

The State of Fiber and FTTH Deployment

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About the Fiber Broadband Association

Our Mission

To accelerate deployment of all-fiber access networks

We Represent

The full fiber ecosystem from consulting, construction, fiber manufactures, electronic equipment suppliers to a full spectrum of broadband service providers of all sizes

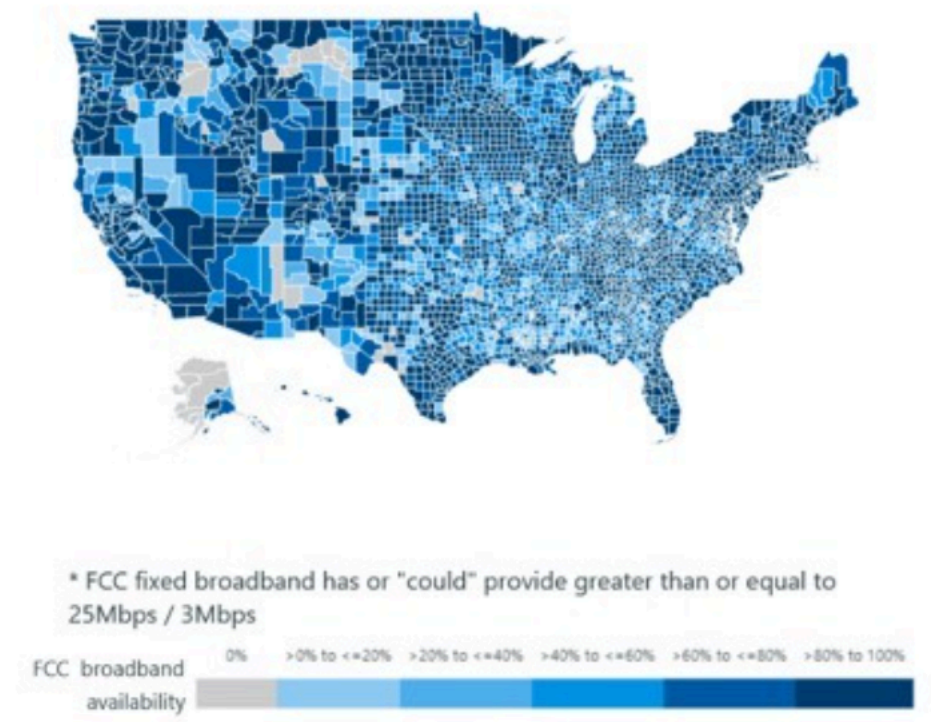


The State of the Communication Infrastructure

According the the FCC

- 94.4% of Americans have access to broadband
- FCC defines broadband as 25/3 Mbps
- 98.5% of Urban areas have broadband
- 77.4% of Rural areas have broadband
 - Varies from 46.9% in Arizona to 97.6% in Rhode Island

FCC reports that 19M Americans don't have broadband availability



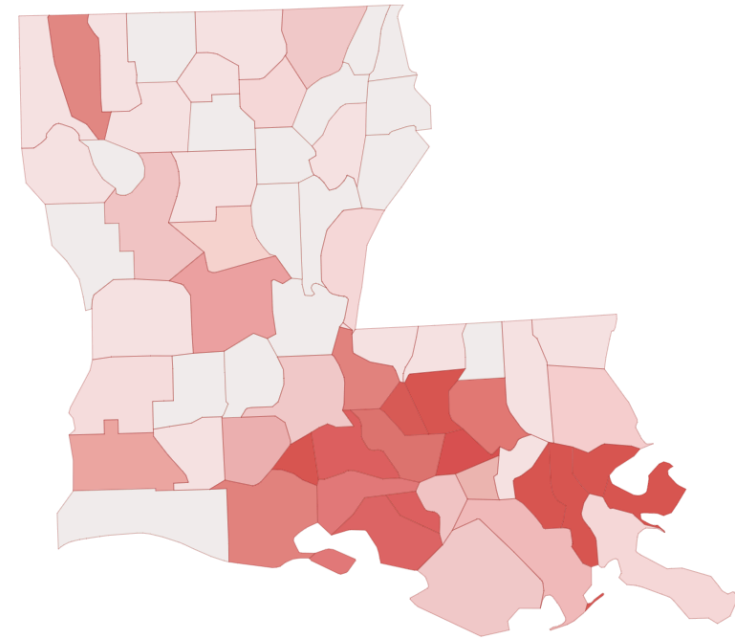
The State of Broadband in Louisiana

Louisiana

- 75.0% of Louisiana have access to terrestrial broadband
- 33rd in the nation for broadband
- 26.9% have access to fiber optics
- Highest concentration of high-speed broadband is in SE Louisiana

13.5% of Caddo Parrish has access to 1Gbps.

- 0% in Red River.
- 0.5% in DeSoto.
- 69.2% in Bossier.



25+ mbps 100+ mbps 1 Gbit [Embed this map](#) [Customize map](#)



The FCC Definition of Broadband

25/3

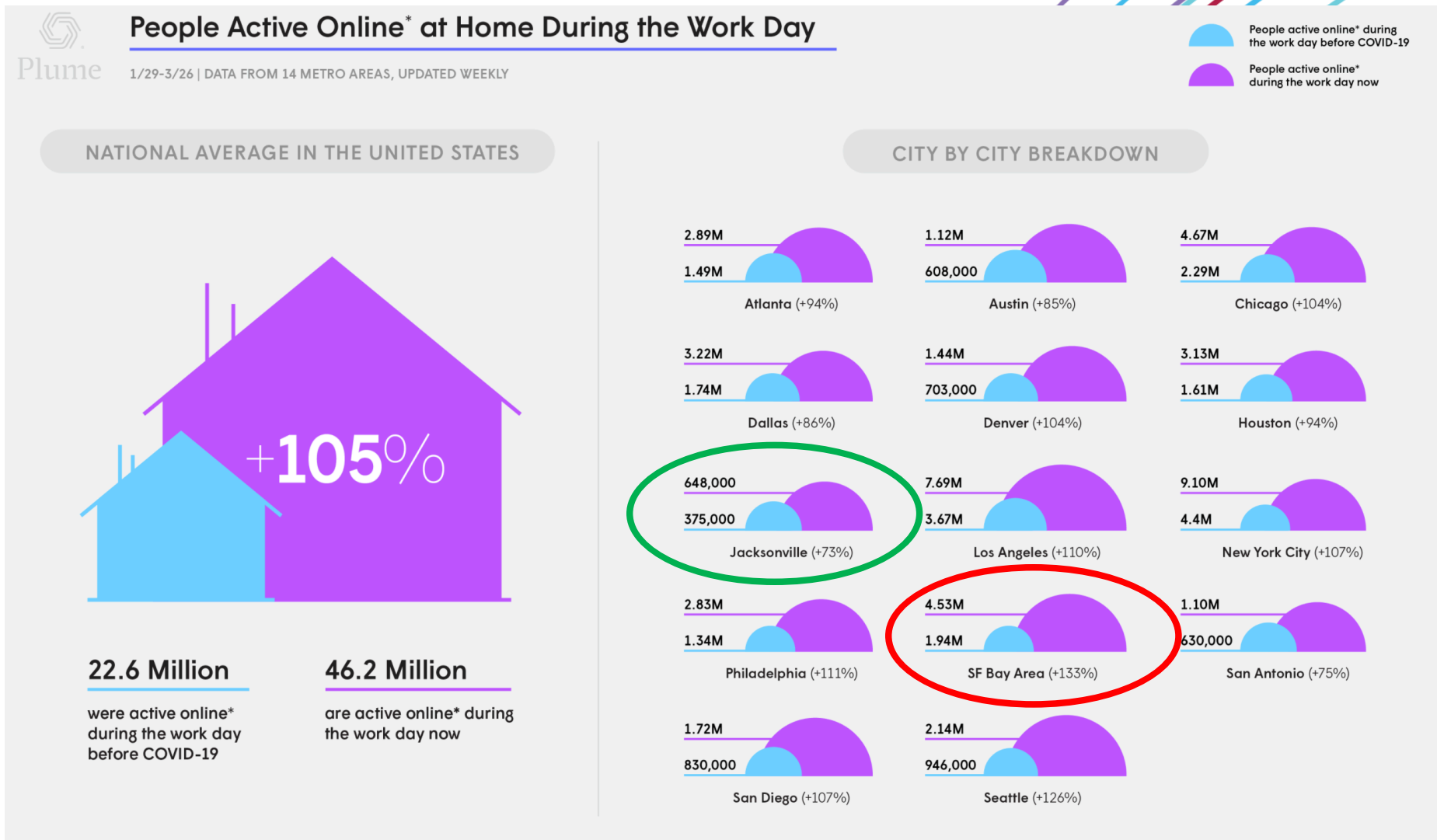


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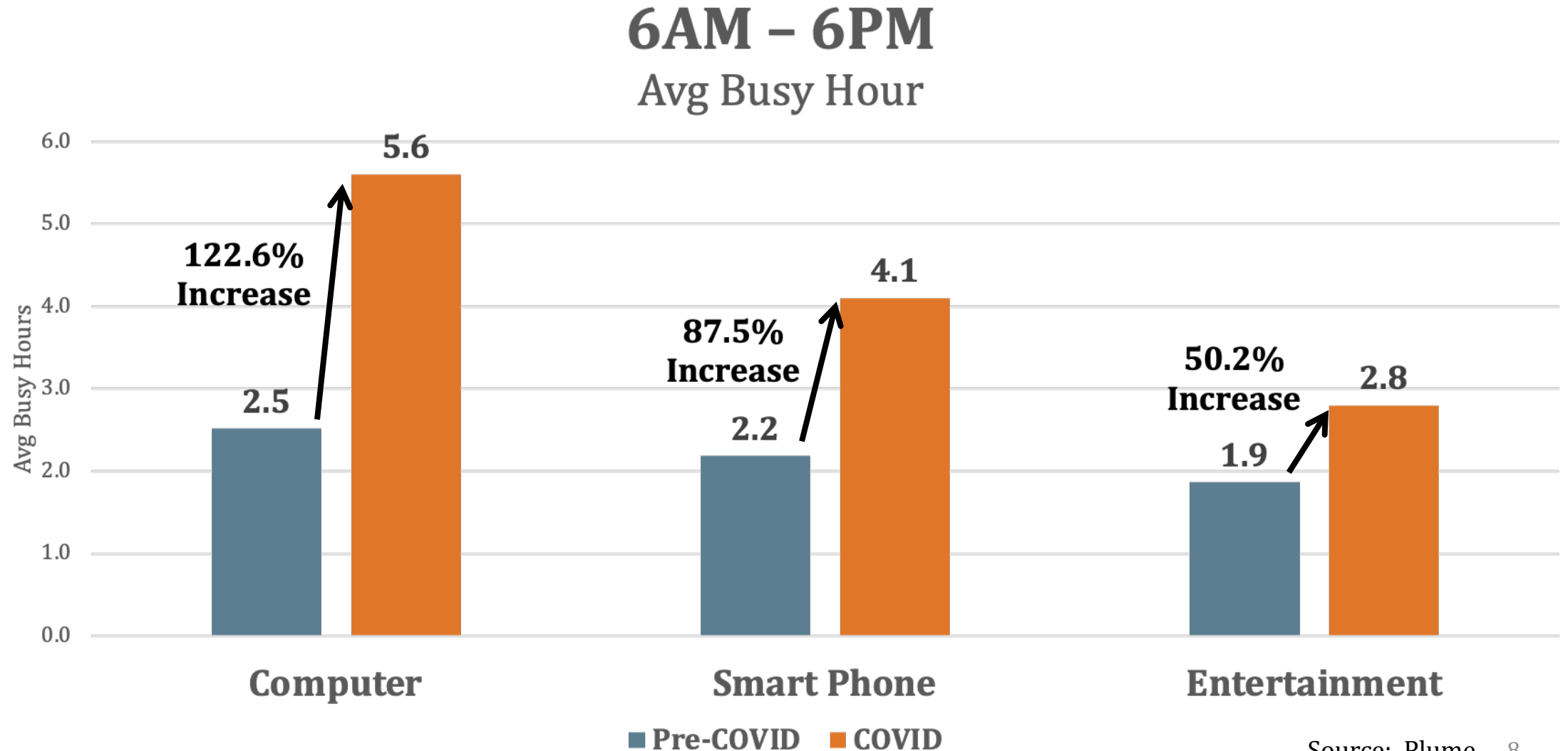


GLOBAL PANDEMIC

>2x Now Work From Home



What We're Doing @Home



What Applications @Home



Zoom Data Usage (WhistleOut)

Quality	Download	Total BW
High	450MB/hr	810MB/hr
720p	675MB/hr	1.08GB/hr
1080p	1.25GB/hr	2.4GB/hr

Symmetrical Bandwidth

The Netflix logo, with the word "NETFLIX" in red capital letters on a black background.

NETFLIX

Netflix Data Usage

Quality	Download
Low	300MB/hr
HD Video	3GB/hr
4K Video	7GB/hr

*Adaptive Rate Video,
adjusts to conditions*



Video Gaming Data Usage

Quality	Download
Fortnite	100MB/hr
World of Warcraft	40MB/hr
Destiny2	300MB/hr

Largely Downstream

Zoom 1080p:

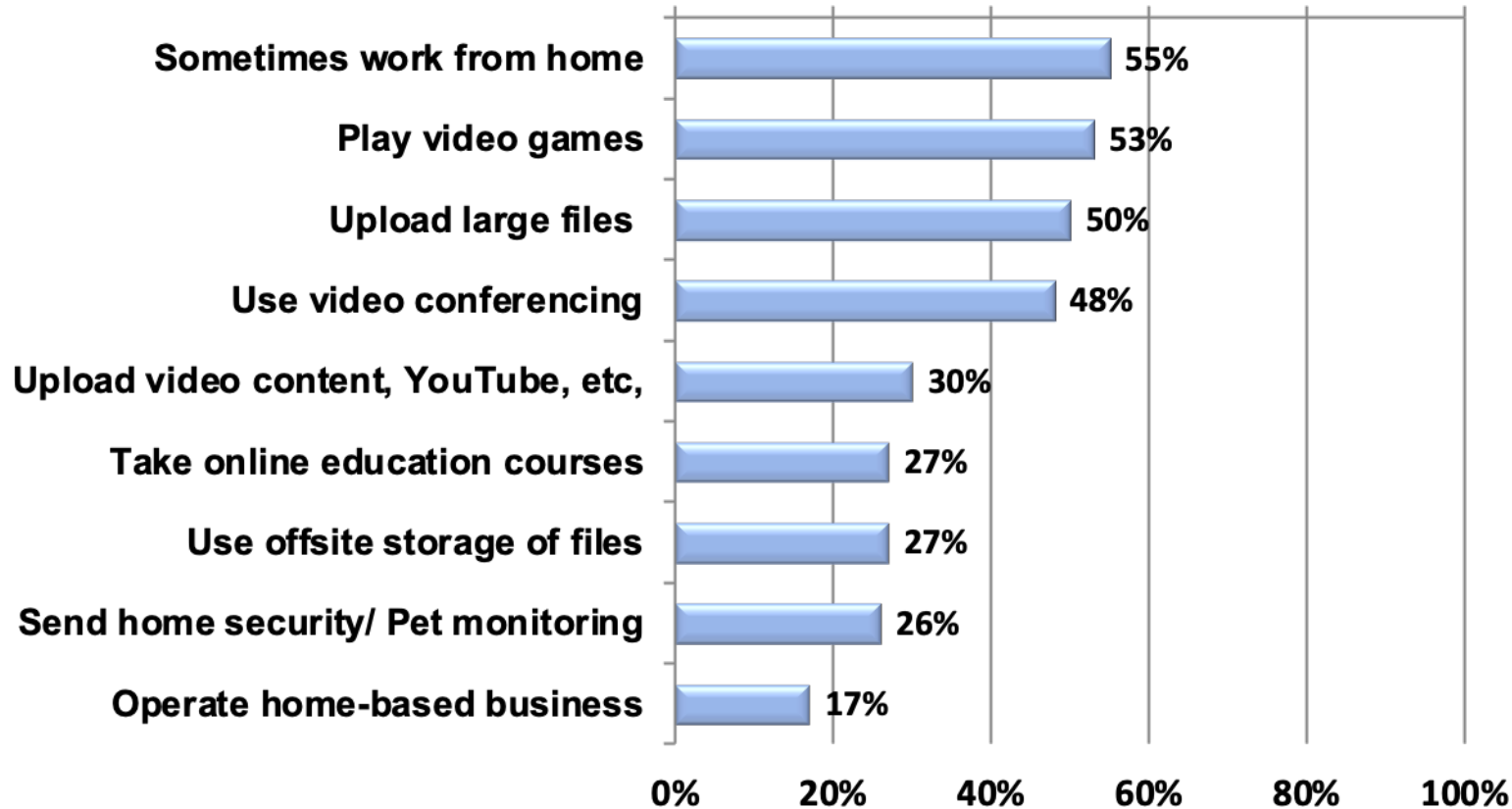
GPON Fiber Network:

$2.4\text{GB/hr} \times 8\text{bits/byte} / 3600\text{s/hr} = 5.3\text{Mbps}$

$2.4\text{G} / 32 \text{ subs} = 80 \text{ Mbps per user}$

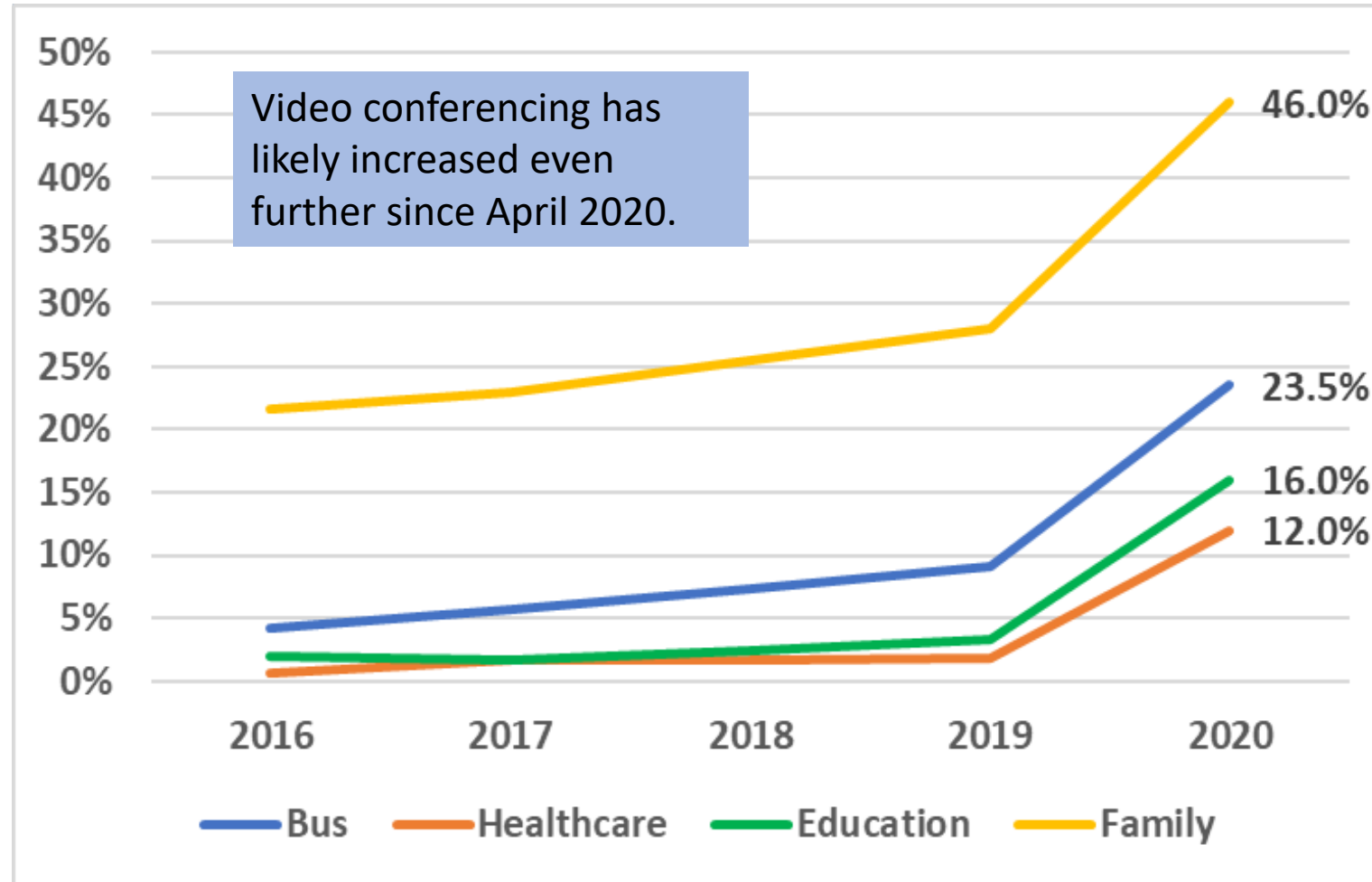
Home Broadband Use Is Becoming More Outbound

Those Age 18-54: RVA Consumer Study April 2020



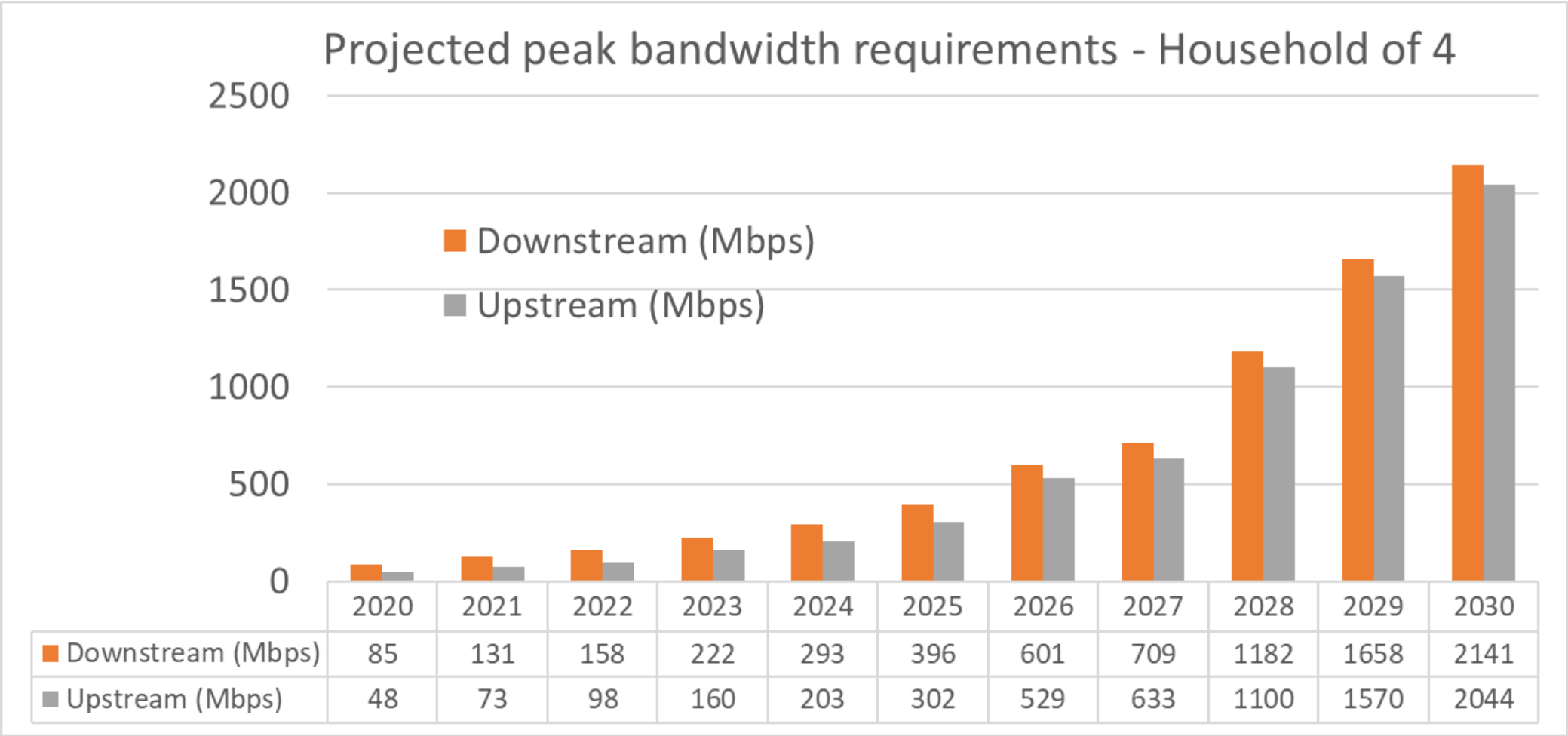
The Use Of Advanced Two-Directional Video Conferencing Has Exploded

Video Conferencing Use Among Entire Sample – RVA Pandemic Study, 2020



Residential Broadband Requirements Will Accelerate

From FBA Technology Committee: Future Applications And Network Implications 2020

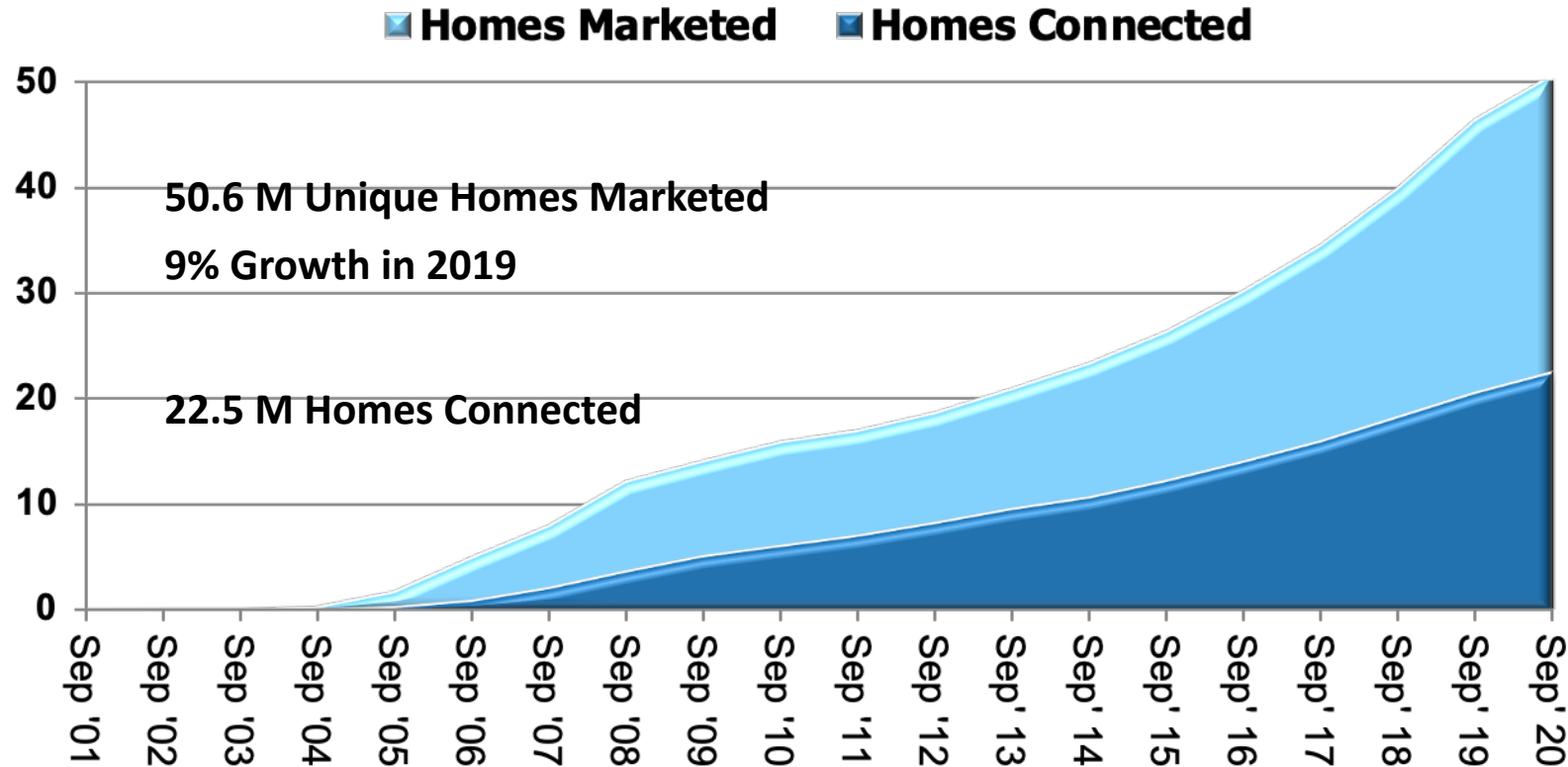


Does not include Robotics

H.266 compression assumed for 8K, HD AR/VR, AR/VR
Retinal

Fiber Broadband Now Passes 50.6 Million Unique Homes* In The U.S.

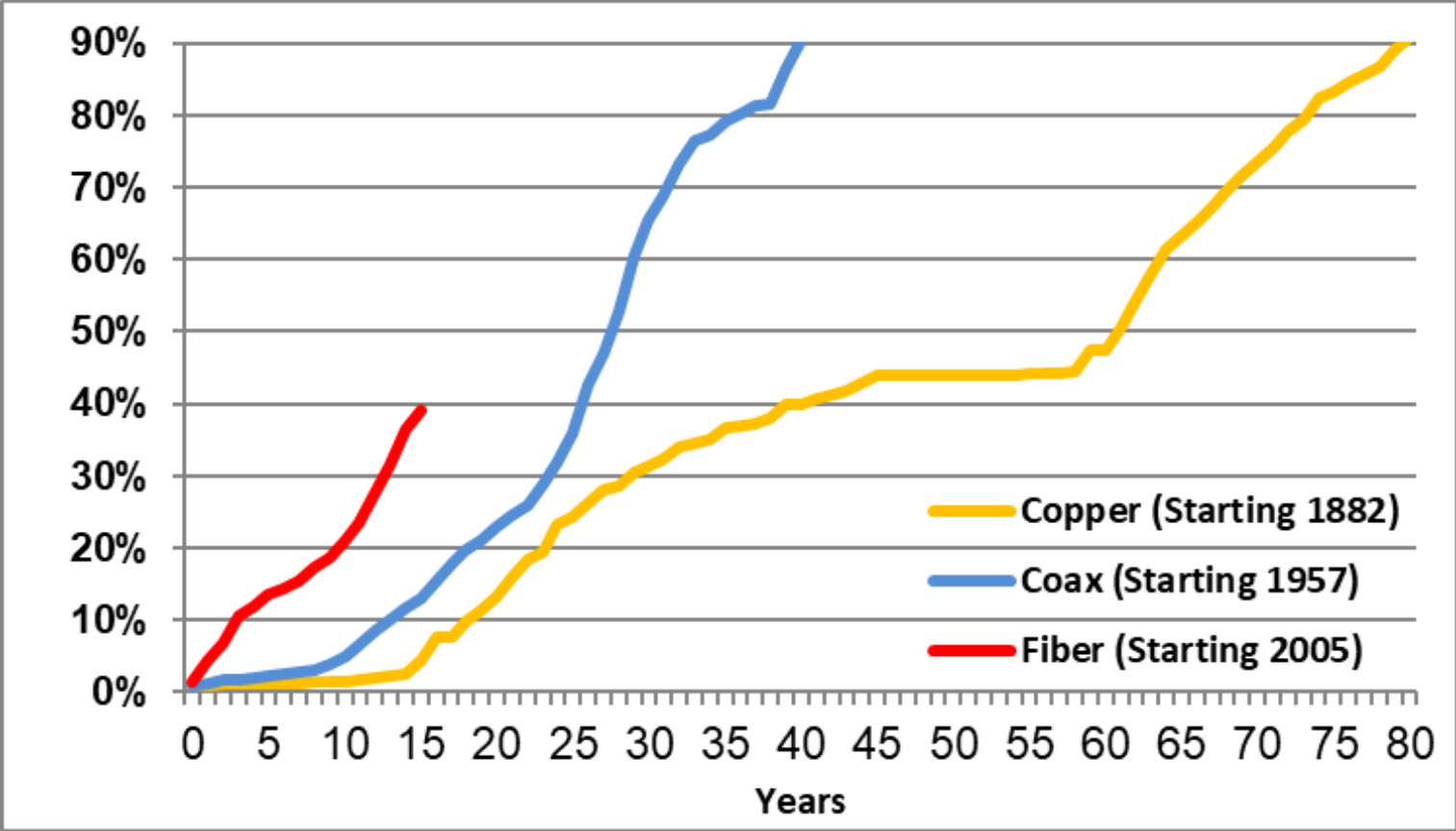
RVA Provider Study 2019



* Number of homes with at least one fiber service marketed (excludes estimate of redundant fiber services available to the same home)

Fiber Availability Is Nearly 40% Of U.S. Households

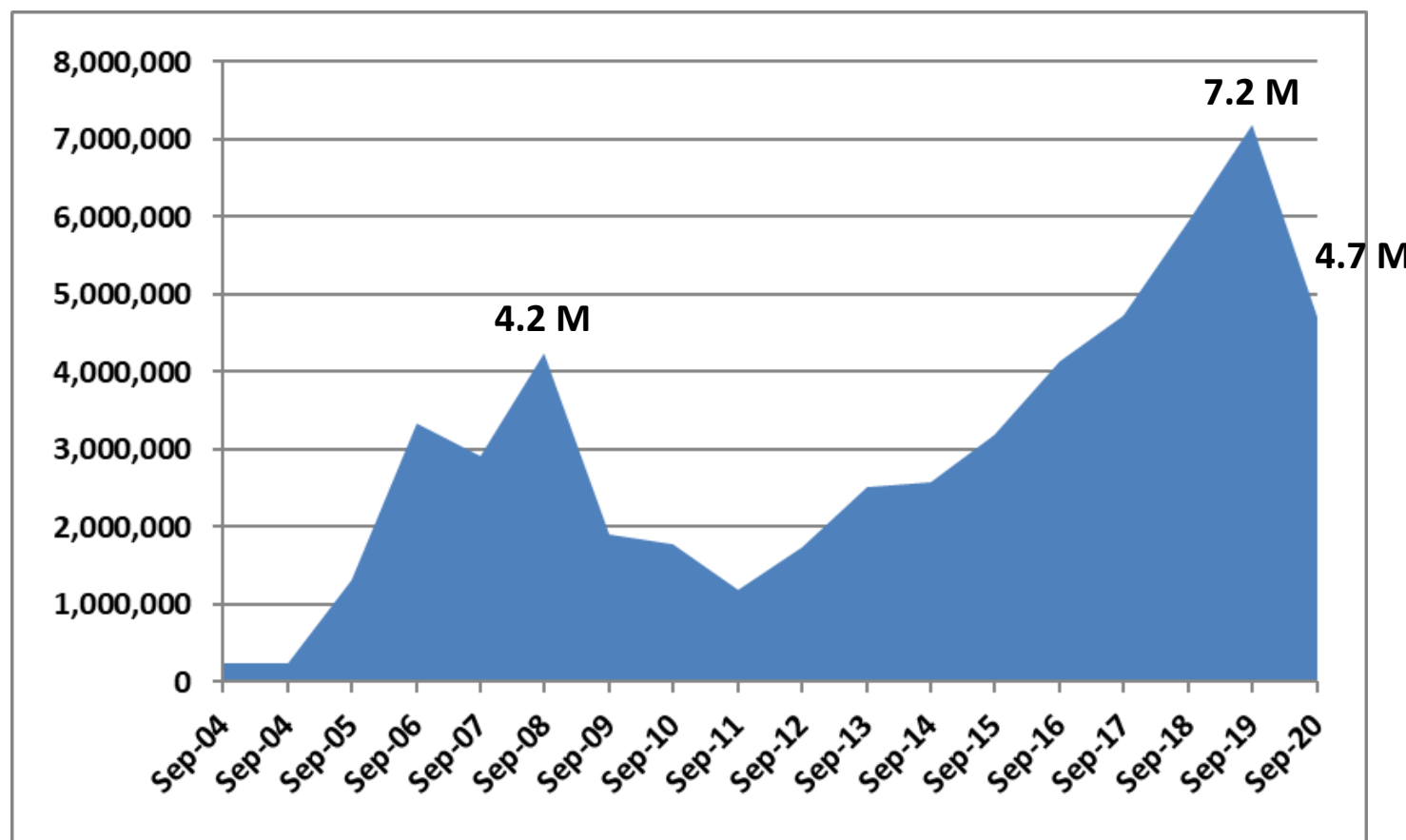
Non-Redundant U.S. Homes-Passed Versus Households (tracking since technology hit 1%)
RVA Provider Study 2020



2020 Represents A "Pause Year" Before New Growth

Annual Homes Marketed (All Years Ending Q3)

RVA Provider Study 2019

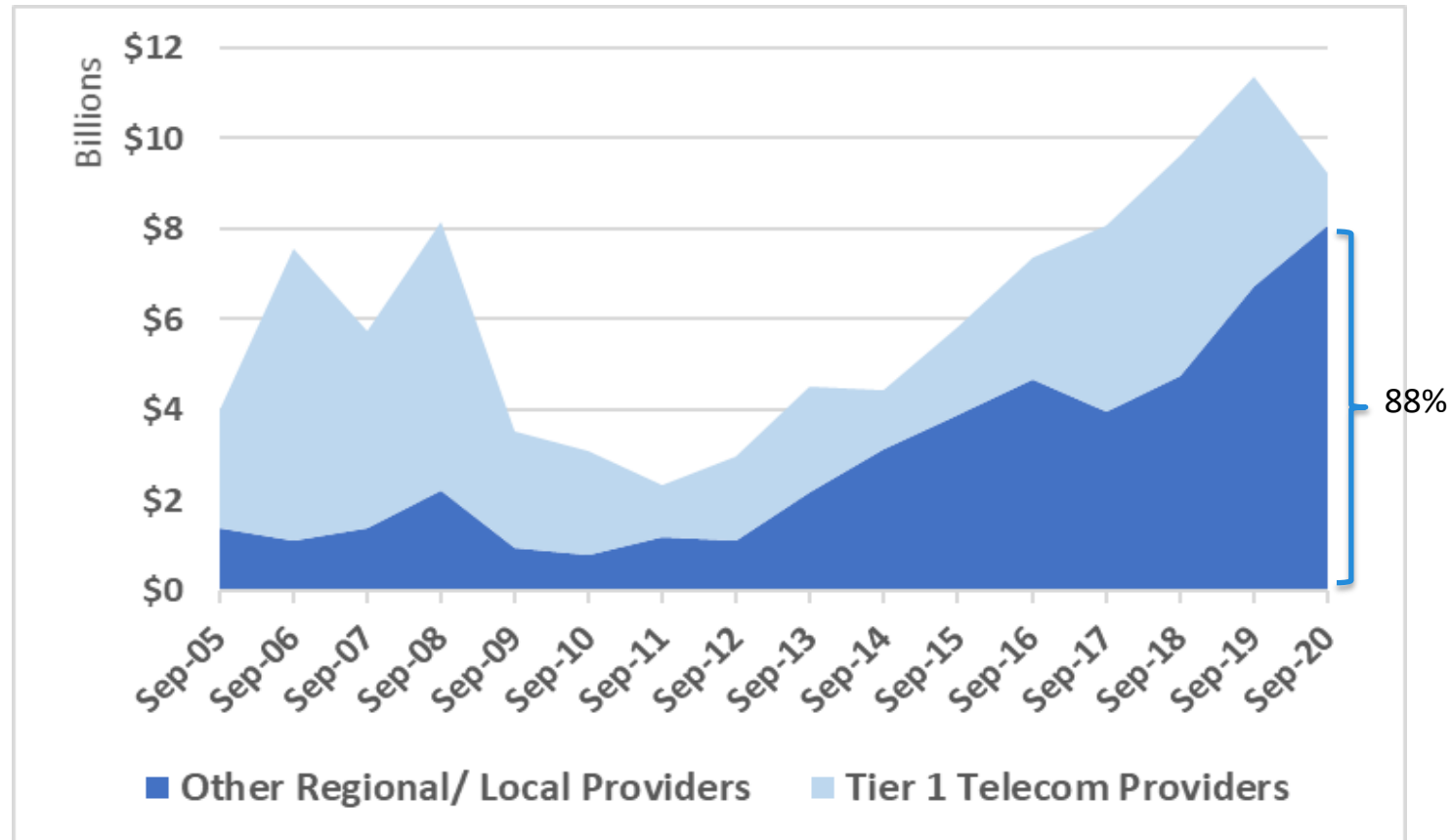


4.7 Million homes newly passed by network operators in 2020.

(4.1 Million unique newly passed homes)

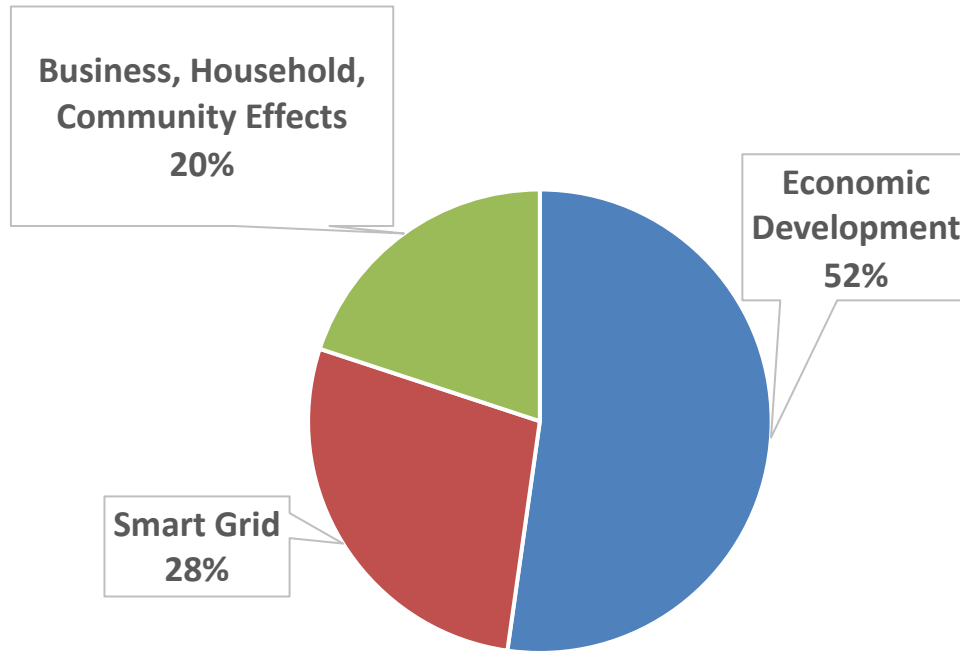
Non Tier-1 Telco Providers Account For A Record Percentage Of U.S. FTTH Capex In 2020

RVA Provider Study 2020



Note: Over 1,100 fiber providers in the U.S.

Economic Impact – Chattanooga Case Study



Realized Economic Benefits

- ❖ Jobs ≈ 9,516
- ❖ Value ≈ \$2.69 billion
- ❖ Value-to-cost ≈ 4.42x
- ❖ Realized benefits exceed projected net benefits, and at a quicker pace.

Table 1. Summary of Estimates (2011 - 2020)			
Category	Source	\$ Millions	% of total
Economic Development	Business Investments	\$962.8	35.7%
	Startup Funding	\$244.4	9.1%
	Real Estate Development	\$141.6	5.3%
	PILOT	\$59.9	2.2%
Smart Grid	Smart Grid	\$750.2	27.8%
Business Effects	Productivity Gains	\$74.31	2.8%
Household Effects	Consumer Surplus	\$128.8	4.8%
	Residential Bill Savings	\$144.9	5.4%
Community Effects	Healthcare	\$18.17	0.7%
	Telecommuting	\$90.62	3.4%
	Education	\$29.83	1.1%
	Publicity	\$47.49	1.8%
	Other	\$3.65	0.1%
Total Value		\$2,696.73	100.0%
Total Jobs		9,516	
Incremental Value-to-Cost ratio		4.42x	

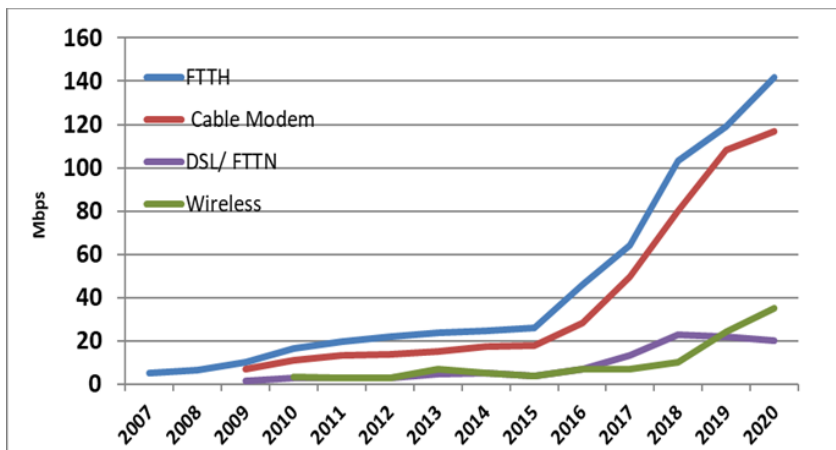
Realized Smart Grid Benefits

- ❖ 2.11M customer interruptions avoided
- ❖ 43% reduction in outage minutes on average
- ❖ \$421M in benefits during major weather events
- ❖ Reduced 1,865 MW of demand and 10,331 MWh of electricity consumption

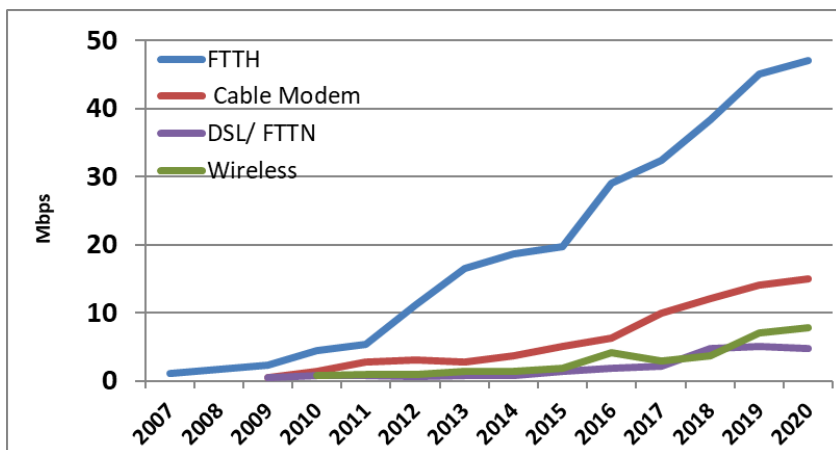
Broadband Performance Has Real World Implications

Random Sample Data From RVA Consumer Study 2020

Tested Download Speeds



Tested Upload Speeds



2020 Internet Performance In 5 Equal Groups

	Group 1 (Top 20%)	Group 2 (Second 20%)	Group 3 (Third 20%)	Group 4 (Fourth 20%)	Group 5 (Lowest 20%)
Download speed (Mbps)	261	103	49	23	4
Upload speed (Mbps)	47	21	14	5	1
Latency (ms)	23	29	36	45	783

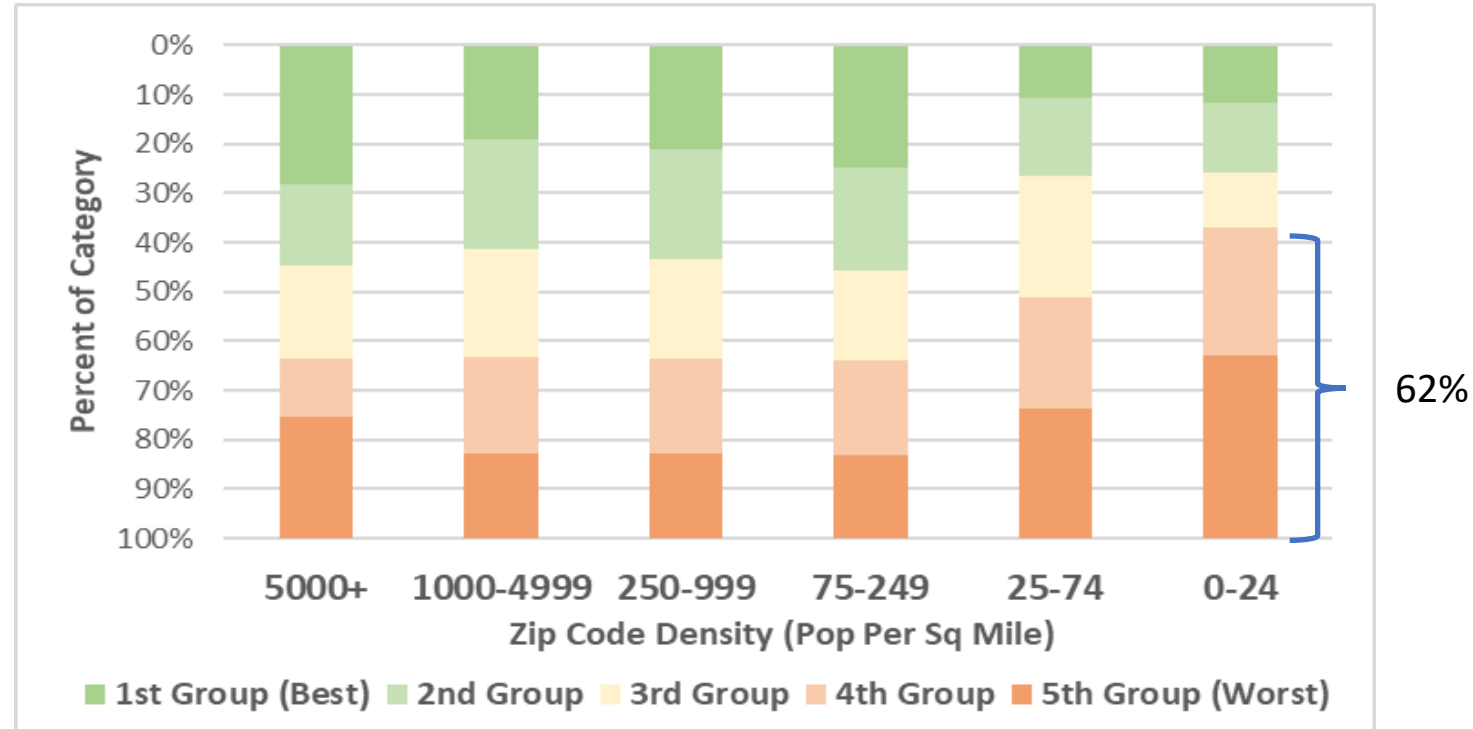


	Group 1 (Top 20%)	Group 2 (Second 20%)	Group 3 (Third 20%)	Group 4 (Fourth 20%)	Group 5 (Lowest 20%)
In-home rationing	18.7%	22.5%	28.6%	34.3%	48.7%
Online time waiting	5.0	5.3	5.6	6.8	11.0

Significantly more in-home rationing (limited the number online at one time), and lower productivity.

The Digital Divide Is Evident – 62% Of Very Rural Users Have Poor Internet

Representation Of Internet Quality Groups By Zip Code Density: RVA Pandemic Study 2020



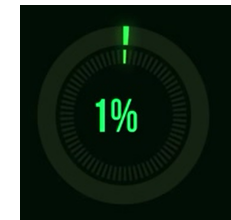
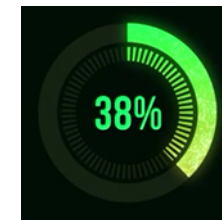
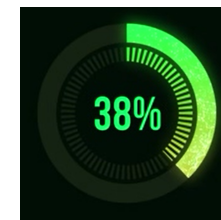
		Group 1 (Top 20%)	Group 2 (Second 20%)	Group 3 (Third 20%)	Group 4 (Fourth 20%)	Group 5 (Lowest 20%)
Download speed (Mbps)	Higher is better	261	103	49	23	4
Upload speed (Mbps)	Higher is better	47	21	14	5	1
Latency (ms)	Lower is better	23	29	36	45	783

Fiber Superiority

Fiber Provides A Superior Experience To Other Types Of Broadband

RVA Broadband Experience Index, 2019

	FTTH	Cable	Wireless	DSL/FTTN	Satellite
2019 BEI	98%	65%	38%	38%	1%
2019 ALTERNATIVE BEI	99%	69%	47%	45%	14%

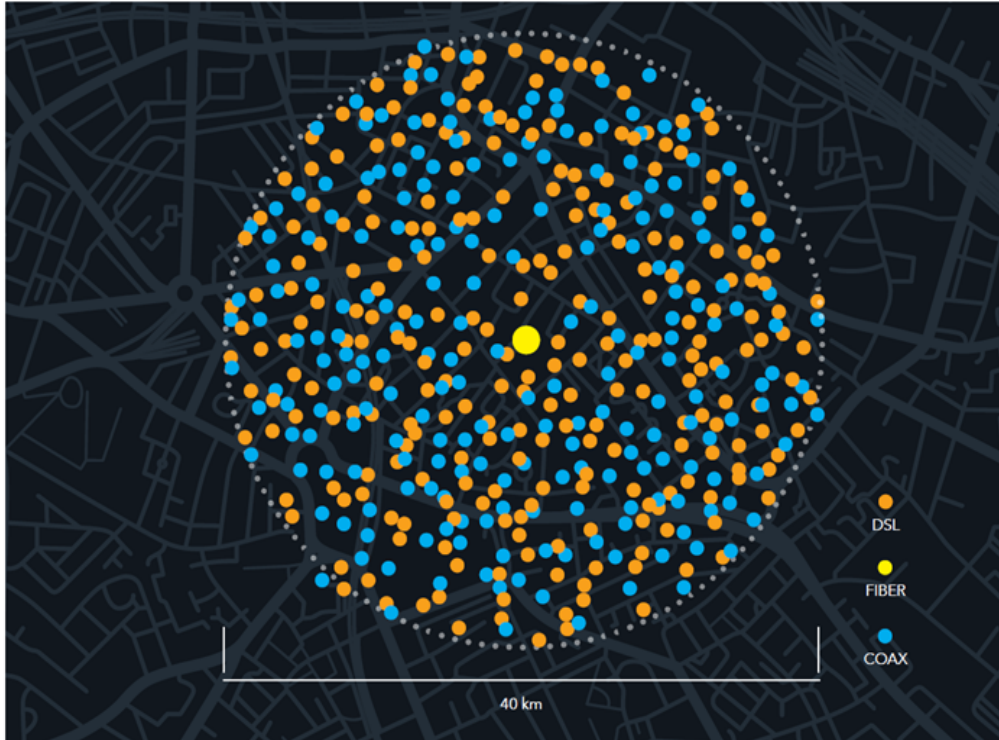


Index based on 2019 RVA consumer survey measurements (and 2017 FCC Data)

- Net Promoter Score
- Reliability
- Upload Speed
- Download Speed
- Latency

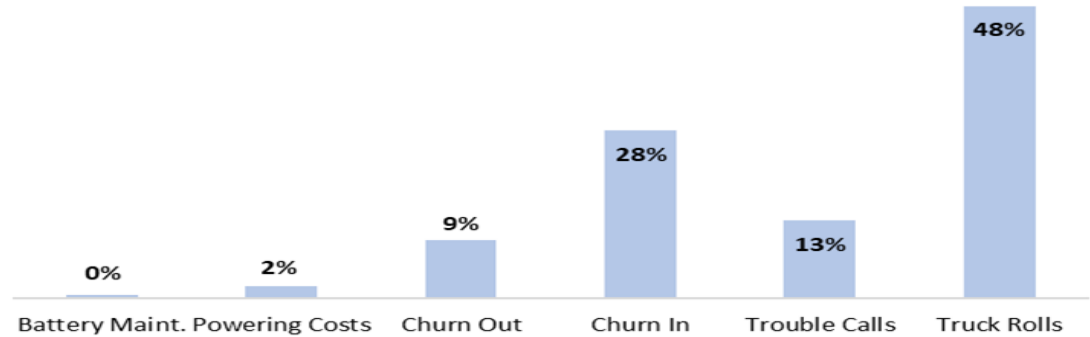
FTTH Has Distinct OPEX Advantages Over Other Methods

FBA OPEX Whitepaper 2020, RVA Background Research

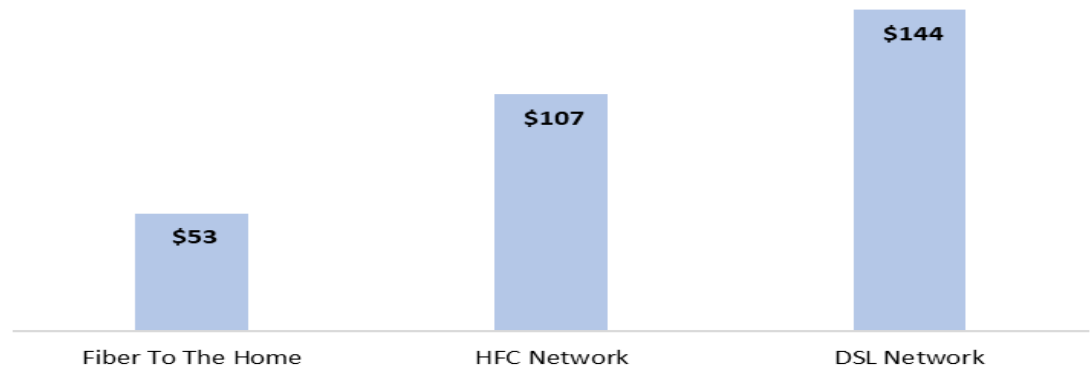


Typical powered equipment in a 40 Km area by provider type. FTTH has one powered point versus hundreds for other methods. The primary impact of this complexity is less reliability.

Average Contribution by Different Components



Total OpEx Per Home Passed Per Year



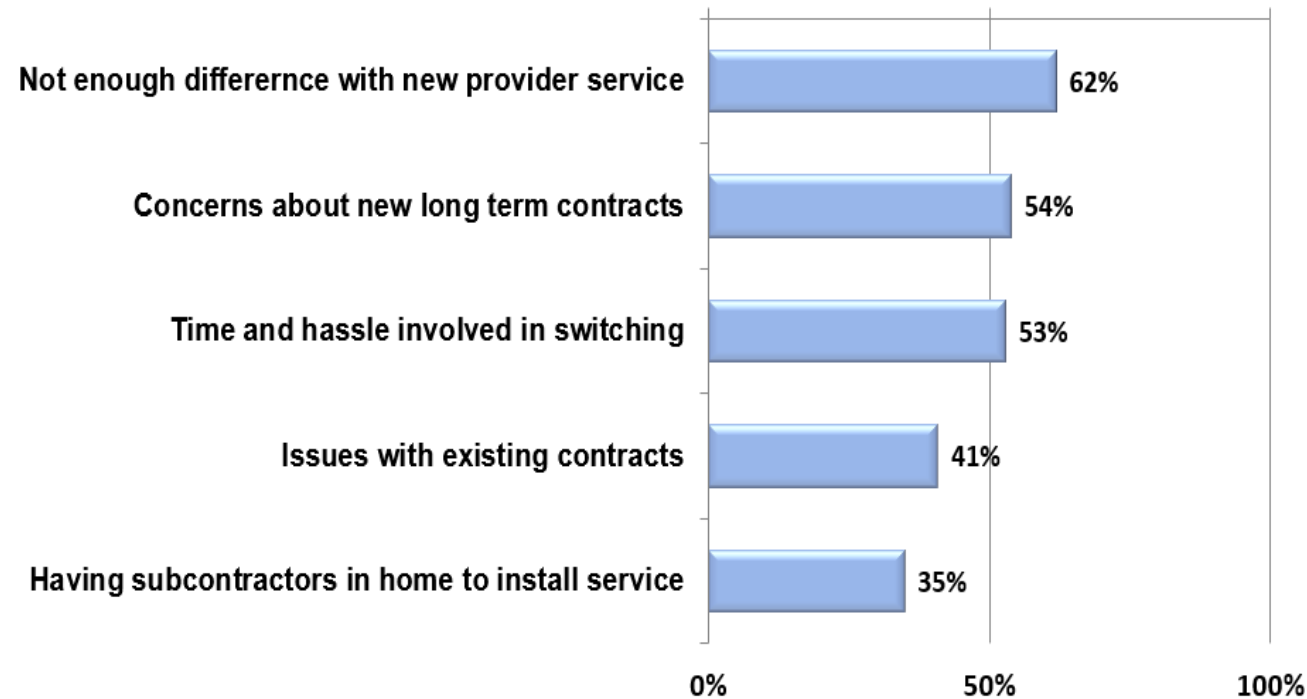
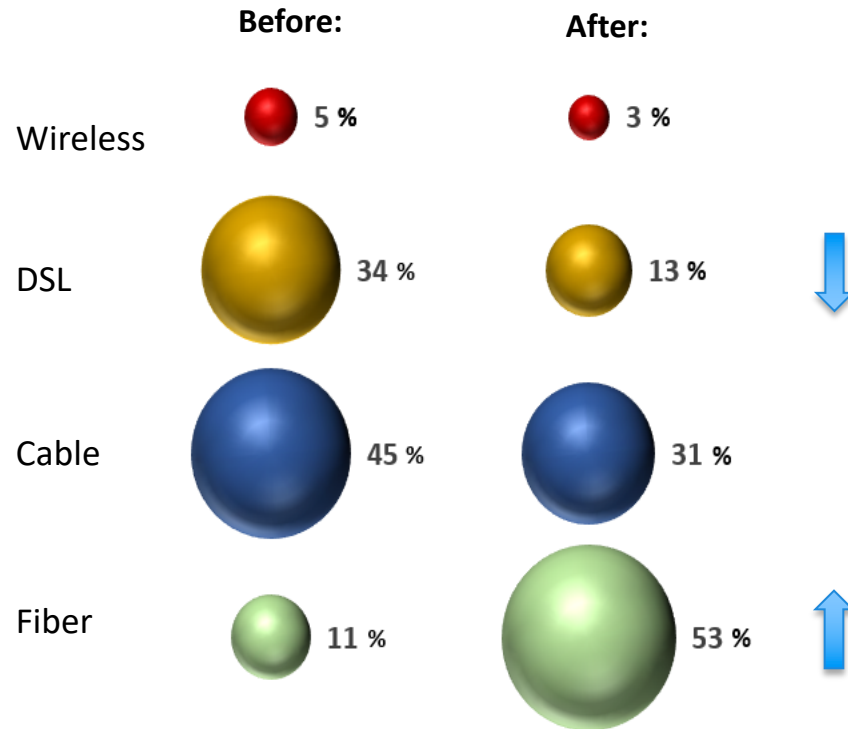
Fiber Wins During Churn

Within Same Residence In Past Three Years

In Areas Where Fiber Is Available: RVA Consumer Study 2019

About 10 % churn each year without a home move:

What slows down Broadband change?

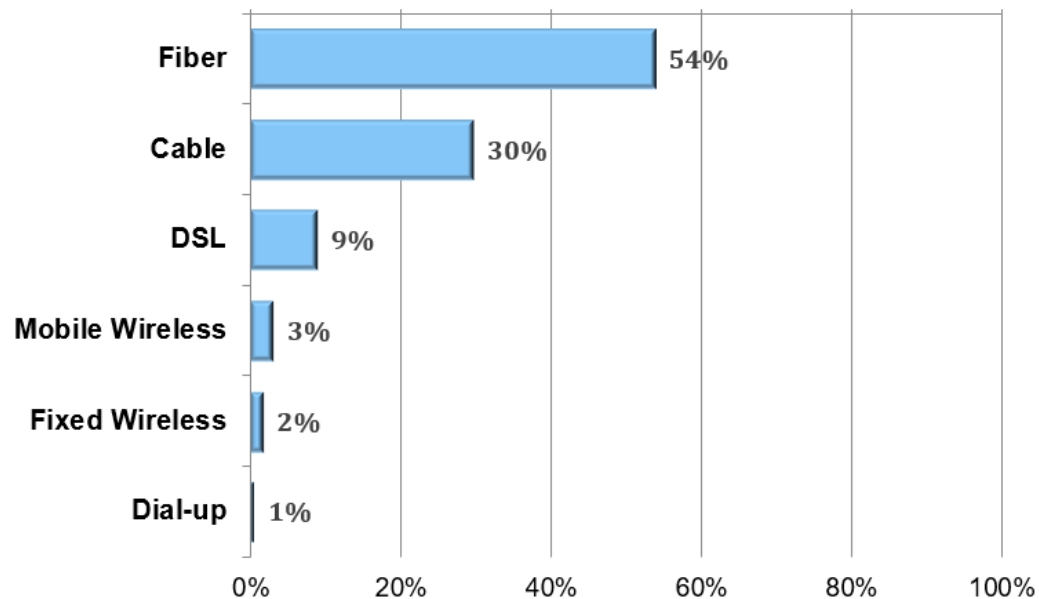


In Mature Fiber Areas FTTH Wins In Market Share

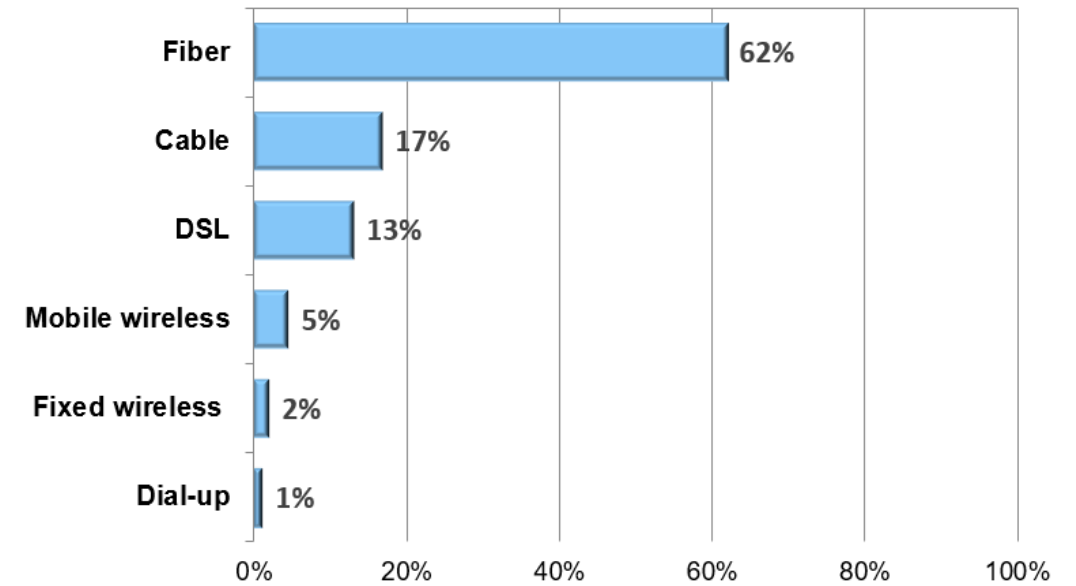
(Market Share Is Higher Than "Take Rates" Which Include Non-Broadband Homes)

RVA Consumer Study 2020

Tier 1 Area (Verizon Fios Example)



Tier 2-3 Areas



FBA Study: Deploying Fiber to 90% of US Households

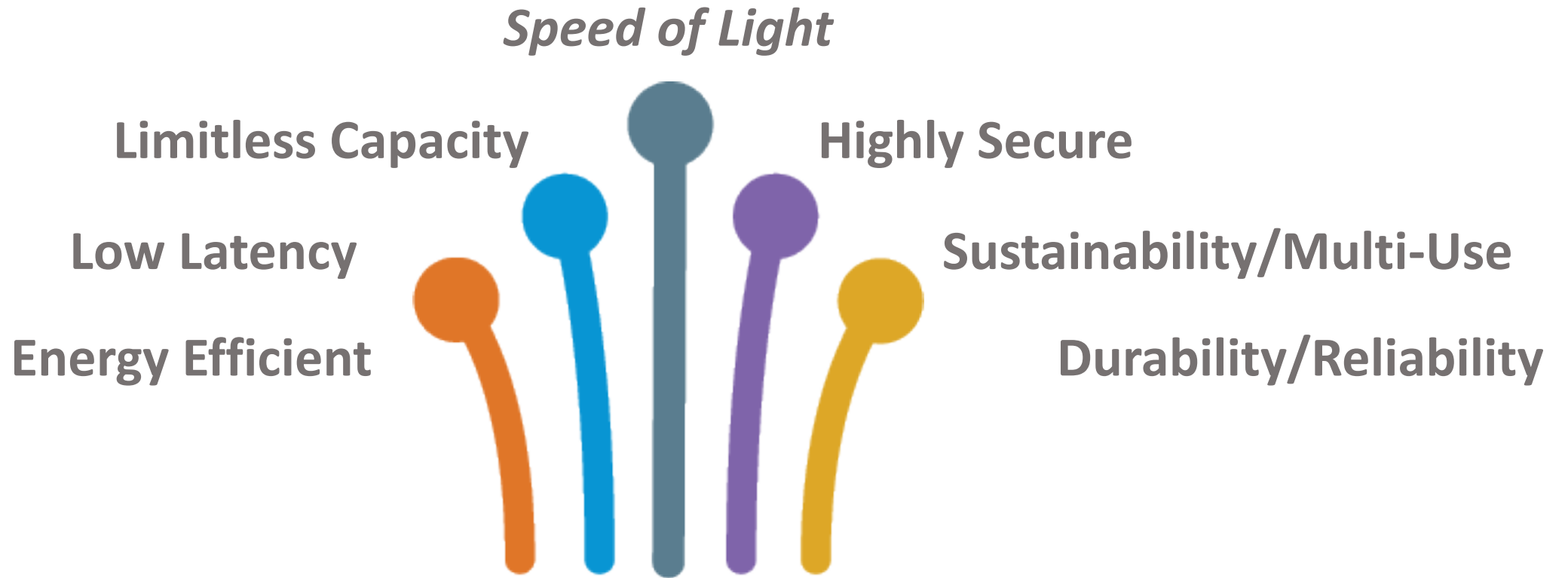
- We can reach **90% of U.S. homes** with fiber broadband networks in the next 10 years.
- Reaching 90% of U.S. homes will cost approximately **\$70B**.
- **We can achieve this** with:
 - Targeted government support
 - Muni builds
 - Private sector innovation
 - Public-private partnerships
 - Innovative deployment models



According to 2019 study from FBA and Cartesian

What's the Definition of Broadband

Fiber Broadband: *If it's not fiber, It's not Broadband*



Fiber Broadband is the gold standard on every dimension



Key Takeaways

- Pandemic wfh / online school has changed the network dynamics
 - Symmetric applications
 - Quality of bandwidth is critical
- Entering significant Fiber investment cycle
 - Public and Private Capex
 - 5G is Fiber
- The sustainable definition of broadband is Fiber
 - *If it's not fiber, it's not broadband*





THANK YOU!

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