ECONOMIC OPPORTUNITY

CHAPTER 13

BROADBAND IS BECOMING A PREREQUISITE to economic opportunity for individuals, small businesses and communities. Those without broadband and the skills to use broadband-enabled technologies are becoming more isolated from the modern American economy.

This is due in part to the rapidly changing nature of work in the digital age. Sixty-two percent of American workers rely on the Internet to perform their jobs.[1] The Bureau of Labor Statistics forecasts that jobs depending on broadband and information and communication technologies (ICT)—such as computer systems analysts, database administrators and media and communications workers—will grow by 25% from 2008–2018, 2.5 times faster than the average across all occupations and industries.[2]

The benefits that flow to the regions, workers and businesses that adopt and use broadband can be seen across the country. Diller, Neb., population 287,[3] is home to Blue Valley Meats, which has seen its business grow more than 30% and its employee ranks double over the last five years, thanks in large part to the creation of a website to extend its product reach.[4] In Youngstown, Ohio, located in the country's hard-hit "rust belt," the Youngstown Business Incubator is fostering companies such as Turning Technologies, recognized by *Inc.* magazine as one of America's fastest-growing software firms.[5] In post-Katrina New Orleans, entrepreneurs are using the Web to serve other small businesses with online marketplaces and customized reservations systems. These new firms are contributing to a flourishing tech community in the Crescent City.[6]

Braodband and the Internet make it possible for small businesses to reach new markets and improve their business processes. They have also become a critical pathway for individuals to gain skills and access careers. And it is a core infrastructure component for local communities seeking to attract new industries and skilled work forces. As a result, small businesses, workers, and communities must have the broadband infrastructure, training and tools to participate and compete in a changing economy. Broadband can help every community. Unfortunately, certain communities such as African Americans, Hispanics and rural Americans face low adoption rates, further limiting the potential benefits of broadband (see Chapter 9).

This chapter contains recommendations to extend the benefits of broadband, and the economic opportunities broadband creates, to more communities. Section 13.1 discusses the impact of broadband on small businesses and entrepreneurship. The section recommends ways to accelerate small business adoption and use of broadband applications by expanding application training and entrepreneurship mentoring programs, while giving businesses access to improved broadband network performance information.

Section 13.2 reviews how broadband connectivity and Web-based applications can help the American workforce build skills and find jobs in more effective ways. This section also recommends the virtual delivery of job training and employment assistance programs.

Section 13.3 explores ways to promote telework among American employees.

Section 13.4 focuses on community development, where broadband availability can be a key element of an integrated approach to regional economic development. This section recommends online tools for regional development managers, more efficient and effective uses of federal resources for regional growth, and expanded technology transfer efforts within local universities.

Additionally, Chapters 8 and 9 of the plan explore how broadband access and adoption by minority populations can further economic opportunities for all, particularly through initiatives such as expanding Universal Service Fund support for low-income and rural communities, and launching a Digital Literacy Corps.

RECOMMENDATIONS

Support entrepreneurship and America's small and medium-sized businesses

➤ Small Business Administration (SBA) resource partner programs should provide enhanced information technology (IT) applications training.

➤ Current federal small and medium enterprise (SME) support programs should use broadband and online applications to scale their services and give small businesses access to a virtual nationwide network of experts.

➤ The government should develop a public-private partnership to provide technology training and tools for small disadvantaged businesses (SDBs) and SMEs in low-income areas.

➤ Congress should consider additional funds for the Economic Development Administration (EDA) to bolster entrepreneurial development programs with broadband tools and training.

Deliver high quality federally-supported job training and placement services virtually

➤ The Department of Labor (DOL) should accelerate and expand efforts to create a robust online platform that delivers virtual employment assistance programs and facilitates individualized job training.

Remove barriers and promote telework within the federal government

➤ Congress should consider eliminating tax and regulatory barriers to telework.

➤ The federal government should promote telework internally.

Enable local and regional economic development

➤ The federal government should develop regional and community broadband benchmarks for use as a central component within economic development planning and programs.

➤ EDA should create an easy-to-use, dynamic online information center that gives regional development managers access to integrated federal, state, local and Tribal data.

➤ The National Science Foundation (NSF) should use its technology transfer grants to spur regional innovation and development as well as greater collaboration across universities.

13.1 SUPPORTING ENTREPRENEURSHIP AND AMERICA'S SMALL BUSINESSES

Broadband can provide significant benefits to the next generation of American entrepreneurs and small businesses—the engines of job creation and economic growth for the country. Small and medium enterprises (SMEs)—businesses with fewer than 500 employees—employ more than half of America's private sector workers and create roughly 64% of net new private sector jobs each year.[7] As of 2006, there were almost 5.4 million firms employing less than 20 people in the U.S. and an additional 20.8 million nonemployer firms.[8] Of that total, approximately 7.6 million firms were owned by women and 4.6 million firms were owned by minorities.[9] In the last 10 years, minority-owned businesses have accounted for more than half of the two million new businesses started in the United States, and created 4.7 million jobs.[10] Home-based businesses and entrepreneurs also have a profound effect on the economy, employing more than 13 million people in the United States in 2008.[11]

Small businesses have been particularly important in high-tech industries. They currently hire roughly 40% of all high-tech workers,[12] and account for a majority of the more than 1.2 million new jobs generated by the growth of the Internet during the last 10–15 years.[13] Moreover, telecommunications has proven to be a particularly successful sector for women- and minority-owned businesses. For instance, in 2002, the more than 6,000 women-owned businesses in the telecom sector generated revenues of more than $7 billion. That works out to $1.1 million in revenues per business, far more than $145,000 in revenues per women-owned business in the economy overall.[14]

Broadband and broadband-dependent applications allow small businesses to increase efficiency, improve market access, reduce costs and increase the speed of both transactions and interactions. By using Web-based technology tools, 68% of businesses surveyed boosted the speed of their access to knowledge, 54% saw reduced communications costs and 52% saw increased marketing effectiveness.[15] However, many small businesses have a knowledge gap about how best to utilize broadband tools, leaving potential productivity gains unrealized. Though private sector options exist for training and educating small businesses, those options are currently insufficient. Targeted government support can help small businesses achieve an optimum level of broadband use.

The Benefits of Broadband for SMEs

The conduct of key business activities such as communication, collaboration, process enhancements and transactions is made easier by use of broadband applications such as online conferencing, social networking, cloud-based business software and e-commerce. Perhaps chief among the benefits of broadband for business is that it allows small businesses to achieve operational scale more quickly. Broadband and associated ICTs can help lower company start-up costs through faster business registration and improved access to customers and suppliers. Broadband also gives SMEs access to new markets and opportunities by lowering the barriers of physical scale and allowing them to compete for customers who previously turned exclusively to larger suppliers.[16] E-commerce solutions eliminate geographic barriers to getting a business's message and product out to a broad audience. However, small businesses are not fully capitalizing on these opportunities. An estimated 60 million Americans go online every day to find a product or service;[17] but only 24% of small businesses use e-commerce applications to sell online.[18] The large majority of small businesses are missing an opportunity to level the playing field versus their larger rivals.[19]

Supporting IT and Application Adoption Among SMEs

The benefits described above are most compelling when broadband is supported with significant investment in IT hardware, software and services and material improvement in business processes.[20] Even technologically lagging firms in the small and midsize space recognize that broadband is a key part of a firm's basic IT infrastructure. Yet IDC, a research firm, indicates that roughly half of small and midsize firms say that

they are cautious when it comes to investing in new IT.[21] Other small businesses voice skepticism about select broadband applications either because of a perceived lack of applicability or uncertain profitability.[22] In addition, small businesses often identify important problems that IT applications can help address but do not link those problems to available solutions. For example, IDC Research shows that approximately 33% of SMEs identify "strengthening customer service and support" as a key spending priority, but only about 10% cite as a priority "improving customer relationship management tools" which are specifically designed to help in this area.[23]

To address these challenges, many small businesses rely on outsourced support when selecting and implementing broadband applications. Applications training and online tutorials are widely available from private application providers such as salesforce.com, Google and Amazon. However, despite these resources, private sector support mechanisms are not sufficient to address the full range of SME training and education needs for a number of reasons:

➤ Particularly in economically disadvantaged, rural or remote areas, direct application training and integration services are often too expensive or unavailable for many small businesses.

➤ Small businesses already pay significantly more per employee for broadband and communications services,[24] making it difficult to afford additional training and support services within a limited IT budget.

➤ Existing support and training initiatives typically target IT staff, omitting the broad range of other employees who can benefit from broadband applications.

➤ Many service providers and vendors do not provide direct support for SMEs.

➤ Service providers and vendors that do target SMEs (such as value-added resellers) are often small themselves and have limited capabilities to support SME broadband and IT needs.

While private sector options exist—particularly as suppliers place emphasis on the SME market—public programs may in certain cases be valuable for addressing these gaps, particularly for rural businesses and those in economically disadvantaged areas. There are some select programs that offer dedicated training to these areas, such as the Louisiana Business & Technology Center Mobile Classroom, which provides seminars, workshops and training programs for small businesses and entrepreneurs in rural communities.[25] However, these programs are uncommon and should be augmented by other dedicated public efforts.

RECOMMENDATION 13.1: **Small Business Administration (SBA) resource partner programs should provide enhanced information technology (IT) applications training.**

Many businesses currently receive a range of assistance from federally sponsored small business support programs, including help with business planning, application usage, finance and marketing. These training efforts, often initiated by the SBA and administered through Small Business Development Centers (SBDCs)[27] and Women's Business Centers (WBCs),[28] may or may not include broadband or IT content, depending on both the goals of the program and the entity in charge.

The SBDCs can be an effective conduit for serving small business needs, reaching more than 600,000 business clients annually and helping create more than 12,000 new small businesses in 2009.[30] Congress should consider ways to leverage

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United Kingdom Transformational ICT Program

The United Kingdom is one of the few nations emphasizing assisting SMEs in the adoption and use of ICTs. In the 2009 Digital Britain report, the Department for Business, Innovation & Skills (BIS) announced £23 million for a three-year pilot program of business support interventions for SMEs to assist them to exploit advanced ICT to transform their business processes. This focus on business support recognizes that the key obstacle to ICT use is SME understanding of the benefits of broadband applications, rather than connecting these businesses to broadband. As a result, BIS has made ICT education and training key priorities to help SME growth. To support this effort, BIS has created the Transformational ICT program. The program has six components that address supply and demand of ICTs for business:

1. Seminars for business owners that demonstrate benefits of ICTs.
2. Assessment of IT challenges for businesses that go through the seminars.
3. Training assistance for employers to increase skills in key areas related to ICT, through the "Train to Gain" program.
4. Assistance for implementing key technology purchases, as well as funding for specialist support.
5. Certification of business service and equipment suppliers to provide guidance on business purchasing decisions.
6. Collaboration with third parties such as financial institutions and insurers to address business needs in a coordinated fashion.[26]

existing assistance provided through those programs to focus training on advanced IT and broadband applications. The budget for upgrading existing SBDC lead centers to receive technology accreditation as Small Business Technology Development Centers (SBTDCs) is estimated at $1 million annually, including costs for supporting 10–12 sub-centers each. This pilot program would create as many as 12 new SBTDCs and 180 sub-centers. This budget reflects the typical scope of technology training initiatives within the SBDCs.

Congress could also consider ways to support technology training among women entrepreneurs through the WBCs. The 110 WBCs currently reach a broad client base that typically includes low-income women, first generation immigrant populations, Native Americans and veterans. These funds will be used to develop a curriculum tailored to women entrepreneurs on the value of broadband-based programs and applications, such as online marketing, financial management, Web 2.0 tools and other online based services. SBA would design this training curriculum to be scalable in addressing the needs of entrepreneurs at all stages of development.

The training programs should include an entry-level "Broadband 101" course to give small businesses an introduction to how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, SME IT training should include resources for non-IT staff, such as how to use e-commerce tools for sales, streamline finance with online records or leverage knowledge management across an organization. The Manufacturing Extension Program, which provides manufacturing companies with services focused on business and process improvements, is one example of a government initiative external to the SBA that has incorporated IT and technology training effectively. In scaling the training program, SBA should also identify outside consultants and private vendors from a variety of communities to help develop curricula and support the creation of a shared online directory to leverage these experts and training courses across locations.

Given that 19% of Americans speak a language other than English at home,[30] SBA should also encourage its SBDCs and WBCs to support more staff and volunteer trainers who can speak a language other than English to ensure that small business digital skills are made available to all Americans.

RECOMMENDATION 13.2: **Current federal small and medium enterprise (SME) support programs should use broadband and online applications to scale their services and give small businesses access to a virtual network of experts.**

In addition to the SBDC and WBC networks, the SBA's portfolio of tools to help entrepreneurs includes programs such as the Veterans Business Outreach Centers and the Service Corps of Retired Executives (SCORE). Collectively, these programs help thousands of entrepreneurs and small businesses by delivering free and low-cost training and one-on-one mentoring and counseling support.[31] Broadband tools and connectivity can further boost the effectiveness of these programs. The Small Business Committees in the House of Representatives and the Senate have already turned their attention to this issue, recommending areas where broadband and the Internet can help the SBA's resource partners.

All of these programs, with the backing of the SBA, should undergo a two-step assessment to identify how broadband can make them more effective:

➤ Identify locations and mentors with sufficient broadband connectivity and collaboration tools to enable them to participate in an online network.

➤ Identify counselor strengths and availability for distance mentoring. SCORE is already prepared to deploy this system; its current online system for pairing individuals with e-mail mentors tracks individual mentor competencies.[32]

The SBDC network, WBCs and the Veterans Business Outreach Centers would need to undergo similar assessments.

Some of these programs have significant scale already. Today, more than 10,500 SCORE volunteers provide counseling to small businesses at more than 800 locations.[33] Nearly 1,000 SBDCs nationwide offer training and one-on-one mentoring for small businesses.[34] Yet many of the SBA partner programs remain constrained by a shortage of brick-and-mortar resource centers, as well as mentors, particularly in rural areas. Moreover, these partner programs must serve a growing and diverse range of businesses. Nationwide, there is an average of 6,500 SMEs per SBDC, with nine states having more than 10,000 SMEs per SBDC.[35]

Tools such as webinars and online training courses, provided by the SBA's existing Small Business Training Network, can potentially provide an effective platform for these efforts. Similarly, adoption of videoconferencing and distance mentoring practices can allow these programs to move beyond networks defined by the location of the mentors to networks defined by the expertise of the mentors. One private sector model is Cisco's internal Specialist Optimization Access and Results (SOAR) program. SOAR allows Cisco employees to leverage experts from different locations through tools such as unified communications and collaboration (including Web conferencing and videoconferencing), customer reference databases, expertise locators, virtual demos and online communities for specialists.[36] The effectiveness of the SBA partner programs can be similarly improved through the use of these tools.

To fully implement next-generation technology within its operations, the SBA should also appoint a broadband and emerging IT coordinator. This individual would ensure that

SBA programs maintain the requisite broadband expertise, tools and training courses to serve small businesses.

RECOMMENDATION 13.3: **The government should develop a public-private partnership to provide technology training and tools for small disadvantaged businesses (SDBs) and SMEs in low-income areas.**

Small businesses represent a crucial source of economic development and growth in low-income areas. They comprise 99% of establishments and 80% of total employment in inner cities and economically challenged areas.[37] They also account for roughly 5.6 million self-employed workers in rural areas.[38] Broadband can serve as a transformational force not just for these businesses, but also for their surrounding communities.[39] Too often, however, businesses in low-income areas—even when they have broadband—lack the necessary tools, expertise and resources to take full advantage of the technology. These businesses can benefit from digital literacy and assistance in fundamental online business activities such as website construction, URL registration and use of social media.[40]

Existing support programs within the SBA, such as SCORE, already help businesses address general training needs, including business planning, identifying sources of capital and improving business efficiency. Assistance with broadband and emerging technologies should be added to the list. Although SCORE is currently positioned to offer a minimum level of technology tools and training to small businesses, these needs are not currently part of the program's core focus. However, SCORE is attempting to increase its support of small businesses in low-income areas and small disadvantaged businesses[41] by expanding its technology expertise and coordinating with local partners.

The SBA and SCORE should enter into a public-private partnership with private communications and technology firms to better address the broadband and technology needs of the small businesses that they serve, with a particular focus on SDBs and small businesses in low-income areas. The partner firms should provide applications, training materials, support services and skills expertise. In addition, SCORE and SBA should work to include SDBs as partners in this effort, to provide both technical expertise and insight on training small businesses across a wide range of rural and urban communities. Contributions by private firms to the partnership should include:

➤ "How to" training for key activities such as digital literacy, e-commerce, online collaboration, search optimization, cybersecurity, equipment use and Web 2.0 tools.
➤ Technical and professional support for hardware, software and business operations.
➤ Licenses for business applications such as document creation, antivirus and security software, and online audio- and videoconferencing.
➤ Website development and registration.
➤ Basic communications equipment, such as low-cost personal computers and wireless routers.
➤ "Train the trainer" assistance to prepare SCORE volunteers.
➤ Funding contributions.

SCORE should provide program coordination while disseminating these new resources through its nationwide network of business counselors and mentors. In doing so, SCORE should coordinate with local community organizations through its chapters in low-income areas to assist with small business implementation and use.[42] This effort ties into SCORE's existing plans to double its volunteer base over the next seven years and reorient its volunteer corps to include more full-time trainers who have the technology expertise that small businesses require.[43] As SCORE expands its volunteer base, it should partner with local educational institutions and graduate programs to recruit young students with business and technology expertise as volunteer trainers. This would create a high-impact service opportunity for young Americans and enable SCORE to cultivate new volunteers who can mentor local businesses over the long term.

The majority of the resources for this program will come as donations of time, money, materials and intellectual property from the collection of private partners and participating foundations. The SBA and SCORE should also coordinate with the Minority Business Development Agency at the U.S. Department of Commerce and the FCC's Office of Communications Business Opportunities to help reach the target small business populations. Congress could consider leveraging the federal investment in SCORE through the SBA's Office of Entrepreneurship Education to integrate content and support rollout of this effort.

RECOMMENDATION 13.4: **Congress should consider additional funds for the Economic Development Administration (EDA) to bolster entrepreneurial development programs with broadband tools and training.**

Existing entrepreneurial development efforts focus on providing assistance in the following areas: funding, business plans, market testing, mentoring, connections with peer entrepreneurs and training courses.[44] Broadband applications increasingly are becoming necessary components of this curriculum, as e-commerce, online marketing and website design skills are critical to business success. Yet too often they are not part of the core mandate of these efforts. Moreover, broadband is allowing individuals in dispersed or rural areas (where high-growth entrepreneurs may be an untapped resource)[45] to access these entrepreneurial development resources through tools such as online collaboration software, knowledge sharing, online mentoring communities, webinar platforms and videoconferencing.

Successful entrepreneurial development programs have been built around a small group of high-growth entrepreneurs, with an emphasis on hands-on mentorship and strong community support. Today, a few such examples of micro-focused programs exist at the state level, including JumpStart in Ohio, KTEC PIPELINE in Kansas, Innovation Works in Pennsylvania and Innovate Illinois. Based on initial evidence showing the effectiveness of these programs, they should be considered models for new entrepreneurial development programs.

In areas with existing state-level entrepreneurial development programs, the federal government can augment state and non-profit funding to help increase the scale and reach of these programs. This can be done through grants earmarked for broadband communications tools. Additionally, EDA should encourage these existing programs to add broadband-centered training courses focused on online marketing and sales, website design and business process applications.

Congress should consider funding to create parallel entrepreneurial development programs that include broadband tools and training in areas not covered by existing programs. Each pilot would have a $3 million annual budget—reflective of the annual budget for those programs currently in place—funded roughly one-third each from federal sources, state and local economic development agencies, and private entrepreneurial support organizations. Ten million dollars in federal funding for this effort, with equal matching funds from state/local and private entities would create 10 new support organizations in areas where EDA identifies the greatest needs. These new programs should have an emphasis on broadband communications tools and training. Federal funds for the pilot program should be granted through a competitive process similar to the U.S. Department of Education's Race to the Top Fund, which will ensure that communities with innovative approaches, strong community support for entrepreneurial development and the appropriate tools to achieve success will receive adequate funding for their programs.

13.2 JOB TRAINING AND WORKFORCE DEVELOPMENT

Jobs increasingly require new skills. Today, the average worker will hold more than 10 different jobs during their prime working years, and the duration of the average job often remains short even as workers approach middle age.[46] Most new jobs today require some level of post-secondary education or professional credentials, but 88 million working adults either have low literacy skills, limited English proficiency or no post-secondary educational credential.[47]

A changing economy, supported by workers taking on jobs that require more skills, demands better training—training that evolves in real time to meet shifting workforce needs. Broadband-enabled job training and search platforms can scale training to reach the greatest possible number of people and do so at a lower cost and in a more flexible manner. Decades of research have found that using technology-based instruction for vocational training reduces the cost of that training by about a third, while increasing the effectiveness of instruction by a third and using a third less time.[48]

Numerous employment assistance solutions targeting various demographic groups exist in the public and private sectors. DOL delivers services through the federally supported workforce development system that help low-income, low-skilled Americans find jobs. These Americans face unique barriers—including low literacy, an absence of digital skills, lack of social networks to connect to opportunities and difficulty accessing traditional training resources due to geography, disability, family responsibilities and other constraints. These groups traditionally depend almost entirely on government assistance to obtain career guidance, employment information and job training funding.

However, the current workforce development system is fragmented[49] and relies heavily on bricks-and-mortar facilities to deliver services.[50] This physical infrastructure makes it difficult to adjust to changes in demand, resulting in inconsistent supply, quality and information distribution. DOL-operated One-Stop Career Centers faced heavy demand in the wake of the 2008–2009 recession, but served only a fraction of the unemployed due to a lack of capacity—in some cases serving 10% or less of a region's unemployed.[51] The challenge of scaling the physical infrastructure of the workforce system is particularly critical during a recession with widespread impact. For instance, in New York City, according to a July 2009 study, 26% of low-income Latinos and 18% of low-income African Americans reported losing their jobs due to the recession, meaning this problem is more acute in certain communities.[52] In addition, skills of One-Stop personnel differ from center to center, creating inequity in the types of information and services customers receive. Delivering services online through a scalable platform would expand the reach of One-Stops to everyone who has access to the Internet. Additionally, adopting content and service standards would ensure every participant receives consistent high-quality service.

Broadband-enabled solutions also address time, information and technology barriers faced by disadvantaged Americans seeking jobs and training. The "anytime, anywhere" nature of an online environment allows people who have daytime

responsibilities to participate in programs during evenings and off-hours. For those without home access to a computer, the 16,000 libraries across the country along with other community access points will help ensure increased access to career tools. Minority groups are often particularly reliant on public Internet access points; a 2002 study found that 13% of African American and 12% of Hispanic households used the Internet in a public library in a single month, compared with 8% of white households.[53] Moreover, 83% of African-Americans and 68% of Hispanics have used their broadband connection to search or apply for a job online, compared to a national average of 57%.[54] Recommendations in Chapter 9 to expand free Internet access at community anchor institutions will help bolster the effectiveness of online workforce development tools.

Innovative online career tools make available a wealth of information and technology to which low-income Americans may not otherwise have had access. Encouraging workforce participation in online job training could also yield long-term cost savings and better outcomes.[55] The National Skills Coalition estimates that an increase in any level of post-secondary education could increase output per capita, increase annual federal tax revenues and reduce use of public programs such as food stamps, Medicaid and Temporary Assistance for Needy Families.[56]

Building a workforce system that allows individuals to seek training more easily and effectively is a significant step in preparing the workforce for future jobs. DOL's Employment and Training Administration is spearheading several efforts to introduce new technology solutions to the workforce development community, including development of a virtual One-Stop. In December 2009, DOL launched the Tools for America's Job Seekers Challenge, in which the country's workforce community sampled and ranked numerous companies' online job search and career advancement tools.[57]

RECOMMENDATION 13.5: **The Department of Labor (DOL) should accelerate and expand efforts to create a robust online platform that delivers virtual employment assistance programs and facilitates individualized job training.**

Creating a broadband-enabled job training and search tool for disadvantaged Americans is of paramount importance to keeping the workforce competitive and ensuring that Americans can earn family-supporting wages. This tool could help participation in job search and training programs among low-income, low-skilled Americans for whom private sector options may not be sufficiently accessible or comprehensive. Developing this online One-Stop platform effectively would involve several steps—termed versions 1.0, 2.0 and 3.0. Each successive iteration of the tool would feature increased functionality, starting with making resources currently available

through off-line One-Stops available online and later offering dynamic features that allow users to discover careers with growth potential in their region. Ultimately, those careers could be mapped to the training required to qualify.

The recommended platform would help unemployed individuals who are motivated to search and train for jobs but who do not know about the existing universe of federally supported employment assistance programs. It would tell them how to access state, local and Tribal programs, which careers are within their reach, which careers have high chances of upward mobility, whether their credentials are competitive with other applicants for the same jobs, where to find job training and how to pay for job training.

The platform's version 1.0 should deliver many of the programs that One-Stops currently deliver. One-Stops operate under a sequential delivery model in which customers must participate in Core Services to be considered eligible to receive Intensive and Training Services. The end-users of the platform would qualify for different levels of service and advance automatically from one level of service to the next until services or eligibility have been exhausted. Encouraging customers with basic levels of digital literacy to use the platform would allow One-Stop counselors to provide more in-person assistance to people who will benefit from additional attention.

Version 2.0 of the platform should offer basic skills training, intermediate digital literacy training and English as a second language coursework. The Council of Economic Advisors has found that "employers currently bemoan the lack of basic skills in the U.S. workforce, and individuals without such skills have a hard time adapting to the ever-changing U.S. workplace."[58] Mechanisms should be put in place for private employers to offer real-time input on tailoring basic skills training to meet the needs of available jobs in the future. Over time, this platform would allow collaboration with community colleges to deliver interactive certificate-bearing online training modules as envisioned for the Online Skills Laboratory.[59]

In version 3.0 of the platform, DOL would transform the way One-Stops deliver job training services by launching an algorithmic, long-term career planning and job training tool. Through the platform, users should be able to:

➤ Assess levels of digital literacy, basic literacy and English proficiency, then review recommended training opportunities to address any basic skills deficiencies.

➤ Evaluate job skills and work experience.

➤ Learn about growth industries and other labor market trends by region.

➤ Access detailed information about professions.

➤ Chart pathways to advance within professions of interest, including understanding specific professional certifications required to pursue and advance within each career path.

➤ Search for jobs on a national level rather than at the state or community level.

➤ Build a resume, write a cover letter and obtain interview preparation assistance.

➤ Apply for jobs, store pertinent application documents and track progress of job applications through a personal dashboard.

➤ Obtain detailed information on necessary job training opportunities, providers and costs, then use the information to apply for federal and state funding for these opportunities.

Research shows that unemployed workers who receive re-employment services land a job and exit unemployment insurance approximately one week sooner than those who do not receive such services. This results in cost savings for DOL, the federal government and society.[60]

In this third phase of development, the platform should serve as a medium through which the workforce development community—non-profit, public and private players—can share best practices, initiate sector partnerships and track long-term program participant outcomes through a high-level dashboard. State-to-state collaboration might generate programs that multiple states could offer together. With better tracking capabilities, the federal government could adjust funding for programs more easily by investing in proven successes while pulling funds from programs producing poor results.

To develop the various versions of this tool, DOL should award "prize" funding to private sector firms that compete to build this employment assistance and job training platform. DOL should work to promote these funding opportunities among SDBs to ensure that there is strong participation across a wide range of eligible firms. DOL should also oversee product development and set relevant data, content and formatting standards. DOL should consider any cost savings that might come from collaborating with the U.S. Department of Energy, which is creating a virtual training software platform focused initially on training materials for weatherization jobs, but that may include advanced functionality that could be used to enhance other training content. DOL has allocated $20 million for its virtual One-Stop project. Additional funding for the platform should be considered in discussions related to reauthorization of the Workforce Investment Act. The platform's ongoing annual maintenance costs should be budgeted to provide quality control, customer service and academic support, on top of technology development costs.

13.3 PROMOTING TELEWORK

Soon after the September 11 attacks, letters containing anthrax spores were sent to Congress, forcing members of Congress and their staffs to work from the Government Accountability Office (GAO) building. This displaced GAO analysts from their offices. But thanks to their government-issued laptop computers, more than 1,000 analysts were able to continue working remotely, maintaining the continuity of operations.[61]

Telework has broader implications than mere continuity of operations. Jeffrey Taggart, a resident of Des Moines, Iowa, has multiple mental and physical disabilities that make working in an office difficult, if not impossible. However, thanks to the Internet, Taggart makes a living from home as a customer service professional.[62]

Such stories are increasingly common as home broadband access has become more widespread. From 2003 to 2008, the number of teleworkers in America increased by 43% to 33.7 million people.[63] One survey estimates that 14% of retirees, 31% of homemakers and 29% of adults with disabilities would be willing to join the workforce if given the option to telework. Making telework a more widespread option would potentially open up opportunities for 17.5 million individuals.[64] Moreover, the average American spends more than 100 hours per year commuting; 3.5 million people spend more than 90 minutes commuting to work each way every workday. Telework allows workers to be more productive by eliminating their daily commuting time. And it gives workers greater flexibility to handle family responsibilities, attend school full time and perform more community service.[65] This is particularly important for those living in rural areas as it can enable these workers to more effectively compete for jobs located elsewhere and perform those jobs via telework.[66]

Telework solutions also help the environment. Every additional teleworker reduces annual CO_2 emissions by an estimated 2.6–3.6 metric tons per year.[67] Replacing 10% of business air travel with videoconferencing would reduce carbon emissions by an estimated 36.3 million tons annually.[68]

RECOMMENDATION 13.6: Congress should consider eliminating tax and regulatory barriers to telework.

Tax and regulatory policy may prevent some employees from teleworking more regularly. Many teleworkers live in a different state from where their firm is located. This can sometimes result in double taxation issues that end up discouraging telework. Most states tax telecommuters based on the percentage of time worked within that state. However, some states tax the full income of nonresident teleworking employees of companies based in their state unless they are working at home "for the convenience of the employer," a category that telework advocates claim is nearly impossible to prove.[69] Since teleworkers are technically working in their home state as well, this opens them up to potential double taxation. There is pending federal legislation to ban states from taxing nonresidents on work done outside the state.[70] Congress should consider addressing this double taxation issue that is preventing telework from becoming more widespread.

RECOMMENDATION 13.7: The federal government should promote telework internally.

The federal government employs more than 2.6 million civilians and more than one million uniformed military personnel.[71] As of 2008, 102,900 federal employees actively teleworked, a 9% increase from 2007.[72] Key institutions are beginning to support telework within the government. The U.S. Office of Personnel Management announced a new telework plan for federal employees in April 2009, including a Telework Managers Council that would develop standards and review agency telework policies.[73] However, more can be done to increase the use of telework within the government.

Agencies must develop guidelines for managers of teleworking employees. According to the American Electronics Association, "The most daunting challenges to widespread adoption [of telework] are cultural, not technical."[74] Giving managers guidelines on best practices for managing teleworking employees will help overcome manager resistance and alleviate any stigma associated with telework as a viable alternative work arrangement. The Telework Managers Council should review agency-developed guidelines in the course of reviewing telework plans and should promulgate best practices to the wider federal, state and local government communities.

Agencies should also evaluate and deploy, where economically attractive, a unified communications platform, including instant messaging, Web conferencing, videoconferencing, voice and a unified message center for all methods of communication. In addition, the federal government should evaluate the impact of videoconferencing to replace travel and improve government efficiency. The General Services Administration should oversee the initial deployment of advanced videoconferencing technologies to overcome cultural resistance to telework and determine whether it should be implemented more broadly.

13.4 LOCAL AND REGIONAL ECONOMIC DEVELOPMENT

The benefits of broadband and its centrality to economic life make it an essential element of local and regional economic development in the 21st century. Broadband enables regions and industries to compete globally, from rural farmers marketing their products nationwide to start-up companies along Massachusetts's Route 128 corridor achieving dramatic breakthroughs in biotechnology that are attracting global attention. Looking ahead, communities without broadband infrastructure will find it more difficult to attract investment and IT-intensive jobs, particularly because they face growing national and international competition. The story of one community in rural Georgia proves to be today's norm rather than the exception. After losing its local textile manufacturing base, the community tried to attract once-outsourced customer services jobs for those left jobless. A major airline expressed interest in developing a customer call center but ultimately passed for one basic reason: The community lacked adequate broadband infrastructure.[75]

Local economic developers should view broadband as a part of local infrastructure development and should incorporate it into local economic development strategies. The federal government can also leverage broadband to facilitate

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Virtual English Teachers in Powell, Wyoming

In late January 2009, the city of Powell, Wyo. (population 5,524),[71] finished an ambitious municipal fiber network, which provides fiber-to-the-premises to 95% of households in the community.[72] The project spurred the growth of new business opportunities in Powell, including the hiring of more than 100 certified English teachers by Wyoming-based

Eleutian to teach conversational English to South Korean students using videoconferencing.[73] Eleutian was able to attract $1.5 million in venture funding from Skylake Incuvest, a South Korean venture capital fund. Eleutian's CEO said that Powell's fiber project was "critical" to hiring the teachers, noting: "Without fiber-to-the-home like Powell [has], we would not be able to offer home-based jobs in Powell."[74]

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better integration of its diverse investments in localities. The Brookings Institution estimates that $76 billion in federal funding for local and regional economic development was scattered across 14 agencies comprising 250 separate programs.[76] This fragmentation makes the need for regional integration of broadband investments into local economic development investments even more critical. Broadband-enabled tools can help federal and local policymakers and citizens get a clearer, more transparent view of these disparate funding streams.

RECOMMENDATION 13.8: **The federal government should develop regional and community broadband benchmarks for use as a central component within economic development planning and programs.**

➤ **The U.S. Department of Commerce and U.S. Department of Agriculture (USDA) should ensure that regions integrate broadband infrastructure into local economic development.**

➤ **To support local community benchmarking, the Department of Housing and Urban Development (HUD) and USDA should integrate technology assessments into the Empowerment Zone (EZ), Enterprise Community (EC) and Renewal Community (RC) programs.**

Broadband infrastructure and a digitally skilled workforce are essential for a region to attract new jobs and investment. One way for communities to determine the level of broadband utilization in their local economy is to develop a set of broadband metrics that can be used to benchmark their performance against communities nationally. For communities with high levels of broadband use, this will help demonstrate the integration of broadband into the local economy, while attracting new private-sector investments. For communities with below-average use, community benchmarking can be an important tool for local planners to set broadband policy goals while ensuring that broadband programs effectively target gaps left by the private sector.

These benchmarks should include the following metrics:

➤ *Access.* The share of community or region with access to broadband services

➤ *Adoption.* Broadband adoption rates by local residents, businesses and institutions

➤ *Usage.* Applications used by local residents, businesses and institutions

These benchmarking efforts should be divided between larger regions that are served by a common network—focusing on broadband access and adoption—and smaller neighborhoods and communities, where benchmarking would focus on usage by local residents, businesses and institutions. Focus at the regional and community level would help ensure that the

benchmarking program would serve the needs of regional or local policymakers. This effort would also help to coordinate federal support for technology planning and economic development, which would lead to more focused investments, as well as cost savings as projects are implemented.

Under the Recovery Act, both the National Telecommunications and Information Administration (NTIA) and USDA's Rural Utilities Service (RUS) were given the responsibility to disburse $7.2 billion for broadband adoption and deployment.[77] In making future disbursements beyond Recovery Act funding, both NTIA and RUS should review how broadband projects integrate into local economic strategies. NTIA and RUS should partner with EDA to develop both broadband and economic development benchmarking metrics that can be integrated into regional development strategies. These efforts could include existing federally supported economic development planning efforts developed by local groups, such as workforce development boards, community colleges and other institutions. Strategies could include a combination of plans for attracting new businesses and industries, plans for local workforce training and development, and measures for improving local digital literacy

One way to implement regional broadband benchmarking is by expanding EDA's Comprehensive Economic Development Strategy (CEDS) process to include a technology assessment. A CEDS is developed by a local strategy committee that includes public officials, community leaders and local business leaders, among others.[78] The CEDS process requires local input concerning strengths and weaknesses of the region and requires a plan of action to address issues such as transportation infrastructure, environmental impact and workforce development. Currently, each economic development district or region eligible for EDA grant funding must complete a CEDS plan at least once every five years to remain eligible for program grants.[79] Moving forward, the CEDS process should require a plan for promoting the use of technology regionally along with an assessment and benchmarking of local broadband resources. Such measurements would help regions determine how attractive their technology infrastructure is for businesses and how equipped their local workforce is to fill new jobs.

HUD and USDA's Empowerment Zone, Enterprise Community and Renewal Community programs encourage the revitalization of impoverished urban and rural communities through economic, physical and social investments.[80] As part of their administration of Enterprise Communities, Empowerment Zones, Renewal Communities and HOPE VI developments, HUD and USDA should incorporate technology as a critical input into the communities that they support. These programs should include a community technology assessment that measures availability, price and adoption of

broadband services. HUD and USDA should also require community plans to set goals for increasing adoption and use of broadband for local development.

Residents of areas currently receiving, or eligible to receive, federal redevelopment assistance pay more for broadband and have lower maximum speeds available to them. There is some evidence broadband prices tend to be higher in low-income rural areas than similarly populated areas with higher median incomes.[81] Enterprise Zones, Empowerment Zones, Enterprise Communities and Renewal Communities have broadband penetration rates of 56%, below the national average of 61% across all Census tracts according to FCC's 2009 Form 477 data.[82] Thirty-four percent of these areas have average penetration rates below 30%.[83] (Penetration rates in Enterprise Zones, which tend to be in more densely populated areas, only match the national average.)

Though geographic characteristics limit deployment of some higher-speed technologies, fewer businesses in EZ/EC/RC areas and census tracts with HOPE VI developments have access to the highest cable and DSL speeds, even when controlling for population density.[84] Opportunities for growth in community broadband connectivity exist in these zones, and communities should leverage existing support for broadband infrastructure deployment, last-mile connectivity and sustainable Internet adoption efforts. Including ICT in strategic plans will enable EZs/ECs/RCs to use grant funds for community technology initiatives in support of economic development.[85]

RECOMMENDATION 13.9: **EDA should create an easy-to-use, dynamic online information center that gives regional development managers access to integrated federal, state local Tribal data.**

To help local economic developers in regions and localities support more competitive clusters, the EDA should build an online information center for regional economic development data.[86] This information center would have three components:

➤ It would continuously update a distributed database containing key economic development indicators[87] at the local, regional and state level, and it would allow users to custom-define regions (comprised of multiple localities or counties) for analysis.

➤ It would offer a searchable online database of federal funding programs that can be used by local developers and matched to their local conditions and industries. This tool would help address the fragmentation and complexities of the grant process.

➤ It would provide an interactive map of current and previous grantees across programs, which would include all completed impact assessments and grantee contact information.

An easy-to-use online resource could help regions identify central "clusters" of industries that provide a competitive advantage, attract skilled labor and reduce company operating costs. These clusters could create spillover effects of formal and informal networks of information sharing as firms participate in what one paper called the "social structure of innovation."[88] Collectively, federal agencies have data on employment, education, traded goods, patents and more. The national information center could bring together these data sources to present a broader picture of how individual communities are performing economically.

The information center would also include an algorithmic tool to match federal grant programs to local conditions and industries. This capability should start with EDA's funding streams and expand over time to include 26 federal grant-making agencies.[89] Further, the center would have information to help grantees understand what projects others in their region

Connecting Broadband With Other Infrastructure to Create Jobs and Opportunity in Rural Virginia

Planning commissions in rural southwest Virginia accelerated job growth by combining broadband deployment with new economic development projects to take full advantage of broadband's benefits. These commissions deployed fiber efficiently by coordinating its deployment with trenching for water or sewer lines, forming the groundwork for a regional broadband network in an area previously unserved due to the high cost of deployment. In addition, localities supported broadband infrastructure by upgrading other key economic development infrastructure assets. For example, the town of Lebanon converted an old strip mall to serve as a job-training center to deliver high school equivalency courses and train workers for IT-related jobs. These efforts helped the community attract new employers and create new jobs. The Lenowisco Planning District Commission reported 1,200 new jobs, $55 million in new private investments and $35 million in new payroll as a result of the region's broadband network. Its sister planning organization, the Cumberland Plateau Planning District Commission, reported 1,100 new jobs, $60 million in private investments and $40 million in new payrolls. The regional networks, which were designed to serve schools, incubators and health care providers, helped attract new employers, such as Northrop Grumman and CGI, to rural southern Virginia, enabling job opportunities that did not exist in the area before.[84]

are pursuing. And it would have impact assessments from prior federal grants, to help regions learn from past projects and make the development process more sustainable.

Congress should consider providing public funding for the creation and operation of a Regional Information Center, as part of EDA's Regional Innovation Cluster Initiative. The information center will gather, analyze and distribute regional economic data, as well as promote best practices in economic development.

RECOMMENDATION 13.10: The National Science Foundation (NSF) should use its technology transfer grants to spur regional innovation and development as well as greater collaboration across universities.

Technology transfer grants can accelerate regional innovation by supporting existing research facilities and improving coordination among local universities, development managers and the business community. NSF is launching a university innovation grant program to support the technology commercialization process through several pilot university programs. Each grant would support the creation of an innovation center that provides proof-of-concept funding and mentoring to accelerate the creation of spin-off companies.[90]

However, smaller colleges and universities may find it difficult to apply for innovation grants because of limited connectivity, exacerbating the divide between large and small institutions. In 2007, the 50 research universities that spent the most on R&D each had an average annual research budget of nearly $550 million, representing (in total) more than 55% of all university research and development (R&D) spending.[91] In contrast, the next 613 universities averaged just $36 million each, accounting for the remaining 45% of university R&D spending.[92]

To assist smaller universities in applying for these grants, NSF should encourage consortia of these universities to pool their R&D resources, technology transfer staff and mentoring and research networks into a single innovation center. Supporting these university consortia could catalyze

technology commercialization and drive regional economic development. It could also provide benefits to a wider range of higher education institutions, including Historically Black Colleges and Universities, regional campuses, and liberal arts colleges.

In addition, NSF should offer support for broadband networks between consortium partners and other institutions that receive the innovation grants. This approach would allow smaller universities to create a critical mass of researchers and technologies, helping attract private-sector support. In addition, it would create an online network of expertise from the participating universities, helping academic institutions adopt best practices for technology transfer management while allowing local businesses to tap into a larger pool of resources to address their innovation challenges. NSF is already supporting these universities with the Experimental Program to Stimulate Competitive Research (EPSCoR), which provides up to $6 million in grants for broadband infrastructure for universities. By starting a new effort coordinating its EPSCoR broadband infrastructure grants and its university innovation grants, NSF can allow consortia to access funds not just for connectivity but also for technology transfer and innovation.

By creating a shared communications network, these consortia would also give researchers and university spin-offs access to resources like grid computing, cloud-based applications, telepresence networks and connections to academic research networks such as the Internet2 Network. In a recent survey of Internet2 universities, all members reported research networks with connections of 100 Mbps or higher, with 76% planning on expanding their connections to 10 Gbps or higher over the next five years.[93] By contrast, universities that conduct research but lack doctoral programs were twice as likely as universities with doctoral programs to have connection speeds below 100 Mbps.[94] To help address this issue, groups of universities that are not connected to an academic network should be given funding priority to expand their connectivity infrastructure.

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76 Karen Mills et al., Brookings Inst., Clusters and Competitiveness: A New Federal Role for Stimulating Regional Economies 24 (2008) (Mills et al., Clusters and Competitiveness).

77 BroadbandUSA, http://www.broadbandusa.gov/ (last visited Feb. 15, 2010).

78 13 C.F.R. § 303.6(a).

79 Econ. Dev. Admin., U.S. Dep't of Com., Comprehensive Economic Development Strategies: Summary of Requirements, http://www.eda.gov/PDF/CEDSFlyer081706.pdf (last visited Nov. 24, 2009).

80 The U.S. Department of Agriculture designates and oversees rural EZs and ECs while U.S. Department of Housing and Urban Development designates and oversees RCs and urban EZs. To qualify, communities must demonstrate economic distress, including poverty rates and unemployment rates higher than the national average. Designation as an EZ/RC/EC confers a range of tax incentives and block grants over an initial 10-year period. *See* IRS, Tax Incentives for Distressed Communities, Pub. 954, Cat. No. 20086A (2004), *available at* http://www.irs.treas.gov/pub/irs-pdf/p954.pdf.

81 FCC, 2008 Form 477 database (accessed Nov. 2009) (on file with the Commission). The Commission used the Form 477 data to estimate, for individual census tracts, the share of households with high-speed connections over fixed-location technologies. Combining reported numbers of total lines in a Census Tract with GeoLytics, Inc census block-level estimates of households in 2009, the Commission determined the number of lines per 1,000 households—or, broadband penetration rates. We filtered the data by census tract, and we flagged census tracts for Empowerment Zones, Enterprise Communities, Renewal Communities, and Hope VI Communities. Filtering by EZ/EC/RC's and Hope IV census tracts, the Commission was able to determine the average broadband penetration rate for

CHAPTER 13 ENDNOTES

each classification. Housing and Urban Development provided the appropriate census tracts. For more detail on the Form 477 results and Commission analysis, please see INDUS. ANALYSIS & TECH. DIV., FCC, HIGH-SPEED SERVICES FOR INTERNET ACCESS: STATUS AS OF DECEMBER 31, 2008, at 1 (2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296239A1.pdf. For more information on Empowerment Zones, Enterprise Communities, Renewal Communities, including maps and locations, please see HUD, Tour EZ/RC/ECs by State, http://www.hud.gov/offices/cpd/economicdevelopment/programs/rc/tour/index.cfm (last visited Feb. 20, 2010).

82 *See* note 81, *supra*.

83 *See* note 81, *supra*.

84 *See* note 81, *supra*.

85 Empowerment Zones: Performance Standards for Utilization of Grant Funds, 72 Fed. Reg. 71 008–018 (Dec. 13, 2007).

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87 Data would come from multiple agency databases, including the Bureau of Labor Statistics, the Census Bureau, the Bureau of Economic Analysis, the US Department of Education, the Employment and Training Administration, and the U.S. Patent Office, among others.

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89 Grants.gov, Agencies that Provide Grants, http://grants.gov/aboutgrants/agencies_that_provide_grants.jsp (last visited Feb. 15, 2010).

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