WINNING THE FUTURE:

A POLICY FRAMEWORK FOR EMPOWERING WOMEN WITH BROADBAND

Produced by:
National Foundation for Women Legislators and National Organization of Black Elected Legislative Women

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I. INTRODUCTION & EXECUTIVE SUMMARY

Broadband Internet access promises to enhance nearly every aspect of modern life and is poised to ensure that the United States remains the most competitive and innovative country in the world.[1] In recognition of the vast potential for this technology, Congress called upon the Federal Communications Commission (FCC) to prepare a *National Broadband Plan* that articulated a strategy for ensuring that the full power of broadband is properly and uniformly harnessed by consumers and innovators across every sector of the economy. The FCC's *Plan*, which was released in March of 2010[2], was hailed as an important first step that will allow our nation to use broadband to "unleash innovation, create new jobs and industries, provide consumers with new powerful sources of information, enhance American safety and security, and connect communities in ways that strengthen our democracy."[3]

Broadband generally and the *National Broadband Plan* specifically are of enormous importance to a wide array of communities and user groups across the country. For example, the *Plan* and numerous reports issued over the last several years have underscored the value of this technology to user groups such as senior citizens[4], people with disabilities[5], minorities[6], and low-income households[7], as well as specific industries like the healthcare[8], education[9], and energy[10] sectors. In each case, broadband is positioned to empower individual users and serve as the basis for fundamentally realigning whole industries. What is notable among all of these important and valuable studies is the lack of a specific focus on how broadband will impact women. Only one notable paper on this topic has been released over the last year. *Empowering Women in the 21st Century: Paving the Way with Broadband and Mobility* was a joint report of the National Foundation for Women Legislators (NFWL) and the National Organization of Black Elected Legislative Women (NOBEL/Women). It was released to the public and subsequently submitted to the FCC in an effort to "map out core principles for national policymakers as they consider our broadband future."[11]

As the NFWL-NOBEL/Women paper makes clear, broadband is a unique medium for women. It "connect[s] [them] to a stunning array of resources."[12] Women are using these resources to "reach out to wide networks of friends and family for support and counsel at any time of the day or night…find jobs, obtain training, address health issues, help aging parents, and make decisions about finances."[13] More specifically, women use broadband to, among other things, enhance interactions with and management of their families; bolster employment opportunities; and increase their participation in community and civic affairs.

This report elaborates on the core themes and proposals put forward in the NFWL-NOBEL/Women paper. In particular, this report further examines the importance of broadband to women by highlighting how women are using this technology to enhance family life, improve health outcomes, bolster their family's education, and pursue additional economic opportunities. Ultimately, this report positions women, particularly female policymakers, as essential stakeholders and key resources in broadband discussions going forward.

A.   *Report Overview*

Each section of the report includes two parts. First, each section provides an overview of how broadband impacts a certain aspect of a woman's life. Section 2 focuses on the impact of broadband on family life and community engagement; section 3 examines how broadband can be used to bolster healthcare; section 4 assesses the impact of this technology on education, focusing on both women as mothers and women as learners; and section 5 underscores the importance of broadband in facilitating economic opportunities for women.

The second part of each section reviews various policy proposals that have been put forward by entities such as the FCC and highlights areas where local and state policymakers can play a leading role in helping to implement those recommendations. Ultimately, a collaborative approach that leverages the core competencies and unique resources of local, state, and federal policymakers, private companies, and nonprofits is necessary to realizing the many important goals included in the *National Broadband Plan* and to ensuring that women are able to reap the many benefits enabled by broadband.

II.   FAMILY LIFE & COMMUNITY ENGAGEMENT

Among the many benefits and services enabled by broadband, perhaps none are as valuable to women as those that directly impact family life and engagement within their communities. Since women are typically at the center of families, they are oftentimes tasked with a broad array of responsibilities that encompass nearly every aspect of daily life, from making financial decisions to caring for children and aging parents. If properly harnessed, broadband could be a platform for not only making many family functions more efficient, it could also serve as a hub to bolster family connections. If they can harness the full power of the broadband platform, then perhaps women, especially those living in predominantly minority and low-income communities, can become ambassadors for this technology, urging others in their families and neighborhoods to adopt and learn how to use broadband to improve their lives.

This section begins by exploring how broadband impacts family life and community engagement. However, women still face a number of barriers to more robust adoption and informed utilization of broadband. Policy recommendations for addressing these barriers and possible next steps for local, state, and federal policymakers are examined in the second part of this section.

A.   *The Impacts of Broadband on Family Life & Community Engagement*

A little more than half of the U.S. population is female.[14] According to a recent analysis by the National Center for Health Statistics, approximately "46 [percent] of women aged 15–44 in 2002 were…married, and 9 [percent] were cohabiting [i.e., living together in a sexual relationship without being married]."[15] However, by 2005, "unmarried households became the majority of all U.S. households."[16] In addition, the Census Bureau in 2007 estimated that approximately 84 percent of single-parent families are headed by women."[17] Moreover, women

who choose to get married are doing so later in life. Indeed, in 2010 the average age of women at first marriage rose to 26 years, up from 22 in 1980.[18]

Women with families comprise a significant share of the workforce. According to the Bureau of Labor Statistics, "the labor force participation rate – the percent of the population working or looking for work – for all mothers with children under 18 was 71.4 percent in 2008."[19] Women are also increasingly working during and after pregnancies in order to bolster family earnings.[20] As a result, the number of two-income families in America has increased dramatically over the last several decades.[21]

These trends demonstrate that the traditional character of family life is changing rapidly in the 21st century. Women have long been seen as the core of most families, but the recent recession and several other societal factors have reshaped and expanded the role of women vis-à-vis families. As noted by NFWL-NOBEL/Women in a previous paper: "These responsibilities can be particularly challenging for women of color and those on low and fixed incomes. The weight of family management falls most heavily on the growing number of single moms, who usually must survive on limited resources or without sufficient family support to help ease their load."[22]

Broadband is an increasingly essential tool for women as they juggle many competing interests. This technology "can be a unifying force, connecting women more closely to family, friends, and community."[23] More specifically, women can use broadband as an outlet to communicate with friends via social networking portals[24]; monitor their child's educational performance via email and online school portals[25]; access online banking and financial resources via a smartphone or laptop[26]; and keep in better touch with parents and grandparents with who might live far away.[27]

The rising prominence of women as consumers of broadband has become a point of competition for a growing number of companies seeking to use the Internet to deliver more targeted services to this large segment of the marketplace. Indeed, the spending power of women is on the rise even during the recession. By one estimate, "in 35 percent of double-income households in the United States, wives now make more than their husbands, up from 28 percent five years ago."[28] As a result, a niche market has developed to provide women with a broad selection of specially designed broadband tools, ranging from designer laptops[29] to smartphone apps that help organize grocery lists.[30] These services are meant to ease the daily burden on women by, among other things, streamlining tedious tasks and freeing time for more pressing activities.

Women are also using broadband-enabled tools to bolster civic participation. In general, women are more avid voters than men. However, even though women had a much higher turnout rate than men during the 2008 election cycle,[31] men are still more likely to use the Internet to engage in civic activity and to participate in political dialogue than women.[32] This is important since "the Internet can deliver political empowerment, especially for women, minorities, the poor, and others who have struggled to have their voices heard."[33] More robust

utilization of broadband would allow women to more actively and consistently contribute to the "ongoing national conversation" that is increasingly being facilitated by broadband connections, laptops, and cell phones.[34] Thus, if women used the Internet to engage in civic activity and political dialogue at the same – or higher – rate than their male counterparts, it is likely that the dialogue in almost every policy issue arena would be affected and perhaps become even more representative since women, after all, constitute more than half of the country's population.

Taken together, these uses signal that broadband is not only a means of connecting women with family, friends, and their children's teachers, but also a vehicle for plugging women into communities. Technology use is often an accurate predictor of one's tendency to engage in group activities. In a recent survey, the Pew Internet and American Life Project found that "80% of Internet users are active in one kind of group or another, compared with 56% of non-Internet users; and 86% of cell owners are active in a group, compared with 62% of non-cell owners."[35] In general, a significant number of women are often more active in community and religious groups than men.[36] And those who are active Internet users "report higher levels of active group participation in the 30 days prior to the survey than do adults who are not online. Specifically, Internet users report higher rates of charitable donations, volunteering, attending meetings and events and taking leadership roles."[37] The Pew report concluded that the Internet has become an important means of holding groups together.[38]

In sum, broadband is quickly becoming the glue that holds many families and communities together. Whether accessed on a laptop or mobile device, broadband is transforming family life and community engagement among women of all ages and races. This technology allows mothers to stay abreast of where their children are and what they're doing at school. It allows them to stay in constant contact with remote relatives and aging parents. It provides an onramp to a growing universe of content that is being designed for the many roles that women invariably play: mother, employee, healthcare decision-maker, and family accountant. Moreover, broadband is also encouraging more community engagement among women. High-speed Internet connections make it much easier to participate in a community organization or church group. As the locus of so much activity within families and communities, women have the ability to play a key role in spreading the word about the real benefits of using broadband among non-adopters.

B. *Recommendations*

In order for women, their families and their communities to reap the full range of benefits enabled by broadband, policymakers at every level of government must address a number of barriers impeding further integration of broadband into family life. These include: bolstering the availability of next-generation wired and wireless broadband networks across the country; increasing broadband adoption across every demographic group; and bolstering digital literacy skills in order to ensure that every user is capable of realizing the full potential of broadband. By collaborating with nonprofit groups, broadband service providers, and other stakeholders, policymakers will assure that these issues are being resolved in a comprehensive and expedient

manner. More specifically, local and state-level policymakers are uniquely positioned to play an invaluable role in coordinating activities "on the ground" within specific communities and neighborhoods. To these ends, policymakers should address three pressing policy priorities vis-à-vis women, family life, and community engagement.

First, the FCC and other federal authorities must ensure that as many people as possible have access to cutting-edge broadband connections. As of 2010, broadband connections of some kind were available to the vast majority of households in the nation. According to the *National Broadband Plan*, "95 [percent] of the U.S. population…live[s] in housing units with access to terrestrial, fixed broadband connections capable of supporting actual download speeds of at least 4 Mbps."[39] In addition, 98 percent of the U.S. population lives in census tracts where at least one wireless provider offers third-generation (3G) mobile broadband service."[40]

Bringing broadband to unserved areas should certainly be a priority, but it should not dominate the resources and attention of policymakers.[41] Rather, policymakers would be wise to focus on creating an environment that encourages additional organic investment in broadband network infrastructure by service providers. Each year, service provides invest billions of dollars in their networks to increase availability and bolster capacity in an effort to keep up with exploding demand for more bandwidth-intensive services like online video.[42] To this end, the *National Broadband Plan* offers a number of recommendations that should be acted upon as soon as possible, either unilaterally by the FCC or Congress or in concert with stakeholders at the local and state level. These include:

> ➢ Making additional spectrum resources available to wireless service providers.[43] Additional spectrum is needed to support the deployment of more robust fourth-generation wireless networks that are capable of supporting much faster upload and download speeds. These networks will play a critical role in supporting further innovation in a variety of sectors, including healthcare (see section III).

> ➢ Modernizing the federal Universal Service Fund to support additional deployment of next-generation wired and wireless broadband networks to all areas of the country.[44]

> ➢ Working with local and state policymakers to facilitate more streamlined and timely access to critical rights-of-way that undergird every broadband network.[45]

> ➢ Partnering with states and municipalities to enhance broadband access at anchor institutions such as libraries and schools.[46]

Second, broadband must be adopted in larger numbers across the United States. By some estimates the broadband adoption rate is about 64 percent across all households.[47] However, the adoption rate among certain user groups remains below the national average:

> ➢ Only 60 percent of women have adopted broadband, compared to 67 percent of men.[48]

➢ Less than half of all Blacks and Hispanics have adopted broadband, compared to 68 percent of Whites and 77 percent of Asians.[49]

➢ 38 percent of people with a disability have adopted broadband, compared to 68 percent without a disability.[50]

➢ 40 percent of senior citizens have broadband at home, compared to 71 percent of adults between the ages of 16 and 44, and 68 percent of those between 45 and 64 years of age.[51]

➢ Households earning less than $25,000 per year have a broadband adoption rate of 36 percent, compared to an adoption rate of 94 percent for households with annual incomes over $100,000.[52]

The reasons for non-adoption are myriad and often differ from user group to user group.[53] However, there are many commonalities, including a perceived lack of relevance of broadband, concerns related to the affordability of the service, and whether it is safe to use.[54] Ultimately, the full potential of broadband can be achieved only if the adoption rate is maximized. For women, increasing the broadband adoption rate across every demographic group is essential to realizing many of the benefits discussed above. For example, broadband can only be used to keep in touch with remote relatives if both sides are connected to the Internet. Similarly, the ability of women to engage in community activities via broadband depends on whether public institutions are wired for broadband.

The FCC's *National Broadband Plan* has articulated a forward-looking strategy for bolstering the nation's broadband adoption rate. In the near term, the FCC should:

➢ Allocate a portion of federal Universal Service funds to subsidize broadband connections for low-income households and other at-risk populations.[55]

➢ Leverage the proximity and core competencies of local and state-level policymakers to bolster broadband adoption in specific communities and locales across the country.[56]

➢ Work with other federal entities, state and local governments, nonprofit groups, and other stakeholders to expand successful public-private partnerships explicitly focused on spurring broadband adoption.[57]

➢ Collaborate with policymakers at the local and state levels and companies in the private sector to "conduct a national outreach and awareness campaign" aimed at raising the profile of broadband among discrete communities of non-adopters.[58]

➢ Identify ways in which to leverage the popularity of wireless broadband among minorities and other user groups so that it can serve as a "gateway to inclusion" across all demographics.[59]

➢ Determine the most effective means of supporting "regional capacity-building efforts [e.g., local and state-level broadband offices] aimed at improving broadband deployment and adoption."[60]

➢ Facilitate the creation of a national broadband adoption best practices clearinghouse that pulls together examples of models, programs, and approaches that have succeeded in spurring utilization in municipalities and states across the country.[61]

In addition, policymakers at the local and state level should encourage women who are already active users of broadband to be ambassadors for the technology within their immediate communities. Hearing about the benefits of broadband from a friend or relative carries significant weight and could help to convince non-adopters of the benefits of using broadband.

Finally, stakeholders in the public and private sectors must work together to ensure that all broadband users are digitally literate and capable of harnessing the full power of broadband. The lack of these skills is a barrier to broadband adoption for a number of people.[62] As such, sharpening digital literacy skills across every demographic group should be a policy priority. To this end, the FCC and other policymakers should:

➢ Work together to formally launch the FCC's proposed National Digital Literacy Corps, the members of which would partner with local institutions (e.g., public libraries) to provide education and training resources for new broadband users.[63]

➢ Ensure the long-term sustainability of digital literacy initiatives being funded by the federal stimulus of 2009.[64] These include ambitious efforts like a nationwide initiative being spearheaded by One Economy in partnership with several civil rights organizations. This program seeks to raise awareness of the transformative power of broadband among some 20 million people across more than 20 states by convening training sessions, providing convenient access to computing equipment, and launching a national public awareness campaign.[65]

By enhancing digital literacy, a greater proportion of broadband adopters will be aware of the practical benefits that this technology enables. For example, enhanced digital literacy could assure that:

➢ More consumers are aware of potential cost-savings flowing from emerging broadband-enabled services like the smart grid. Indeed, in the absence of such awareness, consumer demand for these services might be too low to spur innovators to invest in deploying new systems that could save consumers substantial sums of money in the long run.[66]

➢ Broadband is used to enhance civic participation and community building. Increased use of broadband for these purposes could spur government at every level to increase the number and type of services available online, which could in turn spur demand for broadband across non-adopting communities.[67]

III.   HEALTHCARE

Women and their families will benefit immensely from the many broadband-enabled health information technology (IT), telemedicine, and e-care tools and services that are currently emerging across the healthcare sector.[68] These services are critical to women since, on average, they:

> ➤ Pay more for health insurance than men[69];
>
> ➤ Make the majority of family healthcare decisions[70];
>
> ➤ Are often the primary caretakers for aging parents[71];
>
> ➤ Are more likely than men to have a disability or chronic disease that requires ongoing treatment (e.g., arthritis, diabetes, hypertension)[72]; and
>
> ➤ Consume more health and medical services than men.[73]

Coupled with recent federal healthcare reforms, robust adoption and utilization of broadband-enabled health IT services is essential to ensuring that that healthcare for women becomes more affordable, more ubiquitous, and more effective.[74]

This section highlights how these tools will benefit women and articulates concrete recommendations for ensuring that women adopt and effectively utilize these services in greater numbers in the short term.

A.   *The Impacts of Broadband-Enabled Healthcare on Women*

Increasing the availability, affordability, and utilization of broadband-enabled health IT tools among women of all races is essential given their unique health needs.

Women, on average, have a higher life expectancy than men (80 years vs. 75 years).[75] However, women are more likely than men to suffer from chronic diseases and are more likely to contract a number of fatal diseases.[76] For example, women have higher incidences of arthritis, asthma, and cancer than men.[77] Women are also more likely than men to be severely obese, which often results in being homebound or extremely limited mobility.[78] Moreover, the unique physical nature of women exposes them to pernicious diseases like osteoporosis and thyroid problems, which are relatively rare among men.[79]

In addition, a woman's health varies depending on her income level and her race. Women below the poverty line, for example, are more likely to be obese than women above the poverty line.[80] Conversely, "self-reported health status improves with income. Women…with incomes less than 100 percent of poverty were least likely to report excellent or very good health…compared to about 60 percent of…women with incomes of 200–299 percent of poverty and 73 percent of those with incomes of 300 percent or more of poverty."[81]

Minority women have higher incidences of a number of chronic and fatal diseases than non-minority women. For example:

➢ Even though African American women were "10 percent less likely to have been diagnosed with breast cancer," they were "34 percent more likely to die from breast cancer, compared to non-Hispanic white women."[82]

➢ African American women are "twice as likely to be diagnosed with stomach cancer" than non-Hispanic white women, and are "2.4 times as likely to die" from it.[83]

➢ Hispanic women have "higher incidence and mortality rates for stomach and liver cancer."[84]

➢ Data from 2005 indicate that "Hispanic women were twice as likely as non-Hispanic white women to be diagnosed with cervical cancer."[85]

➢ Older African American and Hispanic women are more likely to develop Alzheimer's disease than older White women.[86]

➢ Asian women have "three times the incidence of liver & IBD cancer as the non-Hispanic white population." [87]

As a result of these trends and the need for specialized reproductive health services, women, as a group, consume significantly more medical services than men. Indeed, according to the U.S. Department of Labor, women account for approximately 60 percent of all expenses incurred at doctors' offices.[88]

Women are also the primary healthcare decision-makers in families. One recent survey estimated that women make approximately 80 percent of family healthcare decisions and are "more likely to be the caregivers when a family member falls ill."[89] These duties include: selecting a family doctor, taking a child to the doctor, ensuring that a child obtains recommended care, and making decisions about children's health insurance.[90] Somewhat paradoxically, these and similar healthcare decisions often lead to anxiety and depression for women, which often result in additional healthcare costs for their families.[91]

However, despite high rates of healthcare consumption by women and relatively high rates of susceptibility to chronic diseases, a significant number of women have either been unable to purchase or to afford healthcare coverage. Indeed, as previously mentioned women pay more for health insurance than men and, until recently, have been more susceptible to being denied healthcare coverage because of a pre-existing condition.[92] Hispanic, Native American, and African American women are more likely than White women to be uninsured, while insurance rates tend to increase among women as they age.[93]

These trends partly explain why many women fail to take advantage of preventative healthcare services like mammograms. According to the Centers for Disease Control in 2008, only 68 percent of women over the age of 40 had had a mammogram in the previous two years, while

only 75 percent of women over the age of 18 had a Pap smear within the previous three years.[94] Recent healthcare reforms have sought to reverse these trends, but additional action is needed. Thus, women in general should begin to adopt and utilize broadband-enabled health IT tools in order to access affordable and convenient healthcare services.

These tools hold much promise for addressing the unique healthcare needs of women. As an overview, these tools impact: the affordability of healthcare; access to healthcare and medical services; how healthcare services are consumed; and the overall healthcare paradigm in the United States.

In terms of affordability, many predict that robust adoption and utilization of health IT, telemedicine, and e-care services will drive down healthcare costs in the long-term. Indeed, the FCC estimates that "electronic health record ("EHR") systems have the potential to generate net savings of $371 billion for hospitals and $142 billion for physician practices from safety and efficiency gains over 15 years. Potential savings from preventing disease and better managing chronic conditions could double these estimates."[95] Similarly, broadband-enabled video consultations could streamline patient care and decrease unnecessary patient transfers, which could result in over $1 billion in annual cost savings.[96] More widespread use of remote patient monitoring services "could generate net savings of $197 billion over 25 years from just four chronic conditions."[97] Cost savings realized in the administration of healthcare services will drive down health insurance premiums and out-of-pocket costs for patients.

Improving healthcare, while reducing costs, is one of the reasons that HITECH was included in the stimulus package of 2009.[98] Under the provisions of HITECH, the Centers for Medicare and Medicaid Services will incentivize hospitals and healthcare providers to adopt EHR systems and use them in a meaningful and value-enhancing manner.[99] To this end, tens of billions of dollars will be spent over the next few years to ensure that as many people as possible – doctors, hospitals, patients, and other healthcare providers – have access to HER systems.[100] The effective use of EHRs depends on access to broadband in order for physicians and hospitals to be able to exchange data. In addition, personal EHRs empower patients to know and understand their medical conditions and treatments and enable them to become partners with their healthcare providers to take control of their health.[101] Patient empowerment and involvement in their healthcare is a key component to improving outcomes and potentially lowering costs.

Indeed, affordable healthcare is of paramount concern to women. Women require more healthcare than men and, on average, pay more for health coverage. In addition, women are more likely to pay out-of-pocket for certain expenses than men because they are more likely to be uninsured or have more limiting plans. For example, a 2005 study by the Kaiser Family Foundation estimated that 80 percent of women who "use prescription medicines regularly pay for some portion of the costs out-of-pocket."[102] The cost savings resulting from adoption and use of health IT services could have enormously positive impacts on the ability of women to purchase necessary health and medical services.

Broadband-enabled health IT services also provides women with access to a wider range of healthcare services. Most importantly, access to these services becomes more flexible and ubiquitous via broadband, which is essential for women, who often juggle a variety of responsibilities. To this end, the growing universe of mobile health services holds much potential for women. These wireless tools will ensure that healthcare is delivered regardless of location. As the FCC has noted, "innovations in mobile medicine include new modalities of non-invasive sensors and body sensor networks…Wireless body sensor networks reduce infection risk and increase patient mobility by eliminating cables; they also improve caregiver effectiveness."[103] In addition, broadband will allow constant access to family EHRs, which could prove invaluable in emergency cases involving children or other family members.

Increasing the amount of healthcare services accessible via broadband-enabled devices will have many other impacts on women. Women are already more likely than men to use broadband to look up health information.[104] As a result, women are poised to be avid consumers of more interactive and comprehensive health IT services delivered via a high-speed wired or wireless Internet connection. This could result in increased use of preventative care services by women. Increasing the consumption of these services by women of all races and ethnicities could result in further cost savings and, more importantly, a healthier female population.

Broadband-enabled health IT tools will also change how women consume healthcare services. For example, broadband will facilitate the delivery of remote monitoring tools that will assist women in caring for themselves, their children, and their aging parents. These tools could be of enormous value to women and their families.[105] To this end, robust utilization of in-home remote consultations would make it more convenient for working moms to telecommute from home by reducing the need to drive themselves or their children to the doctor for regular checkups. These kinds of services could eventually spur small business growth among women looking to reenter the workforce or shift careers (see section V for additional discussion). Similarly, pregnant women are now able to monitor their unborn child's vital signs via an iPhone application. The AirStrip OB "allows obstetricians to use their iPhones to remotely access virtual real-time and historical waveform data for both the mother and baby, including heart tracings and contraction patterns, as well as nursing notes and exam status. The data is sent directly from hospitals' labor and delivery units and can be accessed on the iPhone anytime and anywhere the doctor gets a cell-phone connection."[106] These types of mobile applications can enhance the care available to expecting mothers and provide peace of mind regardless of location.

Remote care is also essential to women who care for aging parents. A growing number of broadband-enabled remote monitoring tools, which leverage wireless sensors and wireless networks to transmit data in real time, are allowing older adults to age at home for longer. This is of critical importance to women since they live longer than men and, as a result, tend to develop more age-related diseases and disabilities.[107] Aging at home provides patients with added comfort and, by using broadband-enabled health IT tools, could be less costly than aging in a nursing home.

An emerging class of these remote monitoring systems is being used to track a range of health metrics. For example, FCC Chairman Julius Genachowski has noted that, via mobile broadband, a "patient's heart rhythm can be monitored continuously, regardless of her whereabouts, and diabetics can receive continuous, flexible insulin delivery through real-time glucose monitoring sensors that transmit data to wearable insulin pumps."[108] In its *National Broadband Plan*, the FCC noted that "mobile sensors in the form of disposable bandages and ingestible pills relay real-time health data (e.g., vital signs, glucose levels and medication compliance) over wireless connections."[109] These services are of particular value to those women, particularly African American and Hispanic women, who are more susceptible to developing diabetes.

Broadband-enabled remote monitoring tools are also being used to identify the early onset of chronic diseases like Alzheimer's. Women are much more likely to develop Alzheimer's since they live longer than men.[110] These types of diseases result in approximately $170 billion in healthcare costs each year.[111] Early interventions that delay the onset of these diseases, however, could result in billions in cost savings and other intangible benefits for women tasked with caring for aging parents.[112] Moreover, older women can use broadband to participate in online games and other activities that stimulate new brain functions, which have been found to delay the onset of certain cognitive diseases.[113]

Overall, broadband-enabled health IT tools are helping to shift the traditional healthcare paradigm towards a model that is more individualized and more geared towards preventative care.[114] Once fully implemented, this new model of care will have enormous impacts on women. They will be able to use broadband to access specialized care for themselves regardless of location. They will be able to make more informed healthcare decisions for their families and will be able to facilitate the delivery of quality in-home care for their children and aging parents. Over the long-term, women will be able to use broadband to save money, access the best care regardless of location, and age at home for longer.

B. *Recommendations*

The President, Congress, the FCC, and policymakers at every level of government recognize the enormous potential of broadband-enabled health IT to transform healthcare in the United States. Over the past year, several federal agencies, including the FCC, have focused on articulating a broad strategy for encouraging the rapid development and adoption of broadband-enabled healthcare tools. To this end, the FCC identified healthcare as a core national purpose for broadband and dedicated a full chapter of its *National Broadband Plan* to it.[115] The *Plan* put forward a number of recommendations to facilitate the timely development of an innovative and forward-looking health IT sector.

In order to realize the many goals identified for broadband-enabled healthcare in its *Plan*, the FCC should collaborate with a wide range of stakeholders, including local and state-level policymakers, in order to ensure that legal and policy frameworks in the states and at the federal level are capable of supporting cutting-edge healthcare tools and practices. In

particular, the following identifies several areas that are ripe for collaboration among policymakers at every level of government.

First, policymakers must focus on ensuring that mobile broadband networks are adequately positioned to serve as the backbone for emerging health IT tools. As mentioned above, wireless broadband is attractive to innovators in this space because of its flexibility and ubiquity. The FCC has recognized this role and has taken important strides to ensuring that innovators have access to the right set of ingredients to bolster wireless networks.[116] Foremost among these ingredients is spectrum, the finite resource that undergirds mobile broadband systems. However, wireless networks are composed of many other components, including routers, towers, and fiber backhaul. Even though the federal government manages the allocation of spectrum resources, local and state regulatory entities have the ability to influence mobile broadband network deployment by, among other things, granting access to rights-of-way. Moreover, policymakers at the local and state levels have the ability to levy taxes on wireless services and on wireless service providers, potentially creating disincentives to deploy and adopt new services in certain areas when tax rates become burdensome.[117] As such, a comprehensive approach to facilitating wireless deployment is necessary to ensure that critical new sectors like health IT are able to flourish in the near term. Critical components of such an approach should ensure that:

➢ The FCC and NTIA work together to realize the President's call for making available an additional 500 MHz of spectrum over the next decade.[118]

➢ New regulations do not impede the ability of broadband network owners, especially wireless service provides, to actively manage their networks and provide priority access for health IT and e-care services.[119]

➢ There is parity in how broadband services generally are taxed vis-à-vis similar services. One possible avenue is a national framework for taxing digital goods and services, as proposed by the FCC.[120]

➢ Municipalities and states do not implement rules and regulations that slow, rather than speed, wired and wireless broadband deployment.

Second, a number of federal and state laws and policies vis-à-vis healthcare will need to change in order to accommodate the expected growth in health IT utilization. These new tools are often beyond the scope of existing laws regarding insurance reimbursement, data security, privacy, and other issues related to the practice of medicine within and beyond state borders. As such, state policymakers are well positioned to facilitate the continued development and deployment of these services. Numerous changes to existing frameworks will be needed to support continued innovation and adoption of health IT services, including:

➢ Easing the regulatory barriers that are impeding further deployment and utilization of health IT tools.[121] These include modernizing and harmonizing state-level approaches to physician licensure, credentialing, privileging, and e-prescribing.[122]

➢ Facilitating adjustments to public and private healthcare reimbursement provisions in order to create incentives for doctors and hospitals to adopt more efficient telemedicine tools.[123]

➢ Collaboration with stakeholders in the public and private sectors to develop standards to govern the generation, analysis, storage, and transmission of digital health data (e.g., EHRs).[124]

➢ Development of a clear roadmap and strategy for using health IT tools to enhance the availability and affordability of quality medical care for women and their families.[125]

Third, states could create funds to support the development and deployment of health IT services and the broadband networks to support them. To this end, state policymakers could import best practices from FCC implementation of proposals related to these issues.[126] A component of these changes could be the transition of state USFs to support health IT networks and services.[127]

Fourth, policymakers at the local and state levels are uniquely positioned to raise consumer awareness of health IT tools in an effort to both drive adoption and ease any fears regarding the privacy and security aspects of these services. Skepticism regarding the value and reliability of health IT services is a significant barrier to more robust utilization of these tools across many demographic groups.[128] A concerted public awareness campaign – perhaps coordinated around health IT status reports issued by the FCC and relevant state entities – could spur adoption of these services by women and their families.[129]

IV. EDUCATION

In addition to enhancing family life and bolstering healthcare opportunities for women, broadband also serves as a delivery platform for innovative educational services and tools. These services are critical to women because they improve learning outcomes for children and provide them with a convenient, flexible, and affordable way to continue forward with their own education.

This section assesses the impact of broadband-enhanced educational opportunities on women as mothers and as learners. This section also highlights the many ways in which local, state, and federal policymakers can work together to ensure that women, their children, and their communities are able to benefit from these opportunities.

A. *The Importance of Broadband-Enhanced Education to Women & Their Families*

Women bear a significant amount of responsibility when it comes to educating their children. Numerous studies have linked the cognitive and psychological development of young children to the choices and actions of both parents.[130] Indeed, the type of environment in which parents raise their children is critical to setting them off on the right path in life. In addition, the level of

educational attainment of parents is a "good index of the social class of the family, and many psychological outcomes, including level of school achievement, frequency of aggressive behavior, and attitude toward authority."[131] However, a recent study found that mothers have much more significant impact on their children's education achievement than fathers.[132] Indeed, this study found a strong correlation between the educational attainment of mothers and the eventual educational attainment of daughters.[133] In particular, the study found that "for every year a woman stayed in full-time education, the likelihood of her daughter also staying for an extra year increased by 20 percent."[134] As such, women have every incentive to use broadband to not only enhance the educational opportunities available to their children, but also to use it to further their own education in the hopes that their own achievement will positively impact their children.

In the United States, there is significant need for improvements to the modern educational system. Students are not being adequately prepared for higher education, the high school dropout rate is still very high, and there is a growing gap in educational achievement between Whites and Asians on one side and Blacks and Hispanics on the other. In particular:

➢ Three out of every 10 public school students fails to finish high school with a diploma.[135] In some urban schools, more than half of students drop out of school.[136]

➢ Only 55 percent of Latino students and 51 percent of African American students graduate from high school, compared to over 75 percent of White and Asian students.[137]

➢ It is estimated that Black and Hispanic students are up to three years behind in learning compared to White students of the same age.[138]

➢ *S*tudents in the U.S. continue to underperform on exams testing a variety of skills, especially those in the STEM fields – i.e., science, technology, engineering and math.[139]

For women who are mothers, broadband matters with regard to the education of their children for three primary reasons.

First, enhanced access to and use of broadband in school and at home improves learning outcomes. The FCC's *National Broadband Plan* included ample evidence of the positive influence that broadband-enabled online classes can have on students, particularly those in middle school and high school.[140] In addition, a number of studies over the last decade have documented the positive impact that Internet use can have on students. For example, a study from 2002 observed that households with children aged 6-17 that had adopted broadband "reported that high-speed access affected both their online and offline activities, including schoolwork" and that, since getting broadband, "66 percent of participating children spent more time online…and 23 percent [improved their] grades."[141] A 2010 study conducted by the U.S. Department of Education found that, "[o]n average, students in online learning conditions performed better than those receiving face-to-face instruction."[142]

These benefits are especially evident and amplified in low-income households. A study from 2006, for example, found that low-income children who used the Internet on a regular basis performed better on reading tests and had higher grade point averages than did children who used it less.[143] A 2007 study by Computers for Youth, a nonprofit that provides low-income families with discounted laptops and digital literacy training, also found a correlation between increased computer and Internet use and improved test scores among this demographic.[144]

Second, broadband connects students to a vast array of educational materials that extend learning into the home and target the individual needs of students. Via broadband, learners of all skill levels are able to learn at their own pace.[145] Equally as important, broadband delivers educational materials and services wherever learning occurs. This means that mobile devices like smartphones and other such devices (e.g., tablets) are turned into educational vehicles by broadband.

Increasing the number and type of learning opportunities promotes the development of non-traditional educational approaches that could appeal to struggling or apathetic students. To this end, broadband is facilitating hybrid learning environments that mix different teaching approaches in the hope that integrating some online learning elements into the traditional classroom model will increase student interest and bolster achievement. Results to date have been promising.[146]

Third, and perhaps most importantly, integrating broadband into the modern educational model facilitates the development of digital literacy skills that are critical to success in the 21st century. Knowing how to use broadband and the universe of tools and services that it enables is essential to competing in the global digital marketplace. The FCC has observed that "digital literacy is a necessary life skill, much like the ability to read and write."[147] To this end, many of these skills are useful in the pursuit of careers in the so-called STEM fields. As a result, the U.S. Department of Education included in its *National Educational Technology Plan* the notion that the strategic use of educational technologies can help to bolster students' digital literacy skills, which in turn can help to improve learning outcomes and position high school graduates for successful careers in a number of STEM and non-STEM fields.[148]

For women as learners, broadband matters because it can connect them to numerous learning opportunities that might not otherwise be available. Enhancing educational achievement for women is essential because of the impact it has on their children and because of the range of economic opportunities that are opened up to them upon completion of higher education (section V provides additional discussion of these opportunities).

In general, women and men have comparable levels of educational achievement. In 2010, it was reported "women over 25…surpassed men in both bachelor's and graduate or professional degrees."[149] Earning such degrees is important to long-term economic success. It has been found that average annual earnings increase substantially with increased educational achievement. Indeed, the Census Bureau found that, in 2008, those with only a high school

diploma earned an average of $31,283 per year, compared to $58,613 for those with a college degree and $83,144 with a graduate degree.[150]

These gains, however, have not been equally distributed. Younger Black and Hispanic women, for example, have not, for a variety of reasons, been able to keep pace with the increased higher educational achievements of their White and Asian counterparts.[151] In addition, by some estimates only one third of all single mothers have some college education, and only 16 percent have earned a college degree.[152] Promoting the existence of a direct correlation between educational attainment and income could help to motivate women to pursue additional schooling. Moreover, the wide availability of broadband and the many educational opportunities that it facilitates could help many of these women achieve these goals.

In general, adults are utilizing broadband to access an array of continuing education programs. Online colleges and degree programs offer one of the most viable means of attaining an advanced degree for many women. The number of students enrolled in these programs has skyrocketed in recent years as the stigma around online degrees has all but disappeared.[153] Moreover, the number of older students enrolled in colleges generally has also increased over the last few years, perhaps reflecting the growing importance of such degrees in the modern workplace.[154]

As educators continue to integrate broadband into a wider range of educational settings across the country, the traditional education paradigm will inevitably shift towards more individualized and on-demand learning.[155] For parents, this will mean that their children will be able to access materials that are calibrated to their specific needs and abilities, allowing them to learn at their own pace without risk of falling behind. For learners, this paradigm will allow students of any age to continue forward with their education and earn the advanced degrees necessary to advance in an increasingly competitive domestic and international labor market.

B.   *Recommendations*

Enhancing educational achievement is a shared goal among policymakers at every level of government. While there are many disagreements regarding the means of achieving this end, there is significant agreement regarding the value of using broadband to bolster learning opportunities and position students of all ages for success in the 21st century. For women as both mothers and as learners, the promise of broadband vis-à-vis education is real. However, a number of open policy questions remain regarding further integration of broadband into the traditional educational paradigm.

Since the provision of education services has historically been a matter for local and state government, policymakers at these levels will play a key role in facilitating the rapid integration of broadband into schools and learning models. The federal government also has a role to play as a significant funder of state education. As such, there are numerous ways in which these and other stakeholders can work together to realize the seemingly limitless potential for broadband-enhanced education.

First, policymakers must work together to ensure that every classroom in the United States has ample broadband connectivity. According to a 2011 report by the FCC, while 95 percent of all participants in the federal e-Rate program reported broadband connectivity to at least one school facility, more than 80 percent said that these connections did not fully meet their current needs.[156] A report from 2009 estimated that the national average Internet access speed per student was just 6.5 Kbps.[157] As a result, many students in classrooms across the country are unable to access even the most basic of broadband-enabled education services. In addition, many of these same students are unable to access these services at home due to lack of a computer and/or the lack of broadband.[158] These students are oftentimes forced to seek computing resources and Internet connections at local anchor institutions like libraries. However, in many cases, libraries are unable to meet the computing needs of children.

In order to level the playing field among students, policymakers should:

- ➤ Continue to implement reforms to the e-Rate fund. The FCC has adopted several changes over the past year in an effort to make the fund more responsive to current needs.[159] Additional changes are necessary to continue bolstering broadband access in schools, including an increase in the total funding available to schools.[160] For example, policymakers could create incentives and mechanisms to increase utilization of wireless broadband services and devices in schools.[161]

- ➤ Work together to determine an appropriate level of broadband connectivity for schools.[162]

- ➤ Ensure that as many schools and libraries as possible are able to use e-Rate funding for broadband connections.[163]

- ➤ Collaborate with local and state policymakers to reward those schools and programs that "best incorporate broadband connectivity into the educational experience."[164] In addition, policymakers and school officials at the local level are well positioned to serve as key resources in the development of knowledge exchanges and best practice clearinghouses that are meant to spur additional adoption and utilization of broadband-enabled tools for learning and teaching purposes.[165]

Second, policymakers must also focus a significant amount of resources on ensuring that all users – women as learners, women as mothers, children, and teachers – have the digital literacy skills needed to realize the full transformative power of broadband. Indeed, the lack of such skills among teachers is especially significant since they are best positioned to instill these skills in students in the first instance.[166] However, parents, and mothers in particular, must also possess these skills if they are to reinforce at home what is learned in school. In order to ensure that all users possess these skills, the following steps should be taken:

- ➤ Local and state officials should develop "digital literacy standards" for curricula and other programs in K-12 settings.[167]

- School officials at the local, state, and federal levels should consider focusing digital literacy development around the STEM subjects in order to bolster achievement in these areas.[168]

- State and federal government entities should create funding mechanisms to "help train teachers in digital literacy and programs targeting STEM."[169]

- Encourage the formation of public-private partnerships in an effort to enhance teacher training in the areas of digital literacy and STEM.[170]

- School officials, policymakers, and other stakeholders at the local, state, and federal levels should continue to work together to implement the STEM-related components of the America COMPETES Act, which was reauthorized in January 2011.[171]

Third, there must be sufficient broadband-enabled outlets and content available to engage women as mothers and women as learners. To this end, the continued development of digital educational resources is essential to ensuring that students of all ages are able to use broadband to enhance their education and position themselves for success in the 21st century. Necessary steps toward achieving these goals include:

- Collaboration among federal and state policymakers and stakeholders in the private sector to "establish standards…for locating, sharing, and licensing digital education content."[172] This is necessary in order to ensure that there is sufficient content available for access on broadband-enabled devices in school and at home.

- Incentives to encourage textbook publishers and other creators of educational content to co-publish content in written and digital form.[173] Once again, this would help ensure that there is sufficient digital content for learners of all ages.

- Local, state, and federal policymakers should work together to develop "interoperability standards" to ensure that data created, owned and/or stored at various levels (e.g., local school districts, the U.S. Department of Education) are compatible.[174] Otherwise, sharing and improving upon content will be all but impossible.

- State education officials should accelerate the accreditation process for new and emerging online learning platforms and portals.[175] Doing so will create additional incentives for students to enroll in these classes, which in turn will create incentives for teachers to bolster their digital literacy skills.

- Additional funding is likely necessary to support the development and deployment of additional online learning opportunities. As such, local, state, and federal policymakers, along with stakeholders in the private and nonprofit sectors, should collaborate on creating new funding mechanisms (e.g., grant programs) to support these efforts.[176]

V.   ECONOMIC OPPORTUNITIES

One of the most important and tangible aspect of broadband for women – especially those tasked with helping to support a family – is its ability to enable more robust economic opportunities. If properly leveraged, broadband Internet access can be a means of working from home, searching for a new job, networking, developing new skills, and launching a small business. It is this flexibility that makes broadband such a valuable tool for women.

This section details the many ways in which broadband impacts the economic opportunities available to women of all ages. This discussion is framed around an analysis of the current financial and employment situation for women in the United States. Even though more women are entering the workforce, there is still a significant income gap between men and women. Broadband could be one of the primary means of closing this divide. This section concludes by articulating policy recommendations aimed at positioning broadband to be an easily accessible and affordable way for women to bolster their economic standing in the United States.

A.   *The Impacts of Broadband on Economic Opportunities for Women*

Women currently comprise about 47 percent of the civil labor force in the U.S. and, in general, have weathered the recession better than men.[177] Indeed, as of February 2011, the unemployment rate for adult women was 8.0 percent, compared to 8.7 percent for adult men.[178] However, the participation rate of women in the workforce is significantly less than the participation rate for men – 73 percent for men versus 60 percent for women.[179] Even so, women's earnings are contributing an ever larger percentage to overall married-couple income.[180]

However, women, on average, still earn less than their male counterparts. Indeed, a wage gap between men and women has persisted over many decades. Currently, women earn approximately 80 percent of what men do.[181] This discrepancy is further exaggerated among African American and Hispanic women. According to the Institute for Women's Policy Research, "African American women earned on average only 61.9 cents for every dollar earned by white men, and Hispanic women earned only 52.9 cents for each dollar earned by white men."[182] A recent report from the U.S. Bureau of Labor Statistics underscored the racial divide in earnings among women when it found that the median weekly earnings of White women employed full-time was $669, compared to $582 for Black women and $509 for Hispanic women.[183] However, earnings increase substantially as women complete more schooling.[184] For example, a woman with only a high school diploma earns an average of only $542 per week, compared to $891 for women with a bachelor's degree.[185]

Even though the employment opportunities for women have generally increased and diversified over the last several years, as evidenced in part by the rising number of women in the workforce, there are still many industries where women face significant barriers. For example, women are far less likely than men to be self-employed.[186] In addition, despite comprising half of the overall population and about half of the overall workforce, women

represented only about a quarter – 27 percent – of computer and mathematics workers nationwide in 2008.[187] For Black and Hispanic women, these numbers are even lower. By one estimate, women and underrepresented minorities, including African Americans and Hispanics, comprise just 8.3 percent of entry-level technical positions, 6.5 percent of mid-level positions, and 5.6 percent of high-level positions.[188] Among Blacks, 4.6 percent of entry-level positions are held by women, while 1.6 percent of high-level technical positions are held by Black women.[189] The employment rate for Hispanic women in similar positions is even lower.[190]

These particular trends are important given the prominence of entrepreneurialism and the high-tech sector in President Obama's plans to revitalize the U.S. economy. In his 2011 State of the Union address, the President underscored the key role that innovation will play in ensuring that the U.S. remains competitive in the global marketplace.[191] In order to "win the future," President Obama envisions an America where the economy is driven, in large part, by scientists and high-tech firms. Working now to prepare the next generation of workers by enhancing the educational opportunities available to students is essential for long-term growth. But in the short-term, it is equally as essential that women and minorities use broadband as a platform to contribute to the revitalization of the U.S. economy, via increased entrepreneurial activity, additional participation in the high-tech sector, and an overall increase in the number of women in the workforce. A primary means for accomplishing these goals is broadband.

Broadband provides women with much needed employment flexibility. Since broadband Internet access is quickly becoming a "prerequisite to economic opportunity for individuals, small businesses and communities," connecting more women and ensuring that they are able to leverage it for economic purposes should be a priority.[192] This technology enables telecommuting, which is an increasingly attractive option for women seeking to reenter the workforce after having a child.[193] Indeed, according to a study cited by the FCC in its *National Broadband Plan*, "31 [percent] of homemakers…would be willing to join the workforce if given the option to telework."[194] Mobile broadband, and the many devices that it enables, is particularly valuable to women who wish to work regardless of location. Wireless broadband untethers workers from an office and allows them to contribute wherever they might be.

Broadband also provides women with access to the increasing number of online-only job postings and applications.[195] According to a survey released by the FCC in early 2010, a higher percentage of women than men use their broadband connections to get information about a job or to apply to an open position.[196] In addition, approximately two-thirds of parents with a minor child at home use broadband for these purposes, suggesting a considerable amount of pent up demand for flexible work options.[197] Similarly, Black and Hispanic broadband adopters are much more likely to access this type of employment information than White users.[198] Broadband Internet access is also useful for networking purposes and for acquiring additional information regarding job opportunities, new industries, and other such resources.

Perhaps most importantly, however, broadband is a key enabler of small and medium enterprise (SME) growth. SMEs are a primary driver of economic growth and job creation in the United States. These firms employ more than half of all private sector workers in the U.S. and

"create roughly 64 [percent] of net new private sector jobs each year."[199] Broadband Internet access is increasingly pivotal to their success, their ability to compete, and the ability of entrepreneurs to launch new SMEs. Indeed, in a report issued in 2010, the U.S. Small Business Administration (SBA) underscored the importance of broadband to small businesses across the United States. Over 90 percent of small businesses have adopted broadband and many are demanding additional capacity in order to deliver more services to consumers.[200] Wireless broadband in particular is increasingly valuable to SMEs since it enables a wide range of devices, facilitates mobility, and has succeeded in creating new markets (e.g., mobile app development).[201] In general, SMEs are especially important in the high-tech sector. The SBA estimates that small businesses hire "40 percent of high tech workers, such as scientists, engineers and computer workers."[202]

Although women and minorities already comprise a sizeable percentage of SME owners in the United States, the number of self-employed women has decreased every year since 2003.[203] In addition, women and minorities have long faced barriers to SME growth, including a lack of access to capital.[204] The FCC, however, predicts that increased adoption and utilization of broadband by these groups could increase the number of women- and minority-owned SMEs in the near term.[205] Ultimately, it is hoped that this technology can ensure that women are able to continue launching small businesses and otherwise pursuing their entrepreneurial dreams.[206]

B. *Recommendations*

Despite many positive indicators, the economic opportunities available to women of all ages have stagnated during the recent recession. Broadband does hold much promise for connecting women to a number of opportunities available online, but much work remains to be done to achieve these goals. To this end, policymakers at every level of government have a responsibility to ensure that women have equal access to the universe of economic opportunities enabled by broadband.

First, policymakers at the local, state, and federal levels should work together to implement a comprehensive approach to enhancing the digital literacy skills of all women in order to ensure that they are fully capable of leveraging the transformative power of broadband for economic gain. Since "sixty-two percent of American workers [currently] rely on the Internet to perform their jobs," increased digital literacy is essential for long-term economic success.[207] Training programs could be layered on top of existing workforce development initiatives in cities and states across the country or new ones could be launched that focus exclusively on digital workforce training. Regardless of the route taken, there are several common goals that should animate policy initiatives. To this end, policymakers should:

➢ Work with the SBA and relevant entities at the state and local levels to "provide enhanced information technology applications training."[208] The SBA could create an umbrella program through which federal funds are funneled to state and local entities engaged in digital workforce development.

- Encourage existing federal and state workforce development programs to "use broadband and online applications to scale their services and give small businesses access to a virtual network of experts."[209] For example, the U.S. Department of Labor could leverage its existing digital resources to "deliver virtual employment assistance programs" more widely available.[210] Making these resources available online would be especially beneficial to those women who wish to work from home.

- Forge public-private partnerships to "provide technology training and tools to small disadvantaged businesses in low-income areas."[211] These efforts would be of value to minority and low-income women, a significant number of which remain unconnected to broadband. Providing these resources could spur additional entrepreneurial activity in some of this country's most disadvantaged areas.

Second, policymakers should pursue a multifaceted strategy for providing direct and indirect financial support and other resources to encourage SME creation by women and minorities. These resources would help to lower the many barriers to entry faced by women and minority entrepreneurs. To this end:

- Additional funding should be directed to federal entities like the Economic Development Administration and state equivalents in order to "bolster entrepreneurial development programs with broadband tools and training."[212] Providing additional resources could help local and nonprofit programs "increase their scale and reach."[213]

- The federal government should continue to develop and scale out programs like Startup America. Launched in follow up to President Obama's 2011 State of the Union address, Startup America is a "White House initiative to celebrate, inspire, and accelerate high-growth entrepreneurship throughout the nation."[214] This public-private partnership will bring together "an alliance of the country's most innovative entrepreneurs, corporations, universities, foundations, and other leaders, working in concert with a wide range of federal agencies to dramatically increase the prevalence and success of America's entrepreneurs."[215] In particular, Startup America will allocate corporate donations and in-kind support to support high-tech SME creation. This effort should serve as a model for municipal and state governments seeking to bolster local economic development.

- Local and state governments should, whenever possible, work to lower and harmonize the tax burden for digital businesses. As previously discussed, a number of digital businesses and services bear a disproportionate tax burden relative to similar services offered in the analog world. Tax parity is essential to supporting a more innovative and competitive SME sector in the U.S.

Third, women in particular will benefit most immediately from broadband by having additional employment flexibility. To this end, policymakers at the federal and state levels should modernize policies to encourage more telework in the public sector and should create incentives for private sector companies to enhance the range of remote working options.[216] Indeed, policymakers have the ability to eliminate "tax and regulatory barriers to telework."[217] For example, in the near term, states could reconcile disparate tax policies vis-à-vis non-resident workers in order to encourage more cross-border telework arrangements.[218] In addition, Congress could address instances of "double taxation" in order to ensure that tele-workers are not inadvertently penalized for working remotely.[219]

Finally, policymakers at the local and state levels should collaborate with stakeholders in the private and nonprofit sectors in order to use broadband to spur local economic development. Several studies have found a direct correlation between broadband availability, job creation, and economic development.[220] As a result, broadband could play an important role in bolstering flagging state and municipal economies. In addition, federal policymakers could redirect funding and grant support to local and regional economic development entities[221] and could encourage the creation of a central clearinghouse of best practices and data to facilitate continued innovation.[222]

VI.   CONCLUSION

The *National Broadband Plan* and subsequent policy actions taken by the FCC and other federal entities in 2010 were critical first steps towards ensuring that broadband is used to "create today's high-performance America – an America of universal opportunity and unceasing innovation, an America that can continue to lead the global economy, an America with world-leading, broadband-enabled healthcare, education, energy, job training, civic engagement, government performance and public safety."[223] Achieving these myriad goals and assuring that every gain that is made is as inclusive as possible will be difficult. Indeed, a 21st century American society where significant numbers of women, minorities, and other under-adopting communities remain offline will delay the realization of the transformative power of broadband. These imperatives are clear. The economic and social health of the United States rests in large part on the many benefits that broadband can deliver. As such, policymakers at every level of government have a duty to ensure that no one is left behind in the transition to a nation whose 21st century social and economic infrastructure is built upon broadband.

In addition to underscoring the importance of broadband to women, this report has also highlighted numerous areas where local, state, and federal policymakers can and should work together to realize the full potential of broadband. Ongoing dialogue and collaboration among policymakers is critical to making incremental progress in every community across the country. In addition, this report has also identified many areas where public-private partnerships can help to address particular issues, especially those related to increasing broadband adoption rates among women and enhancing their digital literacy skills. Moreover, policymakers at the

local and state level have the ability to set critical policies that influence key investment and adoption decisions by service providers and consumers, respectively.

The *National Broadband Plan*'s inspirational vision for broadband in America will require more than just words on a page. It will require hard work, collaboration across party lines, and the dedication of public policymakers in every town, city, and state in the country. If broadband truly is the key ingredient to unleashing innovation and assuring consistent economic growth – and there is no doubt that it is – then policymakers must act with the appropriate urgency to ensure that this call to action does not go unanswered.

ENDNOTES

[1] *See, e.g., Remarks by the President in State of Union Address*, Office of the Press Secretary, The White House, Jan. 25, 2011, *available at* http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address ("*Obama State of the Union 2011*").

[2] *See Connecting America: The National Broadband Plan*, Federal Communications Commission (rel. March 16, 2010), *available at* http://download.broadband.gov/plan/national-broadband-plan.pdf ("*FCC NBP*").

[3] *See Statement from the President on the National Broadband Plan*, Office of the Press Secretary, The White House, March 16, 2010, *available at* http://www.whitehouse.gov/the-press-office/statement-president-national-broadband-plan.

[4] *See, e.g.,* Charles M. Davidson & Michael J. Santorelli*, The Impact of Broadband on Senior Citizens*, A Report to the U.S. Chamber of Commerce (Dec. 2008), *available at* http://www.uschamber.com/sites/default/files/about/BroadbandandSeniors_0.pdf.

[5] *See, e.g., A Giant Leap and a Big Deal: Delivering on the Promise of Equal Access to Broadband for People with Disabilities*, OBI Working Paper Series No. 2, FCC (April 2010), *available at* http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-%28obi%29-working-report-giant-leap-big-deal-delivering-promise-of-equal-access-to-broadband-for-people-with-disabilities.pdf.

[6] *See, e.g.,* Dr. Jon P. Gant et al., *National Minority Broadband Adoption*, Joint Center for Economic & Political Studies (Feb. 2010), *available at* http://www.jointcenter.org/publications1/publication-PDFs/MTI_BROADBAND_REPORT_2.pdf.

[7] *See, e.g.,* Dharma Dailey et al., *Broadband Adoption in Low Income Communities*, Social Science Research Council (March 2010), *available at* http://webarchive.ssrc.org/pdfs/Broadband_Adoption_v1.1.pdf.

[8] *See, e.g.,* Charles M. Davidson & Michael J. Santorelli*, The Impact of Broadband on Telemedicine*, A Report to the U.S. Chamber of Commerce (April 2009), *available at* http://www.uschamber.com/sites/default/files/about/0904Broadband_and_Telemedicine.pdf ("*The Impact of Broadband on Telemedicine*").

[9] *See, e.g.,* Charles M. Davidson & Michael J. Santorelli*, The Impact of Broadband on Education*, A Report to the U.S. Chamber of Commerce (Dec. 2010), *available at* http://www.uschamber.com/sites/default/files/about/US_Chamber_Paper_on_Broadband_and_Education.pdf ("*The Impact of Broadband on Education*").

[10] *See, e.g., FCC NBP* at chapter 12.

[11] *See Empowering Women in the 21st Century: Paving the Way with Broadband and Mobility*, at p. 2, A Joint Policy Paper from NOBEL Women and NFWL, submitted In the Matter of Preserving the Open Internet, GN Docket No. 09-191, FCC (submitted Jan. 13, 2010) (hereinafter "Empowering Women in the 21st Century").

[12] *Id.* at 1.

[13] *Id.*

[14] U.S. Census Bureau, State & County Quick Facts: USA, http://quickfacts.census.gov/qfd/states/00000.html.

[15] *Marriage and Cohabitation in the United States: A Statistical Portrait Based on Cycle 6 (2002) of the National Survey of Family Growth*, at p. 1, National Center for Health Statistics, Centers for Disease Control and Prevention, U.S. Dept. of Health & Human Services (Feb. 2010), *available at* http://www.cdc.gov/nchs/data/series/sr_23/sr23_028.pdf.

[16] Alternative to Marriage Project, Statistics, http://www.unmarried.org/statistics.html (citing the U.S. Census Bureau's American Community Survey: 2005).

[17] *See Custodial Mothers and Fathers and Their Child Support: 2007*" at p. 2, U.S. Census Bureau (Nov. 2009), *available at* http://www.census.gov/prod/2009pubs/p60-237.pdf.

[18] *See Estimated Median Age at First Marriage, by Sex: 1890 to the Present*, Table MS-2, U.S. Census Bureau, *available at* http://www.census.gov/population/socdemo/hh-fam/ms2.xls.

[19] See "Employment Characteristics of Families in 2008," May 27, 2009, available at http://www.bls.gov/news.release/famee.nr0.htm (hereinafter "Employment Characteristics of Families in 2008").

[20] According to the U.S. Census Bureau," 67 percent of women who gave birth for the first time between 2001 and 2003 and worked during their pregnancy. This compares with 44 percent who gave birth for the first time between 1961 and 1965." In addition, 55 percent of first-time mothers in the early part of this decade were working six month after they gave birth. "In the early 1960s, the corresponding percentage was 14 percent." See "Mother's Day: May 10, 2009," Facts for Features, March 10, 2009, available at http://www.census.gov/Press-Release/www/releases/archives/facts_for_features_special_editions/013412.html.

[21] According to the Bureau of Labor Statistics, more than half of all married-couple families were dual-income families in 2008. Employment Characteristics of Families in 2008.

[22] *Empowering Women in the 21st Century* at p. 1.

[23] *Id.* at p. 3.

[24] *See, e.g.,* Amanda Lenhart, *Data Memo: Adults and Social Networking Sites*, Pew Internet & American Life Project (Jan. 14, 2009), available at http://www.pewinternet.org/~/media//Files/Reports/2009/PIP_Adult_social_networking_data_memo_FINAL.pdf.pdf.

[25] See, e.g., *Empowering Women in the 21st Century* at p. 3. Additional impacts of broadband on education are discussed *infra*.

[26] A 2006 study found that men and women are equally as likely to use online banking services. *See* Susannah Fox and Jean Beier, *Online Banking 2006*, at p. 2, Pew Internet & American Life Project (June 2006), available at http://www.pewinternet.org/~/media//Files/Reports/2006/PIP_Online_Banking_2006.pdf.pdf.

[27] An increasingly popular trend among grandparents, their children and grandchildren who live far away or who are unable to travel is using a broadband-enable web-cam to visit with each other. See, e.g., Amy Harmon, *Grandma's on the Computer Screen*, Nov. 26, 2008, N.Y. Times.

[28] *See* Rana Foroohar, *Why Companies Need to Cater to Women*, June 13, 2010, Newsweek, *available at* http://www.newsweek.com/2010/06/13/the-richer-sex.html.

[29] *Id.* (citing a new line of "Vivienne Tam–designed "digital clutch" laptops made by Hewlett-Packard).

[30] *See, e.g.,* Ric Romero, *The Best Smartphone Apps Made for Women*, March 8, 2010, ABC News, *available at* http://abclocal.go.com/kabc/story?section=news/consumer&id=7319408.

[31] *See Voting & Registration in the Election of Nov. 2008*, Table 4b. - Reported Voting and Registration of the Voting-Age Population, by Sex, Race and Hispanic Origin, for States: November 2008, U.S. Census Bureau, *available at* http://www.census.gov/population/socdemo/voting/cps2008/Table%204b.xls.

[32] *See* Aaron Smith et al., *The Internet and Civic Engagement*, at p. 18, Pew Internet & American Life Project (Sept. 2009), available at http://www.pewinternet.org/~/media//Files/Reports/2009/The%20Internet%20and%20Civic%20Engagement.pdf.

[33] *Empowering Women in the 21st Century* at p. 4.

[34] *Id*.

[35] *See* Lee Rainie, Kristin Purcell & Aaron Smith, *The Social Side of the Internet,* at p. 4, Pew Internet & American Life Project (Jan. 2011), *available at* http://www.pewinternet.org/~/media//Files/Reports/2011/PIP_Social_Side_of_the_Internet.pdf.

[36] *Id*. at p. 8.

[37] *Id*. at p. 20.

[38] *Id.* at p. 24.

[39] *FCC NBP* at p. 20.

[40] *Id.* at p. 40.

[41] *See, e.g.,* Blair Levin, *Universal Broadband: Targeting Investments to Deliver Broadband Services to All Americans*, A White Paper on the Universal Service Recommendations of the Knight Commission on the Information Needs of Communities in a Democracy (Nov. 2010), *available at* http://www.knightcomm.org/wp-content/uploads/2010/09/Universal_Broadband_Blair_Levin.pdf ("*Universal Broadband: Targeting Investments*").

[42] *See, e.g.,* Robert W. Crandall & Hal J. Singer, *The Economic Impact of Broadband Investment*, at p. 12, 38-43 (Feb. 2010) (observing that between 2003 and 2009, communication service providers invested over $190 billion in last-mile broadband technologies and estimating the service providers will likely invest an average of $30 billion in broadband networks between 2010 and 2015); Charles M. Davidson & Bret T. Swanson, *Net Neutrality, Investment & Jobs: Assessing the Potential Impacts of the FCC's Proposed Net Neutrality Rules on the Broadband Ecosystem*, New York Law School (June 2010), *available at* http://www.nyls.edu/user_files/1/3/4/30/83/Davidson%20&%20Swanson%20-%20NN%20Economic%20Impact%20Paper%20-%20FINAL.pdf (providing a thorough analysis of the relationship between regulation and investment decisions by innovators in the broadband ecosystem).

[43] *FCC NBP* Recommendation 5.8 (calling for the FCC to make an additional 500 MHz of spectrum available over the next 10 years).

[44] *Id.* at Recommendations 8.1 – 8.15 (outlining the FCC's three step process to modernizing the federal Universal Service Fund and Intercarrier Compensation frameworks). The FCC has begun to take steps toward implementing many of these recommendations. *See In the Matter of Connect America Fund et al.*, Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, WC Docket 10-90 (rel. Feb. 9, 2011).

[45] *FCC NBP* at Recommendations 6.1 – 6.6 (highlighting the many ways in which the FCC, Congress, the states, and municipalities can work together to streamline rights-of-way management).

[46] *Id.* at Recommendations 8.20 and 8.22.

[47] *See Exploring the Digital Nation: Home Broadband Internet Adoption in the United States*, at Table 1, NTIA (Nov. 2010), *available at* http://www.ntia.doc.gov/reports/2010/ESA_NTIA_US_Broadband_Adoption_Report_11082010.pdf ("*NTIA Broadband Adoption Survey*").

[48] *Id.*

[49] *Id.*

[50] *Id.*

[51] *Id.*

[52] *Id.*

[53] *See, e.g.* Charles M. Davidson, Michael J. Santorelli and Thomas Kamber, *Broadband Adoption: Why it Matters & How it Works*, 19 Media Law & Policy 14, 17-22 (2009-2010), *available at* http://www.nyls.edu/user_files/1/3/4/30/84/88/MLP19-1.pdf (discussing an array of trends related to broadband adoption across various user groups) ("*Broadband Adoption: Why it Matters & How it Works*"); Charles M. Davidson & Michael J. Santorelli, *Barriers to Broadband Adoption: A Report to the FCC*, Advanced Communications Law & Policy Institute at New York Law School (Oct. 2009), *available at* http://www.nyls.edu/user_files/1/3/4/30/83/ACLP%20Report%20to%20the%20FCC%20-%20Barriers%20to%20BB%20Adoption.pdf (highlighting a number of barriers to broadband adoption for seniors and people with disabilities and underscoring the sector-specific nature of many of these barriers) ("*Barriers to Broadband Adoption*").

[54] *Broadband Adoption: Why it Matters & How it Works.*

[55] *FCC NBP* at Recommendations 8.6 and 9.1; *Universal Broadband: Targeting Investments* at p. 23-24.

[56] *FCC NBP* at 170-171 (noting that "state and local governments are often in the best position to identify barriers and circumstances unique to their communities").

[57] *Id.* at Recommendations 9.4 and 9.5.

[58] *Id.* at Recommendation 9.7.

[59] *Id.* at Recommendation 9.6.

[60] *Id*. at Recommendation 9.11.

[61] *Id.* at Recommendation 9.13.

[62] *Id*. at p. 174 (finding that 22 percent of non-adopters "cite digital literacy as their main barrier to broadband adoption.").

[63] *Id.* at Recommendation 9.3.

[64] The 2009 American Recovery and Reinvestment Act (ARRA) created a Broadband Technology Opportunities Program within the National Telecommunications and Information Administration (NTIA) of the Department of Commerce, which distributed $4.7 billion to fund the deployment of broadband infrastructure in unserved and underserved areas in the country. Over $200 million of that money was used to support programs that help facilitate broadband use and adoption. *See,* e.g., *Bill Summary: Energy and Commerce Provisions on Healthcare, Broadband and Energy,* U.S. House of Representatives Committee on Commerce, Feb. 12, 2009, *available at* http://energycommerce.house.gov/Press_111/20090212/economiceecoverysummary.pdf.

[65] NTIA, BTOP: Grants Awarded – Sustainable Adoption, http://www2.ntia.doc.gov/grantees/OneEconomyCorp.

[66] *See, e.g., Barriers to Broadband Adoption* at p. 61-62.

[67] *FCC NBP* at Recommendation 14.18.

[68] For an overview of these various technologies, *see The Impact of Broadband on Telemedicine.*

[69] *See, e.g.*, Denise Grady, *Overhaul Will Lower the Costs of Being a Woman*, March 30, 2010, N.Y. Times ("*Overhaul Will Lower the Costs of Being a Woman*").

[70] *See* Kaiser Family Foundation, *Women & Health Care: A National Profile*, at p. vii (July 2005) ("*Women & Health Care: A National Profile*").

[71] *Id.*

[72] *Id*. at p. 8. *See also* Susannah Fox and Kristen Purcell, *Chronic Disease and the Internet*, at p. 11, Pew Internet & American Life Project (March 24, 2010), *available at* http://www.pewinternet.org/~/media//Files/Reports/2010/PIP_Chronic_Disease.pdf (finding that 58 percent of women report at least two chronic conditions, compared to 44 percent of men) ("*Chronic Disease and the Internet*").

[73] *See How Women Will Benefit from Health Care Reform*, at p. 2, National Women's Law Center, (March 2010), *available at* http://nwlc.org/reformmatters/pdf/statewhywomenneedhcr/NATIONALHCRFactSheet_FinalPush.pdf.

[74] *See, e.g.*, Jenna Goodreau, *What the Health Care Bill Means for Women*, March 23, 2010, Forbes.com, *available at* http://www.forbes.com/2010/03/23/health-care-bill-peolosi-forbes-woman-well-being-health-insurance-expenses.html?boxes=Homepagemostpopular; *Overhaul Will Lower the Costs of Being a Woman*.

[75] *See Women's Health USA 2009 – Life Expectancy*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/hi/pages/207le.html.

[76] *Women & Health Care: A National Profile* at p. 8.

[77] *Id.*

[78] *See Women's Health USA 2009 – Overweight and Obesity*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/hi/pages/215oo.html.

[79] *Women & Health Care: A National Profile* at p. 8.

[80] *See Women's Health USA 2009 – Overweight and Obesity*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/hi/pages/215oo.html.

[81] *See Women's Health USA 2009 – Self-Reported Health Status*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/hi/pages/206srhs.html.

[82] *See African American Profile*, U.S. Department of Health and Human Services, The Office of Minority Health, *available at* http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlid=51.

[83] *Id.*

[84] *See Hispanic/Latino Profile*, U.S. Department of Health and Human Services, The Office of Minority Health, *available at* http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlid=54.

[85] *Id.*

[86] *See 2010 Alzheimer's disease Facts and Figures – Special Report: Race, Ethnicity and Alzheimer's Disease*, at p. 47, Alzheimer's Foundation, *available at* http://www.alz.org/documents_custom/report_alzfactsfigures2010.pdf ("*Alzheimer's Report - 2010*").

[87] *See* U.S. Department of Health and Human Services, The Office of Minority Asian American/Pacific Islander Profile, available at http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlid=53.

[88] See *General Facts on Women and Job Based Health,* U.S. Department of Labor, *available at* http://www.dol.gov/ebsa/newsroom/fshlth5.html.

[89] *Id.*

[90] *Women & Health Care: A National Profile* at p. 40.

[91] *Id*. at p. 41. Overall, women have higher rates of depression and anxiety than men. *See Women's Health USA 2009 – Mental Illness*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/hi/pages/227mis.html.

[92] *Overhaul Will Lower the Costs of Being a Woman*. The recently enacted healthcare reform bill will prevent insurers from denying coverage for pre-existing conditions.

[93] *See Women's Health USA 2009 – Health Insurance,* U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hsu/pages/303hi.html.

[94] See Centers for Disease Control, FastStats: Women's Health, available at http://www.cdc.gov/nchs/fastats/womens_health.htm.

[95] *FCC NBP* at p. 201.

[96] *Id.*

[97] *Id.* at p. 202.

[98] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 et seq. (2009). For an overview of the HITECH provisions, *see* HITECH Answers, About the HITECH Act, http://www.hitechanswers.net/about/about-the-hitech-act-of-2009/.

[99] *See, e.g.,* Joseph Conn, *Money to Boost HER Initiatives Nationwide: Stimulus*, Feb. 23, 2009, ModernHealthcare.com, *available at* http://www.modernhealthcare.com/article/20090223/REG/302239983/.

[100] *Id.*

[101] *The Impact of Broadband on Telemedicine* at p. 23, 37

[102] *Women & Health Care: A National Profile* at p. 30.

[103] *FCC NBP* at p. 202.

[104] *See* Susannah Fox and Sydney Jones, *The Social Life of Health Information*, at p. 9, Pew Internet & American Life Project (June 2009), *available at* http://www.pewinternet.org/~/media//Files/Reports/2009/PIP_Health_2009.pdf.

[105] *See, e.g., The Impact of Broadband on Telemedicine* at p. 15-16.

[106] *See* Bernie Monegain, *Physicians Have Access to New Obstetrics iPhone App*, April 13, 2009, Healthcare IT News, *available at* http://www.healthcareitnews.com/news/physicians-have-access-new-obstetrics-iphone-app.

[107] *See Women's Health USA 2009 – Older Women*, U.S. Department of Health and Human Services, Health Resources and Services Administration, *available at* http://mchb.hrsa.gov/whusa09/hstat/sp/pages/238ow.html.

[108] *See* Julius Genachowski, *Mobile Broadband: A 21st Century Plan for U.S. Competitiveness, Innovation and Job Creation: Remarks to the New America Foundation*, FCC, Feb. 24, 2010.

[109] *FCC NBP* at p. 202.

[110] *Alzheimer's Report – 2010* at p. 10.

[111] *Id*. at p. 34.

[112] It was recently estimated that "interventions that could delay the onset of Alzheimer's disease by as little as one year would reduce prevalence of the disease by 12 million fewer cases in 2050." *See* Press Release, *Alzheimer's Disease to Quadruple Worldwide by 2050*, June 10, 2007, Johns Hopkins University Bloomberg School of Public Health, *available at* http://www.jhsph.edu/publichealthnews/press_releases/2007/brookmeyer_alzheimers_2050.html.

[113] *See, e.g.,* Amy Dockser Marcus, *How to Outsmart Alzheimer's*, March 30, 2010, Wall St. Journal.

[114] *The Impact of Broadband on Telemedicine* at p. 1.

[115] *FCC NBP* at ch. 10.

[116] *See Health Care Broadband in America: Early Analysis and a Path Forward*, at p. 5, OBI Technical Paper No. 5, FCC (Aug. 2010), *available at* http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-%28obi%29-working-reports-series-technical-paper-health-care-broadband-in-america.pdf.

[117] *See, e.g.,* Scott Mackey, *A Growing Burden: Taxes and Fees on Wireless Service*, 475-487, Tax Analysts (Feb. 14, 2011), *available at* http://www.ksefocus.com/wordpress-content/uploads/2011/02/2010-Tax-Study-Final-Tax-Notes-PDF.pdf (noting that "Wireless users now face a combined federal, state, and local tax and fee burden of 16.3 percent, a rate two times higher than the average retail sales tax rate and the highest wireless rate since 2005. Consumers now pay wireless taxes, fees, and government charges that exceed the retail sales tax rate." As a result, "State and local efforts to raise revenue from the wireless industry and its customers conflict with the policy goal of increasing consumer broadband adoption.").

[118] *See Presidential Memorandum: Unleashing the Wireless Broadband Revolution*, Office of the Press Secretary, The White House, June 28, 2010, *available at* http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution.

[119] The FCC's recent Net Neutrality order carved out flexibility for "specialized services" and additional flexibility for wireless service providers. *See In the Matter of Preserving the Open Internet*, Report and Order, FCC 10-201 (rel. Dec. 23, 2010). However, it remains to be seen how these rules will be enforced.

[120] *FCC NBP* at Recommendation 4.20.

[121] *Barriers to Broadband Adoption* at p. 36-50.

[122] *FCC NBP* at Recommendation 10.2.

[123] *Id.*

[124] *Id.* Recommendation 10.5.

[125] *Id.* at Recommendation 10.1.

[126] *Id.* at Recommendations 10.6 – 10.9

[127] *Id.*

[128] *Barriers to Broadband Adoption* at p. 44-45.

[129] *FCC NBP* at Recommendation 10.11.

[130] *See, e.g.,* Jerome Kagan, *The Role of Parents in Children's Psychological Development*, Pediatrics, 1999; 104; 164-167, *available at* http://pediatrics.aappublications.org/cgi/reprint/104/1/S1/164.

[131] *Id.* at 165.

[132] *See* Laura Roberts, *Mothers Are Stronger Role Models for Children's Education, Report Claims*, Sept. 20, 2010, Telegraph (U.K.), *available at* http://www.telegraph.co.uk/education/educationnews/8012011/Mothers-are-strongest-role-models-for-childrens-education-report-claims.html.

[133] *Id.* Mothers had a smaller but still discernible impact on the educational attainment of sons. But the educational attainment of fathers had little impact on both sons and daughters.

[134] *Id.*

[135] *See High School Graduation Rate Improves Over Past Decade; Recent Declines Threaten Progress,* at 1, June 9, 2009, Education Week, http://www.edweek.org/media/ew/dc/2009/DC09_PressPackage_FINAL.pdf ("*High School Graduation Rate Improves Over Past Decade*").

[136] *See* Carly Shuler, *Pockets of Potential,* at p. 2, Joan Ganz Cooney Center at Sesame Workshop (2009), *available at* http://www.joanganzcooneycenter.org/pdf/pockets_of_potential.pdf ("*Pockets of Potential*").

[137] *High School Graduation Rate Improves Over Past Decade* at 4.

[138] *See The Economic Impact of the Achievement Gap in America's Schools,* at p. 9, McKinsey & Company (2009), *available at* http://www.mckinsey.com/App_Media/Images/Page_Images/Offices/SocialSector/PDF/achievement_gap_report.pdf.

[139] *See, e.g.,* Kenneth Chang, *White House Pushes Science and Math Education*, Nov. 22, 2009, N.Y. Times (reporting on the launch of a White House initiative – Educate to Innovate – that seeks to "enlist companies and nonprofit groups to spend money, time and volunteer effort to encourage students, especially in middle and high school, to pursue science, technology, engineering and math."

[140] *FCC NBP* at p. 227-228.

[141] *See Connected to the Future,* at p. 6, Corporation for Public Broadcasting, http://www.cpb.org/stations/reports/connected/connected_report.pdf

[142] *See Evaluation of Evidence-Based Practices in Online Learning,* at p. ix, U.S. Department of Education, Center for Technology in Learning (2009), *available at* http://www.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf.

[143] *See* Linda A. Jackson et al., *Does Home Internet Use Influence the Academic Performance of Low-Income Children?* Developmental Psychology, Vol. 42, No. 3 (2006).

[144] *See* Kallen Tsikalas et al., *Home Computing, School Engagement and Academic Achievement of Low-Income Adolescents: Findings from Year One of a Three Year Study of the CFY Intervention*, at p. 5, Computers for Youth Foundation in collaboration with the Educational Testing Service (2007).

[145] *See, e.g., The Impact of Broadband on Education* at p. 22-23.

[146] *Id.*

[147] *FCC NBP* at p. 174.

[148] *See National Education Technology Plan*, Office of Educational Technology, U.S. Dept. of Education (2010), *available at* http://www.ed.gov/sites/default/files/netp2010.pdf ("*National Ed Tech Plan*").

[149] *See Census Data Shows that More Women Than Men Hold College Degrees*, April 21, 2010, Education Portal, *available at* http://education-portal.com/articles/Census_Data_Shows_that_More_Women_than_Men_Hold_College_Degrees.html.

[150] *Id.*

[151] *See* Press Release, *New Data Indicate Educational Attainment Continues to Flat-Line*, Oct. 20, 2010, American Council on Education, *available at*

http://www.acenet.edu/AM/Template.cfm?Section=Press_Releases2&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=38681.

[152] *See* Project Working Mom, Quick Facts on Single Moms and Educational Attainment, http://www.elearners.com/projectworkingmom/resources/go-back-to-school/quick-facts-on-single-moms-and-educational-attainment/.

[153] A Vault.com study found that "85 percent of employers representing a variety of industries across the U.S. feel that online degrees are more acceptable today than they were five years ago." *See* eLearners.com, Facts and Figures from the Online Education Research, http://www.elearners.com/guide-to-online-education/online-education-research.asp.

[154] *See* Tim Hill, *FCC Workshop: Broadband, Online Learning & Job Creation,* at Slide 9, Aug. 26, 2009, Blackboard, *available at* http://www.broadband.gov/docs/ws_job_training/ws_job_training_hill.pdf (citing data from the U.S. Department of Education that found that 39 percent of college students are adults over the age of 25).

[155] *Impact of Broadband on Education* at p. 54-63.

[156] *See 2010 E-Rate Program and Broadband Usage Survey: Report*, at p. 2, Wireline Competition Bureau, FCC (Jan. 2011), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-10-2414A1.pdf ("*FCC e-Rate Report*").

[157] *See* Tom Rolfes and Tammy Stephens, *21st Century Networks for 21st Century Schools: Making the Case for Broadband*, at p. 3, CoSN (July 2009). The FCC's 2011 e-Rate survey found that average speeds to the school were about 10 Mbps. *FCC e-Rate Report* at p. 5. However, these connections are typically shared among many users across the school, often resulting in low levels of bandwidth available per student. *The Impact of Broadband on Education* at p. 16.

[158] *The Impact of Broadband on Education* at p 16.

[159] See *In the Matter of Schools and Libraries Universal Service Support Mechanism*, Sixth Report and Order, FCC 10-175 (rel. Sept. 28, 2010), *available at* http://www.fcc.gov/Daily_Releases/Daily_Business/2010/db1001/FCC-10-175A1.pdf.

[160] *The Impact of Broadband on Education* at p. 68*; FCC NBP* at Recommendation 11.18.

[161] *FCC NBP* at Recommendation 11.23.

[162] *Id.* at Recommendation 11.15.

[163] *Id.* at Recommendation 11.16.

[164] *Id.* at Recommendation 11.24.

[165] The U.S. Department of Education has proposed such an approach in its National Educational Technology Plan. *National Ed Tech Plan* at p. 75-80.

[166] *See, e.g., The Impact of Broadband on Education* at p. 72-73; *FCC NBP* at p. 232-233.

[167] *FCC NBP* at Recommendation 11.9.

[168] *Id.*

[169] *Id.* at Recommendation 11.10.

[170] *Id.* For examples of these approaches, s*ee The Impact of Broadband on Education* at p. 73.

[171] America COMPETES Reauthorization Act of 2010, Public Law 111–358 (Jan. 4, 2011), *available at* http://www.gpo.gov/fdsys/pkg/PLAW-111publ358/pdf/PLAW-111publ358.pdf.

[172] *FCC NBP* at Recommendation 11.1.

[173] *Id.* at Recommendation 11.2.

[174] *Id.* at Recommendation 11.3.

[175] *Id.* at Recommendation 11.4.

[176] *Id.* at Recommendation 11.6 & 11.8.

[177] *See, e.g.,* Dennis Cauchon, *Women Gain as Men lose Jobs*, Sept. 2, 2009, USA Today, *available at* http://www.usatoday.com/news/nation/2009-09-02-womenwork_N.htm (noting that, during the recent recession, many more men than women have lost jobs, which has resulted in a near 50-50 split in employment among men and women).

[178] *See* Press Release, *Employment Situation Summary: Feb. 2011,* March 4, 2011, Bureau of Labor Statistics, *available at* http://www.bls.gov/news.release/empsit.nr0.htm.

[179] *Id.*

[180] According to the U.S. Bureau of Labo8r Statistics, women's earning contributed approximately 36 percent to overall married-couple income in 2007, up from 26 percent in 1978. *See Women in the Labor Force: A Data Book (2010 Edition),* at p. 77 (Dec. 2010), *available at* http://www.bls.gov/cps/wlf-databook-2010.pdf ("*Women in the Labor Force: A Data Book*").

[181] *See Institute for Women's Policy Research, The Gender Wage Gap: 2009,* at p.2 (Updated: Sept. 2010), *available at* http://www.iwpr.org/pdf/C350.pdf.

[182] *Id.*

[183] *Women in the Labor Force: A Data Book* at p. 51.

[184] *Id.* at p. 53.

[185] *Id.*

[186] *Id.* at p. 88 (finding that 38.6 percent of all self-employed persons in 2008 were women, a percentage that has not changed much over the last two decades).

[187] *See* Mike Swift, *Blacks, Latinos and Women Lose Ground at Silicon Valley Tech Companies,* Feb. 13, 2010, The San Jose Mercury News.

[188] *See* Caroline Simard, Ph.D., *Obstacles and Solutions for Underrepresented Minorities in Technology,* at p. 8, Anita Borg Institute for Women and Technology, *available at* http://anitaborg.org/files/obstacles-and-solutions-for-underrepresented-minorities-in-technology.pdf ("*Obstacles and Solutions*").

[189] *Id.*

[190] *Id.*

[191] *Obama State of the Union 2011*

[192] *Id*. at p. 265.

[193] *FCC NBP* at p. 272

[194] *Id.*

[195] *Id*. at p. 270-271.

[196] *See* John Horrigan, *Broadband Adoption and Use in America*, at p. 42, OBI Working Paper No. 1, FCC (Feb. 2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf.

[197] *Id.*

[198] *Id.*

[199] *FCC NBP* at p. 266.

[200] *See The Impact of Broadband Speed and Price on Small Business*, at p. 1-3, Office of Advocacy, U.S. Small Business Administration (Nov. 2010), *available at* http://www.sba.gov/advo/research/rs373tot.pdf.

[201] *Id.* at p. 13-14.

[202] *See Frequently Asked Questions*, Office of Advocacy, U.S. Small Business Administration (Sept. 2009), *available at* http://www.sba.gov/advo/stats/sbfaq.pdf.

[203] *Women in the Labor Force: A Data Book* at p. 88.

[204] For example, a study by CB Insights found that, in a sample of early-stage internet companies from California, Massachusetts, and New York that received venture capital funds during the first six months of 2010, only 1% of founding teams identified themselves as Black, and 11% indentified the team as Black plus at least one other race. *See Venture Capital Human Capital Report, Jan. – June 2010,* at p. 19, CB Insights.

[205] *FCC NBP* at p. 266.

[206] Women have launched an enormous amount of small businesses in the U.S. over the last decade. According to the *National Broadband Plan,* in 2006 "there were almost 5.4 million firms employing less than 20 people in the U.S., and an additional 20.8 million non-employer firms. Of that total, approximately 7.6 million firms were owned by women and 4.6 million firms were owned by minorities." *Id*. (internal citations omitted).

[207] *Id*. at p. 265,

[208] *Id*. at Recommendation 13.1.

[209] *Id.* at Recommendation 13.2.

[210] *Id.* at Recommendation 13.5.

[211] *Id.* at Recommendation 13.3.

[212] *Id.* at Recommendation 13.4.

[213] *Id.* at p. 270.

[214] *See* The White House, Issues: Economy – Startup America, http://www.whitehouse.gov/issues/startup-america.

[215] *Id.*

[216] *FCC NBP* at Recommendation 13.7.

[217] *Id.* at Recommendation 13.6.

[218] *Id.* at p. 273.

[219] *Id.*

[220] *See, e.g.,* Jed Kolko, *Does Broadband Boost Local Economic Development?*, at p. 2, Public Policy Institute of California (Jan. 2010), *available at* http://www.ppic.org/content/pubs/report/R_110JKR.pdf (observing a "positive relationship between broadband expansion and economic growth.").

[221] *FCC NBP* at Recommendations 13.8 & 13.10.

[222] *Id*. at Recommendation 13.9.

[223] *Id.* at p. 3.