

Digital Equity in New England, the Mid-Atlantic States, and Islands: Overview of Broadband Access, Speed, and Affordability among Covered Populations

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*The views here are those of
the presenters and do not
necessarily represent those
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of New York or the Federal
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Purpose



To extract insights on broadband access, speed, and affordability at the regional level in the Northeast, with a particular focus on the covered populations defined by the Digital Equity Act



To provide an additional resource to Northeastern states to cite for their DEA and BEAD Plans and illustrate the unique needs of each covered population



To take stock of publicly available data on digital equity and highlight data needs

Project Scope

- States to be covered: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Pennsylvania, Vermont, Delaware, Puerto Rico, US Virgin Islands
- Covered populations to be included: Rural populations, Aging populations (65+), Low-and-moderate income households, Individuals with disabilities, Individuals with language barriers, Racial and ethnic minorities, Tribal communities, Veterans
 - Not covered: Incarcerated population (Due to lack of regional data in recently released formerly incarcerated individuals)

About the Data

- **Broadband Availability**
 - FCC Form 477/FCC National Broadband Map
- **Broadband Speed**
 - Ookla Speed Tests
- **Broadband Affordability**
 - Broadband Now
 - The MarkUp
- **Other**
 - Affordable Connectivity Program (ACP)
 - To be included: NTIA Internet Usage Survey, ACS Broadband Subscription Stats
- **Demographic Information (Covered Populations)**
 - Census Bureau - American Community Survey (ACS)

Comparing Speed Data: FCC Form 477 Data/National Broadband Map

- Internet Service Providers submit a list of their available offerings for all their locations in the U.S. and territories to the Federal Communications Commission (FCC)
- Can aggregate data to geographies as small as the Census Block level
- Individuals and organizations can challenge the internet or location information on the map by [submitting a challenge](#)
- The challenge process is ongoing, and new maps with the data collected from this process will be released
- Useful for macro-level trends in broadband, will be useful for community-level trends when improved
- **Important caveat:** Since the FCC National Broadband Map challenge process is ongoing (as of the release of this presentation), the maps in this presentation may be outdated and more representative data may be available to use from the FCC for mapping as the challenge process is finalized.

Comparing Speed Data: Ookla Speed Tests

- Ookla collects speed tests worldwide and provides data on average download and upload speeds for geographic tiles, updated on a monthly basis
 - These tiles can be aggregated to Census Bureau geographies
- More populated areas are more likely to be precise, while underpopulated areas may either over or underestimate speed (given lower sample of speed tests, uncertainty around in-home factors)
- Useful for macro and micro-level trends in broadband

Internet Speed and Access to Socioeconomic Activity

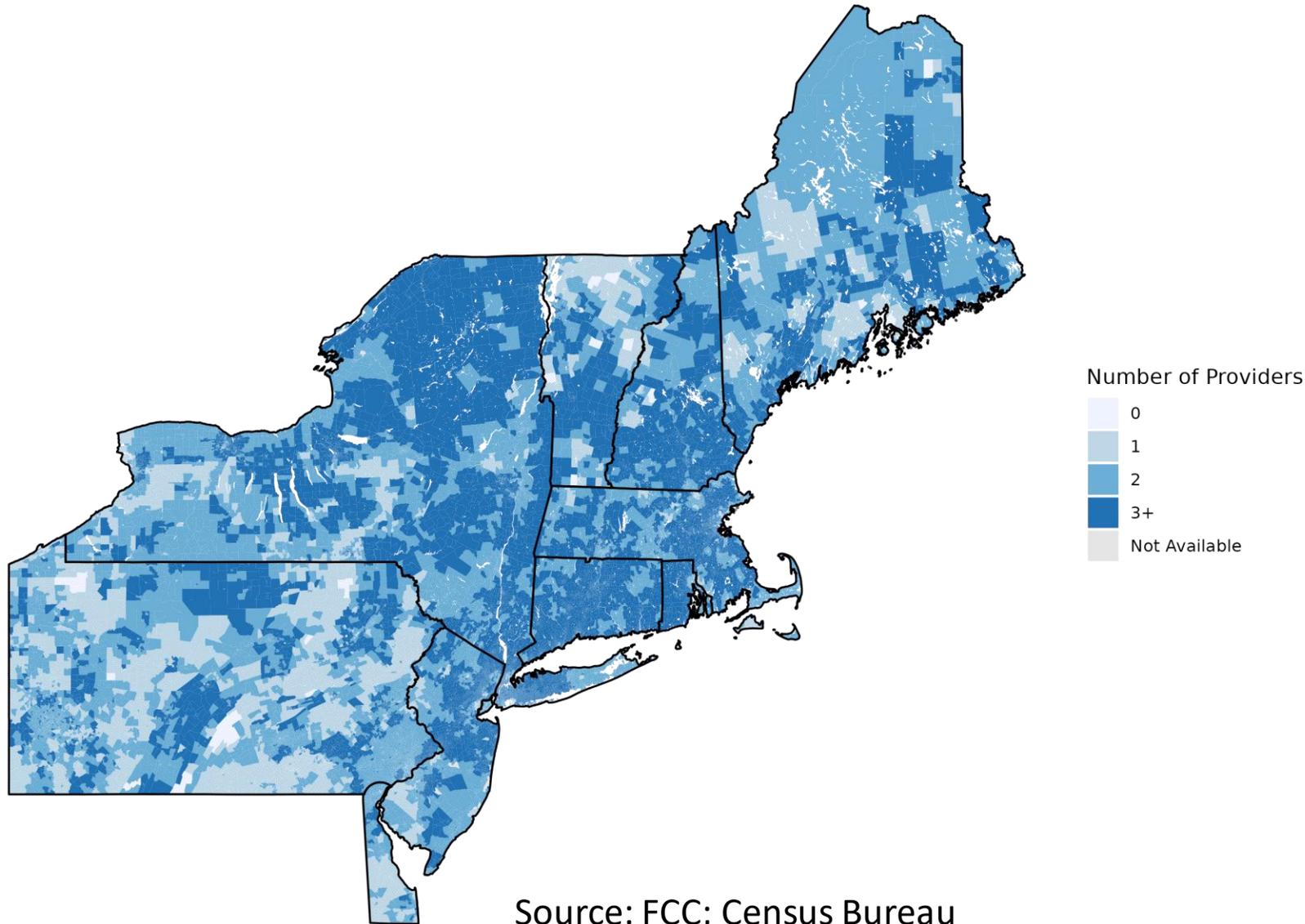
Unserved		Underserved		Served	
Technical Definition	A Family of Five	Technical Definition	A Family of Five	Technical Definition	A Family of Five
No access or access to less than 25 mbps download, 3 mbps upload, and 100 ms latency (25/3)	Up to 2 uses simultaneously	Lack access to 100 mbps download, 20mbps upload, and 100 ms latency (100/20)	Up to 3-4 uses simultaneously	100 mbps download & 20 mbps upload or greater	5+ uses simultaneously

Internet Uses

Learning	Health	Work	Government	Commerce	Community	Enrichment
<ul style="list-style-type: none">• Homework• Tutoring• Group projects• Lecture VODs• Material distribution• Student tracking• Simulations	<ul style="list-style-type: none">• Telemedicine• Health monitoring• Public health awareness• Increase healthcare usage and capacity• Research distribution	<ul style="list-style-type: none">• Work-from-anywhere• E-mailing & scheduling• Presentations, events, & conferences• Continuing education• Online job applications• VR training	<ul style="list-style-type: none">• Smart grid applications• First responder communication• Benefit enrollment• Public alerts• Voter registration• Immunization	<ul style="list-style-type: none">• Home business• Online shopping• Web hosting• Advertising & growth• Customer service• Real-time metrics• Internet-of-Things	<ul style="list-style-type: none">• Communication with friends and family• Social media• Cultural activities• Church services• Neighborhood coordination	<ul style="list-style-type: none">• Diverse content creation• Media streaming• Gaming• News & events• Civic participation• General browsing

Broadband Availability

Internet Providers (at least 100/20 Mbps)



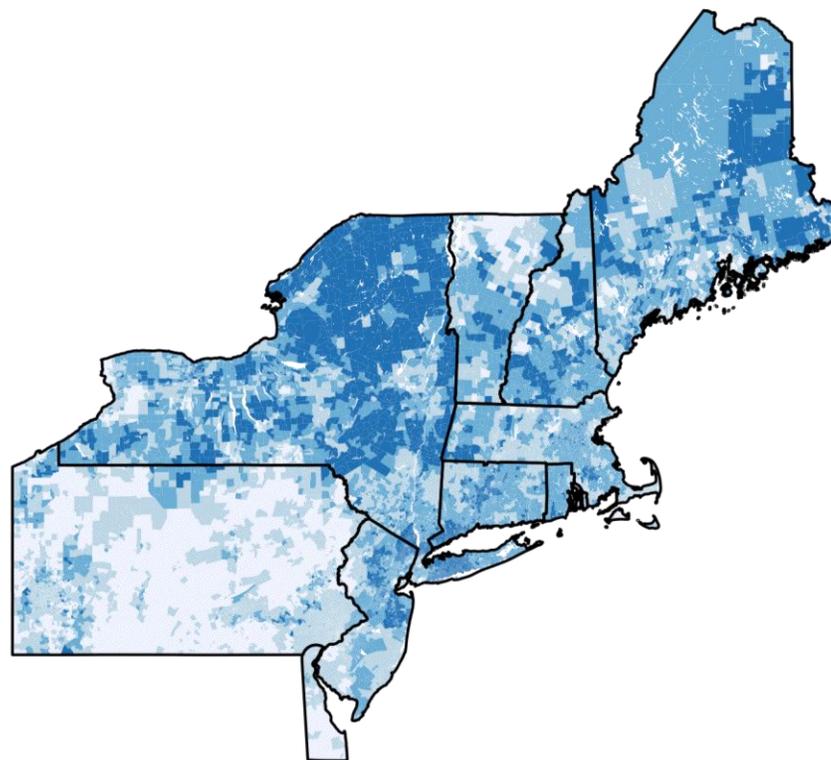
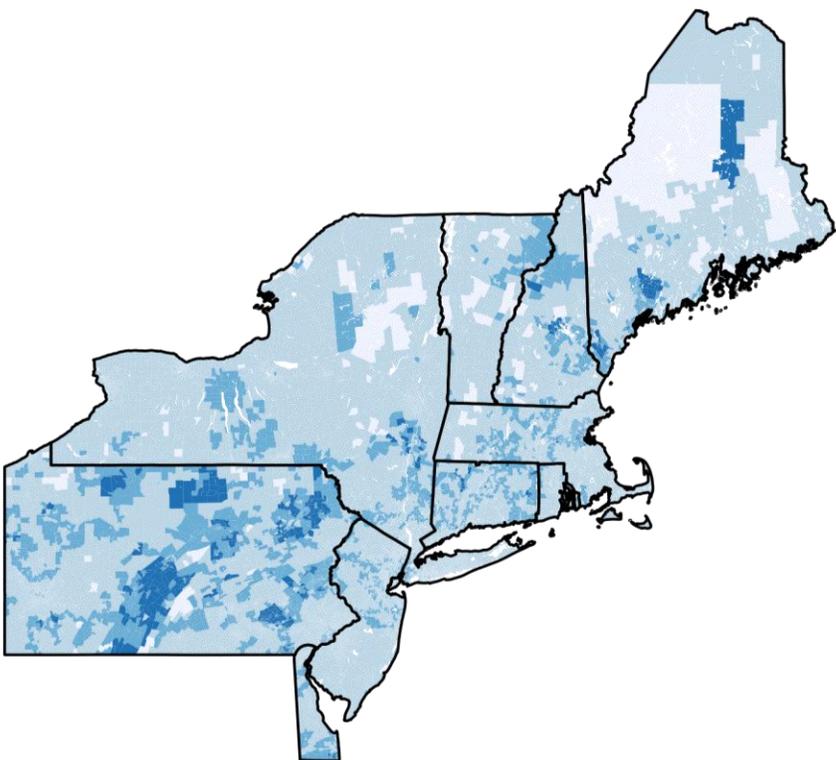
Source: FCC; Census Bureau

- Many areas are serviced by more than 3 providers, but large swaths of rural/less densely populated areas in Pennsylvania, Maine, Vermont, and others see more instances of 1-2 providers
- It may be the case that these disparities are attributed to technology type

Internet Providers by Technology Tiers (at least 100/20 Mbps)

Upper Tier
Cable/Fiber/Fixed Wireless

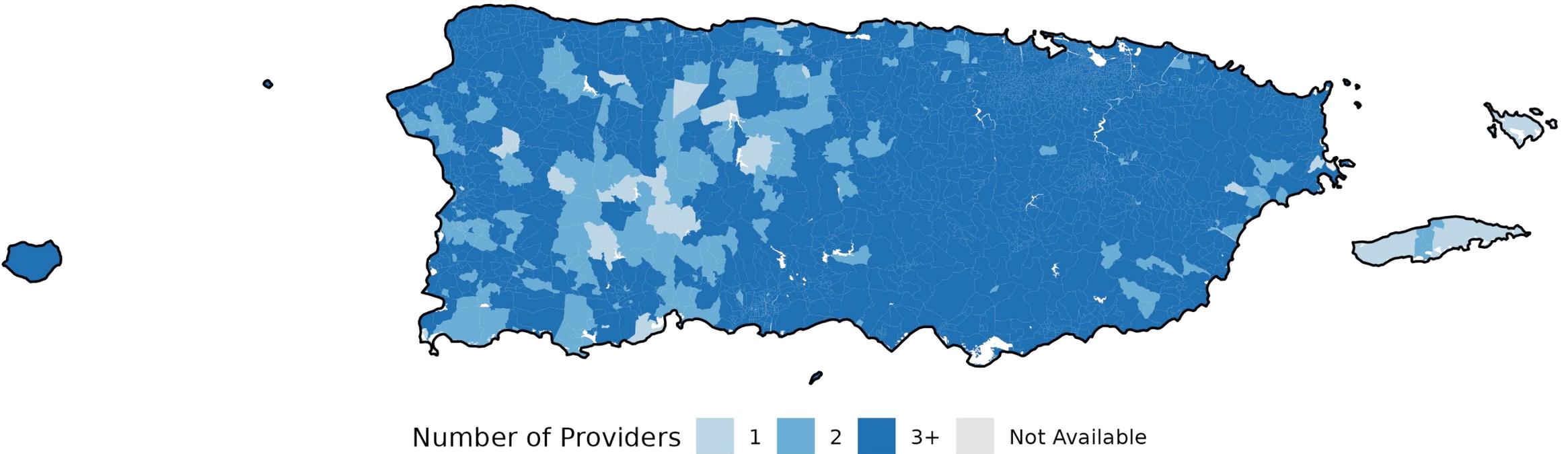
Lower Tier
Satellite/Copper/Other



Number of Providers 0 1 2 3+

- Cable and Fiber offer very high broadband download speeds on average, exceeding 1000 Mbps
 - However, there are fewer areas with more than 1 providers – impact on price/adoption
- Fixed Wireless sees the same trends
- Satellite and Copper generally offer lower speeds (closer to 100/20) than the other three categories, but most of New England sees areas with 3+
 - NGSO satellite options show higher average speeds

Internet Providers (at least 100/20 Mbps)



- Puerto Rico has coverage for almost all of the eastern half of the island in terms of areas with 3+ providers offering speeds of at least 100/20 Mbps (mainly San Juan and surrounding areas)
- The western half of the island has more areas with only 1 to 2 providers. Vieques, the rightmost island, also sees very few providers
- Disparities may be largely associated with differences in topography and income

Table: Share of Covered Populations in northeastern Census Tracts with access to providers offering at least 100/20

Number of providers	0	1	2	3+
Rural Populations	0.1%	4%	18%	78%
Aging Populations (65+)	0%	3%	15%	82%
Low-and-Moderate Income	0.1%	2%	18%	81%
Individuals w/ Disabilities	0%	1%	4%	95%
English as a Second Language	0%	1%	5%	93%
Racial and Ethnic Minorities	0%	2%	7%	92%
Native/Tribal	0.3%	4%	30%	76%
Veterans	0%	0%	4%	96%

Source: FCC National Broadband Map, American Community Survey 2020 5-yr Estimates

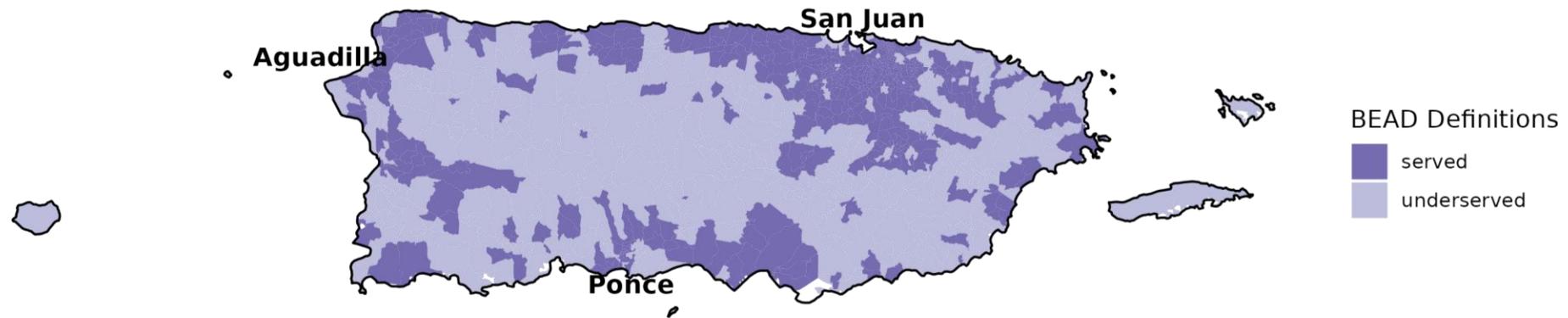
- Nearly zero percent of the covered populations live in census tracts where there are no providers offering at least 100/20 Mbps
- Rural populations, aging populations, and tribal communities are less likely to be in areas with 100/20 Mbps offering
- There may be discrepancies in access on a neighborhood level

Table methodology: shares of the Covered population with access to 10/20 Mbps offerings were calculated as followed: the total number of Covered Population with 0/1/2/3+ providers in a Census Tract divided by the total population of Covered Population in the Census Tract

Access to High-Speed Internet

Puerto Rico Fixed Broadband Speeds

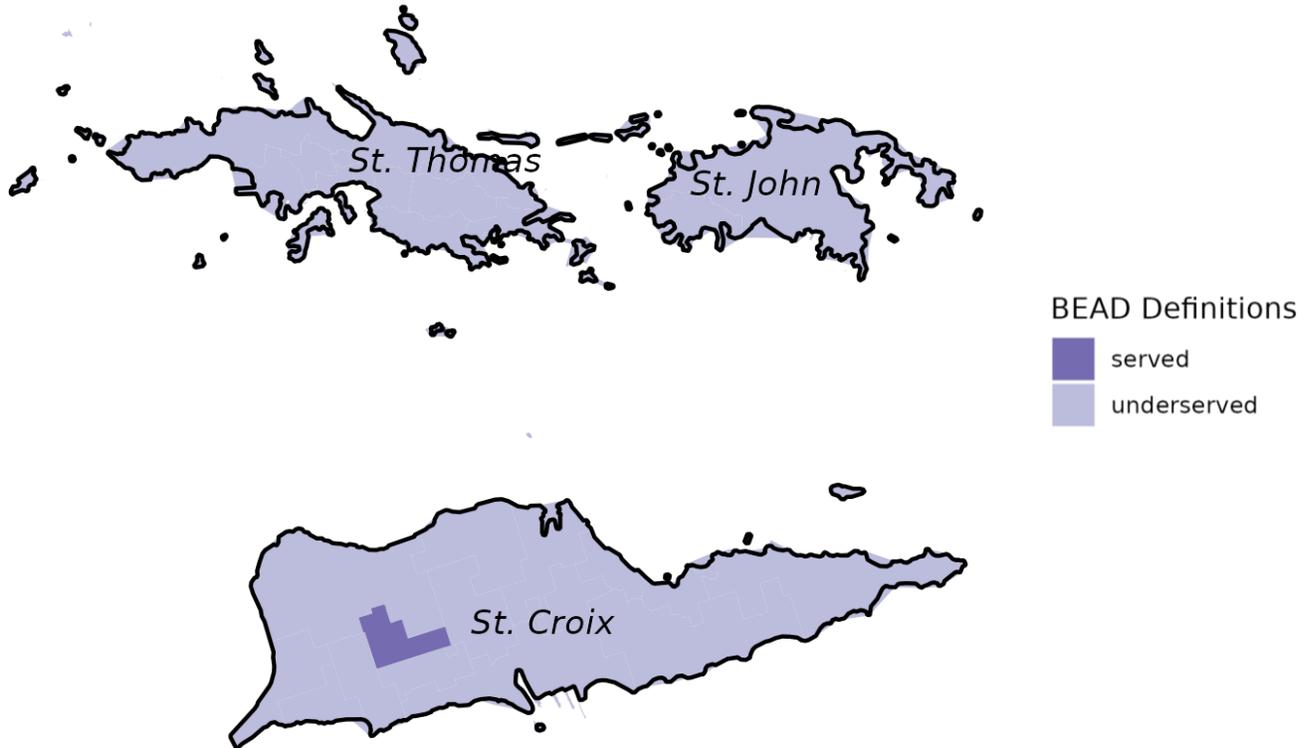
Average Download/Upload Speeds by Census Tract



- Majority of Puerto Rico is underserved, receiving between 25/3 and 100/20 Mbps
- The areas that are served appear to be closer to more urban areas, while areas that are rural are largely underserved

USVI Fixed Broadband Speeds

Average Download/Upload Speeds by Census Tract

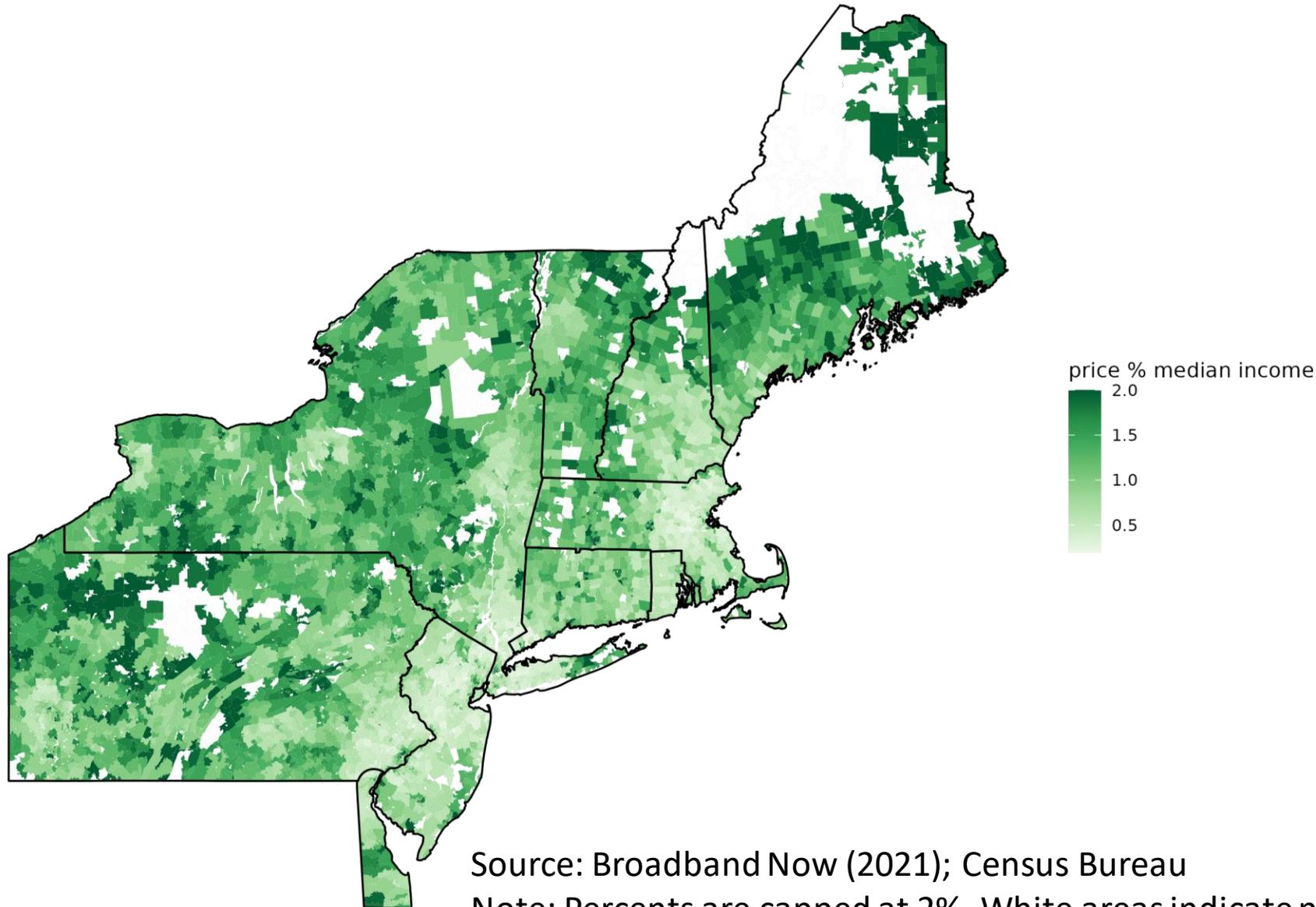


- The vast majority of the USVI is underserved, with most experiencing internet speeds of below 100/20 Mbps
- Limited number of ISPs, and reliance on a long-distance fiber network
- Speed test data can be very informative for the USVI and Puerto Rico because they offer a sample of speeds that communities are experiencing and receiving, in contrast to what ISPs report

Source: Ookla Speed Test Data (7/22); Census Bureau

Broadband Affordability

Lowest available price as % of median household income (25/3 Mbps)

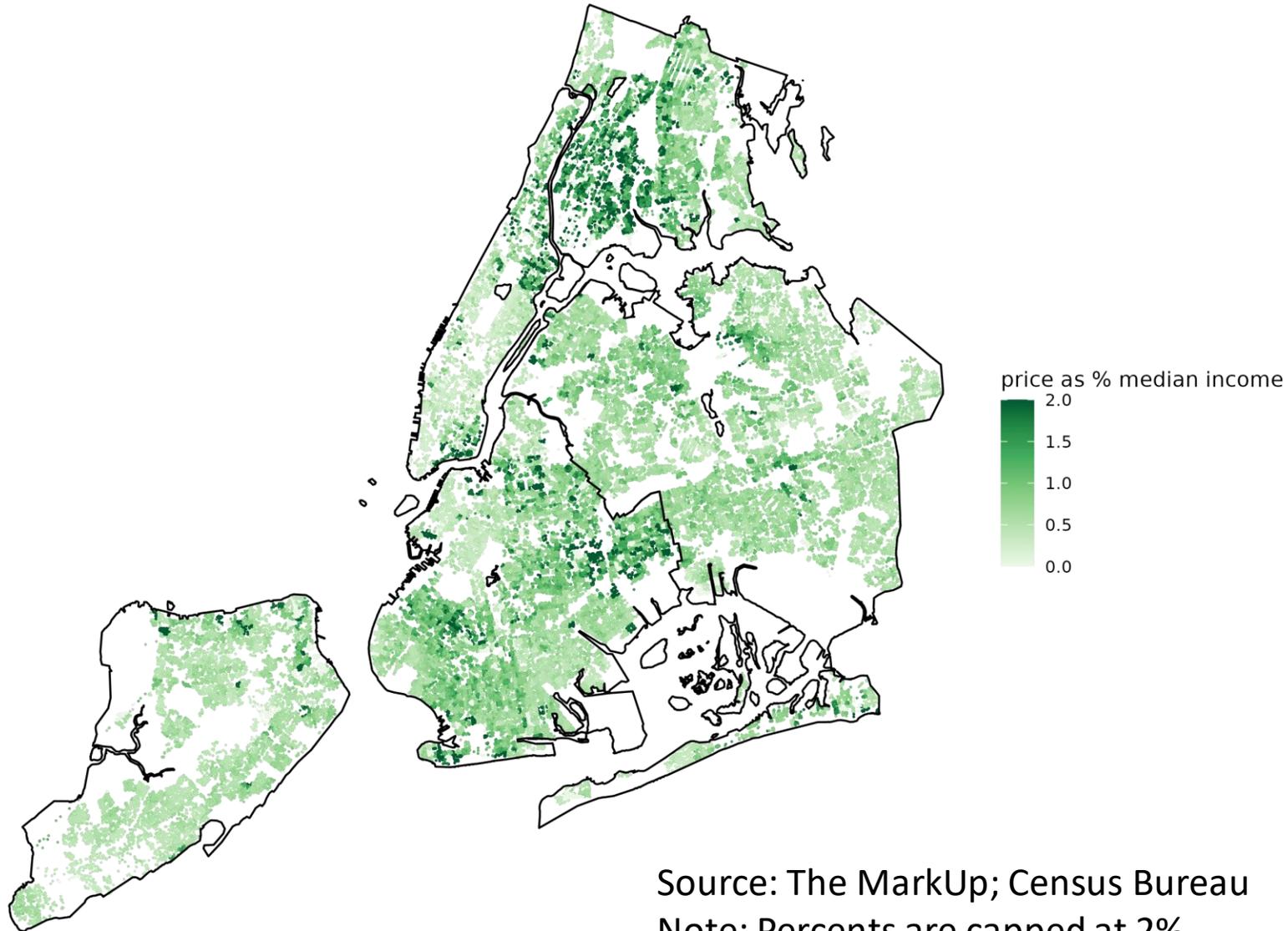


Source: Broadband Now (2021); Census Bureau

Note: Percents are capped at 2%. White areas indicate no data.

- Limited affordability and pricing metrics available from BroadbandNow
- Prices appear to be a small burden on median income in areas that are more urban and populated, while less populated, more rural areas see shares as high as 2%
- Considering this metric is *lowest* available price, 2% is significant
 - LMI populations make trade-offs between utilities including broadband

Broadband Affordability in Cities: Mapping NYC with the MarkUp Pricing Data



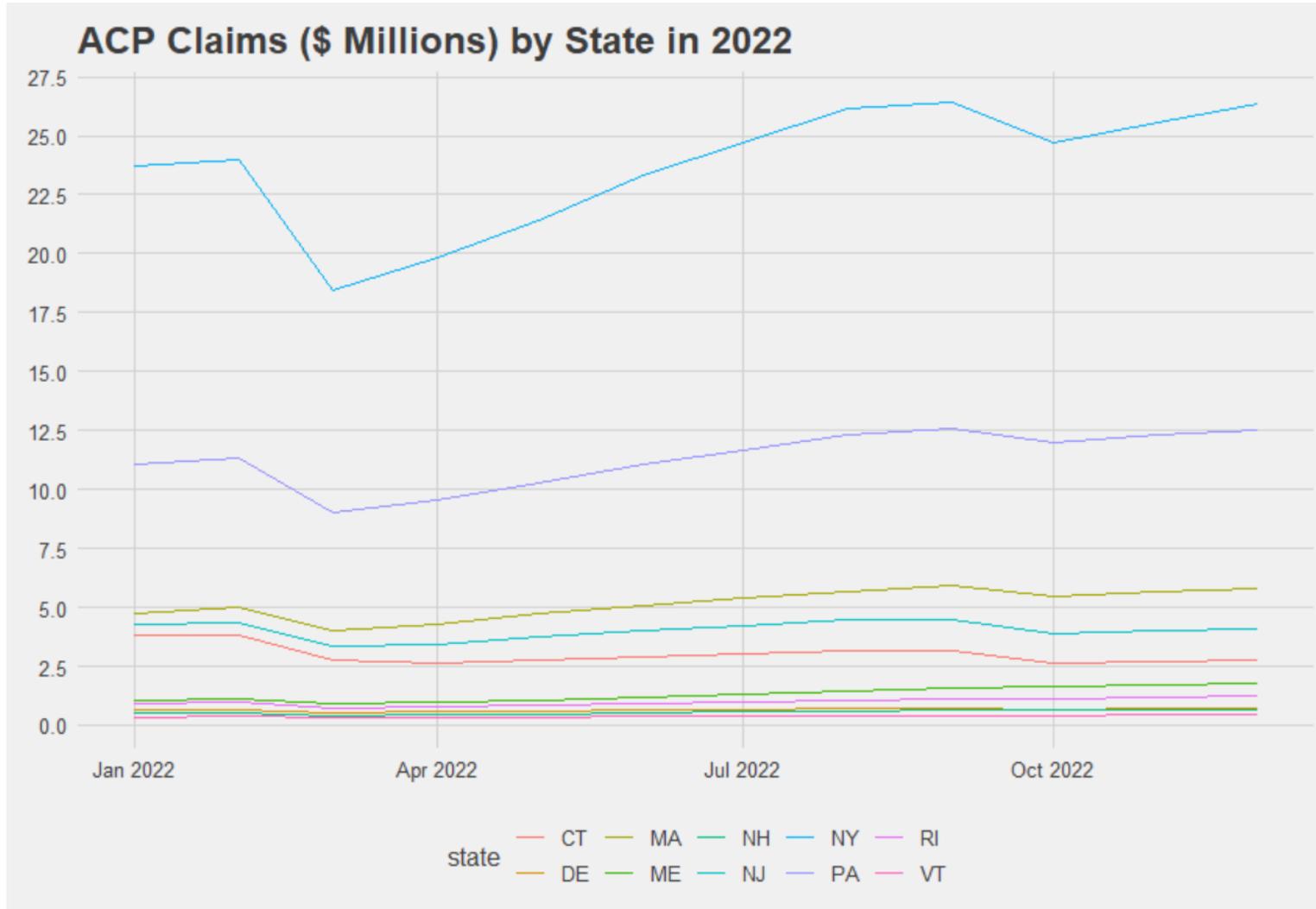
Source: The MarkUp; Census Bureau
Note: Percents are capped at 2%.

- Taking a closer look at New York City shows broadband prices are more of a burden for communities around the city
- Parts of the Bronx, Upper Manhattan, and Eastern Brooklyn see a concentration of households where internet costs are a higher percentage of median income compared to surrounding neighborhoods
- MarkUp data for New York City is only available for one provider and is currently limited to households who purchase internet from this specific provider

Potential Uses of Pricing Data from The MarkUp

- The newly [released technical documentation \(DIY guide\)](#) provides a guide for communities to aggregate addresses in their area and run a web-scraping algorithm to pull prices for various tiers of internet service from different ISPs
- The data collected from this approach is much more granular and accurate. It can also be combined and compared with qualitative information obtained from communities
- City-level data is available to more accurately study the local discrepancies in broadband pricing and demographic characteristics

Affordable Connectivity Program Claims (2022)



- New York and Pennsylvania have claimed the most amount of ACP dollars, compared to other states in the Northeast
- Note that this may be due to the larger population size of these states, but another component could be more pickup in certain states compared to others
- Additional info to come:
 - ACP Enrollment as a share of eligible population by state
 - ACP enrollment and claims among eligible covered populations

Source: Universal Service Administration Co. (USAC)

Takeaways

- On broadband data:
 - Access: FCC National Broadband Map
 - Usage: NTIA Internet Usage Survey, Census ACS
 - Speed: Ookla Speed Tests (or others), FCC National Broadband Map
 - Pricing: Datasets are limited, but BroadbandNow and The Markup offer good metrics.
- On covered populations:
 - Rural, LMI and tribal communities are most impacted by technology type and access.
 - Difficult to understand trends for disabled individuals , ESL, and veteran populations at the tract level - these populations might be better understood with community outreach as well as local datasets specific to these populations and their needs.

Thank You!