Testimony before the Committee on Energy and Commerce
Subcommittee on Communications, Technology and the Internet
United States House of Representatives

Hearing on the National Broadband Plan: Deploying Quality Broadband Services to the Last Mile

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Chairman Boucher, Ranking Member Stearns and other Members of the Subcommittee, I am Mark Dankberg, Chairman and CEO of ViaSat, Inc. ("ViaSat"). I am pleased to have the opportunity to testify before you today on ViaSat's views about the broadband availability gap and the most cost-effective means of closing that gap.

ViaSat is a U.S.-based company that I co-founded in my home 24 years ago. ViaSat is a leading provider of communications networks to U.S. consumers, enterprises, and the U.S. Department of Defense. We are also one of the leading providers of consumer broadband, enterprise and government satellite networks on a global basis. We invent, design and build telecommunications technology. Our goal is to transform the way satellite broadband services are provided today to homes, businesses, community organizations, and first responders, as well as for other national security purposes. We also plan to help ensure that all Americans have the opportunity to access quality broadband services.

We are investing over $400 million in the deployment of a highly innovative new satellite network that will more than triple the quality of satellite broadband service in the United States (and Canada), resulting in quality levels and price points that are comparable to, or better than, today's cable modem, DSL or wireless broadband services. Just four months ago, we invested almost $600 million more to acquire WildBlue Communications, Inc., which is one of the top 20 broadband ISP's in the country and serves over 420,000 U.S. homes today by satellite. WildBlue, and its distribution partners, including DirecTV, DISH Network, the National Rural Telecommunications Cooperative, and AT&T will be the means by which we will deliver this satellite broadband technology to the American public.

ViaSat supports the efforts of Congress and the Administration to facilitate the deployment of affordable broadband services to all Americans. We are encouraged that the

FCC's National Broadband Plan explicitly recognizes the major improvements we are making in satellite broadband, as well as the role satellite can play in cost effectively ensuring universal availability of affordable broadband access.

But there is another important role that satellite can serve here today, and that is to help more accurately assess the extent, and the geographic distribution, of the broadband availability gap in the U.S. today. We'll show quite convincing evidence that the broadband availability gap is in fact bigger than conventional mapping techniques suggest. We'll also show that unserved homes are scattered almost randomly around population centers in a way that will make reaching them by conventional terrestrial networks much more expensive than might otherwise be expected. We'll give you a quick glimpse of the dramatic improvements offered by the latest generation of satellite broadband technology. And, we'll suggest how that technology can help close the availability gap in an extremely cost effective way by either eliminating or greatly reducing the amount of government funding needed to meet the universal availability goal established in the National Broadband Plan.

I. Millions of Unserved and Underserved Homes Are Not Yet Accounted For

The National Broadband Plan aims to ensure that, by 2020, all citizens have access to affordable broadband services with a minimum actual download speed of 4 Mbps. One of the key findings in the National Broadband Plan is that "14 million people in the United States living in 7 million housing units do not have access to terrestrial broadband infrastructure

capable of this speed."[1] This estimate relies on data aggregated from several sources, including self-reporting of service areas by broadband service providers.

The National Broadband Plan acknowledges that data must be collected on an individual household level and recommends that service provider data be supplemented with self-reporting by consumers:

> To improve its ability to make informed policy decisions and to track deployment, adoption and competition issues, the FCC should transition as quickly as practical to collecting location-specific subscribership data by provider, technology, actual speed and offered speed. Such data would make it possible for the FCC to aggregate the data to any geographic level rather than relying on providers to allocate subscribers by census tract or block. The FCC should also continue to utilize consumer-driven data collection methods, such as voluntary speed tests and broadband unavailability registries.[2]

We agree with this point. In our experience, existing data on broadband availability — including the offered speed — has been estimated too coarsely, and significantly understates the availability gap. That is, current assessments tend to assume that if a particular geographic area has service available *anywhere* within its boundaries (*e.g.*, within a census tract), then the *entire* geographic area must have that service. In many cases, that assumption is almost certainly overly optimistic.

We know from experience that *today's* broadband users do not choose a satellite service if they have a terrestrial broadband alternative; satellite today is widely viewed as a service of last resort. We intend to fundamentally change that perception of satellite broadband with the launch of ViaSat-1 next year, by making it a compelling value proposition. But today's

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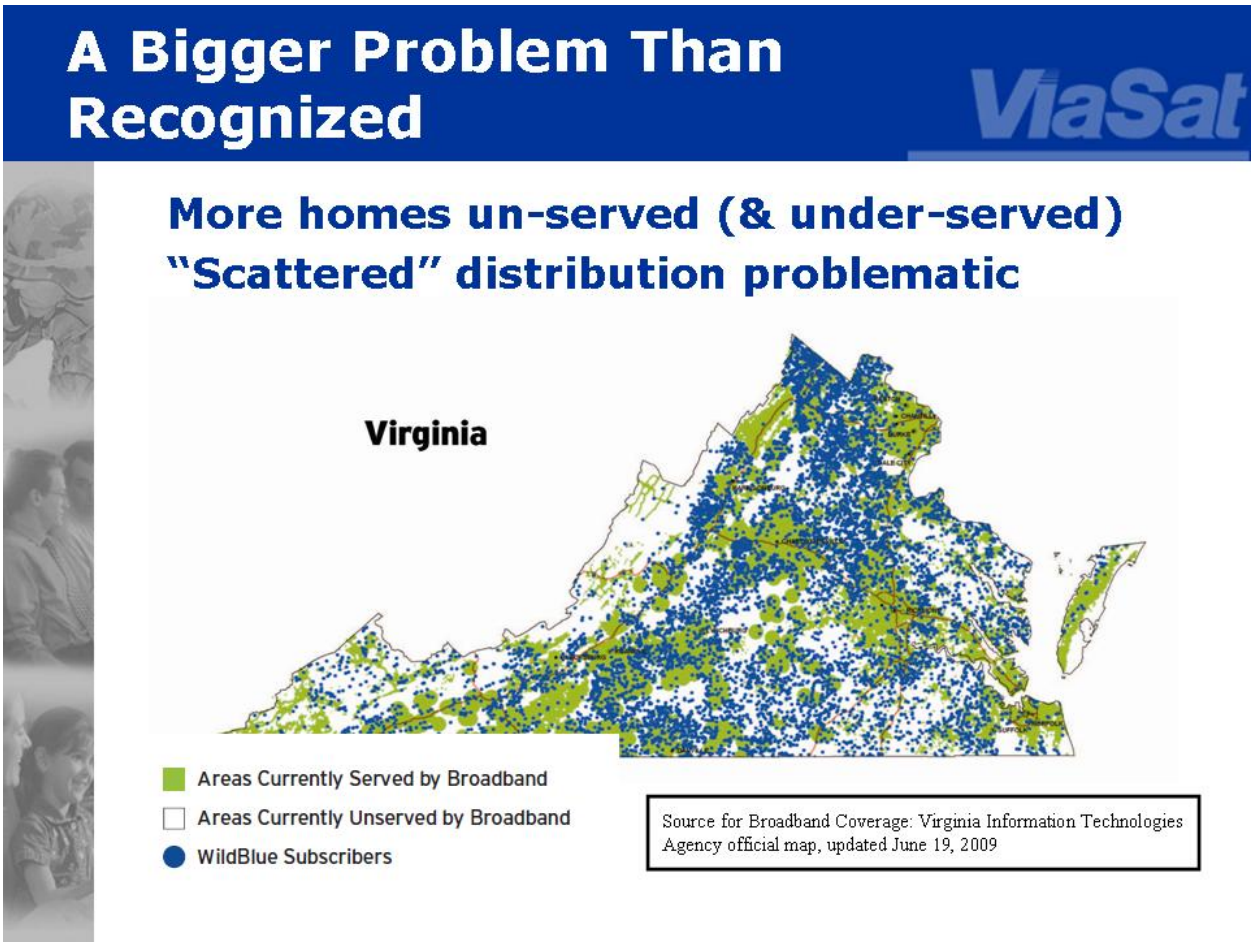
1 *See* Federal Communications Commission, *Connecting America: The National Broadband Plan* (2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296935A1.pdf ("National Broadband Plan"), at 20.

2 *Id.* at 43.

satellite broadband service is not very competitive with DSL or cable modem service because the speeds are comparatively low given the monthly subscription fees.

For this reason, a map showing the location of today's satellite broadband subscribers is a quite effective way to identify geographic areas at a very fine level of detail (*i.e.*, individual homes) that are not otherwise served. The illustration in the slide below superimposes actual WildBlue subscriber locations in Virginia on top of the state's assessment of regions currently served by terrestrial broadband.



As you can see, about half of WildBlue satellite broadband subscribers in Virginia are located in areas identified by state mapping projects as "served." Yet almost 90 percent of WildBlue's subscribers have indicated to us that they have no choice of broadband service other than satellite. As the FCC seems to suspect, it appears the existing methods of data collection materially over-estimate broadband availability. This is why we recommended a year ago to NTIA, RUS and the FCC that they consider adopting a mechanism that would allow citizens to "raise their hands" and be counted as unserved or underserved.[3]

Even if that type of a mechanism is not adopted, examining WildBlue's subscriber base would represent an effective method of "utilizing consumer-driven data collection methods," as the FCC proposes. Our subscribers today have effectively self-identified themselves as unserved by selecting satellite broadband service. Using satellite subscription data to augment current data collection efforts would provide valuable information about broadband availability in the U.S.

Many people have an intuitive sense that satellite broadband serves predominantly rural and remote areas. Our subscriber maps tell a different story. Unserved homes are scattered more randomly and broadly among relatively highly populated geographic regions than most would anticipate. The map of Virginia is typical of this phenomenon. The following slide illustrates the same type of distribution in Ohio.

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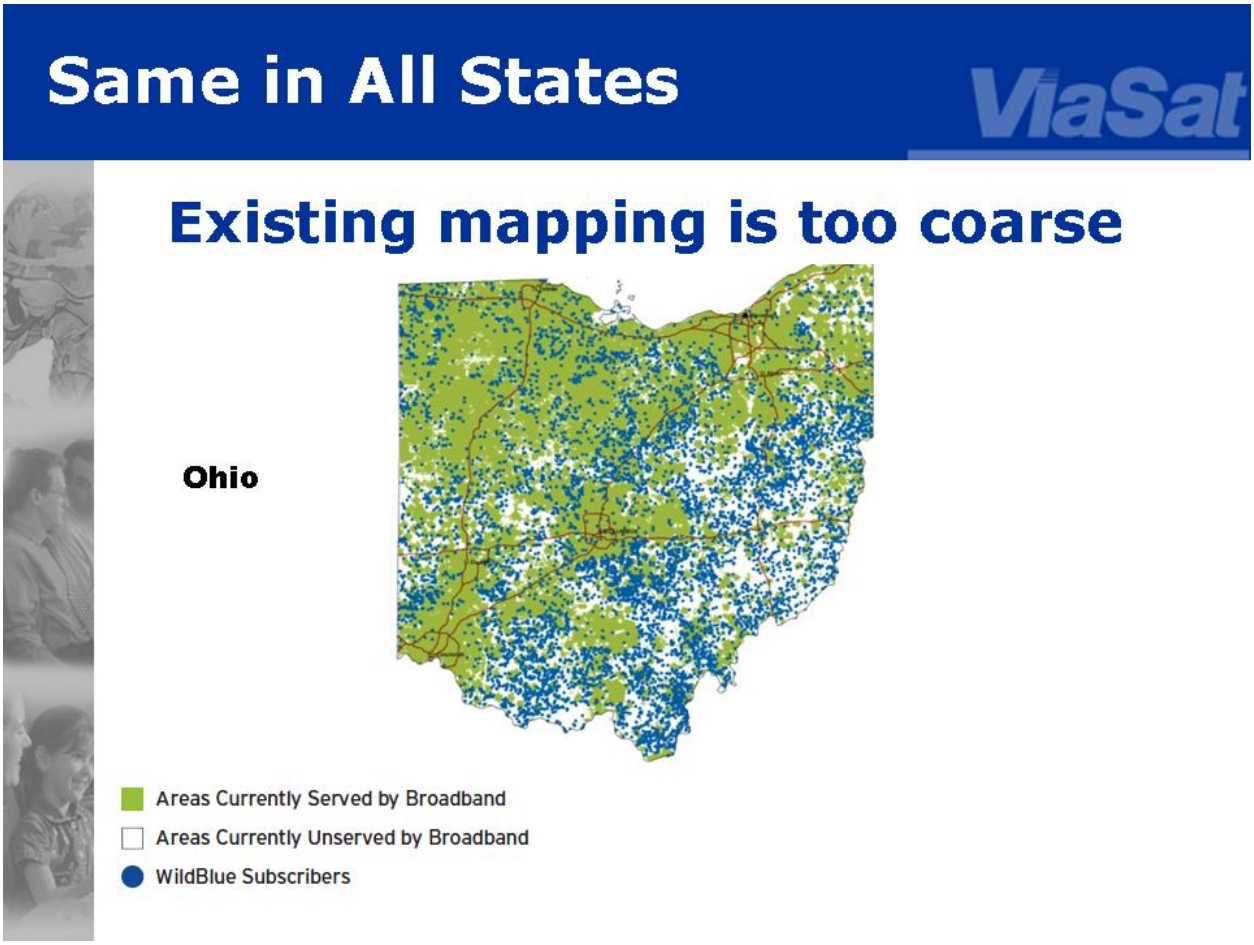
[3] *See The Commission's Consultative Role in the Broadband Provisions of the Recovery Act*, FCC GN Docket No. 09-40, Comments of ViaSat, Inc., at 9-11 (Apr. 13, 2009); *American Recovery and Reinvestment Act of 2009 Broadband Initiatives: Joint Request for Information*, NTIA/RUS Docket No. 090309298-9299-01, Comments of ViaSat, Inc., at 9-10 (Apr. 13, 2009).



It bears emphasis that when unserved households are scattered randomly throughout areas that are otherwise well-served, it changes the calculus for subsidizing the connections of those homes. The terrestrial deployment model of identifying unserved towns and communities and then embarking upon a construction project does not address the issue. Indeed, a sizable percentage of unserved households are within the areas identified as served. It would make little sense to subsidize a dominant or monopoly terrestrial provider to connect the random homes in its coverage area that it has effectively *chosen* not to serve.

Our experience suggests that, in the aggregate, these random "left-out" homes comprise millions of households across the U.S. As discussed in more detail below, the best mechanism for serving those households would be through fair and open competition among

multiple broadband service providers. And if government subsidies are made available, each consumer should be empowered to make the ultimate determination as to how to use that government subsidy toward the service that is best for his or her individual situation. That same methodology also can be effective for reaching any and all homes that want an affordable broadband service that meets the FCC's universal service objective.

II. Satellite Broadband Technology Is Capable of Providing a Quality Experience

We understand that satellite broadband today is considered by some as a service of last resort. Nonetheless, today almost 1 million Americans are satellite broadband subscribers, and the industry is thriving as it serves the most difficult to reach households without *any government assistance whatsoever*. As a new entrant, ViaSat realizes there is great potential for satellite broadband to be a self-sustaining, profitable, competitive enterprise — *if we can make the service much better, and make it a better value for subscribers.* ViaSat is doing just that. By making substantial investments to implement a revolutionary satellite design, ViaSat intends to place the quality and price of satellite-delivered broadband on par with median-quality terrestrial broadband services.

The current evolutionary stage of satellite broadband services is very similar to that of the satellite television industry in 1994 – before the launch of the two largest Direct Broadcast Satellite ("DBS") providers, DirecTV and DISH Network. There were a few million backyard satellite dishes measuring 7 to 10 feet in diameter[4] — with consumers taking extreme measures to receive satellite video services from literally dozens of different satellites, often on a

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[4] *See In the Matter of Competition, Rate Deregulation, and the Commission's Policies Relating to the Provision of Cable Television Service*, Report, 5 FCC Rcd 4962, at ¶ 103 (1990) (discussing "Home Satellite Dish" service).

catch-as-catch-can basis. At that time, some visionary entrepreneurs realized that satellite television could be a great business if they could improve the product, make it as good as or better than terrestrial video services, and make it easier, more convenient, more reliable and more predictable than then-existing satellite video services. The key to success in that industry segment was launching a new class of dedicated satellites (optimized for DBS), and continuing to improve satellite and ground system technology to allow the addition of an increasing number of channels, movies on demand, local programming, High Definition, and other innovative services. Today, approximately 30 million Americans receive video services via satellite,[5] many of them *prefer* satellite-delivered video over competitive offerings from cable and telephone companies, and virtually all Americans get a much higher quality video experience from their cable or telephone company because of the competitive forces that satellite video providers brought to the industry.

In January 2008, ViaSat commenced construction of its ViaSat-1 satellite, which promises to revolutionize the satellite broadband industry, and to have the same competitive effect on DSL, wireless broadband and cable modem service that DBS has had on cable, IP and fiber-delivered television. ViaSat-1 is expected to deliver almost 20 times the bandwidth of WildBlue's best on-orbit satellite and over 100 times the bandwidth efficiency of the best conventional satellites designed and launched as recently as six years ago.

Bandwidth is *the* central value proposition of a broadband service. That is made clear by the explosive growth in consumer demand for high-bandwidth, real-time Internet

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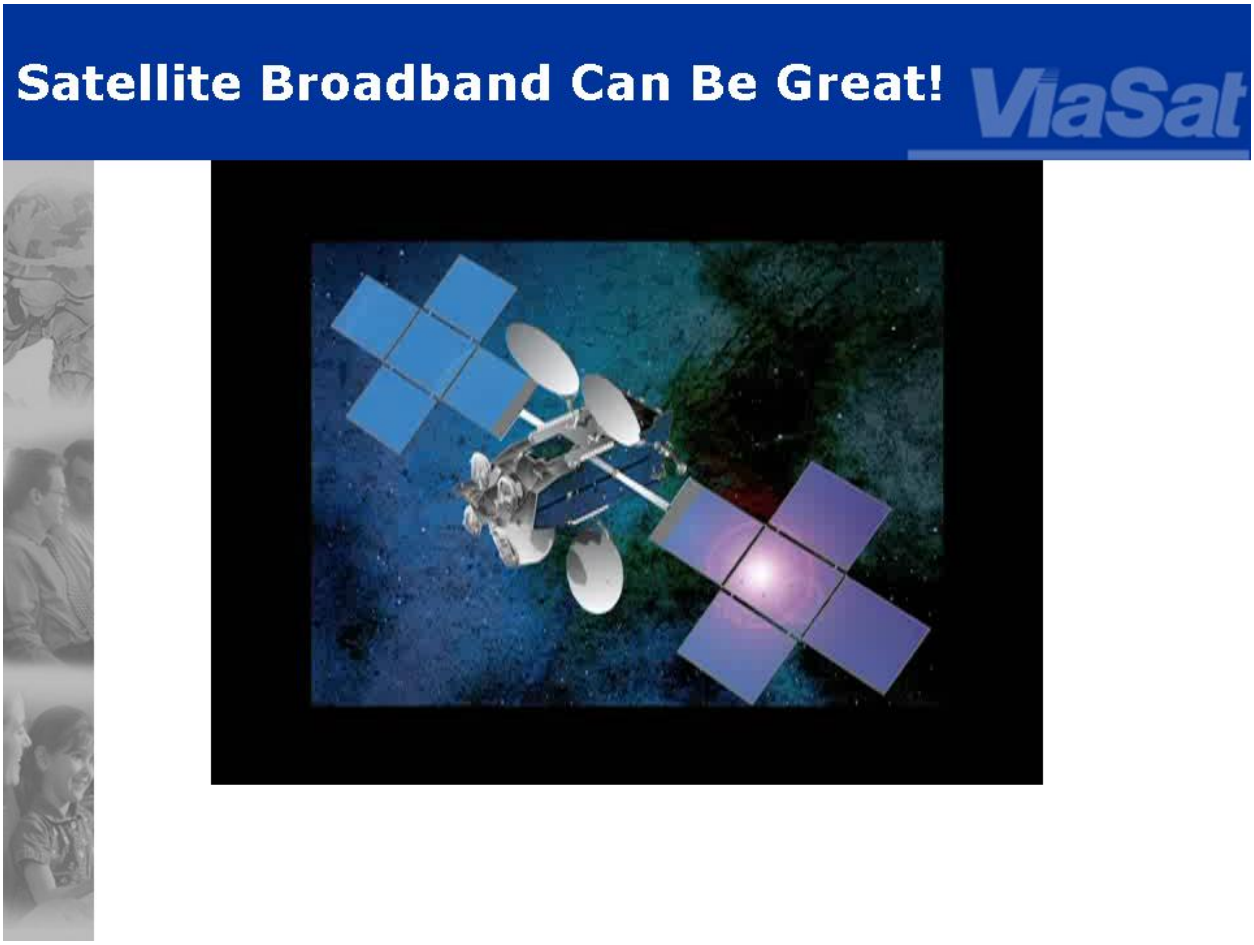
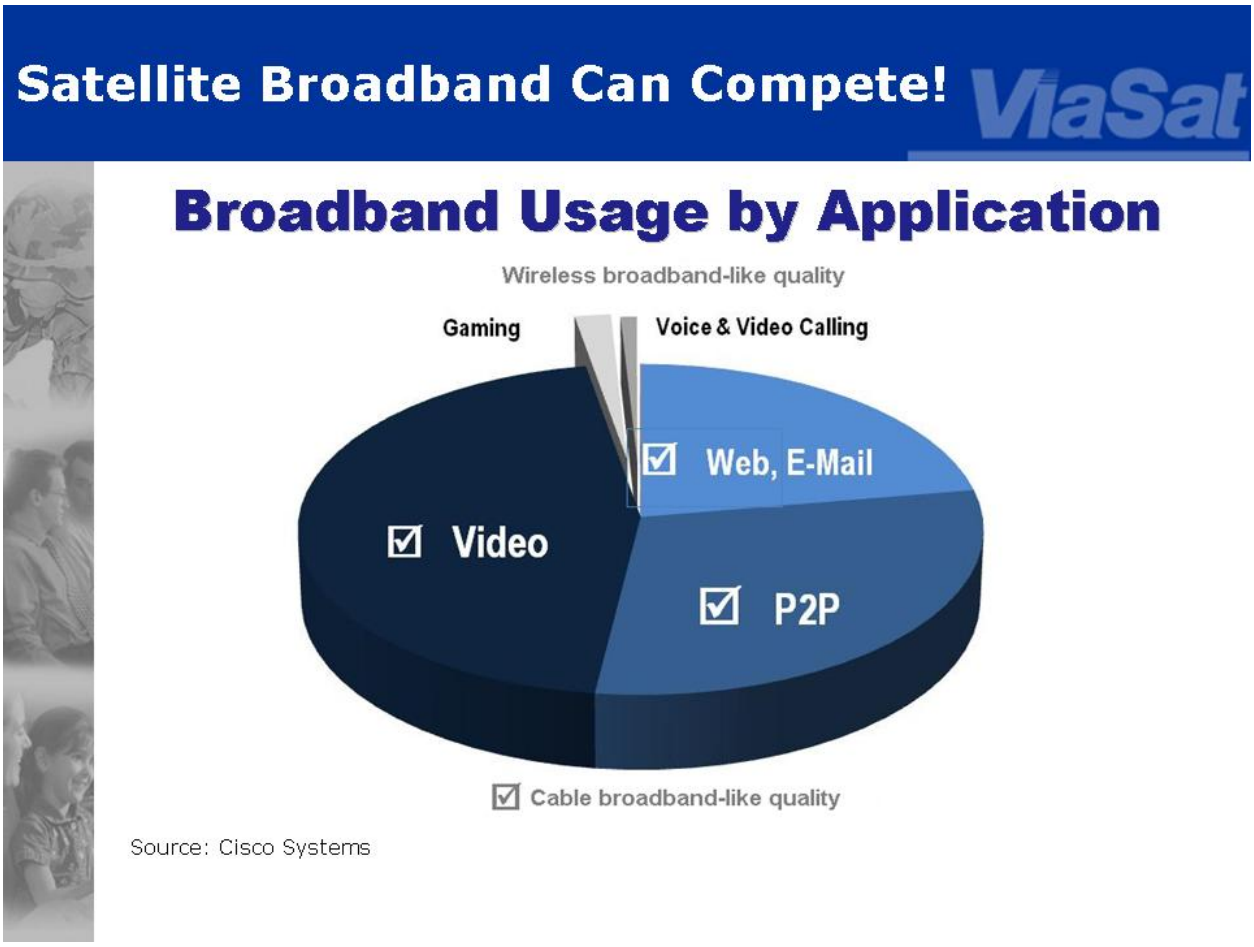
[5] *See* DIRECTV SEC Form 10-K for FY2009, at 4 (filed Feb. 26, 2010) ("DIRECTV 2009 10-K") (noting that DIRECTV provided video service to over 18.5 million subscribers as of the end of 2009); DISH Network Corporation SEC Form 10-K for FY2009, at 1 (filed Mar. 1, 2010) ("DISH 2009 10-K") (noting that DISH Network Corporation served approximately 14.1 million customers as of the end of 2009)..

applications. We are pleased by the FCC's efforts to date in making adequate spectrum available for satellites to support these growing bandwidth needs, and we look forward to working with the FCC to enable additional flexible uses of the radio spectrum, to further increase the bandwidth available on broadband satellites.

While we cannot demonstrate our service in the hearing room, we will show a video clip to illustrate the speed and responsiveness made possible by ViaSat's breakthrough, high-bandwidth, satellite technology.



The slide below depicts data provided by Cisco Systems highlighting how the bandwidth improvements of ViaSat-1 directly target the broadband applications that subscribers use the most.



By far, the greatest amount of Internet bandwidth is consumed by video (viewed on a PC or television set) and by peer-to-peer services. The success of DBS services demonstrates that satellite technology is extremely well-suited for providing competitive video services. Likewise, recent advances in wide area network (WAN) acceleration technology (a variant of a rapidly growing technology used for remote access and “cloud computing” for enterprise customers) enable quality-of-service improvements, and make it possible for ViaSat’s

satellite network to provide cable modem-like speeds and responsiveness for Web surfing, e-mail and other interactive data services.

ViaSat-1, and other broadband satellites in the same generation, will serve as a competitive alternative to wireless, DSL, and even cable for millions of subscribers. Satellite broadband over ViaSat-1 and satellites using comparable technology will be very competitive with cable modem service for those applications that consume about 95 percent of the data carried on the Internet today. The other applications tracked by Cisco[6] — VoIP, video conferencing, and "first person shooter-style" gaming — are more sensitive to time delays that can degrade the quality of the service. In general, our ViaSat-1 satellite system will provide a satisfactory experience, quite comparable to a terrestrial mobile broadband wireless service, for those types of applications. In some cases, we will provide an experience that in fact will be superior to DSL (*e.g.*, where connection speed is even more important than latency, such as with video teleconferencing).

The National Broadband Plan proposes the creation of standardized methods for measuring and disclosing actual broadband service quality, centered on actual speeds.[7] We strongly endorse that approach and believe that such transparency will make satellite-delivered broadband a more attractive competitive alternative for many consumers. We also believe that the ubiquitous availability of a quality and affordable satellite broadband service will impose positive competitive pressures on all terrestrial services, in the same way that satellite video imposes competitive pressure on terrestrial video service providers to deliver greater value to the American customer.

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6 *See Cisco VNI Forecast Widget: Projecting global IP traffic growth, at* http://www.ciscovni.com/vni_forecast/AdvancedEditor.htm (last visited Apr. 18, 2010).

7 *See* National Broadband Plan at 46 (Recommendation 4.5).

III. Satellite-Delivered Broadband Is an Extremely Cost-Effective Solution

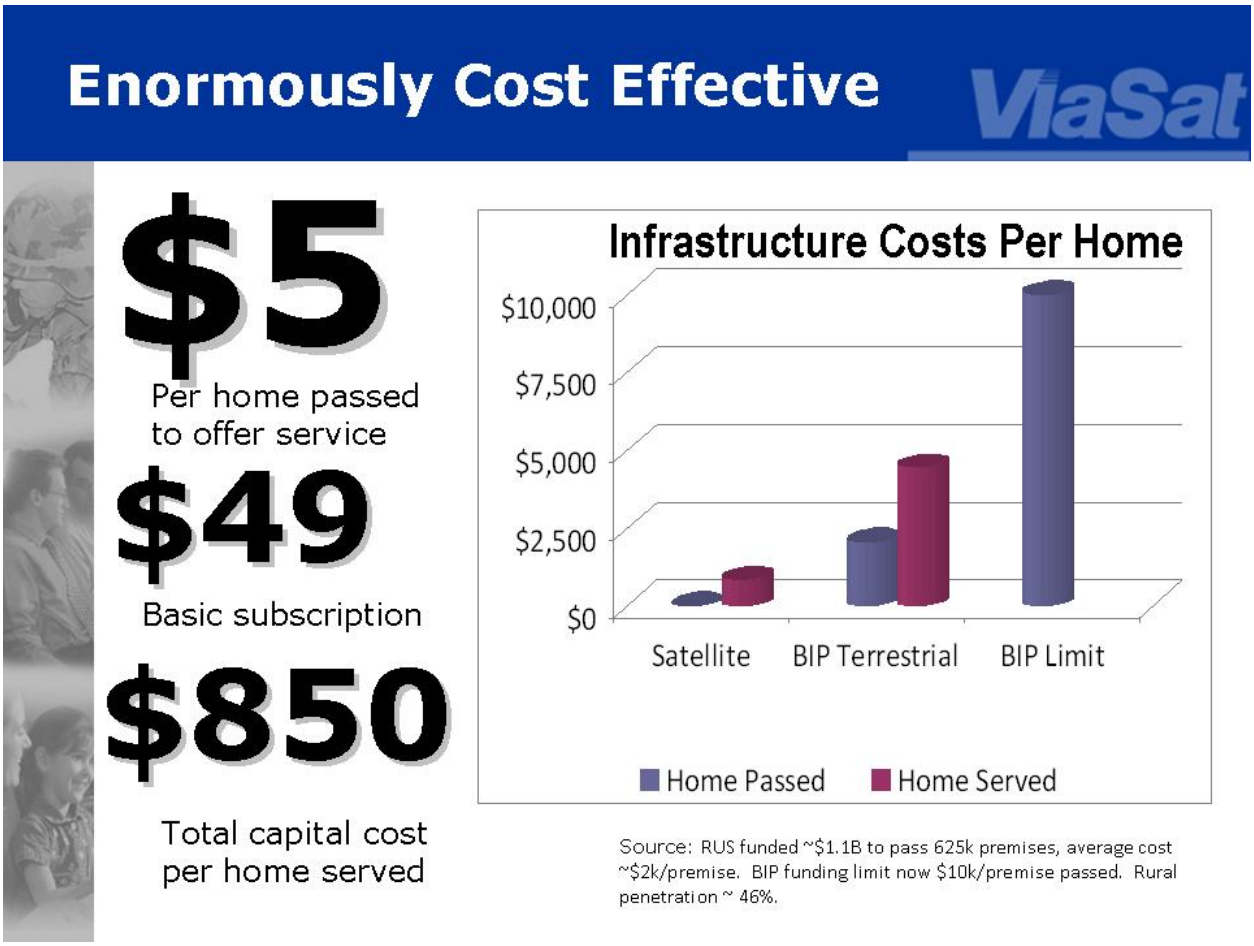
The fundamental competitive advantage that satellites have over terrestrial delivery mechanisms is the enormous capital efficiency inherent in satellite infrastructure. All terrestrial technologies have capital infrastructure costs that are proportional to the distance between the homes they serve and the core network infrastructure, such as a central office. Satellite technology, on the other hand, is largely cost-insensitive to distance. Satellite technology avoids the need to build and maintain expensive last-mile and middle-mile terrestrial infrastructure, the cost of which can be highly variable and increase exponentially with the distance of the consumer from the rest of the network. Rather, a satellite provider's capital infrastructure costs are largely fixed once the satellite is brought into service, and remote or hard-to-reach households are as economical to serve as any other household. This efficiency contributes to the enormous success of satellite-delivered video services in the U.S. today, and even more so in other parts of the world. Satellite video delivery gains economic leverage because the video bits transmitted by the satellite can be received (and shared) by a very large number of subscribers within the coverage area of the satellite without increasing the provider's cost to deliver the service.

A significant difference between satellite video service and satellite broadband service is that satellite video services largely consist of broadcasting the same programming to a large number of subscribers. Due to the shared nature of broadcast data, satellite video providers never really had to develop technology to lower the cost of delivering individual data bits. By contrast, satellite broadband services must deliver different data streams to each individual subscriber. The reason today's satellites were not optimized to deliver individual data streams is

simple: *Until now, a big enough market did not exist to warrant the investment needed to develop such technology*.

That situation has changed. Today, there are about 1 million satellite broadband subscribers, capacity available on existing spacecraft is filling up, and we are launching new satellites to support the growing demand. That demand is also why ViaSat is investing over $400 million to re-engineer the design for broadband satellites, and thus enable the delivery of digital bits to individual subscribers in a cost-effective manner. And that is how we are changing the way satellite broadband will be delivered in the future.

The following slide illustrates the enormous economic benefits that result from driving down the cost of satellite bandwidth for individual broadband subscribers:



Cost per home passed is a critical metric in determining the capital efficiency of a broadband system. This is the case because broadband adoption has a direct economic impact on the cost of providing service. As the FCC correctly recognizes, broadband adoption is an even bigger national issue than *availability*.[8] This is especially true in rural America where adoption rates may be below 50 percent even when broadband is available.[9] The important question of how we educate citizens about the critical role that broadband can provide in creating employment, educational, health-related and other benefits is beyond the scope of today's testimony. For now, the critical point is that a current, real world, 50 percent adoption rate effectively *doubles* the capital cost of serving those who do subscribe. This is a consideration that should go into any decision to invest taxpayer dollars in broadband infrastructure.

In the case of satellite-delivered broadband service, the capital cost per home passed is extremely low, because the infrastructure is shared across an extremely large service area. In the case of ViaSat-1, we estimate the capital cost at about $5 per household.[10] No terrestrial technology comes even close to this.

Satellite service is extremely capital efficient and allows us to keep subscription rates reasonable, without government subsidies, even in areas with low population density or low subscriber density. This makes satellite broadband the perfect technology to provide "fill in" service to those millions of randomly scattered citizens who live in populated areas but who have been passed over by incumbent terrestrial service providers.

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8 *See* National Broadband Plan at 123 ("Lack of adoption is a larger barrier to universal broadband than lack of availability").

9 *See id.* at 167 (Exh. 9-A).

10 The coverage of the ViaSat-1 system will include approximately 80 million U.S. households, and will cost approximately $420 million for the satellite, launch, insurance, and the gateway facilities.

Satellite also is more capital efficient than terrestrial technology when comparing the cost per household actually served. In the case of ViaSat-1, the capital cost of the system, including the cost of satellite infrastructure, ground equipment and the customer premises equipment, is approximately $850 per household served, regardless of the location of that household.

In stark contrast to these $5/household-passed and $850/household-served figures for satellite, published data from the first round of the RUS BIP program suggest that government funding for last mile terrestrial broadband infrastructure alone will yield a capital cost of about $2,000 per household passed and $4,500 per household served.[11] This cost differential becomes even more severe as efforts are made to reach homes that are even more expensive to serve than the "lower hanging fruit" selected by applicants for the first round of BIP funding. Furthermore, for the second round of BIP funding, RUS said it would consider funding

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[11] As of March 30, 2010, RUS had awarded approximately $1.067 billion for broadband projects. *See* USDA, *Agriculture Secretary Vilsack Announces a Recovery Act Broadband Initiative to Bring Economic Opportunity to the Fort Berthold Indian Reservation and Parts of Two States*, Press Release (Mar. 30, 2010). Twenty percent of this amount — or $213.4 million — would be a conservative estimate of the additional, private matching funds to be provided, based on recent experience in the RUS BIP program. *See* USDA, *Agriculture Secretary Vilsack Announces Rural Broadband Projects to Bring Economics Opportunity to Community in Eight States*, Press Release (Mar. 23, 2010) (noting that private funding equal to 45.5 percent of the RUS funding also would be contributed privately). Total investment in the RUS projects as of March 30, 2010 thus can be estimated to be at least $1.28 billion. This investment is intended to make broadband available to 529,000 rural households and 96,000 rural business and public facilities. *Id.* Therefore, the average cost per building passed associated with this RUS funding is at least $2,050. The broadband penetration rate in rural areas with broadband availability is approximately 46 percent. *See* Pew Internet and American Life Project, *Home Broadband Adoption 2009*, at 17 (June 2009), *available at* http://www.pewinternet.org/~/media//Files/Reports/2009/Home-Broadband-Adoption-2009.pdf. Consequently, this RUS funding can be expected to serve approximately 287,500 buildings. As such, the average infrastructure cost per building served associated with this RUS funding is at least $4,454.

last mile projects at capital costs as high as *$10,000 per home passed.*[12] Notably, for an apples-to-apples comparison to satellite, these figures would also need to include the costs of the terrestrial middle mile.

And it also bears emphasis that the ViaSat-1 system will support service at monthly rates that are as low as $49 for a true broadband experience.

IV. Broadband Satellite Technology Is Scalable to Meet Future Capacity Demands

The National Broadband Plan acknowledges that satellites are capable of serving *any* household at the target universal service level of 4 Mbps,[13] but inquires whether satellites have the capacity to meet the needs of *all* unserved households.[14] This is not a shortcoming of satellite technology, but rather simply is an issue of scale that will be quite directly solved with the launch of additional broadband spacecraft. As detailed below, commercial satellite operators have a demonstrated track record of expanding satellite capacity by deploying more satellites to respond to consumer demand. As we will detail, history suggests that market forces will cause commercial enterprises to meet most of the need *without any government subsidies or other market intervention.*

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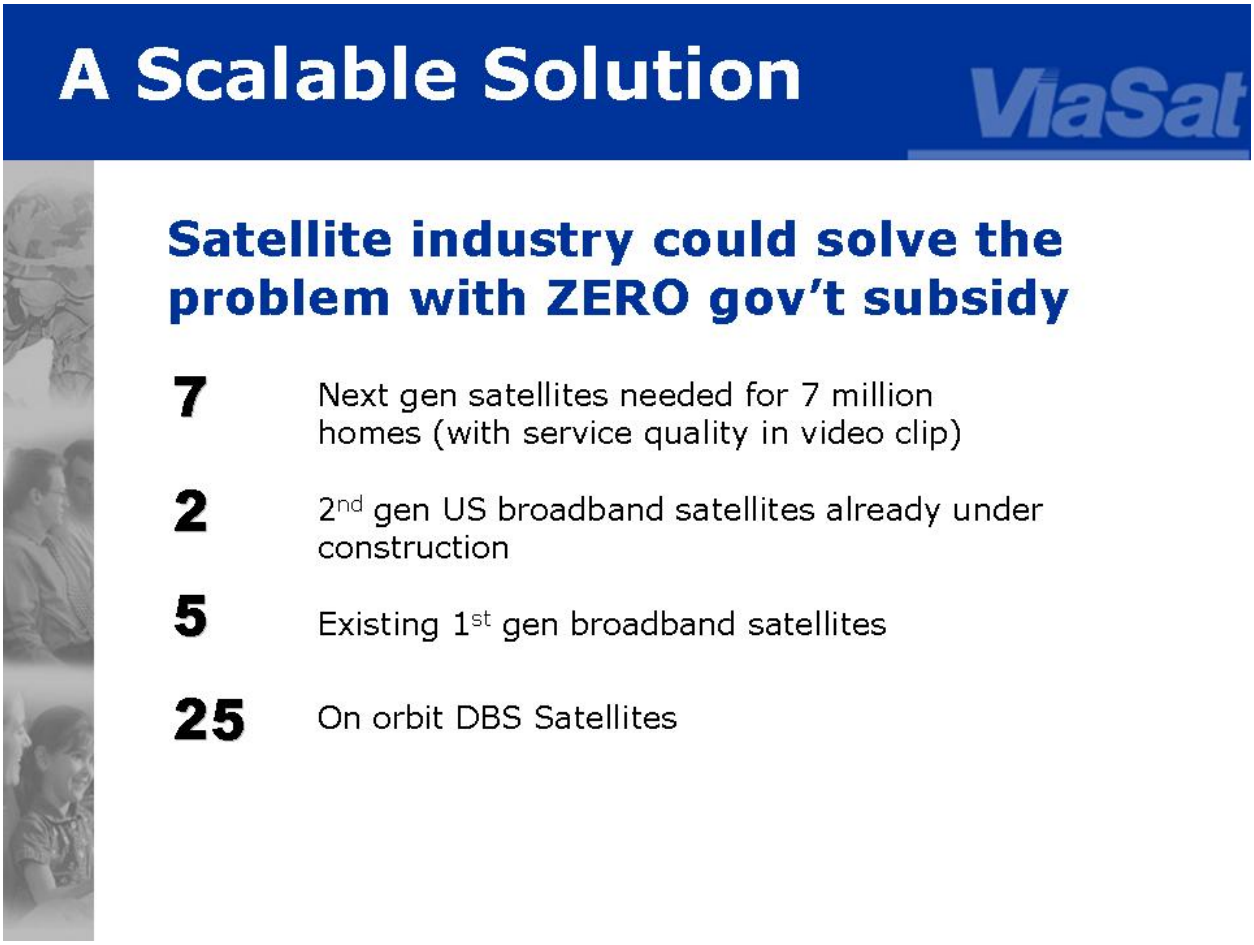
12 *See Department of Agriculture, Rural Utilities Service, Broadband Initiatives Program*, Notice of Funds Availability, 75 Fed. Reg. 3820, 3823 (Jan. 22, 2010).

13 *See* National Broadband Plan at 137 (acknowledging that "satellite is capable of delivering speeds that meet the National Broadband Availability Target . . . .").

14 The Plan suggests that "satellite capacity can meet only a small portion of broadband demand in unserved areas for the foreseeable future" and that "while satellite can serve *any given household*, satellite capacity does not appear sufficient to serve *every unserved* household." *See id.* (emphasis added).



Based on extrapolating trends in bandwidth consumption, and technologies under development, ViaSat estimates that 7 million homes could be served at or above the National Broadband Plan's 4 Mbps "actual speed" target with the launch of only seven "next-generation" broadband satellites. Two of those seven (ViaSat-1 and Hughes Network Systems' Jupiter satellite) are already under construction and are scheduled to be launched in 2011 and 2012, respectively.[15] Thus, the five remaining satellites would need to be procured over the next eight

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[15] *See ViaSat-1 to Transform North American Satellite Broadband Market*, Press Release (Jan. 7, 2008), *available at* http://www.viasat.com/news/viasat1-transform-north-american-satellite-broadband-market; *Hughes to Launch 100 Gbps Throughput Satellite in 2012*, Press Release (Jun. 16, 2009), *available at* http://www.hughes.com/HNS%20 Library%20Press%20Release/06-16-09_Hughes_to_Launch_100_Gbps_High _Throughput_Satellite_in_2012.htm.

years to meet the National Broadband Plan's 2020 target, and those spacecraft are logical replacements for the five existing older-generation satellites that are currently used and/or available for Internet access service (WildBlue-1, Anik F2, Spaceway 3, AMC-15 and AMC-16).[16] Expecting that five additional spacecraft will be procured and launched over the next decade is entirely reasonable.

Over a 15 year period, the satellite TV industry has launched over two dozen DBS satellites to serve 30 million subscribers (a comparable ratio of about 1 million subscribers per spacecraft).[17] We don't have a crystal ball, but historical experience in the DBS context strongly suggests that a similar level of growth in the satellite broadband industry is both technologically and financially feasible.

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[16] WildBlue currently provides satellite broadband services using capacity on WildBlue-1, Anik F2, and AMC-15. *See* http://www.wildblue.com/company/index.jsp (last visited Apr. 17, 2010). AMC-15 and AMC-16 have identical payloads. *See SES GLOBAL Companies Contract Three Satellite Launches with ILS* (Apr. 19, 2004), *available at* http:www.ses.com. Hughes Network Systems provides broadband services over Spaceway 3. *See* http://www.skyway3.com/news.php (last visited Apr. 17, 2010).

[17] *See* DIRECTV 2009 10-K at 9 (noting that DIRECTV "currently has a fleet of twelve geosynchronous satellites . . . ."); DISH Network 2009 10-K at 2 ("We own or lease capacity on 11 satellites in geostationary orbit . . . ."); *see also*, *DISH Network Launches New Satellite to Expand Industry's Largest HD Offering*, Press Release (Mar. 21, 2010) (indicating that recent launch brings the size of the network constellation to 15), *available at* http://dish.client.shareholder.com/releasedetail.cfm?ReleaseID=453561.

V. Any National Broadband Plan Subsidies Should Facilitate Competition and Consumer Choice

One of the proposals made in the National Broadband Plan requires very careful examination:

> There should be at most one subsidized provider of broadband per geographic area. Areas with extremely low population density are typically unprofitable for even a single operator to serve and often face a significant broadband availability gap. Subsidizing duplicate, competing networks in such areas where there is no sustainable business case would impose significant burdens on the USF and, ultimately, on the consumers who contribute to the USF.[18]

This proposal does not take into account, as we have illustrated quite vividly here, that a large proportion of unserved homes are scattered throughout geographic regions where two or more existing terrestrial service providers — such as a telephone company and a cable company — in fact exist. As a policy matter, if subsidies are used at all in that geographic region, the subsidy should go to whichever of the two service providers can more cost effectively serve the unserved premises. In fact, it would be most effective if each subscriber had the opportunity to choose which of the two available service providers would be better for that individual home, based on evaluating competitive offers from the two services (regardless whether the service is subsidized or not).

The FCC has properly recognized that satellite is perfectly capable of serving any of the unserved homes in the U.S., whether in a rural area or not, and at the target universal service quality level. Thus, all of the unserved homes in the U.S. that are reachable by satellite are in a position to choose from at least two service providers. In addition to satellite, those service providers also could be wireless, telco, and cable — and possibly more than one of each type. No doubt, there are disadvantaged Americans who need financial assistance. But we

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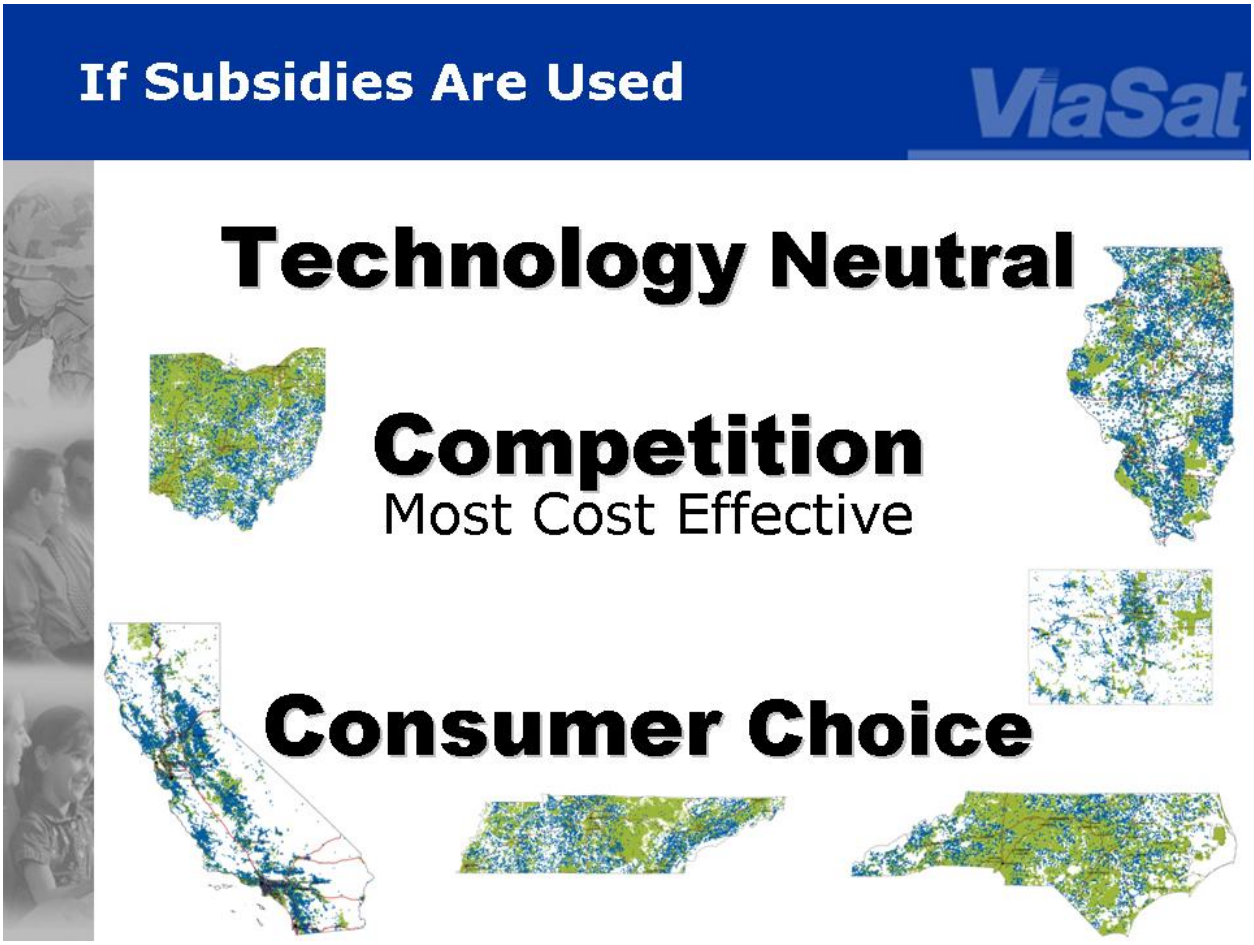
[18] National Broadband Plan at 145.

firmly believe that the needs of those Americans would be served far better by developing a subsidy mechanism that allows them to choose, from among multiple alternatives, the service provider they believe will deliver the best mix of price and quality for their individual circumstances. For these reasons, we urge Congress not to adopt any subsidy mechanism that has the effect of favoring one particular broadband ISP in a particular region, over all other ISPs who also could serve that same region.



ViaSat agrees with the critical observation in the National Broadband Plan that "the exact role of satellite-based broadband and its impact on the total cost of universalizing access to broadband depends on the specific disbursement mechanism used to close the broadband availability gap."[19] We believe that the following five factors (discussed in detail above) present a compelling case that satellite should have a meaningful role in universalizing broadband access: (i) the extent of the availability gap, (ii) the sparse and relatively random dispersion of unserved subscribers (as shown by empirical consumer-driven data collection), (iii) the breakthrough gains in bandwidth efficiency being made by the satellite industry, (iv) the potential to create "gas mileage" like metrics to compare the actual delivered speeds of differing broadband technologies, and (v) the power of competition to drive value creation for consumers.

We also believe that those five factors present a compelling case for the government to adhere to two principles as it determines how to facilitate broadband deployment and adoption: competition and consumer choice.

If the government chooses to subsidize broadband availability at any level, ViaSat strongly urges that any adopted mechanism be open and transparent, and most critically, facilitate enduring competition. Moreover, given the wide dispersion of unserved households, ViaSat urges that any subsidies be provided through a mechanism that empowers every eligible American *to choose* how to spend his or her subsidy dollars. Using federal funds merely to further endow entrenched providers inhibits competitive entry into those markets and takes away the consumer's ability to choose a provider. Putting the choice of broadband service provider in the hands of the consumer cultivates a more competitive landscape. Such a mechanism would provide the incentive for service providers to compete to win customers, thus empowering end

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[19] National Broadband Plan at 137.

users to choose the provider offering the best combination of price and quality. This approach also would foster the competition that is needed to drive future innovation in data transmission technologies.

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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.