fore, with an increasing demand for improved inter-operability between systems. This includes a demand for transparent connectivity between government systems (see 'e-government' above) and between educational networks (see 'National Learning Network', p46.) and within the education system itself. The Information Management Strategy project aims to establish common protocols for collecting and sharing educational information.[21]

The project's objectives include the achievement of agreed standards for:

- school and LEA software and hardware

- technical and software support in schools and LEAs

---

[19] www.cabinet-office.gov.uk/moderngov/anreport/index.htm

[21] www.dfee.gov.uk/ims/

- electronic information collection and transfer

The project will seek to encourage schools and LEAs to hold all regularly collected information in electronic format in their management systems. It will also set up effective mechanisms for handling changes to the strategy itself.

Related developments in the post-16 environment are focused on setting standards and specifications for learning materials and managed learning environments.

Common Standards for Transferring Data

The common basic data set (CBDS) provides the basis for establishing standards for transferring data between sites and between different suppliers' systems (inter-operability). By March 2001 software systems will be compliant with the CBDS definitions needed for pupil transfer in 2001. By April 2001 software will be available that enables all items of the 2001 specification for the common transfer form to be sent electronically.

A standard for data transfer between different software systems has been established. Twenty-three LEAs were involved in the pilot of the 'pupil level annual school census' (PLASC) in 2001. All other LEAs are conducting a trial with a sample of schools. Plans are established to ensure all schools provide their data electronically for the 2002 PLASC.

INFRASTRUCTURE

Equipment in schools sector

The equipment base for primary and secondary schools continues to improve. In 2000, the primary sector was reported as having 330,000 computers, predicted to rise to 382,000 by April 2001.[22] For secondary schools these figures were 489,000 and 563,000 respectively. This corresponded to a survey of schools in England in April 2000 where in primary schools there were on average 17.8 computers, or 1 computer for 12.6 pupils as against 1:13.4 in 1999.[23] For secondary schools there were on average 112.6 computers per school with an average ratio of 1:7.9 pupils against 1:8.4 in 1999. The Standards Fund requirements for England have set baseline figures for these ratios for all schools in England by 2002 of primary 1:11, and secondary 1:7. The significant numbers of schools which are falling far short of these targets will need considerable and carefully planned support. It is estimated that it will take more than 200,000 new computers to bring such schools up to these baseline figures.

Equipment in the post-school sector

Two recent Becta studies have indicated that:[24]

- colleges in England spent some £150 million of their own funds on investment in ILT during the 1999-2000 academic year;

- two-thirds of colleges now have high specification, robust local area networks based on 100 mb/s or gigabit backbones;

- more than a third of colleges have already achieved the sector strategy target of one computer to five full-time equivalent students;

- there is one Internet-enabled computer for every three permanent teaching staff;

- two-thirds of computers currently in service in FE colleges are Pentium II or better.

Sustainability and replacement

Although there has been heavy investment in equipment over the last few years, the time is arriving when equipment will reach the end of its three-year expected life span. Investments being made to improve the pupil:computer ratio within schools will from now on include a proportion of funding designed to maintain this ratio through equipment replacement. The concept of a rolling replacement programme will be the key to maintaining the infrastructure improvements currently being made.

Technical support

The government has recently highlighted the importance of access to good-quality technical support in the education sector.[25] This is an area that must be developed to underpin the rise in quantity and quality of ICT infrastructure in schools.

Connectivity

Connectivity at school level has improved significantly for schools, with

98 per cent of secondary, 86 per cent of primary and 92 per cent of special schools connected to the Internet.[26] If the trend continues then the government's target of connecting all schools to the NGfL by 2002 is highly likely to be met. Increased connectivity has been mirrored by significant increases in the proportion of computers in a school which have access to the Internet. Nearly half the computers in schools are now Internet-connected. In the average primary school in April 2000, 44 per cent of computers were connected, while for the average secondary school the figure is 48 per cent.[27]

Bandwidth

The quality of connectivity continues to increase, with approximately 59 per cent of primary and 77 per cent of secondary schools using ISDN. Special offers to schools were extended to cover evening and weekend use (but incur small additional costs) in April 2000, following consultation by Oftel. The service was also extended to FE colleges and public libraries. All FE colleges will be linked to JANET with broadband connections at 2 Mbits bandwidth by March 2001. Access has also increased significantly in the school sector, with 22 per cent of secondary, 23 per cent of primary and 23 per cent of special schools having broadband connections. The significant increase in connected computers outlined above suggests, however, that the majority of schools still using ISDN2 or dial-up modem connections do not have enough bandwidth to meet minimum recommendations.[28] Developing the broadband network through the regional broadband consortia and other means is therefore an immediate priority. Access to broadband will vary significantly depending on the urban or rural nature of the LEA. The Standards Fund guidelines require all LEAs to reach 20 per cent by 2002. This is not just a concern for the education system: the recent White Paper on Communications included the aim:[29] 'We will promote the availability of widespread access to higher bandwidth services and bring together public and private sector stakeholders to develop a practical broadband strategy'.

National Learning Network

The government is investing £74m in the NLN (see p.41). Becta has responsibility for managing key aspects of the rollout of the NLN. Becta has worked closely with the FE (ILT) committee in developing strategy and in ensuring its effective implementation through a range of supporting measures. The NLN aims to provide a high-speed broadband network for all FE colleges in England. Nine regional support centres in England, with 13 in all nationally, will support this development. In Scotland, Wales and Northern Ireland there are initiatives to strengthen ICT provision and connectivity and all four UK countries have been involved in exchange of strategic planning documents to ensure cohesiveness between these developments. A concerted effort has been made to ensure that the national roll-out of the UfI *learndirect* network is integrated effectively with FE

developments.

Ufl and *learndirect* centres

The national roll-out of the Ufl's on-line *learndirect* network took place in October 2000. This new on-line service will help meet the needs of small and medium businesses and will enable hundreds of thousands of people to improve their skills through a range of over 400 *learndirect* courses in areas such as business and technology skills, ICT and basic skills. These are supported by more than 700 *learndirect* centres across England, Wales and Northern Ireland. Parallel developments in Scotland are being carried through by Sufi (the Scottish Ufl).

'Digital divide'

The encouraging figures outlined above hide a wide difference between the best equipped and the least well equipped schools and colleges. For example, research into 'schools of the future' by Becta found that while very well resourced primary schools came from a wide range of socio-economic contexts, at secondary level there is evidence of a strong digital divide.[30] The 'schools of the future' at secondary level were predominantly found in more privileged areas (two-thirds of these schools were graded A or B for socio-economic privilege by OFSTED). This difference is exacerbated for learners when the home environment is taken into account, where the more affluent have the best access to computer equipment. An Office of National Statistics report revealed that the number of homes with Internet access has now reached 6.5 million (25 per cent of all households), while Oftel puts the figure at 28 per cent, but this varies greatly with income and region (3 per cent of poorer households, 48 per cent of the most affluent). One in three people has access to the Internet if work as well as household access is included (according to the annual report of the e-envoy).

A number of initiatives have been developed to help tackle this difference for learners, including the National e-learning foundation, Excellence in Cities, the City Academies and Computers within Reach. The new White Paper on Communications outlines the government's aim of achieving universal access to the Internet by 2005 at home and work, by offering 100,000 computers for low-income families at low rent and encouraging business and government to provide PCs and Internet access to employees.[31] In the community, it aims to establish by December 2002 over 6,000 UK Online centres, providing Internet access and support and to have all public libraries online by 2002. It is also assessing the costs and benefits of removing barriers to Internet access in pilot schemes covering disadvantaged communities.

The government's target is Internet access for all by 2005, via the computer, interactive digital TV, mobile phone or from public access points in libraries.

The Wired Communities project, starting in 2001, will bring homes in disadvantaged areas on-line.

The DfEE will report on access to ICT in disadvantaged areas annually, starting in April 2001.

School/ community links

Schools' ICT facilities will have to be made available for out-of-hours use by pupils and the local community, to be eligible for NGfL funding in 2001-02. Each school will have to submit an ICT development plan, with LEA approval, showing how out-of-hours accessibility will be achieved. Schools will pay for the hours needed to staff and run this initiative from the Standards Fund. Opening schools' ICT facilities up to the local community is part of the government's policy of reducing the digital divide and of ensuring that educational opportunities extend beyond the school day.

Managed services

Eighteen certified suppliers were announced on 10 May 2000 by Michael Wills MP, Parliamentary Under Secretary of State for Learning and Technology, for the third year of NGfL Managed Services. In June 50 per cent of schools stated that they could benefit from a managed service with 26 per cent of all schools indicating that they were in some form of managed service agreement.[32] Managed services can bring great benefits in terms of reliability and by ensuring that the benefits offered by ICT can be fully exploited within schools.

Procurement

In addition to the 'all-in-one' package offered by managed services, many educational practitioners would prefer the flexibility to purchase or hire equipment, technical support and software from a range of sources. These practitioners still need access to advice and help to ensure they reach an efficient and cost-effective ICT solution for their schools and LEAs. The government announced in January 2001 a new pilot Procurement Advisory Service. The pilot will run for two years from autumn 2001 and will be managed by Becta.

e-mail usage

All schools in Northern Ireland, England, Scotland and Wales have been, or are being, provided with standard domain names of the form <school name>.<LEA or region>.sch.uk. The numbers of teachers and pupils reported as having e-mail addresses continues to increase. In secondary schools over half the teachers in England (52 per cent) had their own personal e-mail address compared with 32 per cent in 1999 and 9 per cent in 1998. The equivalent figures for primary schools were 37 per cent for 2000, 15 per cent for 1999 and 2 per cent for 1998. For pupils a similar increase was noted, so that for secondary schools 26 per cent of pupils had their own e-mail address compared with 12 per cent in 1999 and 3 per cent in 1998. For primary schools the equivalent figures were 9 per cent, 4 per cent and zero. These figures were reflected by the reported increase in use of e-mail by schools so that 69 per cent of secondary schools used e-mail for teaching and learning and 79 per cent for administration; for primary schools the equivalent figures were 53 per cent and 66 per cent.

Personal ownership

A number of government initiatives have contributed to the increased personal ownership of computers by teachers and others in the education system. In particular Phase 1 of the DfEE's Computers for Teachers scheme was completed in 2000, and 2001 sees the launch of phase 2.[33] This scheme offers eligible teachers in England a subsidy of 50 per cent towards the cost of a PC (from an accredited supplier) up to a maximum of £500. The DfEE will pay any income tax and National Insurance due. Phase 2 of the scheme is directed at Key Stage 3 mathematics teachers. Teachers participating in the scheme must have attended or be registered for ICT training. This phase of the scheme is expected to benefit 17,000 teachers, at an additional cost of £12 million, above the £20 million announced in 2000. Computers have also been provided to literacy and numeracy co-ordinators.

A separate scheme is being developed for FE teachers. This scheme - details of which are still to be publicly released - will be run by the LSC. It is expected to start in autumn 2001.

Future technologies

ICT continues to develop rapidly. The size and relative cost of processing power and bandwidth is decreasing. Mobile phone technology is combined with reduction in the size of processors. This has enabled a new type of hand-held 'palm-top' computer, with connectivity. The decreasing cost of computer technology means that access to processing power and Internet content is expanding into more sections of society. In particular more young people have access to ICT, in the family, in their school or college, and increasingly in a mobile and personal format.

Technological developments will continue. In May 2000 the UK Radio-communications Agency published a report in which it reviewed the development of wireless and on-line technology and attempted to predict how it will develop over the next ten years.[34]

The agency concluded that digitisation and Internet standards are driving progress toward convergence of the underlying technology for delivering information, communication and entertainment services to a wide range of user groups. At the same time, there is increasing competition between delivery 'platforms' or channels. Thus, for example, moving video images may be delivered over mobile phones, and e-commerce can take place over interactive digital TV. Ownership structures are changing fast, with horizontal mergers and alliances among content 'players' and vertical mergers along the value chain between content companies, aggregators or publishers and delivery companies.

Wireless

Wired and wireless technologies are interacting increasingly in the marketplace. For example, wireless services already offer converged voice, data and Internet access, soon to be available in broadband, via cellular, satellite and fixed wireless access networks and wireless in-

building systems. These will compete with – or sometimes complement – fixed-line broadband options such as ADSL and its successors, cable modems and optical fibre. Digital broadcasting offers greatly increased interactivity.

In October 2000 the DTI announced consultation on plans to make radio spectrum licences available for 'fixed wireless access' (FWA) for always-on Internet access and data services.

Some 16 licences have been awarded in the Broadband Fixed Wireless Access (BFWA) 28GHz auction, administered by the Radio-communications Agency. These licences will result in 60 per cent of the UK's population having access to broadband high-speed Internet services. There will be a further licence allocation in 2001, as well as consideration being given to getting these services to every part of the UK through national, regional and local initiatives.

Speed

There is a great deal of uncertainty about the speed of deployment of new technologies and services and of their adoption by businesses and consumers. It follows that the implications for demand and management of all these changes within the education system are far from clear. What can be said is that they appear to offer new opportunities to schools to expand the use of technology to promote learning.

Scenarios

The UK Radio-communications Agency presents various possibilities for the development of ICT by 2010. One possibility is that the telecommunications, computing, entertainment and consumer electronics industries will converge around open Internet standards and globally available open services. In this scenario those countries, companies, and consumers that master the Internet economy will prosper. An alternative is that diverse service packages offered through a range of closed proprietary networks will be seen as offering more security and convenience than the open Internet, which will reduce in importance.

Portability

There is similar uncertainty about the balance between portable and 'tethered' access to ICT in the future. Changes in life and work patterns may lead to large increases in the use of personal, mobile, converged services. In this scenario mobile hand-held computers will be the main terminals for networked services access. Alternatively, further increases in the speed and capacity of broadband optical networks (or other 'wired' technology) may lead to an expectation of high-volume communications, information processing and entertainment content as standard, which would lead to a decreasing emphasis on mobile devices.

White Paper on enterprise and

The White Paper *Opportunity for all in a world of change*, published in February 2001, sets out the government's next steps.[35] These will

innovation

include training some 10,000 people in ICT skills, establishing top class university innovation centres, basing enterprise in the regions through incubator funds and accelerating the take-up of broadband technology. The aim is for the UK to have the most extensive and competitive broadband market of any leading industrial country by 2005. In the White Paper it was announced that the government has commissioned a study from N M Rothschild to consider how we can ensure that schools reap the benefits of leading technology in the longer term as bandwidth grows.

UK Online - the broadband future

UK Online - the broadband future, a report to the Prime Minister by the e-Minister, outlines the steps the government will take to ensure a competitive and dynamic market in broadband services.

It predicts that about £500 million is likely to be invested over the next three years to provide broadband connectivity to schools, colleges, hospitals, universities, libraries, health care practices, UK Online centres and other public sector locations. Government will look at aggregating this demand, with a view to facilitating broadband roll-out in regions, particularly where companies may otherwise find it uneconomic. RDAs will take the lead in developing strategies for clustering demand. The government is also setting up a UK Online Broadband Stakeholder Group to be chaired by the e-Minister.

The DfEE is spending £79 million from the Standards Fund over 2000-02 to provide schools with broadband access to the Internet. The money is allocated to Regional Broadband consortia, responsible for procuring bandwidth and developing locally relevant educational content.

SuperJANET4, which went live in March 2000, will connect FE colleges to a high-speed broadband network operating at speeds of 2·5 gigabits per second.

The DTI are to work with the Digital Content Forum and other interested parties to develop pilots stimulating the creation of local broadband content from providers who may include local businesses, newspapers and schools, as well as infrastructure providers. Pilots for these projects will be held in 2001-02.

Appendix: Glossary   52

ADSL	Asymmetric Digital Subscriber Line
ALI	Adult Learning Inspectorate
BESA	British Educational Suppliers Association
BETT	British Educational Technology & Training (event)
CBDS	Common basic data set
CALL	Community Access to Lifelong Learning
CLC	City Learning Centre
DENI	Department for Education in Northern Ireland
DfEE	Department for Education and Employment
DTI	Department for Trade and Industry
EAZ	Education Action Zone
EDP	Education development plan
EiC	Excellence in Cities
FENTO Organisation	Further Education National Training
FWA	Fixed wireless access
GCSE	General Certificate of Secondary Education
GTC	General Teaching Council
HE	Higher education
ICT	Information and communications technology
ILR	Individualised Learner Record
ILT	Information and learning technology
ISR	Individualised Student Record
IT	Information technology
JANET	Joint Academic Network
JISC	Joint Information Systems Committee
LEA	Local Education Authority
LLP	Local Learning Partnership
LSC	Learning and Skills Council

NATED Department	(Welsh) National Assembly Training and Education
NCSL	National College for School Leadership
NGfL	National Grid for Learning
NILTA	National Information and Learning Technologies Association
NLN	National Learning Network
NLS	National Literacy Strategy
NNS	National Numeracy Strategy
NOF	National Opportunities Fund
OFCOM	Office of Communications
OFSTED	Office for Standards in Education
PLASC	Pupil level annual school census
PMS	Performance Management Strategy
QCA	Qualifications and Curriculum Authority
RDA	Regional Development Agency
SBS	Small Business Service
SEN	Special Educational Needs
SME	Small and medium-sized enterprise
TTA	Teacher Training Agency
Ufl	University for Industry
UKERNA	UK Education and Research Networking Association
VTC	Virtual Teachers Centre