Government Funding Influences

January 2022

Discussion Topics

- Government Broadband Funding Program, a deeper dive
  - Pushing the expansion of Fiber for broadband
  - Focus first on Middle Mile then Last Mile
  - Is the impact of stimulus temporary vs. long-term?
  - Supply and Demand side programs
  - Technology Standards pushing 100/20 service (may push 100/100Mbps symmetrical service)
- Changing Competitive Landscape – New Entrants
    - State Government
    - Local Government
    - Utilities
    - Satellite
    - Wireless

Government Funding

Money-Money Everywhere

- USF (High Cost, Schools/Libraries, Low Income)
- BIP/BTOP (Rural High Cost)
- CAF (High Cost)
  - CAM and ACAM
- RUS Loans/Grants (Rural unserved)
- Mobility Fund Auction 1 (Rural unserved)
- NY Auction (Unserved)
- RUS ReConnect (Rural unserved)
- Opportunity Zones (low income)
- Emergency Broadband Benefit (low income)
- CAFII (high cost)
- RDOF 1 (high cost unserved)
- CARES (unserved)
- ARP (unserved)
- Infrastructure Bill (unserved, low income, tribal)
- RDOF 2 (high cost unserved)
- 5G Fund (unserved)

Federal Funding – Once in a generation opportunity

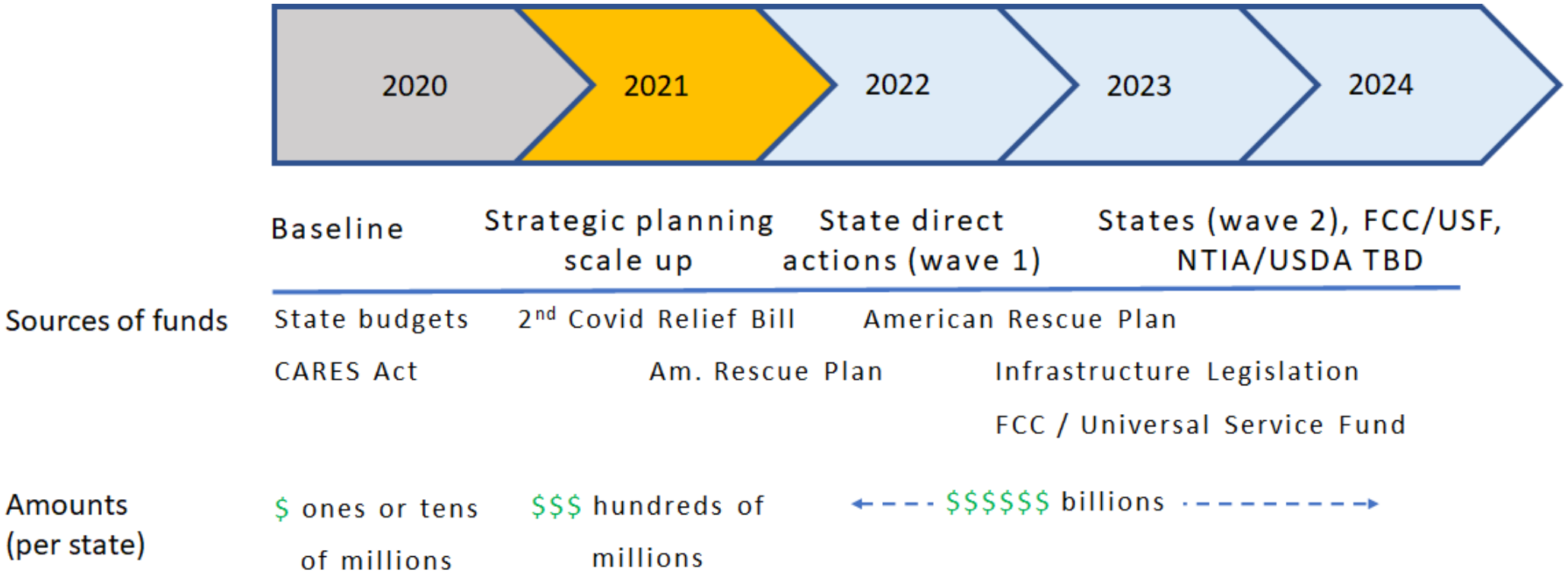
- $100+ Billion Historic Opportunity, 2021-2024
- Order-of-magnitude additions above historical funding in all areas
  - Affordability subsidies: $10 – 30+ B
  - Digital literacy/adoption: $3 – 5 B
  - Deployment: $70 – 100+ B
- Major Role for States, By Design and By Choice

Even as Infrastructure Legislation dominates the "headlines," states are already moving forward with major funding programs under very flexible Rescue Plan rules

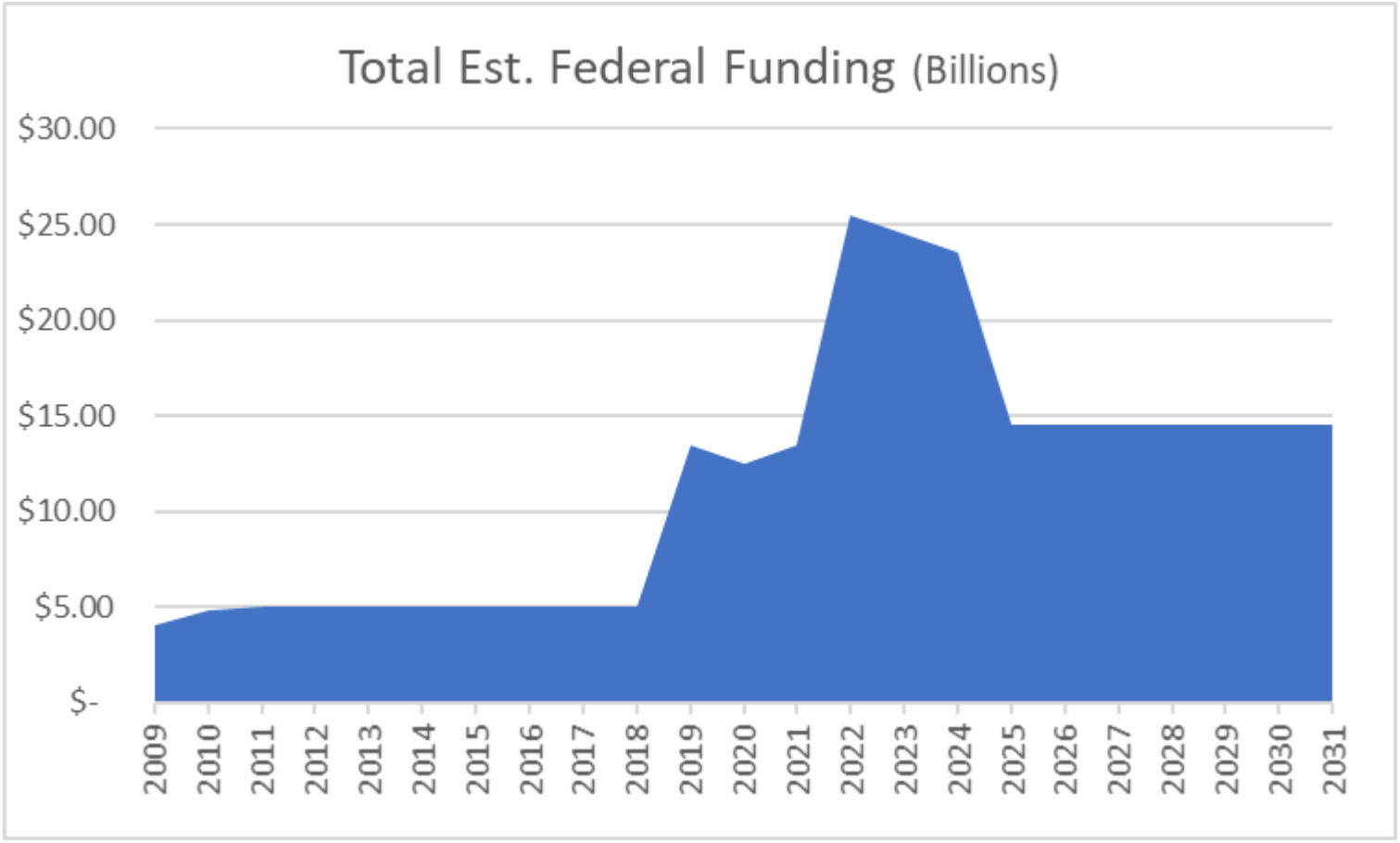
Federal Funding - $100B

Program	Amount	Timing	Agency	Method	Notes
Broadband Infrastructure Program (BIP)	$300M	Now	NTIA	Grant	Requires public sector partner; middle mile eligible
Tribal Broadband Grants	$1B	Now	NTIA	Grant	Requires tribal partner
ReConnect (next phase)	~$2-5B	2022	USDA	Grant	$2b+ funding proposed
State Last-mile (Rescue Plan, SLFRF+CCPF)	~$5-15B	2021-22	20-40 states, via Treasury	Grants / other TBD	Unique criteria in each state. Flexible Treasury rules.
State Middle-mile (Rescue Plan, SLFRF+CCPF)	~$5-10B	2021-22	20-40 states, via Treasury	Grants / other TBD	$3.25b in CA alone. Flexible rules.
Federal Infrastructure Funding [TBD/Congress]	~$40B	2022-23	50 states (not final)	Grants to states then state awards	How much flexibility to states?
RDOF Phase II	$11B	2023-24	FCC	Reverse auction	Largest FCC auction ever
5G Fund	$9B	2023-24	FCC	Reverse auction	Rural mobile service
Estimated Total	~$70-100 billion	2021-2024	Four federal agencies + several dozen states	Several dozen grant programs each with unique criteria + several complex auctions	Public funds will be combined with private investment to generate several hundred billion dollars of projects over the next 5 years

Federal Funding - Timeframe



Federal Funding - Timeframe



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Federal Funding – Potential Areas

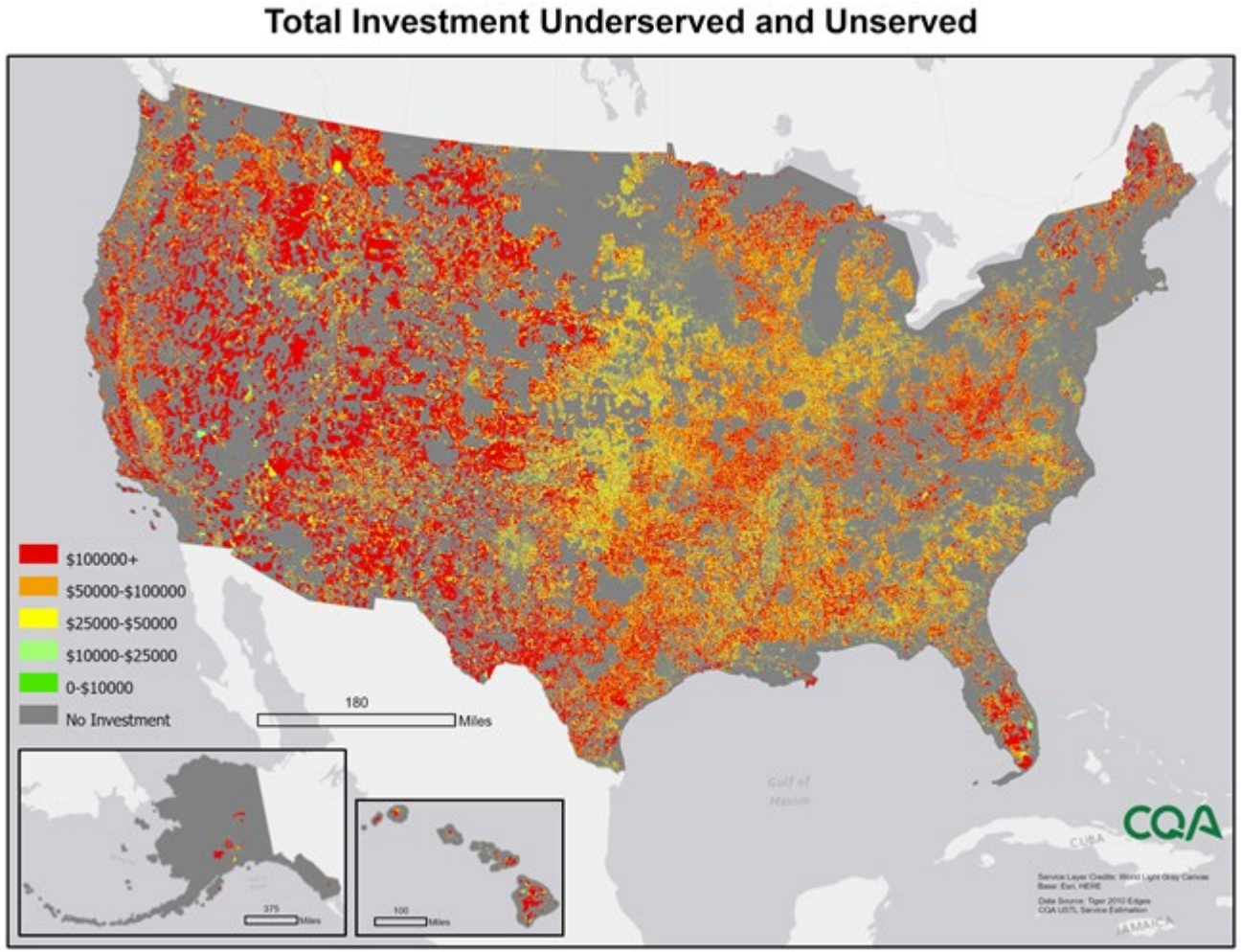
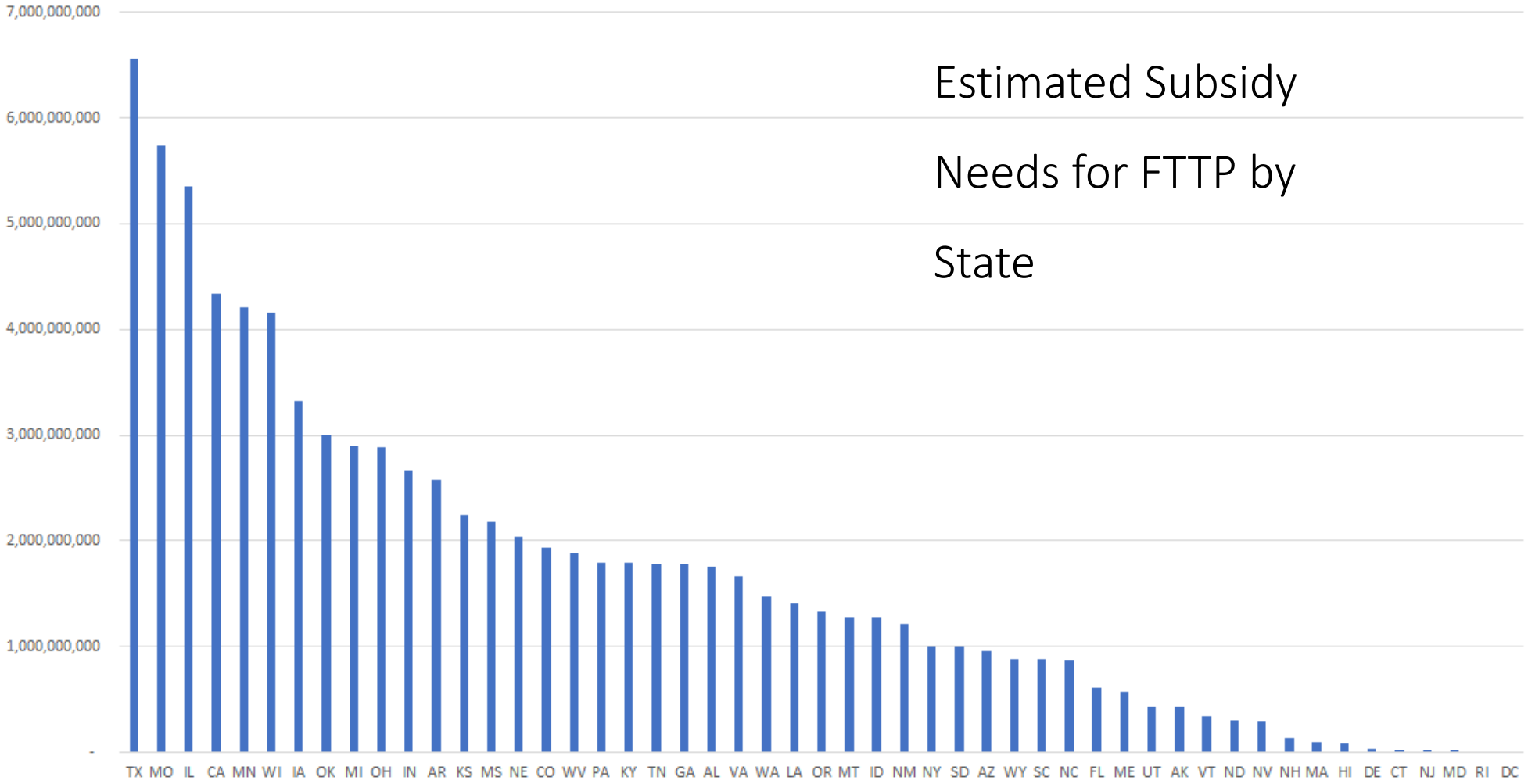


Image provides the average FTTP investment required per location passed in a Census Block for locations not currently served by Fiber or Coax

- Investment applies to occupied areas Unserved or Underserved.
- Areas close in proximity to more populated areas generally require less total investment to bring fiber to end user locations.

Federal Funding – Target areas



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New Competitors from Government Funding

Top 10 CAFII Auction Winners

Top Overall Winners	TierLatency					
Winner	**Above_BaselineLow**	**BaselineHigh**	**BaselineLow**	**GigabitLow**	**MinimumLow**	**TotalSupport**
AMG Technology Investment Group LLC	$25,355,913		$2,772,467			$28,128,379
Wisper ISP, Inc	$21,933,750		$98,188			$22,031,937
Rural Electric Cooperative Consortium				$18,602,249		$18,602,249
Viasat, Inc.		$12,249,988				$12,249,988
California Internet, L.P.	$8,783,240					$8,783,240
Commnet Wireless, LLC			$7,994,169			$7,994,169
Benton Ridge Telephone Company	$4,867,980		$369,202			$5,237,182
Cal.net, Inc.	$5,018,897		$32,768			$5,051,665
Midcontinent Communications	$3,890,234					$3,890,234
Wilkes Telephone Membership Corporation				$3,282,002		$3,282,002
Program Total	**$75,974,532**	**$12,249,988**	**$20,642,756**	**$39,917,512**	**$48,198**	**$148,832,986**

Top 10 CAFII Auction Impacted States

Top Overall States	TierLatency					
State	**Above_BaselineLow**	**BaselineHigh**	**BaselineLow**	**GigabitLow**	**MinimumLow**	**TotalSupport**
MO	$18,670,897		$867,863	$5,938,551		$25,477,312
CA	$13,286,954	$1,391,836	$223,901			$14,902,691
OK	$4,769,312		$1,698,605	$4,858,495	$33,500	$11,359,911
VA				$10,892,361		$10,892,361
IL	$9,585,302		$277,766	$109,923		$9,972,991
TX	$6,309,546		$1,849,396	$83,102		$8,242,044
PA		$1,994,512		$3,688,594		$5,683,106
IA	$4,590,179		$478,226	$360,367		$5,428,772
AR	$39,957		$724,253	$4,434,600		$5,198,809
KS	$3,687,563		$369,054	$623,249		$4,679,866
Total	**$75,974,532**	**$12,249,988**	**$20,642,756**	**$39,917,512**	**$48,198**	**$148,832,986**

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Wilkes Telephone Membership Corporation				$3,282,002		$3,282,002
Tri County Rural Electric Cooperative, Inc.				$3,232,623		$3,232,623
Sunset Digital Communications, Inc.				$2,957,501		$2,957,501
Hawaiian Telcom, Inc.				$1,816,064		$1,816,064
Westfield Gas & Electric Light Department				$1,017,842	$14,698	$1,032,540
Verizon Communications Inc.				$947,693		$947,693
Citynet LLC				$651,771		$651,771
IdeaTek Telcom, LLC				$618,688		$618,688
Barry Electric Cooperative				$610,345		$610,345
Program Total	**$75,974,532**	**$12,249,988**	**$20,642,756**	**$39,917,512**	**$48,198**	**$148,832,986**

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AR	$39,957		$724,253	$4,434,600		$5,198,809
PA		$1,994,512		$3,688,594		$5,683,106
HI				$1,816,064		$1,816,064
MA			$92,151	$1,231,980	$14,698	$1,338,829
MN	$2,840,540		$110,444	$935,395		$3,886,379
TN				$845,734		$845,734
IN	$1,875,443		$331,930	$704,376		$2,911,749
Total	**$75,974,532**	**$12,249,988**	**$20,642,756**	**$39,917,512**	**$48,198**	**$148,832,986**

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New Competitors from Government Funding

Top 10 RDOF Auction Winners by Overall Support

Top Overall Winners			Before Giveback	Giveback Status		
Winner	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**

Top 10 RDOF Impacted States

Top Overall			Before Giveback	Giveback Status		
Winner	Above_BaselineLow	GigabitLow	TotalSupport	Default	Default_GiveBack	Likely
CA	$616,146	$68,892,819	$69,515,813		$33,548	$69,482,264
MS	$4,503,875	$45,068,705	$49,572,580		$553,303	$49,019,277
AR	$1,396,687	$41,027,635	$42,424,322		$162,069	$42,262,253
MN	$842,511	$39,972,564	$40,815,075	$670,943		$40,144,132
IL	$879,592	$36,951,419	$37,831,011		$6,574	$37,824,437
WI	$224	$37,371,282	$37,371,505		$371,074	$37,000,431
PA	$6,968,996	$29,905,324	$36,874,320		$685,983	$36,188,337
MI	$1,787,610	$34,510,895	$36,298,506	$3,020	$25,462	$36,270,024
TX	$15,687	$36,250,606	$36,266,293		$74,689	$36,191,605
WV	$1,414,470	$34,783,009	$36,206,666		$19,695	$36,186,971
Total	**$93,796,346**	**$828,528,329**	**$923,068,871**	**$1,187,122**	**$6,666,217**	**$915,215,533**

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AR	$1,396,687	$41,027,635	$42,424,322		$162,069	$42,262,253
MN	$842,511	$39,972,564	$40,815,075	$670,943		$40,144,132
WI	$224	$37,371,282	$37,371,505		$371,074	$37,000,431
IL	$879,592	$36,951,419	$37,831,011		$6,574	$37,824,437
TX	$15,687	$36,250,606	$36,266,293		$74,689	$36,191,605
WV	$1,414,470	$34,783,009	$36,206,666		$19,695	$36,186,971
MO		$34,629,766	$34,629,766	$5,336	$5,483	$34,618,946
MI	$1,787,610	$34,510,895	$36,298,506	$3,020	$25,462	$36,270,024
Total	**$93,796,346**	**$828,528,329**	**$923,068,871**	**$1,187,122**	**$6,666,217**	**$915,215,533**

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Federal Programs - A Deeper Dive

- Emergency Broadband Benefit
- Opportunity Zones
- RDOF Phase 1
- Consolidated Appropriations Act of 2021
- The American Rescue Plan
- RDOF Phase II
- 5G Fund
- Infrastructure Investment and Jobs Act

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Emergency Broadband Benefit

- In the Consolidated Appropriations Act of 2021, Congress appropriated $3.2 billion to the FCC to help low-income households pay for broadband service and connected internet devices.
- The Emergency Broadband Benefit (EBB) Program will provide a discount of up to $50 per month for broadband services for eligible consumers. Consumers who live on qualifying Tribal lands can receive enhanced support of up to $75 per month toward broadband services.
- Additionally, the program provides a one-time device discount of up to $100 for a laptop, desktop computer, or tablet purchased through a participating provider. The one-time discount requires a consumer co-payment of more than $10 and less than $50.
- The Emergency Broadband Benefit is temporary. It will expire when funds are exhausted or six months after the Department of Health and Human Services (HHS) declares the end of the COVID-19 health emergency.

Emergency Broadband Benefit

Who Is Eligible for the Emergency Broadband Benefit Program?

- A household is eligible if a member of the household meets *one* of the criteria below:
- Has an income that is at or below 135% of the Federal Poverty Guidelines or participates in certain assistance programs, such as SNAP, Medicaid, or Lifeline;
- Approved to receive benefits under the free and reduced-price school lunch program or the school breakfast program, including through the USDA Community Eligibility Provision, in the 2019-2020, 2020-2021, or 2021-2022 school year;
- Received a Federal Pell Grant during the current award year;
- Experienced a substantial loss of income due to job loss or furlough since February 29, 2020 and the household had a total income in 2020 at or below $99,000 for single filers and $198,000 for joint filers; or
- Meets the eligibility criteria for a participating provider's existing low-income or COVID-19 program.

How to Apply

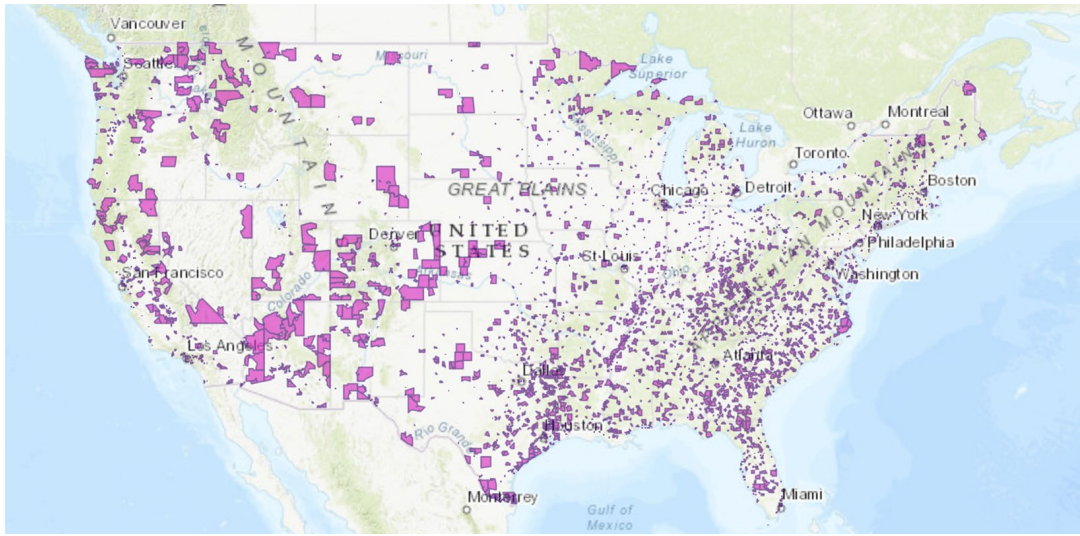
- Eligible households must **both apply for the program and contact a participating provider to select a service plan.**

Qualified Opportunity Zones

Qualified Opportunity Zones

- 2017 Tax Act contained new Tax Code section creating Qualified Opportunity Zone ("QOZ") rules
- Low-Income Census Tracts have been specially designated by the IRS in Notice 2018-48 as Qualified Opportunity Zones
- Designation is intended to spur economic development and job creation in distressed communities throughout the U.S. & U.S. possessions through federal income tax incentives
- Number of QOZs limited to 25% of total number of low-income communities in the State (100% for Puerto Rico)
- Currently 8,764 designated QOZs in the U.S. & U.S. possessions
- QOZs ~12% of all U.S. census tracts & covers ~35M people

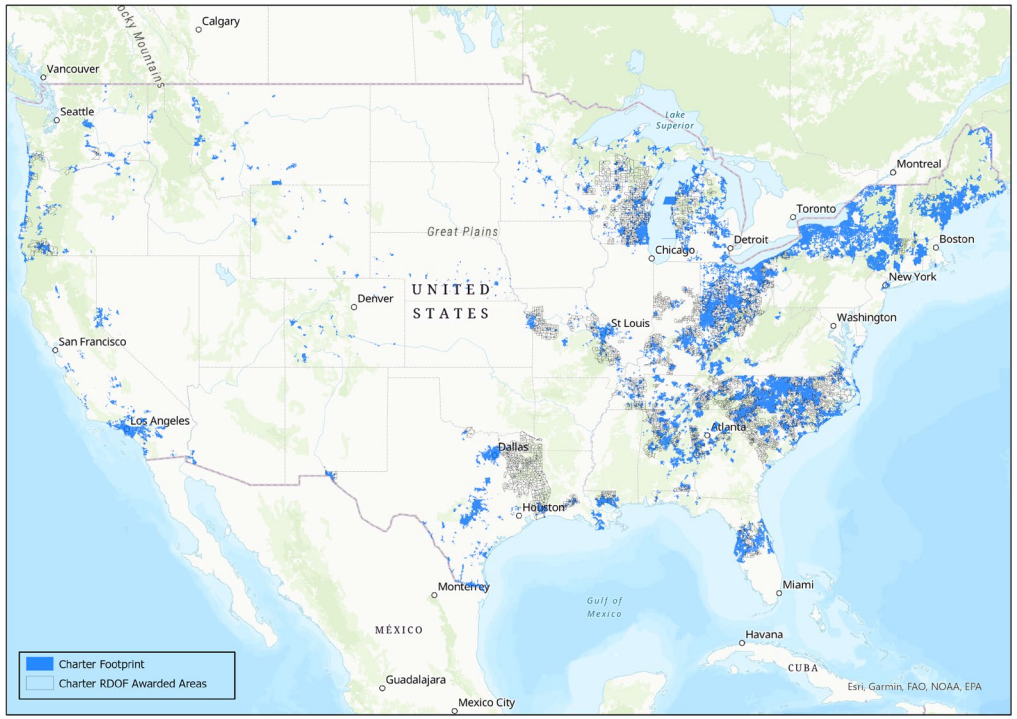
Qualified Opportunity Zones in U.S.



Designated Qualified Opportunity Zone

RDOF

Charter Footprint and RDOF Awarded Areas



Interesting facts:

- 99% of locations offered were awarded
- Participants bid the support down to 40% of the reserve offered
  - Reserve was based on our FTTp costs
- Charter was the biggest winner
- SpaceX, using low earth orbit satellites, was the 2nd biggest winner
  - Offering speeds of 100mbps
- In CA 600 of the 700m went to FW providers.
- 85% of the areas were awarded to providers promising Gigabit speeds
- The FCC allowed FW providers to bid in the Gigabit tier
- RDOF Givebacks and defaults expected to impact about 1.5% of locations.
- FCC has not completed long form review to finalize awards.

Consolidated Appropriations Act of 2021

There is one broadband funding opportunity still available under this Act eligible entities can leverage towards their broadband infrastructure.

Amendments to the Secure and Trusted Communications Network Reimbursement Program

Total: $1.9 billion

Eligible Entities:

- **Providers of Advanced Communication Service**

- Grants available for providers of advanced communication to remove or replace covered communications equipment to protect national security threats to the Commission's communications supply chain
- NTIA will oversee distributing the broadband connectivity grants listed in the Consolidated Appropriations Act of 2021 to the eligible entities that apply and are approved.
- Application Details:
- The FCC had a webinar on September 27th, 2021, to go over the Secure and Trusted Communications Network Reimbursement Program
- The webinar will provide an overview of the Reimbursement Program, provider eligibility information, and application procedures for participating parties

The American Rescue Plan (ARP)

Due to COVID-19, **The American Rescue Plan** has come in to bring the **Coronavirus Capital Projects Fund,** to contribute to the Administration's goal of providing every American with the modern infrastructure necessary to access critical services, including a high-quality and affordable broadband internet connection.

Coronavirus Capital Projects Fund

Total: $10 billion

Eligible Entities:

- **States, Territories, and Tribal Governments**

- Grants available to use towards expanding broadband infrastructure to directly enable work, education, health monitoring, and remote work options.
- Grant Minimum Breakdown:
- A minimum of $100 million for each of the 50 States & District of Columbia
- A minimum of $100 million for each U.S. Territory
- A minimum of $100 million to be split into equal shares for each Tribal government, including the State of Hawaii
- Application Details:
  - The U.S. Treasury is the organization in charge of distributing funding grants listed under the American Rescue Plan
  - Eligible entities will be able to apply for their allocation of the Capital Projects Fund through the Treasury Submission Portal
  - State deadline was December 2021

How to Apply for the Coronavirus Capital Projects Fund?

- Eligible states, territories, freely associated states, and Tribal governments will be able to apply for their allocation of the Capital Projects Fund through the Treasury Submission Portal.

Type	Application Portal Launch Date	Deadline to Request Funding	Deadline to Submit Grant Plan
States, Territories, and Freely Associated States	September 24, 2021	December 27, 2021	September 24, 2022
Tribal Governments	October 1, 2021	June 1, 2022	Not Applicable

RDOF Phase II

The goal of **RDOF Phase II** is to deploy broadband service to locations in census blocks that are partially served and locations that were not awarded during the Phase I auction.

Total: $11.2 billion

Eligible Entities:

Eligible Telecommunications Carriers (ETC's)

- Grants are available through a reverse auction to certified Eligible Telecommunication Carriers (ETC's)
- Phase II is not yet scheduled, with timing still being discussed by the Commission. The FCC plans to use the new Broadband Data Collection (BDC), formally known as Digital Opportunity Data Collection (DODC), to determine the eligible census blocks for partially served areas
- Likely means Phase II will not be scheduled until after the FCC implements the Broadband Data Collection program
- Application Details:
- Phase II Not yet scheduled – Will not be scheduled until after the Broadband Data Collection is complete

5G Fund

The **5G Fund** aims to provide all Americans access to 5G broadband service, especially those living in rural areas where 5G would likely not be deployed.

Total: $9 billion

Eligible Entities:

ETC's with Spectrum Access and Financial/Technical Capability

- The goal is to ensure everyone can have access and benefit from 5G connectivity regardless of whether they live in a rural or urban area
  - Coverage data submitted through the new Broadband Data Collection (BDC) will determine the eligible areas
  - Like RDOF Phase II, scheduling is dependent on when the FCC acquires the new coverage data from the BDC
- Application Details:
- The application window is not yet scheduled. It will not be scheduled until after the Broadband Data Collection is complete.

Infrastructure Investment and Jobs Act (IIJA) - Broadband

Three grant opportunities within this Bill for States and other eligible organizations to use directly to support high-speed broadband service deployment:

- **Grants for Broadband Deployment**
- **Tribal Connectivity Technical Amendments**
- **Enabling Middle Mile Infrastructure**

1. GRANTS FOR BROADBAND DEPLOYMENT

To support the expansion of broadband service

- In rural areas
- To eligible entities that consistently rank below most other eligible entities with respect to broadband access and deployment

Eligible Entities:

States and Territories

Total: $42.5 billion

- Eligible Uses of Grants for Broadband Deployment:
  - Unserved service projects and underserved service projects
  - Connecting eligible community anchor institutions
  - Data collection, broadband mapping, and planning
  - Installing internet and Wi-Fi Infrastructure or providing reduced-cost broadband within multi-family residential building, with priority given to a residential building under certain conditions (conditions listed in the Bill)
  - Broadband adoption, including programs to provide affordable internet-capable devices
  - $100M allocated to each state, $4.2B allocated to high-cost locations by state and remaining $33B allocated based on unserved locations by state.

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IIJA - Tribal Connectivity Technical Amendments

2. TRIBAL CONNECTIVITY TECHNICAL AMENDMENTS

Total: $2 billion

Eligible Entities: A Tribal Government, Tribal College or University, the Department of Hawaiian Homelands on behalf of the Native Hawaiian Community, a Tribal organization, or Native Corporation.

- Originally started under the Consolidated Appropriations Act of 2021, this program is offering more grants to expand the access and the adoption of fixed broadband service that provides quality service on Tribal Land and directly enables remote learning, telework, and telehealth
  - The Commission is looking for covered broadband projects designed to deploy broadband service to the greatest number of households in an eligible service area, and for projects that are cost-effective in areas that are the most rural

IIJA - Enabling Middle Mile Broadband Infrastructure

3. ENABLING MIDDLE MILE BROADBAND INFRASTRUCTURE

Total: $1 billion

Eligible Entities: State, Political Subdivision of a State, Tribal Government, Technology Company, Electric Utility, Utility Cooperative, Public Utility District, Telecommunications Company, Telecommunications Cooperative, Nonprofit Foundation, Nonprofit Cooperation, Nonprofit Institution, Nonprofit Association, Regional Planning Counsel, Native Entity, or Economic Development Authority

- This grant opportunity aims to:
- Encourage the expansion and extensions of middle-mile infrastructure to reduce the cost of connecting unserved and underserved areas to the backbone of the internet (referred to as the "last mile")
- Promote broadband connection resiliency through the creation of alternative network connection paths that can be designed to prevent signal points of failure on a broadband network

→ Grants will be made available on a technology-neutral competitive basis to eligible entities to construct, improve, or acquire middle-mile infrastructure.

Sample State Program

New money is a Federal/State partnership – CA example

Statewide Middle Mile Network – $3.25 billion

- Statewide open-access middle-mile broadband network, managed by nonprofit third-party
- The package includes provisions to streamline state contracting laws and permitting processes for broadband infrastructure projects

New money is a Federal/State partnership – CA example

Last Mile Broadband Grants – $2 billion

To complement the middle-mile proposal, the Broadband Package includes funding for a comprehensive strategy to build last-mile infrastructure

Federal Funding Account – $2 billion

- Establishes a new federally funded account in the California Advanced Services Fund broadband **grant** program to quickly deploy last-mile broadband connections
  - Targeting projects built by 2026

California Advanced Services Fund (CASF) Program Changes

- Provides $50 million for technical assistance grants to enable local governments to build their own networks
- Removes restrictions on local governments applying for CASF

New money is a Federal/State partnership – CA example

Local Government Broadband Loan Loss Reserve Fund – $750 million

- Creates a new state funded "Loan Loss Reserve" Fund to assist local governments in deploying public networks
- Provides collateral to local governments issuing bonds for broadband to facilitate better borrowing rates and terms
- Provides explicit authority to enable local governments to participate in the California Advanced Services Fund, issue bonds, and acquire, construct, improve, and maintain broadband infrastructure

Broadband Mapping

How did we get here?
A Short History of Broadband Mapping

The Barksdale Principle:

"If we have data, let's look at data. If all we have are opinions, let's go with mine."

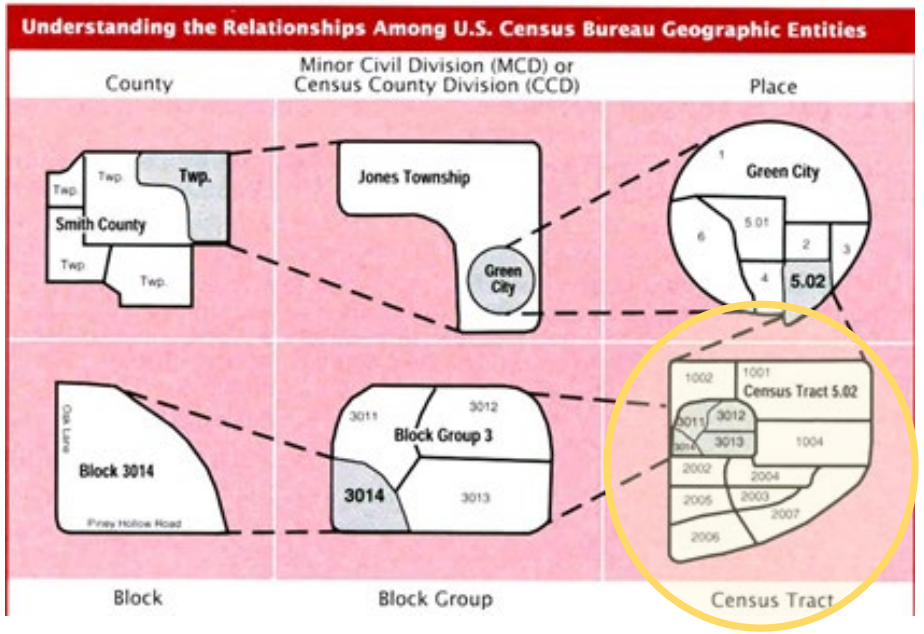
– Jim Barksdale

How did we get here?
A Short History of Broadband Mapping

The Act and Big Geographies: 1996-2009

- Along with putting structure around things like interconnection, preemption, and universal service, the Act called for the FCC to conduct broadband availability data gathering on a semi-annual basis.
- The birth of the FCC's Form 477 process. This was the mechanism the Commission would use to collect and report on internet availability.
- Census Tract Level
  - Census Tracts can contain as many as 8,000 people and span many square miles, while a Census Block can contain as little as zero population and be as small as 2/3rd of an acre.

Census Small-Area Geography

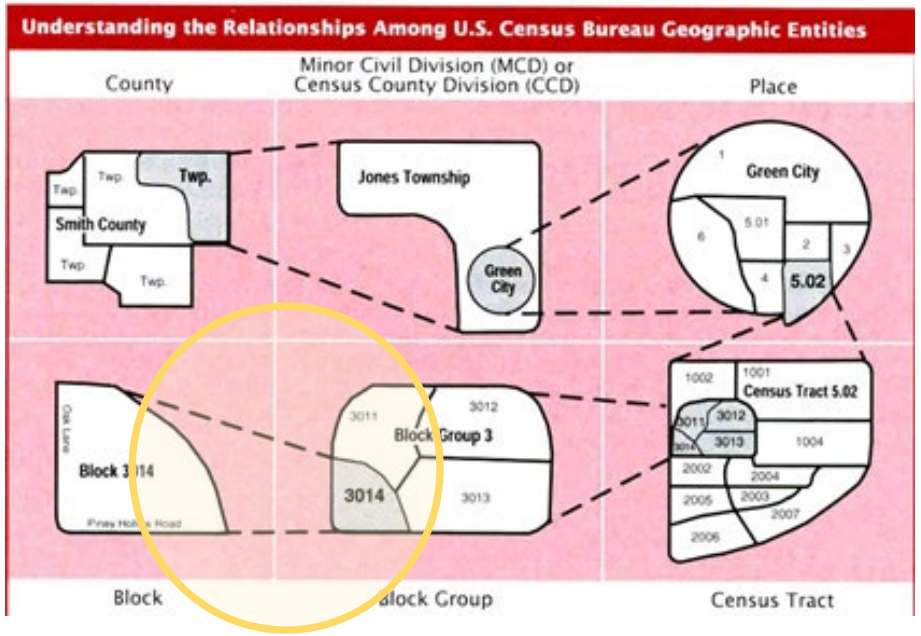


How did we get here?
A Short History of Broadband Mapping

Stimulus, the National Broadband Map, and CAF: 2009-2015

- ARRA: State Broadband Initiative/477 - The goal was to collect data, standardize it, and display it at the census block level.
  - National Broadband Map
  - State Broadband Mapping
- Connect America Fund
  - Used the NBM for fund targeting and management

Census Small-Area Geography



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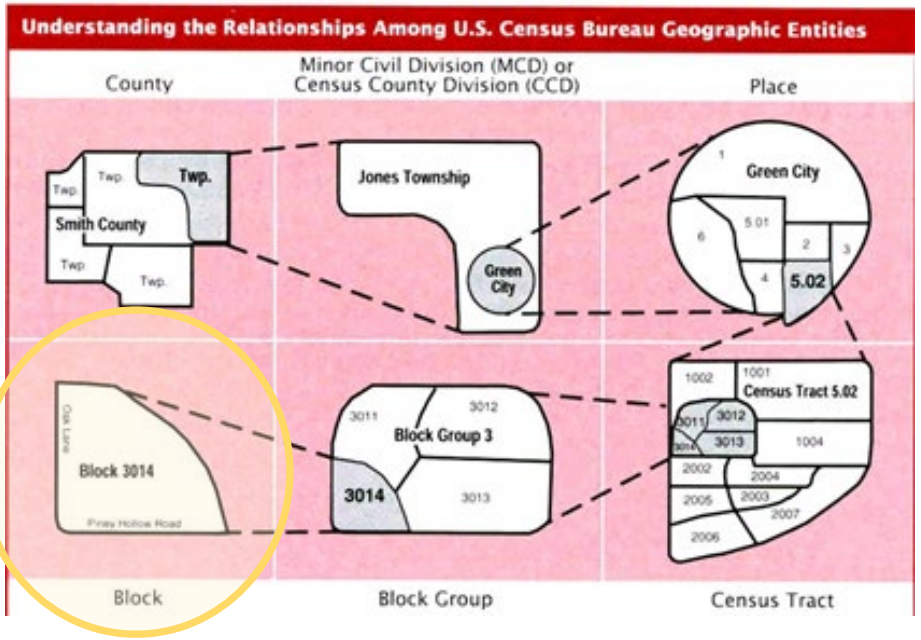
How did we get here?
A Short History of Broadband Mapping

CAF-II, RDOF, and Location-Based Mapping: 2015 – 2021

- Census Block-level data had contributed to the Connect America Fund moving to a reverse auction.
- Eligible census blocks were identified, and reserves were measured using this more granular approach to broadband mapping.
- One served, all served became a bigger problem with policy makers

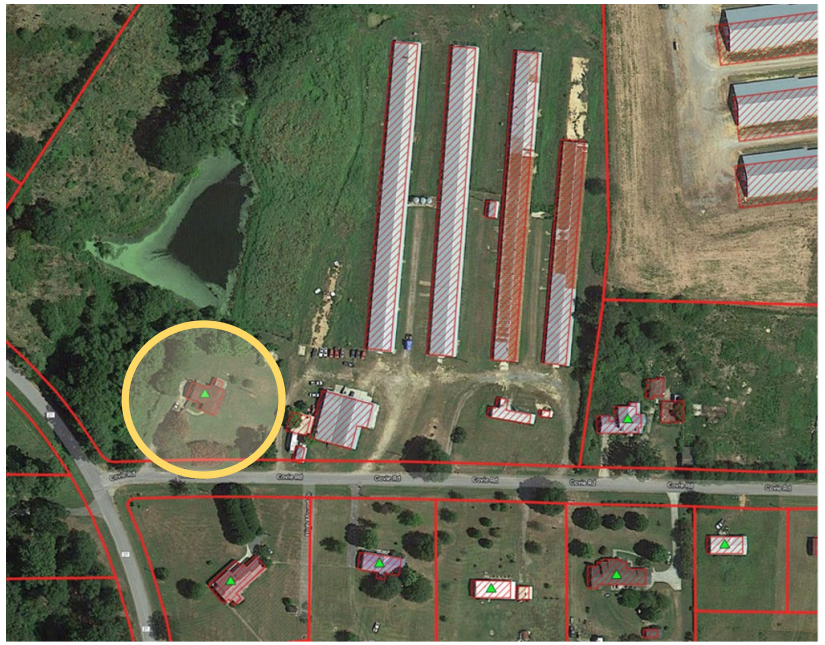
Census Small-Area Geography



How did we get here?
A Short History of Broadband Mapping

Where Broadband Mapping is Going: 2022 –

- Broadband Mapping Initiative worked to find a path to better data.
- CQA developed the Broadband Serviceable Location
- This development made its way to the halls of Congress.
- Broadband DATA Act
- DODC ------ BDC



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How did we get here?
A Short History of Broadband Mapping

- Stems from Hill pressure to the FCC and FCC pressure on providers to modernize 477
- Companion to Rural Digital Opportunity Fund - P/K/A Digital Opportunity Data Collection
- Implements the Broadband DATA Act
- Requires Service Provider Submission of Service Areas by Polygon/Shapefile
- Adopts the Broadband Serviceable Location Fabric
- Includes Challenge Process, Verification, Use of Crowdsourcing and Assistance for Small Providers

BDC/DODC Timeline

- Third Report and Order Out, but BDC/DODC is still a ways away. **At least 6-month notice before data collection deadline**, and many months before BDC location data engagement begins. Likely another 6-months+ before publication.
- State Broadband Maps and NBAM likely needed for upcoming programs
- In the meantime, there may be some burden on providers from various, disparate, data collection programs.
- Before all this can happen, the **Broadband Serviceable Location Fabric** needs to be in place.

What is the Fabric and how will the Fabric to be used for translation?

What is the Broadband Serviceable Location Fabric?

- The Fabric is a comprehensive data set of all individual structures capable of receiving broadband service in the U.S.
- The Fabric will reflect each location as a single point defined by a set of geographic coordinates that fall within the footprint of a building
- A “location” is defined as a business or residential location in the United States at which fixed broadband Internet access service is, or can be, installed.
- The Commission will overlay the Fabric data on top of the providers coverage data to further verify the locations providers submit in their filings are accurate.

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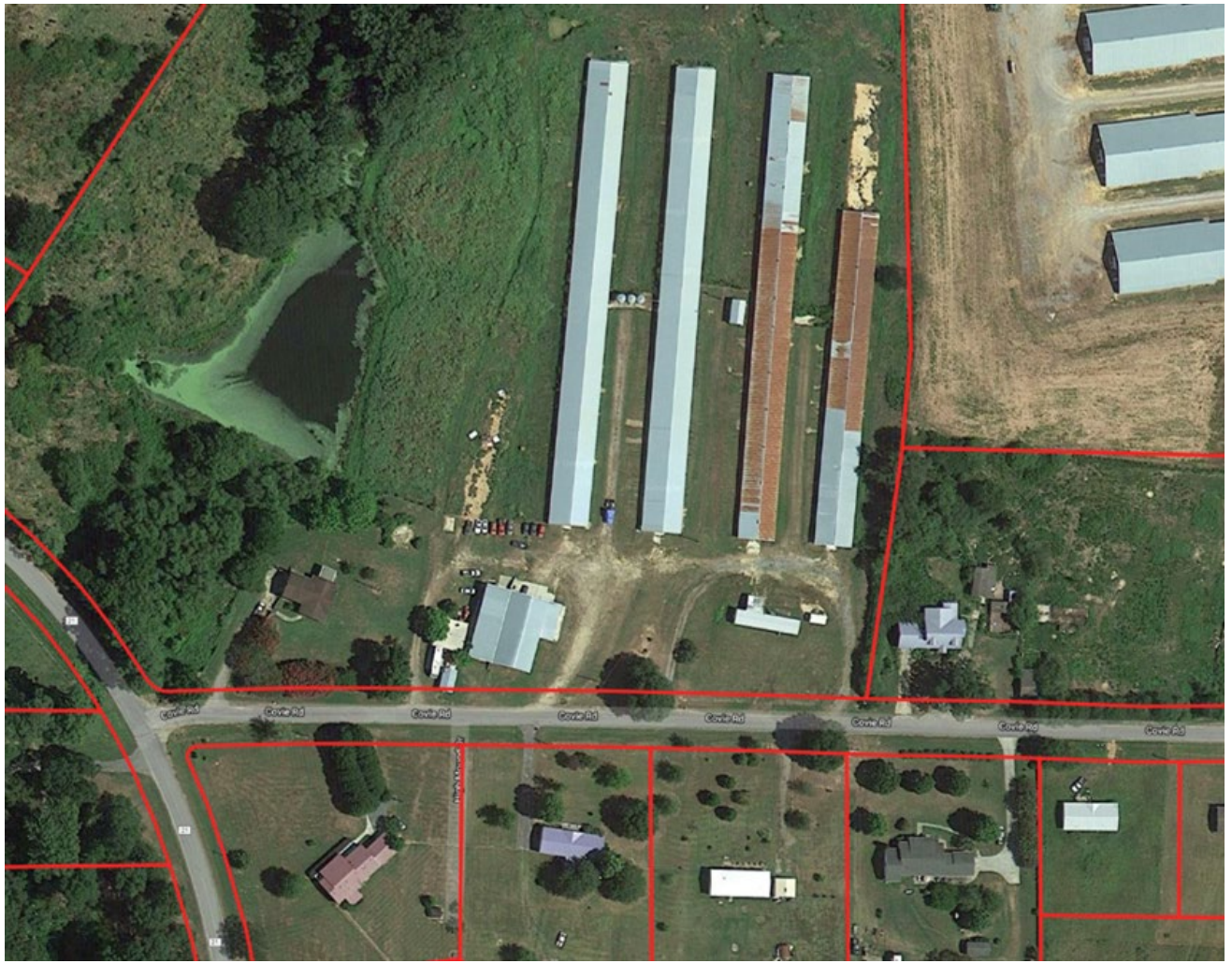
The Fabric – How it works

- Goal: Identify the structure(s) needing service
- Challenges:
  - Secondary structures (chicken coops, barns, garages, etc.)
  - Addresses aren’t automatically geocoded

The Fabric – How it works

- Step 1:
  - Overlay parcel data
  - Use Tax Assessor and parcel attribute data to categorize parcels
    - Are there multiple locations?
    - Does the land use indicate there may be a serviceable structure?
    - Consider improvement value, information on secondary structures, etc.



The Fabric – How it works

- Step 2:
  - Incorporate building footprint data
    - Footprints identify candidate locations for the Fabric
    - Footprints replace an interpolation of textual address data with real-world accuracy of where serviceable structures are

The Fabric – Output

- Step 3:
  - Location and Structure logic is applied to aggregate data
  - The Fabric identifies serviceable structure(s), circled, on each parcel
- Step 4:
  - Once the location is identified, the best address for the location is selected

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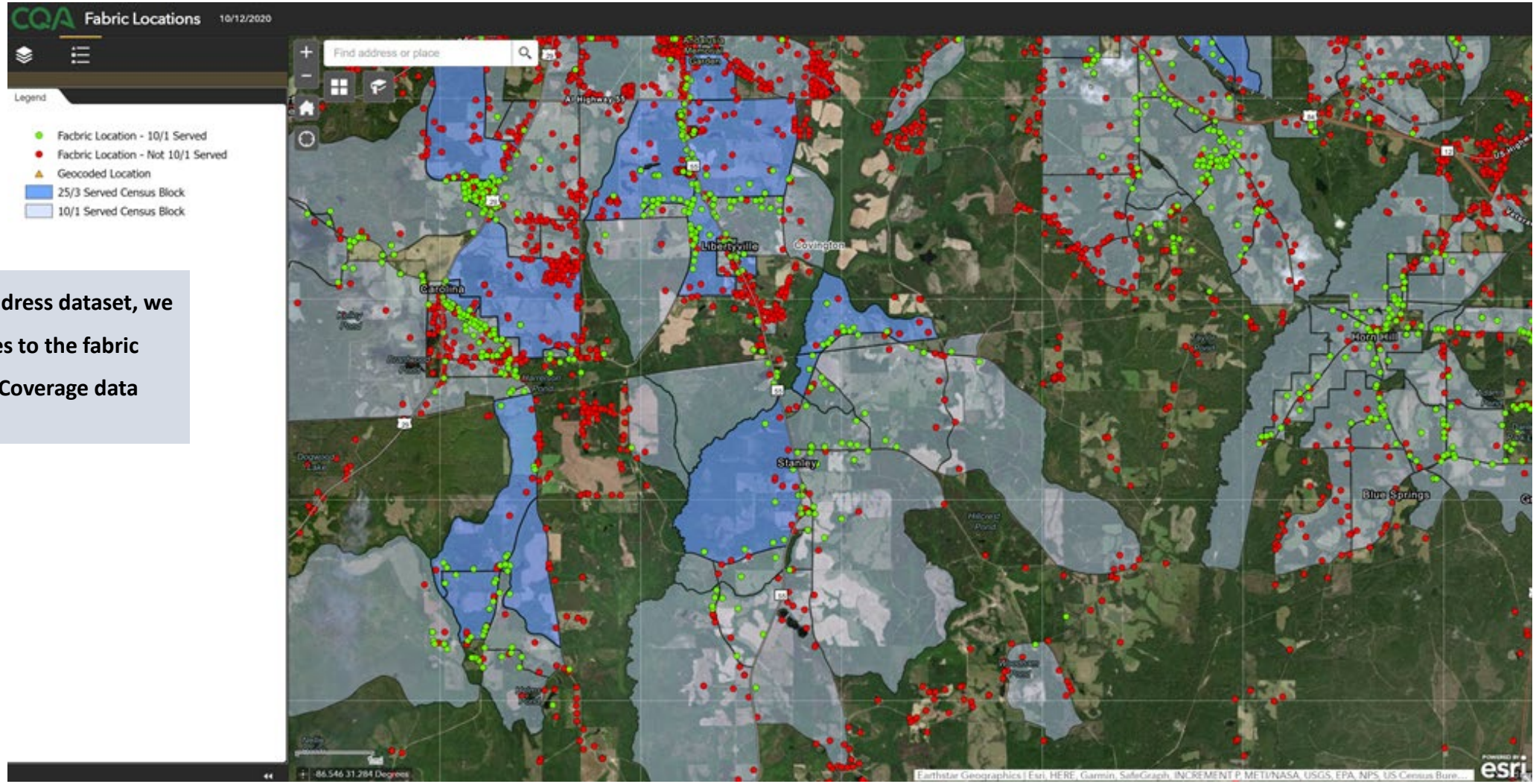
Fabric Value in One Image



Using a Carrier's address dataset, we linked the addresses to the fabric and overlayed 477 Coverage data

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Fabric as of Today

- FCC working toward BDC and the use of the Fabric
  - RFI – RFP – Procurement – Development – BDC - Publish
- States already moving toward Broadband DATA Act standard
- CQA BSLF on Version 4 (all states)
  - ~98% accuracy
  - More to do
  - County outliers
  - Tribal areas
  - Visual Verification

New Federal Requirements

In March 2020, Congress passed the Broadband DATA Act:

Which outlines the Commission's approach to improve broadband mapping that was established in the Digital Opportunity Data Collection proceeding, now called the Broadband Data Collection.

This Act asks the Commission to:

1. Require the **semiannual collection** and dissemination of granular data relating to the availability and quality of service of fixed and mobile broadband Internet access service for use in conjunction with creating broadband coverage maps.
2. Establish processes for the Commission to **verify and protect the data collected.**
3. Establish a process for collecting verified data for use in the coverage maps from **State, local, and Tribal governmental entities, from other federal agencies**, and, if the Commission deems it in the public interest, from third parties.
4. **Establish the Fabric to serve as a foundation** on which fixed broadband availability is overlaid.
5. Establish a **user-friendly challenge process through which the public and State, local, and Tribal governmental entities can challenge the accuracy** of the coverage maps, provider availability data, or information in the Fabric.
6. Develop a **process through which entities or individuals may submit** specific information about the deployment and availability of broadband Internet access service in the United States on an ongoing basis.

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New Reporting Requirements for Providers

New Requirements Introduced in the BDC:

Providers of Fixed or Satellite broadband internet access service shall submit:

- Either a polygon shapefile, list of addresses, or list of locations
- Each provider of fixed wireless broadband internet access service shall submit propagation maps and model details that reflect the speeds and latency of its service or a list of addresses or locations, that document the areas:
  - (1) where the provider has actually built out its broadband network infrastructure, such that the provider is able to provide service, and
  - (2) where the provider is capable of performing a standard broadband installation.
- Indicate for each polygon shapefile or location they submit in the Digital Opportunity Data Collection, whether the reported service is available to residential customers and/or business customers.
- Submit methodology on how the organization generated its polygon shapefiles, propagation maps and model details, or list of addresses or locations.

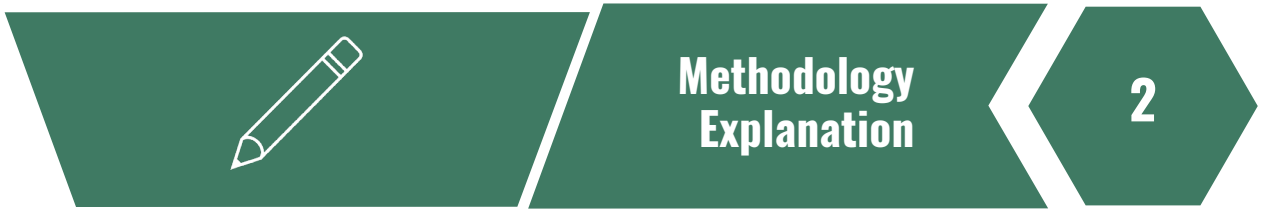
BDC Requirement Summary

- Polygon shapefile
- List of Addresses/List of Locations

- Propagation Map if Fixed Wireless or Mobile
- Model Details

- Methodology for Polygon Shapefile, list of Addresses, or list of Locations

- Methodology of Propagation Map
- Methodology for Model Details



- Certification from a Corporate Officer
- Certification from a Professional Engineer

- This can be one person if said person is both a Corporate Officer and Professional Engineer

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