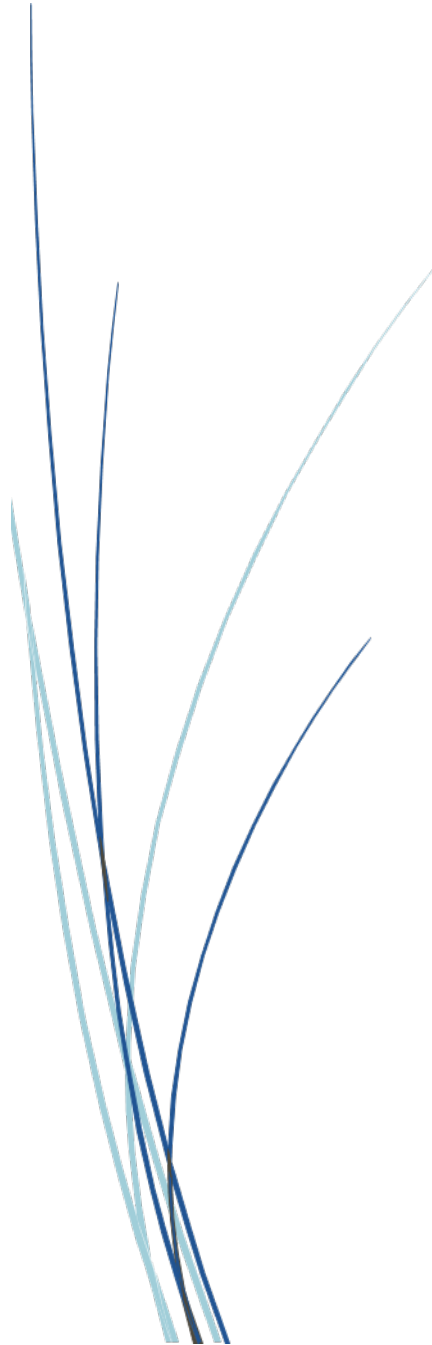


# Boundary and Annexation Survey (BAS) Geographic Update Partnership Software (GUPS) How-to Guide

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*Instructions for Participating in BAS Using GUPS*



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# INTRODUCTION

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## A. The Boundary and Annexation Survey

The Boundary and Annexation Survey (BAS) provides tribal, state, and local governments an opportunity to review the Census Bureau’s legal boundary data ensuring the Census Bureau has the correct boundary, name, and status information. BAS also allows participants to review and provide updates to Census Designated Places (CDPs). Maintaining correct boundaries helps ensure that the Census Bureau assigns the appropriate housing and population counts to each government.

BAS fulfills the agency’s responsibility as part of the National Spatial Data Infrastructure, for which the Office of Management and Budget (OMB) Circular A–16 designates the Census Bureau as the lead federal agency for maintaining national data about legal government boundaries, as well as statistical and administrative boundaries. BAS supports the spatial data steward responsibilities of the OMB E-Gov, Data.gov, the National Map, the Geographic Names Information System (GNIS), the Federal Geographic Data Committee (FGDC), and the Geospatial One-Stop. Title 13, Section 6, United States Code authorizes this survey.

The Census Bureau uses the boundaries collected in BAS to tabulate data for various censuses and surveys including the decennial census, American Community Survey (ACS), and Population Estimates Program (PEP). In addition, the Census Bureau uses the legal boundaries collected through BAS to support several other programs such as the Redistricting Data Program, the Economic Census, the Geographic Update Population Certification Program, and the Special Census program.

## B. Key Dates for BAS Respondents

- January 1**      Boundary updates must be legally in effect on or before this date to be reported in the current survey year.
- March 1**        First BAS deadline - Boundary updates returned by this date will be reflected in the ACS and PEP data and in next year’s BAS materials.
- May 31**        Final BAS deadline - Boundary updates returned by this date will be reflected in next year’s BAS materials.

## C. Adjacencies and Legal Disputes

The Census Bureau will not make any boundary change that affects adjacent legal governments without the appropriate documentation. Please review any changes that affect adjacent governments to determine if they are intentional legal changes.

If the Census Bureau discovers that an area of land is in dispute between two or more jurisdictions, the Census Bureau will not make any boundary corrections until the parties come to a written agreement, or there is a documented final court decision regarding the dispute.

To learn more, please contact the Census Bureau Legal Office at **1-301-763-2918**.

For disputes involving tribal areas, the Census Bureau must defer to the Office of the Solicitor at the Department of the Interior for a legal opinion. Often complicated land issues require an extended period for resolution, and in those cases, the Census Bureau will retain the current boundary in the database until a legal opinion is issued by the Solicitor's office.

## D. Contact Us

If assistance is required in preparing your BAS submission or if you are experiencing issues with the Geographic Update Partnership Software (GUPS), please contact the Census Bureau at [<geo.bas@census.gov>](mailto:geo.bas@census.gov) or **1-800-972-5651**.

When emailing [<geo.bas@census.gov>](mailto:geo.bas@census.gov), please include the following details:

- BAS ID and Government Name,
- Level of geography for which you are submitting,
- Contact information such as a phone number or email address,
- Version of GUPS you are using,
- Full text of the error message received as a screenshot or text (if applicable), and
- Screenshots of discrepancies (if applicable).

## E. Resources

Additional resources are available on our website. Technical documentation and helpful videos are also available to walk through the BAS submission process.

### Technical Documentation

For more technical information about Census Bureau Geography, BAS submission information, change types, and shapefiles, see the BAS Technical Guide at [<https://www.census.gov/programs-surveys/bas/information/respondent-guides.html>](https://www.census.gov/programs-surveys/bas/information/respondent-guides.html).

For supplemental information on functions within GUPS that are specific to QGIS, a QGIS user's manual can be found at: [<http://docs.qgis.org/3.4/en/docs/user\\_manual/index.html>](http://docs.qgis.org/3.4/en/docs/user_manual/index.html).

GUPS Installation files: [<https://www2.census.gov/geo/pvs/gups/>](https://www2.census.gov/geo/pvs/gups/).

### Videos

The Census Bureau created training videos to give BAS participants detailed instructions and information for reporting and submitting BAS changes. These videos are available on the BAS website at: [<https://www.census.gov/programs-surveys/bas/library/bas-videos.html>](https://www.census.gov/programs-surveys/bas/library/bas-videos.html).

# CHAPTER 1 GETTING STARTED WITH GUPS

## What is the Geographic Update Partnership Software (GUPS)?

The Geographic Update Partnership Software (GUPS) is a user-friendly geographic information system (GIS) that is customized for each of the Census Bureau’s geographic partnership programs. GUPS features a BAS and Tribal BAS module offering tools specific to the BAS program and allows participants to create a standardized submission. This allows the Census Bureau to easily process returned BAS files. GUPS is designed to be a digital method to mimic paper map updates, as digital submissions are more accurate than paper updates.

### 1.1 Downloading and Installing GUPS

GUPS is available for installation two ways: direct download from the BAS website or by request on CD/DVD. GUPS is available for download directly from the BAS website <<https://www.census.gov/programs-surveys/bas/technical-documentation/gups-instructions.html>>. If a CD/DVD is requested through the Annual Response Form, a package will be shipped to the participant that includes a CD/DVD containing GUPS, this How-to Guide in portable document format (.pdf), a read me text (.txt) file, and a CD/DVD containing BAS shapefiles. See [Section 1.1.2](#) for step-by-step installation instructions.

Once GUPS is installed, BAS shapefiles can be imported from the BAS website directly into the GUPS application. If a participant requests GUPS software on CD/DVD, the shapefiles are included. [Contact Us](#) to request a data CD/DVD.

#### 1.1.1 System Requirements

Before beginning the installation, check that the computer has the capabilities needed to run GUPS. GUPS is based on QGIS, which is a free and open-source desktop geographic information system application. To learn more about QGIS, visit their website at <<https://www.qgis.org/en/site/>>. The GUPS application was developed for use in a desktop PC or a network environment.

[Table 1](#) lists the hardware and software requirements necessary to install and run GUPS. Also included are the software requirements to submit files through the Secure Web Incoming Module (SWIM) website.

**Table 1: System Requirements for GUPS**

Hardware	Operating System
<p><b>Disk Space Needed to Run GUPS:</b> 4 GB</p> <p><b>Disk Space Needed to Store Shapefiles:</b> Shapefile sizes vary. To view the size of the shapefiles, right-click, and choose <b>Properties</b> in the drop-down</p>	<p><b>Windows®:</b> To run GUPS, Windows users need one of the following operating systems:</p> <ul style="list-style-type: none"><li>• Windows 8®</li><li>• Windows 10®</li></ul> <p><b>Apple®:</b></p>

Hardware	Operating System
<p>menu. The <b>Files Properties</b> box opens and displays the folder size. Select multiple files/folders in the list to view their properties via the same method.</p> <p><b>RAM:</b> 4 GB minimum, 8 GB or more recommended for optimal performance.</p>	<p>Mac OS X® users must secure a license for Microsoft Windows and use a Windows bridge. The suggested bridge software is Boot Camp®, which comes pre-installed on all Mac computers. Locate instructions for using Boot Camp at: <a href="https://www.apple.com/support/bootcamp/getstarted/">https://www.apple.com/support/bootcamp/getstarted/</a>.</p> <p><b>IMPORTANT:</b> Since Boot Camp requires a restart of the computer to set up the bridge, be sure to print the instructions provided at the URL above before beginning installation.</p>

### 1.1.2 Installing GUPS

GUPS is available for download from the BAS website or from the CD/DVD requested through the Annual Response Form. The software should run automatically from the CD/DVD. If it does not, please navigate to the CD/DVD drive and begin with Step 2.

1. Unzip the file “gups.zip” and extract all contents of the unzipped package to a folder on the computer.
2. Click the **Setup-x.x.x** batch file to start the installation.
3. When the installer opens, the **Welcome to the QGIS GUPS Setup Wizard** screen will appear. Follow the instructions on the Wizard and click the *Next* button.
4. The **License Agreement** screen will appear. Review the License Agreement and click the *I Agree* button to continue the install process.
5. The **Choose Install Location** screen will appear. Click the *Browse* button to choose the location where GUPS will be installed. It is recommended to install the application at the default location shown (C:\Program Files\QGIS GUPS). Click the *Next* button to continue the install process.
6. The **Choose Components** screen will appear. The **Select Components to Install** box will be grayed out. Click the *Install* button to continue.
7. The software should take five to ten minutes to complete the install. When the install is complete, the **Completing the QGIS GUPS Setup Wizard** screen will appear. To complete the install, click the *Finish* button at the bottom of the screen.

---

**Note:** Many agencies/organizations require certain security privileges to download and install external software. Work with your local Information Technology (IT) staff person to acquire those privileges or ask they assist with GUPS installation. Please note that GUPS users with different security privileges than the IT staff person that installed the software will encounter problems accessing the directories and plugins needed to operate GUPS if the software is not installed under the user’s profile. To correct this, have the IT staff person reinstall GUPS under the user’s profile using the user’s credentials. If installation problems remain, **Contact Us** for installation assistance.

---

## CHAPTER 2 STARTING A BAS PROJECT

### 2.1 Creating a Project

Once installed, open GUPS by clicking on the QGIS icon that appears after the installation is complete. Once open, you can begin to set up your BAS project.

1. To set up your BAS project, you will use the **Map Management** tool. This tool should open automatically when you open QGIS. If the tool does not open, then you can click on the icon that looks like a map with a north arrow.



**Figure 1. The Map Management button on the Standard toolbar**

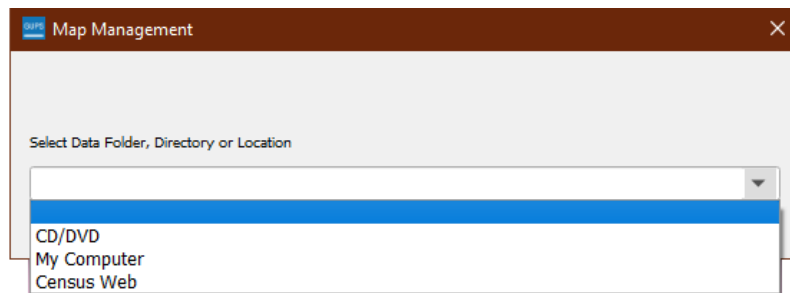
- a. You will use the Map Management tool to set up your workspace and download the Census Bureau's shapefiles for review.

**Figure 2. Map Management options for BAS**

- b. Within the Map Management window, select:
  - i. Program: 2022 Boundary and Annexation Survey or if you are a tribal government, you will select 2022 Tribal Boundary and Annexation Survey.
  - ii. Sub Program: 2022 Boundary and Annexation Survey, or 2022 Tribal Boundary and Annexation Survey.
- c. For standard BAS fill the following:
  - i. State: The working state your government is within (BAS only).
  - ii. Working County: The working county is the county your government is within. If your government is in two or more counties, you will have to create a project for each county your government is in to review your entire boundary.

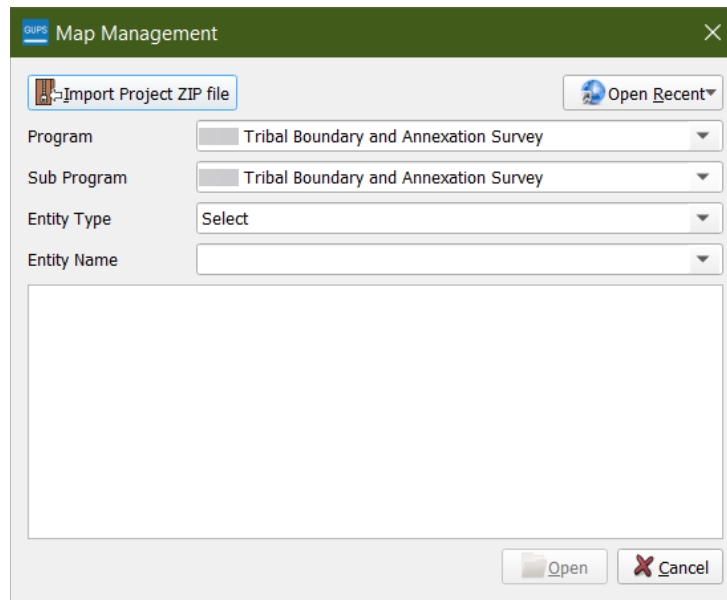
- iii. A dialogue box will appear which will allow you to select the data resource for the Working County. The options to import current Census Bureau geography into the project include:
  - (1) Census Web: shapefiles downloaded directly from the Census Bureau Website or Census Web,
  - (2) CD/DVD: use a disc to import the shapefiles, or
  - (3) My Computer: select shapefiles off your hard drive.

See [Section 2.2](#) for more information on importing Census Bureau geography into the GUPS project.



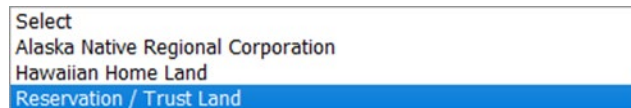
**Figure 3. Dialog box for choosing upload options for the Census Bureau Partnership Shapefiles**

- iv. Entity Type: the type of the government, in which you are reporting.
  - v. Entity Name: the name of the government, in which you are reporting.
  - vi. A list will appear below the chosen government name that contains the names of all the counties in the selected State. The names of the counties that are adjacent to the Working County will show up at the top of the list highlighted in yellow. You have the option to check any counties, including the adjacent counties, that you may want to visualize on the map. If your government is in two or more counties, you will want to select the additional county or counties at this time.
  - vii. Finally, click the *Open* button and the Census Bureau data for your government will appear in your map screen.
- d. For Tribal BAS fill the following:



**Figure 4. Map Management options for Tribal BAS**

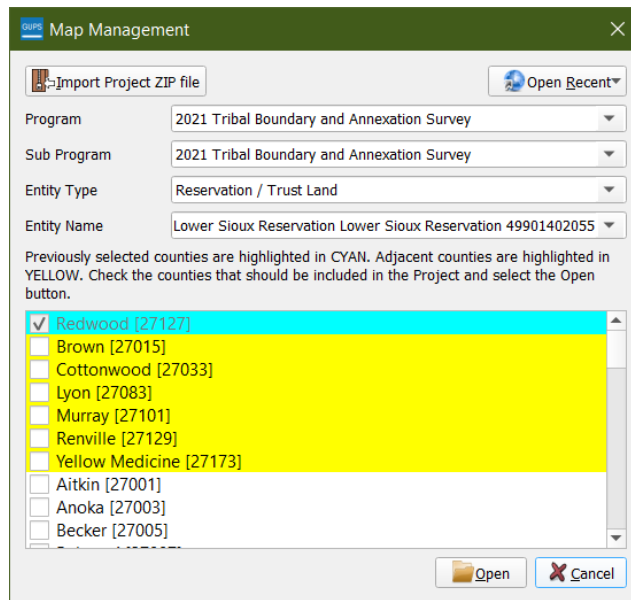
- i. Entity Type: Alaskan Native Regional Corporation, Hawaiian Home Land, or Reservation/Trust Land.



**Figure 5. Tribal BAS Entity Type drop down options**

- ii. Entity Name: Select the name of the area you are reporting from the drop down. This drop down does not include the names of the tribe or tribal governments.
- iii. A dialogue box will appear allowing you to select the data resource for the Working Entity. The options to import current Census Bureau geography into the project include:
  - (1) Census Web: shapefiles directly from the Census Bureau Website or Census Web,
  - (2) CD/DVD: use a disc to import the shapefiles, or
  - (3) My Computer: select shapefiles off your hard drive.

See [Section 2.2](#) for more information on importing Census Bureau geography into the GUPS project.
- iv. A list will appear below the government name that contains the names of all the counties in the selected tribal reservation or trust lands. The names of the counties that are adjacent to the Working County will show up at the top of the list highlighted in yellow. You have the option to check any counties, including the adjacent counties, that you may want to visualize on the map.



**Figure 6. A filled Map Management window with adjacent counties listed in yellow.**

- v. Finally, click the *Open* button and the Census Bureau data for your government will appear in the **Map View**.

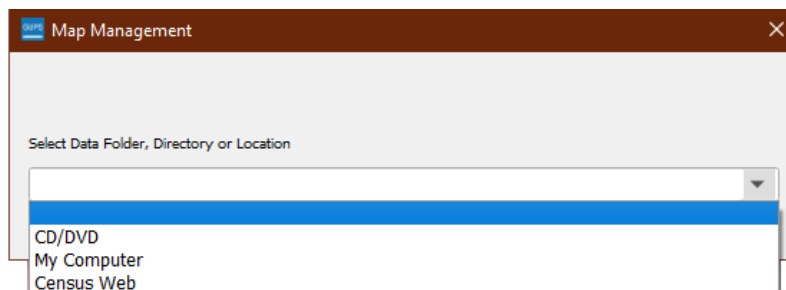
---

Note: If you open Map Management and the options are only for previous year’s BAS or Tribal BAS, update your version of GUPS to the current version ([Section 1.1](#)).

---

## 2.2 Accessing Census Bureau Geography

This section expands on the options to import current Census Bureau geography into your project. The options will appear during Map Management setup after selecting the working county.



**Figure 7. Dialog box for choosing upload options for the Census Bureau Partnership Shapefiles**

### 2.2.1 Census Web (Recommended)

BAS shapefiles can be pulled directly into the application from the BAS website when working in GUPS by choosing the Census Web option during project setup. Users can load the shapefiles as needed or load multiple county files at once. This is the preferred method for loading the



Census Bureau's BAS shapefiles into GUPS as it ensures that required files are placed in the correct location for the application to access.

## 2.2.2 CD/DVD

The GUPS CD/DVD comes preloaded with the required Census Bureau partnership shapefiles. This option is great for poor or no internet access.

When pulling the files from the CD/DVD, the GUPS application unzips them and places them into a pre-established folder created on the computer's home directory during the installation process (C:\GUPSGIS\gupsdata\BAS2022\shape). It then displays them in the application and manages the files. There is no need to take any further action.

## 2.2.3 My Computer

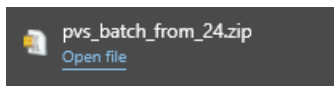
The My Computer option for loading files is to download the shapefiles from the BAS website (or from the Census Bureau ftp2 site), then import them into GUPS. The Census Web option does this process automatically. To use the My Computer option:

1. Navigate to the BAS Partnership Shapefiles page at <https://www.census.gov/geographies/mapping-files/2022/geo/bas/2022-bas-shapefiles.html>.
2. Under '2022 Partnership Shapefiles' in the 'Select a Geography' drop-down box, select the name of the state in which the government is located from the drop-down list.
3. Select the county(ies) or county equivalent(s) needed by clicking the box next to it. Up to five (5) counties may be selected at one time. Once the counties selection is complete, click the Submit button at the bottom left-hand side of the page. Tribal BAS participants should download any counties within their working area.

The screenshot shows the 'Geography' section of the Census Bureau website. The 'Partnerships' tab is active, displaying the 'Maryland Partnership Shapefile Batch Download' page. The page header includes the United States Census Bureau logo and a breadcrumb trail: 'You are here: Census.gov > Geography > Partnerships > Maryland Partnership Shapefile Batch Download'. The navigation menu includes 'Main', 'About', 'Maps & Data', 'Reference', 'Partnerships', 'Education', 'GSS', and 'Contact Us'. The 'Partnerships' section lists various programs, including 'Partnerships Main Page', 'American Indian and Alaska Native Programs', 'Boundary and Annexation Survey', 'Federal Register Notices', 'School District Review Program', 'Local Update of Census Addresses Operation', '2010 Participant Programs', and '2000 Participant Programs'. The main content area is titled 'Maryland Partnership Shapefile Batch Download' and contains the instruction: 'Please select up to 5 individual counties to download the shapefiles for those counties.' Below this instruction is a list of Maryland counties with checkboxes for selection. The counties listed are: Allegany County (24001), Anne Arundel County (24003), Baltimore City (24510), Baltimore County (24005), Calvert County (24009), Caroline County (24011), Carroll County (24013), Cecil County (24015), Charles County (24017), Dorchester County (24019), Frederick County (24021), Garrett County (24023), Harford County (24025), Howard County (24027), Kent County (24029), Montgomery County (24031), Prince George's County (24033), Queen Anne's County (24035), St. Mary's County (24037), Somerset County (24039), Talbot County (24041), Washington County (24043), Wicomico County (24045), and Worcester County (24047). At the bottom of the form are 'Submit' and 'Reset' buttons.

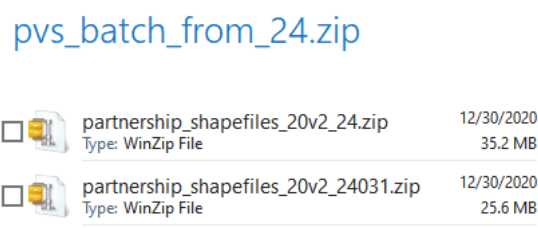
**Figure 8. The Partnership Shapefile Batch Download Page**

4. A prompt to save the file(s) appears.



**Figure 9. Example of the downloaded zip in Edge browser. This prompt will look different depending on which browser is used.**

5. Click the down arrow next to Save and select *Save As* in the drop-down list. The **Save As** dialog box appears, with the file appearing in the **File Name** field. If more than one county was selected, a single zip file containing the selected counties is saved.



**Figure 10. Nested zip files**

6. In the **Save As** dialog box, select a location in the home directory to save the files.
7. Click the *Save* button to save the files in the selected location.
8. To obtain shapefiles for additional counties, repeat the download process as needed.
9. Unzip all the zip files to your working folder.
10. When the geography is selected in GUPS, the application asks to specify the location. Select *My Computer*. Navigate to the location where the files are saved and select the files to upload. GUPS loads the files, then moves them to the pre-established folder in the home directory.

## 2.3 GUPS Overview

Once the project is loaded and open, review the current Census Geography in the map to find areas that need to be updated.

BAS participants can use the BAS Module in GUPS to:

- Add, delete, and modify legal governments (Counties [and equivalent areas], MCDs, Incorporated Places, Census Designated Places, and Consolidated Cities).
- Add, delete, and modify linear features (roads, railroads, and hydrography).
- Add, delete, and modify area landmarks, hydrographic areas, and point landmarks.
- Provide address data for newly annexed areas.

Tribal BAS participants can use the Tribal BAS Module in GUPS to:

- Add, delete, and modify legal governments (Federally Recognized Reservation and Off-Reservation Trust lands, Tribal Subdivisions, Census Designated Places).
- Add, delete, and modify linear features (roads, railroads, and hydrography).
- Add, delete, and modify area landmarks, hydrographic areas, and point landmarks.
- Provide address data for newly added areas.

### 2.3.1 Adding Local Data

To import your own imagery, geodatabase, shapefiles, web mapping service, or other data layers into GUPS use the **Add Data toolbar**.



Figure 11. Add Data toolbar

Although shown in a horizontal position in [Figure 11](#), the **Add Data toolbar** appears arranged vertically to the left of the **Layers Panel** in GUPS. Its buttons are described in [Appendix A](#).

To add a vector layer, such as a shapefile or geodatabase layer from the local computer:

1. Click the *Add Vector Layer* button on the **Add Data toolbar**. The **Add Vector Layer** dialog box opens.



Figure 12. Add Vector Layer button

2. In the Encoding drop-down menu, the default value is 'system'.
3. Click the *Ellipses* button and navigate to the folder where the shapefile or geodatabase is saved on the computer.
4. Left-click the file to be uploaded, then click the *Add* button. The shapefile/geodatabase is added to the **Layers Panel** and to the **Map View**.

Users can also add data from Web Mapping Services (WMS), raster-based imagery, and other data types using the corresponding buttons on the **Add Data toolbar**.

### 2.3.2 Basic Map Tools

The **Standard toolbar** provides the navigation tools to interact with the map and layers' attribute tables. The location of the sub-toolbars can be moved by simply left-clicking the parallel lines preceding the sub-toolbar and while holding down the mouse, dragging the sub-toolbar to the desired location. Most of the sub-toolbar buttons are straight-forward. However, those related to features require further explanation. These buttons are used to identify and select/deselect features on the map and to view feature attributes. They are also used to make measurements and create spatial bookmarks.



Figure 13. Standard toolbar

The **BAS toolbar** provides the BAS-specific functions needed to complete a participant's review and update activities, as well as to import and export zipped shapefiles. The **BAS toolbar** has additional options for toggling imagery.



- Changes from off-reservation trust land to reservation land and changes from reservation land to off-reservation trust land.
- Large changes to existing off-reservation trust land.
- Large changes to existing reservation land.
- Boundary corrections to off-reservation trust land or reservation land that do not follow the general shape of the boundary.

For off-reservation trust land, the most common documentation is a trust deed or a letter from the Bureau of Indian Affairs (BIA). Documents should state that the land is “in trust” for the tribe.

For reservation land, documentation examples include (but are not limited to) federal register notice, Act of Congress, Executive Order, or a new legal opinion issued by the BIA. When submitting large boundary corrections to an existing reservation, please submit the reservation document.

If no documentation is available, please contact the tribe’s regional BIA office to obtain documentation. The Census Bureau will treat legal opinions issued in writing from the BIA as documentation since the BIA is the authority on reservation and off-reservation trust land boundaries. If the Census Bureau cannot interpret a document, such as a treaty, the Census Bureau will contact the BIA for assistance.

For questions about documentation, please [Contact Us](#). To contact the BIA, please reach out to the nearest regional office, see <<https://www.bia.gov/regional-offices>>.

### 2.4.2.2 Creating Legal Changes

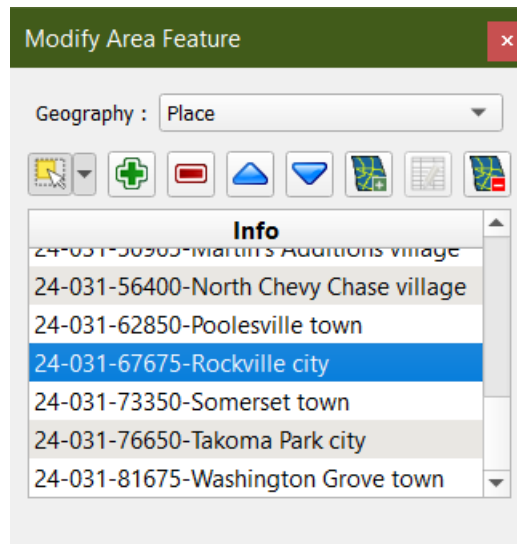
Once you know the faces you want to add or remove from the government, use GUPS to create and submit legal boundary changes.

1. Click the *Modify Area Feature* tool on the **BAS toolbar**.



**Figure 15. Modify Area Feature tool on the BAS toolbar**

2. Select the **Geography** type from the drop-down menu.
3. Select the entity to modify in the **Info** box.



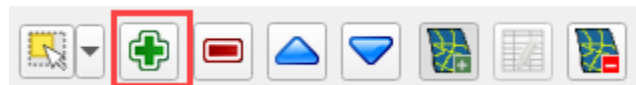
**Figure 16. Modify Area Feature window**

4. Click the *Select Features* button in the **Modify Area Feature** window to activate the select tool, the yellow square and cursor icon.

### **Adding an area through legal change**

To add an annexation or addition to a government as a legal change:

1. Select the faces to modify.
2. Click the *Add Area* tool to add the faces to the selected entity.



**Figure 17. Add Area tool in the Modify Area Feature window**

3. Select **Legal Change** as the change type in the dialog box and click the *OK* button.
4. Fill-out the required fields for the **Create Change Polygons** dialog box.

**Figure 18. Create Change Polygons window for legal changes**

- a. EFF\_DATE: Add the effective date for the legal change. Click on the *Calendar* button next to the **EFF\_DATE** field. When the calendar opens, click on the effective date. The date selected populates the **EFF\_DATE** field.
  - b. AUTHTYPE: Add the authorization type using the drop-down menu.
  - c. DOCU: Either type in the ordinance or other legal documentation number authorizing the new entity in the **DOCU** field, or upload documentation for the change. For BAS, use the document number; a document is not required. For Tribal BAS, upload the document or the reference to the law. To upload documentation, click the *Folder* button next to the **DOCU** field.
  - d. CHNGE\_TYPE: Choose the change type in the drop down.
5. Click the *OK* button. This will create a change in the changes file for the geography selected.
  6. Clicking the *Cancel* button will save the change as a boundary correction.

### Removing an area through legal change

To remove an area from a government as a deannexation, or deletion through a legal change:

1. Select the faces to be marked for removal.
2. Click the *Remove Area* tool to mark the faces to be removed from the selected government.



**Figure 19. Remove Area tool in the Modify Area Feature window**

3. Select **Legal Change** as the change type in the dialog box and click the *OK* button.
4. Fill out the required fields for the **Create Change Polygon** dialog box.

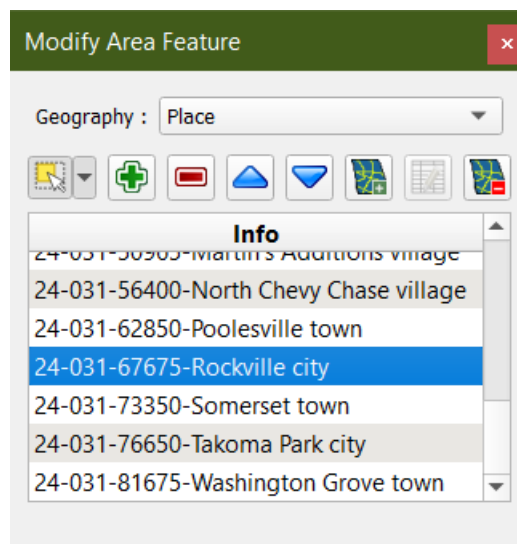
- a. EFF\_DATE: Add the effective date for the legal change. Click on the *Calendar* button next to the **EFF\_DATE** field. When the calendar opens, click on the effective date. The date selected populates the **EFF\_DATE** field.
  - b. AUTHTYPE: Add the authorization type using the drop-down menu.
  - c. DOCU: Either type in the ordinance or other legal documentation number authorizing the removal in the **DOCU** field, or upload documentation for the change. For BAS use the document number; a document is not required. For Tribal BAS, upload the document or the reference to the law. To upload documentation, click the *Folder* button next to the **DOCU** field.
  - d. CHNGE\_TYPE: Choose the change type in the drop down.
5. Click the *OK* button. This will create a change in the changes file for the geography selected.
  6. Clicking the *Cancel* button will save the change as a boundary correction.

### 2.4.3 Boundary Corrections

A boundary correction is the adjustment of a boundary to correct an error in how the Census Bureau depicts an existing boundary. Boundary corrections should follow the general shape of the existing boundary. For both BAS and Tribal BAS, legal documentation is not required when submitting a boundary correction to the Census Bureau.

To create boundary corrections using GUPS:

1. Click the *Modify Area Feature* tool on the **BAS toolbar**.
2. Select the **Geography** type from the drop-down menu.
3. Select the entity to modify in the **Info** box.

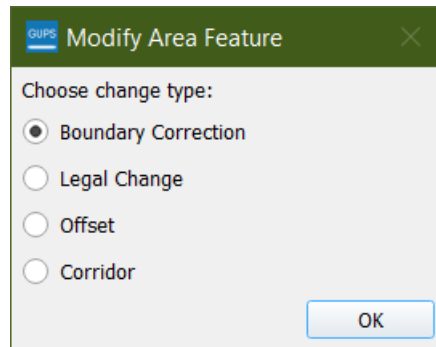


**Figure 20. The Modify Area Feature window with the geography type and government selected**

4. Click the *Select Features* button in the **Modify Area Feature** window to activate the tool.



5. Click on the *Add Area* tool to add the faces to the selected geography or the *Remove Area* tool to remove the faces from the selected geography.
6. Select **Boundary Correction** as the change type in the dialog box and click the *OK* button.



**Figure 21. Modify Area Feature change type dialog box**

## 2.4.4 Linear Features

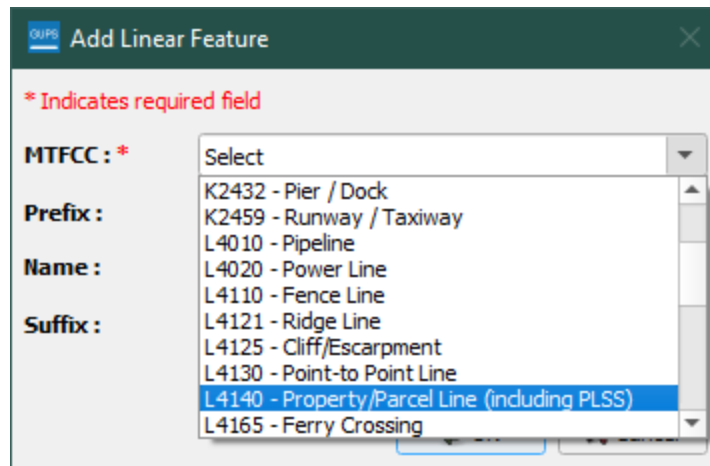
It is important that Census Bureau data reflects the most recent linear features to ensure that new or previously missed housing units located along these features are identified and located. Linear Features include visible features such as roads, railways, water, and coastlines, but also non-visible features such as property lines and survey lines.

When reviewing linear features (edges layer) in the BAS shapefiles, first determine whether any features are missing or need to be deleted. Pay particular attention to areas that have experienced recent population growth or construction activities, as these are the most likely to possess new or altered linear features (e.g., new subdivisions, traffic circles converted to straight ways, or privately maintained roads that serve as public streets, but exclude private driveways). Attribute updates (e.g., name, class code, and address ranges) may also be added for selected features.

You will use the Linear Feature tools on the **BAS toolbar** to add, remove or modify linear features in the project.

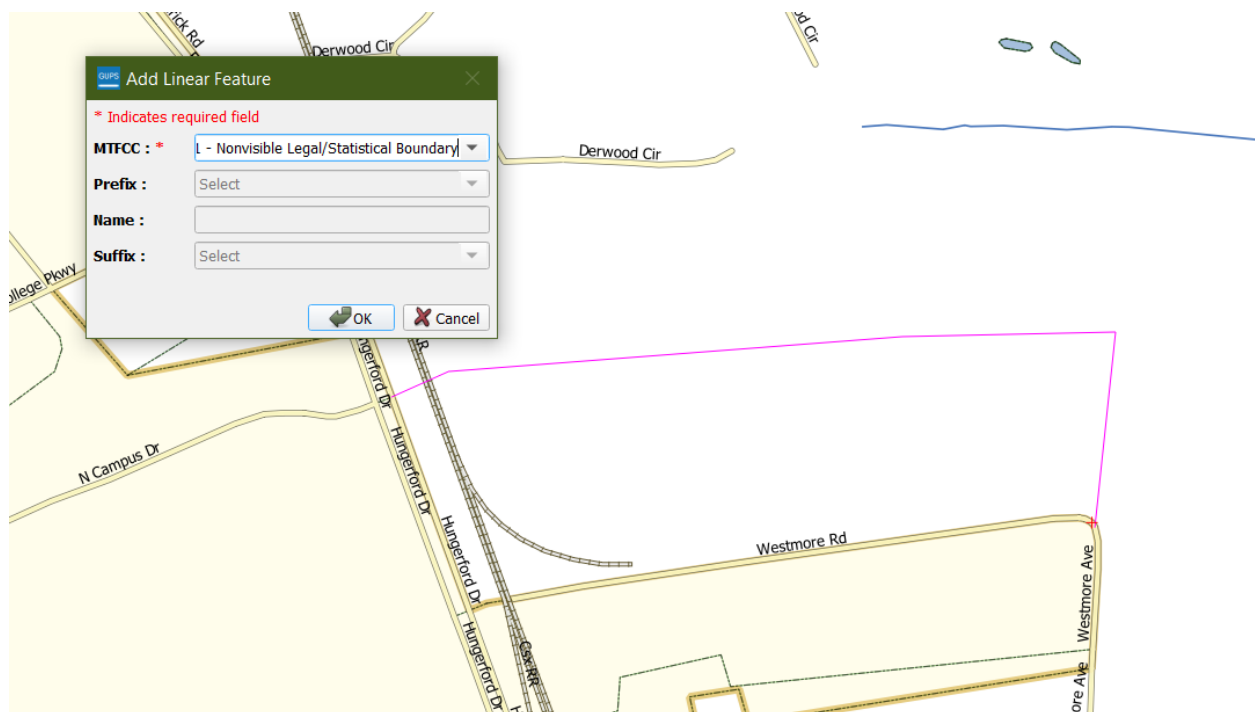
### 2.4.4.1 Adding Linear Features

1. Click the *Add Linear Feature* tool on the **BAS toolbar**.
2. To digitize a linear feature, left-click the mouse at the starting point of the line and continue to left-click the mouse at each vertex of the line. When the new line is completed, right-click the mouse. The right-click tells GUPS to finish drawing and the **Add Linear Feature** dialog box will open.



**Figure 22. Add Linear Feature Dialog Box**

3. Select the MAF/TIGER Feature Classification Code (MTFCC) that corresponds to the type of linear feature being added.
  - a. If you are creating the sides of a polygon to add or remove area from an entity, use MTFCC P0001 – Nonvisible Legal/Statistical Boundary.



**Figure 23. Adding a boundary line in GUPS as a Nonvisible Legal/Statistical Boundary line**

4. Fill out the Prefix, Name, and Suffix fields as applicable. Name is a required field for Primary Roads (S1100) and Secondary Roads (S1200).
5. Click the *OK* button to complete the transaction. The newly digitized linear feature will appear with its corresponding symbology.

#### 2.4.4.2 Deleting and Restoring Linear Features

To mark a feature for deletion:

1. Click the *Delete/Restore Linear Feature* tool on the **BAS toolbar**.



**Figure 24. Delete/Restore Linear Feature button on the BAS toolbar**

2. Left-click the linear feature you want to mark for deletion. A **Delete/Restore Linear Feature** dialog box will open.
3. Click the *OK* button to confirm the action.
4. The linear feature will appear with crossed-out symbology to show it has been marked for deletion.



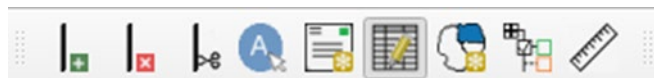
**Figure 25. Crossed-out symbology of a linear feature marked for deletion**

To restore a linear feature marked for deletion:

1. Click the *Delete/Restore Linear Feature* tool on the **BAS toolbar**.
2. Click the linear feature to restore. A **Delete/Restore Linear Feature** dialog box will open.
3. Click the *OK* button to confirm the action.
4. The crossed-out symbology will be removed from the linear feature.

#### **2.4.4.3 Modifying Linear Feature Attributes**

1. Click the *Modify Linear Feature Attributes* button on the **BAS toolbar** to activate the tool.



**Figure 26. Modify Linear Feature Attributes button on the BAS toolbar**

2. Click the linear feature to modify. A **Modify Linear Feature Attributes** dialog box will open.
3. Update the MTFCC, NAME, and/or Address Ranges in the dialog box.
4. Click the *Save* button to confirm the action.

**\* Indicates required field**

TLID : 194772920

MTFCC : \* S1400 - Local Neighborhood Road, Rural Road, City Street

FULLNAME : 39th Ave

LFROMADD : 79936 RFROMADD : 79937

LTOADD : 79998 RTOADD : 79999

Save Cancel

**Figure 27. Modify Linear Feature Attributes dialog box**

## 2.4.5 New Incorporations and Disincorporations

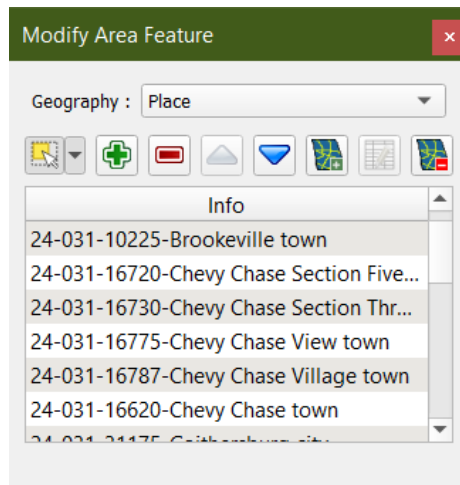
### 2.4.5.1 New Incorporations

In the BAS module in GUPS, you can add a new government using the **Modify Area Feature** tool. The *Add Entity* option is available for the following geographies:

- New reservation and off reservation trust lands,
- Tribal Subdivisions,
- Incorporated Places,
- MCDs,
- CDPs, and
- Area Landmarks.

To add a new government in GUPS:

1. In **Map View**, open the county where you want to add a new government.
2. Click the *Modify Area Feature* button on the **BAS toolbar**.
3. The **Modify Area Feature** dialog box opens.
4. Click the drop-down arrow next to the **Geography** field and select the government type to add from the drop-down menu. In this example a newly incorporated city is added, so 'Place' is selected. The place appears in the **Geography** field and a list of all incorporated places in the county appears in the **Info** list.



**Figure 28. Modify Area Feature tool**

5. Zoom to the location where the new government is located. To select the faces for the government, left-click once on the *Select Features* button in the **Modify Area Feature** window.
6. Click on the map to select the face or faces.

If the government includes only a single face, left-click once on the face to select it. If the government includes several contiguous faces, after left-clicking on the first face, depress the CTRL key and while holding it down, left-click on each additional face to be added. The selected faces are highlighted.

Because all geographic areas consist of faces, you may need to “split” a face to accurately reflect a government’s boundary. To split a face, digitize a new line that represents the boundary’s location ([Section 2.4.4](#)) and assign the appropriate MTFCC. This splits the original face into two faces. Now select the face to add to the new entity.

7. To record the new entity, click on the *Add Entity* button in the **Modify Area Feature** window.



**Figure 29. The Add Entity button on the Modify Area Feature dialog box toolbar**

8. The **Modify Area Feature** dialog box opens.

**Figure 30. Modify Area Feature tool example for new incorporation, "New Place"**

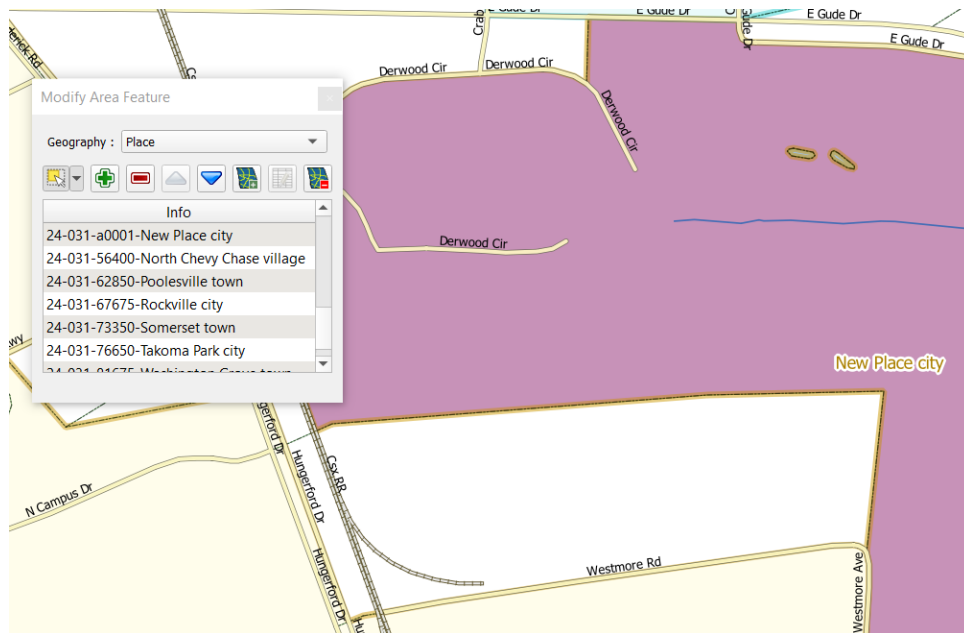
9. In the dialog box, fill-out the following fields:
  - a. Name: Type the new legal government name in the **Name** field.
  - b. LSAD: The Legal/Statistical Area Description. See the BAS Technical Guide at <https://www.census.gov/programs-surveys/bas/information/respondent-guides.html> for more information.
  - c. EFF\_DATE: Add the effective date for the legal change. Click on the *Calendar* button next to the **EFF\_DATE** field. When the calendar opens, click on the effective date. The date selected populates the **EFF\_DATE** field.
  - d. AUTHTYPE: Add the authorization type using the drop-down menu.
  - e. DOCU: Upload documentation for the new incorporation. To upload documentation, click the *Folder* button next to the **DOCU** field.

---

**Note:** Red asterisks indicate required fields. Required fields must be completed to move forward. If one or more required fields are not completed and the *OK* button is clicked, GUPS will prompt the user to complete the fields. Any required field not completed will highlight in red.

---

Once all required fields are completed, click the *OK* button. The faces for the new entity turn purple on the map (color may vary) and the name of the new entity appears in the list of incorporated places in the **Modify Area Feature** dialog box with a placeholder Federal Information Processing Series (FIPS) code.



**Figure 31. An example for a new government "New Place" symbology and placeholder FIPS code**

Once the Census Bureau verifies the new government, an official FIPS code will be assigned. More information on FIPS codes and how they are assigned can be found on the American National Standards Institute (ANSI) page on the Census Bureau web site <https://www.census.gov/library/reference/code-lists/ansi.html>.

The code preceding the new government name in the list is not a FIPS code and should not be used for any official purpose. It is only a placeholder until the official FIPS code can be assigned.

To make additional changes to the map, simply make a new selection in the **Modify Area Feature** dialog box **Geography** field and continue work. You can save changes as they are made or wait until all work on the map is finished. However, saving as changes are completed, is recommended to avoid losing work in the event of a power outage or system interruption.

---

**Note:** If the new government crosses a county boundary, it must be added in both counties separately. After making the change in the working county, return to Map Management, select the other county as the working county, and proceed to add the new government in this county as well. If the added government crosses more than one county boundary, complete the addition in each county affected.

---

### 2.4.5.2 Disincorporations

GUPS also allows for disincorporations in the BAS module. Tribal BAS does not have this functionality for certain geography. If you are a tribal participant wanting to completely remove reservation or trust land, [Contact Us](#).

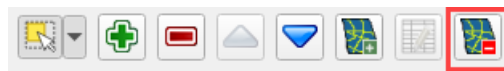
The **Delete Area** feature is available for the following geographies:

- Incorporated Places,
- CDPs, and

- Area Landmarks.

To mark a government for disincorporation or deletion:

1. In **Map View**, open the county that contains the government to be deleted. Be sure that all layers needed are checked on the **Layers Panel**.
2. Click the *Modify Area Feature* button on the **BAS toolbar**.
3. The **Modify Area Feature** dialog box opens.
4. Click the drop-down arrow next to the **Geography** field and select 'Place' in the drop-down menu.
5. Place appears in the **Geography** field and a list of all incorporated places in the county appears in the Info list.
6. Click the government in the list you want to mark for the disincorporation. The map zooms to the selected government.
7. Click the *Delete Area Feature* button in the **Modify Area Feature** dialog box.



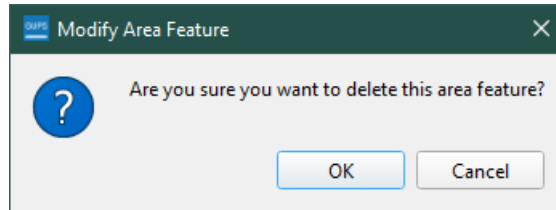
**Figure 32. The Delete Area Feature tool in the dialog box toolbar**

8. The **Modify Area Feature** dialog box will open.
9. Fill-out the following fields:
  - a. **EFF\_DATE**: Add the effective date for the legal change. Click on the *Calendar* button next to the **EFF\_DATE** field. When the calendar opens, click on the effective date. The date selected populates the **EFF\_DATE** field.
  - b. **AUTHTYPE**: add the authorization type using the drop-down menu.
  - c. **DOCU**: Upload documentation for the disincorporation. To upload documentation, click the *Folder* button next to the **DOCU** field.

**Figure 33. The Modify Area Feature box for Delete Area Feature tool**



10. A pop-up prompts, 'Are you sure you want to delete this area feature?'



**Figure 34. Confirmation of area feature deletion**

11. Click on the *OK* button. The disincorporated government turns gray on the map (color may vary) and is removed from the list of incorporated places in the county.

To make additional changes to the map, simply make a new selection in the **Modify Area Feature** dialog box **Geography** field and continue work.

---

**Note:** If the deleted government crosses a county boundary, it must be deleted in both counties separately. After making the change in the working county, return to Map Management, select the other county as the working county, and proceed to delete the government in this county as well. If the deleted government crosses more than one county boundary, complete the deletion in each county affected.

---

## 2.5 Point Landmarks

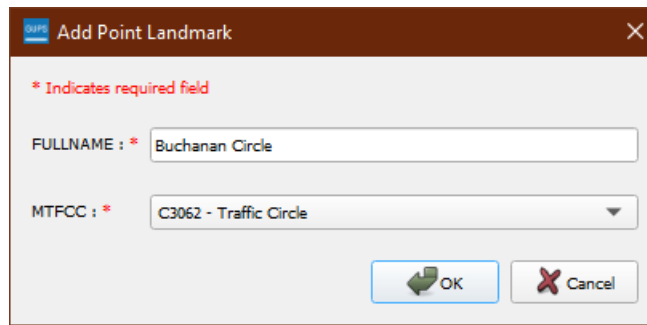
GUPS has the option to add, delete, and modify point landmarks. These include traffic circles, airports, cul-de-sacs, etc.



**Figure 35. The Add, Edit, and Delete Point Landmarks tools**

To add a point landmark:

1. Open the project in **Map View**. Be sure the 'Point Landmark' layer is checked in the **Layers Panel**.
2. Click the green *Add Point Landmark* button on the **BAS toolbar**.
3. Left-click on the map where you would like to add the new point landmark.
4. Type in the name for the new point landmark in the **FULLNAME** field. Then click the down arrow next to the **MTFCC** field to open the drop-down menu.



**Figure 36. The Add Point Landmark dialog box**

5. Select the MTFCC, then click the *OK* button at the bottom of the box.
6. The map updates to show the added point landmark. In this case, a traffic circle was added and named Buchanan Circle.

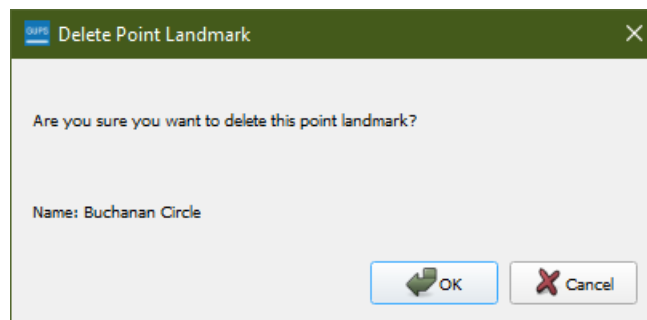
To delete a point landmark:

1. Zoom to the area on the map where a point landmark will be deleted.
2. Click the *Delete Point Landmark* button the **BAS toolbar**.



**Figure 37. The Delete Point Landmark tool**

3. On the map, left-click on the point landmark to delete. The **Delete Point Landmark** dialog box opens and asks to confirm the deletion of the point landmark.



**Figure 38. Delete Point Landmark window**

4. Click the *OK* button. The point landmark shows a red x over it and is marked for deletion in the attribute table.

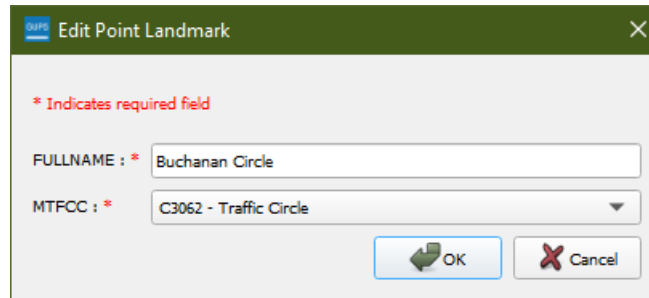
To change the attributes of a point landmark:

1. Zoom to the area on the map where the point landmark is located.
2. Click on the yellow *Edit Point Landmark* button on the **BAS toolbar**.



**Figure 39. The Edit Point Landmark button**

3. On the map, left-click on the point landmark to edit. The **Edit Point Landmark** dialog box opens.



**Figure 40. The Edit Point Landmark dialog box**

4. To change the name, backspace over the name that appears in the **FULLNAME** field, then type in the new name.
5. Click **OK**. The new name of the point landmark appears on the map.

## 2.6 Quality Control Checks

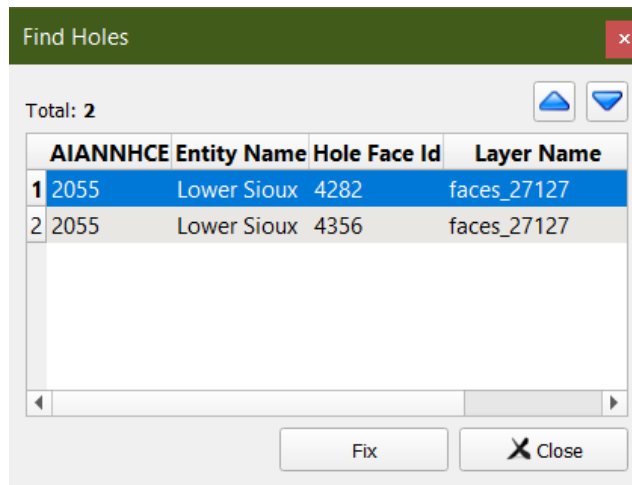
GUPS offers two built-in quality control (QC) checks that must be run before exporting the file. The first QC tool called *Small Area Check* looks for areas added that are smaller than 500 square feet. The second QC tool called *Find Holes* checks for holes that may have been created during the updating process. An error will appear if you try to export the file without running these checks.

1. Save the project.
2. Click on the *Review Change Polygons* tool on the **BAS toolbar**.



**Figure 41. The Review Change Polygons tool on the BAS toolbar**

3. The **Review Change Polygon** dialog box opens.
4. In the **Geography** drop-down menu, choose the level of geography you created changes for.
5. Click the *Small Area Check* tool.
  - a. The *Small Area Check* tool look for areas added that are smaller than 500 square feet and therefore may not meet the 30-foot minimum guideline.
  - b. Click on the results record and zoom to the identified issue. Correct the issue by using the tools on the BAS toolbar. You can either remove, modify, or accept the change.
6. Click the *Find Holes* button.
  - a. The Find Holes tool finds faces that may have been missed when adding or modifying an area feature.
  - b. Click on the results record and zoom to the identified issue. Correct the issue by filling the hole using the **Fix** button.



**Figure 42. An example of the Find Holes tool in the Tribal BAS module**

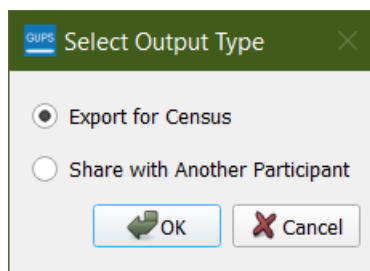
7. If there are no issues found during the quality checks, or once you fix any issues found, you are ready to export your files.

## 2.7 Exporting Changes to Zip

Once you have created and reviewed any changes, you have two options to export the changes—exporting the file to share with another participant or exporting the file for submission to the Census Bureau. In either case, GUPS automatically names the output zip file. It packages all the files required by the Census Bureau (including any documentation uploaded) into the zip file and saves it in a preset location created on the computer during the installation process.

### Create Return ZIP Files

1. Select the *Export to Zip* button on the **BAS toolbar**.
2. A dialog box will appear with the last time the *Review Change Polygons* tool ran in the project. If you have not performed the QC checks with the *Review Change Polygons* tool, an error box will appear. Click the *OK* button and run the QC checks ([Section 2.6](#)) before exporting your file.
3. From the **Select Output Type** dialog box, select the *Export for Census* button to create a file to return to the Census Bureau. Click the *Share with Another Participant* button to create a copy of your project that can be shared with another GUPS user.



**Figure 43. Select Output Type Dialog Box**

4. After selecting *Export for Census*, the **GUPS User Contact Information** dialog box will appear with a BAS Contact Information form. Fill-out the GUPS User Contact Information form. All fields with a red asterisk are required.

The screenshot shows a software dialog box titled "GUPS User Contact Information" with a subtitle "Boundary and Annexation Survey (BAS) Contact Information". The form contains the following fields and controls:

- First Name: \* (text box)
- MI: \* (text box)
- Last Name: \* (text box)
- Dept. Name: \* (text box)
- Position: \* (text box)
- Address: \* (text box)
- City: \* (text box)
- State: \* (dropdown menu, currently showing "Select")
- Zip: \* (####-####) (text box)
- Phone: \* ((###) ###-####) (text box)
- Ext: \* (####) (text box)
- FAX: \* ((###) ###-####) (text box)
- E-mail: \* (text box)
- I am the primary BAS Contact.
- OK button (with a green arrow icon)
- Cancel button (with a red X icon)

**Figure 44. GUPS User Contact Information Form**

5. Click the *OK* button to start the export.
6. A window opens showing the location of the output file on the local system. This is the file you will return to the Census Bureau through the Secure Web Incoming Module (SWIM) in the next section.

## CHAPTER 3 SUBMIT CHANGES TO THE CENSUS BUREAU

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All participants must use the Secure Web Incoming Module (SWIM) to submit their changes to the Census Bureau. Due to security requirements, the Census Bureau cannot accept submissions via File Transfer Protocol (FTP), email or any protocol other than the SWIM site.

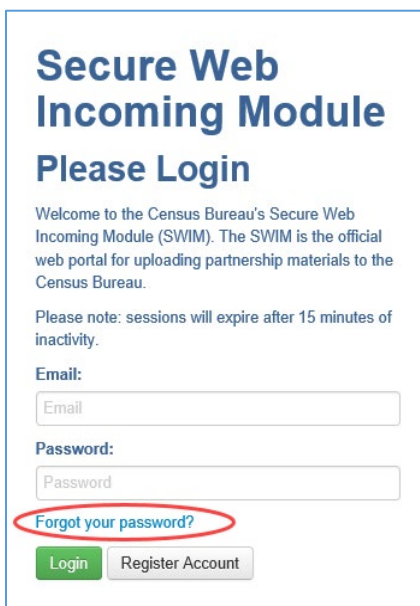
To upload and transmit update files to the Census Bureau, participants must access their SWIM account.

1. Open a web browser window and enter the SWIM URL: <<https://respond.census.gov/swim/>>. SWIM runs on the two most recent versions of each of these major browsers:
  - Microsoft Edge®
  - Google Chrome®
  - Mozilla Firefox®
  - Apple Safari®
2. Participants who already have a SWIM account should proceed to Step 4 to log in.
3. Participants who do not have a SWIM account click the *Register Account* button:
  - Enter the 12-digit token provided by the Census Bureau.
  - Create a password following the five criteria below:
    - a. Username and password are case sensitive.
    - b. It must be at least eight characters in length.
    - c. It must have at least one upper case character.
    - d. It must have at least one lower case character.
    - e. It must have at least one number.
    - f. It must have at least one special character (valid characters are: #, !, \$, &, ?, ~).
  - Complete the registration information form.
4. Log-in to SWIM using your email address and password.
5. Upload a BAS submission:
  - a. Select the *Start New Upload* button.
  - b. Select the *BAS* radio button.
  - c. Select the Entity type (State, Place, County, MCD, Tribal Area, or Consolidated City).
  - d. Select the State and County.
  - e. Click the *+ Add File* button.
  - f. Select the .zip file to upload.
  - g. Double-click on the .zip file to upload. Add additional files in the same manner.
  - h. Add any additional information to the **Comments** field.
6. Click the *Next* button. A **Thank You** screen will appear.
7. Logout of SWIM.

### 3.1 Troubleshooting SWIM

If you are having trouble accessing your SWIM account, here are some tips for using SWIM:

- SWIM email addresses *and* passwords are case sensitive.
- If you forgot your password, participants may reset their password using the “Forgot your password?” link on the login page. Follow the prompts to enter the case-sensitive email address and provide the security answer (not case-sensitive). If the security answer is correct, the SWIM system sends a password reset link to the email account for use in resetting the password. Once logged into SWIM, users can modify their password and security answer by selecting the ‘Change Security’ link at the top, right-hand side of the page.



**Secure Web Incoming Module**  
**Please Login**

Welcome to the Census Bureau's Secure Web Incoming Module (SWIM). The SWIM is the official web portal for uploading partnership materials to the Census Bureau.

Please note: sessions will expire after 15 minutes of inactivity.

**Email:**

**Password:**

[Forgot your password?](#)

- If you cannot recover your password through the “Forgot your Password?” menus, please email [geo.bas@census.gov](mailto:geo.bas@census.gov) with the subject line “SWIM Account Assistance” with a brief description of the issue.
- SWIM accounts are specific to users, not to your government so we do not advise sharing an account. You may always request another account for a new BAS Contact.
- If you already created an account through another program such as PSAP, LUCA, or GSS, you do not need another account. You may use the same previously established login information.

## APPENDICES

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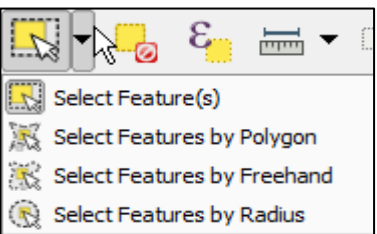

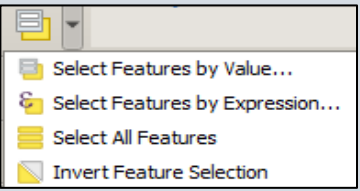





## APPENDIX A GUPS MAPPING TOOLS

### A1 Standard Toolbar
















Table 2: Standard Toolbar Tool Names and Descriptions

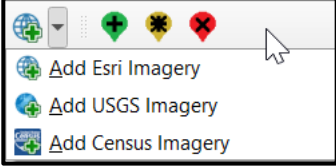



Button	Name	Function/Description
	Save	Saves the current GUPS project, including any user changes to layer properties, projection, last viewed extent, and layers added.
	Style Manager	Allows customization of map symbology.
	Map Management	Chooses a geographic participant program in GUPS and access the automatically loaded default map display layers based on the program chosen.
	GUPS Data Settings	<b>Warning! This tool deletes files and folders permanently!</b> Change GUPSGIS data working directory and clean GUPS project data.
	Search	Searches the map by place, landmark, or street name and zoom automatically to the feature.
	Pan Map	Shifts the map in <b>Map View</b> without changing the map scale. Click the button, then click a location on the map to re-center the map to the clicked location.
	Pan Map to Selection	Shifts the map in <b>Map View</b> to the rows selected in the attribute table for a selected feature. After selecting a feature(s), click the button to re-center the map based on the selected feature(s).
	Zoom In	Displays the map in <b>Map View</b> at a larger scale. Click the button, then click on the map at the location to be zoomed to.
	Zoom Out	Displays the map in <b>Map View</b> at a smaller scale.
	Zoom Full	Displays the map in <b>Map View</b> at a smaller scale and zooms the map view to the full extent of the county.
	Zoom to Selection	Zooms the <b>Map View</b> to the rows selected by query in the attribute table for a feature(s). After selecting a feature(s) on the map, click the button to view the feature(s) at a larger map scale.
	Zoom to Layer	Zooms the <b>Map View</b> to the layer selected in the <b>Layers Panel</b> . After selecting the layer, click the button to zoom to the layer's extent.
	Zoom Last	Zooms the <b>Map View</b> to the previous map extent.

Button	Name	Function/Description
	<b>Zoom Next</b>	Zooms the <b>Map View</b> forward to the next map extent (only if a previous extent is available).
	<b>New Bookmark</b>	Creates and names a spatial bookmark of the current map view.
	<b>Show Bookmarks</b>	Displays all bookmarks created by the user.
	<b>Refresh</b>	Displays <b>Map View</b> to initial full display.
	<b>Identify Features</b>	Identifies geographic features. Click the button, then click on a feature on the map to identify the feature at the location.
	<b>Select Features by Area or Single Click</b>	Allows the user to select layer features in the map window with a single click, by dragging the cursor, or by drawing graphics on the screen. 
	<b>Select Features by Value</b>	Allows selection of features by value or expression. 
	<b>Deselect Features from All Layers</b>	Deselects selected features from all layers.
	<b>Processing Toolbox</b>	Displays list of processing tools available.
	<b>Measure</b>	Provides options to measure linear distance, area, and angles on the map.

## A2 BAS Toolbar









**Table 3: BAS Toolbar Tool Names and Descriptions**


Button	Name	Function/Description
	<b>Add Linear Feature</b>	Add a new linear feature.
	<b>Delete/Restore Linear Feature</b>	Delete an existing linear feature.
	<b>Split Linear Feature</b>	Split a linear feature. One may need to split a linear feature to accurately reflect an entity's location. This feature "splits" the original into two.
	<b>Display All Names</b>	Displays all names for a street with multiple names assigned in the MAF/TIGER System.
	<b>User Address List</b>	Import an address list (.csv, .txt, etc.) into GUPS.
	<b>Modify Linear Feature Attributes</b>	Edit attributes of a selected linear feature.
	<b>Modify Area Feature</b>	Make updates to legal area (annexations, deannexations, boundary corrections, etc.).
	<b>Show/Hide Legend</b>	Shows or hides the Layers tab.
	<b>Geography Review Tool</b>	Review the attribute table for a layer.
	<b>Review Change Polygons</b>	Review change polygons in a layer and make corrections (reviews change polygons for holes and minimum size).
	<b>Import County ZIP</b>	Import zipped GUPS project shared by another GUPS user.
	<b>Export to ZIP</b>	Create the ZIP file containing all required data and shapefiles to be submitted to the Census Bureau or to share with another GUPS user.
	<b>Print Map to File</b>	Export a printable map in *.pdf, *.png, *.tif, or *.jpeg format.
	<b>Internet Map Service</b>	Displays the chosen map location in an internet mapping service, such as Google or Bing Maps
	<b>Add Esri Imagery</b>	Displays satellite imagery overlaid on the QGIS map

Button	Name	Function/Description
		
	<b>Add Point Landmark</b>	Add a new point landmark.
	<b>Edit Point Landmark</b>	Edit point landmark attributes.
	<b>Delete Point Landmark</b>	Delete an existing point landmark.

### A3 Add Data Toolbar

Table 4: Add Data Toolbar Tool Names and Descriptions

Button	Name	Function/Description
	<b>Add Vector Layer</b>	Add vector-based shapefile and geodatabase files.
	<b>Add Raster Layer</b>	Add raster-based shapefile and geodatabase files.
	<b>Add SpatialLite Layer</b>	Add data from a SpatialLite database.
	<b>Add/Edit Virtual Layer</b>	Add or Edit Virtual Layers.
	<b>Add PostGIS Layer</b>	Add PostGIS layer.
	<b>Add WMS/WMTS Layer</b>	Add Web Mapping Services (WMS) and Web Mapping Tile Services (WMTS). Publicly accessible and secured WMS services are supported.
	<b>Add WCS Layer</b>	Add Web Coverage Services (WCS), which provide access to raster data useful for client-side map rendering.
	<b>Add WFS Layer</b>	Add Web Feature Services (WFS).

Button	Name	Function/Description
	<b>New Shapefile Layer</b>	<p>Add a new shapefile layer or new temporary scratch layer.</p> 