



Broadband Deployment Update

Overview of latest developments

2023

- What is the Fabric
- The National Broadband Map
- The Unserved
- Economics of Broadband
- Government Intervention
- Market/Value Impacts

WHAT'S ON THE NATIONAL BROADBAND MAP?

The National Broadband Map consists of 2 datasets, both of which can be challenged:

FABRIC LOCATIONS

- **What is it?**
 - The Fabric is a dataset of all locations in the United States and Territories where fixed broadband internet access service is or could be installed.
- **Who creates it?**
 - The Fabric is developed by CostQuest in consultation with the FCC and in accordance with FCC rules.
- **Challenges and updates timeline?**
 - The Fabric is updated twice per year.
 - For the best opportunity for challenges to be included in version 3 of the Fabric, challenges should be submitted by March 15, 2023.
- **What's on the current map?**
 - Version 1 of the Fabric is the base of the current public map. Version 2 of the Fabric is available to license holders to submit challenges, and for ISPs to submit their updated availability data.

BROADBAND AVAILABILITY

- **What is it?**
 - Broadband availability data shows what broadband services, if any, are available at locations included in the Fabric, as reported by internet service providers every 6 months.
- **Who creates it?**
 - Internet service providers report their availability data to the FCC every 6 months.
- **Challenges and updates timeline?**
 - Broadband availability data is updated consistently over time as challenges are resolved.
 - Challenges are accepted and resolved on a rolling and ongoing basis.
- **What's on the current map?**
 - The map shows availability data as-of June 30th, 2022. The map is also updated biweekly to reflect challenges that have been resolved.



BroadbandMap.gov

Rev. 3/1/2023

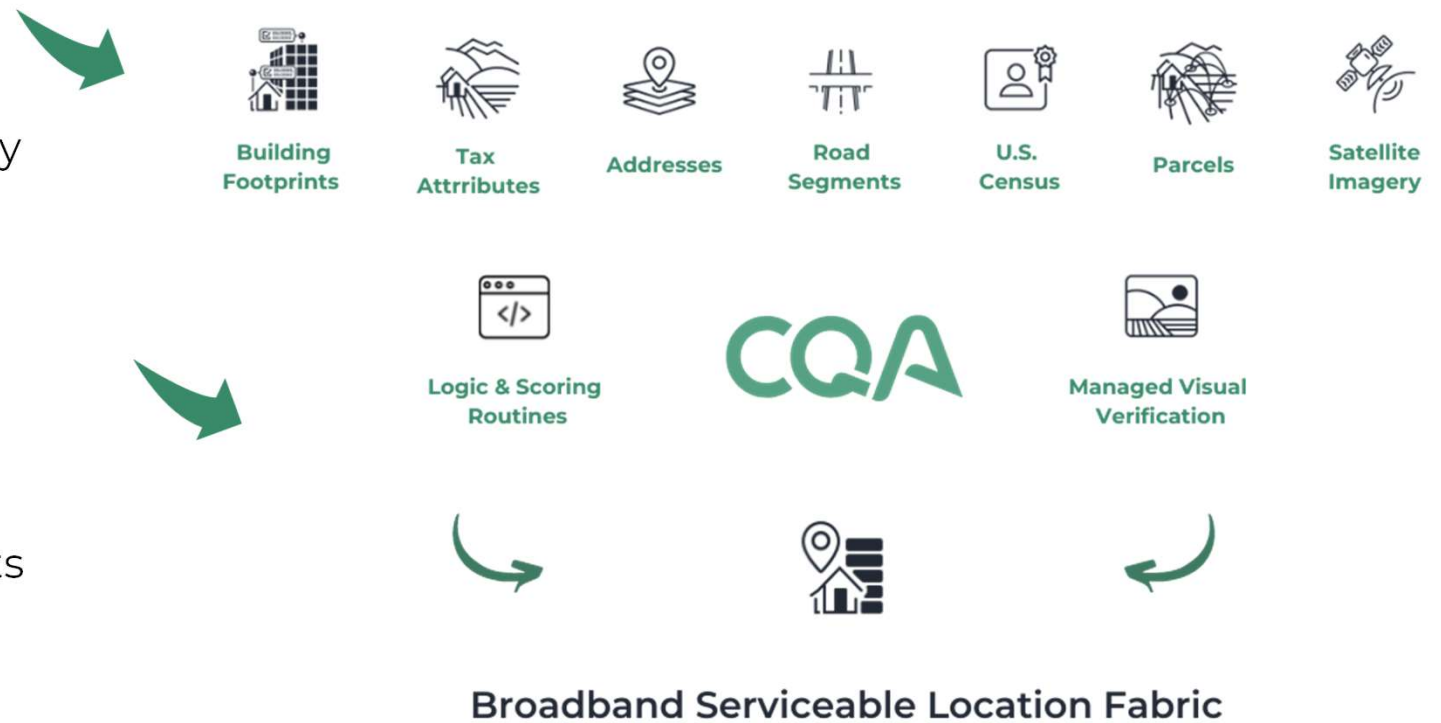
What is the FCC Broadband Serviceable Location Fabric?

- **The FCC Broadband Serviceable Location Fabric (FCC Fabric) is a geospatial data set of all locations (or structures) in the U.S. where fixed broadband internet access service is or could be installed**
- These locations are defined by latitude and longitude coordinates and make up the location points that appear on the **National Broadband Map**, called "**Broadband Serviceable Locations**," as defined by the FCC
- ISP Fixed Service availability data submitted into the Broadband Data Collection (BDC) is overlaid on top of the Broadband Serviceable Location Fabric points
 - As we discussed earlier, CostQuest does not work on the availability side – we are only the data provider
- BSLs are NOT units or addresses - they are structures needing services
 - For example, a multi-dwelling unit such as an apartment building may have multiple addresses, however, the building structure is the BSL and will have the main address for that location
 - The BSL will capture the units in the structure as a separate field
 - **The BSL does include addresses**



Data Sources

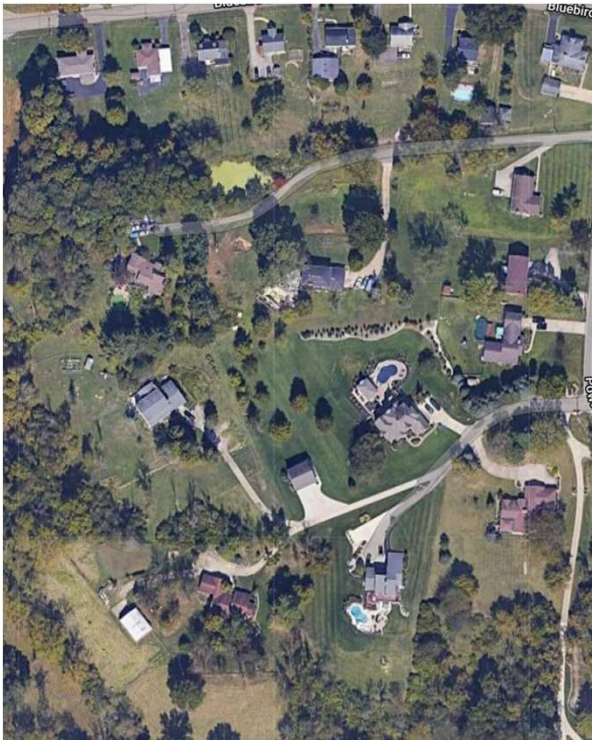
- Parcels
- Satellite Imagery
- Commercial building footprints
- Tax Attributes
- Address datasets
- Roads



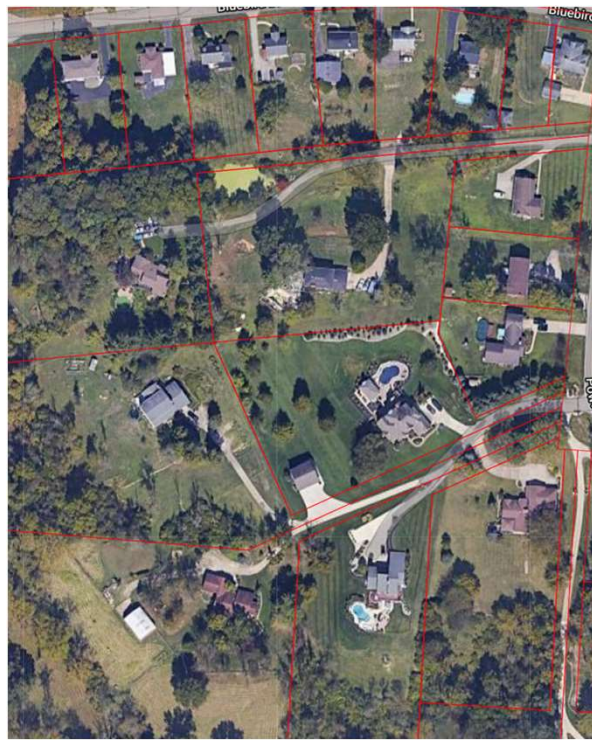
Data and Steps to Identify BSLs

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Objective: Locate BSLs



Process: Pull in Parcels



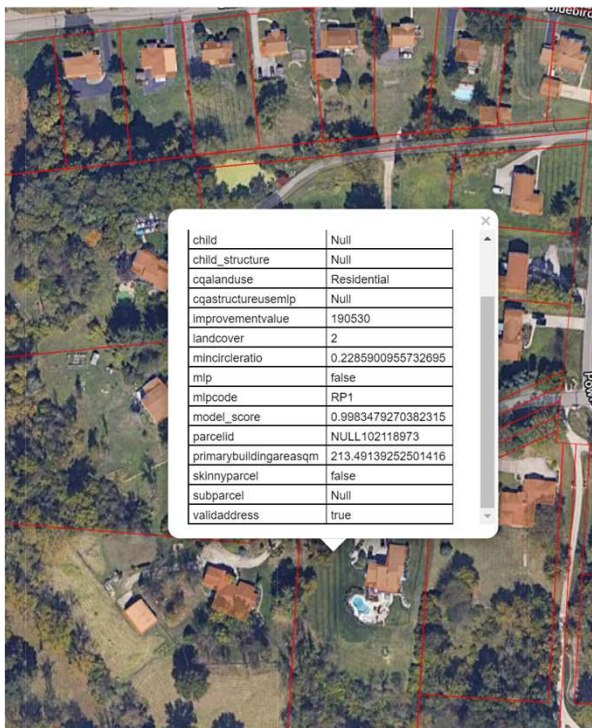
Process: Pull in footprints



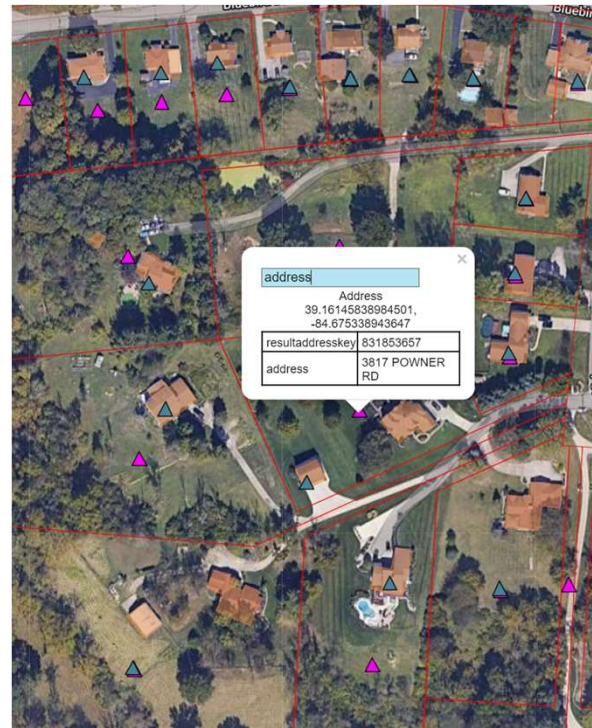
Data and Steps to Identify BSLs

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Process: Link tax assessor data



Process: Link addresses



Process: Identify BSLs



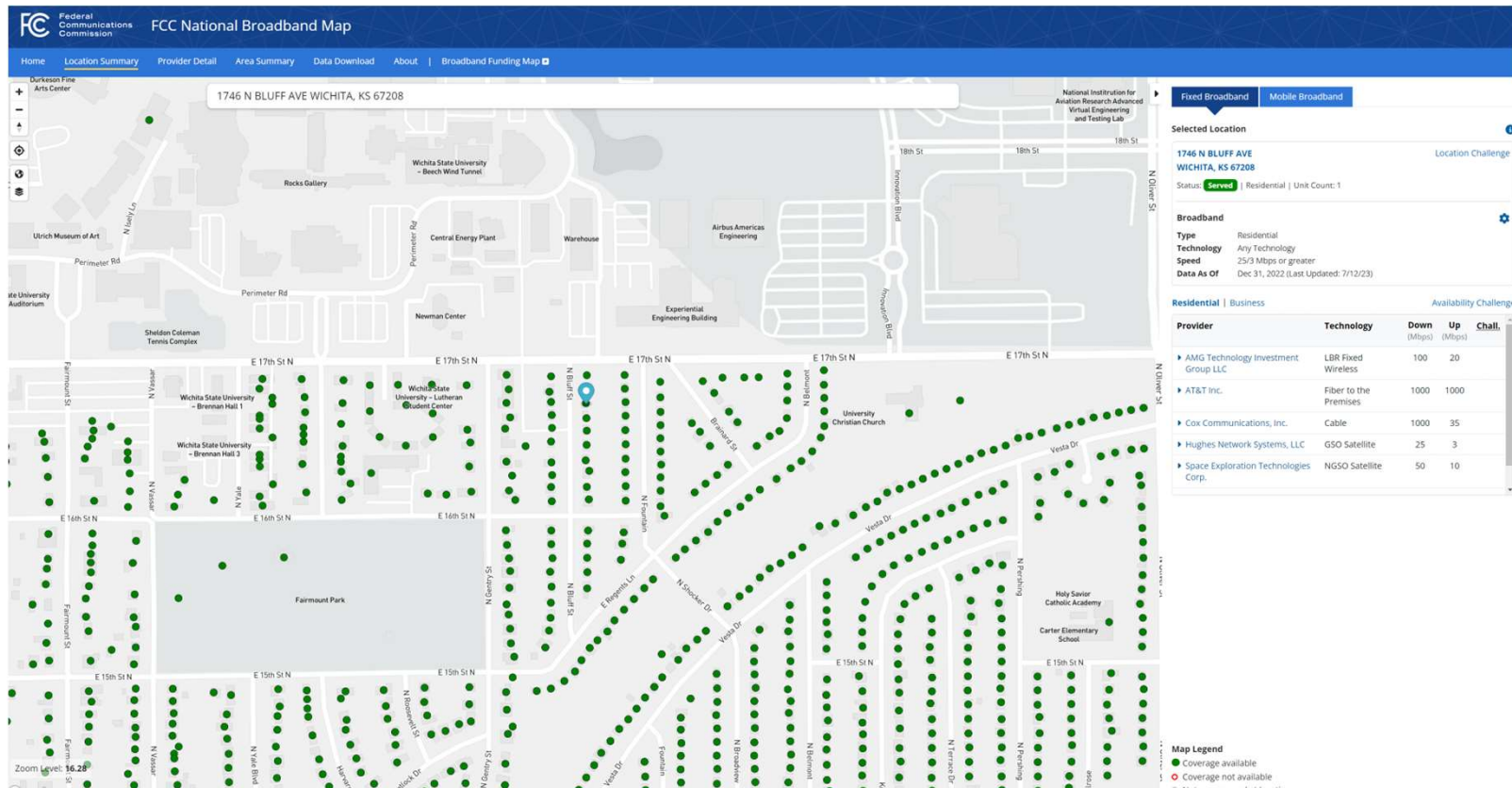


BUILT ON DATA

The National Broadband Map

The National Broadband Map

Address level data



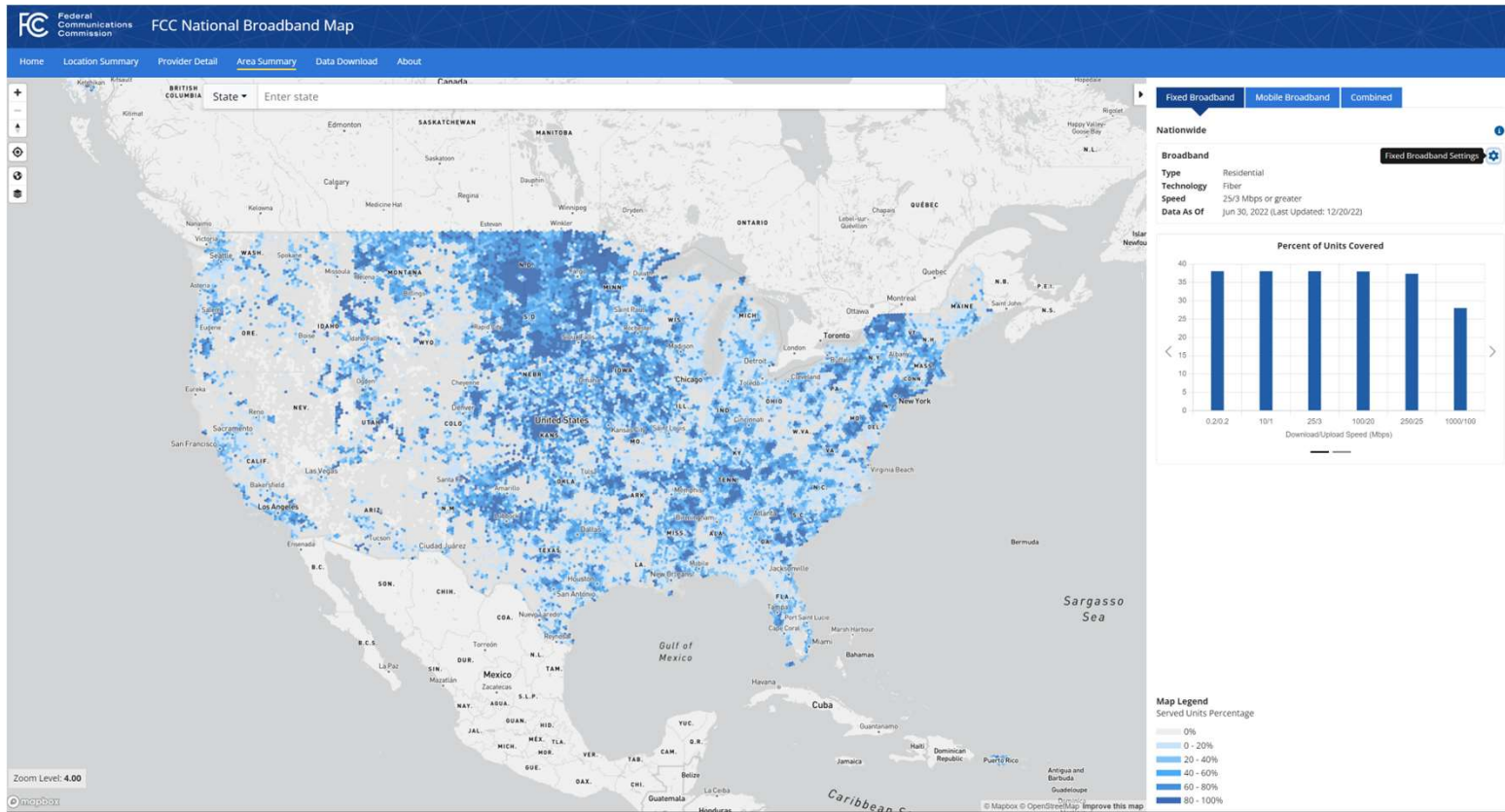
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The National Broadband Map

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All Carriers: Fiber Coverage



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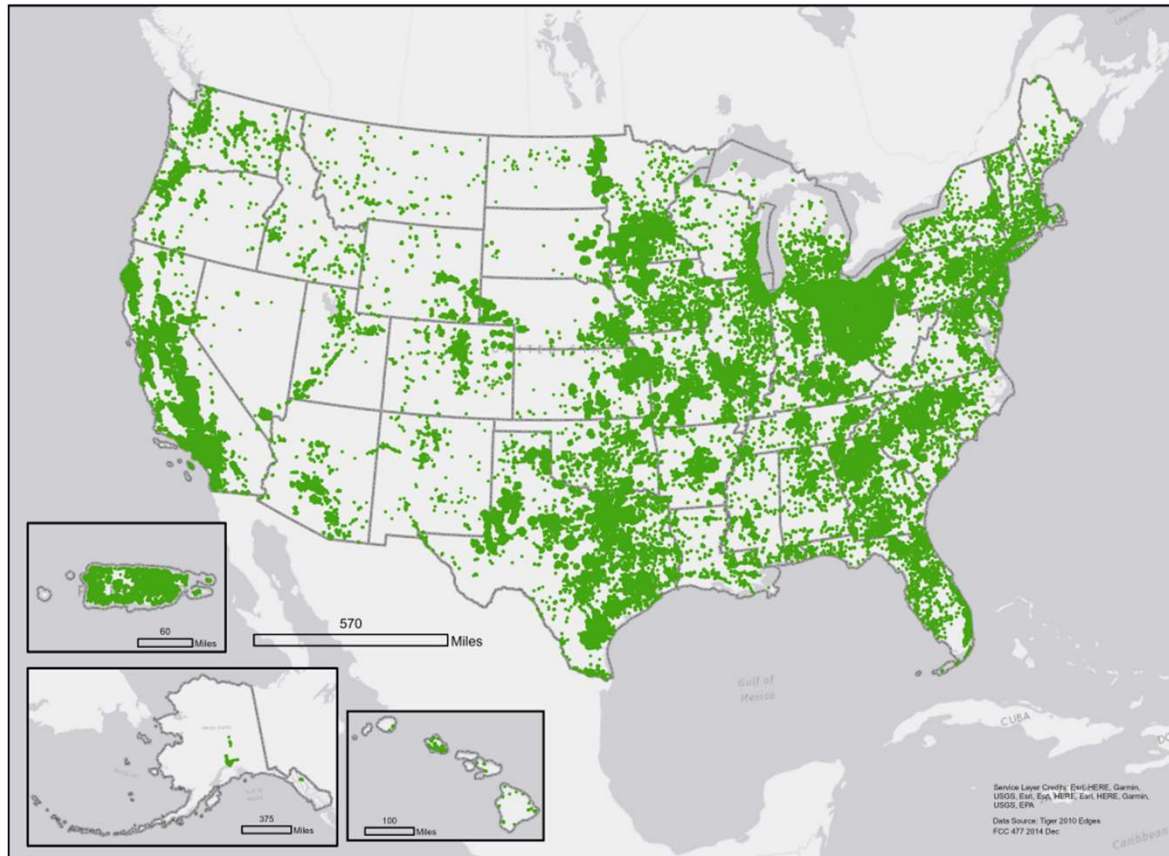


Map Of Locations – not served by fiber and cable

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Served, non fiber and cable

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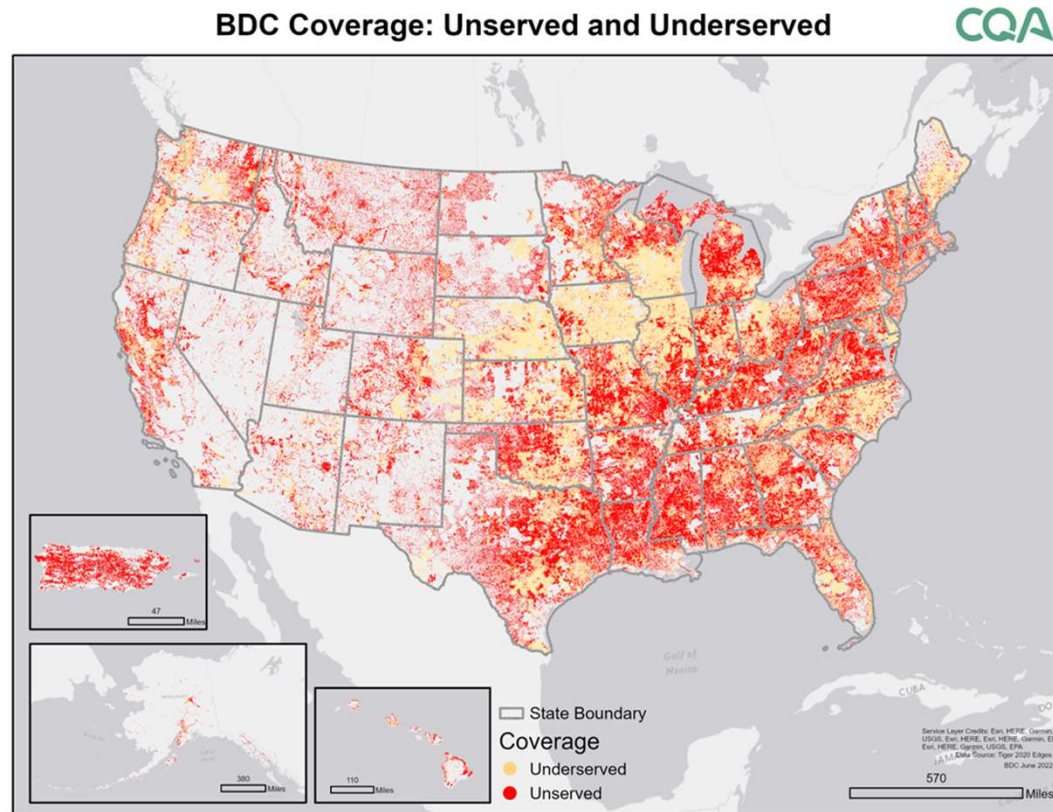


The Unserved

BUILT ON DATA

Map of the Un and Under Served Locations – Full Country

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The National Broadband Map

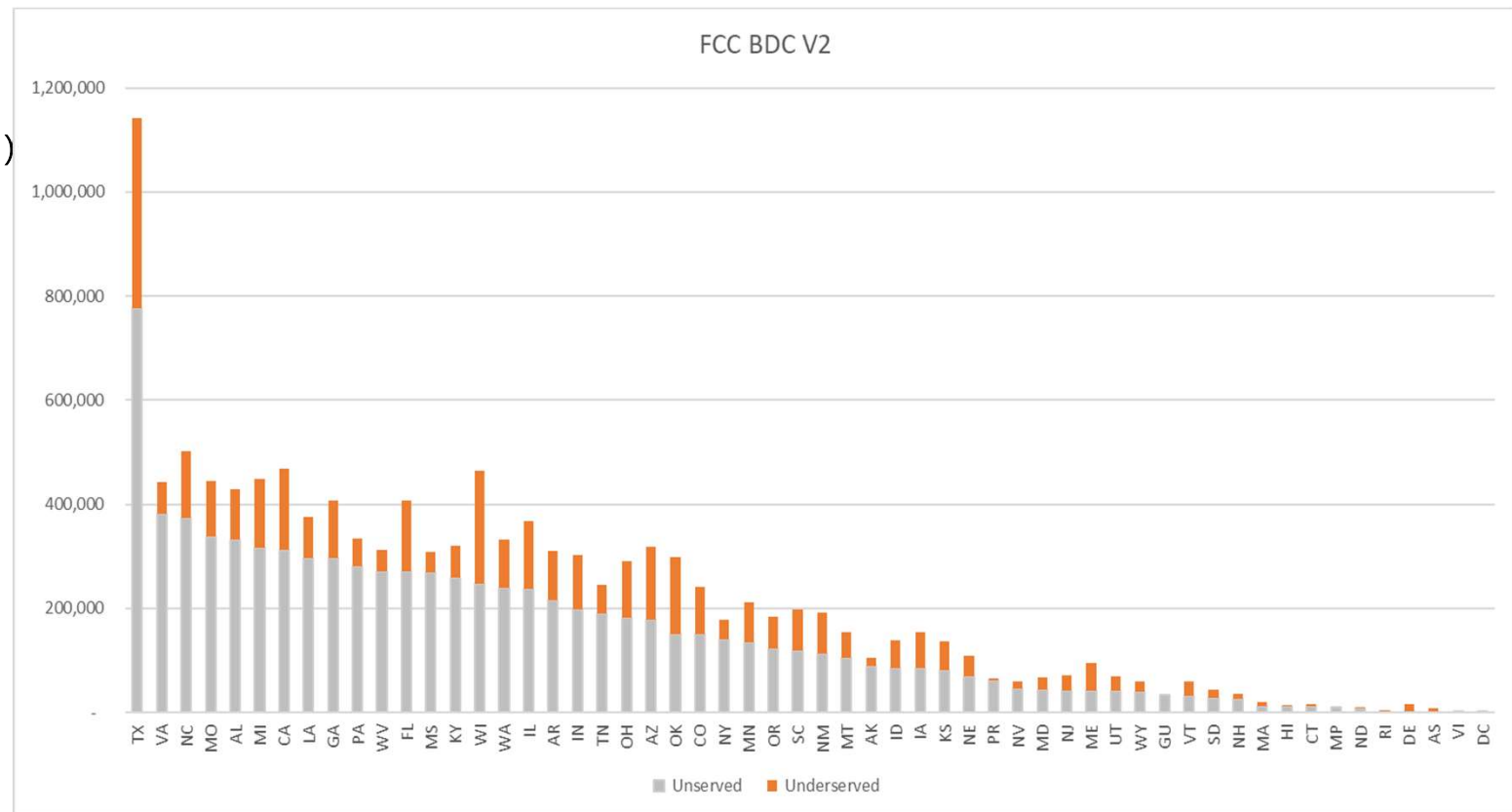
The FCC map Identifies

- Served (>100/20)
- Underserved (>25/3)
- Unserved

BEAD adds further definition to the above:

- Latency <100ms
- Excludes Satellite
- Excludes unlicensed Fixed wireless

This is the most recent BEAD results





Economics of Broadband

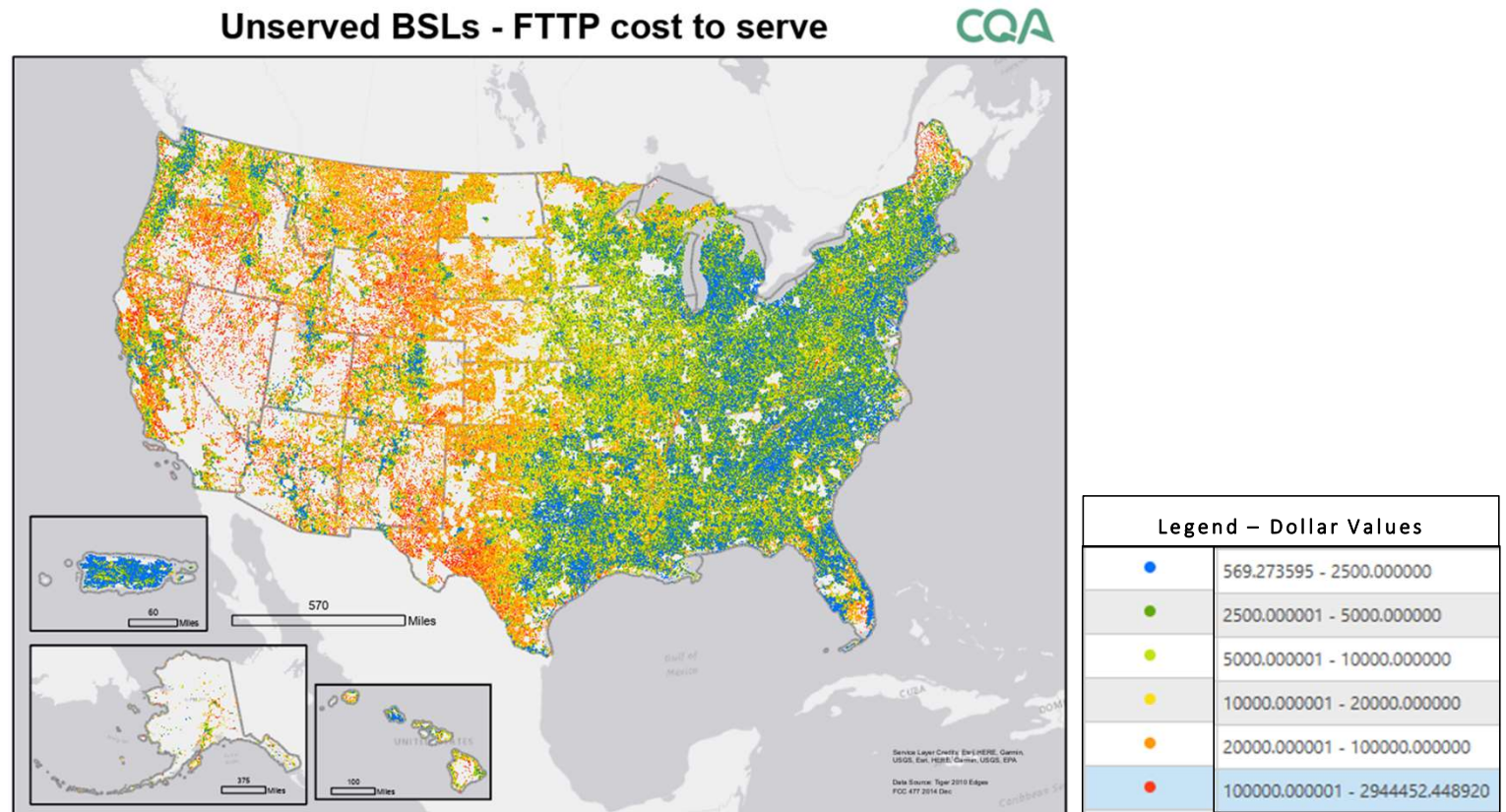
BUILT ON DATA

Fiber Cost to Unserved Locations – Full Country

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As expected, most unserved locations face economic hurdles

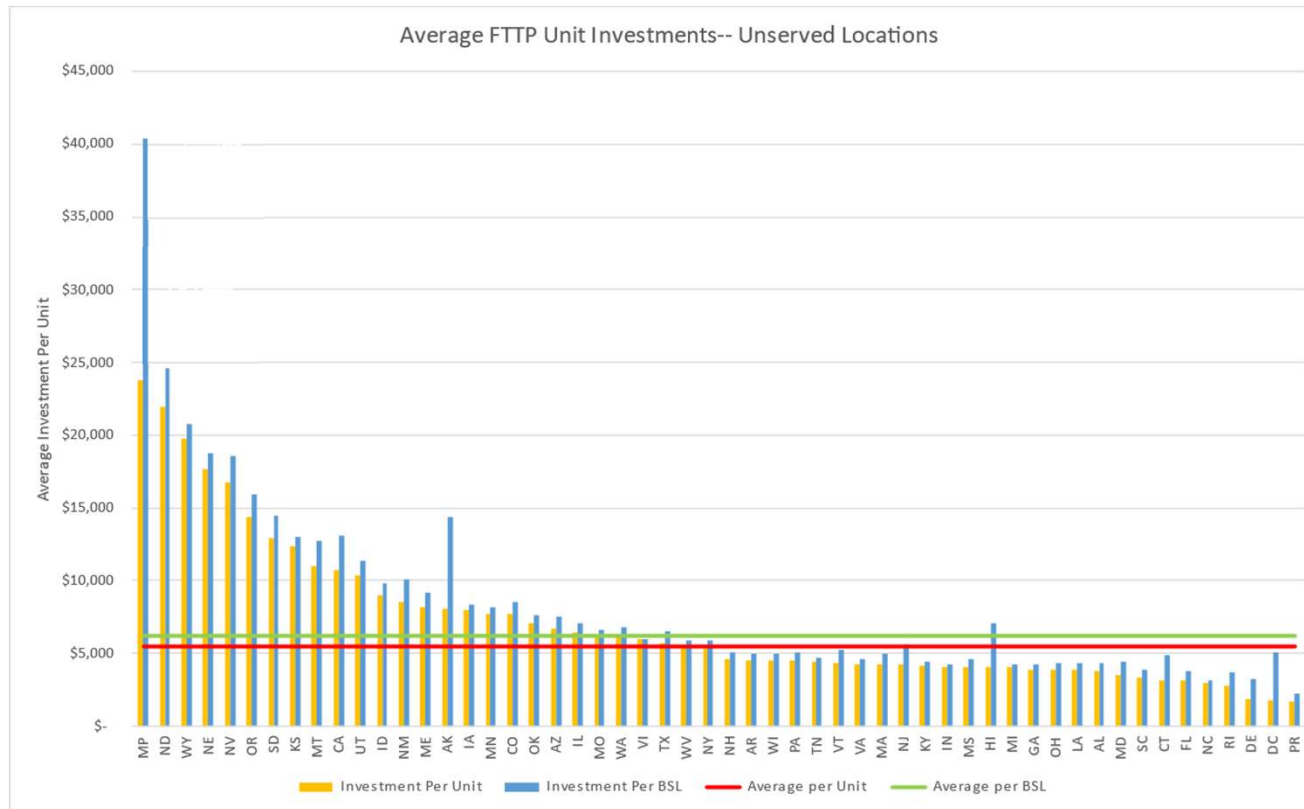
However, there are edge locations that may be more attractive



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Average Fiber Cost for Unserved Locations



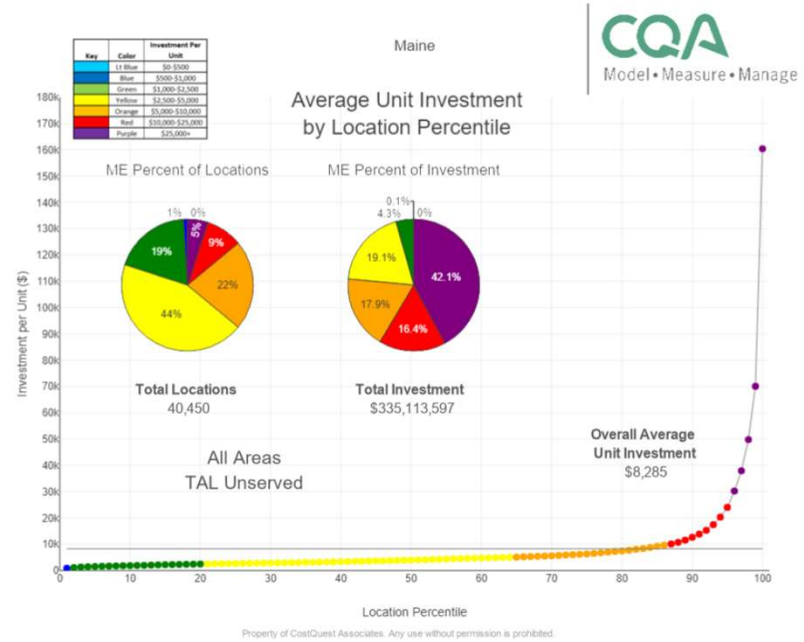
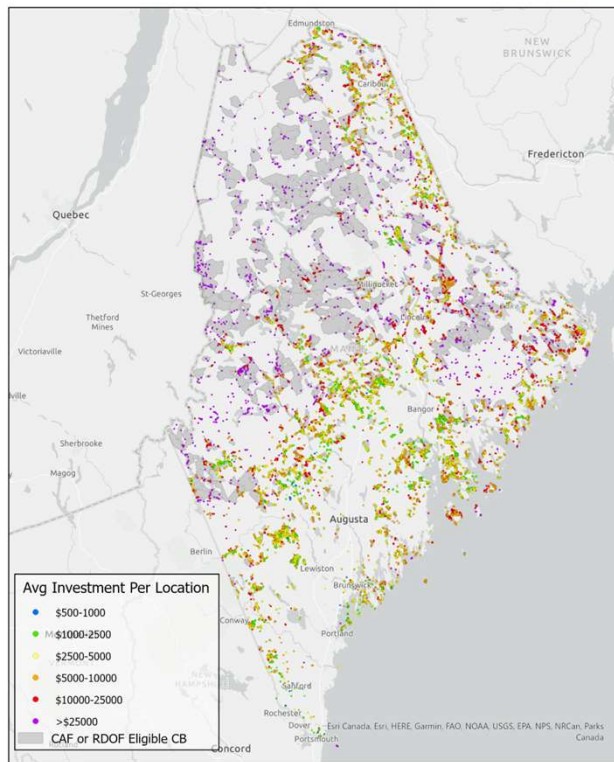
Broadband Serviceable Location (BSL) – Location defined by FCC where fixed broadband internet service is or could be installed.

Unit – serviceable units at a BSL (e.g., a duplex is one BSL, but two units).

Investment – Labor and capital needed to deploy a forward looking, efficiently designed FTTP network. The network includes all equipment, cabling, and supporting structures sized sufficiently to serve all locations with FTTP GPON service.

The Economics of Broadband

Avg Investment Per Location - Unserved 477



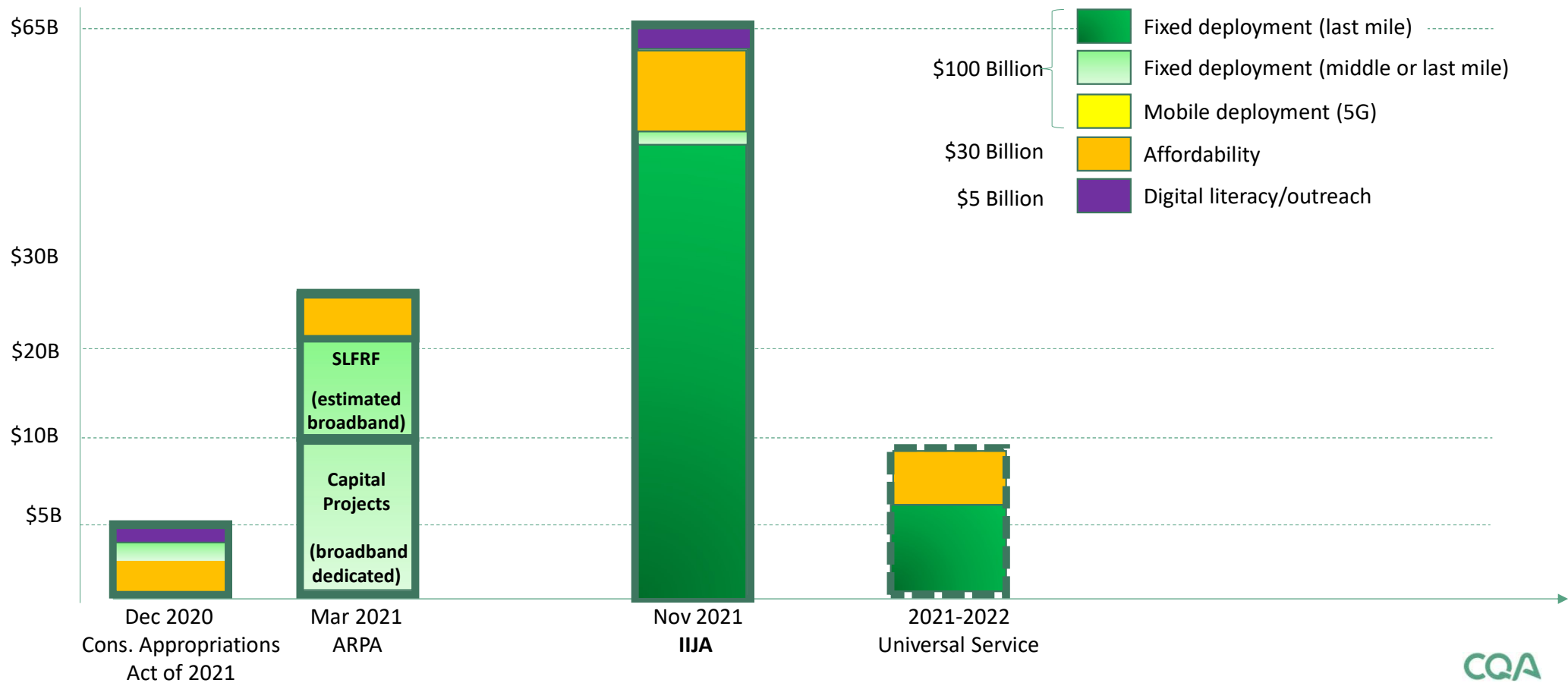
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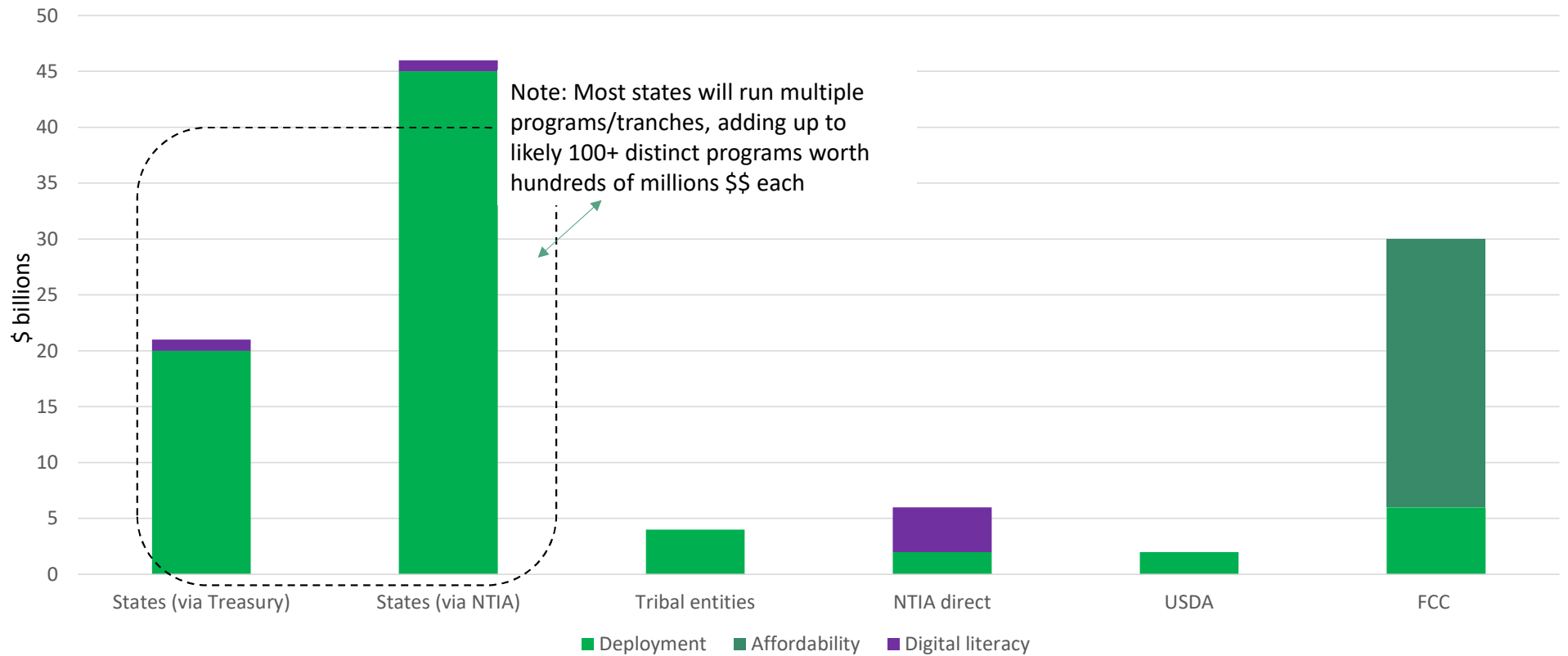


Government Intervention

\$+100 Billion in New Federal Funding for Broadband since late 2020 (by authorization source and date)



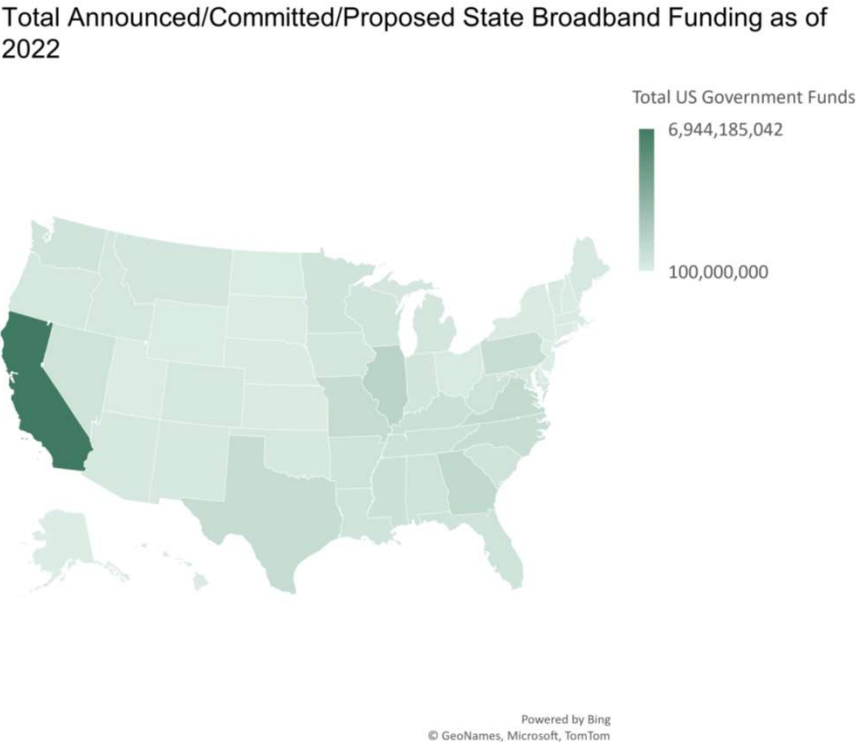
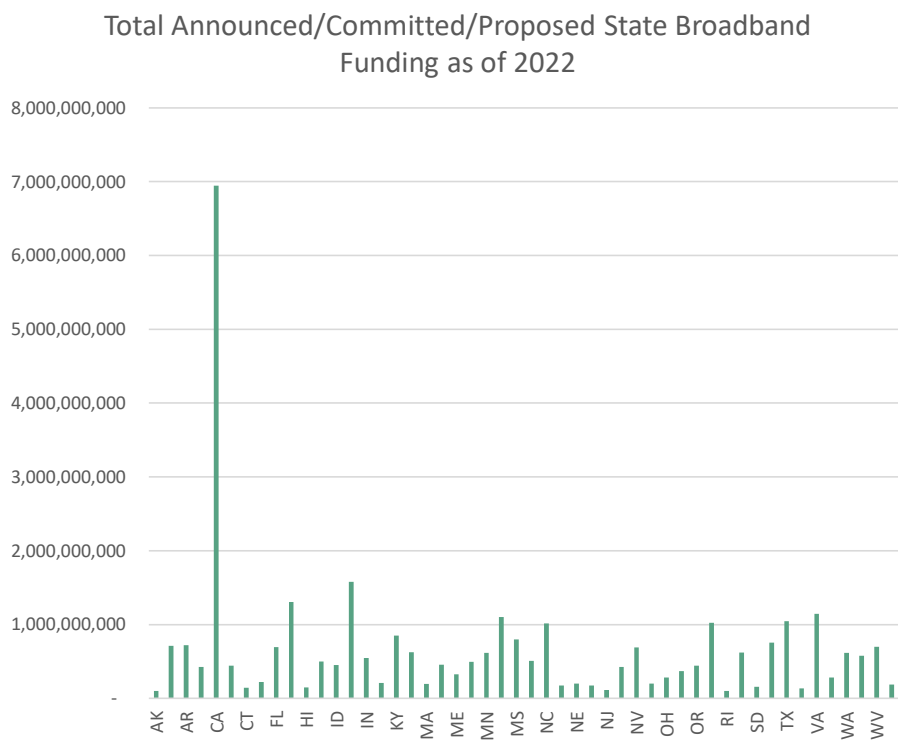
Funding Responsibility by Government Entity



Deployment Funding Timeline

Program	Amount	Timing	Agency	Method	Notes
Broadband Infrastructure Program (BIP)	\$300m	Closed	NTIA	Grant	Requires public sector partner; middle mile eligible
Tribal Broadband Grants	\$1 billion	Now	NTIA	Grant	Requires tribal partner
State ARPA grants round 1 (SLFRF)	~\$10-20 billion	2021-22	20-30 states, via Treasury	Grant	\$+5 billion in CA alone. Very flexible rules
State ARPA grants round 2 (CCPF)	10 billion	2022	50 states, via Treasury	Grant	Highly discretionary to states. Highly flexible rules and project selection.
Middle mile grants (IIJA)	\$1 billion	2022	NTIA	Grant	Pref. for electric utilities
Tribal Connectivity Fund	\$2 billion	2022	NTIA	Grant	Phase 2 extension
ReConnect	\$3 billion	2022-23	USDA	Grant	Phase 3 extension
Infrastructure Investment and Jobs Act	\$42.5 billion	2023-2028	56 entities, via NTIA	Grant	Complex statutory framework to be interpreted by NTIA first
RDOF Phase II	\$16 billion	???	FCC	Reverse auction	May be repurposed?
5G Fund	\$9 billion	???	FCC	Reverse auction	Rural mobile service
	~125 billion	2021-2028			

State Efforts before BEAD



IIJA (2021) – Broadband \$65B

- BEAD
 - Funds: \$42.45B, of which \$41.6B allocated to states based
 - Allocated to States: \$100M each*, 90% on Unserved locations, 10% on High-Cost locations
 - Target: Buildout of Minimum 100/20Mbps – Unserved then Underserved then CAIs then DE
 - Priority: Fiber, under the state's Extremely High Cost Threshold
 - Service Pricing: Low cost plan, middle class plan
 - Agency: NTIA oversees, States run programs
 - Likely Timeframe for rollout: late 2023, early 2024
 - Build Timeframe: 4 years for build from receipt of funds
- Affordable Connectivity Program (ACP)
 - Funds: \$14.2B
 - Target: Service Subsidy
 - Priority: Eligible Consumers (e.g., Poverty areas)
 - Agency: FCC
 - Pricing: \$30/month Subsidy
 - Notes:
 - Replaces EBB
 - Jan signups of 15.8 million
 - Push afoot for additional funds to extend the program
- Other
 - NTIA Digital Equity Program: \$2.75B
 - NTIA Tribal Broadband Connectivity: \$2B
 - RUS Distance learning, Telemedicine: \$2B
 - NTIA Middle Mile: \$1B

BDC

Version 1

- Fabric release on 7/1/2022
- Fabric challenges due by 11/15/2022
- ISP Submissions of coverage by 9/1/2022
- BDC release 11/2022
- Coverage challenges due by 1/15/2023

Version 2

- Fabric release on 1/3/2023
- Fabric challenges due by 3/15/2023
- ISP Submissions of coverage by 3/1/2023
- BDC release 05/30/2023
- Coverage challenges due date not announced

Version 3

- Fabric release by 7/1/2023
- Fabric challenges due - not announced yet
- ISP Submissions of coverage by 9/1/2023
- BDC release 11/2023
- Coverage challenges due by 1/15/2023

BEAD

Timing

- NTIA has announced the Initial Allocation of BEAD to States will occur at the end of June 2023
- NTIA will be using V2 Fabric and V2 BDC
- Some states (e.g., LA) may roll out programs 4th Qtr 2023

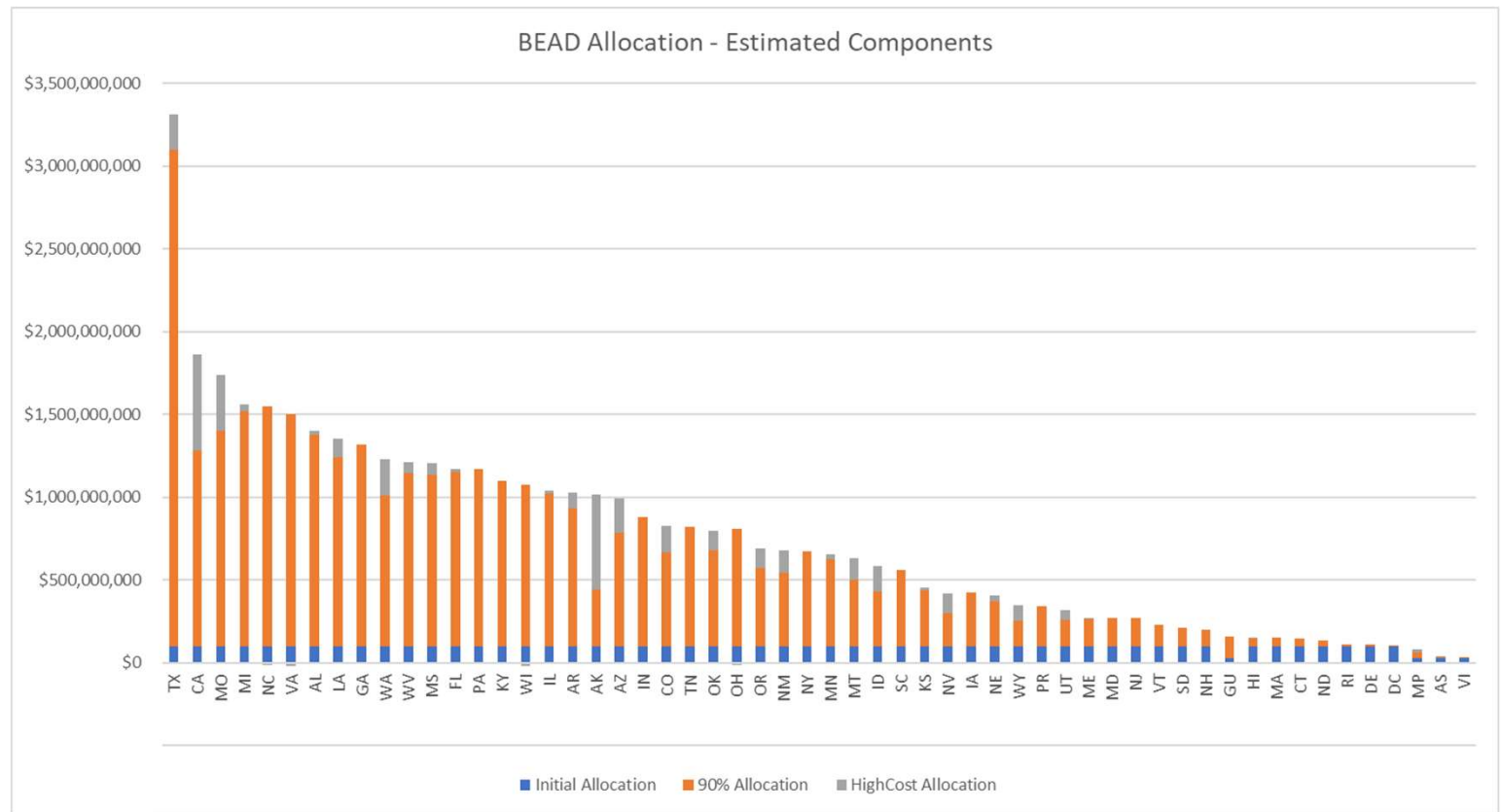
Plans

- Each Eligible Entity (state/DC/Territories) will run its own program
- The Eligible Entities have set up Broadband Offices
- They will implement Grants/Auctions/Competitive grants
 - 56 different programs
- Fiber is preferred technology
 - Eligible Entity will set Extremely High-Cost Threshold, over which alternative technologies can be considered
- States may use the 3rd version of the BDC to identify eligibility for programs
 - Arguments being made to allow states to use their own maps
 - Areas receiving federal funding but not yet built will be excluded (e.g., RDOF, ARPA, ACAM, etc..)

BEAD – Allocation - Estimated Components

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Based on the latest FCC BDC, and the final NTIA allocations, we can estimate the BEAD allocation by component



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Bead Funding versus Need:

- \$41.6B provided
 - ISP match of 25% +, except in High-Cost areas
 - Project areas must have 80%+ unserved
- Previously Federally funded areas are excluded
 - Of 8.5M Unserved, more than 2.7M may be excluded >> 6.75M may be eligible
 - Does not include impact of state programs using ARP and CARE funds
- Of the 6.7M eligible, 3.1 have a negative 20 year NPV of \$42.7B for fiber buildout
- It would seem BEAD is sufficient
 - However BEAD is allocated to states, and there may be states that could have issues achieving 100% fiber for the unserved
 - AK, CA, CO, ID, IL, IA, KS, ME, MN, MT, NE, NV, NM, NY, ND, OK, OR, SD, TX, UT, and WY
 - But...the above does not include the impact of state programs and ARP



Market/Value Impacts

Supply chain and Inflationary pressure

- What is transitory versus the new norm
- Will the government intervention trigger additional issues
 - Beyond government intervention, carriers are deploying more fiber

Consumers should benefit

- As 100Mbps becomes the minimum and 1Gbps becomes the new norm
- ACP and BEAD pricing plans
- Edge out/in introduces new competition
- Digital equity efforts will improve access and adoption

Existing carriers are facing new pressures

- Mobile providers entering the fixed market with high-speed services
- LEO Satellite providers offering high-speed services
- Government funding triggering
 - Edge out, edge in, new builds, abandonment

Conversely, all carriers should benefit

- Broadband impact on economy
- Greater revenue potential (higher uptake)
- Ability to have high-cost areas externally subsidized rather than internally
- Fiber is less expensive to maintain, is somewhat future proof, and has longer lives

Top 10 RDOF Auction Winners by Overall Support

Top Overall Winners			Before Giveback	Giveback Status		
	Above_BaselineLow	GigabitLow	TotalSupport	Default	Default_Giveback	Likely
LTD Broadband LLC		\$132,092,072	\$132,092,072			\$132,092,072
CCO Holdings, LLC		\$122,261,387	\$122,261,387	\$212,045	\$3,913,636	\$118,135,707
Rural Electric Cooperative Consortium		\$110,439,595	\$110,439,595		\$929,835	\$109,509,760
Space Exploration Technologies Corp.	\$88,550,964		\$88,550,964			\$88,550,964
Windstream Services LLC, Debtor-In-Possession	\$629	\$52,288,249	\$52,288,878			\$52,288,878
AMG Technology Investment Group LLC	\$23,575	\$42,899,232	\$42,922,807		\$7,555	\$42,915,252
Frontier Communications Corporation, DIP		\$37,090,083	\$37,090,083			\$37,090,083
Resound Networks, LLC		\$31,068,161	\$31,068,161			\$31,068,161
Connect Everyone LLC		\$26,885,132	\$26,885,132			\$26,885,132
CenturyLink, Inc.		\$26,236,761	\$26,236,761			\$26,236,761
Etheric Communications LLC		\$24,863,496	\$24,863,496			\$24,863,496
Consolidated Communications, Inc.		\$5,887,334	\$5,887,334			\$5,887,334
Frontier Communications Northwest, LLC		\$5,720,265	\$5,720,265			\$5,720,265
Total	\$93,796,346	\$828,528,329	\$923,068,871	\$1,187,122	\$6,666,217	\$915,215,533

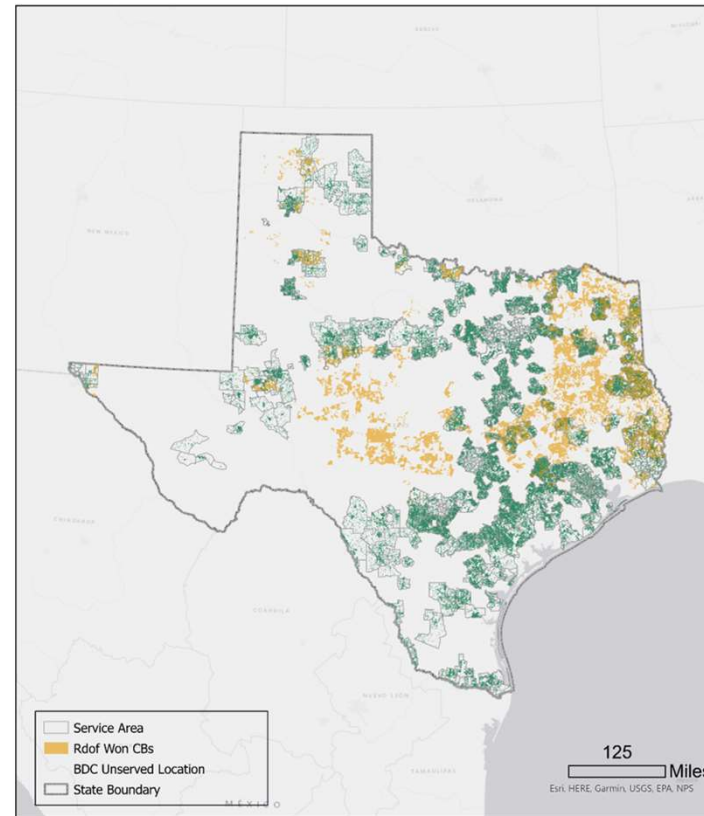
How are property taxes impacted?

Illustrative Impact

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Image depicts the areas of illustrative ILEC that will/have been impacted by government funding

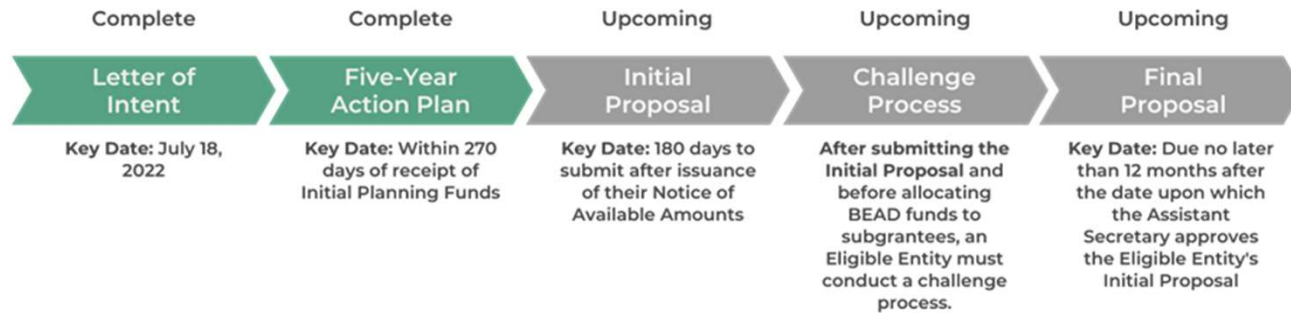
- ↓ Introduces competition
- ↑ Reduces regulatory requirements and build commitments in areas that are uneconomic
- Property Tax reduction?



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BEAD Timeline Overview



The BEAD Initial Proposal is the preliminary version of an Eligible Entity's Final Proposal for grant funding. **Its primary objective is to explain how the Eligible Entity plans to ensure that every resident has access to high-speed, reliable, and affordable broadband connection.** The proposal will detail their utilization of all resources, including the BEAD Program funds and others, to accomplish this goal.

The date that an Eligible Entity's Notice of Available Amounts is released, the NTIA will notify the Entity to submit their Initial Proposal. **Each Entity will have 180 days to submit its Initial Proposal,** but it can be submitted earlier.

1. **Outline of long-term objectives** for deploying broadband, closing the digital divide, addressing access, affordability, equity, and adoption issues. As well, enhancing economic growth and job creation.
2. **Identify and support local, Tribal, and regional broadband planning processes.** As well as describe the coordination efforts with local and Tribal governments to highlight ongoing efforts to deploy broadband and close the digital divide.
3. **Clarify existing federally funded efforts** within the Eligible Entity's jurisdiction to deploy broadband and close the digital divide, including Tribal lands.
4. **Certify coordination efforts with Tribal governments, local community organizations, union organizations, and other groups.** Describe the coordination conducted, ongoing efforts, and plans to fulfill requirements for the Final Proposal.
5. **Identify unserved and underserved locations** using the most recent Broadband Data Maps at the time of submission, this includes Tribal lands.

6. Describe how the Eligible Entity applied the term ‘Community Anchor Institutions’, identified eligible CAls in its jurisdiction and Tribal lands, how their needs were assessed, and specify the type of CAls it intends to serve.
7. Include a detailed plan for carrying out a challenge process as outlined in the notice.
8. Include a plan for competitively awarding subgrants for last-mile broadband deployment projects and other eligible activities. Explain how the Eligible Entity will ensure timely deployment and minimize the BEAD subsidy required. Also, establish an Extremely High Cost Per Location Threshold for subgrantee selection to maximize the use of the best available technology. The NTIA expects this threshold to be set as high as possible to ensure the deployment of end-to-end fiber projects where it is feasible.
9. Explain any preferences for non-deployment-eligible activities using BEAD program funds, including the means of selecting initiatives, addressing the needs of residents, engaging with localities and stakeholders, and considering alternative uses of funds to achieve the BEAD program's equity, access, and deployment goals.

10. Include any proposed initiatives the Eligible Entity intends to implement directly as the recipient without making a subgrant and provide the rationale for this approach.
11. Detail how the Eligible Entity will ensure strong labor standards and protections for subgrantees, contractors, and subcontractors, including compliance with the labor-related subgrantee selection criteria.
12. Describe how the Eligible Entity will ensure the availability of a diverse and highly skilled workforce consistent with the requirements in the notice.
13. Explain the strategy for recruiting, utilizing, and retaining minority businesses, women-owned business enterprises, and labor surplus area firms.
14. Outline steps to reduce costs and obstacles to broadband deployment, promote the use of existing infrastructure, advocate & implement dig-once policies, streamline permitting procedures, and ensure cost-effective access to poles, conduits, easements, and rights of way.

15. Conduct an evaluation of climate threats present within the Eligible Entity and propose mitigation strategies in line with the requirements of this notice.
16. Describe the low-cost plan(s) that subgrantees must offer, in accordance with the outlines of this notice.
17. Describe the intended use of the 20% funding allocation made available upon approval of the Initial Proposal.
18. Disclose whether the Eligible Entity will waive certain laws pertaining to broadband, utility services, or similar subjects because they (1) restrict public sector providers from participating in the subgrant competition or (2) impose specific requirements on public sector entities. Specify any laws that will not be waived and explain how they will apply in the subgrant competition.
19. Certify the Eligible Entity's intent to comply with all applicable program requirements, including reporting obligations and outlining the subgrantee accountability procedures.



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ACAM

BUILT ON DATA

	ACAM BSLs
Served	715,076
Underserved	227,918
Unserved	354,757
Grand Total	1,297,751

On **July 24th**, the FCC adopted an order establishing an enhanced alternative connect America cost model (ACAM) program:

- Requires participating carriers to **deploy voice and 100/20 Mbps** or faster broadband service to 100% of eligible locations in their areas
- Maintains the Commission's long-standing **technology-neutral** approach for deploying services in rural areas of the country
- The program makes **\$13.5 billion** in support available over a ten-year extension of the current A-CAM term
- Utilizes the FCC's **National Broadband Map** and Broadband Data Collection to determine locations to which participating carriers are obligated to deploy
- **Aligns** deployment milestones with the Broadband Equity, Access, and Deployment (**BEAD**) Program, requiring participating carriers to deploy to all locations within four years
- **Complements existing federal, state, and local funding programs**, including the BEAD Program, allowing carriers that elect to participate in the Enhanced A-CAM program the opportunity to establish an enforceable commitment to locations they serve
- Requires participating carriers to participate in the **Affordable Connectivity Program**
- Creates an opportunity for legacy rate-of-return carriers to bring 100/20 Mbps to their customers in exchange for a period of fixed support, followed by a transition to the Enhanced A-CAM model.

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