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

In the Matter of	
Universal Service Contribution Methodology	WC Docket No. 06-122
A National Broadband Plan For Our Future	GN Docket No. 09-51

REPLY COMMENTS OF INTERNET2

John S. Morabito
Danielle N. Rodier
Internet2
1150 18th Street, NW
Suite 1020
Washington, DC 20036

Alan Fishel
Stephen Thompson
Arent Fox LLP
1050 Connecticut Avenue, NW
Washington, DC 20036

Counsel for Internet2

August 6, 2012

TABLE OF CONTENTS

SUMMARY iii

DISCUSSION 1

I. Internet2 Plays an Important Role in Ensuring that the U.S. Meets Critical Broadband Objectives 1

II. The Commission Should Continue to Use a Revenue-Based Approach for Assessing Contributions to the Fund 3

III. The Commission Should Not Exercise its Permissive Authority to Increase USF Contribution Requirements for NRENs 6

A. The Commission is Not Required to Increase the USF Contribution Requirements for NRENs 7

B. Requiring NRENs to Accept Greater USF Burdens Would Impede Scientific Research, the Development of Next Generation Technologies, and Access to Advanced Services 8

C. Refraining from Requiring NRENs to Increase their Contributions to USF Would Be Consistent with Other Advanced Countries' Treatment of NRENs 9

D. Refraining from Requiring NRENs to Increase their Contributions to USF Would Support the Goals of the National Broadband Plan 10

E. USF Requirements are Not Imposed on Certain Other Entities 12

IV. The Commission Should Not Assess Contributions Based Upon Speed or Capacity of Connections 13

CONCLUSION 14

SUMMARY

National Research and Education Networks ("NRENs") play an essential role in the advancement of the nation's broadband capabilities, and, as a result, the nation's competitiveness – both technologically and economically. Internet2, as the leading NREN in the United States, recognizes the need to reform the Commission's universal service contribution methodology. It also understands, however, that how the Commission implements reform will have real and lasting effects on the nation's broadband capabilities and standing in the world. To that end, Internet2 submits its reply comments to address the following issues presented by the Commission's NFPRM.

First, Internet2 agrees with the many commenters who argue that the Commission should, at least in the short-term, continue to use a revenue-based approach for determining USF contributions. A revenue-based approach is both progressive and competitively neutral, while the other approaches under consideration present a host of new and potentially detrimental issues.

Second, Internet2 respectfully urges the Commission to refrain from using its discretionary authority to reform USF in any way that would harm or otherwise unduly burden NRENs. Reform that either requires NRENs to contribute for services for which they do not contribute today or otherwise increases the USF contribution would harm not only the NRENs, but also the important entities they serve. As discussed herein, NRENs provide advanced broadband support to its members and community anchor institutions ("CAIs"). Many of these entities are either exempted from contributing to the Fund or do not contribute to the Fund directly due to the significant public benefits that such entities provide. Moreover, NRENs such as Internet2 provide a unique and essential platform for advanced networking technologies by

facilitating "Big Data" e-scientific research and the development of next-generation technologies and applications at U.S. research universities and government laboratories.

Third, the Commission should not assess contributions based upon the speed or capacity of connections. To do so, would impose an undue burden on the bandwidth needs of certain users. In particular, any new rules that fail to take into consideration the unique bandwidth needs of Internet2 members would negatively affect many of the very entities the Commission seeks to assist by reforming the Fund and would discourage the high-speed services that are critical to our country's success.

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

In the Matter of	
Universal Service Contribution Methodology	WC Docket No. 06-122
A National Broadband Plan For Our Future	GN Docket No. 09-51

REPLY COMMENTS OF INTERNET2

Internet2 submits these reply comments in response to the Commission's Further Notice of Proposed Rulemaking ("FNPRM") released on April 30, 2012, in the above-captioned proceeding concerning contribution issues in connection with the Universal Service Fund (the "Fund" or "USF"). Internet2 is the leading National Research and Education Network ("NREN") located in the United States.[1]

DISCUSSION

I. Internet2 Plays an Important Role in Ensuring that the U.S. Meets Critical Broadband Objectives

Internet2 is a member-owned advanced technology community founded by the nation's leading higher education institutions in 1996. Internet2 provides a collaborative environment for U.S. research and education organizations to solve common technology challenges, and to develop innovative solutions in support of their educational, research, and community service missions. In addition to over 350 member institutions, which include leading universities, corporations, government research agencies like the National Laboratories, federal agencies,

[1] Internet2 is the only U.S. NREN that actively engages its owner-members and works with other global research and education ("R&E") networks to advance the Internet.

state governments, and not-for-profit networking organizations, the broader Internet2 community includes community anchor institutions ("CAIs") across the nation and international networking partners representing more than 50 countries.

Internet2 operates a national high performance network benefitting its members and partners. The newly upgraded 100G-enabled and 8.8 Terabit per second optical network uses both standards-based technologies and protocols, as well as prototypes future Internet technologies. It will support the same wide range of IP and optical services available today — from leading-edge IPv4, IPv6, and multicasting, to new services like static and dynamic point-to-point circuits, software defined networks, and "virtual dark fiber" or "switched optical channels." Internet2 is already stimulating a new generation of innovative capabilities.

The Internet2 network will allow its member institutions to keep pace with the exponential growth in "Big Data" scientific research being driven by the nation's collaborative researchers. The network will support the growing demands of data-intensive e-science, thereby, for example, helping to uncover new energy sources, reduce cardiovascular disease, further cancer research, strengthen programs that combat terrorist threats, and develop new materials for numerous industries. Moreover, the Science and Engineering, Health Sciences, and Arts and Humanities initiatives of Internet2 are facilitating the use of advanced networking applications in support of, among other things, distributed lab environments, remote access to rare scientific instruments, and distributed, large-scale computation and data access, as well as clinical practice, telemedicine, medical and biological research, and health education and awareness.

The Internet2 community is developing breakthrough technologies that support the most exacting applications of today, and will spark the most essential innovations needed for the

future. Activating the same partnerships that produced today's Internet, Internet2's members are forging the future Internet through community, an unsurpassed innovation platform, and transformative, above-the-network services and applications.

Through its partnerships with regional not-for-profit networking organizations (whose networks generally provide an important link between Internet2 and CAIs), the Internet2 network also will provide extraordinary benefits to CAIs nationwide. The network will enable advanced networking features for all of the country's CAIs, including libraries, hospitals, K-12 schools, community colleges, state and local governments, public safety organizations, and other public institutions. The Internet2 network will support the bandwidth needs for all of the approximately 200,000 U.S. CAIs, enabling them to provide citizens across the nation with telemedicine, distance learning, and other important applications, and creating new economic opportunities and jobs.

II. The Commission Should Continue to Use a Revenue-Based Approach for Assessing Contributions to the Fund

As many other commenters have noted, Internet2 agrees that a revenue-based regime is the correct approach for the Commission to continue to use because it is both progressive and competitively neutral.[2] A revenue-based model best matches a party's contributions into the Fund with the value it receives from use of the public networks. By contrast, the other methods under consideration – which do not tie contributions to the revenues received – could easily result in some entities paying considerable amounts into the Fund yet receiving little benefit from

---

[2] *See* Comments of CompTel, WC Docket No. 06-122, GN Docket No. 09-51, at iii and 6 (filed July 9, 2012); *see also* Comments of XO Communications, Inc., WC Docket No. 06-122, GN Docket No. 09-51, at ii and 2 (filed July 9, 2012) ("XO Comments").

the public networks, while other entities may contribute very little to the Fund and receive tremendous benefits from the networks.

Basing the contribution methodology on telephone numbers, for example, would likely be regressive and suffer from myriad disproportional contribution issues, including (i) low volume users paying the same amount as high volume users; (ii) certain services escaping contribution because they do not utilize telephone numbers; and (iii) new incentives to escape contribution by finding ways around using traditional telephone numbers. As detailed in the Higher Education Associations ("HEA") comments, a numbers-based approach to assessing USF contributions would also disproportionately affect higher education institutions, among other CAIs.[3]

A connections-based methodology would likewise be problematic for several reasons. As one commenter has explained, a connections-based approach is fundamentally flawed because "there is little correlation between connection . . . and usage of telecommunications services."[4] As a result, end users will be assessed on their access to the network as opposed to the value they receive from the network. Moreover, if only physical connections are taken into consideration, the services that "ride over" those connections, such as VoIP, would escape contribution and create an opportunity for arbitrage. No less significant, a connections-based methodology would likely impose new administrative costs on both industry and the Universal

---

[3] *See* Comments of EDUCAUSE, AAU, ACE, APLU, AASCU, and NACUBO, WC Docket No. 06-122, GN Docket No. 09-51, at 4-5 (filed July 9, 2012) ("HEA Comments"). The HEA noted in its comments that a member survey conducted by EDUCAUSE regarding a numbers-based approach found that "the average research university has over 21,000 telephone numbers and (at $1 per month per phone number) might pay over $250,000 in annual USF fees – or about 10 times what it pays under the current system." *Id.* at 3 n.10.

[4] XO Comments at 36.

Service Administrative Company ("USAC") in the form of new data collection and reporting requirements, and necessitate changes to billing and reporting systems.[5]

At the very least, the Commission should continue to use a revenue-based methodology in the short-term. Internet2 recognizes that in the long-run additional changes to the contribution methodology may be necessary, including changes that provide additional incentives for increasing the rate of broadband adoption. When that time comes, Internet2 will be ready to help by applying its substantial knowledge about where technology is headed.

But at least for now, replacing the current revenue-based system with a brand new system based on phone numbers or connections would introduce new uncertainties that the industry can ill-afford at this time. As one commenter correctly noted, "[o]ther proposed methodologies for assessing USF contributions would require complex new line-drawing, would require the development of new tracking systems and audit capabilities and would not ensure that providers of interstate telecommunications services make equitable and nondiscriminatory contributions to USF, as required by 47 U.S.C. § 254."[6]

Finally, the inefficiencies and inadequacies inherent in the current revenue-based contribution methodology are not caused by or a symptom of the revenue-based approach. The problems presented by the current revenue-based approach could be solved by improving its implementation and by broadening the revenue base for contributions to include the basic

---

5 *See* Comments of U.S. Cellular Corporation, WC Docket No. 06-122, GN Docket No. 09-51, at 34-35 (filed July 9, 2012).

6 XO Comments at 3. The complexity for complying with a new federal contribution system would only be further exacerbated by the fact that it would conflict with several state-level funds that will continue to be based on revenues and would require carriers to maintain two separate universal service accounting systems.

transmission component of commercial Internet access service.[7] While Internet2 agrees with many other commenters that the Commission has ample authority to broaden the base of contributors into the Fund, if the Commission believes that it is constrained to do so, it should request that Congress amend Section 254 of the Communications Act (the "Act").

III. The Commission Should Not Exercise its Permissive Authority to Increase USF Contribution Requirements for NRENs

Both Congress and the Commission have made advancing broadband the centerpiece of the nation's technology and communications goals. The reasons for this are clear. As the Commission recognized in its National Broadband Plan, an advanced national broadband capability provides "a foundation for economic growth, job creation, global competitiveness and a better way of life."[8] The goals of NRENs, such as Internet2, are completely aligned with those of Congress and the Commission in this important regard. The Internet2 network, for example, deploys advance future Internet technologies, creates a pre-market environment for the development of new network technologies, and provides far more capacity than most other networks, which, in turn, fosters innovation and leads to increased economic development. As discussed more specifically below, any increase in the contributions that NRENs are required to make to support USF may decrease the ability of NRENs to perform the significant role of advancing broadband capabilities and scientific research in the United States. Therefore, Internet2 respectfully urges the Commission to refrain from exercising its permissive authority in such a way that would undermine the very national goals it has identified in the National Broadband Plan and has been directed by Congress to achieve.

---

[7] The Commission has generally referred to this approach as the "Third Way." *See* http://www.broadband.gov/the-third-way-narrowly-tailored-broadband-framework-chairman-julius-genachowski.html.

[8] National Broadband Plan at p. xi.

A. The Commission is Not Required to Increase the USF Contribution Requirements for NRENs

NRENs are not common carriers and do not provide telecommunications services.[9] Accordingly, the Commission is not required to impose USF support obligations on NRENs at all, and therefore the Commission is certainly not required to increase the USF contribution requirements for NRENs. Yet, that unfortunate outcome will occur if the Commission, for example, (i) requires NRENs to contribute for services for which they do not contribute today; or (ii) substantially burdens those entities who provide very high capacity services.

The Commission has the permissive authority under Section 254(d) of the Act to require providers of telecommunications to support the Fund if the Commission so wishes. Thus, the Commission may have the right, but certainly does not have the obligation, to impose such requirements on NRENs in connection with NRENs' provision of telecommunications.

In the FNPRM, the Commission sought comment on when it should refrain from exercising its permissive authority to require certain providers of telecommunications from contributing to the Fund.[10] At the very least, the Commission should not exercise its permissive authority to increase the USF contribution requirements for NRENs. As stated herein, NRENs such as Internet2 are the epitome of entities that should not be required to contribute to the Fund at all, and therefore, at the very least, their USF burdens should not be increased. Section 254(d) provides in pertinent part that providers of telecommunications should only be forced to contribute to the Fund if "the public interest so requires." Here, the public interest does not require mandating that NRENs support the Fund – in fact, as discussed below, just the opposite

---

[9] Internet2 is not a common carrier and cannot be deemed to be providing telecommunications services under the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996), amending the Act.

[10] FNPRM, ¶¶ 46-47.

is true. Accordingly, at the very least, the Commission should not increase the USF burdens on NRENs.

B. Requiring NRENs to Accept Greater USF Burdens Would Impede Scientific Research, the Development of Next Generation Technologies, and Access to Advanced Services

The entities that generally consume advanced communications from NREN networks are researchers in data-intensive scientific fields, developers of next-generation technologies, and CAIs. Each of these stakeholders in the R&E community ecosystem produces positive externalities that should be encouraged because of the spillover benefits that result from maintaining national competitiveness in high-tech fields and providing communities with the technology they need to succeed. Imposing additional fees on NRENs through new or greater USF obligations is therefore not in the public interest as it will result in sub-optimal levels of (i) scientific research; (ii) development of next-generation technologies; and (iii) provision of advanced services to CAIs.

The amount of data-intensive research and development that is occurring today will largely determine this country's competitiveness in cutting-edge scientific and technological fields in the coming years. As discussed above, NRENs such as Internet2 provide a unique platform for advanced networking technologies by facilitating "Big Data" e-scientific research and the development of next-generation technologies and applications at U.S. research universities and government laboratories. In fact, Internet2 was created in response to the failure of private, for-profit carriers to meet the research and education community's unique high-performance computing and communications requirements. It therefore does not serve the public interest to impose additional USF contribution requirements on NRENs, effectively

raising the cost of research and development and placing the United States at risk of becoming less competitive in dynamic scientific fields and high-tech industries.

In addition, one of the primary principals of universal service is to provide access to advanced services in all regions of the nation.[11] NRENs have been instrumental in helping to bridge the digital divide in this country by providing advanced communications to CAIs in underserved areas, but there are several hundred thousand U.S. CAIs, and as the Commission explained in the National Broadband Plan, the work NRENs are performing to connect all CAIs is not yet complete.[12] It is therefore counter-productive to exercise the Commission's permissive authority to require NRENs to contribute more to USF when such requirements impede the Commission's own objectives.

C. Refraining from Requiring NRENs to Increase their Contributions to USF Would Be Consistent with Other Advanced Countries' Treatment of NRENs

Foreign R&E networks operate in many other advanced countries. Realizing the importance of these networks to national competitiveness in cutting-edge scientific research and the development of next-generation technologies, many national governments in other advanced countries directly subsidize their NRENs.[13] In this proceeding, Internet2 is not asking for the

---

11 47 U.S.C. § 254(b)(2).

12 National Broadband Plan at p. 154.

13 *See* National Research and Education Networks: Analysis of Management Issues, Section 5.3, Funding Models (noting that the majority of European NRENs are directly subsidized by their governments), available at http://www.isoc.org/inet99/proceedings/3h/3h_1.htm#funding_models;

International Telecommunications Union Monitoring Report ("ITU Report") (noting that "NRENs act as high-capacity ICT infrastructures to support the work of researchers, promote collaboration, transfer data and share information or confirm experiments"), available at http://www.itu.int/ITU-D/ict/publications/wtdr_10/material/WTDR2010_Target3_e.pdf; *see also* Nordic Infrastructure for Research and Education, Inspiration Paper: The Role of NREN's in 2020, available at http://www.nordu.net/ndnweb/news___events_attchmt/ NORDUnet%20NREN%202020%20Inspiration%20Paper.pdf.

Commission to provide U.S. NRENs with a subsidy, but it is only requesting that the Commission not take the polar opposite approach by requiring them to pay even more into the Fund, especially utilizing the Commission's permissive—*i.e.*, discretionary—authority.

In fact, the United Nations' ITU proposed that "[g]overnments and policy-makers should work with research and education institutions to ensure that the NREN is fully embedded within their overall national innovation system and serves the needs of the local research community."[14] It simply does not serve the need for innovation in the United States or the research community to impose greater burdens through additional USF fees on the domestic innovation capacity of NRENs.

D. Refraining from Requiring NRENs to Increase their Contributions to USF Would Support the Goals of the National Broadband Plan

In Recommendation 8.22 of the National Broadband Plan, the Commission recognized the vital role played by NRENs and other U.S. research and education networks and recommended that the research and education model that has worked so successfully for colleges and universities should be "expanded to other community institutions" and would provide "tremendous benefits."[15] Accordingly, expanding the burdens on NRENs through this proceeding, thereby hindering their ability to perform in connection with the objectives outlined in the National Broadband Plan, would be counter to the public interest.

Moreover, one of the Commission's goals in connection with Recommendation 8.22 of the National Broadband Plan was to "lower the overall costs of building and running anchor institutional networks."[16] Internet2 respectfully submits that ensuring that NRENs are not

---

14 ITU Report at 60.

15 National Broadband Plan at p. 154.

16 *Id.* at 155.

burdened with greater USF-contribution requirements would help guarantee that their costs are not raised; any additional costs would make it more difficult for them to connect additional community anchor institutions and run their national R&E networks. Conversely, if there is any reduction in burdens, NRENs, as not-for-profit entities, will be able to pass on these savings to their community-anchor members.

In addition, as the Commission recognized in its National Broadband Plan, R&E networks played a central role in the development and growth of the Internet itself through ARPANET and later NSFNET. The Commission should not take any action here that would undermine or materially impact the ability of NRENs and the broader R&E community to ensure similarly important innovations and advances in the future.

Moreover, one of the Commission's goals in the National Broadband Plan is to ensure that every community has "affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings."[17] NRENs are taking a lead role in helping the Commission meet this goal by supporting connectivity for CAIs throughout the country through very high capacity networks, and therefore any additional burdens on NRENs are not in the public interest.

Ensuring that NRENs do not face greater contribution requirements also benefits higher education institutions that are in dire need of lowering costs, and certainly cannot afford any increased costs. States are grappling with historic budget deficits and are cutting funding to educational institutions as a result. State appropriations for universities and students have been slashed by 7.6 percent for the 2011-12 fiscal year, and adjusted for inflation, state funding for the

---

[17] *Id.* at XIV.

top 101 public research universities in the United States from 2002 to 2010 has been cut by 10 percent, with nearly three-quarters of the universities losing some state support.[18]

E. USF Requirements are Not Imposed on Certain Other Entities

Currently, because of the benefits that some entities provide to this nation and the focus of their operations, they are not required to contribute to the Fund. For example, providers that serve solely public safety and government entities, including state and local governmental entities serving their own internal needs, are not required to support the Fund. In addition, the Commission does not require "non-profit schools, colleges, universities, libraries, and health care providers to contribute directly to USF."[19] NRENs' membership is dominated by the above-referenced entities, who are also the parties who generally receive—and pay for—NRENs' services. Therefore, while the foregoing current exceptions do not literally apply to NRENs, by analogy they greatly support Internet2's view that no additional USF obligations should be imposed on NRENs.[20] That is, given the extraordinary benefits NRENs provide, and the focus of NRENs' operations and the nature of the parties that generally receive their services, NRENs certainly should not be burdened by supporting the Fund any more than they already are today.

---

[18] *See* http://www.insidehighered.com/news/2012/01/23/state-funds-higher-education-fell-76-2011-12; *see also* National Science Board, Science and Engineering Indicators for 2012, available at http://www.nsf.gov/statistics/seind12/.

[19] *Federal-State Board on Universal Service,* CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, ¶ 800 (1997) (subsequent history omitted); *Federal-State Board on Universal Service,* CC Docket No. 96-45, *et al.*, Fourth Order on Reconsideration and Report and Order, 13 FCC Rcd 5318, ¶ 284 (1997). Internet2 also agrees with HEA that higher education institutions should not be required to contribute as providers. *See* HEA Comments at 5-7.

[20] As noted above, these entities comprise the overwhelming majority of Internet2's members. The R&E ecosystem, however, is not exclusively limited to these types of entities, as a limited number of private research companies collaborate with their public and non-profit sector colleagues via Internet2's high-capacity network.

IV. The Commission Should Not Assess Contributions Based Upon Speed or Capacity of Connections

Internet2 requests that the Commission refrain from adopting proposals contained in the FNPRM that would assess contributions based on the speed or capacity of a connection. Any approach that does not take into consideration the unique bandwidth needs of certain users would negatively affect many of the very entities the Commission seeks to assist by reforming the Fund and would discourage the high-speed services that are critical to our country's success. For example, Internet2 members often require approximately 100 times more capacity than an average broadband user, and utilize delivery protocols that are not generally available to the general public. This community's demand profile for connection capacity differs greatly from residential or business networks, as broadband users from across the country and the world access data on NRENs, thereby leading to very high outbound bandwidth demand.[21]

In addition, imposing higher fees on connection capacity without regard for the use to which it is utilized will disproportionately impact the cutting-edge scientific research taking place at certain U.S. universities, federal agencies, and National Laboratories. For example, physicists at some U.S. universities depend on data from the Large Hadron Collider ("LHC"), located in Geneva Switzerland at the European Organization for Nuclear Research ("CERN"), to conduct their research. Data files that U.S. physicists need to transfer from the LHC to their U.S. laboratories are on the order of petabytes (which is 1 million gigabytes). Any rules that the Commission adopts that will place additional fees on accessing this data will have the perverse effect of making this research more expensive. The same result will hold true for research in medicine, computer science, bioinformatics, biodiversity and ecology, geoscience, and space

---

[21] *See, e.g.*, Internet Bandwidth Management at *The University of Pennsylvania*, at 7, available at http://qos.internet2.edu/wg/calendar/200205-Arlington/200205-kassabian.pdf.

exploration, undermining the country's leadership in all of these fields and the next-generation technologies that such research will produce.[22]

CONCLUSION

For all of the foregoing reasons, Internet2 respectfully requests that the Commission issue an Order in this proceeding consistent with the recommendations set forth herein.

Respectfully submitted,

John S. Morabito
Vice President of External Relations and General Counsel
Internet2
1150 18th Street, NW
Suite 1020
Washington, DC 20036

August 6, 2012

[22] The ITU Report provides that "scientific research is constantly evolving, matched by advances in data analysis and networking technologies. For example, particle physics has only existed as a separate discipline for the last century, and modern bioengineering for a mere two decades, but the data-computing requirements of advanced bioengineering are set to outstrip those of particle physics during the next three years." ITU Report at 48. If the Commission imposes fees based on the capacity of connections, effectively making cutting-edge scientific research more expensive, it will undermine our leadership in this, and other, innovative fields.