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Comments on TRAI's Consultation Paper on Free Data

I welcome the opportunity to comment on TRAI's Consultation Paper on Free Data. I submit these comments as a professor of law and, by courtesy, electrical engineering at Stanford University whose research focuses on Internet architecture, innovation and regulation. My book "Internet Architecture and Innovation," which was published by MIT Press in 2010, is considered the seminal work on the science, economics and politics of network neutrality. My papers on network neutrality have influenced discussions on network neutrality all over the world.[1] I have testified on matters of Internet architecture, innovation and regulation before the US Federal Communications Commission.[2] The FCC's 2010 and 2014 Open Internet Orders relied heavily on my work. I have not been retained or paid by anybody to participate in this proceeding.

My comment is based on and draws heavily on my existing writings on net neutrality. The papers most relevant to this consultation are attached to this submission. The following text summarizes the key ideas and points to the parts of the papers that contain the relevant, more detailed analysis. I would welcome the opportunity to discuss these important issues further.

In January 2016, TRAI adopted a regulation on differential pricing for data services. This regulation adopted a comprehensive framework for differential pricing. The regulation rightly banned the three harmful forms of zero-rating (zero-rating content in return for edge provider payment, as well as zero-rating of select applications or classes of application without a fee), but allowed internet service providers to engage in other forms of differential pricing that do not raise similar concerns. Importantly, the regulation not only adopted rules that were based on sound policy considerations, but also did so in the form of bright-line rules. Bright-line rules provide certainty to market participants, keep the costs of regulation low, limit the potential for regulatory overreach and protect those – Internet users, start-ups, small businesses – who do not have the time or resources to engage in long and costly proceedings before regulators to defend themselves against harmful forms of zero-rating. Not surprisingly, this decision has been lauded as a landmark decision that will allow all Indians to reap the benefits of an open Internet for innovation, competition, and free speech.

[1] See, e.g., van Schewick (2007); Frischmann & van Schewick (2007); van Schewick (2015c).
[2] See, e.g., van Schewick (2008); van Schewick (2010c); van Schewick (2010b); Federal Communications Commission (2014).

After reading the consultation document, I am concerned that TRAI might intend to roll back some of the important protections adopted in that regulation.

My comment makes the following points:

(1) Zero-rating has a strong discriminatory effect. As a result, it raises the same problems from a net neutrality perspective as technical forms of discrimination.
(2) Allowing internet service providers to let providers of Internet applications, content, and services pay to have their content zero-rated ("zero-rating for a fee") violates the goals that net neutrality is designed to protect and should be prohibited. Thus, TRAI's order on differential pricing rightly prohibited these practices.
(3) The alternative models discussed in the consultation paper effectively introduce zero-rating for a fee through the backdoor and should be prohibited, too.
(4) TRAI's differential pricing order leaves open the room for other forms of zero-rating that do not raise net neutrality concerns.

1. Zero-rating has a strong discriminatory effect.

Starting point for an analysis of all differential pricing is the insight that differential pricing, including zero-rating, are just another form of discrimination that allows internet service providers to favor some applications over others. My attached paper "Network Neutrality and Quality of Service: What a Non-Discrimination Rule Should Look Like" explains the discriminatory effect of differential pricing in more detail.[3] My comment focuses on the discriminatory effect of zero-rating as a specific form of differential pricing.

Network neutrality rules aim to prevent network providers from distorting the playing field among applications or classes of applications, and from interfering with users' choices regarding the use of the network.[4] Some commenters assume that zero-rating is less harmful than technical forms of discrimination (such as slowing down or speeding up certain applications), because applications that are zero-rated continue to receive the same technical treatment as applications subject to the cap. However, while zero-rating operates slightly differently, the discriminatory effect is the same: Zero-rated applications are more attractive to users than applications that are not.

Evidence suggests that zero-rating has a powerful effect on people's behavior.

Zero-rated content is more attractive to consumers than content that counts against their cap.

First, research shows that people strongly prefer zero-rated content over content that counts against their cap. For example, in a study commissioned by CTIA, "[n]early three-quarters of respondents (74%) report that they would be more likely to watch videos offered by a new provider if the content did not count against their monthly limit."[5] When Slate experimented with zero-rating and

[3] van Schewick (2015c), pp. 32-33.
[4] The following section is based on van Schewick (2015d), pp. 1-3; van Schewick (2016b), pp. 10-13.
[5] CTIA - The Wireless Association (2014).

"told some would-be listeners that the podcast wouldn't count against the data plans on their smartphones […] users were 61% more likely to press play."[6]

This is not surprising. Consider an Internet service provider that zero-rates its own streaming video application, while the traffic of all other applications is counted towards subscribers' bandwidth cap, a common practice around the world.[7] For users who have not exhausted their monthly bandwidth allowance, watching a video that produces 2 gigabytes (GB) of traffic via an unaffiliated application brings those users 2 GB closer to exhausting their bandwidth cap. By contrast, watching the same video via the Internet service provider's application does not reduce the amount of bandwidth available to users before they reach the bandwidth cap. Users who have exhausted the monthly bandwidth allowance and watch the video using the unaffiliated application will have to bear the consequences of using another 2 GB (e.g., paying overage charges, having their traffic throttled, or being cut off from Internet access), while users watching the video via the affiliated application will not face any consequences. Thus, even if the data packets associated with different streaming video applications receive the same technical treatment in the network, the practice of counting only some streaming video applications towards the monthly bandwidth cap makes those applications relatively more attractive. The lower users' monthly caps, the stronger the pull.

This differential treatment of applications directly translates into a change in behavior. Many consumers are wary of going over their cap. Most consumers don't know how much data specific applications use, and how much monthly data they have left.[8] So the safer approach for customers is to use applications that do not count against their cap.[9] As a result, consumers will prefer zero-rated content over content that eats up their data – a preference based on a provider's inclusion in a zero-rating program, not on the merits of the provider.

This effect can already be observed with respect to Music Freedom, T-Mobile's zero-rating program for music in the US. On Twitter, Reddit, and Medium, T-Mobile customers have reported that Music Freedom affects which music streaming provider they use when streaming music over their mobile 4G LTE Internet connection. When customers find that their preferred provider is not

[6] Knutson (2014).
[7] Digital Fuel Monitor (2014a).
[8] Various studies have documented that customers have trouble understanding how much bandwidth specific applications use and how much data they have already used. See, e.g., Chetty, et al. (2012), pp. 3025 (study of South African households); Chetty, et al. (2015), p. 6 (study of US, South African, and Indian households); Union des Consommateurs (2013), pp. 29-30 (survey of Canadian Internet users); United States Government Accountability Office (2014), pp. 13, 16-17 (US focus groups).
[9] Studies show that Internet customers adjust their online behavior in order to avoid going over the cap, e.g., by reducing their use of the Internet service when they get closer to the cap (Nevo, Turner & Williams (2015), p. 8 (empirical study based on data set of Internet usage data of 55,000 users from an ISP)), by avoiding the use of applications known to be bandwidth-intensive (e.g., streaming video applications) on mobile Internet plans subject to caps (Chetty, et al. (2012), pp. 3025-3026; Horrigan (2014), p. 5 (survey of online Americans); United States Government Accountability Office (2014), pp. 17-18 (US focus groups)) or by waiting to engage in such activities on mobile devices until the device is connected to the Internet via WiFi (Horrigan (2014), p. 5 (survey of online Americans); United States Government Accountability Office (2014), pp. 16-17 (US focus groups)). A recent survey of online Americans found that "[o]ut of 55% of smartphone users with a data cap, more than half – 52% - have altered their online behavior because of the cap – either by not doing some online activities out of concern for hitting the limit or by waiting until they were within Wi-Fi range." (Horrigan (2014), p. 5).

included in the program, they instead use a different streaming provider that is part of Music Freedom – only because it will not count against their monthly cap.[10]

Many zero-rated plans directly limit user choice among competing applications.

Second, many zero-rated plans directly limit the ability of customers to make meaningful choices among competing applications. For example, T-Mobile's Binge On program in the US allows customers to stream "unlimited" video from select video providers included in the program. Customers on the lowest qualifying plan with a 3G cap can watch as much as video as they want from Netflix and other providers in the program. But they can only watch 4 ½ hours per month, or 9 minutes per day, from providers that are not in the program – and that's only if they only watch video and don't do anything else online.[11] Unlimited video versus 9 minutes per day is not a meaningful choice. As a result, video providers not included in Binge On simply cannot compete with companies included in Binge On, no matter how good their offerings.

This is not an isolated example. In the European Union, many ISPs zero-rate their own video applications. Customers on these plans can watch unlimited zero-rated videos, but their bandwidth caps prevent them from watching more than 2–5 hours of video content unaffiliated with the ISPs.[12] Similarly, many ISPs in Europe zero-rate their own cloud-storage applications. Their users can upload 10 gigabytes of traffic to the ISP's cloud storage for free. But it costs between $50 and $70 to upload the same amount of data to other cloud storage sites like Dropbox or Google Drive.[13] These plans make it effectively impossible for unaffiliated providers to compete with the ISP's zero-rated application.

Zero-rating may affect the attractiveness of an application to third parties.

Finally, zero-rating may an application's attractiveness to end users more indirectly by making the zero-rated application more attractive to third parties that are interested in reaching the application's end users.[14] For example, just as consumers are more likely to watch zero-rated videos than videos that count against their monthly caps, video content creators are likely to prefer distribution platforms that are zero-rated over platforms that are not. That means video creators might choose a zero-rated video platform, not for its merits but simply because their videos will be more attractive to viewers if they don't use up viewers' data plans. But if zero-rated applications video platforms attract more video creators than other streaming services, this makes those platforms even more attractive to end users and would further disadvantage video streaming services that are not part of zero-rating programs.

In sum, zero-rating is a powerful tool to favor some applications over others and causes the same problems as technical forms of differential treatment. Like technical forms of discrimination, zero-rating may be used in one of three ways:

- An ISP can offer applications providers to pay for zero-rating.

[10] Trinition (2015); Trinition (2015); Trinition (2015); cocobandicoot (2015); travysh (2015); Sam (@Sammy1AM) (2015); Mad Hatman (@madhatman) (2015); Yiakoumis (2015).
[11] For a more detailed analysis, see van Schewick (2016b), pp. 11-12.
[12] Drossos (2015) (providing data for online video applications).
[13] Digital Fuel Monitor (2014b) (documenting the effect for cloud storage applications).
[14] For a more detailed analysis, see van Schewick (2016b), pp. 12-13.

- An ISP can zero-rate selected applications in a class of similar applications without charging the providers of the zero-rated applications.
- An ISP can zero-rate all applications in a class without charging the providers of the zero-rated applications.

Like the different kinds of technical discrimination, these different kinds of zero-rating pose different problems, and should be evaluated separately.[15]

TRAI's comprehensive regulatory framework for differential pricing for data services rightly banned all of these practices.

2. Zero-rating in exchange for edge-provider payment

ISPs have expressed their interest in offering application providers the opportunity pay to have traffic affiliated with their application exempted from the cap.[16] In the US, AT&T offers a program called "sponsored data," that allows any interested provider to pay to have its content zero-rated.[17] Earlier this year, Verizon announced a similar program.[18] These plans create the same problems as allowing application providers to pay for fast lanes or other technical forms of preferential treatment – a practice banned by the FCC's Open Internet rules and by the EU's net neutrality regulation.

Zero-rating against a fee harms the start-up innovation ecosystem and free speech

Fees in exchange for zero-rating pose the same threat to innovation and free speech as fees in exchange for technical forms of preferential treatment.[19] As the record in the FCC's Open Internet proceeding shows, start-ups, small businesses and low-cost speakers will often be unable to pay to be in the fast lane; they won't be able to pay for zero-rating, either. But if some companies can pay so that their content loads faster or does not count against users' bandwidth cap, then those who can't pay won't have a chance to compete and be heard.

The impact of such fees on innovation, small businesses, and free speech is analyzed in detail in my attached report "The Case for Meaningful Network Neutrality."[20]

For this reason, many commenters in the FCC's Open Internet proceeding asked the FCC to ban this type of zero-rating.[21]

[15] See van Schewick (2016a) and van Schewick (2015d).
[16] The following section is based on van Schewick (2015d), pp. 3-5.
[17] AT&T (2016).
[18] Verizon (2016).
[19] van Schewick (2014); van Schewick & Weiland (2015), p. 87.
[20] van Schewick (2015b), pp. 11-17.
[21] See, e.g., See, for example, 18MillionRising.org, et al. (2015), incl. fn. 1; Common Cause (2015); Future of Music Coalition (2015), pp. 1-2; van Schewick (2015d), pp. 3-8; Vimeo, et al. (2015), p. 2; Union Square Ventures (2015) (all supporting a ban on zero-rating select applications in a class of similar applications and on zero-rating against a fee); van Schewick (2015e), pp. 6-10 (collecting submissions supporting banning zero-rating of select applications in a group of similar applications), 18-20 (collecting submissions supporting banning zero-rating against a fee); Ananny, et al. (2015) (supporting ban on zero-rating against a fee).

Zero-rating against a fee harms users

Proponents of zero-rating argue that allowing application providers to pay for zero-rating will benefit consumers by allowing ISPs to lower prices for mobile Internet services.[22] Like arguments that allowing ISPs to be in the fast lane will result in profits that ISPs will use to lower the price of Internet access or deploy more and better broadband networks, this argument is highly questionable. There is no guarantee that ISPs will use the additional profits to lower the price of mobile Internet service. Economic theory suggests that ISPs' incentive to pass through any profits to users depends on the strength of competition in the market for Internet services. Thus, any benefit in the forms of lower prices is highly speculative. In addition, application providers don't exist in a vacuum. Application providers that pay to be zero-rated will have to recoup the costs of zero-rating somehow – e.g., through higher prices or more advertising on the site. Thus, consumers will ultimately pay the price.

At the same time, there are strong indications that allowing ISPs to charge application providers for zero-rating will harm consumers. If ISPs can charge application providers to be zero-rated, they would have an incentive to lower monthly bandwidth caps or increase the per-byte price for unrestricted Internet use in order to make it more attractive for application providers to pay for zero-rating. The resulting reduction in bandwidth caps harms users and providers of applications that do not pay for exclusion from the cap.[23] This effect can already be observed in Europe.[24] As Digital Fuel Monitor has documented, ISPs that zero-rated their own applications have either restricted the amount of bandwidth that users can pay to low bandwidth caps of 5-10GB, not allowing users to buy more, or increased the per-bandwidth price of unrestricted Internet access so that it becomes more difficult to buy additional bandwidth that can be used without restrictions.[25] According to a recent study by Digital Fuel Monitor, mobile carriers in Europe that zero-rate select online video services offer half as much data volume for the same price as carriers that do not.[26]

By contrast, shortly after the Dutch regulator prohibited ISPs from zero-rating their own applications, KPN doubled its monthly bandwidth cap for mobile Internet access from 5 to 10 GB at no additional cost. It was about to introduce its own mobile TV application, and had planned to zero-rate it. But with zero-rating off the table, KPN faced a choice of offering an application that users can't use (because the bandwidth caps were too low), or increase the bandwidth cap so that users can actually use KPN's application - but in a way that allows users to choose freely among competing applications.[27] Thus, banning zero-rating ultimately benefits all users (even those that aren't interested in using the zero-rated application) and all applications, by making more unrestricted bandwidth available.

[22] Knutson (2014).
[23] See, e.g., Ananny, et al. (2015), p. 3.
[24] Rewheel (2014a); Rewheel (2014b); Digital Fuel Monitor (2015).
[25] Drossos (2015) (summarizing the findings); Rewheel (2014a) (summarizing the findings); Rewheel (2014b) (documenting the price increase).
[26] Digital Fuel Monitor (2016), p. 4.
[27] Digital Fuel Monitor (2015).

Regulators face a trade-off

Ultimately, regulators face a trade-off: Allowing zero-rating against a fee harms start-up innovation and small businesses. It fundamentally changes the environment for free expression online. It creates an incentive to lower bandwidth caps, which harms users and anybody who can't pay for zero-rating. It might, in rare cases, lower the price for mobile Internet access, but users will ultimately pay the price through different channels.

In the context of the debate over edge provider payments for priority or other forms of technical treatment, the regulators' answer has been clear: We are not willing to allow practices that are bound to harm users, innovation and free speech in the hope that this might potentially lead to lower prices or more deployment. The same arguments are directly applicable here.

The solution: ban zero-rating in exchange for edge-provider payment

Thus, any network neutrality rules should explicitly prohibit ISPs from charging application providers for zero-rating.

The problems that drive a ban on zero-rating in exchange for edge-provider payment exist regardless of whether an ISP offers the opportunity to pay for zero-rating to all applications (as in AT&T's sponsored data offering), to all applications in a class of similar applications (i.e. to all music streaming applications) or exclusively to some, but not all applications within a class of similar applications (i.e. only to YouTube, but not to Netflix). Thus, the rules should categorically ban all forms of zero-rating for a fee, regardless of how they are being offered.

Some commenters assume that zero-rating for a fee is fine as long as it is offered on fair, reasonable, and non-discriminatory (FRAND) terms to all edge providers that are willing to pay. Similarly, TRAI's consultation paper seems to assume that the primary problem with zero-rating is that it puts ISPs in the position of a gatekeeper that can pick winners and losers online.

That is, of course, a central concern of net neutrality rules. It is, however, not the only concern. As I have explained elsewhere, net neutrality rules intend to preserve the key factors that have allowed the Internet to foster application innovation, improve democratic discourse, facilitate political organization and action and provide a more decentralized environment for social, cultural, and political interaction in which anybody can participate. These factors are:[28]

1. *User Choice.* Users independently choose which applications they want to use without interference from network providers).[29] Letting users, not network providers, choose which applications will be successful is an important part of the mechanism that produces innovation under uncertainty.[30] At the same time, letting users choose how they want to use the network enables them to use the Internet in a way that creates more value for them (and for society) than if network providers made this choice for them.[31]

[28] The following list is adopted from van Schewick (2015a).
[29] *See* Cerf (2006), pp. 8-9, 13; van Schewick (2010a), pp. 144, 152-55, 293-95, 362-64.
[30] *See* van Schewick (2010c), p. 6; *see also* van Schewick (2010a), pp. 349-51.
[31] *See* van Schewick (2010a), pp. 362-63; Cerf (2006), pp. 8-9, 13. On the importance of user choice for the Internet's social, cultural, and political potential, see, for example, Balkin (2009); and van Schewick (2010a), pp. 359-65.

2. *Application-Agnosticism.* The network is application-agnostic. While an application-agnostic network may have some information about the applications on the network, it does not make distinctions among data packets based on that information.[32] This ensures that network providers cannot interfere with innovators' and users' choices, that they cannot distort competition among applications (or classes of applications), and that they cannot reduce application developers' profits through access fees.[33]

3. *Low Costs of Application Innovation and Speech.* The low costs of application innovation not only make many more applications worth pursuing, but also allow a large and diverse group of people to become innovators.[34] If there is uncertainty (for example, about technology or user needs) or user needs are heterogeneous, a larger and more diverse group of innovators will create more and better application innovation than a smaller, less diverse group of innovators, and these applications will better meet the needs of Internet users.[35] In the current Internet, there is uncertainty and user needs are heterogeneous, so the conditions under which innovator diversity increases the amount and quality of innovation are met.[36]

4. *Innovation without permission.* Innovators independently choose which applications they want to pursue; they do not need support or "permission" from network providers in order to realize their ideas for an application. Adding additional decisionmakers who need to endorse the idea or take action before an idea can be realized increases transaction costs and reduces the chances that innovative ideas can be realized.[37]

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[32] The original Internet was application-blind and application-agnostic. This was a consequence of its architecture, in particular of the broad version of the end-to-end arguments and of the layering principle. *See* van Schewick (2010a), pp. 72-75, 217-18; van Schewick (2004), pp. 101-03; *see also, e.g.*, Cerf (2006), pp. 8-10, 13; Lemley & Lessig (1999), p. 7; Reed (2010). For a short summary of the importance of application-blindness, see van Schewick (2010c), pp. 3-4. For a detailed analysis, see van Schewick (2010a), pp. 215-81, 286-95, 349-53, 355-65. While the analysis in these sources focuses on the impact of application-blindness, the analysis equally applies to application-agnosticism. An application-blind network is necessarily application-agnostic. In particular, both create the same environment for application innovation and network use. Thus, their economic, social, cultural, and political impact is the same. *See also Balkin (2009)*; van Schewick (2010a), pp. 359-65 (focusing on the social, cultural, and political implications); Benkler (2000), pp. 565-568.

[33] Access fees are fees that the network provider imposes on application and content providers who are not its Internet service customers. Access fees come in two variants: In the first variant, a network provider charges application or content providers for the right to access the network provider's Internet service customers. In the second variant, which is sometimes called "paid prioritization" or "third-party-paid prioritization," a network provider charges application or content providers for prioritized or otherwise enhanced access (e.g., access that does not count towards the users' monthly bandwidth cap) to these customers.

[34] For a short version of the argument, see van Schewick (2010c), pp. 2-3, 5-6; and van Schewick (2010b), pp. 4-5. On the low cost of application innovation in the original Internet, see van Schewick (2010a), pp. 138-48, 204-05, 289-90. On the impact of low-cost innovation on who can innovate, see *id.* at 204-13, 292-93. *See also* Balkin (2009) (focusing on the social, cultural, and political implications); Benkler (2000), pp. 565-68 (same).

[35] For a short version of the argument, see van Schewick (2010c), pp. 5-6; and van Schewick (2010b), pp. 4-5. For a detailed version, see van Schewick (2010a), pp. 298-349.

[36] *See* van Schewick (2010a), pp. 356.

[37] On innovation without permission in the original Internet, see van Schewick (2010a), pp. 204, 211, 293. On the impact of innovation without permission on innovation, see *id.* at 345-48. *See also* Cerf (2006), pp. 8-10; Balkin (2009) (focusing on the social, cultural, and political implications).

As I explain in the attached paper "The Case for Meaningful Network Neutrality Rules," concerns about payments for preferential treatments are driven primarily by concerns about their impact on the costs of innovation and speech on the one hand, and on the principle of innovation without permission on the other hand.[38]

These concerns are separate from, and independent of concerns about the deliberate picking of winners and losers.

The attached letter from 36 leading scholars to the Federal Communications Commission and the Federal Trade Commission makes the same point in urging the FCC to adopt a ban on charging edge providers for any form of preferential treatment.[39] The letter's signatories include leading network neutrality experts Lawrence Lessig (Harvard), Barbara van Schewick (Stanford), and Tim Wu (Columbia), former FCC Chief Economist and former Director of the Bureau of Economics at the FTC Jonathan Baker (American University Washington College of Law), leading economist on network neutrality Nicholas Economides (NYU), leading first amendment experts and cyberlaw scholars Jack Balkin (Yale), Yochai Benkler (Harvard) and Pam Samuelson (UC Berkeley), leading scholars of entrepreneurship and innovation Carliss Baldwin (Harvard) and Eric von Hippel (MIT), and leading scholars of journalism, media and technology Ted Glasser (Stanford) and Fred Turner (Stanford).

For these reasons, both the United States and Europe ban ISPs from offering any technical advantage to providers of Internet applications, content, and services for a fee. These bans are not restricted to discriminatory payments, but capture any payment, even it is available on FRAND terms. The same considerations apply here.

Finally, it should be noted that the FCC's 2015 Open Internet Order does not endorse zero-rating for a fee, but subjects it to case-by-case review under the general conduct rule. I would argue that zero-rating for a fee violates the general conduct rule, but this question has not been adjudicated in the US yet. The FCC has started to investigate zero-rating practices, but enforcement was generally put on hold while the court's decision was pending.

3. The alternative models proposed by TRAI do raise the same concerns as zero-rating for a fee and should be prohibited, too.

Introducing an additional intermediary in the form of a platform provider that operates across ISPs does not remove any of the concerns regarding the impact of payments for zero-rating on innovation, small businesses, free speech and creative expression.

And if ISPs can sell data to application providers via an intermediary, they still have the incentive to keep bandwidth caps low and/or increase the price of unrestricted data that was discussed above.

[38] See van Schewick (2015b), pp. 11-17.
[39] Ananny, et al. (2015).

Finally, rewards-based models could amplify these concerns if they reward use of an app with an amount of data that's even larger than what was used for the application.

4. TRAI's differential pricing regulation still allows forms of zero-rating that are not harmful.

Carriers can offer alternative net neutrality-friendly plans that allow customers to access zero-rated content but without the host of harms.[40] Carriers could make certain bandwidth available without limiting how it can be used. This includes, for example, zero-rating offers that zero-rate all applications used during a specific time period, or that offer a zero-rated low-bandwidth mode that the user can use as desired, *as long as they do not involve any fees to participating ISPs*. For example, T-Mobile could offer customers a zero-rated low-bandwidth mode at the same speed as Binge On. Use of that mode would not count against the cap, but customers would be able to use this mode however way they choose: They could watch video *or* do anything else online. Alternatively, carriers could offer customers an option to access zero-rated content in times of low traffic, say 11pm to 6am.

If an application provider wanted to pay for "free data", it could pay an ISP to make available a certain amount of unrestricted data to all of the ISPs' customers. However, to avoid the problems associated with the forms of zero-rating for a fee described above, this payment could not be linked to the use of the application providers' application and would have to be made available to all customers of the ISP. And how the ISPs' customers want to use the data would be up to them. For example, the offering could be marked as "200 MB of unrestricted data brought to you by NameOfSponsoringProvider," (so it would still offer the application provider a promotional benefit), but it would not be tied to use of the providers' application, and users would be able to use it in any way they like.

Such alternatives show that carriers can offer innovative and competitive plans to attract customers without endangering net neutrality principles.

Attachments

Ananny, Mike, Jonathan Askin, Patricia Aufderheide, Jonathan B. Baker, Carliss Y. Baldwin, Jack Balkin, et al. 2015. Letter of 36 leading scholars to the Federal Trade Commission and to the Federal Communications Commission. Attachment to Ex Parte letter in the Matter of Protecting and Promoting the Open Internet submitted February 2, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001025192

van Schewick, Barbara. 2015. The Case for Meaningful Network Neutrality Rules. Report submitted as Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted February 20, 2015 to the Federal Communications Commission GN Dkt. No. 14-28.
Report: http://apps.fcc.gov/ecfs/document/view?id=60001031682

[40] For a longer discussion, see van Schewick (2016b), pp. 31-34.

All documents filed with FCC, including cover letter, report and attachments to report: http://apps.fcc.gov/ecfs/comment/view?id=60001018648

van Schewick, Barbara. 2015. "Network Neutrality and Quality of Service: What a Nondiscrimination Rule Should Look Like." Stanford Law Review, 67(1): 1-166. Article: http://www.stanfordlawreview.org/sites/default/files/67_Stan_L_Rev_1_van_Schewick.pdf

van Schewick, Barbara. 2015d. *Network Neutrality and Zero-rating.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted February 19, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001031582

van Schewick, Barbara. 2016b. *T-Mobile's Binge On Violates Key Net Neutrality Principles.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted January 29, 2016 to the Federal Communications Commission GN Dkt. No. 14-28. https://www.fcc.gov/ecfs/filing/60001386752/document/60001416320

References

18MillionRising.org, Access, Black Alliance for Just Immigration, Center for Media Justice, ColorOfChange.org, Common Cause, et al. 2015. Ex Parte to Federal Communications Commission. GN Dkt. No. 14-28. February 19. http://apps.fcc.gov/ecfs/document/view?id=60001031560

Ananny, Mike, Jonathan Askin, Patricia Aufderheide, Jonathan B. Baker, Carliss Y. Baldwin, Jack Balkin, et al. 2015. Letter of 36 leading scholars to the Federal Trade Commission and to the Federal Communications Commission. Attachment to Ex Parte letter in the Matter of Protecting and Promoting the Open Internet submitted February 2, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001025192

Ananny, Mike, Jonathan Askin, Patricia Aufderheie, Jonathan B. Baker, Carliss Y. Baldwin, Jack Balkin, et al. 2015. *"36 Leading Scholars to Federal Officials: Only the FCC Can Protect the Open Internet."* Letter to Edith Ramirez, Julie Brill, Maureen K. Ohlhausen, Joshua D. Wright & Terrell McSweeny. January 29. https://cyberlaw.stanford.edu/downloads/ProfessorLetterToFTC-20150129.pdf

AT&T. 2016. "Sponsored Data." *AT&T.* http://www.att.com/att/sponsoreddata/en/index.html

Balkin, Jack M. 2009. *Testimony before the Federal Communications Commision at its Workshop on Speech, Democratic Engagement, and the Open Internet.* Federal Communications Commission. http://apps.fcc.gov/ecfs/comment/view?id=6015504602

Benkler, Yochai. 2000. "From Consumers to Users: Shifting the Deeper Structures of Regulation Towards Sustainable Commons and User Access." *Federal Communications Law Journal*, 52(3): 561-579.

Cerf, Vinton G. 2006. *Testimony before the United States Senate, Committee on Commerce, Science, and Transportation, at its Hearing on: Network Neutrality.* commerce.senate.gov/pdf/cerf-020706.pdf

Chetty, Marshini, Ricahrd Banks, A.J. Bernheim Brush, Jonathan Donner & Rebecca E. Grinter. 2012. "“You're Capped!” Understanding the Effects of Bandwidth Caps on Broadband

Use in the Home." *SIGCHI Conference on Human Factors in Computing Systems*: 3021-3030.

Chetty, Marshini, Hyojoon Kim, Srikanth Sundaresan, Sam Burnett, Nick Feamster & W. Keith Edwards. 2015. "uCap: An Internet Data Management Tool For The Home." *CHI 2015 - 33rd Annual ACM Conference on Human Factors in Computing Systems*: 3093-3102.

cocobandicoot. 2015. "Any word on whether the new "Apple Music" streaming service will be included in Music Freedom?" *T-Mobile Wiki.* July https://www.reddit.com/r/tmobile/comments/3bnyty/any_word_on_whether_the_new_apple_music_streaming/

Common Cause. 2015. Notice of Ex Parte to Federal Communications Commission. GN Dkt. No. 14-28. February 18. http://apps.fcc.gov/ecfs/document/view?id=60001030690

CTIA - The Wireless Association. 2014. *CTIA Mobile Wireless Service Survey.* http://www.ctia.org/docs/default-source/default-document-library/2014-ctia-mobile-wireless-service-survey-final.pdf

Digital Fuel Monitor. 2014a. *92 Vertically Discriminated Zero-Rated Mobil Services in OECD, November 2014.* http://dfmonitor.eu/downloads/92_vertically_discriminated_zerorated_mobile_services_OECD_Q42014_PUBLIC.pdf

Digital Fuel Monitor. 2014b. *Still not convinced that some EU telcos are trying to foreclose the mobile cloud storage market?* Digital Fuel Monitor. http://dfmonitor.eu/downloads/Still_not_convinced_that_some_EU_telcos_are_trying_to_foreclose_the_mobile_cloud_storage_market_09062014_PUBLIC.pdf

Digital Fuel Monitor. 2015. *In the Netherlands, where zero-rating is banned, KPN just doubled (free of charge) the mobile internet volume caps to encourage a carefree usage of its online videos.* http://dfmonitor.eu/downloads/Banning_zerorating_leads_to_higher_volume_caps_06022015.pdf

Digital Fuel Monitor. 2016. *The state of 4G pricing – 1st half 2016. Premium Version.* Digital Fuel Monitor. http://dfmonitor.eu/insights/2016_jan_premium_tightoligopoly_eu28/

Drossos, Antonios. 2015. "Guest blog: the real threat to the open Internet is zero-rated content." *World Wide Web Foundation.* February 17. http://webfoundation.org/2015/02/guest-blog-the-real-threat-to-the-open-internet-is-zero-rated-content/

Federal Communications Commission. 2014. "Open Internet Roundtable - Policy Approaches." September 16. https://www.fcc.gov/news-events/events/2014/09/open-internet-roundtable-policy-approaches

Frischmann, Brett M. & Barbara van Schewick. 2007. "Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo." *Jurimetrics Journal*, 47(4): 383–428.

Future of Music Coalition. 2015. Notice of Ex Parte to Federal Communications Commission. GN Dkt. No. 14-28. February 18. http://apps.fcc.gov/ecfs/document/view?id=60001029916

Horrigan, John B. 2014. *Smartphones and Broadband: Tech users see them as complements and very few would give up their home broadband subscription in favor of their smartphone.* Attachment (Smartphones and Broadband) to Public Knowledge's Ex Parte In the Matter of Protecting and Promoting the Open Internet submitted November 13, 2014 GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60000983277

Knutson, Ryan. 2014. "Will Free Data Become the Next Free Shipping?" *The Wall Street Journal.* October 24. http://www.wsj.com/articles/will-free-data-become-the-next-free-shipping-1414105542

Lemley, Mark A. & Lawrence Lessig. 1999. Ex Parte to Federal Communications Commission. CS Dkt. No. 99-251. November 10. http://fjallfoss.fcc.gov/ecfs/document/view?id=6009850930

Mad Hatman (@madhatman). 2015. "@TuneInSupport ok. I guess I won't be using @tunein unless on wifi. You just got #zerorated to chose others on @TMobile #MusicFreedom. Thnx." *Twitter.* December 1. https://twitter.com/madhatman/status/671901027818323968

Nevo, Aviv, John L. Turner & Jonathan W. Williams. 2015. *Usage-Based Pricing and Demand for Residential Broadband.* National Bureau of Economic Research. NBER Working Paper No. 21321. http://www.nber.org/papers/w21321.pdf

Reed, David P. 2010. "A Respone to Barbara van Schewick: Code Needs (Only a Little) Help From the Law." *dpr.* December 15. http://www.reed.com/blog-dpr/?p=85

Rewheel. 2014a. *EU28 & OECD mobile internet access competitiveness report Q4 2014.* http://dfmonitor.eu/insights/2014_nov_premium_q4_update/

Rewheel. 2014b. *Mobile Internet usage price rankings & internet speeds EU 28 & OECD mobile operators - Q4 2014.* http://dfmonitor.eu/insights/2014_nov_premium_q4_update/

Sam (@Sammy1AM). 2015. "@amazonmusic not being part of @TMobile 's #MusicFreedom is about all that's keeping me from switching from Spotify now that I have Prime." *Twitter.* November 10. https://twitter.com/sammy1am/status/664326941747511296

travysh. 2015. "T-Mobile Still Doesn't Understand (Or Simply Doesn't Care) That Their 'Music Freedom' Plan Tramples Net Neutrality." *Reddit.* https://www.reddit.com/r/technology/comments/2net29/tmobile_still_doesnt_understand_or_simply_doesnt/cmdbl9n

Trinition. 2015. "T-Mobile Still Doesn't Understand (Or Simply Doesn't Care) That Their 'Music Freedom' Plan Tramples Net Neutrality." *Reddit.* https://www.reddit.com/r/technology/comments/2net29/tmobile_still_doesnt_understand_or_simply_doesnt/cmdy93o

Union des Consommateurs. 2013. *Limited Usage of Mobile Internet Access Services: Informing and Protecting Consumers. Final Project Report Presented to the Office of Consumer Affairs, Canada.* ISBN 978-2-923405-54-4. http://uniondesconsommateurs.ca/docu/telecom/18-donnees-mobiles-rapport-F-complet-Eng.pdf

Union Square Ventures. 2015. Letter to Federal Communications Commission. GN Dkt. No. 14-28. February 18. http://apps.fcc.gov/ecfs/document/view?id=60001030760

United States Government Accountability Office. 2014. *Broadband Internet: FCC Should Track the Application of Fixed Internet Usage-Based Pricing and Help Improve Consumer Education.* United States Government Accountability Office. GAO-15-108. http://www.gao.gov/assets/670/667164.pdf

van Schewick, Barbara. 2004. "Architecture and Innovation: The Role of the End-to-End Arguments in the Original Internet." PhD Dissertation. Technical University Berlin.

van Schewick, Barbara. 2007. "Towards an Economic Framework for Network Neutrality Regulation." *Journal on Telecommunications and High Technology Law*, 5(2): 329-391.

van Schewick, Barbara. 2010a. *Internet Architecture and Innovation.* Cambridge, MA: MIT Press.

van Schewick, Barbara. 2010b. *Opening Statement at the Federal Communications Commission's Workshop on Approaches to Preserving the Open Internet.* Federal Communications Commission. http://www.law.stanford.edu/display/images/dynamic/publications_pdf/schewick-statement-20100428.pdf

van Schewick, Barbara. 2010c. *Opening Statement at the Federal Communications Commission's Workshop on Innovation, Investment and the Open Internet in Cambridge, MA on January 13, 2010.* Attachment to Barbara van Schewick's Ex Parte to Federal Communications Commission submitted on January 19, 2010 GN Dkt. No 09-191. http://fjallfoss.fcc.gov/ecfs/document/view?id=7020382126

van Schewick, Barbara. 2014. *The FCC Changed Course on Network Neutrality. Here is Why You Should Care.* . Attachment to Barbara van Schewick's Notice of Ex Parte Conversation In the Matter of Protecting and Promoting the Open Internet submitted April 25, 2014 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=7521099988

van Schewick, Barbara. 2015a. *Analysis of Proposed Network Neutrality Rules.* Attachment to Barbara van Schewick's Ex Parte In the Matter of Protecting and Preserving the Open Internet submitted February 18, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001030846

van Schewick, Barbara. 2015b. *The Case for Meaningful Network Neutrality Rules.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted February 20, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001031682

van Schewick, Barbara. 2015c. "Network Neutrality and Quality of Service: What a Nondiscrimination Rule Should Look Like." *Stanford Law Review*, 67(1): 1-166.

van Schewick, Barbara. 2015d. *Network Neutrality and Zero-rating.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted February 19, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001031582

van Schewick, Barbara. 2015e. *The Record Demonstrates Significant Support for Strong Rules.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted February 20, 2015 to the Federal Communications Commission GN Dkt. No. 14-28. http://apps.fcc.gov/ecfs/document/view?id=60001031683

van Schewick, Barbara. 2016a. Comments to Canadian Radio-Television and Telecommunications Commission. File number: 1011-NOC2016-0192. June 28. https://services.crtc.gc.ca/pub/DocWebBroker/OpenDocument.aspx?DMID=2647611

van Schewick, Barbara. 2016b. *T-Mobile's Binge On Violates Key Net Neutrality Principles.* Attachment to Barbara van Schewick's Ex Parte in the Matter of Protecting and Promoting the Open Internet submitted January 29, 2016 to the Federal Communications Commission GN Dkt. No. 14-28. https://www.fcc.gov/ecfs/filing/60001386752/document/60001416320

van Schewick, Barbara & Morgan Weiland. 2015. "New Republican Bill Is Network Neutrality in Name Only." *Stanford Law Review Online*, 67(January 2015): 85-99.

Verizon. 2016. "Introducing FreeBee Data: The new sponsored data service from Verizon." *Verizon.* January 19. http://www.verizon.com/about/news/introducing-freebee-data-new-sponsored-data-service-verizon

Vimeo, Cogent Communications, Contextly, Distinc.tt, Dwolla, Engine Advocacy, et al. 2015. Letter to Federal Communications Commission. GN Dkt. No. 14-28. February 20. http://apps.fcc.gov/ecfs/document/view?id=60001031567

Yiakoumis, Yiannis. 2015. "What is wrong with zero rating, and how to fix it." *Medium.* November 30. https://medium.com/@gyiakoumis/what-is-wrong-with-zero-rating-and-how-to-fix-it-7eb229e9e610