Response Outreach Area Mapper (ROAM) User Guide

www.census.gov/roam

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1 General Purpose of the Response Outreach Area Mapper (ROAM)

The Census Bureau's Response Outreach Area Mapper (ROAM) application was developed to make it easier to identify hard-to-survey areas and to provide a socioeconomic and demographic characteristic profile of these areas using American Community Survey (ACS) estimates available in the Planning Database. Learning about each hard-to-survey area allows the U.S. Census Bureau to create a tailored communication and partnership campaign, and to plan for field resources including hiring staff with language skills. These and other efforts can improve response rates.

Users include Census Bureau Field staff, regional office staff, local officials, other external stakeholders and partners, and the public. The intent is to make this dataset more accessible to assist outreach and planning efforts. Users visualize areas by predicted mail non-response rates to determine the location of harder-to-count areas. Socioeconomic and demographic characteristics provided by the American Community Survey (ACS) are available with a mouse click for users to learn more about an area. Outreach and planning efforts can be well informed and tailored by area.

This web mapping application provides the opportunity to make the Planning Database, including a metric called the Low Response Score (LRS)—or more simply, predicted mail non-response rate—much easier to use and access. The Planning Database is publicly available now, but it is a large comma-delimited file and requires software *(e.g., Excel, SAS, R)* to open and explore it. Beyond that, mapping the LRS requires an entirely different set of software and user skills. Users can now simply open a web browser, look at a map of census tracts classified and shaded by their LRS score, and quickly review a subset of the Planning Database variables (including American Community Survey estimates) to help reveal why an area may be harder to count. For example, a census tract where 52.6% of the households have no one in the household age 14 or above who speaks English "very well" is helpful in understanding why response rates may be lower there.

Specifically, the Census Bureau will use this tool to 1) plan outreach, marketing, and promotional efforts, as well as 2) aide in the planning of recruitment activities and staffing.

2 Census Bureau Planning Database (PDB)

Available online: https://www.census.gov/topics/research/guidance/planning-databases.html

The Census Bureau Planning Database (PDB) exists to plan field activities and for research purposes. The PDB includes the Low Response Score, 2010 Census operational data, and select American Community Survey (ACS) estimates. In its raw form, the PDB can be used in many ways, including the following:

- Identifying areas where special outreach and promotion efforts could be considered.
- Linking spatial map data files to create thematic maps.
- Generating reports, cross tabulations, and simple analyses.
- Planning recruitment activities.

Hard-to-survey areas—those identified by *higher* Low Response Scores—across the country are hard-to-survey for different reasons. Learning about each hard-to-survey area allows the Census Bureau to create a tailored communication and partnership campaign, and to plan for field resources including hiring staff with language skills. These and other efforts can improve response rates.

The PDB is released at two levels of geography: 1) census tract, and 2) census block group. The ROAM application exists at the census tract level.

3 Low Response Score

Nationwide, 79.3 percent of households that received a 2010 Census mail questionnaire completed it and mailed it back. The resulting non-response rate of 20.7 percent was not evenly distributed across the country, but rather varied greatly by location. The Low Response Score (LRS) Ordinary Least Squares (OLS) regression model attempts to assign these variations in response rate for individual census tracts given a set of characteristics available in the Planning Database. In order to predict areas that are less likely to respond, we subtract the return rate from 100 and use that as the dependent variable in calculating the LRS. In other words, the LRS, or fitted value from the OLS regression, is synonymous with "predicted mail non-response rate." As an example, an LRS value of 17.7 should be interpreted as 17.7% of households in that census tract are predicted to NOT self-respond to the decennial census.

Reasons that an LRS is not calculated for a census tract can include:

- a census tract contains zero housing units.
- a census tract falls below a minimum threshold for qualifying addresses in the 2010 Census mailback areas.
- a census tract has its 2013-2017 ACS 5-year estimates suppressed to avoid data disclosure.
- a census tract experiences a geographic boundary change between its 2010 Census geography and 2017 geography for which the 2013-2017 ACS 5-year estimates are based, making it non-comparable.

In this application, an LRS with no data value (null) indicates an LRS was not calculated.

4 General Application Use

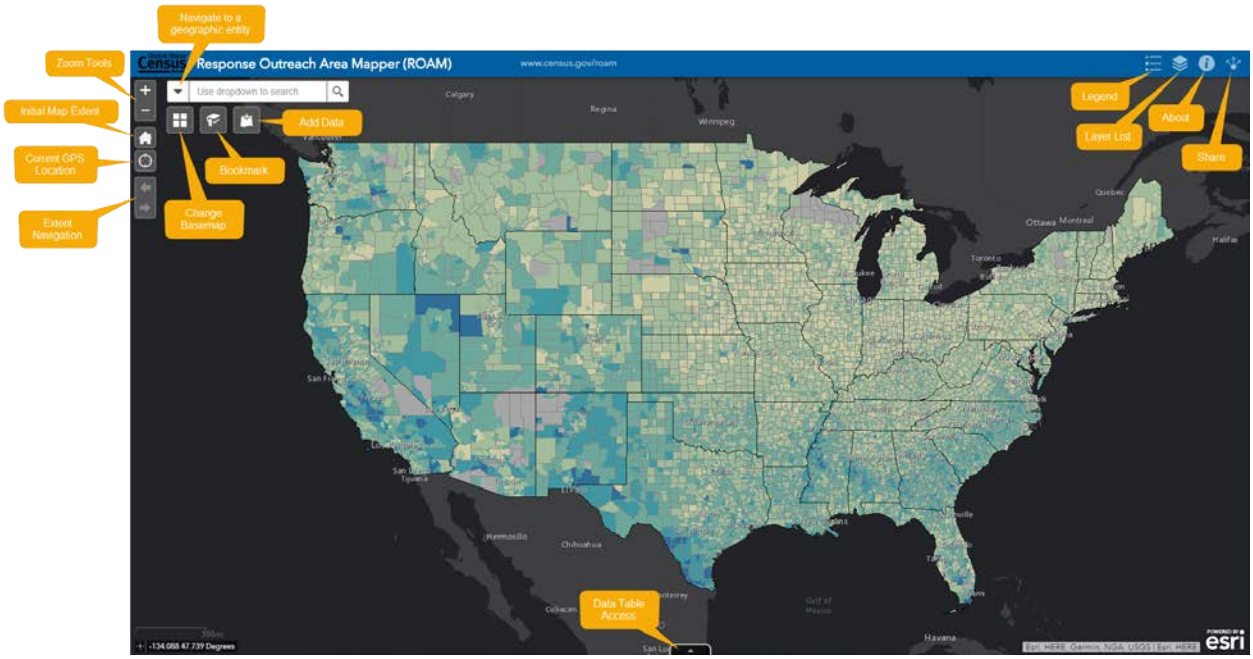
Simply, users can click on a census tract to reveal additional information. In this application, no data value (null) for the LRS indicates an LRS was not calculated. No data value (null) for the ACS 5-year estimates indicates the data are not available in the Planning Database.

- Click on a census tract to generate a pop-up window.
  - The pop-up indicates:
    1. Identifying information.
    2. Low Response Score.
    3. List of ACS 5-year estimates.

On more advanced terms, users can query/filter a Data Table to reveal a subset of census tracts that meet desired criteria. See Section 8, *Using the Data Table*.

5 Application Interface Overview

The screenshot and descriptions below identifies the different buttons and features of the application.



5.1 Navigate to a geographic entity

Allows you to search for a particular geographic entity to zoom to.

Search by:

- Address
- State
- County
- Census Tract
- Regional Census Center (RCC)
- Area Census Office (ACO)
- Tribal Areas: American Indian Reservation and/or Off-Reservation Trust Land; Hawaiian Home Land (HHL); Tribal Statistical Areas including Alaska Native Village Statistical Areas (ANVSAs), Oklahoma Tribal Statistical Area (OTSAs), State Designated Tribal Statistical Area (SDTSAs), Tribal Designated Statistical Areas (TDSAs)
- Alaska Native Regional Corporation (ANRC)
- Minor Civil Division
- School Districts: Elementary, Secondary, and Unified

- 116th Congressional District
- State Legislative District: Upper and Lower Chamber
- ZIP Code Tabulation Area (ZCTA)
- Place

5.2 Zoom Tools

Click the plus sign to zoom in. Click the minus sign to zoom out. Use the mouse wheel to zoom in/zoom out or double click to zoom in.

5.3 Initial Map Extent

Refresh the view back to the contiguous United States. In other words, zoom out to the initial map extent.

5.4 Current GPS Location

Zoom the map to your current GPS Location (functionality limited based on device/device settings).

5.5 Extent Navigation

Click the arrow pointing left to go to the previous extent. Click the arrow pointing right to go the next extent.

5.6 Change Basemap

Choose from various basemaps including satellite imagery and OpenStreetMap.

5.7 Bookmark

Save map extents that you need to revisit. Four bookmarks already exist within the application to help navigate to Alaska, Hawaii, Puerto Rico, and the continental United States.

5.7.1 Create a Bookmark

Navigate to an area of interest, click the Bookmarks button, type a Bookmark Name, and click the plus sign.

5.7.2 Go back to a Bookmark

Click the Bookmarks button and click on the desired bookmark.

5.7.3 Delete a Bookmark

Click the Bookmarks button, click the bookmark to delete, and click “Delete” at the bottom of the Bookmarks window.

5.8 Add Data

Allows you to look for other spatial datasets that already exist on the web. You can temporarily add layers to the map. They will not be saved to the map for next time. The layers you add with Add Data are visible in the Legend and Layers List.

You can use the “Search” tab to look for and add data from a pre-defined existing catalog of data.

You can use the “URL” tab for other web-based spatial datasets. For example, you can add any of the Census Bureau TIGERweb REST Services into the map. A good example of a layer you may want to add is the Transportation (Roads and Railroads) layers. You can click on the “Map Service Links” URL for the desired layer on the TIGERweb REST Services webpage and then copy/paste the resulting URL into the Add Data “URL” tab:

https://tigerweb.geo.census.gov/arcgis/rest/services/TIGERweb/Transportation/MapServer

5.9 Legend

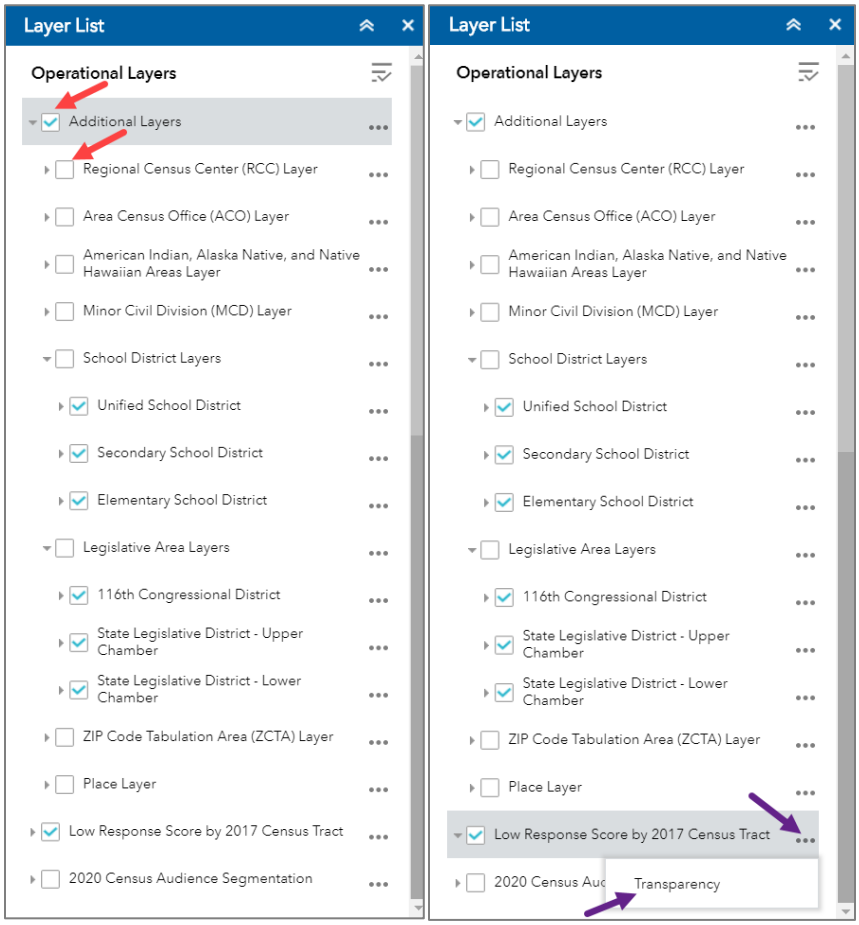
Defines the geographic boundaries included in the map by name and symbology as well as the Low Response Score classification scheme. The layers visible in the Legend reflect the layers currently visible on the map.

5.10 Layer List

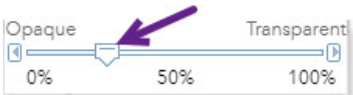
Allows you to turn on/off spatial layers.

In the left screenshot below, the red arrows point to a couple of checkboxes. Clicking any checkboxes in the Layers List turn on (checked) or off (unchecked) the layers. Please note if the “Additional Layers” checkbox is off/unchecked, any of the content nested below will also turn off.

In the right screenshot below, the purple arrows point you to the “Transparency” slider bar, which you can manipulate to make the Low Response Score thematic map darker or lighter.



The “Transparency” slider bar is revealed once you click on “Transparency”; you can click on the slider marker as indicated below and drag it to the left (darker) or right (lighter).



5.11 About

The place to find basic information about the Planning Database and the Low Response Score and how to interpret it. Also contains source information.

5.12 Share

Allows you to share the application with others by creating a URL to send or to post on social media. You can simply copy/paste the link generated automatically or you can click on Link Options to define how the map will get shared. You can define where the map is centered so that you can share a specific area with someone else. In the Link Preview box, a URL will be generated for you to copy/paste, or you can go back to the main pane and click one of the social media icons to share your newly customized URL in that manner.

You can also copy code to embed the application in another website from this pane.

5.13 Data Table Access

The spatial identifier information and data from the Planning Database; Can filter/query; Show/Hide columns.

6 Pop-Up Overview

The screenshot below identifies the functions of the pop-up that results when you click on a census tract.

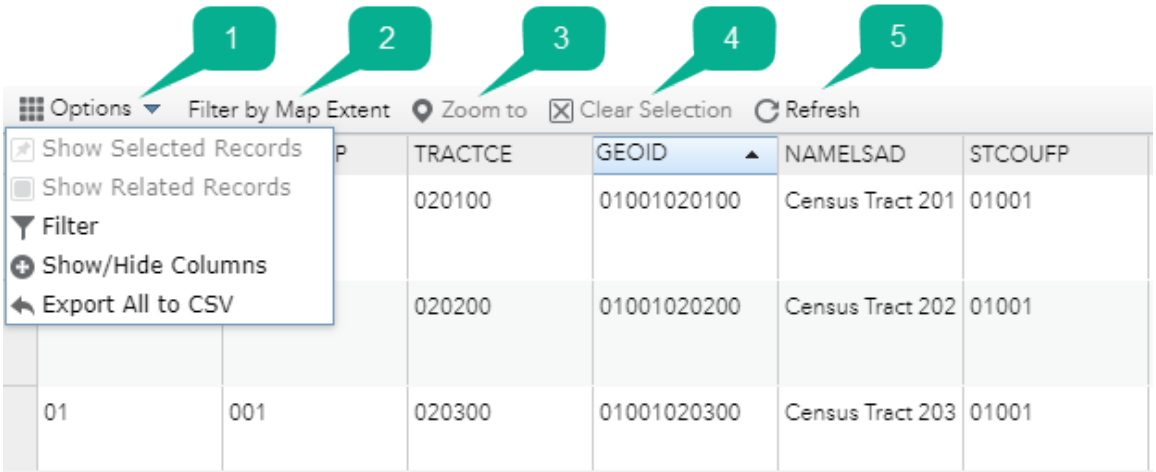
- *Close* – close pop-up
- *Maximize* – make the pop-up larger
- *Scroll* – scroll through the data in the pop-up

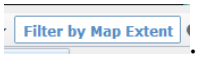
- *Zoom to* – zoom to the extent of the selected tract
- *Ellipsis* – click to access additional pan to, add a marker, and view in attribute table

Note: When you click on a census tract you are not zoomed into, the application may indicate that several census tracts were selected. If you would like to click a specific census tract, zoom in further to that area before clicking on it. The yellow arrow in the screenshot below indicates you have selected two census tracts. If you click the white arrow head in the pop-up window, you can scroll through all two. This may also happen if you have several different layers of geographies turned on. Click the white arrow head to circulate through the selected features.

7 Data Table Overview

The screenshot below identifies the functions available within the Data Table.

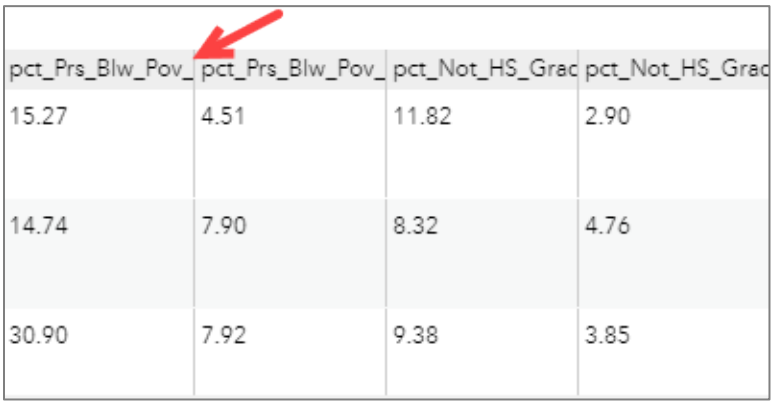


1. Options Menu
    a. Show Selected Records – if you have selected records, this field will be active and only show the selected records in the Data Table
    b. Show Related Records – not an available option; it will always be grayed out
    c. Filter – use this to Filter/Query the Data Table; see Section 8, *Using the Data Table* section for details
    d. Show/Hide Columns
    e. Export All to CSV (.csv is a simple file format used to store tabular data)
2. Filter by Map Extent – when clicked as indicated by a blue rectangle around the button the Data Table will only contain records for census tracts in view: 

. When off (as in the screenshot above) the Data Table will include all census tract records
3. Zoom to – zoom to the selected census tract; can also double click on a record in the Data Table to zoom to a given area
4. Clear Selection – deselect any selected records
5. Refresh – click if the Data Table becomes unresponsive

7.1 View Full Variable Name

To see the full extent of a variable name in the Data Table, hover over the column division in the header of the table until your cursor becomes ' '. At that point, you can click and drag the column to the right to reveal the full column name. Please see Section 7.2.2 *Planning Database Fields/Additional Documentation*, Section 7.2.3 *Federal Communications Commission Fields/Additional Documentation*, and Section 7.2.4 *2020 Census Audience Segmentation Data/Additional Documentation* for information about the column/attribute names.



pct_Prs_Blw_Pov_	pct_Prs_Blw_Pov_	pct_Not_HS_Grac	pct_Not_HS_Grac
15.27	4.51	11.82	2.90
14.74	7.90	8.32	4.76
30.90	7.92	9.38	3.85

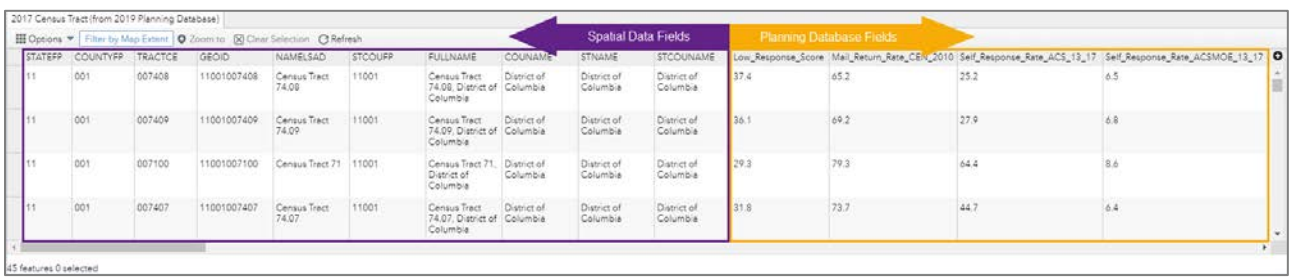
Full column/attribute name as seen below:

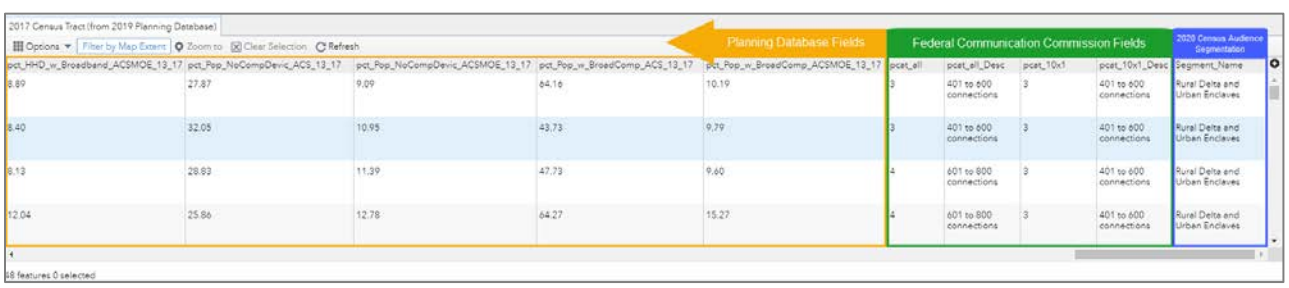
pct_Prs_Blw_Pov_Lev_ACS_13_17	pct_Prs_Blw_Pov_	pct_Children_in_F	pct_Children_in_F
52.57	10.20	77.06	10.32
29.08	10.02	41.41	15.04
40.79	14.98	53.16	14.75

7.2 Data Dictionary for Data Table

The screenshot below identifies the category of fields included in the data table. Below, is a description of these:

- Spatial Fields
- Planning Database Fields
- Federal Communications Commission (FCC) Fields
- 2020 Census Audience Segmentation Field





7.2.1 Spatial Fields

These fields are defined as:

FIELD	TYPE	DESCRIPTION
STATEFP	Text value	State FIPS codes
COUNTYFP	Text value	County FIPS codes
TRACTCE	Text value	Census tract codes
GEOID	Text value	Census tract identifier; a concatenation of state FIPs code, county FIPS code , and census tract code
NAMELSAD	Text value	Translated legal/statistical area description and the census tract name
FULLNAME	Text value	Census tract identifier; concatenation of NAMELSAD, COUNAME, and STNAME fields
COUNAME	Text value	County name
STNAME	Text value	State name
STCOUNAME	Text value	Concatenation of COUNAME and STNAME fields

7.2.1.1 Spatial Fields Additional Documentation

Census Tract Information
https://www2.census.gov/geo/pdfs/maps-data/data/tiger/tgrshp2017/TGRSHP2017_TechDoc_Ch3.pdf

- See "3.4 Census Tracts" for general background information
- See "3.4.1 Census Tract State-based Shapefile Record Layout (Current)" for description of the spatial-related fields

American National Standards Institute (ANSI) Codes Reference Information
https://www.census.gov/library/reference/code-lists/ansi.html

State FIPS Codes information
https://www.census.gov/library/reference/code-lists/ansi.html#par_textimage_3

County FIPS Codes information
https://www.census.gov/library/reference/code-lists/ansi.html#par_statelist

Or reference the entire nation's worth of counties and FIPS codes directly:
https://www2.census.gov/geo/docs/reference/codes/files/national_county.txt

7.2.2 PDB Fields/Additional Documentation

Within the application, the Planning Database Fields in the Data Table match exactly as they are in the actual PDB so that users can download data from the application and then refer back to the full PDB for additional variables. Full definitions and explanations of these are here:
https://www.census.gov/research/data/planning_database/2016/docs/2016-Tract-PDB-Documentation.pdf

7.2.3 FCC Fields/Additional Documentation

Within the application, the FCC Fields in the Data Table match exactly as they are in the actual FCC dataset. Full definitions of the fields can be found in ROAM's data dictionary at census.gov/roam. For additional information:
https://www.fcc.gov/reports-research/maps/residential-fixed-internet-access-service-connections-per-1000-households-by-census-tract/

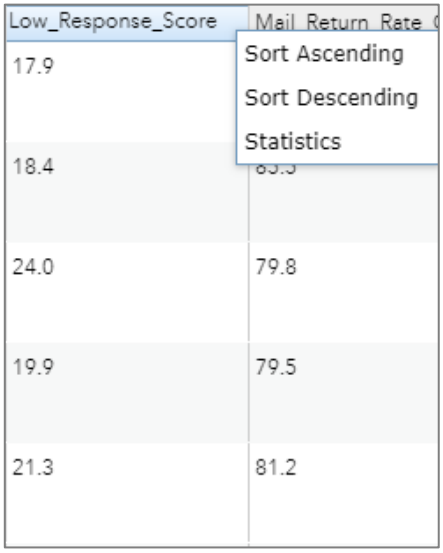
7.2.4 2020 Census Audience Segmentation Field/Additional Documentation

Within the application, the 2020 Census Audience Segmentation Field is the last column in the Data Table. A full definition of the field can be found in ROAM's data dictionary at census.gov/roam. For additional information:
https://www.census.gov/programs-surveys/decennial-census/2020-census/research-testing/communications-research/2020-tract-segments.html

8 Using the Data Table

8.1 Sort

Click on any column heading in the Data Table to Sort the Data Table by that column. Choose to sort ascending or sort descending.

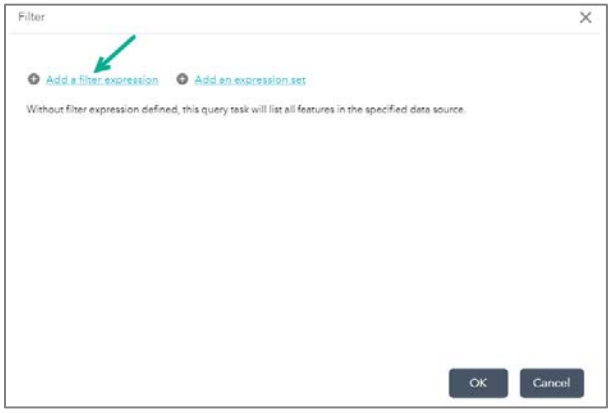


8.2 Filter

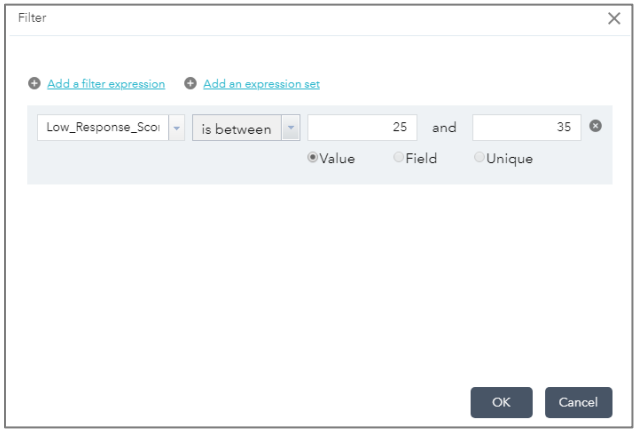
Under the Options menu, click Filter option. Filtering allows you to limit the rows of data in the Data Table. Only features that meet the criteria will be visible in the Data Table. You can filter based on any of the columns that are available in the Data Table.

8.2.1 Add a filter expression

To create a simple query, use this option.

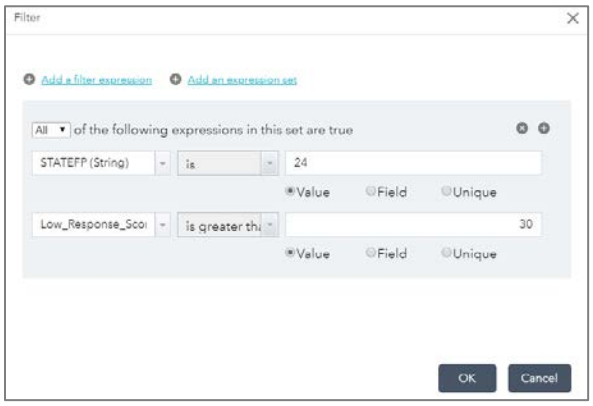


Example: Show records where the Low_Response_Score is between 25 and 35.

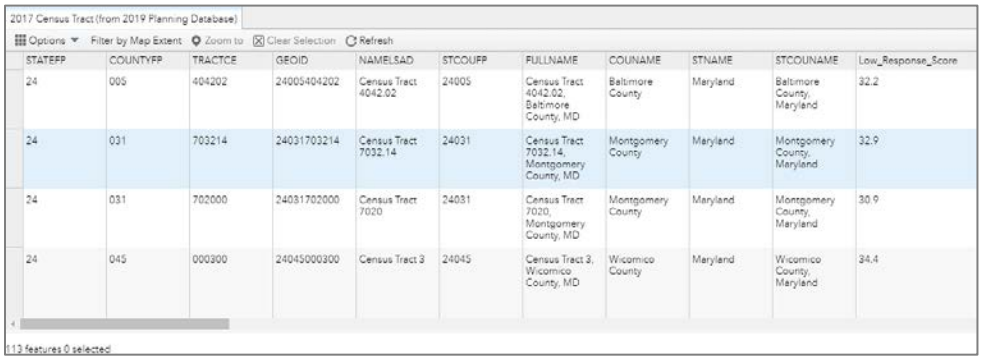


8.2.2 Add an expression set

Use this option when you would like to create multiple filters at once.



Resulting Data Table below shows that 113 features meet ALL criteria; All of the records where Low_Response_Score is greater than 30 in the state of Maryland:

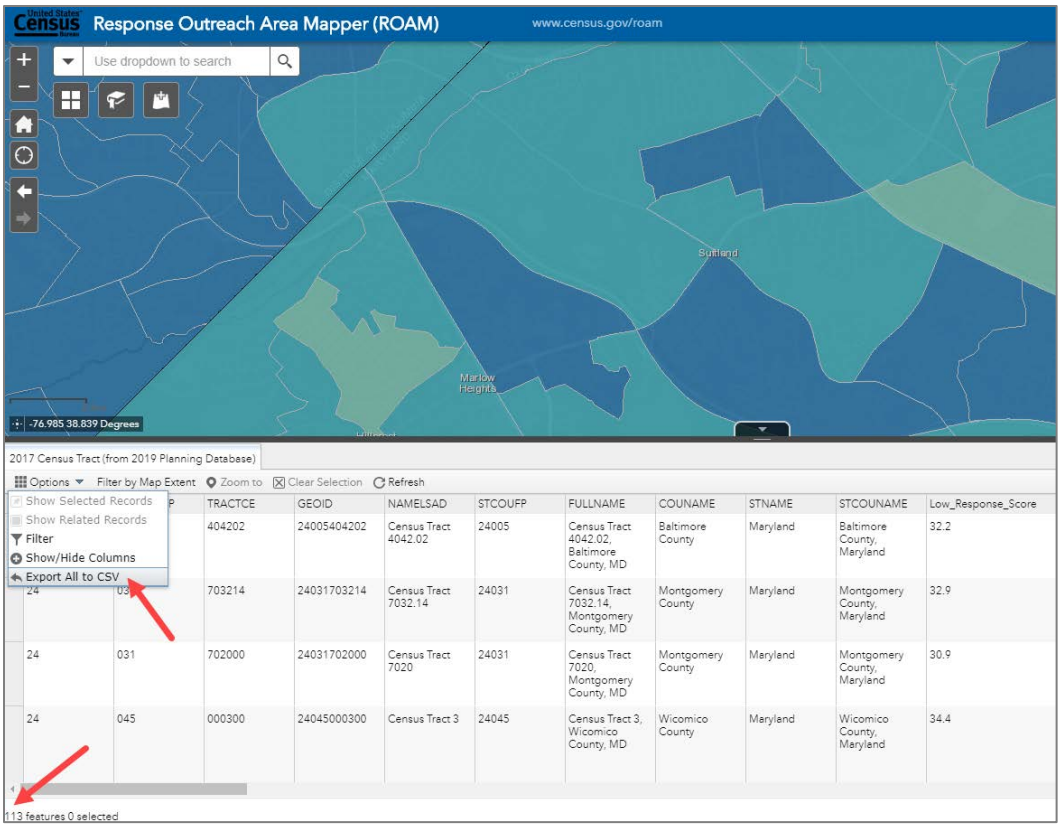


STATEFP	COUNTYFP	TRACTCE	GEOID	NAMELSAD	STCOUFP	FULLNAME	COUNAME	STNAME	STCOUNAME	Low_Response_Score
24	005	404202	24005404202	Census Tract 4042.02	24005	Census Tract 4042.02, Baltimore County, MD	Baltimore County	Maryland	Baltimore County, Maryland	32.2
24	031	703214	24031703214	Census Tract 7032.14	24031	Census Tract 7032.14, Montgomery County, MD	Montgomery County	Maryland	Montgomery County, Maryland	32.9
24	031	702000	24031702000	Census Tract 7020	24031	Census Tract 7020, Montgomery County, MD	Montgomery County	Maryland	Montgomery County, Maryland	30.9
24	045	000300	24045000300	Census Tract 3	24045	Census Tract 3, Wicomico County, MD	Wicomico County	Maryland	Wicomico County, Maryland	34.4

8.3 Download

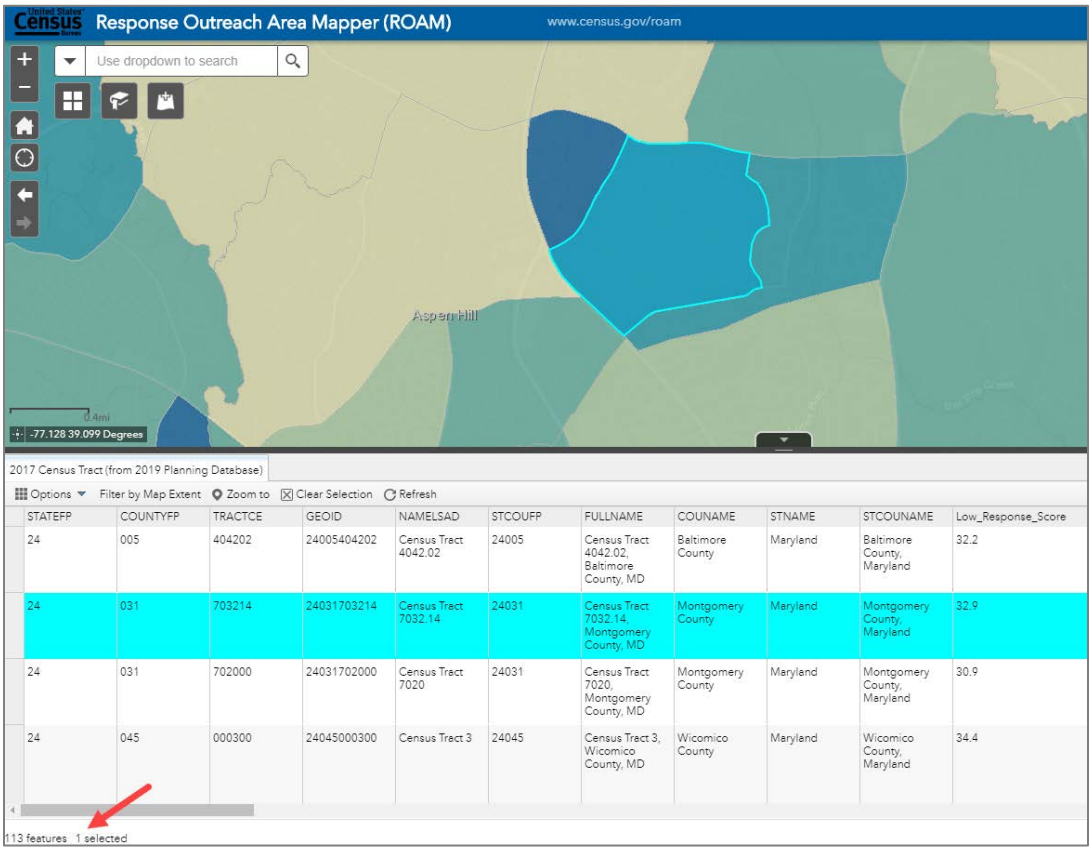
To download data from the Data Table, click the Options Menu → Export All to CSV. Keep in mind that "All" either means 1) ALL the features, or census tract records, currently in the Data Table, or 2) ALL the selected features currently in the Data Table.

In the example below, 113 features will be exported to a CSV because there are no selected features.



In the example below, a user selected one of the census tract records by clicking on it in the Data Table. Now, the 1 selected feature will be the only feature downloaded into the CSV. Use the "Clear Selection" button on the Data Table if you would like to download all of the current census tract records. Or, Shift+Click multiple rows in the Data Table if you only want to download a handful.

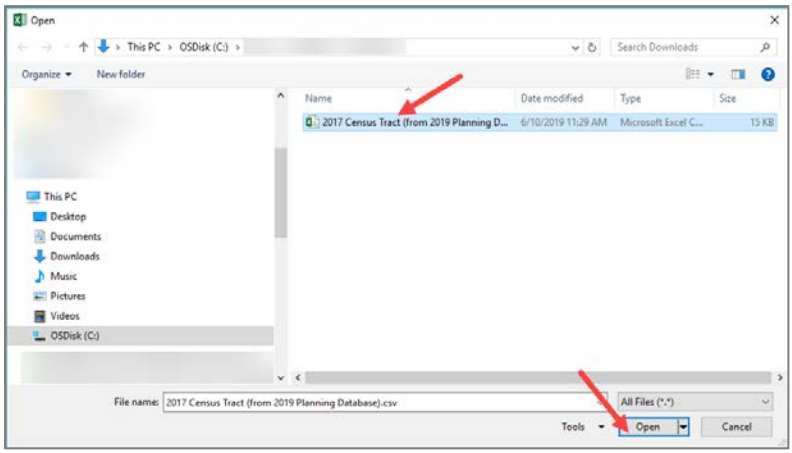
Feature Selected



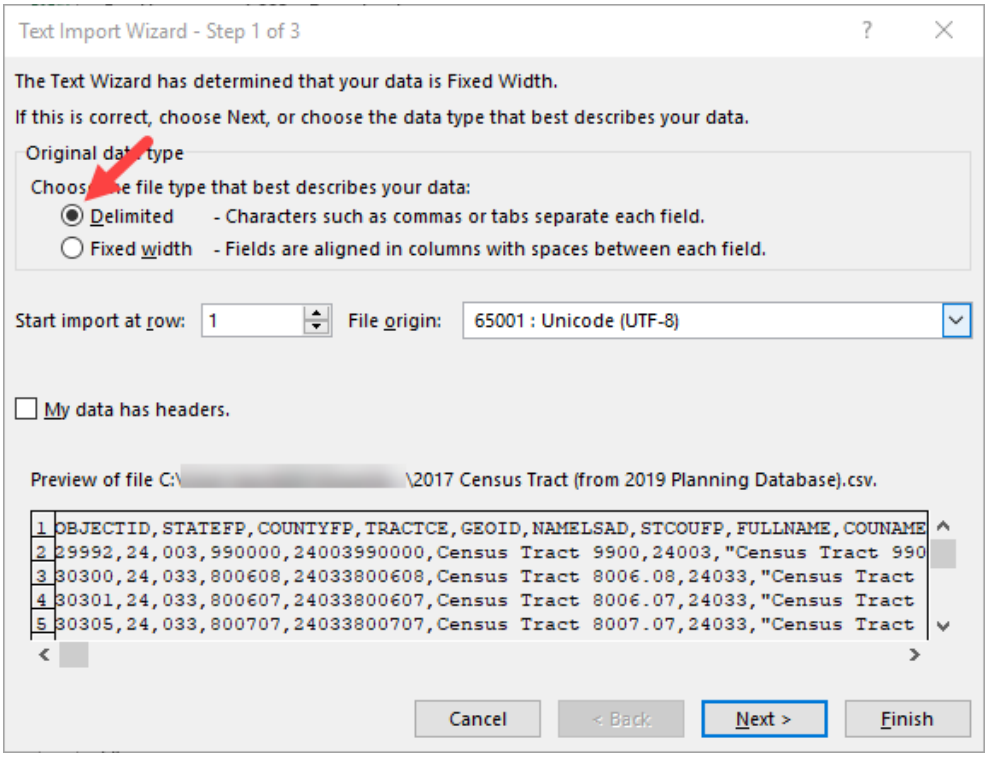
8.4 Microsoft Excel

To open the resulting .csv download in Microsoft Excel with the proper leading zeroes on the STATEFP, COUNTYFP, TRACTCE, and GEOID fields, follow the steps below:

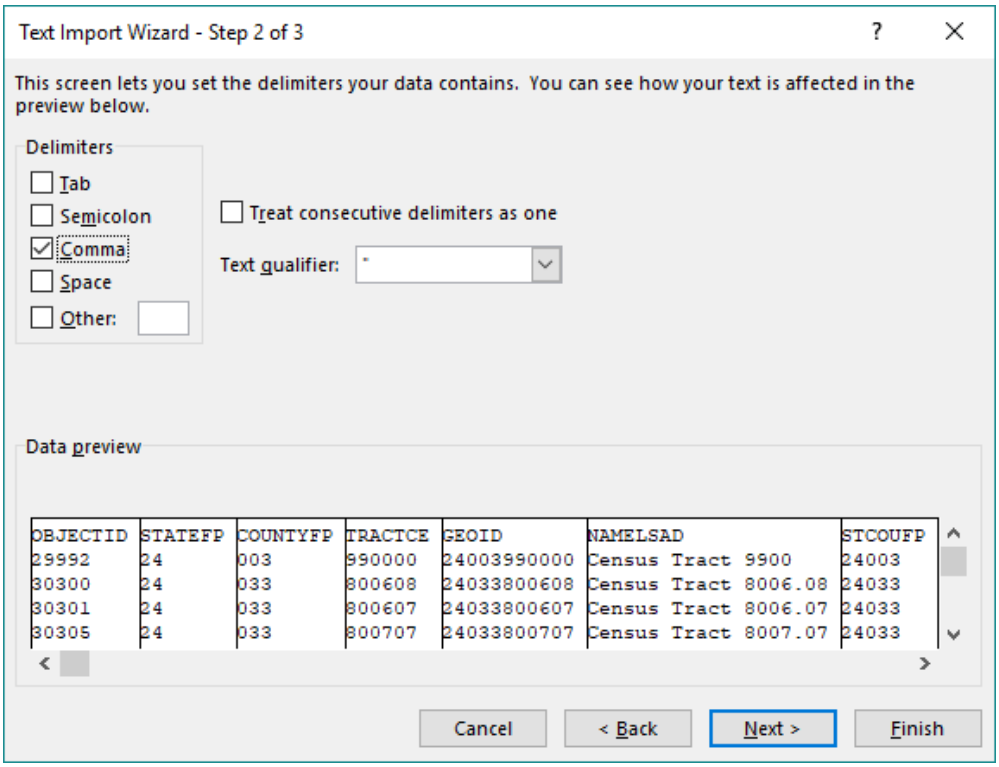
1. Open Microsoft Excel first rather than double-clicking on the .csv file.
2. File → Open
3. Navigate to the downloaded .csv file; you may have to select "All Files" from the file type drop dox to be able to see it; click "Open"



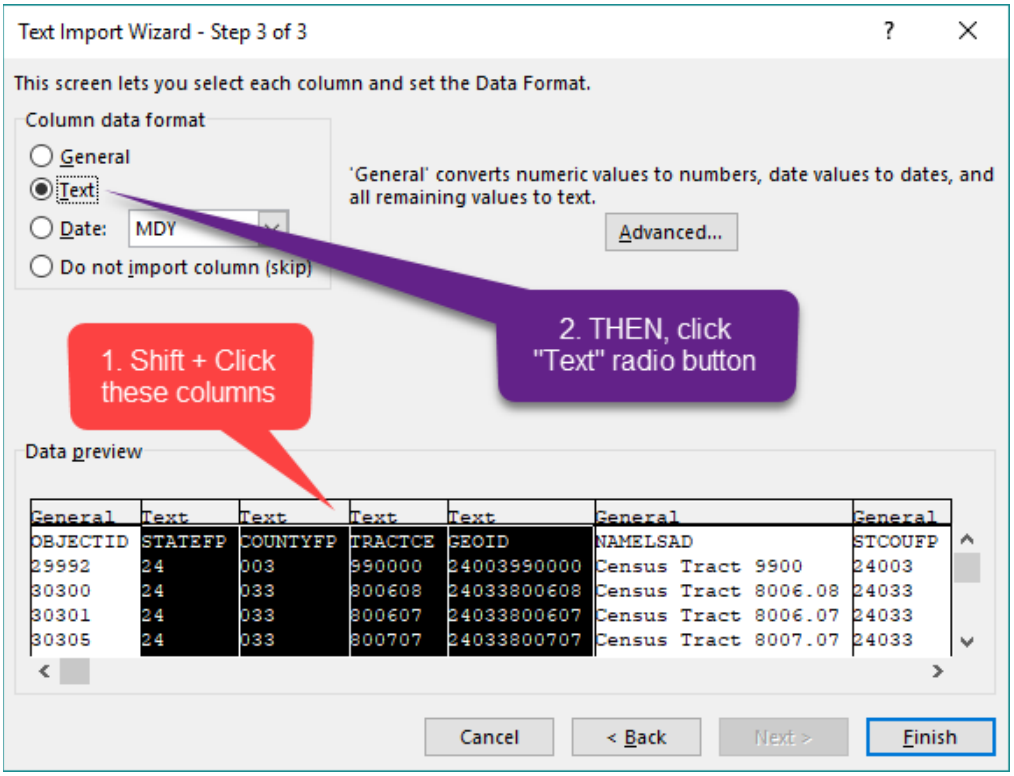
4. Make sure the “Delimited” radio button is chosen; click “Next”



5. Check the “Comma” option from the “Delimiters” section; click “Next”



6. Shift+Click the STATEP, COUNTYFP, TRACTCE, GEOID columns in the Data Preview so that all four fields are highlighted and **then** click the “Text” radio button; click “Finish”:



7. You now have the subset of data you downloaded from the application in a format where the leading zeroes are not lost.

	A	B	C	D	E
1	OBJECTID	STATEFP	COUNTYFP	TRACTCE	GEOID
2	963	01	001	020100	01001020100
3	960	01	001	020200	01001020200
4	1291	01	001	020300	01001020300
5	965	01	001	020400	01001020400
6	1293	01	001	020500	01001020500
7	962	01	001	020600	01001020600
8	964	01	001	020700	01001020700
9	414	01	001	020801	01001020801
10	275	01	001	020802	01001020802
11	961	01	001	020900	01001020900
12	1294	01	001	021000	01001021000
13	1292	01	001	021100	01001021100
14	560	01	003	010100	01003010100
15	569	01	003	010200	01003010200
16	556	01	003	010300	01003010300

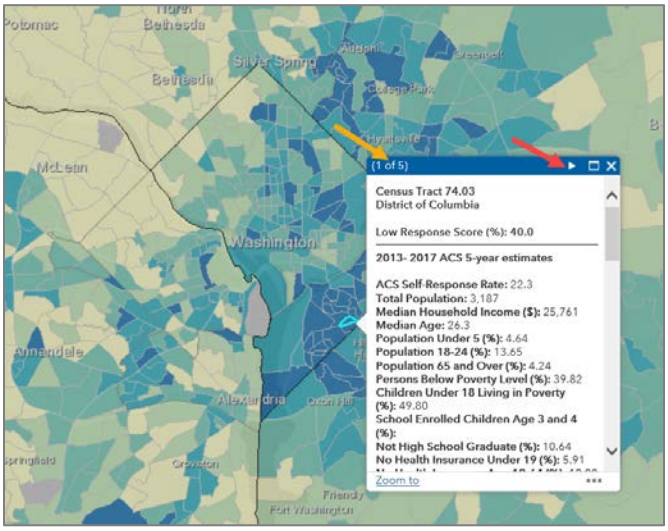
9 Resources

Refer to www.census.gov/roam for additional information.

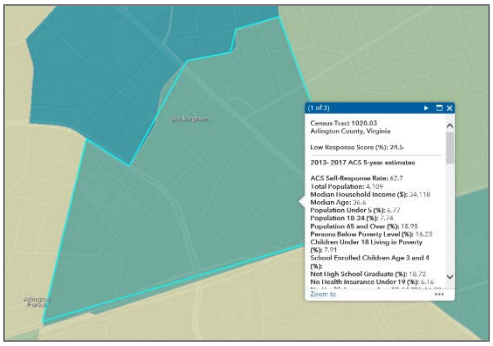
Questions about the Low Response Score or Planning Database can be directed to: Census.PDB.questions@census.gov

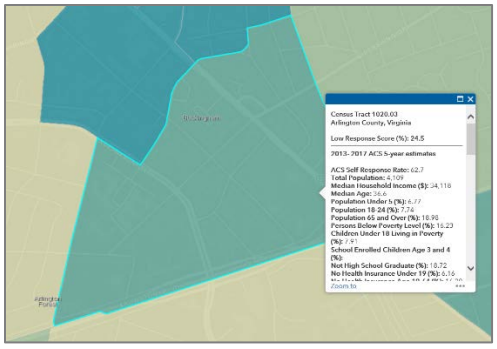
10 Known Issues

- When you click on a census tract you are not zoomed into, the application may indicate that several census tracts were selected. If you would like to click a specific census tract, zoom in further to that area before clicking on it. The yellow arrow indicates you have selected five census tracts. If you click the white arrow head in the pop-up window, you can scroll through all five.



- When you click on a census tract you are not zoomed into and click “Zoom to” in the pop-up window, you may see that the entire census tract is not selected once you are zoomed to it (see below left). Re-click on that particular census tract to see the actual boundary of the census tract (see below right).





- You can access this application on a smartphone or other web-connected device. However, the Filter actions are not very device friendly at the moment.