Testimony before the Committee on Commerce, Science & Transportation
Subcommittee on Communications, Technology, Innovation and the Internet
United States Senate

Hearing on Ensuring Intermodal USF Support for Rural America

Written Testimony of
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Chairman Wicker, Ranking Member Schatz, and other Members of the Subcommittee, I am Michael Rapelyea, Vice President for Government Affairs of ViaSat, Inc. ("ViaSat"). I am pleased to have the opportunity to testify before you today on ViaSat's views about how policymakers can harness competition among service providers and communications technologies to ensure that limited universal service support is used efficiently and effectively to extend the benefits of broadband to rural America.

ViaSat is a U.S.-based company started by its three founders in a garage in San Diego nearly 30 years ago. From those humble beginnings, ViaSat has grown into a global broadband services and technology company with over 3,000 employees. ViaSat also is a leading provider of communications solutions to U.S. consumers, the U.S. government, and the U.S. military. Simply stated, we invent, design, and build telecommunications networks and systems—with a particular focus on satellite technologies.

We use a fleet of spacecraft to provide our Exede broadband service to fixed and mobile terminals. Our advanced technology has revolutionized the industry by reducing the "cost per bit" of delivering broadband service, providing a high-quality service to end users, and affording millions of Americans an effective competitive alternative to wired and wireless terrestrial services. We turn electrons into bandwidth and bandwidth into quality broadband service.

Our satellite broadband customers include individual consumers, small and large businesses, government and military users, and major airlines such as United, JetBlue and Virgin America. ViaSat serves nearly 700,000 customers in their homes and offices, and provides in-

flight broadband on approximately 419 commercial, 300 business, and 400 government aircraft.[1]

Nearly one million personal electronic devices connect each month to the Wi-Fi service provided

through these broadband connections to aircraft. For example, today ViaSat technology can

power my 10 year old son Teddy's iPad on a JetBlue flight heading to Disney and Netflix on my

iPad on a Virgin America flight heading to ViaSat's California headquarters.

ViaSat also provides satellite broadband service to government and military users

for their essential missions and communications needs. Among other things, we provide the

Department of Defense with critical communications capabilities providing situational awareness

to America's warfighters on the ground, at sea and in the air. For example, in connection with

Project Liberty we delivered secure communications channels to U.S. Special Forces in

Afghanistan. We also provide critical public safety connectivity, including to the National

Guard and the American Red Cross during Hurricane Sandy, and to law enforcement

apprehending the Arizona sniper.

It may surprise some, but ViaSat's customers are distributed across the United

States in a manner that roughly follows the U.S. population distribution, as depicted below. So

our strongest markets are more heavily populated areas, not just rural.

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[1]   *See Press Release: ViaSat Announces Second Quarter Fiscal Year 2016 Results* (Nov. 9,
2015), *available at* http://investors.viasat.com/releasedetail.cfm?ReleaseID=941679.

Figure 1. ViaSat Broadband Subscriber Density
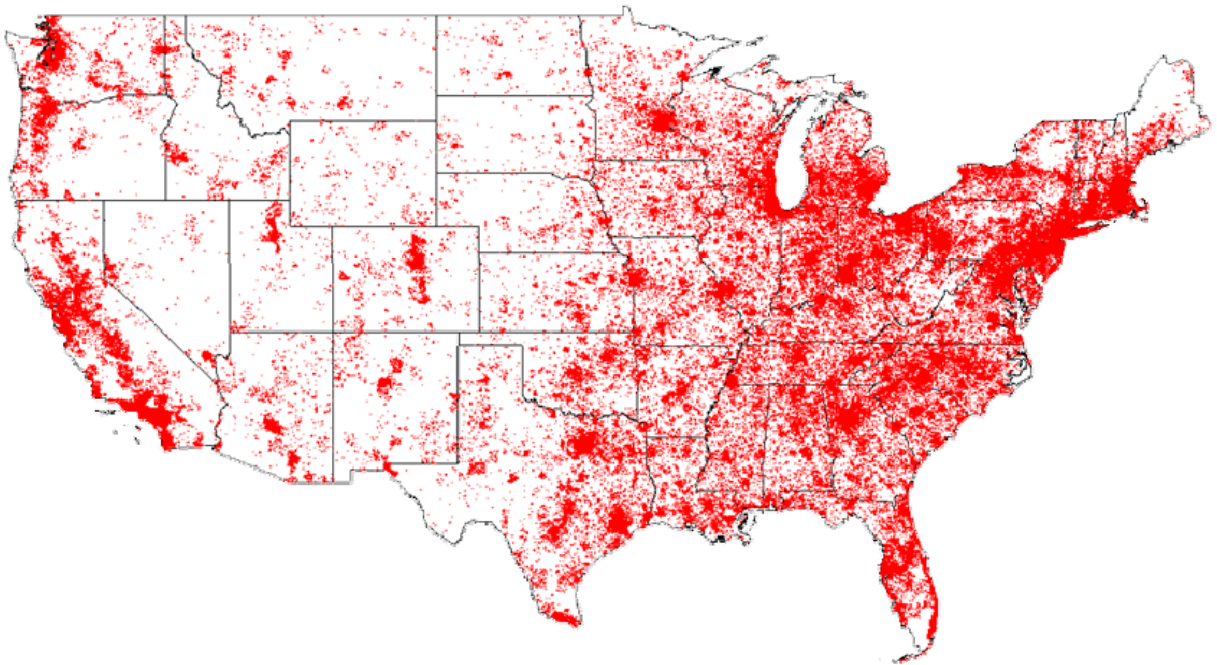
We currently use four spacecraft to provide service, and are launching more to keep up with growing customer demand, expand capacity, and provide even better service. ViaSat-1, launched in 2011, supports speeds to individual users of up to 25/3 Mbps and has a total capacity of approximately 150 Gbps. When it was launched, ViaSat-1 had more than 10 times the throughput of the other Ka-band satellites in orbit.[2] ViaSat's second-generation high-capacity satellite, to be launched within the next year, will double this throughput to over 300 Gbps, and will support speeds well over 100 Mbps.[3] The third-generation ViaSat high-capacity satellites under development each will provide over 1 Terabit per second (1,000 Gbps) of

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[2]   *See ViaSat-1 FAQ*, *available at* https://www.viasat.com/sites/default/files/legacy/web/ViaSat-1_FAQ_3_09_V3.pdf (last visited Jan. 27, 2016).

[3]   *See ViaSat Q2 2016 ViaSat Earnings Conference Call* (Nov. 9, 2015), *available at* http://investors.viasat.com/events.cfm.

throughput and even higher speeds.[4] Our newest and most advanced satellite designs are highly

flexible, allowing us to allocate bandwidth where it is most needed.[5]

Today, in addressing the current state of the universal service fund ("USF"),

efforts to implement the Connect America Fund ("CAF"), and other ongoing reform efforts, I

would like to emphasize four key points:

1.   Satellite technologies *today* are providing high-quality broadband services to American

      consumers—and those same technologies are fully available for use in connection with

      the CAF;

2.   Satellite broadband technologies provide a superior end-user experience that is optimized

      for the vast majority of Internet traffic;

3.   Satellite broadband technologies offer an extremely cost-effective means of serving rural

      and remote areas of the country; and

4.   ViaSat's network expansion plans will be influenced by CAF and other USF policies.

      But current policy proposals do not provide an environment conducive to ViaSat making

long-term commitments to step into the shoes of the wireline incumbents that have declined to

continue to serve the costliest and hardest to reach parts of the nation that are the focus of the

final stages of the CAF.

I.   SATELLITE TECHNOLOGIES PROVIDE HIGH-QUALITY BROADBAND SERVICES TO CONSUMERS *TODAY*

By investing billions of dollars to develop cutting-edge technologies, ViaSat has

fundamentally changed the broadband game. By significantly increasing the level of throughput

(*i.e.,* bandwidth or "speed") achievable over satellite networks, and dramatically lowering the

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[4]   *Id.*

[5]   *Id.*

"cost per bit," we are now attracting customers from our terrestrial competitors, such as 3G and

4G wireless, cable, and DSL. Indeed, roughly one-third of ViaSat's approximately 700,000

satellite broadband subscribers have switched over from terrestrial broadband alternatives. There

is no better indication of widespread market acceptance of satellite broadband solutions.

Furthermore, as shown in the following graph, ViaSat's satellite broadband

service has an overall user satisfaction rating that is on par with that of leading cable and DSL-

based broadband service providers. Notably, the reported level of satisfaction has been rising,

and is considerably higher, since ViaSat-1 was launched in 2011.
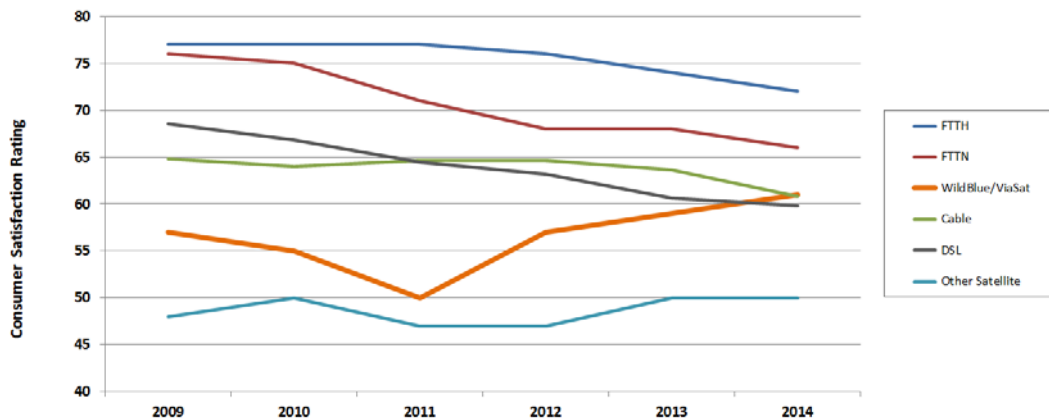
FTTH: FiOS, FTTN: U-Verse, Cable: average score of CableOne, Charter, Comcast, Cox, MediaCom, Time Warner, DSL: average score of AT&T, Century Link, FairPoint, Frontier, Verizon, Windstream. ViaSat not ranked in 2013, data point is interpolated.

Source: *Consumer Reports* issues published February 2010, May 2011, June 2012, May 2013, May 2014, and May 2015, *available at* www.consumerreports.org.

Things have changed dramatically for the better in the past five years. With due respect to

Chrysler, "We are not your father's satellite broadband service."

II. SATELLITE BROADBAND IS OPTIMIZED FOR THE VAST MAJORITY OF INTERNET TRAFFIC

ViaSat's broadband performance has been made possible by dramatic improvements in the throughput—*i.e.,* bandwidth or "speed"—achievable over satellite and improvements with network equipment on the ground. As I described above, the satellites and network architecture that ViaSat plans to deploy in the coming years will support even higher levels of throughput and speed, translating into even higher-quality broadband service for consumers—service that will more than keep pace with the improvements implemented over time by our competitors.

The quality of any broadband service depends on a combination of service characteristics,[6] but bandwidth is *the* central value proposition of a broadband service and speed is the most significant driver of consumer satisfaction. Even a cursory examination of the marketing materials of leading broadband providers reflects that speed is one of the two most critical elements used to market service to the consumer (along with price).[7] And ViaSat has found that the speed of an offered service has a greater impact on consumer adoption than any other factor.

The reason for this is simple: The amount of bandwidth available to a customer has a significant and direct impact on the quality of the end-user experience for the most popular

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[6] *See generally* Mark D. Dankberg, Thomas E. Moore, and Girish Chandran, *Toward a National Broadband Plan: Ensuring a Meaningful Understanding of Broadband Capabilities and Facilitating Competitive Choices* (Aug. 31, 2009), attached to Letter from John P. Janka, Counsel to ViaSat to FCC, GN Docket No. 09-51 (Aug. 31, 2009) (discussing the multiple dimensions of "broadband" service and cautioning against the adoption of overly restrictive performance standards that could artificially constrain the evolution of broadband service).

[7] *See, e.g.,* http://www.verizon.com/home/fios-fastest-internet/#plans (last visited Jan. 12, 2016) (listing Verizon FIOS plans and emphasizing, in bold type, speeds and prices associated with each offering).

broadband applications, which account for the vast majority of Internet traffic. The following

chart, based on data from Cisco's Visual Networking Index, shows a breakdown of consumer

Internet traffic by application type last year:

Consumer Internet Traffic by Application Type (2015)

File Sharing 15% Online Gaming ~0%

Web, Email, and Data 19%
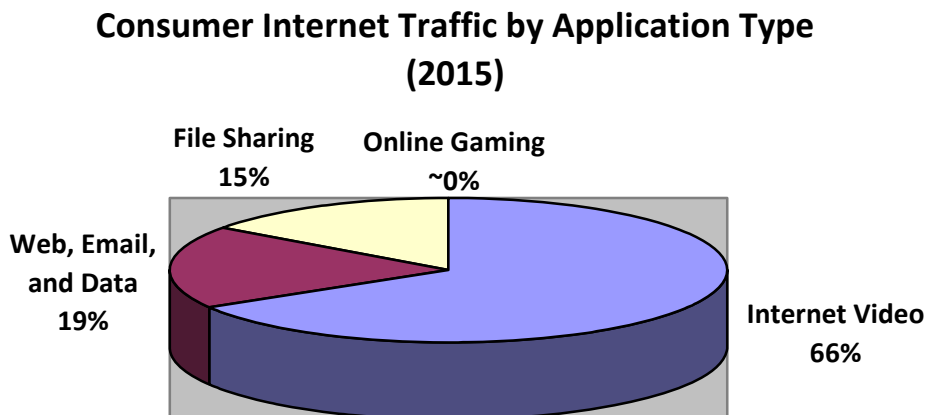
Internet Video 66%

Notably, Internet video streaming and downloads *alone* accounted for over 60 percent of Internet

traffic.[8] These applications are expected to account for more than 80 percent of all Internet

traffic by 2019.[9]

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[8]   *See 2015 Measuring Broadband America Fixed Broadband Report* at 7 n.3 (citing Cisco
        Visual Networking Index: Forecast and Methodology, 2014-2019 White Paper (May 27,
        2015), *available at* http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-
        ngn-ip-next-generation-network/white_paper_c11-481360.html ("Cisco VNI Paper").

[9]   *Id.*

Consumer Internet Traffic by Application Type (2019 Projected)
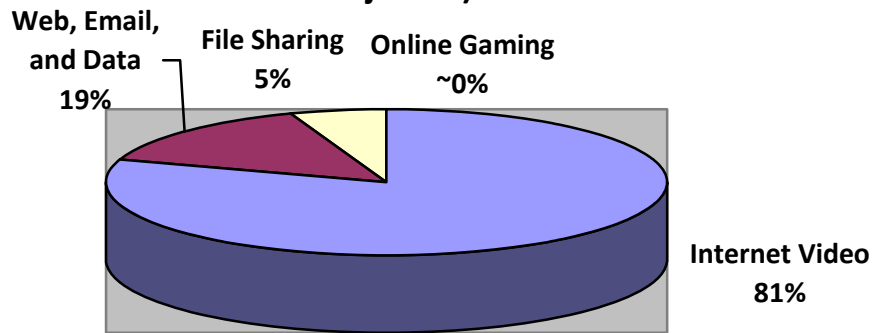
Higher levels of bandwidth permit the transmission of higher-quality data streams. Consequently, the quality of the end-user experience when using these applications is directly tied to the speeds available to that user.

At the same time, higher speeds allow multiple users and devices in a given household to access the Internet simultaneously. Notably, Gartner, Inc. forecasts that over 13.5 billion consumer devices—and over approximately 20.8 billion total devices—will be connected to the Internet by 2020.[10] This would mean roughly three devices for every person on the face of the Earth—and significantly more devices per person in America's hi-tech society.[11] It is no surprise that Cisco predicts that these demands will cause average broadband speeds to double to 43 Mbps by 2019.[12]

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[10] *See Press Release: Gartner Says 6.4 Billion Connected "Things" Will Be in Use in 2016, Up 30 Percent from 2015* (Nov. 10, 2015), *available at* http://www.gartner.com/newsroom/id/3165317.

[11] The U.S. Census projects that worldwide population will exceed 7.5 billion by 2020. *See* International Data Base: World Population: 1950-2050 (last visited Jan. 28, 2016), *available at* ttps://www.census.gov/population/international/data/idb/worldpopgraph.php.

[12] *Id.*

ViaSat's satellite broadband network currently provides service of up to 25/3 Mbps in certain areas and at 12/3 Mbps everywhere else. With the launch of ViaSat-2 within the next year, we plan to introduce packages with even higher speeds. These evolving speeds ensure that our 700,000-plus customers have access to service capable of supporting HD video and other in-demand applications. In contrast, many of these areas remain entirely unserved by incumbent providers, which *might* be able to offer 10/1 Mbps service years from now, and only with significant government subsidies.

III. SATELLITE BROADBAND TECHNOLOGIES OFFER AN EXTREMELY COST-EFFECTIVE MEANS OF SERVING RURAL AND REMOTE AREAS

As noted above, the advanced satellite broadband technologies developed by ViaSat have resulted in a "cost per bit" for ViaSat's network that is dramatically lower than legacy satellite networks. As a result, today's satellite broadband networks offer performance that meets or exceeds that of its competitors. But ViaSat also offers pricing for that performance that is competitive with the alternatives.

Indeed, ViaSat's network is incredibly cost-effective compared not only to last-generation *satellite* networks, but also compared to *existing incumbent networks* (including cable and DSL)—largely due to the enormous capital efficiency inherent in satellite infrastructure (although, even for us, it still costs more to serve users in remote areas, due to the increased costs associated with installation and service calls).

Indeed, a report commissioned by ViaSat in 2011 estimated that nearly half of the housing units identified as "unserved" by the FCC could be served at lower cost with satellite technologies than with terrestrial alternatives.[13] And even where satellite is not the lowest-cost

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[13]   See Dr. Charles L. Jackson, *Satellite Service Can Help to Effectively Close the Broadband Gap* (Apr. 18, 2011), attached as Exhibit A to Comments of ViaSat, Inc., WC

option, its participation in the CAF would spur competition and compel other providers to provide more cost-effective service. In both cases, allowing satellite broadband providers to participate fully and directly in the CAF would result in significant costs savings and better program outcomes. Conversely, excluding or limiting the participation of satellite broadband providers would unnecessarily inflate costs while undermining the universal service policies objectives of the CAF.

IV. VIASAT'S BUSINESS PLANS WILL BE INFLUENCED BY CONNECT AMERICA FUND POLICIES

CAF support undoubtedly would facilitate ViaSat's ability to make its high-quality broadband services available to millions of additional consumers in locations that have been deemed "unserved" by the FCC. ViaSat is well-positioned to make long-term commitments to serve those consumers located in areas supported by the CAF through service plans offering high-quality broadband service at attractive price points, but ViaSat cannot do so without a fair shot at the same support its competitors are seeking.

Consistent with the FCC's longstanding commitment to competitive and technological neutrality, ViaSat has advocated the adoption of CAF eligibility criteria that enable broad program participation by wireline, wireless, satellite, and all other service providers on the same terms and conditions. Stated differently, we believe that policy makers should give the best players a chance to compete. As ViaSat has explained, this approach would offer the best chance of truly bridging the Digital Divide and would facilitate the use of extremely limited CAF funding by the most efficient service providers—regardless of the technologies they use. This

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Docket No. 10-90 (Apr. 18, 2011). Although the data used in that report need to be refreshed to reflect the passage of time (*e.g.,* cost information), we believe the report's basic conclusions with respect to the relative cost-effectiveness of satellite technologies remain sound.

approach would minimize the contribution burden placed on average Americans who fund the CAF through surcharges on their telephone bills.

Unfortunately, recent years have seen the adoption of CAF decisions and policies that favor incumbents over new entrants and certain "traditional" technologies over newer, more advanced technologies—and therefore depart from a longstanding commitment to competitive and technological neutrality. In effect, this approach picks winners and losers before the game even starts.

First, the lion's share of available funding was earmarked for terrestrial incumbents. Now, competitive providers are able to seek only a small fraction of total available funds that those incumbents declined, as well as limited (and not nearly sufficient) funds allocated to extremely costly and hard-to-serve areas.

Second, we have seen and continue to see restrictive technical eligibility thresholds that have little bearing on the quality of the end-user experience. For example, we're still seeing requirements that CAF recipients offer service with 100 milliseconds of latency or less, even though: (i) the vast majority of Internet traffic is not latency-sensitive; (ii) service providers can design their networks to mitigate the impact of latency (*e.g.,* through higher speeds, by using hybrid networks) for the narrow slice of Internet traffic that is latency-sensitive; and (iii) it would be more neutral, efficient, and direct to simply require recipients to meet standards with respect to overall service quality. In short, these restrictions *do not* ensure the quality of service received by consumers, but *do* limit the participation of entire classes of service providers—including satellite broadband providers—and consequently drive up the costs of the CAF program.

By way of example, in connection with the Rural Broadband Experiments auction held in late 2014, we submitted bids requesting support that was far less than the support levels estimated by the FCC wireline cost model. We also offered to use hybrid networks to carry latency-sensitive traffic in a way that would satisfy the 100 milliseconds requirement, and committed to meet the FCC's voice quality standard. Even though we were identified as the provisionally winning bidder in a number of areas, all of our bids were rejected because our *entire* network would not meet the latency requirement—even though the vast majority of Internet traffic (over 60% today and over 80% by 2019) is not latency sensitive, and even though we had a viable solution for handling latency-sensitive traffic in a way that would meet the Commission's standard. More than a year later, we're still trying to compete on a level playing field with all technologies, even though some of the preferred technologies would be extremely expensive and not even have a shot at covering all the remain CAF II households, once again leaving vast areas without broadband. Indeed, the current proposal for the CAF reverse auctions effectively would put us at the end of the line, and would relegate us to the most costly-to-serve areas that terrestrial providers apparently are not interested in or capable of serving.

At times, it seems that the folks crafting CAF policy are not taking in the complete picture, including how service providers actually make their business decisions. It would be a mistake to assume, as some apparently do, that satellite broadband providers would participate in the CAF on the extremely constrained basis that has been proposed. Participating in the CAF comes with a number of long-term obligations, including becoming an eligible telecommunications carrier ("ETC") and taking on carrier of last resort obligations. It could make sense for a provider to assume those burdens if it otherwise had a critical mass of

customers within a state, but that would not be the case for satellite broadband providers under the current approach.

Stated another way, given the choice between committing capacity to high-volume/high-demand areas or a handful of dispersed, low-volume areas, a business is likely to make the same choice as the wireline incumbents that declined many CAF areas last year. Notably, those wireline companies were unwilling to participate in the CAF in those areas even though they would have been able to receive significant support on a state-wide basis and more than achieve "critical mass."

Moreover, the vast majority of capacity available on the new satellites that ViaSat will launch in the next few years is already allocated to beams serving urban areas of the country, in which the vast majority of ViaSat's existing customers are located. We'd likely have to change our plans or build more spacecraft to participate fully in the CAF, which we're willing to do if the playing field is level. But the way things are going with the CAF, it would not make business sense to redirect capacity away from densely populated areas or away from service to airplanes—and foregoing associated revenue opportunities—or deploy new spacecraft simply to serve a limited number of "extremely high cost" areas in return for a relatively small subsidy.

In short, participating in the CAF likely would make sense only if satellite broadband providers could do so fully and on the same terms as everyone else, so that they have the chance to obtain the critical mass necessary to support the business case for participating. For this reason, among others, ViaSat renews its support for the adoption of CAF eligibility criteria that enable broad program participation by wireline, wireless, satellite, and other service providers on the same terms and conditions. This approach would facilitate the use of limited CAF support by the most efficient service providers—regardless of the technologies they use.

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This approach therefore would minimize the contribution burden placed on average Americans who fund the CAF.

To be clear, ViaSat does not support eligibility criteria that would compel some consumers to accept inferior services from certain types of supported providers. Rather, ViaSat supports eligibility criteria that can accommodate differences across technology platforms and facilitate service to geographic areas supported through the CAF at the lowest cost to contributing end users, while still ensuring that consumers receive high-quality broadband services.

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Thank you for the opportunity to appear before you today to discuss these important issues. I would be pleased to answer any questions you might have.