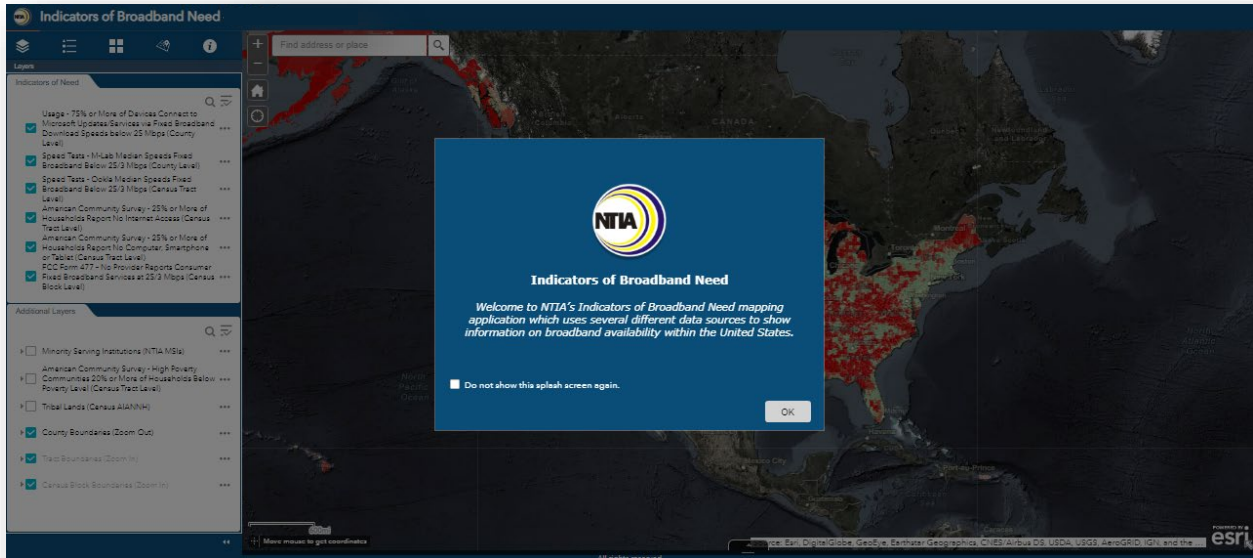


Indicators of Broadband Need User Guide

The [Indicators of Broadband Need](#) map was created by the United States Department of Commerce, National Telecommunications and Information Administration (NTIA). The map brings together several different datasets to show information on broadband availability within the United States. Layers in this map were created using data from the U.S. Census (the American Community Survey), Ookla Speedtest results, Measurement Lab (M-Lab) speed test results, Microsoft, the Federal Communications Commission (FCC), the Department of Education and internal NTIA data resources. All data is shown at one of three Census geographic levels: county, census tract, or census block.



a. The application splash screen

Application Data & Layers

American Community Survey (ACS): The ACS layers shown on the map are based on the collective results of the [U.S. Census American Community Survey](#) taken from 2015-2019, processed, and made available via [Esri Living Atlas](#). There are three ACS layers in the application. Two of the layers function as indicators of broadband need. These layers are based on the Internet Connectivity portion of the ACS. The data for these two layers gives the five-year estimates at the tract level for responses to the ACS questions:

- “At the house, apartment, or mobile home do you or any member of this household have access to the Internet?” and
- “At this house, apartment or mobile home do you or any member of this household own or use any of the following types of computer?”

A third ACS layer showing “High Poverty Communities” appears in the Additional Layers section of the application. This layer was built using the ACS estimates for the last 12 months of 2019 and shows census tracts based on the percentage of residents who report living below 100% of the U.S. Census poverty threshold. The ACS is a yearly survey conducted by the U.S. Census with information collected

from approximately 3.5 million American households. ACS data is collected at the census block group level and can be aggregated to higher census geographies including the census tract level seen on the map. Census tracts without data are shown in gray. ACS Esri Living Atlas layers sourced in the map include:

- [ACS Internet Connectivity Variable Boundaries](#)
- [ACS Poverty Status Variable Boundaries](#)

Measurement Lab (M-Lab): Data is derived from speed test values recorded by [Measurement Lab](#) during the time period from January - June 2020. The layer shows speed test results at the county level. Counties with collective median speed test results below 25/3 Mbps are shown in red while counties with median results above 25/3 Mbps are shown in green. Median values for each county were calculated using the methodology outlined [here](#) by M-Lab, which accounts for user test-taking practices that may skew the median for a given geography. Counties where M-Lab data was not available to the cartographer at the time of this analysis are displayed in gray on the map.

Ookla: Values shown were derived from [Ookla Speedtest](#) results run over the time period from January - June 2020. The layer shows speed test results at the census tract level. Tracts with collective median speed test results below 25/3 Mbps are shown in red while tracts without Ookla results are shown in gray. Tracts with median speeds above 25/3 Mbps are shown in green. Median values for each county were calculated using a methodology recommended by Ookla, similar to the methodology used for [M-Lab median calculations](#), which accounts for user test-taking practices that may skew the median value for a given geography. A description of Ookla's use of median speed test values can be found [here](#).

Microsoft: The dataset combines information on county populations with an estimate of broadband usage over multiple Microsoft services in November 2019. Every time a device using Microsoft software receives an update or connects to a Microsoft service, Microsoft is able to estimate the device's throughput speed based on the size of the packet sent and the time it takes to download. Using this information, Microsoft was able to provide an estimate of the percentage of the population using the Internet at 25 Mbps download speeds or higher in each county. Microsoft estimates that ~157 million people in the US are not using the Internet at such speeds. The layer in this map shows counties in red where 75% or more of users are not using the Internet at 25 Mbps download speeds or higher, according to the Microsoft estimates (reported percentage of broadband use below 0.25 in the dataset). Data does not include values for all counties. Areas with higher usage percentages are shown in green, while areas without data are shown in gray. This dataset is available free for download at this [link](#).

FCC Form 477: This layer was created using the Jan-Jun 2020 FCC Form 477 data collection from U.S. Internet service providers (ISPs). The layer shows areas of the U.S. where no ISP reported consumer fixed broadband Internet services at speeds that meet the [FCC's 25/3 Mbps benchmark for fixed broadband](#). Form 477 data is reported at the census block level, and this layer was created by selecting all land-based census blocks (water census blocks excluded) that had no providers reporting fixed broadband consumer offerings at the 25/3 Mbps threshold or above. Form 477 data is available for download at the FCC's website using this [link](#).

Minority Serving Institutions (MSIs): This point layer shows the locations of institutions eligible as Minority Serving Institutions (MSIs) under NTIA's Connecting Minority Communities (CMC) grant program. The location of each school is taken from the [NCES GIS Database for Post Secondary Schools](#). The school type and its eligibility for NTIA grant programs is determined by the [Department of Education Eligibility Matrix](#) for 2020. Schools defined as eligible or potentially eligible by the eligibility matrix in a given category are designated as MSIs for the purposes of the CMC program. A list of MSI abbreviations is included below:

AANAPISI - Asian American and American Pacific Islander Serving Institutions

ANNH - Alaska Native and Native Hawaiian Serving Institutions

HBCU - Historically Black Colleges and Universities

HSI - Hispanic Serving Institutions

NASNTI - Native American Non-Tribal Serving Institutions

PBI - Predominantly Black Institutions

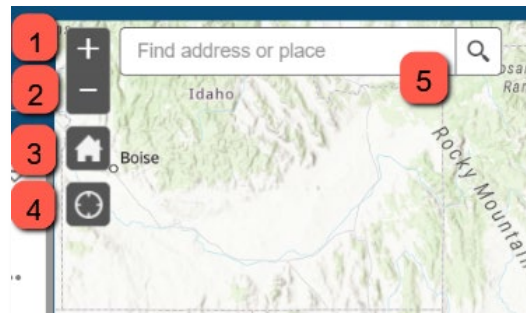
TCU - Tribal Colleges and Universities

Tribal Lands: This layer shows areas designated as [American Indian, Alaska Native and Native Hawaiian Areas](#) (AIANNH) by the U.S. Census in 2020. This dataset is updated on an annual basis as part of the Census [TIGER program](#) and is available for download on the program's website. Areas shown include: Alaska Native Regional Corporations, Tribal Subdivisions, Federal American Indian Reservations, Off-Reservation Trust Lands, State American Indian Reservations, Hawaiian Home Lands, Alaska Native Village Statistical Areas, Oklahoma Tribal Statistical Areas, State Designated Tribal Statistical Areas, Tribal Designated Statistical Areas, and American Indian Joint-Use Areas.

Disclaimer: The data presented is "as is," "as available" for informational purposes. NTIA does not warrant the accuracy, adequacy, or completeness of this information and expressly disclaims any liability for any errors or omissions.

Map Tools

The map portion of the application contains tools for users to navigate the web map.



b. The Zoom In, Zoom Out, Default View, My Location and Search Bar tools

1. **Zoom In:** Zooms closer into the map.
2. **Zoom Out:** Zooms out away from the map.
3. **Default View:** Resets the application to its default view.
4. **My Location:** By allowing the application access to your system's location, users can zoom the map into their current general location.
5. **Search Bar:** Users can type in a location and zoom into that area by clicking on the magnifying glass.

Map Tabs

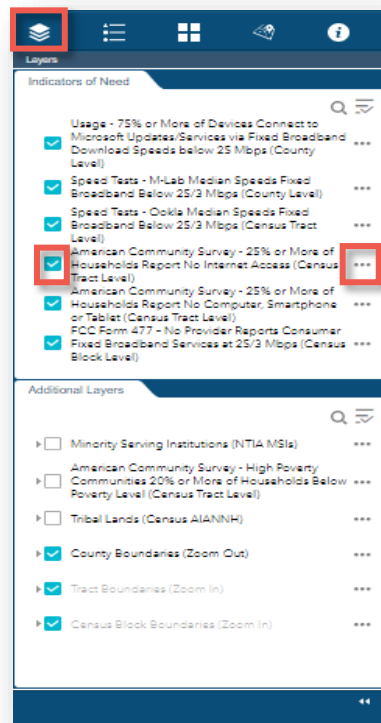
The map features five main tabs: **Layers**, **Legend**, **Change the Basemap**, **Select MSI Type**, and **About**.



c. The five main tabs of the application.

Layers

The Layers tab provides a list of the available data layers in the application. By selecting the check boxes on the left, users can turn the associated layer on and off. To access additional options for each layer, click the ellipses ... to the right of the layer.



d. The Indicators of Need Layers tab

Multiple options are available to users for each layer. These include:

- **Zoom To:** Zooms to the full extent of that layer.

- **Transparency:** Allows users to adjust the transparency of the layer. Adding transparency to the top layers allows you to see them while still viewing underlying layers.
- **Set visibility range:** Allows users to set the scale range for that layer. The layer will appear only inside of the set scale range.
- **Enable pop-up:** Enables and disables that layer’s pop-up on the map screen. Popups are displayed by clicking on a location in the layer.
- **Move Up / Move Down:** Allows users to change the order of layers in the Content Pane. Layers at the top of the pane will appear on top of the other layers underneath of it in the pane.
- **View in Attribute Table:** Opens the layer’s attribute table. The attribute table is discussed more below.
- **Description:** Redirects users to the Item Description for that service.

Zoom to	Move up
Transparency	Move down
Set visibility range	View in Attribute Table
Disable pop-up	Description

b. The additional layer options

Legend

The Legend tab shows the corresponding symbols and colors used by layers in the map. The legend includes a table showing geographic boundaries used by each indicator of broadband need and the colors showing need (red), no need identified (green) and no data available (gray) for each indicator. The legend is static and shows the symbols for all layers whether the layer is active in the map or is turned off.

Legend

Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps	Red	Green	Grey
	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps	Red	Green	Grey
Census Tract	Usage - 75% or More of Devices Connected to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps	Red	Green	Grey
	American Community Survey - 25% or More of Households Report No Internet Access	Red	Green	Grey
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet	Red	Green	Grey
Census Block	FCC Form 477 - No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps	Red	Green	NA

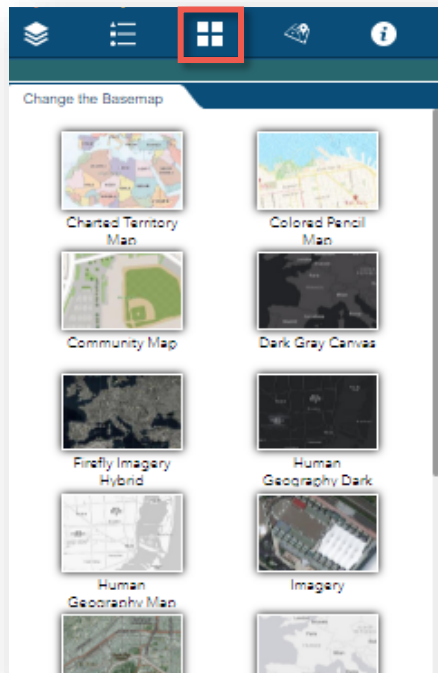
Minority Serving Institutions (NTIA MSIs)

- AANAPISI (Asian American and American Pacific Islander Serving Institutions)
- ANNH (Alaskan Native and Native Hawaiian Serving Institutions)

e. Application legend

Change the Basemap

The Change the Basemap tab allows users to activate various Esri basemaps. The Firefly Imagery Hybrid basemap is loaded by default.



f. The Basemaps tab

Select Minority Serving Institution (MSI) Type

The Select MSI Type tab is a specialized tab designed to work in tandem with the MSI data layer. When the MSI layer is turned on, users can activate this tab's sublayers to view MSI locations by the individual categories outlined below. Slide each toggle button to the right to activate the category. If the MSI layer is turned off, no icons will appear.

AANAPISI - Asian American and American Pacific Islander Serving Institutions

ANNH - Alaska Native and Native Hawaiian Serving Institutions

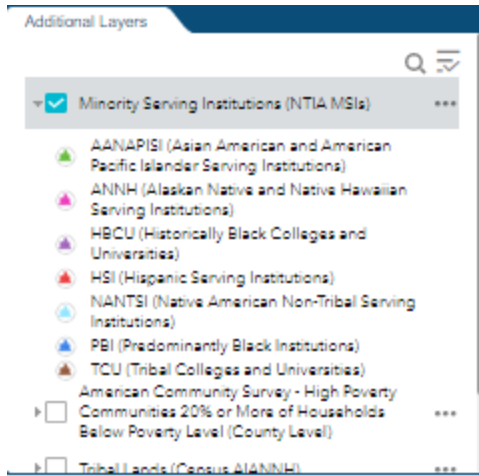
HBCU - Historically Black Colleges and Universities

HSI - Hispanic Serving Institutions

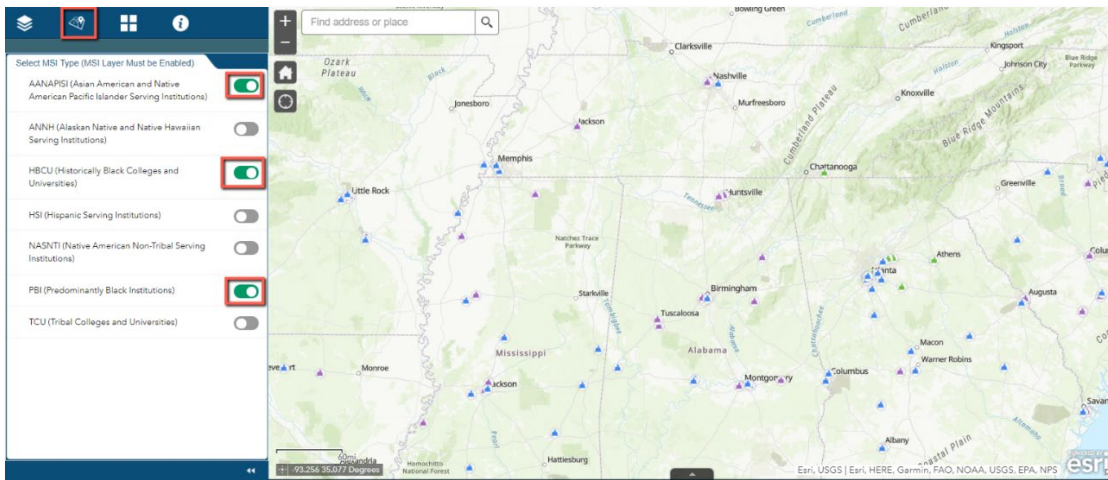
NASNTI - Native American Non-Tribal Serving Institutions

PBI - Predominantly Black Institutions

TCU - Tribal Colleges and Universities



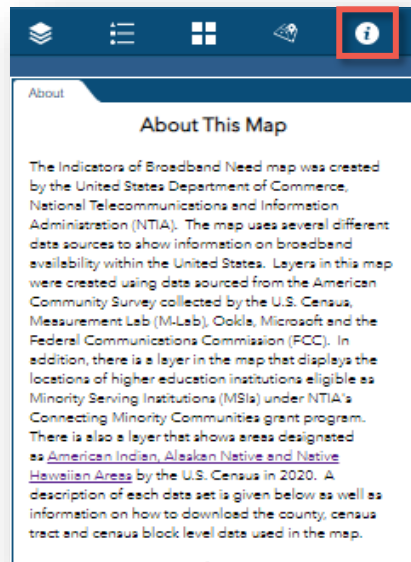
g. Turn on the MSI layer



h. The Select MSI Type pane, with icons on the map

About

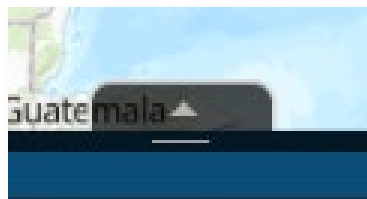
The About tab provides detailed information about the map, including links to the sources used.



i. The About tab

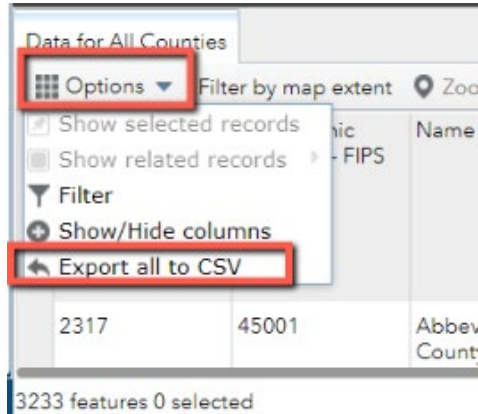
Attribute Table

Finally, the attribute table can be opened by clicking on the arrow at the bottom of the screen. By default, clicking on the arrow brings up attribute tables with data from all census geographies: counties, census tracts, and census blocks. By clicking on the arrow again, users can hide the attribute table.



j. The attribute table Show/Hide arrow

Users can export the attribute table by selecting the Options button and clicking Export all to CSV.



k. The Options and Export all to CSV buttons

Mobile App

This web application is also available to users on mobile devices. Scan the QR code below to access the mobile version.



Scan QR code to view application on your mobile device

l. This QR code allows users to access the mobile version of the app