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Lessons From the Pandemic: Broadband Policy After COVID-19

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U.S. broadband networks weathered the COVID-19 surge in traffic better than most peer nations. The pandemic should galvanize policymakers to ensure broadband can serve as an essential lifeline for everyone, including low-income and rural residents.

KEY TAKEAWAYS

- Since the onset of COVID-19, home broadband traffic is up by roughly 20 to 40 percent. Thankfully, U.S. broadband networks accommodated this higher demand, in part because U.S. network speeds were already faster than many peer nations.
- We should not change what works. Reliance on facility-based competition and light-touch regulation set the stage for the consistent, above-average private investment that sustained U.S. broadband networks through this crisis.
- That current networks so well accommodated the jump in both download and upload traffic indicates there is no need to over-invest public resources to subsidize ultra-fast networks where broadband infrastructure already exists.
- COVID-19 has exposed shortcomings that competitive networks do not adequately address. This should galvanize policymakers to address serious gaps in rural infrastructure, affordability for low-income users, and at-home access for students.

OVERVIEW

The historic COVID-19 pandemic offers a unique opportunity for policymakers to examine the successes and failures of the nation's broadband system. The stay-at-home orders, business closures, and social distancing necessary to fight coronavirus transmission generated a considerable increase in broadband traffic and a dramatic shift in usage patterns. The jump in demand has seen peak traffic roughly 20 to 30 percent higher than before the pandemic.

Thankfully, the increase in broadband traffic was within the anticipated growth in demand operators could already accommodate. As such, U.S. broadband networks were able to accommodate these changes with virtually no drop in performance. The facilities-based competition model the United States relies on to incent providers to invest in infrastructure passed the COVID-19 network stress test, performing better than Internet infrastructure in many other countries. The dynamic broadband competition in the United States has driven billions of dollars into network capacity that met the surge in demand. The light-touch regulatory approach also allowed for network operators to flexibly adjust interconnection levels to meet new changes in demand.

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Nonetheless, the COVID-19 pandemic also amplified some glaring failures with U.S. broadband policy. A persistent digital divide continues to mean not everyone is connected, whether it be due to a lack of infrastructure in rural, uneconomic areas, or a variety of adoption hurdles throughout the country. This evidence from the pandemic should galvanize policymakers and civil society to shift the conversation toward productive gap filling, rather than continuing the tired old debates around issues such as net neutrality and municipal broadband.

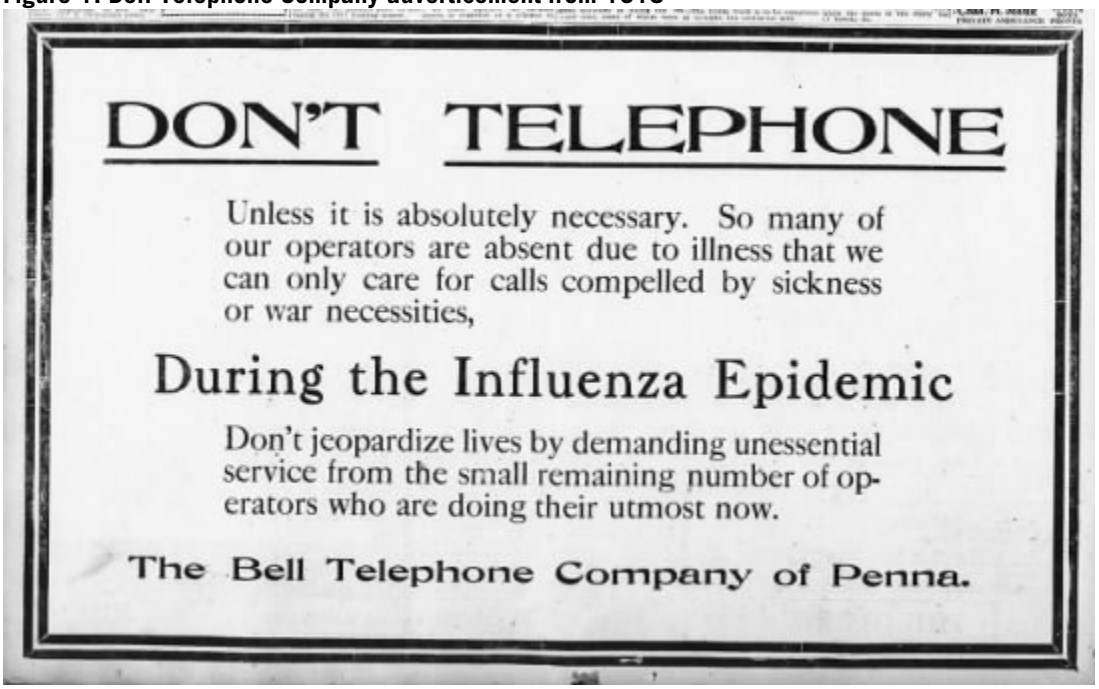
THE GOOD NEWS: U.S. BROADBAND NETWORKS ARE PERFORMING WELL

Thankfully, U.S. broadband networks have performed well through the COVID crisis. Contrary to some ill-founded claims that the Internet was "breaking," broadband infrastructure held up remarkably well considering the broad changes in traffic patterns. Existing end-user speeds handled applications well, and network operators were able to scale up interconnection where needed.

Network Performance

It is not a given that networks perform well in times of social or economic crisis. Take the Spanish flu of 1918 and 1919 for example, when many telephone operators were stricken. To manage, the Bell Telephone company (the nation's predominant telephone provider at the time) ran ads encouraging people not to use the telephone, akin to what some politicians in other nations said to their citizens during COVID: Use the Internet less.

Figure 1: Bell Telephone Company advertisement from 1918[1]



Internet infrastructure as a general matter is well-equipped to handle changes in traffic patterns. The capacity of a given broadband network is not used up over time, rather it is designed to handle any amount of traffic up to a peak load. In pre-pandemic times, the peak the network was engineered to accommodate was typically when most of the population returned home from work or school and might stream a movie after dinner. Whether that same level of streaming traffic is happening throughout the day rather than during the evening hours makes no difference to the links and switches that make up the network.

With most everyone spending much more time at home, the overall use of home broadband is certainly up—by roughly 20 to 40 percent according to most measures.[2] But this increase is still within the peak capacity at any given time. The increases in traffic are largely due to more streaming video—which makes up most of the traffic on the network (over 60 percent)—and large file transfers such as video-game downloads.[3]

Thankfully, decades of sustained investment in infrastructure have resulted in broadband networks that can accommodate higher-than-usual demand for high-bandwidth entertainment. The economic and social dislocation from the pandemic would have been worse if it had occurred before broadband service was so robust. In his 2004 history of the 1918 influenza pandemic, John Barry identified telecommuting as a great tool to slow the spread of disease, but lamented that the "so-called last mile cannot support a significant surge in Internet usage."[4] Today we can say with confidence the last mile can indeed support such a surge.

There was some early concern that broadband networks would not be able to accommodate the increase in traffic or change in patterns without degradation in performance.[5] This turned out not to be the case for many countries, including the United States. Some of the dramatic claims about particular applications seeing a surge of "200 percent" higher network traffic were

misinterpreted by some.[6] Even if voice and telepresence streaming are up considerably, these applications still place relatively little demand on the last mile compared with streaming high-resolution video. Most Zoom streams, for example, are simply a person sitting in front of a static background. Video codecs can efficiently compress that kind of video—there is relatively little information for a talking head. Tripling the number of video conferences is no problem for most networks.

But there has indeed been a significant jump in the overall amount of traffic flowing over last-mile networks. More people are spending more time online, both for work and for pleasure. NCTA—the trade association for the cable industry—reported that peak downstream traffic on cable networks was up 9.1 percent between March 1 and May 30.[7] The peak of upstream data has grown more, albeit from a much lower base: an increase of 26.2 percent in the same time period.[8] USTelecom members saw a mean broadband traffic increase of about 13 percent over pre-COVID levels.[9] Similarly, CTIA, the wireless trade association, noted that wireless traffic increased by about 20 percent, and voice traffic by over 24 percent.[10]

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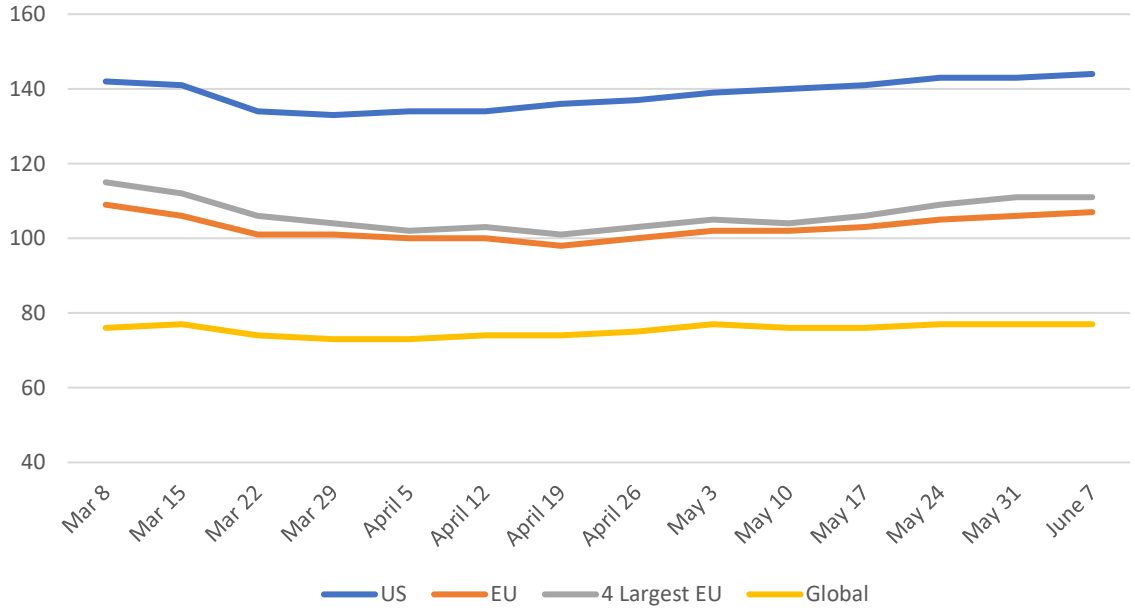
Initial concerns this jump in traffic would result in performance degradation did not pan out, at least in the United States. In fact, one empirical examination of Ookla Speedtest data by Anna-Maria Kovacs of the Georgetown Center for Business and Public Policy concluded, "U.S. networks generally outperformed their peers."[11] Ookla Speedtest data comes from self-generated tests, so there is likely some sampling bias, as users are more likely to measure their connection speed if something appears to be wrong. At least the methodology is consistent across countries, and any bias should generally trend in the same direction for all countries.

The United States, like most other countries, saw a slight dip in overall speeds of tests performed on Ookla's platform, but, as Kovacs pointed out, both the average of EU countries (weighted by number of subscriptions) and the weighted average of the four largest EU countries (Germany, France, Italy, and Spain) saw a deeper descent and more gradual recovery compared with the United States. U.S. speeds were much faster—even after the dip—than both speeds in other nations and the global average.

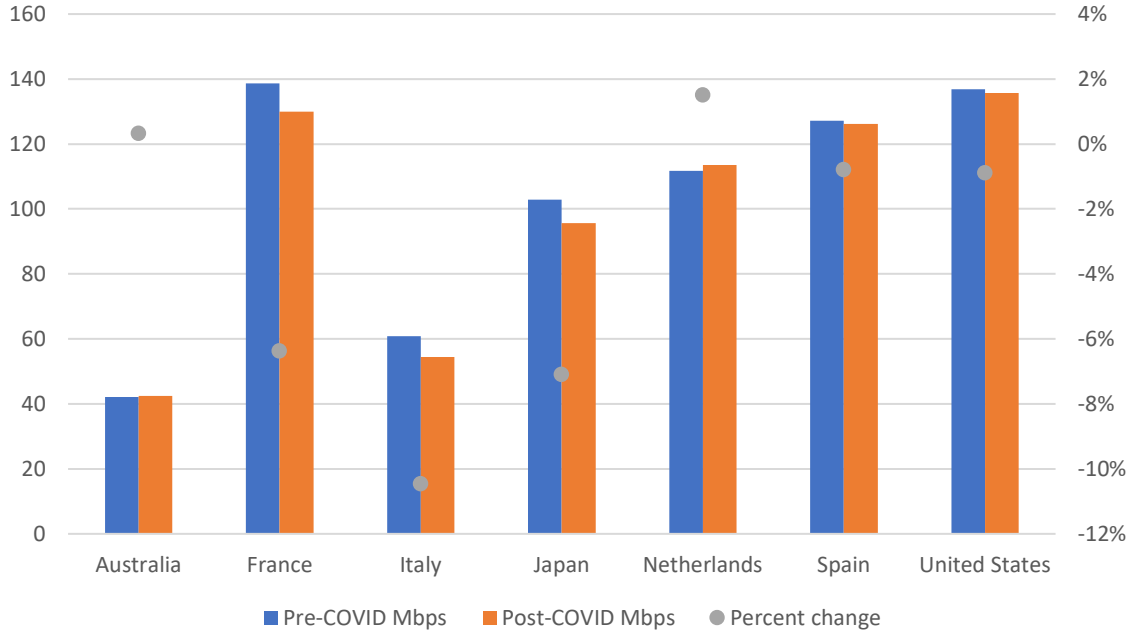
Another empirical examination of similar Ookla Speedtest data (though with a different time period) reveals that most developed countries with advanced broadband infrastructure were able to weather this crisis fairly well.[12] The author noted that poor countries with limited investment in broadband infrastructure, or those that rely on legacy copper-based DSL networks, struggled to keep up with the jump in traffic. The United States saw only a modest decrease in tested speeds, whereas some peer countries, such as Italy and France saw a larger dip.

Figure 2: Fixed broadband network speeds weighted average, Mbps[13]



As was widely reported, some countries in the European Union faced more difficulty accommodating the fluctuation in traffic, leading European Commissioner Thierry Breton to call on Netflix and YouTube to reduce the default video resolution for EU streams.[14] Similarly, the CEO of Telstra, an Australian provider, urged users to download movies overnight, during off-peak usage times, or for families with multiple children to try not to "all use the Internet all at the same time."[15] Because speeds and network capacity were significantly higher in the United States, such rationing steps were not necessary for U.S. broadband users.

Figure 3: COVID-19 impact on fixed download speed, select countries[16]



The Ookla Speedtest data shows about a 1 percent drop in U.S. broadband speeds compared with before the stay-at-home orders. This change is roughly in line with data from the Internet measurement firm SamKnows.[17] There are a wide variety of problems that could lead to a decrease in end-user speeds. Some of these are within the control of Internet service providers (ISPs), some are not. Often the culprit behind poor home Internet performance is the Wi-Fi network, but given the widespread growth in traffic, the small drop in tested speeds was likely due to congestion at some bottleneck in the network.

What would be concerning is if there had been persistent congestion deep within the network. Interconnection capacity—further up the Internet chain, where the large-area networks are connected either directly or through long-haul transit providers—has seen growth of about 20 to 30 percent since the onset of the pandemic, consistent with general trends in local traffic increases.[18] Here again, it appears the United States fared better than some of its peer countries.

An Organization for Economic Cooperation and Development (OECD) report notes some countries' struggles with COVID-related traffic increases were due to particular peering arrangements that were difficult to change on the fly. Actors in countries such as the Netherlands, Brazil, and Germany that host particularly large international Internet exchange points had a larger task in augmenting capacity to cope with the considerable growth in global traffic.[19] Countries with a lack of direct interconnection among large peer access and content networks, such as Canada, faced some difficulty.[20] Although there is not a lot of data available on interconnection practices, according to one survey, U.S. peering link capacity reached an average of only 56 to 74 percent capacity during COVID.[21]

Many developed countries with advanced broadband infrastructure were able to handle the traffic increase with little to no impact on performance—a testament to the resiliency of Internet Protocol-based communications. But the United States was able to adjust to the rapid increase in traffic better than many of its peer countries.

Not All Speed Tests Are Equal

Some advocates still claimed that there was something deeply wrong with broadband performance during COVID, despite the overwhelming evidence to the contrary. Penn State affiliate professor Sascha Meinrath claimed that "increased home [I]nternet use is killing our connection speeds across the country."[22] For those unfamiliar, Meinrath has been at this for some time, long attempting to extrapolate unfounded conclusions from broadband data in an argument for a shift away from broadband provided through private networks engaged in facilities-based competition.

Meinrath's argument was odd: He counted the number of states that saw a decline, however slight, and took it as evidence the Internet was "breaking." Virtually every country saw a slight decline in measured speeds—the handful of U.S. states Meinrath pointed to are not unique here. The temporary decline in performance for most states was in the single-digit percentage range, which would be literally imperceptible to users, especially given the already high U.S. speed.

What is more, there are also problems with the methodology of the measurement tool Meinrath relied on: M-Lab's Network Diagnostic Tool (NDT). M-Lab is not a reliable measure of network speed. Without getting too deep into the technical weeds, the M-Lab measurement uses a single TCP connection, which cannot reliably saturate an entire ISP access link. As University of

Chicago professor Nick Feamster pointed out, "We've known for a decade that NDT can't even saturate a DSL link, let alone today's networks. The method doesn't even reflect what today's apps do."[23] Most applications and web pages will open several TCP connections simultaneously.

Other respected researchers at MIT have noted explicitly that, given this methodology of M-Lab's NDT measurements, it would be inappropriate to take this data as representing simple averages of upload or download speed of different populations.[24] In the M-Lab dataset the MIT academics examined, almost 40 percent of the tests never used all of the available network capacity.[25] The researchers did praise the test for the large amount of data it makes publicly available, and its ability to identify potential performance bottlenecks—but it cannot do the work Meinrath wants here.[26]

There is absolutely no evidence that the pandemic is "breaking the Internet." Just the opposite—U.S. networks have handled this crisis remarkably well.

The website Broadband Now also relies on this NDT test to make flawed extrapolations. But even there, analyst Tyler Cooper noted that the United States was the only large country that recorded no degradation in download speed in April.[27] Other measurement platforms are designed to estimate ISP speeds more reliably. For example, speed tests performed by SamKnows run over 16 parallel TCP connections to measure the full capacity of the link more accurately.[28] This way, if an individual TCP session drops packets for whatever reason, another can pick up the available capacity. SamKnows's study of U.S. broadband performance during COVID concludes that "broadband infrastructure in the U.S. is holding up generally very well given the dramatic increase in [I]nternet usage. Whilst most states are seeing some declines in performance, these are very modest."[29]

Meinrath is correct that the ongoing COVID-19 crisis is revealing a lot of true gaps in broadband policy that deserve attention. We need policy tools in place to ensure students have the devices and connections they need to study from home. We need a more robust subsidy program for low-income broadband users that can swell with crises like this one. But there is absolutely no evidence that "the coronavirus pandemic is breaking the [I]nternet." Just the opposite—U.S. networks have handled this crisis remarkably well.

Existing Speeds Handle Current Applications Well

Broadband policy has long been concerned with the download and upload speeds a nation's ISPs can achieve. In the past, the centrality of this issue made more sense, as available download speed was a limiting factor in the functionality of many potential applications. Today, that is rarely the case. The need for broadband speed has largely tracked the demand for streaming video—today the average broadband home can support multiple simultaneous ultra-high definition streams.

There is a real cost trade-off for the infrastructure needed to provide a given speed target. While fiber technology is able to achieve high speeds, it is expensive to install and does not have the existing, widespread deployments like the infrastructure originally built for cable television or the copper wiring deployed for telephone service. These networks—cable and copper—have some limitations. The last portion of the cable plant, for example, is shared, and DSL throughput over copper drops off quickly with distance. Both of these networks are continuously investing and

pushing high-capacity fiber deeper into the network at a pace balanced to both meet demand and recoup the investment.

Largely due to the writings of Harvard Law professor Susan Crawford, there is a pervasive myth in broadband policy that it is imperative the nation transitions to all-fiber gigabit. In fact, the speeds required to meaningfully participate in online activity are quite low, and the benefits of super-high speeds for average users are relatively marginal. For example, Zoom video recommend 2 Mbps up and down stream.[30] Google recommends a connection of 1 Mbps up and down for a low-definition video call, and 2.6 Mbps down and 3.2 Mbps up for high definition.[31] This compared with the 1,000 Mbps advocates claim is necessary. Yes, more fiber is better, and the gradual transition to fiber—especially the replacement of the legacy copper network—is a good thing and should not be discouraged. But the benefits of all-fiber broadband do not justify the significant intervention at large cost some advocates have called for.

The COVID-19 crisis also informs the debate around the need for symmetrical speeds. Symmetry in broadband policy refers to upload and download performance achieving the same speeds. Infrastructure such as cable or different versions of DSL allocate a larger share of the overall capacity to downloads than to uploads because most residential traffic is in the form of downloads. Popular streaming applications now support 4K video, but most users generally don't live-stream in 4K. And again, most telepresence use is also easily compressed to a very small file size when the video image is relatively static.

Fiber broadband, on the other hand, can more easily achieve high throughput for both the downstream and upstream. For example, the current working definition of broadband at the Federal Communications Commission (FCC) is 25 Mbps in the download, but only 3 Mbps upload.

For years, advocates have claimed that a future of live video uploads and the "sharing economy" would justify massive government investment in fiber infrastructure for significantly greater upload speeds. An unprecedented shift to teleworking saw more growth in the upstream direction than downstream over the past months. Since March, cable networks have seen a roughly 24 percent increase in upload traffic, compared with less than 10 percent growth in the downstream traffic.[32] However, the current actual use of broadband networks is still wildly asymmetric—we download far more than we upload.[33] There is no need for network symmetry given the actual use of the network, even during these days of dramatically increased video conferencing placing unusual demand on access network uploads.

However, the FCC's standard of 25 down and 3 Mbps up would more likely be saturated in the upstream direction than downstream, if a family were attempting multiple high-definition video calls at the same time. The FCC should consider revising its expectations for Universal Service Fund (USF) support—a modest increase from 3 Mbps would better ensure covered households could support concurrent video calls. But in no circumstance should subsidies be reserved for only symmetrical gigabit networks.

As of yet, there are no popular consumer applications that benefit from significantly higher download, much less upload, throughput than what is widely available. This is despite years of widespread gigabit network deployments around the world and well-funded efforts to spur such demand.[34] It appears the only primary advantage of gigabit networks is to reduce the time for

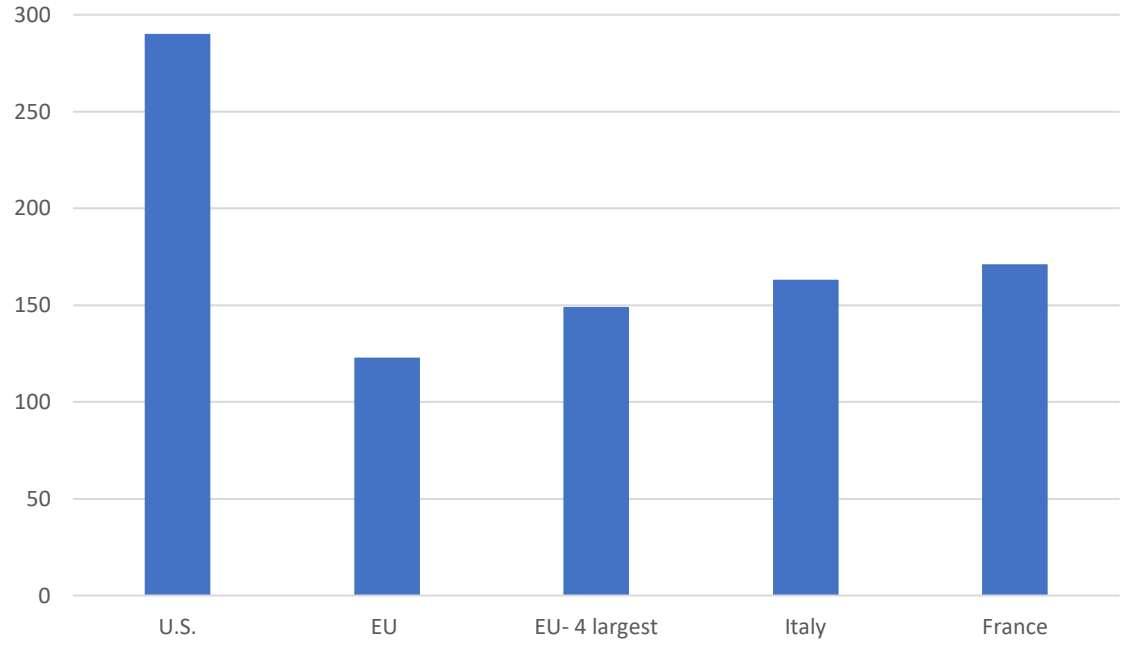
very large file transfers—basically serving human impatience.[35] One day, holograms or 360 degree video may push the need for faster networks, but most of the population already has access to broadband speeds adequate for the foreseeable future. This fact is reflected in demand: Willingness to pay for higher-speed broadband drops off sharply after 50 Mbps.[36] Note, this is different from ability to pay: Low-income Americans may find it difficult to justify the expense of a broadband subscription or a device to make use of it, despite the benefits of broadband access to the user and to society overall.

We Should Not Change What Works Well

The empirical evidence is clear: Countries with either investment-friendly policies, such as reliance on facilities-based competition (e.g., the United States), or countries with massive subsidies (e.g., Sweden's socialized networks), adapted quickly to the increased traffic. Countries either with limited capital or that generally focus on artificial service-based competition through mandated network sharing of DSL-based infrastructure did not do as well.

During COVID, nations such as Canada, S. Korea, the Netherlands, and the United States were able to rely on competition and light-touch regulation because they had a legacy of dual networks (cable and telephone) that could effectively compete against one another in serving broadband Internet access. Competition is one reason the broadband industry has consistently been one of the largest capital investors in the United States. This capital intensity has also grown at above-average rates: The Progressive Policy Institute put the communications and broadband sector as the top industry, with 138 percent growth in capital intensity between 2007 and 2017.[37] In 2018, U.S. broadband providers invested more than double the EU average on a per capita basis, largely because the EU sought intra-model competition on existing incumbent carrier telephone networks, which discouraged new investment.

Figure 4: Telecommunications investment per capita in 2018 (U.S. dollars)[38]



There are multiple reasons that contribute to the United States having such a high level of broadband investment. It is, of course, a relatively rich country with a high gross domestic product (GDP) per capita. It also has a higher cost structure than most countries for providing telecommunications infrastructure. It has widely dispersed rural populations, and with the popularity of detached single-family homes, its cities and suburbs are much less dense than most other countries, requiring more "wire" per customer than most other more urbanized nations.

But the policies that support a framework of facilities-based, dynamic competition are a major factor in generating this level of investment. COVID-19 exposed the risks of the shared infrastructure model more common in the European Union. Even if it is unlikely the United States will go in the direction of service competition over shared infrastructure or mandated wholesaling, the perpetual debate around the legal framework to potentially enact net neutrality rules adds to uncertainty that could undermine investment. Title II of the Communications Act would represent a major step in that direction, potentially risking the continued investment that contributed to resilient networks under COVID-related traffic. This of course does not mean the right kind of net neutrality regulation passed by Congress would not be useful.[39]

A regulatory environment that promotes flexibility and market transactions has been an advantage in quickly adjusting needed interconnection capacity in response to changing traffic patterns.

There is also evidence that flexibility around interconnection was crucial to cope with the jump in demand during COVID-19. Policies that would put rigid requirements around peering practices, such as those contemplated under FCC Chairman Wheeler's oversight, may have risked a worse outcome. A regulatory environment that promotes flexibility and market transactions has been advantageous in quickly adjusting needed interconnection capacity in response to changing traffic patterns.

With the increased importance of broadband to navigating daily life under the pandemic's physical distancing, the risks of bad broadband policy are high. Imperiling world-leading levels of investment for the sake of net neutrality rules that could easily be established through a non-utility framework would be a mistake. Moving away from dynamic competition to serve the vast majority of the broadband-using population would increase the chance for bandwidth rationing such as that required during the pandemic in other countries.

Some commentators have argued that COVID has made broadband more important than ever, and therefore it is time to treat it like a utility. The Center for Democracy and Technology posed the question: "In the middle of COVID-19, can we all agree now that Internet access is a necessity?"[40] The group went on to argue that we need to change our perspective on the "status of [I]nernet access—from luxury to essential utility."[41] Certainly, we can agree that Internet access is a necessity, but it is a huge logical leap to then call for a utility service. Whether something is a luxury or essential is a separate question from how society should produce a good. Assuming that because a good or service is essential it should be provided as a utility can lead to poor results. For example, roads are publicly provisioned in most cities, yet in most places they perform abysmally, as the Texas Transportation Institute's congestion reports sadly highlight every year.[42]

Others argue the pandemic justifying steps in the direction of utility provision. For example, Harold Feld, senior vice president at Public Knowledge, sees the need for subsidies to keep low-income users online as a justification for price regulation under Title II. As he put it, "[S]ometimes even conservatives can recognize when price controls are necessary, like preventing people from getting kicked off an essential service during a pandemic."[43] Harold was right that mechanisms should be in place to prevent people from being kicked off broadband during a pandemic (something most broadband providers committed to), but Title II would be the wrong approach to achieving such protection. Invoking the full panoply of utility regulations available under Title II would risk losing the consistent investment that ensured the networks were able to weather COVID able as well as they did.[44]

We generally consider food and shelter essential, but those goods are provided through market mechanisms, with a social safety net to help those who cannot afford necessities—a system that works well, even if the safety net could be strengthened. Likewise, market-based provision of broadband infrastructure has been a success. Absolutely, the safety net to ensure everyone can obtain affordable, robust broadband access can and should be improved. But we would do well to set aside the Title II trench warfare and turn our attention to fixing the gaps competition does not address, especially if we want to do more than posture, and find solutions that work across the political aisle.

THE BAD NEWS: CHALLENGES AROUND ACCESS, ADOPTION, AND USE REMAIN

The remarkable resiliency of U.S. broadband networks during the pandemic should give us confidence that the basic regulatory framework is sound. But much work remains to be done to fill in the gaps such a system does not address. In some parts of the country, broadband infrastructure is still lacking. There are also many Americans who struggle to afford broadband subscriptions and devices, and therefore cannot access all of its benefits. Some schoolchildren, who come fall may still be expected to engage in some or all coursework online, do not have easy access to a computer in the home. And even when people can get online, many services continue to struggle with the transition to an all-digital lifestyle.

Rural Infrastructure Is Still Lacking

The pandemic has greatly amplified the importance of having either a home or mobile broadband connection—ideally both. However, the economics of widely dispersed populations in rural areas mean large parts of America do not have very robust broadband service. It simply costs more to provide broadband in these places than providers can earn back. According to the best data available today, over a quarter of rural Americans do not have access to broadband with speeds of at least 25 Mbps download and 3 Mbps upload.[45]

How to close the rural-urban broadband availability gap has been a central policy concern for years. Hopefully, this pandemic can serve as catalyst to transition from discussion to action. Congress should fund a one-time, large-scale injection of capital for broadband infrastructure in areas of the country in which it is too costly for private providers to serve. This program should provide the up-front capital to see a major upgrade to rural broadband performance, facilitating a transition away from costly recurring annual support that does not incentivize continued improvements. Ideally, this will be a new, unique deployment fund doing away with the red tape of today's Rural Utility Service or Universal Service Fund that inhibits broad participation by large operators with better economies of scale. Money should be allocated through a technology-

neutral reverse auction, with a focus on achieving reasonable speeds in unserved areas, as determined by a robust mapping and challenge process. To ensure there is enough funding to help most places, only one provider per area should be funded.

There are always up-front judgment calls on what level of funding is necessary to achieve a certain type of broadband performance in a given area, but an auction mechanism can quickly make those difficult decisions.[46] Because remote work, particularly video conferencing, can require higher upload speeds than normal, any program should ensure adequate upload as well as download capacity. But given the experience of COVID-19 highlighting that even modest speeds can allow for robust participation in society, there is little reason to require gold-plated fiber-to-the-home networks up front. For areas seeing new broadband deployments, an all-fiber network will often make sense, but closing the rural digital divide will require a flexible approach—in some areas, a fiber-to-the-node upgrade might be the most cost effective. Elsewhere, difficult terrain may mean a fixed wireless link for the last half mile may be the right approach. Congress should not overpay for fiber when the benefits are slight and other access technologies may be better suited to a particular situation. Finally, new low-Earth orbit satellite-based broadband should be available soon, and policymakers, including the FCC, should recognize that for many places this may well provide an acceptable and affordable competitive alternative, especially when compared with the cost of stringing fiber.

Affordability Remains a Barrier for Some

Despite the increased importance of broadband during the COVID pandemic, many still have not adopted a fixed broadband network in their home. This is for a variety of reasons, but usually stems from a combination of affordability, lack of perceived relevance, and the option for close substitutes such as mobile broadband through smartphones.

The United States has relatively affordable broadband. This has been well recognized by the International Telecommunications Union, which consistently ranks the United States as one of the most affordable nations for entry-level broadband.[47] This is because of the relatively strong price discrimination of U.S. broadband, whereby low-end slower broadband is cheap, while high-end faster options are relatively more expensive. This affordability of broadband was also recognized by a study by the Economist Intelligence Unit commissioned by Facebook.[48] That study has for two years running ranked the United States first in the world for broadband affordability, a "result of competitive mobile and broadband markets and relatively low fixed broadband and smartphone costs."[49] Additionally, several U.S. broadband operators offer specialized low-cost products tailored to qualifying low-income users, such as Comcast's Internet Essentials and Charter's Spectrum Internet Assist.

However, despite broadband being relatively affordable, some Americans still struggle to pay for it.[50] One reason is the United States has among the highest rates of poverty of any developed nation. As such, the federal government must ensure everyone who wants a broadband connection is able to afford one.

Broadband adoption and affordability are not distributed evenly across demographics. Compared with the 21 percent of white adults who go without broadband in the home, 34 percent of black adults, 39 percent of Latino adults, and 47 percent of those on tribal lands lack a connection.[51] When it comes to affordability, 36 percent of black Americans and 54 percent of Hispanic Americans worry about paying their broadband bills, compared with 21 percent of white

Americans.[52] The centrality of broadband to participation in society during the COVID crisis has highlighted the importance of adoption and affordability as a critical social issue. As put by a group of civil rights leaders and FCC Commissioner Geoffrey Starks in a recent op-ed, broadband is treated as a civil right that "we can't afford to lose but many can't afford to have."[53]

With a longer time horizon in mind, Congress should work to reform the FCC's Lifeline program to expand and improve subsidized broadband options for low-income users, including allowing households to have two connections (e.g., one mobile and one fixed broadband), something that is now expected by middle- and upper-income households. Ideally, any additional relief package would include general fund support for such an expansion, and would be designed for broad participation by operators, not restricted to only designated Eligible Telecommunications Carriers.[54]

There is an urgent, short-term need for a subsidy to help Americans pay their broadband bills.

The Lifeline program (or its successor) should also be modified to incorporate automatic stabilizers.[55] The Lifeline program should always be there to help the neediest Americans; it can also play an important counter-cyclical role. This is one reason efforts to place an unduly restrictive cap on the program are misguided. When the economy turns sour, Lifeline support should be available to help a greater number of people stay online so they can find new job opportunities, retrain to change careers, or even just get information they need to navigate a challenging time.

Ideally, Lifeline would have been able to swell during COVID, both in the level of support and eligibility, to ensure everyone could afford to be online. Instead of risking a partisan debate over the exact scope of a policy response, or disagreement over what is legally permissible under a vague statute in the midst of a crises, these decisions should be made up front. For example, perhaps if the unemployment rate in a particular labor market area were to exceed 7 percent, Lifeline would automatically expand to a larger subsidy and broader eligibility.

There is also a more urgent, short-term need for a subsidy that helps Americans pay their broadband bills. FCC Chairman Pai has called for such a subsidy, "I believe now is the time for legislation to ensure that… all Americans—remain connected until this emergency ends."[56] Under the chairman's "Keep Americans Connected Pledge," 785 broadband providers have committed to not disconnecting consumers when they are unable to pay. The pledge has been a successful public-private endeavor to ease the burden on struggling Americans, but the longer the crisis goes on, the less tenable this arrangement becomes. Even if these companies were worker-owned co-ops that donated all "profits" to good causes, eventually even they would need to collect revenue. As such, Congress should step in to help consumers pay these broadband bills directly rather than rely on extended payment plans. Deferred bills are often no more easily paid after a crisis, with many Americans being unemployed throughout.

Some Students Lack Broadband

The need for widespread physical distancing as schools throughout the nation closed highlights a key challenge: Many students lack broadband and device access at home. Roughly 1 in 5 teens report having trouble completing online homework because of a lack of connection or device.[57] About 40 percent of teachers report that many of their students do not have a computer or the

necessary access to do their homework.[58] As a result, in a time of physical distancing, many schools are faced with a Hobson's choice: either continue teaching with remote technology tools, realizing some kids will be left behind, or stop teaching altogether.

Most households with school-aged children have broadband available to them, but some lack the resources to subscribe or purchase computers. Congress should support, through general funds, a program whereby schools are able to purchase computing devices (either laptops or tablets, depending on the age of the children) for all students qualifying for free or reduced-cost lunch programs. These devices could be loaned out to students during the school year to enable them to do homework, and during times of school closure due to national emergencies such as the coronavirus to engage in home schooling. At the same time, tools within the FCC's E-Rate program could be expanded to reimburse schools for Wi-Fi hotspots or wired broadband installation kits to provide connectivity for students in their homes.[59] The FCC arguably has the authority to do this today, but Congress should clarify and put the funding source on surer footing.

The broad COVID-19 recovery bill passed by the House, the HEROES Act, would take several steps toward addressing some of these problems.[60] The bill would appropriate $5.5 billion to address the digital divide during the pandemic through a variety of mechanisms. It would expand the FCC's E-Rate program, allowing schools and libraries to purchase connectivity devices for our school-aged children who do not have access at home. The legislation would also provide a subsidy of up to $50 per month toward broadband subscriptions, and up to $100 for connected devices for low-income families and the surge of 40 million newly unemployed people.

Many Important Services Still Struggle in an Online-Only Environment

There would be tremendous spillover benefits if society were able to be organized under the assumption everyone has an Internet connection. But ensuring everyone has access to broadband is only a threshold in transitioning to an economy that not only uses digital tools just to be more resilient in the face of infectious diseases, but is also more productive overall. The COVID pandemic has pushed us in this direction, often requiring some sort of connection to participate in all sorts of basic services (e.g., even ordering take-out at a restaurant requires one to pay online).

However, considerable friction remains in the ability of health, education, and other providers to deliver services primarily over broadband. This is even more problematic in times of crisis, as we saw with the poor performance of most state unemployment insurance websites during the pandemic. Digital-first enrollment for government services could also stand to be improved. More than half of U.S. state government unemployment websites have crashed in recent weeks due to surges in applications, and over 80 percent of state government unemployment websites fail at least one basic test for mobile page load speed, mobile friendliness, or accessibility.[61]

COVID-19 is a cautionary tale highlighting the need to strengthen our public health-care system. But it should also be a warning to strengthen and make more resilient a variety of sectors through better use of technology to both enable more productive physical distancing and increase productivity and flexibility of key productive systems. Investments in technology and digital transformation would have the added benefit of boosting U.S. gross domestic product through better and more-efficient education, health care, manufacturing, transportation, and more, while making the economy and society more resilient should we face another similar crisis.

CONCLUSION

This crisis is an opportunity to galvanize policymakers to action. An honest examination of the evidence shows the basic framework of broadband infrastructure is working well to drive investment in high-performing Internet infrastructure. Rather than turning away from what works, policymakers should preserve the investment-friendly regulatory framework and then work to address the remaining weak spots in broadband. A significant capital investment to bring robust broadband to unserved rural areas, an improved Lifeline program to ensure broadband affordability, and capital infusions to bring government services into the 21st century would go a long way toward achieving a more just and effective broadband network for all Americans.

About the Author

Doug Brake directs the Information Technology and Innovation Foundation's work on broadband and spectrum policy. He writes extensively and speaks frequently to lawmakers, the news media, and other influential audiences on topics such as next-generation wireless, rural broadband infrastructure, and network neutrality.

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The Information Technology and Innovation Foundation (ITIF) is a nonprofit, nonpartisan research and educational institute focusing on the intersection of technological innovation and public policy. Recognized as the world's leading science and technology think tank, ITIF's mission is to formulate and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress.

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