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October 21, 2019

VIA ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W., Room TW-B204
Washington, DC 20554

Re: Reply Comments on WC Docket Nos. 19-126 and 10-90

Madam Secretary:

Since the time of the Buckeye Hills Regional Council comment filing on September 19, 2019, we have advanced our analysis and in this reply comment filing share the additional insights. We specifically address two particular areas of analysis.

1. Better quantification of the persistent digital desert afflicting low population density areas of Appalachian Ohio.
2. The results of our own cost study, or "mini-CAM," for our first engineering zone. We selected the 50 square mile engineering zone from our 8-county study area. The engineering zone exhibits representative characteristics of population density, household income, terrain and foliage cover allowing extrapolation across a broad area. We will complete analysis of at least one more engineering zone in the course of our ARC-funded study with results coming in after the closing date for RDOF replies.

Sincerely,

Tom Reid

Broadband Consultant for the Buckeye Hills Regional Commission
President of the Reid Consulting Group

Attachment: Supplemental Data for Addressing the Digital Divide in Appalachian Ohio



Supplemental Data for Addressing the Digital Divide in Appalachian Ohio

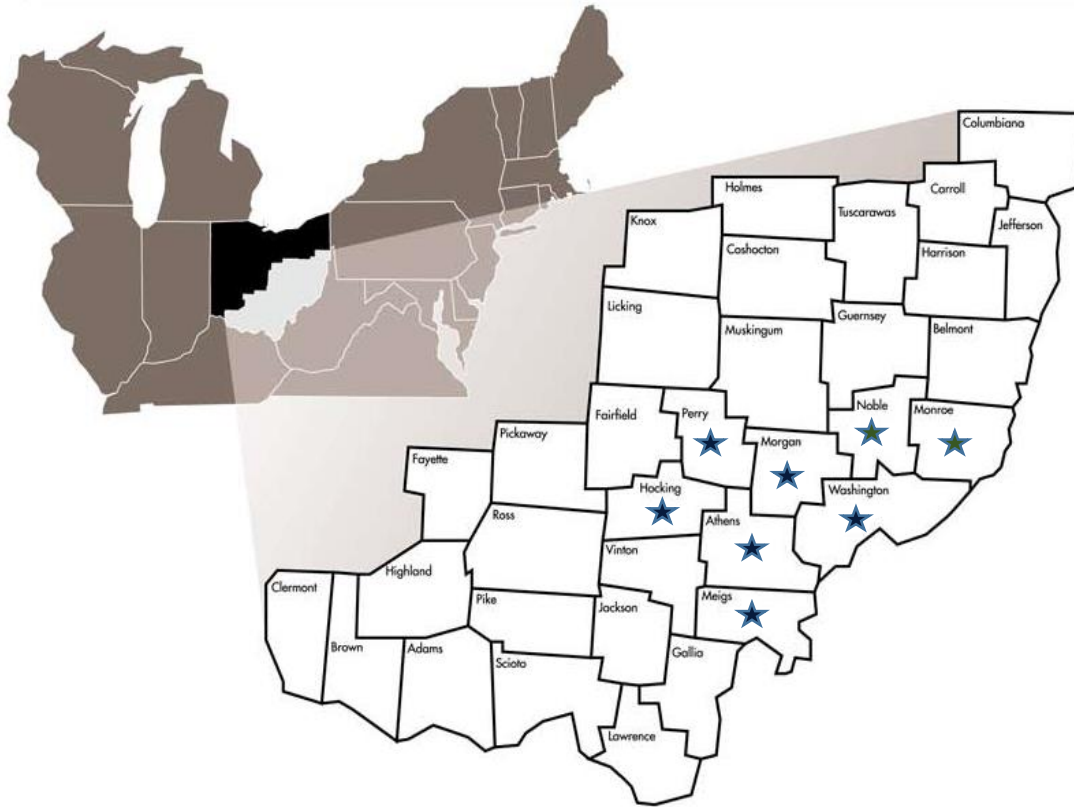


21 October 2019

Tom@ReidConsultingGroup.com



Connecting Appalachia



Tremendous Regional Collaboration

- Economic Development Agencies
- Healthcare Providers
- K-12 Information Technology Centers
- County Commissioners
- Higher Education

\$130 million in middle mile fiber builds in the last ten years

“Starred” counties in the current ARC-funded study

In the digital desert... McDonalds as Study Hall

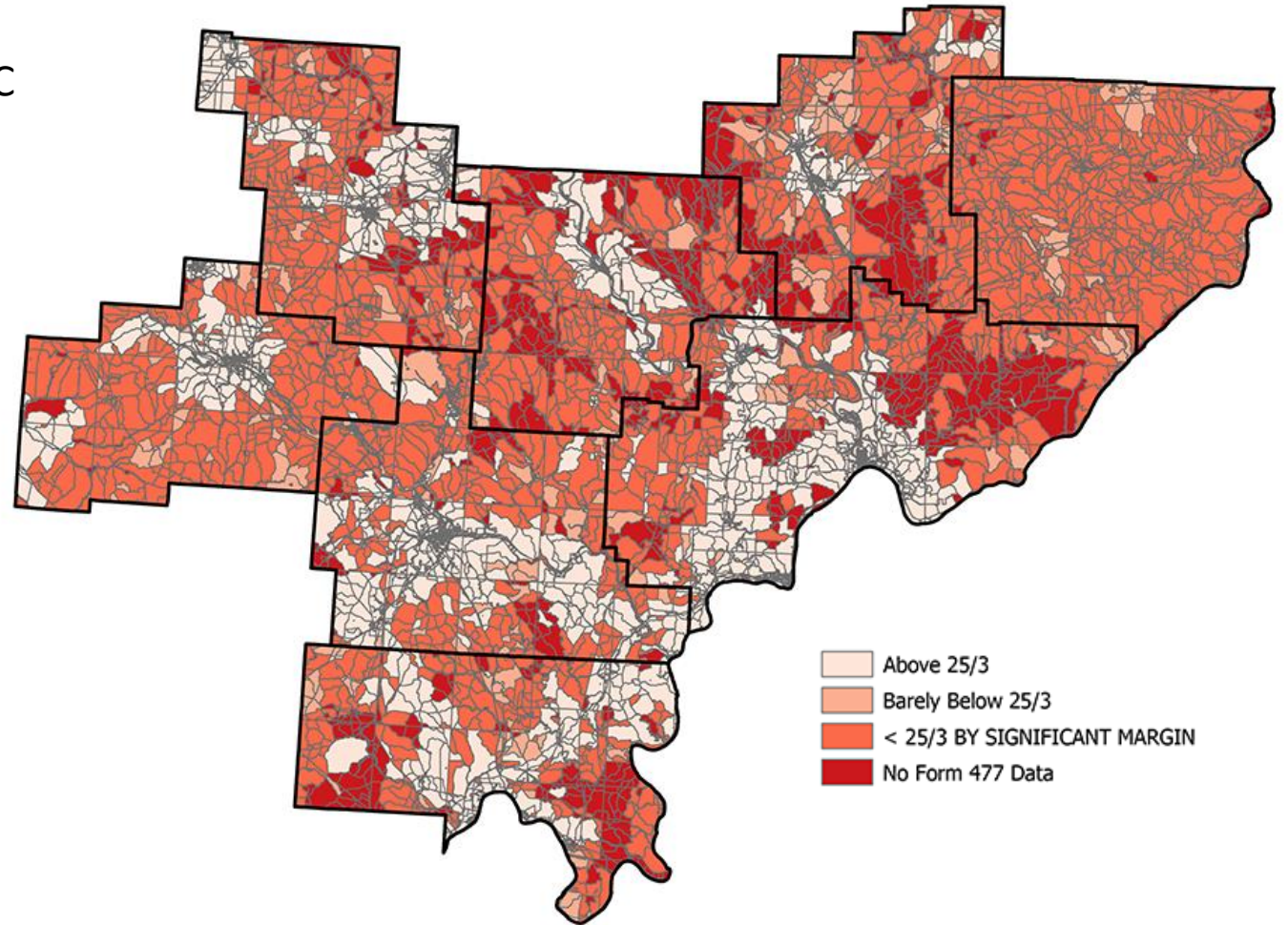
- Even more prevalent today than when published in 2013
- More schools assume home broadband in types of assignments
- Snow-day e-school becoming common
- Huge handicap for job seekers as well
- Precludes remote work opportunities



[Wall Street Journal on Jan 28, 2013](#)

Tremendous Negative Impact

- Combination of FCC Form 477 Data and USAC HUBB Data reveals a stark image of the digital desert
- 75% of the 8-county study area lacking broadband according to current FCC definition of 25/3
- Further, in many areas availability severely limited due to deteriorating copper cables



Digital Desert More Extensive Than Revealed by 477 Data

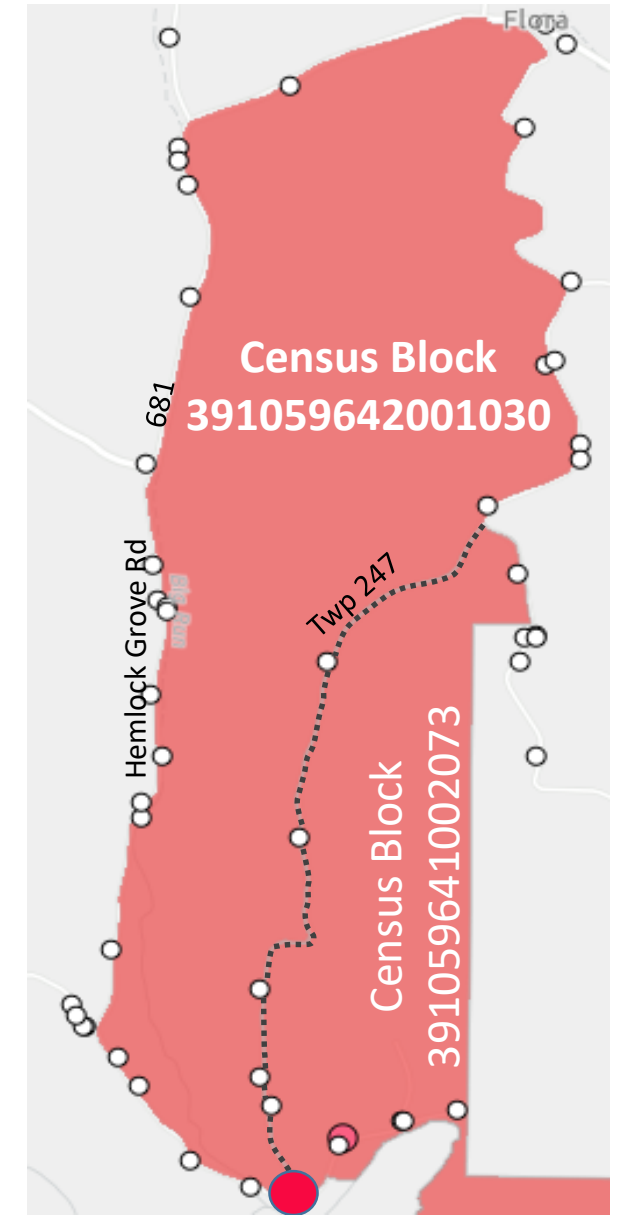
Any 100,000 households in Appalachian rural expanse*			
5,000 to 8,000 square miles			
Source	FCC Form 477	Research-Informed Correction Factor	
Measure	Trusted, not verified	5x	10x
10/1 Broadband Availability	62%	12%	6%
Unserved	38%	88%	94%
Unserved Households	38,000	87,600	93,800

- Research utilized combination of FCC Form 477 and USAC HUBB data
- Helps in understanding the magnitude of the broadband availability problem
- Does **not** identify defensibly unserved areas to escape “carve-outs” meant to prevent over-building and/or double funding of service areas

Warping the Coverage Numbers

- Typical Example
 - Census Block 391059642001030 in Meigs County, Ohio
 - 740 Acres
 - 12 households per square mile
 - 14 Households in block, many others adjacent (white dots)
- Funded under CAF II
 - Frontier deployed broadband to one household (pink dot in far south of block)
 - Letter of the law satisfied, but certainly not the spirit
 - Entire census block mapped as served by FCC
 - Thus blocked from receiving funding from other programs

13:1 Over-Estimation of Coverage



De Facto Abandonment of Copper Cables

- Incumbent telcos petitioning to abandon aged copper cables – **doing it de facto now**
- Allowed to deteriorate in place
- **Insufficient to provide reliable telephone service let alone broadband**
- Staffing so low that restoration takes multiple weeks
- **Poses life/safety risks**, particularly in areas also lacking cell service (much more prevalent than maps indicate)
- Yet accepted hundreds of millions to provide broadband across the same cables

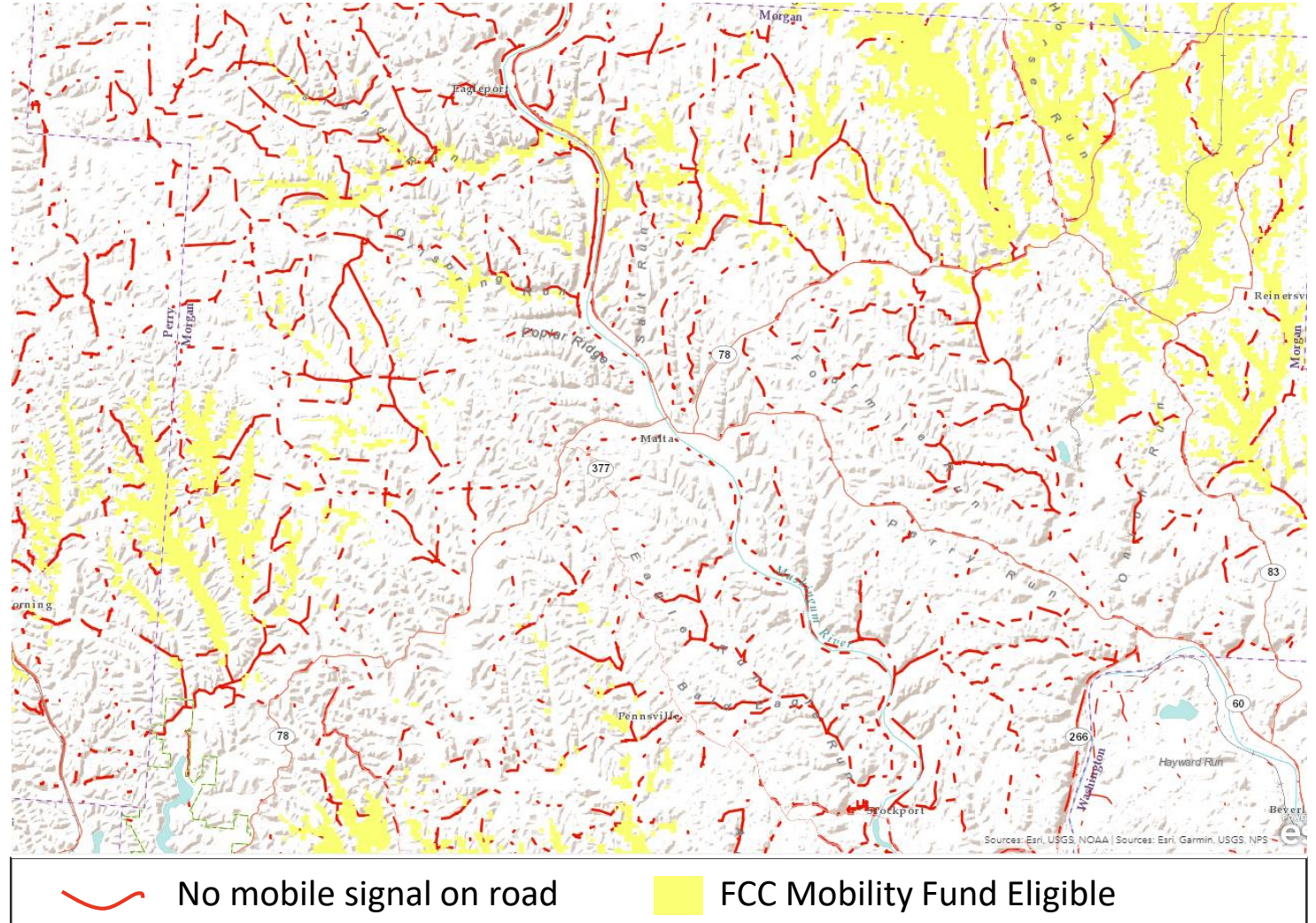


Note: AT&T has invested in fiber-fed towers to deliver fixed wireless in their CAF II areas. While laudable, they will not achieve 100% coverage and thus not reach the threshold for abandoning their copper plant.

Mobile Services Overstated as Well

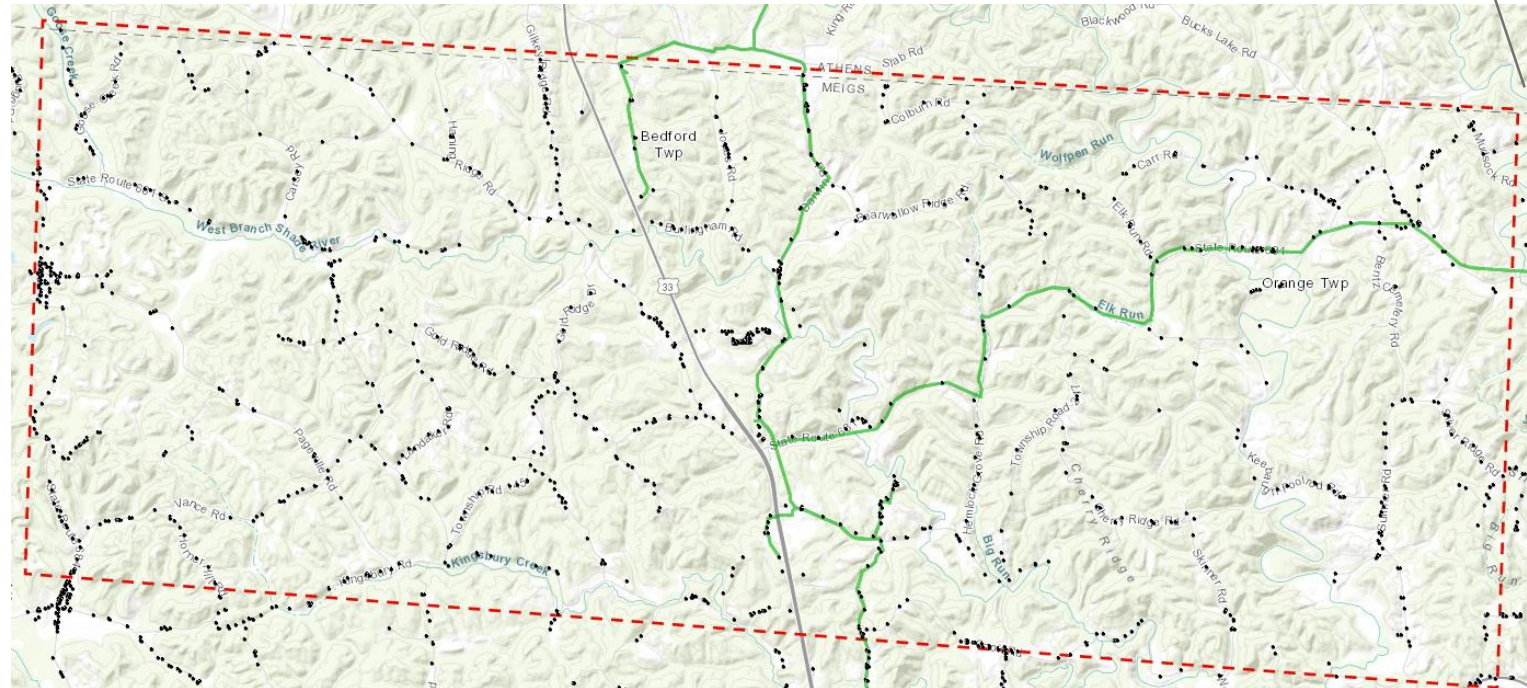
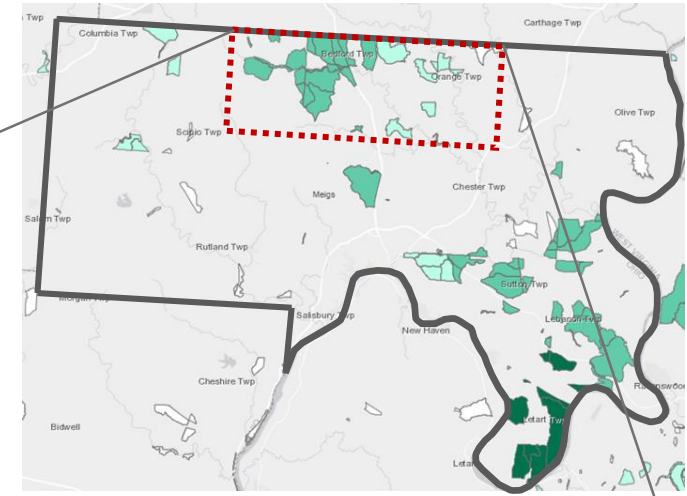
- Mobile services also dramatically overstated in our region
- Further diminishes opportunity for broadband services
- Exacerbates the life/safety issues from de factor copper abandonment
- Red lines shows lack of coverage on roads from:
 - AT&T,
 - Verizon,
 - T-Mobile, or
 - Sprint

Source: Ohio Department of Transportation,
2017 drive study conducted by
ConnectedNation



Engineering Zone A Meigs County

- Our first of multiple engineering zones to assess costs of serving the region
- Terrain typical of broader service area
- Population density below 20 households per square mile
- Contains Auction 903 blocks (teal shaded census blocks)
- Significant foliage cover
- Pre-existing middle mile fiber
- 50 square miles



Fiber-to-the-Premise

Only option for 100% Coverage

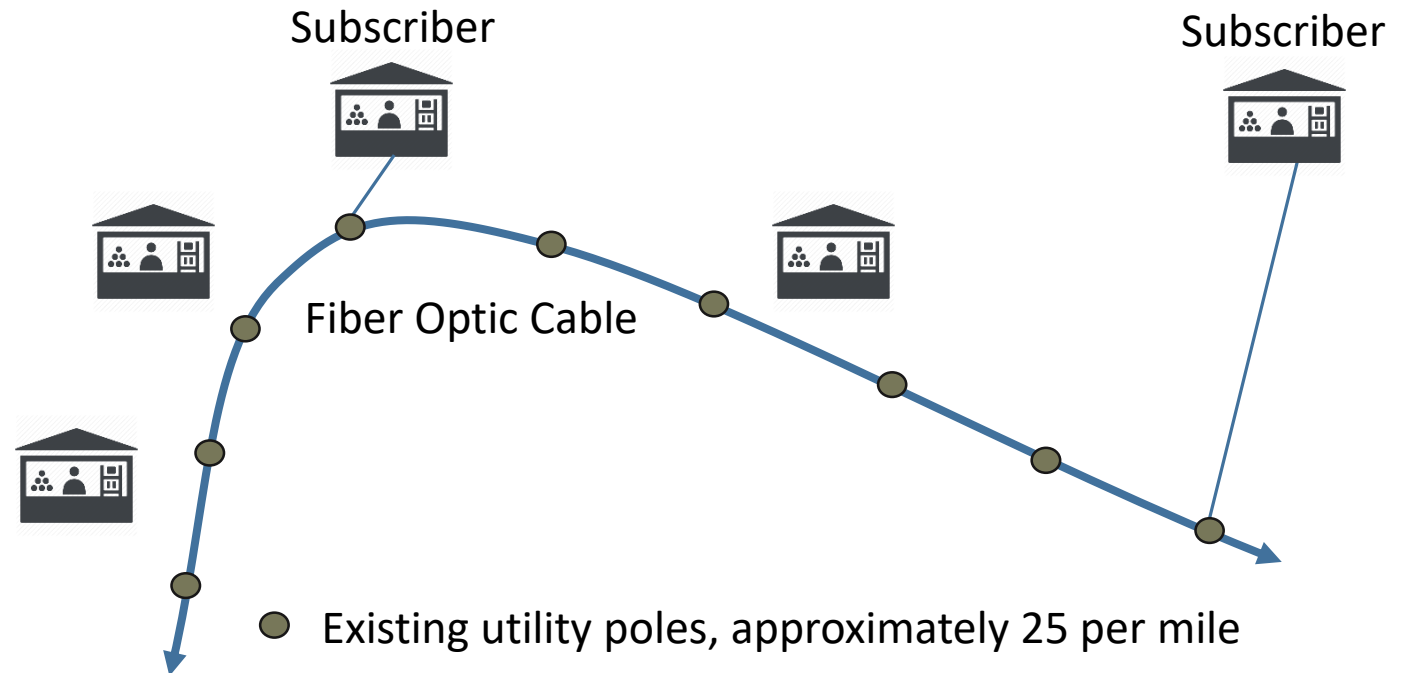
Connect America Cost Model (CAM)

Pass the House
Connect to the Subscribers
Operate and Maintain the Service

Less Projected Revenue

% Market Penetration
\$ of Average Bill

Equals the **Reserve Price** offered in
reverse auction



Our “mini-CAM” cost study utilized the same methodology as the FCC CAM by designing fiber-to-the-premise following road centerlines. We engineered to reach every household identified in the [State of Ohio LBRS data set](#).

Costs and Reserve Requirements in the Rural Expanse

			Monthly	
Cost Element	Per Mile	Per Household	BHRC "Mini-CAM"	FCC CAM from Auction 903 in Region
Base Fiber Infrastructure to Pass	\$30,432	\$3,900	\$33	Calculated based on FCC Connect America Fund Model (CAM)
Base Make-Ready to Pass	\$25,080	\$3,200	\$27	
Base Operations and Maintenance			\$24	
Subscriber Costs – Allocated*		\$731	\$25	
Monthly Costs = Connect America Fund Model			\$109	\$87 to \$116
Average Revenue per Subscriber			\$50	\$75
Market Penetration in First Six Years			x 40%	x 70%
Less Subscriber Revenue Offset			- \$20	- \$53
Reserve Price in RDOF Auction			\$89	\$34 to \$63

FCC CAM may underestimate make-ready costs in Appalachia

In discussions with electric utilities and cooperatives in our region, we do not see a way to avoid this level of make-ready investment, estimated at \$1,000 per pole

* Subscriber costs of \$2,200 plus \$34 per month for the projected 40% take-rate extended across the entire base of eligible premises

Reserve Prices Necessary in Appalachia

Metric	FCC CAM from Auction 903 In-Region	BHRC Mini-CAM
Connect America Cost Model (CAM)	\$87 to \$116	\$109
Reserve with Current Threshold Subtract 70% * \$75 = \$52.50	\$34 to \$63	\$56
Not viable – No responses to Auction 903 in Appalachian Ohio		
Reserve with Proposed Threshold Subtract 40% * \$50 = \$20.00	\$67 - \$96	\$89
Reserve with Proposed Bump* 10% Bump on Top of v.2	\$74 - \$106	

The FCC's possible 10% bump as suggested in the NPRM would elevate the reserve prices in our region to the range needed based on our "Mini-CAM" cost study

Auction 903 Reserve Pricing with Proposed Modifications

Target Areas	CAM	Subscriber Offset	Reserve		
			Auction 903	Modified to 40% at \$50	+ 10% Bump
Meigs County, Ohio (726 households across 238 square miles in 10 census block groups)	\$86.75	\$52.50	\$34.25	\$66.75	\$75.43
Athens, Perry and Hocking Counties, Ohio (214 households across 100 square miles in 4 census block groups)	\$100.95	\$52.50	\$48.45	\$80.95	\$91.05
Brooke and Ohio Counties, West Virginia (219 households across 49 square miles in 4 census block groups)	\$103.30	\$52.50	\$50.80	\$83.30	\$93.63
Marshall and Wetzel Counties, West Virginia (2,249 households across 800 square miles in 26 census block groups)	\$116.26	\$52.50	\$62.76	\$96.26	\$107.89

This data comes from four areas examined for Auction 903, two within our current 8-county Ohio study area and two in adjacent areas across the river in West Virginia

Limited ARPU

*“Cable One said its average revenue per user was up 5.5% to \$70.80 in the first quarter, giving it the **highest ARPU on residential broadband among publicly traded U.S. cable companies....**”*

“Operator continues to marginalize video and move base to standalone broadband.”

[Multichannel News May 2019](#)

- Our region is **not** going to out-spend the Cable One subscribers
- No legacy video to inflate average spend
- Broadband-only will be the most common subscription
- Charter-Spectrum offers 100/5 in surrounding towns for \$45/month
- Proposed ARPU = \$50 per month



Camper as a permanent dwelling on Markham Road in Meigs County, Ohio, a common reality in the region

Limited Penetration and Low ARPU

- Families in substandard housing unlikely to pay for broadband
- Families with low household income unable to pay for broadband
- Areas in which broadband has NEVER been available will be slow to subscribe until benefits become clear
- Low capacity competition that meet the “Netflix adequacy threshold” may be retained for a period of time

Appalachian Ohio*:

11 poorest counties in Ohio
17% - 30% household poverty
34% to 60% near poverty

*Economic conditions even
worse in the “rural expanse”*

* Sources: The Ohio Poverty Report, Ohio Development Services Agency, February 2019,
and [US Census Quick Facts](#)



Limited Penetration

Pew Internet Research* further supports lower penetration assumptions in low income households

Household Income	Less than \$30,000	\$75,000+
Internet Use	82%	98%
Home Broadband Subscription	56%	92%
Smartphone-Dependent Internet	26%	5%

Program Year	Proposed Market Penetration	
	Incremental	Cumulative
Year 3	16%	
Year 4	8%	24%
Year 5	8%	32%
Year 6	8%	40%

* [Pew Internet Fact Sheet, Internet-Broadband](#), and [Pew Research Fact Tank, Digital Divide Persists....](#)

Huge Portion of the Area Unserved or Underserved

			Of the Rural Expanse				
	Total Area	Rural Expanse	No 477 Data	Well Below 25/3	Barely Below 25/3	Above 25/3, HUBB 10/1 Only	RDOF Phase 1 Eligible
8-County Study Area	3,701	2,779	1,054	978	509	183	2,724
			38%	35%	18%	7%	98%
Of Total Area		75%					

One can understand the potential impact of RDOF on our region when considering:

- 75% of our 8-county study area is in the “rural expanse”
- 98% of that area will be in RDOF Phase 1 if the NPRM inclusion parameters survive into the Order

Crucial to Hit the Target

Crucial proposed modifications to deliver the needed higher reserve prices in Appalachia

- 1. Strongly favor gigabit speeds in auction weighting**
to incentivize long-term investments, e.g. fiber-to-the-premise
- 2. Lower market penetration assumption to 40%**
from the current FCC assumption of 70%
- 3. Lower the average revenue per household to \$50**
from the current FCC assumption of \$75



Our Region's Only Hope

- Appalachian Ohioans clearly face a digital desert
- The CAF II allocations were unfortunately ineffective
- Strong support from the region reinforces our message
- If our proposed modifications result in over-pricing of the reserve, will be rectified during the reverse auction
- If not a wholesale change across Appalachia, then consider conducting an experiment in our study area
- **Our region desperately needs to advance the broadband agenda**
- **RDOF likely the only opportunity during the 2020's**