

The State Of The North American Fiber Deployment

January 2025



RVA LLC
Market Research & Consulting

**Fiber
Broadband**
ASSOCIATION

Where Are We?

2024 RVA Market Research For The FBA

The Direct Productivity Value Of Gigabit Fiber Speeds

FBA Fiber Resources: *“Gigabit Fiber Can Add \$326B to US GDP”*

FBA 2024 Fiber For Breakfast # 32: *“Why You Should Always Sign Up For Gig+ Service”*

Fiber Broadband Consumer Differentiation And Marketing

FBA Fiber Resources: *“2024 Consumer Internet User Study”*

FBA 2024 Fiber For Breakfast #45: *“Getting Even More From Fiber: Providers Should Augment And Amplify The Advantage!”*

Fiber Broadband 2024 Fiber Deployment Overview

FBA Fiber Resources: *“2024 Fiber Deployment Study”*

FBA 2024 Fiber For Breakfast # 51: *“How Strong Is The Current And Future FTTH Market”*

Deployment Study Methodology



Triangulation Of Data Sources:

- Analysis of public company data
- 2024 FBA/ RVA surveys of mid-size and smaller providers
- Data from 2024 FBA/ RVA Consumer Study
- Review of 2024 FCC mapping data and other government sources
- Data from other industry association surveys
- Interviews and data from vendors and engineers

All data sources have error and biases. Using multiple sources helps identify and minimize error.

FCC “census” data for household fiber passings is the best it has ever been... but still has error.



Instruction clarity and bias opportunity



Sampling errors



Acquisition and compilation errors and delays

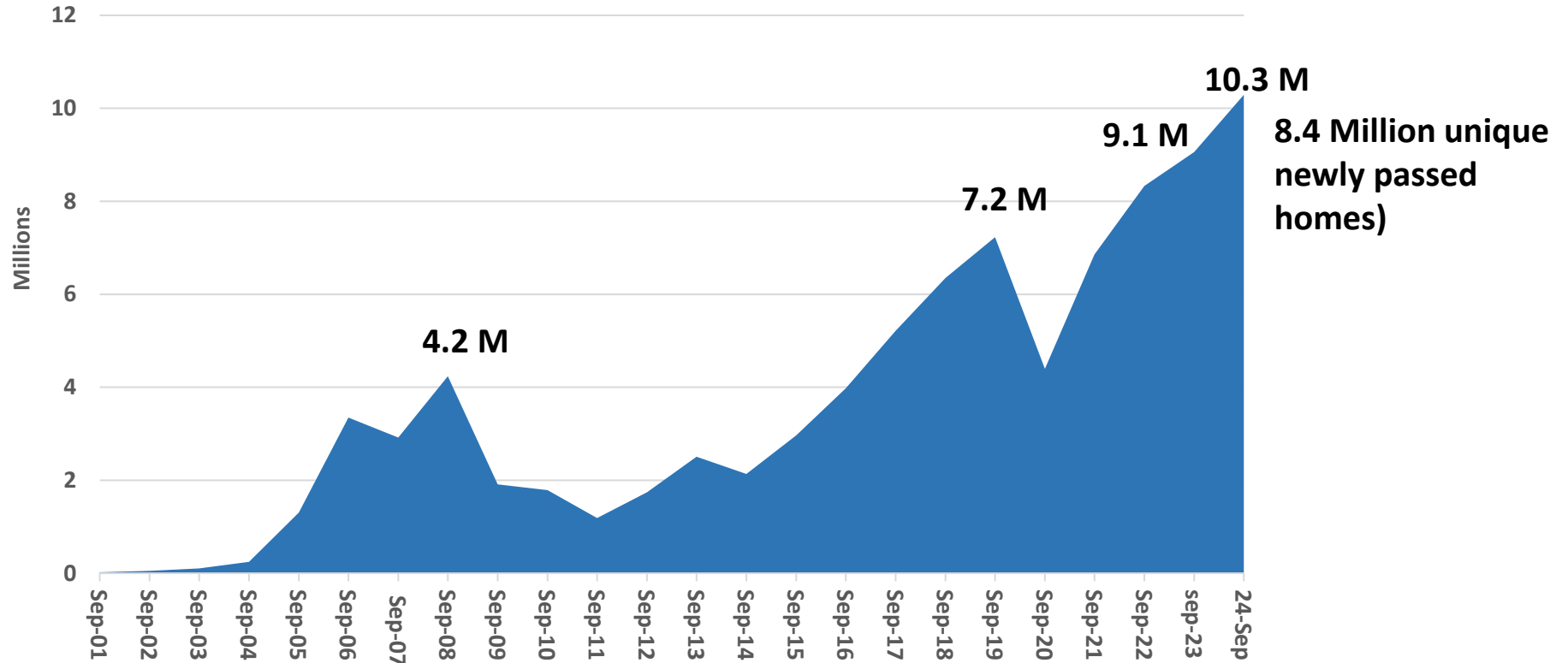


Methodology errors, reporting clarity

2024 Sets A New Record For The Highest Annual FTTH Growth

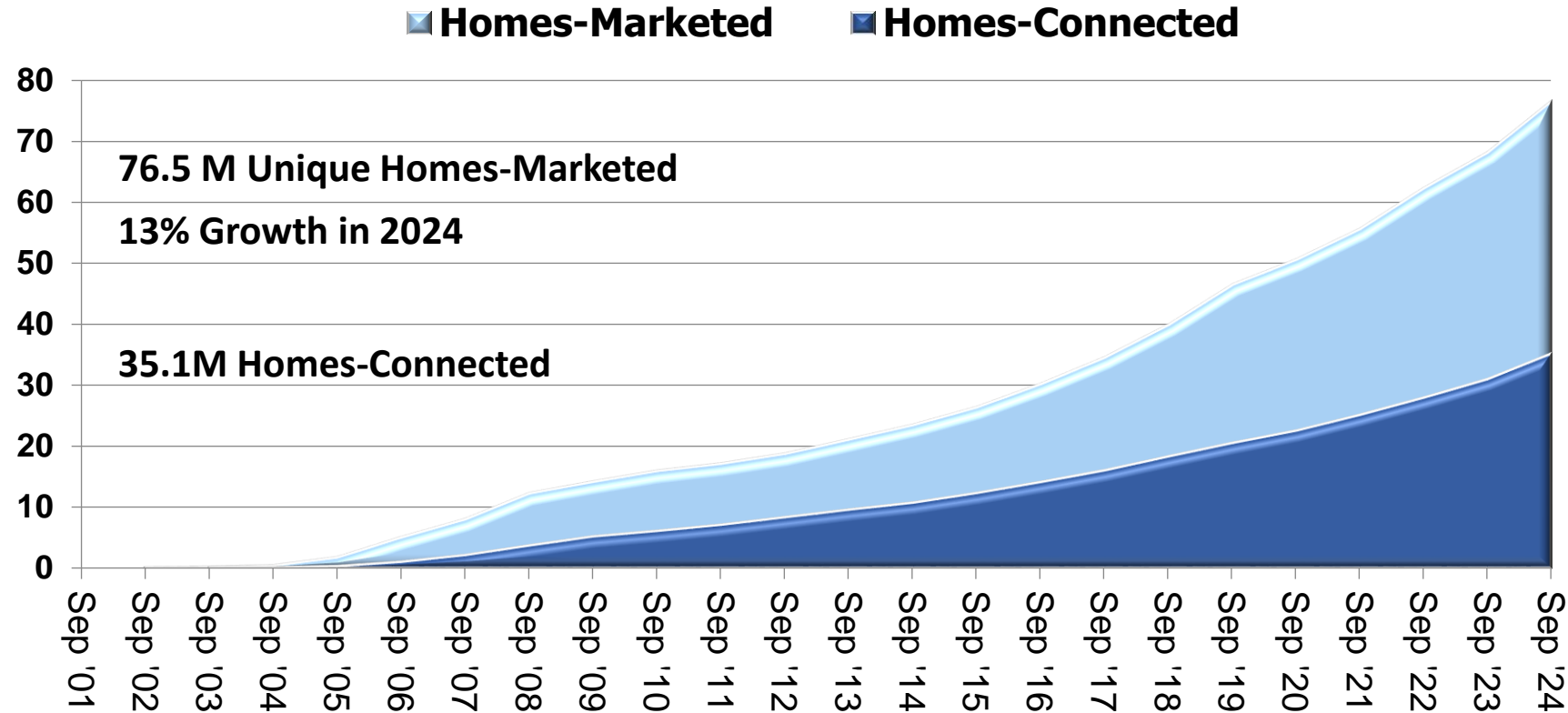
Annual Homes-Marketed (All Years Ending Q3)

2024 FBA/ RVA Provider Study



Fiber Broadband Now Passes 76.5 Million Unique U.S. Homes*

2024 FBA/ RVA Provider Study



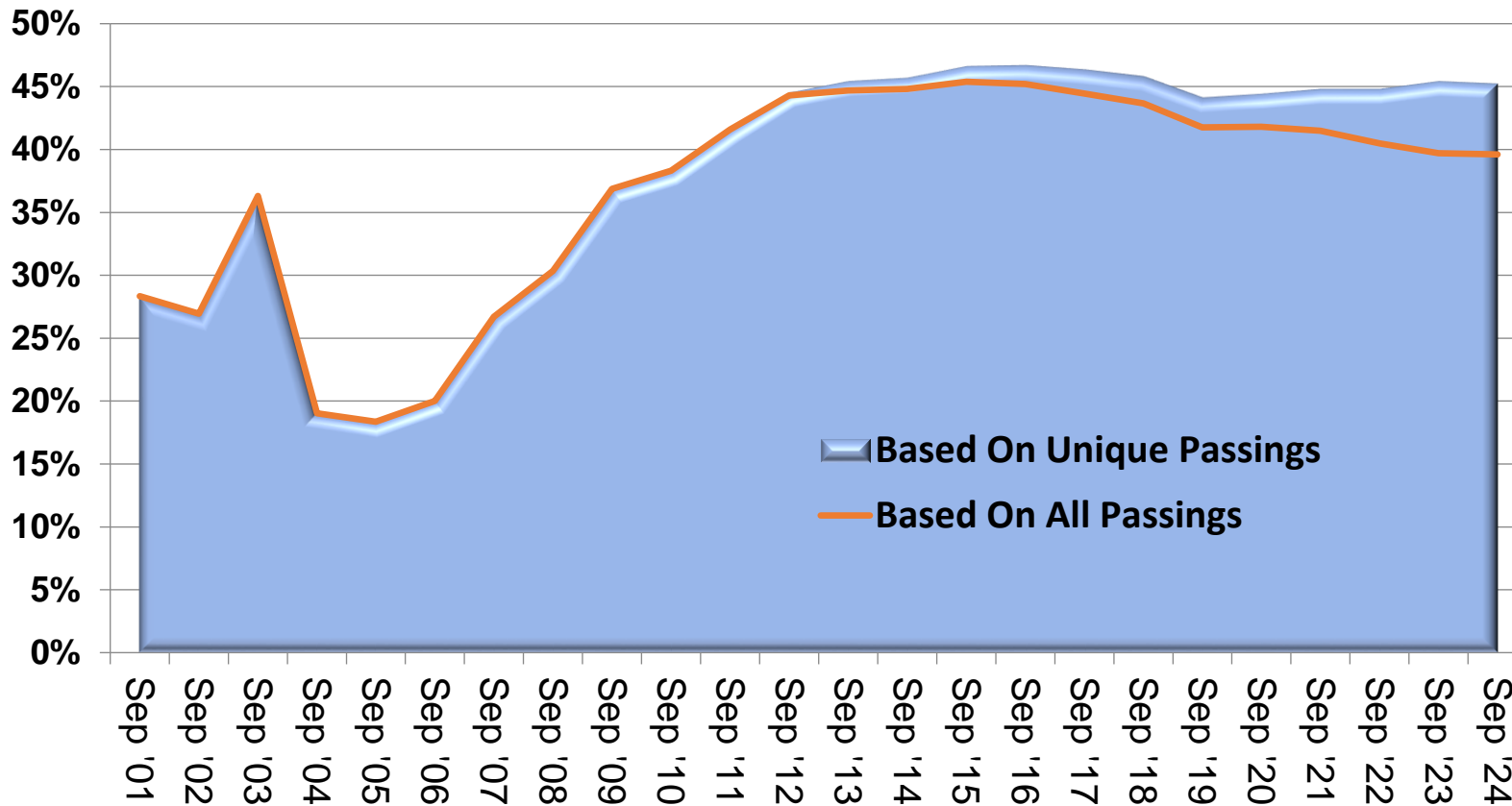
Including homes with more than one passing, there are **88.1 million FTTH Passings** in the U.S.

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

U.S. Fiber Take-Rates Have Increased Slightly - Even During A Heavy Build

2024 FBA/ RVA Provider Study

Providers are reporting faster ramp rates to the 20% level... and higher ultimate take-rates.

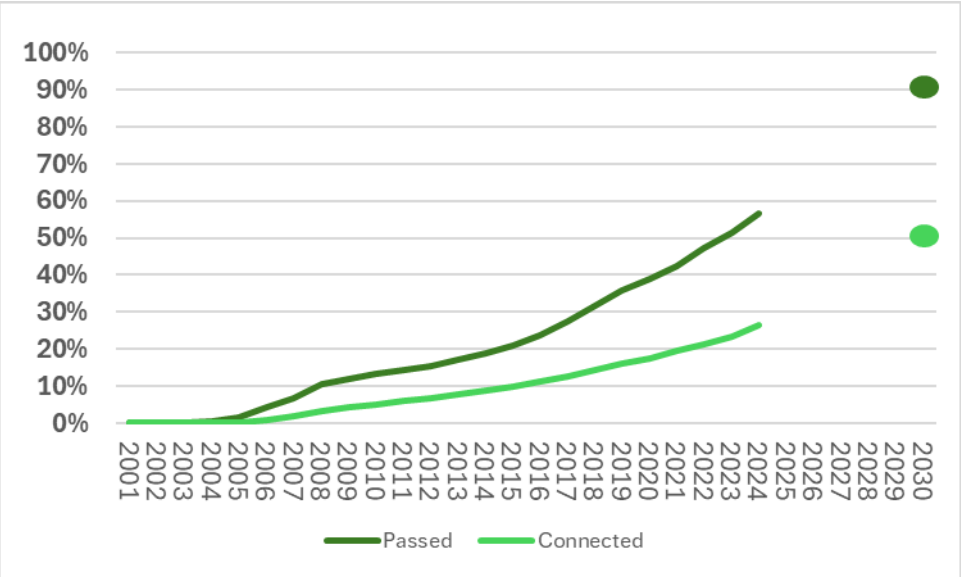


45.2% average take
(based on unique passings)

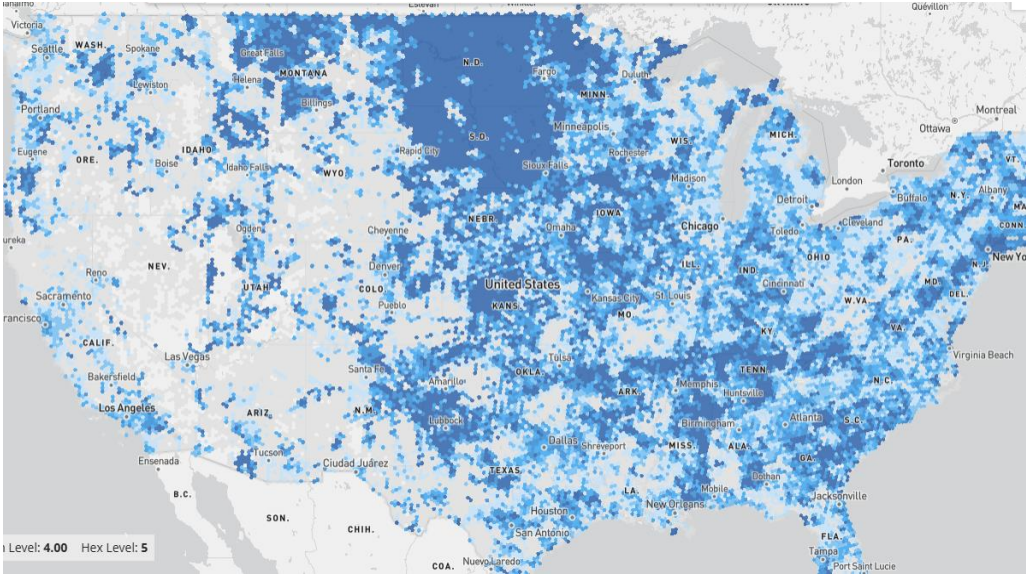
39.6% average take
(including homes with more than one fiber provider)

Fiber Now Passes 56.5% Of U.S. Households And 18% Of Second Homes Non-Redundant U.S. Primary Homes-Passed Versus Households

FBA Progress Toward Goals: Percent Of Households



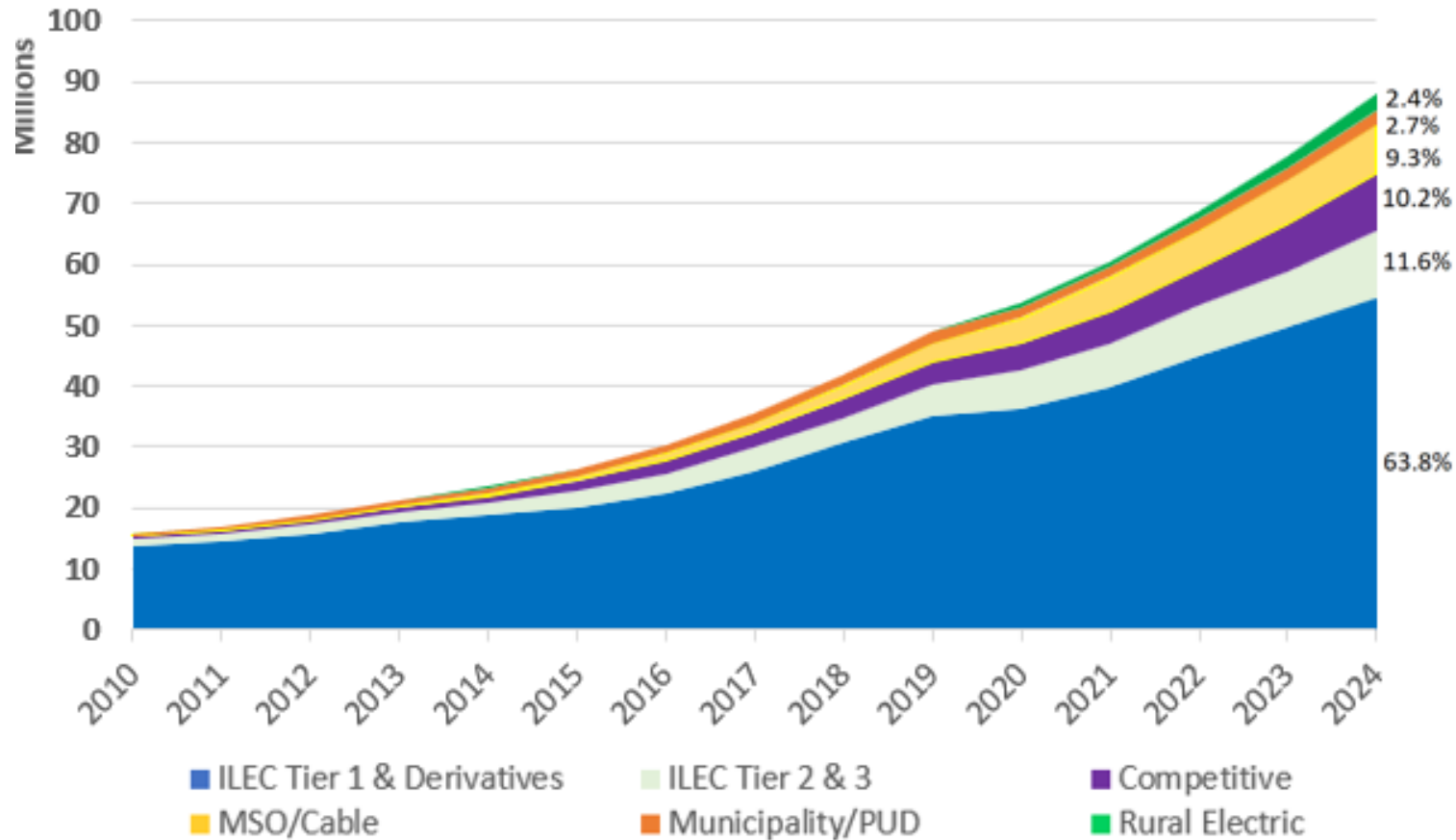
FTTH Density: FCC Mapping



The FBA is making good progress toward its goals.

The Diversity Of Fiber Providers Is Increasing Over Time

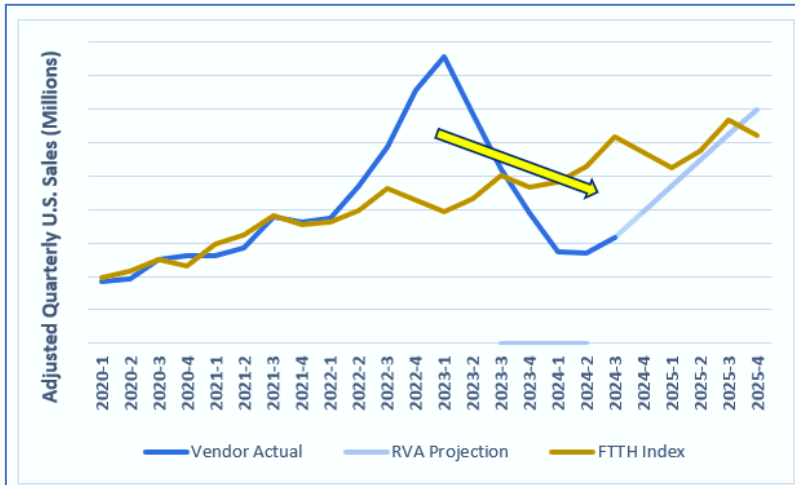
Provider Type Proportion Of All Passings



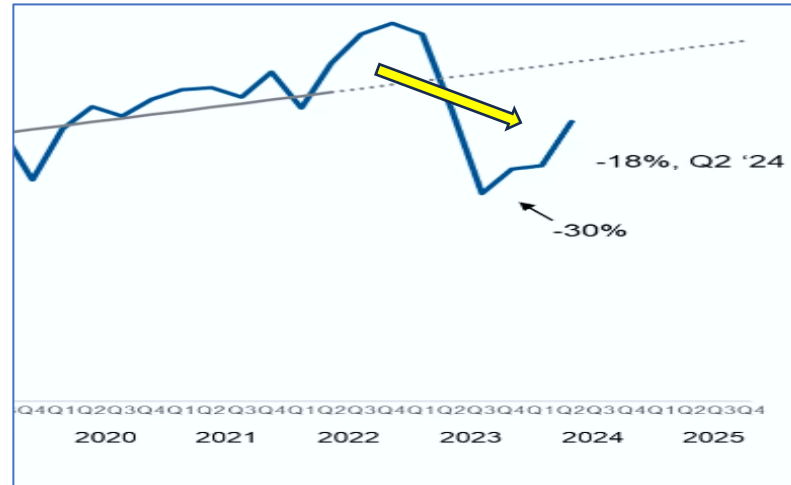
The FTTH Inventory Glut Is Now Resolving

Example: Vendor North American Quarterly Sales Versus FTTH Index

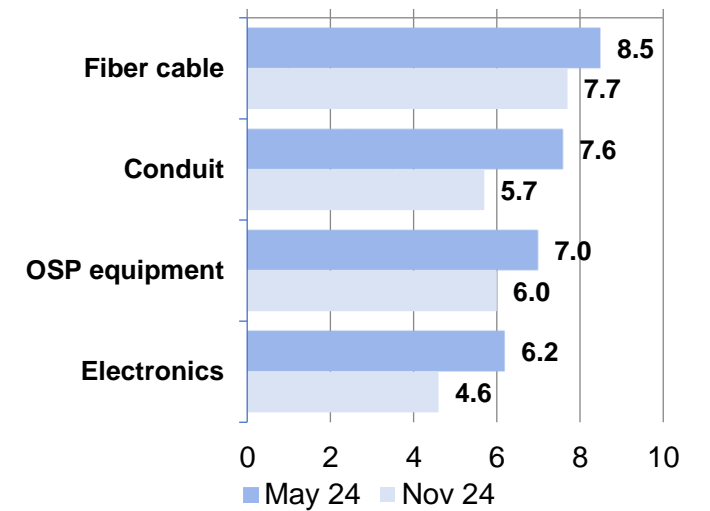
OSP Vendor



Corning



Months Inventory: Small Providers
RVA Provider Study



Most vendors report their sales are now increasing again

Recovery varies by segment

The U.S. FTTH Addressable Market In The Next Decade Is Still Very Large



FTTH Providers are Reporting lower take rate break even because of:

- Lower Opex
- Lower ARPU
- Higher ramp rates
- Lower churn

RVA Estimates: 88 Million Down – 149 Million To Go

48% of first passings remain (through 2034)

87% of second and third passings remain (current estimate)

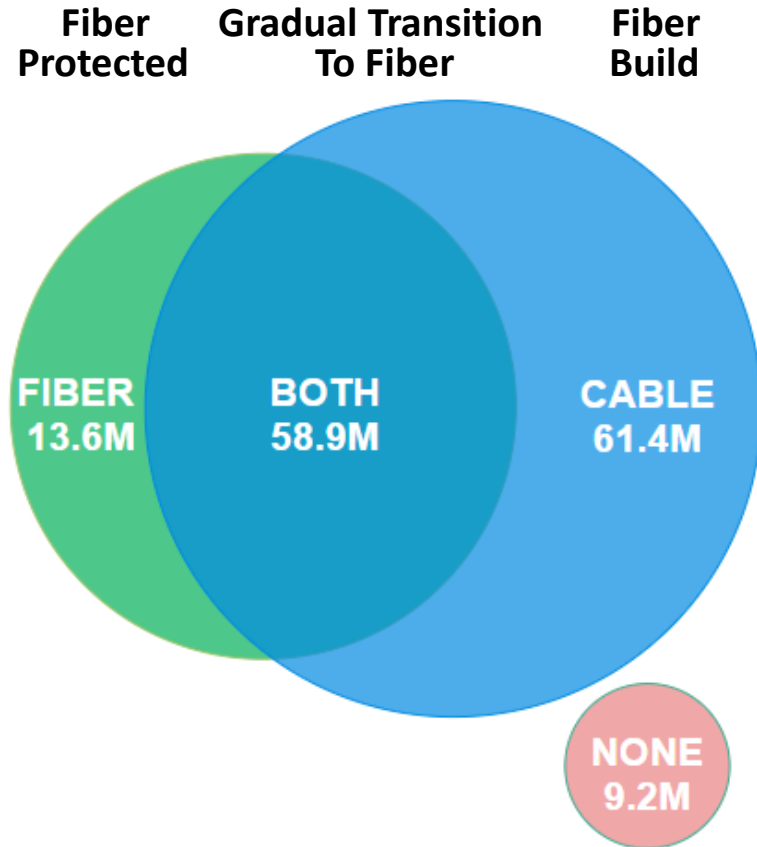


	Dense – Low Income	Dense – Mid-High income	Small town/ Rural	Second Homes	Total
First Passings Possible	28.5	70.4	38.2	10.7	147.8
First passings Now	11.3	43.5	17.8	3.9	76.5
First passing left	17.1	26.9	20.4	6.8	71.3
Redundant Passings Possible	5.3	72.4	10.7	0.5	88.9
Redundant Passings Now	1.0	8.7	1.9	0.0	11.6
Redundant Passing Left	4.4	63.7	8.8	0.5	77.3
Total Passings Left	21.5	90.6	29.2	7.3	148.6

Notes: Assumes 10M in household growth. Assumes 2M rural not buildable (off grid). The number of redundant passings is most speculative.

FTTH's Main Competition (HFC Cable) Is Starting To Bleed

Status Of Fiber To HFC Competition U.S. Homes, New Street Research, Dec 2023



Two-Year Net Adds Among Churning or New Users All Provider Sizes, FBA/ RVA Consumer Study, April 2024

Areas Fiber Available:

	Churn in	Churn out	Net	New User
Fiber	57%	15%	41%	45%
DSL	6%	23%	-17%	2%
HFC	21%	54%	-33%	35%
Fixed Wireless	13%	1%	12%	10%
Mobile Wireless	2%	3%	-1%	8%
Geo Sat	1%	4%	-3%	0%
Leo Sat	0%	0%	0%	0%

Areas Fiber Not Available:

	Churn in	Churn out	Net	New User
Fiber	0%	0%	0%	0%
DSL	4%	37%	-33%	8%
HFC	54%	51%	4%	59%
Fixed Wireless	27%	2%	25%	12%
Mobile Wireless	8%	7%	1%	18%
Geo Sat	3%	4%	-1%	1%
Leo Sat	4%	0%	4%	1%

(Mobile Wireless included when the primary method used at home.)

Public cable companies lost 265,000 Internet customers in Q3 2024. RVA does not believe DOCSIS 4.0 will significantly stem this trend.

Where Are We Going?

The Money Is Flowing Strongly Into The Market



Private Equity

S&P Global estimates private equity has committed about **\$80 billion cumulative** to telecom in the past five years (the majority to fiber).

Disbursement occurs over multiple years.



Mergers And Acquisitions

Fiber merger and acquisition activity is on the rise – **often increasing deployment funds.**

Large plays include T-Mobile, hedging their wireless position, and Canadian companies such as Cogeco and Bell Canada, hedging their Canadian investments.



Capex Reinvestment

U.S Telecom reports an average of **\$96 billion capex annually** for telecom (not all for fiber) from large public telecom companies alone in each of the past 2 years.

Adjusted for inflation, this is almost double the average capex investment for the previous 20 years. **AT&T and Verizon have recently reported increased future capex.**



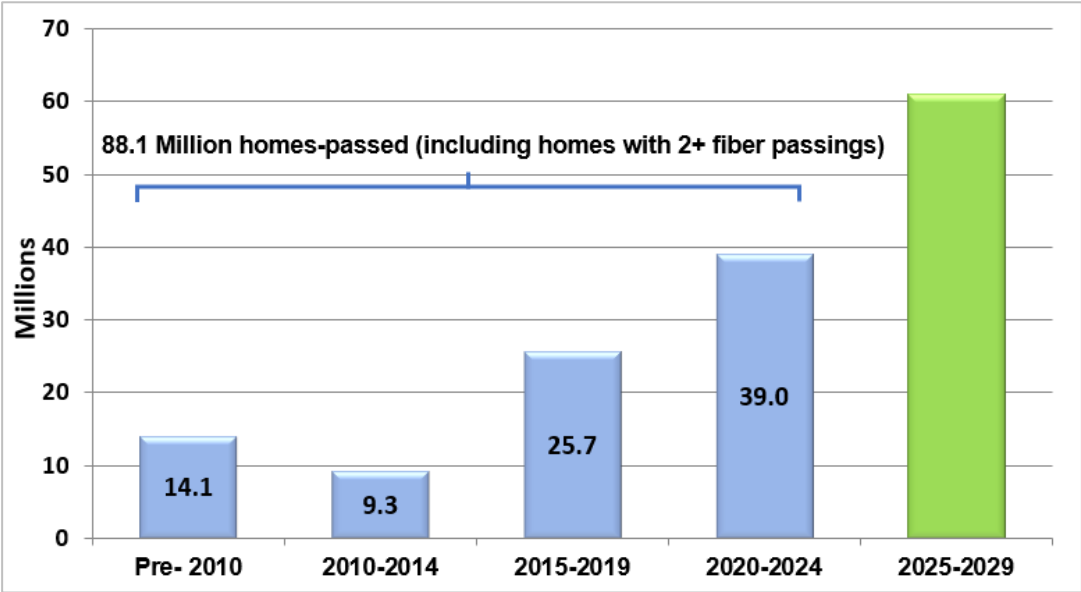
Public Funds

The FCC reports a total of **\$64 billion cumulative** authorized over the past five years from the FCC, RUS, NTIA, and Treasury Department – primarily to fiber. This does not include **\$42.5 billion from the NTIA BEAD** program that is just starting to make awards (most to fiber).

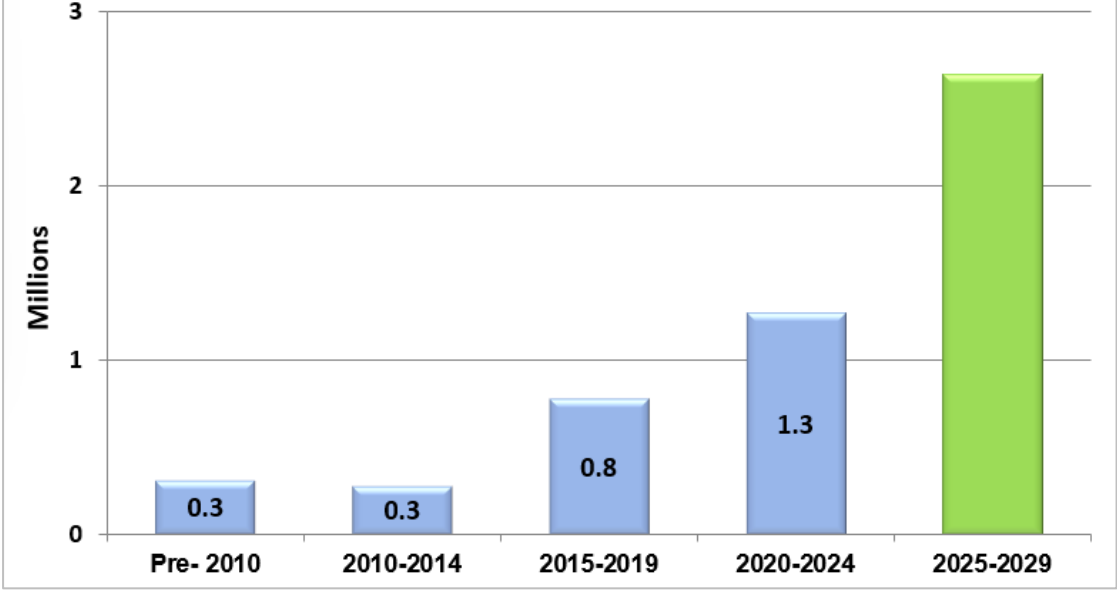
Disbursement occurs over multiple years.

The Five-Year U.S. FTTH Forecast Looks Strong (Exact 2025-2029 Forecast Not Yet Available)

Homes-Passed



FTTH Route Miles



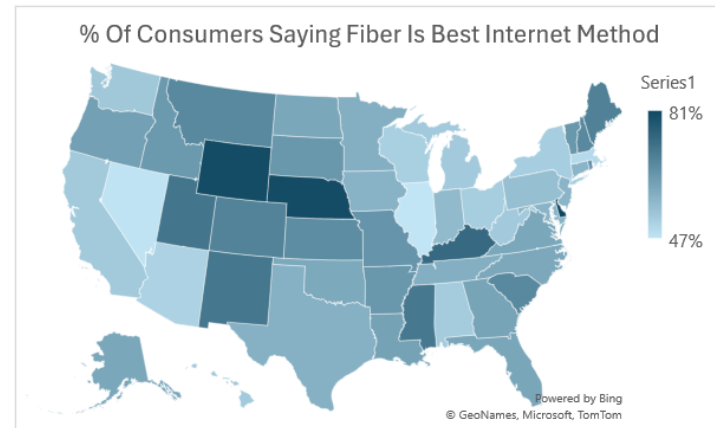
The 2025-2029 period could see a 50%+ increase in homes-passed and a 100%+ increase in route miles to support homes passed. Workforce limitations are assumed to constrain deployment somewhat.

BEAD Will Be Significant For FTTH: But There Are Uncertainties To Navigate

Maintain Program Fiber Preference



Most state broadband offices have a fiber preference. Louisiana (the first state with awards) gave 96% to fiber. Consumers rate fiber as the best method in all 50 States – far above the next method selected (usually HFC).

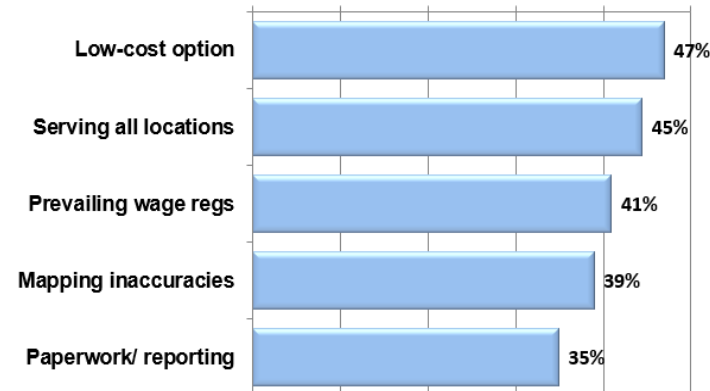


Possibly Reduce Obstacles To Bidding



Many providers mention participation obstacles to BEAD. Any opportunity to reduce those obstacles would increase participation from fiber vendors and potentially reduce bid prices.

ISPs Rating BEAD Obstacles Significant (Top 5)



RVA survey of small to mid-sized ISPs early 2024

Possibly Eliminate 100% Coverage Requirement



For states without sufficient funds, the 100% coverage mandate causes the percent fiber to be reduced if fiber bids are higher than expected. Any opportunity to eliminate the 100% mandate would increase the percent of fiber builds under BEAD.

	Type	Cost per	Ratio	Passed	Cost
Intention	Fiber	\$9K	75%	75K	\$675M
	Alt	\$3K	25%	25K	\$75M
Realign				100K	\$750M
	Fiber	\$12K	50%	50K	\$600M
	Alt	\$3K	50%	50K	\$150M
				100K	\$750M

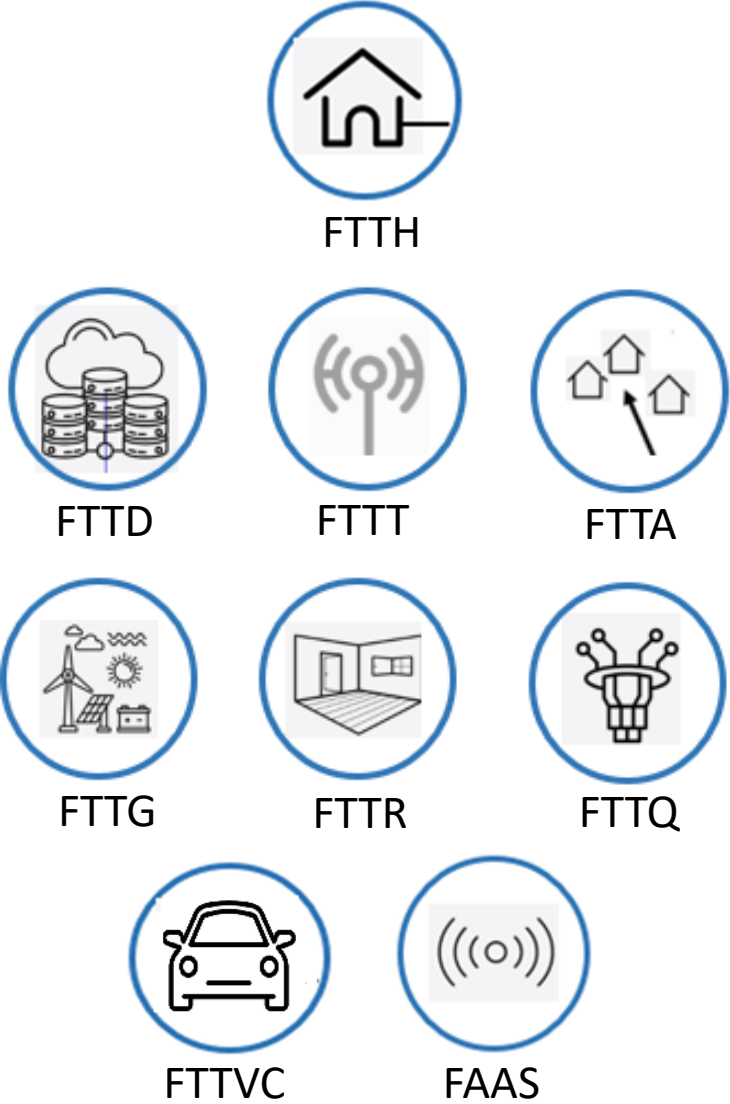
The Full Fiber Future Is Looking Bright!

While the FTTH market is approaching maturity in the next decade, other fiber use cases are relatively early in their market evolution. Fiber markets include:

- FTTH: Fiber-to-the-home
- FTTD: Fiber-to-the-data (data centers)
- FTTT: Fiber-to-the-tower (macro and small cell antennas)
- FTTA: Fiber-to-the-area (long-haul and middle-mile)
- FTTG: Fiber-to-the-grid (alternative energy, microgrids)
- FTTR: Fiber-to-the-room (inside the home or office)
- FTTQ: Fiber-to-the-qubit (quantum computing apps)
- FTTVC: Fiber-to-the-vehicle controller
- FAAS: Fiber-as-a-sensor (fiber sensing)



Recent RVA research now indicates other growing fiber markets may keep the fiber market strong for many years beyond the maturity of the FTTH boom.

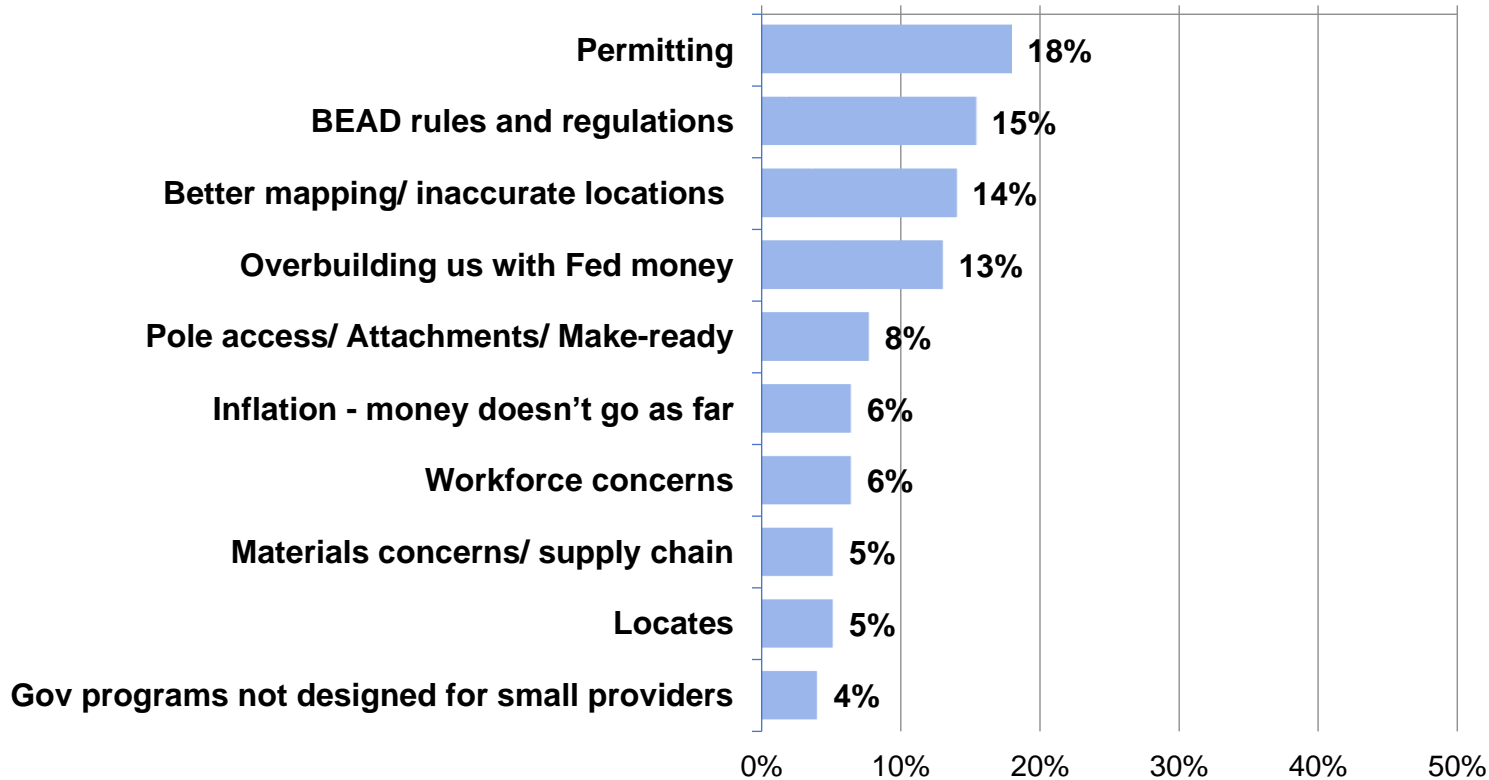


What Are The Challenges?

Permitting Is The Current Top Of Mind Challenge To Providers

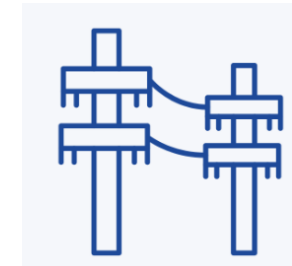
2024 FBA/ RVA Provider Study

Small Providers (Quantitative: Top Ten Responses)



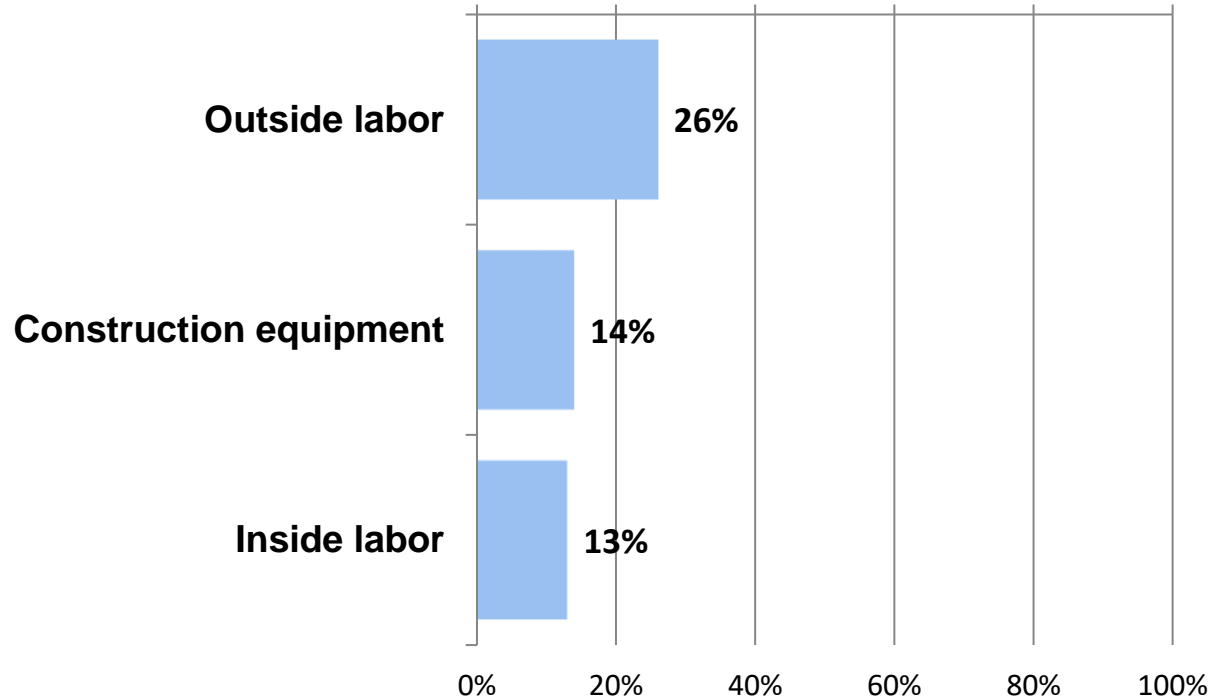
Large Providers (Qualitative Responses)

- Permitting
- Ease Of Decommissioning Copper
- Pole Access/ Make-Ready



Labor And Construction Constraints Are Increasing – But Not Yet Critical

Percent Rating As A Significant Constraint: 2024 FBA/ RVA Small/Mid Provider Study



Overall, small providers estimated they could have built 7% more in 2024 if they had no labor constraints.

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*If It's Not Fiber,
It's Not Broadband*