ribbon TECH FORUM 23

The Regulatory and Strategic Outlook for Rural Broadband Leaders – A Consultant's View

Terry Chevalier

sunstone

Dee Herman

HERMAN & WITEAKER

Your Presenters

Terry Chevalier

Managing Director

Sunstone Associates

Dee Herman

Principal

Herman & Whiteaker

Your Presenters

This is the Consultant

Terry Chevalier

Managing Director

Sunstone Associates

This is NOT a Consultant

Dee Herman

Principal

Herman & Whiteaker

We are seeing significant changes in the industry …

	The Digital Divide	The 5G Business Case	New Technology
What we're seeing …	>$100B in programs towards closing the Digital Divide that will take us through the end of the decade?	Hundreds of billions to capital & spectrum for 5G but where's the return?	5M+ fixed wireless users for broadband … who would've thought?

We are seeing significant changes in the industry …

	The Digital Divide	The 5G Business Case	New Technology
What we're seeing …	>$100B in programs towards closing the Digital Divide that will take us through the end of the decade?	Hundreds of billions to capital & spectrum for 5G but where's the return?	5M+ fixed wireless users for broadband … who would've thought?
… but what we knew	*"Efforts to close the digital divide may take several years to a decade, with governments and industry working together to expand broadband access in underserved areas."* - Telecommunications Analyst, 2017	*"Initial 5G revenue streams will emerge within the first few years, but significant gains will come as the ecosystem and user base mature over the next 5-10 years."* - Telecom Industry Insider, 2017.	*"The rise of 5G will significantly boost the capabilities of fixed wireless access, offering gigabit-speed internet to urban and suburban areas."* - Telecom Consultant, 2018

… and what is happening today can be a harbringer of the future

"Predictions are hard …
especially about the future."
– Yogi Berra

We asked rural broadband leaders what was on their minds

Irrational Fiber Overbuilders	Complex Grant "stacking" and delays	Uneconomical USF requirements from E-ACAM	Increased competition from Big cable, Big telcos
5G Fixed Wireless	Challenging rural Economics	Supply chain	Open Access Models
Changing Customer Demands	Private Investors	Rising equipment costs	Labor and Talent Shortages

We asked rural broadband leaders what was on their minds

Irrational Fiber Overbuilders	Complex Grant “stacking” and delays	Uneconomical USF requirements from E-ACAM	Increased competition from Big cable, Big telcos
5G Fixed Wireless	Challenging rural Economics	Supply chain	Open Access Models
Changing Customer Demands	Private Investors	Rising equipment costs	Labor and Talent Shortages

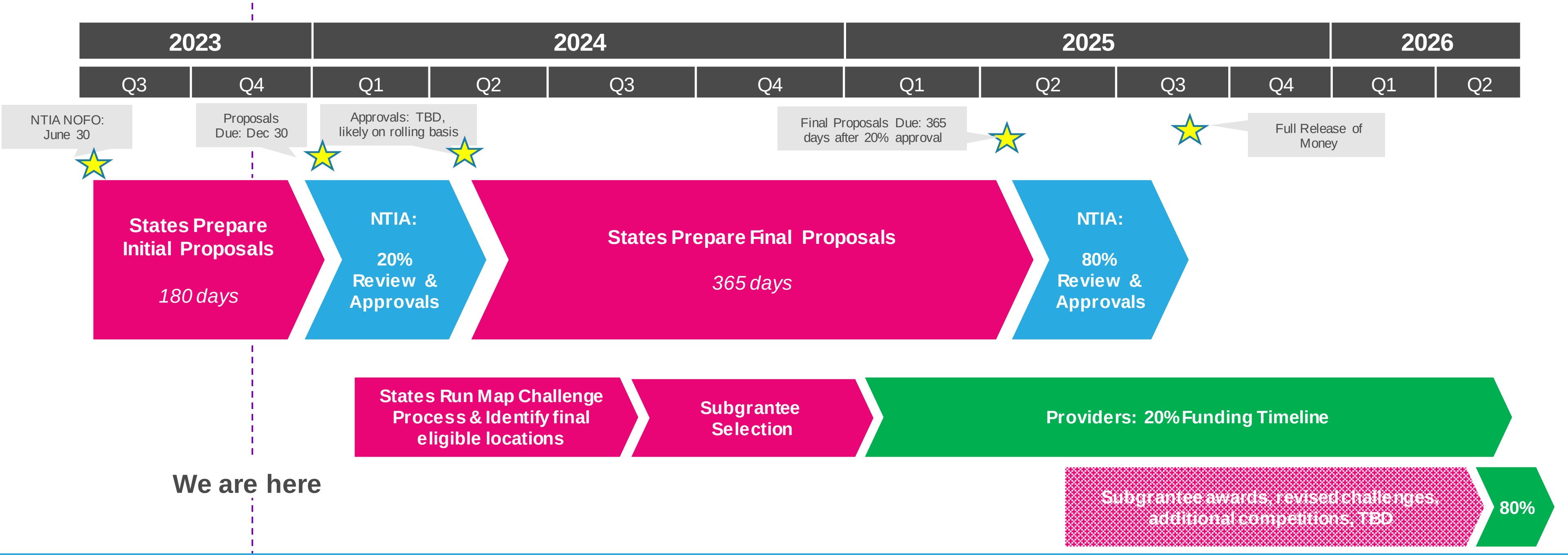
The Regulatory & Strategic Outlook

- The BEAD Land Grab
- Enhanced ACAM & the USF Outlook
- Changing Competitive Landscape

The BEAD Land Grab

BEAD: Timeline of Key Events

Estimated timeline for a “typical” state



However, states are at different “readiness” levels suggesting variation in availability

BEAD: Current Status

Considerations

- Key Points
  - **$42.45B** allocated to states. ($41.6B to be made available)
  - State allocations announced
  - Unserved areas: No broadband service or lack reliable broadband at 25/3
  - Underserved areas: Lack *reliable* broadband at 100/20 and latency less than 100/MS

What's Ahead

Map Challenges

- Map Challenges key by eligible entities;
- Handled on a state-by-state basis through broadband offices;

Longer Term

- What will the long-term support be after BEAD funded networks are built and operating?

Other Key Issues

- Financing & Letters of Credit
- Prevailing wage and labor
- Build America, Buy America
- Extremely High Cost Threshold
- Cybersecurity/ Supply Chain Security

BEAD: Project Spending Forecast

A Consultant's View

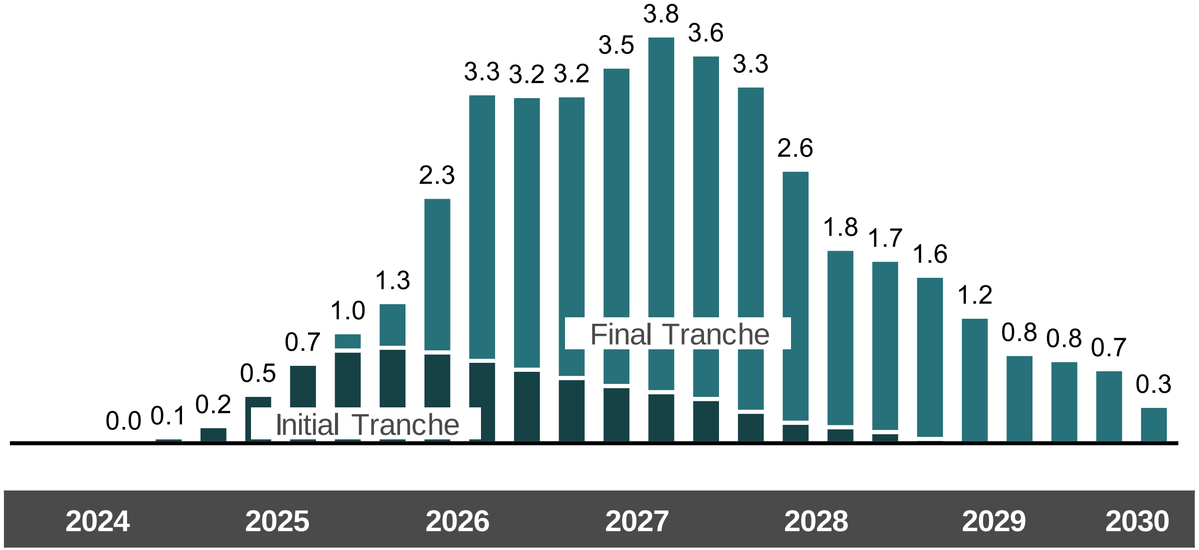
Variation in state readiness and four-year builds spreads impacts over **longer time**

Extent of the builds could be **challenging** for the industry

- Permitting and approvals
- Supply chain
- Labor
- Delays could increase overall costs
- Reimbursement timelines

Quarterly estimated spending forecast from BEAD dollars ($B)

Dollars spent by providers over a 4-year build



Source: Sunstone Analysis and Estimates based on "baseline" award timelines and estimated level of readiness by State using CPF awards, 5 Year Plan Submissions, Initial Proposal Vols I and II status

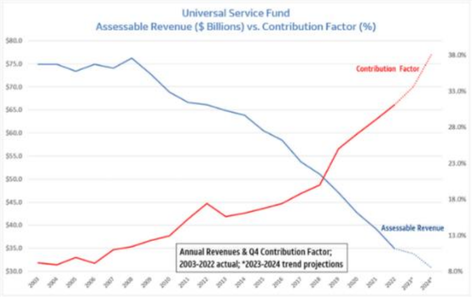
Enhanced ACAM and the USF Outlook

Enhanced ACAM: Results

- The basics:
  - Elections were made September 29, 2029
  - Funding begins January 1, 2024
  - Provides 15 years of funding for carriers electing E-ACAM to build 100/20 to 100 percent of the locations in a carrier's study area.
  - Construction to locations to be completed by 2028
- FCC can make adjustments to locations for the next two years based on map information.
- FCC passed the 50 percent threshold of total locations to continue the program.
  - 43 percent of carriers accepted E-ACAM offer; 31% from ACAM, 11% from CAF/BLS
  - 34% remain in BLS; 21% remain in ACAM

USF Considerations

- Ongoing legal challenges
- Contribution reform



USF: Implications on growth and support

Going forward, rural firms with support will fall in one of three categories

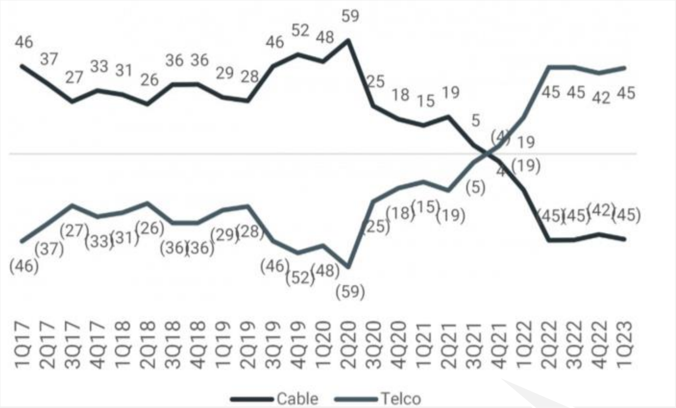
E-ACAM *Enhanced - Alternative Connect America Model*	**"Milestone" Programs** *ACAM I, ACAM II, CAF Auction, RDOF*	**Legacy Rate of Return** *Broadband Loop Support (CAF BLS)*
Took the offer	***Did not take offer; current performance support will expire***	***Did not take offer; relying on ongoing legacy support***
Some certainty of support (?)	**Sustainable economics required**	Support continues to be **uncertain** and subject to external factors
Areas **(potentially) immune** to BEAD dollars	Locations **could be subject** to BEAD dollars	Locations **could be subject** to BEAD dollars
Meet the build and monitor location counts	**Develop build strategy, financing plan, and BEAD response strategy**	**Continue advocacy, reduce reliance on support, and develop BEAD response strategy**

Changing Competitive Landscape

Fixed Wireless Impacts

Fixed Wireless Access (FWA) is hitting the Cable MSOs' broadband gains but thus far in higher density areas

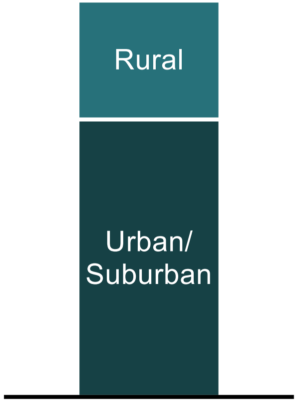
Change in market share - Cable vs. ILECs (including FWA)



Source: Lightreading.com, "Cable broadband getting hammered by FWA but poised to recover", May 2023

4/21: T-Mobile launches FWA nationwide

Source of FWA gains



FWA gains morphology

Source: Wells Fargo

FWA likely to be more prevalent in rural going forward

*"…T-Mobile's FWA offering has begun to run up against competition ... Partly as a result, T-Mobile is shifting more of its FWA efforts toward prepaid customers, business users and **subscribers in rural areas**…"*

Lightreading, February 2023

*"Here in rural Alabama [T-Mobile] have been **building EVERYWHERE**, and I mean EVERYWHERE!!"*

- Reddit user, March 2023

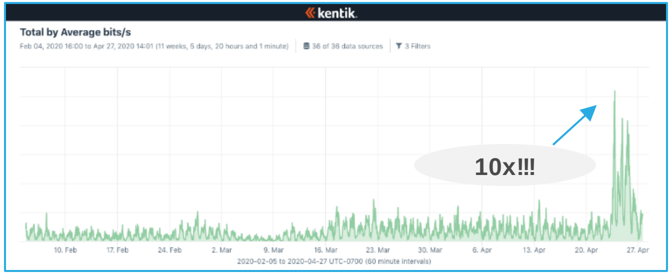
*"AT&T CEO John Stankey gave some credit to AT&T Internet Air for helping the company return to positive broadband growth, as it continues to **sunset its old copper plant** and simultaneously roll out new fiber."*

- FierceWireless on AT&T Q3 2023 results

Speed and Capacity

Streaming events driving significant network demand

(Example: traffic on NFL network before and during the draft)

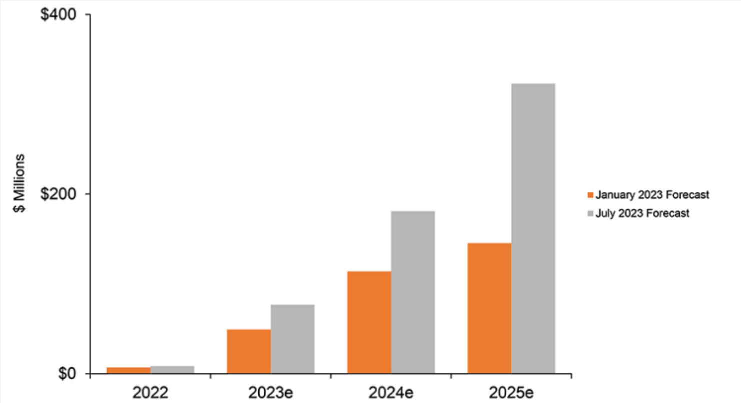


Multi-Gig Offers are becoming the norm to compete

(Example offers in the market)

Most providers are using XGS-PON, but 25GS is around the corner …

Worldwide 25GS-PON Equipment Revenue Change in forecasts



Source: Dell'Oro Group

Source: Internet searches; data from kentik.com blog, "Why Network Capacity was Critical for the NFL Draft – And Will Be for Other Sporting Events to Come"

The Outlook

Industry Outlook

Near Term
Next 12 mo

States working to obtain BEAD funds and establish grant processes

E-ACAM commences

FWA starts turn-up in rural areas

General aggressive marketing tactics from incumbents to win share/ maintain base; also focused upgrade efforts to remove areas from BEAD funding

Medium Term
12 to 24 mo

Initial awards made and underway; industry identifies program issues and wrestles with potential adjustments/ reforms

E-ACAM operators begin build; ACAM operators seeing end of build; RDOF ongoing – may see more defaults

FWA making greater inroads in rural

Continued efforts from all incumbents to reach multi-Gig speed capabilities

Longer Term
24+ months

Industry is "in the build" with ongoing management of pricing impacts, supply chain managing and labor availability

E-ACAM in the throes of build; USF transformation discussions ramp as BEAD is administered

Initial 10Gbps offers begin to appear; 25 GS-PON deployments more mainstream

More upgrades from DOCSIS to fiber to set higher standard for competition

Industry Outlook

Near Term *Next 12 mo*	Medium Term *12 to 24 mo*	Longer Term *24+ months*
States working to obtain BEAD funds and establish grant processes *E-ACAM commences* *FWA starts turn-up in rural areas* *General aggressive marketing tactics from incumbents to win share/ maintain base; also focused upgrade efforts to remove areas from BEAD funding*	*Initial awards made and underway; industry identifies program issues and wrestles with potential adjustments/ reforms* *E-ACAM operators begin build; ACAM operators seeing end of build; RDOF ongoing – may see more defaults* *FWA making greater inroads in rural* *Continued efforts from all incumbents to reach multi-Gig speed capabilities*	*Industry is "in the build" with ongoing management of pricing impacts, supply chain managing and labor availability* *E-ACAM in the throes of build; USF transformation discussions ramp as BEAD is administered* *Initial 10Gbps offers begin to appear; 25 GS-PON deployments more mainstream* *More upgrades from DOCSIS to fiber to set higher standard for competition*

Build your **expansion plan** and **financing strategy**

Drive **customer experience/ loyalty**, and build **operational efficiency** into the base

Industry Outlook

Near Term *Next 12 mo*	Medium Term *12 to 24 mo*	Longer Term *24+ months*
States working to obtain BEAD funds and establish grant processes *E-ACAM commences* *FWA starts turn-up in rural areas* *General aggressive marketing tactics from incumbents to win share/ maintain base; also focused upgrade efforts to remove areas from BEAD funding*	*Initial awards made and underway; industry identifies program issues and wrestles with potential adjustments/ reforms* *E-ACAM operators begin build; ACAM operators seeing end of build; RDOF ongoing – may see more defaults* *FWA making greater inroads in rural* *Continued efforts from all incumbents to reach multi-Gig speed capabilities*	*Industry is "in the build" with ongoing management of pricing impacts, supply chain managing and labor availability* *E-ACAM in the throes of build; USF transformation discussions ramp as BEAD is administered* *Initial 10Gbps offers begin to appear; 25 GS-PON deployments more mainstream* *More upgrades from DOCSIS to fiber to set higher standard for competition*
Build/execute your **expansion plan** and **financing strategy** Drive **customer experience/ loyalty**, and build **operational efficiency** into the base	Commence your **execution plan**/ BEAD or state grants/ establish **staffing and supply chain plans** **Upgrade** your middle mile/ aggregation layer in advance of demand Begin to look for **"stranded" assets** and "failed" or struggling projects	

Industry Outlook

Near Term *Next 12 mo*	Medium Term *12 to 24 mo*	Longer Term *24+ months*
States working to obtain BEAD funds and establish grant processes *E-ACAM commences* *FWA starts turn-up in rural areas* *General aggressive marketing tactics from incumbents to win share/ maintain base; also focused upgrade efforts to remove areas from BEAD funding*	*Initial awards made and underway; industry identifies program issues and wrestles with potential adjustments/ reforms* *E-ACAM operators begin build; ACAM operators seeing end of build; RDOF ongoing – may see more defaults* *FWA making greater inroads in rural* *Continued efforts from all incumbents to reach multi-Gig speed capabilities*	*Industry is "in the build" with ongoing management of pricing impacts, supply chain managing and labor availability* *E-ACAM in the throes of build; USF transformation discussions ramp as BEAD is administered* *Initial 10Gbps offers begin to appear; 25 GS-PON deployments more mainstream* *More upgrades from DOCSIS to fiber to set higher standard for competition*
Build/execute your **expansion plan** and **financing strategy** Drive **customer experience/ loyalty**, and build **operational efficiency** into the base	Commence your **execution plan**/ BEAD or state grants/ establish **staffing and supply chain plans** **Upgrade** your middle mile/ aggregation layer in advance of demand Begin to look for **"stranded" assets** and "failed" or struggling projects	Execute your **broader expansion** plans; keep up with your build Experiment with **"up the stack"** services or **wholesale models** to monetize the network Begin exploring **longer term M&A** opportunities

But regardless…

“There's two buttons I never like to hit: that's panic and snooze”

- Ted Lasso

Want to learn more?

Join us tomorrow at our breakout session to continue the conversation where we will answer your questions

“Conversations on the Industry Outlook for Rural Broadband Leaders”

AM IP Optical Breakout Session track

ribbon

TECH FORUM 23