Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Restoring Internet Freedom	)	WC Docket No. 17-108

Reply Comments of Bret T. Swanson[1]

August 30, 2017

The Federal Communications Commission has asked for comments on its proposal to return the Internet to its original legal classification as a "Title I information service," following the Commission's surprise 2015 redefinition of both wired and wireless broadband as "Title II telecommunications services." We favor the return of the statutorily mandated and spectacularly successful information service designation.

In short, the longstanding Title I information service policy resulted in:

- $1.5 trillion in broadband infrastructure investment in the U.S., beginning in the mid-1990s;
- widespread deployment of, and access to, high-capacity wired and wireless networks and Internet services;
- staggering consumer usage and benefits, manifest in per capita and per user U.S. data traffic two to three times greater than many other advanced nations; and
- the cultivation of many of world's most innovative, valuable, and influential mobile, Web, content, software, cloud, ecommerce, social, and computer firms.

More important for the future, the information service designation maximizes the likelihood that the Internet will continue to be an open-ended platform for economic innovation and cultural expression for decades to come.

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The imposition of Title II telephone rules on the Internet was unnecessary, ill-advised, and risky. There was no reason to abandon a successful policy. The burden fell on the Commission to demonstrate the necessity for a radical change of course. It did not. The *Order* botched key technical considerations, mostly ignored economic analysis, and mangled the little economics it attempted. The *Order* was also illegal. It evaded straightforward statutory language, usurped authority, abused administrative procedure, and may impinge on Constitutional protections.

We leave the legal analysis to many other able commenters. We do wish, however, to respectfully weigh in on several technical, economic, and policy matters that are informed by our research over the past two decades.

The Unparalleled Success of 'Information Services'

At the time of the *Order*, the facts demonstrating the health of the U.S. Internet industry were unequivocal. As we wrote in the introduction, the longstanding, bipartisan Title I information service policy resulted in:

- $1.5 trillion in broadband infrastructure investment in the U.S., beginning in the mid-1990s [2];
- widespread deployment of, and access to, high-capacity wired and wireless networks and Internet services;
- staggering consumer usage and benefits, manifest in per capita and per user U.S. data traffic two to three times greater than many other advanced nations; and
- the cultivation of many of world's most innovative, valuable, and influential mobile, Web, content, software, cloud, ecommerce, social, and computer firms.

At the time the *Title II Order* was debated and issued, the United States had just 4% of the world's population, yet the U.S. enjoyed 10% of the world's Internet users, 25% of its broadband investment, and 32% of its consumer Internet traffic.[3] Compared with most advanced nations – Japan, Germany, and France, for example – the U.S. generated two to three times more consumer Internet traffic per user.[4] (See nearby graphic.)

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[2] See, for example, "Broadband Industry Stats," U.S. Telecom, https://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment.

[3] Bret Swanson. "Internet traffic as a basic measure of broadband health." American Enterprise Institute. November 2014. http://www.aei.org/publication/internet-traffic-basic-measure-broadband-health/

[4] Ibid.

Other indicators from across the Internet ecosystem showed dynamism and explosive growth in content, devices, network services, apps, and ecommerce. As we wrote at the time,

> consumers and firms now upload 100 hours of video to YouTube every minute, and YouTube streams more than 6 billion hours of video per month. In the first quarter of this year, Netflix streamed 6.5 billion hours of video over the Internet, most of it in the US. HBO, CBS, sports leagues, and dozens of small firms are launching their own streaming franchises on the web. Apple and Google are competing fiercely in mobile operating systems, consumer video, and cloud apps and services.
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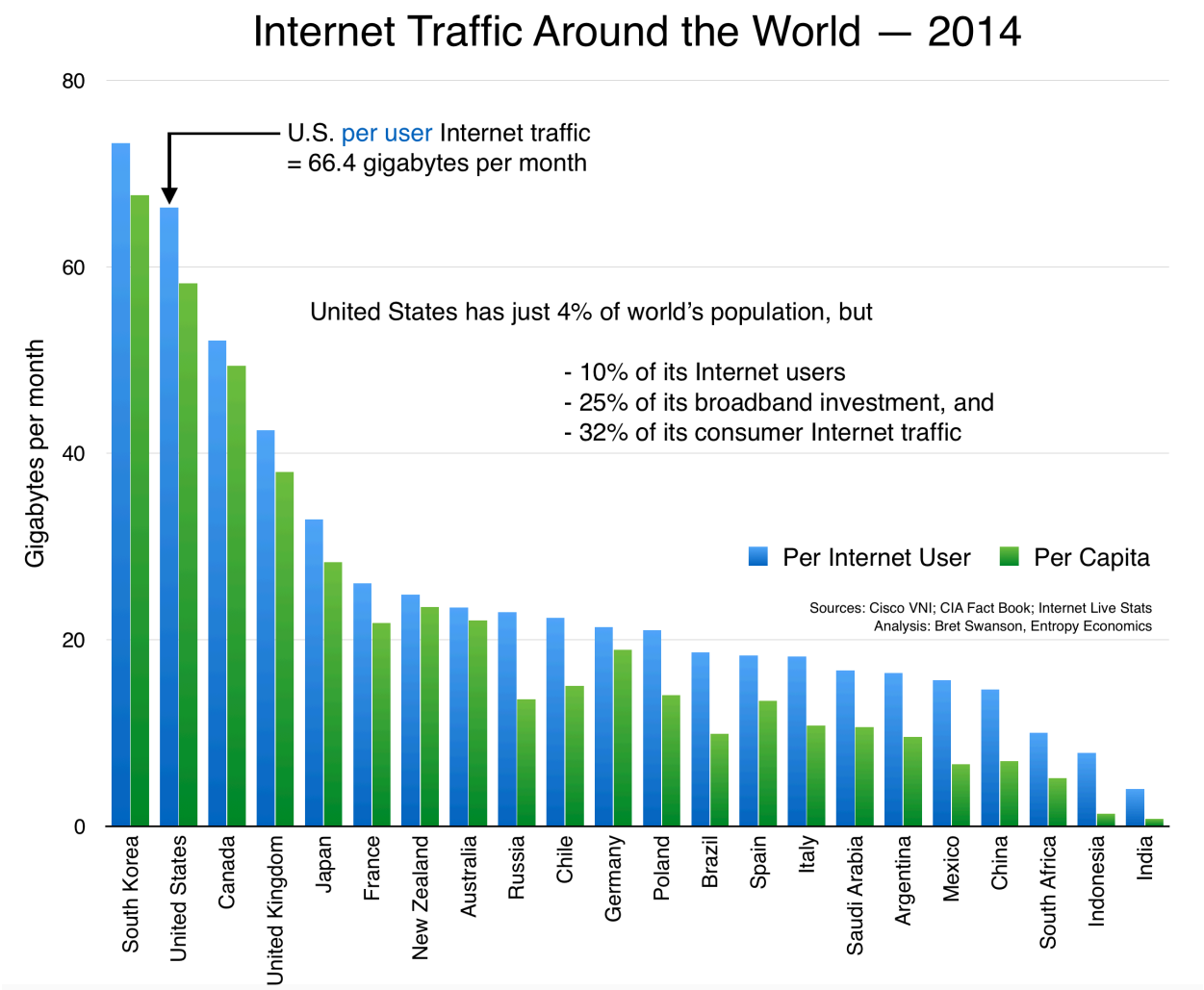
> Facebook now boasts nearly 1.35 billion monthly active users. And start-ups now routinely go from zero to hundreds of millions of users in a matter of a few years. So high are the valuations of many young Web firms – Uber, WhatsApp, Snapchat, Dropbox, etc. – that some (not me) worry that we're in the midst of another Silicon Valley bubble. Amazon.com sold $85 billion worth of merchandise, digital content, and cloud services in the last 12 months. UPS, after misjudging the impact of online shopping last winter, is adding 100,000 additional delivery workers this holiday season to meet off-



> the-charts demand. Does it appear that consumers are having trouble getting "access to a website"? Are network firms limiting "which online stores you can shop at, or which streaming services you can use?" [5]

In another item, we emphasized (and celebrated) the financial success of the supposedly vulnerable "edge" companies and criticized the lack of expertise the FCC was employing in its decision-making process:

> Seventy-three private firms, according to The Wall Street Journal, are now members of "the billion-dollar startup club." Fifty of these start-ups are American, and a number of them have recently achieved valuations of $10, $20, even $40 billion.
>
> The total value of the 50 US club members is $223.9 billion and does not include the 10 club members that went public or were acquired in 2014. Many US public technology firms are, likewise, booming. The market values of just seven tech leaders – Apple, Google, Microsoft, Facebook, Oracle, Intel, and Amazon – total around $2.25 *trillion*. Apple alone is twice as valuable as any firm in the world, including Exxon Mobil and Google.
>
> Yet against this backdrop of mind-boggling success by firms at the "edge" of the network, the Federal Communications Commission is poised to regulate the Internet for the first time. Its central rationale is to protect these vulnerable "edge" firms, but It's not clear they need anyone's help. The regulations are so sprawling and intrusive that not only will they discourage investment in network infrastructure, they will also boomerang on the "edge" firms themselves. In fact, on Friday, Google wrote to the FCC asking the commission to drop a bizarre provision, known as broadband subscriber access service (BSAS), that could force Google to pay ISPs around the world for each bit it sends a consumer. Who knows how many odd provisions like this we will find? Who can say what all the unintended consequences will be?
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> The all-out boom in content, apps, devices, and Internet traffic suggests the bipartisan policy of light-touch regulation, adopted during the Clinton administration, is working. The Net is free, open, and prosperous. In the face of such success, the burden is on the FCC to show why a dramatic reversal of policy is needed. Yet the FCC offers only vague theories and stories of hypothetical harm.
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> The notion that Brian Roberts or Randall Stephenson wants to block a Tumblr blogger or a grandmother on Etsy from selling her hand knitted scarves on the Web is preposterous. Yet Tumblr and Etsy have worked activists into a frenzy, and the FCC is relying on them as expert witnesses. (You can judge the quality of their expertise for yourself.)

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[5] Bret Swanson. "This Web boom must end!" American Enterprise Institute. November 14, 2014. http://www.aei.org/publication/web-boom-must-end/

> What the FCC does not do is weigh these myths against the very real costs of its proposed "fix"–regulation of the Internet under Title II of the Communications Act of 1934.[6]

Imposing a sweeping new regulatory policy affecting a large, sprawling, and dynamic part of the economy should require rock solid findings that market failures are serious and widespread and that the proposed policy can meaningfully boost the health of the industry and consumer welfare. The Commission made no such finding of market failure and offered no cost-benefit analysis of its new policy.

The Commission attempted a bait-and-switch. It used a prevailing narrative that the U.S. had fallen behind in broadband deployment, speed, and usage in order to justify an unrelated policy to ban paid priority and other behaviors that might limit access to content or harm "edge" companies. Never mind that the policy did not logically follow from the narrative. The data showing that U.S. Internet users consume and generate for more traffic than anyone else (saving South Korea) helped disprove both the bait and the switch. Extremely high per capita and per user traffic demonstrates (and bolsters other evidence[7]) that high-capacity networks were widely deployed and widely used. The high traffic figures also showed a healthy market for content flowing freely over those networks, contradicting the notion that ISPs were systematically blocking or throttling traffic, or even had a strong incentive to do so.

An "Economics-Free Zone"

The Commission relied on two narratives to support its 2015 policy: (1) the supposedly lackluster U.S. broadband market and (2) the supposed potential of Internet service providers (ISPs) to block, throttle, or prioritize traffic, based on their unique "incentive and ability" to do so. The Commission, however, failed to support either of these narratives with facts or economic analysis.

The Commission could not show that the broadband market was uncompetitive and could not demonstrate the market failures that are normally necessary to trigger intrusive regulation. It thus focused almost entirely on the hypothetical possibility that ISPs would block, throttle, or

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[6] Bret Swanson. "FCC votes to regulate a booming Internet." American Enterprise Institute. February 26, 2015. http://www.aei.org/publication/fcc-votes-regulate-booming-internet-aei-welcomes-rep-greg-walden-discuss-next-chapter/

[7] Bret Swanson. "The need for speed. How does U.S. broadband measure up?" American Enterprise Institute. September 30, 2013. http://www.aei.org/publication/need-speed-us-broadband-measure/

prioritize traffic, or engage in other conduct (such as partnerships, interconnection, or pricing strategies) it might one day find distasteful. Every ISP of note had already, for years, foresworn blocking and throttling in publicly available statements of official corporate policy. And the prioritization of traffic was either non-existent or likely to be welfare-enhancing. The quantum leap to Title II thus appeared unnecessary. The Commission, though, insisted that to *enforce* the no-blocking and no-throttling rules, and in order to implement its bright line ban on paid priority and its open-ended "general conduct standard," Title II was necessary.

The problem was that the Commission asserted a series of one-sided arguments, without laying a foundation of facts or consulting the well-known economic literature. Multi-sided markets, paid priority, arms-length partnerships, and various forms of vertical integration, it was well known, can often (even usually) accelerate innovation and create large consumer benefits. Under certain conditions, these practices can have anti-competitive or anti-consumer effects, but the Commission simply asserted they always, rather than rarely, had negative effects. The Commission also simply asserted that all incentives would entice ISPs to block or degrade traffic, rather than to continue providing customers with the service they demonstrably loved: access to the open Internet. The Commission thus banned paid priority outright and issued skeptical commentary on paid peering and zero-rating, two key innovations that provided large consumer benefits. They did so without citing any of the relevant literature, which would have showed the Commission was way off base.

The Commission's own chief economist, Tim Brennan, joked that the *Title II Order* was an "economics-free zone" – meaning void of economic analysis. He later clarified that a little economics had found its way into the Order. "But a fair amount of the economics was wrong, unsupported, or irrelevant," he concluded.[8] The Order's analysis of ISP incentives was "wrong," he said. Its linchpin theory of a "virtuous circle" that only worked in one direction was "unsupported," he said. And the Order's citations of academic work on "price discrimination" in its analysis of "paid priority" were, Brennan said, "irrelevant." The *Order* also ignored the robust critiques of three additional former FCC chief economists who had submitted comments.

In order to reinforce how much economics the *2015 Order* ignored, we list below a number of economic analyses and declarations, which offer useful commentary and reviews of the literature: Comments of AT&T & Expert Economist Declaration, AT&T, July 17, 2017; Comments of CALinnovates & Expert Economist Declaration by Dennis Carlton,

[8] Tim Brennan. "Is the Open Internet Order an 'Economics-Free Zone'?" Free State Foundation. June 28, 2016. http://www.freestatefoundation.org/images/Is_the_Open_Internet_Order_an_Economics_Free_Zone_062816.pdf

CALinnovates, July 17, 2017; Comments of CTIA & Expert Economist Declaration by Bob Hahn, CTIA, July 17, 2017; Comments of Comcast & Expert Economist Declaration by Christian Dippon, Comcast, July 17, 2017; Comments of FTC Acting Chairman Maureen K. Ohlhausen, Chairwoman Maureen K. Ohlhausen, July 17, 2017; Comments of the Georgetown Center for Business & Public Policy Joint Economist Filing, Georgetown Center for Business & Public Policy, July 17, 2017; Comments of Larry Downes, Larry Downes, July 17, 2017; Comments of Oracle, Oracle, July 17, 2017; among many others.

When a government attempts to impose far-reaching rules on a major part of the economy, it should have to do a real economic analysis. The Commission didn't.

Incentive and Ability

The *Title II Order* was predicated on the theory that ISPs – and only the ISPs – have the incentive and ability to block or degrade traffic. Nearly all the evidence, however, showed that there was a much stronger incentive to provide access to the open Internet. Exploding data traffic and widespread edge company success demonstrated the ecosystem's incentives were aligned for complementary innovation – a virtuous circle, you might say.

More recently, it has become apparent that, in contrast to the ISPs, the content, software, Web, ecommerce, and cloud firms often have more (1) insight and control over stored content and network flows; (2) influence over what content users can find and see; and (3) data about Internet users themselves. These capabilities are not necessarily problematic. They often are the basis for products and services that consumers like. But they show that the *Title II Order's* assertion that only ISPs have the "incentive and ability" to block or degrade content is wrong.

In one of the most egregious examples, "In June of 2016, Netflix admitted to throttling video speeds on AT&T and Verizon networks, in secret, for over five years."[9] Netflix had for years been the chief accuser of ISP bad behavior and prime advocate for "strong net neutrality." This episode demolished the theory of the *2015 Order*.

[9] Bret Swanson. "Silicon Valley's Dangerous Political Game." Entropy Economics. July 2017. http://entropyeconomics.com/wp-content/uploads/2017/07/EE-Tech-Note-Silicon-Valleys-Dangerous-Political-Game-07.10.17.pdf

The Internet Is Interstate Commerce

In recent years, a number of sates have endeavored to get into the Internet policy game. Especially after the Commission issued the most recent NPRM, several states proposed their own data privacy laws, for example. But if ever there were an economic activity that met the definition of *inter*state commerce, it is the *Inter*net. Congress has the Constitutional authority to regulate interstate commerce, and states must submit to its primacy.

We debated this issue in the late 1990s, when the Internet was beginning to show that the old telephone regulatory model was obsolete. In the telephone world, the Communications Act governed. But the state utility commissions also had a role because much of telecom was "local." States had authority to regulate local telephone services within a national framework.

The Internet blew apart the old ways of doing things. Internet access and applications are inherently non-local services. In this sense, the "cloud" analogy is useful. Telephones used to be registered to a physical street address. Today's mobile devices go everywhere. Data, services, and apps hosted in the cloud serve end users who could be anywhere. It makes no sense to govern the Internet locally. And doing so could have confusing and potentially catastrophic effects.

The Democratic FCC Chairman Bill Kennard weighed in on this matter in the late 1990s. He was in the middle of the original debate over broadband and argued firmly that cable modem broadband was a Title I information service and should not be swept into the morass of Title II telephone regulation.

In a 1999 speech, he admonished those who would seek to regulate broadband at the local or state level:

> Unfortunately, a number of local franchising authorities have decided not to follow this de-regulatory, pro-competitive approach. Instead, they have begun imposing their own local open access provisions. As I've said before, it is in the national interest that we have a national broadband policy. The FCC has the authority to set one, and we have. We have taken a de-regulatory approach, an approach that will let this nascent industry flourish. Disturbed by the effect that the actions of local franchising authorities could have on this policy and on the deployment of broadband, I have asked our general counsel to prepare a brief to be filed in the

> pending Ninth Circuit case so we can explain to the court why it's important that we have a national policy.[10]

As the Internet becomes an ever more important component of all that we do, as complexity spreads, as it touches more parts of the economy, this principle only becomes more important.

The Unintended Consequences of Exemptions and Carve Outs

Do Title II's most enthusiastic backers realize that it doesn't protect net neutrality? The reality is that for all of the *Title II Order's* complicated baggage and intrusive regulation, it may include an easy way for ISPs to completely avoid it. The fact is if ISPs edit or filter the content accessible via their broadband service, the *Order* may not apply to them at all. The policy analyst Brent Skorup has repeatedly highlighted this surprising backdoor in the 2015 *Title II Order*.[11]

In their reply denying the most recent *en banc* request, Federal Appellate Judges Tatel and Srinivasan confirmed that the 2015 *Order* offers an exclusion for edited or filtered broadband offerings from the BIAS designation that is the *Order's* centerpiece. It is still unclear how the Commission would have distinguished an edited or filtered service from a basic BIAS service because the Commission also said that an ISP would have to meet certain requirements to avoid the BIAS designation. And yet regardless of how the Commission decided to parse the fine definitions, such an exemption would only confuse and frustrate the Commission's intended policy of "preserving and promoting an *open* Internet."

Exemptions for specialized, managed, or filtered services may be preferable to a regime in which the harsh rules apply to all services. But they also create incentives for behavior that the Commission was trying to discourage. As understood by the Appellate judges, the *Order* seems to say: the no-blocking, no-throttling, and no-paid priority rules only apply to open Internet services that don't block, throttle, or prioritize. Services that block, throttle, or prioritize are not BIAS and thus not subject to the rules. Can that make any sense?

We addressed this perverse possibility in our reply comments of 2010, and reiterated the point in our 2014 comments:

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[10] William E. Kennard. "The Unregulation of the Internet." July 20, 1999. https://transition.fcc.gov/Speeches/Kennard/spwek924.html

[11] See, for example, Brent Skurup. "Here's why the Obama FCC Internet regulations don't protect net neutrality." Technology Liberation Front. July 12, 2017. https://techliberation.com/2017/07/12/heres-why-the-obama-fcc-internet-regulations-dont-protect-net-neutrality/

the Commission should consider several unintended consequences of moving down the path of explicitly defining, and then exempting, particular "specialized" services while choosing to regulate the so-called "basic," "best-effort," or "entry level" "open Internet."

Regulating the "basic" Internet but not "specialized" services will surely push most of the network and application innovation and investment into the unregulated sphere. A "specialized" exemption, although far preferable to a Net Neutrality world without such an exemption, would tend to incentivize both CAS providers and ISPs service providers to target the "specialized" category and thus shrink the scope of the "open Internet."

In fact, although specialized services should and will exist, they often will interact with or be based on the "basic" Internet. Finding demarcation lines will be difficult if not impossible. In a world of vast overlap, convergence, integration, and modularity, attempting to decide what is and is not "the Internet" is probably futile and counterproductive. The very genius of the Internet is its ability to connect to, absorb, accommodate, and spawn new networks, applications and services. In a great compliment to its virtues, the definition of the Internet is constantly changing.

Moreover, a regime of rigid quarantine would not be good for consumers. If a CAS provider or ISP has to build a new physical or logical network, segregate services and software, or develop new products and marketing for a specifically defined "specialized" service, there would be a very large disincentive to develop and offer simple innovations and new services to customers over the regulated "basic" Internet. Perhaps a consumer does not want to spend the extra money to jump to the next tier of specialized service. Perhaps she only wants the service for a specific event or a brief period of time. Perhaps the CAS provider or ISP can far more economically offer a compelling service over the "basic" Internet with just a small technical tweak, where a leap to a full-blown specialized service would require more time and money, and push the service beyond the reach of the consumer. The transactions costs of imposing a "specialized" quarantine would reduce technical and economic flexibility on both CAS providers and ISPs and, most crucially, on consumers.

Or, as we wrote in our previous Reply Comments about a related circumstance, "A prohibition of the voluntary partnerships that are likely to add so much value to all sides of the market – service provider, content creator, and consumer – would incentivize the service provider to close greater portions of its networks to outside content, acquire more content for internal distribution, create more closely held 'managed services' that meet the standards of the government's 'exclusions,' and build a new generation of larger, more exclusive 'walled gardens' than would otherwise be the case. The result would be to frustrate the objective of the proceeding. The result would be a less open Internet."

> It is thus possible that a policy seeking to maintain some pure notion of a basic "open Internet" could severely devalue the open Internet the Commission is seeking to preserve.[12]

The Order seems to say, open services are subject to the rules, while closed services are not. This perverse and confusing reading of the *Order* only highlights its unworkability, or its uselessness.

The Growing Need for Differentiated Internet Services

The *2015 Order* is even worse suited to the future Internet than to today's. The future Internet will spread more deeply into more industries, which will require more diverse and differentiated services.[13] The Internet of Things will require low-power and low-capacity but ubiquitous connectivity. Autonomous vehicles will require low-latency, highly robust connectivity. Virtual reality will require super-high capacity, while medical and industrial applications will require absolute reliability. The diversity of Internet uses is growing, and the diversity of network capabilities, consumer demands, and pricing plans will likewise need to proliferate.

5G wireless is exemplary of this new Internet world, where a sprawling network will serve a multitude of needs. As we wrote in a survey of the 5G future,

> The variety of applications and devices will be matched by a variety of network capabilities, wire- less services, and business models. And yet the idea behind 5G is to serve nearly all of these markets with an integrated core network that can apportion resources and accommodate changing usage scenarios on the fly and serve a multitude of cell-types and spectrum bands.
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> 5G will enable a proliferation of business models beyond traditional mobile phones for personal and business use. Retailers, manufacturers, utilities, and logistics firms will rely on the new network for supply-chain, remote monitoring, and industrial maintenance services. Fleets of cars, trucks, and perhaps drones will connect to the network for both navigation and entertainment. Health care, education, and entertainment firms could develop special products relying on the new network. And in many geographies, 5G could even offer residential and small business broadband that will compete with cable and telecom providers of wired broadband. In addition, the 5G network will be designed to be a truly general purpose plat- form that can accommodate all kinds of "plug- and-play" devices and services not yet conceived.

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[12] Bret Swanson. Reply Comments in the FCC matter of Protecting and Promoting the Open Internet. September 15, 2014. http://entropyeconomics.com/wp-content/uploads/2014/09/EE-FCC-Reply-Comment-Protecting-Open-Internet-09.15.14.pdf

[13] Michael Mandel and Bret Swanson. "The Coming Productivity Boom: Transforming the Physical Economy with Information." Technology CEO Council. April 2017. http://entropyeconomics.com/wp-content/uploads/2017/03/The-Coming-Productivity-Boom-Transforming-the-Physical-Economy-with-Information-March-2017.pdf

> Many providers of content and services will deliver their products to consumers in the traditional manner—through the Web or apps. The growing array of services and business models, however, will enable more varied payment relationships. One new model, for example, is known as sponsored data, in which content providers help pay for the data consumed when people use their products. Already we are seeing content firms (such as Spotify, Pandora, Netflix, Facebook, and ESPN) partner with mobile carriers (T-Mobile, Verizon, and AT&T). In one form of sponsored data, called zero rating, data from a select content provider is not counted against a consumer's data allowance. Entertainment firms have been the most aggressive early users of sponsored data, but one can imagine that many other types of firms will make use of this model. Providers of health care, educational, and workforce training apps, for instance, may include the data consumed by their services as part of their offerings.
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> The proliferation of devices, apps, services, content, and business models suggests an environment of widespread experimentation with technologies and product offerings.[14]

Title II regulation, designed for a homogeneous telephone network delivering a single voice service, is particularly ill-suited to a 5G network serving a multitude of people and machines running thousands of heterogenous applications and *information services*.

[14] Bret Swanson. "Imagining the 5G Wireless Future: Apps, Devices, Networks, Spectrum." Entropy Economics. November 2016. http://entropyeconomics.com/wp-content/uploads/2016/11/Entropy-Economics-Imagining-the-5G-Future-Nov-02-2016.pdf