Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	**)**	
	)	
A National Broadband Plan for Our Future	**)**	**GN Docket No. 09-51**

COMMENTS OF INTEL CORPORATION

June 8, 2009

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COMMENTS OF INTEL CORPORATION

Intel Corporation (Intel) hereby submits the following comments in response to the Notice of Inquiry in the above-captioned proceeding. Intel, the world leader in silicon innovation, develops technologies, products, and initiatives to continually advance how people work and live.[1] Intel has a long history of supporting public policies that promote ubiquitous, affordable, high-quality broadband in the United States (U.S.) and around the world. Intel is committed to America's global competitiveness and has years of experience working to advance universal broadband and personal computer (PC) ownership.

A significant part of Intel's strategy involves harnessing our manufacturing and technology leadership to bridge the digital divide in the U.S. and around the world. Intel's years of experience with our World Ahead program – enabling Internet access and accelerating PC ownership for remote and underserved communities worldwide – have shaped our optimistic view of the future. Intel believes that ensuring sustainable

[1] Additional information about Intel is available at www.intel.com/pressroom and http://blogs.intel.com/policy .

deployment and adoption of cutting-edge broadband technologies by all Americans is essential to bridging the digital divide in our country and enabling the U.S. to be globally competitive in the long-term. Accordingly, Intel fully supports the commission's efforts seeking a national broadband plan for the future of the U.S. The starting point for the broadband plan should be the Commission's policies designed to foster facilities-based competition.[2]

1.0 Brief Review of the Current Broadband Market Status.

In a relatively short time, broadband has become a worldwide, mainstream success, as a platform for news, entertainment, socializing, health, education, commerce, and many other uses, with more to come. Since the internet is not controlled by a central authority, new sources of content can emerge at any time, from any individual, from any country. Some persist perfectly well by serving a niche audience. Others, like social networking, peer to peer file sharing, and user-generated videos, grew at extraordinary rates.

In a recent survey, broadband ranked number one, as the discretionary expenditure consumers would least likely give up. Just ten years ago, it would not have even been a candidate for the list.

[2] Report and Order and Order on Remand and Further Notice of Proposed Rulemaking (Triennial Review Order), CC Docket Nos. 01-338, 96-98, 98-147, rel. Aug. 21, 2003, available online at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-36A1.doc.

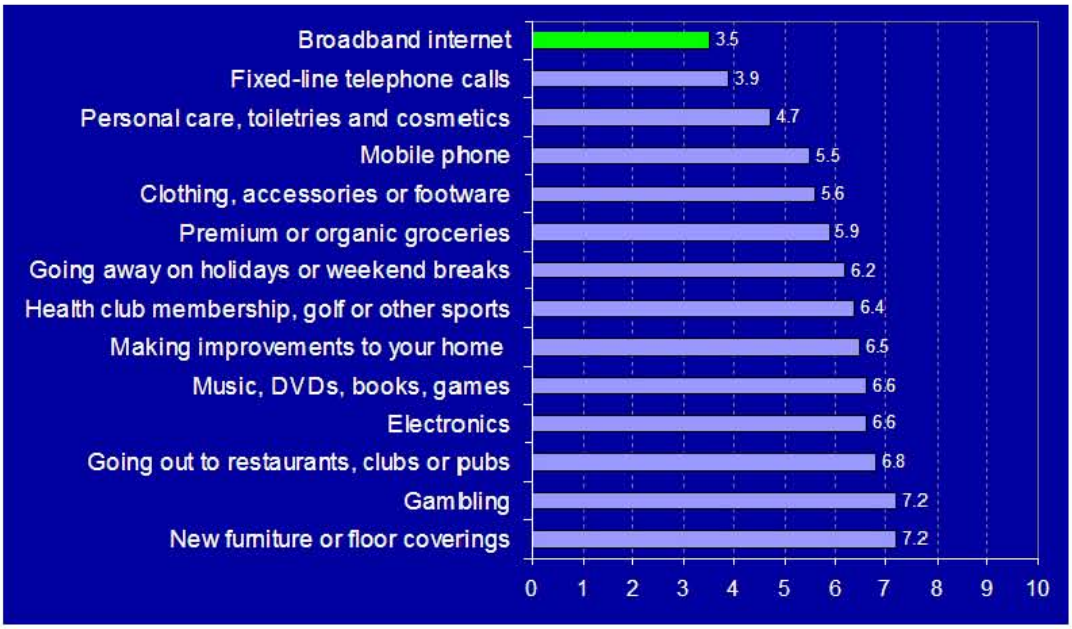

Figure 1. Broadband ranks as "least likely to give up" among consumer discretionary expenses. Economic vulnerability scores: 10= extremely likely to cut back, 0= not likely at all to cut back. Source: Ofcom: "The International Communications Market 2008," at 39.

Nonetheless, while the statistics vary in their methodologies and error margins, approximately 45% of U.S. households do not subscribe to broadband service. In terms of population, the non-broadband-households in the U.S. would be equivalent to the world's *tenth largest country*.[3]

Of the households subscribing to any internet service, approximately 10% still use a narrowband (e.g. dial-up modem) connection--sometimes by choice, sometimes due to lack of a broadband option.

[3] At 2.57 persons per household (2006 Census Bureau figures), this equates to approximately 135 million people, which puts the figure in 10th place, behind Russia's 140 million people (see http://www.geohive.com/earth/population1.aspx for world population by country). The key point is that a very large number of U.S. citizens are not benefiting from the value of broadband connectivity. The number would be even larger if non-users within subscribing households were included.

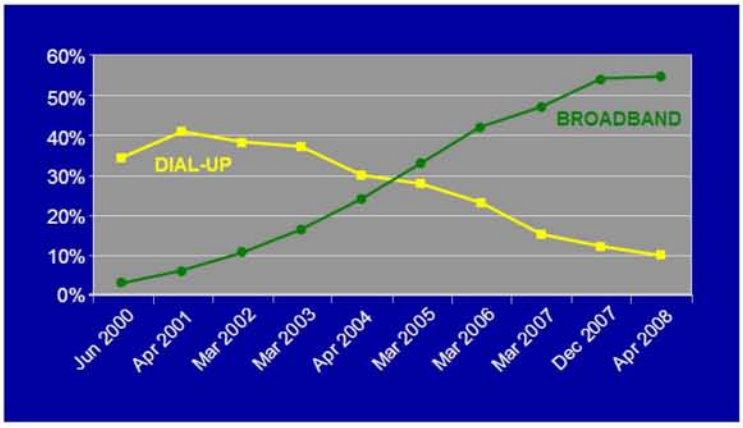

Figure 2. Comparing broadband and dialup penetration trends.
Source: Pew Internet & American Life Project, Home Broadband Adoption 2008, July 2008.

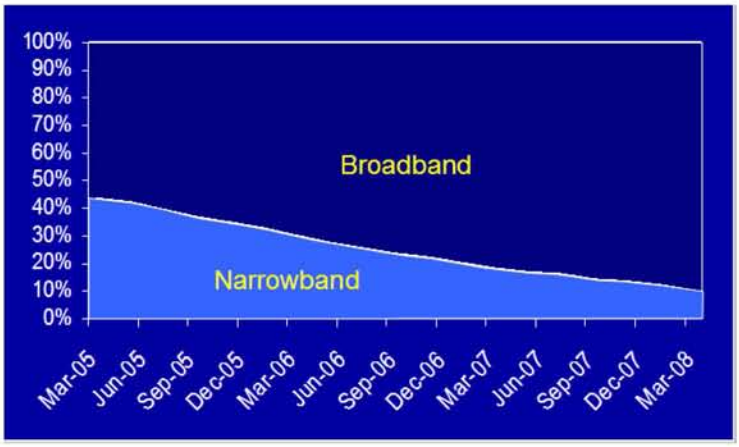

Figure 3. Percentage split between broadband and narrowband, among internet subscribers.
Source: http://www.websiteoptimization.com/bw/0805/ viewed 5/26/2009. Nielsen Online original source.

1.1 Measuring U.S. Broadband Progress.

Detailed information on the U.S. broadband market and trends thereof, gathered under a consistent and relevant methodology, is important for informed decision-making and course corrections. Some metrics can be defined and collected in numerous ways,[4]

[4] Many differences exist in data gathering and tabulation methods across different sources for broadband market figures. For example, in the case of subscriber penetration figures, some are based on surveys and state the statistical margin of error and confidence level, while some don't. Some include subscriber figures only from the largest service providers, and/or a mix of residential and business subscribers. Some include certain seasonal adjustments like short-term subscriptions by college students in temporary housing nationwide. Some include wireless subscribers, satellite subscribers, and alternative wireline technologies such as broadband over power lines. Some are based on total occupied households, some are based on total housing units including unoccupied, some are shown as a percentage of

depending on the specific measurement purpose. Intel supports targeted Commission-defined metrics to quantify U.S. subscribers and availability by technology, application utilization, and broadband network capabilities.

With respect to broadband network capabilities, additional metrics beyond just peak speed (bandwidth) are necessary, for example time-of-day and duration limitations, as well as round-trip-delay. However, measures and trends of actual usage data rates are useful and necessary components of measuring progress by region, particularly for the general public. An approximation to the current broadband speed distribution nationwide is illustrated in the figure below, showing the range 0-2Mbps (all speeds greater than 2 Mbps are grouped into the top category). Note the visual correlation between the higher speed portions of the country (shown in pinkish-purple), and the areas of higher population density (darker blue areas in the figure that follows it).

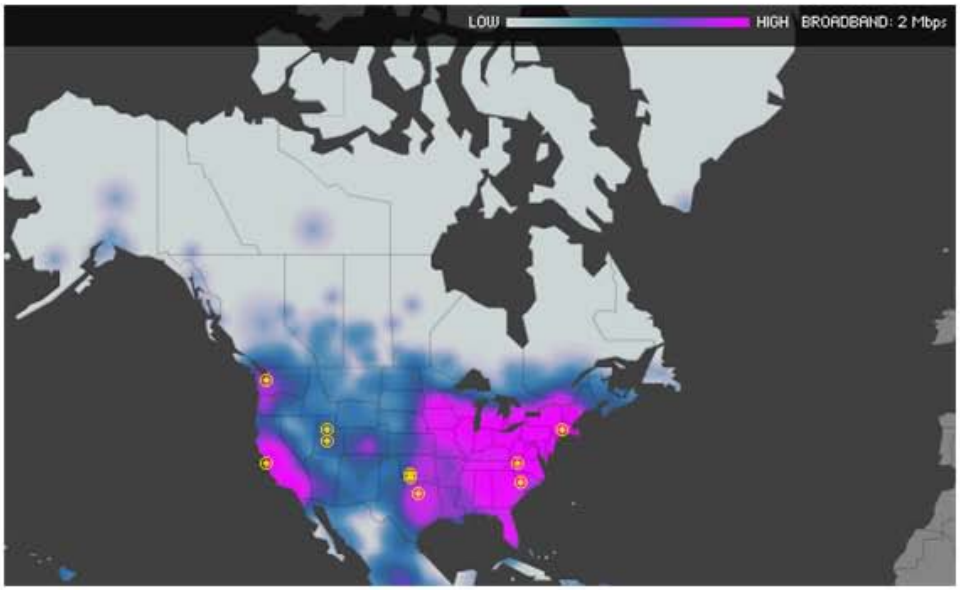

Figure 4. Color-coded geographic distribution of broadband speeds 0-2Mbps.
Source: http://www.akamai.com/stateoftheinternet ,Global Broadband Adoption, accessed 5/26/2009

homes with broadband service available, and some are shown as a percentage of zip codes or other geographic partitioning with at least one subscriber.

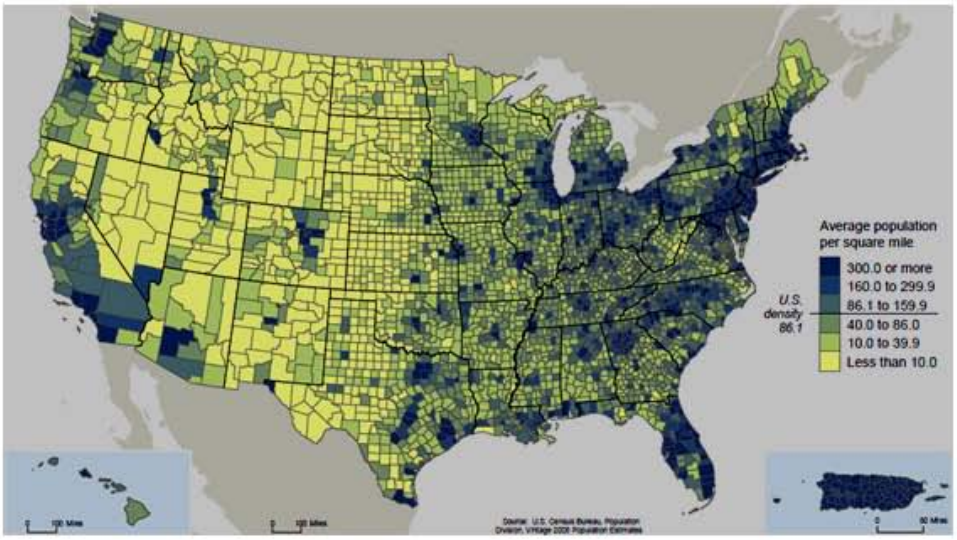

Figure 5. Color-coded population density by county.
Source: US Census Bureau, July 2008 data.

As expected, the higher population density areas of the country have higher available broadband speeds, on balance. A graphical mapping tool similar to the above figures, but based on the FCC's revised data gathering methods, would be useful for educating the public on the nation's broadband progress. Linking that database of provider-reported service bandwidth to a composite of the various broadband speed test websites (which collect actual end-to-end usage data rates) could serve as a valuable cross-check on the Commission's new data gathering methods. It would be valuable to know as soon as possible, if the Commission's revised data gathering methods could benefit from certain adjustments in the parameters.

2.0 Deployment: Fostering Mobile as well as Wireline Broadband to Every American Should be a Goal of the National Broadband Plan.

While mobile and fixed/wireline broadband share some operational attributes, they also have fundamental and permanent differences. Mobility is a unique attribute that many broadband subscribers value for certain types of content, applications, and services

(CAS). Unlike the category difference between 1G/2G mobile phones and landline phones (which essentially perform a single task—voice telephony), the diverse and growing universe of broadband CAS, not to mention the growing computer-like capabilities of mobile devices, implies a dynamic marketplace with much room to grow and change. Some CAS are optimized for, or dependent on mobility, some may be targeted at the vast bandwidth of next-generation fiber broadband, and some will be equally suited for both wireline and mobile broadband.

A user may subscribe to wireline, mobile, or both modalities of broadband and this can vary with age, changes in one's family status, job status, types of leisure activities, relocating from an urban to a rural area, etc. The level of substitutability between mobile and wireline broadband can range from 0% to 100% for any given user, and involves more considerations than the choice between mobile and landline telephony. Also, given lower economies of scale than in fixed wireline networks, wireless broadband may represent an important source of new entry and competition in the broadband market.

Therefore, Congress and the Commission should foster deployment policies that would give all consumers choice between the mobile and wireline broadband platforms, and not erect any artificial barriers or in/direct biases. This is an achievable goal, and could be a world-leading outcome for the U.S. if policymakers develop a national plan to reach it.

2.1 The "Unserved," "Underserved," and "Unconvinced" Categories Represent Three Distinct Challenges.

Households that do not subscribe to broadband can be categorized into three groups, which reflect the supply and demand issues: *unserved*, *underserved*, and *unconvinced*.

An *unserved* household does not have broadband service available; an *underserved* household (recognizing the Commission has not yet defined the term) has minimal broadband service available, and an *unconvinced* household is a non-adopter, i.e. does not subscribe to broadband service for a variety of reasons,[5] regardless of availability. As defined here, the *unserved* and *underserved* groups represent supply-side issues, while the *unconvinced* group represents demand-side issues. Once the supply-side issues are resolved for the *unserved* and *underserved*, a portion will subscribe, and a portion will enter the *unconvinced* group. The next two figures below depict the gaps in supply (unserved) and demand (unconvinced) for wireline and mobile broadband. The underserved gap is not included because the term is not yet defined and therefore could only be arbitrarily quantified.

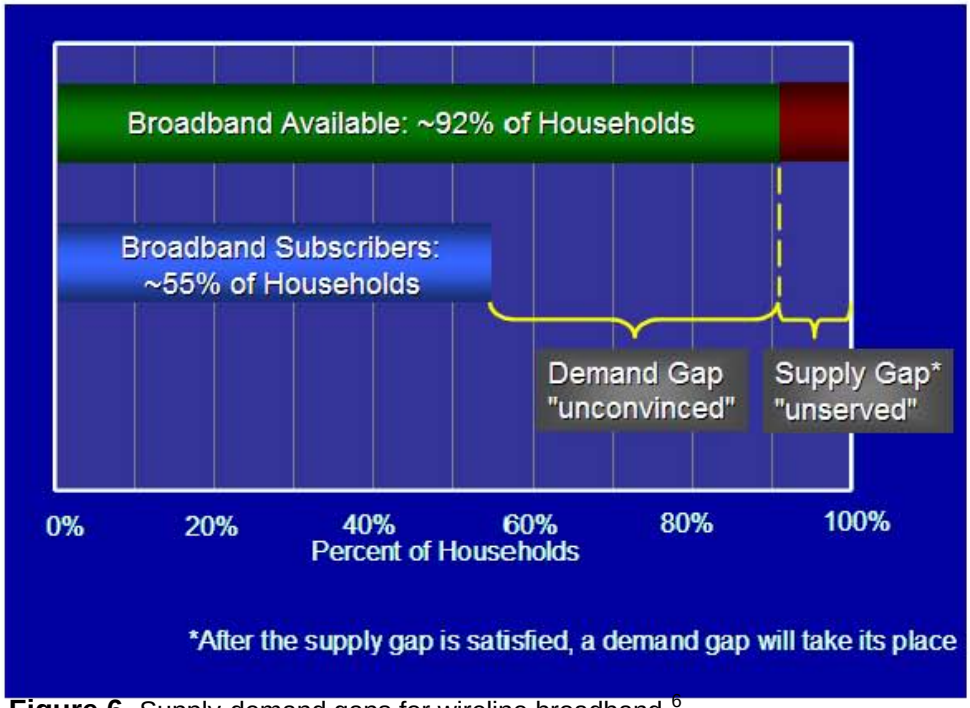

Figure 6. Supply-demand gaps for wireline broadband.[6]

[5] In general, the reasons given for not subscribing to broadband include (in no particular order): too costly, lack of computer/skills, not interested, waste of time, don't have service available, too old to learn modern technology, too complex or frustrating, too busy/no time, physically unable. Pew Internet collects the various reasons into four categories: 1) Usability issues; 2) Price (including computer and access) issues; 3) Lack of availability; 4) Relevance. Relevance is the most frequently cited category while availability is the least frequently cited category.

[6] The figure represents the supply-demand gaps for wireline broadband, after approximately 10 years of market growth. Tabulations of unserved broadband households from: Peha, Jon M., Bringing Broadband to Unserved Communities, July

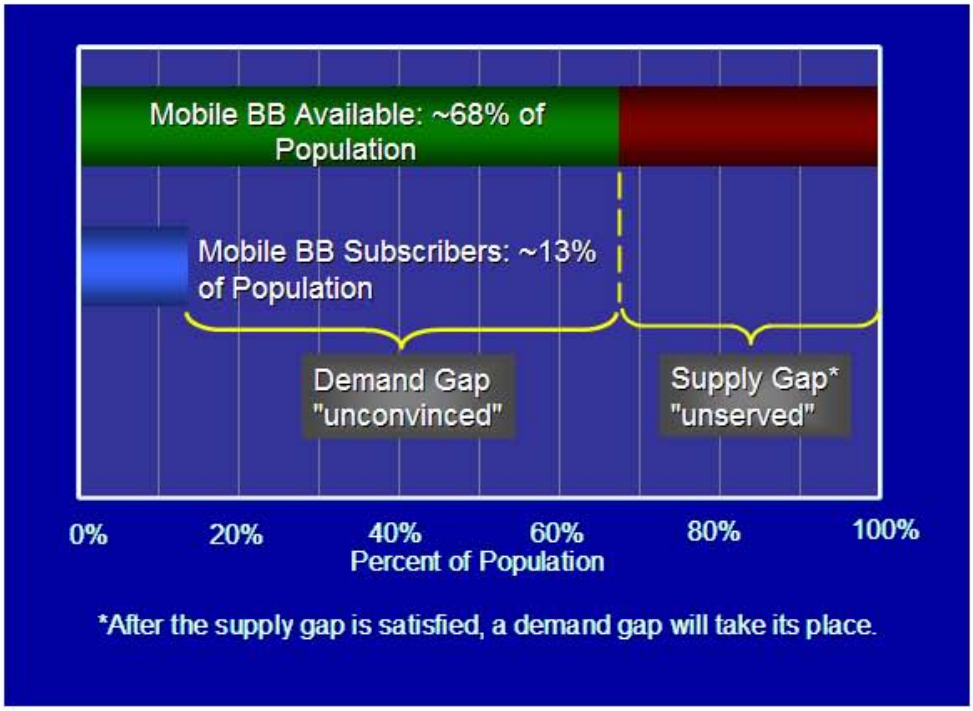

Figure 7. Supply-demand gaps for mobile broadband.[7]

Importantly, in both cases the demand gap is larger than—and persists longer than—the supply gap. Even when the supply gap is resolved, some portion of it will be replaced with a demand gap. Thus, a demand-side stimulus program could have a higher impact on our nation's "broadband bottom line," and this is another area where the U.S. could achieve a world-leading broadband outcome, by placing greater emphasis on demand-stimulation than other nations.

2008, and cable industry data from http://www.ncta.com/Stats/BroadbandAvailableHomes.aspx, which gives a conservative estimate that assumes zero overlap with DSL or other wireline. Broadband subscribers from Pew, Home Broadband Adoption 2008.

[7] The figure represents the supply-demand gaps for mobile broadband (3rd Generation and beyond) after approximately 5 years of market growth. Mobile broadband figures are in terms of population rather than households, owing to the nature of the infrastructure, i.e. its lack of discrete endpoint ties to households. The unserved population is based on an *ex parte* submission filed by CTIA in January 2008 (WT Docket No. 06-150), stating 210M coverage for broadband wireless, and subtracting from a total US population of 305M people in 2008. Mobile broadband subscriber figure from Nielsen Mobile, "The Worldwide State of the Mobile Web," July 2008, at 3 (also noting that among the 16 countries tracked, the US leads in mobile internet active users, as a percent of mobile subscribers). The figure used is a conservative estimate of "active users," as opposed to the many mobile subscribers having basic data service (e.g. text messaging) available from their telephony subscription, but not using it.

Intel commented extensively on the demand-stimulation topic in our submission to NTIA relative to the Broadband Technology Opportunity Program. Those comments are included as an Exhibit to our submission in the instant proceeding, and can also be downloaded from: http://www.ntia.doc.gov/broadbandgrants/comments/7B2E.pdf

The definition of underserved will also have a large impact on the scope of the national plans, as well as the stimulus fund distributions. In some proposed definitions, the methods and metrics used to define broadband serve as a threshold in the definition of underserved. Intel recommends that any Commission definition of broadband include multiple factors, not just a speed/bandwidth metric. Likewise, any Commission definition of underserved should include multiple factors. A distinction between wireline and mobile wireless underserved definitions may be desirable, due to the inherent coverage and service differences.

3.0 Adoption: Demand-Side Issues are Significant, and Should be a Goal of the National Broadband Plan.

The Rural Broadband Strategy Report[8] recognizes the need for demand-stimulation. Less clear, however, is the Commission's understanding of the proportion of effort needed between the supply and demand sides of the equation. The report accurately notes the dearth of highly-specific data with respect to broadband. But a broad sampling of statistically meaningful data—gathered by a large number of professional market research firms over many years—does exist. This data representing demographic categories of adoption could be useful in developing a plan to address and prioritize

[8] Copps, Michael J., Bringing Broadband to Rural America: Report on a Rural Broadband Strategy, May 22, 2009. Download from: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291012A1.pdf

adoption issues. However, very specific “per household” data will be necessary to implement any plans.

As the earlier discussion and figures in Section 2.1 illustrate, lack of adoption represents a greater proportion of the population than lack of availability. Furthermore, when the supply/availability issue is resolved, the adoption issue will continue. The following table shows broadband adoption broken out by several demographic categories, for the years 2005-2008.

The low income, elderly, and low educational attainment demographics were consistently lowest in adoption and growth trend across the survey time frame. In stark contrast, the higher income brackets (excluding the >$100k bracket which was already the highest adoption level in each period), younger age groups, and higher educational attainment categories each increased adoption by more than 30 percentage points from 2005-2008. In light of these trends—which are confirmed by other research reports—Intel supports a trial program of vouchers (for computers and/or broadband service costs), targeted at the low income demographic.

Trends home broadband adoption by group (% in each group with broadband at home)	% with broadband at home (2005)	% with broadband at home (2006)	% with broadband at home (2007)	% with broadband at home (2008)
Yearly adoption				
All adults	33%	42%	47%	55%
Gender				
Male	31	45	50	58
Female	27	38	44	53
Age				
18-29	38	55	63	70
30-49	36	50	59	69
50-64	27	38	40	50
65+	8	13	15	19
Race /ethnicity				
White (not Hispanic)	31	42	48	57
Black (not Hispanic)	14	31	40	43
Hispanic (English speaking)	28	41	47	56
Educational attainment				
Less than high school	10	17	21	28
High school grad	20	31	34	40
Some college	35	47	58	66
College +	47	62	70	79
Household income				
Under $20K	13	18	28	25
$20K-$30K	19	27	34	42
$30K-$40K	26	40	40	49
$40K-$50K	28	47	52	60
$50K-$75K	35	48	58	67
$75K-$100K	51	67	70	82
Over $100K	62	68	82	85
Community type				
Urban	31	44	52	57
Suburban	33	46	49	60
Rural	18	25	31	38

Figure 8. Broadband adoption demographics 2005-2008.
Source: Pew Internet & American Life Project, Home Broadband Adoption 2008, July 2008.

Successful, but small-scale efforts to increase broadband adoption have been demonstrated, and they generally involve targeted local efforts. For example, the "No Child Left Offline" initiative in Kentucky, which donated personal computers to school-aged children, helped increase broadband adoption in its targeted communities by 211%, compared to just 42% in non-participating regional communities.[9] Such efforts can

[9] Source: http://connectkentucky.org/_documents/connected_winter_08_web.pdf

involve private-sector donations or subsidies. A federally-funded computer literacy effort could multiply the positive impact, and also serve as the central repository to document public and private sector efforts toward demand stimulation, and share best practices.

Mobile broadband may itself be one of the better "traveling salesmen" to increase broadband adoption. Mobility allows current users (family and friends) to bring broadband to non users, to show them over time, what types of capabilities and value broadband has. The appeal and value of broadband is not necessarily intuitive to a non-subscriber, and some find the technology intimidating. A leisurely exposure via mobile broadband devices of family or friends may be one of the better solutions to reaching this category of non-subscriber, since they are not generally receptive to the marketing and advertising efforts.

3.1 Broadband Health, Education, and Energy Initiatives Increase the Value of Broadband and Help Drive Adoption.

In examining the vital role broadband will play in addressing many of the nation's critical problems, three key areas, namely education, energy, and healthcare, are discussed below.

3.1.1 Education and Broadband

Broadband connectivity plays a critical role in improving the quality and competitiveness of our education system with the result that it will help create a highly qualified and competitive workforce at all skill levels. Broadband enables users with tools such as video conferencing and VOIP to be connected to educational resources, and educators to electronically manage interaction with students. Access to advanced, affordable learning tools such as distance learning, web-based instructional systems, virtual

classrooms, and distributed learning programs also generally require the performance levels of broadband.

Broadband will shape our children's education in ways we can only dream about, offering instant access to the world's reference libraries, and networking with other schools and colleges at the touch of a keyboard. It will also drive changes in teaching methods and curriculum content to reflect the huge opportunity such access to information presents. Students with mobile broadband will be able to connect in classrooms, libraries, and other remote locations, to manage assignments, reports, etc.

3.1.2 Energy and Broadband[10]

A national broadband policy can help the United States improve energy efficiency, reduce greenhouse gas emissions, decrease dependence on foreign oil and at the same time stimulate the economy and create new jobs. In its U.S. addendum to the SMART2020 Report commissioned by the Global eSustainability Initiative and The Climate Group, the Boston Consulting Group calculated that annual CO2 emissions in the U.S. can be reduced 22% in the next decade through the concerted application of broadband and IT in four areas:

- **Smart power grids** – reduce CO2 by up to 480M metric tons. Smart power grids involve putting a two-way communications network overlay on top of the electric grid to improve transmission efficiency, better enable bringing renewable energy sources onto the grid, and enable better real-time management of electricity consumption. The

[10] Intel is a founding member of the Digital Energy Solutions Campaign (DESC). DESC is a consortium of IT & telecom companies, trade associations and environmental NGOs who will be working to help shape climate and energy policy in Washington and beyond. The included passage is attributable to the DESC. See for example DESC comments filed in the instant proceeding, June 5, 2009

fastest way to achieve a smart grid is to apply the capabilities of the country's wireline and wireless network providers to the grid.

- **Smart buildings** – reduce CO2 by 440M metric tons. Creating a smart building infrastructure means putting intelligence and broadband capability into homes, commercial buildings, and factories to improve the ability to manage their energy consumption.
- **Smart transportation** – reduce CO2 by 360M metric tons. Achievement of this goal calls for employing intelligent transportation systems and fleet management systems and building the infrastructure to support plug-in hybrid vehicles, as well as providing incentives for the development of more efficient traditional vehicles and transportation technology systems.
- **Travel substitution programs** – reduce CO2 by 130M metric tons. This initiative means encouraging the use of broadband and related ICT technology for telework, flexible work schedules, and virtual meetings to reduce travel by both road and air.

The grand total of a 22% CO2 reduction translates into gross fuel and energy savings of $240B, or a reduction of 36% in imported oil. Realization of the full 22% reduction can be achieved, however, only if every household and business is connected to the Internet. From a policy perspective, the two key initiatives are: 1) deploy broadband to the remaining unserved homes, that today have no broadband option; and 2) promote demand stimulation initiatives to help millions of U.S. households that do not subscribe to any internet service.

3.1.3 Health Care and Broadband

The delivery of comprehensive, efficient, and cost-effective health care for all consumers is one of the greatest challenges facing our nation today. Some reports have estimated

savings of $800 billion in health care costs from increased use of broadband to provide health care services. Intel advocates the following steps that can make a significant difference in the quality of health care for all Americans: development of electronic medical records; effective, secure broadband to enable medical information to follow the patient from doctor to hospital to home; and broadband access to health care resources for rural populations. Availability and adoption of broadband by all Americans is central to accomplishing these objectives. Mobile health care workers in particular, will benefit from ubiquitous mobile broadband.

According to the results from the "Connected Kentucky"[11] project, access to broadband improves health care outcomes. Kentuckians with broadband were 53% more likely to use the Internet for health applications than the state average. Overall, 72% of broadband subscribers say they are more empowered health consumers due to their ability to get health information online.

Broadband can positively impact nearly every aspect of health care. Some examples of areas that benefit from ubiquitous broadband include: electronic health records, telemedicine, home telehealth and medical monitoring, teleradiology, e-ICU, and many more. As a result, there are both medical and non-medical benefits that are equally vast.

4.0 International Studies: Tracking the U.S. Progress Compared to Other Nations is a Valuable Undertaking for the Commission.

Initially, broadband growth was concentrated in developed nations, similar to other technology markets. Emerging markets and developing nations have made great strides in all aspects of technology adoption in recent years. A U.S. leadership position in ICT

[11] (see http://connectkentucky.org/)

(Information and Communication Technologies) now requires contending with the ambitions of a much larger cross-section of the globe. As the two figures below illustrate, the top 10 emerging markets now have more internet users and mobile phone subscribers than the top 10 developed markets. These "competitive broadening" effects are significant developments that must be considered when prioritizing the goals and objectives of the national broadband plan.

Figure 9. Comparing Internet users across the top 10[12] emerging and developed markets.
Source: International Monetary Fund, International Telecommunications Union, Morgan Stanley Research ("Economy + Internet Trends," March 2009).

[12] Top 10 emerging markets by GDP: China, India, Russia, Brazil, Mexico, Turkey, Indonesia, Iran, Poland and Saudi Arabia. Top 10 developed markets: US, Japan, Germany, UK, France, Italy, Spain, Canada, South Korea, and Australia.

Figure 10. Comparing mobile subscribers across the top 10 emerging and developing markets. Source: Same as figure above, including footnote defining the markets.

In light of this much larger worldwide field of "competitor nations" for broadband and communications technology, and the fact that several of these nations have significant national broadband plans of their own, regaining U.S. leadership in the areas where the U.S. has slipped will require a comprehensive plan that examines and compares not just the traditional competitor nations, but the emerging markets as well. Multiple comparison metrics (e.g. covering adoption, availability, network performance,[13] and demographic breakouts) should be used, to avoid skewed metrics. Intel believes that the Commission plan should include an ongoing information-gathering effort to document, track, and grade the progress of the U.S. broadband policies as well as broadband deployment, capability, penetration, and prices relative to the policies and programs of other nations. It is these comparisons to other nations that are at the root of the current debate about U.S. broadband adequacy. In part, these debates are related to the use of single-point

[13] An example of inter- and intra-country network performance measurements worldwide is found in the annual report from the Stanford Linear Accelerator Center (SLAC) et. al. The 2009 report is available at http://www.slac.stanford.edu/xorg/icfa/icfa-net-paper-jan09/report-jan09.doc (~20MB file).

comparisons, and inconsistent metrics and methodologies across the comparisons. It is also important to consider these comparisons in light of the regulatory, cultural, economic, social, and demographic differences between these nations, especially when it comes to comparing rate-of-change and trend lines.

Comparing statistical sub-groups along demographic category lines can show vast differences from aggregate population statistics,[14] and are the more appropriate and representative measures for addressing those unwilling and/or unable to subscribe, in a targeted fashion. The "willing and able" portion of the market has for the most part already subscribed. The remaining portion of the population will not just succumb to mainstream market momentum. They require a targeted demand-side/adoption approach that comprehends and resolves their reluctance or inability to subscribe, in a sustainable way.

Intel believes the U.S. can prosper and advance relative to other nations by focusing significant effort and resources on demand-side improvements (in addition to supply-side efforts). While other nations will *recognize* there are demand-side issues, the scope of their solution may not align with the scale. A properly balanced U.S. plan will improve not just the trends of the lagging demographic groups, it will improve the aggregate population statistics as a by-product.

Some examples of demand-side stimulus in other nations include: a PC subsidy in Singapore, offered to students from low income families and persons with disabilities[15]; a tax rebate program in Australia to cover computers, internet access, and educational

[14] See for example, Figure 8 in earlier section.
[15] http://www.ida.gov.sg/Programmes/20060419155649.aspx?getPagetype=34

software for school-aged children[16]; a subsidy in China to cover PC purchases in rural markets.[17]

5.0 Spectrum Reforms: The FCC and Congress Should Undertake Meaningful Spectrum Regulatory and Legislative Reforms.

The transition to a flexible, market-oriented spectrum policy in the U.S. has been demonstrated to increase spectrum utilization and assignment efficiency, to advance market growth, and to encourage innovation that otherwise would not have been permitted under the rigid rules and mandates of the past.[18] At the core of the flexible spectrum regulation methodology are the principles of technology neutrality and service neutrality.

New wireless technologies and applications continue to be developed at a rapid pace, under the Commission's flexible methodology. However, the most desired spectrum, below 3.5 GHz, has for the most part already been assigned and allocated, or has already undergone a re-banding exercise where incumbent users were relocated to higher bands. Consequently, locating and freeing up new bands for more efficient and/or valuable use has never been more important, or more complex. It is vital for U.S. competitiveness.

This proceeding gives unique opportunity to embrace further market-oriented, flexible enhancements to our nation's spectrum policy. A precursor to the policy enhancements is a spectrum inventory of government band assignments and their geographic

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[16] "Investing in the future - KEEP PENRITH WORKING," *Penrith Press*, Aug. 14, 2009; "Education tax refund," *Centralian Advocate (Australia)*, Feb. 17, 2009.

[17] http://www.gartner.com/resources/165400/165448/chinas_rural_communities_pre_165448.pdf

[18] Horne, David, Intel Corp., Market-Oriented Spectrum Policy Evolution in the United States, April 2009 (submitted as an Exhibit to Intel's comments in the instant proceeding. Also available from: http://blogs.intel.com/policy/2009/06/market-oriented_spectrum_policy_evolution_in_the_united_states.php

boundaries. Intel supports a spectrum inventory effort, and the "Radio Spectrum Inventory Act"[19] could be used as the starting point.

However, Intel also recommends that the NTIA should identify significant new bands from government users, e.g. 200 MHz or more, for auction. Its analysis should be based on factors such as the geographic band assignment inventory, the antiquity of the equipment technology deployed in each assignment, and the availability of suitable spectrum to move to. As in the AWS auction[20], NTIA's estimate of moving the government users would become the reserve price of the auction. Besides freeing up valuable spectrum for advanced wireless services, this approach could give some government users new network equipment and devices with minimal disruption due to relocation.

Furthermore, Congress should give the FCC expanded auction authority to free up additional commercial spectrum through two-sided auctions and auction vouchers.[21] These auction methodologies may provide sufficient incentive for existing private spectrum license holders to self-identify and relocate by choice. In turn, it would also reduce the scope of detailed and costly spectrum utilization data acquisition and analysis. Intel urges Congress to act quickly in granting the Commission explicit two-sided auction authority and auction voucher authority for a fixed term.

[19] S.649, Radio Spectrum Inventory Act, 111th Congress, March 19, 2009 (Kerry, Snowe, Nelson, Wicker)

[20] http://www.ntia.doc.gov/ntiahome/press/2005/relo_12282005.htm

[21] Two-sided auctions involve spectrum voluntarily offered by incumbent license holders, to be auctioned together with unassigned spectrum. It requires explicit Congressional approval because challenges to its legality under the current language of the statue exist. The process allows bidders to aggregate fragmented spectrum at little risk. Auction vouchers are given to incumbent license holders in exchange for turning in their license.

6.0 Summary of Recommendations:

- The starting point for the broadband plan should be the Commission's policies designed to foster facilities-based competition.

- The Commission should define targeted metrics to quantify U.S. broadband. For example, subscriber penetration and availability by technology, application utilization, and broadband network capabilities

- A graphical broadband mapping tool, based on the FCC's revised data gathering methods, would be useful for educating the public on the nation's broadband progress. Linking that database of provider-reported service bandwidth to a composite of the various broadband speed test websites (which collect actual usage data rates) could serve as a valuable cross-check on the Commission's new data gathering methods.

- Congress and the Commission should foster deployment policies that would give all consumers choice between the mobile and wireline broadband platforms, and not erect any artificial barriers or in/direct biases.

- A supply-side stimulus program for unserved and underserved is important. However, demand-side issues affect a larger number of Americans and demand-side stimulus could have a higher impact on our nation's "broadband bottom line"

- Any Commission definition of broadband should include multiple factors, not just a speed/bandwidth metric. Likewise, any Commission definition of underserved should include multiple factors.

- A trial program of vouchers (e.g. for computers and/or broadband service costs), targeted at the low income demographic, could help improve adoption.

- A federally-funded computer literacy effort could multiply the positive impact of established, but small-scale programs, and also serve as the central repository to document public and private sector efforts toward demand stimulation, and share best practices.

- The following steps can make a significant difference in the quality of health care for all Americans: development of electronic medical records; effective, secure broadband to enable medical information to follow the patient from doctor to hospital to home; and broadband access to health care resources for rural populations.

- The Commission plan should include an ongoing information-gathering effort to document, track, and grade the progress of the U.S. broadband policies as well as broadband deployment, capability, penetration, and prices relative to the policies and programs of other nations.

- The U.S. can prosper and advance relative to other nations by focusing significant effort and resources on demand-side improvements. Other nations may focus primarily on the supply-side issues.

- The “Radio Spectrum Inventory Act,“ S.649, is a useful starting point for spectrum inventory/census efforts.

- The NTIA should identify significant new bands from government users, e.g. 200 MHz or more, for auction.

- Congress should act quickly in granting the Commission explicit two-sided auction authority and auction voucher authority for a fixed term.

Respectfully Submitted,

/s/ David Horne

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