

# **The Realities of Satellite Broadband**

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# High-Quality Broadband Is Becoming a Necessity

Characteristic	Consumer Demand	Applications Impacted
High Speed	<ul style="list-style-type: none"><li>• Median Speeds higher than 65 Mbps in 2017</li><li>• By 2020, 1 Gbps will be commonly available</li></ul>	eHealth, distance education, VPNs, interactive applications, gaming, Internet of Things
Low Latency	<ul style="list-style-type: none"><li>• FCC standard of 100 ms or less</li><li>• Terrestrial network latencies are 12 to 58 ms</li></ul>	Interactive applications, distance education, video conferencing, Internet of Things
High Capacity	<ul style="list-style-type: none"><li>• FCC minimum is 160 GB/mo for support programs and will increase</li><li>• 190 GB/mo average in 2015; today usage is much higher</li></ul>	Video-based applications, eHealth, distance education, online backups, gaming
High Reliability	<ul style="list-style-type: none"><li>• Today, customer health and security often rely on broadband</li></ul>	Public safety, healthcare, and commerce
Economical and Scalable	<ul style="list-style-type: none"><li>• Network must cost-effectively scale to meet increasing customer demand</li></ul>	All applications

# Both GEO and LEO Satellites Have Difficulty Meeting Customers' Needs

## Geostationary (GEO) Satellites

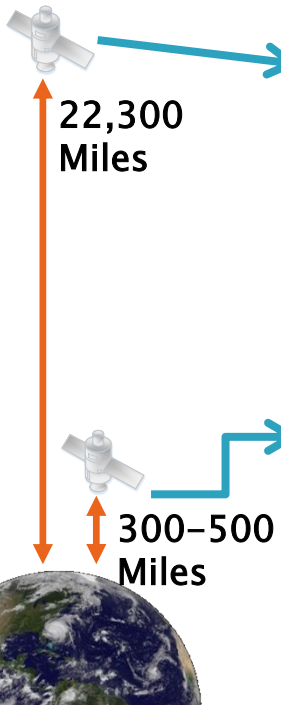
- Effective at broadcasting to multiple locations simultaneously , but less effective for interactive applications when low latency is critical
- Latency of 599 ms–629 ms (20 times greater than landline broadband); Twice the delay for “Double Hop” situations
- Solar interference during a multiple day period causes outages, sometimes in excess of 15 minutes

## Low Earth Orbit (LEO) Satellites

- Hundreds or thousands of satellites are required to provide coverage, making the initial cost high
- Billions of dollars of ongoing investments are required to replace satellites with a life span of 5–7 years
- Past launch attempts have not proven commercially successful
- Complex hand-offs between satellites are required
- Delays have extended the deployment timeframe

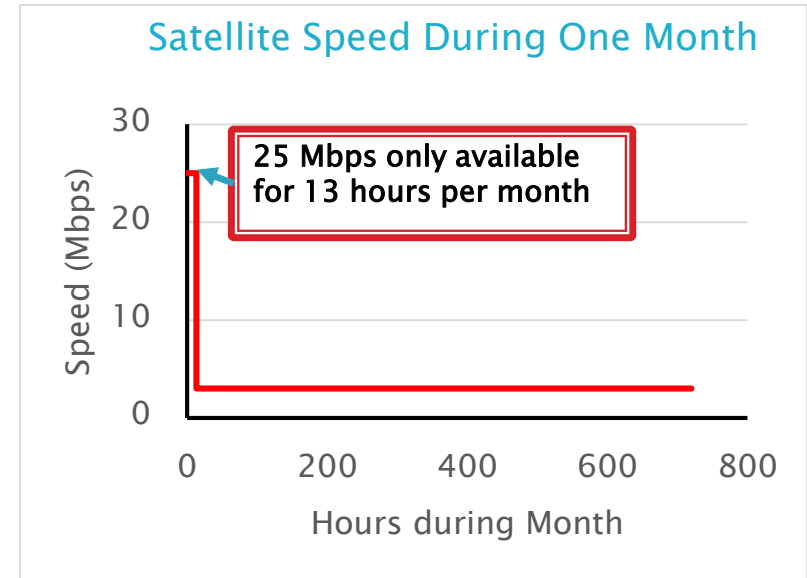
## Both GEO and LEO Satellites

- Spectrum is limited so it must be reused to increase capacity
- Satellite frequencies are susceptible to weather degradation



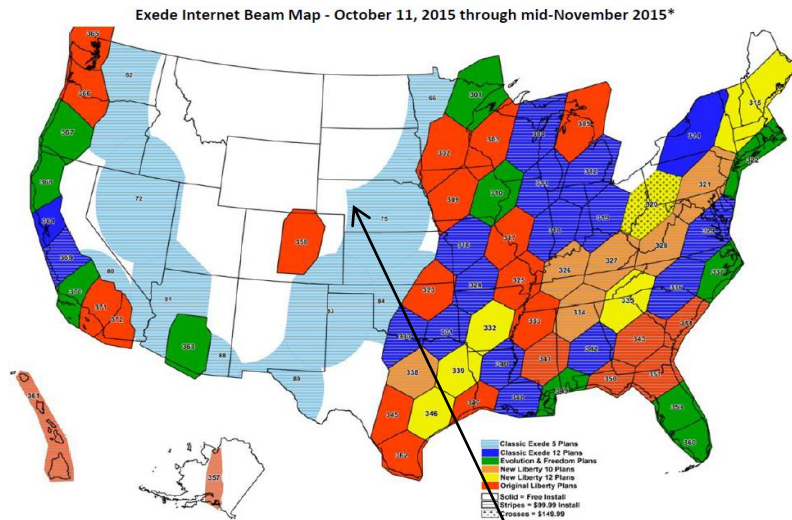
# Advertised Speed Is Only Available for Limited Portion of the Month

Provider	Data Threshold (GB/month)	Initial Speed (Mbps)	Speed above Data Threshold (Mbps)	Effective Speed (Mbps)
Hughes	10	25	3	4.2
	20	25	3	5.3
	30	25	3	6.5
	50	25	3	8.8
ViaSat	12	12	3	3.6
	18	12	3	3.9
	150	12	3	10.1



- ▶ Satellite speeds are reduced once customers exceed data thresholds, which are *much* lower than average usage levels
  - Most data thresholds are a fraction of the average customers' usage, estimated to be 190 GB/month
  - The advertised speed is available for less than 2% of the month
- ▶ The *best* satellite speeds are lower than the *worst* urban wireline speeds

# Satellite's Spotty Capacity Is Particularly Lacking in Western States



[https://www.wildblueworld.com/dealer\\_comm/plan\\_map\\_summary\\_1112015-112015.pdf](https://www.wildblueworld.com/dealer_comm/plan_map_summary_1112015-112015.pdf)

Note: Additional Exede satellites have not been placed in service since the date of this map.

ViaSat is not accepting new customers

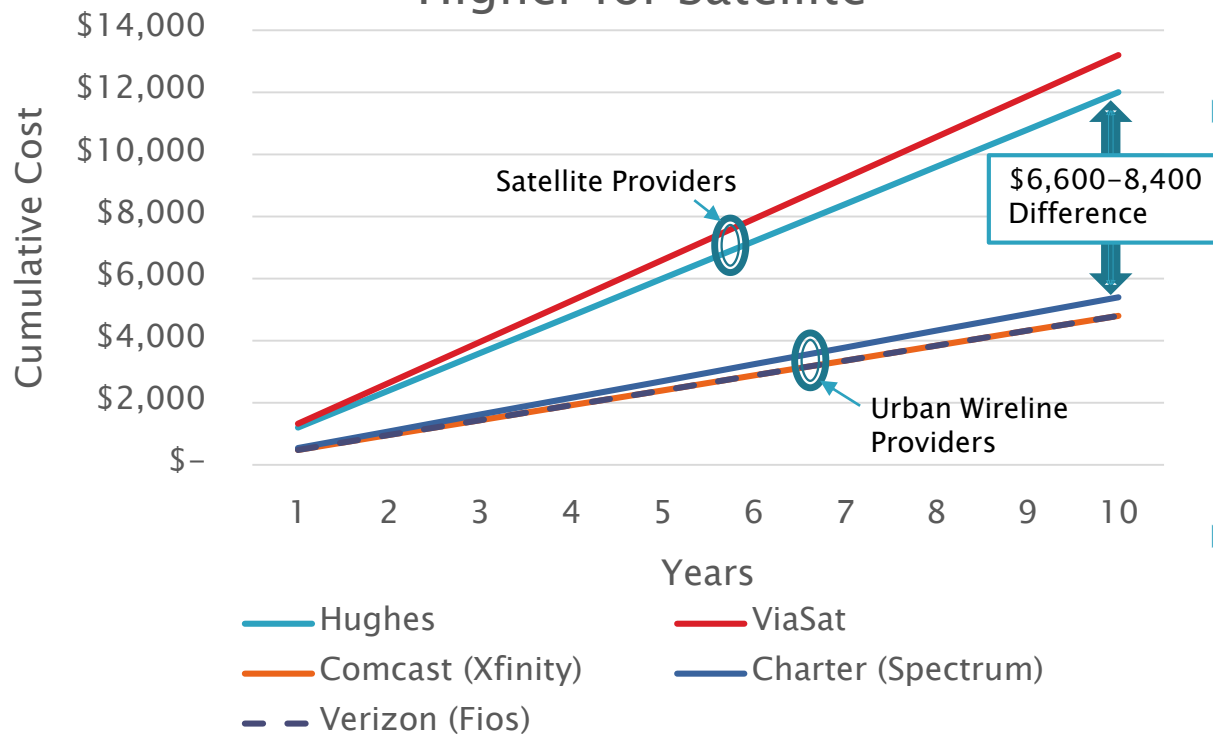
- ▶ One next generation satellite has the capacity to serve
  - 60,000 customers, or less than 0.06% of the US households, subscribing to a 25 Mbps plan\*
  - 300 customers simultaneously using a 1 Gbps plan, which is commonly available in urban areas
- ▶ Combined, Hughes and ViaSat have 730 Gbps of capacity
  - Each customer could only use 430 kbps simultaneously
  - Only 9% of their 1.7 million customers could watch an HD movie simultaneously

\*Assuming an oversubscription ratio of 5:1



# Satellite Customers Pay More for Less

## Cumulative Consumer Cost Is Much Higher for Satellite



- ▶ A satellite consumer pays \$6,600 to \$8,400 more over 10 years than does a wireline customer
- ▶ Satellite consumers receive lower quality broadband
  - Lower speeds (Half the median US speed)
  - Lower data capacity (Five times lower than wireline plans)
  - High Latency
  - Less reliability
- ▶ In many cases, the cost difference could pay for a better quality, more scalable terrestrial-based broadband network

# As Many Locations as Possible Should Receive Terrestrial Broadband Service

- ▶ FCC should be realistic when considering the claims of the satellite industry
- ▶ The FCC should not be influenced by claims that cannot be backed in the marketplace
  - We will assist the FCC in conducting a trial comparing terrestrial and satellite broadband in real-world applications
- ▶ FCC should increase funding for RoR broadband
  - A-CAM should be funded to at least \$200/location
  - A decision by 12/31/17 will lock in carriers' commitments to serve tens of thousands of new locations