2021 BAS PARTNERSHIP TOOLBOX

The 2021 BAS Partnership Toolbox provides step-by-step instructions to facilitate the updating process. These instructions are best used in conjunction with the Boundary and Annexation Survey (BAS) Respondent Guide: Digital. For best results, use the toolbox in ArcGIS 10.0 and higher (not including ArcGIS Pro).

1 How to Use the BAS Partnership Toolbox

In an effort to ease the burden of creating BAS updates, a toolbox was developed for ArcGIS. This toolbox simplifies the updating process by automating the downloading of data, creating changes, removing slivers, formatting and checking attribution, and preparing/exporting files for submission. Before running these tools, users will need the following:

- **The Boundary and Annexation Survey (BAS) Respondent Guide: Digital** which can be downloaded at: <https://www.census.gov/programs-surveys/bas/geographies/map-tools/arcmap-tools.html>.
- **The BAS Partnership Toolbox**, which can be downloaded at: <https://www.census.gov/programs-surveys/bas/geographies/map-tools/arcmap-tools.html>.
- **The BAS ID for the government being processed.** This can be found on the BAS Annual Response email or online at: <https://www.census.gov/programs-surveys/bas/technical-documentation/code-lists.html>.
- **A shapefile or feature class showing the legal boundary of the government.**
  - Data in this layer should have data including the name of the government being processed formatted to agree with the Census Bureau's naming convention for the same government as found in the NAME field or the NAMELSAD field for Minor Civil Division (MCD) and American Indian / Alaska Native / Native Hawaiian (AIANNH).
- **The 2021 BAS Partnership Shapefiles located at:** <https://www.census.gov/geographies/mapping-files/2021/geo/bas/2021-bas-shapefiles.html>.

2 Toolbox Tools Setup

These Toolbox tools were designed primarily for use in ArcCatalog though they run in ArcMap as well. The instructions for most steps are assuming use in ArcCatalog.

1. Unzip the **BAS Partnership Tools.zip** to the C: drive or other preferred working folder. The folder location does not matter as long as it can be accessed from ArcCatalog. Inside there will be a folder called DBAS, containing all the files to work with for a government.

2. Open ArcCatalog and connect to the DBAS folder. When expanded, the following should be visible:
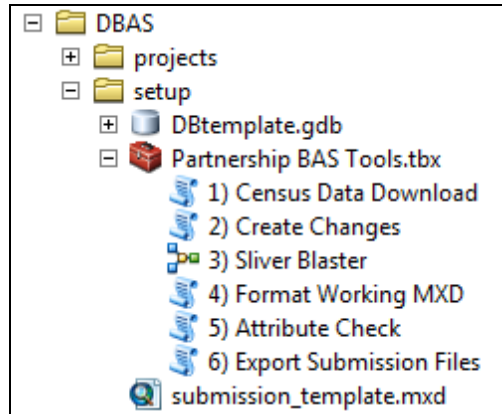

Figure 1. Partnership BAS Tools Menu

Note: To connect to a folder in ArcCatalog, click on the Connect to Folder button on the Standard Toolbar, find the DBAS folder, and then click OK.

3 Census Data Download Tool

The Census Data Download tool will gather all the partnership shapefile data needed to create changes from the Census Bureau website. If the data is on a Census Bureau provided disc, this tool will also work but only if the data is loaded to the computer before running the tool. This tool can also use the ZIP files downloaded from the 2021 BAS Partnership Shapefiles site: <https://www.census.gov/geographies/mapping-files/2021/geo/bas/2021-bas-shapefiles.html> and outlined in **Chapter 3** of the *Boundary and Annexation Survey (BAS) Respondent Guide: Digital*. Please follow the steps below to run the Census Data Download tool.

1. Expand the **DBAS folder** and the **setup subfolder**. In the setup folder, find the **Partnership Toolbox**. Expand the toolbox and double click on the **1) Census Data Download** tool.
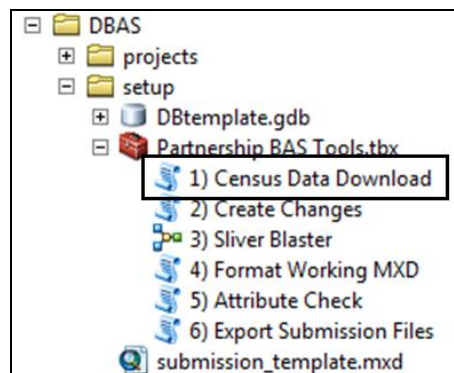

Figure 2. Partnership BAS Tools Menu with Census Data Download Selected

2. There are two ways to use this tool: one that downloads the data from the Census Bureau for the user and one that takes in a folder with the Census Bureau data already downloaded. If you have already downloaded the data, you must unzip the downloaded pvs batch zip file (e.g. pvs_batch_from_<st>) to display the partnership shapefiles zip files (e.g. partnership_shapefiles_20v2_<st> and partnership_shapefiles_20v2_<stcou>). The tool will look for these partnership_shapefiles zip files when it runs.

- Enter the 11-digit BAS ID in the **User's BAS ID** field. If you are a county participant, responding for the governments within your jurisdiction, you will enter the County BAS ID.
- Select Yes or No under the **Use Data Downloader?** field. If you select No, you must enter a path to the already downloaded partnership shapefiles zip files in the next field.
- Navigate or drag the folder into **Path to ZIP files** field. Make sure the folder only contains the Census Bureau ZIP files to ensure there are no future data issues.

This example shows how a user would complete the fields to have data downloaded for them.
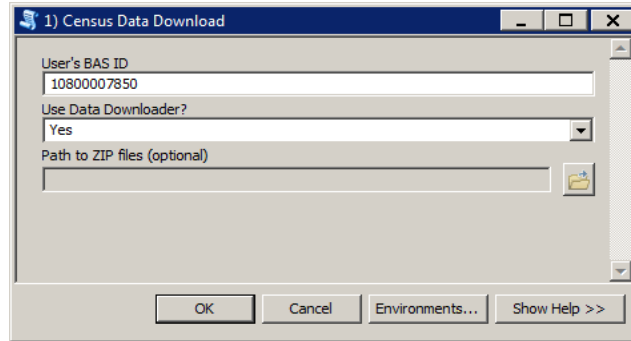
Figure 3. The Census Data Download Window with 'Yes' in the Use Data Downloader Field

This example shows how a user would complete the fields if they already have the partnership shapefiles downloaded and saved on their computer.
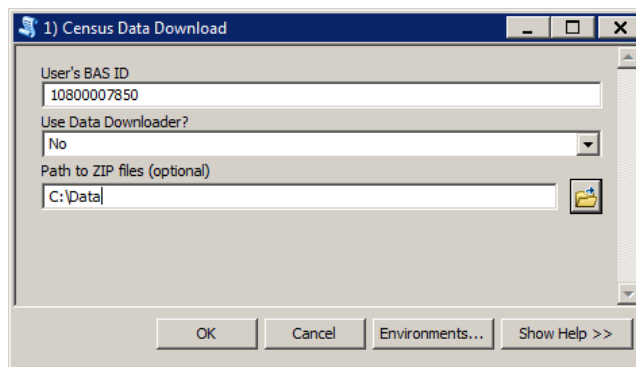
Figure 4. The Census Data Download Window with 'No' in the Use Data Downloader Field

3. Click **OK** to run.
4. When this tool is complete, there should now be a folder for the BAS ID in the projects folder. Inside that folder, there will be a geodatabase with reference data in it and an archive folder.
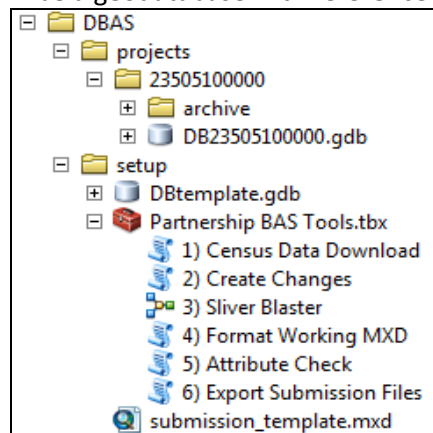

Figure 5. Partnership Tools Menu Showing a Folder for the BAS ID in the Projects Folder

Note: The archive folder contains other Census Bureau data that may be useful as well.

4   Create Changes Tool

Once the necessary Census Bureau data is obtained, run the **2) Create Changes** tool to create the change polygons. Before this tool can successfully complete, there must be an attribute field in the local boundary layer that contains the name of the government or governments as they appear in Census Bureau records (**Figure 6**). This includes matching capitalization, spacing, and in the case of MCDs a descriptor of the geography (e.g. township, village, borough, etc.) which can be found in the NAMELSAD field of the bas_cousub layer in the reference feature dataset (**Figure 7**). If it is a new entity or the legal name is changing, it does not need to agree though other attribution must be updated to reflect this change.

Figure 6. NAME Field in Census Data vs Local Boundary Data

The bas_place layer on the left shows how the Census Bureau NAME field is populated for all the places in Butler County, PA while the local places data shows how local data may need to be manipulated to agree with the Census Bureau NAME field.

Figure 7. Appropriate Attribution for COUSUB or AIANNH Changes

The bas_cousub attribution on the left in the NAMELSAD field shows how the local MUNICIPALI field on the right should be formatted to ensure that the Create Changes tool works for the MCD changes in Butler County, PA.
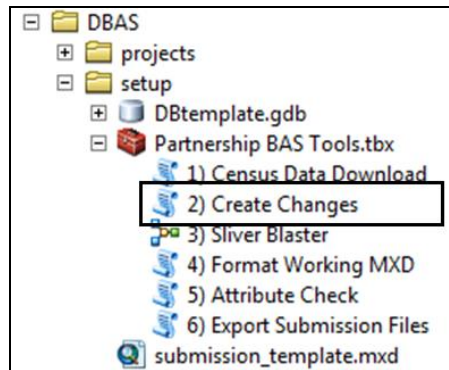
1. Double click on **2) Create Changes** tool.

Figure 8. Partnership Tools Menu with Create Changes Tool Selected

2. In the **Create Changes** window:
    *   In the **Local Boundary File** field, enter the path or navigate to the full boundary polygon.
    *   Enter the 11-digit BAS ID in the **BAS ID** field. If you are a County participant you will put the County BAS ID.
    *   Under **Changes Being Processed**, choose the type of changes to create from the dropdown options:
        a. Incplace (incorporated place).
        b. County.
        c. Cousub (MCDs).
        d. AIANNH (Tribal areas).

    *   For the **Name Field in Local Data**, the boundary file may need to be modified to agree with a field in the Census Bureau's data. Type the name of the field (as it appears in ArcCatalog) containing the information matching the Census Bureau's NAME field. If processing an MCD or AIANNH file where the Census Bureau NAME field contains duplicates, match the Census Bureau's NAMELSAD.
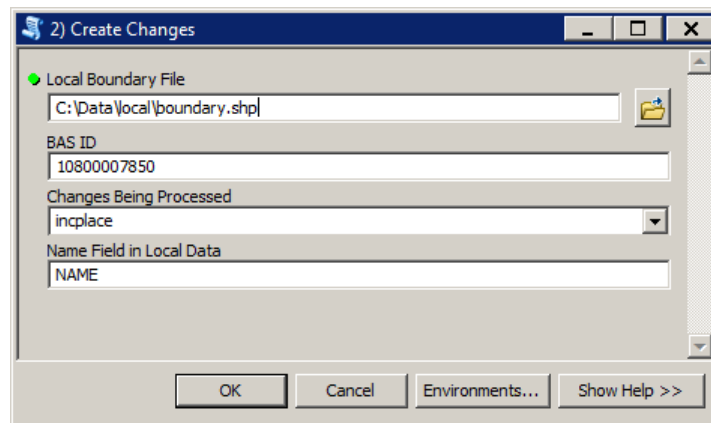

Figure 9. Create Changes Window

3. Click **OK** to run the tool.

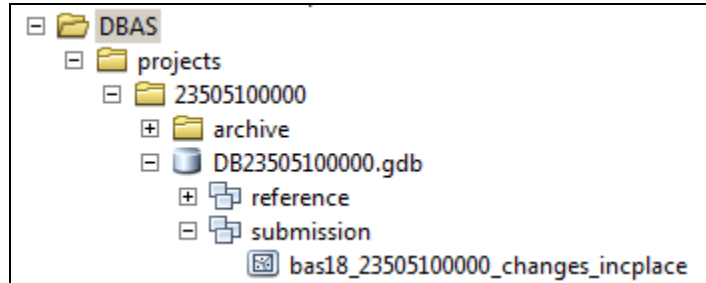4. Once the tool is complete, the output will be placed in the geodatabase under the submission feature dataset.

Figure 10. Partnership Tools Menu with Geodatabase

5. Repeat steps for any other levels of geography that need changes created.

5 Sliver Blaster Tool (Optional)

The Sliver Blaster tool is useful for governments that have numerous very small change polygons that are time consuming to manually parse through for deletion. Since the Census Bureau cannot guarantee inclusion of changes under 30 feet at their widest point, use this tool to remove changes that are lower than that threshold. Participants can also change the tolerance for slivers if they know there are small changes that need to be included. This automated tool will vary in processing time depending on the number of features in the entity.
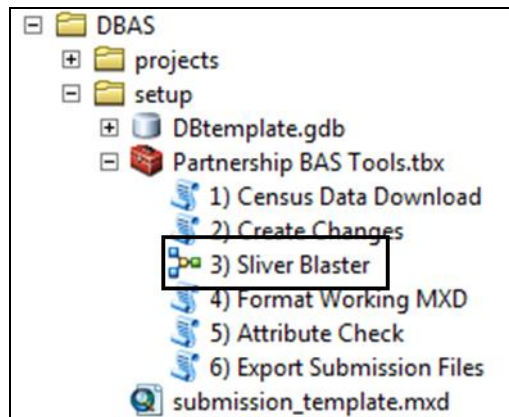
1. Double click on the **3) Sliver Blaster** tool.

Figure 11. Partnership Tools Menu with Sliver Blaster Selected

2. In the **Sliver Blaster** tool window:
   - The **Changes File** refers to the file created in the previous step, found in the submission feature dataset.
   - The **Census Edges** feature class is found in the referenced feature dataset and is called bas_edges.
   - The **Buffer Distance** field is set to 30 feet by default, but this can be adjusted to accommodate smaller changes.
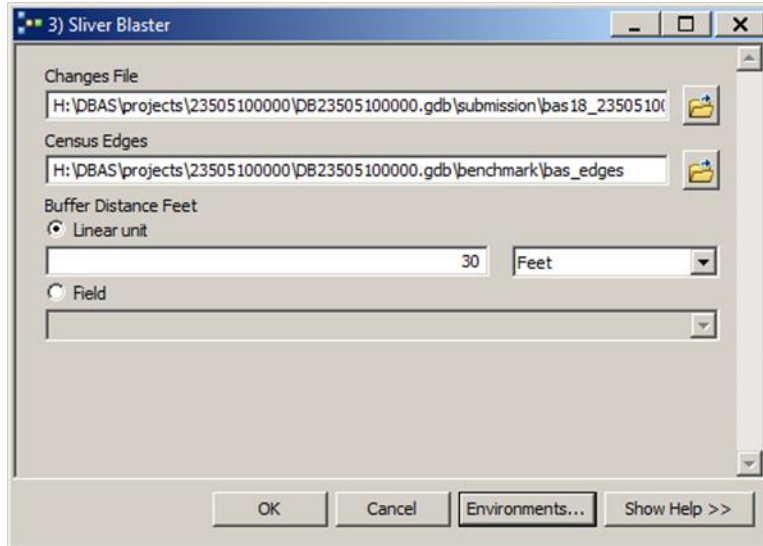
3. Click **OK** to run.

Figure 12. Sliver Blaster Window

6 Format Working MXD Tool (Optional)

The intent of this tool is to create a map document (.mxd) for users containing their change file and all of the reference layers they will need to finalize a submission. If users would prefer to use their own .mxd, this step is not required.

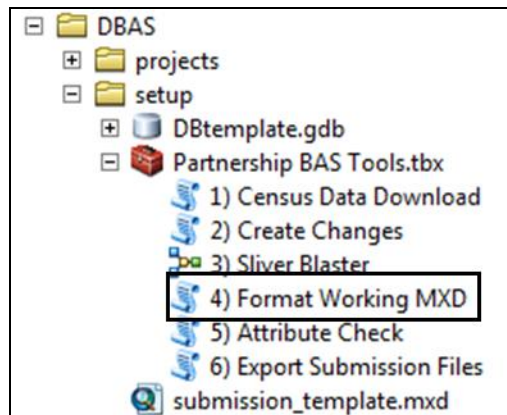1. Double click on the **4) Format Working MXD** tool.

Figure 13. Partnership Tools Menu with Format Working MXD Selected

2. The only input for this tool is the **Working Folder**, which is the folder with the governments BAS ID as its name.
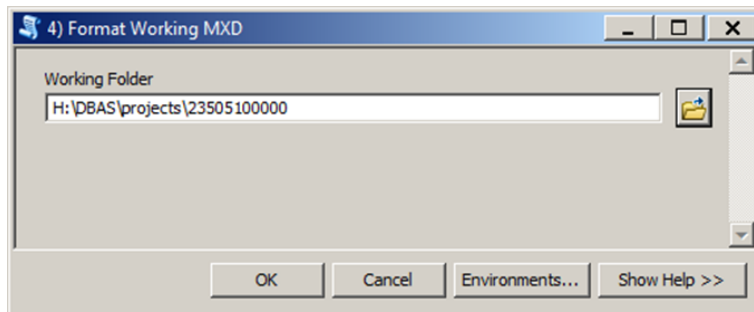

Figure 14. Format Working MXD Window

3. Click **OK** to run the tool.
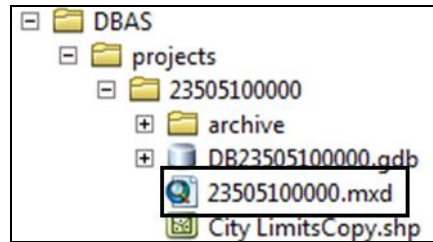4. Open the new .mxd and begin working with the change polygons.

Figure 15. Projects Submenu with .mxd File Selected

7 Attribute Check Tool

This tool is used to verify that there are no inconsistencies with the data included in the submission. Run this tool during or after change polygons have been reviewed for spatial accuracy to produce a report of attribution errors (see **Section 5.6** of the *Boundary and Annexation Survey (BAS) Respondent Guide: Digital* for guidance on conducting a spatial review). It may also run for all levels of geography that have changes since it is run on each individual change file.
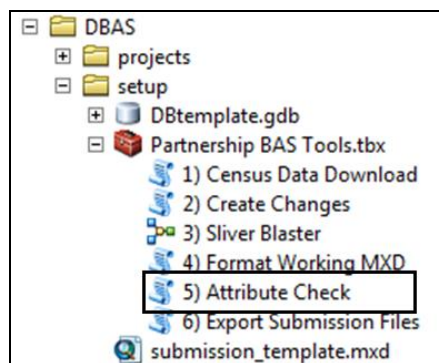
1. Double click on the **5) Attribute Check** tool**.**

Figure 16. Partnership Tools Menu with Attribute Check Selected

2. In the **Attribute Check** window:
   - The **Change File** should be the change file created in tool **2) Create Changes** for which to generate a report.
   - In **Geography Type**, chose the type of geography being worked on from the dropdown. The same options as the Create Changes tool are available here.
   - The last input is the optional check box for **Includes Changes in Georgia**. This box only needs to be checked if responding in the state of Georgia.
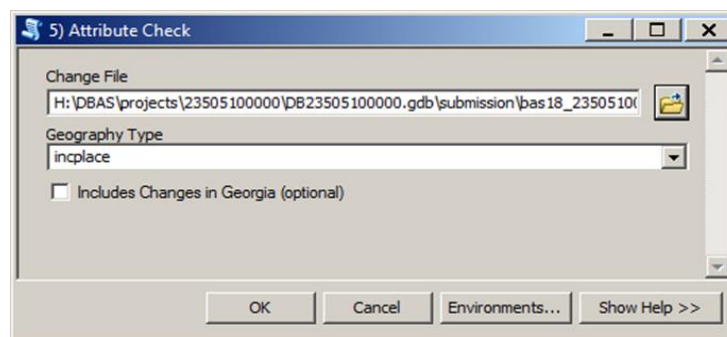

Figure 17. Attribute Check Window

3. Click **OK** to run the tool.
4. There should now be a text file in the working folder called **attribute_check_<geogtype>.txt** containing all the discrepancies identified in the change file that still need to be fixed.
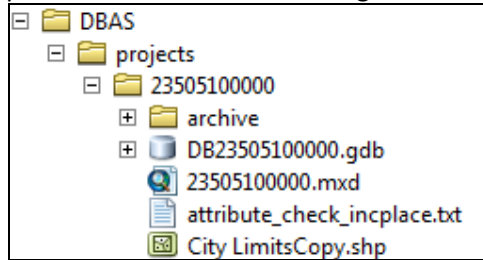

Figure 18. Projects Submenu Showing an attribute_check Text File

8 Export Submission Tool

Upon review of the changes file and the attribute error report, the finalized changes may be exported for submission to the Census Bureau. This tool can also be used to provide updated contact information with the submission.

Note: This tool does not submit the changes, it just makes a file for submission. Please follow Step 9 for submission guidelines.

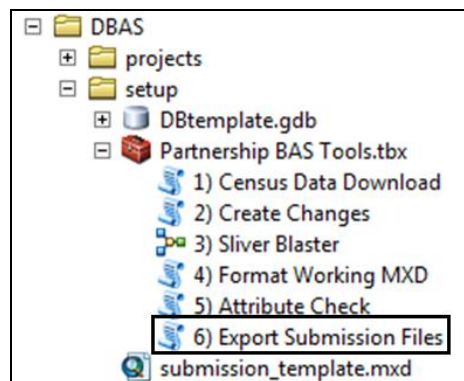1. Double click on the **6) Export Submission Files** tool.

Figure 19. Partnership Tools Menu with Export Submission Files Selected

2. In the **Export Submission Files** tool window:
   - Enter the 11-digit BAS ID in the **BAS ID** field.
   - Under **Additional Files**, drag in or navigate to any additional files to be included in the submission. This can include parcel data, legal documentation, or any other helpful supporting data. This is an option field so it can also be left blank. There is no need to add the changes layers here as the tool will handle those already based on the BAS ID.
   - For **BAS Contact**, **Entity Name**, **Contact Title or Department Name**, **Address**, **Email**, and **Phone Number**, please include any or all contact information updates that are to be sent to the Census Bureau. These fields can be left blank if there are no updates, though if someone other than the BAS Contact prepared the submission, include the contact information.
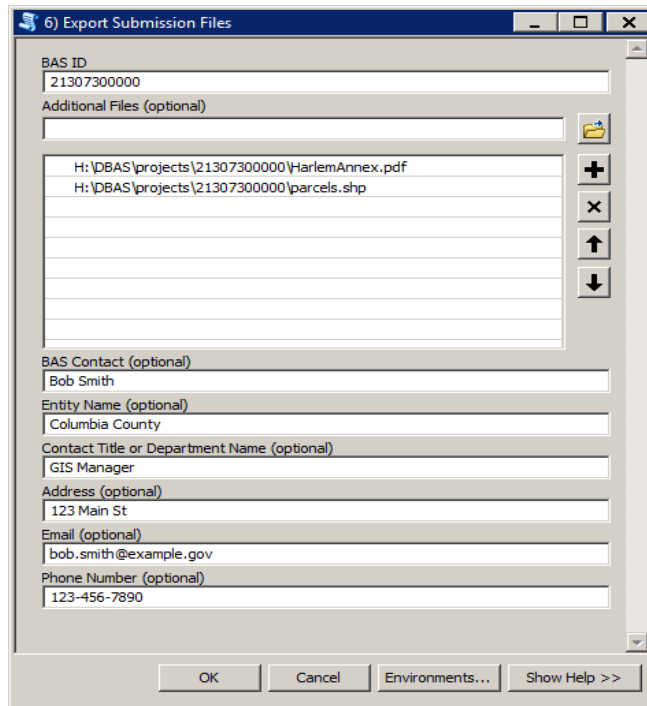
Figure 20. Export Submission Files Window

3. Click **OK** to run the tool.

9 Submitting Files through the Secure Web Incoming Module (SWIM)

The Census Bureau requires participants to submit updated BAS materials as ZIP files using the Census Bureau's **SWIM** site. Please submit only the ZIP file(s). **SWIM** is located at: <https://respond.census.gov/swim>. For instructions on how to use SWIM, see **Section 5.7.6**, **Submitting Digital Files through SWIM** of the *Boundary and Annexation Survey (BAS) Respondent Guide: Digital*.