

ORAL ARGUMENT SCHEDULED FOR FEBRUARY 1, 2019

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

Case No. 18-1051 (and consolidated)

MOZILLA CORPORATION, ET AL.,
Petitioners,

v.

**FEDERAL COMMUNICATIONS COMMISSION
and UNITED STATES OF AMERICA,**
Respondents.

ON PETITIONS FOR REVIEW OF AN ORDER
OF THE FEDERAL COMMUNICATIONS COMMISSION

**BRIEF FOR AMICUS CURIAE ROSLYN LAYTON
IN SUPPORT OF RESPONDENTS**

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October 18, 2018

**CERTIFICATE AS TO PARTIES, RULINGS, RELATED CASES,
AND OF COUNSEL REGARDING NECESSITY OF SEPARATE
AMICUS CURIAE BRIEF**

A. Parties

Except for the following, all parties, intervenors, and amici appearing in this Court are listed in the Brief for Respondents Federal Communications Commission and United States of America.

The following additional parties have filed either notice or motion for leave to participate as an *amici*, as of the date of this filing:

- International Center for Law and Economics and Participating Scholars
- Multicultural Media, Telecom and Internet Council
- Phoenix Center for Advanced Legal and Economic Public Policy Studies
- The National Association of Manufacturers, The Chamber of Commerce of the United States of America, The Business Roundtable, and The Telecommunications Industry Association
- Richard Bennett, John Day, Tom Evslin, Shane Tews, and Martin Geddes
- Tech Knowledge
- Technology Policy Institute
- Washington Legal Foundation and Southeastern Legal Foundation

B. Rulings Under Review

The ruling under review is a promulgation of the Federal Communications Commission (FCC), *Restoring Internet Freedom*, Declaratory Ruling, Report, and Order, 33 FCC Rcd 311 (2018) (“*RIF Order*”) (JA-__).

C. Related Cases

Related cases appear listed in the Brief for Respondents.

D. Necessity of Separate Amicus Curiae Brief

A separate brief from amicus curiae Roslyn Layton is necessary because—as described *infra*—Roslyn Layton possesses a unique perspective from having published peer-reviewed research on an empirical investigation she performed on the impact of net neutrality rules to mobile application innovation in 53 countries, using recognized measurement tools and statistical methods from data science. Accordingly, this brief will help the Court to understand why the *Restoring Internet Freedom Order* was reasonable and justified given the academic evidence, or lack thereof, for the virtuous circle theory that was previously relied on to justify utility regulation and the positive effects of light touch regulation internationally as compared to heavy regulation.

CORPORATE DISCLOSURE STATEMENT

Roslyn Layton is an individual and is not subject to the corporate disclosure requirements of Fed. R. App. P. 26.1 and D.C. Cir. R. 26.1.

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Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601 (2015)3, 4, 5, 7

Restoring Internet Freedom, Declaratory Ruling, Report & Order, and Order, 33 FCC Rcd 311 (2018)4, 8

OTHER AUTHORITIES

Joint Pet’r’s for Intervenor Br. 3, Aug. 27, 2018, ECF No. 174743311

Reply Comments of Roslyn Layton, *Protecting and Promoting the Open Internet*, GN Docket No. 14-28 at 3 (filed Sep. 15, 2014)9

Roslyn Layton, “Does Net Neutrality Spur Internet Innovation?” at 3-4, AEI (Aug. 2017) (Attached to Reply Comments of Silvia Elaluf-Calderwood, PhD., *Restoring Internet Freedom*, GN Docket No. 17-108 (filed Aug. 29, 2017)15

**STATEMENT OF IDENTITY, INTEREST IN CASE,
AND SOURCE OF AUTHORITY TO FILE
AS AMICUS CURIAE**

Roslyn Layton is a scholar on regulatory economics who has written extensively about internet regulation. Her academic publications on internet regulation include:

- ROSLYN LAYTON, WHICH OPEN INTERNET FRAMEWORK IS BEST FOR MOBILE APP INNOVATION?: AN EMPIRICAL INQUIRY OF NET NEUTRALITY RULES AROUND THE WORLD (Aalborg University Press, 2017), [http://vbn.aau.dk/en/publications/which-open-internet-framework-is-best-for-mobile-app-innovation\(b1f05c8d-b31e-47cd-b19d-bcf6893e7e5b\).html](http://vbn.aau.dk/en/publications/which-open-internet-framework-is-best-for-mobile-app-innovation(b1f05c8d-b31e-47cd-b19d-bcf6893e7e5b).html) (last visited Oct 18, 2018)
- ROSLYN LAYTON & SILVIA ELALUF-CALDERWOOD, ZERO RATING: DO HARD RULES PROTECT OR HARM CONSUMERS AND COMPETITION? EVIDENCE FROM CHILE, NETHERLANDS AND SLOVENIA (Social Science Research Network, 2015), <https://papers.ssrn.com/abstract=2587542> (last visited Oct 18, 2018)
- BRONWYN E. HOWELL & ROSLYN LAYTON, EVALUATING THE CONSEQUENCES OF ZERO-RATING: GUIDANCE FOR REGULATORS AND ADJUDICATORS (Social Science Research Network, 2016), <https://papers.ssrn.com/abstract=2757391> (last visited Oct 18, 2018)
- Roslyn Layton, “Evidenced-Based Internet Policy for Emerging Nations: Maximizing Network Investment And Local Content Development,” *Competitiveness in Emerging Markets: Market Dynamics in the Age of Disruptive Technologies* (Springer, 2018) <https://www.springer.com/gp/book/9783319717210>

Ms. Layton has held an academic appointment at Aalborg University, Center for Communication, Media and Information Technologies to study the economic impact of information communication and information technology policy. She is a Visiting Scholar at the American Enterprise Institute. She serves on the Program

Committee of the Telecom Policy Research Conference. She has testified on internet policy, privacy, antitrust, competition and regulation before the United States Senate Judiciary and Commerce Committees and before telecom regulators in Canada, Mexico, Colombia, Peru, India, Denmark, Norway, Sweden, and at the United Nations Internet Governance Forum.

Ms. Layton is filing solely as an individual and not on behalf of any institution. *See* D.C. Cir. R. 29(d). All parties have consented to the filing of this brief, subject to applicable word count limitations. *See* Fed. R. App. P. 29(a)(2); D.C. Cir. R. 29(b).

STATEMENT OF AUTHORSHIP AND FINANCIAL CONTRIBUTIONS

No party's counsel authored this brief in whole or in part. No party or party's counsel contributed money intended to fund the preparation or submission of this brief, and no person other than amicus and her counsel contributed money intended to fund the preparation or submission of this brief.

STATUTES AND REGULATIONS

Pertinent statutes and regulations are contained in the Respondent's Brief.

INTRODUCTION AND SUMMARY OF ARGUMENT

The 2015 *Title II Order's* conception of a rarefied "virtuous circle" is an invented notion, unsupported by the most cited works of the academic literature of innovation. Nor does that literature support the *Title II Order's* prophylactic price and data controls to stimulate internet innovation. Moreover, an empirical investigation of net neutrality policies worldwide demonstrates that countries with hard bright line rules do not exhibit increased innovation at the edge. On the contrary, increased edge innovation is seen in countries with soft net neutrality rules (*e.g.*, Sweden, Norway, Denmark, South Korea) and in countries with no rules at all. Acknowledging that there is no academic or empirical support of the virtuous circle theory to justify regulating broadband internet access service ("BIAS") as a utility service, or the bright line rules adopted in the *Title II Order*, the Federal Communications Commission was correct to restore the proven policy

approach employed from 1996 to 2015 in the *Restoring Internet Freedom Order* (“*RIF Order*”).

ARGUMENT

I. THE COMMISSION’S DETERMINATION THAT A LIGHT TOUCH REGULATORY APPROACH BEST SUPPORTS INTERNET OPENNESS, INVESTMENT, AND INNOVATION WAS REASONABLE AND RATIONAL.

As the *RIF Order* correctly notes, “the economic analysis in the [2010] *Open Internet Order* and *Title II Order* was at best only loosely based on the existing economics literature, in some cases contradicted peer-reviewed economics literature, and included virtually no empirical evidence.”¹ Given that the “virtuous circle” theory and its associated regulatory regime has no justification in the academic literature, no empirical test or proof, or independently verifiable measure of its efficacy, the *RIF Order* properly rejected the virtuous circle as the basis for regulation.

The *Title II Order* declared that internet innovation is predicated on a “virtuous circle” which operates in clockwise fashion: (1) “Edge providers” create services and applications which are demanded by users; (2) users purchase broadband to access the apps and services; and finally, (3) BIAS providers invest

¹ *Restoring Internet Freedom*, Declaratory Ruling, Report & Order, and Order, 33 FCC Rcd 311, 381 ¶ 118 (2018) (“*RIF Order*”) (JA-___).

in networks to facilitate the other two processes.² Without any source of authority or evidence, the *Title II Order* pinpoints the essential actors, their inherent motivations, and an unwavering chronological process that moves in a clockwise direction.³ This is a presumptuous statement to make with little to no academic or empirical support for a market as large and complex as America's internet-enabled information technology economy. Indeed, network engineers in *Verizon v. FCC* testified to the fact that investment by internet service providers ("ISPs") frequently precedes innovation, noting that the virtuous circle could turn both clockwise and counterclockwise and that ISP investment could also be shown to spur edge provider service development.⁴

An example of proof to the contrary of the virtuous circle theory is the mobile application "Uber," which recorded its first live ride in San Francisco in 2010.⁵ A critical mass of smartphones and 3G, 4G and 4G/LTE networks⁶ enabled

² "Edge provider development "increase[s] end-user demand for [Internet access services], which [drive] network improvements, which in turn lead to further innovative network uses." See *Protecting and Promoting the Open Internet*, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601, 5603, 5604, 5608-09, ¶¶ 2, 7, 20-21 (2015) ("*Title II Order*") (JA-__); see also *Preserving the Open Internet; Broadband Industry Practices*, Report and Order, 25 FCC Rcd 17905, 17910-11, ¶ 14 (2010) ("*Open Internet Order*") (JA-__).

³ See *Title II Order*, 30 FCC Rcd at 5603, ¶ 7 (JA-__).

⁴ Br. Amicus Curiae of Internet Engineers & Technologists at 22, Nov. 15, 2012, ECF No. 1405207, *Verizon v. FCC*, 740 F.3d 623 (D.C. Cir. 2014).

⁵ Avery Hartmans & Nathan McAlone, "The story of how Travis Kalanick built Uber into the most feared and valuable startup in the world," *Business Insider* (Aug. 1, 2016), <https://www.businessinsider.com/ubers-history>.

the necessary network effects for a seamless, peer-to-peer ride-hailing and food delivery app like Uber to come into being. 4G/LTE required years of planning both in international standards development and spectrum allocation.⁷ ISPs had to purchase spectrum, rollout network equipment, and—crucially—sell phones and subscriptions all before there was an app economy.⁸ The iPhone, one of the most significant innovations in the mobile economy, was launched in an exclusive partnership between AT&T and Apple in 2007.⁹ At the time, it was only a 2G phone: it had no high-speed mobile apps as we know them today. The Apple App Store came a year later. AT&T helped to make the iPhone more affordable with subsidies to reduce the cost.¹⁰ Because of the ubiquity of smartphones and the speed of networks to support real-time geolocation capabilities, Uber was able to

(footnote continued)

⁶ “MetroPCS Launches First 4G LTE Services in the United States and Unveils World’s First Commercially Available 4G LTE Phone,” CNN Money (Sep. 21, 2010), <https://money.cnn.com/news/newsfeeds/articles/prnewswire/MM68045.htm>.

⁷ See Mike Dano, “U.S. LTE Buildout Timelines,” FierceWireless, <https://www.fiercewireless.com/special-report/u-s-lte-buildout-timelines> (last accessed October 18, 2018); Recon Analytics LLC, “How America’s 4G Leadership Propelled the U.S. Economy” (April 16, 2018), https://api.ctia.org/wp-content/uploads/2018/04/Recon-Analytics_How-Americas-4G-Leadership-Propelled-US-Economy_2018.pdf.

⁸ Strand Consult. “Korea’s Mobile Market – A Window to 3G,” 2004, <http://www.strandconsult.dk/sw485.asp>. Although the first smartphones (phones with computing functions) came from Nokia, Ericsson, and Motorola, it was the iPhone that popularized the smartphone. The first mobile apps appeared in South Korea and Japan in the mid-1990s and were used on basic mobile feature phones, not smartphones.

⁹ Jeffrey Powers, “Apple Releases 1st Gen iPhone,” Day in Tech History (June 29, 2016), <https://dayintechhistory.com/dith/june-29-2007-apple-releases-1st-gen-iphone-edge>.

¹⁰ Saul Hansell, “The \$831 iPhone,” *Bits Blog* (blog) (Oct. 25, 2007), <https://bits.blogs.nytimes.com/2007/10/25/the-831-iphone>.

provide \$11.3 billion dollars' worth of services across the globe in the first quarter of 2018 alone.¹¹

Apple's voice assistant, Siri, is another example that undermines the virtuous circle theory. While the technology for speech recognition was long in the making at many institutes around the world, Siri did not appear until the iPhone 4S was released in October 2011. Mobile networks had to have sufficient signal processing capacity before Siri could become standard in Apple's online ecosystem. These are only a couple of examples of how ISP investment has been shown to spur edge provider service development, not the other way around.

The *Title II Order* incorrectly asserts that the ISP is the only "gatekeeper" in the virtuous circle.¹² ISPs were perceived as singularly bad actors in a complex, interconnected system. In fact, the notion that the ISP would act as a gatekeeper to stymie edge provider innovation contradicts the very description of the virtuous circle theory. It is illogical to assert that the ISP benefits financially from the virtuous circle and would simultaneously try to undermine it. Such a behavior is not profit maximizing. While it is clear that ISP investments enable investment in

¹¹ Johanna Bhuiyan, "Uber turned a profit thanks to its deals in Southeast Asia and Russia," Recode (May 23, 2018), <https://www.recode.net/2018/5/23/17380952/uber-2018-financials-yandex-grab-softbank>.

¹² The *Title II Order* concluded that Commission action was necessary to protect this virtuous cycle because "gatekeeper" power on the part of ISPs might otherwise thwart it. *See Title II Order*, 30 FCC Rcd at 5608-09, 5628, ¶¶ 20-21, 78 (JA-__); *see also Open Internet Order*, 25 FCC Rcd at 14868, ¶ 24 (JA-__) (asserting that "broadband providers have the ability to act as gatekeepers").

applications at the edge, there is no empirical evidence that innovations at the edge are necessary for broadband investment. Such a theory is not found in the academic research and cannot be relied on as the basis for subjecting only broadband network providers to heavy-handed regulation.

The *RIF Order* correctly observes that the proper model for the internet is that of two-sided markets.¹³ The two-sided markets theory is one of the most referenced subjects in the innovation literature, with thousands of peer-reviewed articles covering a variety of industries. The theory was first proposed by Nobel economist Jean Tirole¹⁴ and Jean-Charles Rochet in 2003¹⁵ and offers a robust counterpoint to the *Title II Order's* virtuous circle theory. The theory of two-sided markets observes that there is an inherent incentive to price efficiently, lessening the likelihood of market failure. Platforms want to get both sides of the market “on board” so they tend to maximize—not foreclose—the participation of the other parties. Anything that an ISP does to foreclose one side or the other, reduces its profits. This suggests that there is no incentive for operators to behave in a way that harms content providers or users. One illustration of this cooperative operator-

¹³ See *RIF Order*, 33 FCC Rcd at 81 ¶ 119 (JA-___) (“The underlying economic model of the virtuous cycle is that of a two-sided market.”).

¹⁴ “Jean Tirole—Facts,” Nobel Media, http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2014/tirole-facts.html (last accessed Oct. 18, 2018) (awarded for “his analysis of market power and regulation”).

¹⁵ Jean-Charles Rochet & Jean Tirole, “Platform Competition in Two-Sided Markets,” 1(4) *Journal of the European Economic Association* 990–1029 (2003), <https://www.rchss.sinica.edu.tw/cibs/pdf/RochetTirole3.pdf> (“Rochet & Tirole”).

content provider relationship is Comcast's partnership with Netflix.¹⁶ In 2016, Comcast, a cable provider, gave consumers the opportunity to add Netflix, a popular, over-the-top streaming service, to its Xfinity cable subscription package. Users who purchased this option were able to browse and access Netflix content seamlessly in Comcast's library via Comcast's X1 user interface. Netflix proved to be one of the most popular on demand services on Comcast's X1 platform, while X1 drove increased Netflix subscriptions. Unsurprisingly, both companies expanded their partnership in 2018.¹⁷

Jan Sapprasert and Koson Fagerberg analyzed top academic papers on innovation as measured by citations and impact before and after 1985.¹⁸ The key theories that emerge include two sided markets,¹⁹ creative destruction,²⁰ disruptive innovation,²¹ complementary assets,²² the innovation ecosystem,²³ and the

¹⁶ See Reply Comments of Roslyn Layton, *Protecting and Promoting the Open Internet*, GN Docket No. 14-28 at 3 (filed Sep. 15, 2014), <https://ecfsapi.fcc.gov/file/7522710801.pdf>; Press Release, "Comcast and Netflix Expand Partnership Following Successful Xfinity X1 Integration" (April 13, 2018), <https://corporate.comcast.com/press/releases/comcast-and-netflix-expand-partnership-following-successful-xfinity-x1-integration>.

¹⁷ *Id.*

¹⁸ Jan Fagerberg & Koson Sapprasert, "TIK Working Papers on Innovation Studies," Centre for Technology, Innovation and Culture, UiO, Nov. 2011, <https://www.sv.uio.no/tik/InnoWP/Fagerberg%20%26%20Sapprasert%2020111115.pdf>.

¹⁹ Rochet & Tirole, *supra* n. 15.

²⁰ J.A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* (Harper, 1942).

²¹ CLAY CHRISTIANSEN, *THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL* (Harvard Business Review, 1997).

diffusion of innovation.²⁴ The virtuous circle theory does not appear in this authoritative review.

If the *Title II Order* had taken an honest and forthright review of the academic literature, the virtuous circle theory would not have been relied on as the basis for a decision to impose utility-style regulation on ISPs to incentivize innovation at the edge. Another option available to the FCC would have been to conduct an empirical test of the various Open Internet policies attempted over the years. The following section describes one such test which demonstrates that soft or no regulation of BIAS results in more innovation than hard rules, particularly with respect to mobile BIAS.

II. A RANGE OF POLICY INSTRUMENTS HAVE WORKED TO PROTECT NET NEUTRALITY, INCLUDING REGULATORY REGIMES LIKE THE ONE UNDER REVIEW.

A variety of policies can preserve net neutrality. Indeed, Ms. Layton's research shows statistical significance for the superiority of soft policy instruments, such as the multistakeholder model, code of conduct, and self-regulation. No country which has employed "hard" regulation for net neutrality, such as the rules

(footnote continued)

²² David Teece, "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," 15(6) *Research Pol'y* 285-305 (Dec. 1986), [https://doi.org/10.1016/0048-7333\(86\)90027-2](https://doi.org/10.1016/0048-7333(86)90027-2).

²³ BENGT-ÅKE LUNDVALL, ED., *NATIONAL SYSTEMS OF INNOVATION: TOWARD A THEORY OF INNOVATION AND INTERACTIVE LEARNING*, Revised Ed. (Anthem Press, 2010).

²⁴ EVERETT ROGERS, *DIFFUSION OF INNOVATIONS*, 5th Ed. (Free Press, 2003).

in the *Title II Order*, has prompted greater edge innovation than in countries with lighter touch regulation.

Non-government petitioners concede that the FCC's earlier, light-touch policy measures successfully protected internet openness. Referring to a series of different measures including the Four Freedoms, the *2010 Open Internet Order*, and the Open Internet Advisory Committee, the petitioners favorably observed, "The FCC's Long-standing net neutrality protections fueled growth and innovation for both ISPs and the internet economy."²⁵ Yet, the *2015 Order* far exceeded these earlier measures—even though it was far from clear that such harder rules would lead to more innovation. This should have been tested in advance. Evidence-based policymaking is a rational, linear process to make decisions based upon an evaluation of problems and possible solutions, the collection of information about the solutions, and the measurement of outcomes expected with possible solutions.²⁶

²⁵ Joint Pet'r's for Intervenor Br. 3, Aug. 27, 2018, ECF No. 1747433 (JA-___).

²⁶ Roslyn Layton, "Evidenced-Based Internet Policy for Emerging Nations: Maximizing Network Investment and Local Content Development" in *COMPETITIVENESS IN EMERGING MARKETS: MARKET DYNAMICS IN THE AGE OF DISRUPTIVE TECHNOLOGIES, CONTRIBUTIONS TO MANAGEMENT SCIENCE* at 211-29 (Springer Int'l Publishing, 2018), [//www.springer.com/gp/book/9783319717210](http://www.springer.com/gp/book/9783319717210). Too frequently emotional arguments are made for a desired policy which otherwise is not justified by the technical or economic requirements. An evidence-based approach is (1) aligned with national laws and institutional goals; (2) based on rational, comprehensive data and evidence—both quantitative and qualitative; (3) clearly states the reasons why it's needed and the proposed outcome; (4) provides a framework for achieving the outcome; (5) concise, clearly communicated and widely understood; (6) creates value and benefits with measurable outcomes; and (7) monitored, evaluated and reviewed regularly. Policy research is the methodical enquiry of the efficacy of political decisions over a period. Such analyses are concerned with the effects and implementation of a policy.

(continued on next page)

Ms. Layton's research in evidence-based policy demonstrates how a study of policy measures could be constructed and what the evidence says about the approach taken in the *Title II Order*.²⁷

Over the past decade, there have been a series of natural experiments on net neutrality at the nation-state level, providing an opportunity to study the policy instruments and their effects. Net neutrality rules around the world can be characterized as either “soft” or “hard.”²⁸ Soft, or voluntary, rules consist of principles, codes of conduct, multi-stakeholder dialogue, and self-regulation. In soft regimes, the telecom regulator plays the role of a facilitator, allowing experimentation and partnerships in the internet value chain but maintaining the ability to intervene if harm occurs. Hard rules, on the other hand, are mandatory and rigid, with substantial penalties for non-compliance. Promulgated through legislation or regulation, these rules generally prohibit blocking, throttling, and prioritization.

(footnote continued)

Performance measures could include effectiveness (how does the policy address the targeted problem), unintended effects, and equity (what are the effects on different groups). The implementation considers issues such as the cost, feasibility, and acceptability. The objective is to inquire to what degree is policy effective to achieve its stated goal.

²⁷ ROSLYN LAYTON, WHICH OPEN INTERNET FRAMEWORK IS BEST FOR MOBILE APP INNOVATION?: AN EMPIRICAL INQUIRY OF NET NEUTRALITY RULES AROUND THE WORLD at 114 (Aalborg University Press) (2017), http://vbn.aau.dk/files/255922611/PHD_Roslyn_Layton_E_pdf_rettet.pdf (last visited Oct 18, 2018) (“LAYTON THESIS”) (describing how such empirical tests can be performed).

²⁸ *Id.* at 127.

Beginning in 2009, countries like Sweden, Norway, and Denmark implemented voluntary soft net neutrality rules.²⁹ For some five years, these rules were largely successful. Edge application innovation continued, there were no significant violations, and there was no litigation against regulators. Despite the success of countries with soft rules and against the wishes of the Nordic and United Kingdom telecom regulators, the European Parliament promulgated hard net neutrality rules through legislation in April 2016.³⁰ Japan and South Korea, innovative countries with high degrees of network investment, still maintain their existing soft regimes today.³¹ Switzerland, another innovative country, has had a successful regime of a voluntary code of conduct for many years.³²

²⁹ *Id.* at 129.

³⁰ *Id.* at 132.

³¹ *See id.* at 216, 442-43.

³² *See id.* at 442-43.

Table 1. Countries with Soft vs. Hard Rules for Net Neutrality

Soft Rules		Hard Rules	
Sweden	2009	Chile	2010
Norway	2009	Canada	2010
Japan	2010	The Netherlands	2012
France	2010	Colombia	2011
Denmark	2011	Peru	2012
United Kingdom	2011	Slovenia	2012
South Korea	2011	Turkey	2012
Austria	2013	Argentina	2013
Switzerland	2014	Israel	2013
		Ecuador	2013
		Brazil	2014
		Mexico	2014
		Italy	2015

Source: LAYTON THESIS, *supra* n. 27.

In 2010, Chile was the first country to enact a hard net neutrality law, a remedy to years of litigation against the telecom regulator for attempting to enforce rules for which it had no authority.³³ In 2012, the Netherlands³⁴ and Slovenia³⁵ were the first European countries to make hard net neutrality laws. Unsurprisingly, the effort to make harder, bright-line rules has been coupled with litigation against regulators in many countries, as bright-line rules frequently conflict with competition principles, free enterprise laws, and national constitutions.

³³ *Id.* at 225.

³⁴ *Id.* at 28, 129.

³⁵ *Id.* at 129.

High level results from a separate study on the mobile application economy suggest that promised benefits from net neutrality policy do not necessarily flow to the countries that make rules.³⁶ Countries like Chile and the Netherlands that have had hard net neutrality rules for years comprise a small fraction of the value of the mobile app economy, while China, which has no rules, continues to garner an increasing share of mobile app innovation, revenue, and downloads. China became the world's largest app market by downloads in 2016, surpassing the US, with more than 50 billion downloads and some USD \$10 billion in revenue.³⁷

To address the gap in regulators' analysis, Ms. Layton's research evaluated the impact of net neutrality rules across countries on mobile networks.³⁸ She hypothesized that countries that adopt net neutrality rules should experience an increase in mobile app innovation, whether in the number or rank of apps produced in the national economy. She developed a statistical methodology that measured

³⁶ Bryan Pon, "Winners & Losers in the Global App Economy" at 8, Caribou Digital. <http://cariboudigital.net/wp-content/uploads/2016/02/Caribou-Digital-Winners-and-Losers-in-the-Global-App-Economy-2016.pdf>.

³⁷ App Annie, "App Annie Mobile App Forecast: China to Surpass the US in 2016," Mar. 4, 2016, <https://www.appannie.com/en/insights/market-data/mobile-app-forecast-china-to-surpass-us-in-2016>.

³⁸ LAYTON THESIS, *supra* n. 27; *see also* Roslyn Layton, "Does Net Neutrality Spur Internet Innovation?" at 3-4, AEI (Aug. 2017), <https://ecfsapi.fcc.gov/file/10829080119475/Does%20Net%20Neutrality%20Spur%20Internet%20Innovation.pdf> (Attached to Reply Comments of Silvia Elaluf-Calderwood, PhD., *Restoring Internet Freedom*, GN Docket No. 17-108 (filed Aug. 29, 2017), <https://ecfsapi.fcc.gov/file/10829080119475/Elaluf%20Calderwood%20FCC%2029%20August%202017.pdf>).

the number of locally developed mobile apps in the country for relevant periods before and after rules were imposed, as well as the corresponding levels of downloads and, where possible, revenue. She used the app store software measurement tools AppAnnie and Apptopia and controlled the analysis for the sophistication and penetration of advanced mobile networks in the country. The results were regressed for the type of net neutrality rules, soft, hard or none.

To make more meaningful comparisons and avoid inevitable differences between countries, the investigation drilled down on two similar countries with different rules: Denmark with soft rules (self-regulation) and the Netherlands with hard rules (legislation with bright lines). There was no weighting for the type of app or its publisher as that would violate the net neutrality precept that all data are equal. A video game app was considered the same as an e-government app. The analysis consisted of counting all discrete apps that appeared in app stores in Denmark and the Netherlands and then identifying the country in which the app was made and its corresponding net neutrality regime.

Table 2. Countries of Origin for Top Apps Used in Denmark and the Netherlands (2010–16)

Soft Rules	Apps	No Rules	Apps
Austria	6	Australia	22
France	21	Belgium	3
Japan	7	Belarus	2
Norway	11	Bulgaria	1
South Korea	5	China	21
Switzerland	11	Czech Republic	4
Sweden	37	Egypt	1
United Kingdom	52	Finland	21
Total	150	Germany	26
Average	18.75	Hong Kong	2
Denmark	115	India	3
		Ireland	2
		Croatia	2
Hard Rules	Apps	Lebanon	3
Argentina	4	Liberia	1
Brazil	1	Lithuania	2
Canada	7	New Zealand	4
Israel	6	Russia	5
Italy	1	South Africa	1
Turkey	1	Spain	1
Total	20	United Arab Emirates	1
Average	3.33	Vietnam	2
The Netherlands	102	Total	130
		United States	302

Source: LAYTON THESIS, *supra* n. 27.

The results of the investigation did not support the hypothesis that hard rules promoted more edge innovation.³⁹ From 2012 to 2016, Denmark *increased* its local

³⁹ LAYTON THESIS, *supra* n. 27 at 4-5.

mobile app development, while the Netherlands *decreased* its development, both to a statistically significant degree. Over that period, Denmark produced 115 of the top apps in the country, while the Netherlands produced 102. At the time of measurement, both Denmark and the Netherlands had four mobile network operators and multiple mobile virtual network operators.

As for the total apps used in Denmark and the Netherlands during the period, just 20 apps were produced in countries with hard net neutrality rules. Notably, a significant number of apps (150) were produced in soft-rule countries outside of Denmark. Countries with no rules produced a significant number of apps (130) that were subsequently consumed in Denmark and the Netherlands. The US accounted for 302 apps, but these apps were published before the *2015 Open Internet Order*. Over that period, some apps were retired, some were merged into other platforms, and others continued in successive versions. The original research documents these evolutions.

The next table shows the statistical results of the rankings for apps from each type of net neutrality regime.⁴⁰

Table 3. App Store Rankings for Apps from Different Net Neutrality Regimes

		Denmark, 2012	Denmark, 2016	The Netherlands, 2011	The Netherlands, 2016
Mean	Locally Made	41.97	26.50	31.17	42.57
	USA	21.37	20.03	18.37	14.43
	Soft Rules	42.29	53.20	47.80	43.13
	Hard Rules	-	-	-	-
	No Rules	37.80	53.93	51.86	41.97
Median	Locally Made	43.5	27	34	46
	USA	23	21	16.5	13.5
	Soft Rules	40	59	48.5	38.5
	Hard Rules	-	-	-	-
	No Rules	42	51	49	45.5

Source: LAYTON THESIS, *supra* n. 27.

For example, the average Danish app increased in rank in the app store from 42 to 26 over the period, but the average Dutch app fell in rank from 31 to 43. The changes in rank status are statistically significant. There were so few apps from countries with hard rules that the rank analysis could not be performed.

Over that period, Denmark succeeded in producing several “killer apps,” which were adopted globally, notably the game “Subway Surfers” by Kiloo. The

⁴⁰ *Id.* at 5.

number of downloads and revenue of this single app over 90 days in 2016 exceeded the total downloads of the top 18 Dutch-made apps in the Netherlands for the same period and equaled the revenue (Table 4). Even with the world's toughest net neutrality law, the Dutch didn't succeed to produce a killer app for consumers during the period.

Table 4. The Global Success of “Subway Surfers”

90 Days in 2016	Denmark		The Netherlands	
	Downloads	Revenue	Downloads	Revenue
“Subway Surfers”	4.5 Million	\$3.6 Million	-	-
Top 18 Apps	8.2 Million	\$5.5 Million	2.7 Million	\$3.6 Million

Source: LAYTON THESIS, *supra* n. 27.

The net neutrality regime alone did not explain all the differences between Denmark and the Netherlands, so Ms. Layton investigated the level and type of mobile broadband networks and subscriptions. Denmark enjoyed a significantly higher rate of adoption of next-generation (3G and 4G) network subscriptions for mobile broadband.⁴¹ Moreover, Denmark displayed a significantly higher rate of postpaid mobile subscription (Table 5). A country with a high rate of postpaid advanced mobile broadband subscriptions (and smartphones) offers critical mass for app developers to deploy their innovations.

⁴¹ *Id.* at 6.

Table 5. Mobile Broadband Subscriptions in Denmark and the Netherlands

Denmark	2013	2014	2015	2016
2G Percentage of Total Subscriptions	26.3	22.0	17.9	14.3
3G or 4G Percentage of Total Subscriptions	73.7	78	82.2	85.6
Prepaid Percentage of Subscriptions	17.2	17.7	17.6	17.1
Postpaid Percentage of Subscriptions	82.8	82.3	82.4	82.9

The Netherlands	2013	2014	2015	2016
2G Percentage of Total Subscriptions	41.4	32.8	23.8	16.8
3G or 4G Percentage of Total Subscriptions	58.7	67.2	76.3	83.2
Prepaid Percentage of Subscriptions	37.3	39.1	38.8	37.6
Postpaid Percentage of Subscriptions	62.7	60.9	61.2	62.4

Source: Ovum, “Mobile Subscription Revenue and Forecast 2016–21,” August 2016.

In general, there was more economic freedom for Danish ISPs during the period than in the Netherlands. Danish mobile operators were allowed permission-less innovation to market their services, and, as a result, exhibited a significantly higher percentage of postpaid subscriptions and subscriptions for next-generation mobile networks. Danish mobile operators enjoyed freedom to experiment to get

users to adopt next-generation mobile networks. The country's mobile operators have employed free data for more than a decade to incentivize users to try mobile broadband subscriptions. They are also aggressive to partner with local content companies to promote Danish content. Such efforts, however, were discouraged in the Netherlands. Indeed, the net neutrality law prohibited ISPs from offering zero rating or free data for stand-alone services. This provision was struck down in early 2017, as the court ruled that it violated the new EU net neutrality law.

Ms. Layton's investigation found significant statistical support that soft net neutrality rules adopted voluntarily could promote edge innovation. However, hard rules adopted through legislation and regulation were not associated with greater mobile app development for the given country. The explosion of mobile apps from countries with no net neutrality rules and the general lack of mobile apps from countries that have had hard rules for years run counter to net neutrality claims. Indeed, the only countries with edge innovation at the scale that rivals Google and Facebook are China (Baidu, TenCent) and Russia (Yandex)—both countries with no net neutrality rules. Free Press, a leading organization for net neutrality, claims, "Without Net Neutrality, the next Google would never get off the ground."⁴² To date, no such Google rival has emerged from countries with hard

⁴² Free Press, "Net Neutrality – What You Need to Know Now," <https://web.archive.org/web/20170407175245/https://www.freepress.net/net-neutrality-what-you-need-know-now> (April 7, 2017).

net neutrality rules. In short, policy development based on assumptions that heavy-handed regulation of broadband providers will produce greater innovation at the edge is belied by the facts. Nor is there any academic research that supports such a theory. Thus, it was a highly rational and reasonable decision for FCC to reject this approach in the RIF Order and to return to the proven light touch regime that had proven so successful from 1996 to 2015.

CONCLUSION

For the reasons stated herein and in the Respondent's Brief, the Court should affirm the *RIF Order*.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This document complies with the type-volume limit of Fed. R. App. P. 29(a)(5) and 32(a)(7)(B) because, excluding the parts of the document exempted by Fed. R. App. P. 32(f) and D.C. Cir. R. 32(e)(1), this document contains 5,343 words.

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October 18, 2018

CERTIFICATE OF SERVICE

I hereby certify that on October 18, 2018, I electronically filed the foregoing with the Clerk of the United States Court of Appeals for the District of Columbia Circuit by using the appellate CM/ECF system. Participants in the case who are registered CM/ECF users will be served by the appellate CM/ECF system.

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Robert G. Kirk

October 18, 2018