Broadband Pricing:
What Consumer Reports Learned From 22,000 Internet Bills

FIGHT FOR FAIR INTERNET

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CR Consumer Reports®

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Executive Summary

High-speed internet service, commonly referred to as broadband, has become a requirement of 21st-century American life—a virtual necessity for many people attending school, getting and performing many jobs, receiving medical care and government services, or trying to purchase goods and services that are unavailable locally.

Yet broadband service is too expensive for many Americans to afford.

Consumer Reports (CR) launched the Fight for Fair Internet campaign to encourage policymakers and service providers to make broadband more accessible and affordable. This study was designed to shine a light on an important component of that goal: determining what consumers pay for internet service, and exactly what they get for their money.

To do so, we collected and analyzed more than 22,000 consumer broadband bills. Many of the consumers who shared their bills also took internet speed tests and completed a survey on their satisfaction with and the reliability of their internet service. While this is not a nationally representative study and is not predictive of the broadband market, it is one of the most ambitious efforts of its kind to understand how much consumers are paying at a moment in time.

We believe our findings have important public policy implications.

Key Findings:

Median cost of service

Among the 18,359 consumer bills on which an internet price could be identified, the median cost of high-speed internet service was $74.99 per month. Approximately half of the households were paying between $60 and $90 per month.

Confusing bills

Bills that are hard to understand make it difficult for consumers to budget and compare prices with alternative service options. The following factors contribute to this billing confusion:

> ***Bundles.*** Numerous internet service providers (ISPs), including Comcast (Xfinity), the nation's largest provider, do not always itemize the internet

price within their “bundled” TV, phone, and internet packages. This was true of 2,827 of the 22,088 bills we analyzed, and 1,810 were issued by Comcast. This practice makes it impossible for both consumers and CR’s researchers to determine the cost of the service and compare it with other providers.

Discounts. Many ISPs offer discounts on broadband service, including introductory promotional discounts and conditional discounts such as auto-pay discounts. The discounts identified typically ranged from $10 to $50. Discounts generally benefit consumers, but also make it challenging for consumers and researchers to determine the true cost of service and to compare it with other providers’ prices. For example, it is not always clear from bills when discounts will expire and what the price will be afterward. Notably, more than half of the AT&T and Verizon bills we analyzed contained discounts, while none of the Google Fiber bills in our sample included discounts.

Fees. ISPs charge a wide range of fees that, together, can add up to a significant portion of the overall cost of service and contribute to the confusion around internet pricing. Individual fees tied directly to internet service in our sample typically ranged from $2.49 to $9.95 per month. It is often difficult to determine whether these fees are associated with broadband or other elements of a service bundle. Some of these fees, such as the cost of renting a modem or wireless router from the provider, are avoidable, but most are not.

The unavoidable fees are especially problematic because consumers may believe they are government-imposed when, in fact, many are company-imposed and distinguished from the core service price at the provider’s discretion. More than a dozen ISPs were found to charge company-imposed fees—also known as junk fees—under names such as “network enhancement fee,” “internet infrastructure fee,” “deregulated administration fee,” and “technology service fee.” They can surprise consumers when they appear on monthly bills, and can enable providers to raise prices without seeming to violate marketing or contractual price commitments.

Data cap charges. Several providers, including fixed broadband providers Comcast (Xfinity), Cox, Optimum, AT&T, and Wave Broadband, impose data caps in at least some areas and charge overage fees for exceeding

those caps, or fees for unlimited data. Unlimited data can add as much as $49.99 per month to the base cost of service.

Speed limitations

The results of online speed tests can depend on time of day, the quality and speed of a home WiFi network, and other factors unrelated to ISP performance.

That said, some study participants clearly experience severe broadband speed limitations. Download speeds routinely fail to match the advertised “up to” speeds of several ISPs. This was especially true of consumers paying for “premium” plans purporting to offer download speeds of between 940 and 1,200 Mbps, who in fact experienced median speeds of between 360 and 373 Mbps.

In addition, we found that a large number of consumers who participated in our study pay as much or more for a sub-broadband plan (which is generally defined as a download speed of less than 25 Mbps) as other consumers pay for advertised speeds of 300 Mbps or higher.

Lack of competition

CR counted how many ISPs were reflected in bills for each ZIP code where we had participants. We did not independently determine how many ISPs operate in each community, but our findings do point to a lack of choice for many consumers.

CR collected 9,116 bills from ZIP codes where we detected just one ISP. In ZIP codes where bills from two ISPs were present in our sample, that number dipped to 7,273. Three or more competitors were spotted in ZIP codes accounting for only 1,802 bills.

Though not conclusive evidence of a lack of competition, we found it telling that the overwhelming majority of bills came from ZIP codes where all study participants subscribed to the same ISP, or one of just two ISPs.

The data from bills analyzed by CR suggests that competition results in lower broadband prices. Americans in markets where we received bills from at least three broadband competitors reported paying, on average, about $5 per month less for service than those in areas where we received bills from one or two providers, and reported prices were lower still as the number of local competitors increased. This mirrors the findings of previous studies.

Policy Implications:

Make broadband label easier to find

The Federal Communications Commission's proposed broadband "nutrition" label, designed to bring greater price transparency and uniformity to the broadband market, should be a) required to appear on all monthly broadband bills and b) machine-readable.

Encourage broadband competition

Two policy changes could spur competition in the broadband industry: permission and support for the creation of municipal broadband networks, and greater regulatory scrutiny of the legal challenges and other efforts by incumbent ISPs to thwart new competition in underserved areas.

Strengthen FCC oversight

The FCC should reassert its regulatory authority over the broadband internet service industry, which would allow the Commission to ensure consumers have non-discriminatory access to broadband, monitor price-gouging, bar anti-consumer business practices, and better address price and fee transparency.

I. Introduction: Why CR Launched the Fight for Fair Internet Campaign

Consumer Reports (CR) launched the Fight for Fair Internet campaign in July 2021 with the goal of making broadband internet service accessible to and affordable for all Americans. An important element of that endeavor is simply establishing how much U.S. consumers pay for broadband, and precisely what they get for their money.[1]

Previous research has looked at broadband pricing by drawing on data from publicly available sources such as internet service provider (ISP) websites, and represents solid and valuable work.[2] However, we hypothesized that previous research may not have fully captured some of the variables that affect the actual prices that consumers pay for broadband service, and could be usefully complemented by new research. CR therefore determined to collect data directly from monthly ISP bills sent to and paid by real consumers. And, indeed, after more than 10 months spent analyzing and extracting data from more than 20,000 consumer broadband bills, a more robust picture of the prices paid by the participants has emerged. We not only achieved the goal of finding out how much consumers are paying for their internet service but also uncovered many additional costs of broadband service, including package speed costs, equipment costs, data and usage costs, various fees, and more.

Broadband access is an increasingly important policy and pocketbook issue because fast, reliable internet service is an increasingly essential commodity. This was true before the COVID-19 pandemic, but it became urgently clear in March 2020 when, virtually overnight, millions of consumers began working from home, children were suddenly expected to attend school via the internet, and many healthcare visits were replaced with telehealth appointments to limit exposure to the coronavirus.[3] At the same time, with traditional forms of social interaction, entertainment, and travel curtailed, already popular streaming video services quickly became a primary source of

[1] For further information describing CR's Fight for Fair Internet campaign (formerly known as Let's Broadband Together), see https://www.consumerreports.org/media-room/press-releases/2021/07/consumer-reports-launches-broadband-together----a-nationwide-sea/. Broadband internet access service, or BIAS, is defined by the Federal Communications Commission as an internet connection capable of at least 25 Mbps downstream speed and 3 Mbps upstream speed, and was last updated in 2015. The current Chair of the FCC, Jessica Rosenworcel, announced plans earlier this year to update that definition to 100 Mbps downstream and 20 Mbps upstream. See Chris Velazco, "FCC calls 25 Mbps 'broadband' speed. The push is on to up it to 100," *Washington Post,* July 19, 2022.

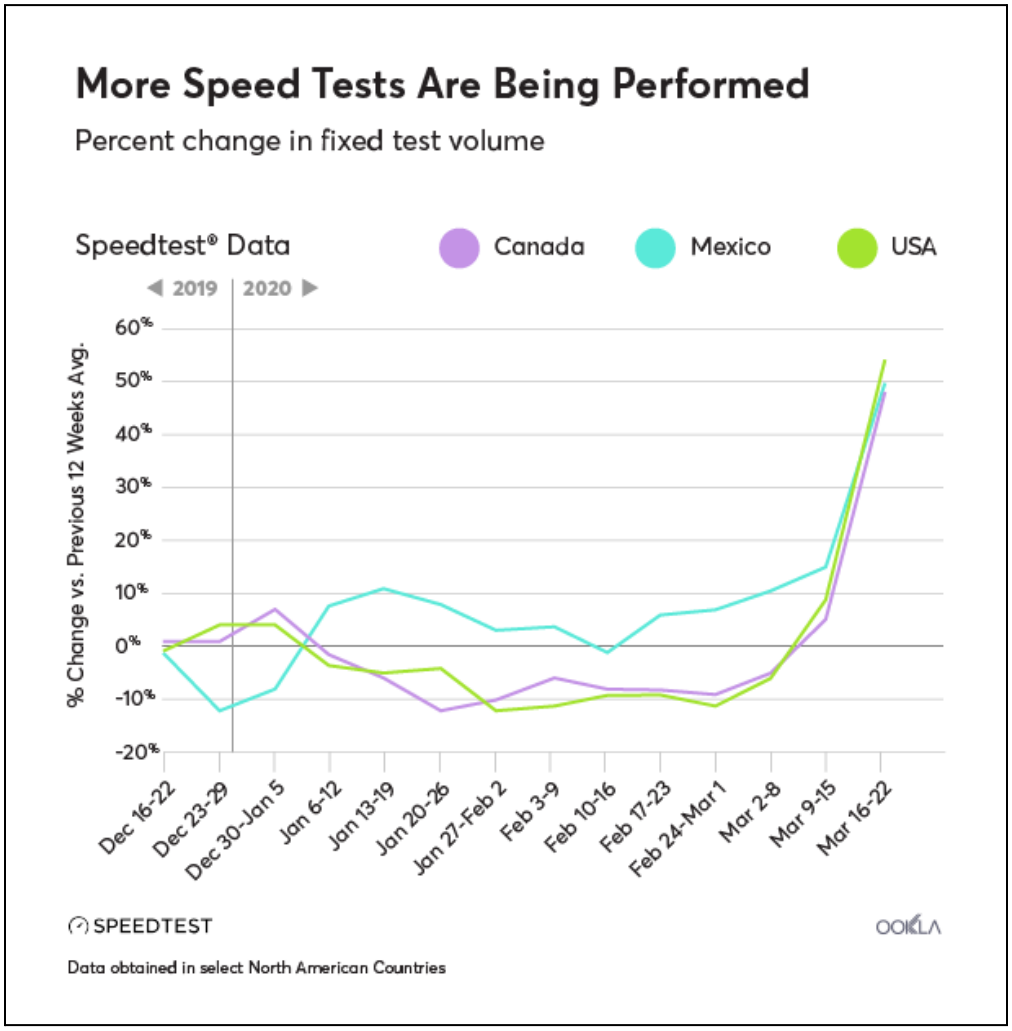
[2] See Becky Chao, Claire Park, Joshua Stager, "The Cost of Connectivity 2020," *New America's Open Technology Institute,* July 15, 2020, https://www.newamerica.org/oti/reports/cost-connectivity-2020, and S. Derek Turner, "Price Too High and Rising: The Facts About America's Broadband Affordability Gap," *Free Press,* May 20, 2021, https://www.freepress.net/sites/default/files/2021-05/prices_too_high_and_rising_free_press_report.pdf.

[3] Colleen McClain et al., "The Internet and the Pandemic," *Pew Research Center,* September 1, 2021, https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic.

entertainment, and many Americans began routinely using the web to connect with friends and loved ones via video calls.[4]

Dramatic upticks in online internet speed testing—Ookla (speedtest.net) recorded a more than 50 percent increase in the 12-week average of speed tests taken in the U.S. the week of March 16-22, 2020—demonstrate the extent to which consumers suddenly became "internet aware," having recognized the need for both fast and reliable internet service.[5]

Figure 1



[4] Id.; See also: Brad Adgate, "The Impact COVID-19 Had On The Entertainment Industry In 2020," *Forbes,* April 2021, https://www.forbes.com/sites/bradadgate/2021/04/13/the-impact-covid-19-had-on-the-entertainment-industry-in-2020/?sh=613d3670250f.

[5] Screenshot taken from "Tracking COVID-19's Impact on Global Internet Performance," *Ookla Insights Articles,* (March 13, 2020; updated July 20, 2020). Previously available at: https://www.ookla.com/articles/tracking-covid-19-impact-global-internet-performance.

CR survey data confirms the point: Nationally representative surveys show that, between July 2017 and May 2022, the percentage of Americans who agreed that internet service is "as important as water or electricity" increased from 61 percent to 71 percent, and hit a high of 80 percent in April 2020.[6] And more recently, 84 percent of respondents to Consumer Reports' 2022 Telecommunication Survey of 33,204 CR members, reporting on their experiences with their current home internet service provider as of March 2022, said the same (though this was not a nationally representative survey).

At the same time, broadband *pricing* also took on heightened significance, as it became clear that internet "access" was not merely a matter of having the technical means to connect but also the economic means. Indeed, in a nationally representative survey of 2,565 adult U.S. residents conducted by CR in 2021, nearly a third of U.S. consumers who did not have broadband said the reason is because "it costs too much."[7] Broadband service, it appears, is simply too expensive—and therefore inaccessible—for many of the most financially vulnerable Americans.

The words of Virginia "Ginny" Madsen, a retiree living in San Leandro, California, who was interviewed by Consumer Reports in 2021, captures the vital importance of broadband in everyday life:

> "I spent my stimulus check to be able to keep my internet access because I realized it was too important to lose. This is an infrastructure. This is just like water service, sewer service. This is like electricity! People can't live without this anymore. If businesses and government entities are going to require that you have internet access, then they need to make sure that you can get it without being poverty-stricken over it."

Accordingly, broadband affordability became an important component of the federal government's response to the pandemic. The first COVID relief packages included funds in support of existing broadband programs.[8] But the December 2020 creation of the Emergency Broadband Benefit program (EBB) did far more, providing qualified

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[6] The first survey result can be found in a 2017 Consumer Reports nationally representative survey appended to CR's Reply Comments submitted to the FCC's "Restoring Internet Freedom" proceeding, (WC Docket No. 17-108) on August 30, 2017. Available at: https://www.fcc.gov/ecfs/document/10831277255624/1. The second survey results are available as part of CR's May 2022 "American Experiences Survey (AES): A Nationally Representative Multi-Mode Survey." Available at: https://article.images.consumerreports.org/prod/content/dam/surveys/Consumer_Reports_AES_May_2022.pdf. The April 2020 survey results are part of CR's April 2020 "American Experiences Survey (AES): A Nationally Representative Multi-Mode Survey." Available at: https://article.images.consumerreports.org/image/upload/v1666112268/prod/content/dam/surveys/Consumer_Reports_AES_Internet_Only_April_2020.pdf.

[7] Survey Report, "BROADBAND: A Nationally Representative Multi-Mode Survey," *Consumer Reports,* (July 2021): 3, https://article.images.consumerreports.org/prod/content/dam/surveys/Consumer_Reports_Broadband_June_2021, (CR 2021 Broadband Survey).

[8] Kathryn de Wit and Anna Read, "States Tap Federal CARES Act to Expand Broadband," *The Pew Charitable Trusts,* November 2020, https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2020/11/states-tap-federal-cares-act-to-expand-broadband.

low-income households with a $50 monthly subsidy applied to internet service ($75 on Tribal lands). The EBB program in turn laid the groundwork for further government support for affordable broadband, and lives on today—albeit as a lower $30 per month benefit, though the $75 amount was unchanged for Tribal lands—as the Affordable Connectivity Program (ACP), a component of the Infrastructure Investment and Jobs Act of 2021 (IIJA).[9] That law also included a requirement that any ISP receiving federal money ($42B+) to deploy new internet infrastructure must offer a low-cost option to help more consumers afford broadband service.[10]

The 2021 infrastructure law also included two more important components aimed at broadband affordability, both of which CR actively supported: one, a directive to the Federal Communications Commission (FCC) to collect annual pricing data in conjunction with the second directive, the development of a standardized consumer broadband label (or broadband "nutrition" label) that will require ISPs to disclose pricing information, performance data, fees, and other information relevant to consumers' purchasing decisions.[11]

These measures were necessary because the broadband market has been largely unregulated since the so-called Restoring Internet Freedom Order (RIFO) was adopted by the FCC in late 2017.[12] At that time, RIFO unraveled the Commission's net neutrality rules, stripped broadband internet's status as a telecommunications service, and passed most of the Commission's regulatory authority over broadband from the FCC to the Federal Trade Commission (FTC). This happened even though many ISPs also provide telephone and television services—typically using the same delivery technology and infrastructure—that continue to be regulated by the FCC, and even though the FCC maintains far more institutional knowledge about broadband technology than the FTC does.

One result of this regulatory confusion is a broadband marketplace largely devoid of requirements for or guidance on how ISPs should present pricing information to consumers. As a result, monthly bills vary from provider to provider, and some ISPs use more than one format. And while some bills are relatively easy to decipher, with prices clearly identified, others obscure the price of internet service in a variety of ways.

This doesn't just frustrate consumers. It also prevents them from comparing prices, thereby disrupting the proper functioning of the marketplace. And it potentially hampers

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[9] "The Infrastructure Investment and Jobs Act," Pub. L. No. 117-58, 135 Stat. 429, 1238 § 60502(a) (2021). Available at: https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf.
[10] Id. at 1199, § 60102(h)(4)(B).
[11] Id. at 1243, § 60502(c)(1) and 1244, § 60504.
[12] "Restoring Internet Freedom Order," WC Docket No. 17-108, Declaratory Ruling, Report and Order, 33 FCC Rcd 311, (adopted December 14, 2017; issued January 4, 2018) (RIFO). Available at: https://www.fcc.gov/document/fcc-releases-restoring-internet-freedom-order.

policy decisions at a time when governments are spending billions of taxpayer dollars to expand broadband service to as many consumers as possible.

A better understanding of what consumers actually pay for broadband service, based on the crowd-sourced data in this report, can and should inform ongoing policy discussions regarding ways to increase broadband affordability, access, speed, and reliability. It also suggests ways that ISP bills can and should be made clearer and more useful for consumers. And our findings can and should help guide the FCC as it finalizes requirements for the standardized consumer broadband label it's been charged with creating.

NCTA–The Internet & Television Association, a trade group for the broadband industry, has long maintained that ISPs provide consumers transparent billing and pricing information on their websites and in their promotional materials, and that a large majority of Americans have multiple broadband providers to choose from. A spokesperson for the NCTA reiterated those points in November 2022 when a Consumer Reports reporter contacted the group about this report's findings.[13]

[13] For more details about NCTA's response, see "You May Be Paying Too Much for Your Internet" at https://www.consumerreports.org/electronics-computers/telecom-services/you-may-be-paying-too-much-for-your-internet-a7157329937/.

II. How CR Conducted the Study

CR launched the Fight for Fair Internet campaign on July 13, 2021, working with dozens of partner organizations to reach a large and diverse group of potential participants.[14] This outreach directed interested consumers to a microsite that:[15]

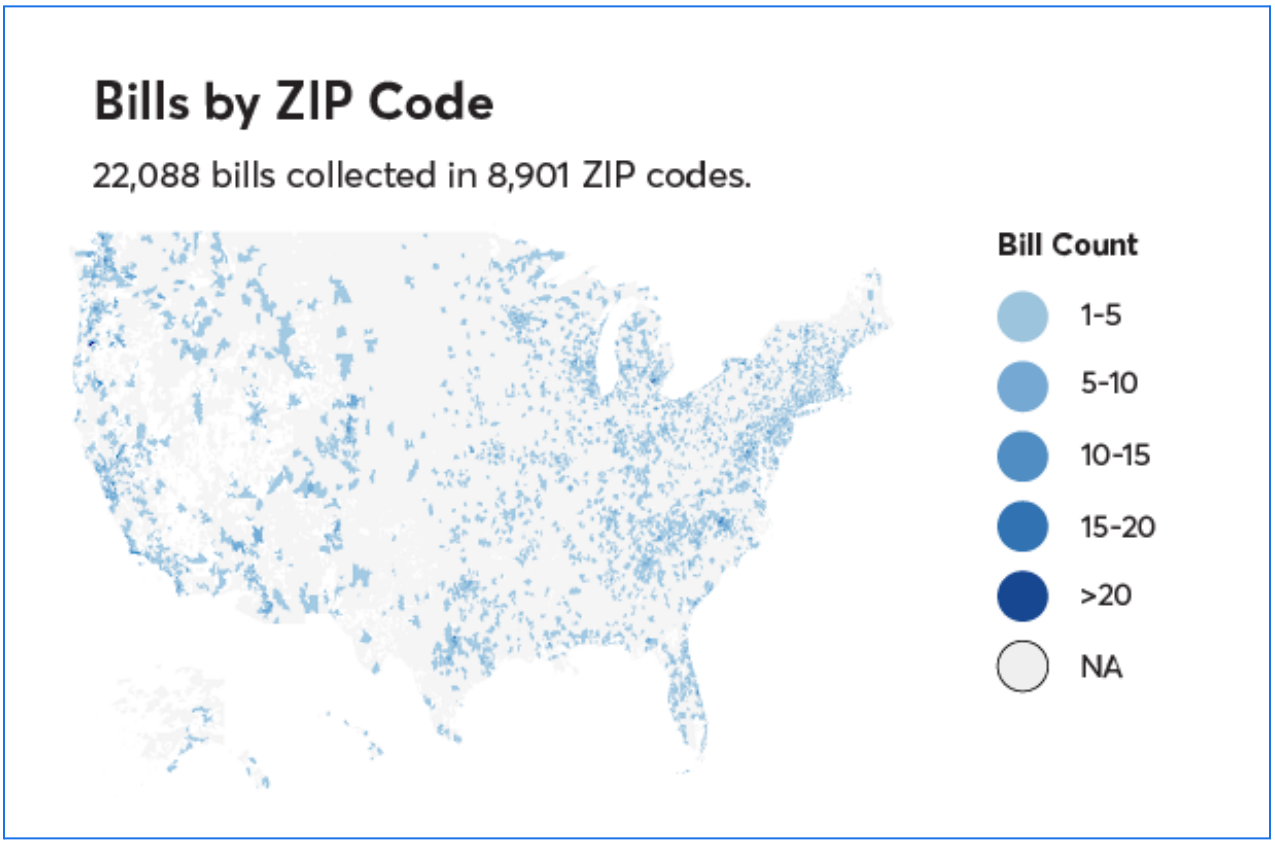
- explained the purpose of the project;
- asked participants to share a copy of their monthly ISP bill;
- encouraged them to run an internet speed test using an online tool maintained by Measurement Lab, or M-Lab, the results of which were recorded by CR; and
- prompted them to take an optional survey designed to capture participants' demographic data and to gauge their satisfaction with and the reliability of their internet service. We did not extract personally identifiable information from the bills; only ZIP codes were retained for geographical location purposes.

By the end of 2021, more than 57,000 internet users had visited the microsite. For a variety of reasons, we analyzed only a subset of the submitted bills. Some bills were issued by foreign ISPs and because we sought to study prices paid by consumers in the U.S., they were discarded. We also removed all business internet, wireless internet, and seasonal internet bills. More significantly, others were discarded because they lacked an itemized list of charges, making it impossible to distinguish internet service costs from taxes, fees, and other charges unrelated to internet service, which would distort our findings. Notable characteristics of the 22,088 bills ultimately analyzed include the following:

- Bills came from all 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.
- Bills originated in 8,901 of the 41,683 ZIP codes in the U.S, with 85.8 percent coming from urban areas, 6.7 percent from suburban areas, and 3.6 percent from rural areas.
- Bills were analyzed from 526 unique, domestic ISPs where a line item for internet price was identified, though the overwhelming majority (92.4 percent) were issued by 25 ISPs, which included the nation's largest ISPs.
- Bills represented a variety of provider types, including those that deliver internet service via coaxial cable, fiber-optic cable, satellite, fixed wireless, and DSL delivered over legacy phone networks.

[14] For a full list of partner organizations, see Appendix B.
[15] The site can be visited at https://www.consumerreports.org/upload/broadband.

Figure 2.1



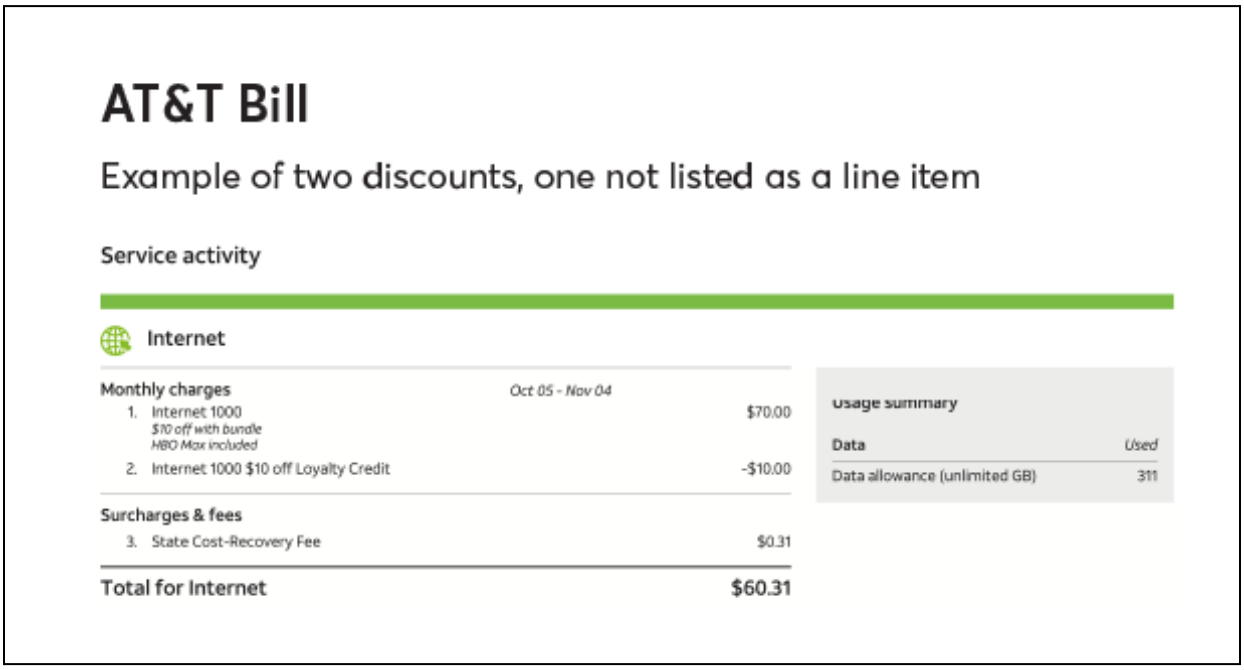
Data Challenges

For “internet-only” bills, where broadband was the only service provided and paid for, extracting price data from the bills was relatively straightforward. The task was more difficult when internet service had been “bundled” or packaged along with television and/or phone service for a single price. Numerous ISPs, including Comcast (Xfinity) and others often do not itemize the internet price within their bundled bills. In cases where a bundled services bill did not include a line item specific to internet service, data from that bill was not incorporated into our internet pricing analysis and was simply recorded as a bundled bill.

Discounts presented another challenge. Discounts are generally beneficial to consumers, of course. But they can make it confoundingly difficult for consumers, as well as researchers, to determine the “true” price of internet service. Ideally, a bill would be clear about the reason for the discount, how long it lasts, and whether it is dependent on certain actions, such as enrolling in paperless billing, auto-payment, or a bundled service package. In fact, that was rarely the case in the bills we examined.

An AT&T bill sent to CR by one participant is illustrative. It gives a line item price of $70 for internet service with a plan name of Internet 1000. Beneath that, in italics, it says that a discount of $10 was included in that price as a discount for bundling service, presumably for as long as the consumer keeps that bundle. Beneath that, a $10 "Loyalty Credit" is deducted from the internet price but doesn't specify how the customer earned or can maintain that discount. In short, a bill such as this informs customers how much service costs in the current cycle but offers far less clarity on what it will cost in the future.

Figure 2.2



To address the issue of discounts, we extracted both pre- and post-discount prices as well as the amount of the discounts. To further examine the effect of discounting on internet pricing, we determined the percentage of all bills, and the percentage of each ISP's bills, that included discounts.

So what can we accurately say is the price this consumer is paying AT&T for broadband in our sample bill above? The full, undiscounted price of $80? Or the discounted price of $60, or should that be treated as a temporary sale price? For the purposes of this study, CR attempted to untangle discounts in this bill by citing $80 as a pre-discount price, two discounts of $10 each resulting in a post-discount price of $60. We repeated this analysis for discounted bills issued by major ISPs to better understand how discounts can both blur and lower the prices paid for broadband.

Another challenge was the need to ensure that discounts and fees *would* be counted when associated with internet service and *would not* be counted when associated with television or phone service. To ensure this, we extracted every line item from every legitimate ISP bill and classified each based on the type of service provided (internet, television, or phone). This enabled us to identify which, if any, discounts, and fees were associated with internet service. To avoid artificially inflating or deflating the internet price and related internet charges (e.g., modem rental fee), if it could not be determined whether a fee or discount was associated with internet service—and not with phone or television service—it was not counted toward the internet service price or as a related internet charge. For a more detailed discussion of the methodology used to analyze our data sample, please refer to Appendix A.

III. What the Pricing Data Tell Us

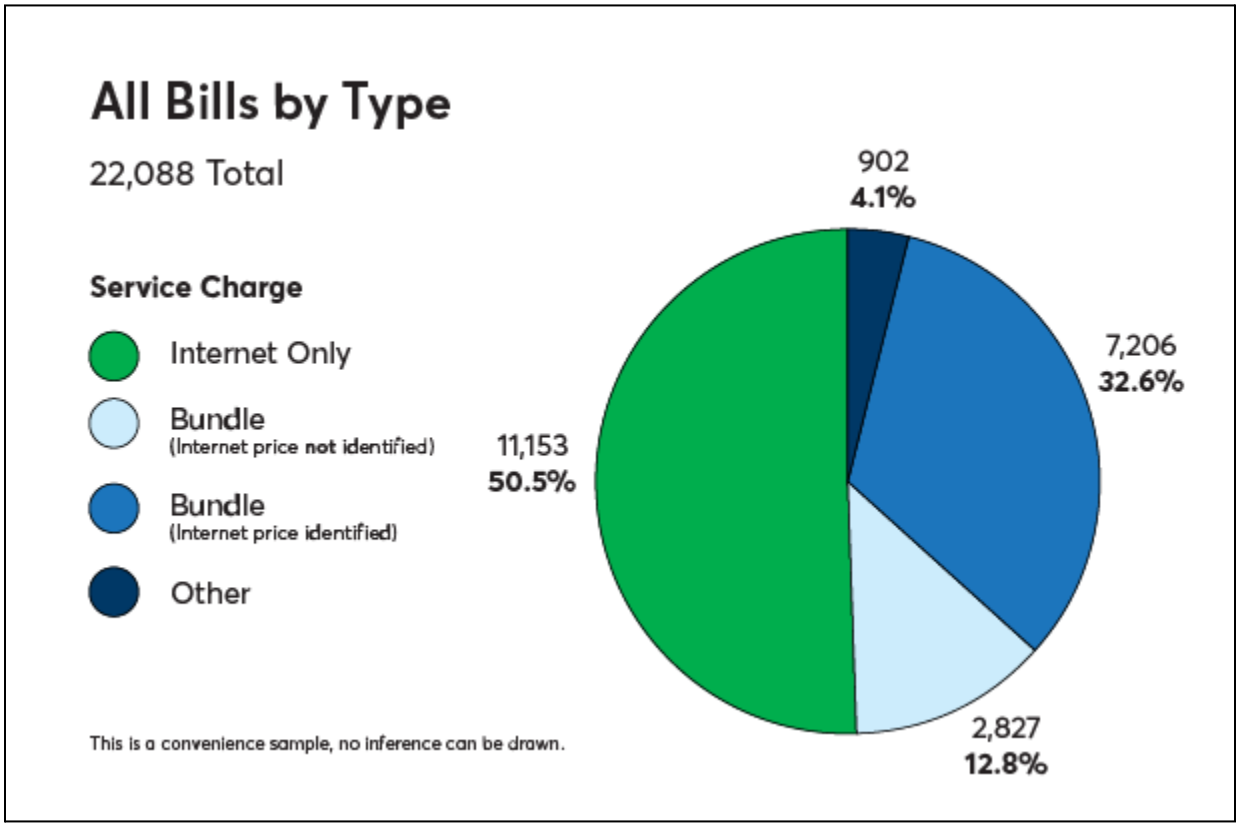
An important element of Consumer Reports' Fight for Fair Internet campaign is improving our understanding of how much consumers must pay for broadband service, including the various components of broadband prices.

Bundles

Service packages that bundle together broadband with television and/or phone services can save consumers money but also have the effect of distorting the true price of internet service, preventing shoppers from comparing prices, and otherwise making rational spending and budgeting decisions.

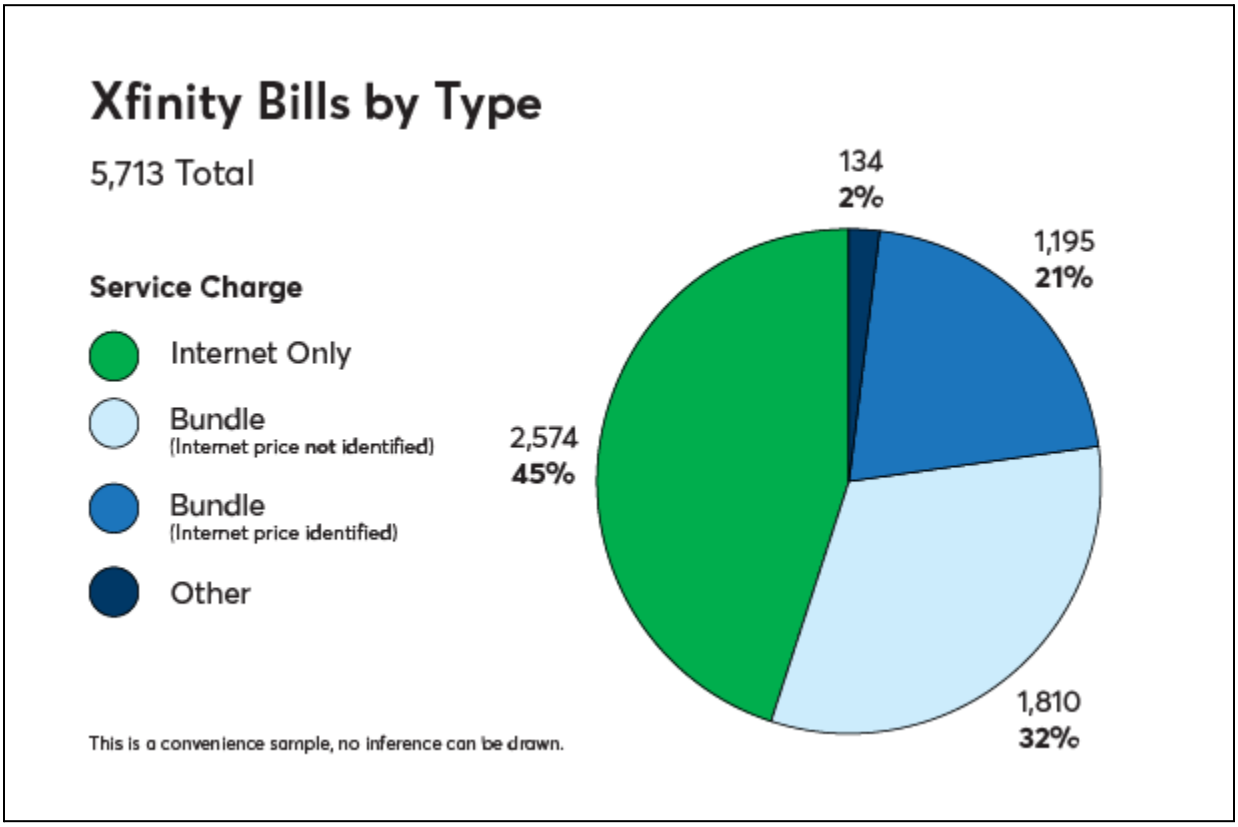
This is especially true when the pricing components of a bundled package are not broken down on bills, as we found to be the case with 2,827 bills in our sample. When we could not extract an internet price from a bundled bill, we recorded the data as a "bundle with no internet price" and did not count it in our pricing analysis. An internet price could be clearly identified on 18,359 of the 22,088 bills.

Figure 3.1



Comcast (Xfinity), the country's largest ISP, rarely lists the internet component of its bundled package prices. In fact, though we received 5,713 bills from Comcast consumers, 1,810 (32 percent) were bundled bills on which we could not identify an internet price, which reduced the number of Comcast bills in our data sample.

Figure 3.2



Other companies routinely list the price for each service within their bundled package bills, and those values were captured in our pricing analysis. Our sample included 7,206 bundled bills in which an internet price was listed.

Speed Boost Charges

Some ISPs charge an additional fee for increased speed performance, such as an additional $20 for a "speed boost" to 300 Mbps download speed. We treated these costs as part of the base internet price to accurately reflect what the consumer is paying for the service received.

Broadband Prices

The following table shows the mean and median prices for the 20 ISPs with the largest number of bills sent by participants.[16]

Figure 3.3

Average Internet Price by Provider

ISP	Mean Price	Median Price
Suddenlink (Altice USA)	$91	$90
Optimum (Altice USA)	$90	$90
Verizon	$83	$88
Cox Communications	$80	$81
Spectrum (Charter)	$78	$75
Atlantic Broadband	$78	$76
Consolidated Communications	$78	$63
Xfinity (Comcast)	$75	$78
CenturyLink	$70	$56
Google Fiber	$69	$70
Sparklight	$67	$65
AT&T	$66	$65
Wave Broadband	$61	$60
Metronet	$61	$60
WOW!	$60	$60
Windstream	$59	$59
Sonic	$57	$50
RCN	$56	$55
Ziply Fiber	$54	$55
Frontier Communications	$53	$50

ISPs with largest sample sizes displayed; satellite ISPs excluded.
This is a convenience sample, no inference can be drawn.

[16] Since the launch of CR's Fight for Fair Internet campaign, the following ISPs have rebranded their service: Suddenlink has been renamed and is now sold under the Optimum brand; both are owned by Altice USA. RCN, Wave Broadband, and Grande Communications are now all branded as Astound Broadband. Atlantic Broadband has changed its name to Breezeline. Additionally, some Windstream bills in our sample are branded and sold under the Kinetic name.

Tier Flattening

Researchers and consumer advocates have long noted a broadband-industry phenomenon known as "tier flattening," in which consumers who have access only to the oldest and slowest internet infrastructure are forced to pay as much or nearly as much for inferior service as those served by newer, faster infrastructure. (The "flattening," in other words, reflects the narrow range of prices corresponding to a wide range of service speeds.) Tier flattening most commonly affects low-income consumers, who are most likely to live in rural and urban areas where premium broadband service is not available.[17]

We sought to determine whether tier flattening was characteristic of the pricing data we collected. From our sample, 1,133 AT&T bills provided a convenient case study because the names of the company's service plans correspond to the "up to" download speed (in Mbps) offered.[18] And, indeed, as the table below shows, AT&T customers with the five slowest service plans pay between $55 and $70 a month, while those with the five fastest plans generally pay only marginally more.

Figure 3.4

AT&T Internet Costs by Package

Non-discounted prices of internet-only bills

Package	Bill Count	Mean Price	Median Price
Internet 10	12	$51	$55
Internet 12	23	$58	$63
Internet 18	43	$64	$65
Internet 24	56	$68	$70
Internet 25	73	$60	$60
Internet 45	25	$74	$80
Internet 50	109	$66	$68
Internet 100	89	$63	$60
Internet 300	124	$67	$65
Internet 1000	579	$78	$80

This is a convenience sample, no inference can be drawn.

[17] Bill Callahan and Angela Siefer, "TIER FLATTENING: AT&T and Verizon Home Customers Pay a High Price for Slow Internet," *National Digital Inclusion Alliance,* July 31, 2018, https://www.digitalinclusion.org/wp-content/uploads/2018/07/NDIA-Tier-Flattening-July-2018.pdf. See also Leon Yin and Aaron Sankin, "Dollars to Megabits, You May Be Paying 400 Times As Much As Your Neighbor for Internet Service," *The Markup,* October 19, 2022, https://themarkup.org/still-loading/2022/10/19/dollars-to-megabits-you-may-be-paying-400-times-as-much-as-your-neighbor-for-internet-service.

[18] See https://www.att.com/support/article/u-verse-high-speed-internet/KM1010095/.

Discounts

Broadband providers offer consumers a range of discounts, including limited-time promotional discounts for new customers, discounts earned by bundling internet service with television and/or phone service, and discounts for enrolling in automated payment plans. We manually reviewed bills to identify pre-discount prices, discounts, and post-discount prices. If it was clear that a discount was deducted from the internet price—including on bundled bills—we accounted for it in our calculations. If we could not determine which service a discount applied to within a bundled bill, we did not include it in our pricing analysis.

Figure 3.5

Prevalence of Discounts

Percent of bills that had discounts from selected ISPs

ISP	Percent of Bills With Discounts	Mean Discount	Median Discount
Consolidated Communications	66%	$39	$30
Verizon	58%	$46	$40
AT&T	57%	$18	$20
Suddenlink (Altice USA)	53%	$31	$27
WOW!	53%	$16	$10
Atlantic Broadband	41%	$30	$21
CenturyLink	38%	$37	$16
Spectrum (Charter)	34%	$25	$24
Optimum (Altice USA)	29%	$47	$50
Xfinity (Comcast)	19%	$37	$36
Sonic	13%	$13	$10
Windstream	11%	$15	$11
Sparklight	8%	$12	$15
Cox Communications	8%	$26	$16
RCN	2%	$9	$10
Google Fiber	0%	$0	$0

Top ISPs as ranked by number of bills analyzed; satellite ISPs excluded;
non-discounted mean (rounded to the nearest dollar) & median discount values displayed.
This is a convenience sample, no inference can be drawn.

As the table above shows, many ISPs discount the price of broadband based on the bills we studied, some more than others. Notably, more than half of the AT&T and Verizon bills we analyzed contained discounts, while none of the Google Fiber bills in our sample included discounts. Because the bills we collected represent a snapshot of time, we cannot definitively say whether these percentages are indicative of how many customers of a particular ISP are receiving discounts, and it is likely these percentages fluctuate.

Discounts generally benefit consumers, of course. But they can also make it difficult for consumers (and researchers) to determine the true cost of service and to compare it with other provider prices. Among other issues, it is not always clear from bills when discounts will expire and what the price will be afterward.

Equipment Charges

Many ISPs offer consumers the option of renting a modem (which connects a home computer or network to the ISP) or modem-router combination (which additionally allows other home devices to connect to that internet connection, usually via a WiFi signal). Because consumers can generally avoid these extra charges by purchasing their own equipment, we treated them as optional equipment fees. That was also how we treated "WiFi fees" and similarly named fees, which—though not technically an equipment rental fee—essentially unlock the WiFi functionality of ISP-provided modem-router devices.

Until recently, some ISPs routinely charged consumers for modems they supplied even if the consumers decided to use their own devices instead.[19] Congress outlawed that practice in 2019, with CR's vocal support.[20] Nevertheless, some consumers continue to rent such devices from their ISP, so we cataloged these costs to determine how much these rental fees are adding to their monthly internet bill.

[19] Jon Brodkin, "Frontier Customer Bought His Own Router—But Has to Pay $10 Rental Fee Anyway," *Ars Technica,* July 2, 2019, https://arstechnica.com/information-technology/2019/07/frontier-customer-bought-his-own-router-but-has-to-pay-10-rental-fee-anyway.
[20] "Television Viewer Protection Act of 2019," Pub. L. No. 116-94, 133 Stat. 3198, § 642(c) (2019).

Figure 3.6

Prevalence of Equipment Charges

Percent of bills with equipment charges with average costs

ISP	Percent of Bills With Equipment Charge	Mean Price	Median Price
Sonic	80%	$10	$10
Optimum (Altice USA)	67%	$13	$10
Windstream	67%	$10	$10
Consolidated Communications	63%	$15	$12
Atlantic Broadband	48%	$17	$15
CenturyLink	37%	$10	$10
Wave Broadband	30%	$17	$16
Spectrum (Charter)	29%	$6	$5
Sparklight	29%	$11	$11
WOW!	29%	$12	$14
Xfinity (Comcast)	28%	$16	$14
RCN	27%	$14	$13
Suddenlink (Altice USA)	26%	$18	$10
AT&T	25%	$9	$10
Cox Communications	24%	$13	$12
Verizon	21%	$15	$12
Frontier Communications	18%	$10	$10
Metronet	17%	$13	$10
Ziply Fiber	14%	$10	$10
Google Fiber	0%	$0	$0

Top ISPs as ranked by number of bills analyzed; satellite ISPs excluded;
non-discounted mean (rounded to the nearest dollar) & median price displayed.
This is a convenience sample, no inference can be drawn.

Company-Imposed Fees, aka Junk Fees

Some ISPs charge mandatory fees with names such as "network enhancement fee" (Optimum) and "deregulated administration fee" (Windstream/Kinetic). Here, for example, is how Wave Broadband describes its "internet infrastructure fee":

> "Internet Infrastructure Fee helps defray costs associated with building and maintaining Wave's fiber rich broadband network, as well as the costs of expanding network capacity to support the continued increase in customers' average broadband consumption. This fee is neither government-mandated nor a tax, fee or surcharge imposed by the government; it is a fee that Wave assesses and retains."

That description at least makes clear to consumers who are motivated to dig around in the fine print that it is not a government fee or tax. But the way these fees are presented on bills frequently creates the false impression that they are imposed by government regulation or taxation, when instead they are often routine input costs and distinguished from the core service price only at the provider's discretion.

As CR noted in a 2019 study, "How Cable Companies Use Hidden Fees to Raise Prices and Disguise the True Cost of Service," analogous fees are commonplace in the cable television market.[21] They appear to be less common in the broadband market. But where they do exist, they have the same effects and can add up to a significant portion of the total cost of service.

Such fees do a disservice to consumers by muddying the true price of broadband, making it difficult for consumers to compare prices, creating a pretext for providers to advertise low base rates while actually charging higher prices, and enabling providers to raise prices while superficially appearing to honor lower introductory or contractually promised base rates.[22]

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[21] Jonathan Schwantes, "How Cable Companies Use Hidden Fees to Raise Prices and Disguise the True Cost of Service," *Consumer Reports,* October 3, 2019, https://advocacy.consumerreports.org/research/2019-cable-fee-report.

[22] In a Consumer Reports "Share Your Story" campaign conducted last year, CR members shared stories of confusing advertising practices and promotional rates, and some members reported how fees make it difficult for them to understand the costs associated with their internet service. See https://digital-lab.consumerreports.org/2021/11/15/an-analysis-of-broadband-isp-practices.

Figure 3.7

Company-Imposed Fees

A sample of mandatory fees imposed by ISPs

ISP	Company-Imposed Fee Name	Cost
Atlantic Broadband	High-speed Network Recovery Fee	$5.25
CenturyLink	Broadband Cost Recovery Fee	$3.99
Consolidated Communications	Broadband Cost Recovery Fee	$2.97
Frontier Communications	Internet Infrastructure Fee	$6.99
Grande Communications	Network Access and Maintenance Fee	$5.57
Metronet	Technology Service Fee	$9.95
Optimum (Altice USA)	Network Enhancement Fee	$3.50
RCN	Network Access and Maintenance Fee	$5.57
Service Electric	Network Access Fee	$4.00
Suddenlink (Altice USA)	Network Enhancement Fee	$3.50
Verizon	Municipal Construction Charge	$2.49
Wave Broadband	Internet Infrastructure Fee	$5.57
Windstream	Deregulated Administration Fee	$7.77

This is a convenience sample, no inference can be drawn.

In this report, we are calling these “company-imposed fees” to distinguish them from government-imposed fees and taxes, but many industry critics and consumer advocates refer to them—not inappropriately—as “junk fees.” In short, we see no reason that such fees should be presented to consumers as line items separate from the price of basic internet service.

Data Caps and Related Fees

Our sample includes bills on which an ISP imposes a “cap” or limit on the amount of data the customer can use per month, and then charges an “overage fee” if the

customer exceeds that limit. Most ISPs will lift the data cap or offer unlimited data use for an additional fee.

Companies that use data caps include large ISPs such as Comcast (Xfinity), Cox Communications, and AT&T, and smaller ones such as Suddenlink and Wave Broadband. In our sample, ISPs typically set their data cap above 1TB per month. ISPs commonly claim that most customers do not exceed their cap, but our sample included bills on which terabyte caps were exceeded. We also found that some ISPs do not impose data caps uniformly across their coverage territory, which will be discussed in Section 4, on competition.

Figure 3.8 shows examples of submitted bills that contain charges for unlimited data allowance (Cox Communications and Comcast/Xfinity, respectively) and a data overage fee (Comcast/Xfinity).

Figure 3.8

Samples of Fees for Unlimited Data and Additional Usage

MONTHLY SERVICES	Jun 17 - Jul 16
INTERNET	
Premier Internet Service	$97.99
Unlimited Data Plan	49.99
Total Internet	**$147.98**
TOTAL MONTHLY SERVICES	**$147.98**
TOTAL NEW CHARGES	**$147.98**

Regular monthly charges	$275.88
Your Xfinity package	$213.98
X1 Premier Double Play Includes Digital Premier, Streampix, AnyRoom DVR Service, HD Technology Fee and Performance Pro Internet	$165.00
TV: Starz	$8.99
TV: More Sports & Ent Pkg	$9.99
Internet: Unlimited Data Option	$30.00
Peacock Premium ($4.99 value) Included in your Xfinity package on us. Experience timeless movies, TV shows and exclusive originals that you can't not watch. Just say "Peacock" into your Voice Remote to start streaming or visit xfinity.com/peacock to learn more.	$0.00

One-time charges	$10.00
Additional usage	$10.00
Internet: Additional Usage @ $10/50GB May 01 - May 31	$10.00

We found that satellite internet providers, which are often the only internet choice in rural areas, tend to set relatively low data caps—as low as 50MB, in some cases—and sell additional blocks of data for a substantial fee. This can sometimes result in staggeringly large internet bills: One HughesNet monthly bill in our sample totalled more

than $465 because of a 25GB data token purchased for $300 by the consumer who exceeded the plan's 50MB data cap.

Historically, these caps were attributed to the technical limitations of satellite-provided internet service and the need to restrict bandwidth to better manage network congestion.[23] At least one satellite provider in our data sample, however, Starlink, does not currently impose data caps on its customers.

At a time when consumers are increasingly reliant on broadband, data caps lacking a clear justification unnecessarily discourage internet use and increase prices. Earlier this year, CR publicly supported the introduction of the Uncap America Act, introduced by Sens. Ben Lujan, (D-N.M.), and Cory Booker, (D-N.J.)[24] The legislation would, among other things, forbid ISPs from imposing data caps unless they could supply a technical justification to the FCC.

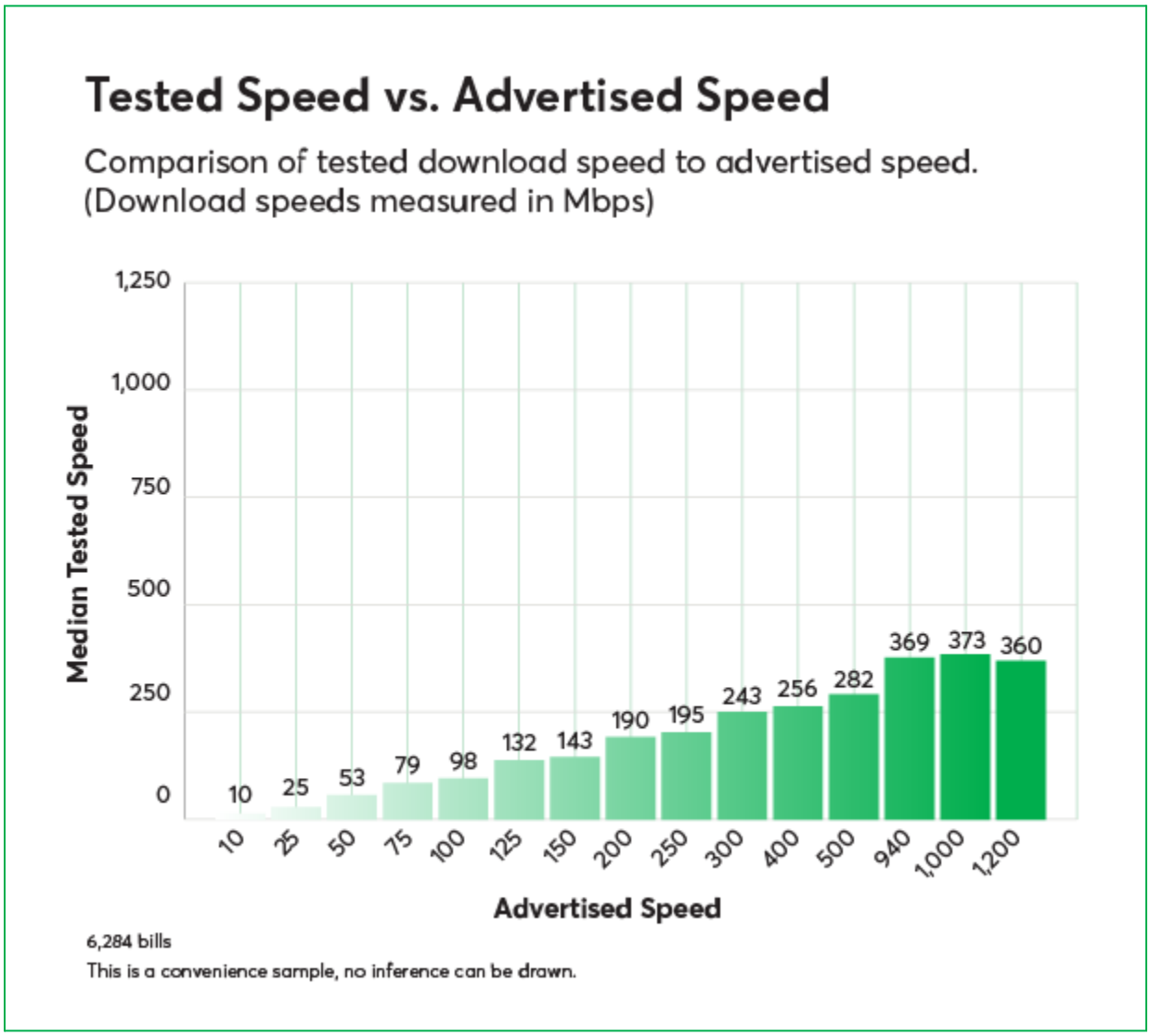
Speed Test Results

One aim of this study is to better understand the relationship between real-world internet performance and the speeds offered when customers sign up. To gather data, we asked all participants to take an internet speed test using an online tool hosted by Measurement Lab (M-Lab), and to report their upload and download speeds. M-Lab's speed test does not purport to measure the advertised speeds offered by ISPs. Participants conducted a total of 21,481 usable speed tests.

Because ISPs do not consistently print the download or upload speeds for a service package on their bills, our analysis was restricted to the subset of bills on which we could identify an advertised download speed. As the graphic below suggests, in some cases, the measured speed matched the "up to" advertised plan speed; in other cases, the measured speed was much lower than the advertised speed.

[23] Open Internet Advisory Committee Federal Communications Commission Report, "Policy Issues in Data Caps and Usage-Based Pricing," Federal Communications Commission, August 20, 2013, https://transition.fcc.gov/cgb/oiac/Economic-Impacts.pdf.
[24] Jonathan Schwantes, "Consumer Reports supports the Uncap America Act to limit unnecessary internet data caps," press release, Consumer Reports Advocacy, July 21, 2022, https://advocacy.consumerreports.org/press_release/consumer-reports-supports-the-uncap-america-act-to-limit-unnecessary-internet-data-caps.

Figure 3.9

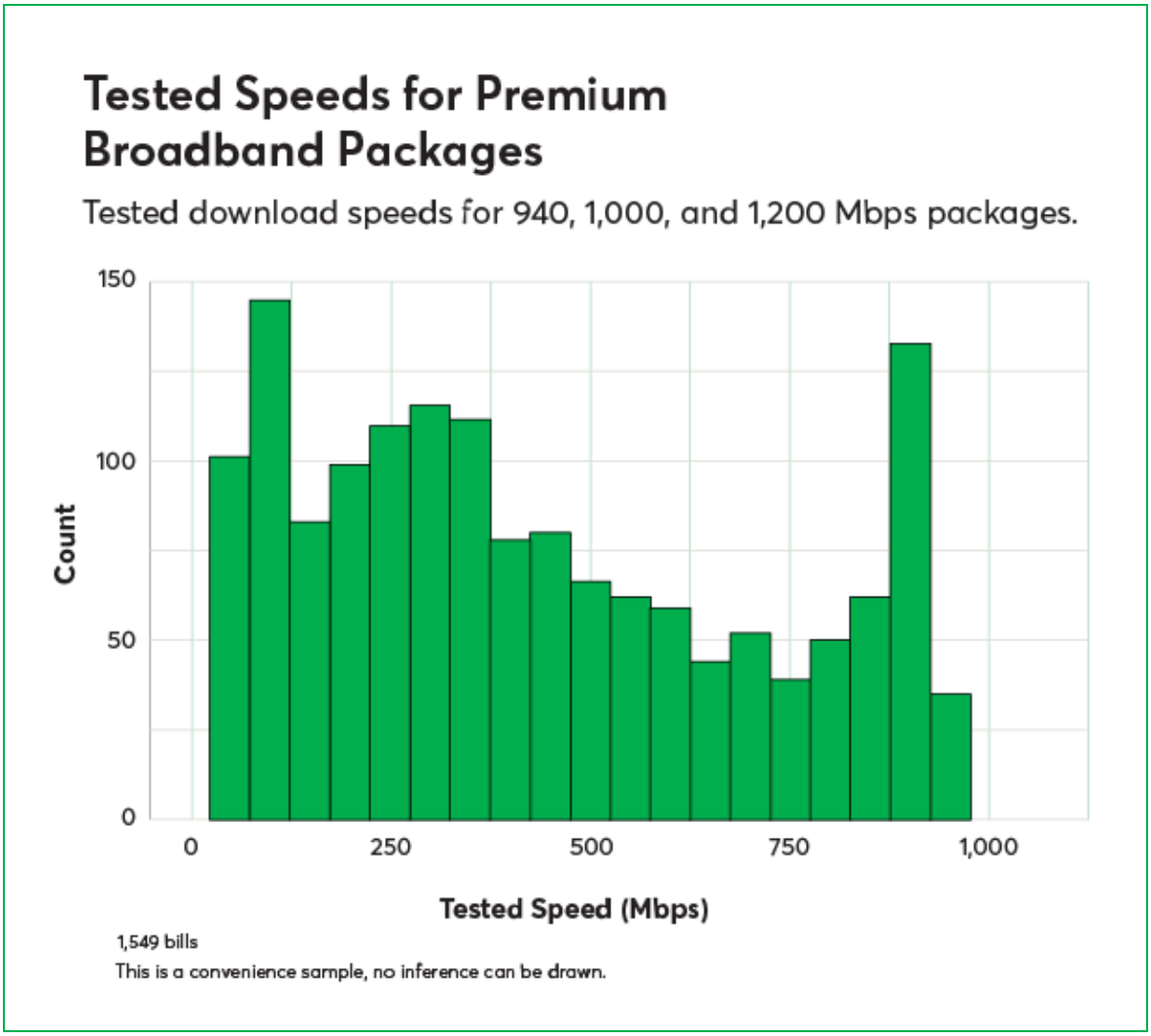


It is important to understand that internet speed tests have limitations. A single speed test doesn't necessarily reflect typical conditions, let alone optimal ones. A test performed during peak usage times, for example, when network congestion is heaviest, is likely to be slower than one performed during a low-usage time. Additionally, speed test results can be heavily dependent on the quality and speed of one's home WiFi network and whether one is connecting via a virtual private network (VPN). This study did not control for such variations.

It is also worth emphasizing that ISPs typically market their broadband service as delivering "up to" certain upload and download speeds. This practice, though arguably confusing, is not a guarantee of certain speeds.

All that said, we found many instances where measured download speeds did not match the advertised “up to” speeds of several ISPs. This was especially true for users paying for premium plans purporting to offer download speeds of “up to” between 940 and 1,200 Mbps, who in fact reported median measured speeds between 360 and 373 Mbps, as can be seen in Figures 3.9 above and 3.10 below. Since M-Lab does not attempt to measure advertised speeds, these discrepancies should not be interpreted as a reflection of whether or not users are receiving the service they are paying for. Nevertheless, they do provide valuable insight into how consumer’s experience their connectivity.

Figure 3.10



IV. Competition

Compounding many of the problems caused by a lack of regulation in the broadband market is the industry's lack of competition: Some consumers simply have little or no choice of broadband providers.[25] One additional goal of the current study was to explore the extent to which local competition among broadband providers benefits consumers by lowering prices and improving the quality of service, as standard economic theory would predict and as other recent research has shown to be the case.[26]

CR's own research shows that consumers are acutely aware of the market's lack of competition. According to CR's 2021 broadband survey, 26 percent of U.S. consumers who have broadband in their household say only one company was available when they were choosing their household's internet service.[27] Additionally, a survey of 33,000 CR members (in this case not a nationally representative sample) found that more than one in five (22 percent) said they were not aware of any ISP options other than their current provider. Another 30 percent said they had just one other provider to choose from other than their current provider.

Both anecdotal evidence and academic research indicate that robust, head-to-head competition leads to lower consumer broadband prices and better service. For example, it was reported that when AT&T entered the Kansas City market in 2015, it pledged to match the price and speed of Google Fiber's existing Gigabit offering, at the time priced at $70 per month.[28] Similarly, in 2017, Comcast reportedly offered prices $40 to $50 lower for its Gigabit service in Longmont, Colorado, where it faced competition from a municipal fiber-optic network, LPC NextLight, than in nearby communities where it did not.[29]

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[25] "FCC Releases 2020 Communications Marketplace Report," GN Docket No. 20-60, Federal Communications Commission, (December 31, 2020): 86-87 at para.126. Available at: https://www.fcc.gov/document/fcc-releases-2020-communications-marketplace-report. The report shows that more than 14.5 million (4.4 percent) U.S. residents have zero choices for fixed broadband at the 25/3 Mbps speed tier, and 27.5 million (8.3 percent) and 42.7 million (12.9 percent) residents lack even one provider for the 100/10 Mbps and 250/25 Mbps speed tiers, respectively. The equivalent numbers for residents who have only one choice of provider for the same tiers are 72.6 million (21.9 percent), 118.7 million (35.8 percent), and 172.5 million (52 percent).

[26] Tyler Cooper, "Competition and Pricing: How Starlink Could Change the Internet Industry," BroadbandNow, September 2020, https://broadbandnow.com/report/starlink-competition-and-pricing; see also Dan Mahoney and Greg Rafert, "Broadband Competition Helps to Drive Lower Prices and Faster Download Speeds for U.S. Residential Consumers," Analysis Group, November 2016, https://www.analysisgroup.com/globalassets/content/insights/publishing/broadband_competition_report_november_2016.pdf.

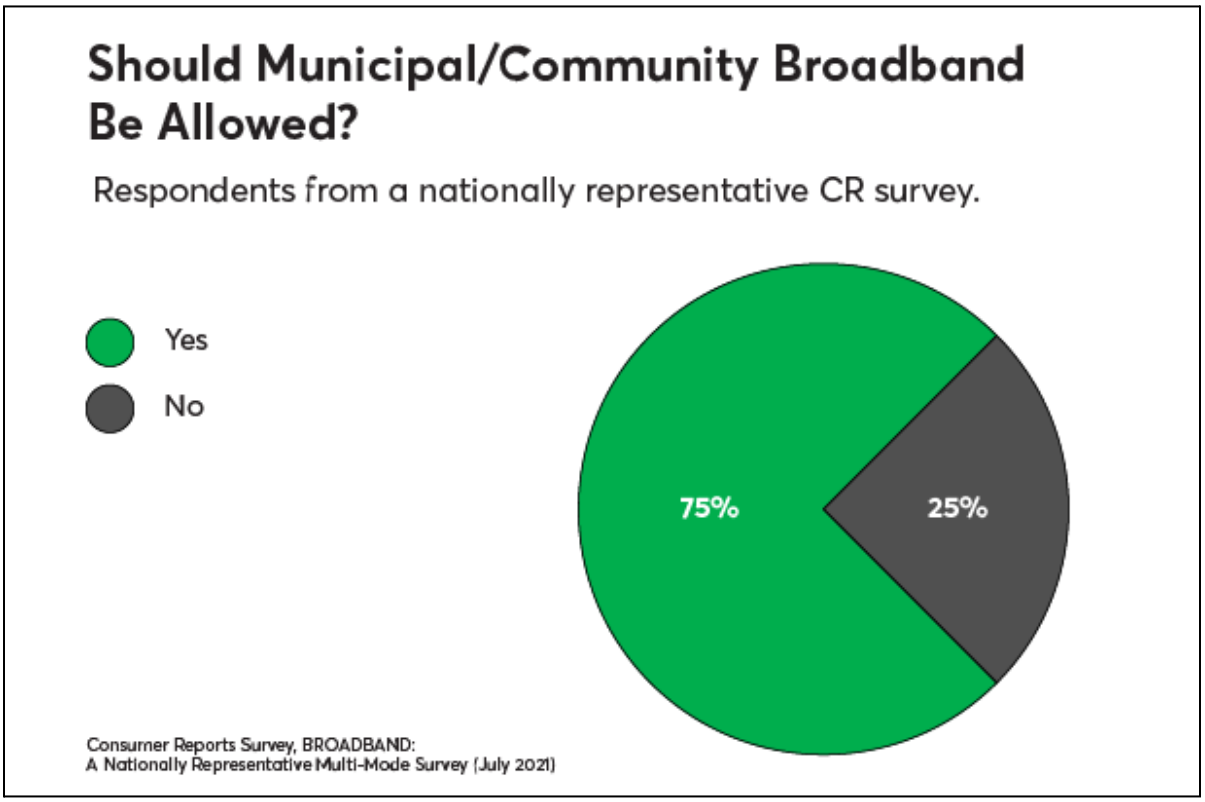
[27] CR 2021 Broadband Survey at p.2.

[28] Ben Popper, "AT&T Announces It Will Match Google Fiber's Price and Speed in Kansas City," *The Verge,* February 2015, https://www.theverge.com/2015/2/17/8050935/att-google-fiber-kansas-city-gigapower-internet-price-match.

[29] Karen Antonacci, "Comcast rep caught spreading misinformation about Longmont's NextLight to Fort Collins," *Times-Call,* June 2017, https://www.timescall.com/2017/06/22/comcast-rep-caught-spreading-misinformation-about-longmonts-nextlight-to-fort-collins.

Not surprisingly, however, incumbent ISPs have generally been resistant to the entry of new competition into their markets. Some have mounted legal challenges intended to stop funding of potential competitors in underserved markets.[30] And some of these anti-competitive efforts have reportedly been fed by misinformation about the price and services offered by competitors.[31] To make matters worse, 17 states have laws that restrict or make it difficult for localities to build their own broadband networks, adding another barrier to competition, according to MuniNetworks.org, an organization that supports the development of local broadband networks.[32] Meanwhile, according to CR's 2021 broadband survey, three out of four Americans feel that municipal or community broadband should be allowed to compete with conventional ISPs.[33]

Figure 4.1



[30] Issie Lapowsky, "A poor Louisiana community won $4 million for broadband. An ISP giant is standing in its way," *Protocol,* September 12, 2022, https://www.protocol.com/policy/sparklight-east-carroll-broadband; see also Ben Brody, "Bad broadband maps are keeping people offline, and everyone knows it," *Protocol,* January 4, 2022, https://www.protocol.com/policy/deer-isle-broadband-maps; see also Karl Bode, "Monopoly Internet Service Providers Mire Grant Process With Costly, Empty Challenges," *Institute for Local Self-Reliance,* December 22, 2021, https://ilsr.org/monopoly-internet-service-providers-mire-grant-process-with-costly-empty-challenges.

[31] Karen Antonacci, "Comcast rep caught spreading misinformation about Longmont's NextLight to Fort Collins," *Times-Call,* June 2017, https://www.timescall.com/2017/06/22/comcast-rep-caught-spreading-misinformation-about-longmonts-nextlight-to-fort-collins; see also Maren Machles, "A Tale of Two Cities in Maine: Municipal Broadband and Misinformation," *Institute for Local Self-Reliance,* December 7, 2021, https://ilsr.org/a-tale-of-two-cities-in-maine-municipal-broadband-and-misinformation.

[32] For an updated list of states that have laws that restrict municipal broadband networks, see https://muninetworks.org/content/preemption-detente-municipal-broadband-networks-face-barriers-19-states.

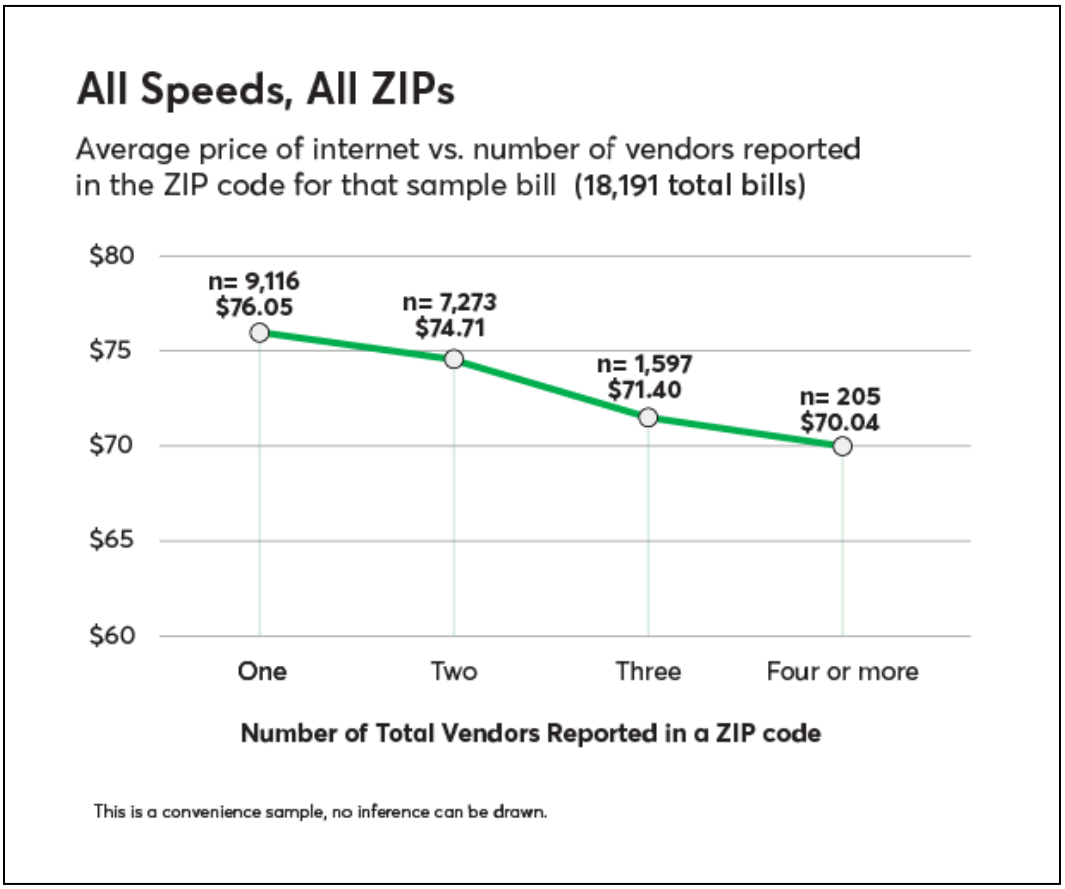
[33] CR 2021 Broadband Survey at p.8.

Findings Regarding the Effect of Competition

It was in this context that CR sought further data on the question of whether more broadband competition would benefit consumers, beginning with CR's 2021 broadband survey. That survey indeed suggests that the presence of multiple ISPs in a market leads to lower prices, specifically finding that Americans in markets with two broadband competitors reported paying about $5 per month less for service than those with only one provider, and reported prices were lower still as the number of local competitors increased.[34]

The current study produced similar results, as the table and graph below indicate. In Figure 4.2, the x-axis shows the number of providers represented among the respondents in each ZIP code; the y-axis, the average monthly price paid by respondents in those ZIP codes.

Figure 4.2



[34] CR 2021 Broadband Survey at p. 2-3. See also: graphic on p.13 at https://advocacy.consumerreports.org/wp-content/uploads/2021/08/CR_Broadband-Survey_8_2021_VF.pdf.

Figure 4.3

Vendors in a ZIP Code and Corresponding Sample Statistics

Reported Vendors	Bill Count	Mean Price	Median Price
1	9,116	$76.05	$74.99
2	7,273	$74.71	$74.99
3	1,597	$71.40	$70.00
4 or 5	205	$70.04	$65.00

Note: This is a convenience sample, no inference can be drawn.

We should be clear about the limitations of our data in this context. We cannot, based on the current study, know for certain how many ISPs operate in these ZIP codes, only how many ISPs were represented among the people who volunteered for our study. Nor do we know that all the consumers in ZIP codes with multiple ISPs actually have a choice between that number of ISPs because access to a given ISP's service can vary from street to street or even building to building.

Nonetheless, it's notable that these findings closely mirror CR's earlier survey results. And the large number of bills from ZIP codes with one, two, and three providers puts the general trend line on firm statistical ground.

One additional finding of this study is worth emphasizing in the context of broadband competition: Numerous ISPs do not impose data caps uniformly across their coverage territory. This is notable in part because of a 2020 episode in which Comcast, a longtime user of data caps in its Midwestern and Western markets, announced it would begin using them in its Northeastern markets for the first time.[35] However, after public

[35] The introduction of data caps in Comcast's Northeastern service territory was first reported by the online publication *Stop the Cap!* on November 23, 2020, citing new language on Comcast's customer service FAQ page: "Customers in select markets can take the months of January and February to understand how the new 1.2TB Internet Data Plan affects them without additional charges," Comcast wrote on its new customer FAQ page. "We'll credit your bill for any additional data usage charges over 1.2TB during those months if you're not on an unlimited data plan. It does not apply to Xfinity Internet customers on our Gigabit Pro tier of service, Business Internet customers, customers with Prepaid Internet, or customers on Bulk Internet agreements." Available at

outcry including vocal opposition by Pennsylvania attorney general Josh Shapiro, the company postponed implementing the plan and, to date, has yet to expand data limits into the Northeast.[36] As noted by *MarketWatch*, "Comcast operates in 39 states and had begun enforcing the caps in 27 of them," but the 12 states and the District of Columbia in its Northeast region remain data cap-free as explained above.[37] Noteworthy is that Comcast faces head-to-head competition for its broadband service from cap-free Verizon Fios in most of those states, but not in those where it imposes a cap.[38]

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https://stopthecap.com/2020/11/23/breaking-news-comcast-introducing-1-2-tb-data-cap-in-northeast-mid-atlantic-regions/. See also Kim Lyons, "Comcast to impose home internet data cap of 1.2TB in more than a dozen US states next year," *The Verge,* November 23, 2020, https://www.theverge.com/2020/11/23/21591420/comcast-cap-data-1-2tb-home-users-internet-xfinity.

[36] "At AG Shapiro's Urging, Comcast Delays New Data Thresholds," press release, Office of Attorney General Josh Shapiro, February 3, 2021, https://www.attorneygeneral.gov/taking-action/at-ag-shapiros-urging-comcast-delays-new-data-thresholds; see also Sean Hollister, "Comcast delays new data caps for at least another year, which is weird because it should be forever," *The Verge,* December 16, 2021, https://www.theverge.com/2021/12/16/22840165/comcast-data-cap-delay-isp-dec-2021; see also Jeff Baumgartner, "Comcast will keep data caps out of the Northeast in 2022," *Light Reading,* December 15, 2021, https://www.lightreading.com/cable-tech/comcast-will-keep-data-caps-out-of-the-northeast-in-2022/d/d-id/774117.

[37] Jacob Passy, "Comcast won't charge if you go over your internet data limit — but only if you live in this part of the country," *MarketWatch,* February 4, 2021, https://www.marketwatch.com/story/comcast-will-delay-caps-on-home-internet-use-but-only-if-you-live-in-this-part-of-the-country-11612378152.

[38] Ry Crist, "Xfinity vs. Verizon Fios: Comparing Home Internet Services for Your Household," *CNET,* June 2, 2022, https://www.cnet.com/home/internet/comcast-xfinity-vs-verizon-fios/.

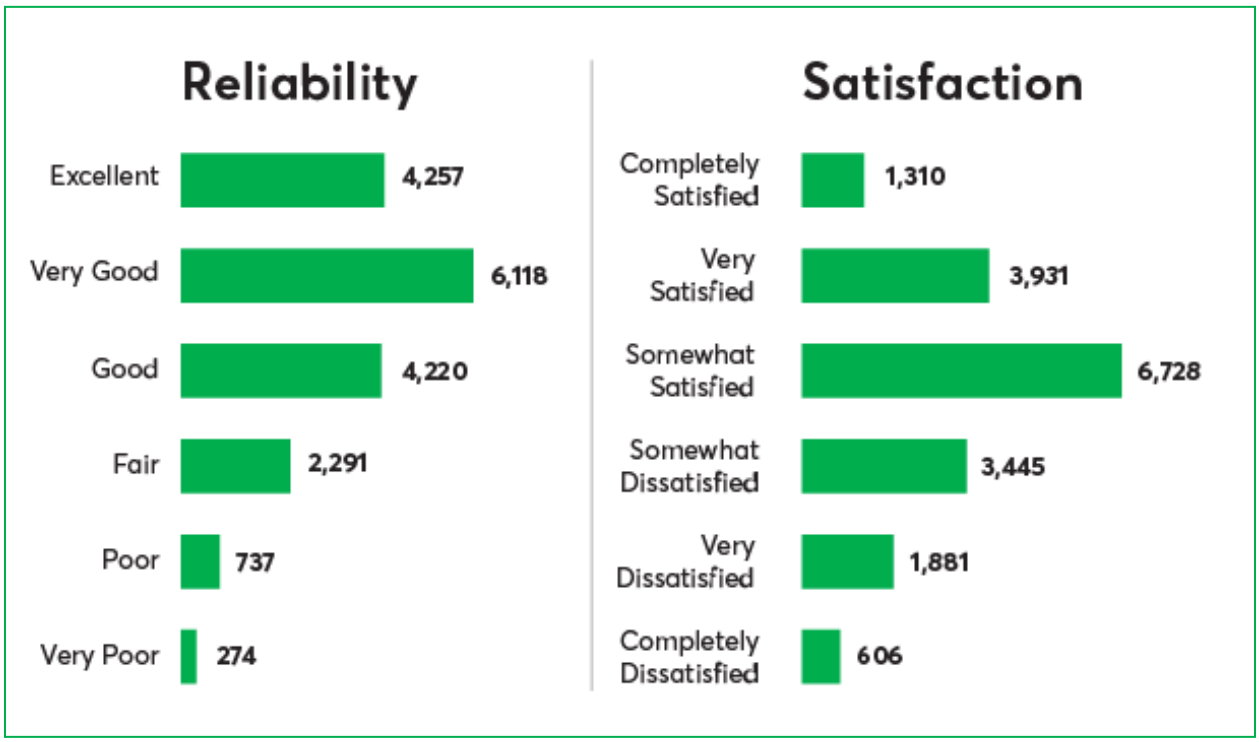
V. Reliability and Satisfaction

The optional survey we asked participants to complete included questions about the reliability of, and their overall satisfaction with, their internet service.

Respondents were asked to rate the reliability on a scale of *excellent, very good, good, fair, poor*, or *very poor***.** They were asked to rate their overall satisfaction with their internet service, when considering all factors including price, customer service, and connection speed, on a scale of *completely satisfied, very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied*, or *completely dissatisfied.*

The results of this survey are shown in Figure 5.1, below.

Figure 5.1



These numbers give a generally positive impression of the industry, with a large majority (82 percent) of consumers rating the reliability of their internet connection good or better and 66 percent saying they are “somewhat” or more satisfied.
Some interesting nuances emerged when we plotted the relationship between the two questions, with the satisfaction values on the y-axis and the reliability values on the x-axis, as shown in Figure 5.2 below.

Figure 5.2

Reliability vs. Satisfaction

Counts of responses

Reliability	Completely Dissatisfied	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Completely Satisfied
	Satisfaction					
Excellent	14	77	225	1,023	1,705	1,213
Very Good	43	269	852	2,893	1,967	94
Good	77	421	1,186	2,291	242	3
Fair	120	614	1,035	505	17	0
Poor	144	432	145	16	0	0
Very Poor	204	68	2	0	0	0

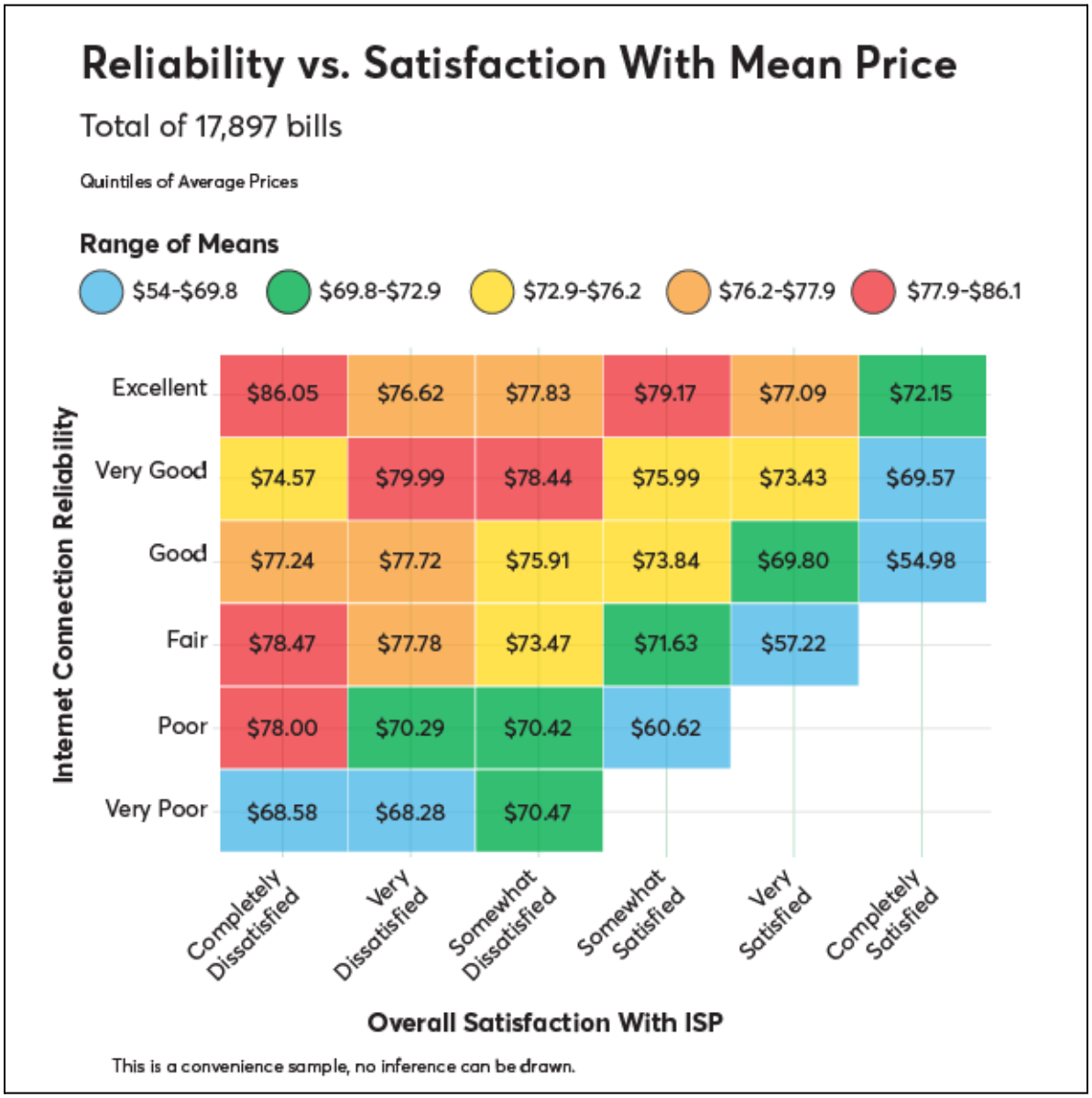
This allows one to see, for example, that 204 respondents characterized the reliability of the service as “very poor” and their satisfaction level as “completely dissatisfied”—a correspondence that makes intuitive sense. The lower right and upper right quadrants similarly make intuitive sense: It’s easy to understand why no deeply satisfied respondents reported poor or very poor reliability, and why many customers with excellent reliability would report being completely or very satisfied.

The upper left quadrant, however, where low satisfaction scores overlap with high reliability ratings, is harder to understand. One would think reliable service would correspond with relatively high satisfaction levels, but in fact more than 3,000 respondents rated the reliability of their internet connection as “good” or better but overall were “somewhat dissatisfied” or worse. Why would that be?

Price seems to have been an important factor. When we broke the price ranges into quintiles and color-coded the same grid by the average price paid by the respondents in each box (see Figure 5.3), it became clear that most of the high reliability/low satisfaction quadrant paid among the highest prices for their broadband service. To be

more precise, eight out of the nine boxes in the quadrant were paying an average of $75 or more a month for internet service.

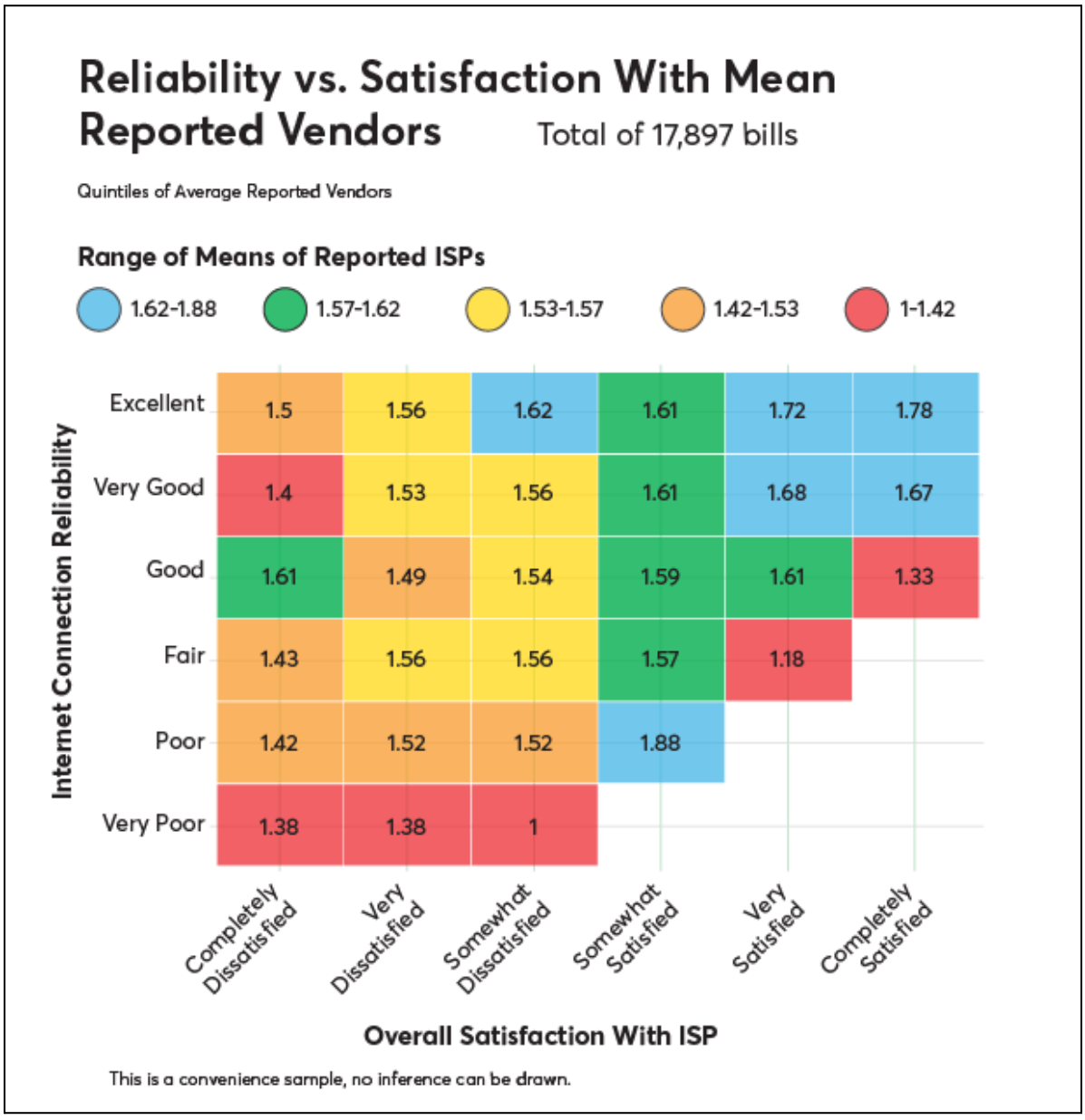
Figure 5.3



Consumer choice—or lack thereof—also seems to be a factor, which isn't surprising given what we previously noted about the relationship between competition and price. When we color code the grid using the average number of ISPs competing for the respondents in that square (see Figure 5.4), the high reliability/low satisfaction quadrant (upper left) is populated by consumers with relatively few choices—while the high satisfaction/high reliability quadrant (the upper right) shows consumers who, on average, have more choice of ISPs.

It is worth noting that the overwhelming majority of the bills we analyzed were from ZIP codes with only one or two ISPs (16,389 out of 18,191 bills with identifiable ZIP codes, see Figure 4.3), so although these averages may seem close in value, the differences are statistically meaningful.

Figure 5.4



To summarize, these findings suggest that:

- ➢ many consumers who rate their service as relatively reliable are, at the same time, relatively dissatisfied overall with their internet service, and this pattern

correlates with relatively high service prices and a relative lack of local broadband competition; and

- ➢ consumers who rated their broadband service as highly reliable and were “very satisfied” or “completely satisfied” overall with their service generally live in areas with relatively robust broadband competition and generally pay lower prices for their broadband service.

Combined with the evidence that broadband competition leads to lower prices, we assert that competition can lead to happier consumers as well.

VI. Policy Implications

The COVID-19 pandemic not only increased the importance of broadband access and affordability but also spurred the federal government to make historic investments to expand internet service in unserved and underserved areas, and launch efforts to help all consumers afford broadband. Care should be taken to ensure the money is spent wisely and addresses the problems—high prices, confusing bills, scarce competition, lack of regulatory oversight—present in the broadband marketplace.

CR recommends the following as potential solutions:

Make the broadband "nutrition" label easier to find

Last year, Congress mandated that the FCC develop and implement a standardized consumer broadband label with the goal of bringing greater price transparency and uniformity to the broadband market. The label is to be based on an earlier version proposed by the Commission in 2016, which in turn had been modeled on the standardized nutrition label created by the U.S. Food and Drug Administration. The law will require ISPs to display the label "to disclose information" to consumers regarding their broadband plans. CR has long supported the effort.

Will the FCC's consumer broadband "nutrition" label help clear up some of the billing confusion identified in this report? Because the label will require clear disclosures of pricing information, discounts, fees, and internet performance, it may.

The single best way the Commission could ensure that the maximum number of consumers will see and benefit from the label would be to require it to appear on every monthly broadband bill. If the label is displayed only on ISP websites and marketing materials—and not on monthly bills—CR and other consumer advocates fear that many existing customers will never see or derive any benefit from the label. The same could be true if the label is buried in fine print or merely linked to by hyperlink. For that reason—and especially in light of this report's findings about confusing billing practices and the lack of information on ISP bills—the FCC should adopt our recommendation to require the label on monthly ISP bills. The agency clearly has the authority to do so.

CR also argues that the labels should be machine-readable. A machine-readable label would better enable regulators, researchers, consumer advocates, and others to track and compare pricing across hundreds of ISPs, and potentially

make it easier for consumers to compare the prices and service offerings of competitors in their communities.

For more on CR's broadband nutrition label recommendations, see our comments in the FCC docket.[39]

Require data cap justification

Data caps that lack a clear justification unnecessarily discourage internet use and increase prices, both by overage fees when caps are exceeded or by unlimited data allowance charges (sometimes as high as $50) that consumers choose to pay to avoid worrying that their data use could trigger overage fees. To tackle the harms posed by data caps in the fixed broadband market, CR publicly supported the introduction of the Uncap America Act, introduced by Sens. Ben Lujan and Cory Booker earlier this year.[40] The legislation would, among other things, forbid ISPs from imposing data caps unless they could supply a technical justification to the FCC.

Encourage broadband competition

There is no easy way to increase competition in areas where consumers are saddled with a monopoly provider and high prices. But two widely discussed policy changes could begin to address the problem: One, policymakers could permit and support the creation of municipal broadband networks; and two, they can more thoroughly scrutinize—and, where appropriate, put a stop to—legal challenges and other efforts by incumbent ISPs to thwart new competition in underserved areas.

Strengthen FCC oversight

Finally, the FCC should reassert its regulatory authority over the broadband internet service industry. The Commission could do this on its own, or Congress could intervene. Many of the ills identified in our study could be better addressed if the FCC asserted jurisdiction over broadband as a telecommunications service, which would give the Commission broader powers to ensure non-discriminatory access to broadband, monitor price-gouging, bar anti-consumer business practices, and better address price and fee transparency.

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[39] Comments of Consumer Reports (with Public Knowledge and Common Sense Media), CG Docket No. 22-2 (March 9, 2022). Available at: https://www.fcc.gov/ecfs/document/1030968554762/1.

[40] Jonathan Schwantes, "Consumer Reports supports the Uncap America Act to limit unnecessary internet data caps," press release, Consumer Reports Advocacy, July 21, 2022, https://advocacy.consumerreports.org/press_release/consumer-reports-supports-the-uncap-america-act-to-limit-unnecessary-internet-data-caps.

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Appendix A: Detailed Methodology

Consumer Reports' Fight for Fair Internet campaign collected a sample of more than 22,000 internet service provider (ISP) bills with corresponding internet speed tests and surveys from volunteers across the country. Bills were collected between July 2021 through December 2021. Although the sample is impressive and groundbreaking—it includes bills from every state and territory in the United States and covers nearly 700 internet service providers—it is a convenience sample, and as such, no statistical inference can be drawn, only observations.

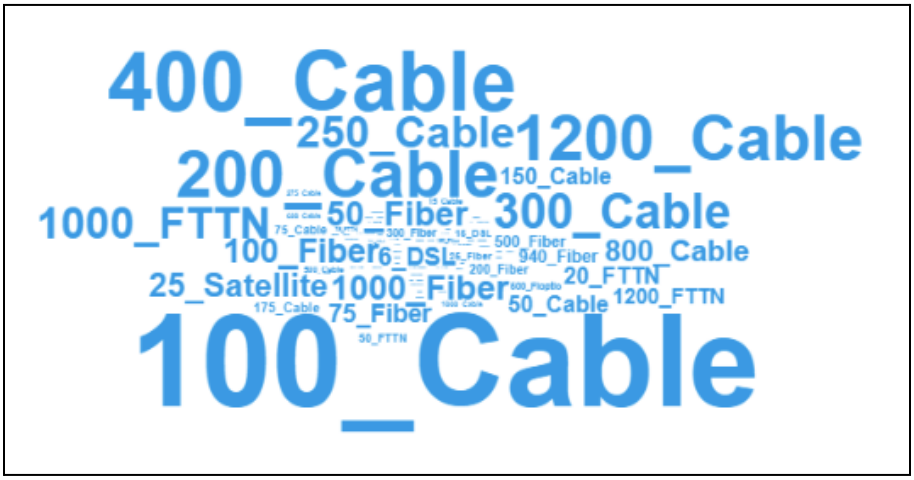
We extracted the data from the collected bills using an OCR machine. This first capture of the data provided sufficient descriptions of bill line itemizations and corresponding charges to enable robust feature engineering. Thus, we employed this data to investigate vendors, the features of their advertised packages, and the corresponding charges on consumers' bills. Wherever possible, we verified and augmented our data with publicly available information provided by our partners at broadbandnow.com. From this work, we identified hundreds of ISPs and captured as much corresponding information for each as possible.

Upon completion of this intense investigation into providers, we built a hierarchical classification structure for the bill line itemizations in the sample with the goal of finding and extracting all charges relating to wired internet. To this end, our internal subject matter expert and data science team collaborated closely to ensure all charges relating to TV, video, wireless internet, fixed wireless internet, landline phones, and special internet services (e.g., business and seasonal internet) were classified accordingly for easy removal from the sample data prior to analysis. Although we encountered many taxes and government-imposed fees, both general and relating to specific services, we classified them accordingly and removed them from the sample data prior to analysis, because they are often not itemized or allocated to a specific service.

Through this classification work, we discovered hundreds of internet packages offered to consumers, ranging from 0.8 Mbps download speed DSL packages to 2GB per second download speed fiber packages. In total, we found more than 10 internet connection types, e.g., fiber, fiber-coax, satellite, DSL, etc., corresponding to more than 50 internet download speeds in the sample, which highlighted the presence of more than 160 combinations of connection types and download speeds for internet packages.

Figure 1 below displays a word-cloud of the combinations of connection types and speeds found in the sample. We isolated all internet package prices whenever an itemization of the service charges were provided on the bill—we considered the package charge plus any additional charge for increased speeds as the internet package price—and classified them accordingly. Note that we classified and removed bundle charges and do not have corresponding internet prices for bills for a bundled service where an itemization of the service charges was not provided on the bill.

Figure 1



In addition to identification and subsequent second-level classification of internet prices, we created second-level classifications of equipment fees and company-imposed fees. The internet equipment fees were further split into satellite equipment fees and modem, router, and related WiFi fees. The company-imposed fees subset consists of data and usage fees; DNS and IP fees; miscellaneous fees like activation fees, late fees, and shipping and handling fees; and internet and network fees. Each charge classified as an internet and network fee was thoroughly investigated by our internal subject matter expert and data science team prior to being classified as such. We chose to exclude internet support fees, internet protection fees, wire maintenance fees, and wire protection plan fees from company-imposed fees because we believe most are optional services.

See Figure 2 below for the full classification structure we built to capture such fees; internet equipment is its own classification. In particular, see Table 1 below to see which vendors are charging internet and network fees (which are explained in the report).

Figure 2

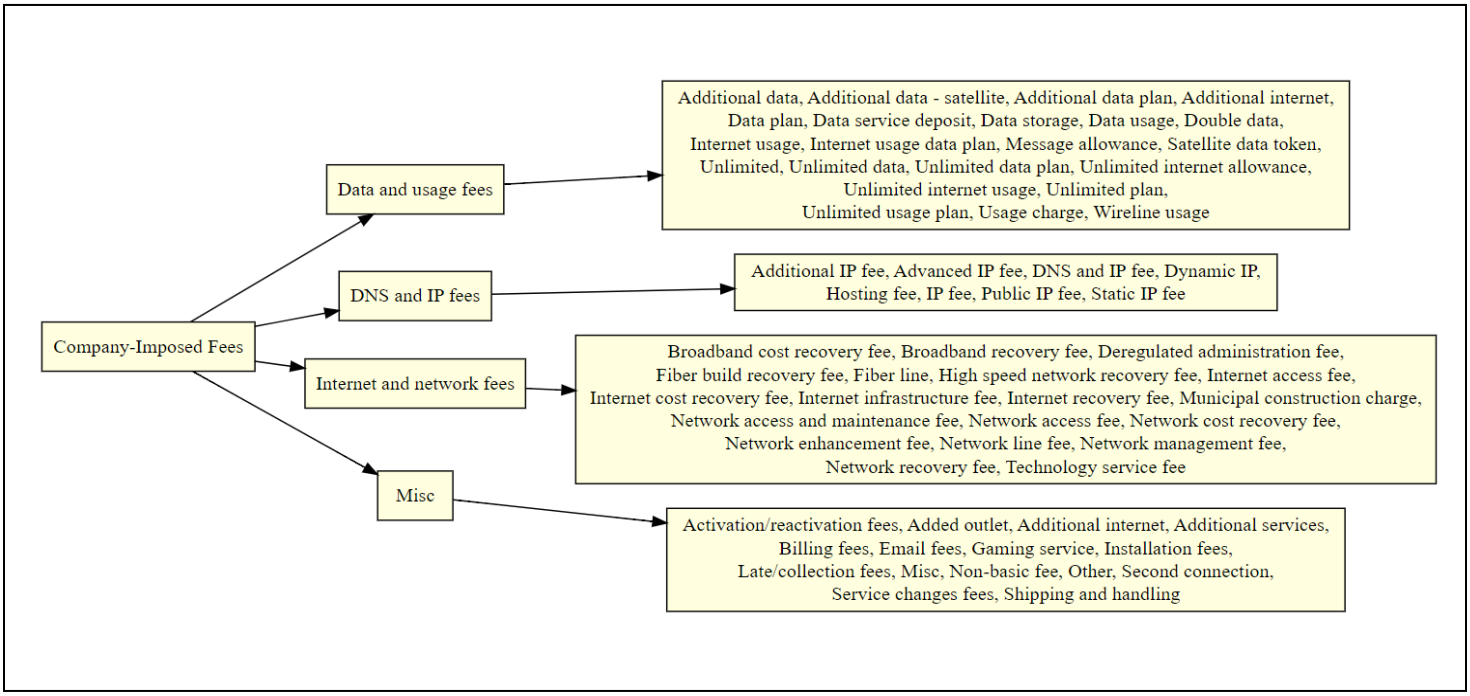


Table 1

Vendor	Count of Bills With Fee	Name of Fee
Frontier Communications	525	Internet Infrastructure Fee
Optimum	438	Network Enhancement Fee, Network Access Fee
RCN	298	Network access and maintenance fee, Municipal construction charge
Suddenlink	264	Network enhancement fee
Verizon	230	Municipal construction charge
Wave Broadband	140	Internet infrastructure fee
Windstream	109	Deregulated administration fee
Metronet	98	Technology service fee
Atlantic Broadband	65	High speed network recovery fee, Network recovery fee
Consolidated Communications	61	Broadband cost recovery fee, Fiber build recovery fee
Centurylink	52	Broadband cost recovery fee, Internet cost recovery fee
Grande Communications	35	Network access and maintenance fee
Service Electric	30	Network access fee
GCI Communication	11	Network access fee
ImOn Communications	8	Internet infrastructure fee, Network access fee
South Slope Cooperative Communications	6	Internet infrastructure fee
WOW!	4	Network line fee
Blue Stream	3	Network recovery fee
Mtco Cable	3	Technology service fee
TDS Telecom	3	Broadband recovery fee
North State	2	Internet recovery fee
The Computer Works	2	Technology service fee
Vexus	2	Network access fee
Atla	1	High speed network recovery fee
CC Communications	1	Fiber line
Dfn	1	Network recovery fee
Homeland Optical Technology	1	Internet access fee
MTA Solutions	1	Network access fee
Solarus	1	Network enhancement fee
Total Highspeed	1	Network cost recovery fee
West Carolina Rural Telephone Cooperative- Inc.	1	Broadband recovery fee
Ziply Fiber	1	Network enhancement fee

While building the hierarchical classification structure outlined above, we manually extracted data from all bills in the sample to ensure robustness and accuracy of the data. We used the classified machine-extracted data to build ensemble classification models to quickly and efficiently classify the manually extracted data.

For model-building, model-classification, and all subsequent analyses and reports, we used the programming language R and its corresponding IDE RStudio. In particular, we employed the tidymodels package to build an ensemble of local binary classifiers for speed and accuracy. We included Logistic, KNN, Random Forest, and XGBoost classifiers in the ensemble. Each was individually tuned to the first-level classification of internet and then put into the ensemble, which was again tuned and then applied to each of the nine first-level binary classifications. See the resultant confusion matrices in Figures 3 and 4 below that show the performance of the models on the manually extracted data for two of the first-level classifications.

Figure 3

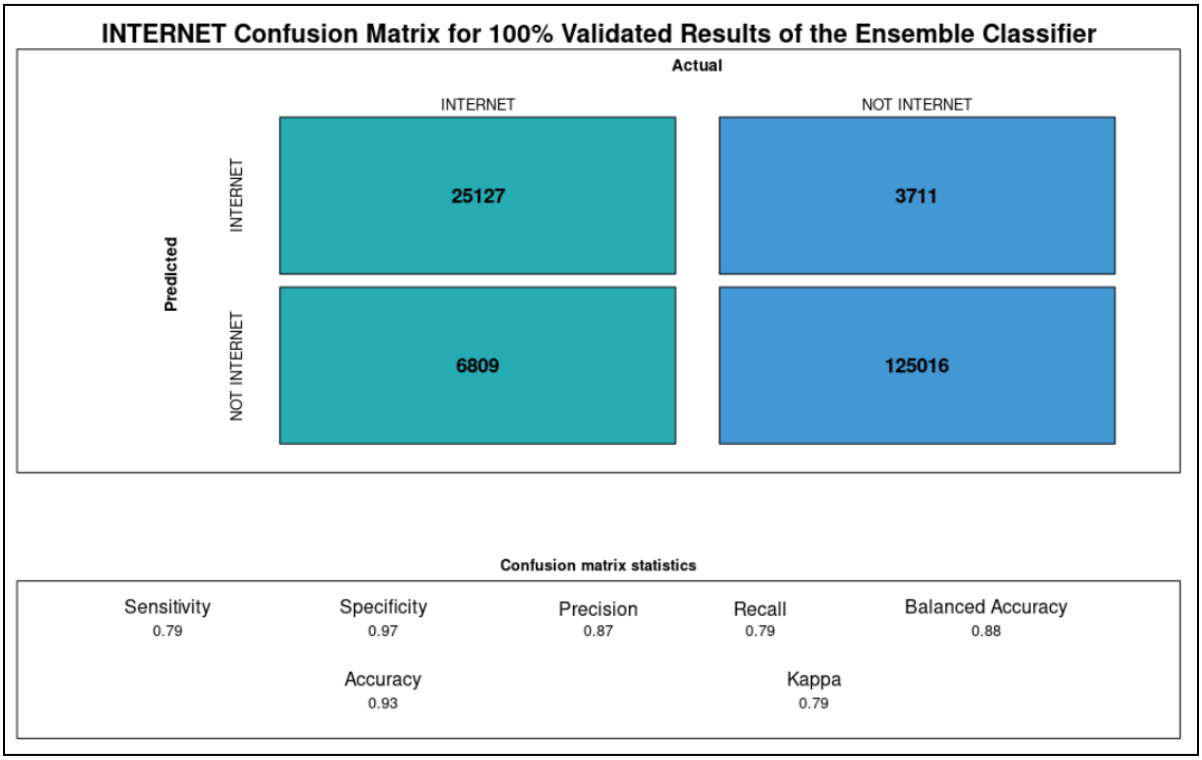
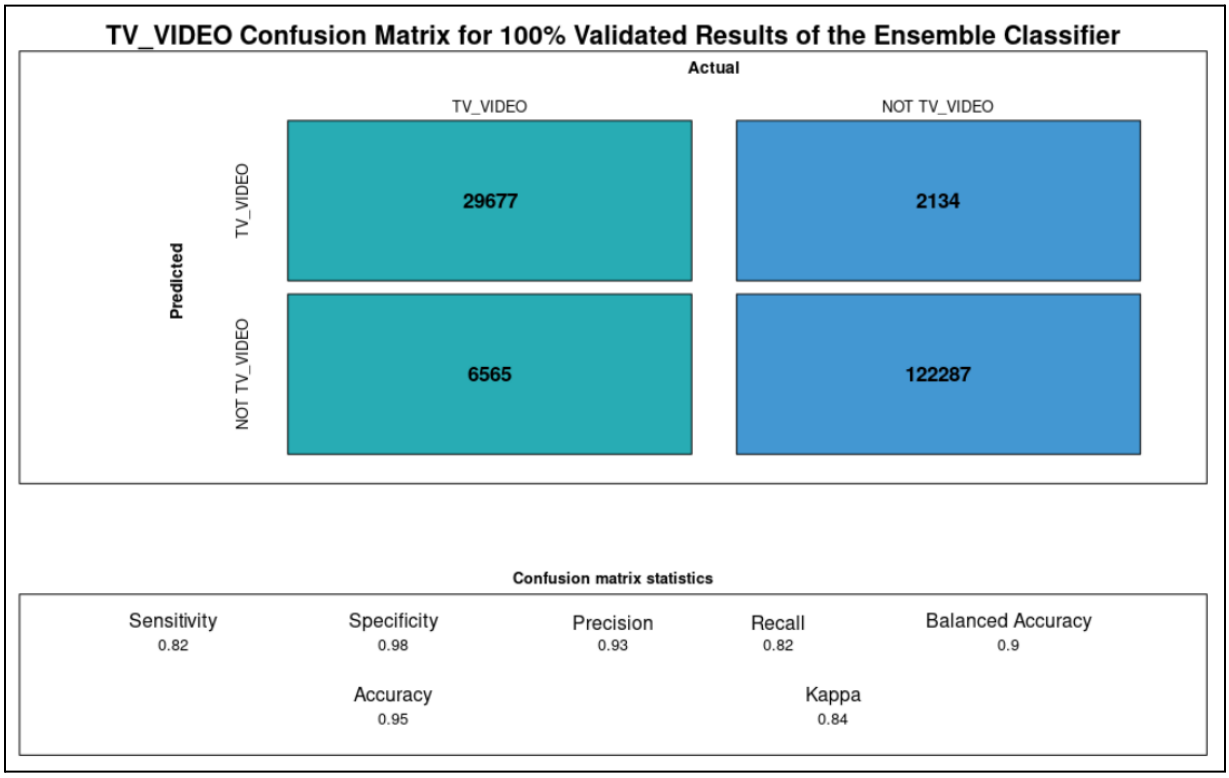


Figure 4



Given the results of the first-level classifiers and that the classification structure was engineered to have the same few second-level classifications for each provided service, we chose to build only an XGBoost model for the second-level classifier. Although via subsequent validation, we extracted, further classified, and analyzed only internet data, we tuned this second-level classifier using all of the machine-extracted data and applied it to all of the manually extracted data.

Due to sample size constraints given the complexity of the remaining structure, our data science team completed the bottom-level classifications manually. This process included 100 percent manual validation of the model classifications for the first two classification levels, followed by manual classification of the next two classification levels. Note all classification work on the manually extracted data was done by the same team that built the initial structure from the machine-extracted data to ensure consistency and accuracy of data classification and subsequent representation.

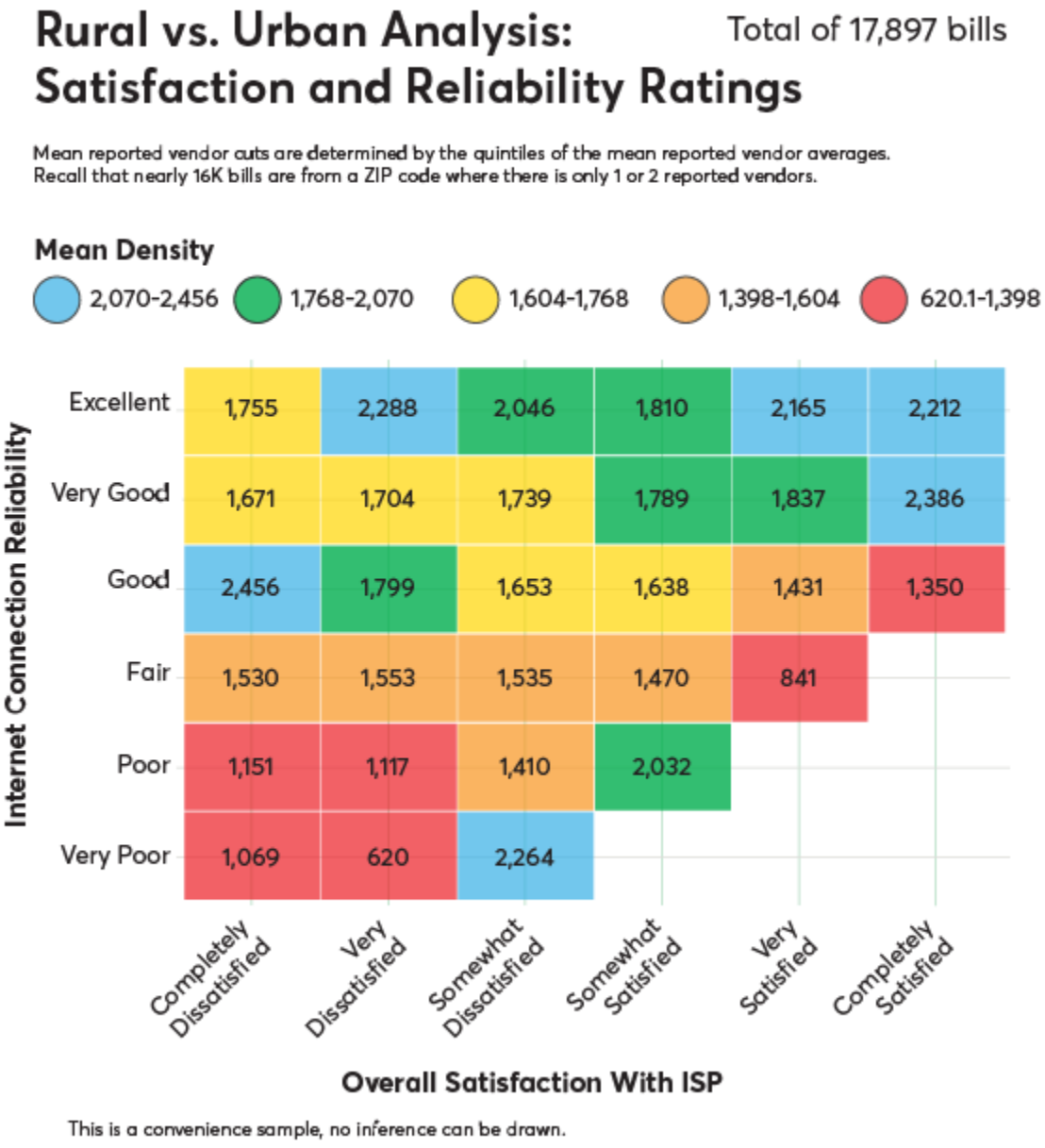
All analyses for resultant reports are completed with the validated ML-classified manually extracted data.

Appendix B: List of Partner Organizations

The following organizations help launch the Fight for Fair Internet campaign in 2021.

American Economic Liberties Project
American Library Association
Amerind
Benton Institute
BroadbandNow
Color of Change
Connect Humanity
Consortium for School Networking (CoSN)
Detroit Community Technology Project
Fair Count
Impremedia
Institute for Local Self-Reliance (ILSR)
Library Futures
MediaJustice
M-Lab
Mozilla Foundation
National Consumers League
National Digital Inclusion Alliance
Open Technology Institute at New America
Next Century Cities
NTEN: The Nonprofit Technology Enterprise Network
Oishei Foundation
Public Knowledge
Public Utility Law Project of New York (PULP)
Rural Assembly (Center for Rural Strategies)
Southern California Tribal Chairman's Association
State EdTech Directors Association (SETDA)
United Church of Christ (Media Justice Ministry)
X-Lab

Appendix C: Comparing Rural vs. Urban Satisfaction and Reliability Ratings



Appendix D: Comparing Satellite Internet Service Providers

Monthly Price for Internet Service

ISP	Mean Price	Median Price
Viasat	$117	$100
Starlink	$99	$99
HughesNet	$88	$70

Monthly Cost of Equipment Fees

ISP	Percent of Bills With Equipment Charge	Mean Price	Median Price
Viasat	87%	$10	$10
HughesNet	61%	$14	$15
Starlink	0%	$0	$0

Note: At the time of this publication, Starlink was charging a one-time $599 equipment charge in lieu of a monthly rental fee. See https://www.starlink.com/ for more information.