



Statement before the House Energy and
Commerce Committee Subcommittee on Communications and Technology
On Empowering and Connecting Communities Through Digital Equity and Internet
Adoption

Testimony from Roslyn Layton

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Chairman Pallone, Ranking Member Walden, Subcommittee Chairman Doyle, Ranking Member Latta, and members of the subcommittee, thank you for the opportunity to testify today on internet adoption and digital inclusion. I am pleased to offer some highlights of the academic and empirical literature, some practical experience, and some policy recommendations on these topics. My comments are informed by my work as a researcher with the American Enterprise Institute (AEI) and the Center for Communication, Media, and Information Technologies (CMI) at Aalborg University in Denmark. At CMI we bring multidisciplinary perspectives and problem-based learning to our inquiries. CMI also partners with Ghana Telecom University College to host doctoral students and learn about these questions in emerging countries. I have written articles and book chapters about the policy challenges and solutions to digital adoption across countries.¹ I have also edited a book on gender and digital inclusion.² And I am honored to serve as the vice chair of the Program Committee of the Telecom Policy Research Conference.

The case of Denmark itself is instructive for this topic. Denmark is perhaps the world's leading digital nation as measured by access, use, and skills. Denmark has opted not for broadband subsidies and price regulation, instead allowing consumers and providers to determine their preferences, albeit with appropriate transparency disclosures. However, the government digitized all its services to force individuals and enterprise to adopt the internet. This also served to lower cost of service provision.³

Highlights from the Academic and Empirical Literature

The many articles on internet adoption can be boiled down to one important point: People adopt services, not networks.⁴ The demand for broadband is "derived demand": Consumers adopt broadband for the services they get from networks, not for the networks themselves. To maximize the value of broadband for its users, it is important then to allow the many facets of consumer demand to be manifested.

When a centralized authority mandates the parameters of broadband, it limits and reduces the preferences that individual consumers can express. Price controls and one-size-fits-all mandates deny consumers their freedom of choice and force them to pay for content, data, and features they do not necessarily recognize or value. Moreover, the hitherto shaping of the broadband market by speed requirements (an arbitrary parameter regulators selected because of its relative ease of measurement) has reduced consumers' ability to select and contract for their preferred features, such as quality, customer service, safety, durability, and flexible pricing.⁵

¹ For example, see Knud Erik Skouby and Idongesit Williams, eds., *The African Mobile Story* (Denmark: River Publishers, 2014); and Datis Khajeheian, Mike Friedrichsen, and Wilfried Mödinger, eds., *Competitiveness in Emerging Markets: Market Dynamics in the Age of Disruptive Technologies* (Berlin, Germany: Springer, 2018).

² Idongesit Williams, Olga Millward, and Roslyn Layton, eds., *Gender Gaps and the Social Inclusion Movement in ICT* (Hershey, PA: IGI Global, 2018).

³ Joseph Kane and Roslyn Layton, "Alternative Approaches to Broadband Policy: Lessons on Deregulation from Denmark" (working paper, Mercatus Center, Arlington, VA, March 22, 2017), <https://www.mercatus.org/publications/technology-and-innovation/alternative-approaches-broadband-policy>.

⁴ Justin Hurwitz and Roslyn Layton, "Debatable Premises in Telecom Policy," *John Marshall Journal of Information Technology & Privacy Law* 31, no. 4 (2015), <https://repository.jmls.edu/jitpl/vol31/iss4/1/>.

⁵ Layton and Howell, "How Title II Harms Consumers and Innovators," AEI, July 14, 2017, <https://www.aei.org/research-products/report/how-title-ii-harms-consumers-and-innovators/>.

To realize digital inclusion, policy should therefore focus more on demand than supply. Consumers have a diverse set of needs, and not everyone wants to be included in the same way. In editing the book *Gender Gaps and the Social Inclusion Movement in ICT*, I learned there is no one right policy for “digital inclusion.” There are different needs and approaches, and in a free society, policy should allow individuals to express their preferences.

In the hearing memo, Chairman Pallone highlighted the National Telecommunications and Information Administration (NTIA) survey.⁶ The report notes that the US has 100 million households online, itself a bipartisan policy success that should be recognized. Importantly in the last decade, the cost of computing equipment being a barrier has fallen from 21 to 4 percent as a reason for not being online. Interestingly, 16.2 million households are not online because of lack of need or interest, a number that has increased significantly in the past decade.⁷ An additional six million households report that cost of internet access is the barrier to internet adoption. This is important because for two-thirds of the people not online, making the internet available or faster will not help them access it.

Pew offers valuable research on internet adoption and has followed the issue closely for 15 years, noting nine out of 10 Americans using the internet regularly.⁸ Gaps that remain can be attributed to age, income, education, and community type. These factors do not presuppose that one network or mode is preferable. Moreover, closing these gaps is largely about empowering individuals, not favoring any one firm or technology.

Indeed, the single best thing we can do for internet adoption and inclusion is to support the framework for our current growing economy, which continues to deliver increased wages, employment, and opportunity. To the extent that people have more money in their pockets, they can buy more of all goods and services, including broadband. As an economic matter, broadband takes up a decreasing share of people’s income, so it makes little sense to reduce the cost of broadband versus addressing the other areas that take up a greater portion of income. Americans spend more on housing, transportation, education, food, clothing, and even discretionary travel than on broadband. It is illogical to attack a single line item in the monthly budget that accounts for less than \$100, when the smarter approach would be to reduce the cost of the items costing hundreds, if not, thousands of dollars per month.

Nevertheless, despite the data showing that US has some of the lowest prices per unit cost to connect online and some of the lowest entry level prices anywhere in the world, some believe that the price of broadband is too high.⁹ This is likely the unintended consequence of the historical broadband policy which has favored the interest of Silicon Valley to minimize their data transit costs. The practical effect of this policy is that the end users pays 100 percent of the last mile access cost while the content provide provides little to nothing.

In a free multisided market, content providers would play a greater role to support last mile network

⁶ Rafi Goldberg, “Unplugged: NTIA Survey Finds Some Americans Still Avoid Home Internet Use,” US Department of Commerce, National Telecommunications and Information Administration, April 15, 2019, <https://www.ntia.gov/blog/2019/unplugged-ntia-survey-finds-some-americans-still-avoid-home-internet-use>.

⁷ “The proportion of offline households citing lack of need or interest has increased from 39 percent in 2009 to 58 percent in 2017.” Goldberg, “Unplugged.”

⁸ Pew Research Center, “Internet/Broadband Fact Sheet,” June 12, 2019, <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>.

⁹ <https://www.mercatus.org/publications/technology-and-innovation/innovation-investment-and-competition-broadband-and-impact>

cost, and individuals would practice more discretion to the content they access. Ideally we would see different cost sharing models depending on supply and demand. In any case, moving to more decentralized model, should allow greater cost sharing among the largest parties that use the network, more diversity in connectivity options, and a better fit for consumers' preferences and budget.

John Horrigan, a leading researcher on broadband adoption, notes:

Even with the availability of low-cost offers, it remains a challenge to encourage the remaining disconnected people to sign up for broadband service. And we still have limited understanding of how newly-connected low-income people use the internet and how it affects their lives.¹⁰

This underscores that policy meant merely to promote low-cost solutions does not address individual needs.

The national discussion on privacy also underscores that many are overwhelmed by being online, so this offers an important counterpoint in the rush to dictate inclusion with a predetermined set of factors. The notion of a privacy right—indeed, a right to not be online—could explain why some among the 16 million households offline do not believe the internet is useful. It appears that for some, being offline is a choice, and it raises an important question of whether such a freedom is honored in the digital society.

Moreover, important research from the Organisation for Economic Co-operation and Development (OECD) shows there is not a linear relationship between the presence of information technology in the home and classroom and student performance.¹¹ There is no evidence that higher broadband speeds are required for improved student performance. Mr. Pallone's citation that three million school-age children without internet access at home is concerning; however these children are likely suffering from a variety of challenges, such as lack of parent availability, a stable living situation, and so forth.¹² It is misguided use of broadband policy to think that subsidized internet will itself remedy education performance, when larger systematic factors need to be addressed and, in so doing, would likely resolve the connectivity issue.

Practical Experience with Broadband Adoption

I mentioned that content providers could play a greater role to support network deployment, and indeed, advertising-supported broadband is a possibility. After all advertising is what supports the millions of services on the internet itself. Moreover, broadband providers have tried many ways to reduce the cost of their services to end users, particularly with free and discounted offers to compete in the marketplace. This marketing should be welcomed and encouraged. Consumers love such programs, but sometimes these programs do not meet the aesthetic preferences of self-appointed consumer

¹⁰ John B. Horrigan, *Reaching the Unconnected: Benefits for Kids and Schoolwork Drive Broadband Subscriptions, but Digital Skills Training Opens Doors to Household Internet Use for Jobs and Learning*, Technology Policy Institute, August 2019, 2, https://techpolicyinstitute.org/wp-content/uploads/2019/08/Horrigan_Reaching-the-Unconnected.pdf.

¹¹ Bronwyn Howell, "Do More Computers and Software Really Make Students Better Learners?," AEIdeas, September 22, 2015, <https://www.aei.org/technology-and-innovation/computers-software-really-make-students-better-learners/>.

¹² Naomi Schaefer Riley's work provides valuable insight and explanation to the complex issue of child welfare. See American Enterprise Institute, "Naomi Schaefer Riley," <https://www.aei.org/profile/naomi-riley/>.

advocates and regulatory elites who may block these diversity-enhancing market developments.¹³ My empirical research demonstrates how the poor are harmed when policy restricts pricing flexibility.¹⁴

Indeed, T-Mobile's Binge On and Music Freedom were wildly popular, prompting millions of customers to switch. But the response of the 2015 Federal Communications Commission (FCC) and the California legislature was to shut down programs that consumers love. MetroPCS was one of the first firms to offer 4G wireless service. In 2010, after analyzing its customer behavior and making engineering enhancements in its network, MetroPCS developed an attractively priced 4G plan with free YouTube for low-income rural residents. But the plan was ultimately torpedoed by consumer advocates who complained to the FCC.¹⁵ MetroPCS, unable to compete with such a regulatory straitjacket, was ultimately acquired, reducing the number of mobile operators.

This regulatory discrimination extends to many welfare-enhancing activities such as health care providers subsidizing the cost of prenatal videos and mobile operators daring to enter the highly concentrated online advertising industry. This ideological prejudice, in which regulators, not consumers, decide the broadband products we get to have, costs our economy about \$30–\$40 billion annually,¹⁶ an amount equal to four times what we spend on the Universal Service Fund each year. We could have closed the digital divide years ago, had our regulatory policy not prioritized aesthetic purity (and some content provider profits) over the welfare of the poor.¹⁷

Consider that before broadband, Netflix sent a DVD by the US Postal Service. The customer paid for a subscription, and Netflix paid the postage. Now that Netflix is online, the customer still pays the subscription fee, but Netflix sends the postal fee to the broadband provider. The broadband provider thus must collect that fee from the entire subscriber base, whether or not they subscribe to Netflix. Netflix has grown its customer base without meaningfully having to increase its delivery costs. Indeed, video from such leading firms as Netflix and YouTube accounts for 20 percent of all downstream traffic in the US.¹⁸ However, these firms do not meaningfully participate in defraying the cost of last mile broadband networks.

¹³ Marvin Ammori, "T-Mobile Is Likely Violating Net Neutrality," Slate, December 15, 2015, http://www.slate.com/articles/technology/future_tense/2015/12/t_mobile_s_binge_on_program_likely_violates_net_neutrality.html.

¹⁴ Roslyn Layton and Silvia Elaluf-Calderwood, "Zero Rating: Do Hard Rules Protect or Harm Consumers and Competition? Evidence from Chile, Netherlands and Slovenia," August 15, 2015, <https://ssrn.com/abstract=2587542>. Additional discussion at Howell, Bronwyn E. and Layton, Roslyn, Evaluating the Consequences of Zero-Rating: Guidance for Regulators and Adjudicators (August 2016). TPRC 44: The 44th Research Conference on Communication, Information and Internet Policy 2016. <https://ssrn.com/abstract=2757391>

¹⁵ Brent Skorup, "If You're Reliant on the Internet, You Loathe Net Neutrality," RealClearMarkets, February 12, 2014, https://www.realclearmarkets.com/articles/2014/02/12/if_youre_reliant_on_the_internet_you_loathe_net_neutrality_100893.html.

¹⁶ George S. Ford, "Net Neutrality, Reclassification and Investment: A Counterfactual Analysis," Phoenix Center for Advanced Legal & Economic Public Policy Studies, April 25, 2017, <http://www.phoenix-center.org/perspectives/Perspective17-02Final.pdf>.

¹⁷ <https://arstechnica.com/information-technology/2017/05/a-trump-fcc-advisors-proposal-for-bringing-free-internet-to-poor-people/>

¹⁸ Sandvine, "The Global Internet Phenomena Report," 2019 <https://www.sandvine.com/global-internet-phenomena-report-2019>

Data from the International Telecommunications Union on internet penetration provide additional insight. India's telecom regulator boasts of having the most restrictive internet traffic rules and price controls.¹⁹ Unsurprisingly, only one in three Indians is online today. Indeed, if India allowed the pricing flexibility practiced in other emerging countries, there could be as many as 400 million more Indian internet users today, and the country's gross domestic product would get a significant bump.

It is helpful that we study some market success stories. Comcast has taken the research on broadband adoption to heart, incorporating devices and skill training into its first-time internet adoption program. Comcast's Internet Essentials (IE) added eight million new users in eight years, better results than any government program. This was done without subsidies. Notably, Comcast is redoubling its commitment to IE without any regulatory mandate to do so.²⁰

It is encouraging to see states and cities taking a proactive approach. For example, some two dozen states have already adopted model codes for 5G and small cell deployment.²¹ This is crucial to speed deployment and support competition by multiple providers. Moreover, the process to find local partners and join complementary assets should be encouraged. This is the essence of innovation, and such cooperation is essential for developing the apps and services for 5G.

Naturally cities and states want to improve their residents' welfare. However, the notion of "digital inclusion" should not be the justification to add costs to network deployment—for example digital inclusion fee on broadband providers. Frequently this is done as a way for financially stressed cities to find new sources of revenue. This fee creates the same distortion as taxes on communication service, making it more expensive for the end user and reducing the resources for deployment.²² When cities do this, they also reduce the resources that can be deployed in rural areas.

Moreover, some states and localities attempt an end run around federal policy defined by Congress—for example, with partisan litigation efforts brought by states to either remove or reinstate FCC policy.²³ These efforts are costly and counterproductive and distract resources away from the six million individuals we ostensibly want to help.

Policy Recommendations

¹⁹ Roslyn Layton, "Why Does California Want to Adopt India's Failed Internet Regulation?," *Forbes*, July 13, 2018, <https://www.forbes.com/sites/roslynlayton/2018/07/13/why-does-california-want-to-adopt-indias-failed-internet-regulation/#42673ff4541a>.

²⁰ Roslyn Layton, "8 Million Low Income Households Connected in 8 Years—Policy Takeaways from Comcast's Internet Essentials," *Forbes*, August 7, 2019, <https://www.forbes.com/sites/roslynlayton/2019/08/07/8-million-low-income-households-connected-in-8-years-policy-takeaways-from-comcasts-internet-essentials/>.

²¹ Heather Morton, "Mobile 5G and Small Cell 2019 Legislation," National Conference of State Legislatures, July 17, 2019, <https://www.ncsl.org/research/telecommunications-and-information-technology/mobile-5g-and-small-cell-2019-legislation.aspx>.

²² Roslyn Layton, "Where Are the Silicon Valley Firms When It Comes to Digital Inclusion in San Jose?," *Forbes*, November 16, 2018, <https://www.forbes.com/sites/roslynlayton/2018/11/16/where-are-the-silicon-valley-firms-when-it-comes-to-digital-inclusion-in-san-jose/>.

²³ Roslyn Layton, "Never-Ending Net Neutrality Litigation Means Lawyers Always Win," AEIdeas, October 9, 2019, <https://www.aei.org/technology-and-innovation/never-ending-net-neutrality-litigation-means-lawyers-always-win/>.

Traditional modes of broadband subsidies, however well-intentioned, are ineffective and unsustainable. The surcharge on the Universal Service Fund, just one component of the many federal broadband subsidy programs, has risen from 3 percent in 1998 to 24.4 percent today.²⁴ This is a growing tax levied on a declining service that falls hardest on the poorest people. The Lifeline program needs revolutionary, not evolutionary change.²⁵ Rather than throw more good money after bad, we should improve existing programs. Fortunately, the FCC is reversing this trend and deserves the right to try.

Under FCC Chairman Ajit Pai's leadership, the FCC is on the right track to close the digital divide, and these efforts should continue. This includes but is not limited to the Connect America Fund (CAF) Phase II reverse auction, the first time use of an innovative model in which operators bid for connect an area by lowest cost.²⁶ This program attempts to focus funds on areas with little to no network build-out, not displace existing investment.²⁷ In the EU, providing subsidies to areas with existing networks is a violation of state aid rules.²⁸ CAF II has allowed \$1.5 billion to be distributed to connect more than 713,000 homes and businesses nationwide. The auction was also open to all network types and through intermodal, competitive bidding, the FCC reduced \$3.5 billion from the \$5 billion expected to connect these unserved areas.²⁹ I also welcome the proposed \$20.4 billion Rural Digital Opportunity Fund in applying the lessons of the reverse auction to expand broadband in unserved rural areas.³⁰

Also laudable are the FCC's efforts to improve wireline³¹ and wireless network regulation³² so that these networks can be built more quickly and with less money³³ and that the transition to modern broadband networks can be accelerated.³⁴ The FCC is also combatting abuse by franchising authorities, practices which increases the cost of cable to end users and reduce deployment.³⁵

²⁴ Daniel Lyons, "Universal Service Fund Budget Cap Promotes Efficiency, Sustainability," AEIdeas, August 19, 2019, <https://www.aei.org/technology-and-innovation/telecommunications/universal-service-fund-budget-cap-promotes-efficiency-sustainability/>.

²⁵ <https://www.aei.org/technology-and-innovation/paternalism-and-prediction-errors-revisiting-lifelines-minimum-service-standards/>

²⁶ <https://www.fcc.gov/document/connect-america-auction-expand-broadband-713176-rural-locations>

²⁷ Federal Communications Commission, "Connect America Fund (CAF)," February 2, 2017, <https://www.fcc.gov/general/connect-america-fund-caf>.

²⁸ Roslyn Layton, "Municipal Broadband: A Wolf in Sheep's Clothing?," AEIdeas, November 7, 2013, <https://www.aei.org/technology-and-innovation/telecommunications/municipal-broadband-wolf-sheeps-clothing/>.

²⁹ Ajit Pai, statement before the Subcommittee on Financial Services and General Government, Committee on Appropriations, US Senate, May 7, 2019, <https://docs.fcc.gov/public/attachments/DOC-357354A1.pdf>.

³⁰ Federal Communications Commission, "FCC Fact Sheet: Rural Digital Opportunity Fund," January 9, 2020, <https://docs.fcc.gov/public/attachments/DOC-361785A1.pdf>.

³¹ <https://www.fcc.gov/document/accelerating-wireline-broadband-infrastructure-deployment>

³² <https://www.fcc.gov/document/wireless-infrastructure-nprm-and-noi>

³³ Roslyn Layton, "The FCC Fast-Tracked 5G Wireless. Now It Proposes the Same for Cable.," AEIdeas, July 15, 2019, <https://www.aei.org/technology-and-innovation/telecommunications/the-fcc-fast-tracked-5g-wireless-now-it-proposes-the-same-for-cable/>

³⁴ <https://docs.fcc.gov/public/attachments/DOC-347790A1.pdf>

³⁵ Roslyn Layton, "How Local Government Gets in the Way of Better, Faster, and Cheaper Broadband," AEIdeas, February 27, 2019, <https://www.aei.org/technology-and-innovation/telecommunications/how-local-government-gets-in-the-way-of-better-faster-cheaper-broadband/>.

Under then Chairman Upton and Sub-Committee Chairman Walden in 2014, the Energy & Commerce Committee led an effort to modernize the Communications Act in 2014,³⁶ an important and overdue effort that came to an abrupt halt. Yet this work must still be done as the exigence of regulatory siloes deters competition and innovation in a world in which communications, content, and computing have converged. That we fail to realize individual preferences for internet adoption and inclusion likely reflects that regulatory frameworks from the last century persist. Consider that telephone regulation is 86 years old and still on the books; cable, 36 years; mobile wireless, 25 years. To realize greater digital adoption and inclusion, we must update our outdated laws to reflect the dynamic competition in the marketplace³⁷ and modernize obsolete regulatory structures.³⁸ This is the kind of bold work that this Commission should do, not doubling-down on outdated policies written in the age of the rotary phone.

One area where Congress must act is spectrum, and only Congress has the power to solve the problem. We connect to the internet increasingly and wirelessly. While the US has made important strides in 5G, we still need major spectrum reform. The US government sits on most of the frequencies, and an audit of federal spectrum is needed to develop a 21st century approach to the resource. Only Congress can authorize auctions, appropriate audit funds, and enable the agency reforms needed so that the US is on the same page to win the global 5G race.³⁹ While the US has many advantages, it lacks sufficient mid-band spectrum, particularly the C-band, the frequencies which 23 nations have already prioritized for 5G and where standards for devices will be harmonized globally. The window of opportunity for the US is closing on this front, and it is critical that this committee encourage the FCC to conduct a speedy public auction for the C-band. This is also the fastest way to get 5G to rural areas.⁴⁰

I also encourage this committee to consider the role of satellite broadband.⁴¹ New high throughput satellites offer 100 Mbps, making this technology a contender for rural and urban use. This demands immediate attention as the Chinese are already closing their digital divide for 100 million people via satellite and will export the model globally.⁴² Moreover satellite technologies needn't be subsidized.

In your reflection on digital adoption and inclusion, please remember that people adopt services, not networks; that price flexibility serves consumers; and that modernizing regulation makes network deployment quicker and cheaper. Thank you for this opportunity to testify today.

³⁶ <https://republicans-energycommerce.house.gov/commactupdate/>

³⁷ Richard Bennett et al., "Comments on Communications Act Modernization," January 31, 2014," <https://ssrn.com/abstract=2388723>.

³⁸ <https://www.aei.org/research-products/report/the-signs-and-symptoms-of-regulatory-obsolescence-in-network-industries/>

³⁹ <https://www.forbes.com/sites/roslynlayton/2020/01/07/ces-displays-a-grand-vision-for-mobile-tech-but-not-the-spectrum-to-deliver-it/>

⁴⁰ American Enterprise Institute, "C-Band Spectrum and the Race for 5G," YouTube, January 24, 2020, <https://www.aei.org/multimedia/c-band-spectrum-and-the-race-for-5g-in-60-seconds/>. See further <https://www.forbes.com/sites/roslynlayton/2019/11/13/on-c-band-spectrum-auction-speed--is-all-that-matters/>

⁴¹ Roslyn Layton, "For Mid-Band Spectrum, Markets Can Produce Better Outcomes Than Regulators Can Engineer," AEIdeas, July 26, 2019, <https://www.aei.org/technology-and-innovation/telecommunications/for-mid-band-spectrum-markets-can-produce-better-outcomes-than-regulators-can-engineer/>.

⁴² Larry Press, "Hongyun Project—China's Low-Earth Orbit Broadband Internet Project," CircleID, June 4, 2019, http://www.circleid.com/posts/20190604_hongyun_project_chinas_low_earth_orbit_broadband_internet_projec_t/; and Robert Clark, "China Joins Global Satellite Broadband Party," Light Reading, November 22, 2019, <https://www.lightreading.com/asia-pacific/china-joins-global-satellite-broadband-party-/d/d-id/755882>.