



DIGITAL FUTURE INITIATIVE

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DIGITAL FUTURE INITIATIVE

CHALLENGES AND OPPORTUNITIES FOR
PUBLIC SERVICE MEDIA IN THE DIGITAL AGE

A REPORT BY THE DFI PANEL
JAMES BARKSDALE AND REED HUNDT
CO-CHAIRS



CHALLENGES AND OPPORTUNITIES FOR PUBLIC SERVICE MEDIA IN THE DIGITAL AGE





DIGITAL FUTURE INITIATIVE:

**CHALLENGES AND OPPORTUNITIES
FOR PUBLIC SERVICE MEDIA IN THE DIGITAL AGE**

A Report of the Digital Future Initiative Panel

December 15, 2005

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TABLE OF CONTENTS

Membership of the Digital Future Initiative

| | |
|--|------------|
| Foreword by James Barksdale and Reed Hundt | 1 |
| Executive Summary | 5 |
| 1. Challenges, Opportunities and Obstacles: A Transition to the Digital Future of Public Broadcasting | 15 |
| Modernizing Education: A Series of Lifelong Education Initiatives | 18 |
| Community Engagement: Local Roots, National Solutions | 21 |
| A 21st Century Delivery System: Any Content, My Time, My Way | 22 |
| Public Broadcasting’s Strengths: Trust and Localism ... And a Weakness | 23 |
| Strengthening Public Broadcasting for the Future: Finding the Digital Transformation | 25 |
| 2. Analog to Anytime: The Traditional Broadcast Era is Ending | 31 |
| New Tools, New Rules | 31 |
| Four Transforming Trends | 34 |
| The New ‘Broadcast’ Paradigm..... | 37 |
| 3. Challenge No. 1: Lifelong Education Initiatives..... | 41 |
| The Challenge: Improving Student Achievement in the Media Age | 41 |
| The Opportunity: Generation M, Meet Public Service Media..... | 45 |
| Why Public Media Can Boost Academic Achievement..... | 46 |
| Digital Learning and Student Achievement | 48 |
| The Recommendations: Making the Leap with Public Television’s Digital Learning Services | 49 |
| 1. Early Childhood 360 Initiative: Tools for Teachers, Parents and Caregivers | 54 |
| 2. A National E-Learning Content and Applications Initiative..... | 60 |
| Applications for Special Communities of Learners | 67 |
| 4. Challenge No. 2: Community Engagement..... | 73 |
| A. Nurturing Localism: A Digital Civic Forum for Every State..... | 73 |
| B. Public Health, Public Media: A Public Health Information Service | 79 |
| C. Connecting Communities: An Emergency Preparedness Network | 85 |
| 5. Challenge No. 3: The Digital Content Transformation..... | 93 |
| A. A Public Service Media Web Engine | 94 |
| B. Transitioning Content: Digital Rights Acquisition..... | 99 |
| 6. Funding the Digital Content Transformation and the Need for a Privatized Digital Future Endowment | 103 |
| The Unfunded Future: The Costs of the Digital Content Transformation | 103 |
| The Need for a ‘Digital Future Endowment’: Private Operation, Public Accountability | 108 |
| Seeding the Fund: The Need for Enhanced and Sustainable Income | 110 |
| Enhancing Both Private and Public Support for the Digital Future | 121 |
| 7. Next Steps: We Can Get There From Here | 123 |



FOREWORD

As the public broadcasting system approaches its fifth decade of service to this country, it is confronted by technologies and trends that are fundamentally reshaping the American media landscape. The ongoing transition to digital media technologies is for public broadcasters both a great challenge and a momentous opportunity. Our nation's media marketplace is becoming increasingly fragmented and on-demand. Yet, as one-way, over-the-air broadcasting loses its pre-eminence, the demand for content that can be accessed anytime and anywhere, on a growing variety of platforms and devices, will steadily expand. If today's public broadcasters can successfully adapt to this new environment, the potential for enhanced public service through digital media is vast – in education, civic engagement, health care and other pressing public needs.

At such a critical juncture, it is useful to step back and consider the larger, longer-term public interest. The first Carnegie Commission on Public Television played such a role four decades ago, mapping a vision that led directly to the enactment of the Public Broadcasting Act of 1967. A movement by communities to sponsor

educational television stations, which began in the 1950s, was thereby enhanced to create a national organization, the Public Broadcasting Service, and an agency to channel federal support, the Corporation for Public Broadcasting, that ensured that every state and media market would have at least one noncommercial TV and radio station.

Thanks to the generous support of the MacArthur Foundation and the leadership of PBS, we have been privileged to co-chair the Digital Future Initiative, a panel of national leaders from outside the system and within it. As a kind of latter-day Carnegie Commission, the DFI panel has spent much of the past year considering the future of public broadcasting and how this highly valued institution can best serve Americans in the years to come. The future of the public broadcasting system rests heavily on the path it chooses now.



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This report – the elaboration of a vision for the digital future of public service media – is not a passive academic analysis of public broadcasting’s current situation. Rather, it is intended as a suggestion of how much more the public broadcasting system can and should do for this country – if it is given adequate resources to take advantage of the possibilities of digital technology.

Today, public broadcasting cannot make



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realistic plans at any level – stations or network – that are commensurate with the challenges and opportunities of the new digital era. The system is too dependent on the vagaries of year-to-year congressional appropriations. It is also too dependent on the vagaries of various drives for charitable contributions. Public service media needs new, substantial and sustainable resources to be sure it can not only keep the doors open, but also keep pace with the public’s growing need for trusted, noncommercial media.

This report also represents a truly collaborative effort. Our distinguished colleagues on the DFI panel brought to this task a broad diversity of perspectives and experience, as well as a passion for public service media. We also deeply appreciate the detailed input the panel has received from local station leaders, national experts and others.

At the DFI’s first meeting in December 2004, we quickly decided that tackling the

nation’s literacy and learning crisis should remain the single most important mission for public service media. We agree with those who argue that America’s educational system is in crisis, one evidenced by stagnant student achievement and declining global competitiveness. More than 30 percent of our children are not even completing high school. And almost 50 million American adults over the age of 16 are functionally illiterate; they can’t read a newspaper and understand it, or make sense of a map. This has a negative impact on American businesses, on our nation’s economic productivity, and on the prosperity of individuals and families. It also threatens our democracy, since even the most essential role of electing and holding public officials accountable demands an awareness and understanding of increasingly complex public policy choices.

Although study after study tells us that skill development in early childhood is the most crucial element of a child’s education, for all too many of our children, this element is lacking. The widespread failure to deliver adequate early childhood education (by parents and other caregivers, not just formal teachers) has deep and lasting repercussions, as most of these children never catch up. Instead, they often find themselves unable to compete in an increasingly knowledge-intensive workplace. This is cause for concern not only because we owe more to all our children, but also because a high-quality workforce is essential for national competitiveness in the global economy. Already, U.S. firms are forced to look overseas not only for cheap labor, but increasingly for highly-skilled workers in

FOREWORD

precisely those areas – including math, science and engineering – where American students are struggling.

This widening academic gap is among the greatest threats facing us as a country – and the single most important point of convergence between the strengths and capabilities of the public broadcasting system and the needs of the country. The combination of deep local roots and national infrastructure, a tradition of creating excellent and informative multimedia content, and a reputation for trustworthiness makes the public broadcasting system a natural candidate for national leadership in the campaign to prepare our young people to learn, and to help make all our citizens far better educated. Public broadcasting is uniquely positioned to contribute to education whenever, wherever and however our citizens want to access it.

Emerging digital media technologies hold great potential as educational tools. Their interactivity and responsiveness to individual needs can provide the sort of one-on-one attention for our students (of all ages) that we cannot currently afford. However, this potential is rarely realized in America’s schools today because, while in most cases the digital infrastructure is in place, educational content is largely lacking. The tracks are in place, but the trains are too few and far between. Working closely with teachers and other educational experts, we feel that public broadcasters must step up and help supply this educational content.

Today’s children are immersed in digital media, consuming an average of 45 hours

per week, far more time than they spend in school. Worse, much of this content – whether violent video games or inappropriate television shows – lacks redeeming value. But we should not blame the technology for declining achievement; it is a delivery mechanism. The reality is that while media is a big part of the problem, media is also essential to the solution. Learning for future generations will come increasingly through new digital media, in and out of the classroom, in a more hands-on and interactive way than is typical today. Amid decades of national hand-wringing about the “idiot box,” public television used creativity, animation and audio to teach kids to read, count, do math and learn history, geography and science. In the same way, public broadcasters must be open to turning this new generation of powerful digital media platforms to the service of American society.

This service should not be limited to a narrow conception of education. We believe that in the digital future, all Americans should continue to be able to depend on public broadcasters to furnish them with the reliable, unbiased information they need in the course of their lives. In the report, we identify a number of areas where the need for information goes unmet by the commercial media, and where we believe public broadcasters should expand their current services, leveraging digital technologies to engage the needs of



Today’s children are immersed in digital media, but much of this content – whether violent video games or inappropriate television shows – lacks redeeming value

communities nationwide. This is particularly true in the broad and critical area we call Community Engagement. For example, we recommend that the ability of local public television and radio stations to



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broadcast multiple channels of programming in digital formats should be leveraged to greatly expand coverage of local civic affairs. Likewise, health care and emergency preparedness are critical issues where public broadcasting is ideally suited to offer both a reliable source of new broadcast content and a multimedia Internet gateway to aggregations of trusted information in a user-friendly format.

At its essence, this report concludes that America's emerging digital media environment and the public's increasing need for a trusted source of noncommercial information suggest that public service media should remain an essential part of our national life. Public broadcasting's most basic strength has always been, and must remain, that it is fundamentally open – open to new content, open to technological change and, most importantly, open to all points of view. For nearly 40 years, Americans have depended on public broadcasters to open their airwaves to every rational point of view, providing a civil and tolerant space for a discourse that is educational in the broadest sense of the word.

This report is not the end of the Digital Future Initiative, but its launching point. We call for an active Phase Two by leaders

from the local stations, PBS, National Public Radio and third parties to develop detailed programs, budgets and accountability metrics that implement these recommendations. There are many competing demands on the nation's public and private resources. Public broadcasting needs to be able to justify in detail why it needs substantially more funds and what it will do with a Digital Future Endowment. The DFI report is, we hope, a preliminary stage in the public broadcasting system's successful transformation to a new and expanded role in the digital future.

We expect that public broadcasters will continue to offer the nation the best service they can. But ultimately, the success or failure of the vision our panel lays out in this report lies, in great part, out of the control of those within the system. It is up to us – it is up to all Americans – to decide whether public broadcasters will receive from both private and public sources the resources they need to continue to serve us with the best and most trustworthy informational content available.

Finally, we wish to thank the public-spirited supporters of this endeavor for their irreplaceable contributions: We especially thank the members of the DFI panel for their dedicated service; PBS President Pat Mitchell for initiating this process – and her peerless leadership in carrying it onward; Michael Calabrese, the DFI project leader, for drafting the panel's report; and the dozens of PBS, NPR, and local station staff who generously offered their counsel and expertise throughout this process.

**James Barksdale
Reed Hundt**

Co-Chairs, Digital Future Initiative



REPORT OF THE DIGITAL FUTURE INITIATIVE

EXECUTIVE SUMMARY

America's public broadcasting service stands at a historic intersection of challenge and opportunity:

The challenge is to shape the transformational changes associated with today's new and rapidly evolving digital media technologies for the public good. The era of broadcasting as an exclusively scheduled and one-way service is ending. Already the "push" of scheduled and limited programming is steadily being replaced by the "pull" of more diverse content selected by consumers – media on "my time" that is also segmented and formatted for delivery not only on television and radio, but also on computers, cell phones, PDAs, iPods and other increasingly portable devices.

The opportunity for increased public service in this digital future is even more dramatic than the technological shift. The digital transformation creates not only vast new commercial markets for media, but also enormous new opportunities for *public media* to meet the nation's diverse needs for lifelong education, increased engagement in local civic affairs, public health and emergency preparedness information, and other noncommercial content. It will be an

era in which public broadcasting's strengths grow even more obvious and unique. No other media enterprise is better structured with its national/local model of service, or more experienced in the use of technology, or better positioned with its high level of trust, to capture additional value in the Digital Age. At the same time, no other media enterprise is more poorly financed to pursue the opportunity. The mandate of the Digital Future Initiative (DFI) is to put forth new possibilities for service and for securing the resources to provide them.

From the beginning, public broadcasting has been underfinanced for the mission so clearly laid out in the 1967 Carnegie Commission Report, a report that President Lyndon B. Johnson echoed as he signed the Public Broadcasting Act, challenging public broadcasting to manage the miracles of mass communication (then limited to television and radio) to create miracles of learning and to be a marketplace of ideas. Within a few short years this mission – to use media to educate, to inform, to inspire, to reflect this country's history and culture –

 ***The era of broadcasting as an exclusively scheduled and one-way service is ending***

united local public television and radio stations into a national “network” reaching every community, connected by a new satellite interconnection system, and receiving small annual appropriations from Congress.

With a unique national/local delivery of programs and services and a public/private structure for funding, public broadcasting has been creating “miracles” ever since:



As one-way, analog broadcasting is supplemented by a wide variety of digital media formats and platforms, the public broadcasting community needs to reconstitute itself as public service media

producing the very best in educational children’s programs, comprehensive science and history content, and top quality drama and cultural performances, while also becoming the nation’s most trusted source of news, information and independent documentaries. Public broadcasters have also led the way when new technology applications emerged that could enhance public service. Public broadcasters pioneered closed-captioning on programs, distance learning, delivery of curriculum content to classrooms and, significantly for this report, were the first broadcasters to transition to digital technology over both television and radio, an unfunded mandate that will cost at least \$2 billion to complete.

Now the question is how to harness the new, rich and flexible digital media technologies to create new miracles of learning and community engagement. This report attempts to address how best to do just that: to turn technology’s challenges into

opportunities, technology’s promise into actions. Specifically, the report focuses on four areas where digital technology can meet the growing educational needs of learners of all ages, and also strengthen community and country by informing and engaging citizens about the civic issues of our times – from health care, to the processes of democratic governance, to the exigencies of emergency alert and preparedness.

As one-way, analog broadcasting is supplemented by a wide variety of digital media formats and platforms, the public broadcasting community needs to reconstitute itself as *public service media*. Rather than serving as an arbiter of excellence in scarcity (deciding what airs on a limited time schedule), PBS, NPR and their member stations now have the opportunity to be the conveners and leaders of a much larger effort to create far more content and support its delivery in far more ways.

The audience-aggregating power of the Internet, combined with low distribution costs, makes viable “niche” programming that is not economically feasible for either commercial or public broadcasters today, but which the original Carnegie Commission challenged public broadcasting to provide from the beginning. Public broadcasting can employ digital media to enhance delivery of public service media to traditionally under-served groups while expanding offerings to all Americans by offering a national (indeed, international) outlet for local and specialty programming.

Public broadcasting is uniquely qualified to address these challenges: It is one of the

EXECUTIVE SUMMARY

most trusted public institutions in the nation; it is deeply rooted in American communities, with 348 public television stations and an even larger number of public radio stations operated by colleges and universities, community foundations, state commissions and school districts; and it has a proven record of producing high-quality programming with the public interest foremost in mind. Now it is time for public broadcasting to meet the challenges of a new era.

As it embraces emerging media technologies, public broadcasting can and must use these tools to address two urgent national challenges: lifelong education (from our youngest toddlers to our oldest citizens) and community engagement.

A Digital Future for Lifelong Education

For all the progress that many of the nation's schools and school systems have made, student achievement is still stagnating in critical subject areas and in too many communities. Although a nation's human capital will increasingly determine the living standards of its citizens, America's young people lag behind their counterparts in many of the countries that are our economic competitors. In tomorrow's globalized, high-technology economy, workers will need more skills and knowledge than ever before to qualify for and keep new and better jobs. That is why public television should greatly expand and improve its efforts to promote lifelong education for Americans – from the developmentally crucial preschool years, to K-12 and home school education, to higher education,

continuing education, education for the learning disabled, workplace training and retraining. In the new economy, education is a lifelong process.

A recent study of the media habits of children aged 8 to 18 dubbed today's youth *Generation M* (for Media). While media is a big part of the problem, it is also essential to the solution. One way to leave no child behind is to follow them home. If "Gen M" is not likely to reduce their media consumption, then we need to reach them everywhere they are with compelling but also educational content.

Unfortunately, the nation's schools do not have the educational content to make the fullest use of these new technologies – indeed, most children and adolescents have more sophisticated media technology and software in their bedrooms than in their classrooms. Like commercial content, educational content must be customized for delivery on the devices that occupy more of their time than school itself – the Internet, video games, DVDs, iPods and, yes, sometimes even broadcast television – not only with dedicated channels for kids and education, but also with curated gateways to a vast and indexed archive of educational video on demand.

Public television has demonstrated excellence in promoting and improving early childhood learning. Now is a pivotal time to provide public television with substantial new resources to expand from that base. Government spends \$500 billion annually on public education – but less than \$50 million on R&D and content for educational



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technology, far less than what is spent by the video game industry alone. In its most important recommendations, this report explains why and how public television should promote lifelong education by launching two far-reaching national educational initiatives with a wide range of traditional and nontraditional partners:

Ready to Learn: The Early Childhood 360 Initiative

We need to build on the proven success of PBS's *Ready To Learn* program to prepare



Research shows that if children have not mastered basic learning skills by the third grade, they never catch up

content and training materials for parents, teachers and caregivers so that our youngest children are far better prepared to read and learn. Research shows that if children have not mastered basic learning skills by the third grade, they never catch up. A few broadcast television

programs, regardless of their quality, are not enough. We need to fund an extensive, multimedia, on-the-ground outreach and training effort – through local stations in partnership with educators in communities nationwide – to teach and equip the adults who prepare our youngest children to be ready to learn at school.

Lifelong Educational Content: The National E-Learning Initiative

We call on PBS to convene and lead the creation of an extensive new online library of digital educational content and new e-learning tools (such as electronic games) with an initial focus on the third through the twelfth grades. This will include

producing content in key areas such as math and science for special communities of learners, particularly the home-schooled, students with learning disabilities, students from homes where English is the second language, and adults needing literacy and workforce training. This content will be available online and supported by sophisticated new search, segmentation and other tools.

A Digital Future for Community Engagement

We believe that public broadcasting can and must leverage its unique strengths – particularly its strong local roots and reputation for trustworthiness – to address three important needs currently impacting American communities: first, the need for a robust, thoughtful, factual and civil discussion and coverage of local, state and national civic affairs; second, the need for broad dissemination of public health information for our citizens; and third, the need for localized emergency preparedness education and emergency alert communications that anticipate potential disasters and disruptions.

Civic Engagement

The cornerstone of a healthy democracy is an informed and engaged citizenry. However, the commercial broadcast media leave gaping holes in the coverage of public issues and the workings of our democratic institutions on the local, state and national levels. The discussion that does take place about public issues has become increasingly partisan, sensationalized and devoid of objective facts. It is hardly a surprise that in this environment more than half of all

EXECUTIVE SUMMARY

Americans don't even vote in most elections.

At the local, state and national levels, public broadcasting already offers high-quality public affairs programs, including local news and discussions. Both NPR and Public Radio International (PRI) have expanded their excellent national and international coverage even as the commercial networks slash theirs. This report recommends that public broadcasting build on these efforts and create digital channels and online portals for Americans to access improved and expanded coverage of local news and governmental, civic and cultural affairs. Eventually, public broadcasting should create public squares – digital civic forums – in every state. Public television stations in Alaska, Minnesota and other states are already leveraging their digital multi-channel capacity for this purpose – and, with adequate resources, the new technologies can allow public service media to facilitate informed civic engagement in every state.

Public Health Information

America's aging society faces an increasing number of personal and public health issues, yet our nation has few and intermittent means of communicating important health care information via the mass media. The mere existence of excellent information on a website is not sufficient to meet the need. Public broadcasters in states like Kentucky are already leading the way. This report recommends that public television and radio partner with expert health care organizations to offer on-air and online

content, along with community outreach, to provide a substantial increase in reliable public health information to the public in every locality.

Community Preparedness and Homeland Security

The terrorist attacks of September 11, 2001 challenged the security of the United States and the safety of its citizens. They uncovered weak spots in the nation's emergency communications infrastructure, gaps made more glaringly apparent during Hurricane Katrina this year. One of the greatest weaknesses is that most of the nation's emergency response agencies and personnel – even those in the same communities – cannot effectively or efficiently share information among themselves or with the public.

Emergency preparedness and response is not a core mission of public broadcasting, but the system has national satellite and fiber capacity to contribute, and its member stations make up a network reaching 98 percent of the American public. The public broadcasting system cannot and should not become the national or local emergency network, but given their public interest mission and credibility, PBS, NPR and member stations can convene national and local partnerships to create interoperable and more effective public emergency alert and information systems,



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leveraging both current and new digital capacity. In addition, public broadcasters have the content creation and communications expertise to generate national and local preparedness programming for broadcast and Internet access in emergencies, for public education and for emergency responders (“just-in-time training”).

Making the Digital Transformation

To make the transition from one-way broadcasting to public service media, and particularly to serve the educational and community purposes discussed above, PBS, NPR and their national and local partners should work jointly to create an innovative

and unprecedented content archive and delivery system.



Without digital rights, the great treasure of the national and local station archives will be lost for many of its best educational and other uses

Unlocking Existing Content

Public television and radio have produced a treasure trove of content over the years. But this content is not automatically or readily available for use in the digital world.

Two steps are necessary to make this content available for delivery on demand. First, intellectual property rights must be addressed. In general, most public broadcasting entities do not have 100 percent ownership of – that is, unrestricted rights to use – programming they have broadcast. Their rights are often limited to broadcast use and limited in time. A continuing, anytime, on-demand content service requires the intellectual property

rights to use the content for those new purposes in new and diverse formats. This involves an extraordinary process of agreements between public broadcasters and producers, unions for creative talent, holders of music rights and others. Second, the content needs to be digitized, reformatted and indexed by segment so that it is easily accessible and searchable by teachers, students, parents and others. Some users may want the entire program; some may want clips; some may want some of the backup material on a website. This combination of rights and reformatting presents a complex and expensive hurdle.

The stakes are high. Without digital rights, the great treasure of the national and local station archives will be lost for many of its best educational and other uses. Public broadcasting will not be able to use the content in these new ways. And educators, students, parents and every interested American will be the losers. That is why we recommend that additional funds be provided to public broadcasting to purchase the rights and make it possible to convert archived programming to digital forms for new educational, community service and other noncommercial purposes. This will not be cheap, but the cost of not doing it will be much higher, for our children’s education and our nation’s civic and cultural life. It is why we also recommend that PBS provide a national service of rights management through the public service media engine discussed below.

The New Distribution Services Paradigm

PBS and NPR have long histories of serving their member stations by providing a

EXECUTIVE SUMMARY

national network interconnection. We need a 21st century version of that – a *Public Service Media Web Engine*. This set of services would make it possible for Americans to access public service media anywhere, anytime and on demand through current local and national portals like pbs.org, npr.org and station websites.

The mechanisms would be invisible to consumers, but the fully customizable, searchable, web-based set of content and services backing up the portals would provide virtually unlimited “shelf space” for new, current and archived content. It should become the world’s largest aggregation of noncommercial media content – and also include resources from other national and local public institutions as well. It would increase the use of all content in any place and at any time. And it would improve the calculus of content creation for the nation’s noncommercial media creators because it would expose those products to an international audience, not just a local one. Just as they manage the current satellite and fiber interconnection system on behalf of their members, so too could PBS and NPR take the lead in developing this on-demand model as a new media distribution system open to the content of all public service media creators.

Funding the Transition to Public Service Media

Bringing public broadcasting into the digital age will require substantial new resources. But America’s public broadcasting system – particularly the nation’s 348 local TV stations and their national organization, PBS – is facing a

crisis of its own. While the system’s income is essentially flat and barely adequate to continue current analog operations in most local markets, the one-time cost to transition the system’s infrastructure and content from analog to fully digital will require an additional expenditure on the order of \$2 billion over five years. Where will these resources come from? There is no one silver bullet.

The current federal contribution to public broadcasting has never been sufficient. Alone among the public media services of the world’s leading nations, public broadcasting in America is overly dependent on the vagaries of year-to-year Congressional appropriations. For every federal dollar received, PBS, its producers and stations have leveraged \$5 to \$8 from the private sector to sustain both a national program schedule and robust local programming. However, with increasing production costs and growing needs to retain rights to optimize value across all new digital media platforms, more funds will be necessary merely to sustain what is currently being produced and distributed. Simply to purchase the infrastructure it requires if it is to keep broadcasting in digital only, the public broadcasting system requires an additional \$700 million over the next five years. To complete the digital content transformation and provide expanded content and services for education and other urgent needs, public broadcasters will face additional substantial costs.



America’s public broadcasting system – particularly the nation’s 348 local TV stations and their national network, PBS – is facing a crisis of its own

The system needs to raise new and more substantial, sustainable and independent streams of private *and* public funding. The current funding models for public



America's public service media system cannot thrive in the digital future if it remains dependent on inadequate, unpredictable and potentially politicized annual appropriations from Congress

broadcasting are woefully inadequate to make a robust transformation to the digital era, let alone to meet the challenge of providing the enhanced educational, civic and community information services recommended in this report. Business leaders, foundations and philanthropists need to invest significantly more than they do at present in the programs recommended here. At the same time, we believe that America's public service media system cannot thrive in the digital future if it remains dependent on inadequate, unpredictable and potentially politicized annual appropriations from Congress. While the panel believes it is premature to endorse any particular source, the report suggests possible options for new public revenues, including modest user fees on new digital televisions and video recorders, on non-educational video games, and increased annual user fees on commercial broadcast spectrum licenses.

We recommend that these new resources be managed through a private and independent *Digital Future Endowment*, which could be administered through distinguished independent boards affiliated with the existing PBS and NPR foundations. These foundations should leverage public funds, or earmarked user fees, with stepped-up private fundraising

efforts on a matching basis. Where appropriate and possible, their grants should be subjected to clear, research-based performance requirements.

We challenge federal and state governments, foundations, private sector institutions and public broadcasting's leaders to consider this new era in media, the Digital Age, as the time when public service media, more than at any other time in its proud history, should have both the expansive vision and the resources to meet its mission to serve the public.

Next Steps

This report kicks off a national effort to bring public broadcasting into the digital era, as *public service media*, so that it can meet the nation's needs in education and community engagement while continuing its unique contribution to our cultural life. The national organizations and the stations they serve need to work together to assess the needs of the public and then to shape responses to these needs that both national content and local content and services can best fill. A strong PBS and a strong NPR are essential to meeting new demands and seizing the new opportunities outlined in this report. However, there is just as critical a role for the local stations, which will be much more than distributors of national content, as indeed they are now. They will be full partners in the development of new content and the evolution of current educational services to meet the needs of students and teachers, and essential in fulfilling public service media's role in every community to be the public square, the forum for diverse ideas, perspectives and in-depth civil discourse.

EXECUTIVE SUMMARY

Getting the balance right between national and local in terms of the content and distribution of new services will take thoughtful consultation with local PBS and NPR stations and their constituencies throughout the country. This consultative process has already begun at PBS, as the system's president and CEO is traveling to various communities, at the invitation of local stations, to hold public forums and meetings with constituency groups such as teachers, university and college partners, and business and cultural leaders. There need to be as many of these local consultations with

communities as possible to ascertain what the public needs and expects from digital media and how public service media should respond to these needs with new and valued services.

We hope that PBS and its colleagues will carry our recommendations forward. We strongly encourage the public television system to establish working groups of leaders from among its staff, its stations and producers, third-party experts and allies to develop detailed business plans and budgets for delivering the specific programs to meet the vision described here.



CHALLENGES, OPPORTUNITIES AND OBSTACLES: A TRANSITION TO THE DIGITAL FUTURE OF PUBLIC BROADCASTING

America's public media stand at a crossroads.

When Congress passed the Public Broadcasting Act of 1967, PBS and its stations became the educational and noncommercial alternative in a three-network, exclusively over-the-air television market. With the launch of *All Things Considered* in 1971, NPR set a new standard in radio for thoughtful, in-depth public affairs content to which it has held ever since. Now, 35 years later, today's already fragmented, 500-channel cable and satellite subscription TV market is about to change radically again. Broadcast radio, too, is facing new challenges, including increased competition from satellite radio, Internet radio and podcasting.

A new digital era is emerging – an era of personal, portable and interactive devices with access to content in forms of the consumer's choosing, virtually anywhere and at anytime. The traditional "push" of scheduled and limited content will be steadily eclipsed by the "pull" of unlimited content on demand for use not just on television and radio, but also on computers, cell phones, PDAs, iPods and other devices. In the past two months alone, commercial

broadcast networks ABC, NBC and CBS all announced plans to offer episodes of popular current TV shows for download and on-demand viewing at a nominal cost, while Warner Brothers has announced its intention to make thousands of episodes of classic TV shows from its extensive library available on demand for free to users of its AOL service.

As PBS, NPR and their hundreds of local stations retool to make their own transition to this new world of digital, portable and on-demand media, they too must reconsider their mission. Public *broadcasting* needs to reconstitute itself as *public service media*. Public broadcasters need to define themselves more by the excellence of content they help produce, rather than the means by which it is distributed. The profusion of commercial delivery platforms (e.g., Internet, cable, wireless) and the power of computing will, over time, seriously change how most Americans access "content" of all kinds, and thereby change the role public broadcasters play.

 **A new digital era is emerging.... The traditional "push" of scheduled and limited content will be steadily eclipsed by the "pull" of unlimited content on demand**

As they maintain the high quality services presented to the public today, and embrace emerging media technologies, public broadcasters should in practice address two national needs that PBS, NPR and their affiliate stations are uniquely qualified to tackle.

First and foremost is education. There is the urgent need to address the nation's education crisis and to support learning for



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Americans of all ages. As innumerable studies have concluded, and as the nation's educators would be the first to confirm, we need new, better and more accessible methods to get our preschool children ready to learn. We must also boost the effectiveness of instruction in literacy, math and science for a generation of students who need the capacity to compete in a global economy. Moreover, in today's high-skill, high-tech, highly competitive international economy, the need to develop and improve skills and knowledge continues long after age 18 or age 21. Workers need career-long education, training and retraining. With the increasing reliance on distance and Internet learning, public television should also expand its services to learners long past their school years. We therefore recommend very substantial initiatives in early childhood and lifelong learning.

In addition to this primary challenge of lifelong education, public broadcasting at both the national and station level needs to redouble its efforts in community engagement, with a focus on two crucial

problems: the need for a robust, factual and civil discussion of local, state and national public issues, and the health of our citizens.

Public broadcasters can also help to mitigate another problem – the coarsening of our culture. The popularity of violent and sexually inappropriate video programs and games, and our children's easy access to them, has sparked new waves of alarm. Commercial television continues its race to the bottom – not only on late-night cable, but even during what was once the “family hour” on network TV. Ultimately, it's all about content. We can vilify the violent video game, and the machine on which it's played, or we can turn that machine into an ally and harness its power to teach something good. In the past few decades, while many assailed television as the idiot box, public television used creativity, animation and audio to teach kids to read, count, do math and learn history, geography and science. Likewise in our increasingly always-on, interactive and multimedia future, it's all about content, and how we use it.

From America's education crisis to the challenges of improving local civic life and public health, the nation needs a thorough retooling and refocusing of our public broadcasting system. PBS, NPR and other public radio distributors, and local stations should continue to provide the educational and other public service content that the commercial market does not. The need for noncommercial, multimedia public service content from a trusted source will only grow, so now is decidedly not the time to reduce public funding for public service media.

CHALLENGES, OPPORTUNITIES AND OBSTACLES

The public broadcasting system brings special and considerable resources to these challenges. The public networks and their stations have decades of experience and accomplishment; they enjoy the trust of the American people; they are deeply rooted in hundreds of communities; and they have longstanding working relationships with national and local institutions of all kinds, from colleges and universities to school systems, parent organizations, and civic, scientific and religious organizations, to name just a few. While public television has become less visible in a landscape flooded with hundreds of cable and satellite TV offerings, it is every bit as essential to address unmet needs for noncommercial and educational programming. In the world of analog broadcasting, it stood out as a safe haven for children and a source of rich cultural, educational and public affairs programs. Amid the growing fragmentation of our digital, on-demand future, public service media can serve these purposes and add the capacity to address new and urgent national needs.

Equipping public broadcasters to embrace new technologies and address new challenges will also require new financial resources. After examining the system's needs and opportunities, we believe that increased, more independent and sustainable public and private sector support for public service media is both desperately needed and an important investment in our nation's future. However, the system's history of public service and extraordinary support among the electorate does not by itself entitle public broadcasting to far more public and private funding. There are many worthwhile causes and many competing demands on the nation's

public and private resources. In our first meeting, we decided that charting the digital transformation of public media must begin with an assessment of the nation's need for noncommercial information services. Along with its recommendations for embracing new technologies and addressing some urgent national needs, this report also calls for a process, including a variety of key stakeholders, to develop detailed programs and budgets to address those needs. Particularly in education, the programs need to encompass methods of quantifying performance and success.

If public broadcasters are to expand their mission and address these urgent public needs by harnessing emerging digital technologies, they will require substantial funds that are not now present.

The cost of building out the physical infrastructure required for the public broadcasting system's transition to digital has been estimated at \$1.9 billion. While PBS, NPR and their member stations have already covered a large fraction of this cost, current appropriations submissions for public broadcasting still indicate a financial liability of \$700 million for digital infrastructure over the next five years beyond the funds the public broadcasting system currently raises through public funds, individual pledges and private sources. In addition to this one-time technical transformation are enormous costs for content creation, intellectual



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property rights clearance for existing and new content, and the tools to manage and deliver both over multiple platforms and on-demand. We strongly recommend a process to develop specific programs to pin



Learning for the next generations will come increasingly through new media, in and out of the classroom, in passive, active and interactive ways

down these costs, develop specific proposals and priorities, and pursue the new sources of funds that will be required.

Mustering new resources to meet new challenges to serve the public in new ways is in the best traditions of public broadcasting. The media environment has changed,

but the basic purposes and guiding principles have remained. Unlike its commercial counterparts, public broadcasting is the only mass media ready and willing to direct its resources to leverage digital technologies to vastly expand – and localize – the information services it provides to the public for lifelong learning, public health, civic engagement, emergency preparedness and other pressing public needs that arise in the future.

The major new programming service initiatives that we recommend and describe in the remainder of this report include:

- *Early Childhood 360 Initiative: Tools for Teachers, Parents and Caregivers*
- *A National E-Learning Content and Applications Initiative*
- *Nurturing Localism: A Digital Civic Forum for Every State*

- *Public Health, Public Media: A Public Health Information Service*
- *Connecting Communities: An Emergency Preparedness Network*
- *A Public Service Media Web Engine*

Modernizing Education: A Series of Lifelong Education Initiatives

A central recommendation of this report is that education should remain a core mission for public television – and that PBS and its stations should play a primary leadership role in developing sources of e-learning applications and content that are universally accessible, affordable, aligned with state curriculum standards, and accompanied by local partnerships that include training for teachers, parents and caregivers.

Learning for the next generations will come increasingly through new media, in and out of the classroom, in passive, active and interactive ways. It must involve children, parents, educators, adult learners, educational institutions and others. No institution has the credibility, reach, track record, will and resource base to do this like public television – but we underline that we are calling for a much larger and more aggressive role for public television in particular.

Media Is Part of the Problem . . . and Essential to Its Solution

Our nation faces an educational crisis that demands new and more effective ways to reach students and educators alike to improve literacy, strengthen math and

A Brief History of Public Broadcasting in the United States

Local public radio and television stations have existed alongside commercial broadcasters since the earliest days of broadcasting in the United States. Although no national public broadcast service existed before the late 1960s, in 1952 a grant from the Ford Foundation established the nation's first educational television network, the National Educational Television (NET). In 1957, Senator Warren Magnuson introduced a bill "to expedite the utilization of television facilities in our schools and colleges, and in adult training programs." While this bill did not pass at the time, it ultimately resulted in the Education Television Facilities Act of 1962.

During the years immediately after, public support grew for transforming the loose association of "educational TV stations" scattered across the country – and supported principally by states, universities and foundation grants – into a strong, inter-connected system for public broadcasting. This led to the formation in 1965 of the Carnegie Commission on Educational Television, which recommended a blueprint for a broader, national service it called "public broadcasting." The Commission's recommendations quickly found champions in a reform-minded Congress.

On November 7, 1967, within months after the Carnegie Commission issued its report, President Lyndon Johnson signed into law the Public Television Act, which for the first time authorized federal operating aid to public television and radio stations through a new, private agency called the **Corporation for Public Broadcasting (CPB)**. Today, CPB administers close to 15% of public broadcasting's revenue, which it receives through advanced federal appropriations, and distributes these revenues among more than 1,000 public television and radio stations.

On November 3, 1969, CPB and various public television entities incorporated a new nonprofit organization, the **Public Broadcasting Service (PBS)**, to connect the nation's public television stations and to serve as a central distributor of national programming produced by its member stations. Today, PBS is owned and operated by 348 member stations that together reach 98 percent of American homes.

In 1970, **National Public Radio (NPR)** was created as a national production center for news, information and cultural programming, and as a coordinator for national program distribution. NPR began its national program service in 1971 with production of *All Things Considered*, then a daily hour of in-depth, primarily national, news, and is now the primary distributor of content to the nation's public radio stations.

In 1980, local public television stations formed the **Association of Public Television Stations (APTS)** to support a strong and financially sound noncommercial television service for the American public. APTS works on behalf of local stations to advocate public television interests at the national level.

In 1983, **Public Radio International (PRI, originally named the American Public Radio Network)** was formed as a producer and distributor of programming for public radio. PRI is now the nation's largest distributor of non-commercial radio content, delivering over 400 hours of news, classical music and contemporary culture programming per week. Several of the signature programs originally distributed by PRI, such as *A Prairie Home Companion* and *Marketplace*, have more recently switched to being distributed by **American Public Media (APM)**, the national production and distribution arm of Minnesota Public Radio.

science proficiency, and generally to provide the skills necessary to compete in a global, 21st century economy. While the distractions of electronic media are a big part of the problem, media technologies are also essential to the solution. One way to leave no child behind is to follow him home. If Generation M is not likely to reduce its media consumption, then we need compelling but also educational content. We need the capability to reach students, teachers and parents both in school and at home – in every community across the nation – with new and affordable educational technologies and content delivered across multiple platforms. Like commercial content, educational content must be customized for delivery on the devices that occupy more of our children’s time than school itself – the Internet, video games, DVDs, iPods and sometimes even broadcast television – and not only with dedicated channels for kids and education, but also with curated gateways to a vast and indexed archive of educational content on demand.

Compelling content delivered through interactive media applications can engage children and boost educational productivity. The U.S. Department of Education’s *National Education Technology Plan* laments that whereas technology has transformed virtually every industry, “[s]chools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks.”¹ The federal E-rate program has already connected virtually every classroom and library to the Internet, laying the

“tracks” for advanced learning applications and digital content. However, multimedia content and e-learning tools that are aligned with curriculum standards and easy for teachers, parents and students to use are in short supply, and certainly not accessible and affordable to every school district, much less to individuals. Yet, electronic textbook supplements, a searchable online library of video and data archives, interactive educational games and virtual reality simulations would be both more productive and more familiar to a generation that spends far more hours connected to digital media than they do in school.

A Digital Classroom: The Scope and Reach of Current Learning Services

Public television is uniquely positioned to lead the effort to modernize the nation’s learning infrastructure, combining national expertise in educational content creation with the presence of local stations partnered with school districts and educators in every state. PBS and its member stations constitute one of the country’s largest educational institutions, serving citizens across the country and learners of all ages, leveraging a broad range of technologies.

Here is the clearest indication of the advantages that public television brings to the challenge of educating our young people: Ask any parent and you will find that PBS is the most trusted brand for children and education, a safe haven for kids in a crowded and too often

¹ U.S. Department of Education, “A Golden Age in American Education: How the Internet, the Law and Today’s Students are Revolutionizing Expectations,” *National Education Technology Plan 2004*, available at: <http://NationalEdTechPlan.org>.

CHALLENGES, OPPORTUNITIES AND OBSTACLES

inappropriate media landscape. Although perhaps most admired for preschool educational programming – from the classic *Sesame Street* to the highly effective *Between the Lions* – PBS and its stations have already created a trusted, highly popular presence on the Internet. The pbskids.org website, which features enriching and interactive learning experiences for children, has become a popular “first website.” Services such as *PBS Ready To Learn*, *PBS TeacherLine*, and *WGBH Teachers’ Domain* already are leveraging public television’s content for educational instruction. PBS provides thousands of free curriculum resources to teachers and students; pbs.org receives more than 56 million visits each month, and roughly one-third of the traffic from adult visitors comes from educators. In addition to its educational services for kids and teachers, PBS and its stations are pioneering digital services for lifelong learning and workforce training as well.

The nation’s need for multimedia educational content is far greater, yet the resources invested in education, both programming and digital support for it, are being cut back. Government spends \$500 billion annually on public education – but less than \$50 million on research and development on educational technology. In contrast, the R&D costs for a top-ten video game now routinely average \$15 million each. We believe that it is critical to our nation that PBS and its stations have the resources needed to play a leadership role, at both the national and local levels, in convening the public and private organizations which care deeply about the need to have an educated society, and to leave no child or adult out of it.

Community Engagement: Local Roots, National Solutions

The vibrancy and effectiveness of America’s democracy and economy depend on our citizens’ ability to access accurate and in-depth information as they make important decisions. Unfortunately, it has become clear that in two areas of national life this information flow has been inadequate, and the disconnect is threatening the health of our society. Increasingly, the quality of available information about public affairs and public health is often inadequate to support citizens as they make choices that affect their lives and the lives of their neighbors. And although these issues are relevant nationwide, their impact is often felt most intensely at the level of the individual community (which is also often the location of critical relevant information). PBS, NPR and their local stations – with their deep local roots and their reputation for providing trustworthy content – are ideally positioned to help solve these problems by leveraging emerging technologies to provide the information and resources a healthy society requires.



Increasingly, the quality of available information about public affairs and public health is often inadequate

Despite the desire to better inform and motivate civic engagement, however, the number of PBS stations doing so remains small. Currently, only 20 PBS stations have the resources to offer in-depth local news programming and only a few have been able to launch a dedicated civic affairs channel using their new digital television multi-channel capability. The completion of the transition to DTV and the creation of a

The Alaska Channel: Uniquely Alaskan News

One of only a few PBS stations already operating a dedicated public affairs channel, Alaska's channel KTOO launched the Alaska Channel in 1995, prior to DTV multicasting. Reaching citizens statewide over cable, the Dish Network, and more recently over-the-air via DTV transmission by Alaska public television stations, as well as by live webcasts and live audio streams, the station covers Alaskan state legislative sessions and other events on a low budget and with simple production values, much like C-SPAN. The station also showcases Alaskan history, arts, culture, wildlife and the historical and cultural traditions of the Alaskan natives. A live talk show allows viewers to call in and share their thoughts. The station also seeks out programming of Alaskan interest. The station delivers news and weather to the most rural parts of the state and serves as a primary source of information there. The politically neutral KTOO capitalizes on partnerships with the state and municipal governments, as well as with the University of Alaska, other public TV stations, commercial broadcasters, and cable and satellite services. The station's annual budget of \$577,000 is funded by the private sector and the City of Juneau, and has no cable revenue or state funding.

PBS Public Affairs national programming service could greatly facilitate enhanced civic affairs coverage by many more local stations.

In Section 4 of this report, we recommend that PBS, NPR and their local stations facilitate a broader and richer public affairs dialogue, and enhance local efforts by creating a "Digital Civic Forum" in every state – and that stations seek new sources of private and local government funding to expand their own offerings. We recommend that this initiative capitalize on the potential of new media technologies to build a more inclusive public sphere by offering citizens the opportunity to participate more actively in the civic debate. In other words, when local PBS stations move from programming four digital television channels to producing on-line, on-demand content, far more opportunities for both "speaking" and "listening" can be created. A "Digital Civic Forum" in every state could integrate international, national and local content into personalized, on-demand programs for citizens and serve as a virtual "public

square" where citizens can engage their leaders and each other as active participants in our democracy.

A 21st Century Delivery System: Any Content, My Time, My Way

In the digital future, simply producing excellent content will not be enough. Public broadcasters must also ensure that their programming is made available to the public (and particularly teachers, parents and learners) how and when they need it. In Section 2 of this report, we describe the "Analog to Anytime" transition that is already reshaping America's media landscape. This transition represents not only a great challenge, but a momentous opportunity for public broadcasting to enhance its service to the public.

In Section 5 of this report, we recommend that public broadcasters assume a leadership role in developing an on-demand multimedia search and delivery system worthy of the excellent and innovative content that will result from the Lifelong Learning Initiatives and other

CHALLENGES, OPPORTUNITIES AND OBSTACLES

programming. PBS, NPR, producing stations and information technology industry partners should take the lead in the construction of a sophisticated online archive and search engine to facilitate the indexing, identification and retrieval of noncommercial media content on demand. These systems would center on a bundle of web-based content and supporting services that we collectively call the *Public Service Media Web Engine*. While this initiative must confront significant challenges, foremost among which is the problem of rights acquisition, it has the potential to confer significant benefits not only on its users but also on the public service media system as a whole.


Public Broadcasting's Strengths: Trust and Localism ... And a Weakness

The public broadcasting system brings great strengths to these challenges, particularly the trust it enjoys among most Americans and the roots and relationships it has developed in communities throughout the country.

Trust: Recent public opinion surveys find that among America's public institutions, public television is No. 1 in public trust (far ahead of the government and all other media) and considered "money well spent" by more than four out of five taxpayers. A Roper Public Opinion Poll in February 2005 found that 50 percent of the public say they trust public television "a great deal," compared with 26 percent for the court

system and 16 percent for the commercial TV networks and federal government. Three out of four voters surveyed said they view public television as an "excellent" or "good" value for tax dollars spent – about the same as top-ranked military defense and law enforcement. A majority said that the federal government provided "too little" financial support for public broadcasting. Polls show that even voters who seldom watch public television themselves agree that public broadcasting is a valuable public service that they are willing to support.² These findings confirm similar results obtained by the Corporation for Public Broadcasting (CPB), in its own public opinion research in 2003. The results of the survey suggested that most Americans believe that public television provides high-quality programming that is more trustworthy, in-depth and less biased than any major commercial news network (see sidebar).³

Localism: Much of this perceived value stems not only from the unique role that public broadcasting plays in providing high-quality and informative programming, but also because of the inherent localism that is less and less evident among commercial offerings. America's public television and radio stations serve and



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² Corporation for Public Broadcasting, "A Report to Congress on Steps Taken by the Corporation for Public Broadcasting in Response to Section 19 of the Public Telecommunications Act of 1992 for the period January 1, 2003 to December 31, 2003," available at: http://www.cpb.org/about/reports/objectivity/03_obj_balance.pdf

³ PBS Research, "Roper Public Opinion Poll on PBS: 2005 vs. 2004"

Public Opinion Polls Reveal Strong, Bipartisan Support for PBS

In 2003, the Corporation for Public Broadcasting commissioned two polling firms to examine public perceptions of public television and radio. The results indicate that overwhelming majorities of Americans value public broadcasting as a trusted source of news and information. In February 2005, a poll conducted by Roper Center for Public Opinion Research found similar results. Among the findings of the 2005 survey:

- PBS is the most trusted public institution, with almost twice as many Americans saying they trust public television “a great deal” than say they trust courts of law
- PBS ranks first among public institutions that deliver “excellent” or “good” value for tax dollars – more than law enforcement, military defense or the space program
- PBS ranks first in viewer satisfaction with programming. More Americans say that they are “very satisfied” with PBS programs than cable or commercial broadcast programming
- Public television is ranked the “most important” kind of television to have—more than commercial broadcast television or cable
- PBS is the most trusted source of news and public affairs programs. It is trusted more than CNN, Fox News, NBC, MSNBC, ABC and CBS
- 82 percent of Americans believe that money given to PBS stations from government, corporations, and individuals is money well spent
- 51 percent of Americans believe that federal funding for public broadcasting is “too little”

operate locally in every community in America – with multiple stations in many markets. These community licensees are all locally owned and operated, with local community service boards overseeing their direction. The 348 stations affiliated with PBS, and NPR’s nearly 700 member stations, for example, are operated by colleges and universities, community foundations, state commissions and school districts. Most stations strongly reflect and identify with the unique values and priorities of their local communities – and frequently produce content specifically targeted at local needs, such as adult education, public health, business development, immigration and the environment.

Structure and its Resulting Culture: In the course of our meetings, we saw how the current structure of public broadcasting and the culture it has produced are not as conducive to change and to grasping these new opportunities as they need to be. The system is decentralized to a fault. There are significant inefficiencies stemming from this. As one station leader said recently: “We don’t each have to bake our own cookies.” At the same time, strong and adequately resourced national institutions are lacking. The national organizations too often compete with each other to lead in every area, rather than focusing their leadership, and getting support from the system, within their designated areas: CPB

CHALLENGES, OPPORTUNITIES AND OBSTACLES

as political “heat shield” and financial manager; NPR, PBS and producing stations as content sponsors/creators, network managers and national fundraisers; and the Association of Public Television Stations as public affairs advocate. Some stations seem to be caught between the understandable belief that “all is local” and the understanding of the need for strong national organizations.

The nature of the system is that there will always be a strong local component. But public broadcasting will not be able to take advantage of these new opportunities unless there is a strong national leadership, particularly in sponsoring content creation.

At the conclusion of this report, we urge *all* the entities that comprise public broadcasting to approach the digital future as *one system*.

Strengthening Public Broadcasting for the Future: Funding the Digital Transformation

Public broadcasters cannot effectively address America’s needs in education or community engagement unless they successfully complete their own digital transition. America’s public broadcasting system – particularly the nation’s 348 local TV stations and their national network, PBS – is facing a crisis of its own. For noncommercial television broadcasters, the congressional requirement to transmit both in analog and digital, and the prospect of a 2009 statutory deadline for completing the

digital TV transition and ceasing analog operations, have become a major challenge. More than \$1 billion already has been invested in building digital broadcasting infrastructure, most of it by stations for transmission equipment and the larger required towers. While half of this burden has been met by special federal appropriations, the rest represents a diversion of revenue that would otherwise go to content services. As of February 2005, public television stations had raised about \$480 million from state governments and \$260 million from private sources, for a total of \$733 million. At the same time the federal government had allocated only \$320 million to the digital transition for public television stations.⁴ Completing the transition to digital infrastructure will require an additional \$700 million over the next five years simply to purchase the equipment needed by PBS and its stations to complete the DTV transition.

That is the hardware side. The digital *content* transformation for public broadcasting will cost far more, and virtually none of it is funded. There will be a one-time cost attributable to digitizing the system’s vast treasury of analog content and an even more costly need to acquire the legal rights to make that content available for anytime, on-demand distribution through an easily searchable online portal, as we recommend later in this report. This



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of its own**

⁴ As of February 2005, federal appropriations for the digital transition totaled \$319.8 million, while state government contributions totaled \$479.8 million. Comparable figures for private donations for the digital transition were unavailable at the time of writing. See Corporation for Public Broadcasting, “Appropriation Request and Justification: FY 2006 and FY 2008,” February 2005, p. 16, Appendix I.



The system's income is effectively flat and barely adequate to continue current analog operations in most local markets

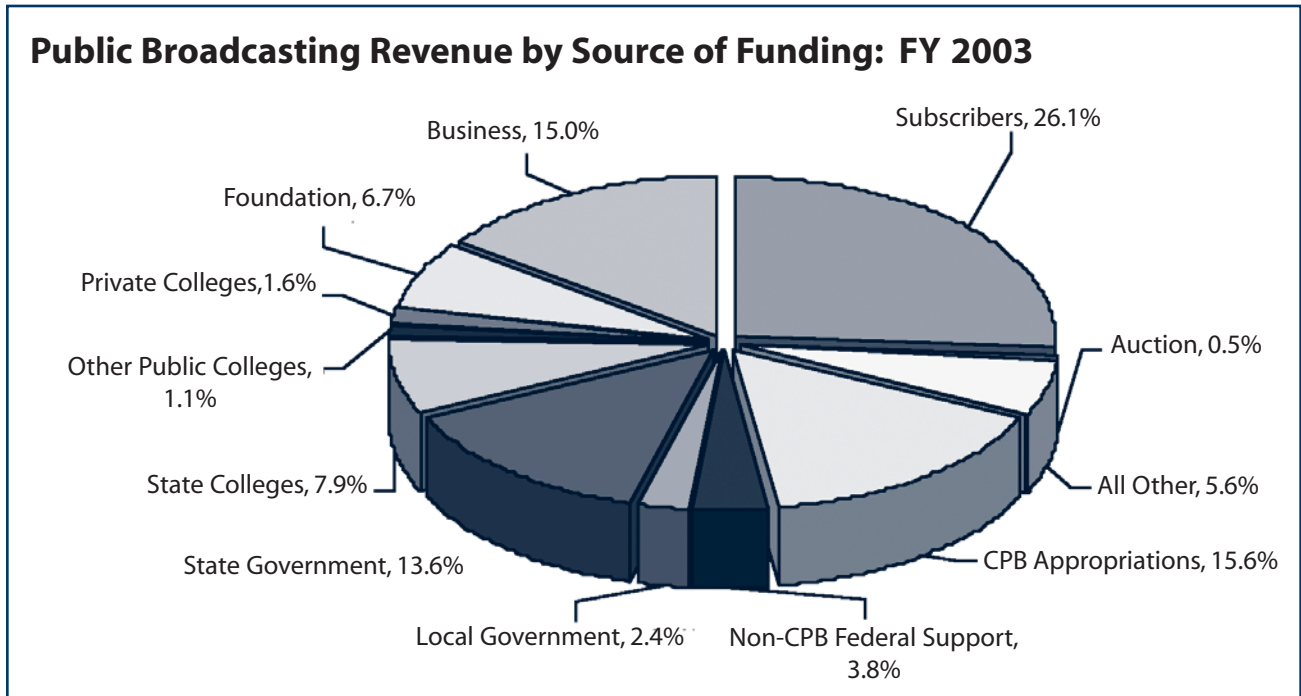
cost will be substantial.⁵ Then there will be the longer-term and continuing annual expenditures for new local and national content creation for lifelong learning, civic affairs, public health, and other services that a successful transition will make possible.

The special costs faced by public broadcasters as they strive to make the digital transformation on the scale recommended in this report generally fall into the following categories:

- **New Digital Content:** Costs associated with expanded education

and other public service initiatives, such as civic affairs and health

- **Digitizing Analog Content:** Digitizing archives and acquiring the digital rights required to reformat and repurpose content for different uses and for delivery over a variety of devices
- **Digital On-Demand Web Engine:** Creating a sophisticated online, on-demand distribution system to aggregate and distribute online e-learning and other public media content
- **Digital Infrastructure:** Transmission and production facilities



⁵ This area is so new that there are no reliable estimates of the overall costs that will be incurred. One of the key functions of the second stage of the DFI we recommend is to develop more specific cost estimates and implementation plans for both archive digitization and the new content creation and distribution initiatives described in this report.

America's DTV Transition

The Telecommunications Act of 1996 set as one of its main goals to provide a policy framework for America's transition from analog to digital television (DTV) broadcasting. Congress lent a second channel to TV station licensees with the same bandwidth (6 MHz) as the first channel. During what was originally anticipated to be a 10-year transition (ending Dec. 31, 2006), one TV channel (the analog channel) would cater to viewers with the old TV sets; the other loaned channel (the DTV channel) would cater to those with the new advanced TV sets (those equipped with DTV tuners). After the vast majority of Americans (later set at 85 percent of households) could receive broadcast DTV signals, the analog channel would be returned. The spectrum is extremely valuable. Much of it will be auctioned for commercial uses; the rest has already been allocated for important public safety uses.

Unfortunately, that transition has progressed much more slowly than envisioned in the 1996 Act. Consumers have not been willing to purchase advanced TVs, as the prices of such TVs are still relatively high. Also, until quite recently, there has been a dearth of compelling broadcast DTV content to spur consumers to make the switch. At the same time, broadcasters have been slow to begin providing high-definition or multichannel digital programming, as broadcasting in digital format requires significant investment and infrastructure upgrades. As of 2004, only an estimated 2.4 percent of American households were equipped to view over-the-air DTV signals.

This penetration rate is expected to rise to 10.8 percent in 2005 alone, as a result of an FCC decision to mandate the inclusion of broadcast DTV tuners in most digital sets. This DTV "tuner mandate" consists of a series of deadlines by which TV manufacturers are required to integrate over-the-air tuners in all new digital television displays by July 1, 2007. Household penetration of broadcast DTV tuners is expected to rise sharply as prices continue to fall and more high-definition digital programming becomes available. In addition, far higher numbers of households subscribing to cable and satellite services will be viewing DTV signals as they replace analog sets.

The completion of the nation's DTV transition, however, is expected to require the passage of legislation, now pending in Congress, that sets a deadline for digital-only broadcasting and also makes available a digital-to-analog converter subsidy for at least those low-income households that currently receive their television service on analog, over-the-air TVs. This will allow stations to cease analog transmissions and return their analog channels without fear of leaving Americans who rely on free over-the-air TV without the ability to receive a television signal.

- **Interconnection:** Completing PBS's Next Generation Interconnection System and NPR's ContentDepot
- **Ongoing maintenance,** repair and human capital costs

These transition costs are above and beyond current analog services and annual governmental appropriations.

The system's income is effectively flat and barely adequate to continue current analog operations in most local markets. Contrary to public perceptions that public broadcasting relies primarily on tax dollars, as it does in other advanced nations, federal appropriations to CPB cover barely 15 percent of total current system costs (see chart above). And given large federal and state budget deficits, traditional government

The Digital Future of Public Radio

While television's digital transition has attracted the lion's share of media attention, public radio has been undergoing a digital transition of its own, one that promises to bring listeners enhanced sound quality and a host of new services.

The Transition

In contrast to the DTV transition, the digital radio transition has not been federally mandated. Also, unlike television, where digital signals are being broadcast on a new set of channels, radio stations are keeping their assigned frequencies. The digital radio standard endorsed by the FCC, HD Radio™, was developed by iBiquity Digital Corporation as a form of in-band on-channel (IBOC) technology. IBOC technology allows stations to broadcast in "hybrid" mode – combining digital and analog signals over the same frequency. Because both signals will be transmitted on the same frequency simultaneously, audience members who have not yet purchased a new digital radio receiver will still be able to listen to analog radio.

As with digital television, digital radio's technical characteristics make for improved quality. Digital FM signals will provide CD-quality audio, and AM signals will provide audio fidelity comparable to current-day (analog) FM sound. Static is virtually nonexistent, as digital radios contain a "smart receiver" capable of filtering the signals that cause static. Digital radio is also largely immune to interference.

New Services – Data and Multicasting

Aside from bringing improvements in audio quality, the transition to digital radio will enable broadcasters to provide services never before possible. Digital stations can supplement audio signals with streams of data that can then be displayed on receivers. Broadcasters can use this feature to transmit a station ID, song and artist information, or even traffic and weather updates.

Another new service made possible with digital radio broadcasting is digital multicasting, pioneered by NPR. In 2003, NPR launched the Tomorrow Radio Project to test the viability of digital radio multicasting in several markets throughout the United States. While NPR has successfully demonstrated two distinct multicast streams, advances in compression technology will allow HD Radio's digital signal to be further subdivided, enabling stations to provide a multitude of program options.

Why Multicasting for Public Radio?

Radio multicasting is especially attractive for public radio, which encompasses a diverse array of programming formats, each often appealing to distinct audiences: news, talk, classical music, jazz, world music, Americana and more. Multicasting offers the potential to provide several programming streams dedicated to different segments of the listening audience. Mike Starling, vice president for engineering and operations at NPR, puts it best: "Public radio looks at multicasting with HD Radio as more than just a new technology. It's a creative, cost-effective way to extend our public service at a time when demand for public radio is greater than ever. We want to offer better and more choices for our listeners."

(continued)

CHALLENGES, OPPORTUNITIES AND OBSTACLES

To that end, beginning this summer, NPR began offering five programmed music formats for its digital multicasting stations: classical, jazz, electronica, triple-A and folk. NPR is also developing other programming formats for stations, including a news and information service and formats tailored to serve culturally diverse audiences. Currently, 56 public radio stations are broadcasting in HD Radio, with over 300 additional stations committed to converting in the coming months. Of those, 50 will be multicasting by the end of 2005.

Other Digital Services – Streaming and Podcasting

In the digital future, NPR and other public radio producers are committed to making as much programming as possible available online in digital format, through streaming broadcasts and podcasting as well. In an innovative pilot program, Public Radio International, one of America's largest producers and distributors of non-commercial radio programming, is collaborating with Duke University to make much of PRI's content available via streaming audio and digital media files, such as MP3s, available to Duke students, free of charge. Duke faculty will in turn integrate segments of PRI programs, including "The World" and "Studio 360 With Kurt Anderson," into course instruction.

While NPR, PRI and other public radio entities are committed to providing support to all stations switching to digital broadcasting and experimenting with multicasting, streaming and podcasting, significant expenditures will be required in order for public radio stations, producers and distributors to continue to innovate and offer enhanced services.

appropriations could decline in real terms. The decision of the House Appropriations Committee to make major cuts in public broadcasting's appropriation in 2005 – although reversed on the House floor – was a significant warning to the system.

With corporate underwriting for public television declining in a more fragmented media environment, and the individual donor base aging, a consulting study presented to the PBS Board of Directors in 2003 grimly concluded that "today's economic pressures at both the local and national levels will only increase." Public radio has had more success, but its stations (many of which are also television licensees) face most of the same pressures. The DFI panel agreed unanimously that in light of the system's acute need for an additional, dedicated source of funding, any reduction in current levels of

government support would be counterproductive. At the same time, we believe that America's public service media system cannot thrive in the digital future if it remains dependent on inadequate, unpredictable and potentially politicized annual appropriations from Congress. The system needs to build a Digital Future Endowment from more substantial, sustainable and independent streams of private *and* public funding sources.

Raising and investing *new and additional sources of funding* is essential. The current funding models for public broadcasting are woefully inadequate to make a robust transformation to the digital era, let alone to meet the challenge of providing the enhanced educational, civic and community information services recommended in this report. Government, business leaders, foundations and philanthropists also need

to invest significantly more than they do at present in the programs recommended here. While the panel believes it is premature to endorse any particular source, the report suggests options for new public revenues, including modest user fees on new digital televisions and video recorders, on non-educational video games, and increased annual user fees on commercial broadcast spectrum licenses.

A Head Start Toward the Digital Future

Despite this fundraising shortfall, public broadcasters have been pioneers in experimenting with digital broadcasting, and have made important strides in creating the infrastructure for a digital future. In 1989, a PBS member station in Seattle, KCTS, joined with a public TV station in Japan to become the first station in the United States to produce HDTV programming.⁶ Presently, 302 out of 348 PBS member stations are broadcasting in digital, reaching 94 percent of households in America.⁷

Those public television stations that have made the transition have been leading the

effort to experiment with the opportunities created by a digital environment. In particular, multicasting – which allows a TV station to broadcast at least four different digital channels in the bandwidth required to broadcast just one analog channel – has given local TV stations the opportunity to provide more specialized programming to meet the educational, civic and cultural needs of the communities they serve. Denver’s KBDI currently provides its community with three digital channels and envisions four channels of specialized content in the near future in addition to its current primary channel: KBDI-Citizen (for local public affairs and local news), KBDI-abc (for children’s programming), KBDI-Arts (for local theatrical, cultural and musical events), and KBDI-World Cultures (with programming about both local and global cultural diversity).⁸

While not subject to the same spectrum allocation issues as commercial and public television broadcasters, public radio is beginning its own digital transition. In 2003 it began experiments with multichannel digital broadcasts. This is more fully described in the box on pages 28 and 29.

⁶ Lotta, Louin, “PBS Debuts High-Definition TV,” *Associated Press*, November 9, 1998.

⁷ Ed Caleca, PBS, Personal Communication, March 11, 2005.

⁸ KBDI12, “Digital Multicasting,” available at: http://www.kbdi.org/tv_schedule/digital_multicasting.cfm.



ANALOG TO ANYTIME:

THE TRADITIONAL BROADCAST ERA IS ENDING


Traditionally, public broadcasters of all kinds have defined themselves in two dimensions: their delivery channel – over-the-air television or radio broadcasting – and by their commitment to excellence and public service in programming. In our digital future, mass media will be less about broadcasting, and more about ubiquitous, always-on access to virtually any content over personal and portable high-speed Internet connections on devices of the consumer’s choosing. Public *broadcasting* needs to reconstitute itself as *public service media*. New technologies make this change possible. The nation’s needs – in education and in civic life – make this change essential.

The era of broadcasting as an exclusively scheduled, one-way service is ending. Commercial broadcasters, media companies and information technology organizations of all kinds are adapting to this change. Public broadcasters must not lag behind. Today the “push” of scheduled and limited programming is rapidly being replaced by the “pull” of content on demand selected by consumers. Instead of the current broadcasting focus on real-time distribution, surveys and actual experience show individuals increasingly want media

on “my time” – which means not only at any time, but “my way” – segmented and formatted for delivery not just on television and radio, but also on computers, cell phones, PDAs, iPods and other devices.

New Tools, New Rules

The new multi-channel DTV capacity the government has given to both commercial and public broadcasting stations, and the very important agreement reached between public television and the cable industry to carry at least four public television programming streams in each market, are critical tools to expand video programming services. Likewise, the transition to digital and high-definition radio will offer public radio listeners additional channels of programming. However, the successful future of public broadcasting will not be based primarily on programming several channels instead of one. From the era of limited delivery channels to the public, we

 ***The era of broadcasting as an exclusively scheduled, one-way service is ending... individuals increasingly want media on “my time” – which means not only any time, but “my way”***

are already approaching an era when high-speed Internet connections can potentially deliver thousands of them – and combine with other digital technologies to fundamentally change the way the public accesses and consumes information.

Consider how Americans have changed the way they consume media in just the last five years: U.S. broadband penetration has increased from under 2 percent in 2000 to over 27 percent in 2004,⁹ as a steadily rising share of households switch from dial-up to higher-speed cable, DSL and wireless broadband connections. In 2000, a Veronis Suhler Stevenson survey showed that Americans devoted an average of 866 hours to broadcast TV annually and 107 to the Internet, a ratio of 8:1. The projection for 2005 had the TV/Internet ratio at 785 hours to 200, or just under 4:1.¹⁰ This shift has occurred at the relatively slow and asymmetrical bit-speeds of cable modems and DSL telephone connections (1-to-3 megabits-per-second [Mbps]). In South Korea – the nation with the world's highest rates of broadband penetration – roughly 20 percent of households already receive 20 Mbps connectivity, speeds that permit multiple streams of HDTV-quality video. Although it may take five to ten years in the United States, widespread fiber-to-the-

home will push these bit-speeds well beyond 20 Mbps and give most Americans the ability to watch, download, or interact with high-definition video content from a virtually unlimited number of sources worldwide.

At the same time, the experience of websites like Netflix.com, Rhapsody.com and others is showing that the national markets created by the Internet and emerging digital media technologies are fundamentally altering the way the public can make its choices, altering the economics of the media at the same time. Five years ago, less than 10 percent of American homes owned a DVD player. By the end of 2004, 60 percent owned at least one DVD player and revenues from DVD sales and rentals stood at over \$20 billion, twice as much as the amount taken in by movie box office sales.¹¹ Suddenly, movies with average or poor box office attendance can become huge successes on DVD.¹² This phenomenon is not just limited to films. Today, with revenues of \$2.3 billion, the fastest growing component of DVD sales is television shows.¹³

The rapid take-up of DVDs in America presages a much larger revolution in media that will be shaped and amplified by the

⁹ 2000 estimate based on FCC, "High-Speed Services for Internet Access: Status as of June 30, 2004," December 2004, available at: http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd1204.pdf; 2004 data from Arthur D. Little, "Broadband Update 2005," cited in Web Site Optimization, "UK's Digital Divide - US Broadband Penetration Jumps to 58.5% in April - May 2005 Bandwidth Report," available at: <http://www.websiteoptimization.com/bw/0505/>.

¹⁰ *Ibid.*

¹¹ Digital Entertainment Group, Press Release, January 6, 2005, available at: <http://www.dvdinformation.com/News/press/CES010605.htm>.

¹² Nason, Pat, "Analysis: DVD Success Transforms Business," *UPI*, December 15, 2004.

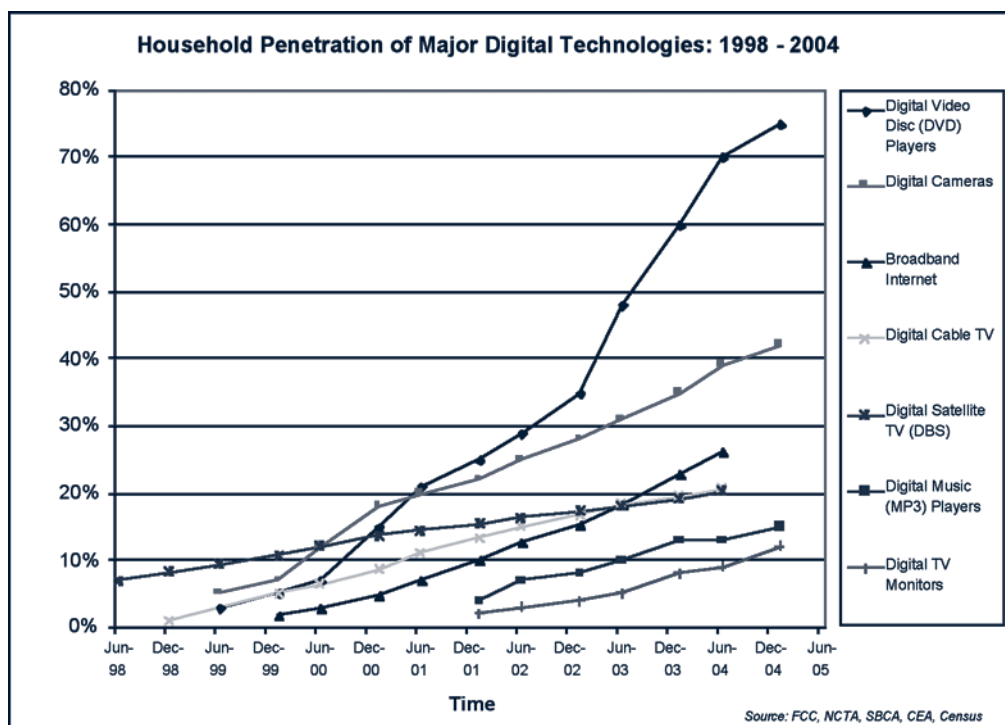
¹³ Bentley, Rick, "TV show DVDs are selling faster than any other kind of DVDs these days," *The Fresno Bee*, March 13, 2005.

ANALOG TO ANYTIME

ability of new technologies to empower the public to express its choices more readily. Multiple platforms for digital content – 250-channel cable systems and the Internet, video games, MP3 players, iPods and video-enabled cell phones – have fragmented audiences. And as digital devices converge, competition between different types of content for niche audiences will become even greater. Microsoft’s new Xbox 360, released in November 2005, combines in one device a video game console, wireless broadband capability, a DVD and music player and a video camera.

The pace of technological change is relentless, with successive waves of digital

media technologies being rapidly adopted (see the chart below).¹⁴ The implications for broadcasting, in particular, are immense. As a study by Deloitte Touche Tohmatsu, a consulting firm, puts it, “What was previously considered ‘television content’ is now being burned onto DVDs, time-delayed by Personal Video Recorders (PVRs), broken into fragments, piped on demand over the Internet, downloaded to mobile devices and syndicated around the globe.”¹⁵ Increasingly, this content can be created and disseminated over the Internet by individuals and start-ups with no ties to traditional media outlets. Just as podcasting has become a popular means to download audio clips, high-speed broadband connections and portable video



¹⁴ Ernst & Young, *Fast Forward: Technology Propels Media and Entertainment CEOs into the Future*, 2004.

¹⁵ Deloitte Touche Tohmatsu, *Television Networks in the 21st Century: Growing Critical Mass in a Fragmenting World*, available at: http://www.deloitte.com/dtt/cda/doc/content/dtt_tmt_TelevisionnetworksGLOBAL_042005.pdf.

devices recently have spurred the creation of Internet-delivered video clips known as “vlogs.” The immediate popularity of Apple’s new video iPod is another indicator of the radical changes that are reshaping the media landscape.

Four Transforming Trends

All media is facing a world of intense competition and increasing audience



Digital technologies are driving four important trends that will help shape the future of public service media

fragmentation. Beyond this, digital technologies are driving four important trends that will help shape the future of public service media.

First, new technologies allow the delivery of content to shift from scheduled programming to “my time,” or viewer-chosen program times. In a seminal article on the implications of this trend for public broadcasting, Dennis Haarsager, general manager of the public radio and TV stations in Pullman, Washington, writes:

Although *My Time* has been with the print media since Gutenberg and with us broadcasters since the phonograph record and VCR, we have only recently begun to think about adapting our distribution, production and rights structures to this new reality. In the meantime, consumers have rebelled against our schedules and seized many

opportunities to consume their media when they choose.

The average consumer increased *My Time* media usage from 375 hours to nearly 500 hours between 1997 and 2002, and is expected to further increase it to nearly 600 hours by 2007, according to the media merchant bank Veronis Suhler Stevenson. (For comparison, consumer use of broadcast TV channels declined 15 percent to 786 hours between 1997 and 2002, while radio listening increased 6 percent to 994 hours.)¹⁶

Digital video recorders (DVRs), which allow consumers to time-shift their TV viewing and skip over commercials, are expected to be used in more than 20 million homes by 2008.¹⁷ Surveys show that personal video recording services like TiVo substantially change viewer behavior: users report they increase their total viewing time by 20 percent (to 20.8 hours per week), that they time-shift 60 percent of the programs they watch, and skip over 92 percent of the ads in programs recorded.¹⁸ The fundamental choices that DVRs enable for viewers – “to watch what I want, when I want, where I want” – are precisely the choices that technologies such as broadband Internet and video-on-demand services are vastly amplifying. For example, the largest personal video recording service, TiVo, has announced a new service in partnership with Netflix to allow users to download movies, TV shows

¹⁶ Haarsager, Dennis, “It’s About Time,” *Current*, November 15, 2004, available at: http://technology360.typepad.com/technology360/2005/01/my_time.html.

¹⁷ PriceWaterhouseCoopers, *Global Entertainment and Media Outlook: 2004-2008*.

¹⁸ “In Embracing Digital Recorders, Cable Companies Take Big Risks,” *Wall Street Journal*, April 6, 2004; “Forrester: 92% of Ads Skipped by DVR Users,” *Multichannel News*, September 8, 2004.

and music over the Internet directly to the hard drive of their DVR for “my-time” viewing.¹⁹ According to Kagan Associates, 23.9 million cable and satellite TV homes will have access to video on demand (VOD) by the end of 2005.²⁰

Second, as storage and distribution costs are practically eliminated, virtual “shelf space” becomes limitless, and the availability of content that would otherwise sell in very low volume (if at all) multiplies. With this explosion of content, mass audiences give way to niche programming. A very small demand for content aired in one local market becomes viable as many such markets are aggregated on a national, or even international, scale. Today’s mass market will steadily be replaced by a massive number of special interest niche markets. For example, there may be a very small market in the broadcast area of a single Minnesota public TV station for cultural programming about immigrants of the Hmong tribe of Laos, but it may be a much larger market if anyone in the nation can access the programming, on their own schedule, using the device of their selection.

This radical transformation is best described in “The Long Tail,” an essay by Chris Anderson, the editor of *Wired* magazine (October 2004), that built on a speech he made to public broadcasting’s Integrated Media Association in April 2004. “The average Barnes & Noble carries 130,000 titles,” Anderson observes, but

“more than half of Amazon’s book sales come from outside its top 130,000 titles.... Forget squeezing millions from a few megahits at the top of the charts. The future of entertainment is in the millions of niche markets at the shallow end of the bitstream.”²¹ Commercial broadcasting faces the same opportunities and problems. “Our business has been built on the economics of scale,” observes Rashid Tobaccowala, president of Internet Media Services at Starcom IP. “And instead we’re going to go into the economics of re-aggregation.”

This is not to say that the market for mass media programming, or selection of programming by a third party (or even over-the-air broadcasting), will disappear. But we do believe this new market reality will come to dominate consumer choices over time.

Third, as content becomes abundant and readily available, the focus will shift from promoting a few “hits” to helping viewers make informed choices by guiding them to content they are most interested in. In an on-demand world, channel surfing will be replaced by customized searching. Amid the vast, sometimes chaotic universe of



The focus will shift from promoting a few “hits” to helping viewers make informed choices In an on-demand world, channel surfing will be replaced by customized searching

¹⁹ “New Services by TiVo will Build Bridges from Internet to the TV,” *The New York Times*, June 9, 2004.

²⁰ Farhi, Paul, “Channel Surfing, Erosion & Networks Treading Water,” *The Washington Post*, September 18, 2005, page N1.

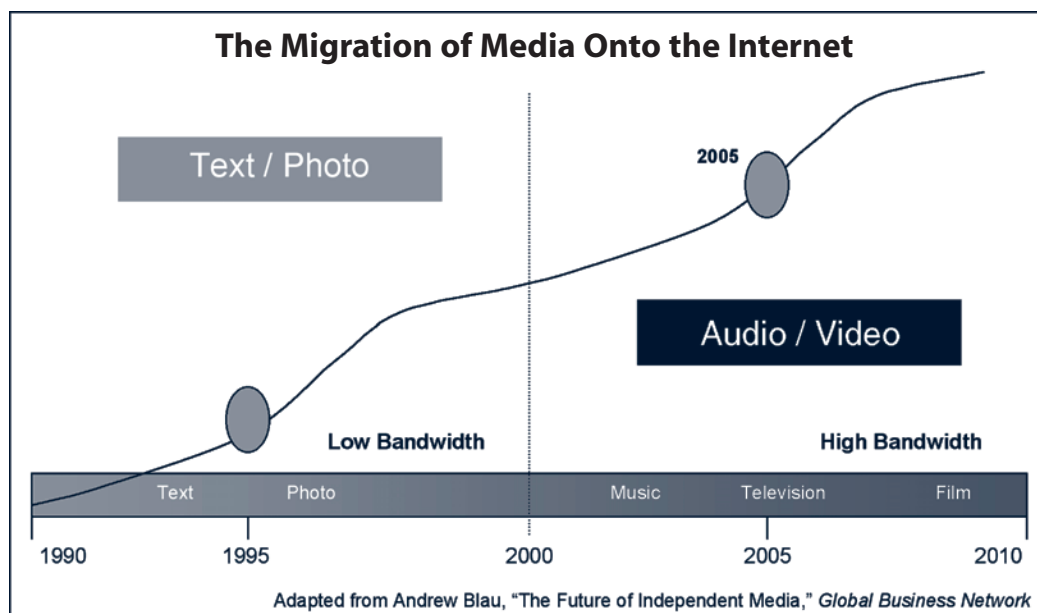
²¹ Andersen, Chris, “The Long Tail,” *Wired*, October 2004, available at: <http://www.wired.com/wired/archive/12.10/tail.html>.

online content, we believe that many users will want to rely on trusted “brands” like PBS and NPR as signposts to guide them to excellent and trustworthy content. This guiding function should be supplemented by powerful online content search and recommendation tools that public broadcasting needs to have at its disposal. This is why, in Section 5, we recommend the establishment of an online *Public Service Media Web Engine*.

Speaking at the PBS *Showcase* convention in April, 2005, Ted Sarandos, the chief content officer of DVD rental company Netflix, described the refinement of “collaborative filtering” technologies that use viewers’ own feedback to identify and recommend content they want with an extraordinary degree of accuracy. “We create the long tail,” Sarandos said, noting that Netflix subscribers select an average of 98,000 different titles each day, a large share of which they never considered until the search engine matched their own feedback

on previous rentals to the overall library. He noted that PBS programming is already selected disproportionately by Netflix subscribers because of its advantage as a well-known and trusted brand.

Fourth, the Internet becomes a platform that can leverage traditional “programming” into a multimedia experience for consumers who want more depth. The program on TV or radio becomes an executive summary, inspiring viewers to drill deeper on a linked website for print documents, data and additional audio and video clips. PBS and NPR have been pursuing this model for a decade, and many member stations are already starting to move in this direction. PBS.org, for example, is one of the world’s most trafficked dot-org sites, with 1,300 companion sites linked to public television programs and special projects. During the first half of 2005, the site had an average 56 million unique visits and 92 million page visits each month according to PBS server



logs. NPR.org has likewise doubled its online audience in recent years, logging an average 23 million visitors weekly. NPR's website provides not merely extended audio resources, but photos, columns, documents and other postings from the network's reporters and other sources as well.

We believe these trends and innovations are merely a glimpse of what is possible given the right partners, the right programs and sufficient resources.

The New 'Broadcast' Paradigm

We believe that public service media leaders need to acknowledge and leverage these trends, not merely to keep pace with public demand, but to realize the great potential for expanded public service. Public service media as a community can carry its mission effectively into the digital future only if it rethinks its role and priorities in our radically evolving media environment. For example, the old analog mentality of achieving high ratings for the scheduled lineup of a handful of programs must be replaced by a new commitment to produce a diverse range of content. The concept of "broadcasting" to the most general audience must increasingly give way to a focus on creating content that serves unmet needs and which often narrow casts to niche (and other underserved) audiences. Some of this is simply time shifting – allowing audiences to see programs when they want to watch them. Most important, measures of audience share need to account for the "long tail" – that is, in a digital, on-demand

world the value of public service media can best be measured in aggregate over a period of years, not by live audience share on a particular evening.

There is already some early evidence of how the new paradigm can work in public broadcasting's favor. A

recent CPB-commissioned study suggested that public broadcasters have had difficulty meeting the needs of two major audience segments, largely because they are currently forced to watch or listen to programs at scheduled times. These two groups are classified as the "innovating and inclined" and the "distracted and unavailable." They

represent 26 percent of all viewers, are short on time, but are heavy users of technology and frequent listeners to NPR. As public service media makes the shift to the on-demand, my-time world, these underserved audiences will gain access to the programming that most interests them.²³

Public broadcasters in other countries are already acting on the urgent need to meet the demands created by these changes. The British Broadcasting Corporation recently decided to allocate close to \$400 million a year – 60 percent of the money saved by controversial cutbacks – on new-media projects and digital services. The BBC is expected to invest this money in the digital switchover, new-media platforms and navigation, a digital curriculum for schools



The old analog mentality of achieving high ratings for the scheduled lineup ... must be replaced by a new commitment to produce a diverse range of content that serves unmet needs

²³ Haarsager, *supra* note 16.

and a digital archive of TV programming for libraries, as well as local news and radio services for a greater number of communities. The BBC's director of new-



“... our My Time distribution platform will need access to the whole range of sophisticated support systems ... search, recommendation, reputation and digital rights management technologies”
–Dennis Haarsager

media and technology, Ashley Highfield, emphasized the importance of this transformation by saying, “We need to meet the changing needs of our audience and they expect us to provide services on their terms. Over half of Britain is online and 50 percent of people online use bbc.co.uk.”²⁴

To reach new and underserved audiences in America, the atomized structure of today's public broadcasting system needs to be replaced by a new, more collaborative approach. As Dennis Haarsager, a public radio and television general manager, has written, the future cannot be effectively seized by each station alone:

No single U.S. broadcaster has enough cleared content [intellectual property rights] to create a sufficiently long tail – that is, with the necessary critical mass. More importantly for success, our My Time distribution platform will need access to the whole range of sophisticated support systems that Amazon, for example, has refined – search, recommendation, reputation and

digital rights management technologies. ... These requirements ... would be best developed or acquired collaboratively. The end result, however, can wear a “skin” that makes it look just like part of your station's website.²⁴

Haarsager and several other public broadcasting executives have advanced this vision by launching **Public Service Publisher**, an initiative aimed at developing an online search and distribution system for public radio and TV content. Recently, Public Service Publisher has partnered with the Open Media Foundation to produce a beta version of Open Media Network (see sidebar), a TV Guide-style application that allows the public to locate and download over the Internet, to a variety of devices, content produced by participating public broadcasting stations, as well as by other creators. The creation of a multimedia search engine and Internet portal along these lines that could aggregate and offer all of the archives and new digital content of public broadcasters (and others) nationwide would be of enormous value to society. PBS's Google search module for station sites, which enables content searches across PBS.org and local station sites, is another example of how network TV can transition into a networked multimedia gateway.

The Public Service Publisher initiative and PBS's work with Google are two examples of how emerging digital technologies offer the potential to greatly expand the utility of public service media to the American

²⁴ White, Geoff, and Maria Esposito, “Extra £220 million for BBC new media...,” *Broadcast Now*, June 2, 2005.

²⁵ Haarsager, *supra* note 16.

Case Study: The Public Service Publisher Trial

A group of public radio and TV stations recently launched *Public Service Publisher* (PSP), an initiative to develop an online portal that offers users worldwide, anytime access to a selection of public broadcast and other programming. The service went live in beta form in April 2005, offering content through the Open Media Network (discussed below). Participating public radio and TV stations are allowing users to search an aggregated database of on-demand media content and to freely download content on multiple devices, including PCs, iPods, digital video recorders and cell phones.

Several public television stations – including KWSU (at Washington State University), WGBH (Boston) and KQED (San Francisco) – have authorized the use of their material through Creative Commons licenses. Unlike traditional “all rights reserved” copyrights, digital rights management under a Creative Commons license allows producers to choose whether content can be shared, duplicated or viewed a set number of times. Future versions will permit stations (and other content providers) to collect payments for premium content, potentially creating a new revenue stream for the production of new public service media programming.

PSP is the centerpiece of a broader effort to facilitate the location and legal mass distribution of audio and video content over the Internet. The Open Media Network (OMN), established by the nonprofit Open Media Foundation, will provide access to a wide variety of content, including not only public television and radio programming, but also independently produced movies, podcasts and video blogs, while protecting the producers’ copyrights. OMN is one model of harnessing long-tail economics by combining a familiar interface, including an easy search and personalized recommendation system, with aggregated rights-protected content and a powerful distribution network.

In May 2005, the BBC launched its own three-month trial of a similar service, the Interactive Media Player (iMP), which initially allows Internet users to download and watch 190 hours of TV programming and 310 radio shows. The iMP trial builds on the BBC’s existing Radio Player, which allows listeners to download programs up to seven days after broadcast. “iMP could be the iTunes for the broadcast industry, enabling our audience to access our TV and radio programs on their terms – anytime, any place, any how,” said Ashley Highfield, the BBC’s director of new media and technology.

public, even as they simultaneously reduce and fragment the audience for traditional broadcasts. Public broadcasting’s core strengths – high-quality niche programming, strong public trust, rich archives and content that maintains its value for a long time (a “long shelf life”) – are precisely the elements of a “long tail” that provide lasting value to the public.

The public broadcasting system is experimenting with other digital media technologies that will help lay the

groundwork for this future. The Corporation for Public Broadcasting has developed a core public broadcasting metadata standard, PBCore, which will allow content to be easily searched, shared, archived, combined or used in new ways with new digital platforms. Several stations are already providing local content through on-demand streaming. Others, including NPR, Public Radio Exchange and PBS have developed Really Simple Syndication (RSS) feeds to alert users through text and audio to programming they might be interested in.

WGBH, the local station in Boston, has developed the WGBH Forum Network, an online service that streams archived and live public lectures in audio and video. The public has already used the service to stream over 113,000 lectures, with 70 percent of the audience listening to the entire lecture. Moreover, these lectures have been streamed by 1,000 academic institutions worldwide.²⁵ WGBH is part of a wider national network that includes public

television stations in Cleveland, New York, Portland and Oregon.

Public broadcasting leaders are aware of these key technology and consumer trends. Important steps have been made. We see exciting examples of what is possible beginning to emerge. However, the system is only at the very beginning of this transition: operationally, culturally, legally and financially.

²⁵ WGBH, "About the WGBH Forum Network," available at: http://forum.wgbh.org/wgbh/about_us.php



CHALLENGE NO. 1:

LIFELONG EDUCATION INITIATIVES

Public broadcasters can make a unique – and valuable – contribution to improving and expanding education and training in America. The national interest in modernizing and improving U.S. education and training, from preschool to the workforce, is clear. For the past 15 years, student achievement has been stagnant or declining, while the economy keeps demanding higher skills and the ability to learn new skills lifelong. Meanwhile, workers need to keep their skills current in order to qualify for and keep new and better jobs.


Fortunately, the opportunity to meet the demand for high-quality education and training also is apparent. Today’s young people get their information and entertainment from media of all kinds – in fact, they are being called “Generation M.” By embracing 21st century technologies and expanding their educational offerings, public broadcasters can find new ways to reach and help students, educators and workers striving to develop new skills. To an important degree, the future of our educational system and our economy depends upon public broadcasters meeting that challenge.

The Challenge: Improving Student Achievement in the Media Age

As American students fall further behind their peers in other countries, the nation needs new and better ways to reach students, parents and educators alike to improve literacy, teach learning skills, strengthen math and science and provide the skills necessary for Americans to compete in a global economy.

The crisis in student achievement begins before children even enter kindergarten, and it continues through elementary school, middle school and high school.

The crisis is especially severe among the most vulnerable segments of society, those families who have the greatest need for quality education as a vehicle for upward mobility. Student achievement problems – and potential solutions – often have their roots in the earliest years of a child’s learning process, making these years crucial to educational success:

 **Student achievement problems ... often have their roots in the earliest years of a child’s learning process, making these years crucial to educational success**

The Early Years: Although research shows that early childhood learning is a crucial indicator of future academic performance, the quality of early childhood education is highly uneven. Only 10 percent of three- and four-year-olds nationwide were served by a state-funded preschool program in 2004, and as many as 12 states had no state-funded preschool programs.²⁶ Uneven access disproportionately affects the poor, as they are less likely to have the opportunity to experience a literacy-rich learning environment in the developmentally important preschool years. According to the U.S. Department of Education, low-income students between the ages of three and five are far less likely than their peers to be enrolled in a center-based preschool program.²⁷ Those who do attend center-based programs have uneven access to qualified teachers because of the wide variation in state licensing requirements for childcare and preschool programs.

K-12: By first grade, children who enter school without phonological awareness (the ability to hear and manipulate phonemes, the smallest units of speech) and who struggle to begin reading due to this or another learning disability are at great risk of falling behind their peers, never to catch up in any academic subject. Their inability

to read at grade level often causes a loss of self-esteem, leading to a downward spiral to low expectations and lack of confidence. Three-fourths of children who eventually drop out of school say they find it difficult to read, and only 2 percent of students who receive special education for reading difficulties complete college.²⁸

The crisis in student achievement begins with reading, but it doesn't end there. With the exception of recent gains in mathematics scores, student achievement in every subject, at virtually every grade level, has remained essentially stagnant, or has declined, in the last decade. Less than one-third of 4th-grade and 8th-grade students were at or above proficiency in reading in 2003.²⁹ Achievement in science and mathematics was not much better: The latest data from 2000 indicates that only one-third of 4th-grade and 8th-grade students were performing at or above proficiency in science, while only 21 percent of 12th-grade students performed at or above proficiency. The achievement gaps between racial groups were large and showed no improvement between 1992 and 2003: African American and Hispanic students consistently scored 10 and 13 percent lower than their white peers over this period.³⁰ In 2000, only 3

²⁶ W. Steven Barnett, Jason T. Hustedt, Kenneth B. Robyn, *et al.*, *The State of Preschool: 2004 State Preschool Yearbook*, National Institute for Early Education Research, 2004, available at: <http://nieer.org/yearbook/pdf/yearbook.pdf>.

²⁷ Department of Education, *Condition of Education 2004*, Indicator 1.

²⁸ Lyon, G.R., *Measuring Success: Using Assessments and Accountability to Raise Student Achievement*, Testimony to Subcommittee on Education Reform, Committee on Education and the Workforce, U.S. House of Representatives, March 8, 2001, available at: http://www.nrrf.org/lyon_statement3-01.htm.

²⁹ "The Nation's Report Card: Reading Highlights 2003," *National Assessment of Educational Progress*, National Center for Education Statistics, Washington, D.C., November 13, 2003, p. 1.

³⁰ *Ibid*, p. 13.

**The Quality of Education and American Competitiveness:
What Leaders are Saying**

“Over the next decade, the United States will face ever increasing competition in the global economy. To an overwhelming extent, this competition will involve the mastery and application of new technologies in virtually every field of human endeavor. It will place particular emphasis on the need for heightened skills in mathematics and science. It is the responsibility of this nation’s educational enterprise – including policymakers – to help secure our economic future by ensuring that our young people are adequately prepared to meet these challenges. Today, they are not.”

U.S. Dept. of Education, National Education Technology Plan 2004

“One of the pillars of American economic prosperity – our scientific and technological superiority – is beginning to atrophy even as other nations are developing their own human capital.... There may be no attack, no moment of epiphany, no catastrophe that will suddenly demonstrate the threat. Rather, there will be a slow withering, a gradual decline, a widening gap between a complacent America and countries with the drive, commitment and vision to take our place. History is replete with examples of world economies that once were dominant but declined because of myopic, self-determined choices.”

Joint Statement by 15 leading business groups announcing the Education for Innovation Initiative (July 2005)

“There is a quiet crisis building in the United States – a crisis that could jeopardize the nation’s pre-eminence and well-being. The crisis has been mounting gradually, but inexorably, over several decades. If permitted to continue unmitigated, it could reverse the global leadership that Americans currently enjoy. The crisis stems from the gap between the nation’s growing need for scientists, engineers, and other technically skilled workers, and its production of them.”

Dr. Shirley Ann Jackson, President, Rensselaer Polytechnic Institute and chair of the Council on Competitiveness, Blue Ribbon Panel on Higher Education

“We are very concerned that the U.S. will lose its competitive position. For Microsoft, it means we are having a tougher time hiring... The jobs are there, and they are good-paying jobs, but we don’t have the same pipeline.”

Bill Gates, Microsoft (April 27, 2005)

“[T]he Program for International Student Assessment results announced last week [December 2004] show America continues to trail economic competitors in student math and science performance. This should be a wake-up call for all of us.”

Business Roundtable (Dec. 14, 2004)

percent of African American students and 7 percent of Hispanic students scored at or above proficiency in science in the 12th grade.³¹

Falling Behind Other Countries

In addition to poor results on national assessments of student achievement,

³¹ “The Nation’s Report Card: Science Highlights 2000,” *National Assessment of Educational Progress*, National Center for Education Statistics, Washington, D.C., November 20, 2001.

American students also have lagged behind in comparison to peers in other countries. In 2003, American 8th-grade students were ranked 15th in the world in mathematics, according to the Trends in International



While student achievement has been stagnating, the skill requirements for jobs have been increasing

Mathematics and Science Study (TIMSS) survey,³² and the Program for International Student Assessment (PISA) in 2004 ranked 15-year-olds in the U.S. at 24th in mathematical literacy and 26th in problem-solving out of 41 participating nations. The report states that U.S. students “did not measure up to the international average in mathematics literacy and problem-solving skills.”³³

In 2004, the United States, which once led the world in high school completion rates, ranked 10th among member countries of the Organization for Economic Co-operation and Development (OECD) in the percentage of adults, ages 25 to 34, with a high school degree.³⁴ And among high school graduates who enter post-secondary education of any type, 46 percent (including 64 percent of those entering community colleges) are required to take remedial courses in one or more subjects because they lack the skills to take regular courses.³⁵

These students are less likely to stay in college and earn a degree.³⁶

Higher Skill Requirements

While student achievement has been stagnating, the skill requirements for jobs have been increasing. Although the U.S. Department of Labor predicts that 70 percent of the 30 fastest-growing job categories will require education beyond high school,³⁷ many Americans lack even basic skills. By 2000, more than 30 percent of the entering high school class of 1997 had dropped out, and subgroup differences were large: while about a quarter of white students failed to graduate, 45 percent of African American students, 47 percent of Hispanic students and 43 percent of Native American students had dropped out.³⁸

These numbers are disconcerting for what they suggest about America’s long-term competitiveness and future economic growth. What is at stake is not only the well-being of individual Americans, important as that is. It is the competitive position of our entire economy. In the global economy, workers’ skills determine whether a country can continue to lift its living standards. That is why, when America’s young people are falling behind their international peers, it is such a serious crisis.

³² Trends in International Mathematics and Science Study, 2003, available at: http://nces.ed.gov/pubs2005/timss03/tables/table_03.asp.

³³ Program for International Student Assessment, www.pisa.oecd.org.

³⁴ *Education at a Glance 2004*, OECD, <http://www.oecd.org/dataoecd/34/55/33714494.pdf>.

³⁵ “Closing the Graduation Gap: Toward High Schools that Prepare all Students for College, Work, and Citizenship,” Bill and Melinda Gates Foundation Policy Paper, April 2003, p.4.

³⁶ *Ibid.*

³⁷ *Ibid.*, p. 1.

³⁸ *Ibid.*, p. 2.

LIFELONG EDUCATION INITIATIVES

American companies are searching overseas not just for cheap labor, but increasingly for high-skilled workers in precisely those areas – including math, science and engineering – where American students are struggling. The U.S. has an alarming and unsustainable reliance on foreign human capital in science and technology industries that drive economic growth. In a special report to the President in 2004, the National Science Board warned that the shortage of scientists and engineers, “threaten[s] the economic welfare and security of the country.”³⁹

The need for education, training and retraining does not stop at the end of high school, a two-year college or a four-year college. In the new economy, education is a lifelong process. Helping our workforce adjust to the rapidly evolving demands of the new economy will require a culture that facilitates learning at each stage of life. Whether nurturing the learning environment in the critical preschool years, or sustaining that environment through K-12 schooling, or making a high-quality college education accessible to all, or ensuring that America’s workforce always has access to the training it needs to stay competitive, lifelong education is no longer a luxury, but a necessity.

The Opportunity: Generation M, Meet Public Service Media

So how can the nation reach and teach young people who are falling behind their peers throughout the world? Fortunately,

this crisis contains the seeds of opportunity. For better and for worse, America’s young people rely on media of all kinds for information and entertainment. PBS, its member stations and their partners have the potential to provide young people with the educational content they need and in formats that they will find attractive, engaging and accessible.

Today’s young people live in a world that has been revolutionized by information technology. The presence of these new technologies in their lives is pervasive: the average American child spends more than six hours a day using TVs, DVDs, portable music players, computers, video games and other media.⁴⁰ Unfortunately, however, the content that children watch over these electronic devices – whether it is violence in a video game or commercial programming – is too often inappropriate.

In Generation M, so named by the Kaiser Family Foundation in its extensive 2005 report on the media habits of children, kids live on a multimedia planet where they interact daily with images, sound and data. They take input from many screens, often at the same time. That’s how kids between ages 8 and 18 cram 8.5 hours of screen time per day into 6.5 hours.⁴¹ They multi-task with handhelds like cell phones, iPods and

 **The average American child spends more than six hours a day using TVs, DVDs, portable music players, computers, video games and other media**

³⁹ National Science Board, “An Emerging and Critical Problem of the Science and Engineering Labor Force,” National Science Foundation, January 2004, NSB 04-07.

⁴⁰ Roberts, Donald F., *et al.*, “Generation M: Media in the Lives of 8- to 18-Year-Olds,” Kaiser Family Foundation, March 2005, available at: <http://www.kff.org/entmedia/entmedia030905pkg.cfm>.

⁴¹ *Ibid.*

Nintendo DS (successor to Game Boy). They play with friends on Playstation or Xbox consoles. They power up and enjoy streaming video or music on a broadband connection at home or chat with multiple friends through instant messaging. And although African American and Hispanic children are less likely to have access to a computer or the Internet at home, they are



At school, kids are often forced to “power down” – they put aside their interactive, fast-paced and interactive electronic leisure world and sit with a pencil, paper and 10-year-old textbooks

no less likely to grow up in homes with a media-rich environment when it comes to DVD players, digital video recorders, or video game consoles.⁴²

Of course, kids still watch TV – just not the way their parents did. They watch not only broadcast television, but also access hundreds of cable channels, DVDs, satellite TV and video on demand. For Generation M, engaging in recreational media is a full-time job, at more than 44 hours per week. That’s more time than they spend in school.

Our Schools: Behind the Media Curve

But much of this advanced technology is left behind when kids walk through the doors of their schools each morning. The fact is that many kids’ bedrooms are more technologically sophisticated than their classrooms.

At school, kids are often forced to “power down” – they put aside their interactive, fast-paced and interactive electronic leisure world and sit in rows equipped primarily with a pencil, paper and 10-year-old textbooks. At the same time, teachers must do their best to communicate complex information to a large class of individuals of widely varying abilities and learning styles.

This culture clash must be reconciled. While many educators recognize that students regularly use media that could enhance teaching as well as entertain, teachers also know that they need the educational digital content that works in and outside the classroom. These teachers also know the importance of training, tools and support necessary to optimize their use of technology and the exciting choices it provides. Unfortunately, most teachers do not have even the basics of technology today. Nor do parents and other caregivers. As the U.S. Department of Education concludes in its *National Education Technology Plan*, “tech-savvy high school students are often far ahead of their teachers. This ‘digital disconnect’ is a major source of frustration among today’s students.”⁴³

Why Public Media Can Boost Academic Achievement

While the mass media is a big part of the problem, media technology is also essential to the solution. We need to create new forms of educational media and bring them

⁴² *Ibid.*

⁴³ U.S. Department of Education, “A Golden Age in American Education: How the Internet, the Law and Today’s Students are Revolutionizing Expectations,” *National Education Technology Plan 2004*, available at: <http://NationalEdTechPlan.org>, p. 45.

LIFELONG EDUCATION INITIATIVES

into young people's schools, their homes and their lives.

America's homes and classrooms could better boost academic achievement if they had ready access to the high-quality multimedia resources that are needed to engage teachers and students in information-age learning. As the U.S. Department of Education suggests in its 2004 *National Education Technology Plan*, digital multimedia technologies are uniquely suited to many of the goals of the No Child Left Behind Act since they can improve student achievement by capturing interest, sustaining motivation and personalizing development, enhancing choice and tracking progress.⁴⁴


The problem is not primarily one of infrastructure; instead, poor teacher training and the absence of high-quality digital content for education have handicapped the use of new technologies in the classroom. And yet, a wealth of evidence, including a number of highly successful programs across the country, indicates that technology can register substantial improvements in student achievement if the right components are in place. What do those components include? Of the seven recommendations put forth by the *National Education Technology Plan*, consider just these three: 1) move toward digital content, 2) support e-learning and virtual schools, and 3) improve teacher training.

More than any other national institution, public television is uniquely equipped to turn these recommendations into reality. The combination of national expertise and local presence in every major community in the

nation places PBS and its member stations in a position to help America's teachers and parents make the digital transition. Public television is especially well-positioned for this effort, given its decades-long history of developing educational content and its loyal base of teachers and parents who rely on public television as a source of trusted and exciting learning resources. These singular strengths should be leveraged to improve the quality of American education.

While NPR and its stations have not traditionally focused on education to the extent that public television has, public radio can nevertheless make a strong contribution to the effort to improve American education. Public radio shares with public television a network of deep roots in local communities, a rich tradition of building partnerships and an overarching commitment to producing excellent public service content. Public radio content, while often not designed as explicitly educational, is undeniably valuable as a learning resource, especially in the areas of public affairs and culture. This and other areas for contribution by the public radio system should be explored and exploited.

To mobilize the resources made possible by a digital age, policymakers need to rethink their conceptions of "broadcasting" altogether. In a digital world, users (whether teachers, parents, caregivers or students) will

 **National expertise and local presence in every major community in the nation places PBS and its member stations in a position to help America's teachers and parents make the digital transition**

⁴⁴ *Ibid.*

be able to choose from a multimedia library of digital learning content, at a time, a place and on a device of their choosing, with the ability to customize the content and maintain a constant record of progress.

Digital Learning and Student Achievement

The very qualities that make these new media forms so engaging hold the potential to enrich the classroom experience and improve student learning. We know we can do better than the traditional one-teacher/classroom-lecture model; already, teachers are moving away from lecturing to playing the role of facilitators in the classroom. Technology can provide the right tools to maximize the effectiveness of teachers in this new role by providing in-depth resources, hands-on interactivity and the constant feedback that we cannot otherwise afford for all our children. With the necessary components in place, digital technologies, including the Internet, allow schools to engage with real-world data; connect to subject area experts around the world; access and evaluate primary sources; engage in on-demand simulations to model difficult concepts; and more. With strong training in using technology effectively, teachers can use digital applications to address individual student learning styles, connect learning to the “real world” by integrating contemporary events and offer a better platform for real-world thinking and problem solving than memorizing facts from a textbook. This focus on using technology effectively in the classroom is

the key insight of a report for the Gates Foundation by Jeffrey Fouts: “As educators and researchers look to the future, they are no longer asking the question, ‘*Should technology be used in education?*’ Instead, the focus is ‘*How should technology be used to help students achieve higher levels?*’”⁴⁵

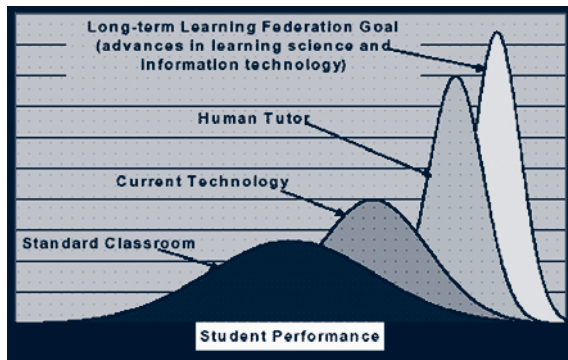
The Federation of American Scientists (FAS) concludes that information technologies provide an affordable way to implement these strategies, with capabilities in simulation, assessment and tailoring that can greatly improve student achievement.⁴⁶ FAS President Henry Kelly informed the DFI, during a day-long public forum on January 12, 2005, that the FAS Learning Federation believes that interactive, self-paced e-learning tools, such as online tutoring, can boost educational productivity even higher than one-on-one tutoring by a teacher (see graphic).

A growing body of research by organizations evaluating various digital classroom applications, such as the Center for Children and Technology, SRI and WestEd, demonstrates that these interactive technologies can have a positive impact on student achievement and teachers’ professional practice. In one study, researchers examined various uses of technology in the classroom, and found substantial improvements in student achievement. “Intelligent tutoring systems” are among the most promising tools that are emerging from research on ways to integrate technology effectively into the classroom. In Pittsburgh, researchers successfully

⁴⁵ Fouts, Jeffrey T., “Research on Computers and Education: Past, Present and Future,” Bill and Melinda Gates Foundation, February 2000, p. ii.

⁴⁶ The Learning Federation, Federation of American Scientists.

LIFELONG EDUCATION INITIATIVES



Source: Federation of American Scientists

integrated “intelligent tutor” software into a 9th-grade algebra curriculum focusing on mathematical analysis of real-world situations.⁴⁷ Researchers have also found that students experienced increased motivation and self-esteem and accomplished more complex tasks when their classrooms had high degrees of technology.⁴⁸

Studies also indicate that technology can greatly benefit students with learning disabilities. In a comparative study of 4th-, 5th- and 6th-grade students with learning disabilities, pupils randomly assigned to a video instruction group for reading vocabulary and comprehension had higher word acquisition scores than students in the control group.⁴⁹ In another study, researchers intensively used a gamelike learning environment called FastForward Language Training to teach at-risk children with dyslexia. Brain scans showed brain

activity to increase in multiple regions in the brain, bringing the activity closer to that in children without dyslexia. These children began to process language more adeptly, and their scores on several language and reading tests improved.⁵⁰

Perhaps most importantly, the benefits of technology have yielded significant returns for those school districts that have effectively integrated technology into their curricula. The Chugach school district in Alaska implemented a major technology program to deal with a crisis in student achievement and staff retention. Between 1998 and 2001, student use of the Internet increased from 5 percent to 93 percent as the school district integrated technology into student learning. The results were impressive: reading scores rose from the 28th percentile in 1995 to the 71st percentile in 1999; mathematics scores increased from the 54th percentile to the 78th, and language arts scores rose from the 26th percentile to the 72nd.⁵¹

The Recommendations: Making the Leap With Public Television’s Digital Learning Services

In the *National Education Technology Plan*, former U.S. Secretary of Education Roderick Paige laments that whereas technology has

⁴⁷ Koedinger, K., et al., “Intelligent tutoring goes to school in the big city,” *International Journal of Artificial Intelligence in Education*, 8 (1997), pp. 30-43, Human-Computer Interaction Institute, Carnegie Mellon University, available at: <http://act.psy.cmu.edu/awpt/AlgebraPacket/kenPaper/paper.html>.

⁴⁸ *Supra* note 45, p. 13.

⁴⁹ Xin, J. F. & Reith, H., “Video-assisted vocabulary instruction for elementary school students with learning disabilities,” *Information Technology in Childhood Education Annual*, 2001, p. 87.

⁵⁰ Temple, E., et al., “Neural deficits in children with dyslexia ameliorated by behavioral remediation: Evidence from functional MRI,” *Proceedings from the National Academy of Sciences*, Vol. 100(5), March 4, 2003, pp. 2860-2865, available at: <http://www.pnas.org/cgi/doi/10.1073/pnas.0030098100>.

⁵¹ *Supra* note 43.

Serious Games

A number of organizations are experimenting with serious games – games that apply the latest technology to learning. The Federation of American Scientists is developing two computer games as pilots to learn more about the potential of serious games. *Discover Babylon* will combine library and museum collections in a simulation of ancient Mesopotamia, where players will solve puzzles by exploring the art, culture and science of the civilization. *Immune Attack* will teach students about the human immune system, using realistic 3-D visualizations of human biology.

In another pilot project, researchers from Harvard University, George Mason University and the National Science Foundation, in collaboration with several other partners, developed the Multi-User Virtual Environment Experiential Simulator, which simulates River City, a small town in late 19th-century America. Students are asked to discover the reasons behind the degrading health of the town's citizens and, in the process, learn about methods of scientific inquiry. Early findings from the pilot are encouraging, suggesting strong learner outcomes and sustained engagement beyond the presence of a novelty effect.

transformed virtually every industry, “[s]chools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks.” America’s e-learning gap is no longer primarily a problem of physical infrastructure. By 2005, nearly 99 percent of schools in America were connected to the Internet and the student-to-computer ratio was down to 5:1.⁵² The federal E-rate program has already connected virtually every classroom and library to the Internet, laying the tracks for advanced learning applications and digital content that for the most part has not been developed in a way that is easy for teachers to use, nor in a format aligned with curriculum standards that is both accessible and

affordable to every school district in every town. Although the tracks are in place, the trains are still missing.

One of the most important means of realizing the benefits from technology is to ensure that teachers are equipped with the content they need to make use of technology in the classroom. All too often, teachers are very interested in using digital media, but do not know the best way to use such content in a classroom setting. Or, they simply cannot find the content they need easily, especially content that is packaged in a way that is tailored to teaching or aligned with curriculum standards. A recent study on teachers’ use of digital resources by the Education Development Center described the problem as follows:

The overwhelming volume of resources, the vast array of websites, the complexity of Internet searches, the questions of validity, and ease of use can make finding high-quality resources



One of the most important means of realizing the benefits from technology is to ensure that teachers are equipped with the content they need to make use of technology in the classroom

⁵² *Supra* note 43, p. 10.

LIFELONG EDUCATION INITIATIVES

for K-12 users a daunting, if not sometimes impossible, task.⁵³

The study concludes that teachers need to be able to find digital resources more easily; the content should be teacher-tested and immediately applicable to lesson plans; content should be applicable to a diverse group of learners; teachers should have easy access to training; and professional development is most effective when it is local and aligned with educational standards for that state and the immediate technology environment.

These two fundamental requirements for rapidly scaling up the nation's use of its existing digital infrastructure – creating high-quality, tailored digital content and disseminating teacher resources and training – play to public broadcasting's strengths. PBS and its stations have been pioneers in using the media of television, video and the Internet to deliver high-quality education content with ease of use to learners of all ages. In doing so, they have earned the trust of the nation's educators. Currently, 31 percent of adult visitors to PBS's website are educators, a figure that has doubled in the past six years. This is a mark of teachers' trust in the PBS brand and growing interest in public television's digital learning resources.

Moreover, public broadcasters have long studied the changing media and education landscapes. PBS commissions nationwide research each year to study the use of video and digital media by teachers. Additionally, producers of many public television programs like *Sesame Street*, *Between the*

Lions, *Cyberchase* and others have conducted research on the educational effectiveness of their content. Some member stations have also analyzed the effectiveness of companion websites to the programs that they create. For example, WGBH in Boston found that its companion websites expanded both the reach and shelf life of its educational programs, such as *Science Odyssey*, *Africans in America*, *Evolution*, and *Building Big*. In addition, an independent study of the WGBH companion website for the televised series based on Daniel Yergin's bestselling historical text, *Commanding Heights*, found statistically significant learning gains for students enrolled in courses in macroeconomics and international economics in universities and community colleges.

PBS's producers and its member stations create some of the highest quality educational content available today. Shows such as *Between the Lions*, *Cyberchase*, *The NewsHour with Jim Lehrer*, *NOVA*, *Frontline*, *Building Big* and *ZOOM* are already heavily used by caregivers, parents and teachers. In 2004, PBS and its stations deployed prototypes and conducted field research of next-generation K-12 services that would deliver content and data in integrated, on-demand formats across multiple technical delivery systems.

PBS and its member stations need to build on their collective experience, leveraging digital technology for education to implement two digital learning concepts that address critical needs and opportunities in American education and call on public television's distinct infrastructure and strengths.

⁵³ Hanson, Katherine, and Bethany Carlson "Effective Access: Teachers' Use of Digital Resources in STEM Teaching," available at: http://www2.edc.org/GDI/publications_SR/EffectiveAccessReport.pdf.

National Programs Leveraging Digital Technologies for Education

Early Childhood: PBS *Ready To Learn*

Developed in cooperation with the U.S. Department of Education, PBS *Ready To Learn* service (pbs.org/readytolearn) has helped nearly one million parents and teachers prepare eight million children for success in school. For the past 10 years the service has provided funding to support educational children's programming, available to 98 percent of homes nationwide, and related local and national outreach designed to improve early learning skills in young children. Each program funded by *Ready To Learn* is accompanied by extensive Web and print content for children, parents and educators. The companion websites of *Ready To Learn*-funded programs each receive a minimum of several hundred thousand to over six million page views each week.

Through workshops conducted by participating local PBS stations, parents and educators are trained to extend the educational value of the programming through reading and other learning activities with children. Increasingly, local stations are making these workshops available to participants as a series, and including extensive follow-up, to maximize the impact and efficiency of the *Ready To Learn* training.

Over the past five years alone, participating PBS member stations have conducted more than 45,000 workshops attended by more than 500,000 parents and educators. The new *Ready To Learn* outreach cooperative agreement/grant recently awarded by the U.S. Department of Education to CPB (in collaboration with PBS) does not include continuing support for these workshops. Many stations have expressed a commitment to seek alternative sources of funding to continue their successful local outreach services. CPB has pledged \$6 million over the next three years to assist stations in sustaining and expanding their early childhood services during this transition period. A significant amount of additional funding from other national sources will be needed to realize the full potential of this service to positively impact the early learning and school readiness of our nation's young children.

Teacher Training: PBS *TeacherLine*

PBS *TeacherLine* (pbs.org/teacherline), funded by a grant from the U.S. Department of Education, helps preK-12 teachers acquire the skills they need to prepare students for a successful future. PBS *TeacherLine* provides online professional development through facilitated and standards-based courses, supportive and collaborative learning communities, and Internet-based resources. *TeacherLine's* goal is to develop and nationally distribute high-quality online courses and certificate programs. *TeacherLine* is currently distributed through 84 local PBS stations. More than 50 local PBS stations collaborated with PBS on the development of *TeacherLine*.

TeacherLine offers more than 90 courses in mathematics, reading, instructional technology, instructional strategies, science, and curriculum mapping. These courses are facilitated by specially trained educators, combining face-to-face professional development with online instructional design. More than 500 online facilitators have been trained by PBS *TeacherLine*, and tens of thousands of educators have taken PBS *TeacherLine* courses.

(Continued)

LIFELONG EDUCATION INITIATIVES

Online Content: *PBS TeacherSource*

PBS TeacherSource (www.pbs.org/teachersource) helps pre-K through 12th grade educators learn effective ways to incorporate online tools in the classroom through nearly 4,000 free lesson plans, teachers' guides, home-schooling guidance and other resourceful activities, all correlated to national and state curriculum standards.

TeacherSource provides an archive of resources across grades and subject areas, and offers value-added content including guidance on fair use and copyright in the classroom; an annotated index of recent educational technology studies, media literacy research and statistics, and information about PBS broadcast programming. More than 40,000 subscribers nationwide receive *Teacher Previews*, PBS's weekly e-mail newsletter written for educators. *TeacherSource* also features details on local PBS stations' education services and TV schedules, recommended educational books and websites, and special resources for school library media specialists, a critical audience for PBS.

Higher Education: *Adult Learning Service*

PBS and numerous local PBS stations have a long history associated with higher education service offerings. From 1981 until recently, PBS's *Adult Learning Service* was the nation's largest source of high-quality multimedia courses, partnering with local PBS stations to serve more than 800 U.S. colleges and universities, with more than six million adults earning college credit using PBS courses.

In September 2005 PBS ceased operations of its *Adult Learning Service*. In recent years, the explosion of distribution options has changed the demand for these courses. Colleges now require video content that can be segmented and distributed digitally as part of online courses. Among other factors, *the prohibitive costs to clear rights and restructure existing courses for this segmented, digital distribution* have resulted in PBS discontinuing the *Adult Learning Service*. This is a clear example of the inability of PBS to follow a recommendation of the DFI panel because of a lack of funds.

Workforce Training: *Workplace Essential Skills*

Local PBS stations make available a variety of offerings in this area. The flagship station in this effort is Kentucky Educational Television (KET). The *Workplace Essential Skills* courses, produced by KET for the PBS LiteracyLink project, are available to more than 73 million households via broadcast on 199 local PBS stations.

Workplace Essential Skills teaches both the skills and the attitudes necessary to succeed in a workplace setting. Reading, writing, math, communication and problem solving are presented in workplace contexts. As part of the course, learners see how to prepare résumés and applications as well as how to prepare themselves for interviews and for the workplace. In-depth documentary and scripted footage shows what employers look for in new hires and how to thrive in a new job.

Workplace Essential Skills is a comprehensive integrated multimedia learning system, with workbooks, an interactive online component, and teachers' guides to help both students and teachers.

1. Early Childhood 360 Initiative: Tools for Teachers, Parents and Caregivers

RECOMMENDATION: *PBS, its member stations and key partners should build on the foundation of the PBS Ready To Learn service to launch a major national preschool learning initiative with content development, training and outreach tailored for parents, caregivers and early childhood educators. The goal should be to improve the learning skills of preschool and early elementary grade children – at home, at school and in their communities.*

If every child entered kindergarten ready to learn, our nation could make swift progress toward the goal of improving educational

“[T]he bottom line is simple –

and urgent. . . . Research tells us that if a child can't read by third grade, he or she may never catch up”

–U.S. Secretary of Education

Margaret Spellings

achievement for all children. Experts are clear on what it takes for us to move toward that day: Young children must be consistently immersed in rich learning environments that cover the full spectrum of learning needs – from language and literacy, to cognitive math/science skills, to social and emotional development – taught by all the adults who care for them, not only their teachers. Public broadcasting and its partners must help prepare teachers, parents

and caregivers to take a pro-active role in the cognitive development of young children, giving them the content, training and tools they need to offer children the educational start critical for success in the classroom and beyond.

In this effort, early literacy skills will be a central priority. In a speech to the Education Writers Association on May 6, 2005, U.S. Secretary of Education Margaret Spellings highlighted the literacy challenge that faces our nation: “[T]he bottom line is simple – and urgent. Research tells us that once a child starts to slip in the early grades, it is extremely difficult for him or her to catch up. Research tells us that if a child can’t read by third grade, he or she may never catch up. That’s why we must be serious about education reform. No more excuses.”

In an analysis of the home learning environment and kindergartners’ reading scores, the U.S. Department of Education found a strong positive relationship between the two, for both poor students and their peers.⁵⁴ This is not surprising: cognitive, biological and socio-cultural models of literacy development confirm that the preschool years are crucial in developing children’s literacy.⁵⁵ Further, a large number of studies confirm the importance of experiences in the home and in childcare, as well as other preschool classroom settings.⁵⁶ In particular, numerous reports emphasize

⁵⁴ Department of Education, *Condition Education 2003*, Indicator 36.

⁵⁵ Neuman, S.B. and Dickinson, D. K. (2002), *Handbook of Early Literacy Research*. New York: Guilford Press. In Halle, T., Calkins, J., Berry, D., et al., “Promoting Language and Literacy in Early Childhood Care and Education Settings,” *Child Care and Early Education Research Connections*, September 2003, available at: <http://www.childcareresearch.org>.

⁵⁶ For a review of recent research, see Halle, T., Calkins, J., Berry, D., et al., “Promoting Language and Literacy in Early Childhood Care and Education Settings,” *Child Care and Early Education Research Connections*, September 2003, available at: <http://www.childcareresearch.org>.

LIFELONG EDUCATION INITIATIVES

the importance of environments that are rich in language and literacy, the development of sound-letter correspondence, and reading aloud to young children.⁵⁷ The importance of the learning environment in these early years has critical implications for economic development. In a paper published by two economists at the Federal Reserve Bank of Minneapolis, the authors estimate that the annual, inflation-adjusted rate of return from early childhood development could be as high as 16 percent, an extraordinarily high rate relative to other investments in economic development, or even in the private sector.⁵⁸

The PBS *Ready To Learn* service, funded in large part by the U.S. Department of Education, has made great strides in laying the foundations for learning skills and success in school for children under eight years of age. *Ready To Learn* combines the power and reach of quality children's programming like *Sesame Street* and *Between the Lions*, with accompanying websites and print materials for children, parents and educators. In addition, parents and teachers receive training from participating PBS stations on how to extend the value of the PBS *Ready To Learn* media by engaging children in related books and hands-on learning activities at home and in the classroom. It is the kind of encompassing program we mean when we use the term "360."

Numerous studies confirm that this multifaceted approach incorporating programming, multimedia and outreach has proved a powerful and effective strategy in laying the foundations for learning readiness. A 2000 evaluation of *Between the Lions* showed that children who watched it outperformed those who did not by nearly 4-to-1 in measures of phonemic awareness and concepts of print.⁵⁹ A 2003-2004 study by WestEd tested the impact of *Ready To Learn* programs on overall language competence and cognitive academic language proficiency in children in eight states and the District of Columbia. Children who attended childcare centers where a teacher had attended a *Ready To Learn* workshop – and the children viewed *Sesame Street* or *Between the Lions* – exhibited greater improvement in their ability to associate simple and complex drawings, as well as their recognition of increasingly difficult words, than their counterparts. Parents and educators who attended workshops were more likely to read aloud to their children, discuss the content of a program while watching it with a child, as well as afterwards, and engage children in books and activities related to the themes of the programs.



The authors estimate that the annual, inflation-adjusted rate of return from early childhood development could be as high as 16 percent

⁵⁷ See, for example, recommendations of the National Research Council of the National Academy of Science (Snow, Burns, & Griffin, 1998); position statement of the International Reading Association (IRA) and the National Association for the Education of Young Children (NAEYC), and the *Handbook of Early Literacy Research*, cited in Halle, T., Calkins, J., Berry, D., et al.

⁵⁸ Grunewald, Rob, and Art Rolnick, "A Proposal for Achieving High Returns on Early Childhood Development," Draft Version, December 22, 2004.

⁵⁹ "Summative Evaluation of *Between the Lions*: A Final Report to WGBH Education Foundation," Deborah L. Linebarger, PhD, University of Kansas, July 21, 2000; "Data Collection of Federal Performance Indicators for PBS *Ready To Learn*: Year 4 Summary Report," WestEd, August 2004.

In-school viewing studies of *Dragon Tales* conducted in 2000-2001 by Sesame Workshop found that the program had a positive impact on several key early learning related skills. After children viewed 20 episodes of *Dragon Tales*, assessments showed that viewers significantly increased the frequency with which they chose to do challenging tasks, started or organized play with others,



A three-year study found that “Sesame Street” viewing was positively associated with performance in reading, mathematics, vocabulary and school readiness

shared with their peers, and cooperated with others in comparison to a control group that watched a different educational program.

Similarly, a three-year study found that *Sesame Street* viewing was positively associated with performance in reading, mathematics, vocabulary and school readiness.⁶⁰

Further, a follow-up study determined that high school students who were frequent viewers of *Sesame Street* at age five had significantly better grades in English, science and mathematics. These students also read more books for pleasure and had higher motivation toward achievement.⁶¹ A 2003 study on the impact of *Cyberchase* on math-related learning of elementary school children found that the program’s presentation of mathematical content was clear to the children within its target audience, they could replicate the

solutions seen in the series and (to a lesser but still significant degree) could apply the same concepts and problem-solving techniques to new problems as well.⁶²

While these programs have an impressive reach and have already had a measurable impact on preparing children for lifelong learning, in the digital future PBS and its stations can aim to do even better. Indeed, the CPB/PBS *Ready To Learn* programming and outreach proposals recently selected by the U.S. Department of Education for a five-year grant build on the research already conducted to address preschoolers’ needs, including the training and materials useful to help caregivers and families to prepare preschoolers to succeed. Moreover, if we are ever to achieve our national educational goals, it is essential that *everyone* involved in a child’s early education – from parents to relatives to childcare providers and preschool teachers – learn the best, research-based, day-to-day techniques for teaching children learning skills. In today’s world, children are often put under the care of responsible individuals other than parents and teachers. PBS should expand the outreach focus of the *Ready To Learn* program by capitalizing on the opportunities of digital technology to reach the 2.3 million adults paid to care and teach preschool children, along with reaching their parents and other caregivers.

One of our greatest early childhood education challenges is to effectively reach

⁶⁰ Mielke, Keith W., *A Review of Research on the Educational and Social Impact of Sesame Street*, in “G” Is for Growing, p. 90 (citing research conducted by the Center for Research on Influences of Television on Children [CRITC]).

⁶¹ *Ibid.*, p. 90-91 (citing study by researchers at CRITC and the University of Massachusetts at Amherst).

⁶² “*Cyberchase* Season 2 Summative Study,” Shalom Fisch, Ph.D., MediaKidz Research & Consulting, July 2003.

LIFELONG EDUCATION INITIATIVES

and train this diverse universe of teachers, parents and caregivers. The needs and opportunities for outreach are quite different in a large, well-run preschool than they are in a small daycare center or family caregiver's private home. Caregivers' scattered locations and lack of "substitutes" make one-stop, in-person training difficult to deliver. And the wide range of parents' and caregivers' own education, literacy levels and native languages presents additional barriers to an on-site, one-size-fits-all approach. This is where the digital future comes in. With the customization and accessibility that new digital tools enable, and the proven training skills of local stations, we believe effective training could be offered to millions of teachers, parents and caregivers nationwide. PBS and its members can build on the success of their *Ready To Learn* workshops, tools and community outreach networks by developing a digital professional development suite that could break

through the barriers of access and cost that limit outreach today.

The CPB Digital Services Grant, awarded to Mississippi Public Broadcasting, will create workshops using *Between the Lions* programs and related materials to train preschool childcare givers not affiliated with formal learning centers (e.g., Head Start and Bright Horizons), an underserved but key audience. The training, which will be delivered by DTV datacast, on local cable channels, over the Internet and face-to-face, will show caregivers how to use *Between the Lions* to reinforce literacy as well as build their own literacy skills.

The primary challenge faced by *Ready To Learn* is that it is such a small program relative to the need nationwide. Less than \$25 million is spent on it annually. This provides an average of 0.6 full-time-equivalent outreach positions in each PBS member station. Given the importance of this issue to our society, we believe that the

PBS KIDS On Demand

In August 2003, PBS launched PBS KIDS On Demand, a package of 80 PBS Kids shows that PBS and producers licensed to iN Demand, a leading pay-per-view program distributor, for a one-year pilot. The pilot, which was available in nearly eight million homes, proved a hit with viewers and became one of the most popular channels offered by iN Demand. Usage data indicated that viewers used the On Demand programming to supplement their local stations' over-the-air kids' programming. On Demand viewing spiked daily from 4 to 8 p.m., the times when most stations switch from kids' to news and current affairs programming. Encouraged by the success of this pilot, in April 2005 PBS announced the launch of PBS KIDS Sprout On Demand, a package of children's programs available free to subscribers to Comcast Digital Cable beginning in September. The VOD service will offer 50 hours of programs a month, with 25 percent of the programs updated every two weeks.

Among this report's broad recommendations is that PBS employ new technologies to enhance the value of its programming for viewers. The PBS KIDS video on-demand services represent an area in which PBS is already employing new digital technologies and innovative partnerships to bring its excellent content to its audiences on their terms. The popularity of these services among audiences demonstrates just how much these groundbreaking efforts are valued by the public, and may indicate an appetite for expanded on-demand services from America's most trusted producer of educational programming.

federal government must do much more and that the private sector and philanthropies need to invest in this area in a major way.

To make such initiatives most effective, PBS, its member stations and their national partners need to construct dynamic, fully integrated education content (programs) that are customized to individual learners. These need to be a flexible combination of engaging educational content for use with and by young children with integrated professional development and training for their educators, parents and other caregivers. A variety of platforms can be used to deliver this content to all users:

- Traditional media, including video and print materials;
- Interactive digital media, such as games and tutorials, delivered via websites and DVDs; and,

- Community-based, broadcast and online outreach and training for educators and parents.

PBS and its member stations need to begin by organizing a major national dialogue with key academic experts and partners, develop top-of-the-line early childhood learning skills-focused educational content in addition to that which is already available from public television on air, online and in print. We suggest that partners include academic experts in early childhood learning; research consortia and clearinghouses such as the Children's Digital Media Center, based at Georgetown University, and the Center for Best Practices in Early Childhood at Western Illinois University; national organizations such as the National Center for Family Literacy, National Association for the Education of Young Children, International Reading Association and Reading Is Fundamental and the National Council for Early Childhood Professional Recognition;

Ohio: Statewide Educational Offerings

Eight Ohio public television stations participate in the *Ready To Learn Service*, reauthorized by Congress in the No Child Left Behind Act of 2001. The program has had profound impacts on children and families, particularly those with low English proficiency, low literacy or disabilities, and for those who live in rural areas. *Ready To Learn* stations provide noncommercial television programming of high quality and educational value; distribute free books to poor children; distribute magazines in Spanish as well as English to let parents and teachers know about educational programming; provide workshops for parents and caregivers about early childhood development; and collaborate with other early childhood education organizations including federal programs like Head Start and local organizations such as schools and libraries.

Ohio's *Ready To Learn* started in 1998, when the state sought to partner with public television as a strong, trusted source of information that reached almost every home. Its eight member stations develop public service announcements, hold training sessions and distribute materials. From July 1, 2004, to June 20, 2005, WGTE alone offered 56 workshops in its broadcast community based on Ohio Department of Education standards. The workshops are free and open to childcare providers, attracting people of all income ranges, ethnic backgrounds and family types. Studies have shown that six months after attending a workshop, participants watch more educational television and engage in more interactive learning.

LIFELONG EDUCATION INITIATIVES

state leaders and education agencies; home school leaders; business leaders; the youth electronic gaming industry; and community leaders recruited by PBS stations. We recommend that a major initiative along these lines be fleshed out in detail in Phase II of DFI.

The framework, specific initiatives and content created by such a braintrust should be delivered through a publicly accessible, anytime/anywhere digital library – the Internet-based Public Service Media Web Engine we describe in Section 5 below. They should include a set of programs and tools that are appealing to young people and easy to access and use for parents,

caregivers, home-schoolers, traditional schools and preschools and childcare centers nationwide. These resources have to be available on-demand and aligned with national and local curriculum standards. In such a model, parent and teacher guides and training modules will be companion pieces, along with tools to track children’s progress. Homes, childcare centers and preschools not equipped with broadband Internet connections, which are likely to be disproportionately situated in low-income and rural areas, should be able to receive these materials in the form of DVDs from local public broadcasting stations as well, in order to increase accessibility of the tools to all children and

What Is the Value of This Initiative for Parents and Caregivers?

- Resources to support children’s learning
- Guidance on how to use these resources effectively
- Accessibility at home, work or other convenient locations
- Availability on demand via Internet, broadcast, datacast and DVD
- In-person family learning support from PBS stations and local partners
- Spanish language content and outreach tools
- Adult learning resources, coordinated with the children’s resources
 - Offered in partnership with local and national organizations
 - Linked to welfare-to-work, workforce development and GED programs

What Is the Value of This Initiative for Early Childhood Educators?

- Resources to support and track children’s learning
- Accessible at home, work or other convenient locations
- On-demand Internet, broadcast, datacast and DVD resources
- Robust and personalized professional development tied to degree programs, and licensure or certification requirements
- In-person services from PBS stations and local partners
- Integration between children’s, parent’s and teacher’s resources

What Is the Value of This Initiative for Children?

- Personalizes early learning packages
- Universal accessibility
- On-demand resources via Internet, broadcast, datacast and DVD
- Engaging video, audio, images and interactive games
- Resources for English language learners

their educators. We also recommend a study on how to make as much material as possible accessible to parents and caregivers who are English language learners. The children they care for are often in greatest need of learning support. Such materials and training should be customized by local stations, in partnership with local organizations, to serve local needs.

2. A National E-Learning Content and Applications Initiative

RECOMMENDATION: *PBS and its member stations should work with diverse partners, major educational and cultural institutions, businesses and philanthropies to create an extensive and easily searchable online library of digital education content and interactive training tools to meet the needs of teachers and learners of all ages and needs.*



Online and on-demand

E-learning tools – engaging, interactive, self-paced, personalized – offer great potential for boosting the productivity of classroom instruction and learning in all environments

As technology enables a world where content is accessed anytime and anywhere, we strongly urge PBS, its stations and partners to launch a major national initiative to develop a vast online archive of multimedia educational content that is specifically suited to the capabilities of new technology – and to the needs of students, teachers and parents. Moreover, public television has the ability to use its rich local networks to help teachers learn to use technology effectively in the classroom by

conducting workshops and delivering training tools for using technology. The basic characteristics of online and on-demand E-learning tools – engaging, interactive, self-paced, personalized – offer great potential for boosting the productivity of classroom instruction and learning in all environments. By integrating digital multimedia education resources into the classroom, schools also can diminish their reliance on costly and quickly outdated textbooks. With many school districts adopting new textbooks only once a decade, greater use of digital resources offers the opportunity of engaging, up-to-date and ultimately cost-effective teaching tools.

Member stations should ensure that digital content is aligned with state curriculum standards and customized to enhance local use. PBS should lead the effort of collaborating with industry and public organizations, as well as national cultural institutions such as the Library of Congress, the Smithsonian Institution and the National Archives, to integrate their resources into a vast federated online learning library. PBS and its member stations should seek out and work closely with partners in industry, academia and government (such as the U.S. Department of Defense) to develop interactive software, such as online games, simulations and intelligent tutor systems. These tools can then be customized and made accessible and affordable to all.

PBS can and should convene varied partners for different National E-Learning Initiative programs. For example, it should seek a close partnership to develop math and science content with the 13 national

LIFELONG EDUCATION INITIATIVES

business organizations that recently announced a major initiative in this area.⁶³

History is a key area on which this initiative should focus. Young people's knowledge of even the fundamentals of American history and civics has been on a steady and well-documented decline for a generation or more and, by most standards, has remained at an unacceptable level for some time. For example, the American Council of Trustees and Alumni surveyed students at the 55 most elite colleges and found that only 60 percent were able to correctly place the Civil War within a fifty-year spread; and 63 percent did not know what the Emancipation Proclamation actually granted. According to the most recent National Assessment of Educational Progress – the “nation’s report card” – only a quarter of 12th-graders could name two ways in which the U.S. Constitution limits government power.

In order to halt and reverse this decline in knowledge of American history and civics, the Corporation for Public Broadcasting recently launched a \$20 million American History and Civics Initiative, calling on public television managers, film makers and content developers – especially in the high tech and interactive media sectors – to work with educators in creating groundbreaking new media projects and methods to improve the learning of American history and civics by middle and high school students.⁶⁴ PBS, NPR and local stations

should embrace the content created by this initiative and should work aggressively to distribute it over multiple platforms.

This content should reside in a national online learning library that will be part of the Public Service Media Web Engine described below. The Engine will provide ease of information access through searching and aggregation, customization, anytime/anywhere availability and a rich source of data to constantly improve the quality of the resources. At the level of content within the library, the strengths of digital media include exciting and engaging multimedia content, interactivity, immediate access to related resources, customization to learning styles through intelligent tutoring and constant feedback for tracking progress.

A study by the Education Development Council asserts that teachers have significant interest in multimedia resources. Teachers want web-based materials that save time and energy, like efficient search engines and easy-to-navigate websites. Moreover, they want to be able to easily determine the validity of digital resources, and they want these resources to be easily available on the multiple-platform environment of most schools.⁶⁵

Public broadcasters can draw from the experience of a very similar initiative that is already under way in the United Kingdom. In 2003, the British government awarded

⁶³ Business Roundtable, *et al.*, “Tapping America’s Potential: The Education for Innovation Initiative,” July 2005, available at: <http://www.businessroundtable.org/pdf/20050803001TAPfinalnb.pdf>.

⁶⁴ Corporation for Public Broadcasting Press Release, April 11, 2005.

⁶⁵ Brumfield, Robert, “Study: These factors retard digital teaching,” *eSchoolNews*, June 1, 2005; Katherine Hanson and Bethany Carlson, “Effective Access: Teachers’ Use of Digital Resources in STEM Teaching,” available at: http://www2.edc.org/GDI/publications_SR/EffectiveAccessReport.pdf.

Philadelphia's WHYY: A Hub for Community and Education Partnerships

WHYY is the Philadelphia area's largest public service media provider, broadcasting to more than 2.6 million households in Pennsylvania, southern New Jersey and Delaware. The shift to digital technology has allowed WHYY to explore using new platforms of content distribution, including VOD and Philadelphia's planned citywide WiFi network, as well as hosting an education portal for Pennsylvania elementary and secondary schools.

The advent of digital technology coincided with the return to WHYY's roots of lifelong learning for the community. The vastly increased capacity of DTV and the Internet was coupled with the station's heightened aspiration to partner with its community and share its digital resources. WHYY sees its future as a "hub" or "convener" of a network of community partnerships that will provide social, cultural and educational services to the community. WHYY will be the digital communications partner for community institutions.

Among the goals:

- **Learning Lab:** A central WHYY mission is to share digital technology with the education community. The facility is multi-purpose: featuring a wired performance/lecture space; classrooms and project spaces. Pilot projects using the Learning Lab are already under way.
- **Local Access Unit:** WHYY's Learning Lab is used to train community partners to produce digital video (WHYY lends partners the necessary equipment, teaches necessary skills and assists in production). This results in content for WHYY digital channels and content for the organization as a whole.
- **Workforce Training:** WHYY digitized 100 hours of PBS Workforce Essential Skills and GED Training videos, which were datacast to personal computers at 20 workforce training centers across the region. Spanish translation of this content is under way.
- **Custom TV:** Customized TV for niche audiences. WHYY regularly datacasts customized blocks of programming to partners, which transfer it to their channel. Initial partners include retirement communities and prisons.
- **Community Production:** WHYY is outfitting the Curtis Institute of Music's theater for capturing content. WHYY gets content for distribution platforms. Curtis gets video for instruction purposes.

£150 million to the BBC to create a national multimedia educational service. The new service, called Digital Curriculum, is expected to begin in January 2006 and will be free and accessible to all pupils, teachers and parents online in the classroom, at home and at venues throughout local communities across the U.K. The Digital

Curriculum initiative aims at providing high-quality interactive resources to stimulate learning at home and school, while complementing current school curricula. It will also aim to support learners of different abilities, to bridge the home-school divide and to support lifelong learning.⁶⁶

⁶⁶ BBC, "BBC Digital Curriculum," http://www.bbc.co.uk/info/policies/digital_curriculum5.shtml.

Teachers' Domain: A Groundbreaking Resource

Since 2000, Boston station WGBH has been developing digital library collections and companion professional development courses for *Teachers' Domain*, a digital service designed to harness the educational resources of public television and its institutional partners to support standards-based teaching and learning. With over \$11 million in funding and major support from the National Science Foundation's National Science Digital Library, the service has had an initial focus on the sciences, and is now expanding into other core curriculum areas. It features video segments from series such as *NOVA*, *Frontline*, *ZOOM* and *American Experience*, as well as interviews, audio clips, interactive Web-based activities, photographs, animations, graphics and primary source document texts. Carefully selected, and often re-edited to address the needs and realities of K-12 educational settings, these resources are organized to align with commonly taught curriculum units and performance standards at both state and national levels.

Resources are presented with extensive contextual information that allows for practical, effective use – background essays, closed captions, annotations and lesson plans. Each is correlated to individual state as well as national standards, and can be organized into resource folders that allow customization and sharing. Detailed metatagging also permits other digital libraries and catalogs to harvest data about the resources, facilitating interoperability and expanding both reach and impact. *Teachers' Domain* can function as a stand-alone resource or as a complement to other educational multimedia services. It is designed to support local stations' educational activities.

The professional development tier of *Teachers' Domain* features a series of online courses that incorporate the rich-media resources in the digital library, supplemented by video footage illustrating effective classroom practice. These research-based, online courses reflect a constructivist, inquiry-oriented approach, and provide both a range of effective methodologies for use in teaching as well as a deeper understanding of subject area content.

Research on the effectiveness of the *Teachers' Domain* model was conducted by the Center for Children and Technology at the Education Development Center in 2003-2004. Featuring case studies of its application in a demographically diverse range of school districts, this research concluded that "almost unanimously, case study participants found *Teachers' Domain* to surpass their expectations of what an educational web experience could and should consist of – links and multimedia worked a vast majority of the time, materials were well organized and easy to understand, the link to standards and their school's curriculum was apparent, and a rich array of materials in different formats in one place was very desirable to them."

Teachers' Domain has also been selected as a model program within the National Science Foundation's National Science Digital Library (NSDL), shaping programwide approaches to such features as standards correlation, content support for teachers and students, and user customization. By late 2005, *Teachers' Domain* will serve as the NSDL's primary portal for the K-12 audience. This service has also been the recent focus of attention from the Corporation for Public Broadcasting, which has allocated funds to support development of localization features of *Teachers' Domain* at Penn State Public Broadcasting, KQED in San Francisco and Mississippi Public Broadcasting. These station efforts are aimed at further engaging public television stations in the expansion, promotion, and distribution of the service across the country.

Public television also can draw on experiences closer to home, such as PBS *TeacherSource*, Maryland Public Television's

ThinkPort, *EdOnline* by New York's WNET, the Utah Education Network and the *Teachers' Domain* produced by Boston's

WGBH. With major support and funding from the National Science Foundation, WGBH has created a digital library of more than 1,000 resources, including re-versioned content tied to its award-winning programs, such as *NOVA*, *Frontline*, *ZOOM* and *Building Big*. Educators can search the library by resource, format, grade level, subject area and keyword (see sidebar).⁶⁷

Portals to Partnership

The National E-Learning Initiative will greatly benefit from the local roots of the public broadcasting system. Local stations often bring 30 years or more of commitment and collaboration toward lifelong learning in their communities. They are ideally suited to both convene partnerships and curate local academic, cultural and corporate resources. Station leaders' demonstrated knowledge of local

 **Local stations often bring 30 years or more of commitment and collaboration toward lifelong learning in their communities**

educational needs, demographics and economies should empower them to reach underserved audiences, whether they are illiterate adults in Kentucky or young dropouts in Texas.

Local public television stations can work with parents, teachers, local governments and students to develop content that is aligned with local curricula and relevant to the community's needs. In addition, local public television stations can develop and contribute their own educational resources, both expanding the

library and increasing experimentation in the kinds of digital learning content that are most effective. One example is Boston station WGBH's partnership with Mississippi Public Broadcasting to build on the ability of *Between the Lions* to support childcare providers.

One general feature of this National E-Learning Initiative (for which national funds should be sought) should be to add local features to the national content where appropriate. We urge PBS member stations, acting in concert with other state and local organizations, to develop community-based extensions of the new learning tools (e.g. regional history to customize a national history program). Resources permitting, they should develop programs to produce locally relevant content from local partners that supplements the national resources. They should consult with state and local school officials on whether curricula could be customized to meet the needs of local districts, as well as how best to address relevant state standards.

E-Learning Applications: Interactive Games, Tutoring, Simulations

To make optimal use of the capabilities of new digital technology, public broadcasters should lead a process to develop interactive E-learning applications including interactive games, intelligent tutoring and simulations for delivery on multiple platforms. PBS has already started down this path, working with publishers of textbooks to create companion CD-ROMs and DVDs to

⁶⁷ National Science Digital Library, "Teacher's Domain Pathways to Science," available at: http://nsdl.org/ofinterest/?ctype=rss&rss=partner_libraries#td.

Potential Partners' Projects on Interactive Educational Media

By combining public television's experience producing exciting educational content available for multiple media platforms – and parents' trust of public television's content – with the technology and development experience of those in research and industry, interactive educational media can be effectively developed. Potential partners and some of their current projects include:

- **The Federation of American Scientists**, which is currently developing the games *Immune Attack* and *Discover Babylon* to teach students human biology and the history and culture of ancient Mesopotamia, respectively, in addition to the *Mass Casualty Incident Response* game for first responders.
- **The U.S. military**, which has long taken advantage of the learning potential of interactive games and simulations. The Pentagon spends more than \$4 billion each year on simulation equipment and war games like *Full Spectrum Warrior* and *America's Army*.
- **The Woodrow Wilson Center**, a nonpartisan research organization, which sponsors the *Serious Games Initiative* (<http://www.seriousgames.org>). This burgeoning movement is experimenting with games that go beyond entertainment to tackle serious challenges in public health, public policy and social change.
- **LeapFrog Enterprises**, which embeds its technology inside books that attach to electronic pads. The software allows children to learn Spanish or arithmetic with music and audio to supplement the book. Leapster, their new handheld device for kids in grades K -12 , teaches letters, colors, shapes, numbers and reading.
- **Massachusetts Institute of Technology** experts, such as Henry Jenkins of the Comparative Media Center, who are studying ways to use games to teach students math, science, engineering and other subjects.
- **University of Wisconsin** experts like Kurt Squire, who is working on educational games that engage students as fully as recreational ones do.
- **Carnegie Mellon University's** Entertainment Technology Center in Pittsburgh is developing a number of digital educational games as part of wider research in entertainment technology.
- **The Institute for Creative Technologies**, in California, which has developed a learning simulation game to train C.I.A. analysts to anticipate the actions of terrorists. The institute was formed by the U.S. Army to aggregate the knowledge of the entertainment and video game industries and academia to try to create breakthrough uses of games technology.

complement broadcasts of such programs as *Scientific American Frontiers*. But it really only has its toe in the water.

Education experts are now taking notice of video games, especially online multi-player

games that require communication and collaboration with other players, as ways to align students' media-rich environments outside of school with what happens inside the classroom. Research into video games poses an unprecedented opportunity to

marry cognitive research with the capabilities of technology to create rich, engaging simulations and virtual environments while focusing on what makes students learn most effectively. For example, cognitive scientists know that children learn faster and better when they learn by doing. Researchers also know that individualized teaching, with unlimited questions and feedback, produces the best results. In fact, while students are likely to ask only 0.27 questions every half-hour in a



Interactive software can harness the potential of this research and deliver the benefits of hands-on learning and one-on-one tutoring that were once thought too expensive to offer most children

standard classroom, students ask 27 questions every half-hour, on average, with interactive learning.⁶⁸ Interactive software can harness the potential of this research and deliver the benefits of hands-on learning and one-on-one tutoring that were once thought too expensive to offer most children, even though those who receive such care clearly outperform learners in the standard classroom.

Interactive technologies can reinforce curriculum material as students learn at their own pace, repeating material when required. Technologies such as intelligent tutoring systems can also continuously improve their effectiveness by drawing on a constant source of real-time data from the learner. Interactive technologies like multi-player games can also encourage collective problem solving, by allowing students to

chat or message or talk to each other as they explore a simulated environment. Digital media can also provide access to experts and other students from around the world, while serving as a means for both learners and teachers to share their experience with one another.

Public television programming is widely trusted by parents and educators, and PBS and its stations have decades of experience in tailoring education content to different media technology, whether television or the Internet. By working with partners in government, research and industry, PBS and its stations can combine the trust of their consumers and their experience in developing appealing, engaging, high quality educational content with the game development experience of partners to bring educational content to the next generation of media platforms (see sidebar).

Henry Kelly, the president of the American Federation of Scientists, pointed out to the DFI panel that public broadcasting should not attempt to undertake major game development on its own. "Look at the expertise, the hundreds of millions of dollars that have been invested by the Department of Defense in simulations and electronic learning of all kinds. Look at the video games industry," he said. "Partner with them." Kelly gave the example of the commercial industry becoming expert at making games harder or easier as the user succeeds or fails. He and others suggested that PBS focus on two roles: convening/leading other partners and contributing multimedia content.

⁶⁸ Henry Kelly, President, Federation of American Scientists, public presentation to the DFI panel, January 12, 2005.

LIFELONG EDUCATION INITIATIVES

Officials in the electronic games industry told us that it is not uncommon for \$10 million to \$15 million to be spent on the R&D of a new game, employing more than 100 people for one to two years. In this field, children are expert consumers; it is important for public broadcasting to meet their expectations.

Applications for Special Communities of Learners

Public broadcasting should develop focused extensions of this E-Learning Initiative to address the needs of special communities of learners, including home-schooled students, English language learners and students with learning disabilities, as well as adult literacy and workforce training. Public television is ideally positioned to take advantage of the capabilities of emerging digital technologies to enhance the usefulness and accessibility of learning materials and interactive tools for these communities of special learners.

Home Schooling: Rich Resources to Chart Your Own Path

For a growing number of children, home schooling is the future of education. An estimated 850,000 students – nearly 2 percent of the country’s total school-aged population – are being home-schooled, according to the U.S. Department of Education. Numerous companies now offer home school curriculums, many based on providing a classical education, rich in literature, history, geography and skill building in mathematics and grammar.

PBS has recognized the rise of home schooling and has already initiated efforts

to ensure that the nation’s growing population of home-schooled children has access to top-quality educational resources. For example, PBS has established partnerships with publications for parents of home-schoolers, such as *Homeschooling Parent* magazine, to feature lesson plans and materials from PBS *TeacherSource*. Moreover, PBS regularly engages home-schooling parents as advisors to its educational service initiatives.

While forging partnerships with home-schooling communities and their providers is an essential first step, far more can be done in the digital age. The average home-schooling family spends more than \$600 per child annually on curriculum materials and could greatly benefit from expanded and convenient access to a vast library of video, data and other searchable material aligned to curricula they are following. Creating an extensive multimedia learning library and interactive online applications would provide a rich instructional resource of particular benefit to home-schooling families. Special services, such as digitized libraries, online lesson plans and subject-matter guides, can also be offered to supplement the home school providers’ curriculum packages. PBS and its stations could also provide core curriculum packages that align with standards in various states.

Local stations’ contributions to the national learning library would also provide home schoolers with easy access to community information and resources. A National



PBS has already initiated efforts to ensure that the nation’s growing population of home-schooled children has access to top-quality educational resources

Online Learning Library would aggregate substantial content to serve niche communities of home schoolers; for example, parents of home schoolers who spend additional time doing hands-on activities could easily search and find helpful resources that have been gathered from across the nation. An online learning library also provides the opportunity for



Digital education technology offers a powerful new tool to educators to help students with learning disabilities learn to read

parents who have used the resource to communicate with each other about their experiences. Home schoolers are particularly interested in hands-on, *local* educational resources and experiences (such as museum exhibits and living history sites). PBS and its stations could serve home schoolers by working with other local institutions to suggest information on educational experiences and opportunities, and to link them with national digital resources that provide additional context to the topic being studied.

Literacy and Learning Disabilities

Digital education technology offers a powerful new tool to educators to help students with learning disabilities learn to read. Millions of students with learning disabilities are significantly hampered in their success in school and conventional instructional methods are unable to help them. For some children with disabilities such as dyslexia, reading can be akin to searching for a needle in a haystack.

PBS and its member stations already provide widely used services directed at

learning-disabled students, their parents and their teachers. Currently, WETA in Washington, D.C., operates LDOnline.org, the leading website on learning disabilities for parents, teachers and other professionals. The website features a wealth of information to help parents and teachers better understand their child's disabilities and how to overcome them, both at home and in the classroom. The LD Online Store offers an extensive array of products, including books and videos for kids, parents and teachers. WETA also offers Reading Rockets, a multimedia project designed to help children who struggle to learn to read, and *ColorinColorado*, one of the first bilingual websites geared to help children acquire literacy skills. Similarly, WGBH produced a show featuring experts on dyslexia, called *Misunderstood Minds*, which aired nationally on PBS; the show maintains a companion website of useful resources on pbs.org. The Cornerstones Project, funded by the U.S. Department of Education and developed by WGBH's National Center for Accessible Media, adapts *Between the Lions* content to further the literacy-acquisition skills of children with hearing disabilities. PBS's website also maintains an entire section devoted to helping parents and educators remain informed about the needs of children with disabilities.

In the digital future, PBS and its stations should seek to greatly expand and integrate these efforts and, resources permitting, make them available on-demand for low cost or free to ensure that all learning-disabled students have access to the best educational materials available to help them thrive and meet their potential. The digital future of public television offers much hope

LIFELONG EDUCATION INITIATIVES

and promise for children from poor families and students with learning disabilities.

Simply organizing a digitized library of video, lessons and other resources is not enough for these children. Scientific research into what works and what does not for children struggling with a reading disorder has made great headway. Grabbing hold of the research sail, PBS can race into the digital future by providing a coherent, research-based selection of literacy products and programs made accessible for all students who are challenged to decode or comprehend the written word. Looking ahead, PBS, in partnership with local stations, can greatly enhance the quality and availability of multimedia educational resources for learning disabled students, their teachers and their parents. Such an initiative could:

- Make multimedia, digitized products accessible to reading-disabled children and adults;
- Better support professional development efforts for teachers of reading-disabled students; and,
- Provide resources for parents to help their children at home.

Dyslexic children and adults require an alternative way to receive information. While video is an effective way to convey information, the text on today's websites is extremely difficult for many readers to decode in a timely fashion. PBS and its stations could provide read-along text for all materials related to lesson plans on their websites. Similar to the Kurtzweil technology that scans and then "reads" for students while they track the written text on the

computer screen, a reading-disabled student could access public service media material by hitting a "play" button and the material could be read aloud. Videos featuring text, games, lessons and other materials must all be made accessible to children through technology that allows the text to be read by the computer. Building on its experience with emerging readers, as well as years of research and feedback, PBS should continue its efforts to integrate enlarged text as another feature that makes public television material accessible to readers with disabilities.

Similarly, state-of-the-art gaming technology could be made accessible to struggling readers through text that can be read by the computer. Visual experiences and games in context, such as the Constitutional Convention and other simulations, are ideal for struggling readers who often rely on visual skills and learn best when material is placed in context.

Teacher Professional Development

PBS and its stations can also build on their experience in providing professional development for teachers of students with learning disabilities to focus on alternative ways to present material, including the use of technology. The goal is for students to achieve their potential, even if that means providing alternative ways to access high-level material for learning-disabled students who also are gifted learners – so-called "twice exceptional" students. PBS member

 ***PBS, in partnership with local stations, can greatly enhance the quality and availability of multimedia educational resources for learning disabled students***

Multimedia Educational Opportunities in Kentucky

Kentucky Educational Television signed on the air in 1968 as Kentucky's statewide public broadcasting network, and stands today as the largest PBS member network in the country, with 32 transmitters – half of them digital – and three translators. KET broadcasts not only wide-ranging local arts, cultural, documentary and public affairs productions, but also adult education programs and college-credit telecourses to viewers both in Kentucky and in neighboring states. The station now has a widely acknowledged reputation as the best producer of video instruction in adult basic skills and workplace education.

KET distributes its adult education materials in a variety of ways, in order to reach as many participants as possible. In partnership with PBS, the Kentucky Department of Education and the National Center on Adult Literacy, KET has helped develop and launch the LiteracyLink project, which broadcasts on public television and has online components as well, including assistance for students preparing for the GED exam. KET also publishes and distributes the KET Adult Learning Quarterly newsletter.

stations should, perhaps in collaboration with a local university's school of education, provide on-the-ground teacher training and support to help educators identify and understand learning disabilities, as well as learn the latest techniques to teach and motivate learning-disabled students. PBS should create online personalized service accounts, linked to assessment tools, that allow parents and educators to measure and track student progress to find out if their student is on track or needs extra help. PBS also can create a "promising practices" section on the website that includes contact information for teachers to network with other teachers working to improve the literacy skills of young children, middle-schoolers and young adults.

While work is under way for teaching young children to read, the future focus of the literacy movement is how to improve reading skills of middle school and high school students, as detailed in the *Reading*

Next report.⁶⁹ A special PBS track on adolescent literacy would learn from and implement the lessons from this ongoing research into reading, to benefit learning-disabled and other children.

Parent Support

Many parents of all economic levels are not prepared to teach their young child crucial learning skills. This inability becomes more critical when their child has a learning difference. Parents of children with learning differences need advice and resources on techniques to use with their children that will support learning in all its forms. Parent workshops sponsored by local affiliates, in collaboration with community organizations, are another way to get these critical information resources into the hands of parents from a range of income levels. These workshops would teach parents how to utilize the online resources PBS will provide, as well as provide relevant media

⁶⁹ Biancarosa, G., and Snow, C. E. (2004), *Reading Next—A Vision for Action and Research in Middle and High School Literacy: A Report to Carnegie Corporation of New York*, Washington, D.C.: Alliance for Excellent Education.

New Jersey Network's Adult Education Focuses on Disadvantaged

Using datacasting, the New Jersey Network meets the state's most pressing needs in workforce training and adult education. In cooperation with the New Jersey Department of Labor and Workforce Development, NJN Public Television uses a variety of delivery systems including analog and digital television, videotapes, online services and workbooks to offer participants personalized educational opportunities in reading, writing, math, communication, financial literacy, job searching and general life skills. Supplementing the multimedia materials, NJN has also established Career Centers throughout the state. These centers, and all of NJN's adult learning offerings, focus even more energy on welfare registrants, dislocated workers and even prison inmates wanting to make a transition. NJN also makes an extra effort to make its materials available to hearing- and sight-impaired participants. Participants can work at their own pace using DTV technology, computer software, Internet and print materials and training services.

including videos and lesson plans on DVDs for parents who do not have Internet connections.

Educators and parents need a coherent plan for helping their children. PBS.org, backed up by the Public Service Media Web Engine discussed below, could provide that one-stop shop for teachers and parents of learning disabled students. A section on the PBS website dedicated solely to teaching learning skills to children with learning disabilities, based on solid research, plus parent and teacher outreach, is the first step to a future in which no learning disabled student is ever left behind.

Workforce Training and Adult Literacy

Amazon. eBay. Wal-Mart. Google. The rules of commerce and communication continue to morph into business models yet unseen. Even "old" jobs are evolving to require ever more skills and training. From libraries to factories to grocery stores, technological literacy has become a basic skill.

Why such radical change? As employers turn to new technology to boost productivity and efficiency, workers are expected to master an array of information, telecommunications and manufacturing technologies. Information technology takes an increasing share of business equipment purchases, requiring nonsupervisory and production workers in manufacturing and service industries to continually upgrade their skills to maintain competence.

In this new economy, lifelong skills development must become a central pillar. Jobs of the future will require greater flexibility and fluency with technology that most workers do not yet possess. Jobs requiring high skills will experience the fastest growth, with eight of the ten fastest growing jobs demanding moderate- to long-term training, if not a college education.⁷⁰ And as the American workforce faces an increasingly competitive international



**The Public
Service Media
Web Engine ... could
provide that one-stop
shop for teachers and
parents of learning
disabled students**

⁷⁰ U.S. Department of Commerce, *et al.*, *21st Century Skills for 21st Century Jobs*, 1999.

market and high rates of technological obsolescence, training and periodic skills upgrading will be essential to ensure that workers remain productive over the course of their careers, as well as able to transition between jobs with as little pain as possible.

Unfortunately, many American workers lack even basic skills – a problem compounded by high drop-out rates at the high school level. More than one in five Americans operates with literacy and numeracy skills at or below the fifth-grade level. Another quarter top out at the sixth-to-eighth-grade level. Less educated workers unable to upgrade their skills are likely to suffer a lifetime of lower living standards. The typical high school dropout earns 42 percent less than the average high

school graduate, and that graduate earns 77 percent less than someone with a college degree.⁷¹ And of course, those with less education are most likely to be unemployed. When they lose their jobs, they are also less likely to find a new one.

As the stations profiled above indicate, public television is already experimenting with ways to serve these communities. The digital transition will enable PBS and its stations to do far more to reach out and equip adults with the skills they need to improve their quality of life, as they deliver similar services and experiment with new ways to help adults learn more effectively. These crucial efforts should be built upon and extended under the National E-Learning Initiative.

⁷¹ *Ibid.*, (figures as of 1997).



CHALLENGE NO. 2:

COMMUNITY ENGAGEMENT

RECOMMENDATION: *Public television and radio broadcasters should leverage their unique strengths – particularly their strong local roots and reputation for trustworthiness – to more deeply engage their communities in two-way discussions of critical concerns. We suggest starting this by more fully addressing three important needs currently affecting American communities: the need for a robust, thoughtful and factual discussion of local, state, national and international public affairs issues, and the need for a broad, locally customized dissemination of public health and emergency preparedness information to all citizens.*

A. Nurturing Localism: A Digital Civic Forum for Every State

Public broadcasters should leverage digital multi-channel capacity to dedicate, in each state and/or major metropolitan area, a digital channel and online platform to expanded coverage and discussion of local news, government and civic and cultural affairs. This effort should be supported and supplemented with a national Digital Public Affairs programming service. At both the local and national levels, expanded civic affairs, news and election coverage

should be financed solely by citizens, foundations and other private sources to the greatest degree feasible.

The Challenge: Informing and Engaging Americans in the Drama of Democracy

The cornerstone of a healthy democracy is an informed and engaged citizenry. In the digital age, Americans now have more methods of communication and more sources of information than ever before in our history. The advent of digital multicasting and the interactive, on-demand resources of the Internet – available over a multitude of platforms that include PCs, TVs, PDAs, iPods and cell phones – is exponentially increasing the ways in which people can access and share information. Yet voter apathy and public ignorance of the workings of government at all levels remains high, especially among young people. While digital technologies have the potential to inform and engage civic discourse, they will not by themselves inspire honest debate, inform opinions or motivate active citizenship. Engaging a

 **The cornerstone of a healthy democracy is an informed and engaged citizenry**

substantial share of our fellow citizens in civic affairs will require a highly visible and accessible source of trusted content, coverage and community discussion dedicated to illuminating issues of local, state, national and international concern.

Commercial broadcast media have generally withdrawn from serious public affairs programming, leaving gaping holes



**The Campaign
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programming focused
on local public affairs**

in their coverage of civic affairs on the national – and especially on the state and local – levels. A report released in May by the Campaign Legal Center showed that only three-tenths of one percent of commercial digital broadcast programming focused on local public affairs.⁷² Neither are the workings of local school boards, town councils and state legislatures the province of commercial stations, or even of C-SPAN, the national affairs cable channel. Mass media election coverage is widely criticized for focusing more on the “horse race” than on informing citizens about the issues and substantive positions of candidates. Studies regularly show that elections below the presidential level receive very little coverage at all on television.⁷³ It is not likely that commercial broadcasters will take advantage of the enhanced capacity and new platforms of the digital age to expand their local and state civic affairs coverage.

The public is aware of the need for trusted information on civic issues. For example, a national telephone poll for the nonprofit Internews Interactive in 2000 found high levels of interest. Among the 1,000 citizens polled, 83 percent thought an interactive “Citizens’ Channel” would be a credible way to present important issues; 70 percent said they would be likely to watch; 52 percent would go to a public place to participate in programs; 45 percent would call in or e-mail to the programs; and, significantly, 59 percent said such a channel should be affiliated with public broadcasting.

Existing Initiatives: Public Broadcasting and the Public Square

Local public television and radio stations are already well known for their commitment to in-depth coverage of civic affairs in their communities. And many local public stations are already breaking new ground by applying expansive digital technology – from multicasting to the Internet – to amplify their civic affairs coverage. For example, WGBH/WNET World is a digital multicast channel, broadcast in the Boston and New York markets, that offers in-depth coverage of news and views from around the world along with insightful history and science programs with a global perspective. Other stations are providing unprecedented access to state and local institutions, town meetings and debates, and other information vital to those seeking to be engaged in local civic life. These dedicated state or local public affairs channels also

⁷² “Broken Promises: How Digital Broadcasters Are Failing to Serve the Public Interest,” Washington, D.C., Media Policy Program of the Campaign Legal Center, May 23, 2005.

⁷³ “Most Local TV Newscasts Are Ignoring the 2002 Mid-Term Elections,” Washington, D.C., Alliance for Better Campaigns, October 16, 2002.

COMMUNITY ENGAGEMENT

often include enhanced coverage of local business, economic and cultural issues (see sidebar for a sampling of stations using multicasting capacity for enhanced civic affairs coverage).

Of course, state and local variation will be a defining feature of a dedicated civic affairs “channel”: while some local stations will decide to work within the framework of a national program service others with sufficient resources may choose to produce an entirely local or regional forum. PBS, NPR, PRI and local stations should work together to develop a national-local initiative to help stations build robust local public affairs content offerings around core programming from the national networks.

In addition to these nascent local efforts, PBS is developing a national programming service known as *Public Square*. The goal is to create a dynamic, vibrant national civic space in which citizens are informed about and engaged with the world around them. This national service could greatly expand on existing public affairs programming, in partnership with local stations, to offer in-depth news, thought-provoking discussions, challenging documentaries and locally-produced content and coverage of local government meetings, accessible through multiple electronic platforms.

RECOMMENDATION: *Public broadcasters should collaborate to build a Digital Civic Forum in every state and support this effort with a national public affairs programming service.*

With the multi-channel capacity of digital television and radio – and the recent agreement by the cable industry to carry as

many as four local PBS programming streams in each market – every state could have a dedicated local civic affairs channel. A dedicated channel could provide rich programming, including gavel-to-gavel coverage of legislative proceedings and public meetings, civic and cultural events, election debates and candidate coverage, as well as call-in shows and digital town meetings to encourage civic participation. Digital radio and technologies such as podcasting offer similar promise for public radio’s public affairs offerings. The spread of high-speed broadband and VOD will create a multiplicity of outlets for such programming and a cost-effective means to create interactive discussions among and between citizens and civic leaders. The aggregated, online presence of this new local civic and cultural resource can become a Digital Civic Forum that is uniquely suited for each state.

Unfortunately, a major roadblock to stations’ efforts to take advantage of expanded distribution capacity has been the lack of adequate resources to produce additional content for distribution. At present, only 20 PBS affiliates have the resources to offer in-depth local news programming, and only a few have launched a dedicated civic affairs multicast channel. Many public radio stations are similarly under-resourced. The digital age presents enormous opportunities for local stations to provide unparalleled, multiplatform coverage of public and civic affairs that will not be available via commercial television or radio. It is essential for the continued growth and vibrancy of our democracy to ensure that these stations have the resources to fulfill this potential.

Public Television Stations: Using Digital Multicasting to Expand Local Public Affairs Coverage

The Alaska Channel

A prime example of public television's mix of local commitment and digital innovation is KTOO's Alaska Channel, which covers Alaskan state legislative sessions and other events on a low budget and with simple production values, much as C-SPAN does on a national level. The channel is available to Alaskans over-the-air on DTV, as well as through cable and satellite carriers, a live webcast and live audio streams. Beyond covering civic affairs, the channel showcases Alaskan history, arts, culture and wildlife, as well as the historical and cultural traditions of Alaskan natives. These features combine to create a uniquely Alaskan sense of place, giving viewers a better understanding of Alaska's history and cultures, as well as a chance to be engaged in civic life. KTOO partners with state and municipal governments, as well as with the University of Alaska, other public television stations, commercial broadcasters and cable and satellite services. The station has an annual budget of \$577,000 and is funded entirely by the private sector and the City of Juneau, receiving no cable revenue or state funding.

The Minnesota Channel

A program service of Twin Cities Public Television (TPT), The Minnesota Channel gives qualifying local groups (such as nonprofit educational, governmental and other public service organizations) a means to adapt their content for broadcast. In Minnesota, as in many other areas, community groups often hold notable events such as public meetings, performances, lectures and debates. Unfortunately, these events usually do not reach most people interested in them. Furthermore, most groups do not have the production facilities or access to the airwaves that would allow them to broadcast their content and reach a larger audience. TPT is thus tapping into a wealth of latent local content while empowering community groups to produce and air their own broadcasts. TPT does not limit access to groups able to pay their own production costs, although most do, and does significant outreach to groups traditionally underserved by mainstream media. In the four years since the initiative was launched, TPT has created partnerships and programming with a wide cross-section of local groups, including the Mayo Clinic, St. Paul Chamber Orchestra, Minnesota International Center, Kev Koom Siab (Hmong language group) and many others. The Minnesota Channel was launched as a dedicated digital multicast stream in September.

FocusWest

A consortium of Western public television stations (Idaho Public Broadcasting, KNPB in Reno, Nevada, KUED in Salt Lake City, Utah, Oregon Public Broadcasting and Wyoming Public Television) has created a multistate partnership called FocusWest to deliver news and public affairs programming of interest to Americans in the rural Intermountain West through a combination of a digital multicast channel, web and DVD services. Now in its second season, the project brings together local and regional perspectives, and aims to deepen and enhance understanding of significant public issues. Funded by a grant from the Ford Foundation, the project aims to combat the limited availability and high price of news and public affairs content in these rural states. Productions have included special reports on western prisons, water supply management in the west and on the increasing political influence of Hispanics in the region.

Northeast Ohio's Ideastream

Ideastream formed when Northeast Ohio's PBS and NPR affiliates joined to forge new ways of serving their community through broader community partnerships. Its programming closely reflects the concerns of the community, as

(continued)

COMMUNITY ENGAGEMENT

expressed in town-hall meetings held as part of an outreach effort called “The Listening Project.” An example is “A Quiet Crisis,” a public affairs series focusing on local concerns about schools, the environment and the area’s economy. Ideastream, along with six other community education and municipal organizations, has helped launch OneCleveland, the country’s largest high-speed, community-based broadband network. Ideastream will use the OneCleveland network to deliver multimedia services, applications, and educational and civic programming via wireless Internet connections. By promoting affordable, communitywide wireless broadband access, ideastream and OneCleveland have created an infrastructure that guarantees all citizens the chance to learn about and engage in local and national civic affairs.

South Carolina Channel

South Carolina Educational Television Network (ETV) currently offers gavel-to-gavel coverage of the state’s General Assembly on “SC Channel,” a digital broadcast service dedicated to politics, arts and culture in the state. Each day the General Assembly is in session, SC Channel’s signature programming block, State House Today, broadcasts proceedings of both houses. The daily State House Today block also includes taped playback of selected committee meetings, interviews with legislators and profiles of past state leaders. Other programming produced exclusively for SC Channel includes Bluegrass Express, dedicated to regional music, and ETV Sports, covering local high school and college sporting events that are not broadcast by commercial media outlets.

JerseyVision

New Jersey Network’s “JerseyVision,” a dedicated digital multicast channel, offers locally-produced news, public affairs and arts programming. The channel offers extensive coverage of all branches of government. Public affairs programs broadcast on the channel include: *NJN News*, covering the issues and people that impact the citizens of New Jersey; *Congress Watch*, featuring comprehensive, in-depth interviews with members of New Jersey’s Congressional delegation; *On the Record*, featuring interviews with newsmakers; and *Reporters Roundtable*, a discussion of media coverage of state and local issues. *Images/Imagenes* and *Another View*, award-winning programs focusing on the issues facing New Jersey’s Latino and African American communities, respectively, are also broadcast on JerseyVision.

Maryland Public Television

MPT produces a “Public Square” suite of public affairs and business programming and an accompanying website. Plans to introduce a dedicated Public Square DTV channel are in the works. Programs in the block include *Direct Connection* and *State Circle*, dedicated to local civic affairs; *Outdoors Maryland*, focusing on the region’s diverse ecosystems; *Artworks This Week*, profiling local arts and culture; and *Business Connection*, covering Maryland’s businesses and economic development. The MPT Public Square website allows users to access multimedia resources from both national PBS programming and locally-produced public affairs shows.

KQED

San Francisco’s KQED provides comprehensive civic affairs coverage on its primary and digital multicast channels, providing more in-depth coverage of local and state politics than any nationwide newscast can hope to accommodate. Each election season, KQED produces a series of programs on important local and regional issues. These specials feature debates by balanced and diverse expert panels in which viewers from across Northern California submit their questions by phone or e-mail. Video and audio content of the specials are posted online for easy, on-demand access by those who cannot watch the broadcasts. This in-depth coverage of hometown politics keeps citizens informed and promotes accountability and transparency in local institutions.

A National Public Square Infrastructure to Support Station Efforts

The DFI panel urges PBS to collaborate with NPR and local member stations to launch and expand its *Digital Public Square* media service. The service can provide enhanced national and international affairs content, as well as platforms for civic engagement, which stations can supplement and customize with a diverse array of locally produced and locally relevant civic content.

As a national service, *Public Square* should be a digital, multiplatform media service, consisting of a dedicated public affairs channel with interactive components such as a companion content-on-demand offering, online interactive forums and streaming to wireless and portable devices. It should be accessible through the Web portals sponsored by local stations, PBS and NPR.

By integrating international, national and local content into on-demand programs for citizens, the *Public Square* portal could give people a new level of access and new ways both to receive and engage with information. And by delivering information in dynamic and creative ways, we can hope to engage younger Americans, who are avid users of mobile communication devices.

At present, the centerpiece of the service is intended to be a four-hour block of national and world affairs programming produced by a wide range of public and independent news outlets. This video content is to be supplemented by an equivalent block of public affairs radio content from NPR and

its local stations, available in a variety of formats and platforms. *Public Square* would include highly interactive and viewer-driven components, such as video blogs with commentary, feedback and perspectives from diverse individuals around the country and the globe. *Public Square* has the potential to give real people the opportunity to join experts, pundits and politicians on current affairs programs using their own personal digital devices.

Member stations could utilize the *Public Square* infrastructure to distribute their own locally produced public affairs content, locally or internationally. For example, stations could integrate their own local affairs programming with the national *Public Square* programming, and also make local web content available through the *Public Square* Web portal, which could be accessed from station websites or through PBS.org and NPR.org. Using the *Public Square* system, individuals looking for civic resources and news coverage from any level of government will be able to enter a trusted, nationally recognized public broadcasting gateway. Individuals looking at information on the national level will be able to link easily to the local-interest content of member stations. Similarly, those exploring civic resources on the local level through a station's website can browse "upward" to the national level through an easily navigable *Public Square* interface.

The creation of a national *Public Square* infrastructure is expected to significantly increase the number of local public broadcasters able to sponsor their own dedicated digital channel for civic affairs, or at least offer enhanced civic affairs content, whether on-air or online. Many of the

COMMUNITY ENGAGEMENT

public television and radio stations currently lacking the financial resources to offer expanded and enhanced civic affairs content are already well positioned to do so from a strategic standpoint, as they have developed strong partnerships with municipal and state agencies and organizations, as well as other local public stations. Sharing the *Public Square* infrastructure will help these stations ramp up their local affairs production and distribution capacity.

Support Enhanced Civic Affairs Programming From Diverse Sources

Unlike the other digital content initiatives recommended in this report, civic affairs coverage can be inherently controversial and create real and perceived conflicts with the subjects covered, particularly elected officials, corporations and other potential or actual sources of funding. To be comprehensive and credible, public affairs programming should be insulated to the greatest degree possible from all forms of outside editorial influence. To ensure this independence, it is essential that no funding, whether from public or private sources, be permitted to come with strings attached; editorial decisions should be made without consideration of their implications for funding sources. We recommend that to the extent feasible, the financing for *Digital Public Square*, and for civic affairs programming in general, should not be dependent on any single source, but should be derived from a diverse array of sources, public and private. Channeling this support through the Digital Future Endowment recommended in Section 6 would also help to ensure that no one source can wield undue influence.

B. Public Health, Public Media: A Health Care Information Service

Another key area of community engagement is public health. Even though Americans regularly pick health care as one of their primary concerns about the future, there is no coordinated large-scale effort to provide easy access to important public health information via mass media. Public service media can play a leading role in this area in partnership with respected medical and research institutions. Public broadcasters should partner with the Centers for Disease Control, leading university medical schools and others to launch a national Digital Health Information Service offering in-depth coverage of public health and medical issues. The service can offer practical reports, compilations of information and interactive features on a wide variety of medical conditions and public health issues. Program content can be integrated with both a searchable online content portal, as well as with local station and community-based outreach efforts, to extend the reach and educational impact of the service.



To ensure this independence, it is essential that no funding, whether from public or private sources, be permitted to come with strings attached

The Challenge: Informing an America on the Brink of a Public Health Crisis

America's aging society is on the brink of a public health crisis. The fastest-growing age group in America is the over-85 group. The huge Baby Boomer generation's first wave of 60-plus members will soon be

eligible for Medicare. U.S. health care spending is projected to nearly double within the next decade, growing far faster than the economy and consuming close to one-fifth of the nation's economic output.⁷⁴ Health insurance costs have risen at double-digit rates for the past four years,⁷⁵ a trend that is placing unsustainable pressures on consumers and employers alike. A recent study projects that the number of uninsured people will increase



With an aging population and more “consumer-driven” health plans, accessible health care information will become increasingly important

by 11 million over the decade ending in 2013 as health insurance becomes increasingly unaffordable.⁷⁶

These recent sharp increases in health insurance premiums are caused in large part by diseases of lifestyle such as obesity and complications from smoking that are highly prevalent among Americans and highly preventable through public awareness. Millions more suffer from other chronic conditions that go untreated because of a lack of education about causes and treatment options. These unfortunate circumstances point to a failure to ensure that citizens have adequate and unbiased information to make proper lifestyle choices and treatment decisions. With an aging population and a trend toward more “consumer-driven” health plans, accessible health care information

will become increasingly important for individuals, firms and the economy.

At the same time, there is a real gap in media coverage of health-related issues. While broadcast and cable news outlets provide a fair amount of reporting on health and medicine (the Discovery Health Channel is entirely dedicated to the topic), most mass media reports are superficial or, even when a program is excellent, are rarely connected to in-depth and continuing community outreach or information online. Typically, health reporting tends to be biased toward new and novel treatments, romanticized reports on “miracle cures” that readily capture public attention, but rarely provide extensive and consumer-friendly information about risks and benefits of specific drugs, tests and treatments that the public needs.

Of course, in the digital era, broadcast media is not the only source for health news and information. Individuals increasingly turn to the Internet for on-demand and personalized health information when they need it. An increasing number of Americans, particularly the affluent and non-elderly, go online to gather information about medical problems, to learn about courses of treatment, to get virtual diagnoses and “second opinions,” or to find patient-support groups. However, what is missing is a trusted, comprehensive and clearly

⁷⁴ Heffler, Stephen, *et al.*, “Health Spending Projections Through 2013,” *Health Affairs* Web Exclusive, Feb. 11, 2004, available at: <http://content.healthaffairs.org/cgi/content/full/hlthaff.w4.79v1/DC1>.

⁷⁵ “2004 Annual Survey on Employer Health Benefits,” Kaiser Family Foundation and Health Research and Educational Trust, available at: <http://www.kff.org/insurance/7148/index.cfm>.

⁷⁶ Gilmer, Todd and Richard Kronick, “It's The Premiums, Stupid: Projections Of The Uninsured Through 2013,” *Health Affairs* Web Exclusive, April 5, 2005, available at: <http://content.healthaffairs.org/cgi/content/abstract/hlthaff.w5.143>.

COMMUNITY ENGAGEMENT

communicated aggregation of the best unbiased information on public health issues, combined with an effective national and local communications and outreach program. Government and academic sites (such as the National Institutes for Health) are highly reliable, but generally not well known or not oriented toward using media to make their information understandable and appealing to the average person. Commercial sites, even if they are free or affordable, are often underwritten by industry players or are trying to sell certain products or services. In such cases, advertising on the website may not be clearly distinguishable from actual content. Some noncommercial sites do provide good public health information, but these are limited in their reach by their Web-only format and lack of outreach.

RECOMMENDATION: *With partners and member stations, PBS and NPR should create a Digital Health Information Service that combines on-air programming, online multimedia content and community outreach about health care issues.*

By combining health-related broadcast programming with comprehensive online content from expert health and medical partners, delivered over multiple platforms and with extensive local partnerships and outreach efforts, public television and radio stations can serve as trusted local providers of health and medical information.

Of course, unbiased reporting and community outreach on health issues are nothing new for public broadcasting. PBS, NPR and their local stations have a distinguished history of producing groundbreaking and critically acclaimed

programming on public health issues. A number of local public stations have already initiated their own highly effective programming and outreach efforts targeted at pressing community health issues.

Among the most ambitious is Kentucky Educational Television's *Common Health of Kentucky* initiative, which began this year with a 13-part broadcast series on effective community health

programs. KET will also distribute multimedia "Healthy Lifestyle Toolkits" both online and through statewide community outreach (see sidebar). In central Pennsylvania, WPSX produces *Creating Health*, a monthly program that encourages healthy living habits by educating the public on the connections to health problems (see sidebar). WXXI in Rochester, N.Y., leverages partnerships with local doctors and medical

research institutions to produce *Second Opinion*, a series giving viewers a look at how doctors make tough diagnostic and treatment decisions (see sidebar). It is important that stations continue to have the resources to do more programs like this in the future, especially given the potential of digital broadcasting and other technologies to provide more health-related content.

Beyond the local level, public broadcasters should continue to use their award-winning and respected talents in documentaries and story-telling to highlight pressing national and international public health issues. PBS has an especially distinguished history of



What is missing is a trusted, comprehensive and clearly communicated aggregation of the best unbiased information on public health issues, combined with an effective national and local communications and outreach program

Promoting Public Health through Community Outreach and Partnerships

Kentucky: KET's *Common Health of Kentucky*

The health status of Kentuckians has reached a crisis point. The state is at or near the bottom on a series of U.S. health status indicators. Obesity, inactivity and poor diet contribute to costly and destructive chronic illnesses such as diabetes, cardiovascular disease, cancer, dental problems and depression. Kentucky faces an added challenge with the nation's highest percentage of smokers – and the burden of smoking-related illnesses such as asthma and lung cancer. KET and the Foundation for a Healthy Kentucky teamed up to create a sustainable community-media collaboration to bolster health promotion models proved by data to be successful (“Models that Work”) and inform and engage public dialogue about health and its economic value to the Commonwealth of Kentucky.

As the first step in this long-term project, KET is producing a 13-part television series focusing on these “Models that Work” and providing mechanisms for viewer action to replicate or adapt these models in other communities throughout the state. The goal of the series is to raise the public's perception of the stake everyone has in promoting not just their individual well-being, but overall community health. Featured programs are in the areas of student health, domestic violence/personal safety, workplace wellness, disease management/chronic diseases, improving health care access, substance abuse, fitness, nutrition, smoking prevention, eldercare and mental illness.

Material from the series will be re-purposed to produce a *Healthy Lifestyle Outreach Toolkit*, available online, which will contain video modules, training resources and contact information to enable replication of model programs. In the long term, KET will use the Internet as a continuing means of encouraging and facilitating community action in health matters. Community leaders from around the state will be able to network online to share which projects they are taking on, what challenges are being encountered in implementing programs, ideas on how to improve or adapt models and other relevant thoughts.

Central Pennsylvania: WPSX's *Creating Health*

In 2004, Penn State Public Broadcasting TV station WPSX produced *Creating Health*, a monthly program focusing on top health issues in Central Pennsylvania. In connection with the program, the station and local partners provided extension educators in the counties served by the station. The extension educators met with community groups and visited schools to educate students on health issues and to encourage the development of healthy living habits; the program's website provided valuable links to in-depth information on all health topics discussed.

Rochester, N.Y.: WXXI's *Second Opinion*

The award-winning PBS series *Second Opinion*, produced by Rochester's WXXI, engages nationally recognized healthcare professionals and patients in a fast-paced, provocative discussion of medical cases. *Second Opinion* is seen on over 150 stations across the U.S. The series aims to let Americans take charge of their own healthcare by giving them the information they need to make informed decisions. The first season of *Second Opinion* dealt with medical issues ranging from heart failure and breast cancer to nutritional supplements and

(continued)

COMMUNITY ENGAGEMENT

obesity, while season two, which began production in the summer of 2005, plans to tackle everything from diabetes to depression. WXXI produces *Second Opinion* in collaboration with nationally recognized medical professionals and research institutions from the Rochester area. The Larry Kohn Journal Club, a group of top physicians and researchers in Rochester, served as medical advisors for the first season, and Dr. Roger Oskvig, an acknowledged leader in gerontology and associate professor of medicine at the University of Rochester Medical Center, was the program's principal medical advisor. The medical center has agreed to co-produce the second season of the program, and Dr. Oskvig will continue to act as principal medical advisor. *Second Opinion* boasts a comprehensive companion web site at: pbs.org/secondopinion. As *Second Opinion* demonstrates, PBS stations can leverage partnerships with respected local medical institutions to produce powerful, informative and engaging health programming.

such programming. For example, *On Our Own Terms: Moyers on Dying* and *And Thou Shalt Honor* were two widely viewed series on end-of-life care and eldercare, respectively, that were supplemented by online content and ambitious off-air community outreach efforts that magnified the societal impact of these specials (see sidebar). Member stations around the country used these PBS programs as opportunities to open up intense dialogues and educational campaigns in their communities.

The value of the programming and coordinated community outreach described above, already happening in some states, could be vastly enhanced with an interactive online web portal designed to aggregate and disseminate practical information on diseases, illnesses and treatment options for the American public. PBS is in a strong position to establish and leverage partnerships with esteemed medical and research institutions (such as the Mayo Clinic, the American Medical Association and the *New England Journal of Medicine*), government entities (such as Veterans Administration hospitals, the U.S. Food and Drug Administration and the U.S. Library of Medicine), and respected industry labs and sources. While many agencies and medical research institutions

already invest in communicating their findings (often through websites), the American public still has no central noncommercial gateway – no “one-stop shop” – for trusted health and medical information.

Once again, public broadcasting cannot, and should not, undertake all this by itself. Its medical and public health partners must provide the expertise behind the content. But we believe the entire public broadcasting system has a potentially powerful role to play in leadership and in communications and outreach. PBS should play a leadership role in convening both local stations and the nation's leading sources of unbiased and research-based medical information – and then aggregating and organizing the wealth of available information and presenting it in a way that is accessible to the average American.

What could be revolutionary about a digital health information service is not merely the content that it will present, but the way in



A digital health information service will provide the American public with an easy-to-use, comprehensive, accessible and – most importantly – trusted source of health and medical information in the digital future

Amplifying the Impact of Health Documentaries: Online Content, Off-Air Outreach

On Our Own Terms

Among the most notable recent examples of public television's unique ability to illuminate a difficult issue is *On Our Own Terms: Moyers on Dying*, a national discussion on end-of-life care. America's aging population presents caregiving challenges and raises serious moral and spiritual questions about humane care at the end of life. The producers of *On Our Own Terms* took two years to develop the program, examining elder care in hospitals, hospices and homes, and speaking with terminally ill patients and their families. The result was a four-part, six-hour series, exploring in depth difficult end-of-life issues. It was seen by more than 18 million people in its initial broadcast.

The effort made by *On Our Own Terms* to inform and assist the public in addressing a difficult topic did not begin or end with its initial broadcast. In advance of the initial airing, the production team conducted videoconference training for station personnel involved in community affairs; launched a detailed website to provide articles and background information on end-of-life resources, care options and therapy support; worked closely with caregiving organizations to mobilize their membership and spread the dialogue and information engendered by the program; and participated in a cover story in *Time* and features in other popular magazines. In addition, with the assistance of local stations, more than 300 community coalitions formed throughout the country to hold town meetings and group discussions, publish local resource directories, staff hotlines, conduct professional training and create other efforts to enhance caregiving and provide additional public forums for discussion. At the same time, more than 60 public stations created local companion programming on end-of-life issues.

And Thou Shalt Honor

And Thou Shalt Honor, a program on caregiving for the elderly, was accompanied by significant supplemental off-air efforts. In its over-the-air broadcast in 2002, *And Thou Shalt Honor* reached more than 6.5 million people. In the same time frame, producers for the program developed off-air efforts involving 532 partner organizations. State health and aging agencies showed the program and handed out materials on caregiving and conducted seminars; member stations organized town meetings; and outreach coordinators screened clips in more than 300 communities. In addition, more than 62,000 people visited the program's website from October to December 2002, learning more about long term care, volunteer opportunities to assist Alzheimer's patients and support networks, among other topics. Another 3,000 videos were distributed during that time. In total, through the initial airing, additional video units sold, website visits, viewer responses and outreach efforts, PBS estimated that the program impacted more than 113 million people during the fourth quarter of 2002.

which it will be made accessible to all Americans. In the Digital Age, Americans are demanding more personalized and on-demand content. A health information service could combine a digital broadcast channel with a rich, multimedia Internet gateway to truly revolutionize the way

Americans obtain their information about health and medicine. Using Internet-enabled television sets, viewers will instantly be able to link to in-depth information about anything they view on the broadcast stream. With the ubiquitous broadband and wireless Internet access that

COMMUNITY ENGAGEMENT

will be available in the coming years, Americans will have the instant and portable access to data and streaming video content they need to make informed health decisions, even on the go. Patients will be able to form support groups and interact with each other online through voice- and video-over-Internet Protocol.

In taking on this educational role, we assume that PBS will not conduct medical research on its own, nor will it offer medical advice. It should, however, distinguish itself from commercial media offerings and provide true added value for the American public by focusing not only on the causes and possible treatments of specific diseases, but on realistic assessments of the potential benefits and risks of treatment options. Combining public broadcasting's existing strengths in investigations and documentaries with sound partnerships in medical research, extensive digital content over multiple platforms, and off-air outreach, a digital health information service could provide the American public with an easy-to-use, comprehensive, accessible and – most importantly – trusted source of health and medical information in the digital future.

C. Connecting Communities: An Emergency Preparedness Network

Following the terrorist attacks of September 11, 2001, our nation has moved to a constant state of vigilance. We have restructured our government and dedicated many billions of dollars to better address the issue of homeland security. Yet nearly four years after the attacks, the nation has no effective national network for real-time emergency communication to the public,

among first responders across agencies and jurisdictions, or for the dissemination of emergency preparedness education.

To remedy this weakness, it is necessary to build out a robust broadband digital network that leverages the broadcast infrastructure and is capable of facilitating real-time interagency emergency communications and communications to the public. This same broadband network can also be used as a conduit for preparedness education.

Where will this network come from? Because public broadcasters represent the only truly national and inter-connected broadcast network, with a trusted presence in nearly every community, we recommend that PBS enhance its existing and planned digital infrastructure to include an interconnection backbone designed to serve this role for homeland security, in partnership with other federal and state networks. PBS and its member stations nationwide are uniquely suited to play a major role in resolving this gap in homeland security, because of the system's primary assets: a national digital backbone infrastructure, respected neutrality and relationships with community leaders, and strong experience in public interest and educational programming. Using its nationwide communications network as a hub, the public television system should play a convening role in a cooperative initiative among local, state, tribal and federal emergency, response and related first-

 ***PBS and its member stations nationwide are uniquely suited to play a major role in ... creating and distributing content for education on emergency preparedness***

responder organizations to create a shared emergency network, as well as create and distribute content for education on emergency preparedness.

The communications contribution includes the national satellite and fiber backbone, the local video and voice channels, and local datacasting capability, an initiative developed and currently being tested by a consortium of local stations led by the Association of Public Television Stations. Beyond providing “pipes,” the station leadership role is even more important. We believe the national public broadcasting organizations, along with the local stations that will be playing a leading community preparedness role, should be funded on the federal, state and local levels. With funding secured to support these critical initiatives, stations will be able to use their trusted and respected local position to be conveners, as well as creators of customized local emergency content for training and actual event use.

The Challenge: Informing and Protecting America

In an era in which technology can bring news, information, and entertainment to almost any electronic device, even in the farthest reaches of the world, most U.S. emergency response agencies and personnel – even those within the same jurisdiction – cannot effectively or efficiently share data.

To achieve stronger homeland security, emergency agencies and safety communications should be viewed as a single enterprise, albeit with tens of thousands of agency owners. This

enterprise needs to provide full interoperability among all agencies, delivering secure information and communication to and from response agencies and responders. It also needs to provide comprehensive public warning and education. To be cost-efficient, it must be multi-user, multi-use and cover all hazards.

RECOMMENDATION: *Public broadcasters should collaborate with public safety agencies, at the national and local levels, to facilitate the creation of a national emergency communications network, as well as to produce and disseminate emergency preparedness information to the general public.*

To connect the myriad disparate systems and institutions that currently exist, a cooperative initiative of local, state, tribal and federal emergency response and related public service organizations should be formed to create a shared inter-network. This inter-network would not necessarily replace existing local infrastructure, but rather would enhance existing networks and facilitate communication through the creation and management of the shared message-routing directory and security protocols that are needed to enable this process. This initiative requires a trusted and neutral leadership entity. Public television can effectively serve in this capacity.

Public television has a long history in using new technologies for educational and public service purposes. Guided by the efforts of the Association of Public Television Stations on behalf of its member stations, PBS and public television broadcasters have taken an active

COMMUNITY ENGAGEMENT

leadership role in exploring opportunities to enhance homeland security on the local, state and national levels. Through numerous pilot projects and real-world initiatives, public television broadcasters have proven that the digital television spectrum and infrastructure provide a ready platform for these types of applications. These projects demonstrate the capabilities of public television's digital network. Some examples:

- NCA-DEAS (National Capitol Area Digital Emergency Alert System) – A joint prototype project led by APTS and involving PBS, WETA (Washington, D.C.) and the Department of Homeland Security to demonstrate datacasting technologies for communicating alerts, instructions and other critical information.
- WXXI (Rochester, N.Y.) – WXXI is using a portion of its digital spectrum to develop a broadcast network for local first responders, providing on-demand training videos and vital information for use in responding to incidents
- New Jersey Network – NJN is working with the New Jersey State Office of Emergency Management to develop a datacasting application to send vital information – evacuation instructions, bioterrorism alerts, images of skin rashes, medical procedures, etc. – to local first responders.
- KERA (Dallas) – KERA is partnering with the University of Texas Medical

Branch at Galveston, one of the nation's largest providers of telemedicine and home of a maximum biological containment laboratory (BSL4 research laboratory), to link many of the nation's most prestigious researchers in the fields of biological defense, vaccine development and emerging infectious diseases to a major digital network delivery system.

- KLVX (Las Vegas) – KLVX has worked with the Clarke County Emergency Preparedness office to leverage KLVX's in-place distribution network, which provides video and other information directly to local schools. Having designated local schools as emergency evacuation sites/shelters, the county office has partnered with KLVX to enhance its ability to provide critical communications information to these sites in the event of an emergency.

In looking at the potential role for PBS and public television, it is important to look beyond the existing important yet narrowly focused initiatives. There are three attributes of the public broadcasting enterprise that can be further leveraged in the creation of a national homeland security network:

- **Transmission** – Public television has in place today a national backbone interconnection system consisting primarily of a digital satellite-based delivery network, which reaches

every state and significant community in the country with local media and datacasting capability covering over 98 percent of Americans. Over the next 12 to 15 months, PBS will be undertaking a project to replace this current distribution infrastructure with an advanced satellite and terrestrial delivery network, which will leverage the full capabilities of digital broadcast technologies. This system, the Next Generation Interconnection System (NGIS), when fully funded and implemented, can potentially provide a robust and effective transport layer for homeland security applications.⁷⁷

- **Neutrality** – Public television consists of respected and neutral local station organizations directed by community leaders; PBS can play a similar role at the national level in cultivating and managing the key public and private partnerships.
- **Experience** – Highly experienced and successful local and national programming production and distribution capabilities.

Public Broadcasting's Role

Building upon existing infrastructure, experience and expertise, public

broadcasters can play an integral part in the national homeland security fabric at both the national and local levels (see table).

Leadership

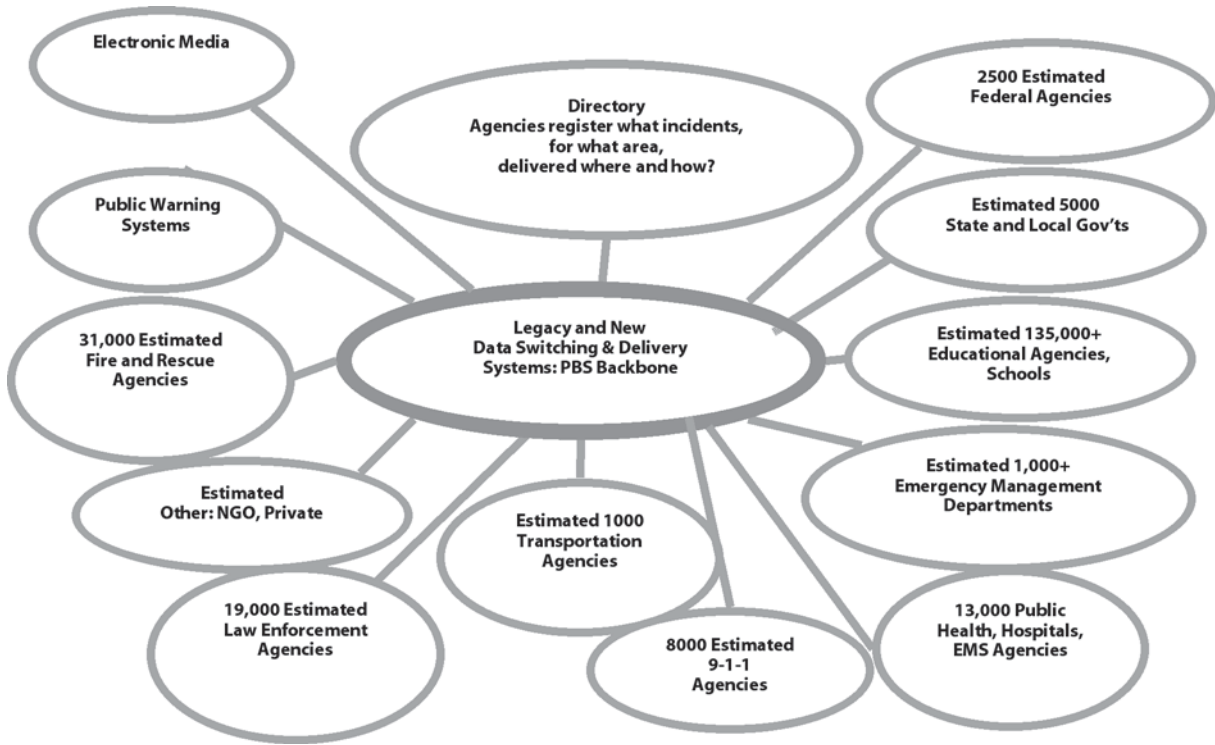
A principal role for PBS would be that of national leader in convening the coalition partners and facilitating identification of the connectivity and interconnection requirements of the various agencies at the local, regional and national levels. Second, PBS would work in collaboration with the initiative partners to incorporate agreed-upon standards, routing and authorization applications, data messaging formats and any necessary pilot demonstrations. We recommend that PBS and its stations consider taking a national leadership role in that cooperative project.

The challenges of creating a nationwide inter-network are great. Such a unified network will need a set of cooperative institutions and electronic tools to carry out their policies, including security, rights management, authentication, an electronic registry of agencies for routing, and network coordination and diagnostics. To be successful, these cooperative institutions need leadership at the national, regional and local levels. This is where we believe public television, undertaking a neutral leadership role, can be most useful.

The local stations are plugged into their communities; members of their boards are community leaders. The stations should

⁷⁷ As of June 2005, the Next Generation Interconnection System has been partly funded, having received total appropriations of \$50 million in fiscal years 2004 and 2005. In order to take advantage of this public television backbone for homeland security purposes, the system must be fully funded in the amount of \$120 million. Additional funding above and beyond the system's funding will be required to layer homeland security functions on top of the public television distribution infrastructure.

Public Television as a Leader and Convener of a Homeland Security Inter-Network



have major credibility as neutral parties at a time when “turf” needs to be worked out, and they have clear educational expertise. Therefore, they are in a position to play an extremely useful role in coordinating the public/private local emergency network and partnerships to enhance emergency preparedness. This includes coordinating community education on emergency preparedness.

Emergency Preparedness Programming for the Public

The public television community can and should produce a wide array of national and local content, including general public education on preparedness, specific training clips and continuing education for emergency responders. The local stations

can develop emergency preparedness education content that is customized to address the varied environments and unique risks – including natural disasters – that face individual states and local communities. They can elaborate, customize and supplement national programming to make it more effective locally. And they can manage its distribution to the public through a full range of outlets, including broadcast channels, datacasting, through schools, DVD distribution, websites and terrestrial links, to name but a few. This initiative, when

Public television should produce a wide array of national and local content, including general public education on preparedness, specific training clips and continuing education for emergency responders

fully funded and supported, can effectively fill a void in the national communications infrastructure.

Infrastructure

Public television should leverage major elements of its existing and developing digital distribution supply chain to provide key parts of the needed digital emergency infrastructure: national and regional backbone and network capability for two-way interagency communications, local one-way public communications, and datacasting for public warning and education. This can have great value as either a primary or backup communications channel. PBS and its stations should not attempt to be the emergency network, but they can, and should, contribute important pieces.

It should be noted, however, that in order to make this contribution effective, it would be necessary to enhance and incrementally augment portions of the local and national digital infrastructure and the Next Generation Interconnection System to support the specific needs and requirements of homeland security. The NGIS architecture would need to be enhanced to include a robust transport layer at local, regional and national sites not included in the original design and requirements. Public television stations may also require augmentation at the transport layer to connect to local agencies. Initial costs include extending the PBS interconnection system into a national emergency preparedness network; equipping local stations to be state and local hubs for first responders and the public; creating educational content on

emergency preparedness, customized to local circumstances, for first responders and for the general public; and funding local stations to be community preparedness coordinators.

The additional costs associated with these enhancements can be broken down into two parts: one-time equipment and organizational startup costs, and continuing service and programming costs. A conservative estimate of the capital costs of augmenting the Next Generation Interconnection System to support such an initiative would be \$50 million for startup, including funds to refresh the technology over the life of the system to keep the network up to date. Recurring local/national transport costs would cost an additional \$2 million annually. In addition to the capital costs, in order to launch this initiative, PBS would need to resource a new department within the technology and operations corporate area, which would be tasked with managing and maintaining this critical application. This project office would require an estimated annual operating budget of approximately \$800,000.

Public broadcasting has a strong track record in technology innovation and distribution excellence. Public television's national distribution infrastructure could serve an important role in forming a vital national homeland security communications network. However, it is important to restate that such an endeavor would require resources appropriate to that task. This augmentation would be above and beyond the currently planned Next Generation Interconnection System infrastructure, and would require

COMMUNITY ENGAGEMENT

| | National | Local/Regional |
|------------------------------|---|---|
| Leadership | <ul style="list-style-type: none"> • PBS as a leading convener of a national public/private partnership | <ul style="list-style-type: none"> • Facilitate local discussions |
| Infrastructure | <ul style="list-style-type: none"> • Digital interconnection systems | <ul style="list-style-type: none"> • Digital transmission • Datacasting |
| Content / Programming | <ul style="list-style-type: none"> • PBS facilitates production of content for national/local distribution • Examples: Texas A&M, Louisiana State | <ul style="list-style-type: none"> • Creation of local preparedness information • Outreach on nationally developed programs |

additional funding. This funding would likely be sought from the relevant government agencies at the federal, state and local level and would be in addition to current levels of funding.

The direct initial cost of developing these systems is surprisingly modest: APTS estimates that it will cost \$10 million over the next five years to provide equipment for DTV datacasting, such as IP encapsulators, servers and receivers. However, providing this invaluable service to the nation is dependent, at least in part, on the public broadcasting system making a strong transition from analog to digital, so that the digital infrastructure to provide emergency management agencies with the network capabilities they need is in place and reliable. These basic infrastructure and administrative costs also do not include the potentially greater costs of community preparedness education content for ongoing

broadcast and outreach to the general public in communities nationwide.

To fund and support this program, PBS and local public television stations should receive continuing payments from federal and state emergency agencies. Without being exhaustive, we note the following programs as possible sources:

- Department of Homeland Security accounts for interoperability, public warning, emergency response, training and drills, state, local and community preparedness
- Department of Health and Human Services accounts for bioterrorism and hospital preparedness
- Departments of Justice, Agriculture, Energy, Transportation and Defense accounts for homeland security



CHALLENGE NO. 3:

THE DIGITAL CONTENT TRANSFORMATION

To make the transition from one-way broadcasting to public service media, and particularly to serve the educational and community purposes discussed above, PBS and its national and local partners should create an innovative content archive, management and delivery system. This will not be easy. At a minimum, it is clear the system will require significant new funding sources to create a vast new archive and on-demand delivery system.

There is a misconception that the public broadcasting system is sitting on a treasure trove of past programming that is just waiting to be digitized and made available on the Internet for the public to download and view at its pleasure. Unfortunately, that is not true. The area of digital rights ownership, rights management and content aggregation and delivery are enormously complex. Until now, most rights obtained by public broadcasting were for “broadcast,” and then often for a limited time, such as two years. In many cases there is no single owner of programming with whom to renegotiate. Instead, a wide variety of parties often have rights of different kinds, allowing them to block the digital use of a program or to hold out for terms that make repurposing the content

impractical. In addition to the producers, these can range from residuals for actors, directors and writers, to music and photos. Similarly, the legal status of Internet usage of programs is not clear.

One thing is sure. Transforming public broadcasting and its vast archive of legacy programming to meet the vision described in this report will be complicated and expensive. Many parties will have veto power. It will require national leadership, good will and substantial new resources to accomplish this important mission.

The public would benefit from easy, on-demand access to all noncommercial content, and yet producers, creators and stations have legitimate interests that must also be reasonably protected. In order to build the critical mass of online content that will be the core of this system, PBS and its partners should collaborate with content rights owners to facilitate the digitizing and

 ***PBS and its partners should collaborate with content rights owners to facilitate the digitizing and repurposing of archived analog content for use in the digital future***

repurposing of archived analog content for use in the digital future.

A. A Public Service Media Web Engine

RECOMMENDATION: *PBS, NPR, PRI and local stations, together with other leading national and local partners, should create an unprecedented new content archive and delivery system – a Public Service Media Web Engine – to enable Americans to access public service media anywhere, anytime and on-demand. This Web Engine should provide a readily*



America's public service media system must supplement its traditional broadcast service with a new and fundamentally different mode of delivering content *searchable archive, surrounded by supporting functions and services for content creators, distributors and end-users. Easily accessible through Web portals like pbs.org, npr.org and station websites, the engine would provide virtually unlimited "shelf space" for current and archived content, increasing the utilization of all content across both space and time, thereby improving the economics and audiences of public service content.*

This report recommends several programming initiatives, calling for a renewed commitment to the creation of excellent and innovative content that address pressing national needs. What must distinguish this new content from what has gone before, however, is the manner in which it reaches its audience. We believe that America's public service media system must supplement its

traditional broadcast service with a new and fundamentally different mode of delivering content. That new digital distribution system in turn will also create new production opportunities for more stations and producers to serve more and more constituencies.

This section addresses the new form of content management and distribution we believe is required: a Web-based "engine" that allows parents, teachers and the general public to access the vast, and hopefully rapidly growing, universe of public service media content. This engine would consist of a federated Web-based archive of digital on-demand media, housed on the various servers of its many different owners, with sophisticated search capabilities and related tools and services for its various users. Functions such as program segmentation, digital rights management, collaborative filtering and billing (for content not freely available) would likely be integrated. It would be accessible via user-friendly, fully customizable portals like pbs.org, npr.org and station websites, and would allow users to search for, locate and access the resources they need, bringing this vast universe of noncommercial content to them on their terms.

The engine should not be a mere "super server," where all the content is located, nor should it replace the excellent websites the system has created. It should provide a set of common management and distribution services – the Internet equivalent of the current interconnection PBS runs for its station members.

The value of this engine is rooted in the richness of the digital media archive from

which it will eventually be able to draw. PBS, NPR, producing stations and their public service media partners will need to provide the critical core of content for the archive both by creating new digital media – this is the role of the recommended content initiatives – and by digitizing and providing access to their current content. This content would not be limited to video and audio programs, but would also include articles, interviews, games, data sets, curricula, teacher and parent guides, links to websites and other interactive multimedia.

This core should in time be supplemented by content from a wide variety of outside sources, such as independent documentary filmmakers and national institutions of learning. As a gateway to public service content, this Web Engine could also index and facilitate access to multimedia content produced by many of the nation’s other educational and cultural institutions, including museums, libraries, historical societies and universities. PBS and NPR should act as the leading conveners of contributors to the archive, leveraging public broadcasting’s status as the largest and most trusted public service media institution in the nation to build a virtual treasure trove of digital media as deep and rich as it is wide-ranging and comprehensive.

More Room on the Shelf: Implications for Content Creation

In creating a digital media archive whose size is limited only by the availability of content to upload, public broadcasters and their partners will do more than simply provide Americans with a tremendously

valuable educational and entertainment resource. By providing a platform for content delivery largely unencumbered by the limits of traditional media – time, space and bandwidth – they will make possible the production and consumption of content that would never before have been economically feasible.

With its virtually limitless “shelf space,” the Web Engine will allow producers and consumers of so-called “niche” content to harness the power of the “long tail” (discussed in Section 2), so that geographically dispersed but numerically significant audiences are able for the first time to access the special programming they desire. Audiences should be aided in their search for content they want by a powerful set of tools that include a Google-style search engine, collaborative filtering (which refines searches over time using the consumer’s own preferences), and recommendations and advice from PBS, NPR and member stations. The new “long tail” programming economics will benefit especially those audiences that the public media system exists to serve – audiences too small or too poor to be attractive to for-profit media. These audiences, once aggregated, will soon find their media needs met by producers who find serving them economically viable.

Similarly, content that today cannot find audiences large enough to support it because of the limited space and geographical reach of traditional media will



As a gateway to public service content, this Web Engine could also index and facilitate access to multimedia content produced by many of the nation’s other educational and cultural institutions

be economically feasible as it becomes accessible to audiences across America and even internationally. Local PBS stations whose audiences have been limited by the strength of their broadcast signal will find that, with the Web Engine's infinitely broader reach (the Internet), locally created content can find much larger audiences (national and international) and potentially



With its virtually limitless "shelf space," the Web Engine will ... benefit especially those audiences that the public media system exists to serve – audiences too small or too poor to be attractive to for-profit media

provide new revenue streams through online underwriting and payments for "premium" content. Our hope is that this expansive, federated distribution system can create new revenue streams for stations and other noncommercial content creators, generating resources for new services.

In addition to vastly greater "shelf space," the engine will afford a longer "shelf life" for content that might otherwise have been broadcast once and relegated to dusty storerooms and inaccessible analog archives. Through the engine, such content can remain useful, perpetually available to anyone who might need it, assuming that legal rights to the content can be obtained.

Public Media on My Time: The End-User Experience

Because most of the components of this engine do not currently exist, public broadcasters and their partners must develop the digital archive and portal themselves. This requires the convening of

expert working groups to design everything from governance and business rules to the technology underlying a federated system for storage of the vast amounts of digital content, as well as its interactions with existing portals. Many, if not most, of these services are being developed for commercial purposes. Therefore, we see no need for public broadcasting to build its own software tools. At the same time, it is apparent, as station general manager Dennis Haarsager has written, that this is not an enterprise that each station (or a handful of stations) can do on its own. The best way to do it is under national leadership, the way the interconnection was done.

We recommend that the engine have a number of important features:

Content. First and foremost, the archive system should provide access to a very large share of all noncommercial multimedia content produced and owned by a wide variety of sources. This would be a linked set of digital archives and stores (probably owned by multiple parties) of multimedia on an unprecedented scale – and not a single large archive.

Upload Rights. The system needs to allow various levels of access for depositing content, depending on the user's identity. Greatest access would be granted to PBS, NPR, PRI and local public stations, which would use the archive as a pool from which to complement and/or construct their broadcast schedules. They would also be the gateways for the introduction of content into the archive; only they (and, of course, other agreed-upon partners) could upload content into the archive. This would ensure

that no unsuitable content made its way through the portal. There would perhaps be certain designated areas for content uploaded by individual creators, such as digital message boards or citizen “video-blogs,” supplementing the Digital Civic Forum initiative, that allow individuals a chance to express themselves via public service media.

Ratings. When a public broadcasting entity uploads content, that content would be “tagged” so that it is searchable by point of origin, among other criteria. PBS and NPR might also prominently tag content as “PBS or NPR Recommended,” indicating to audiences that it met the high standards for PBS and/or NPR programming, and allow users to search for content on this basis. Similarly, individual users could rate content; such feedback could yield aggregate ratings for content that would be accessible to other users. Individuals’ ratings of content could also be extrapolated to provide recommendations for further viewing, as part of the collaborative filtering model currently employed by the online movie rental service Netflix and many others.

Multiple access portals. Because the Web Engine will be accessible through Web interfaces fully customizable by partners and end-users, there will be a large number of different access portals, all drawing on a central repository of content administered by PBS, NPR and their partner organizations. We recommend that the Web Engine interface be fully accessible and customizable by local stations and other partners. Presumably, the Web Engine would be accessible through each member station’s current website, as well as

www.pbs.org and www.npr.org. While every portal will employ the same powerful engine tools, each partner organization should be able to access the archive through an interface modified to suit the needs of its particular constituency. This allows portals administered by local stations and partner organizations to wear digital “skins” that identify them as, for example, for early childhood learners, or as a service of a local station. More substantive customizations might include search filters to block content deemed inappropriate for children using the portal, or links around the portal directing users to content recommended by the host organization.

This customizability allows the engine to be modified by content partners to fit the particular needs of any constituent group. This capability will allow public broadcasters to integrate the Web Engine initiative with the content initiatives discussed earlier in the report, reinforcing the effectiveness of each.

To develop this library, PBS and its stations must make the digital transition, overhauling rights packages, reducing the cost of production, developing new content for new media, and working with a variety of partners to improve the usefulness of the nation’s digital education resources for teachers and students. Further, public television must draw on its extensive local networks to develop and contribute content that is relevant to each of their communities, as well as to develop the training tools for teachers in their communities to use digital media in the classroom. PBS must also collaborate with institutions such as the Library of Congress, the Smithsonian Institution and the



This expansive, federated distribution system can create new revenue streams for stations and other noncommercial content creators, generating resources for new services

National Archives to develop standards that allow teachers to easily integrate digital versions of the nation's cultural and educational treasures into the classroom.

For the past three years, PBS has worked with groups including the Education Development Center to identify the key elements that deliver the greatest impact on teaching and learning. This work suggests that the Web Engine

recommended here can be designed to complement the K-12 portion of the E-Learning Initiative with features that include:

- Special interfaces for students, classroom teachers and parents
- A searchable index of video segments, interactive games, simulations, diagrams, data and primary sources compiled into a suite of on-demand, multimedia reference tools
- Organization by subject area, grade level and curriculum topic
- Curating content, to provide the best and most relevant resources on particular topics
- Collaboration by member stations with partners to ensure that content is aligned with state academic content standards

- Robust online and face-to-face professional development for teachers to understand how to use the materials to teach key subject areas (utilization) and to increase their own subject area knowledge
- Online communities for sharing learning and training experiences
- Applications allowing students to create their own multimedia projects, synthesizing materials within the library with their own locally created media

By virtue of its flexibility, the Web Engine will allow access to a vast library of content while retaining the local control that is among public broadcasting's greatest strengths. The task of continually customizing and curating a portal to make the engine work optimally for local users and constituents will provide a new and continuing role for local stations and their partner organizations in the digital future.

Services to Support the Archive: Engine as "Back Office"

PBS, NPR and their partners should also equip the Web Engine with an array of services and tools capable of accommodating the management and distribution of content from a variety of sources. It should offer secure upload and download by authorized users, and ensure that content owners' rights are protected by implementing digital rights management. It should feature secure billing systems for "premium" pay-per-view material and payment systems for rights owners. It should allow for delivery of digital media, but also for shipping of hard

copies – for example, a documentary on DVD – to customers on demand. These services, whether offered to partners, content producers and end-users, whether free or for payment, would support the operation of the archive both operationally and financially in a variety of ways. They would be among the engine’s most important attributes, often invisible to audiences, but nevertheless, acting as the archive’s instrumental “back office.”

The design and creation of the technical infrastructure required to support this archive and interconnection system are beyond the resources the public broadcasting system currently has at its disposal. We encourage it to consider partnerships, including with expert technology companies. As part of DFI Phase II, we strongly recommend that a detailed technical, operational and business plan be developed for the Web Engine, and that partnership exploration and fundraising for it be launched.

B. Transitioning Content: Digital Rights Acquisition

RECOMMENDATION: *Public broadcasters should work with content producers to facilitate the repurposing and redistribution of digital versions of archived analog programming, as well as new digital broadcast content, by public broadcasters for education and other noncommercial purposes for access over the entire range of digital media platforms and personal, on-demand devices.*

Public broadcasting sits on a vast treasure trove of existing content. But it is not automatically or readily available to use in the digital world. Digitizing today’s rich

archive of educational content for delivery on-demand is an expensive two-part process: intellectual property rights to repurpose the content must first be procured; only then can content be digitized, reformatted and indexed by segment, so that it is easily accessible and searchable by teachers, students, parents and others. Without digital rights, the great treasure of the PBS, NPR, PRI and local station archives will be lost for many of their best educational and other uses, and the system will not be able to digitize, reformat or repurpose such content for the variety of innovative, multimedia uses that are possible in the digital age.

In no realm of public television’s mission is the rights acquisition question more important than in education. As PBS and public television stations continue to expand their role in providing quality digital educational content and applications to schools all over America, it is essential that the problem of digital rights acquisition be resolved in a manner that allows efficient and low-cost repurposing of archived analog and new digital content, while upholding the purpose of copyright by ensuring reasonable compensation to content creators. Furthermore, the acquisition of flexible digital rights by PBS and other public television entities is also important from the perspective of schools and teachers. The schools of the future will be able to store and distribute digital



It is essential that the problem of digital rights acquisition be resolved in a manner that allows efficient and low-cost repurposing of archived analog and new digital content, while ensuring reasonable compensation to content creators

educational content over secure school networks. Teachers who want to integrate digital content into their own multimedia lesson plans within the fair use guidelines of copyright law will need the flexibility to do so.

The Challenges of Clearing Digital Rights

Currently, PBS, NPR and member stations generally hold only limited noncommercial broadcast and (in the case of public television) cable distribution rights to recently archived analog programming. Public broadcasters frequently lack the



Public broadcasters frequently lack the rights necessary to distribute such programming by means of newly developed technologies, such as on-demand over the Internet rights necessary to distribute such programming by means of newly developed technologies, such as on-demand over the Internet, and to repurpose such content for use in educational and other kinds of derivative works. Without such rights, PBS, NPR and their member stations will be unable to make their traditional program content available to the increasingly large segment of the public that relies exclusively on digital technologies.

In order to obtain more expansive digital rights, public broadcasting entities currently must navigate a cumbersome and expensive negotiation process, on a program-by-program basis, with each of the many parties that holds rights in one or more of the underlying elements of each program. Underlying program elements

that may need to be cleared include, but are not limited to: rights in music, literary materials, images, stock footage, artwork, graphics and photographs that are used in the program; commercial signs, labels and other promotional materials subject to trademark protection under federal and state law; the names, images and likenesses of persons that may be protected by rights of privacy or publicity; and rights to use “talent” in accordance with applicable union/guild agreements.

Simply clearing the rights to use any one of those program elements may require negotiations with multiple unrelated parties (e.g., music, where at a minimum the independently-owned rights in the composition and the sound recording, respectively, typically must be cleared). Even assuming it is possible for producers to identify and contact all such rights holders (an especially daunting task for programs produced long ago), and to undertake negotiations with each of them, producers often encounter holdouts who refuse to license their rights at a reasonable price, or insist upon arbitrary or capricious conditions or limitations. This results in costly and overly restrictive rights that constrain public broadcasters from harnessing the full power of digital technology to create innovative ways to utilize and distribute their distinctive and enriching content.

A key difficulty is that this is a new market. Therefore the value of these rights is not known in many instances, nor are there established business models for creating that new economic value. Uncertainty breeds delay, particularly when there are multiple and unaffiliated parties involved.

THE DIGITAL CONTENT TRANSFORMATION

If the rights clearance process is not fixed, it will be a tremendous loss to the public and to the nation's educational system in particular.

We believe this is an area in which PBS, NPR, and the producing stations for public television and radio must be leaders. They already negotiate for rights on behalf of their respective systems. We recommend a

concerted effort to understand the full scope of these issues and to explore solutions during DFI Phase II. We urge the public broadcasting system and its leading content-producing partners to forge a proposal that promotes broad and efficient public distribution of noncommercial content, while at the same time protecting the legitimate interests of creators and producers.



FUNDING THE DIGITAL CONTENT TRANSFORMATION AND THE NEED FOR A PRIVATIZED DIGITAL FUTURE ENDOWMENT

RECOMMENDATION: *Both the public and private sectors must step up to provide the resources needed to realize the digital future of public service media. In addition to public television’s remaining need for roughly \$700 million for digital transition infrastructure, public broadcasting overall lacks funding sources to meet the far more costly and long-term challenge of completing a digital content transformation that includes the sort of public service media initiatives recommended here for education, community engagement and other vital public needs – all costs above and beyond current funding levels. Substantial new grants of both private and public funding will be needed. Where possible, these new resources should be managed through a private and independent Digital Future Endowment, with the flexibility and incentives to leverage public funds, or earmarked user fees⁷⁸, with stepped-up private fundraising efforts on a matching basis.*

The Unfunded Future: The Costs of the Digital Content Transformation

The public service media initiatives outlined in the preceding pages are as ambitious as they are vital to meet national needs in the areas of education, civic engagement, public health and emergency preparedness. Moreover, it is likely that future national crises and new public needs will increase the need for robust noncommercial information beyond these current areas of need. But for public service media to achieve its digital transformation – and to leverage emerging media technologies to fulfill this expanded mission – it will take an immense effort and huge resources that are not now there. The unfunded, one-time cost of transitioning the nation’s public broadcasting infrastructure to a digital system capable of delivering the expanded services described here is at least \$700 million over the next five years, a figure that does not take into account the costs associated with the expanded content services themselves. It is imperative that

⁷⁸ While Mimi Weyforth Dawson expressed support for “incentives to leverage public funds,” she opposes any new taxes in the form of “earmarked user fees.”

FUNDING THE DIGITAL CONTENT TRANSFORMATION

both government and the private sector, including corporations, business leaders and foundations, participate in this challenge to contribute to the modernization and expansion of America's public service media system.

Public Television's Digital Infrastructure: One Analog to Multiple Digital Program Channels

The first step to completing the digital transition is to finish the one-time build-out of the infrastructure required by the stations and PBS to produce and deliver digital content and services over multiple channels in every market nationwide. Current estimates of the *still-unfunded* costs for this infrastructure for public television exceed \$700 million over the next five years.

Four categories of equipment that is needed over the next five years account for about two-thirds of the total digital infrastructure investment (see table below). First, public television stations need to be operating their primary digital service at full power by July 1, 2006, at the levels established by the FCC. The cost of upgrading low-power UHF transmitters to high power, which is much more expensive than upgrading VHF transmitters, is expected to be \$174 million. Second, the cost of equipment to customize up to four standard-definition (SD) program streams for local stations is expected to be at least \$176 million. Such SD customization capability for local stations requires significant station investment in traffic and automation hardware/software and SD switchers,

| Digital Transition: Remaining Infrastructure and Equipment Costs Stations and PBS (in millions) | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|---------------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 5-year total |
| Transmission (total includes \$23 million for PBS National DTV Infrastructure) | \$129 | \$122 | \$34 | \$15 | \$8 | \$308 |
| Basic SD and HD (limited local customization) | \$81 | \$0 | \$0 | \$0 | \$0 | \$81 |
| SD & HD (full customization including interstitials, branding and automation) | \$96 | \$96 | \$53 | \$3 | \$0 | \$248 |
| HD Production | \$50 | \$40 | \$24 | \$2 | \$0 | \$116 |
| Datacasting | \$5 | \$4 | \$2 | \$0 | \$0 | \$11 |
| PBS Next Generation Interconnection System | \$40 | \$30 | 0 | 0 | 0 | \$120* |
| Total | | | | | | \$884 |
| * The total funding requirement for the Next Generation Interconnection System is \$120 million. As of June 2005, NGIS has received partial funding of \$50 million. | | | | | | |
| Source: PBS, CPB. | | | | | | |

FUNDING THE DIGITAL CONTENT TRANSFORMATION

servers, routers, monitoring and satellite receiver equipment. Third, local stations need equipment to do local high-definition production with limited editing, at a projected cost of \$106 million. Finally, network infrastructure at PBS headquarters has to be updated to respond to local stations' changing requirements. Network infrastructure equipment, which includes new-format tape machines, servers and audio distribution devices, is expected to cost \$120 million. Local stations need equipment to do local high-definition production with limited editing, at a projected cost of \$106 million.

The following sections describe the additional, mostly unfunded costs associated with the digital future of public service media recommended in this report.

1. Interconnection: National Distribution System

Public television is currently replacing its national distribution infrastructure. The Next Generation Interconnection System (NGIS) has been designed to replace the current public television interconnection system, and to meet the needs and requirements for national distribution of public television programming content. A total of \$120 million is needed over five years to complete this distribution platform which, as described in Section 4, can also be leveraged as the backbone for a nationwide homeland security alert and communications network.

2. Creating New Digital Content of National Relevance for Education and Other Needs

As detailed in Section 3, the overdue modernization of America's learning

methods will benefit greatly from the development and widespread availability of high-quality, multimedia content and software applications aligned with state curriculum standards. In addition, proposed initiatives to better inform the public on matters related to civic affairs and public health would be of significant social value if made accessible to all Americans, as described in Section 4. Rough estimates suggest that the annual cost of the content initiatives described above – for education, civic affairs and public health programming, training and outreach – could quickly climb to at least \$250 million per year above current public media expenditures in these areas. While digital media can be more efficient to produce and distribute, producing more and making all of it (including the current analog archive) continually available on a variety of platforms of the consumer's choice increases costs, not merely with respect to presentation in diverse formats, but particularly with respect to the acquisition of copyright permission from producers, actors, musicians and others. Indeed, the problem of digital rights acquisition, discussed in the preceding section and again below, is a substantial wild card in projecting the future costs facing the digital future of public service media.

We strongly recommend that the second stage of this Digital Future Initiative include the development of detailed project



The annual cost of the content initiatives for education, civic affairs and public health programming, training and outreach could quickly climb to at least \$250 million per year above current public media expenditures

plans with projected budgets in the high priority areas we suggested, so that there are much firmer cost requirements to include in detailed proposals to carry out these recommendations.

3. Rights Acquisition and Digitization: Reformating the Analog Archive to Digital

PBS, NPR, PRI and the local producing stations need to digitize, reformat and index analog archives to make them usable for digital broadcasting. Public



The problem of digital rights acquisition ... is a substantial wild card in projecting the future costs facing the digital future of public service media

broadcasters must also clear the additional hurdle of the digital rights acquisition necessary to enable content to be reformatted from analog to digital, and to authorize its flexible re-use across multiple digital platforms. Without digital rights, the great treasure of the PBS and local station archives will be lost for many of its best educational and other uses.

The costs associated with this two-stage process are considerable. To understand the magnitude of the task, consider the estimated cost of digitizing the analog archives of WTTW, a public television station in Chicago. With 36,000 tapes to archive, WTTW estimates that it would take 43,000 hours, or 27 worker-years, to digitize, reformat, segment and index its analog archive. The total cost of this undertaking, including labor, equipment, supplies and overhead, is estimated at roughly \$4.5 million over a three-year period. The analog archive of WTTW – a single station – is dwarfed by the combined

size of the PBS and local producing-station archives, which will correspondingly require a much larger investment of resources to make their analog content available for digital broadcasting.

Finally, before public broadcasters can use these digitized archives, they must acquire digital rights to authorize their use across multiple digital platforms, and in multiple ways. Digitization is a relatively small hurdle compared to the costs of rights for the wide range of digital uses of content, and the likely complexity of those negotiations. Public broadcasters should work together with rights owners to find ways to lighten the burden of this expensive negotiation process. A special effort should be made to develop a model for digital rights acquisition that puts analog content to its best use in the digital media environment and distributes the resulting costs and benefits equitably among rights owners, public broadcasters and audiences.

4. Public Service Media Web Engine

As we recommend in Section 5, PBS and NPR should lead a joint effort with their stations and partners to develop a Public Service Media Web Engine that will provide access to the nation’s public service, noncommercial content and make it easily accessible by consumers on demand. As described in Section 2, some public broadcasting executives already are pursuing one path to this vision by testing the Public Service Publisher, an online search and distribution prototype for viewing and downloading public radio and TV content on demand. In addition, PBS.org already hosts more than 50,000

audio and video files, accessible through co-branded media players. PBS.org's search module, powered by Google, and its American Field Guide portal, developed by Oregon Public Broadcasting in partnership with more than 50 member stations, demonstrate the potential of virtual local content aggregation on a national scale. The Web Engine recommended in this report would be of enormous value to society if it succeeds in providing access, at the lowest possible cost, to all of the archives and new digital content of public broadcasters and other partnering institutions nationwide.

Whatever technology is ultimately adopted, the digital future for anytime, anywhere access to the entire range of public service media content requires an integrated content system built to the highest commercial Internet technology standards. It must sit on top of a federated system, governing access to the programming and other content created by local stations, PBS, NPR, PRI, local and national libraries, museums, historical societies and other partners. It should include personalized search and recommendation functionality, and be able to handle digital rights and automated payment mechanisms to accommodate the widest possible participation of public stations, creators, nonprofit institutions and other partners.

While a Public Service Media Web Engine will be of major benefit to the public, it will also entail substantial start-up and future costs as well. A variety of business models need to be explored, including online underwriting, download charges associated with certain premium content or services, and the like. Because a large part of the

demand will be for educational content, a large share of the costs should be raised from sources other than the individual students, teachers and parents seeking to access public media content for educational purposes.

5. Homeland Security: Backbone for National Preparedness Network

In Section 4, we described how public television's transition to digital media platforms can present a very valuable contribution to critical gaps in America's emergency preparedness and response systems. A completed NGIS infrastructure could effectively serve as a key part of the backbone for a national emergency response and homeland security communications network; local television and radio stations can be a critical part of a modern public warning capability; APTS, some local stations and PBS are now testing an additional datacasting capability using stations digital capacity; and there are discrete content preparation needs at both the national and local station levels where public broadcasters, partnered with public safety experts, could provide important emergency-preparedness education and other services. At a time when there is a strong need for coordinated and cooperative action by a wide variety of public and private organizations to prepare for and respond to emergencies, both PBS and its stations are correctly seen as trusted public interest conveners.



While a Public Service Media Web Engine will be of major benefit to the public, it will also entail substantial start-up and future costs as well

Obviously, there would be additional costs for the system to perform these new roles. Homeland security activities should be funded by existing governmental programs



The vehicles most appropriately adapted to an expanded role of managing a Digital Future Endowment for what is today public television and radio, respectively, are the existing PBS and NPR Foundations

for those purposes (such as grants from the Department of Homeland Security or the Centers for Disease Control).

In sum, the challenge before public broadcasters is straightforward: the system must be able to pay the one-time cost of completing the infrastructure transition from analog to digital, and then meet the larger costs over time for the digital transformation of rights, content and Web Engine distribution. The need for multimedia public service content from a trusted, accountable source will only grow. To meet this challenge, new governance structures and new funding sources are imperative.

The Need for a ‘Digital Future Endowment’: Private Operation, Public Accountability

Because of the economics of producing, aggregating and distributing high-quality video content through all the outlets discussed, it is more critical than ever that the national public service media networks – PBS and NPR – and their member stations have the enhanced resources they need to operate for the benefit of the public and the system as a whole. The DFI panel believes that the resources solicited and raised for this bold venture should as much as possible

be managed through a private and independent Digital Future Endowment, in much the same way that many of the nation’s pre-eminent cultural and educational institutions operate (such as the Kennedy Center for the Performing Arts and leading universities). The resources raised and deposited into this Digital Future Endowment should be in addition to, and not include or diminish, current levels of public and private support. Rather, the purpose of the Endowment is to create a privately managed source of *enhanced* funding to help make attainable the sort of expanded vision of digital media services, particularly for lifelong education, described in this report. For this reason, the fund’s structure must provide for both flexibility and incentives to leverage any deposits of public funds, or earmarked user fees, with private fundraising efforts (on a matching basis), as well as for enhanced returns from market-rate investment management.

The vehicles most appropriately adapted to an expanded role of managing a Digital Future Endowment for what is today public television and radio, respectively, are the existing PBS and NPR Foundations. While NPR’s private, nonprofit foundation is well-established, having received a large grant from Joan Kroc, heir to the McDonald’s restaurant fortune, the PBS Foundation was only established in 2004. It received its first large contribution recently from the Ford Foundation. We believe these already-incorporated private foundations should have prestigious, balanced and independent governing boards to oversee management of the Digital Future Endowment. They are in the best position to coordinate the digital content transformation for public broadcasting,

enabling the production of educational content and multimedia applications with nationwide relevance. The foundations should have the flexibility to raise funds and to allocate them in ways that best meet the challenges of the future.

As private, charitable foundations, these Digital Future Endowments should receive and privately invest grants of both public and private funds. The governance, as the foundations are currently structured, includes a majority of members appointed by the PBS or NPR boards, as well as representation for the public broadcasting community, with a focus on a broader range of national leaders. That broader representation should enable the foundations to operate with a breadth of vision and a level of credibility that will insulate them from many of the outside pressures on public broadcasting that exist today. We believe it is vital that the PBS and NPR foundations – or whatever vehicle might be chartered to function as this Digital Future Endowment – be absolutely independent of the political process in its editorial function. The Endowments should also be free to make grant decisions based solely on merit and the best interests of the public service media system as a whole. A diverse advisory board of stations and outside members with expertise in the education, technology, serious gaming and other disciplines relevant to the foundations' mission should also be actively involved in recommending the content and applications that are funded.

We recommend that the enhanced endowment or trust funds for the future of public service media should be structured to include the following special features:

New, Enhanced Sources: The private endowments should seek a regular flow of new funding both from private and public sources. Their efforts to get public funding should not compete for the existing sources that stations, PBS, NPR and PRI now rely on – such as annual advance federal appropriations – but instead aggressively seek new sources and ventures, such as special grants for a significantly expanded effort for early-childhood education. Similarly, they should pursue private funding – from corporations, foundations and individual philanthropists – at levels and from sources beyond those relied on today.

 **Public funds should be sought on a matching basis, with strong accountability and results measurements incorporated wherever possible**

Matching Challenge: Public funds should be sought on a matching basis, with strong accountability and results measurements incorporated wherever possible. In general, stations, PBS, NPR, or other eligible noncommercial applicants should be able to receive funds only on the basis of a 50-50 match of public money with funds raised from private individuals and corporations. Public broadcasting entities should apply and receive funding only to develop content and applications of national or regional interest, with strong preference for significant matches. This leverages public support and better ensures that private individuals, foundations, educators and other donors agree that projects deserve support. Furthermore, matching funds ensure that the private sector assumes a proper share of the costs of educating and preparing the workforce it relies upon for its success.

Sustainable Flow: The system should strive to secure sustainable sources of funding that can be managed through the Endowment. After completion of its initial mission to finance the short-term and very costly digital content transformation, the



Just as America's public broadcasting serves all sectors of society, so should its financial support be drawn from a broad cross-section of funding sources in both public and private sectors

foundations should strive to build up an endowment that can also generate its own recurring investment income to help fund the expansive, continual public need for noncommercial content in years ahead. Where possible and desirable, the recommended initiatives should be structured to yield ongoing revenue streams to support themselves and other public media services, whether through underwriting, "premium" content fees, or other mechanisms.

Draw Down Process and Accountability:

Expenditures should be limited by well-defined guidelines that describe the Endowment's expanded and national educational mission. Wherever possible, research and testing to determine program effectiveness must be included in proposals and submitted during and following performance. Advancing lifelong education services and community engagement should be the primary but not exclusive missions. The foundations should have special annual reporting requirements.

Governance and Administration: The private entity should control the collection, investment and disbursement of revenue. It should have the latitude to adopt

investment policies, much like a private university endowment fund, to achieve market-rate returns. Trustees should include representatives from public broadcasting entities (local stations and national entities) and from among citizens with expertise in education, digital media, private fund management and other substantive areas of focus for public service media in the digital future.

Seeding the Fund: The Need for Enhanced and Sustainable Income

There is no question that current sources and levels of support are insufficient to enable public broadcasting to make the transition and remain relevant in a world of on-demand digital media, let alone achieve its promise by vastly expanding its role as a national producer and distributor of on-demand education content. The costs of the digital content transformation are above and beyond current requirements for the system and therefore require resources that are in addition to, and do not diminish, current sources of funding.

It is essential that all sectors of American society contribute to this pressing national need. Public opinion surveys (see Sidebar, Section 1) consistently find that overwhelming majorities of Americans value highly the services public broadcasters provide and feel that public funds given to support them is money well spent. As public broadcasters work to implement digital technologies to strengthen and extend these services, especially in the vital areas of education and community engagement, it is imperative that financial support for this trusted national institution is made

commensurate with the value Americans place on and derive from it.

Just as America's public broadcasting serves all sectors of society, so should its financial support be drawn from a broad cross-section of funding sources in both public and private sectors. The DFI believes that enhanced streams of support, from both the private and public sectors, are essential to transforming public media apace with public needs in the on-demand digital era. In addition to these external funding sources, public broadcasters should be afforded the flexibility to pursue ancillary revenue through mission-related ventures that could produce revenue streams to fund their core activities.

While the DFI panel believes it is premature to endorse any particular new funding sources, it is clear that all possible ideas that could contribute to an enhanced, diversified and sustainable funding portfolio deserve serious discussion. We are confronted with a fundamental fact. We have a national public broadcasting system, but unlike most other developed countries, we have chosen not to fund it nationally (see Sidebar: "Public Broadcasting Around the World"). We have forced public broadcasting into a hybrid. We see no near term possibility of that changing, of there being a single silver bullet that will address the needs described herein.


At the same time, "Just give us more" is not the right answer either. Only specific amounts of funding for measurable projects of public importance are fundable in today's constrained fiscal environment. Therefore, we have recommended a DFI Phase II, during which the system should plan and

ascertain with a much higher degree of certainty what it will cost to make the digital content transformation and to implement the program initiatives recommended here. Nevertheless, there is no question in our minds that far more resources need to be invested in this national treasure; the only questions are 'how much?' and 'from whom?' The following sections survey some of the options for public and private funding that were presented to the DFI panel.

Private Funding Sources

Transforming the private PBS and NPR foundations into Digital Future Endowments will also require far more pro-active efforts at private fundraising, from individuals, corporations and charitable foundations, primarily. By pursuing these and other private sources of funding in addition to enhanced public funds, public broadcasters can build a robust and diverse funding structure that will make the system as a whole less vulnerable to problems with any single funding source.

Corporations: Though their support for public television has declined of late, support from America's businesses remains indispensable to the system as a whole. The DFI panel feels that business support for public broadcasting must be increased to reflect the value the system confers, not only on society in general, but on American businesses in particular. The benefits of public broadcasters' educational services are not limited to the people they impact directly.

 ***There is no question in our minds that far more resources need to be invested in this national treasure; the only questions are 'how much?' and 'from whom?'***

Public Broadcasting Around the World

Most leading industrialized countries have long-standing traditions of public broadcasting – and considerably greater levels of public funding. As the capsules below indicate, the public broadcasting systems in many advanced nations have funding streams that are allowing them to make a more robust transition to new digital formats and services. By comparison, America’s public broadcasting system receives very limited support from mandated fees or federal appropriations.

United Kingdom

The British Broadcasting Corporation (BBC) was created in 1922 by leading radio set manufacturers to provide a national radio broadcasting service. Today, the BBC runs eight television channels, ten radio networks, the popular website bbc.co.uk and broadcasts internationally in 43 languages. The BBC has been at the forefront of developing new digital content and services in the U.K., including Digital Classroom, a major initiative for expanding multimedia learning, and the Interactive Media Player, an online, on-demand service for BBC programming. The BBC is primarily funded through an annual television license fee that is set by Parliament, and is required of anyone who owns a television receiver. In 2004, the annual license fee per receiver was £126.50 (about \$230). The same year, the BBC’s total revenues were £3.7 billion (about \$6.7 billion), with the television license fee accounting for £2.8 billion (about \$5.07 billion), or 75 percent, of revenues.

Germany

Germany has two public broadcasting systems: the Association of Public Broadcasting Corporations (ARD), which comprises nine regional public broadcasting corporations, and Zweites Deutsches Fernsehen (ZDF). The largest system in Europe, it encompasses film production, 22 television channels and more than 50 radio stations. Germany’s public broadcasting system is funded by a mandatory license fee on television receivers, which costs about \$252 annually per receiver; in 2004, the system received \$7 billion from this license fee.

United States

Annual Public Funding Per Capita: \$1.49

United Kingdom

Annual Public Funding Per Capita: \$83

Germany

Annual Public Funding Per Capita: \$85

To the contrary, the public broadcasting system plays a leading role in building the educated, high-skill workforce American businesses rely on. To the extent that the system is given the resources it needs to take advantage of digital technologies to enhance its services, this will be even more the case. Unfortunately, corporate support for public

broadcasters – both the national organizations and local member stations – does not currently reach a level appropriate to the magnitude of this value. Public broadcasters much reach out aggressively for this support, whether in the traditional form of corporate underwriting, or in innovative public-private partnerships with businesses.

Canada

Canadian citizens are served by the Canadian Broadcasting Corporation (CBC)/Radio-Canada, which was created by an Act of Parliament in 1936. CBC/Radio-Canada’s mandate requires it to provide radio, television and new media services that are distinctively Canadian, leading the system to broadcast in English, French and eight Aboriginal languages. With an operating budget of \$1.33 billion in 2003-2004, CBC/Radio-Canada receives 70 percent of its funding – about \$28 per person – from the Canadian government. The organization has invested in a wide range of new media platforms, with CBC.ca and radio-canada.ca emerging as the country’s top providers of information and news on the Internet and over wireless devices.

| |
|---|
| Canada |
| Annual Public Funding Per Capita: \$28 |

Japan

Japan’s public broadcasting system, Nippon Hoso Kyokai (NHK), began as Japan’s first radio network in 1925, gaining legal independence from government control in the postwar years. NHK comprises two core networks: NHK Sogo (which broadcasts news, cultural, and entertainment programs) and NHK Kyoiku (which focuses on educational programming). As most digital television receivers in Japan already include Internet connectivity as a standard feature, NHK is working to integrate data communications into the television medium, with such services as data broadcasting, interactive programs, mobile reception and more. NHK is funded chiefly through mandatory fees on broadcast receivers to further secure independence from government control. In 2004, the annual receiver fee for a color television was approximately \$139, while the annual receiver fee for digital satellite reception was approximately \$238. In 2004, NHK’s total revenues were \$6.35 billion, of which 98.6 percent were received from mandatory fees on broadcast receivers.

| |
|---|
| Japan |
| Annual Public Funding Per Capita: \$49 |

Australia

Created in 1932, the Australian Broadcasting Corporation (ABC) is a national, commercial-free, public broadcasting network that reaches 98 percent of all Australians through multiple platforms. ABC operates five national radio networks, 60 local radio stations, a public TV network, a satellite television network, one of Australia’s most popular websites and an on-demand broadband service. The system is moving rapidly to digitize its archives over the next three years to meet its digital content needs. In 2004, ABC received about \$562 million, or 83 percent of its total revenues, from government appropriations.

| |
|---|
| Australia |
| Annual Public Funding Per Capita: \$28 |

Private Philanthropic Foundations: Similarly, foundation support, already a mainstay of the system, should be enhanced in order to allow public broadcasters to realize the promise of the digital future outlined in this report. Public

broadcasters, particularly PBS and NPR, should pursue much larger grants from foundations to allow them to build a Digital Future Endowment that can meet the requirements of the digital transformation on a sustaining basis. In particular, these

grants should be used as seed money to launch projects that can be made sustainable over the long run, using built-in revenue sources or other recurring sources of funding. Whatever form these contributions take, however, it is clear that if education and community engagement are truly to be national priorities,



**Business support
for public**

**broadcasting must be
increased to reflect the
value the system
confers, not only on
society in general, but
on American businesses
in particular**

foundation support for public broadcasters must be substantially increased.

Individual Donors: In addition to the above sources, public broadcasters must receive stronger support from individual donors. Americans, unlike taxpayers in most other Western nations, are not required by law to support their public broadcasting system beyond a relatively

small federal government contribution. Unfortunately, as this report has detailed, the public broadcasting services so many Americans value so highly are far from free. Americans must do more to support their public broadcasting system, or it will not be able to continue to serve them as it has for so long. This is particularly true of the wealthiest Americans. PBS and NPR should approach these individuals, many of whom share their commitments to education, civic life and public health, and ask for their help in serving their country's most pressing needs. These individual – from the child who collects pennies to donate to her local station to the mega-donor who seeds the Digital Future Endowment – should be looked upon not merely as donors, but as partners in building a brighter future for this country.

Public Funding Sources

Federal Appropriations: Federal appropriations to the Corporation for Public Broadcasting represent a crucial 15 percent of the system's overall budget. Stations whose markets do not support extensive private fundraising rely heavily on federal contributions, and other stations rely on public funds to leverage private support. This is a critical contribution and one that should be expanded to meet the new challenges and responsibilities outlined here. Congressional appropriations to the system should *increase* in order to supply PBS, NPR and their member stations the resources required to continue to serve the American people with excellent television and radio programming. According to the public opinion poll cited in Section 1 above, PBS ranks first among public institutions that deliver "excellent" or "good" value for tax dollars – more than law enforcement, military defense or the space program. Nearly 80 percent of Americans feel it is important for the federal government to support PBS, while 90 percent rate PBS programming "high quality." Unfortunately, federal appropriations do not correlate to these high levels of public support for PBS and represent the lowest per capita contribution to public broadcasting by any Western nation (see sidebar).

The federal contribution should not be limited to the annual lump sum appropriation to the Corporation for Public Broadcasting. The public service media of the future described here can serve (indeed, already serves) specific governmental objectives (such as direct programs to assist

young children, job training, public health); these functions should be supported by grants from the agencies responsible. In addition, new, relevant and sustainable sources of public funding should be considered.

Earmarked Federal Funds: One promising approach to public funding would be the allocation of a modest but sustainable federal revenue source to flow into the Digital Future Endowment for public service media. Federal trust funds typically match an earmarked revenue source, such as a user fee, to a related public need. Current federal trust funds are financed from a variety of sources, including excise taxes, customs duties, royalties, rents, user fees and sales of goods.

These earmarked funds have two obvious advantages: First, if they are properly structured, they can provide a dedicated source of funds that will be used to finance a specific activity; if the related expenditures are limited to the fund's income, there is no adverse impact on the federal budget, nor even a need to go through a traditional appropriations process each year. Second, earmarked funds may appeal to a public interested in supporting a particular activity by linking funding sources to the targeted activity – and, of course, when a user fee is assigned to the public need, then those who consume the service provided will typically contribute most to its cost.

The following are some examples of the financing of earmarked funds:

- The **Federal Spectrum Relocation Fund**, established under the Commercial Spectrum Enhancement Act of 2004, reserves auction receipts from bands of spectrum reallocated from federal use to commercial use, allowing the military and other public agencies to purchase state-of-the-art digital equipment and other relocation costs in return for clearing designated bands to be auctioned for commercial use (see below).

- The **Universal Service Fund and E-rate** are financed by contributions from all carriers of interstate telecommunications. The universal service program is not supported through annual federal appropriations, but privately through carrier-to-carrier transactions – and administered by the **Universal Service Administrative Company**, a nonprofit corporation appointed and overseen by the FCC (see Sidebar).

- The **Land and Water Conservation Fund** is financed by receipts from oil and gas leases on the Outer Continental Shelf. It is subject to annual appropriations committee action.

- The **Highway Trust Fund** is financed by federal excise taxes on motor fuels (18.3 cents per gallon on gasoline and 24.3 cents per gallon on diesel) as well as truck-related taxes, such as taxes on truck tires, the sale of trucks and trailers, and heavy vehicle use.⁷⁹



One promising approach to public funding would be the allocation of a modest but sustainable federal revenue source to flow into the Digital Future Endowment for public service media

⁷⁹ U.S. Department of Transportation: Federal Highway Administration, “Financing Federal-Aid Highways,” available at: <http://www.fhwa.dot.gov/reports/fifahiw/y/fifah05.htm>.

The 'E-rate' Program

The Telecommunications Act of 1996 adopted new goals for the universal service fund program, which was originally designed to subsidize phone service to rural, isolated and high-cost areas. The Act made schools, libraries and rural health care providers eligible to take advantage of the universal service fund (USF), enabling them to draw funds for advanced telecommunications services such as high-speed Internet access and Internet backbone equipment. USF funding for schools and libraries is provided by the Universal Service Support Mechanism's Schools and Libraries Program, also known as "E-rate."

The federal **universal service program is not supported through annual federal appropriations**, but privately funded through fees on carrier-to-carrier transactions. Every provider of interstate telecommunications services (local and long distance wireline companies, PCS and cell phone companies, etc.) must contribute to the USF program based on a contribution factor determined every quarter to meet the demand from USF recipients. Phone companies pass the cost of the USF on to their customers, who typically see a surcharge on their basic monthly phone charges to fund the USF, a portion of which funds the E-rate program.

The FCC determined that the E-rate program would be administered by the Schools and Libraries Division of the **Universal Service Administrative Company (USAC)**. USAC is a non-profit corporation, created as part of the FCC's order establishing the USF, and appointed by the FCC. USAC is directed to maintain and report to the FCC "detailed records relating to the determination and amounts of payments made and monies received in the universal service support mechanisms." As part of the Universal Service Support Mechanisms (which has no sunset clause from Congress), **E-rate is not subject to periodic Congressional authorizations**, while its administration by an independent corporation under the supervision of an independent regulatory agency (FCC) insulates it somewhat from political pressure.

A large part of it is a true trust fund, with mandatory spending on highway infrastructure.

An example that is particularly relevant to public broadcasting is revenue generated from the commercial use or auction of spectrum, most commonly known as the "public airwaves." PBS affiliates occupy one or more channels in every TV market that will be returned at the end of the DTV transition for auction to the wireless industry. Earmarking a share of those proceeds – or, preferably, advancing a share of proceeds from other, earlier-occurring spectrum auctions – can also provide incentives for early clearance of spectrum space needed by industry for wireless broadband services.

One very recent and relevant precedent for an auction earmark is the Federal Spectrum Relocation Fund signed into law by President Bush in December 2004. Under the Commercial Spectrum Enhancement Act (CSEA), up to \$10 billion from the future auction of frequencies now used by the military and certain other federal agencies is reserved in a trust fund to assist the Defense Department and other agencies in making a rapid and smooth transition to new frequencies with state-of-the-art digital equipment. This legislation offers both a precedent and potential model for establishing a fund dedicated to promoting the digital future of education and public service media. For example, Congress could earmark for public broadcasting a portion of the revenue from future

FUNDING THE DIGITAL CONTENT TRANSFORMATION

spectrum auctions, including the anticipated auction of returned analog TV channels over the next several years, to ensure public broadcasters are able to roll-out enhanced digital services.⁸⁰

A pending legislative proposal is structured along these lines: the Digital Opportunity Investment Trust (DOIT) Act, introduced this year in both the House and the Senate by a bipartisan coalition of senior members of Congress (see sidebar). If it is enacted, DOIT could provide a flow of additional funding to public broadcasting stations for some of the educational purposes described above. The sponsors of DOIT have worked along with the Association of Public Television Stations to propose that public stations be guaranteed a substantial share of the interest income from the trust's endowment fund. While the DFI applauds and supports DOIT, especially its focus on funding digital education R&D initiatives, we believe it is essential to recognize that additional funding sources will be needed by public broadcasting to address both the immediate high costs of the digital content transformation (such as digital rights) *and* the substantial future costs of the system's ambitious content initiatives to promote lifelong education, public health, civic affairs and other future needs. The DOIT legislation generally restricts its uses of funds to the development of new learning

technologies and applications, so even if DOIT is well funded, public broadcasting will need additional sources of support for rights acquisition and other content initiatives.

User fees that are related to the digital future of television and commercial media offer another category of modest and potentially sustainable funding sources that should be considered by Congress as a means to secure a Digital Future Endowment. While the DFI panel believes it is premature to endorse any particular source, the following options are among those frequently mentioned as reasonable and relevant to the purpose.



One very recent and relevant precedent for an auction earmark is the Federal Spectrum Relocation Fund signed into law by President Bush in December 2004

One-time fee on new digital TVs/DVRs:

A modest, one-time user fee on new digital TV sets could be an appropriate means to support public broadcasting's digital future. The United Kingdom, for example, imposes an annual \$233 license fee on all households with color televisions to fund the BBC.⁸¹ Germany and Japan rely almost entirely on a similar TV receiver fee (see sidebar above). In comparison, a one-time,

⁸⁰ Congress might initially seed a digital future fund with proceeds from the auction of 90 MHz of spectrum reallocated under the CSEA, tentatively scheduled for the second half of 2006, to the extent that the proceeds exceed 110 percent of the estimated total cost to relocate the federal users (which is the minimum the auction must raise to be finalized under CSEA). Budgetary concerns can be resolved by earmarking only an increment of auction revenue that exceeds the Congressional Budget Office (CBO) "score" – the revenue officially projected from the CSEA auctions. The current CBO score is approximately \$15 billion, although private estimates based on market transactions for similar spectrum suggest the government's receipts could easily exceed this amount by \$5 billion to \$10 billion.

⁸¹ BBC, "About the BBC: License Fee," March 15, 2005, available at: <http://www.bbc.co.uk/info/licencefee/>; Exchange rates calculated using Federal Reserve Board data from March 11, 2005, available at: <http://www.federalreserve.gov/releases/h10/update/>.

The Road to a Digital Opportunity Investment Trust (DOIT)

The Digital Opportunity Investment Trust (DOIT) Act aims to enhance education in the digital age by creating a trust financed by interest from the proceeds of spectrum auctions beginning in fiscal year 2008. In May 2005, the proposed legislation was introduced in the Senate by Senators Christopher Dodd (D-Conn.), Olympia Snowe (R-Maine), Conrad Burns (R-Mont.) and Richard J. Durbin (D-Ill.), and in the House by Reps Ralph Regula (R-Ohio), Edward Markey (D-Mass.) and Paul Gillmor (R-Ohio).

The DOIT effort originated outside of Congress, in 2001, when former FCC and PBS Chairman Newton N. Minow and former PBS and NBC News President Lawrence K. Grossman released a report entitled *A Digital Gift to the Nation*, in which they called for the establishment of a Congressionally chartered, nonprofit, nongovernmental agency that would provide funding for research and development of advanced digital technologies to enhance education and lifelong learning. The trust would provide grants to nonprofit institutions seeking to leverage digital technology to improve educational content and methods, in a manner similar to the way the NIH and NSF provide funds for health and science research, respectively. Among other things, DOIT will fund projects that would:

- Digitize the materials stored in universities, libraries and museums and make them available over the Internet.
- Develop interactive learning models and simulations using advanced digital technologies.
- Create training materials for workforce development, adult learning, skills improvement and civic engagement.
- Develop programs to measure the learning progress of individual students, so teachers can adjust their teaching to the specific needs and abilities of each learner.

The Digital Promise coalition recognizes the unique position of PBS and its affiliated stations to create and deliver compelling digital educational content and applications. The bill proposes that 21 percent of the trust's income be diverted annually to the Corporation for Public Broadcasting for distribution to qualified local public television stations and national programming distributors, to finance the development of digital educational content and services. CPB would allocate the funds annually through a competitive grant application process of eligible public broadcasting entities.

The proposed trust would be self-sustaining and financed by the interest income from investing a portion (30 percent) of the proceeds from radio frequency spectrum auctions, beginning in 2008. This parallels a precedent in the U.S. of using revenues from the sale of public resources to finance education for all. The Northwest Ordinance of 1787, for example, used funds generated by the sale of public frontier lands to help fund K-12 education in every new state, and the Land Grant Colleges Act, signed by President Lincoln in 1865, conferred federal lands on the states to establish institutions of higher learning. For more information on DOIT, visit www.digitalpromise.org.

1 percent fee added to the price of new DTV sets would cost American consumers under \$10, on average, for a television set that would last anywhere from three to seven years, a tiny fraction of the user fee for public broadcasting charged in countries that do not rely heavily on direct government appropriations. Since an estimated 20 million DTV sets and displays will be sold in the U.S. during 2005, a 1 percent fee could generate roughly \$200 million annually in revenue.⁸² The burden could be spread further by applying the fee more broadly, such as to digital video recorders. DVRs are highly valued for their ability to skip sponsorship messages, which undermines the value of corporate underwriting, already a diminishing source of revenue for public broadcasters.

One-Time Fee on Video Game Software:

Another option is a modest fee on video game software, earmarked explicitly to support multimedia digital learning content and e-learning tools for America's classrooms and homes. Video games today use some of the best technology available to engage children in virtual worlds that are often shockingly violent and increasingly dangerous in their real-world effects.⁸³ A recent study by the Kaiser Family Foundation found that four out of five children between the ages of 8 and 18 live in a home with a video game player, while the average child has two video game consoles at home. The average time spent playing video games (for 8- to 18-year-olds)

almost doubled in the last five years, from 26 minutes a day in 1999 to 49 minutes a day in 2004, with boys on average playing video games for 72 minutes a day. The large and rapidly-growing market for games also would enable a user fee to be quite modest. With domestic sales of video game software at \$7.3 billion in 2004, the video game industry is almost as large as the motion picture industry, which took in box office sales of \$9.2 billion over the same period. Therefore, for example, a one-time fee limited to 1 percent of projected computer and video game software sales could generate at least \$80 million annually in revenue.

Annual User Fee on Commercial Broadcast Spectrum Licenses:

A perennial proposal relates to the collection of a user fee to be paid by commercial broadcast station licensees. The federal government regularly assesses a user fee or royalty when it allows a private entity to use a public resource for commercial purposes, and this now applies to most spectrum use except for broadcasting. Although cell phone and most other new commercial licensees have often paid substantial amounts at auction for use of the public airwaves, commercial



User fees that are related to the digital future of television and commercial media offer another category of modest and potentially sustainable funding sources that should be considered by Congress as a means to secure a Digital Future Endowment

⁸² Consumer Electronics Association, *U.S. Consumer Electronics Sales and Forecast 2000-2005*, January 2005.

⁸³ See, for example: Kevin W. Saunders, "Regulating Youth Access to Violent Video Games: Three Responses to First Amendment Concerns," Michigan State University, DCL College of Law: Public Law & Legal Theory Working Paper Series: Research Paper No. 01-15, 2003, p. 53.

broadcasters pay only a *de minimus* fee to cover the cost of administering the FCC licensing system. President Bush, like President Clinton, has routinely submitted budgets to Congress proposing the imposition of an increased spectrum user fee on commercial TV broadcast licenses. For example, a user fee based on just 1 percent of commercial TV and radio gross advertising revenue would generate more than \$550 million annually in revenue.

Ancillary Funding Sources

In addition to enhanced public and private funding of public broadcasting, public broadcasters should consider means by



Public broadcasters should consider means by which they can pursue ancillary but mission-related activities to generate revenues to be reinvested in new public interest content

which they can pursue ancillary but mission-related activities to generate revenues to be reinvested in new public interest content. It is important to stress that such activities should not distract public broadcasters from their public service mission; no amount of revenue is worth such a sacrifice. But public broadcasters possess a number of assets that, under carefully developed and tested scenarios, could be leveraged through

mission-related activities to yield revenue for reinvestment in content creation and other core activities. While much more investigation is required before any such initiative can be advanced, it is likely that the

sophisticated on-demand content engine recommended here can be used to generate revenues to be reinvested in new public interest content. Just as PBS Video today charges consumers ordering “premium content,” such as popular DVDs and VHS tapes by mail, online distribution mechanisms, such as the Public Service Publisher that is now being tested, offer an opportunity to efficiently generate additional streams of revenue. Indeed, the local stations collaborating on the PSP trial plan to build in a wide variety of pay-per-view and digital rights management options to accommodate the varied needs of noncommercial content creators. We recommend that the entire system experiment with a range of technology-enhanced possibilities.

Public Television Stations Should be Permitted to Lease Ancillary Channels, or Blocks of Time, for Access by Other Noncommercial Entities:

Digital compression will at least initially give local public television stations the capacity to broadcast as many as six streams of programming, as well as the option to do data-casting. Allowing public TV stations to voluntarily lease some of their excess channel capacity to other nonprofits, for noncommercial services, has several advantages. First, it raises money for individual local stations, particularly those that have extra capacity due to a lack of resources to produce sufficient local programming. Second, it reduces the cost of TV access to other noncommercial entities – including local hospitals, local government units and religious broadcasters⁸⁴ – that

⁸⁴ Henry Becton expressed opposition to any policy that would encourage or require stations to lease airtime for religious programming. Because many local public broadcasting stations are licensed by government entities and public universities, he believes it is important to maintain a clear separation between public media and sectarian religious content.

need airtime to reach constituencies but do not want to operate a station or purchase time on commercial stations. Third, it increases information diversity. If public TV were to lease its channel space for the highest amount, the airtime would be leased to commercial entities at rates which would be prohibitive for nonprofit entities. Therefore, restricting the lease of channels to nonprofits allows more noncommercial voices to access the airwaves.

Implementing this proposal would require a change in either the FCC's rules regarding ancillary and supplementary services, or in the underlying statute, to allow noncommercial licensees to sell or lease time slots or channels on their "broadcast" channels. Under current rules, both commercial and noncommercial broadcasters can profit from the lease of extra spectrum capacity for paid, subscription TV services. However, noncommercial broadcasters cannot profit from the lease of extra spectrum capacity for free, over-the-air programming services, even if the programming is to be aired by another nonprofit entity and is a noncommercial service.⁸⁵

Enhancing Both Private and Public Support for the Digital Future

At various times, experts have suggested a number of dedicated funding sources that would give American public broadcasting the stability and resources of many of its counterparts in other nations, such as the BBC. The DFI panel is not at this time

recommending any particular source of new and enhanced federal support; that is a decision best left to public broadcasting and political leaders after a second stage of specific program development, planning and public outreach. In large part this merely recognizes public policy reality. In the face of any serious opposition, there has to be a broad consensus on the national value of specific expenditures before a successful coalition can be formed to pursue such funding.

Given the critical missions at stake, at the appropriate time, *all* relevant sources of potential revenue should be considered. In addition to the need for an additional and sustainable stream of public revenue, we believe that each current source of funding should be strongly requested to do substantially more in the traditional way:

- Instead of cutting the annual CPB appropriation as was proposed in 2005, it should be increased by at least \$75 million, with the extra funds targeted to pay for the digital transformation.
- A special, large program should be funded through the Department of Education that at least triples the size of the current *Ready to Learn* program, and also funds a pilot to test a specific National E-Learning Initiative in one or two subject matter areas.



Allowing public TV stations to voluntarily lease some of their excess channel capacity to other nonprofits has several advantages

⁸⁵ According to Section 73.621(d) of the Commission's rules, "A noncommercial educational television station may broadcast programs produced by or at the expense of, or furnished by persons other than the licensee, if no other consideration than the furnishing of the program and the costs incidental to its production and broadcast are received by the licensee."

- American businesses should match the federal *Ready to Learn* program through contributions to the Digital Future Endowment.

- State governments should support outreach programs for Early Childhood, and make specific matching contributions to the Digital Future Endowment for National E-Learning projects (with a goal of



The DFI panel is not

recommending any particular source of new and enhanced federal support; that decision is best left to public broadcasting and political leaders after a second stage of specific program development, planning and public outreach

attracting matching funds from business and/or philanthropic sources).

- American businesses should fund a very significant five year National E-Learning Initiative program in math and science.

- American information technology businesses should combine to underwrite the costs of the Public Service Media Web Engine, including a modest endowment for paying the costs of digital rights.

- The international electronic games industry should create a special program with significant funding over the next five years to pay for the development of educational games, in partnership with PBS and producing member stations.

- The health care industry should create a special program to fund the health

information initiative described here. CDC should provide matching grants to the Digital Endowments for that purpose.

- The Department of Defense should put significant resources and experience into a partnership with public television and its partners to develop sophisticated online educational tutoring and simulation tools for teenagers.

- Other state and federal training programs should invest in National E-Learning Initiative programs and partnerships for their target audiences.

- Foundations should make significant, long-term commitments to the implementation of this vision. They should pay special attention to those areas that are unlikely to be funded by corporations and government.

- Individual philanthropists should offer matching grants for specific National E-Learning Initiative areas.

- Public broadcasting should launch a campaign to explain the digital content transformation to its viewers, and ask them to increase their already substantial contributions to make this transformation a reality.

- Public broadcasting should explore collaboration with for-profit partners, fees for premium on-demand content, online underwriting, and other similar ventures that do not affect its public service media mission.



NEXT STEPS: WE CAN GET THERE FROM HERE


This initial report marks the beginning of a campaign to secure a digital future for public service media. It reflects a studied consensus about the compelling new public services that a digitally transformed public service media system can provide for the benefit of all Americans in every community. What it does not yet reflect are specific business plans, a consensus on the specific types of programming and other content that should be produced, or detailed cost projections from the stations, PBS, NPR and their partners – a process we encourage PBS to convene immediately. To move from broad vision to concrete plans, the proposals made here also need more input from experts in education, technology, public health and other fields. Third-party partners need to be recruited. And, perhaps most importantly, any plan for a digital future for public service media needs direct and wide-ranging input from the “experts” that matter most: the general public and the local community institutions through which they speak. These steps – and the forging of a broad consensus on both programmatic priorities and future funding sources – must come next.

Therefore, this final set of recommendations, related to the need for

an extensive consultation with stations, potential partners and the citizenry at large, is addressed to the public broadcasting community itself. We urge the entire system to jointly and actively engage in planning to seize the opportunities – and shoulder the costs – of the digital future. We particularly urge the two national organizations – PBS and NPR – to take the lead in launching a Phase Two of this Digital Future Initiative that is focused on consultation, specific business plan development, partnership recruiting and fundraising. Working groups of subject matter experts and public broadcasting leaders should be organized to work on the implementation of each of the programmatic initiatives in this Report.

These final recommendations for a second phase of the Digital Future Initiative include:

Approach the Digital Future as One System: It is critical that the stations and national organizations address these

 **We urge the entire system to jointly and actively engage in planning to seize the opportunities – and shoulder the costs – of the digital future**

challenges as a unified team. The digital future requires strong national organizations – and the great strength of the national organizations is the local stations. The public is served by both together. There is no room in the digital future for “we/they” tensions. Just as local station programming has been aggregated with success under the NPR and PBS “brands” for many years, the virtual aggregation of public service content within a trusted, well-known and cost-effective Internet-based distribution system will be even more critical in the digital future. It is our hope that using a Digital Future Endowment to raise and invest new and additional sources of funding – and deploying it to fund services systemwide – will provide a means by which all the pillars of the public media system can stand together in support of ever richer and far-reaching public service.

Consult Local Stations and Community Partners: While each of the major initiatives proposed here will require the national organizations, particularly PBS, to play a leadership and convening role, it is critical that the next stage include detailed consultation with local television and radio affiliates. In turn, it is important that the stations seriously reflect on their own digital initiatives and their potential role in the national ones we recommend here. Stations are in the best position to conduct a “digital service ascertainment” within local communities, particularly among potential community partners.

Initiate an Extensive Community Outreach Process: PBS has already initiated a general outreach to the public, including a series of public forums across

the nation, encouraging diverse input on the future of public service media. The general public needs to know how and why public television and radio are evolving – and offer their ideas and input about what people in communities across the country expect, need and may be willing to support. This process could also help mobilize the support for public broadcasting that comes out so strongly in public opinion polls but has not yet translated into enhanced public and private funding for the enhanced media services that parents, citizens and voters should want and need.

Develop third-party partners: Public broadcasting cannot launch or sustain these ambitious new programming services alone, whether for education, civic affairs, public health or homeland security. Public media has communications platforms, production expertise and outreach capability through stations operating in every community. But it needs to harness all this in tandem with the core stakeholders in each field. The system needs most urgently to convene partners and allies from all sectors that care, or should care, about the future of American education. These potential partners include business in general, education-minded business leaders in particular, citizen groups, educational groups of all kinds, the media, education experts, the electronic game industry, the Administration overall, and the Departments of Education, Defense and Labor in particular.

Develop Detailed Service Plans and Budget Estimates: This outreach and consultation process should lead to a more specific and detailed plan for enhanced digital services, particularly learning

NEXT STEPS

services, and budgetary projections of the estimated cost to meet these public needs. Actually raising new funds in the large amounts we believe are required, from public and private sources, will require far more detailed business plans and cost estimates at both the national and local station levels than was feasible during the course of our panel's process to date.

Challenge Both Public and Private

Sectors: Both the federal government and

leading private sector institutions need to step up and agree to fund a Digital Future Endowment – the independent, self-sustaining funding mechanism described in Section 6. One way to begin this process would be to convene a Digital Future Summit that brings together leading policymakers, corporate, education, foundation, media sector and other leaders for a serious effort to forge consensus on the most important substantive programs.

