



# The Effect of Satellite and Wireless on Rural Universal Service Policy

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## SUMMARY

- The National Broadband Plan set an objective of universal access to data speeds of at least 4Mbps.
- Technological innovation has resulted in a dramatic increase in competition for the supply of data and voice service in rural areas.
- It is now possible to obtain 3Mbps or faster rates of data transfer practically anywhere, either over 4G cellular wireless, or over satellite. The National Broadband Map, commissioned by the Federal Communications Commission, shows that more than 99.9 percent of Americans have access to some form of broadband with download speed in excess of 3 Mbps. In many rural areas, such services can be delivered at significantly lower cost than through new cable or fiber lines.
- In addition, many rural homes without cable or fiber can obtain relatively high-speed wired broadband through DSL over existing copper lines.

- The National Broadband Plan universal service objective has thus been met and no more subsidies are needed.
- Continuing to subsidize the deployment of wired broadband in rural areas through the Connect America Fund and other programs undermines the incentive of cost-competitive firms to invest in infrastructure, harming competition and likely reducing the proportion of people who are able to access higher speed broadband.

## INTRODUCTION

Since its inception in 1934, the Federal Communications Commission (FCC) has been charged with ensuring “that all Americans should have access to communications services”. In the early days, the only way this “universal service” requirement could be achieved was through the laying of copper wires for telephone or telegraph. Over time, however, new technologies have been developed that enable many more ways to com-

municate. Unfortunately, however, the mindset of the FCC has not kept pace with technology.

Currently, the FCC requires suppliers of wireline service to collect a “universal service fee” from customers. This fee supports the Federal Universal Service Fund (FUSF), which totals \$8 billion annually.<sup>1</sup> The FUSF consists of four components, three of which route distributions directly or indirectly to users.<sup>2</sup>

- Low-Income Support, also called the Lifeline program, which assists low-income customers by helping to pay for monthly telephone charges so that telephone service is more affordable.
- Schools and Libraries Support, also known as “E-Rate,” which provides telecommunication services, Internet access and infrastructure support to eligible schools and libraries.
- Rural Health Care Support, which allows rural health care providers to pay rates for telecommunications services similar to those of their urban counterparts.
- High-Cost Support, which distributes funds to telecommunications companies serving rural areas. Some states also have funds that mirror this approach.

The fourth fund, High-Cost Support, is perhaps the most problematic. Even the name of this component is potentially misleading. The cost of acquiring and laying a mile of fiber optic cable (or copper, or coax) is not much different in rural areas than urban. (It is often cheaper, due to lower costs of right-of-way acquisition, fewer disruptions to cable laying, and fewer problems with scheduling and permitting.) But compared with large towns and cities, the density of dwellings and businesses is typically much lower, so the cost of reaching each customer with wirelines is higher in rural areas. But wirelines aren’t the only way to reach customers.

The underlying presumption of current universal service policy—that rural telecommunications cannot be delivered at net profit—is out of date. Not only does it fail to account for the fact that some rural consumers would likely be able and willing to pay for premium service at a higher price, but it ignores the existence of platforms that in many cases have lower capital costs per customer served, such as wireless and satellite. As

a result, consumers in urban and suburban regions end up subsidizing inefficiently provided service to consumers in rural areas—even though these consumers can already access quality service for similar prices supplied by unsubsidized providers.

In 2010, the FCC set out a plan to expand access to high-speed broadband data service. In spite of the technological revolution in telecommunications service in the past decade, the universal service aspects of the plan built upon the existing structures and assumptions underlying the FUSF. This policy brief aims to critically evaluate those universal service elements and offer an alternate solution.

## THE NATIONAL BROADBAND PLAN

The National Broadband Plan set forth by then-FCC Chairman Julius Genachowski in 2010 outlined six “Goals for a high performance America”:<sup>3</sup>

1. At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second by the year 2020.
2. The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
3. Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
4. Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
5. To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
6. To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

In addition, the Plan set out a National Broadband Availability Target pertaining to Goal 3, which asserts that:<sup>4</sup>

*“Every household and business location in America should have access to affordable broadband service*

with the following characteristics:

- Actual download speeds of at least 4 Mbps and actual upload speeds of at least 1 Mbps
- An acceptable quality of service for the most common interactive applications

*The FCC should review and reset this target every four years.”*

In order to achieve the Availability Target, the FCC created a Connect America Fund (CAF) that will direct subsidies to broadband access platforms. As a mechanism, it is little more than a new name for the FUSF’s High-Cost Support, which in 2011 allocated \$4.6 billion for rural telecommunications.<sup>5</sup> The CAF sustains the same subsidy mechanism, only instead of directing payments to single line voice telephony, it shifts funding to broadband infrastructure.

The assumptions underlying the CAF are also broadly the same as for the FUSF: that telecommunications service is a natural monopoly and the capital requirements of rural service are too high to be recouped through rates consumers can afford. Both were true once, but neither is anymore. Reliable, quality broadband service at speeds of greater than 3 Mbps and at reasonable cost is available from more than one provider in nearly every part of America. The National Broadband Map, created and maintained by the National Telecommunications and Information Administration in collaboration with the FCC, shows that more than 99.9 percent of Americans have access to some form of broadband with download speed in excess of 3 Mbps, either by satellite, terrestrial wireless, or wired technology.<sup>6</sup> Notably, the map shows that 82.3 percent have access to some form of wireless with an advertised speed of 3 Mbps or higher, including 34.1 percent with access to fixed terrestrial service, 30.1 percent with access to unlicensed wireless service, and 76.1 percent with access to mobile broadband at the requisite speed.<sup>7</sup>

While wireline platforms—digital subscriber line (DSL), coaxial cable and fiber—together still make up the majority of broadband connections, wireless access methods are being adopted at a faster rate, providing evidence that consumers see wireless as a viable alternative. The latest FCC data shows that fixed connections (which include fixed wireless) with download

speeds at or above 3 Mbps and upload speeds at or above 768 kbps increased from 56 percent to 64 percent of total fixed connections. Among mobile wireless subscriptions, the share increased from 14 percent to 28 percent (see Figure 1).<sup>8</sup>

More significantly, however, FCC data shows that wireless data connections of at least 200 kbps overtook wireline connections of similar speeds in 2011. Of 186.7 million such residential connections, 106 million, or 56.8 percent, were wireless. Even at relatively low speed links, wireless has become the preferred choice for data.<sup>9</sup>

Further, the FCC estimated that, in October 2012, only 0.5 percent of U.S. households lived outside of mobile broadband coverage areas—the figure was 2.2 percent in rural areas and just 0.1 percent in non-rural areas. Competition is considerable, too. The same research determined that nearly 90 percent of the U.S. population is served by two or more mobile service providers (see Figure 3).<sup>10</sup>

The data show it is no longer necessary for telecommunications companies to lay a wireline connection ten miles or more to reach one residence in order to achieve “universal service.”

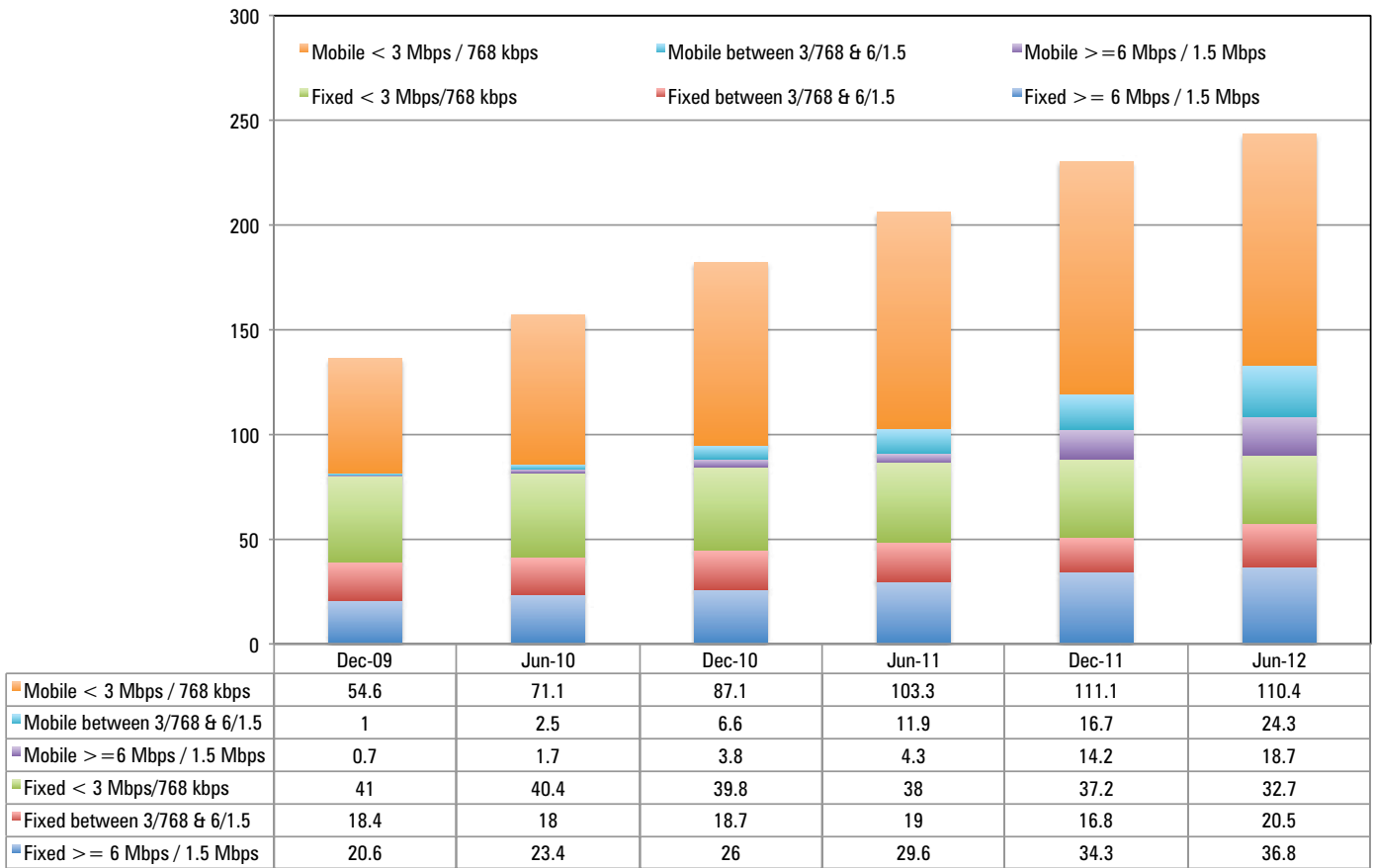
It is time that the FCC took these new realities fully into consideration. Now that consumers in rural areas have a choice of service providers, a structure where funding goes to a subset of these providers—namely those who rely solely on wireline infrastructure—is highly questionable. The state of Colorado recently demonstrated an understanding of this when its PUC issued an order to end its own service provider subsidy program—citing the availability of competitive alternatives.<sup>11</sup>

## THE SUBSIDY PROBLEM

The FUSF is funded by a surcharge on all phone bills, including voice-over-IP service offered by companies such as Vonage, as well as some cable TV companies. These funds are used to subsidize a select group of telephone companies determined by state public service commissions, within parameters set by the FCC, and known as eligible telecommunications carriers (ETCs). ETCs can in principle use any technology platform, as long as they operate facilities and are not simply reselling another provider’s service.



Figure 1: Fixed Connections and Mobile Connections by Speed 2009-2012



Source: FCC Wireline Competition Bureau

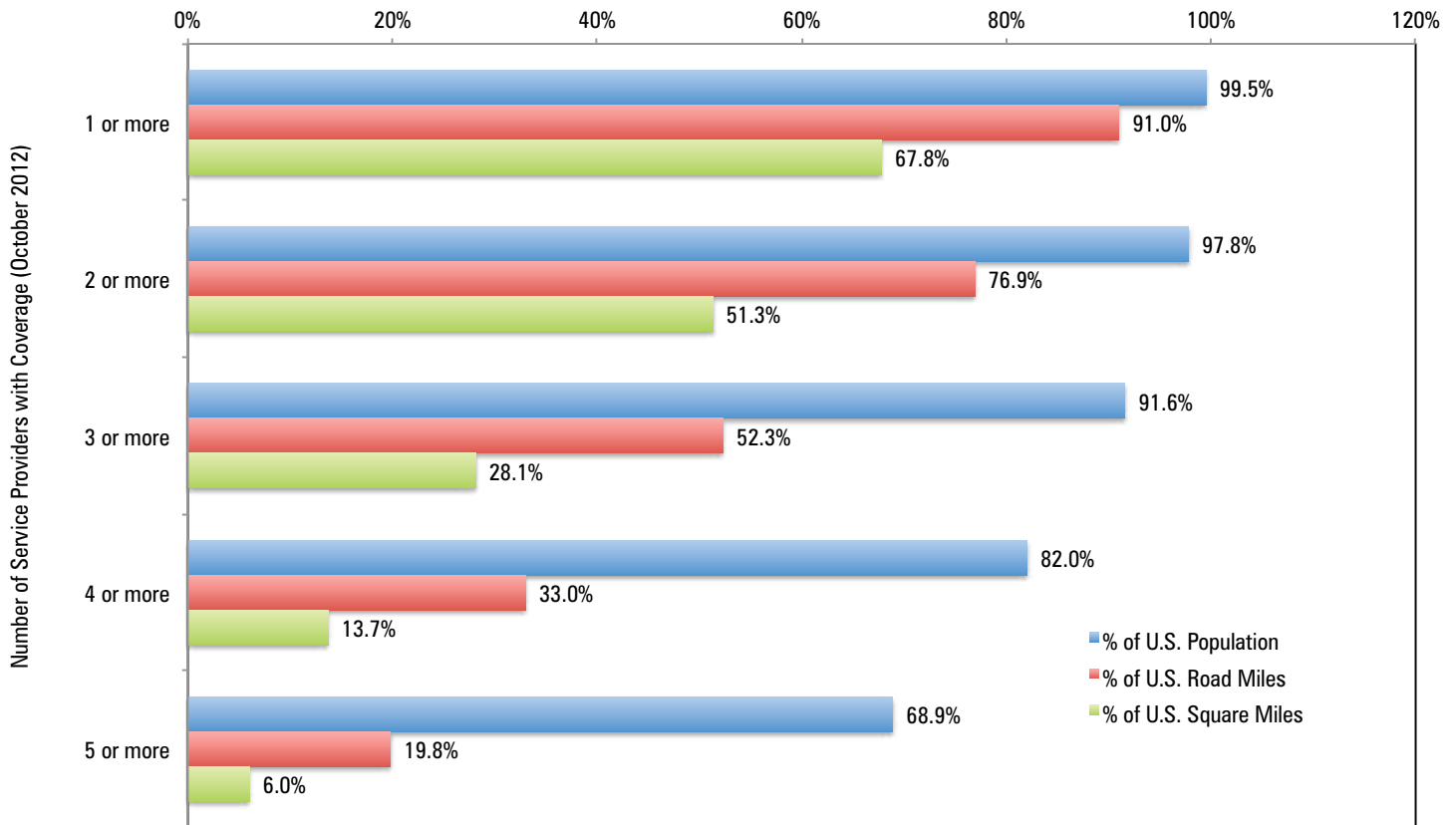
Figure 2: Residential Connections over 200 kbps in at Least One Direction 2007-2011 (In thousands)

Technology	2007		2008		2009		2010		2011	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
Total	73,984	79,090	88,190	103,300	117,089	132,567	149,441	171,773	186,704	
Total Fixed	64,875	67,554	69,047	71,509	73,394	75,251	76,918	78,906	80,711	
Mobile Wireless	9,109	11,536	19,142	31,791	43,695	57,316	72,523	92,867	105,993	

In addition, distributions from the FUSF's High-Cost Support Fund are made on a cost-plus basis, that is, the fund compensates rural phone companies 110 percent of their capital costs for rural deployment. This simply encourages greater spending. Why spend \$1 million on wireless broadband construction and net \$100,000 from the government, when a company can spend \$10 million on high-end fiber optics systems (being sure to spend the extra money to bury the fiber, not simply use existing poles) and net \$1 million?<sup>12</sup>

An intrinsic consequence of this subsidy regime is that it inhibits investment and take-up of alternative technologies that could deliver universal broadband at a real profit. For example, a wireless or satellite provider might be able to provide 4 Mbps or better broadband to rural consumers for a price of \$50/month (comparable to rates in denser metropolitan areas) and be profitable. But the incentive to enter that market is dampened when an ETC-designated service provider whose costs are more than \$50/month can provide a

Figure 3: Estimated Mobile Wireless Broadband Coverage by Census Block, Oct. 2012



Source: Mosaik Data, 2010 Census

similar service for a price of only \$40/month and still make a “profit” as a result of CAF subsidy.

Moreover, America’s subsidized rural phone companies are still losing voice customers while failing to gain traction in broadband. This makes the FUSF funds doubly wasteful. Not only is the government funding the ETCs’ expensive infrastructure, but the very consumers who are the intended beneficiaries of these subsidies are rejecting the ETCs’ service.

CenturyLink, which at \$18.4 billion in revenues ranks as the nation’s largest rural phone company, saw voice lines drop to 13.7 million in 2012 from 14.9 million in 2011. Broadband connections saw only slight growth—reaching 5.85 million in 2012 from 5.6 million in 2011.<sup>13</sup> As a percentage of overall corporate sales, revenues from consumer and small business phone customers dropped to 54 percent in 2012 from 57 percent in 2011.<sup>14</sup> That these rural companies are

losing customers makes a prima facie case for competition—consumers have other choices. Yet federal and state USF payouts to CenturyLink grew to \$543 million in 2012 from \$510 million in 2011. The 2011 payout itself was an increase from \$431 million in 2010.<sup>15</sup> CenturyLink’s net profit for 2012 was \$777 million.<sup>16</sup> That means in 2012, federal and state USF subsidies contributed almost 70 percent of its bottom line.

Windstream, with total 2012 revenues of \$6.16 billion, saw voice lines drop to 1.84 million in 2012 from 1.93 million the year before, while high-speed Internet lines remained flat at 1.2 million for the same period. Overall consumer service revenues dropped to \$1.34 billion in 2012 from \$1.39 billion in 2011.<sup>17</sup> Meanwhile, FUSF payouts to Windstream grew to \$337.3 million in 2012 from \$302.9 million the year before.<sup>18</sup> Moreover, Windstream’s 2012 FUSF revenues were double its overall corporate net income of \$168 million.<sup>19</sup>

Without the subsidies, Windstream would be a failing business.

At Frontier Communications, voice line revenue was \$257.8 million in 2012, down from \$319 million in 2011. The company last year lost 240,000 voice customers, but gained only 23,400 broadband customers. Government subsidies were up, however, to \$318.6 million in 2012 from \$300.1 million in 2011.<sup>20</sup>

In other words, FUSF maintains a system of corporate welfare that rewards inefficiency and holds back innovation. To the extent that the CAF is modeled on the FUSF, it is likely to have a similar effect.

## RURAL TELECOMMUNICATIONS IN THE 21ST CENTURY

When one reads over the various arguments for rural subsidies, one finds consistent evocation of the progressive era, when the government subsidized water and electricity infrastructure to swaths of rural areas of the U.S. *The Path to Power*, the first volume of Robert Caro's biography of Lyndon B. Johnson, tells the story of how, as a congressman in the 1930s, LBJ brought electricity to the Texas Hill Country west of Austin, dramatically improving the quality of life for the relatively poor farmers who lived there.

While current telecom policy tends to see rural America through that Depression-era lens, the reality of modern rural America is very different. Drive through LBJ's boyhood landscape today—on the very road he helped pave as a young man—and you will find campgrounds and high-end RV parks with free WiFi, highway infrastructure and a series of boutique wineries. Although the rural character remains, town like Fredericksburg are weekend shopping and dining meccas, and once isolated small towns like San Marcos have been absorbed into the suburbs of Austin and San Antonio.

To be sure, there are still economic problems in many rural areas, yet at the same time, wealthier individuals are choosing to live in many of these areas and build profitable businesses. Whether a successful Hill Country ranch or winery should have its 100 Mbps fiber optic line underwritten by urban-dwellers who are often less well-off is a legitimate question. Yet this is current FCC policy.

Rural America today is not the rural America of the progressive era. Although population density is low and local economies are not always as vibrant and diverse, rural areas do not lack conveniences of modern infrastructure. Water, electricity, roads and other networked systems serve these areas. Goods and services can easily move to and from these areas, and the local population has far more mobility. Rural does not necessarily equal poor. For example, rural areas of North Dakota are seeing huge economic growth due to the boom in hydraulic fracturing. Other rural areas, such as Jackson Hole, Wyoming and Coeur D'Alene, Idaho, are five-star vacation destinations.

For many, rural living is a choice. It offers a retreat from the noise and traffic of cities and suburbs. It offers space and scenery. But lifestyle choices involve trade-offs. In return for a larger home and more outdoor living space, there is a longer drive to the supermarket. In return for the chance to grow your own vegetables, you might miss dining at charming ethnic restaurants. Likewise, city and suburban living might give you access to a 40 Mbps fiber connection, but a rural location might mean settling for 5 to 10 Mbps via satellite or wireless.

## SATELLITE

In a 2006 paper, economist Thomas Hazlett suggested rural telecom users would be better served, and the FUSF better administered, if every user in rural America were given a satellite phone. Based on Hazlett's calculations, the FUSF could pay for every household in Alaska to have satellite phone service at far lower cost than it was incurring by providing subsidies to wireline providers on a cost-plus basis.<sup>21</sup>

Hazlett's paper predated the explosion in broadband applications such as social networking and IPTV services like Netflix and YouTube. Today he might suggest that instead of a simple satellite phone, government pay for rural satellite broadband connections. But as satellite service is affordable, subsidies may not even be necessary.

Broadband via satellite offers a solution to rural broadband delivery. Unfortunately, it barely amounts to a blip on the FCC's radar. The National Broadband Plan brings up satellite only to dismiss it:

*“While satellite is capable of delivering speeds that meet the National Broadband Availability Target, satellite capacity can meet only a small portion of broadband demand in unserved areas for the foreseeable future. Satellite has the advantage of being both ubiquitous and having a geographically independent cost structure, making it particularly well suited to serve high-cost, low-density areas. However, while satellite can serve any given household, satellite capacity does not appear sufficient to serve every unserved household.”<sup>22</sup>*

To be generous, this statement may have been true in 2010, when the report was published. However, it is more than debatable now. Slowly and somewhat quietly, satellite services have been evolving to the point where they are competitive as a platform for high-speed Internet service.

To be sure, DirecTV and Dish Network, the two major satellite TV providers, still partner with wireline telecom providers for Internet services in many areas of the country. Therefore, at the moment, they do benefit from FUSF funding in rural areas. But these relationships do not appear to be long-term. Satellite providers ultimately hope to capture these Internet service revenues for themselves by using satellites for broadband. HughesNet Internet, which Dish Network acquired in 2011, is already marketing satellite broadband in rural areas. Its price for basic 10 Mbps download, 1 Mbps upload is \$59.99 per month, although promotional offers are often available.<sup>23</sup>

These rates are comparable to cable broadband rates, which range between \$50 and \$60 a month for comparable speeds. Most important, however, they are unsubsidized. Left alone, market forces can indeed deliver broadband to rural areas.

There’s every reason to believe satellite services like HughesNet will expand. For one, spectrum re-allocations have allowed direct broadcast satellite transmissions to move to radio frequencies better suited for high-bandwidth services, including high-definition television and high-speed Internet.<sup>24</sup> The shift to new frequencies will also solve the problem of serving a larger number of households. New satellites to accommodate high-bandwidth communications, such as Hughes Network Systems’ Jupiter 2 and Spaceway 3, are in production.

Satellite connections will always be limited by the physics of lightspeed. In an interactive session, signals must make two trips of approximately 44,000 miles, which takes about half a second, a delay known as latency. By contrast, fiber optics has a latency of about a tenth of a second. Until recently satellite latency was compounded by the time it took to process signals in the ground-based equipment. That’s where most of the recent improvement efforts have been focused. The Spaceway 3 satellites, for example, will be able to do some signal processing onboard, saving time on the ground. Meanwhile, on the ground, software is being used to reduce the amount of data in the “packet headers”—information that machines use to process and transmit bitstreams but that does not pertain to the application. That means less data taking up transmission time.

For consumers, this means that satellite broadband only diminishes applications that depend on very fast real-time interaction, such as some multiplayer gaming. Satellite receivers, PCs smartphones and other personal communications devices buffer streaming video, so reception is rarely affected. Even voice applications, such as Skype, work well with little noticeable degradation. In parts of the world without wireline infrastructure, such as Eastern Europe and Russia, satellite is a major means of voice and broadband communications.<sup>25</sup>

Customer satellite dishes are also getting smaller and more compact. That means faster installation times. Satellite dish installers can now do as many as four installs a day compared to two previously. This translates to better customer service and more efficient use of labor.

## WIRELESS AND WIRELESS EXTENSIONS

Satellite is not the only alternative to capital-intensive wireline-based broadband. The latest generation of wireless networks can carry data at speeds of 10 Mbps and greater. These so-called “Fourth Generation Long Term Evolution,” or 4G LTE, networks have already been deployed in major metropolitan areas. Service providers are now deploying them in secondary

markets and rural areas, usually along major interstate and U.S. highway corridors.

Wireless networks still come with extensive costs. Acquisition, approval and construction of tower sites are expensive and time-consuming. Wireless networks also have a substantial wireline component: towers need to be connected to distant switching and routing systems, usually via aggregate fiber optic links that are either built or leased.

But unlike wireline-based residential broadband, wireless networks in rural areas can spread their costs among more users. Rural wireless networks also support roaming traffic. A more extensive wireless network offers greater utility to all users. Returning to the example of locations such as Jackson Hole and Coeur D'Alene, vacationing customers from San Francisco or Seattle can be confident that their wireless devices will work as well as they do at home.

This is why wireless companies are pushing ahead with network upgrades. AT&T operates 4G LTE networks in 261 markets, covering 200 million people. In early June, the company announced it was adding 22 more markets—many of them rural areas such as Batesville, Arkansas; Florence, Alabama, and McAllen, Texas—along with plans to add 77 new markets by the end of summer 2013. Its overall goal is to cover 250 million of the 314 million U.S. population with 4G by the end of the year.<sup>26</sup>

Verizon Wireless, meanwhile, has launched LTE in 491 markets, and its footprint encompasses 287 million people.<sup>27</sup>

Figure 4 shows FCC data on 3G/4G rural buildouts based on individual company reports.<sup>28</sup>

These numbers cover people beneath the wireless companies' own coverage umbrellas. They do not constitute all those who might nonetheless have broadband wireless access. Another aspect of wireless that is often overlooked by regulators is the small industry that has grown up around wireless extension. As the term suggests, a wireless extension is a piece of radio equipment that strengthens and amplifies a signal from a nearby cellular tower to improve or extend coverage. Since the wireless "last mile" is radio, logistics of service delivery are far easier. The lower cost of wireless extension relative to wireline trenching and cabling makes it possible for users to purchase the nec-

essary equipment and contract for its installation.

Users can and do take ownership of their last mile broadband needs, freeing themselves from service provider construction timetables using private contractors such as GTW Systems of Tulsa, Oklahoma.<sup>29</sup> Commercial property owners are among the biggest markets for wireless extensions. If you work in a big city high-rise, chances are that the building manager has contracted for wireless extensions so there is quality wireless phone service throughout the interior of the building. Oil and gas fields represent critical facilities yet are often located miles from major highways and population centers, so field service companies use wireless extension systems for communications, remote monitoring and mobile workforce support.

Similarly, many Native American casino resorts in the central and upper Midwest are located on rural reservations. Many of them have invested in wireless extension systems that bridge signals to more distant cell towers. This allows guests to have the full value of their mobile devices. At the same time, the extensions meet the reservations' own wireless requirements.

Costs of wireless extensions have declined to be within reach of homeowners who live in rural or remote areas and want better wireless coverage in their home. While the market is currently high-end, the trend indicates that these extensions will become more affordable over time, especially in new housing developments where cost and installation can be managed through a homeowners association.

## CONCLUSIONS AND RECOMMENDATIONS

Current universal service policy makes some sweeping generalizations about broadband. One is that satellite and terrestrial wireless services lack the quality and value of fiber optics or DSL.

Landline service is no longer a necessity for a functional broadband connection. Moreover, its value is questionable. Although it offers more bandwidth, it has limited mobility. Landline phones and devices must be tethered to a wall. Not every user sees wireline—even fiber to the home—as the best choice. The market is sending this message. The biggest rural phone companies—CenturyLink, Windstream and Frontier Com-



Figure 4: 3G/4G Deployment Reported by Selected Mobile Wireless Service Providers

Service Provider	HSPA, HSPA+, and EV-DO Deployment	LTE and WiMAX Deployment
Verizon Wireless	As of May 2012, EV-DO Rev. A network covered 290 million POPs.	As of Nov. 2012, LTE network covered more than 250 million POPs. Planned to expand LTE nationwide in 2013 to have LTE coverage similar to its 3G network.
Verizon Wireless – LTE in Rural America Partners		As of March 2013, the program included 20 small, rural providers that had launched or planned to launch LTE to areas covering approximately 2.8 million people across 14 states. By March 2013, 7 of these providers had launched LTE: Bluegrass Cellular (Kentucky), Pioneer Cellular (Oklahoma), Cellcom (Wisconsin), Thumb Cellular (Michigan), Strata Networks (Utah), Chariton Valley (Missouri) and Cross Wireless (Oklahoma).
AT&T Wireless	As of mid-year 2012, all of AT&T’s network was covered by HSPA+, covering 275 million POPs.	As of Nov. 2012, LTE network covered 150 million POPs. AT&T plans to deploy LTE to 80 percent of the U.S. population, or approximately 250 million POPs, by the end of 2013, and to 300 million by the end of 2014.
Sprint Nextel	As of January 2012, EV-DO Rev. A network covered approximately 274 million POPs.	As of September 2012, LTE service was offered in 19 cities and Sprint planned to deploy LTE to 100 additional cities within several months and to complete LTE build-out by the end of 2013.
Clearwire		As of June 2012, WiMAX network covered approximately 134 million POPs. Planned to launch LTE in 31 urban markets by June 2013.
T-Mobile	As of September 2012, HSPA+ 21 network covered over 200 million POPs and HSPA+ 42 network covered 184 million POPs.	As of December 2012, planned to deploy its LTE network in the United States to 100 million people by July 2013 and 200 million people by year-end.
MetroPCS		As of the end of July 2012, LTE network covered all of the major metropolitan areas MetroPCS serves, including Atlanta, Boston, Dallas, Detroit, Jacksonville, Las Vegas, Los Angeles, Miami, New York, Orlando, Philadelphia, Sacramento, San Francisco and Tampa.
Leap	EV-DO deployed to entire network footprint, which covered approximately 95.3 million POPs at the end of 2011.	As of October 2012, Leap had launched LTE service in Tucson, AZ and Las Vegas, Nevada. Leap expected its LTE network to cover approximately 21 million POPs by the end of 2012. The company planned to deploy LTE to approximately two-thirds of its network footprint over two to three years.
US Cellular	EV-DO network covers 98 percent of its customers.	As of June 2012, LTE network covered 30 percent of customers and US cellular expected to cover 58 percent by the end of 2012.
C-Spire	EV-DO network covered approximately 4.7 million POPs at the end of 2011.	As of October 2012, C-Spire offered LTE service in 31 cities in Mississippi. C-Spire planned to further expand its LTE network to 6 more cities by the end of 2012.

munications—are losing customers even as they collect more and more government subsidies each year.

The truth is there is substantial choice for rural consumers: Copper-based DSL, wireless and satellite. Price points and value propositions differ, but the availability of satellite, which is priced the same no matter where the customer lives, changes the cost equation dramatically.

Rural customers have embraced these alternatives. Satellite is capable of 4 Mbps download—the baseline broadband definition set by the FCC’s National Broadband Plan. Wireless technology capable of these speeds is rolling out. Wireless extension systems, purchased by users and installed by contractors independent from service providers, are accelerating the availability of fourth-generation wireless systems.

In light of these developments, the regulatory mindset needs to change. With satellite-based broadband, no rural area can be said to be truly “broadband-deprived.” Access is now predominantly an affordability issue, not a geographic one. Universal service policy must focus on users and user objectives, not on service provider infrastructure and timetables.

Under the National Broadband Plan, CAF subsidies to rural broadband would total \$15.6 billion over the next decade.<sup>30</sup> That is small relative to recent FUSF transfers. In addition, the FCC plan seeks to reduce and ultimately phase out the complicated intercarrier compensation structure that sets artificial rates rural companies can charge large carriers for call completion.

Nonetheless, the FCC should be far more aggres-

sive in reducing subsidies, thereby creating a sound investment climate for technologies such as satellite and wireless, which can deliver broadband at prices that consumers can afford yet operate profitably and without the crutch of chronic government support. In this environment, existing rural service providers would have to adapt—perhaps by serving businesses or high-end clientele willing to pay a premium for “gold-plated” fiber optic connections—or exit the retail market.

Ideally, government broadband subsidies should be eliminated. The Connect America Fund, which uses the same corporate welfare model as its FUSF High-Cost Support predecessor, should be rethought, especially as the incumbent companies that receive the bulk of its distributions continue to lose customers to competitors.

If subsidies are to be disbursed, they should be based on merit, not geography. The Lifeline program is a good model. They should come in the form of credits or vouchers, and be allocated to users who can then apply them to the service provider of their choice.

## ABOUT THE AUTHOR

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## ENDNOTES

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12. While the FUSF is the focus of this discussion, this fund is not the only source of government funding for rural service providers. In addition to the FUSF, there are many other government broadband programs. The departments of Agriculture and Commerce provide grants and low-interest loans for rural providers, the departments of Health and Human

Services, Education and Homeland Security fund telecom infrastructure for applications-specific purposes, such as telemedicine, distance learning and emergency communications. Several federal-state partnerships, such as the Appalachian Regional Commission, the Delta Regional Authority and the Denali Commission, also fund broadband initiatives. Not every dollar in these funds goes to telephone companies. Portions are distributed to local governments, school districts, non-profits and other entities that have a role in extending broadband to areas where it is needed.

13. CenturyLink, Securities Exchange Commission Form 10K, 2012, p. 5

14. Ibid, p. 7.

15. Ibid, p. 14.

16. Ibid, p. 5.

17. Windstream Communications, Financial Supplement to Annual Report on Form 10-K For the Year Ended Dec. 31, 2012, p. F-3.

18. Ibid, p. F-16,

19. Ibid, p. F-5.

20. Frontier Communications 2012 Form 10-K, p. 41.

21. Thomas Hazlett, "Universal Service Subsidies: What Does \$7 Billion Buy?" Mercatus Center of George Mason University, June 2006, p. 2.

22. National Broadband Plan, p. 137.

23. HughesNet, "Do More with Gen4," HughesNet Internet website, available at <http://www.hughesnet.com/index.cfm?page=Plans-Pricing#gen4>.

24. Specifically, DBS services are shifting to the Ka band (26-40 GHz) from the Ku band (12-18 GHz).

25. See Tokuo Oishi, "VoIP and Satellite Systems: System Integrator's Perspective," NSGData, May 27, 2005, available at [http://www.nsgdata.com/solutions/application\\_briefs/NSGData\\_VoIP%20and%20Satellite\\_R1\\_052705.pdf](http://www.nsgdata.com/solutions/application_briefs/NSGData_VoIP%20and%20Satellite_R1_052705.pdf).

26. Kevin Fitchard, "With the Big Cities Covered, AT&T Starts Filling in its LTE Gaps," GigaOm, June 5, 2013, available at <http://gigaom.com/2013/06/05/with-the-big-cities-covered-att-starts-filling-in-its-lte-gaps/>; also, "New Markets Get AT&T 4G LTE," AT&T press release, June 19, 2013, available at <http://www.att.com/gen/press-room?pid=2943>.

27. Kevin Fitchard.

28. Federal Communications Commission, *16th Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, pp. 7-8.

29. For examples of extension services these contractors offer and the markets they address, see GTW Systems, [www.gtwsystems.com](http://www.gtwsystems.com).

30. David Salway, "FCC Delivers National Broadband Plan: All Eyes on Congress," About.com: Broadband Industry, no date, available at [http://broadband.about.com/od/congressionalaction/a/Fcc-Delivers-National-Broadband-Plan-All-Eyes-On-Congress\\_2.htm](http://broadband.about.com/od/congressionalaction/a/Fcc-Delivers-National-Broadband-Plan-All-Eyes-On-Congress_2.htm).



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