

Comments on the Formulation of the National Broadband Research Agenda

We welcome the opportunity to respond to the Request for Comments (RFC) from the National Telecommunications and Information Administration (NTIA) and the National Science Foundation (NSF) to inform the development of the National Broadband Research Agenda.¹ We support the Broadband Opportunity Council's overall goals and in particular the objectives of this notice to "improve data collection, analysis, research, and their applications for the benefit of broadband policy development, program implementation, and program evaluation."² And we wholeheartedly agree that a robust agenda will help both the U.S. government and external stakeholders in a myriad of ways. These comments respond to a number of questions posed in the RFC, including questions 4, 7, 9-11, 13, 15, 17, and 18.³ They are submitted on behalf of researchers and students affiliated with the Berkman Klein Center for Internet & Society at Harvard University.

I. Introduction

As academics affiliated with a research center whose mission is "to study [the] development, dynamics, norms and standards" of the internet and its impact on society, we are deeply invested in understanding the evolution of high speed internet access adoption and the resultant socio-economic effects.⁴ The Berkman Klein Center has a history of studying internet access adoption on both a granular and a global scale to provide the policymakers, journalists, and the public with objective analysis. Recently, under the direction of Professor Susan Crawford, the Center launched the Responsive Communities Initiative, which hopes to, in part, "address the barriers to ubiquitous, affordable, high-speed internet access as a matter of social justice, as well as economic policy," with a particular focus on local government-based initiatives like municipal fiber networks.⁵

To further this goal, as researchers and students working at the Berkman Klein Center, we have spent a substantial amount of time investigating the cost of internet access service in more than forty communities across the United States that are served by municipal fiber internet service providers (ISPs), in order to understand their pricing structures and the competitive effects of these networks. We are interested in

¹ Request for Comments on the National Broadband Research Agenda, 81 Fed. Reg. 175 (Sept. 9, 2016) at 62479.

² *Id.* at 62480.

³ The RFC asks, *inter alia*, for comments in response to the following questions:

4. What are the critical data and research needs in the areas of broadband deployment and access?
7. What are the critical data and research needs in the areas of broadband adoption and utilization?
9. What specific research and data are needed to understand how rural residents and other population groups that have traditionally under-utilized broadband technology (e.g., seniors, low-income families, persons with disabilities) can better adopt and use broadband?
10. What are the critical data and research needs in the area of broadband and its economic and social impact?
11. What specific research proposals, and associated methodologies, regarding the socioeconomic impact of broadband should be prioritized?
13. What opportunities exist to improve the sharing of research from federal research programs with external stakeholders (e.g., industry, academia)? Likewise, how can external stakeholders better share their research with federal agencies?
15. Given limited federal budgets and existing research efforts led by industry, academia, and other external groups, what specific role should the federal government play in the area of broadband research (e.g., funding, data gathering, coordination)?
16. Are there opportunities to collect new broadband-related data or expand current data sets within federal programs that fund and/or produce research?
17. What data (whether public or commercial/proprietary) would facilitate ground-breaking research related to broadband, if that data were to become available?
18. What are possible changes to federal policies and programs that could enhance broadband research?

⁴ *About*, The Berkman Klein Center for Internet & Society (accessed Sept. 29, 2016): <https://cyber.harvard.edu/about>.

⁵ Responsive Communities Initiative (accessed Sept. 29, 2016): <http://www.responsivecommunities.org/>.

granular pricing information in particular since the price of service has often been cited as one of the key barriers to internet access adoption in the United States.⁶

Our research efforts highlight a much larger gap in the United States: the lack of a nationwide, comprehensive database on internet access packages available to residential consumers.⁷ While some data exist on average annual spending on internet service nationwide, the level of detail in these data sets is simply inadequate to use for meaningful comparative research or to correlate with demographic or socioeconomic factors that might also affect internet access adoption. Aggregate annual pricing statistics also fail to sufficiently explain the breakdown of costs that individual consumers face, which may include monthly service charges, introductory pricing that changes over time, installation fees, activation fees, data overages, and equipment purchases, among others. Moreover, high-level numbers do not allow researchers to evaluate the effects of competition in regional marketplaces; they also mask a wide variation in pricing from community to community, as internet service providers may offer different speed tiers and pricing options in different service areas.⁸

A comprehensive database that includes granular, accurate pricing information would be a boon to many diverse constituencies in addition to researchers like ourselves. Communities could use the information to evaluate whether to build their own networks or implement other policy solutions; researchers trying to understand trends in internet access adoption could quickly evaluate the impact of price; policymakers at the state and federal levels could use the dataset to inform regulatory decisions; and ordinary consumers could easily compare internet access service offerings and make informed decisions. The formulation of a National Broadband Research Agenda represents a perfect opportunity to fill in these gaps and create a groundbreaking and multi-use tool from which individuals and institutions alike could benefit tremendously.

II. The Lack of Comprehensive Data is a Major Impediment to Research About Broadband Access and Adoption and the Development of Targeted Policy Solutions

The lack of comprehensive data about internet access pricing and availability in the United States is a major barrier to conducting research about internet access adoption and the state of competition across the country. Indeed, one of the major themes in the comments submitted to the Broadband Opportunity Council in June 2015 was a need for better and more comprehensive data on internet access and the cost of internet service in the United States.⁹ Without comprehensive, granular data on price and speed, it remains extraordinarily difficult to understand the state of play in the United States, let alone develop targeted solutions to address existing inequities. We know, for example, that Americans pay more for high-speed internet service than citizens of most OECD countries, and internet access adoption has largely plateaued, with the number of adult home broadband users actually dropping slightly from

⁶ Maeve Duggan & John B. Horrigan, *Home Broadband 2015*, Pew Research Center (Dec. 21, 2015): <http://www.pewinternet.org/2015/12/21/home-broadband-2015/>; *Broadband Opportunity Council Report and Recommendations*, United States Department of Commerce & United States Department of Agriculture (Aug. 20, 2015): https://www.whitehouse.gov/sites/default/files/broadband_opportunity_council_report_final.pdf

⁷ We note that there are some commercial data sets available which contain this information, but they tend to be both costly and proprietary, which reduces their utility and has to date kept them out of the public debate as well as limited their use by researchers.

⁸ OECD, *Fixed broadband subscription price ranges* (Sept 2014), produced and distributed by OECD Digital Economy Outlook: <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>

⁹ *Broadband Opportunity Council Report and Recommendations*, United States Department of Commerce & United States Department of Agriculture (Aug. 20, 2015): https://www.whitehouse.gov/sites/default/files/broadband_opportunity_council_report_final.pdf (noting that a “number of themes emerged from the comments including the need for... more data and research on broadband.”).

2013 to 2015.¹⁰ Several studies suggest that a lack of competition is a key challenge, since only a small number of cities offer Americans a choice from at least three broadband providers, and three out of four Americans have, at most, one provider selling high-speed internet access service.¹¹ But without the ability to compare these numbers to pricing data and other demographic factors, it remains extraordinarily difficult for researchers and policymakers to identify effective solutions in this area.

These data are also essential to document and study the impacts of digital inclusion and internet access adoption programs on long-term internet access subscription. The Obama Administration has made connecting the unconnected a policy priority in recent years, launching a number of initiatives like ConnectHome and supporting existing efforts by the Federal Communications Commission and other agencies to bridge the digital divide by offering subsidies or discounted internet access service to various segments of the population.¹² Yet these programs are being launched and evaluated without the ability to consider key metrics like speed and price.

The importance of collecting and publicizing detailed data on cost and service levels was underscored by a recent case in which the FCC imposed merger conditions that would require AT&T to provide discounted pricing to low-income populations, but apparently overlooked the fact that many of the poorest residents in inner-city Cleveland and Detroit would never be eligible for the program. When AT&T purchased DirecTV earlier this year it agreed to offer 5 Mbps or 10 Mbps service to households participating in the federal Supplemental Nutrition Assistance Program (SNAP) for \$10 per month. If such speeds were not available, AT&T agreed to offer at least 3 Mbps for \$5 per month.¹³ AT&T claimed that only two percent of its customers could not get speeds of at least 3 Mbps, making the program, known as “Access from AT&T,” seem comprehensive.¹⁴

However, the National Digital Inclusion Alliance checked the data this year—census block by census block—and found that in inner city Cleveland and Detroit, the fastest AT&T download connection was 1.5 Mbps or less in 21 percent of census blocks. Many customers in those areas are paying as much as \$30 for DSL service ranging from 768 Kbps to 1.5 Mbps.¹⁵

AT&T initially declined to revisit the matter. But following a week of negative press attention, the company reversed course and publicly promised to expand its discount program to the two percent of its

¹⁰ *Id.* at 9; OECD, *Fixed broadband basket med 3: 25 GB / month. 10.240 Mb/s and above* (Sept 2014), produced and distributed by OECD Digital Economy Outlook: <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>; Duggan & Horrigan (2015).

¹¹ *Broadband Opportunity Council Report and Recommendations*, United States Department of Commerce & United States Department of Agriculture (Aug. 20, 2015): https://www.whitehouse.gov/sites/default/files/broadband_opportunity_council_report_final.pdf; *Prepared Remarks of FCC Chairman Tom Wheeler*, Federal Communications Commission (September 4, 2014): https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf; *Broadband Opportunity Council Report and Recommendations*, United States Department of Commerce & United States Department of Agriculture (Aug. 20, 2015): https://www.whitehouse.gov/sites/default/files/broadband_opportunity_council_report_final.pdf.

¹² See, e.g., *Fact Sheet: ConnectHome: Coming Together to Ensure Digital Opportunity for All Americans*, The White House (Jul. 15, 2015): <https://www.whitehouse.gov/the-press-office/2015/07/15/fact-sheet-connecthome-coming-together-ensure-digital-opportunity-all>; *ConnectED: President Obama’s Plan for Connecting All Schools to the Digital Age*, The White House (Jun. 6, 2013): https://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf.

¹³ Memorandum Opinion and Order in the Matter of Applications of AT&T and DirecTV For Consent to Assign or Transfer Control of Licenses and Authorizations, MB Docket No. 14-90 (Jul. 28, 2015).

¹⁴ *Access from AT&T*, AT&T (accessed Oct. 7, 2016): <https://www.att.com/shop/internet/access/#/>.

¹⁵ Angela Siefer, “Access from AT&T” Not Available to 1.5 Mbps Households, National Digital Inclusion Alliance (Sept. 5, 2016): <http://www.digitalinclusionalliance.org/blog/2016/9/5/access-from-att-problem>; Isidore, Chris “AT&T to Change Policy of Charging Poor Customers More for Super-Slow Internet,” (Sept. 9, 2016): <http://money.cnn.com/2016/09/09/technology/att-internet-for-poor/>; see also Appendix B: AT&T’s offer of \$30 for 1.5 Mbps service (accessed Oct. 11, 2016).

15.6 million customers with internet access services below 3 Mbps.¹⁶ If detailed local speed and pricing information had been available from the start, however, the FCC and AT&T might have been able to craft a more comprehensive discounting solution in the first version of the merger agreement.

III. Current Data Collection Conducted by the Federal Government and Independent Organizations is Insufficient

Currently, different branches of the federal government and independent agencies collect various pieces of data from private actors, but there is no single, comprehensive source or database that reliably and accurately maps broadband availability, advertised speed, actual speed, monthly price, and other critical information for researchers. For example, the FCC collects data about advertised speed tiers and other service offerings through the annual Form 477, as well as pricing data from schools and libraries that participate in the E-rate program, which subsidizes internet access to those institutions.¹⁷ The National Broadband Map makes available self-reported data about residential and commercial service providers serving communities around the country.¹⁸ And the Commerce Department collects and publishes aggregate data about the state of broadband competition in the United States.¹⁹ But these data are not collected in a coordinated manner, nor are they always made available to researchers and the public in formats that allow for integration with other data sets. Moreover, these efforts have generally been limited in their scope. The FCC, for example, has previously declined to collect pricing information from any broadband providers through the annual Form 477 reporting requirements it imposes on internet access providers, and has itself conceded that it does not have the “reliable data as to the actual prices consumers pay for these services” that would need to conduct substantial analysis on the impact of price.²⁰

Several independent organizations have also attempted to collect specific information about broadband pricing in various U.S. cities in recent years, at least in part to fill the gap in available data. The Open Technology Institute at New America has published an annual *Cost of Connectivity Report* in 2012, 2013, and 2014 that includes information about available speeds and prices in eight U.S. cities and compares these prices to internet service in cities in Europe and Asia.²¹ The Center for Public Integrity did a study in 2015 comparing speed and price information from five American cities to five French cities of similar size and urbanicity levels in order to highlight the effect of competition on broadband price.²² Google has also collected and released broadband pricing data sets on an annual basis since 2012, which include some data from major U.S. internet service providers.²³ But these efforts fall far short of collecting this information on a national scale.

¹⁶ *Id.*, Isidore.

¹⁷ *Form 477 Resources*, Federal Communications Commission (accessed Oct. 7, 2016): <https://www.fcc.gov/general/form-477-resources-filers>.

¹⁸ *About*, National Broadband Map (accessed Oct. 7, 2016): <http://www.broadbandmap.gov/about>.

¹⁹ See, e.g., *Competition Among U.S. Service Providers*, U.S. Commerce Department (Dec. 16, 2014): <http://www.esa.doc.gov/reports/competition-among-us-broadband-service-providers>.

²⁰ See, e.g., Patrick Lucey, *FCC Prioritizes Incumbent Protection in Data Collection Order*, Community Broadband Networks (Jul. 17, 2013): <http://muninetworks.org/content/fcc-prioritizes-incumbent-protection-data-collection-order>; “2016 Broadband Progress Report,” Federal Communications Commission (Jan. 29, 2016) at para. 103.

²¹ Danielle Kehl, et al., *The Cost of Connectivity 2014*, New America’s Open Technology Institute (Oct. 30, 2014): <http://www.newamerica.org/oti/policy-papers/the-cost-of-connectivity-2014/>; Hibah Hussain, et al., *The Cost of Connectivity 2013*, New America’s Open Technology Institute (Oct. 28, 2013), <http://www.newamerica.org/oti/policy-papers/the-cost-of-connectivity-2013/>; Hibah Hussain, et al., *The Cost of Connectivity 2012*, New America’s Open Technology Institute (Jul. 19, 2012): <https://www.newamerica.org/oti/policy-papers/the-cost-of-connectivity-2012/>.

²² Adam Holmes & Chris Zubak-Skees, *U.S. Internet Users Pay More and Have Fewer Choices than Europeans*, The Center for Public Integrity (Apr. 1, 2015): <https://www.publicintegrity.org/2015/04/01/16998/us-internet-users-pay-more-and-have-fewer-choices-europeans>.

²³ See Vincent Chiu, *Global Broadband Pricing Study: Update and Call to Action*, Google Policy By The Numbers (Feb. 25, 2015): <https://policybythenumbers.googleblog.com/2015/02/global-broadband-pricing-study-updated.html>.

Independent researchers face significant capacity constraints that limit their ability to collect this information on a large scale. Because this data is not made available directly by ISPs and their customers, collecting it requires visiting the individual website of each service provider and looking at the available packages in each location—a daunting task, particularly in a country the size of the United States. Moreover, in addition to the sheer volume of data, in certain cases key pricing information may be rendered inaccessible by a website’s terms of service or through a requirement that consumers enter personal information, which may include a social security number or a credit card number. In the course of our research, for example, we discovered that some of the largest ISPs in the United States, like Verizon, use disclaimers on their websites that prohibit collecting pricing information without an intent to purchase service.²⁴ These disclaimers can prevent researchers from collecting pricing information in order to avoid legal liability. The practical result is that any data set collected through these methods necessarily leaves out information about some ISPs, making it substantially less useful.

The most effective solution to address the lack of data, therefore, is to harness the power of the federal government to collect this pricing information directly from ISPs themselves and to make this data available to researchers and the public. The federal government is uniquely situated to collect this information comprehensively and share it with the public, as it does with similar resources like the National Broadband Map. Changes adopted during the modernization of the FCC’s E-rate program in 2014 provide a potential model for such collection: in its July 2014 Report and Order, the FCC announced that it intended to collect granular information about price and speed from all ISPs receiving subsidies through the E-rate program and make that data available to the public, subject to certain narrow limitations.²⁵ While this represents an excellent first step, it practically goes without saying we need to understand much more than simply what schools and libraries are paying for internet access service.

IV. The Federal Government Should Collect Granular Pricing Data Directly from Internet Service Providers to Facilitate Meaningful Research

At a minimum, the following data is needed to facilitate meaningful research in the area of broadband access and adoption:

- Advertised download and upload speeds;
- Monthly price (including, where applicable, promotional discounts);
- One-time fees (e.g. activation or installation fees, required equipment purchases);
- Recurring fees (e.g. modem or other equipment rentals);
- Contract length and any applicable termination fees; and
- Data caps or other service limits.

It is not sufficient to collect aggregates or averages from national service providers. These data need to be collected at a granular level in order to provide a complete geographic picture of internet access in the United States. At a minimum, information should be collected from ISPs at the census tract level, but ideally in even greater detail, such as at the block group or block level.²⁶ As explained above, aggregated data masks variations in price that can be present from city to city, or even neighborhood to neighborhood.

²⁴ See Appendix A, *Verizon Internet Service Disclaimer* (accessed Sept. 29, 2016).

²⁵ Report and Order and Further Notice of Proposed Rulemaking in the Matter of Modernizing the E-rate Program for Schools and Libraries, WC Docket No. 13-184 (Jul. 23, 2014). See also Danielle Kehl, *What’s Inside the FCC’s E-rate Order?* New America’s Open Technology Institute (Aug. 4, 2014): <https://www.newamerica.org/oti/blog/whats-inside-the-fccs-e-rate-order-2/>.

²⁶ For further explanation of the need for data at the block group or block level as opposed to census tract data, see Letter from New America’s Open Technology Institute to Marlene H. Dortch, Secretary of the Federal Communications Commission, WC Docket No. 11-10 (Jun. 19, 2013), available at: <https://ecfsapi.fcc.gov/file/7520923365.pdf>.

These data points should be integrated into a central repository such that machine-readable, structured data sets are available both for government use and researchers alike.²⁷ The data sets should also be made publicly available so that individual citizens can benefit from this information when making personal choices about internet access options or evaluating it as part of a broader community effort.

V. Conclusion

As we explain above, granular pricing data is a prerequisite for understanding internet access adoption patterns in the United States and rectifying inequities in high speed internet access. While several research organizations have tried to fill the gap, unconnected Americans cannot afford to wait for independent researchers to gather this information piecemeal. National, granular, machine-readable pricing data could help extend the reach of existing assistance programs to more Americans, as well as provide better tools for crafting new policy solutions at every level of government.

The federal government is the entity best suited to collect pricing data in sufficient detail and at a large enough scale to create a comprehensive database. The federal government also has the unique ability to collect pricing information directly from the ISPs and their customers, assuring a level of accuracy that individual researchers currently cannot achieve. By including granular pricing data in the National Broadband Research Agenda, the NTIA and NSF can create a tool that will aid individuals, communities, researchers, and policymakers as they work to close the digital divide for all Americans.

Respectfully submitted,

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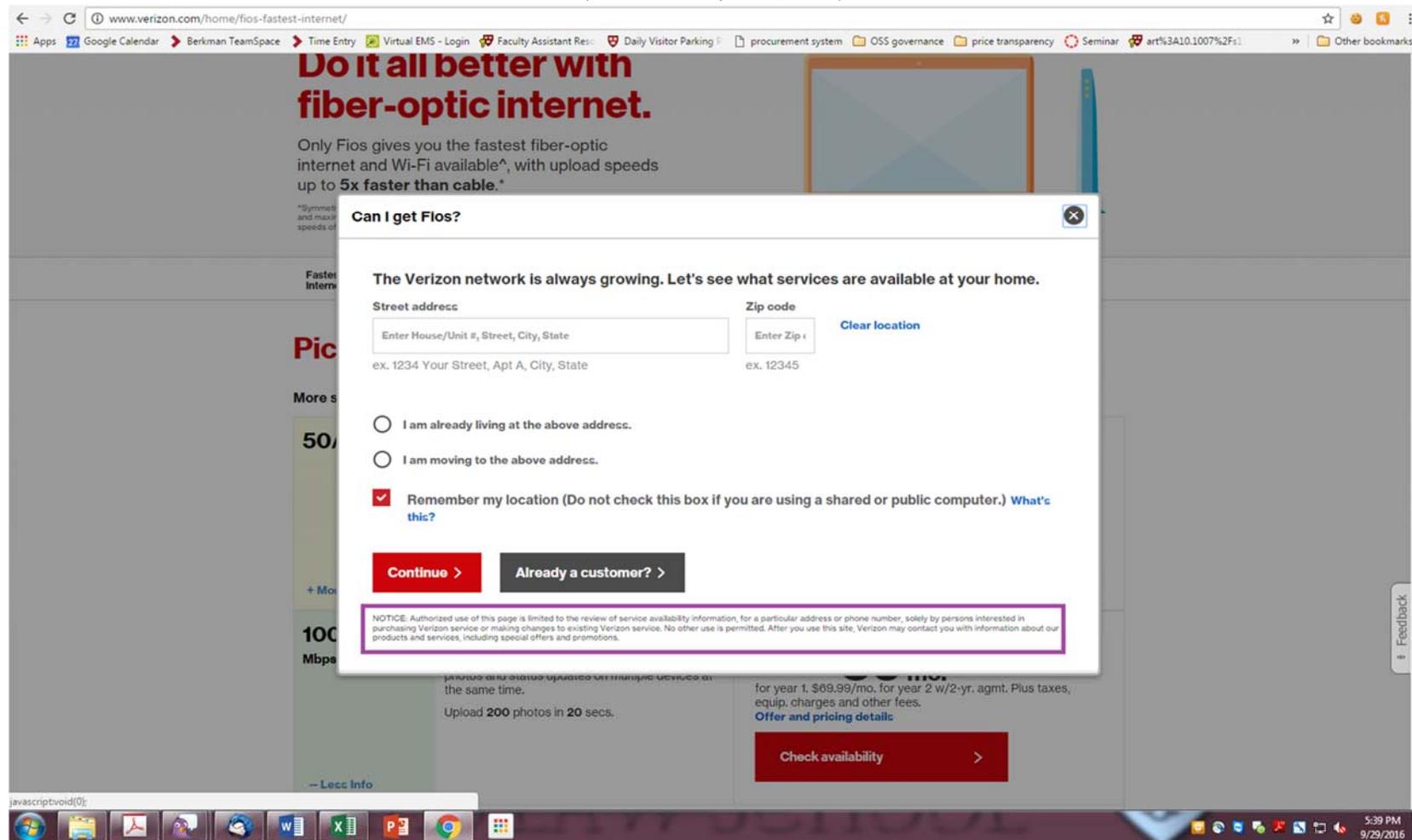
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²⁷ There are numerous government-led efforts focused on how to structure and release data, including the White House's Open Data Policy and the broader Open Data Initiative. See, e.g., *Open Data Policy—Managing Information as an Asset*, Executive Office of the President, Office of Management and Budget (May 9, 2013) <http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf>; *Open Government Initiative*, The White House (n.d.): <http://www.whitehouse.gov/open>; *Open Data Policy Guidelines, Version 3*, The Sunlight Foundation (Mar. 2014): <http://sunlightfoundation.com/opendataguidelines/#openformats>.

APPENDIX A: Verizon internet service search disclaimer (accessed Sept. 29, 2016)



Disclaimer (in purple rectangle) reads: *Notice: Authorized use of this page is limited to the review of service availability information, for a particular address or phone number, solely by persons interested in purchasing Verizon service or making changes to existing Verizon service. No other use is permitted. After you use this site, Verizon may contact you with information about our products and services, including special offers and promotions.*

Appendix B: AT&T's offer of \$30 for 1.5 Mbps service (accessed Oct. 11, 2016).

The screenshot shows a Google Chrome browser window displaying the AT&T website. The address bar shows the URL <https://www.att.com/shop/u-verse/offers.html>. The browser's bookmark bar includes items like 'Apps', 'CloudTrax', 'generator', 'NDIA', 'Form 477 data an', 'Check Availabilit', 'Sign in', 'Bookmarks', 'blogroll', 'cartodb', 'slack', and 'Batch Geocode'. The main content area features a bundle configuration section with icons for TV, Internet, and Digital Home Phone. A promotional banner states 'Add TV to get Internet for \$30/mo. for 2 years-guaranteed!' and 'Plus get \$50 in Reward Cards!'. Below this, a card for the 'Express' service is highlighted, showing a price of '\$30' (plus tax for 12 months with a 2-year agreement). The card also mentions 'Plus get a \$50 Reward Card', 'Up to 1.5 Mbps', and 'Includes 1TB of data/mo.'. It is described as 'BEST FOR LIGHT WEB SURFING' and 'Downloaded a 30-minute HD movie in under 6 hours.'. The card includes a list of 'Plan Features' and an 'Add to cart' button. At the bottom of the card, there is a link to 'Build your own bundle'. The Windows taskbar at the bottom shows the system tray with icons for network, volume, and battery, along with the time '10:00 AM' and a 'Chat available' notification.