Please find attached the Appendices documents relating to the California
Emerging Technology Fund Comments responding to the Broadband
Opportunity Council Notice and Request for Comment. We are not
including documents where we provided a weblink, however. If there are
problems with any of the web links or opening the documents, please call us.

If you have questions, please contact Susan Walters at
susan.walters@cetfund.org or Rachelle Chong at rachellechong@gmail.com.
Thank you,

Rachelle Chong
Outside Counsel to CETF

415 288 4005 Tel.

EXECUTIVE ORDER S-06-09 by California Governor Schwarzenegger

WHEREAS Information and Communications Technologies (ICT) Digital Literacy is a defining component of California's competitiveness for a knowledge-based economy and is growing in importance to attract capital investment that will generate higher quality jobs; and

WHEREAS ICT Digital Literacy skills are vital to California's ability to compete successfully in a global information and knowledge economy; and

WHEREAS ICT Digital Literacy is defined as using digital technology, communications tools and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge-based economy and society; and

WHEREAS there is widespread recognition documented in numerous national and international reports by entities such as the World Summit on the Information Society (WSIS) that ICT Digital Literacy is essential for increasing productivity, improving quality of life, and enhancing global competitiveness; and

WHEREAS even though the first inaugural annual survey by the Public Policy Institute of California in partnership with the California Emerging Technology Fund and ZeroDivide (titled *Californians and Information Technology*) found that nearly seven in ten Californians and strong majorities across demographic groups believe it is very important to have Internet access, there is a persistent Digital Divide in California as evidenced by the fact that:

- Less than half of Latinos (48%) have home computers, compared with about 86% for Whites, 84% for Asians, and 79% for Blacks.

- Only 40% of Latinos have Internet access, and only 34% of Latinos have broadband connections at home, while majorities of other racial or ethnic groups have both Internet access and broadband connections.

- Only 32% of Californians are very confident about using the Internet.

- More than 56% of parents indicate that they visit their children's school websites, but only 30% of those with household incomes under $40,000 indicate doing so, as compared to 84% of those with incomes of $80,000 or more.

- More than 62% of Californians indicate a concern that lower-income areas are less likely than others to have access to broadband Internet technology.

- There is a disparity among ethnic/racial groups, income levels, and regions when comparing rates of computer ownership, Internet access, and broadband connections at home.

- A majority of residents express concern that Californians in lower-income areas and rural areas have less access to broadband Internet technology than others.

- There are indications that since 2000, computer use has grown among whites (79% to 85%) and blacks (76% to 83%), as has Internet use (70% to 81% for whites, 60% to 82% for blacks), but among Latinos, computer use has declined (64% to 58%) and Internet use is unchanged (47% to 48%), while Asians have seen declines in both their use of computers (91% to 81%) and the Internet (84% to 80%).

WHEREAS to ensure continued global competitiveness in today's knowledge-based economy, it is increasingly important for workers to be able to cope with changes in the nature of work, shifts in the labor demand, and changes in required ICT skills for the jobs being generated; and

WHEREAS at the individual level, the ability to read, write, do math, problem solve, work in a team, think critically and use ICT is essential to education and workforce preparation, employment success, civic participation, health care, and access to entertainment; and

WHEREAS the State of California supports ICT for applications in government, education, workforce, health care, business and other areas; and

WHEREAS it is recognized that all residents must have the opportunity for full participation in the educational, civic, cultural, and economic sectors of California society and must have accessibility to and appropriate skills for fully utilizing government, education, workforce, health care, business, and other services; and

WHEREAS it is an important goal to ensure that California residents are digitally literate, and that they recognize the importance of (1) access to information and communications technologies regardless of income, geographic location or advantage; (2) the provision of ubiquitous broadband service in a competitive marketplace at affordable cost; (3) opportunities for residents to acquire ICT digital literacy skills in order to benefit academically, economically and socially; (4) the development of a California ICT Digital Literacy Policy that declares that all residents of California should be digitally literate; and (5) a seamless continuum of digital literacy competencies with benchmarks, metrics, assessments and certifications endorsed by the State to identify the ICT digital literacy proficiencies of residents, students, and workers; and

WHEREAS a California ICT Digital Literacy Policy would support a framework and continuum of digital literacy skills, benchmarking, and metrics consistent with globally accepted standards, and would ensure accountability for assessing progress and success; and

WHEREAS an ICT Digital Literacy Policy would be consistent with the Administration's goal to strengthen the economy, expand the skilled workforce, and increase competitiveness in sciences, technology, engineering and math industries and careers.

NOW, THEREFORE, I, ARNOLD SCHWARZENEGGER, Governor of the State of California, by virtue of the power and authority vested in me by the Constitution and laws of the State of California, do hereby order effective immediately:

1. A California ICT Digital Literacy Leadership Council (Leadership Council) is hereby established. It shall be chaired by my Chief Information Officer. Membership on the Leadership Council shall include the Secretary of Education, the Secretary of Labor and Workforce Development, the Secretary of Business, Transportation and Housing, and the Secretary of State and Consumer Affairs. The Leadership Council shall invite the Superintendent of Public Instruction to participate as a member of the Leadership Council.

2. The Leadership Council shall establish an ICT Digital Literacy Advisory Committee (Advisory Committee). Membership on the Advisory Committee shall include representatives of entities with an interest in ICT Digital Literacy, such as the California Economic Strategy Panel, California Workforce Investment Board, State Board of Education, California Community Colleges, California State University, University of California, public-purpose private-sector organizations such as the California Emerging Technology Fund, California Business Roundtable, California Chamber of Commerce, American Electronics Association, TechNet, and leaders from the private sector. The Majority and Minority Leaders of the Senate and Assembly shall be invited to each appoint a Legislator to serve on the Advisory Committee.

3. The Leadership Council, in consultation with the Advisory Committee, shall develop an ICT Digital Literacy Policy, to ensure that California residents are digitally literate.

4. The Leadership Council, in consultation with the Advisory Committee, shall also develop a California Action Plan for ICT Digital Literacy (Action Plan). The Action Plan shall include:
    a. Definition of the basic elements of Digital Literacy.
    b. Description and articulation of a "continuum" of skills required for Digital Literacy.
    c. Strategies and actions for incorporating Digital Literacy into workforce training statewide.
    d. Strategies and actions for incorporating Digital Literacy into K-12 and higher education.
    e. Acceptable frameworks for assessment and certification.
    f. Recommended curricula consistent with the assessment frameworks.
    g. A timeline for implementation of the Action Plan.
    h. Identification of metrics to ascertain the achievement of ICT Digital Literacy.

5. The Action Plan shall be consistent with the recommendations of the California Broadband Task Force Report - January 2008: *The State of Connectivity Building Innovation Through Broadband*.

6. The California Workforce Investment Board (WIB) shall develop a technology literacy component for its five-year Strategic State Plan to:

    a. Raise the level of Digital Literacy in California by supporting technology training and integrating Digital Literacy skills into workforce development activities.
    b. Expand Career Technical Education (CTE) opportunities and Digital Literacy programs community colleges.

c. Build consensus at the State and local community levels by identifying Digital Literacy ecosystems to drive models of excellence, benchmarking, and reliable metrics for measuring success.

d. Provide workforce examples of skills training and job-placement community-value projects for e-government, e-health or other conveniences.

e. Engage the ICT industry and entertainment mega-industry along with large employers to promote applications.

f. Highlight collaborative models in underserved communities and culturally diverse populations.

g. Build and resource a strong coalition empowered to achieve near-term action and results-oriented outcomes.

h. Reward success to reinforce best practices, individual champions, economic results, and public awareness and support.

7. These activities are to be accomplished through realignment of existing personnel and resources without additional state funding. However, the Leadership Council is authorized to identify and deploy non-state resources that can work in collaboration with State agencies to help build a public-private sector alliance for the purpose of assisting in implementation of the goals of this Executive Order.

8. The Leadership Council shall submit the Action Plan to me by December 31, 2009 or sooner.

9. The Leadership Council shall comply with applicable open-meeting laws.

I FURTHER REQUEST that the Legislature and Superintendent of Public Instruction consider adopting similar goals, and that they join the Leadership Council in issuing a "Call to Action" to schools, higher education institutions, employers, workforce training agencies, local governments, community organizations, and civic leaders to advance California as a global leader in ICT Digital Literacy by:

1. Incorporating ICT Digital Literacy into workforce training programs and curricula.

2. Supporting and promoting ICT Digital Literacy by encouraging all public agencies to optimize e-government and the availability of public services online.

3. Requiring employers and employer organizations to identify requisite ICT Digital Literacy skills for 21st century jobs and to articulate appropriate training and assessment standards to local, regional and state agencies responsible for workforce training.

4. Encouraging public and private sectors to join forces and form public-private partnerships to promote ICT Digital Literacy.

I FURTHER DIRECT that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this Order.
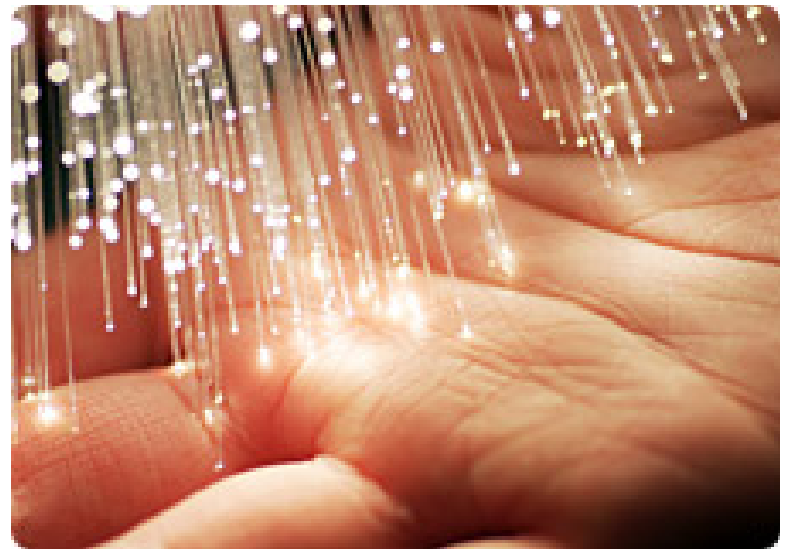
WORLD CLASS E-SKILLED WORKFORCE

Digital Literacy and Information and Communications Technologies

Overview

- The Case for Digital Literacy and Information Communication Technology Skills (ICT)
- Careers in ICT for Underserved Californians
- Workforce Projections
- Framework for Action

Defining ICT and Digital Literacy

"The ICT term is widely used outside the US, for example by the United Nations, European Union, World Bank and Int'l Telecom Union."

MPICT

- **Digital Literacy** is using digital technology, communications tools and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge society.

- **Information and Communications Technologies** (ICT) is an umbrella or catch-all term to encompass everything related to computing, software, information, networking and communications technologies. If it has or uses software controlled electronic circuitry or is a technology that helps people or devices communicate with each other, it's ICT.

The Case for ICT Skills Development

- ICT Digital Literacy will ensure that our State will maintain global leadership in information and communications technological innovation and workforce competitiveness;

- Our students and employees must be ready for the workforce of the 21st century, where digital literacy skills are critical to California's ability to compete successfully in a global information and knowledge economy;

- The workforce of the 21st Century is increasingly required to be digitally literate;

- A collective mindset favoring digital literacy and the understanding that information and communication technologies improve the quality of life in the 21st century is essential for success.

ICT Industries - Globally

Direct ICT spending is clearly a very important part of the U.S. and world economies.

□ "ICT has proven to be a key enabler of socioeconomic progress and development, enhancing productivity and therefore economic growth, reducing poverty and improving living standards in many ways." World Economic Forum, The Global Information Technology Report 2008-2009

□ "The ICT sector in the EU represents 5.6% of EU GDP (670 Billion Euro) and 5.3% of total employment in 2007. 50% of the EU productivity growth comes from ICT and 25% of research expenditure (2002-2003)." European Commission Enterprise and Industry

ICT Industries - US

ICT is not yet a widely used term in the U.S., and because the U.S. does not account for economic or industry activity under that category, it is difficult to accurately quantify the value of ICT in the U.S. economy.

□ "ICT industries remained strong, rising 9.0 percent. These industries accounted for 4 percent of GDP, but accounted for 30 percent of real GDP growth in 2008." U.S. Dept of Commerce, Bureau of Economic Analysis 2008

□ "From the trough of $US 2.1 trillion in 2001, total ICT spending will more than double to $US 4.4 trillion in 2011, a compound annual growth rate of 7.7%...." World Information Technology and Services Alliance 2008

□ Bureau of Labor Statistics ("BLS") data indicate that there were about 4.5 million workers in Primary ICT occupations (3% of all jobs) and 12.6 million workers in Secondary ICT occupations (8% of all jobs) in the U.S. in 2008.
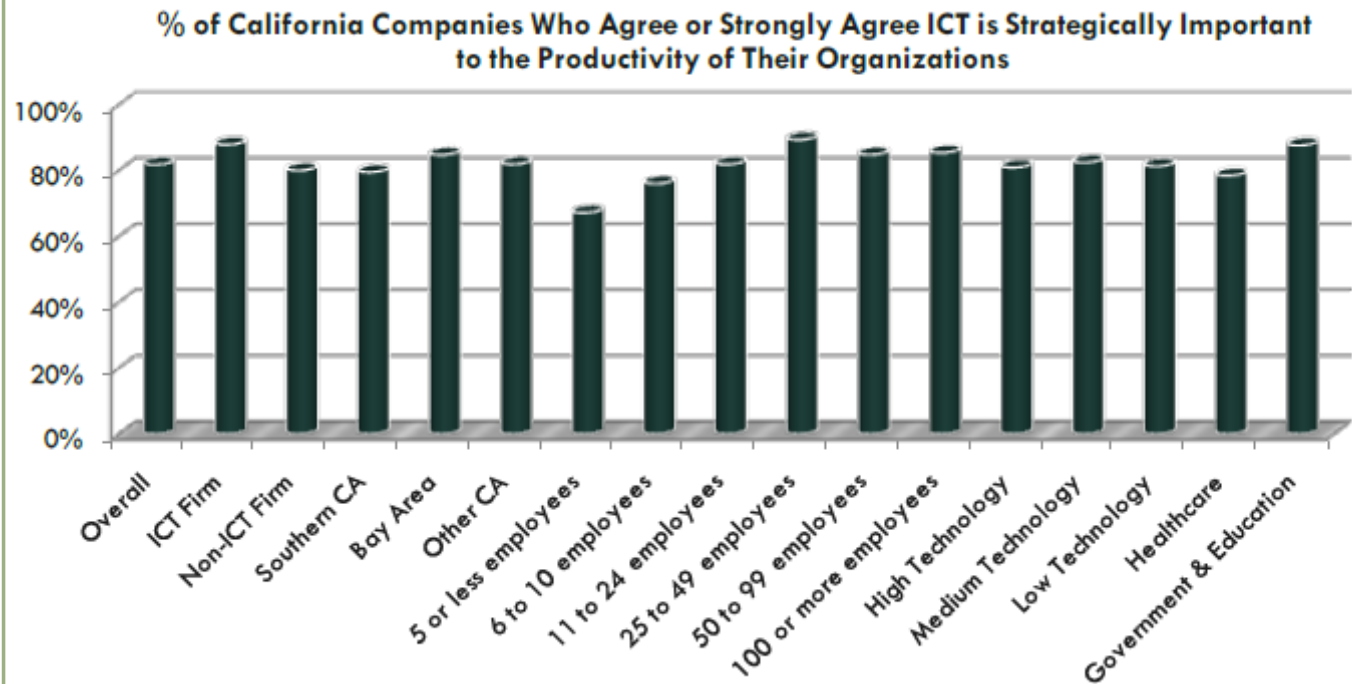
ICT Industries - California

The ICT sector is a major industry cluster in California

- About 46,000 companies, 4% of all companies (1 in 28 companies), which ranks 12th among California industries by firm counts.

- Almost $172 billion, or 6% of total California private sector revenues (1 in every $17.50 in private sector revenues), which ranks 6th among California industries by revenues.

- About a million California workers, 4% of the total state workforce (1 in 17 jobs), which ranks 12th among California industries by employee counts.

- About $76 billion, or 12% of private sector wages ($1 of every $8.61 in private sector wages), which ranks 2nd among California private industries by total wages paid. Wages per employee about twice the state average.

- Significant job growth approaching 20% for ICT industries from 2006 to 2016, outpacing the nation.

- Higher concentrations of ICT firms and employment in Los Angeles and Silicon Valley/San Francisco Bay regions, as well as Orange and San Diego Counties.

Is ICT Strategic to CA Companies?

ICT industries are clearly a major driver of the California economy, representing a significant percentage of its businesses, revenue, employment, and total wages.

% of California Companies Who Agree or Strongly Agree ICT is Strategically Important to the Productivity of Their Organizations

Centers of Excellence - 2011

Advancing Digital Literacy in the Greater Sacramento Region

- Summary Employer Findings
  - 85 percent of the survey respondents reported that information and communications technologies are important to the productivity of their organizations.
  - 75 percent reported that ICT skill sets will grow in importance for their employees.
  - 66 percent of the respondents said that applicants with an ICT digital literacy certificate would have a competitive advantage during the hiring process.
  - 39 percent of the firms surveyed expect to add workers with ICT skills to their payroll over the next 2 years.
- Advanced ICT workers are expected to perform tasks such as enabling end user ICT devices and operating systems and supporting enterprise-wide ICT data centers and systems.
- ICT users are not required to perform high level ICT functions, but they do need to have a basic set of ICT competencies.

California Leading the Way

- Governor Schwarzenegger signed an Executive Order (12393), supporting an ICT Literacy policy framework. It notes that "ICT Digital Literacy skills are vital to California's ability to compete successfully in a global information and knowledge economy".

California Executive Order 12393

□ 6. The California Workforce Investment Board (WIB) shall develop a technology literacy component for its five-year Strategic State Plan to:

a. Raise the level of Digital Literacy in California by supporting technology training and integrating Digital Literacy skills into workforce development activities.

b. Expand Career Technical Education (CTE) opportunities and Digital Literacy programs in community colleges.

c. Build consensus at the State and local community levels by identifying Digital Literacy ecosystems to drive models of excellence, benchmarking, and reliable metrics for measuring success.

d. Provide workforce examples of skills training and job-placement community-value projects for e-government, e-health or other conveniences.

e. Engage the ICT industry and entertainment mega-industry along with large employers to promote applications.

f. Highlight collaborative models in underserved communities and culturally diverse populations.

g. Build and resource a strong coalition empowered to achieve near-term action and results-oriented outcomes.

h. Reward success to reinforce best practices, individual champions, economic results, and public awareness and support.

Ideal for Entry Level/Transitioning Workers

- Industry Recognized Credentials

- Living Wage

- Proven Career Path

- Cross-Sector Job Market

- Promising Labor Market Outlook

THE
STRIDE
CENTER

Proven Career Path

Career with **UPWARD MOBILITY**

…coupled with valuable credential in the form of **TECHNICAL CERTIFICA-TIONS**

Which path would you take for a career in Microsoft Technology?

- ⊙ Coursework
- ⊘ Coursework & Examination
- ⊚ Certification or Credential
- ⊙ Job Role/Achievement

**Note: Individuals can enter the roadmap at any point depending upon existing skills*

New to Information and Computing Technology

Key Foundational Education

Entry level certifications (Both Microsoft and CompTIA) are at the base of a multi-pronged career path.

Computer Desktop Fundamentals (Windows XP or Vista)

Networking Fundamentals (CompTIA Net +)

Computer Technician

Computer Hardware Fundamentals (CompTIA A +)

Digitally Aware Individual

Digital Literacy Certificate

Computer Basics

The Internet and World Wide Web

Productivity Programs

Computer Security and Privacy

Digital Lifestyles
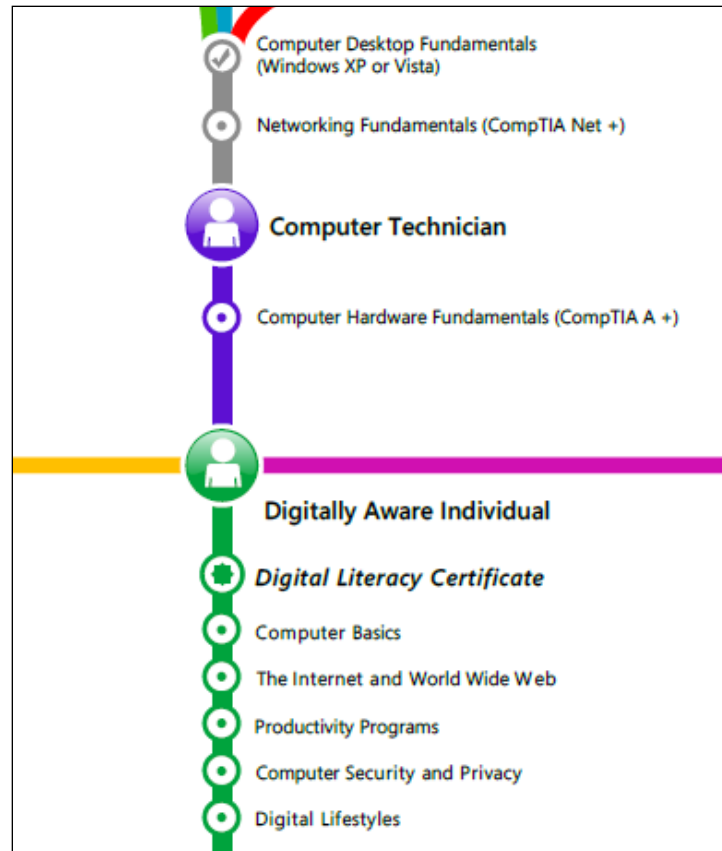
Industry Recognized Certifications

THE STRIDE CENTER

"Overall, companies are 3 times more likely to value a credential certifying basic ICT User Knowledge and skills (digital literacy)"

- ☐ Certifications are essential for transitional or entry level workers.

- ☐ Multiple certifications significantly increase the likelihood of employment success (+30%)

- ☐ Credential for a worker entering a new career field.

Ideal for Entry Level Workers

THE STRIDE CENTER

Entry level pay ranges from $15 to $24 per hour

Up to 56% wage gains in the first 3 years

Excellent future pay potential

Salaries by Job Role		
Job Role	**Salary**	**Base***
IT Manager	$87,934	2,068
Network Administrator	$63,160	1,272
IT Project Manager	$94,457	1,166
System Administrator	$67,393	1,123
IT Department Head or Director	$100,757	926
IT Consultant	$87,739	878
IS-IT-Technical Analyst	$69,886	876
Systems Engineer	$85,032	795
Technical Support or Helpdesk Professional	$54,732	772
IT Architect	$102,894	674
Software or Applications Developer	$82,151	545
Other IS, IT or Technology Function	$65,560	523
Telecom or Voice Professional	$74,580	499
Engineer	$84,446	486
Technician	$53,342	484
Security Professional	$87,408	445
Network or LAN Manager	$77,788	444
IT Executive (CIO, CTO, etc.)	$127,073	410
Business Analyst	$75,525	399
Database Administrator or Manager	$83,256	371
Figure 11		*** Number of Survey Respondents**

Entry Level Positions

Tech Republic – 2010 Salary Report

Multi-Sector Employment

All sectors of the economy depend on technology and technology services

Salaries by Industry

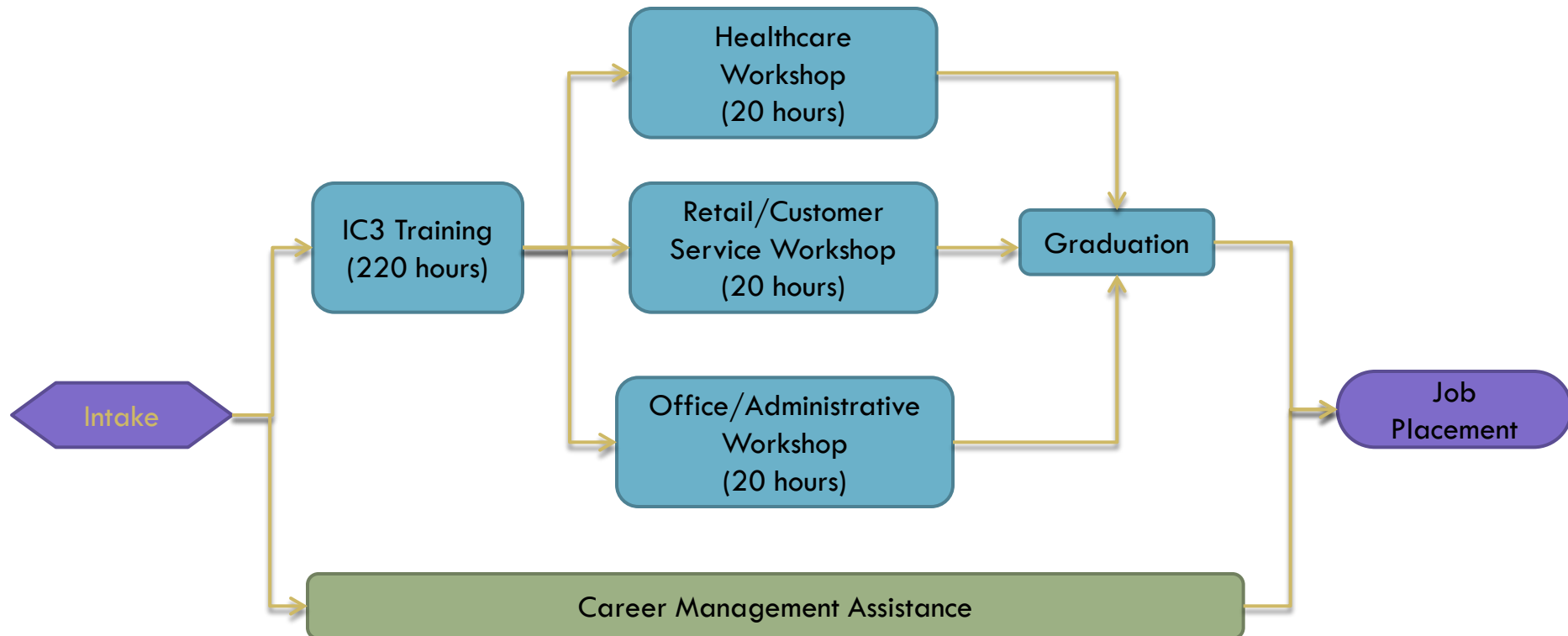| Industry	Salary	Base*
Government (non-defense)	$77,333	1,586
Healthcare	$79,623	1,561
Banking & Finance	$89,128	1,532
Education	$66,680	1,416
Telecommunications	$83,009	1,209
IT Related Services	$82,779	1,161
IT Consulting	$91,668	1,129
Insurance, Real Estate, Legal	$85,096	904
Manufacturing - Industrial	$80,012	868
Manufacturing - Consumer	$82,823	619

Figure 12   * Number of Survey Respondents

Tech Republic – 2010 Salary Report

Jobs Across California

Average Annual Job Openings by County

Categories (top to bottom):
- San Jose-Sunnyvale-Santa Clara MSA
- San Francisco-San Mateo-Redwood City Metro Div
- San Diego County
- Sacramento-Arden Arcade-Roseville MSA
- Orange County
- Oakland-Fremont-Hayward Metro Div
- Los Angeles County

X-axis: **Total Annual Job Openings, Thousands** (0, 25, 50, 75, 100, 125, 150, 175, 200, 225)
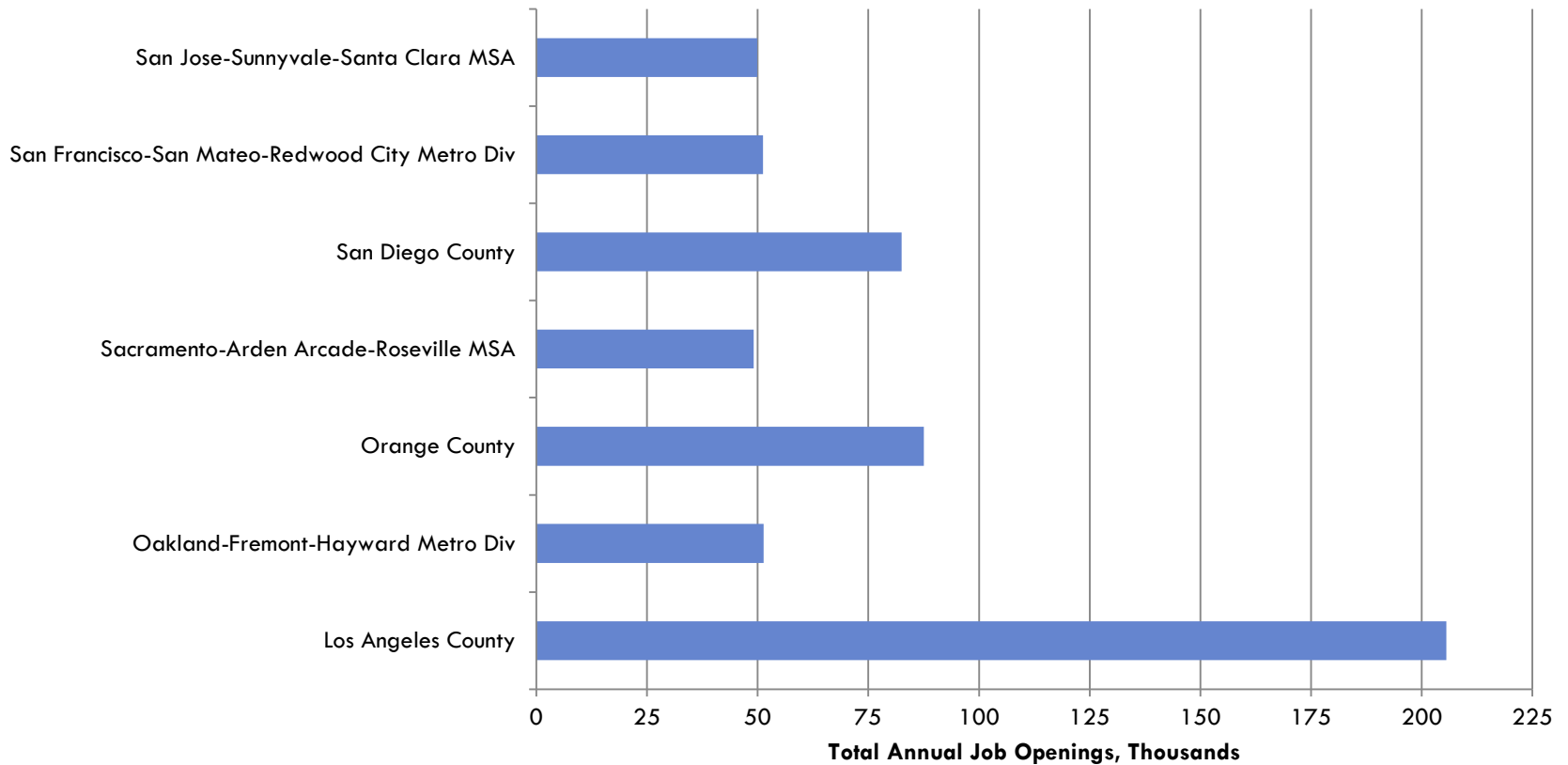
Training Using ICT Philosophy

The ICT Continuum

Access

Digital Literacy

Access to Secondary ICT Jobs

Access to careers in Primary ICT
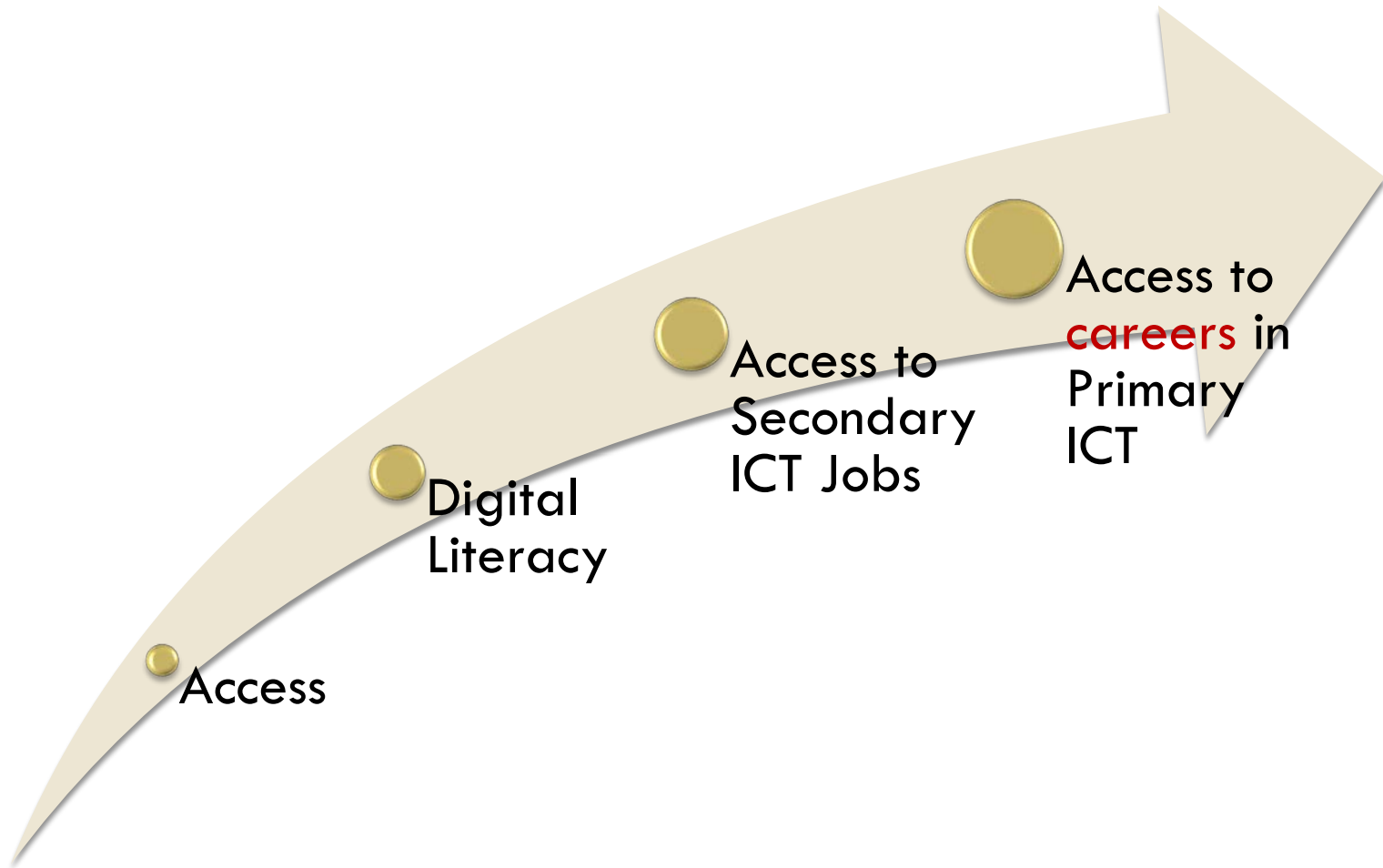
How Can The Stride Center Help?

- Proven Track Record
  - Student Retention over 80%
  - Certification Success over 80%
  - Job Placement over 80%
- Hands-on, state of the art classroom setting with emphasis on professional and life skill development
- Able to provide distance learning digital literacy training for qualified students.
- 5 active training locations

THE
STRIDE
CENTER

How Can EmpowerNet CA Help?

- Helping nonprofit training providers across the state to start best practice ICT training programs.

- Providing hands-on consulting to new programs to ensure successful start up and strong results.

- Building a learning community for continuous improvement.

- Providing program start-up funding for qualified new programs.

- All services are virtually free until May, 2012.

Framework for Action

- Adopt local initiatives to promote digital literacy in all approved training programs

- Add Primary and Secondary ICT jobs and careers to local training initiatives and approved career tracks

- Encourage ICT Job Development

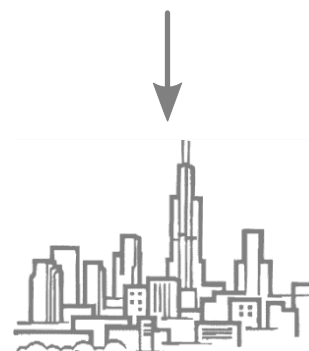- Endorse EmpowerNet CA to help prepare local providers to deliver best practice ICT training.
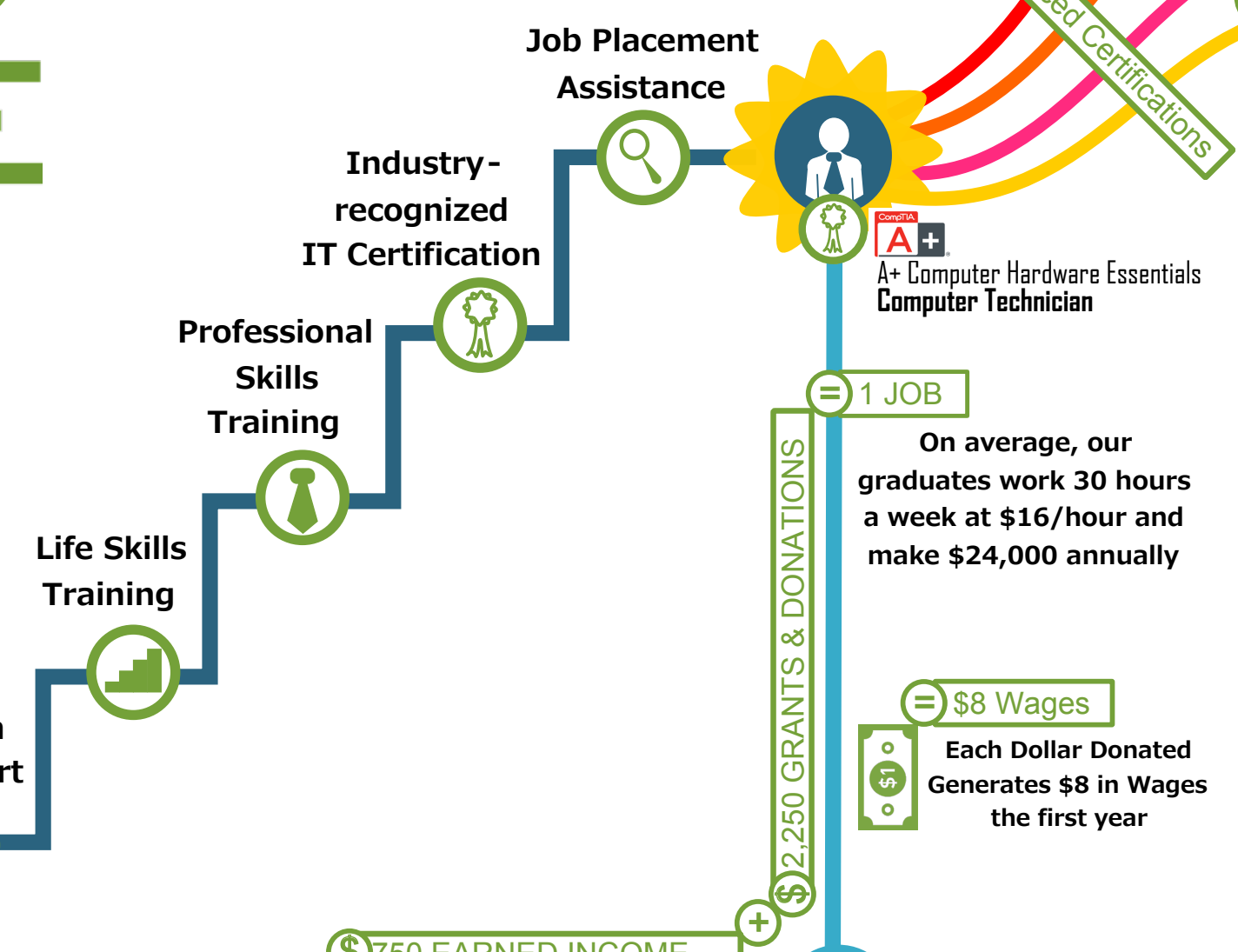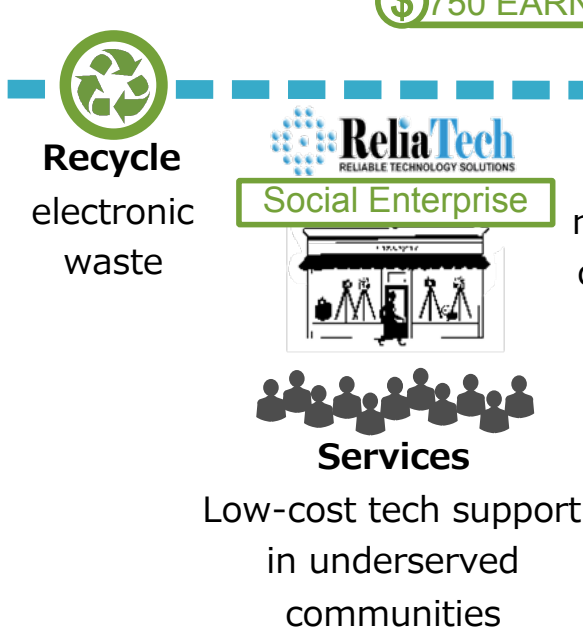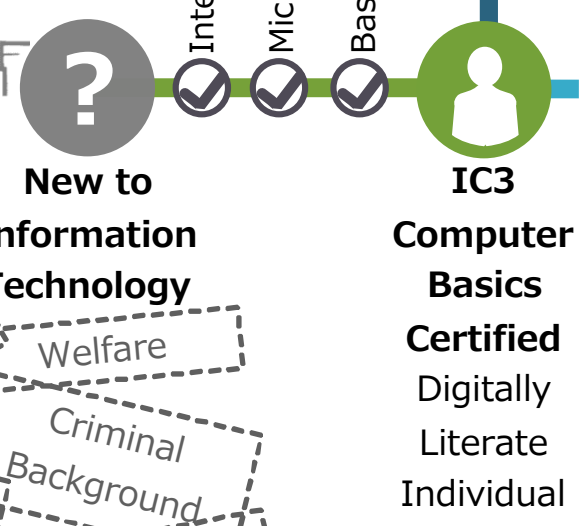
Questions?

THE STRIDE CENTER

Unemployment in the IT Sector is only

4%

Unemployment in Inner Cities exceeds

20%

Inner Cities
Underserved Communities
Welfare
Criminal Background
Poverty
Low Income
Drug Abuse
Barriers to Employment
Homelessness

New to Information Technology

Internet | Microsoft Office | Basic Troubleshooting

IC3 Computer Basics Certified
Digitally Literate Individual

Recycle electronic waste

ReliaTech
RELIABLE TECHNOLOGY SOLUTIONS
Social Enterprise

Services
Low-cost tech support in underserved communities

Resell refurbished computers

Internships at ReliaTech
Hands-on work experience for our graduates

$750 EARNED INCOME

$2,250 GRANTS & DONATIONS

Student Retention and Support

Life Skills Training

Professional Skills Training

Industry-recognized IT Certification

Job Placement Assistance

A+ Computer Hardware Essentials
Computer Technician

= 1 JOB
On average, our graduates work 30 hours a week at $16/hour and make $24,000 annually

= $8 Wages
Each Dollar Donated Generates $8 in Wages the first year

Advanced Certifications

Network+ Network Plus **Computer Technician**
Security+ Security Plus **Computer Technician**
Server+ Server Plus **Computer Technician**
Microsoft CERTIFIED Technology Specialist — Microsoft Certified Technology Specialist **Computer Technician**

2009-2011 Impact

1297 Enrolled

1023 Graduated

762 Certified

568 Employed After Graduation

79% Retained Support and Retention

5080 Hours Life Skills Training

7620 Hours Professional Skills Training

74% Certified Industry-Recognized IT Certification

56% Job Placement Computer Technicians Employed Upon Graduation

60 Tons Recycled Electronic Waste

2,076 Computers Recycled, Refurbished & Resold

77 Internships Hands-on Work Experience

*Preliminary version, not ready for publishing

RESOLUTION

Information and Communications Technology (ICT) Digital Literacy

WHEREAS, Information and Communications Technology (ICT) Digital Literacy is defined as using digital technology, communications tools and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge society;

WHEREAS, a California ICT Digital Literacy Policy will ensure that our State will maintain global leadership in information and communications technological innovation and workforce competitiveness;

WHEREAS, our businesses and resident must be ready for the demands of the 21st century economy, where digital literacy skills are critical to a California's ability to compete successfully in a global information and knowledge economy;

WHEREAS, the workforce of the 21st Century is increasingly required to be digitally literate;

WHEREAS, a collective mindset favoring digital literacy and the understanding that information and communication technologies improve the quality of life in the 21st century;

WHEREAS, the State of California should bring digital literacy strategies to government, education, health care, business and other areas in order to enhance opportunities for our people, firms, institutions and government entities to be world leaders in technological innovation;

WHEREAS, a digital literacy policy and framework would support a continuum of digital literacy skills, benchmarking and metrics that are consistent with globally accepted standards, and would ensure accountability for assessing progress and success; therefore, be it

RESOLVED, That the Workforce Development Board of Contra Costa County support steps to enable the people of California to participate competitively in the 21st century global workforce, and harvest the benefits of an information and knowledge society;

RESOLVED: That Workforce Development Board of Contra Costa County will promote: (1) access to information and communications technology by our people regardless of income or advantage; (2) opportunities for our people to acquire ICT digital literacy skills in order to benefit academically, economically and socially; (3) initiatives encouraging local training providers to incorporate ICT digital literacy training in all approved training programs.

The Connectivity Gap: The Internet Is Still Out of Reach for Many Low-Income Renters

Having a home computer and Internet access is increasingly important for individual and family well-being and self-sufficiency. The availability of Internet access is associated with greater student achievement,[1] improved health outcomes,[2] and less social isolation,[3] as well as with more robust economic growth.[4] Connecting to the Internet is increasingly the way people learn, get health care information, share news, pay bills, and interact with government. Most Americans say that being online is essential for "job-related or other reasons."[5] However, low-income individuals and families—and particularly very low-income renters—are far less likely than others to have Internet access or a computer at home. The persistent digital divide in the U.S. exacerbates economic inequality and risks leaving low-income individuals and families further behind.[6]

## Low-Income Renters are Much Less Likely than Other Households to Have Home Computer or Internet Access

In 2013, 84 percent of U.S. households had a computer at home and 74 percent had home access to the Internet.[7,8] But there are significant variations across income groups, and low-income renters—including many served by federal housing programs—are among the least likely to have access to technology in their homes.

Thirty-seven percent of extremely low-income renters (with incomes below 30 percent of area median income) do not have a computer at home and 54 percent do not have home Internet access (Figure 1). Among renters with incomes between 31 and 50 percent of area median income (AMI), 29 percent have no home computer and 46 percent have no home Internet access. The likelihood of having access increases as households move up the income scale.

Very Low-Income Renters are Somewhat More Likely to Rely on a Smartphone Rather than a Laptop or Desktop Computer

While smartphones are useful for some Internet applications, a home laptop or desktop computer can be necessary for some important tasks, including accessing health information or doing schoolwork.

Eleven percent of very low-income renter households (with incomes below 50 percent of AMI) rely solely on a smartphone or other handheld device for their at-home computer access, compared to nine percent of all renters (Figure 2). Higher-income renters are much more likely to have a desktop or laptop at home—70 percent of all renters compared to 55 percent of very low-income renters.

Legend: ■ No Computer at Home ■ No Internet Access at Home
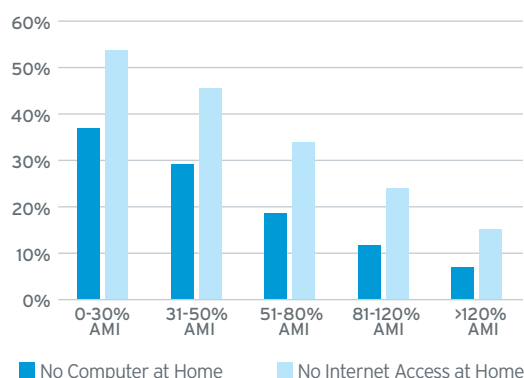
Source: 2013 American Community Survey 1-year PUMS file

◄ **FIGURE 1**

Share of Renters with No Computer and No Internet Access at Home by Income, 2013

Only Half of Very Low-Income Renters Have Home Internet Access

Among very low-income renters with home Internet access, the most common type of access is via a cable modem. Mobile broadband access is the second most common mode of home Internet access. However, the availability and speed of different Internet connections vary substantially around the country.[9]

Not only is having access to home Internet important, but having sufficient speed to use online education and training programs like streaming course lectures or to maintain a video connection with a health care provider is equally as important.

Very Low-Income Senior and Disabled Renters are Unlikely to Have Home Computer or Internet Access

Nearly 70 percent of very low-income senior renters do not have a computer and 74 percent do not have home Internet access. Very low-income disabled renters also lack access; more than half have no computer of any kind and about two-thirds do not have access to the Internet in their homes. A lack of access to technology can limit opportunities for seniors and disabled persons to stay connected to friends and families and precludes them from accessing Internet-based health care options.

Very low-income renters with children are more likely than other low-income renters to have both a home computer and home Internet access.

Part of the reason households with children are more connected is because of the focus on access and the integration of the Internet into education. For very low-income seniors and disabled renters, illustrating the benefit of home Internet access has been more of a challenge. However, as federal benefit programs like Social Security move online, Internet access will become critical for older adults and disabled persons.

FIGURE 2

Computer and Internet Access Type

	SHARE OF HOUSEHOLDS	
	VERY LOW-INCOME RENTERS	ALL RENTERS
TYPE OF COMPUTER		
Smartphone only, no computer	11%	9%
Computer only, no smartphone	19%	16%
Both computer and smartphone	37%	53%
Neither computer nor smartphone	34%	22%
TYPE OF INTERNET ACCESS[a]		
Mobile broadband	20%	29%
DSL	12%	15%
Cable modem	30%	40%
Fiber optic	4%	6%
Other	4%	4%
No Internet access	50%	35%

[a]Numbers sum to more than 100 because households may have more than one source of home Internet access.

Source: 2013 American Community Survey 1-year PUMS file

FIGURE 3

Very Low-Income Renter with No Computer and No Internet Access at Home, 2013
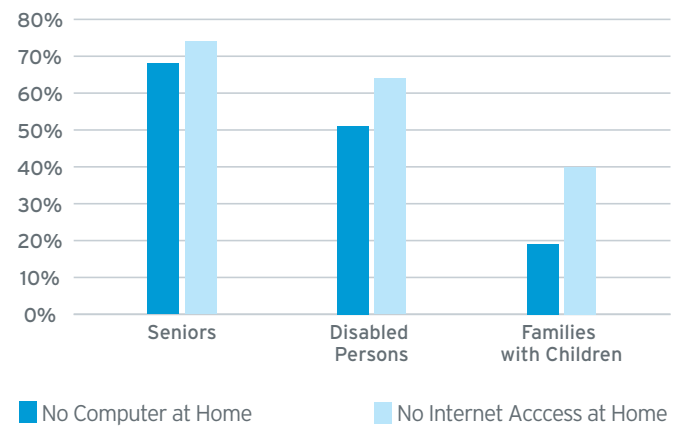
Source: 2013 American Community Survey 1-year PUMS file

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7. All data in this report were tabulated from the 2013 American Community Survey 1-year public use microdata sample (PUMS) file.

8. For this report, "computers" include desktops, laptops, notebooks, and smartphones as well as other handheld computers. Internet access includes wireless broadband, dialup, DSL, fiber optic, cable model and satellite Internet services.

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A POLICYMAKER'S GUIDE TO SPURRING ICT ADOPTION

By Dr. Robert D. Atkinson and Ben Miller

ITIF | **INFORMATION TECHNOLOGY & INNOVATION FOUNDATION**

Overview

Policymakers around the world have been asking for years how to create "the next Silicon Valley." This is understandable: in the digital economy, they see leadership in information and communications technologies (ICT) as the key to boosting competitiveness, spurring growth, and creating jobs. But while policymakers' general instinct is right, their specific question is based on the wrong premise. Since the turn of the millennium, using ICT has created much more growth than producing ICT.

This is because ICT products and services are essential production tools for all industries in today's digital economy. When organizations and consumers purchase mobile phones, servers, software, broadband Internet access, and the like, they become significantly more productive than they were before, and the ripple effects of that increased productivity contribute much more to overall economic and job growth than do the technology companies that make those products. This is good news for policymakers, because it is much easier to expand ICT use than it is to build the next Silicon Valley.

DON'T ENVY: Instead of trying to recreate Silicon Valley, policymakers should spur ICT adoption.

ICT products and services are essential production tools for all industries in today's digital economy.

THINK BROADLY: Every sector benefits from ICT use.

Policymakers and the broader public often overlook the impact of using IT over making it, in large part due to the highly visible success of large ICT companies, particularly those from the United States. The intuitive reaction of policymakers is to say, "Google and Apple are successful U.S. companies, so if we want to be as rich as the United States, then we need our own Google and Apple."

This view misses the fact that the ICT industry is only a small part of the broader economy—approximately 6 percent in the United States, for example. Instead of focusing on that small sliver, it would be much easier for policymakers to drive growth by helping the other 94 percent—including high-tech and low, both goods and services—become robust ICT adopters.

Scholarly research from around the world shows clearly that increasing the use of ICT, particularly by business, is a key driving force of productivity growth in most nations, developed and developing, and will likely continue to be so in the future. Yet many of the policies that countries have implemented to grow their own Googles and Apples have had the unintended effect of reducing ICT use by businesses and consumers because these policies often raise the prices of ICT goods and services or limit local availability of the world's best products and services. As this guide shows, there are three key steps to boosting ICT adoption and hence growth: keeping ICT prices low, keeping ICT demand high, and supporting enabling factors, such as broadband deployment and e-government.

POLICY CHECKLIST

1. Keep ICT Prices Low

✓ Eliminate Tariffs and Discriminatory Taxes

✓ Ensure Users Can Buy Best-in-Class Technology From Anywhere in the World

2. Keep Demand High

✓ Limit Regulation to Keep Markets Dynamic

✓ Reduce Small Businesses Preferences

✓ Help Small- and Medium-Sized Enterprises Adopt ICT

✓ Provide Tax Incentives for ICT Investment

3. Support Key Enabling Conditions

✓ Benchmark ICT Use

✓ Support Broadband Deployment and Adoption

✓ Support Digital Literacy

✓ Use ICT Solutions to Transform Government

✓ Encourage Digital Transformation in Key Sectors

✓ Encourage Data Use

Why is ICT Adoption Important?

Increasing productivity is the single best way to drive economic growth and improve standards of living. Productivity increases stem from a variety of factors, but the principal one is producers and consumers using more and better tools in their work and daily lives. And, in today's economy, the tools that are most effective in raising productivity are ICT-based, including computer hardware, software, high-speed data networks, and tools that incorporate all three of those components, such as computer-aided manufacturing systems and self-service kiosks.

Businesses, nonprofit organizations, and governments use these tools to improve their internal operations and to conduct transactions with other organizations. This is happening in every sector in every economy, from farming to manufacturing to services to government.

Because ICT is today's only "general-purpose technology," as steam engines were in the 18th century, ICT adoption boosts productivity in a variety of ways. ICT increases organizations' and individuals' access to information. Whether that is information to help citizens improve their health care, students learn, farmers find market information, small start-up businesses find investors, or shippers optimize their routes, more information enables better decisions.

ICT also helps organizations increase efficiency. ICT can help businesses better understand and control their production processes, which eliminates waste and improves coordination. Manufacturers can use ICT to automatically reorder parts, perform rapid prototyping, or improve any number of other processes. ICT also reduces transaction costs, with processes like "one-click shopping" and automated bill payment. ICT enables companies to find more customers, and it allows consumers to find better prices and more choices.

A multitude of studies confirm these positive impacts. In fact, from the mid-1990s through 2014, nearly all scholarly studies on the subject have found that ICT has significant, positive effects on productivity. These benefits accrue to large and small firms, goods- and services-producing industries, and developed and developing nations alike. Firm-level studies also show that firms with high levels of ICT use are more likely to grow and less likely to go out of business than other firms. In the last decade, national studies have found that, in most nations where data is available, productivity gains from ICT use have been much higher than productivity gains from ICT production. And there is a strong positive correlation between the proportion of businesses that use the Internet and a country's labor productivity growth.

Policies to Drive ICT Adoption

Since boosting ICT adoption by all parts of an economy is a key to driving growth, policymakers should take the following three steps to advance that goal.

Step One: Keep ICT Prices Low

As any Economics 101 textbook shows, rising prices generally lead to falling demand. And numerous scholarly studies have found this is no less true for ICT. Therefore, a key way countries can encourage ICT use is to ensure that their policies do not raise the costs of ICT goods and services. Yet, in their desire to grow their own Silicon Valleys, many nations have set policies that result in less ICT adoption, not more.

Eliminate Tariffs and Discriminatory Taxes

At least 31 countries impose combined ICT tax and tariff rates greater than 5 percent of product or service costs, and several of them add more than 20 percent to costs. Another 40 countries impose ICT taxes and tariffs of between 1 percent and 5 percent above the tax rates levied on other products. Nations should follow the lead of Colombia, which recently reduced taxes on ICT and signed on to the Information Technology Agreement to eliminate ICT tariffs.
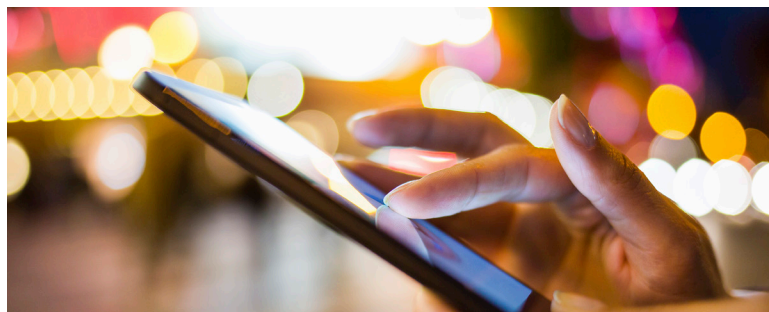
REMOVE BARRIERS: High taxes and tariffs on ICT devices and services are self-defeating.

Ensure Users Can Buy Best-in-Class Technology From Anywhere in the World

An array of barriers raises the costs of ICT goods and services, including local content requirements, limits on foreign direct investment, restrictive certification and licensing requirements, and government procurement preferences for domestic ICT production. These measures also reduce quality, since, by definition, competitively priced, high-quality, domestically produced products would not need protections.

The same is true of data center localization requirements, barriers for cloud computing services, and limits on cross-border data flows. Regardless of the justification, these policies prevent domestic companies from using lower-cost or better-quality cloud services from foreign providers. Moreover, with virtually all industries generating and analyzing data, cross-border data restrictions hurt not just IT industries, but traditional industries as well.

Step Two: Keep Demand High

It's not enough to keep ICT prices low; policies also should spur ICT demand.

Limit Regulation to Keep Markets Dynamic

If firms cannot capture the full benefits of using ICT, then they will invest less. In many nations, labor market and product regulations serve as a key deterrent to adoption, because they lower the productivity impact of ICT. Labor market regulations often reduce managers' flexibility, preventing them from using ICT to realize production efficiencies. Product market regulations, either at the economy-wide level (e.g., competition policy) or at the sectoral level (e.g., industry-specific economic regulations), too often protect firms from competition, which limits the incentive to invest in ICT. Overly restrictive privacy rules also reduce revenues and ICT use and limit many of the benefits to a society from digital information. If there is regulation, it should be "light touch"—deliberately designed to have as little impact on the market as possible.

Reduce Small Businesses Preferences

Many nations subsidize or otherwise favor small- and medium-sized enterprises (SMEs), which lowers ICT adoption by shifting the structure of the economy away from mid- and larger-sized firms. This is because larger firms invest more in ICT, on average, because they can gain greater economies of scale. Both factors help explain why they are usually more productive and pay higher wages. Therefore, nations should work toward regulatory, fiscal, and tax parity between large and small firms.

Help Small- and Medium-Sized Enterprises Adopt ICT

There's a difference between subsidizing or protecting SMEs and helping them gain the capabilities to be more innovative or productive. SMEs often do not have the resources to determine the most effective ways to integrate ICT into their businesses. Technical assistance programs can help SMEs determine how to incorporate ICT, help them acquire those technologies through supportive financing, and show them how to use them.

Provide Tax Incentives for ICT Investment

Business invests less in ICT than what is optimal for economic growth because the benefits from ICT investments spill over to suppliers, competitors, and customers. So a growing number of nations provide tax incentives for ICT investment. Nations should provide incentives such as accelerated depreciation for ICT investments in order to raise the after-tax rate of return of these investments. They also should ensure that ICT, including software, qualifies for any tax incentives designed for machinery purchases, and that these incentives are available to firms of all sizes.

Step Three: Support Key Enabling Conditions

Government can also help ICT adoption by creating supportive conditions and factors for adoption.

Benchmark ICT Use

Nations cannot manage what they do not measure. That is why they should measure ICT adoption among businesses, including such indicators as the number of companies with a website and the quantity of ICT capital investment; and among consumers, including factors such as the share of households online, the amount of e-commerce purchases, the use of online banking services, and the like.

DRIVE BROADBAND: The right policies can speed deployment and use of 21st century networks.
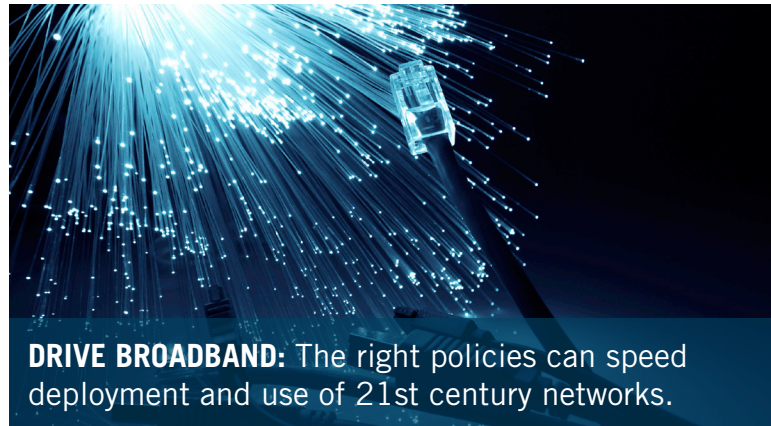
Support Broadband Deployment and Adoption

Achieving the full benefits of ICT requires advanced communication networks, so nations need policies to support the deployment of robust wireline and wireless broadband networks. Policymakers should craft national broadband plans; ensure that tax policies allow providers to depreciate network investments more quickly; subsidize build-out to high-cost areas; ensure adequate spectrum availability while using spectrum auctions as a way to allocate a scarce resource, rather than as a way to raise revenues; and provide flexible pole attachment and tower citing policies, all the

while ensuring that broadband regulations neither limit nor artificially spur competition. Among other steps, nations also should facilitate broadband adoption by providing subsidies for computers in schools and low-income households.

Support Digital Literacy

Taking full advantage of ICT requires workers and consumers to have digital skills. From basic digital literacy to software engineering, ICT skills exist on a spectrum from simple to advanced. Nations should ensure that schools teach digital literacy, high schools and technical institutes provide training for more advanced ICT skills, and colleges support computer science programs.

Use ICT Solutions to Transform Government

To lead by example, government officials at all levels should leverage their own ICT efforts to achieve more effective and productive public sector administration. Among other things, this means government should not only actively develop e-government solutions, but should also consider how ICT can be used to solve a wide array of pressing public challenges, from protecting the environment to enhancing public safety to improving transportation mobility. In addition, governments should encourage businesses and consumers to use ICT to interact with public agencies.

Encourage Digital Transformation in Key Sectors

The private sector will drive much of the process of digital transformation, but government can and should play a supportive role. Smart polices can spur ICT adoption in an array of industries, including transportation, energy, and education, and in ICT areas including mobile commerce, Internet of Things, digital authentication, smart meters, and intelligent transportation. For example, governments can provide incentives for utilities to invest in smart meters; they can be lead users of mobile commerce; and they can require construction companies doing business with government agencies to use building information modeling systems (BIM).

Encourage Data Use

Data is an increasingly important driver of productivity and innovation. In particular, publically provided data has been put to a wide variety of commercial uses around the world and continues to provide valuable benefits, including improving the quality of health care providers, reducing energy use and improving transportation mobility. Governments should adopt open data policies that encourage businesses to use this data to create value.

Conclusion

Driving growth through supporting ICT adoption is a strategy that is available to virtually every nation. Still, policymakers might worry that if their enterprises use ICT to become more efficient that they will not create needed jobs. Luckily, policymakers can rest easy. The scholarly evidence from both developed and developing economies shows clearly that higher productivity leads to more, not fewer, jobs. For example, in a study of the relationship between productivity and employment in developing economies, the United Nations Industrial Development Organization found that "productivity is the key to employment growth," while a World Bank survey of over 20,000 businesses in about 50 low-middle income countries found that firms using ICT have higher productivity but also greater sales and employment growth.

In summary, nations have an array of tools at their disposal to spur ICT adoption among all sectors of their economy—agriculture, manufacturing, and services—and all players (business, government, and nonprofit). The key is to keep ICT prices low and demand high, all the while supporting enabling conditions and factors. Following this path will lead to more and better jobs, higher incomes, and more sustained growth.
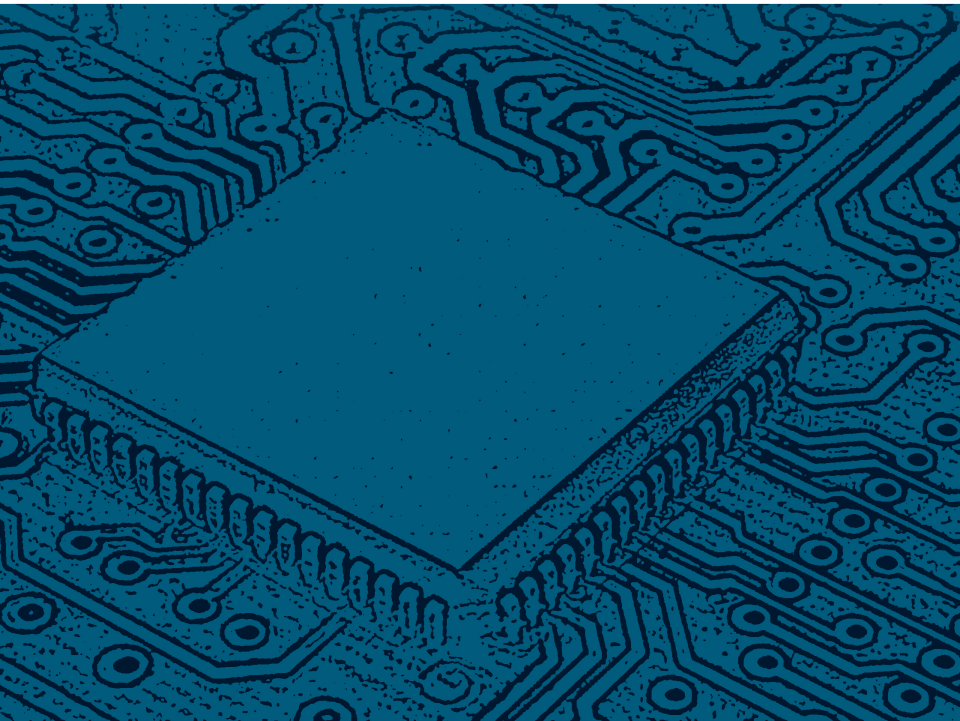

BUILD THE FUTURE: Scholarly evidence shows productivity leads to more jobs, not fewer.

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& INNOVATION FOUNDATION
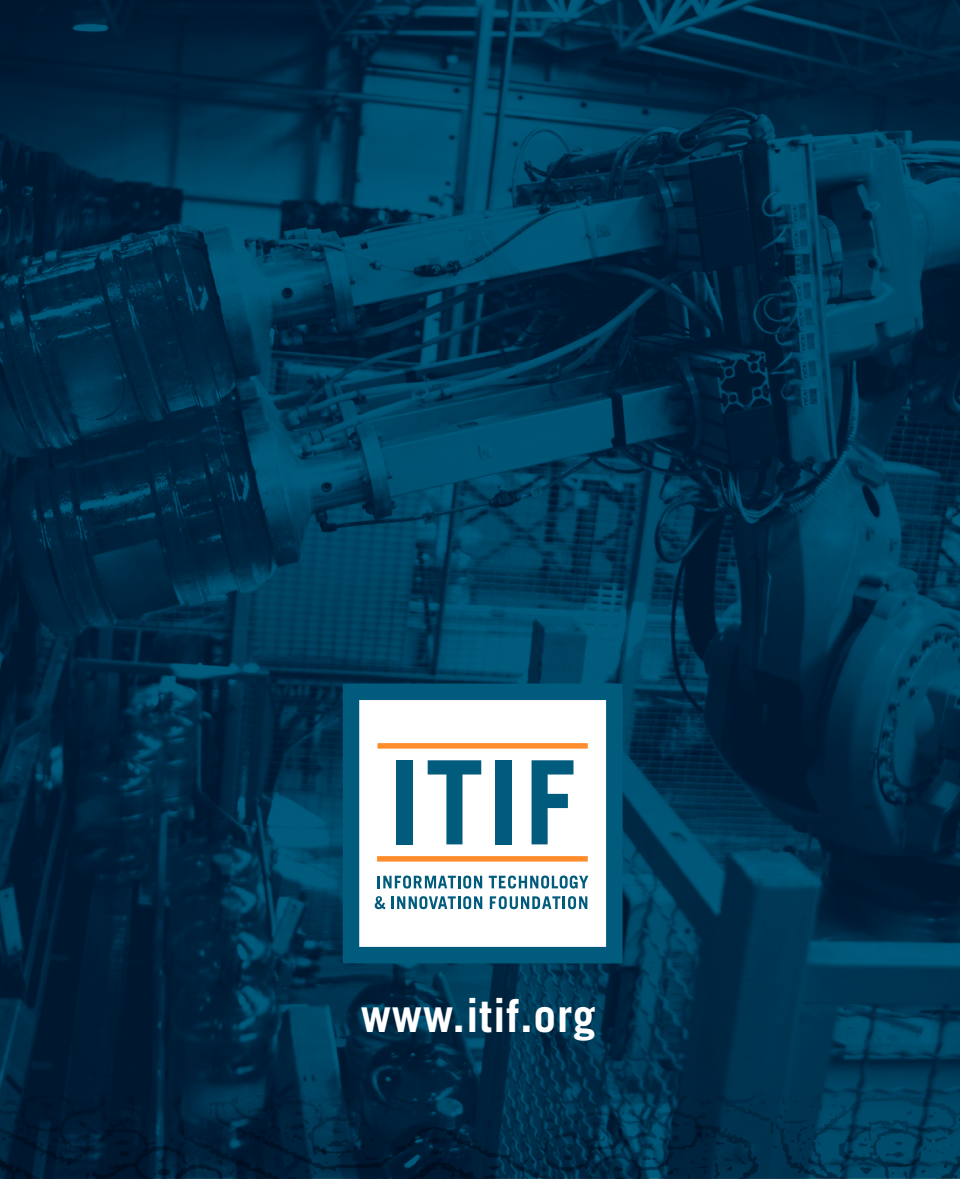
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A Leading Digital Nation by 2020: *Calculating the cost of delivering online skills for all*

What is the investment needed to get everyone in the UK using the internet regularly with Basic Online Skills?

Report by Catherine McDonald, for Tinder Foundation and Go ON UK, February 2014

Foreword by Jim Knight

It's been my privilege to be Chair of the Tinder Foundation now for two years. In that time I've seen the truly inspirational work UK online centres up and down the country do for some of the very hardest to reach and most vulnerable groups in our society. And I've seen how getting people online gets results - whether that's a new job, a saving, some key information or support, a sense of purpose, control or confidence.

What's more, we've been able to prove that those micro results add up to something of macro value - not just for the individuals involved but for the country as a whole.

Thanks to the Government Digital Service (GDS), we know that just getting people to transact with government online could save some £1.7 billion a year. Not a big enough number for you? Well thanks to the work of Martha Lane Fox, Go ON UK and Booze & Co, we also know that being a leading digital nation in the global economy would realise some £63 billion worth of benefit.

The fact of the matter is that digital exclusion is costing Britain money. Not having the access, motivation or skills to use the internet has a real social and human impact, affecting pay, health, educational attainment and more. That in turn has an economic impact, and it's now holding Britain back.

We've had and won this argument. It's not in dispute that a 100% digital nation could and would make Britain truly Great - saving the government and NHS billions of pounds, boosting the economy and building both human capital and social cohesion.

This report is, in many ways, an answer to the problem we've been talking about since we started to calculate the cost of digital **EX**clusion in monetary terms. It gives us a price for digital **IN**clusion, and calculates what it's going to cost us to give everyone online skills - some £875 million.

Yes, it's a big number. Yes, I know how many noughts that is. And no, I'm not foolish enough to assume the maths is anything like as simple as £63 billion minus £875 million. This report doesn't cover infrastructure, big businesses, SMEs etc etc - it's 'just' about getting individuals the online skills they need. But the fact is that the cost-benefit ratio is still pretty compelling - a drop in the ocean compared to the potential savings and benefits of investment.

This report certainly does not suggest it is the role of government to fork out for digital inclusion. On the contrary, it is something in which I strongly believe the commercial and voluntary and community sectors must be equal partners.

But when it comes down to it, it's worth it. We're worth it. So let's be bold - let's work together.

And let's get it done by 2020.

Jim Knight, Lord Knight of Weymouth & Chair Tinder Foundation

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1. Executive summary

This report sets out, for the first time, the investment needed to equip 100% of the adult population in the UK with the Basic Online Skills they need to regularly use the internet for themselves by 2020. At the time of publication of this report (February 2014), 78% of the UK adult population have Basic Online Skills, leaving 11 million people still left without the basics needed to use the web in the 21st century.

There are many benefits to getting the nation online. For example NHS could save close to £108 million if just 1% of their face to face visits were converted to visits to NHS Choices and the Government saves around £194 per person[1] when they do transactions over the internet rather than in person. The average household could save up to £560 a year just by shopping and paying bills online[2]. Using the internet also helps people learn, find a job and stay in touch with loved ones. Overall the UK's GDP would also benefit substantially.

This model outlines the investment required to get everyone sufficiently skilled that these benefits could be realised.

Some of these 11 million people will go online by 2020 without additional interventions, if the current levels of support offered by organisations like Tinder Foundation, Go ON UK and partners remain. These people have been identified by the model. If no **additional** activity occurred beyond current levels, we predict that 89% of the UK population will have Basic Online Skills by 2020. It is important to note the model assumes current levels of support and investment will remain in order for us to achieve this figure.

This means that, on current trends and using current programmes, around 6.2 million people in 2020 will not have the Basic Online Skills they need to regularly use the internet for themselves.

We believe that in order to realise the large potential benefits to individuals and the economy, and to be able to compete internationally, additional investment should be made to reach these remaining 6.2 million people by 2020.

Countries such as Norway have usage rates in 2013 of 98% and therefore by adopting an accelerated approach we could reach 90% well before 2020, with a goal to reach as close to 100% as possible by the end of the decade.

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[1] Tinder Foundation: http://helenmilner.com/2014/02/07/measuring-our-impact-a-wow-moment/

[2] Source: Manifesto for a Networked Nation, Race Online 2012, July 2010

The economic model calculates that the remaining 6.2 million people without Basic Online Skills in 2020 are not likely to be reached on current trends and with current programmes: by definition the current trends and programmes will not have affected them. These include around 2 million people of working age (around 5% of working age people) and around 4 million retired people.

In the model we assume that someone, for example, who has never used the internet will be much less likely to acquire Basic Online Skills than someone who uses the internet regularly but does not yet have the full set of Basic Online Skills. We also consider the effect of people's personal circumstances – such as employment status, disability and income – on this likelihood.

The model defines the investment needed to reach the final 6.2 million people with additional interventions, using the costs of current interventions as a baseline. The current cost for supporting an individual has been calculated at £47 based on the known costs of some current interventions. We assume that a lower likelihood of reaching these 6.2 million people on current trends and with current programmes means that future programmes may need to be even more specialist or even more targeted and therefore more costly. Our model shows that the average costs of supporting individuals within this final 6.2 million may be higher than £47 per person, especially where people have a combination of circumstances that each make them less likely to have online skills.

We calculate that the total investment required to equip
100% of the UK adult population
with the Basic Online Skills they need to regularly use the internet for themselves
by **2020** is
£875 million.

We do not believe the Government should shoulder the full responsibility, but we suggest it might be split equally between the Government; the private sector, and the voluntary and community sector.

The investment required to ensure a nation with 100% Basic Online Skills will be
£292 million for each sector.

The report encourages Government and partners in the private and voluntary and community sectors to act early in investing in Basic Online Skills as the sooner the investment, the sooner and greater the benefits to citizens and to the UK economy. Our model shows that there is a need to increase investment now. We should not wait, if we

are to avoid a situation where 6.2 million people in 2020 are without Basic Online Skills and – as more and more of the world moves online – increasingly digitally excluded.

The figures should not be seen as precise predictions. Instead, they indicate – for the first time – the scale of investment that would be required over the period to 2020 to generate significant benefits to citizens and to the economy.

Note: The costs given in the report are the costs of equipping people with Basic Online Skills. It does not include the costs of devices or of broadband roll out or connectivity

2. Why calculate the cost?

It is clear that UK society and the UK economy will benefit if there are more people using the internet proficiently. Increasingly, internet skills are becoming 'basic skills' that are assumed by employers and service providers. People who lack these skills are at risk of being left behind the 'digital divide', unable to take advantage of the benefits – social, financial, developmental and more – the internet brings.

To get online people need to be ready, willing and able to use the internet to meet their needs. That means accessing affordable hardware, software and broadband connectivity and having the skills and motivation to use the internet.

Successive governments have invested tens of millions of pounds in getting more people online. It is currently an open question as to how much investment is required to reach everyone who is left online and who should pay.

This report answers that question. It derives the additional cost of equipping everyone with the skills they need to use the internet proficiently – in addition to current programmes. We should note that this report does not address hardware and software costs, or broadband costs, which would be additional.

We recognise that over time, increasing numbers of people are becoming proficient users of the internet and are taking advantage of the benefits it brings.

People who use the internet experience many benefits

- People in Britain will buy £221 billion of goods and services online a year by 2016[3], with the average saving per household estimated at £560 per year just by shopping and paying bills online[4]

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[3] Source: Investing in Britain's Future, HM Treasury, June 2013
[4] Source: Manifesto for a Networked Nation, Race Online 2012, July 2010

- 72% of employers say they would not interview an entry level candidate without basic IT skills.[5] Getting online could really benefit the 75,000 jobseekers allowance claimants who currently have never been online.

- Getting online gives someone the potential to increase their lifetime earnings by £8,300[6]. People with good IT skills earn between 3% and 10% more than those without.

- Having a degree makes people 3 times more likely to use the internet than others[7].

Having more people proficiently using the internet will also bring economic benefits to UK PLC. Go ON UK and Booz & Co found that, had the UK achieved global leadership in digitisation – which includes, but is much more than, getting more people online - it could add £63 billion to its annual GDP[8]. That figure includes a wide range of benefits, including:
- *Individuals* can expect better quality of life through improved education, health, wealth and well-being
- *Small and Medium-Sized Enterprises* would benefit, e.g. digital technology can enable SMEs to unlock as much as £18.8 billion in incremental revenue
- *Charities* can make a bigger impact for less cost, e.g. significantly enhancing fundraising potential
- *Government* can better meet the goals of constituents through universal digitisation – e.g. central and local governments can potentially recoup billions annually with the digital delivery of services[9].

We recognise that helping everyone to have the skills to use the internet proficiently will not alone deliver £63 billion. But we anticipate that if every adult used the internet by default for their everyday transactions, it would go a significant way towards delivering these economic benefits.

The cost model that underpins this report was constructed with a working group made up of partners from the private, public, voluntary and academic sectors. It recognises that some people will start to use the internet proficiently either under their own steam or using current interventions and that others will not. It identifies dimensions that make people more or less likely to start to use internet proficiently and uses assumptions to

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[5] Source: ICM/UK Online Centres Survey, February 2012

[6] Source: Champion for Digital Inclusion - The Economic Case for Digital Inclusion, Price Waterhouse Cooper, Oct 2009

[7] Source: Cultures of the Internet: the internet in Britain, OxIS, Oct 2013

[8] Source: Go On UK & Booz & Co "This is for Everyone: The Case for Universal Digitisation", 2012

[9] Source: Go On UK & Booz & Co "This is for Everyone: The Case for Universal Digitisation", 2012

derive the cost of extra support for those who need it.

The model should be used to frame discussions about the future funding and investment required to get everyone using the internet proficiently.

3. What are we aiming for?

We are aiming for 100% of over 16s in the UK to be regularly using the internet themselves, with Basic Online Skills, by 2020.

We can break this statement down.

100% of all over 16s in the UK…
We considered whether to set a goal lower than 100% - say 90% or 95% - but we see no reason not to be ambitious for everyone if we are to be amongst the nations who have achieved nearly their whole populations as internet users, such as Norway and Iceland, where the figure is 98%. The UK is already doing well in the digital economy race but for UK PLC to remain competitive, we need to be among the very best. We recognise that some people have personal circumstances that make it unlikely they will get online, but we believe that every single person could enjoy a benefit from being online. This is why we are aiming for 100%.

…regularly using the internet themselves…
We believe regular use is important. Currently there are 1.2 million people who have used the internet in the past but have 'lapsed' and do not currently use it. That means they aren't able to take advantage of the benefits the internet brings.
We also believe is it important for people to have the skills to use the internet themselves and not rely on someone else. Some uses, such at Universal Jobmatch, are best done directly, not through a second party.

…with Basic Online Skills…
We aim for people to have Basic Online Skills, as defined by Go ON UK.

8

Table 1: Go ON UK definition of Basic Online Skills[10]

Skills	Communicate	Find things	Share personal information
Activity	Send and receive emails	Use search engine Browse the internet	Fill out an online application form e.g. ● Job application ● Make a booking or purchase ● Access government services ● Register on social website
Underpinned by: **Keeping safe online**	Identify and delete spam	Evaluate which websites to trust	Evaluate which websites to trust Set privacy settings

To reach our goal, it is not enough to have 100% of people using the internet regularly but only doing a limited range of activities or unable to keep safe online.

We recognise that, in future, we may want to aim for a higher skills threshold, as the range of everyday services that are provided online by default increases. *We anticipate this would cost more than our calculations.*

…by 2020

As this report shows, 2020 is significantly earlier than current trends. We believe the 2020 timescale would give UK PLC competitive advantage, meaning more of the potential economic benefits could be realised sooner.

Terminology: in this report we use the term 'meeting our criteria' to mean people who are regularly using the internet themselves with Basic Online Skills

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[10] Go On UK definition of Basic Online Skills

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4. Where are we now?

In the UK around 22% of over 16s (11 million people[11]) do not have Basic Online Skills, and 78% do. If we are to achieve 100%, we will need to reach these 11 million people.

Figure 1 Breakdown of the 11 million people who don't meet our criteria[12]
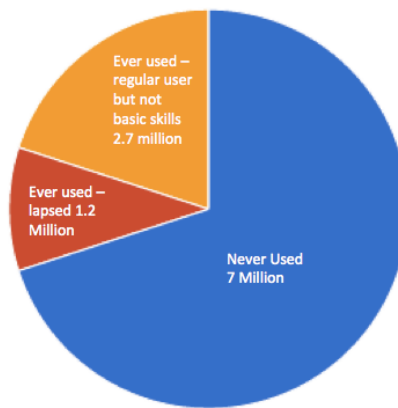
Just over half of the 11 million people are over 65s, and 44% have low incomes[13].

7 million of the 11 million people have never used the internet. There are also 4 million people who are either lapsed users – people who have previously been online but do not use the internet any more – or they are people who use the internet in a limited way, using some, but not all, of the skills that make up 'Basic Online Skills' as defined by Go ON UK.

5. Are the remaining 11 million people more or less likely to reach our criteria in future than others were?

The 11 million who do not meet our criteria are not a homogeneous group. They are diverse in terms of their personal circumstances – age, income, health, keenness to use the internet, access to devices and broadband and so on.

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[11] Source: Ipsos MORI BBC Digital Capabilities Update, September 2013.

[12] Source: Author's analysis of Office of National Statistics: Internet Access Quarterly Update, November 2013 adjusted for the 11 million total. Note: numbers in chart do not sum to 11 million due to rounding

[13] Source: Ipsos MORI BBC Digital Capabilities Update, September 2013. 53% of the 11 million are over 65 years old.

Table 2 Analysis of the 11m by historical internet use and socio-economic group[14]

	Historical internet use				
Of the 11m...	Thousands never used	Thousands who have lapsed (not used in last 3 months)	Thousands who use the internet regularly but don't have basic online skills	Total (thousands of people)	
AB	877	194	430	1,501	More likely to reach
C1	1,420	325	721	2,466	
C2	1,461	268	595	2,325	
DE	3,257	451	1,000	4,708	Less likely to reach
Total	7,015	1,239	2,746	11,000	

Less likely to reach ← → More likely to reach

Some people in this 11 million may be **more likely to be reached** than people who have recently met our criteria. For example:

- On current trends, increasing normalisation and affordability of internet-enabled devices and broadband, friends and family to advise and so on, means many people will get online without the need for extra interventions.

- Government and the private sector are increasingly providing services digitally by default - the market is driving people online.

- Current programmes to give people skills to get online are operating effectively and at scale and are increasingly well known and accessible.

Also, over time, as more digitally-engaged young people reach adulthood, we would expect the proportion of the population that regularly uses the internet to increase.

However, the remaining people may be **less likely to be reached** than people who have recently met our criteria.
For example:

- The current interventions haven't successfully reached them so far.

- They have relatively low historical use or may have never used the internet.

- Their personal circumstances in terms of skills, willingness or wider circumstances, may make it less likely that they will meet our criteria on current trends and with current programmes.

- We may need new, potentially more expensive, interventions for these groups.

Note: this report looks at how many of the 11 million might reasonably be expected, on the basis of current skills programmes, increasing affordability and current market trends, to develop the skills to start using the internet regularly themselves – and calculates how much it will cost to help the remainder.

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[14] Source: author's analysis of: ONS: Internet Access Quarterly Update November 2013 and Ofcom: Adult Media Use and Attitudes Report, April 2013
14

6. Who will regularly get online with basic skills by 2020 anyway – on current trends or with current programmes?

Some of the 11 million people left to reach will meet our criteria by 2020 on current trends, or using current programmes – that is, without us doing anything **differently**.

We can identify the number of people this describes by looking at three dimensions – two that deliver growth and one that offsets that growth.

There will be *growth* in the number of people who meet our criteria by 2020 because of two dimensions:

i.   The population is ageing:
   - adults who already meet our criteria keep their skills as they age
   - rising 16s are more likely to be online than other groups
   - mortality rates in low user groups are higher.

ii.   There will be new take-up: people who don't currently meet our criteria will do so:
   - by making use of current interventions
   - under their own steam.

As mentioned above, there is increasing normalisation and affordability of internet-enabled devices and broadband – which means that increasing numbers of people will have internet-enabled devices even if they do not currently use them for internet access.

As also noted above, the Government and the private sector are increasingly providing services digitally by default, many of which are cheaper online, so people are getting more into the habit of using the internet – even if grudgingly so.

There is also the 'peer group pressure' factor. As more and more people are seeing the benefits of being online, people who do not meet our criteria are increasingly being offered encouragement and advice to get online. As increasing numbers of people have Basic Online Skills, those who don't will typically have friends and family who will encourage and help them.

In this analysis we assume that all of the current programmes and interventions delivered by Tinder Foundation, Go ON UK and partners will continue and support the current trend of take-up of internet skills and usage. That is, over the next six years, current programmes will continue to support new people.

i. The population is ageing

As mentioned above, we know that 78% of people currently meet our criteria. By mapping this onto the population growth projections for different age groups we can estimate that, on the basis of an ageing population alone, the figure will become around 84% by 2020. Note that this is 84% of the projected 2020 population, not of the current, smaller, population.

Note on the model: For annual population projections to 2020 we used the same underlying population change data that the Policy Exchange used in their 2013 report "Smaller, Better, Faster, Stronger - Remaking Government for the Digital Age" (in which they made projections on the numbers of people who will have *ever* used the internet in the future), which we understand was informed by the Office of National Statistics' population projections. We assume in this calculation of the model that everyone who currently meets our criteria will continue to do so – this will be adjusted when we consider an off-set later in this section.

ii. There will be new take-up: people who don't currently meet our criteria will start to do so

Looking at current trends of internet take up for different age groups we estimate that new take up will add another 5 percentage points, meaning 89% of the UK's 2020 population of over 16s will meet our criteria without us doing anything different – that is, on current trends and with current programmes.[15]

Note on the model: The current data on people meeting our criteria is limited: we know that around 11 million (22%) of over 16s do not meet our criteria, meaning 78% do, but there is as yet no trend data. Trend data is expected to start to be collected later in 2014. In the meantime, we can infer trends, based on trends in people using the internet at all, adjusted for proportions in different groups meeting our criteria. We used trends in take up of internet use – from consecutive Office of National Statistics Internet Access Quarterly Updates – as a proxy for trends in meeting our criteria, then made adjustments to strip out growth due to ageing population (so as not to double count in our calculations) and so as to reflect proportions meeting our criteria.

But there will be an off-set in the growth due to:

iii. People who have previously met our criteria but who have ceased to do so by 2020:
- people who currently meet our criteria but will have lapsed in their use by 2020.
- people who between now and 2020 will come to meet our criteria for the first time will nonetheless by 2020 will have subsequently lapsed in their use.

Currently, around 3% of people who have ever used the internet have since lapsed in

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[15] Author's analysis of current trends on internet take up by age group, adjusted so as not to double count the impact of an ageing population, and adjusted to show trends in meeting our criteria.

their use of it[16]. We can assume that, for the same reasons there are upward trends in new take up, the level of lapsing will reduce by 2020. On our calculations, by 2020 there will be around 860,000 people who, at that point in time, will have previously met - but will no longer meet - our criteria.

This leaves around 6.2 million over 16s who, in 2020, will not meet our criteria on current trends and with current programmes. We will analyse this group in the next section.

7. Who is left? How many people, and what considerations do we need to make about the likelihood they will meet our criteria by 2020?

After we account for people who will meet our criteria on current trends including using current programmes, less those that will lapse in their use, we calculate that, in 2020, 6.2 million people over 16 will be left.

The 6.2 million includes just over 2 million people of working age[17]. This represents 5% of working age people, and includes 440,000 people aged 16-24. This will include people who have more complex needs such as literacy and numeracy and who are likely to have higher rates of unemployment. These groups may also interact more frequently than others with local and central government services, yet, on our model, will be less likely than others to access these services online. If they are not helped to meet our criteria it will be disadvantageous to the people themselves as well as more costly to Government and to private sector service providers.

The 6.2 million figure also includes just over 4 million retired people[18]. The internet is increasingly seen as a way to keep people connected, and there is a particular risk of social isolation in older people – with consequent health and welfare problems. Investment to help older people meet our criteria could have substantial benefits in terms of delivering the Government's aims for an ageing society.

If we want to achieve our goal of reaching 100% of people by 2020 we need to consider what reasons may make people in the 6.2 million less likely to meet our criteria with current programmes alone, and what the investment is that is needed to address these reasons.

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[16] Source: Office of National Statistics: Internet Access Quarterly Update, November 2013, Table 6A: Recent and lapsed Internet users, UK

[17] We have used 16-64 years old to mean people of working age

[18] We have used 65 years old and over to mean retired people

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The 6.2 million people who are left are made up of several different groups. Considerations such as historical use, employment, income, education and skills, health and disability may affect how likely someone is to meet our criteria on current trends and using current programmes.

We assume that people who have never been online will be less likely to meet our criteria than those who have. We also assume that people on lower incomes (for example from socio-economic groups DE) will be less likely to do so than others. We know from statistics[19] that people with a disability, especially a work-limiting disability, are less likely to have used the internet at all. We assume that people's employment status may affect their use, that is, that people who are not in a job – who are unemployed or retired – are less likely to regularly use the internet.

We can analyse the 6.2 million on the basis of these considerations, as follows:

Table 3 Breakdown of the 6.2 million by historical internet use, employment, disability and socio-economic group (thousands) [20]

Socio-economic group?	AB						C1						C2						DE						Total
Disability?	Work-limiting		Disabled DDA		Not disabled		Work-limiting		Disabled DDA		Not disabled		Work-limiting		Disabled DDA		Not disabled		Work-limiting		Disabled DDA		Not disabled		
In work?	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	
Never used	0	5	17	272	36	204	0	9	27	440	58	331	0	9	28	453	59	341	0	20	61	1009	132	759	4,270
Ever used - lapsed	0	1	8	32	18	30	0	2	14	54	30	51	0	2	11	44	25	42	0	3	19	74	41	71	573
Ever used - regular use no skills	0	4	15	20	109	60	0	6	25	34	183	101	0	5	21	28	151	83	0	9	35	48	254	140	1,332
																									6,175

Note on the model: we have assumed costs are independent of age, though clearly different age-ranges will have different proportions of people in each groups – this is built into the model.

Note on the model: we will allocate, for each consideration, a factor that relates to the likelihood of people meeting our criteria on current trends or with current programmes

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[19] Source: Office of National Statistics: Internet Access Quarterly Update, November 2013

[20] Author's analysis of: Office of National Statistics: Internet Access Quarterly Update, November 2013, Office of Labour Market Statistics, November 2013, Office of National Statistics: Disability Employment Rates, November 2013
20

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8. What effect might these considerations have on the level of support and intervention needed to help people meet our criteria?

We need to consider the degree to which the people who make up the 6.2 million may be less likely than others to meet our criteria.

Our model assigns factors to each group within the 6.2 million, that relate to their likelihood of meeting our criteria on current trends including using current programmes. This is based on factors that research[21] shows us affect someone's likelihood to use the internet: historical internet use, employment, disability and socio-economic group (as a proxy for income and skills).

Historical internet use factors
We assume that someone who regularly uses the internet but does not have the full set of Basic Online Skills is more likely to meet our criteria on current trends including using current programmes, than someone who has lapsed in their use. In turn we assume that someone who has used the internet but has lapsed in their use is more likely to come to meet our criteria than someone who has never used the internet.

Employment factors
We assume that someone who is not in employment – who is of working age but not in a job, or who is retired – is less likely to meet our criteria on current trends including using current programmes.

Disability factors
We assume that someone who has a disability, particularly a work-limiting disability, is less likely to meet our criteria on current trends including using current programmes. Research[22] shows that this is the case in terms of whether people have ever used the internet.

Socio-economic group factors
We assume that someone who is in socio-economic group AB or C1, which we have used as a proxy for income and skills, is more likely to meet our criteria on current trends including using current programmes than someone in a different socio-economic group.

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[21] Source: Author's analysis of ONS: Internet Access Quarterly Update November 2013 and Ofcom: Adult Media Use and Attitudes Report, April 2013
[22] Source: ONS: Internet Access Quarterly Update November 2013

Research[23] shows that people's socio-economic group affects their likelihood of using the internet at all, a little or a lot.

Within the 6.2 million there are different groups of people with every combination of the considerations above.

Note on the model: The model assumes that each of these considerations affect someone's likelihood of meeting our criteria with current trends and current programmes, but the variables in the model can be adjusted to alter the extent to which – if at all – this is the case.

The numerical factors assigned to these variables in the model are given in Appendix B

Note on the model: We assign the average person who currently gets online under their own steam or using current programmes a numerical factor of 1, meaning that they are certain to meet our criteria on current trends including using current programmes alone.

We assume that at least some people within the 6.2 million are less likely than others to meet our criteria on this basis. We assign a factor of less than 1 to indicate a lower likelihood of them meeting our criteria on current trends including using current programmes. For example for some groups it may be half as likely and we would assign a factor of 0.5, compared to the average person above. Our model assumes that likelihood of 0.5 means the programmes required would cost twice as much as current programmes.

Now, we need to calculate current costs and then weight them for the 6.2 million, according to the factors we have assigned.

9. What is the investment needed to help people who are left?

How much do current interventions cost?

UK online centres have helped over 1 million people at an average cost of £30 per person. But we recognise this is likely to be an underestimate of the costs of all current programmes. Firstly, not all intervention costs are included: there are many other programmes and there are other funding sources. Secondly, not every participant will meet our criteria – not everyone will go on to use the internet regularly with Basic Online Skills.

For modelling purposes we assume a more accurate cost of current programmes and interventions that help people meet our criteria, is around **£47 per person.**

Note on the model: we assume that £30 underrepresents the accurate cost by 20% for each of the two reasons given, which leads to an accurate cost of £47 per person

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[23] Source: Ofcom: Adult Media Use and Attitudes Report, April 2013

How much will it cost to help the 6.2 million people who are left?

We can calculate the average cost per person in the groups we have analysed, using the current £47 cost per head calculated above, weighted by the factors we assigned for different groups. Each person in the 6.2 million will be a combination of the different dimensions of historical use, employment, disability and socio-economic group.

Note on the model: If someone was assigned a combined factor of 1 the cost would be £47. A combined factor of less than one leads to a higher cost.

For some groups, universal un-targeted interventions will be as, or more, cost-effective as targeted interventions. For other groups, interventions will need to be bespoke and targeted and likely high cost.

Table 4 Average cost of intervention per person in each group, using the assigned factors

	Socio-economic group AB						Socio-economic group C1						Socio-economic group C2						Socio-economic group DE					
	Work-limiting disability		Disabled DDA		Not disabled		Work-limiting disability		Disabled DDA		Not disabled		Work-limiting disability		Disabled DDA		Not disabled		Work-limiting disability		Disabled DDA		Not disabled	
	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job	Job	No job
Never Factor	N/A	0.21	0.42	0.29	0.60	0.42	N/A	0.21	0.42	0.29	0.60	0.42	N/A	0.17	0.34	0.24	0.48	0.34	N/A	0.15	0.29	0.21	0.42	0.29
Cost per person	£-	£223	£112	£159	£78	£112	£-	£223	£112	£159	£78	£112	£-	£279	£140	£199	£98	£140	£-	£319	£1?9	£228	£112	£159
Ever-lapsed Factor	N/A	0.32	0.63	0.44	0.90	0.63	N/A	0.32	0.63	0.44	0.90	0.63	N/A	0.25	0.50	0.35	0.72	0.50	N/A	0.22	0.44	0.31	0.63	0.44
Cost per person	£-	£149	£74	£106	£52	£74	£-	£149	£74	£106	£52	£74	£-	£186	£93	£133	£65	£93	£-	213	£106	£152	£74	£106
Ever-regular no skills Factor	N/A	0.35	0.70	0.49	1.00	0.70	N/A	0.35	0.70	0.49	1.00	0.70	N/A	0.28	0.56	0.39	0.80	0.56	N/A	0.25	0.49	0.34	0.70	0.49
Cost per person	£-	£134	£67	£96	£47	£67	£-	£134	£67	£96	£47	£67	£-	£167	£84	£120	£59	£84	£-	£191	£96	£137	£67	£96

highest cost — £319 · *lowest cost* — £47

Our analysis shows that the lowest average cost would be £47 per person and that for others the average cost is as much as £319 per person.

If we are indeed serious about reaching our goal of 100% of people meeting our criteria by 2020 we need to recognise that increased investment is needed so no-one is left behind.

Note on the model. The model calculate different costs per person based on different cost factors due to different considerations, which can be varied. Therefore, these illustrated costs – which are based on the variables in the previous page – can vary based on variables used.

Conclusion

By 2020 there will be 6.2 million people who will not have met our criteria on current trends including using current programmes.

As we have seen, this 6.2 million people can be analysed in terms of different dimensions of: historical internet use; employment; disability; and socio-economic group.

As we have also seen, the average cost of helping people within the 6.2 million to meet our criteria ranges between £47 per person and £319 per person, depending on the combinations of the different dimensions. See model for full details.

Looking at the 6.2 million collectively, the total investment required, on top of the cost of existing interventions, would be **£875 million.**

10. Who should pay – and how much?

If the total investment required was split equally between …

- Government
- Private sector – though this would require a step change in private sector behaviour – perhaps through Government influence?
- Voluntary and community sector.

… for each sector the investment required is **£292 million** for each sector over the period to 2020.

The Government may need to provide a share bigger than a third, as the private sector may prefer to provide resources in-kind and the voluntary and community sector is already significantly investing in supporting people to get Basic Online Skills.

It is worth noting this is likely to be something of an underestimate as by 2020 we may want a higher skills threshold than we have used here, for example to access the increasing number of online Government or retail services. As Government and retailers put more services online and expect a higher internet proficiency of their users, the skills that are required increase – that is, the threshold of what will count as 'basic' skills will rise. Also, it is likely that as fewer and fewer people are left, interventions will have fewer economies of scale, so the per head cost is likely to go up. It is also possible that the cost of the current interventions is an underestimate.

The model ignores the costs of any hardware, software or connectivity – but it is likely that this will need to be funded for some people.

Appendices

Appendix A – Summary of Numbers Used

11 million	Number of people in 2013 who don't have Basic Online Skills, using the internet regularly – of which…
7 million	Number of people who have never used the internet
1 million	Number of people who are lapsed users of the internet
3 million	Number of people who use the internet regularly but don't have Basic Online Skills
6.2 million	Number of people who, in 2020, won't meet our criteria on current trends or with current programmes
100%	Target – aiming to reach 100% of people who aren't regularly online with Basic Online Skills
2020	Date by which to meet target 100%
£47	Historical cost per person of existing interventions
£47-£319	Range of costs of intervention per person, depending on people's historical use of the internet and other considerations
£1.5 billion	Total investment required for 100% of the 11 million people were to require costed interventions
£875 million	Total investment required for reaching the 6.2 million people who won't meet our criteria on current trends or with current programmes by 2020
33%	Proportion of total investment required to be borne by each of three sectors: Government; private sector; voluntary and community sector
£292 million	Suggested Government investment needed over the period to 2020

Appendix B - Numerical factors assigned to variables in this model

The model assumes that each of these considerations – historical use, employment status, disability, socio-economic group – affect someone's likelihood of meeting our criteria with current trends and current programmes.

The model assigns the following likelihood factors based on each of these considerations.

As noted in the report, we assume that at least some people within the 6.2 million are less likely than others to meet our criteria on this basis. We assign a factor of less than 1 to indicate a lower likelihood of them meeting our criteria on

current trends including using current programmes. For example for some groups it may be half as likely and we would assign a factor of 0.5, compared to the average person above. Our model assumes that likelihood of 0.5 means the programmes required would cost twice as much as current programmes. We have assigned the following factors in our model.

Internet History

Never	Ever – lapsed	Ever – regular no skills
0.6	0.9	1.0

Employment

Employed	Unemployed/retired
1.0	0.7

Disability

Work-limiting disability	Disabled DDA but not work-limiting	Not disabled
0.5	0.7	1.0

Socio-economic group

AB	C1	C2	DE
1.0	1.0	0.8	0.7

The variables in the model can be adjusted to alter the extent to which – if at all – this is the case. For example, if were to assume that none of these factors affect people's likelihood to meet our criteria on current trends including using current programmes, we would set all factors to 1.0, and the cost per person would be the current average cost per person, i.e. £47.

Appendix C – Methodology Used to Develop This Model

This model is based on analysis of available data and, where there are gaps in the data, we have made assumptions, which are clearly labelled as such. The aims, assumptions and principles underlying the model were arrived at following input from representatives from the Government Digital Service, Policy Exchange, Google, Point Topic, and the Broadband Stakeholder Group, as well as from Tinder Foundation and Go On UK.

The model was further refined with input from Tinder Foundation board members, Go ON UK and the Policy Exchange.

We are grateful for all the input we received.

This document has been prepared for Tinder Foundation, solely on the terms agreed with Catherine McDonald Consulting

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It's Not Your Grandfather's Farm, … Anymore!

Combine Two California Core Strengths:
Agriculture and Technology
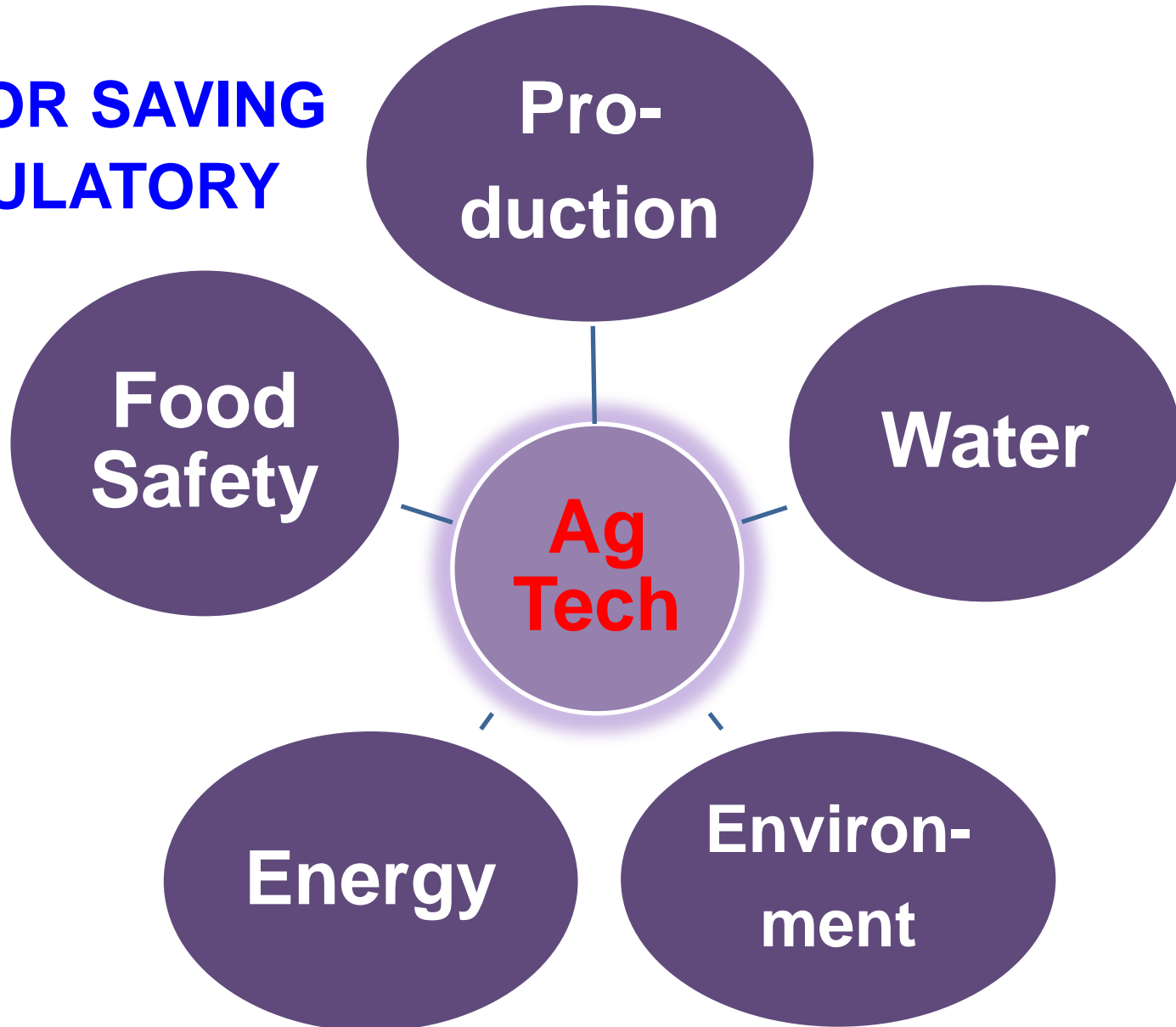
AGRICULTURE & FOOD

Team Leader: David Shabazian, Sacramento Area Council of Governments, (916) 340-6231, dshabazian@sacog.org
Mary Kimball, Center for Land-Based Learning, (530) 795-1520, mary@landbasedlearning.org

Issue Contact: Tara Thronson, Valley Vision, (916) 325-1630, tara.thronson@valleyvision.org

Broadband Access Essential to Meet Growing Food Demands and Enhance Rural Economies

Requested Action:
- Provide resources to expand broadband infrastructure to rural areas in the next Farm Bill.
- Continue to encourage the deployment of more broadband infrastructure to drive advancements in mobile technology and rural economic diversification and expansion.
- Continue to encourage the proliferation of more spectrum to drive advancements in mobile technology.

Background:

Benefits of Broadband

Current trends are predicting an increase in an urbanized population and growth of the global middle class, driving global food production demand to double by 2050. Our planet has at most, 12 percent more arable land available for intensive crop production. To help meet the growing worldwide food demand we need to farm efficiently and effectively move those products to market. A missing link in meeting these needs and opportunities is adequate broadband (high-speed internet) infrastructure in rural areas. Wireless technologies are changing the face of agriculture production. Broadband is a broad infrastructure platform that serves as the foundation for economic growth and other co-benefits, such as:

- More efficient use of water, fertilizer and fuel use with remote sensing technology;
- Reduction of ground water contamination from over watering;
- Assistance with peak power demand through smart grid power management and renewable energy sources from farms;
- Real-time in-the-field detection of food pathogens prevents contamination from entering national food distribution system and cross contamination;
- Expanded market and distribution networks, providing the ability to monitor markets in real-time, connect with buyers and employ applications that improve the logistics of moving product to market.;
- Enable farm equipment to self-operate

- Access to important services such as tele-medicine, remote learning and e-commerce that help rural communities improve the quality of life and diversity their economies.

Unfortunately, many rural areas in California are not adequately serviced and thus these technologies cannot by fully adopted.

The agricultural economy in the State of California is the 9th largest globally when compared against entire nations, and a $1.7B industry (farm gate) in the Sacramento Area. Crop production and food manufacturing account for 30% of the Region's annual export activity. The cluster (agriculture plus 20 other related activities) supports 37,000 jobs and $3.5 billion of output. The cluster consists of mainly economic base activities and supports high employment multiplier effects. Based on data projections, agriculture cluster employment is already anticipated to grow by 1% and output is expected to increase by 24% in the 2010-2020 period.

Broadband Access Gaps Remain
While there is growing awareness of the importance of broadband for economic competitiveness, public safety, securing employment, e-government, remote access to healthcare and education, and reducing transportation-related greenhouse gas emissions – significant gaps exist both with access to broadband infrastructure, and with overcoming barriers to adopting and using broadband. The State of California seeks 98% broadband deployment and 80% broadband adoption by 2015. The California Public Utilities Commission reported in 2012 that over 50,000 households in the rural areas of the Sacramento region with low density or difficult terrain have yet to be served by broadband, and parts of the urban core have adoption rates as low as 30%.

The Sacramento region has taken action to address these disparities. Through the efforts of a four-county broadband consortium, and the use of maps showing broadband availability, broadband infrastructure deployment priorities have been identified and we have developed a diverse coalition of partners and stakeholders, including the jurisdictions. Just as it took federal support to electrify the nation, the Sacramento region is well positioned to effectively assist in deployment of much-needed additional broadband infrastructure.

The Importance of Broadband Infrastructure
The terrain and population of the remaining unserved and underserved households may best be served by wireless providers (mobile or fixed). In addition to infrastructure funding support, we have heard from multiple stakeholders that to best meet the broadband needs in the rural areas and to support the increasing data demand on existing bandwidth, **additional spectrum should be made available**.

FCC chairman Julius Genachowski expects the number of mobile broadband users to more than quadruple to 5 billion by 2016. Cisco Systems Inc. projects that mobile devices will outnumber the Earth's population by 2016, resulting in an 18-fold increase in global mobile data traffic between 2011 and 2016. Additionally, studies have identified adoption of mobile data plans to be highest in ethnic groups that have traditionally be the lowest adopters of at-home subscriptions. Wireless broadband, both mobile and fixed, has the potential to substantially transform the every-day life of Americans,

from distance education to energy efficiency to wireless health diagnostics and monitoring. The critical component behind wireless broadband is spectrum. Expanding the available spectrum expands access, drives innovation and expands economic prosperity.

Can the Internet Help Save the Environment? Yes.

"Investment in broadband infrastructure is a fundamental part of sustainable social and economic growth, and is essential to building a greener and more equitable California."

John Gioia, Contra Costa County Supervisor
President of California State Association of Counties
Member of California Air Resources Board

Broadband and the Environment: Technology Strategies for a Greener California

We've all heard of the ways we can help save the planet, such as conserving energy in our homes and driving fewer miles in our cars. Such common environmentally-conscious strategies become a lot easier when technology supports our efforts. It turns out that high-speed Internet—also known as broadband—can do exactly that.

Today, workplaces, government offices, farms, schools, hospitals, and households use broadband to cut costs and carbon emissions. Internet tools and electronic communications allow Californians to use computers and smart devices to work from home, manage irrigation in the fields, apply for a driver's license, get a check-up with a healthcare specialist, and monitor thermostats while away from home. When we use less fuel, water, and electricity, we emit less air pollution into the atmosphere.

These modern-day approaches to managing daily life all depend on having fast, reliable, and affordable Internet service everywhere—from the kitchen table to the tomato field. E-Government, Telehealth, Teleworking, Precision Agriculture, Smart Building, and Smart Grid are key opportunities in which Californians are making progress to conserve resources and promote cleaner, healthier lifestyles.

Affordable, accessible broadband is critical for California to meet its greenhouse gas (GHG) emissions goals, which will reduce impacts on the environment and improve the quality of life for all.
The data proves it. Let's all promote broadband for a greener California!

August 2014

E-Government
Skip the Trip, Go Online

E-Government services allow Californians to obtain services online, saving time, money, and travel-related pollution. The California Department of Motor Vehicles (DMV) encourages customers to "Save Time, Go Online", and the program has been met with great success. In 2013, nearly one quarter of all California vehicle registrations—over 8 million—were completed electronically.[1] Drivers were able to trim the number of trips to the DMV while keeping fuel costs in their wallets.

Governments at all levels can drive efficiency while improving customer service.[2] The federal government is encouraging the shift to electronic communications, for example, by promoting online tax filings and direct deposit payments. Those activities alone last year saved the federal government $64 million in paper costs.[3]

Telehealth
Bring Quality Healthcare Closer to You

Telehealth brings the healthcare provider and patient together online, ensuring quality and timely care, saving travel headaches, and encouraging better monitoring of health status. Each online health appointment saves 95 percent of GHG emissions that would result from a typical drive to a doctor's office.[4]

Based on the findings at a California hospital serving a large rural area, the California Telehealth Network estimates that the value of each follow-up consultation conducted online saves $300 by eliminating transportation costs and counting wages that would be lost due to time off. In a single year, those savings added up to 288,000 fewer miles driven at a single hospital. Imagine the combined impact of online consultations across all 345 hospitals in the state.

Teleworking
Cut Traffic and Carbon Emissions

Teleworking utilizes alternative worksites and video conferencing while generating cost savings, boosting employee satisfaction, and reducing GHG emissions. Companies that encourage their employees to telework see results both in economic value and in positive impacts on the environment. If an employee works from home one day per week, reducing car travel by 7 percent and air travel by 10 percent, the carbon reduction impact could be as much as 65 megatons of CO_2 with a corresponding national economic value of $25 billion by 2020.[5]

Experts at UC Davis and UC Irvine reviewed available research and discovered similar findings. For home-based workers, they found that work-related miles driven were reduced by 90 percent. For telecommuters working at a central site away from the main office, mileage reductions ranged between 62 and 77 percent.[6]

Precision Agriculture
Save Water and Increase Productivity

Precision Agriculture preserves one of California's most precious resources: water. Water delivery accounts for 20 percent of the state's total energy consumption, and the agricultural sector is a major user.[7,8] Precision Agriculture uses real-time information to help farmers more efficiently irrigate and monitor their crops. Wireless broadband-enabled systems supply satellite observations and data about the plants, soil, atmosphere, and irrigation systems to help farmers manage their fields and livestock.

The results are encouraging: farmers have seen increases in productivity ranging from 20 to 70 percent, and a decrease in water use ranging from 20 to 30 percent[8] (depending on how many water-use efficiencies have been previously implemented on a given farm). More efficient agricultural practices save money and reduce water and delivery-related energy consumption.

Smart Building
Make Buildings More Energy Efficient

Smart Building strategies make for better working environments and lead to significant energy savings. Energy use in buildings ranks as the second highest source of GHG emissions in California.[9] In Northern California alone, the 481 most-efficient buildings saved approximately $148 million in annual utility costs and reduced GHG emissions equivalent to that produced by 50,800 homes.[10]

Modern construction standards are leading to better efficiency, but energy waste persists in older buildings because of inefficient heating and cooling, lighting, and other power systems.[11] Building management systems (BMS) use technology to control and monitor usage patterns, which can lead to major improvement even in older construction. Utilities and technology companies now are providing online services to track daily energy usage for industry, public facilities, and residences.

Smart Grid and Electric Vehicles
Drive for a Cleaner California

The Smart Grid is an electricity supply network that uses digital communications technology to detect and react to changes in usage. While providing critical information to help Californians conserve at work, at home and on the road, the Smart Grid also allows for easier integration of solar and wind in the power supply.[12]

When the Smart Grid and Electric Vehicles (EVs) operate together seamlessly, large reductions in energy usage and GHG emissions can be achieved. The transportation and power sectors, in fact, have the highest potential for Internet-enabled reductions of GHG pollution— and now account for more than 40 percent of the estimated total reductions in California. EVs are one of the most promising technologies for reducing fuel consumption and air pollution.[12,13]

To reach their highest potential in cutting energy use and resulting emissions, the Smart Grid and EVs must work interdependently. For example, EV owners need online access to obtain real-time information from the Smart Grid to ensure that they plug in when electricity demand—and usually prices—are at their lowest.

Without online monitoring and communications, it is impossible to manage energy demand in 21st century California. The repercussions of poor management are large on the environment as well as the economy. For example, when the electric grid becomes strained, often-dirtier backup generators are fired up to meet peak demand.[13] Carefully coordinated policy, planning, and investment around EV infrastructure and the Smart Grid will go a long way to help Californians realize their largest potential for reducing air pollution and GHG emissions.
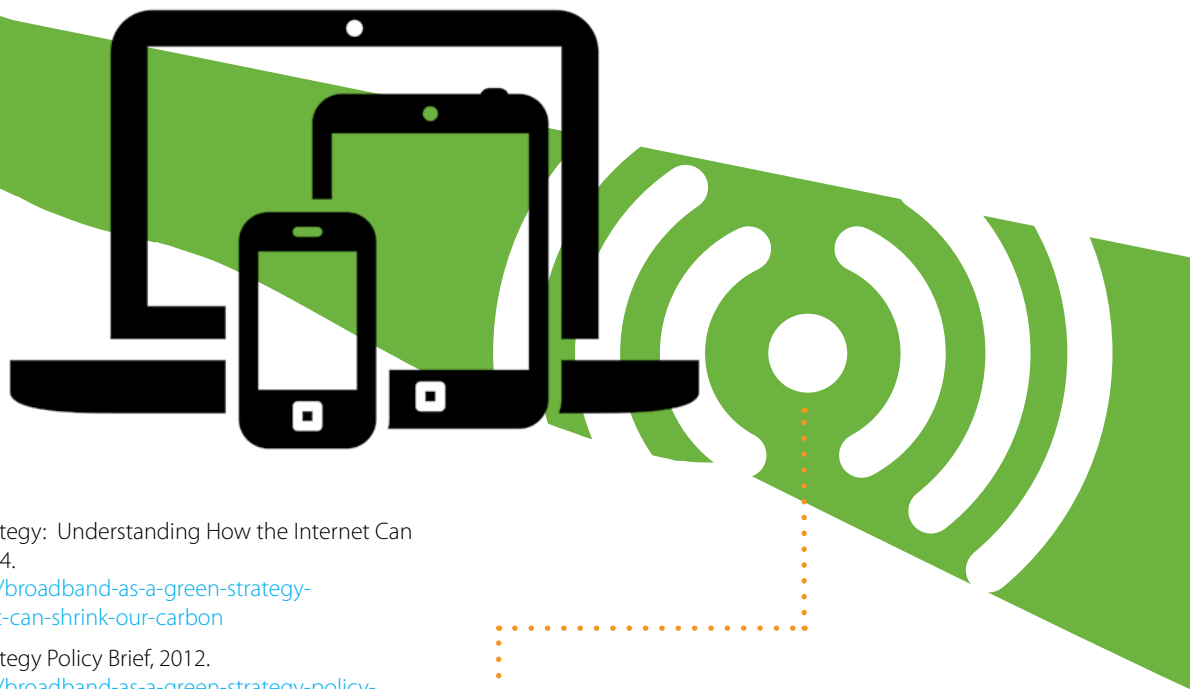
Learn More

- **Read** Broadband as a Green Strategy: Understanding How the Internet Can Shrink our Carbon Footprint, 2014.
  http://valleyvision.org/resources/broadband-as-a-green-strategy-understanding-how-the-internet-can-shrink-our-carbon

- **Read** Broadband as a Green Strategy Policy Brief, 2012.
  http://valleyvision.org/resources/broadband-as-a-green-strategy-policy-brief-2012

- **Read** Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption.
  http://www.cetfund.org/resources/information/model-policies-and-ordinances

Act Now

- **Encourage** your jurisdiction to implement the Checklist in the CETF Resource Guide for Local and Regional Government Leaders: Getting Connected for Economic Prosperity and Quality of Life.

- **Champion** policies that support broadband infrastructure investment and include broadband infrastructure in land use and other community plans.

- **Promote** the role that broadband plays in achieving emission reductions when state leaders are developing greenhouse gas reduction policies, goals, and investments.

About the California Emerging Technology Fund
The mission of the California Emerging Technology Fund is to close the Digital Divide in California by promoting high-speed Internet access at home. The goal is to reach 98% of all residences with broadband infrastructure and to achieve 80% home adoption by 2017. This statewide goal can only be accomplished if the following specific hard-to-reach target communities achieve at least a 70% adoption rate: low-income populations, Latino households, rural communities, seniors and people with disabilities. For more information, please visit www.cetfund.org.

About Valley Vision
The mission of Valley Vision is to provide research, collaboration, and leadership services to make California's Capital Region prosperous and sustainable. Valley Vision functions like a social enterprise, combining the rigor of a for-profit business with the passion of a nonprofit to drive large-scale initiatives to success. The goal is to bring individuals and organizations together to find impactful solutions to issues pertaining to social equity, the environment and economic development. For more information, please visit www.valleyvision.org.

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Testimony to the United States Senate
Senate Subcommittee on Communications, Technology and the Internet
"Broadband Adoption: The Next Mile"
Tuesday, October 29, 2013
Sunne Wright McPeak
President and CEO
California Emerging Technology Fund

Closing the Digital Divide is an Imperative

Imagine if you were not able to communicate instantaneously with others using your smart phone, digital tablet, or computer. That is the reality for more than 9 million Californians who live in remote rural communities, on tribal lands, in low-income neighborhoods, or who have a disability. Those of us who have the benefit of a personal computing device coupled with high-speed connections to the Internet—referred to generically as "broadband" that includes both wireline and wireless technologies—have come to depend on this connectivity for our work, staying in touch with family and friends, and making our daily lives easier.

Broadband is essential 21st Century infrastructure for global competiveness. It is a key factor in attracting capital investment to generate jobs. Communities without broadband are being left behind in the Digital Age—remote rural areas, poor urban neighborhoods, and people with disabilities are even more disadvantaged without broadband availability and computing devices to access the Internet. Closing the Digital Divide with public policies and strategies to achieve ubiquitous broadband deployment and to accelerate broadband adoption is an imperative for economic prosperity, quality of life, and family self-sufficiency. Fortunately, it is a goal that can be achieved with inspired vision, focused leadership, alignment of existing resources, and enlightened investment of a modest amount of additional public funding to encourage partnerships—federal-state, public-private, and provider-community. There is ample research and empirical evidence about what it takes to get the job done.

The California Experience and Progress in Closing the Digital Divide

California has some of the most challenging terrain in the nation for broadband deployment and the largest populations of disadvantaged residents as priority communities for broadband adoption. When California began to focus on closing the Digital Divide, the number of "unconnected" residents was the equivalent of having 5 other states within our boundaries. Approximately 94% of all residents had broadband access—however the 6% of residents totally unserved represented 768,000 households (about 2 million residents), more than the population of the State of Nebraska spread out over more than 44,000 square miles of inhabited area, the size of the State of Kentucky. Almost 13 million residents (largely urban poor) were not connected, more population than the State of Illinois.

In addition, 1.9 million people with disabilities were off-line, the population of the State of New Mexico. And, 680,000 Native Americans were not connected, larger than the population of the State of Alaska. It should be noted that California has the largest population of Native Americans than any other state with 111 federally-recognized tribes. Most of the tribal lands lack broadband connectivity and want broadband access according to recent consultations of Tribal Leaders being convened by Judge Cynthia Gomez, the Governor's Liaison to Tribal Governments and the Executive Secretary of the California Native American Heritage Commission in collaboration with the California Emerging Technology Fund and the Corporation for Education Network Initiatives in California (CENIC).

The California Emerging Technology Fund (CETF) was established at the direction of the California Public Utilities Commission (CPUC) in the orders approving the 2005 mergers of SBC-AT&T and Verizon-MCI. The successor companies agreed to provide a public benefit by contributing a total of $60 million into CETF, a new non-profit organization with the mission to close the Digital Divide in California. CETF became operational in 2007, working in partnership with the Governor and State Administration, Legislature, CPUC, local governments, policy groups, and a network of more than 80 community-based organizations (CBOs) to systematically implement a Strategic Action Plan to close the Digital Divide in California, tackling both broadband deployment and adoption challenges. CETF reports to the Legislature through the CPUC.

In addition to establishing CETF, California policymakers have taken other key steps to close the Digital Divide, including:
- In 2007 the Governor with the support of the Legislature convened the California Broadband Task Force which produced the base report to focus attention on the issues.
- In 2008 the CPUC and the Legislature established the California Advanced Services Fund (CASF) to subsidize broadband deployment to unserved and underserved areas by converting a high-cost universal service fund for telephone service to support broadband infrastructure while also significantly reducing the annual surcharge amount collected from ratepayers. Through subsequent legislation, the total amount authorized to be collected for CASF has been increased to $315 million.
- In 2009 the Governor issued an Executive Order to advance digital literacy that sets forth official State policy and requires agencies to develop and implement an action plan.
- In 2010 the Legislature and Governor established the California Broadband Council in statute to sustain State attention and leadership to close the Digital Divide.
- In 2013 the Legislature and Governor authorized CASF funds to be used for broadband connectivity in publicly-subsidized multi-unit affordable housing.

The sum total of this collective effort is significant progress in the last 6 years. In 2008, California's statewide adoption rate for Internet use was 70% with 55% having broadband use at home—the same as the national average. Today, 86% of Californians use the Internet and 75% access the Internet at home with a high speed connection (including 6% that access the Internet only by a mobile "smart phone"). Also, there have been significant increases in broadband adoption by priority consumer populations:
— Low-income households up 20 percentage points (from 33% in 2008 to 53% in 2013).
— Latino households up 18 percentage points (from 34% in 2008 to 52% in 2013).

— People with disabilities up 20 percentage points (from 36% in 2008 to 56% in 2013).

The Role of the California Emerging Technology Fund

The California Emerging Technology Fund (CETF) has been a pivotal partner in driving this progress on closing the Digital Divide, serving as a catalyst for focus, action and results by: (a) setting the goals for broadband deployment and adoption; (b) delineating the strategic framework to achieve the goals with regular reports on progress to foster accountability; and (c) making targeted and leveraged investments in public policy initiatives and grants to CBOs. CETF is performance-driven and outcomes-focused. The CETF Strategic Action Plan is based on research and fact finding about "what works" and sets forth the overall approach and strategies to close the Digital Divide, including the metrics for accountability that provide the disciplined focus on results. CETF set the following goals for achieving success by 2017—10 years after CETF began operations—which have been embraced widely by policymakers and stakeholders.

> Broadband Supply – 98% Deployment
> - Access for At Least 98% of All Households
> - Robust Rural-Urban California Telehealth Network (CTN)
> - All Tribal Lands Connected and Part of CTN
>
> Broadband Demand – 80% Adoption
> - Overall Statewide Adoption At Least 80% by 2015 and 90% by 2020
> - All Regions and Socioeconomic Groups within 10 Percentage Points of Overall Adoption (At Least 70%)
> - Increased Overall Accessibility and Universal Design
>
> Broadband Global Leadership – Within Top 3 Rankings
> - Appropriate and Sufficient Speeds for Consumer Applications that Drive Adoption
> - Increased Economic Productivity
> - Reduced Environmental Impacts

There is not a "silver bullet" to closing the Digital Divide—no one strategy or action will get the job done. However, there is "silver buckshot"—a "critical mass" of inter-related and mutually-reinforcing strategies and actions that do succeed. To achieve the optimal impact and a higher return on investment of the original seed capital, CETF employs 5 overarching strategies to drive progress on the broadband deployment and adoption goals:
1. Civic Leader Engagement
2. Venture Philanthropy Grantmaking
3. Public Policy Initiatives
4. Public Awareness and Education
5. Strategic Partnerships

Successful implementation of these strategies requires engaging and partnering with "trusted messengers" and "honest brokers" who know their local communities and target neighborhoods, including local government officials, regional civic organizations, and successful CBOs. CETF has focused on 3 priorities for grantmaking: rural and remote areas; urban disadvantaged neighborhoods; and people with disabilities. CETF has awarded more than $31 million in grants to community-based organizations (CBOs) and public agencies as "partners" in achieving the broadband deployment and adoption goals.

Leadership and Strategic Investments by the Federal Government

California's progress in closing the Digital Divide has been significantly advanced by the leadership of the California Congressional Delegation and strategic investments by the federal government. The Federal Communications Commission (FCC) awarded $22.1 million from the Rural Health Care Pilot Program (matched by $3.6 million from CETF) to connect a network of more than 800 facilities in rural and urban medically-underserved communities that comprise the California Telehealth Network (CTN). Telehealth is a major public policy initiative in California to drive both broadband deployment and adoption. Thus, the FCC Healthcare Connect Fund is a vital resource for the future, although the program needs some refinement. In addition, California has benefited greatly from partnerships with the U.S. Department of Commerce National Telecommunications and Information Agency (NTIA) under the American Recovery and Reinvestment Act (ARRA) Broadband Technology Opportunities Program (BTOP).

NTIA awarded 13 ARRA BTOP grants for broadband infrastructure deployment exceeding $428 million and 17 grants for broadband adoption totaling almost $122 million, including support for CTN operations and development of services. NTIA provided 2 grants to CETF for a total of $14,359,476 (matched by CETF $2,551,796) to support 19 CBOs (sub-awardees) resulting in more than 200,000 broadband adoptions and more than 2,700 jobs, which met and exceeded the contractual performance objectives. These grants were concluded as of June 2013 and are summarized below.

Broadband Awareness and Adoption

The Broadband Awareness and Adoption (BAA) project mobilized the expertise and resources of 8 partners (sub-awardees) to reach communities most impacted by the Digital Divide: low-income families, limited English-speaking Latinos, rural residents and people with disabilities. BAA partners worked with schools, churches, health clinics, job training programs, and social service providers to develop model "service ecosystems" which included technical support, low-price computers, and affordable broadband connections. Key accomplishments include:

- Increased awareness about the benefits of broadband among 13,296,068 low-income residents (266%).
- Provided 719,255 low-income individuals with basic Digital Literacy skills to use broadband technology (106% goal).
- Achieved 198,714 new broadband subscriptions by low-income households (149% goal) and distributed 6,866 computers to low-income households (172% goal).

Total BAA Budget	$9,360,672
NTIA Grant	$7,251,295
CETF Match Funds	$ 979,476
Partner Cash Match	$ 882,667
Partner In-Kind Match	$ 247,234

Access to Careers in Technology

The Access to Careers in Technology (ACT) project engaged 11 partners (sub-awardees) to establish scalable workforce development programs while expanding access to broadband and 21st Century jobs in low-income communities throughout the state. Individuals with multiple barriers to employment--ranging from the homeless to former drug addicts—completed Information and Communications Technology (ICT) training to obtain jobs in a spectrum of major industries from engineering to entertainment with pathways to living-wage careers in high demand. Key accomplishments include:

- Trained 24,675 low-income youth and adults and 12,044 small business owners and employees with Digital Literacy skills (101% goal).
- Secured 2,745 ICT career-path jobs for low-income residents (107% goal).
- Achieved 9,331 new broadband subscriptions by low-income households and distributed 5,547 computers to low-income households (101% goal).

Total ACT Budget	$11,081,130
NTIA Grant	$ 7,108,181
CETF Match Funds	$ 1,572,320
Partner Cash Match	$ 2,379,839
Partner In-Kind Match	$ 20,790

Lessons Learned

The successful implementation of the NTIA grants by CETF and our 19 partners was led by Senior Vice President Susan Walters, who prepared a report *Lessons Learned from the Field* which has been submitted as part of this testimony for the Congressional record.

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CETF Lessons Learned from ARRA NTIA BTOP Grants

- Grantee executive leadership and staff management capacity are essential.
- Coaching and the "learning community" were key to reaching goals.
- Thoughtful work plans in advance led to faster recognition of problems.
- Anchor institutions and community organizations need to work to ensure that clients actually obtain broadband (information and encouragement alone are not sufficient).
- Integrating digital literacy training and broadband adoption into existing programs is the best way to ensure sustainability and continually narrow the Digital Divide.

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The experience of all NTIA grantees has been incorporated into the NTIA Took Kit which is a very useful compilation of data and recommendations for accelerating broadband adoption. NTIA Administrator Larry Strickling and his team (Laura Breeden and colleagues) have a wealth of knowledge about "what works" and established working relationships with state agencies and non-profit organizations throughout the nation that are valuable assets that should be supported and leveraged for sustained progress in closing the Digital Divide.

Broadband Empowers People and Transforms Lives

The California Emerging Technology Fund (CETF) has amble evidence about the ways in which broadband access and information technology empowers people and transforms lives. This is particularly effective when broadband is integrated into services and programs that have relevance to everyday living, such as in school, job training, housing, and healthcare.

For example:
- CETF has developed School2Home to turn around low-performing middle schools through the integration of broadband and computing technology into the teaching and learning processes with significant parent engagement. Not only is School2Home improving academic performance above district and statewide gains, but also driving broadband adoption: Spanish-speaking parents increased broadband adoption at home from 48% to 76% (a 58% increase) and English-speaking parents increased from 84% to 94% (a 12% increase).
- CETF partner The Stride Center has a significant track record in training and securing employment for individuals with multiple barriers to employment, demonstrating that ICT workforce preparation can result in 90% of the clients obtaining jobs with a median wage double the overall regional labor market average.

The power of the statistics on closing the Digital Divide and performance data on the grants comes to life with the stories of the people who are becoming self-sufficient and productive taxpayers because of these public and private investments. Consider the experience of these real people who have benefited from broadband access and information technology:
— Daniel made the honor roll once he had broadband at home and was able to keep up with his homework assignments and navigate the Internet to gather information.
— Yanira was as a grocery delivery driver when she injured her back and couldn't work in that job any longer. With an online course she learned how to write a resume and cover letter, search for job listings, and email applications to companies—when she began she didn't even know how to send e-mails. After just a month, she started a new job in the delivery business making nearly $3 more per hour.
— Henri recently landed his first job as a digital animator after receiving job training and now is on a career pathway with living wages.
— Rosa is getting her high school equivalency diploma after completing two computer skills certification classes to earn a free refurbished computer and signing up for broadband at home.
— Alicia used to struggle to find work, but now works fulltime after learning how to use electronic job boards in a digital literacy class.
— Deborah was able to keep up with her high school homework with the benefit of broadband access and graduated with a 4.0 GPA. She searched the Internet for the right college and was able to apply online for admission and a full scholarship.
— Maria's flower shop has blossomed since attending a computer training class and learning how to manage and market her business.
— Sheryl turned her live around from drug abuse and losing her children after learning computer skills at a non-profit that received ARRA funds from NTIA BTOP. Today she has a full-time job, which allowed her to regain custody of her children.

Conclusions for Closing the Digital Divide and Accelerating Broadband Adoption

Although there has been a steady rise in the number of people adopting and using broadband at home, it is becoming increasing harder to reach those who remain off-line because they are remote rural residents without access and urban poor residents without digital literacy skills or the means to afford market prices. However, all the data and experience indicates that the vast majority of people who do not have or use broadband at home want to adopt the technology when they understand the value proposition and have access. Thus, it is very important to understand what actually works to reach these consumers who should be regarded as "prospective customers in emerging markets."

Dr. John Horrigan (who helped develop the National Broadband Plan and has worked for the Pew Charitable Trusts and Joint Center for Political and Economic Studies) concludes that the cost of digital exclusion is real and rising and that the broadband adoption challenge has three primary dimensions: cost, relevance, and digital literacy. He further finds increasing broadband adoption requires sustaining capacity and scale of strategic initiatives with states and local communities involved in the "ground game" to focus on "digital readiness" in unserved and disadvantaged communities. He provides valuable insights to guide the work in accelerating broadband adoption.

The following are the major conclusions from the experience of the California Emerging Technology Fund and our community-based partners who have been on the ground in unserved rural communities and disadvantaged urban neighborhoods.

- It is essential to set goals with quantified metrics and accountability for performance in order to drive broadband deployment and adoption to close the Digital Divide and to regularly report to the public and stakeholders to ensure continued focus on the goals.

- Optimizing impact of any investment requires engaging public officials at all levels of government and civic leaders in regional consortia and local communities. There is no substitute for leadership, but leaders need to be involved in developing the strategies and supported in systematically implementing a coherent, integrated plan.

- Broadband adoption will succeed by working in partnership with community-based organizations that are the "trusted messengers" and "honest brokers" for the unserved and disadvantaged populations.

- Affordable broadband offers are required to increase adoption among low-income households. This is likely to require an Affordable Broadband Lifeline Rate Program given that voluntary efforts to date have had modest market penetration for a variety of reasons, with the most extensive program reaching less than 10% of eligible participants.

- Sustainable broadband adoption requires a comprehensive approach that targets and aligns resources in low-income communities with an integrated, comprehensive "neighborhood transformation" strategy that incorporates broadband adoption into other services, such as education, workforce preparation, and healthcare.

Recommendations for Continued Federal Government Leadership in Broadband Adoption

There is a foundation of leadership and expertise in the federal government on which to launch the next generation of work to accelerate broadband adoption to close the Digital Divide in America. In particular, the powers and resources of the FCC coupled with the experience and relationships of NTIA in collaboration with the other federal departments is a solid platform for action. Congress can greatly augment this foundation by the following actions:

➢ Set national goals and performance metrics for broadband deployment and adoption along with a timetable and assigned responsibilities for achieving them to encourage implementation of the National Broadband Plan and utilization of the NTIA Took Kit. Institute regular Congressional oversight proceedings to ensure performance and accountability.

➢ Integrate broadband and information technologies into all federal policies and programs through funding incentives to align efforts across departments. There is a need to "connect the dots" with a set of coherent strategies that transcend "bureaucratic silos" to optimize access to and use of the Internet with high-speed connections. For example:
  — U.S. Department of Health and Human Services (HHS) should build upon the ARRA Health Information Technology for Economic and Clinical Health Act (HITECH) framework to encourage stronger linkages and purposeful collaboration of health exchanges and "meaningful use" to the telehealth networks funded by the FCC Rural Health Care Pilots and/or the new Healthcare Connect Fund. HHS and the FCC should make a concerted joint effort to connect all state and local government public health services, federally-qualified health centers (FQHCs), critical care hospitals, tribal healthcare facilities (if desired by Tribal Leaders) to these telehealth-telemedicine networks. This kind of an effort will need to be coordinated with other departments and programs, such as the U.S. Department of Agriculture's Distance Learning, Telemedicine and Broadband Program to ensure rural communities are connected.
  — U.S. Department of Education should aggressively encourage the integration of broadband and computing technologies into the teaching and learning processes in all federal grants to improve education, particularly to turn around low-performing schools because of the ability of the technology to engage and involve low-income parents with an approach similar to School2Home. Implementation nationwide of Common Core Standards will require a major effort on a scale not yet contemplated by educators and policymakers. Promise Neighborhoods grantees should be encouraged to promote "smart communities" by incorporating broadband adoption strategies into their programs.
  — U.S. Department of Labor should encourage integration of digital literacy and ICT skills training into all existing workforce preparation programs through Workforce Investment Act allocations to states and all other grants.
  — U.S. Department of Housing and Urban Development should promote "smart housing" in all publicly-subsidized multi-unit complexes by allowing the installation of an advanced communications system with broadband connectivity in each residence to be included in construction costs and the maintenance of such a system to be included in operating budgets. Choice Neighborhoods grantees should be encouraged to incorporate broadband adoption strategies into their programs.

— U.S. Department of Agriculture (Rural Utility Service and all other rural economic development programs) should encourage larger-scale integrated proposals for existing grant funds that combine broadband deployment and adoption. There should be consideration of easements for broadband deployment in National Forests to support public safety, emergency response, and homeland security.

— U.S. Department of Interior should identify all resources to assist Tribal Leaders (who request such assistance) in providing broadband service to Tribal Lands. There should be consideration of easements for broadband deployment in National Parks to support public safety, emergency response, and homeland security.

— U.S. Department of Homeland Security should become a proactive partner in FirstNet to accelerate broadband deployment and adoption to support public safety, emergency response, and homeland security.

➢ Request and support the FCC to accelerate reform of the Universal Services Fund (USF) and incorporate best practices for sustainable broadband adoption. With limited resources, priority consideration for funding and/or subsidies to broadband providers should be given to companies that: (a) have a coherent, explicit program with quantified goals and metrics to increase broadband adoption; (b) partner with CBOs that have a proven track record as the "trusted messenger and honest broker" in broadband adoption; and (c) target low-income communities in collaboration with other stakeholders pursuing "digital inclusion" and "neighborhood transformation" strategies (such as digital literacy in schools, workforce training, or publicly-subsidized housing).

— An Affordable Broadband Lifeline Rate Program should be established within the next year and made available to residents in low-income census tracts in which there is a coherent "digital inclusion" component of a "neighborhood transformation" initiative with responsible local governments, key stakeholders, and respected CBOs.

— Renewal and reform of eRate should prioritize low-performing schools and libraries in low-income neighborhoods that have established a coherent program with quantified goals and accountability to increase broadband adoption, especially as part of an overall "neighborhood transformation" initiative.

— Connect America Fund and other programs to subsidize broadband infrastructure should give priority funding to deployment projects with plans and partners to promote broadband adoption.

➢ Provide additional funding to NTIA as a prudent investment in global competitiveness to establish the "next generation" broadband adoption program that builds upon the ARRA BTOP experience, aligns with other existing efforts, and leverages federal resources through partnerships to achieve explicit adoption goals and outcomes by 2020.

— Encourage states to adopt broadband adoption strategies and plans by giving priority consideration for funding to projects that align with and complement state programs that have explicit adoption goals with accountability for performance.

— Facilitate collaboration among successful BTOP grantees to join forces with state governments to develop broadband adoption strategies and plans.

— Request assistance from the National Association of Regulatory Utility Commissioners (NARUC) to engage states and convene information forums on development of broadband adoption strategies and plans.

- Foster public-private partnerships to accelerate broadband deployment and adoption. There is no substitute for the innovation and efficiency of the private sector when engaged as sincere partners motivated to achieve explicit goals. Public-private partnerships can significantly leverage public resources for a higher return on investment to taxpayers and ratepayers.
  — Request the FCC and NTIA to engage broadband providers in helping design the "next generation" broadband adoption program to achieve explicit goals and outcomes.
  — Encourage providers to partner with EveryoneOn (formerly Connect-to-Compete) by setting adoption targets coupled with affordable broadband offers that can be made available without undermining profitability. There needs to be market competition for low-income consumers to become sustainable broadband customers.
  — Request the FCC to structure USF reforms for a Broadband Lifeline Rate Program and eRate to encourage and reward providers who partner with non-profit intermediaries (such as EveryoneOn) and trusted CBOs with a proven track record and align with state plans. Reimbursement and subsidies from the USF should reward public-private partnerships that drive to and achieve explicit broadband adoption goals.