Broadband USA

NTIA Grants Program in the Consolidated Appropriations Act of 2021

March 17, 2020

2:00 pm EST

Registration is required for each webinar:

https://broadbandusa.ntia.doc.gov/event

Today's Participants

Moderator/ Presenter:

- Karen Perry, Senior Policy Analyst, BroadbandUSA, NTIA, Department of Commerce

Presenters:

- Lai Yi Ohlsen, Project Director, Measurement Labs
- Bryan Darr, Vice President, Smart Communities, Ookla

Helpful Information

Questions

- Please type questions in the Q&A box on the right hand side of the screen. Questions will be taken after the final presenter.

Presentation

- The presentation along with a transcript and recording will be available on the BroadbandUSA website within 7 days of this webinar under Events/past events.
- https://broadbandusa.ntia.doc.gov/past-event

Technical Assistance

- Guides, products, publications, and other tools are available to assist you with the planning, funding and implementation of your broadband project.
- https://broadbandusa.ntia.doc.gov

Using Data as a Foundation for Broadband Planning

Karen Archer Perry

February 17, 2021

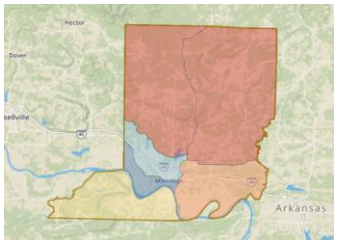
Using Federal Data as a Foundation for Planning

Major federal broadband data sets

Federal tools to access open data

Third party tools and speed tests

Add local insights



Three Federal Sources for Computer and Internet Data

✓ American Community Survey (ACS)
U.S. Census Bureau

- NTIA Internet Use Survey
U.S. Census Bureau Current Population Survey (CPS)

- Form 477 Broadband Deployment and Subscription
Federal Communications Commission (FCC)

American Community Survey - 17 Million Households over 5 years

United States Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov

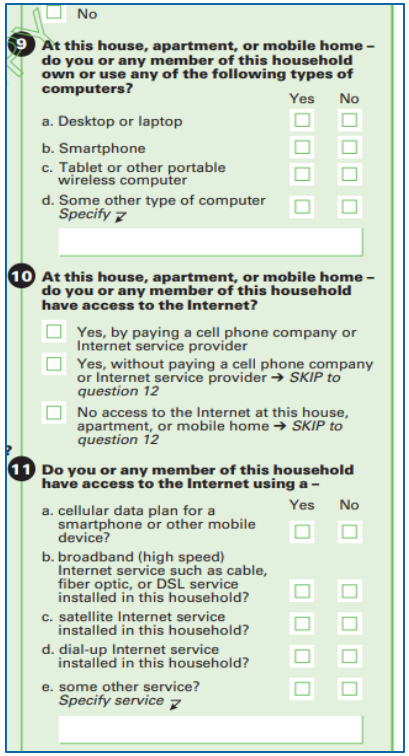
ACS surveys 3.5M households per year for total of 17M households.
5-year estimates include:

- All 3,142 counties
- Tribal areas
- Populations of 20,000 or less
- Geographic areas down to the tract and block group level

www.census.gov/programs-surveys/acs

Comprehensive Demographic Data

United States Census Bureau | U.S. Department of Commerce, Economics and Statistics Administration, U.S. CENSUS BUREAU, census.gov



No

9 **At this house, apartment, or mobile home – do you or any member of this household own or use any of the following types of computers?**

	Yes	No
a. Desktop or laptop	☐	☐
b. Smartphone	☐	☐
c. Tablet or other portable wireless computer	☐	☐
d. Some other type of computer *Specify*	☐	☐

10 **At this house, apartment, or mobile home – do you or any member of this household have access to the Internet?**

- ☐ Yes, by paying a cell phone company or Internet service provider
- ☐ Yes, without paying a cell phone company or Internet service provider → *SKIP to question 12*
- ☐ No access to the Internet at this house, apartment, or mobile home → *SKIP to question 12*

11 **Do you or any member of this household have access to the Internet using a –**

	Yes	No
a. cellular data plan for a smartphone or other mobile device?	☐	☐
b. broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?	☐	☐
c. satellite Internet service installed in this household?	☐	☐
d. dial-up Internet service installed in this household?	☐	☐
e. some other service? *Specify service*	☐	☐

- Subjects:

Age, race and ethnicity, income and poverty, number of children, veteran status, housing type, education level, employment status, industry, commute, and…

Computer ownership, internet subscriptions, cell phone use

- Current Release:

2015-2019 5-year estimates - December 10, 2020

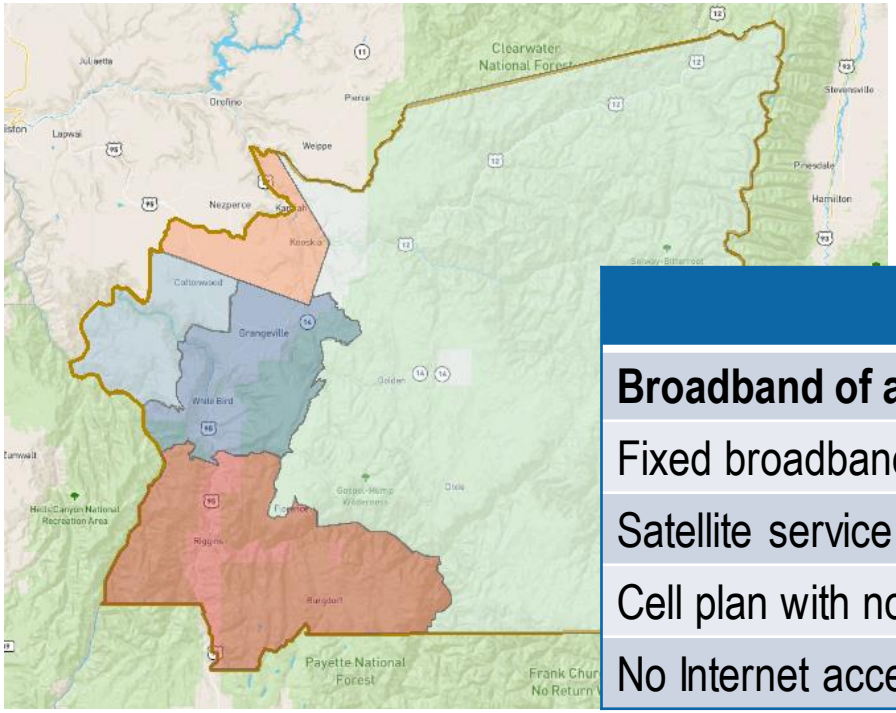
www.census.gov/programs-surveys/acs/methodology/questionnaire-archive.html

ACS Questions on Internet Subscriptions

- With an Internet Subscription
  - With Broadband of any type
    - Wireline as cable, fiber optic or DSL
    - Cellular data plan
      - Cellular data plan only
    - Satellite Internet service
    - Other Service
  - Dial-up only
- Without an Internet subscription
  - Have Access but no subscription
  - No Internet Access

data.census.gov

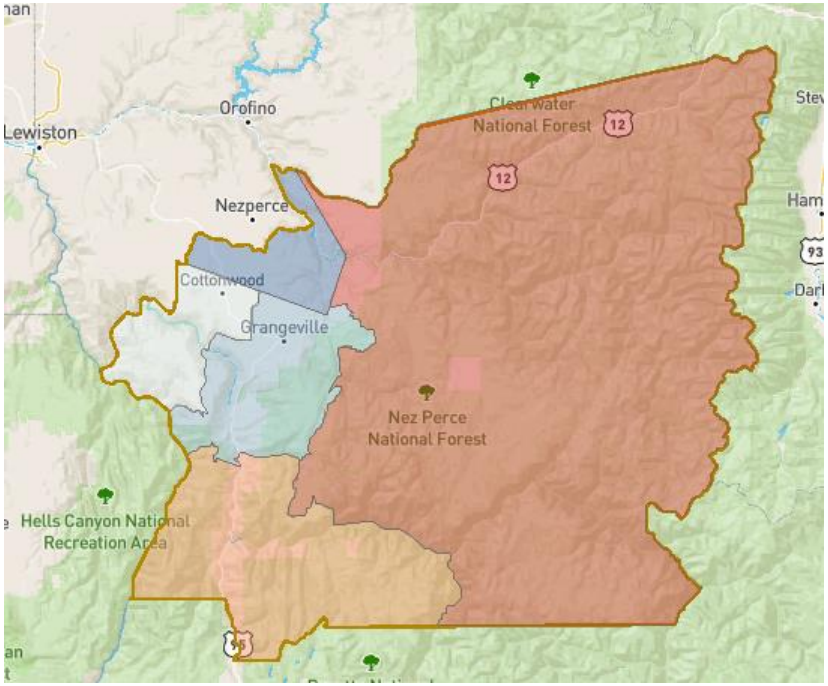
Internet Subscription in Idaho County, ID



	Idaho County	USA
Broadband of any type	**69.4% +/- 3.2%**	**82.7%**
Fixed broadband	37.1% +/- 3.0%	68.9%
Satellite service	29.3% +/- 3.0%	6.3%
Cell plan with no other data	7.1% +/- 1.9%	10.0%
No Internet access	25.1% +/- 3.6%	13.9%

ACS Internet Subscription Rates; Map courtesy of I3 Connectivity Explorer©

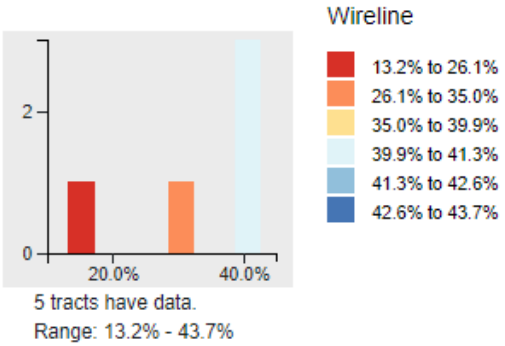
Fixed Broadband Subscription in Idaho County, ID



Census Tract Range

13.2% to **43.7%**

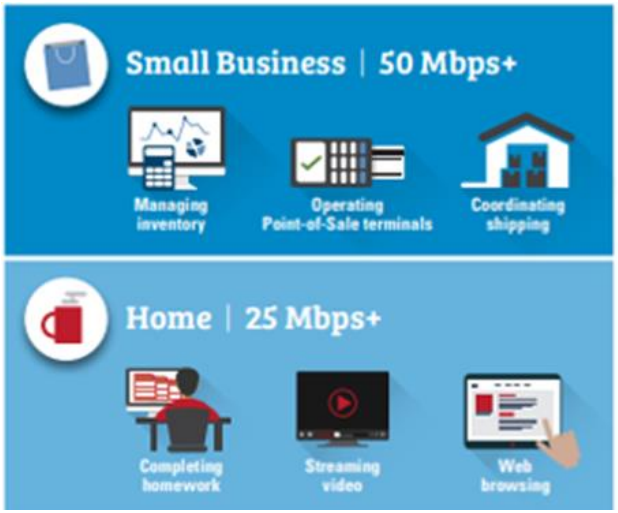
County median 37.1% +/- 3.0%



ACS Internet Subscription Rates; Map courtesy of I3 Connectivity Explorer©

ACS Questions on Device Ownership

- Households with one or more computing devices
  - Desktop or laptop
    - Desktop or laptop and no other computing device
  - Smartphone
    - Smartphone with no other computing device
  - Tablet
    - Tablet with no other computing device
  - Other computer
    - Other computer with no other computing device
- Without a computer



data.census.gov

Digital Divides in Idaho County (pop 16,411)

Homework Gap (under 18)
- 12.2% of children under 18 have no computer and no Internet
- 7.8% of children under 18 have a computer but no Internet

Workforce Gap (ages 18-64)
- 11.5% of adults have no computer and no Internet
- 24.8% of adults have a computer but no Internet

Healthcare and Family Connections Gap (ages 65 plus)
- 8.1% of seniors have no computer and no Internet
- 2.2% of seniors have a computer but no Internet

American Community Survey 2015-2019 Computer and Int
Subscription

Digital Gaps

1600 gap for children

1600 gap for adults

600 gap for seniors

Putting the Data in Your Hands! Tools

NTIA Data Explorer	ntia.doc.gov/data
American Community Survey	data.census.gov
QuickFacts	census.gov/quickfacts
Broadband, Equity, COVID-19*	coronavirus-resources.esri.com
BroadbandNow*	broadbandnow.com
Speedtest by Ookla*	speedtest.net
Measurement Lab*	speed.measurementlab.net
I3 Connectivity Explorer*	i3connect.org

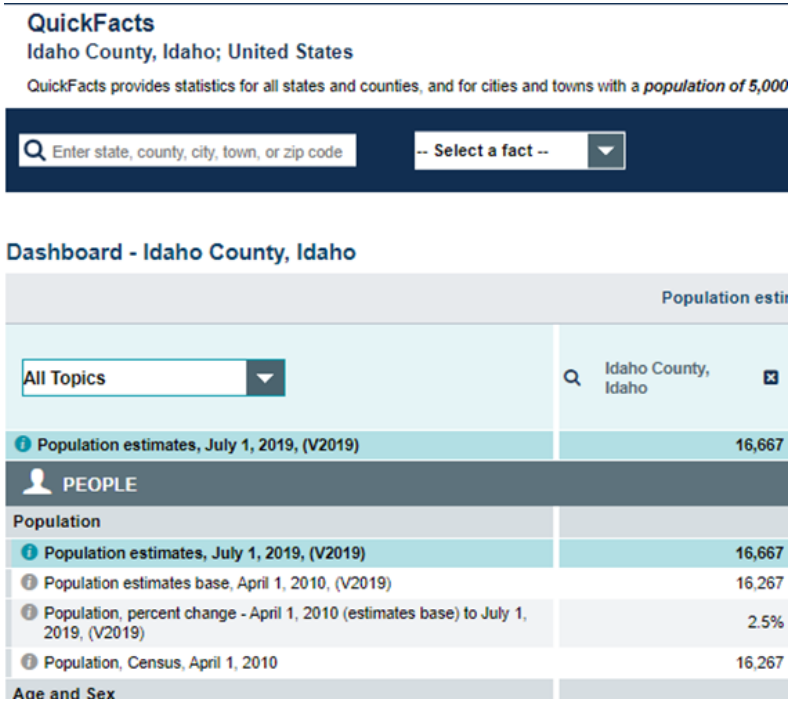
**These are not federal tools. They are external tools or products, listed here because they are used frequently by our clients to access data when developing broadband plans.*

QuickFacts

- People
  - Population
  - Age and Sex
  - Race and Hispanic Origin
  - Population Characteristics
  - Housing
  - Families and Living Arrangements
  - Computer and Internet Use
  - Education
  - Health
  - Economy
  - Transportation
  - Income and Poverty
- Businesses
- Geography

- QuickFacts

https://www.census.gov/quickfacts/fact/



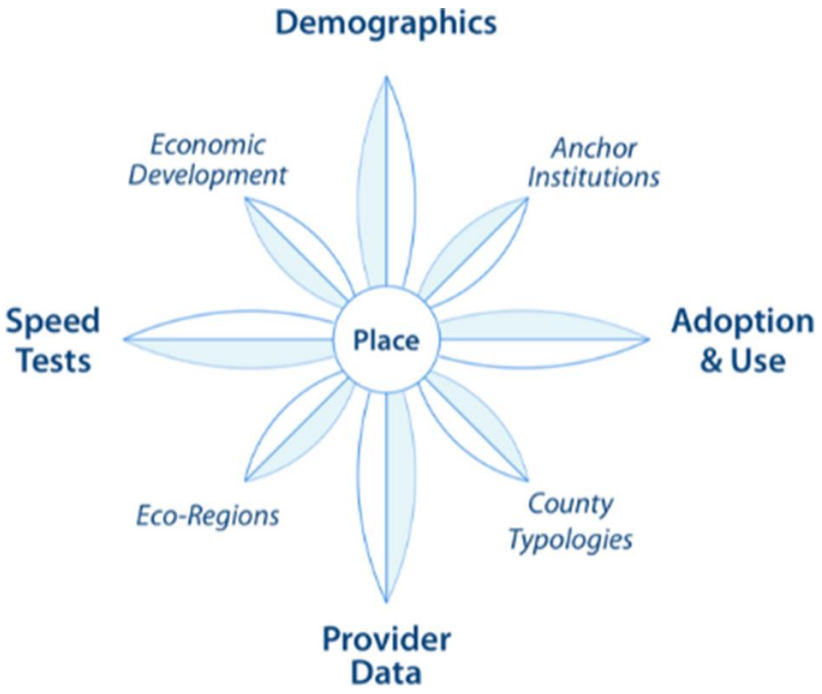
- Recovery Metrics – Updated Weekly!
- Household Pulse Survey Dashboard

I3 Connectivity Explorer – A place-based view

Internet as Infrastructure

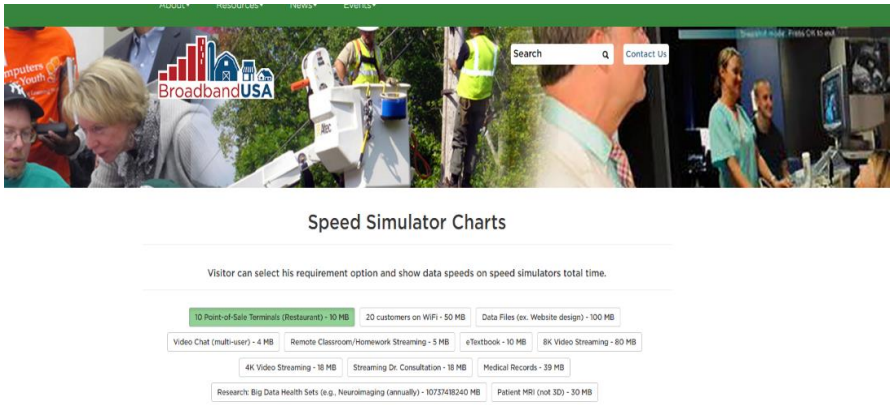
Views broadband connectivity data broadly through the lens of the places we live:

- Towns
- Counties
- County subdivisions
- Tribal regions
- School Districts
- Congressional Districts
- States



i3connect.org *https://community.internet-is-infrastructure.org/*

Contact BroadbandUSA



Submit Technical Assistance form:
https://broadbandusa.ntia.doc.gov/ntia-common-content/how-we-can-help

Website: https://broadbandusa.ntia.doc.gov/

Email: broadbandusa@ntia.doc.gov

Phone: 202-482-2048

Contact:

KPerry@ntia.gov or 202-697-2104

Lai Yi Ohlsen, Project Director, Measurement Labs

Measurement Lab
@measurementlab

Lai Yi Ohlsen
laiyi@measurementlab.net

Mission

M-Lab's mission is to measure the Internet, save the data and make it universally accessible and useful.

Motivation

M-Lab @ CS&S Code for Science & Society

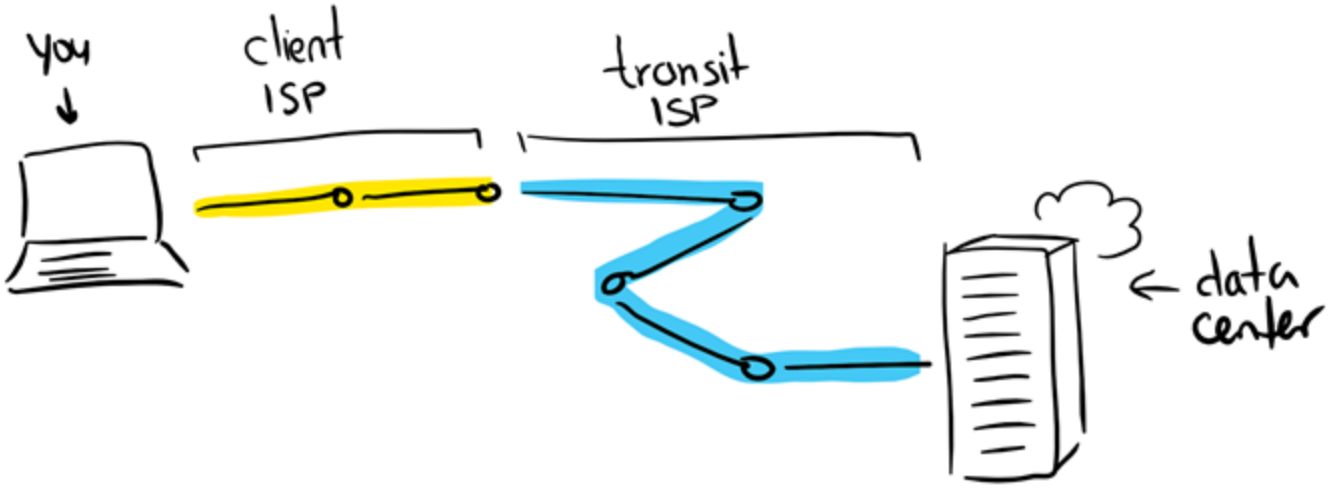
M-Lab's mission is to measure the Internet, save the data and make it universally accessible and useful.

We do this because we are want to support a healthy Internet and we know a healthy Internet can be taken for granted.

How we measure the Internet

MLAB
@ CS&S Code for Science & Society

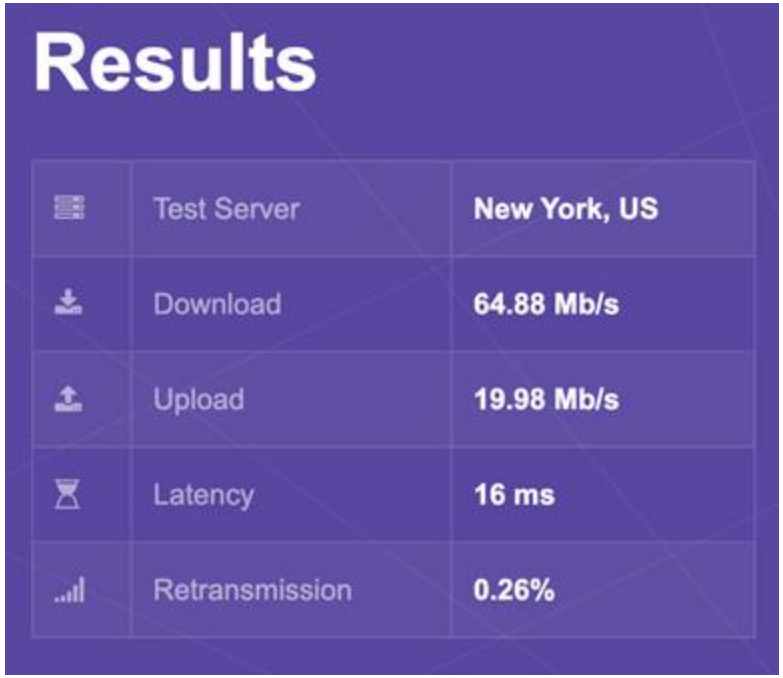
We run an off-net platform of 500+ servers in 130+ metros.



How we measure the Internet

MLAB @ CS&S Code for Science & Society

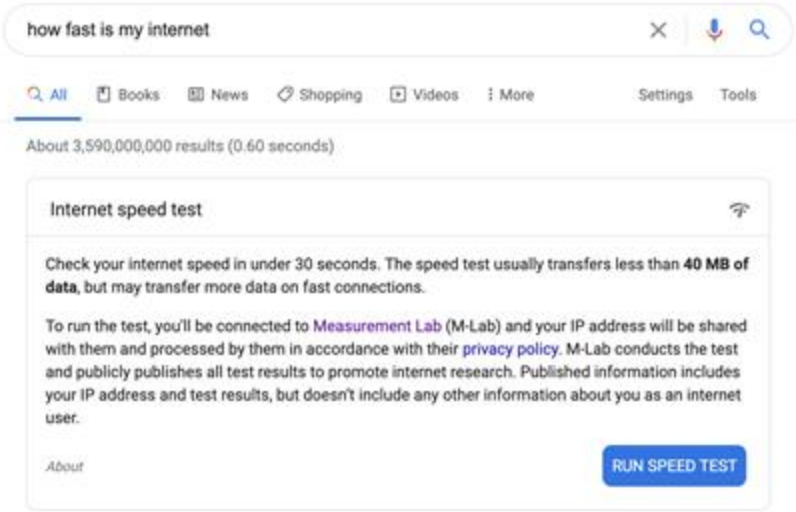
NDT reports the upload, download, and latency metrics of a connection's "single-stream bulk transport capacity", a standard defined by the IETF and provides an effective baseline for a user's performance.

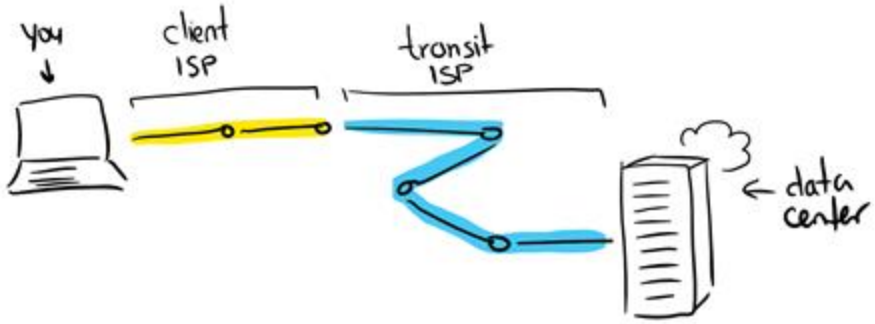


How we measure the Internet

MLAB @ CS&S Code for Science & Society

Data is generated by users using client applications to run tests against M-Lab servers.

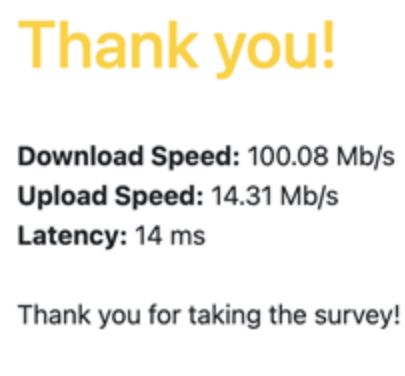


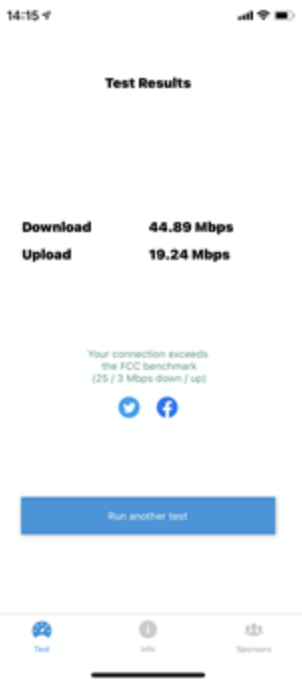


Data

MLAB @ CS&S Code for Science & Society

When a user runs a test, they are shown their results and the results are then publicly archived in our free and open database.

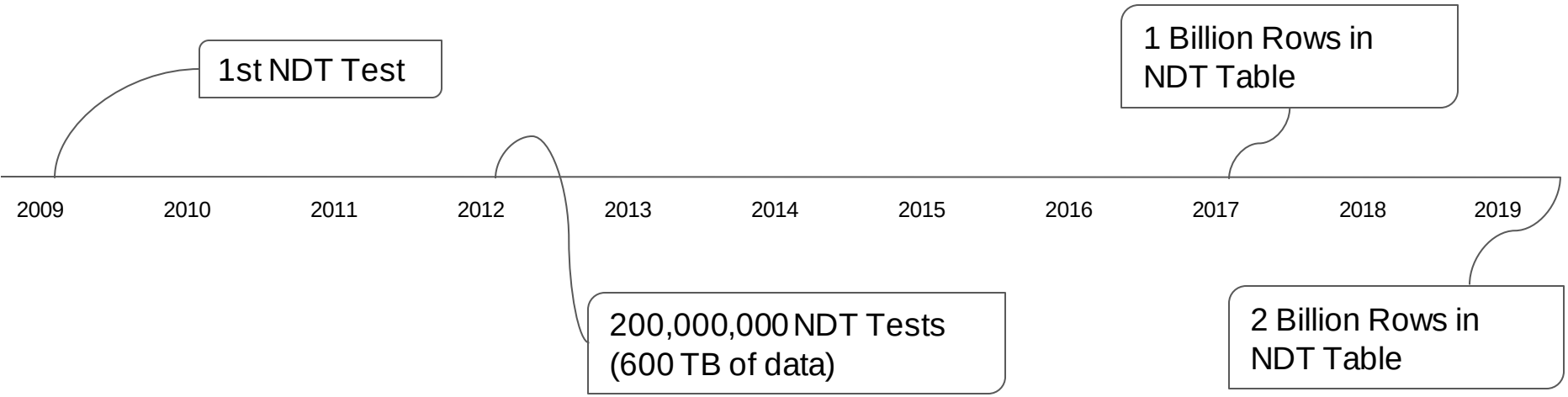




Data

MLAB @ CS&S Code for Science & Society

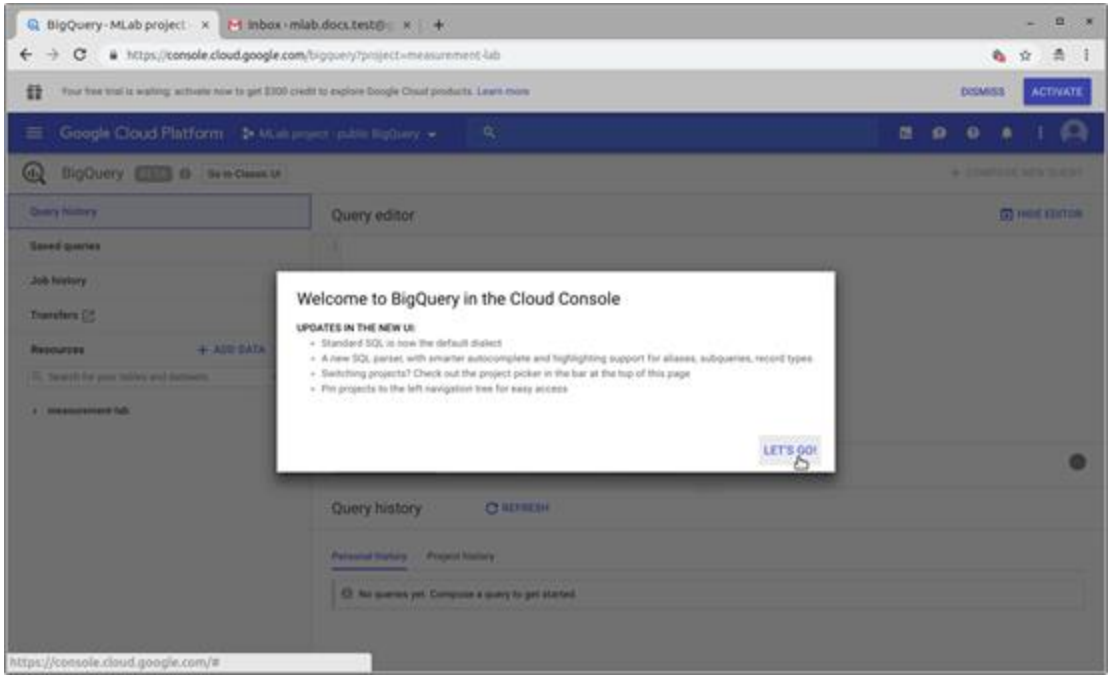
As of 2021, we have over 2 billion rows of NDT data.



Data

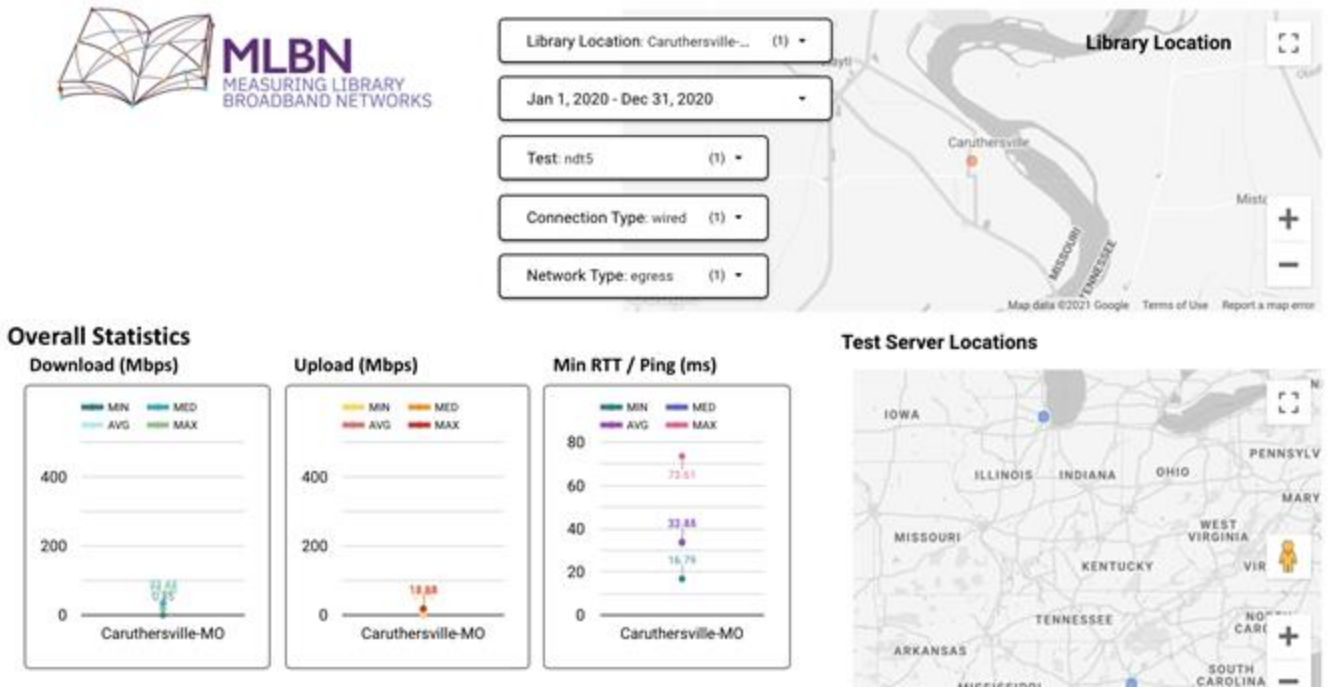
MLAB @ CS&S Code for Science & Society

All data is publicly archived and accessible for free using BigQuery.



Data

The data can be visualized using tools such as DataStudio.



Data

The data can be visualized using tools such as DataStudio.

MLAB

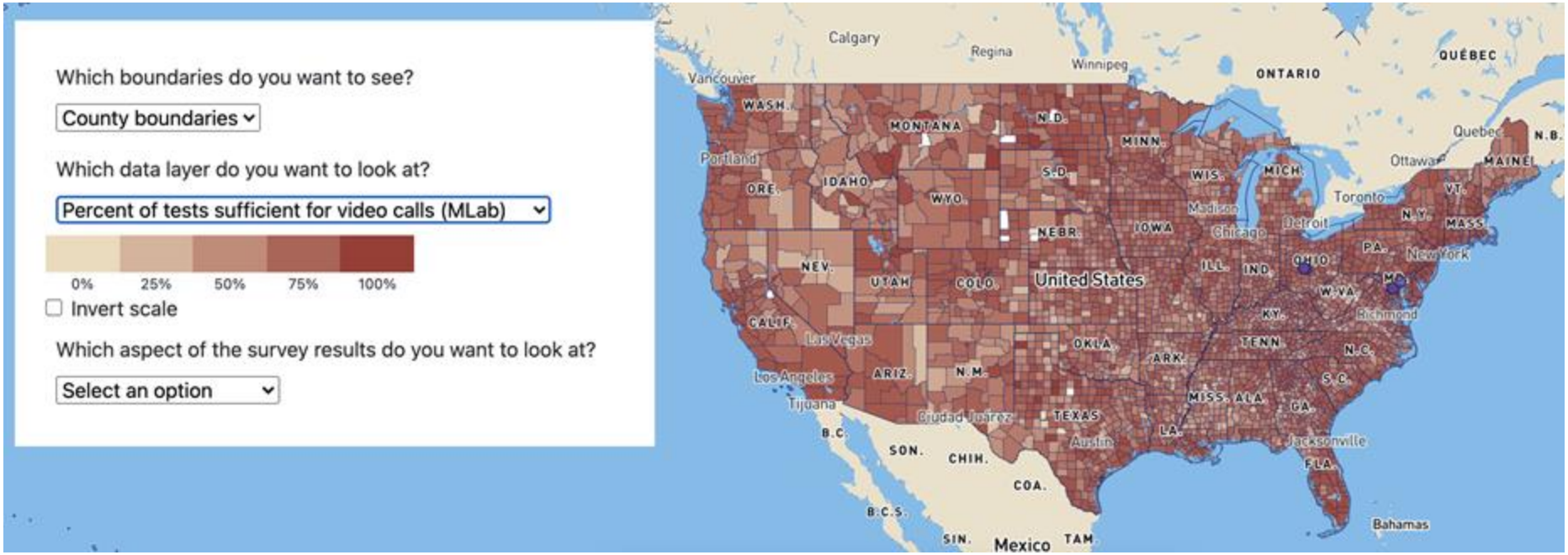
@ CS&S Code for Science & Society

Test	Server Network/Host	Location
ndt5	Level 3 Parent, LLC	Chicago, US
ndt5	GTT Communications Inc.	Chicago, US
ndt5	TATA COMMUNICATIONS (AMERICA) INC	Atlanta, US
ndt5	GTT Communications Inc.	Atlanta, US
ndt5	Telia Company AB	Atlanta, US
ndt5	Cogent Communications	Atlanta, US
ndt5	Level 3 Parent, LLC	Atlanta, US
ndt5	Cogent Communications	Chicago, US
ndt5	Zayo Bandwidth	Chicago, US
ndt5	TATA COMMUNICATIONS (AMERICA) INC	Chicago, US

1 - 10 / 10

Data

MLAB @ CS&S Code for Science & Society



Local data collection

MLAB

@ CS&S Code for Science & Society

All M-Lab code is open source. NDT can integrated into any website or you can use an existing integration such as TestIT, SpeedUp America or Piecewise.

Good for: public engagement and citizen science campaigns.

Automatic, recurring measurements

MLAB

@ CS&S Code for Science & Society

MLBN
MEASURING LIBRARY BROADBAND NETWORKS

Automatic, recurring measurement can help eliminate issues of self-selection bias and require minimal human intervention.

Good for: feasibility studies and community anchor institutions.

chrome web store

Home > Extensions > M-Lab Measure

M-Lab Measure

Offered by: Measurement Lab

★★★★★ 12 | Social & Communication | 1,000+ users

Mission

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Questions? support@measurementlab.net

Measurement Lab
@measurementlab

MLAB
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Using Data as a Foundation for Broadband Planning

February 17, 2021

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Ookla®

The global leader in mobile and broadband network intelligence, testing applications and technology. Internet service providers, mobile network operators, businesses and government agencies alike rely on Ookla for unparalleled and immediate information on the state of networks and online services.

Trusted by the Public

- Hundreds of millions of users
- 10+ million tests taken every day (**34+ billion** tests to date)
- Anonymized data ensures privacy and GDPR compliance
- Clients include every major telecom provider in the United States

Speedtest has the most …

Users Tests Data Insight

SPEEDTEST®

SPEEDTEST by OOKLA

2020 Speedtest Stats for the United States

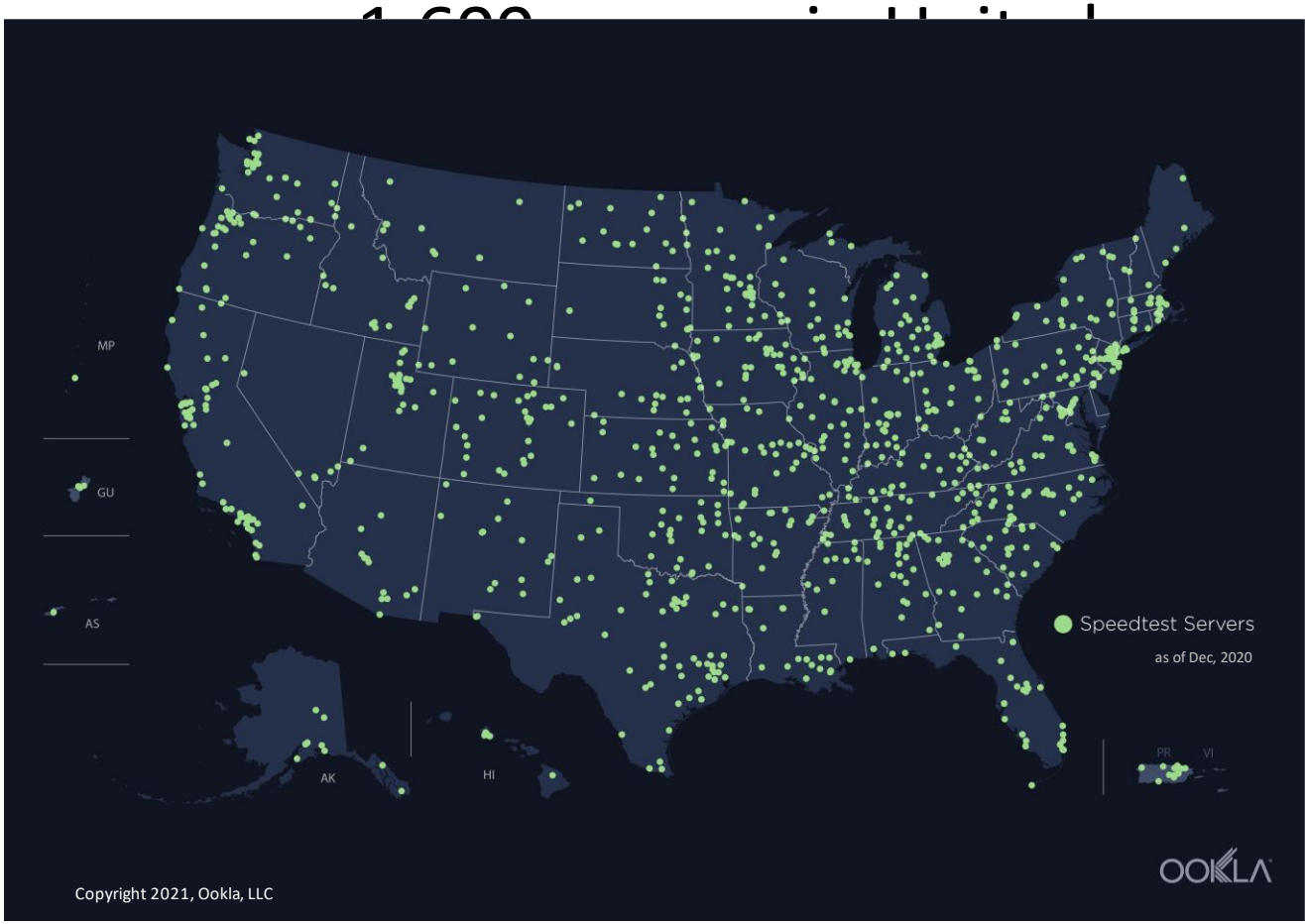
293 million
tests combined on fixed & wireless networks

taken on

58 million
unique devices

Key Stat
includes 154 million
tests with GPS precision location

Speedtest Server Network™ has



Speedtest Intelligence®

Why do states need to supplement their data collection efforts?

- Lack of historical data
- Participation will decrease without constant enagement
- Search engine results and app stores will not present your test near top of 1st page
- **Need for greater volume! Speedtest® is collecting an average of 60x more tests**

Examples of Local Collection Efforts

As of Jan 29, 2021	Maine	Minnesota	Washington	Wyoming
Announced launch date	Nov 24, 2020	Aug 3, 2020	Jul 30, 2020	Jul 18, 2019
Test count since launch	14,478	47,716	33,054†	2,754*
Weeks operational	9.5	25.5	26	79
Local Efforts Average per week	**1,524**	**1,871**	**1,271**	**35**
2020 Speedtest™ measurements	1,124,573	5,071,852	8,345,312	445,476
Ookla Average per week	**21,626**	**97,536**	**160,486**	**8,567**

†Test count as of 2/3/12
*Test count has not recently changed

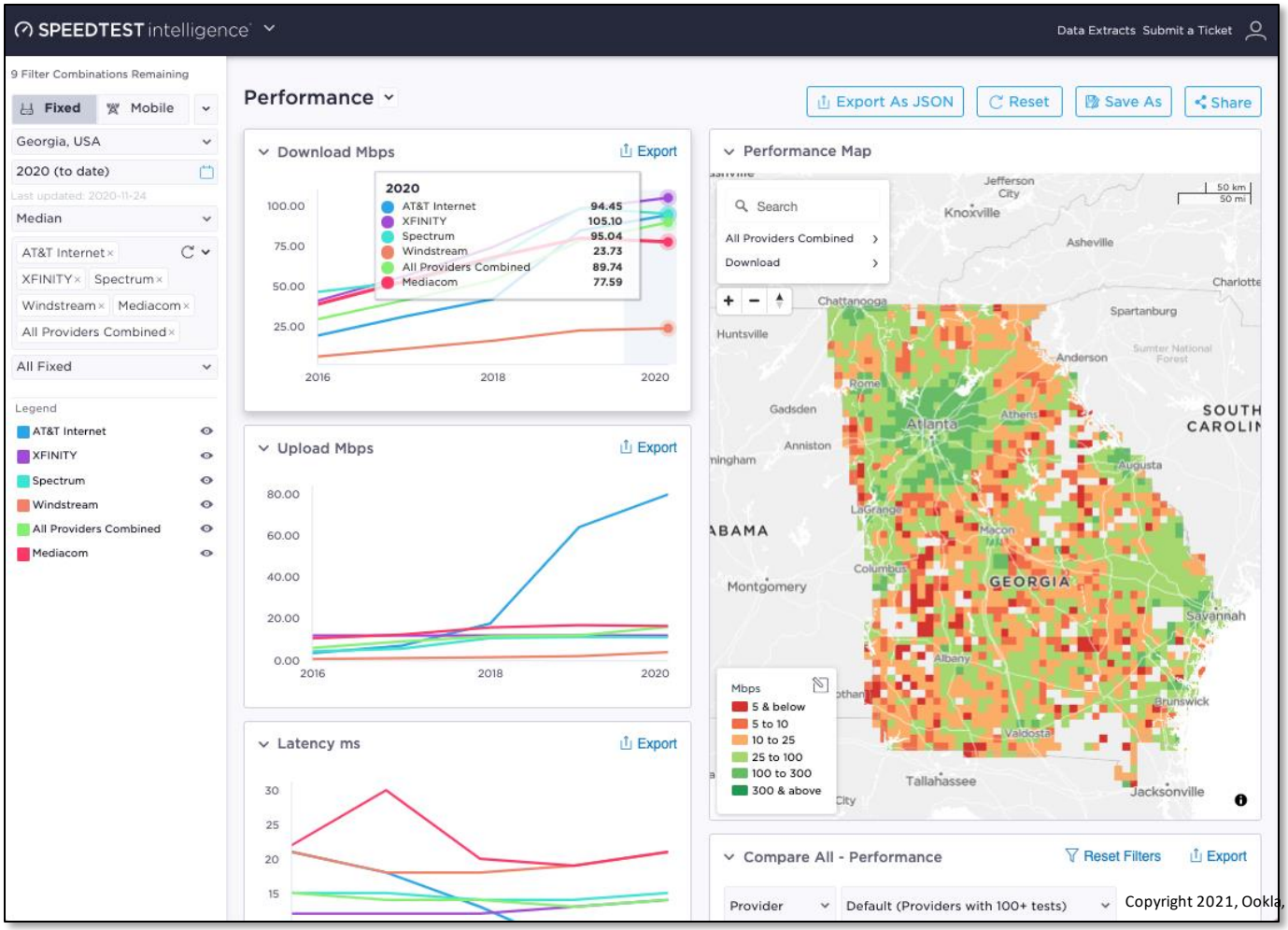
Speedtest Intelligence® Portal

Example:

Georgia

All Fixed Operators

Jan – Nov 2020



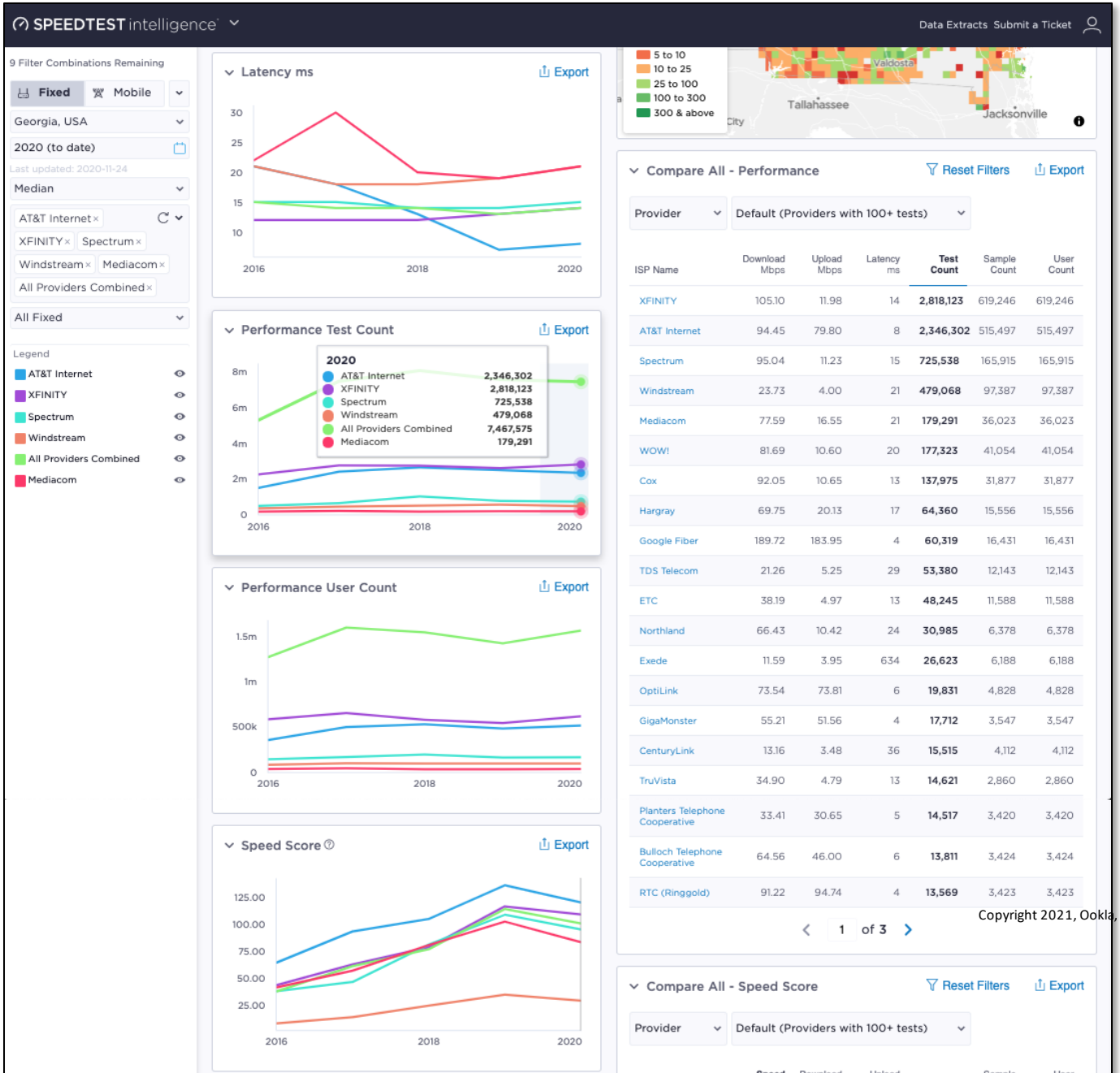
Speedtest Intelligence® Portal

Example:

Georgia

All Fixed Operators

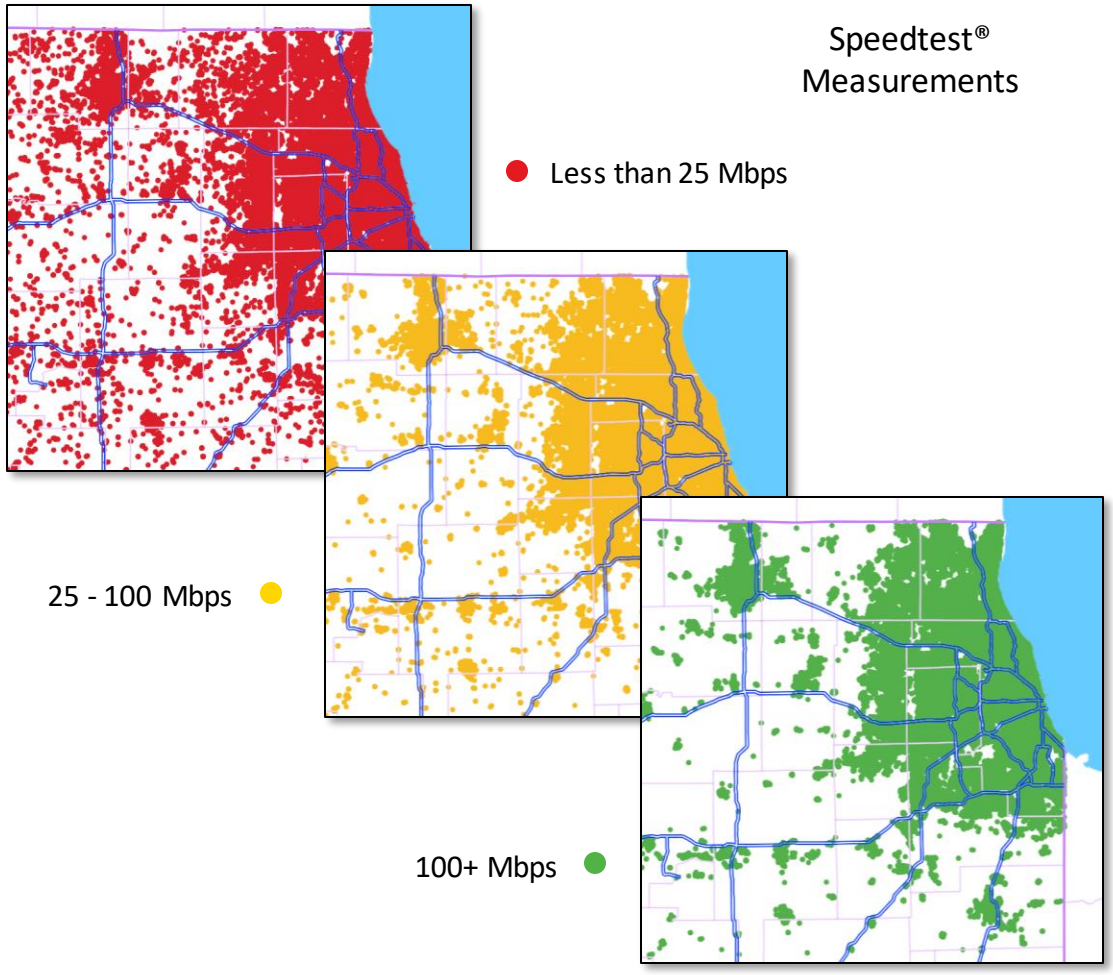
Jan – Nov 2020



Example:
Northeast Illinois
Nov 2019 – Jan 2020

Consumer-Initiated Fixed Network Performance

- Fixed operators tested via Android and iOS devices
- Filtered for records with GPS-provided longitude and latitude

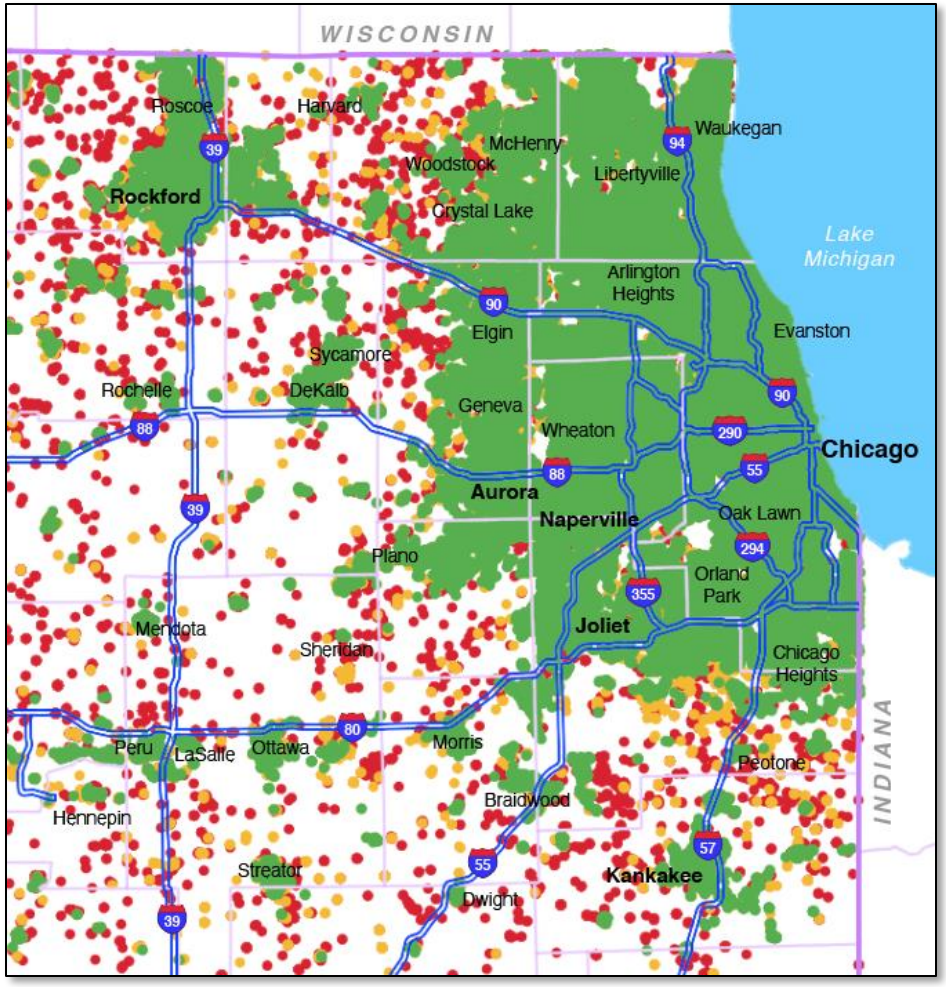


OOKLA®

Example:
Northeast Illinois
Nov 2019 – Jan 2020

Consumer-Initiated Fixed Network Performance

- Fixed operators tested via Android and iOS devices
- Filtered for records with GPS-provided longitude and latitude
- Layering with highest speeds on top allows underserved areas (RED) to clearly show through



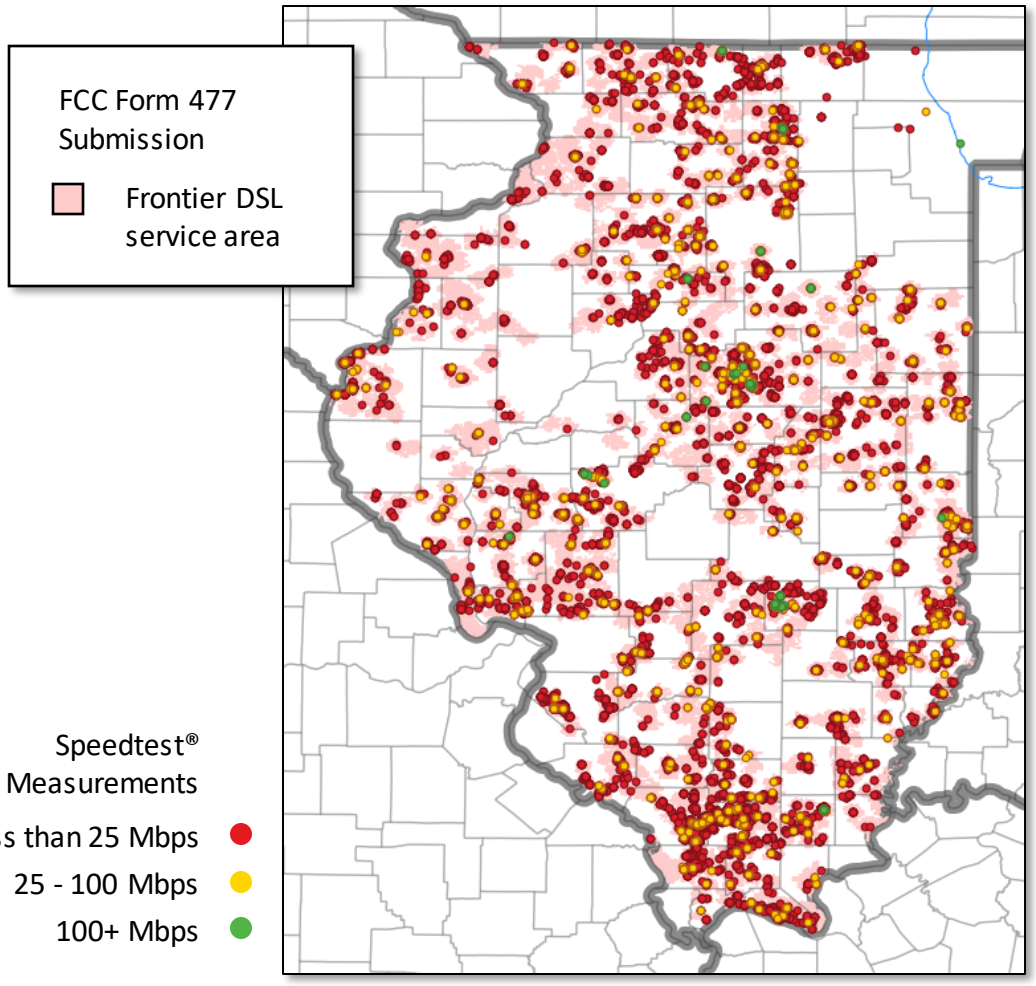
Speedtest® Measurements

- Less than 25 Mbps
- 25 - 100 Mbps
- 100+ Mbps

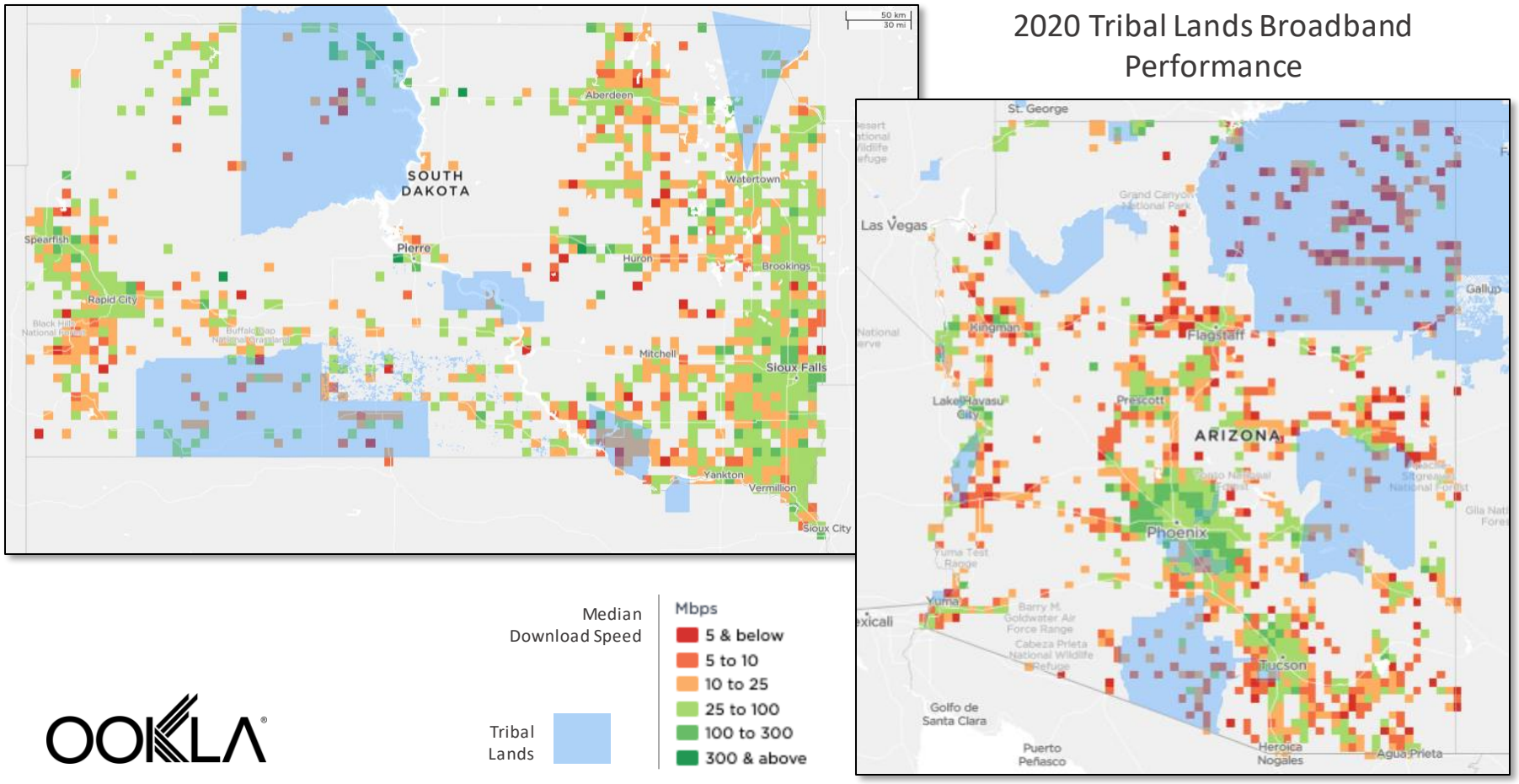
Example:
Northeast Illinois
Nov 2019 – Jan 2020

Consumer-Initiated Fixed Network Performance

- Fixed operators tested via Android and iOS devices
- Filtered for records with GPS-provided longitude and latitude
- Compare test results to each ISP's Form 477 footprints



2020 Tribal Lands Broadband Performance



OOKLA®

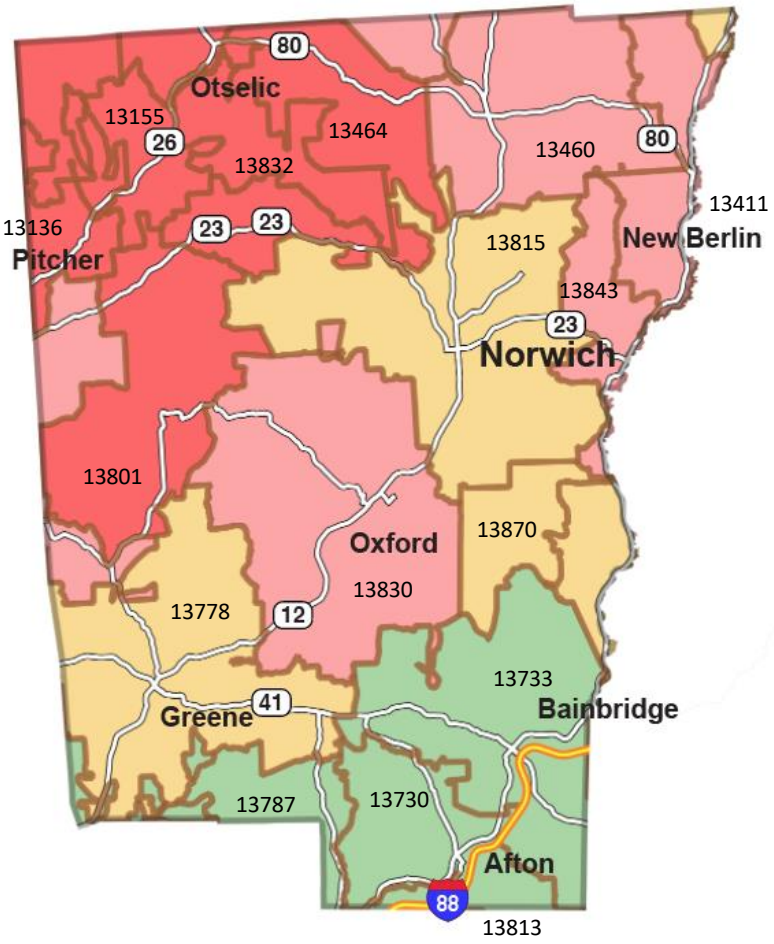
Speedtest Intelligence®

Consumer-Initiated Fixed Network Performance

Example:

Chenango County, NY

All Operators
Jan – Jun 2020



Download Speeds

Median Speeds
by Zip Code

- Less than 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps

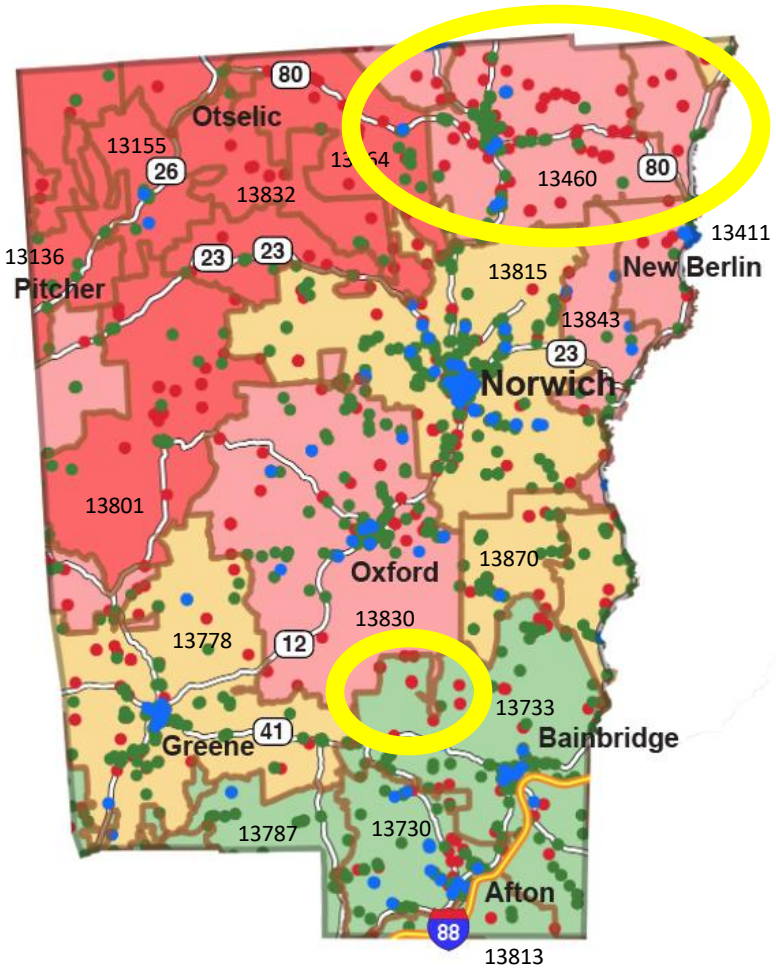
Speedtest Intelligence®

Consumer-Initiated Fixed Network Performance

Example:

Chenango County, NY

All Operators
Jan – Jun 2020



Download Speeds

Median Speeds
by Zip Code

- Less than 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps

Speedtest®
Measurements

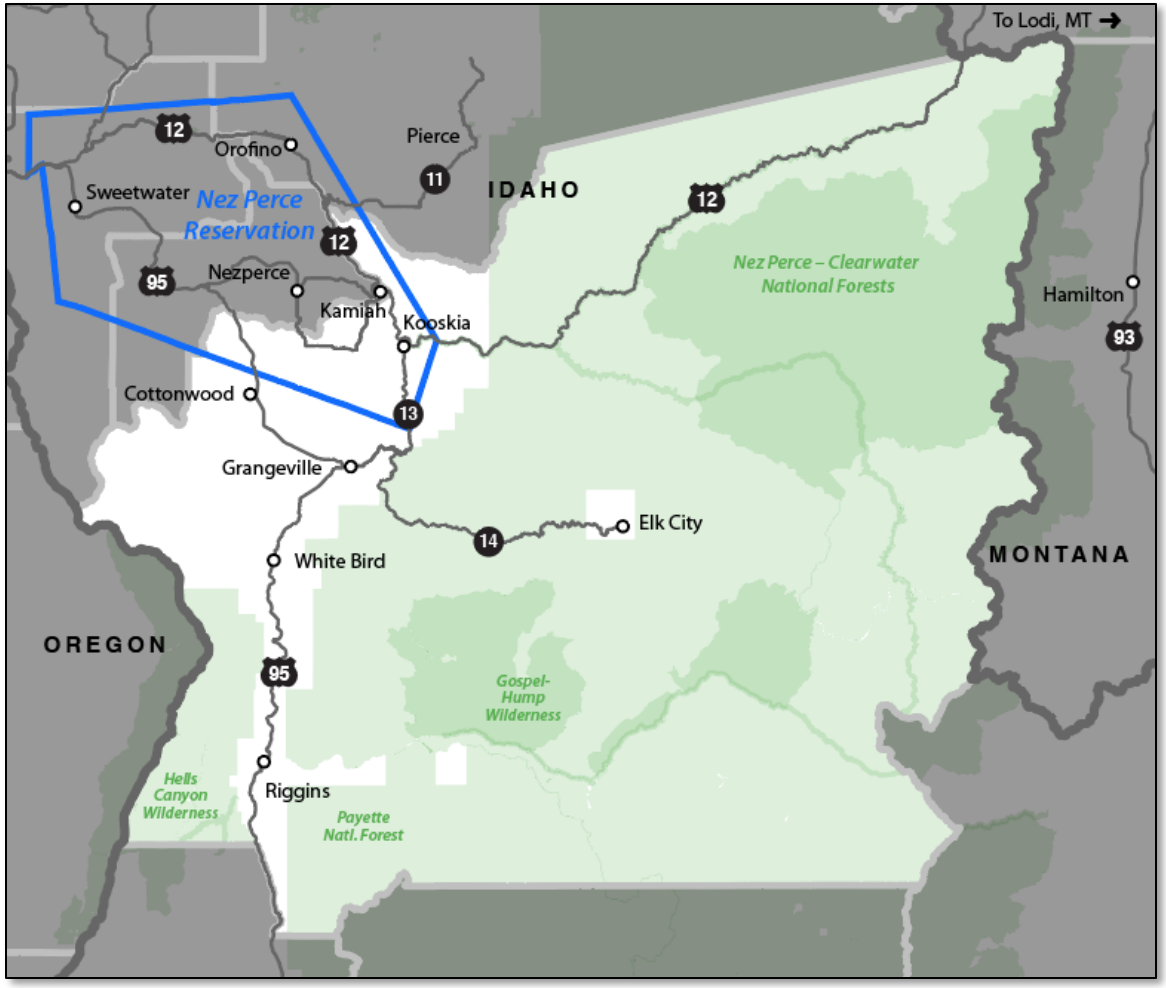
- Less than 25 Mbps
- 25 - 300 Mbps
- 300+ Mbps

Example:

Idaho County, ID

Year 2020

- Identify where people are and where they are not



National Forest or Wilderness area

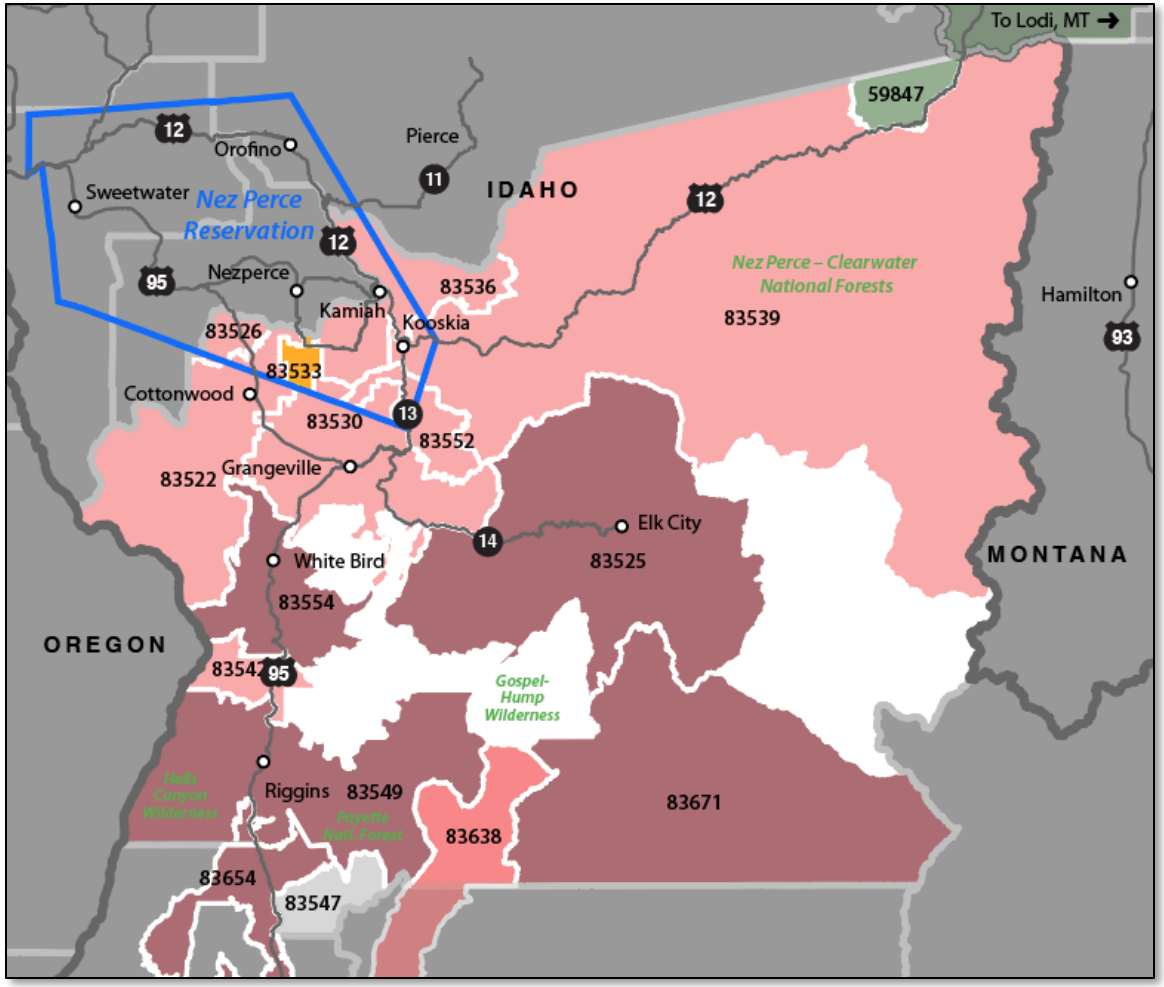
Tribal Lands

Example:

Idaho County, ID

Year 2020

- Identify where people are and where they are not
- Zip codes can represent extremely large areas



Median Speeds by Zip Code

- < 10 Mbps
- 10 - 25 Mbps
- 25 - 50 Mbps
- 50+ Mbps
- No Zip Code assigned

Tribal Lands

OOKLA®

Example:

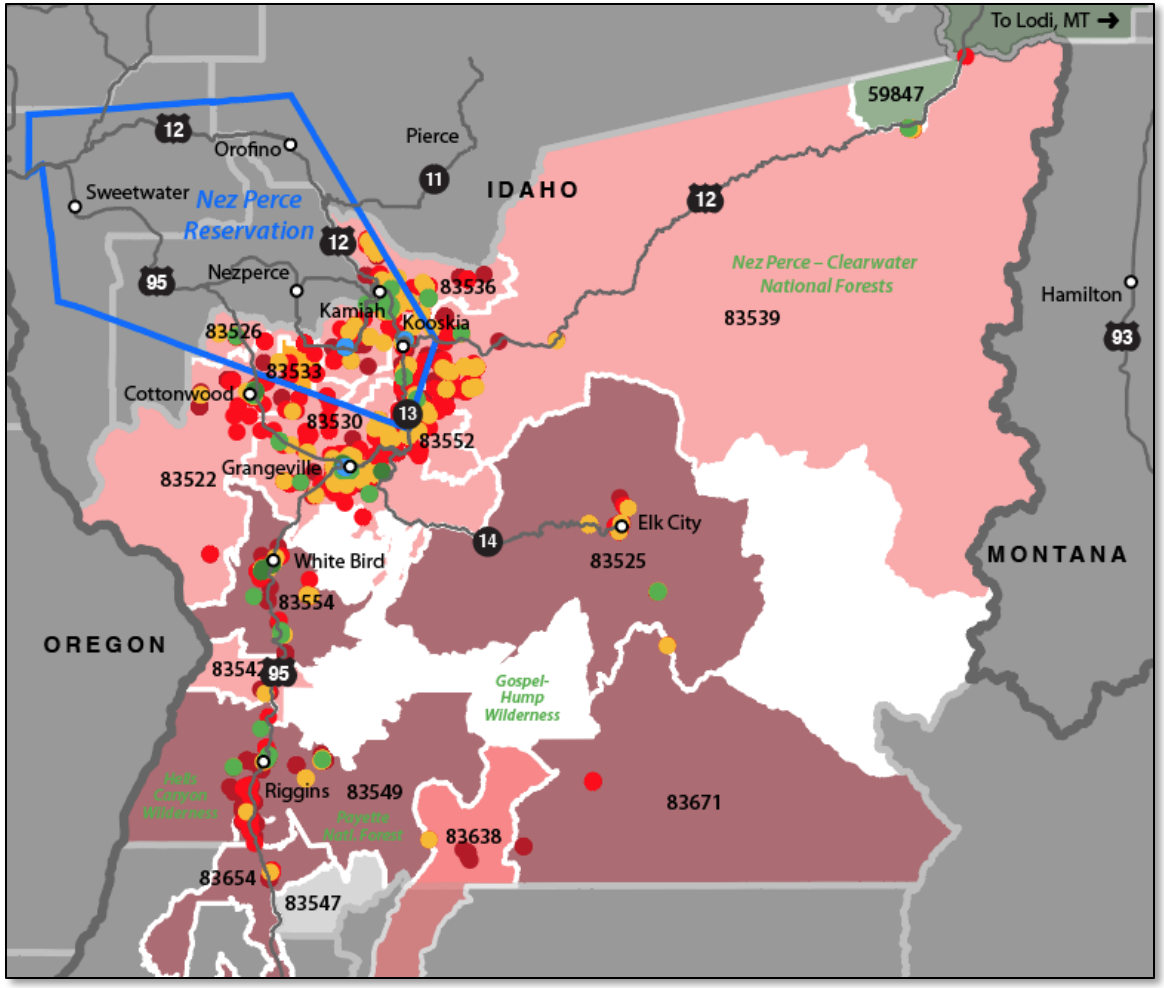
Idaho County, ID

Year 2020

- Identify where people are and where they are not
- Zip codes can represent extremely large areas
- Pinpointing communities in need helps prioritize funding
- Tribal lands offer additional funding opportunities

Speedtest® Measurements	Median Speeds by Zip Code
< 10 Mbps	< 10 Mbps
10 - 25 Mbps	10 - 25 Mbps
25 – 50 Mbps	25 - 50 Mbps
50 – 100 Mbps	50+ Mbps
100 – 300 Mbps	
300+ Mbps	No Zip Code assigned

Tribal Lands



Better Data Means Better Decisions

- A small investment in better data can inform better decisions
- Target areas where broadband is needed most
- Avoid over-building and harming existing businesses
- Analyze using your demographics — do the most good, for the most people
- Prioritize fiber in the Right-of-Way

OOKLA®

Cell Analytics™

Solving for where Wi-Fi/LTE hotspots will work

Schools

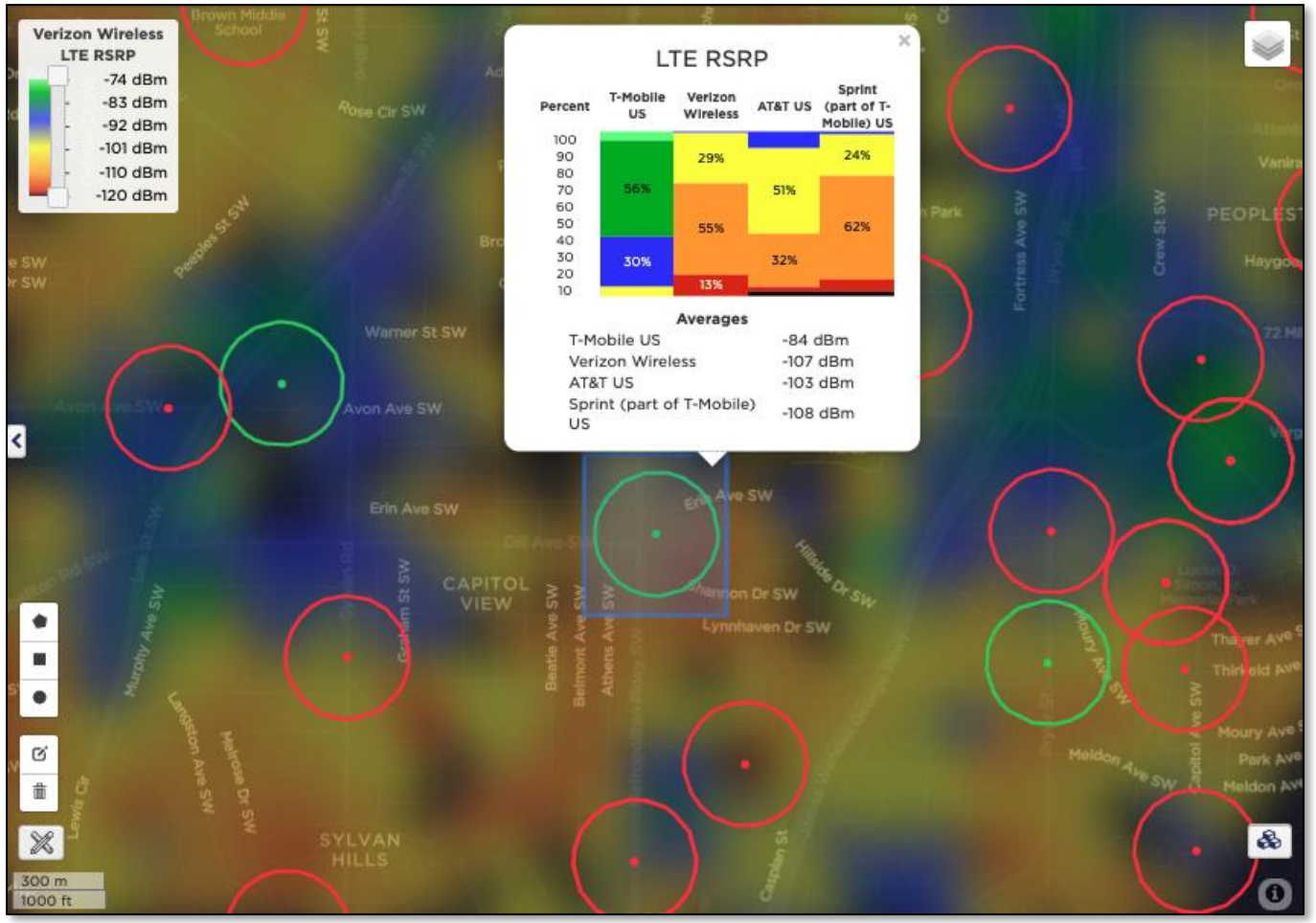
Libraries

Signal Strength

Strong

Medium

Weak



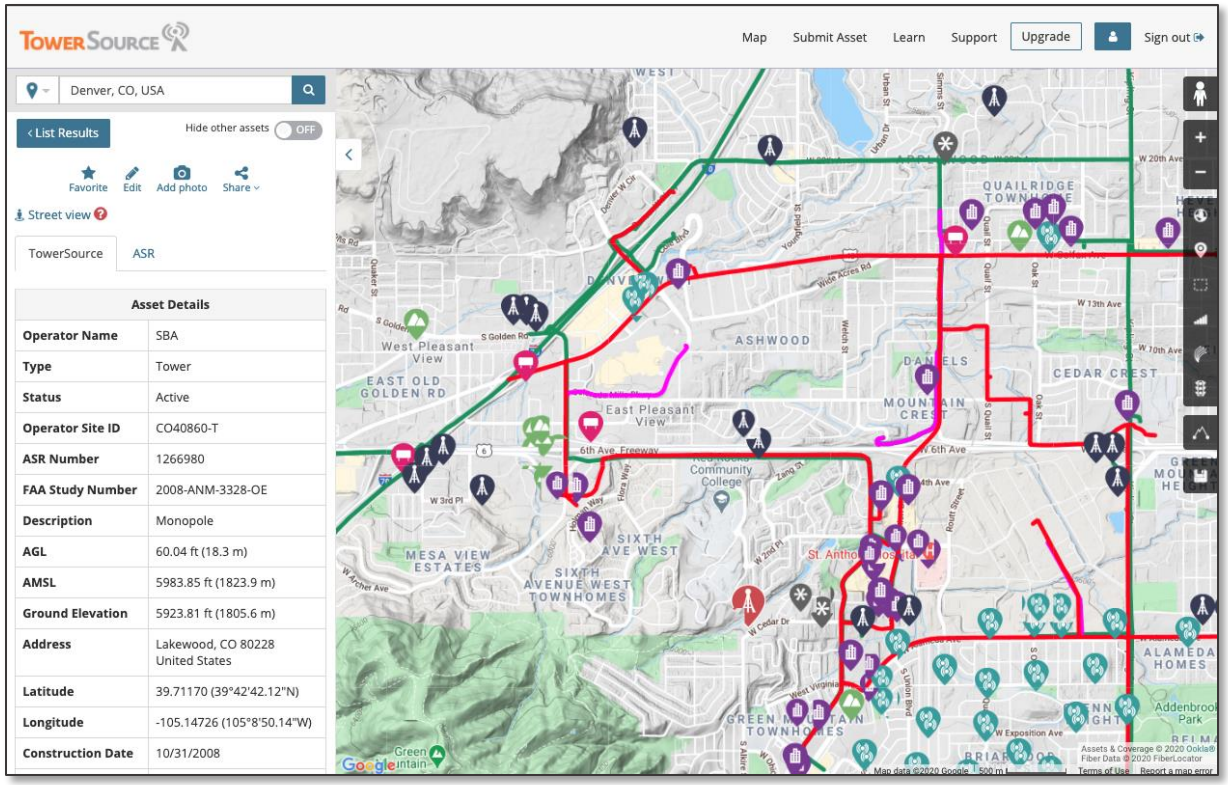
Georgia Department of Education

OOKLA®

TowerSource™

Wireless network asset intelligence

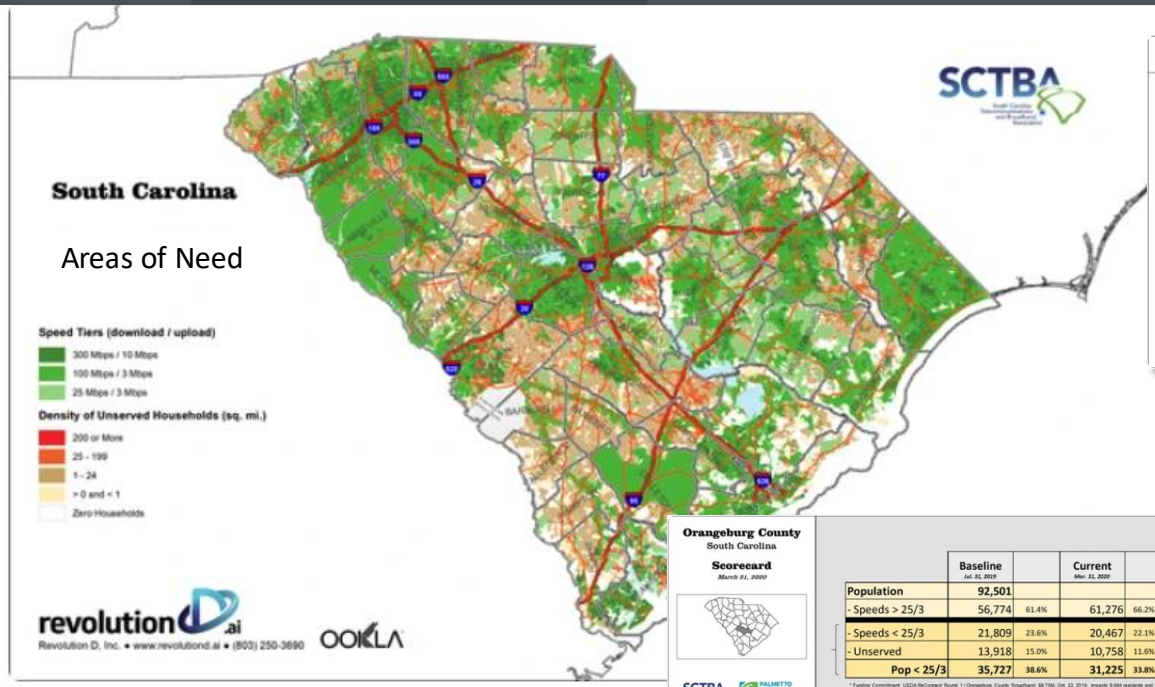
- Some remote areas may best be served by wireless connections
- Identify existing infrastructure
- Import data into your existing GIS platform
- 3x the assets in the FCC's ASR (Antenna Structure Registration)
- Overlay with other data such as fiber routes and demographics

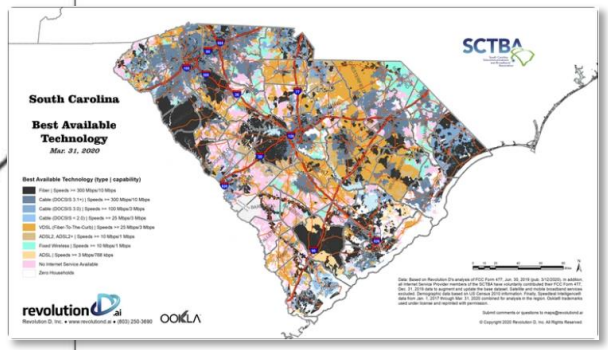


OOKLA®

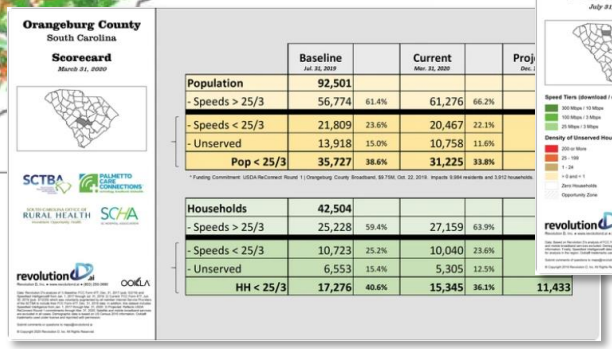
SOUTH CAROLINA
DIGITAL DRIVE

scdigitaldrive.com





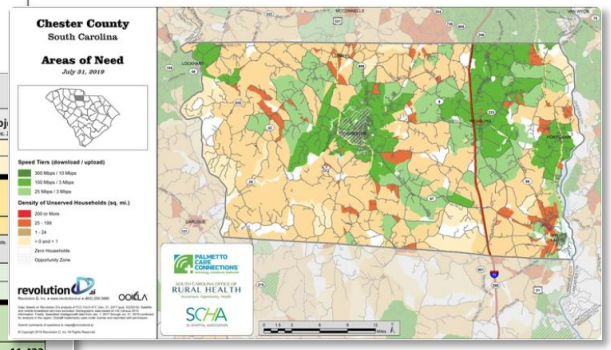
Best Technology Available



	Baseline Jul. 31, 2019		Current Mar. 31, 2020		Proj Dec.
Population	92,501				
- Speeds > 25/3	56,774	61.4%	61,276	66.2%	
- Speeds < 25/3	21,809	23.6%	20,467	22.1%	
- Unserved	13,918	15.0%	10,758	11.6%	
Pop < 25/3	35,727	38.6%	31,225	33.8%	
Households	42,504				
- Speeds > 25/3	25,228	59.4%	27,159	63.9%	
- Speeds < 25/3	10,723	25.2%	10,040	23.6%	
- Unserved	6,553	15.4%	5,305	12.5%	
HH < 25/3	17,276	40.6%	15,345	36.1%	11,433

* Funding Commitment: USDA ReConnect Round 1 | Orangeburg County Broadband, $9.75M, Oct. 22, 2019. Impacts 9,664 residents and 3,912 households.

County-by-County Scorecard



County Broadband Atlas

OOKLA®

West Virginia Announces “Most Accurate Broadband Map to Date”

The Herald-Dispatch herald-dispatch.com HUNTINGTON, WV

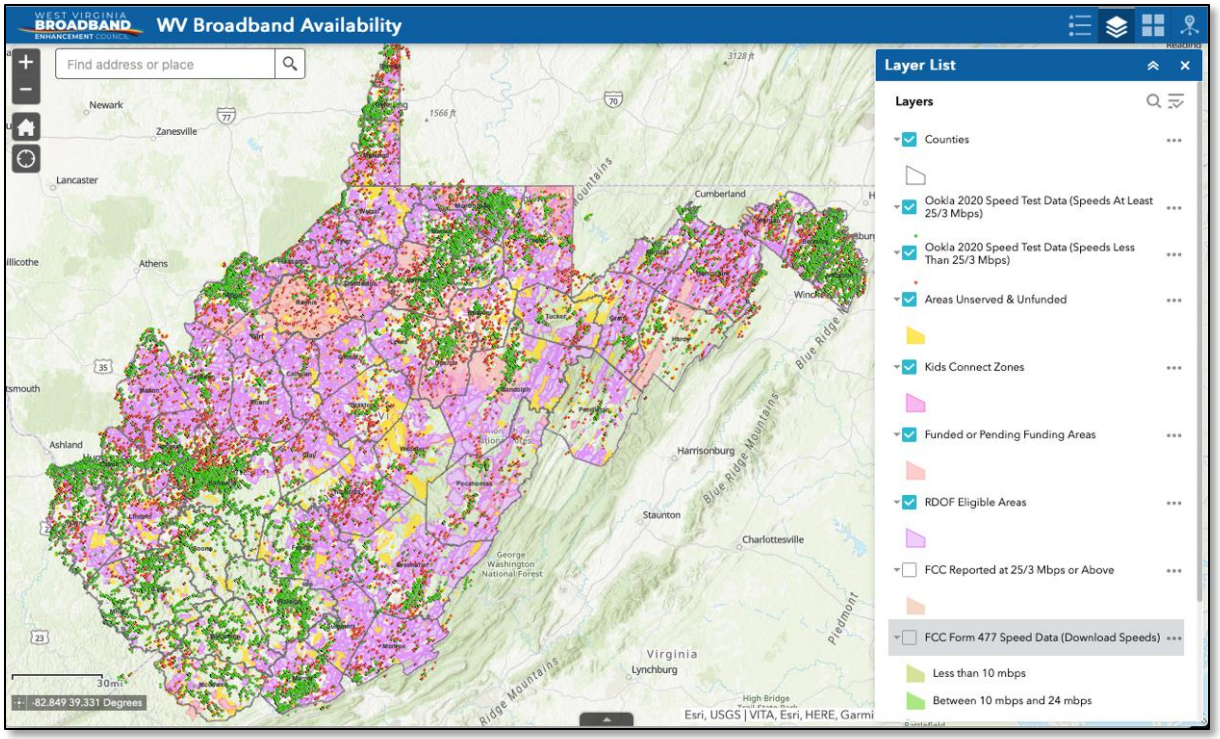
Excerpt – Nov 30, 2020

“Previous broadband availability maps — such as those provided by the FCC — relied on information from carriers and used the speeds they were advertising in an area, not the speeds actually received by consumers

Our first-of-its-kind map instead uses actual speed data from consumers, and the result is now the most accurate, detailed map of where broadband is and is not in the state of West Virginia.”

— Delegate Daniel Linville

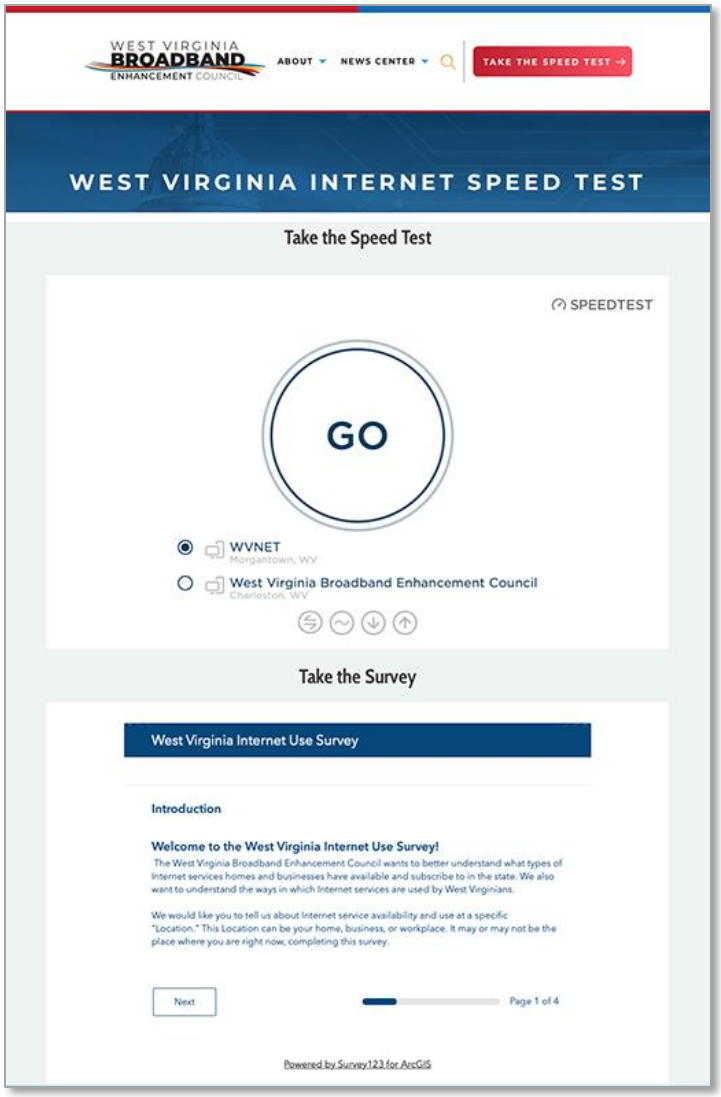
The map was completed recently with financial support from the National Telecommunications and Information Administration, the West Virginia Department of Commerce and state Development Office’s Office of Broadband. Thanks to a grant, the state partnered with Ookla, the developers of www.speedtest.net



Speedtest Custom®

Use the power of Speedtest to engage directly with your citizens by encouraging data collection. This configurable, mobile-friendly, HTML5-based testing solution is the industry gold-standard used by major telecommunications companies around the world.

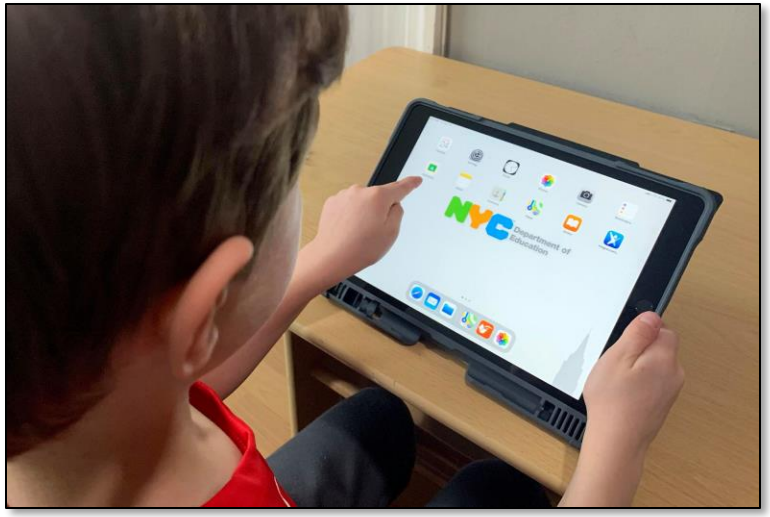
- Put Speedtest directly on your own website **for free**
- Embed your free test on up to 200 web pages
- Use the global Speedtest Server Network™
- View Snapshot stats for the previous days
- Download individual results
- Link to your own broadband survey
- Use survey to capture reports from no-service areas



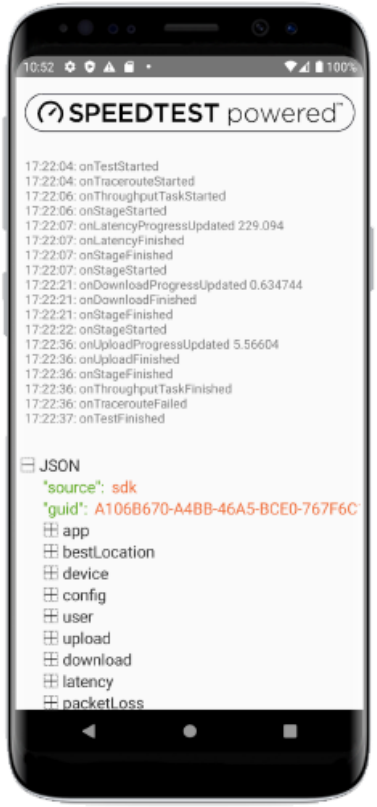
Distance Learning & the Digital Divide

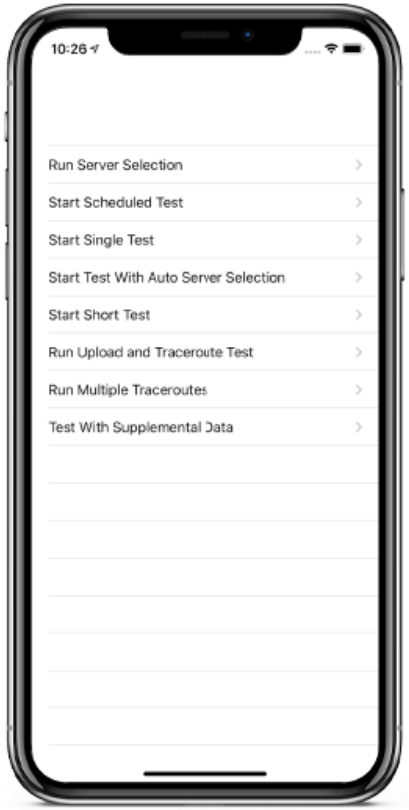
Speedtest Powered — Mobile SDK

- Even before COVID, the digital divide created a homework gap for students lacking internet connectivity
- Trigger Speedtest measurements programmatically on Android & iOS
- Prepare for what's ahead and collect data while respecting privacy and security laws



Major School District Trial Underway





Using Data as a Foundation for Broadband Planning

Thank You!

Bryan Darr
Vice President, Smart Communities
Ookla

Bryan.Darr@Ookla.com

Data as the Foundation for Broadband Planning

Questions and Comments

- Please type your questions in the Q&A box.

- The slides, transcript, and a recording will be posted on the BroadbandUSA website within 7 days of the webinar.

https://broadbandusa.ntia.doc.gov/past-event

Broadband USA

Tune in for the next
Practical Conversations Webinar

NTIA Grants Program in the Consolidated Appropriations Act of 2021
March 17, 2020
2:00 pm EST

Registration is required for each webinar:
https://broadbandusa.ntia.doc.gov/event

BroadbandUSA is available to help communities with their broadband access and digital inclusion efforts

For General Information:

202-482-2048

broadbandusa@ntia.doc.gov

https:broadbandusa.ntia.doc.gov/resources

To Request Technical Assistance (TA):

Broadband TA Request Form - https://broadbandusa.ntia.doc.gov/ntia-common-content/how-we-can-help

BBUSA Resources

- Implementing a Broadband Network Vision: A Toolkit for Local and Tribal Governments
- Community Broadband Roadmap Toolkit
- Guide to Federal Funding of Broadband Projects
- Using Partnerships to Power Smart Cities