



Why We Need Net Neutrality Legislation, and What It Should Look Like

BY DOUG BRAKE | MAY 2018

Instead of relying on near-impossible mechanisms to restore deeply flawed rules, policymakers should be negotiating in earnest to settle the net neutrality debate, ultimately making both political parties, and more importantly, U.S. citizens and businesses, much better off.

A key reason for the contentious fight over net neutrality regulation, and the source of its partisan strife, is that the way we classify broadband Internet access for legal purposes could have weighty long-term implications: Do we want a broadband system more like a public utility under Title II of the Communications Act, or do we want to rely on private companies to drive the evolution of broadband, with relatively light oversight from the Federal Trade Commission (FTC)? But this is a false dilemma predicated on outdated law, and it has resulted in a ping-ponging of broadband regulations. Congress can and should act to end this “long national nightmare” that is the net neutrality war. There is ample room for a bipartisan compromise on net neutrality that would not only lock in noncontroversial ex ante protections and finally end the absurd back-and-forth on Federal Communications Commission (FCC) jurisdiction, but also secure funding to help close the digital divide with programs that promote digital literacy and broadband adoption—while also accelerating deployment in rural areas.

With the *Restoring Internet Freedom Order* having hit the Federal Register, broadband Internet access will once again be considered an “information service” under the law—just as it was from 1998 to 2016.¹ With it comes a host of implications, the most important of which is the FCC in effect deciding Congress has not given it the authority to act as the

primary regulator of broadband—while in the same process repealing the 2016 net neutrality rules grounded in common carriage.

A subset of net neutrality stalwarts has worked hard to tie its preferred legal authority over implementing net neutrality—Title II of the Communications Act—to net neutrality rules themselves. This notion of Title II being necessary to achieve “real” net neutrality is fiction, especially when it comes to legislation. Congress can craft FCC authority as narrow or broad as it sees fit. Same goes for net neutrality proper: Congress can create its own specific regime, or leave it to the FCC to develop specific rules.

Net neutrality litigation to date has focused, with minor exception, on statutory interpretation of the FCC’s authority to create particular kinds of rules, and are not limited by constitutional concerns.² Congress is free to address both the question of authority and the substance of those rules, free from the constraints of the old FCC Title I and Title II silos—silos designed during and for an era of fax machines, circuit-switched telephony, and CompuServe email.

A Congressional Resolution of Disapproval (under the Congressional Review Act, or CRA) to stop the FCC is highly unlikely to prove fruitful. It instead serves primarily as a political messaging tool for Democrats. It also makes little sense to wait for the various legal challenges to wind their way through the courts. The Supreme Court and the D.C. Circuit Court of Appeals have made it clear that the statute is ambiguous and the FCC has broad authority to interpret it as it wishes—it is highly unlikely an appeal of the *Restoring Internet Freedom Order* will see Title II regulations restored. As such, the only real hope advocates of Title II-grounded net neutrality rules have is a Democrat in the White House in 2021—and presumably in perpetuity after that if they want to avoid a repeat of the 2017 repeal.

Instead of relying on near-impossible mechanisms (or risky political bets) to restore deeply flawed rules, policymakers should be negotiating in earnest to end the debate on net neutrality, and in the process make serious advances to close the digital divide—ultimately making both political parties and, more importantly, U.S. residents and businesses, much better off.

The deal proposed here is relatively simple: Instead of focusing narrowly on net neutrality issues, expand the scope of legislation to include funding for broadband adoption and digital-literacy programs, while at the same time establishing baseline rules to protect and promote the open Internet.

Harvard Law scholars Roger Fisher and William Ury are famous for the principled negotiation strategy they encapsulated in their bestseller *Getting to Yes*. One of the key principles they espouse for successful win-win negotiations is inventing options for mutual gain—expanding the number of bargaining chips available to find opportunities where one side benefits while the other gives up little.

This “Negotiation 101” principle means legislation to solve glaring deficiencies in the Communications Act should not be narrowly focused on issues where there is significant

daylight between the two political parties—namely paid prioritization and the scope of FCC authority. Instead, other policy objectives that broaden the potential benefits for either side should be explored.

Broadband Framework Options	2016 Open Internet Order	2018 <i>Restoring Internet Freedom Order</i>	ITIF Proposal
Description of Framework	“Title II for the 21st Century”; common carrier regulation of broadband providers	FCC reverts to Title I for broadband markets, leaving oversight to the FTC	Compromise, uniting appropriate jurisdiction for open Internet rules with broadband adoption and rural deployment funding
Impact on Investment	Likely a drag on investment	Likely a modest improvement in network investment environment, but with long-term uncertainty remaining	Predictable, light-touch rules and increased broadband users will encourage infrastructure investment
Impact on Internet Openness	Attempt to protect was short-lived	Likely none	Locks in jurisdiction to protect and promote
Impact on Innovation	Chills network innovation	Promotes innovative traffic differentiation, but uncertainty may chill innovation at application layer	Stable clarity for innovation in both networks and applications
Immediate Impact on Individuals	None	None	Greatly expanded programs for digital literacy and broadband adoption

A BIPARTISAN COMPROMISE ENDING THE NET NEUTRALITY DEBATE IS IN EVERYONE’S BEST INTEREST (EXCEPT TITLE II ZEALOTS)

Despite all the noisy wrangling over net neutrality, there is real opportunity for this embarrassing ping-ponging about the scope of FCC authority over broadband to result in a true bipartisan achievement for both parties.

Democrats

Those left of center often argue that the relatively concentrated market for broadband Internet access, combined with the existing communications and media on offer, give providers the incentive and ability to restrict output in ways that harm consumers or competition. More specifically, Democrats on the Hill have taken issue with the FCC recently putting the FTC in charge of overseeing net neutrality issues, and have been

“Negotiation 101” would dictate that to solve the glaring deficiencies in the Communications Act, legislators should seek other policy objectives, aside from net neutrality, that broaden the potential benefits for either side.

attempting to roll back the FCC’s *Restoring Internet Freedom Order* through an obscure legislative mechanism known as the Congressional Review Act—an attempt even net neutrality advocates acknowledge is a long shot.

In a push to gain a key additional vote, Senate Democrats adopted the messaging of some of the more hardline advocates, proclaiming Internet users’ favorite websites would become noticeably “slower” unless the 2015 net neutrality rules were restored. But if this were true, why then did the ISPs not “slow down” traffic at any point during the previous years when Title II rules did not apply to broadband? The Democrat’s assertion saw Salvador Rizzo award them “three Pinocchios” in his “The Fact Checker” column at *The Washington Post*.³ And Rizzo is right: Net neutrality fears are often overstated, and the examples of unfair conduct advocates rely on are not only vastly exaggerated, but few and far between.

If Democrats really believe in these apocalyptic scenarios, they should attempt to craft a legislative solution that ties the hands of the current and future administrations. A new law would effectively lock in permanent net neutrality protections that are stronger than those that exist now. They could also secure support for bridging the digital divide—a far more concrete and serious problem than the theoretical fears of net neutrality harms.

Democrats have also advanced a specific plan under the LIFT (Leading Infrastructure for Tomorrow’s) America Act to improve broadband infrastructure.⁴ Arguing, “America needs a Roosevelt Plan to bring [I]nternet to every farm, school, and neighborhood,” Democrats from the House and Senate have called for \$40 billion in direct federal funding for high-speed broadband infrastructure.⁵ The Trump administration’s recent infrastructure plan rightly received cool support from Democrats when it came to broadband funding.⁶ The block-grant, state-led proposal would likely see broadband funding lost in the cracks. As Blair Levin argued in a Brookings blog post, “The proposed approach will end up delivering little of the abundant bandwidth the country’s rural areas need to thrive in the digital age.”⁷ Democrats should demand a bipartisan net neutrality legislation that includes funding for an effective acceleration of rural broadband.

Beyond rural network availability, the digital divide continues to be a serious issue facing the country. While the focus of the last several months has been on infrastructure availability in rural areas, urban subscription rates remain unevenly distributed. Brookings Institute research examining broadband adoption at the neighborhood level across a number of metropolitan areas found that “geography and income levels are the two greatest drivers of broadband subscription gaps, perpetuating the digital divide in even the most connected metro areas.”⁸ While the digital divide has been a key focus for Democrats, it does not receive nearly the same level of attention as net neutrality, resulting in an unfortunate misalignment of policy.

The Obama administration attempted to address broadband adoption and digital literacy through a number of programs. The Obama Council of Economic Advisors seriously examined the digital divide, with research that could continue to guide policy efforts.⁹ This

research, consistent with many other studies, found “substantial disparities in both Internet use ... concentrated among older, less-educated, and less-affluent populations.”¹⁰

The Obama administration also made efforts to help address the digital divide through the ConnectHome initiative, which sought to bring together ISPs, nonprofits, and other private-sector actors to “offer broadband access, technical training, digital literacy programs, and devices for residents in assisted housing units.”¹¹ Unfortunately, despite being a productive program, it was never funded, and instead was forced to rely on the charity of the private sector.

Democrats should use their net neutrality leverage to extract meaningful appropriations to help close the digital divide. In addition to programs like ConnectHome, funding could go directly to local digital-literacy nonprofits that help provide low-cost computers, access, and training.

Republicans

Republicans tend to prefer an antitrust approach to net neutrality issues, favoring general-practice enforcement bodies, like the FTC, or court action under antitrust laws. They are generally happy with the status quo under the current FCC as far as net neutrality rules go. But they should realize the pendulum will almost certainly swing back to Title II with the next Democratic administration—and it could very well be “Title II-medium” (rather than the supposed “Title II-lite” claimed under then-chairman of the FCC, Thomas Wheeler).

Republicans have made clear their backing of the *Restoring Internet Freedom Order*, including over 100 GOP members of Congress who wrote in their support of the FCC’s plan to restore broadband to a lighter-touch jurisdiction, treating the technology as an information service under the Communications Act. They acknowledged the important effect of the order lies in its jurisdiction, but pointed to the need for legislation to secure settled rules long-term:

After broadband is restored to its rightful regulatory home, under the light-touch approach that guided federal oversight ... for decades, the stage will be set for Congress to determine how best to enact permanent protections for the bipartisan net neutrality principles on which we all agree.¹²

Most notably, chair of the House Communications and Technology Subcommittee, Rep. Marsha Blackburn (R-TN) has introduced the Open Internet Preservation Act, which would prohibit broadband providers from blocking lawful applications or nonharmful devices, or degrading lawful Internet traffic—in other words, no blocking or throttling.¹³ While there is almost no real-world risk of either happening, it is important to send a message to edge innovators that this practice will be prohibited by statute. The Act would also allow specialized services that go above and beyond “best efforts” Internet service for compensation (i.e., a “yes” to voluntary paid prioritization).

Despite the demonization of paid prioritization by many net neutrality advocates, a small share of applications (think high-bandwidth, low-latency applications, like quality video

conferencing) that would gain from voluntary paid prioritization, to the consumer's benefit. Blackburn's bill is an excellent place to start with open Internet legislation, but it will have to do more to bring Democrats on board.

Republicans have the opportunity to lock in reasonably constrained FCC authority, and take the potential for onerous common carrier regulation off the table. They can preserve the dynamic, market-led communications sector by finding common ground on the limits of FCC jurisdiction and specific rules on paid prioritization, and authorizing funds for broadband adoption and digital literacy.

Republicans are generally more comfortable with allowing paid prioritization overseen by antitrust law—the regime in place today. Acting Chair of the Federal Trade Commission Maureen Ohlhausen, for example, argues, “Net neutrality proponents too easily dismiss antitrust,” explaining that in addition to economic values, “Competition law can indeed protect noneconomic goals like free speech and democratic participation, ... to the extent that consumers actually value those goals above others.”¹⁴ But while antitrust could help, any legislation that allows paid prioritization should have regulatory guardrails, including a ban on exclusive deals and a requirement to provide similar terms to similar customers.

However, Republicans should not make the same mistake Democrats did in early 2016, as the next Democrat-controlled FCC will likely have the political capital to reinstate Title II. It is in both parties' interest to end the national nightmare that is the net neutrality wars, particularly given only a small number of hardcore Title II advocates vociferously resist such a bipartisan legislative solution.

WE SHOULD NOT RETURN TO TITLE II

As we have previously argued, the hardline Title II advocates, like Free Press or Demand Progress, fight for their preferred policy approach not because it would secure better broadband performance, robust competition, or outcome for consumers.¹⁵ Rather, they want to see broadband provided as a public utility because of a broader political ideology grounded in a deep distrust of the private sector. For them, broadband is too important to be trusted to private companies.¹⁶ Unfortunately, their campaign of fearmongering has attracted sizable support online.

Common carriage regulation of the type found in Title II is best reserved for explicit monopoly markets with little room for innovation—not dynamic services like Internet access provision. Common carriage, where used, has proven difficult to implement and enforce, risks dramatically reducing the incentive to economize on costs or innovate new technologies or business models, and inevitably raises barriers to entry. In short, this is not a preferable route to go down for regulating a dynamic, evolving, and competitive service like Internet access. The current FCC was right to correct the error of the 2015 Open Internet Order.

It should be remembered that Wheeler's initial net neutrality proposal did not involve subjecting broadband to Title II regulation. It was only after pressure from net neutrality

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advocates and eventually the Obama White House that he relented and sought Title II. To be sure, in the Open Internet Order, the former chairman did forbear from a wide array of onerous Title II common carriage provisions, such as price regulation and open access requirements.¹⁷ While this forbearance in and of itself exposed Title II as a kludge of a legal mechanism for supporting open Internet rules, it also presented a dangerous slippery slope policymakers should avoid. The Title II Order’s “for now” language clearly leaves the possibility of these legal tools, intended for a then-monopoly telephone network, being applied in the future.

The most onerous regulations—price regulation and mandated sharing—would be difficult for the FCC to implement as a political matter, although perhaps not if both branches of Congress and the White House are Democratic in 2021. Considering both how certain aspects of telecommunications policy have become markedly more political, and the partisan, populist roil U.S. politics is currently experiencing, these fears are not unfounded.

What is more, this step—in the direction of this much more onerous regime—Title II classification represented may well have depressed investment in the sort of long-term, sunk-cost infrastructure that supports the open Internet. The FCC was right to return to a less onerous regime, but legislation would undoubtedly provide more lasting certainty.

Policy uncertainty raises both risk and investment costs. Broadband infrastructure is particularly affected by uncertainty, as it requires enormous fixed-cost investment—and companies typically scale down risk whenever the level of future returns is unpredictable.¹⁸ In 2013, Jason Furman, then-chairman of the White House Council of Economic Advisers, explained, “Investments in infrastructure depend critically on a stable, predictable, and light-touch regulatory regime.” While there are many legitimate goals of regulation, this need for stability and predictability has historically been “the motivation for the approach this administration and the Federal Communications Commission have taken in a wide range of areas like the Open Internet.”¹⁹

Common carriage has had a challenged history in telecommunications, especially when it comes to investment.²⁰ Democrats should recognize that supporting strong, enforceable net neutrality rules should not and need not come at the cost of onerous regulations that move us in the direction of heavily regulated monopoly, rather than innovation-generating competition. Policymakers should not seek to return to Title II regulation of Internet access, and attempts to reinstate the 2015 Open Internet Order are highly unlikely to succeed. Serious negotiations for a bipartisan legislative compromise should begin now.

Neither the Congressional Review Act nor Litigation Is Likely to Succeed

The Congressional Review Act allows Congress a streamlined legislative process to repeal recently passed regulations.²¹ Within 60 legislative days after a new regulation is published in the Federal Register and transmitted to Congress, a simple majority of both chambers can vote to strike down the new rules, assuming the bills were signed by the president. Within telecommunications policy circles, this mechanism is best known for rescinding the broadband privacy rules passed under President Obama.²²

Any reasonable analysis of the current attempt to roll back the *Restoring Internet Freedom Order* through a CRA vote must recognize it is virtually impossible. Even Title II advocate Harold Feld says he “doesn’t want to oversell” when remarking he “wouldn’t classify it as *impossible*.”²³ Not impossible, but darn close. Feld strongly supported the Title II Order and the pending CRA to effectively reinstate those rules—he would have every reason to help build its momentum by stretching the odds of its passage.

The CRA is not a legitimate tool to advance open Internet policy, but rather a purely political messaging tool. It is regrettable that something so critical to U.S. economic policy—regulation of the key communications platform of today—is such a political football.

Litigation is also unlikely to see the return of the 2015 Open Internet Order rules. A collection of 22 state attorneys general, as well as a handful of nonprofit organizations, has filed a petition for review.²⁴ The case is now under the purview of the U.S. Court of Appeals for the D.C. Circuit.

Supreme Court precedents *Brand X* and *Chevron* make clear this challenge is a real uphill battle. The courts have given the FCC broad deference to interpret its ambiguous statute, and *Brand X* has already found the classification of broadband access as a lightly regulated information service to be a reasonable interpretation. As respected lawyer and former FTC policy director David Balto explains:

Generally speaking, the FCC just needs to articulate facts that demonstrate the reasonableness of their interpretation in order to receive *Chevron* deference. It shouldn’t matter that the FCC has whipsawed back and forth or is presenting entirely different conclusions than the [Open Internet Order]. Here the Supreme Court is clear...²⁵

Litigation is unlikely to change the FCC’s ability to change broadband classification with every new administration. Democrats would be wrong to hold out for an upset in the courts or to wait until a possible Democrat-controlled FCC in 2021. However, Republicans likewise should realize that if a deal is not achieved before the next change in administration, a return to Title II is very plausible.

WE SHOULD ALSO NOT BE CONTENT WITH FTC OVERSIGHT

Not only is the claim of Title II being necessary for net neutrality simply false, there is little evidence the FCC’s involvement is even necessary for an open Internet. However, neither is the FTC alone sufficient to ensure a flourishing Internet ecosystem. FTC oversight, while certainly a more powerful tool to keep broadband providers honest than some Title II advocates claim, is not sufficient to give web innovators confidence their new products and services will be allowed to scale unimpeded.

Access to high-speed Internet is a powerful force for democracy, education, and commerce. Any enforcement regime should acknowledge that there are more than purely economic harms at stake when a free and open Internet is challenged. Furthermore, the critical role

the Internet plays in enabling innovation throughout the U.S. economy deserves a forward-looking regulatory approach. Antitrust enforcement actions are often only focused on the particulars of the cases involved in enforcement proceedings, and lack a proactive approach. Relying solely on antitrust principals does not ensure the interests of future innovators are represented. Moreover, the responsiveness of antitrust enforcement is often insufficient to thwart potential threats to business models in real time.

The Internet is an incredibly complex system that supports an amazing array of services and applications. It is possible—perhaps even likely—problems will eventually arise that implicate open Internet concerns. These problems may be legitimate threats to Internet openness or innocuous, unpredictable changes to the system, such as unintended consequences of subtle technical changes to the network. It would be better if the FCC were to design an institutional process that collaboratively uncovers the truth in a complex and contentious technical environment, rather than rely on adversarial processes. The specific harms that may be of concern are relatively subtle, and, as economist Hal Singer has persuasively argued, difficult to address through antitrust alone.²⁶

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Federal Legislation Should Supersede State Efforts

Today's relatively hands-off approach of leaving it to the FTC to oversee broadband access has left a perceived void some states have been eager to fill. It is unclear whether these state-level efforts are legal considering the FCC's explicit claim to preemption within the *Restoring Internet Freedom Order*. Regardless, a uniform federal framework that allows network services to scale, without being limited by arbitrary boundaries, would be better overall.

Multiple conflicting or diverse state laws would unnecessarily add to compliance costs and the complexity of operations. Broadband technology allows for many communications functions to be abstracted away from the physical hardware (if not shifted to the edge altogether) and can achieve scale far beyond any state's borders.²⁷ The right balance on net neutrality should be struck at the national level, and allow networks to achieve scale with low cost from compliance complexity.²⁸

CONGRESS SHOULD START NOW ON BIPARTISAN LEGISLATION

While it may be unlikely the political will exists to pass significant open Internet legislation before the next midterm elections, the time for good-faith negotiations is now.

Democrats should not allow themselves to be influenced by a small number of highly vocal activists, and instead recognize the benefits of light-touch, but effective, open Internet protections can be had with the significant upside of securing funding for broadband adoption, digital literacy, and rural deployment, among other policy objectives. Similarly, Republicans should recognize that, absent legislation, there is a risk of Title II—and all its problems—returning. They should, however, cede ground to allow for expert-agency oversight and enforcement at the FCC, as well as authorize spending that furthers the adoption and use of broadband.

Granted, heading into midterms with a Republican-controlled government does little to whet the political appetite for “Kumbaya” compromises. But it is important for Congress to begin having earnest conversations about how to secure bipartisan legislation, work through the sticking points, and broaden the scope of the potential bargaining chips that can be used to achieve win-win negotiations.

No Blocking, No Throttling: Protection of Best-Efforts Internet Is Widely Agreed Upon

The concerns about Internet access providers blocking and throttling Internet traffic are wildly overstated. There is no evidence of any major broadband provider ever having blocked or slowed traffic in an anticompetitive fashion. Even the facts at issue in the widely misunderstood case of *Comcast Corp. v. FCC* (2010) is no cause for alarm, as it was resolved by the offending Internet application rightly changing its protocols so as to prevent harming broadband customers’ online experience.²⁹

Regardless, the arguments for allowing legal traffic to be blocked are thin, and application-layer innovators deserve confidence their new products or services will be allowed to compete unimpeded. A rule against capricious blocking or slowing of legal Internet traffic is widely favored.

Legislation Should Allow for Some Forms of Paid Prioritization

Most of the conversation around innovation and network neutrality is frustratingly narrow. Unfortunately, only one, very specific type of innovation has gained cachet in the broader public conversation: edge application layer innovation. Policymakers should appreciate and promote innovation both at the application layer and within networks.

Johannes Bauer and Günter Knieps, of Michigan State University and the University of Freiburg respectively, made exactly this point in their recent paper “Complementary Innovation and Network Neutrality.”³⁰ Discussing the popular “permission-free” innovation at the application layer, they wrote:

Yet, not all types of Internet-based innovation fit into this framework. The growing relevance of video, cloud computing, and Internet of Things (IoT) applications requires that innovations in traffic service networks meet quality of service (QoS) needs, which cannot be met in the historical, best-effort network. Because such innovations will become more important in the future, the provision of differentiated QoS in traffic networks becomes a precondition for expanding the innovation opportunities for applications and services in higher layers.³¹

The Quality of Service mechanisms Bauer and Knieps discuss are needed to expand the opportunity for innovation because of basic limitations in network resources. Users’ demand for broadband capacity is “bursty” in that it rapidly changes as they perform different tasks on the Internet.³² Progressing from a single user’s link deeper into the network different IP-based communications are joined together in a process called multiplexing.³³ But each piece of equipment and link of a network has a limitation on the capacity it can handle. In order to economize performance, operators make sophisticated predictions about how much capacity will be needed at any given point within the

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network, setting it to a level that total instantaneous peak demand will only occasionally exceed capacity. This is much more efficient than building the equivalent of a 20-lane freeway to handle the occasional Sunday traffic coming from the football game. Yet even these predictions cannot entirely prevent random combinations of traffic spikes coming together to create congestion.³⁴

In most circumstances, and for most applications, unpredictable congestion is no cause for alarm, as operators can take steps to minimize it, and the basic protocols of the Internet detect packets being dropped as a result of congestion and send them again. However, these protocols are not a cure-all. In fact, the relatively large control loop built into these protocols can sometimes exacerbate the problem.³⁵ The resulting increase in delay from a few lost packets is so slight that users generally do not even notice—let alone care about—as it might take a few extra milliseconds to, say, receive an email or load a web page.

The key problem is some applications simply cannot tolerate too much delay (latency) or variance in delay (jitter). Generally these are real-time services—such as Voice over Internet Protocol (VoIP) or teleconferencing. Of course, real-time services can be made functional to some degree without specialized prioritization, with Skype and FaceTime being obvious examples (who has not at one point or another had a Skype call gone awry?). When on a poor connection, or calling someone far away, it is difficult to use real-time applications with much confidence. For example, a high-resolution teleconference with attendees in different countries is unlikely to go well without some form of prioritization.³⁶

Although this “best-efforts” system has to date been reasonably sufficient, many of the exciting innovations that lie around the corner, including those that rely on virtual reality, will increasingly require reliable, low-latency connections. And while some applications affirmatively need prioritization or some kind of differentiation, other applications can easily tolerate delay or jitter. For example, bulk file transfers such as software and operating-system updates do not care about delay. Whether a given operating system is updated now or two minutes from now—or even in two hours—makes no difference to most users, and hence the vast majority of applications, including the “next Google” born in some garage will be more than satisfied with the best-efforts Internet, especially as average broadband speeds continue to increase on the order of 25 percent annually.³⁷

Indeed, these enhanced quality-of-service applications are anticipated to be a key component of 5G networks. Non-zero-sum trade-offs around technical requirements of different types of applications are an obvious, economical way to achieve radical improvements in perceived end-user performance, and have therefore been designed into specifications related to 5G.

The U.K. telecom regulator Ofcom has pointed to concerns that the EU net neutrality regime is too strong and could unduly constrain the evolution of 5G services.³⁸ In a section titled “Net neutrality regulation may need to evolve to facilitate innovations in networks,” Ofcom discusses capabilities unlocked in next-generation networks that will enable network operators to provide dedicated virtual networks and better quality of experience to

different customers over common network elements. Ofcom states, “It will be important to ensure that regulation does not prove an impediment to such innovation, particularly net neutrality rules,” and proposes working with the EU body recommending net neutrality regulations to tweak the rules and ensure innovation continues to flourish.³⁹

The key is establishing rules that protect best-efforts delivery of traffic while allowing for competition to drive improvements in speed and other performance metrics, and providing networks the space to innovate with new, dynamic services that go above and beyond basic broadband. As tech columnist for the *Boston Globe*, Hiawatha Bray, put it in a recent piece arguing for legislation on net neutrality, “As long as companies are forbidden from actively slowing down Internet services that don’t pay extra for superior service, I don’t see a problem.”⁴⁰

The proposal for network neutrality made a lot more sense when first articulated almost 16 years ago.⁴¹ Back in the early days of broadband Internet, bandwidth was far more constrained. For example, in 2003, when Tim Wu called for nondiscrimination in Internet traffic, the FCC defined high-speed broadband as 200 kbps (according to Ookla, the average U.S. speed for the first half of 2017 was over 64 Mbps—more than 300 times faster).⁴² Much of the economic concern behind net neutrality has traditionally revolved around video, as activists worried that incumbent video distributors would make it difficult for over-the-top video providers. But today’s significantly increased bandwidth, which is available to the vast majority of U.S. consumers, has proven more than sufficient for streaming high-definition entertainment on multiple devices.

The relative abundance of bandwidth available today is likely the reason, at least in part, why Netflix CEO Reed Hastings stated during the development of the *Restoring Internet Freedom Order* that net neutrality was not the company’s “primary battle.”⁴³ He explained, “Where net neutrality is really important is the Netflix of 10 years ago.”⁴⁴ This is not only the result of Netflix having successfully negotiated favorable, long-term interconnection agreements during the 2014–15 net neutrality debate, but because the broadband infrastructure provided by Internet access providers is sufficient for their business model, and the potential for capricious throttling of their popular service is virtually null.⁴⁵

This does not, however, mean that some traffic differentiation is not still needed to improve the consumer experience for a particular, albeit small, share of applications, particularly those that are latency sensitive.⁴⁶ These include, for example, high-quality real-time video, shared virtual reality spaces, and robotics control—generally wherever humans interact, at a certain distance, with short time-scale feedback requirements. Basic websites or buffered video should not require prioritization at all. Compromise is needed and should be easily achievable on paid prioritization, whereby prioritization that unlocks new possibilities for real-time applications flourishes, while anticompetitive abuses are prohibited. These practices could be overseen by a multistakeholder, such as the Broadband Internet Technical Advisory Group, or BITAG.⁴⁷

Facile arguments that a lack of strong rules would allow ISPs to “pick winners and losers” would be easily countered by simple rules around what kinds of paid prioritization should be allowed.

Before the truly difficult questions need to be unknotted by a multistakeholder group, simple rules around prioritization could be established. Straightforward guardrails can easily eliminate the majority of stated concerns from those skeptical of paid prioritization. For example, Congress should prohibit any exclusive deals for prioritization. Congress or the FCC should require operators to offer like terms to similarly situated users.

Facile arguments from net neutrality advocates that a lack of strong rules would allow ISPs to “pick winners and losers” would be easily addressed by simple rules around what kinds of paid prioritization should be allowed. Specifically, paid prioritization should be offered on fair terms, ideally through open and transparent APIs, and be available to all comers on the similar terms.⁴⁸ This is the same position ITIF laid out in response to so-called zero-rating or “free-data” arrangements.⁴⁹ And of course, with strong rules on degrading or throttling in place, all applications would still enjoy “best-efforts” transit at ever-increasing speeds.

Scope of FCC Jurisdiction Is a Sticking Point

FCC Chairman under President Clinton, William Kennard, in a 1999 speech titled “The Unregulation of the Internet: Laying a Competitive Course for the Future” argued why it was in “the national interest that we have a national broadband policy ... a de-regulatory approach, an approach that will let this nascent industry flourish.”⁵⁰ We continue to believe a light-touch approach like Kennard articulated is the best. However, not everyone agrees.

Many Title II activists want to secure the power to regulate broadband providers as common carrier, not for the sake of “strong” net neutrality, but because it is the only feasible route to broadband as a public utility. They lobby Democrats in hopes they will hold out for a return to Title II, rather than work for legislation that can lock in effective net neutrality protections and secure new benefits that cannot be achieved through current laws. They are willing to give up broadband being a dynamic service that is provided through market competition, in order to turn it into a static public utility.

For example, Harold Feld of Public Knowledge, in a speech titled “Broadband as a Public Utility,” explicitly framed the net neutrality wars as a critical turning point (comparing the *Title II Order* to Stalingrad) within a much broader ideological battle (which he calls “one big culture war”).⁵¹ He says:

“Public utility” is the ultimate heresy to this culture of caveat emptor our opponents have worked so hard and spent so much to create. It is an affront to the worship of the gods of the marketplace by declaring that a society cannot reach its true potential, morally or economically, without some government oversight and intervention in the marketplace. It is for this reason that our opponents are so desperate to undermine the concept of public utility, and why it is so critical that we embrace it.⁵²

Mr. Feld’s argument that the extreme of public utility regulation is necessary in order to achieve effective government oversight and reach society’s true potential is misguided. There is no reason the innovation-producing and investment-inducing competition-led

communications sector cannot be preserved, while simultaneously providing meaningful oversight and enforcement that enables a robust ecosystem of edge innovation. This is not a binary choice between public utility and laissez-faire. Utility-style regulation is not necessary for society to reach its goal of enabling edge Internet innovation.

Those right of center, on the other hand, are generally skeptical of giving the FCC an inch, lest it take a mile. Indeed, some on the right advocate doing away with the FCC altogether. Take, for example, Brent Skorup of the Mercatus Center, who argues in a piece titled “Who Needs the FCC?” that, “Congress needs to pave a path toward not only limiting the agency's power over the [I]nternet but eliminating most FCC authority outright.”⁵³ Many Republicans see the FCC’s vague charge to advance telecommunications policy “in the public interest” as an increasingly outdated and ever-growing mandate that makes less and less sense as the predominant communications platform transitions from regulated local monopoly to heated competition.

However, proposed Republican legislation tends to offer relatively narrow bright-line rules and little other FCC authority over broadband access providers. Considering the rather limited number of examples of net neutrality concerns that have risen to the level of necessitating government intervention to resolve—and the success of the market-driven broadband system in the United States under prior light-touch oversight—relatively constrained FCC authority is reasonable. There is simply no need for the FCC to get involved in broadband privacy, for example.⁵⁴

But at the same time, the FCC does need real authority to mediate disputes with expert insight, untangling responsibility for unintended consequences in a complex system, and giving confidence in its ability to police abuses, as unlikely as they are to arise.

THE GRAND BARGAIN ON NET NEUTRALITY AND ITS BENEFITS

There is a good deal of flexibility for a potential deal that would end the back and forth on net neutrality inherent to changes in administration. The proposed outline that follows basically pairs relatively constrained FCC oversight of light-touch but effective net neutrality rules with expanded programs for broadband adoption and digital literacy, as well as funding for rural broadband to best promote an innovative Internet ecosystem going forward. This is a deal both parties should be proud to claim victory from.

- **Clarify that broadband Internet access service is not a “telecommunications service” under Title II of the Communications Act.** Congress should first and foremost remove Title II from the broadband picture, and add a new section to the Communications Act to cover broadband with rules that are properly tailored to the dynamic, competition-driven communications network that is the Internet—not to old-fashioned telephone service.
- **Put widely agreed upon open Internet protections, including no-blocking, no-throttling, and transparency requirements, on firm legal ground.** These bright-line rules are low-hanging fruit that can, if implemented properly, do most of the heavy lifting of protecting the open Internet without negatively impacting innovation or

investment in the network—while also giving application-layer services certainty to invest.

- **Allow pro-competitive traffic differentiation for applications that require it, while preventing anticompetitive abuses of prioritization.** Legislation should allow clear flexibility for traffic differentiation for applications that require it, avoiding an overbroad flat ban on prioritization, while clearly prohibiting anticompetitive conduct. Legislation should put some restrictions on paid prioritization to limit the potential for abuse, such as a simple ban on exclusive dealing or a requirement to offer similar terms to all customers.
- **Give the FCC reasonable, but bounded, jurisdiction to enforce open Internet rules.** Specifically, a new broadband title of the Communications Act should find a compromise regarding the scope of the FCC's jurisdiction, but focus narrowly on open Internet rules and bridging the digital divide—leaving a broader update to the Communications Act for another day.
- **Expand the scope and funding of existing digital-literacy and broadband-adoption programs.** Legislation should expand support for existing adoption programs, such as NTIA's Broadband Adoption Toolkit, the ConnectHome initiative, and expansion of the FCC's Lifeline program, while also establishing a national clearinghouse to support local digital-literacy and adoption initiatives. Authorizing real funding for demand-side broadband adoption and digital literacy would greatly help in closing the digital divide.

While these proposals represent a potentially fruitful starting point, there is certainly potential for other policy priorities that cannot lawfully be achieved under the current Communications Act to broaden the scope of negotiations. These include prison-phone-rate reform, E-Rate-funded middle-mile access reform, solidifying and modernizing the Lifeline program, etc. There are numerous policy objectives in both parties that could be achieved through legislation that are not allowed under current law (regardless of how broadband is classified).

The opportunity to turn what appears to be an intractable partisan debate into a win for both parties, and more importantly, make U.S. consumers and businesses significantly better off, is at hand. Taking the FCC off the seesaw of over- and under-regulation by removing the constraint of outdated legal classifications can be done. It will require combining balanced, even-handed net neutrality rules that allow for innovation while cutting off the potential for abuse; reasonably constrained, but not non-existent FCC authority; and significant programs and real spending to address the digital divide and need for greater rural broadband infrastructure. The current trench warfare that is the net neutrality debate is helping no one other than the most entrenched advocates who benefit from constant conflict. It is time for détente. Congress, in taking up a net neutrality compromise, has an opportunity to demonstrate to the American public that it can move beyond partisan stalemates. Advocacy-group extremists may not like it, but the American people will certainly benefit from it, should a solution come to pass.

ENDNOTES

1. Although similar questions regarding the line between basic and enhanced services date back to the Computer Inquiries of the 1960s and onward, the first clear articulation that Internet access was not a telecommunication service is in a 1998 report to Congress from the FCC, which states “As a legal matter, the Commission is renewing its determination that the Telecommunications Act should be read to affirm the unregulated status of information services, including Internet access services.” Federal-State Joint Board on Universal Service, *Report to Congress*, FCC 98-67, 13 FCC Rcd. 11501 (1998) https://transition.fcc.gov/Bureaus/Common_Carrier/Reports/fcc98067.pdf.
2. For discussion of some of the First Amendment issues, see Brent Skorup, “ISPs have a First Amendment right to block offensive content,” *Plain Text* (Nov, 2015), <https://readplaintext.com/isps-have-a-first-amendment-right-to-block-content-323ca1ebdf0b>.
3. Salvador Rizzo, “Will the FCC’s net neutrality repeal grind the Internet to a halt?” *Washington Post* (March, 2018), <https://www.washingtonpost.com/news/fact-checker/wp/2018/03/05/will-the-fccs-net-neutrality-repeal-grind-the-internet-to-a-halt/>.
4. See Senate Democrats, “A Better Deal: Universal High-Speed Internet,” <https://www.democrats.senate.gov/files/documents/BDUniversalHighSpeed9.28.17.pdf>.
5. Ibid.
6. See, Lauren Gardner and Tanya Snyder, “Democrats cool to Trump’s infrastructure pitch.” *Politico* (Dec. 2017), <https://www.politico.com/story/2017/12/14/democrats-trump-infrastructure-pitch-223057>.
7. Blair Levin, “Trump infrastructure plan not likely to impact rural broadband,” *Brookings* (Feb. 2018), <https://www.brookings.edu/blog/the-avenue/2018/02/02/trump-infrastructure-plan-not-likely-to-impact-rural-broadband/>.
8. Adie Tomer, et al., “Signs of digital distress,” *Brookings* (Sept. 2017), <https://www.brookings.edu/research/signs-of-digital-distress-mapping-broadband-availability/>.
9. Obama Whitehouse, “Mapping the Digital Divide,” *Council of Economic Advisers Issue Brief* (July 2015), https://obamawhitehouse.archives.gov/sites/default/files/wh_digital_divide_issue_brief.pdf.
10. Ibid.
11. Obama Whitehouse, “Fact Sheet: ConnectHome: Coming Together to Ensure Digital Opportunity for All Americans,” (July 2015), <https://obamawhitehouse.archives.gov/the-press-office/2015/07/15/fact-sheet-connecthome-coming-together-ensure-digital-opportunity-all>.
12. Greg Walden et al., “Letter to the Honorable Ajit Pai,” *Congress of the United States* (Dec. 2017), <https://energycommerce.house.gov/wp-content/uploads/2017/12/121317-FCC-Net-Neutrality.pdf>.
13. Open Internet Preservation Act, H.R. 4682, 115th Congress (2017) <https://www.congress.gov/bill/115th-congress/house-bill/4682>.
14. Hon. Maureen K. Ohlhausen, “Antitrust over Net Neutrality: Why We Should Take Competition In Broadband Seriously,” 15 *Colo. Tech. L.J.* 119 (2016), https://www.ftc.gov/system/files/documents/public_statements/1054963/ohlhausen_cotechjournal.pdf.
15. See, Robert D. Atkinson and Doug Brake, “How Broadband Populists Are Pushing for Government-Run Internet One Step at a Time,” ITIF (Jan. 2017), <https://itif.org/publications/2017/01/23/how-broadband-populists-are-pushing-government-run-internet-one-step-time>.
16. Ibid.
17. Protecting and Promoting the Open Internet, WC Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601 (2015).

18. See Doug Brake “Broadband Myth Series, Part 1: What Financial Data Shows About the Impact of Title II on ISP Investment” *ITIF: Innovation Files* (June 2017), <https://itif.org/publications/2017/06/02/broadband-myth-series-part-1-what-financial-data-shows-about-impact-title-ii>.
19. Jason Furman, “Total Factor Productivity and Telecommunications: Policy Ingredients for Shared Growth” *Remarks as Prepared AEI’s Center on Internet, Communications and Technology Policy* (Sep. 2013), https://obamawhitehouse.archives.gov/sites/default/files/docs/aei_jf_telecom_9.17.13.pdf.
20. See, e.g., Bruce M. Owen, “Antecedents to Net Neutrality,” *Regulation*, Vol. 30, No. 3 (2007).
21. See 5 U.S.C. 801-08.
22. See, e.g., Li Zhou, “Trump makes it official and signs broadband privacy CRA,” *Politico Morning Tech*, (April 2017), <https://www.politico.com/tipsheets/morning-tech/2017/04/trump-makes-it-official-and-signs-broadband-privacy-cra-219590>.
23. Emphasis in original. Harold Feld, “What You Need To Know About Repealing The Repeal of Net Neutrality—How The CRA Works.” *Wetmachine: Tales of the Sausage Factory*, (Jan. 2018), <http://www.wetmachine.com/tales-of-the-sausage-factory/what-you-need-to-know-about-repealing-the-repeal-of-net-neutrality-how-the-cra-works/comment-page-1/>.
24. Eric T. Schneiderman, et al., Protective Petition for Review, In the United States Court of Appeals for the District of Columbia Circuit, Case No. 18-1013, *available at* https://ag.ny.gov/sites/default/files/petition_-_filed.pdf.
25. David A. Balto, “Chevron Deference and Net Neutrality,” (January 4, 2018). Available at SSRN: <https://ssrn.com/abstract=3096567> or <http://dx.doi.org/10.2139/ssrn.3096567>.
26. Hal J. Singer, “Paid Prioritization and Zero Rating: Why Antitrust Cannot Reach the Part of Net Neutrality Everyone is Concerned About,” *The Antitrust Source* (Aug. 2017), https://www.americanbar.org/content/dam/aba/publishing/antitrust_source/aug17_singer_8_2f.authcheckdam.pdf.
27. See Doug Brake, “National Networks Need National Policies” *ITIF* (Nov. 2017), <https://itif.org/publications/2017/11/09/national-networks-need-national-policies>.
28. *Ibid.*
29. *For discussion, see* Doug Brake and Robert D. Atkinson, “Comments of ITIF in the matter of Protecting and Promoting the Open Internet,” GN Docket 14-28 (July 2014), <http://www2.itif.org/2014-comments-fcc-open-internet.pdf>.
30. Johannes Bauer and Günter Knieps, “Complementary Innovation and Network Neutrality,” *Telecommunications Policy* (Dec 2017), <https://www.sciencedirect.com/science/article/pii/S0308596117304615>.
31. *Ibid.*
32. For example, loading a web page will open several data streams at once, fetching several images, advertisements, and text from a web page’s server. The load on the consumer’s broadband pipe peaks as those resources are loaded, then returns to baseline as the consumer scrolls through the page.

Streaming video adds considerably to this load, putting a constant stream of data onto the channel. As consumer’s broadband subscriptions have been increasing in speed, the demands of the average websites have grown, with more and more streaming video advertisements and resource-intensive designs, resulting in large, random spikes of capacity demand over short time scales.
33. This technique allows for a single communication channel to be shared by a number of different data streams at the same time. Multiplexing results in tremendous gains to efficiency, as the down time between any one user’s bursts of traffic are smoothed out and available capacity is more fully taken advantage of.

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34. Similarly, denial-of-service attacks, network failures or unexpected routing changes, or cell overload in the mobile context can all cause congestion. For the most part, users' instantaneous capacity demands are not correlated—we are talking much shorter time scales than the general ebb and flow of traffic patterns throughout the day. Intermittent congestion is perhaps more likely when everyone comes home from work and flips on their favorite streaming service, but this type of congestion, while fleeting, is largely unpredictable, and different from the more lasting congestion at points of interconnection that has been in the news. For good discussion of congestion at points of interconnection, see David Clark et al., "Measurement and Analysis of Internet Interconnection and Congestion," (paper, CSAIL, MIT & CAIDA, University of California, San Diego, September 9, 2014), <http://groups.csail.mit.edu/ana/Measurement-and-Analysis-of-Internet-Interconnection-and-Congestion-September2014.pdf>.
 35. In TCP, oversimplifying a bit, the sender waits for an acknowledgement from the intended receiver. If it is not received in time, the sender backs off its sending rate, assuming packets are lost due to congestion. However, the control loop is so large, and the effect of a few dropped packets so severe, that this mechanism serves more to avoid congestion collapse for the overall system and does not optimize for any one application.
 36. One way to think about some types of applications effectively ruled off the public Internet by the strict net neutrality rules is by comparing a VoIP call to carrier-grade voice. Indeed, it's odd that net neutrality advocates celebrate a flat ban on paid prioritization when it effectively locks entrepreneurs out of providing carrier-grade services. Daniel Berninger, who has challenged the new FCC regulations in court, is a prime example of those hit by this chill on innovation. Berninger, who did early work on VoIP technology at Bell Laboratories and founded the Voice Exchange Communication Committee to promote IP-based HD Voice service, is familiar with the engineering it takes to offer new types of high-quality services. In his court filings, Berninger explains: "Because latency, jitter, and packet loss in the transmission of a communication will threaten voice quality and destroy the value proposition of a high-definition service, it is imperative that network operators prioritize this traffic.... The best efforts model associated with existing IP interconnection agreements does not enable the relevant implementation requirements necessary to support high-definition voice." *U.S. Telecom Association, et al., v. Federal Communications Commission and United States of America*, Case No. 15–1063, U.S. Court of Appeals for the District of Columbia Circuit (declaration of Daniel Berninger), http://transition.fcc.gov/Daily_Releases/Daily_Business/2015/db0730/DOC-334664A1.pdf.
 37. Cartesian, "US Broadband: Speeds Have Been Rising 25% Annually," <http://www.cartesian.com/us-broadband-speeds-have-been-rising-25-annually/>.
 38. See Ofcom, "Enabling 5G in the UK" (March 9, 2018), <https://www.ofcom.org.uk/spectrum/information/innovation-licensing/enabling-5g-uk>.
 39. Ibid.
 40. Hiawatha Bray, "On Net neutrality, it's time for Congress to act," *Boston Globe* (Dec. 2017), <https://www.bostonglobe.com/business/2017/12/13/net-neutrality-time-for-congress-act/RDy7bNUgw5Fo9c8pnQB14I/story.html>.
 41. See Tim Wu, "A Proposal for Network Neutrality" (June, 2002), <http://www.timwu.org/OriginalNNProposal.pdf>.
 42. Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket No. 98-146, Report, 17 FCC Rcd 2844, (2002); Speedtest Reports: United States 2017, *Ookla* (Sept. 2017) <http://www.speedtest.net/reports/united-states/>.
 43. See Dieter Bohn, "Netflix CEO says net neutrality is "not our primary battle," *The Verge* (May 2017), <https://www.theverge.com/2017/5/31/15719824/netflix-ceo-reed-hastings-net-neutrality-not-our-battle>.
 44. Ibid.

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45. See, Doug Brake, “Netflix Grows Up,” *Innovation Files* (March 2014), <https://www.innovationfiles.org/netflix-grows-up/>.
 46. For discussion, see forthcoming ITIF report on paid prioritization; Peter Rysavy, “Testimony of Peter Rysavy Before the Subcommittee on Communications and Technology,” Hearing on “From Core to Edge: Perspective on Internet Prioritization” (April 17, 2018), <http://docs.house.gov/meetings/IF/IF16/20180417/108168/HHRG-115-IF16-Wstate-RysavyP-20180417-U21.pdf>.
 47. See Broadband Internet Technical Advisory Group, <https://www.bitag.org/>.
 48. For relevant discussion, see Nick Feamster, “Software-Defined Networking: What’s New, and What’s New for Tech Policy?” *Freedom to Tinker* (Feb. 2018), <https://freedom-to-tinker.com/2018/02/12/software-defined-networking-whats-new-and-whats-new-for-tech-policy/>.
 49. Doug Brake, “The Economics and Innovation Behind Free Data,” ITIF (May, 2016), <https://itif.org/publications/2016/05/23/mobile-zero-rating-economics-and-innovation-behind-free-data>.
 50. William E. Kennard, “The Unregulation of the Internet: Laying a Competitive Course for the Future” Speech before the FCBA (July 1999), <https://transition.fcc.gov/Speeches/Kennard/spwek924.html>.
 51. Harold Feld, “Broadband Access As Public Utility—My Speech at Personal Democracy Forum,” *Wetmachine* (June 2015), <http://www.wetmachine.com/tales-of-the-sausage-factory/broadband-access-as-public-utility-my-speech-at-personal-democracy-forum/>.
 52. Ibid.
 53. Brent Skorup, “Who Needs the FCC?” *National Affairs* (Winter, 2016), <https://www.nationalaffairs.com/publications/detail/who-needs-the-fcc>.
 54. See Doug Brake, et al., “Broadband Privacy: The Folly of Sector-Specific Rules” *ITIF* (March, 2016), <https://itif.org/publications/2016/03/01/broadband-privacy-folly-sector-specific-rules>; Doug Brake, et al., “The FCC’s Privacy Foray” (April 2015), <https://itif.org/publications/2015/04/20/fcc%E2%80%99s-privacy-foray-privacy-regulation-under-title-ii>.

ABOUT THE AUTHOR

Doug Brake is the director of broadband and spectrum policy with the Information Technology and Innovation Foundation. He previously served as a research assistant at the Silicon Flatirons Center at the University of Colorado. Doug holds a law degree from the University of Colorado Law School and a Bachelor's in English Literature and Philosophy from Macalester College.

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