

**Boundary and Annexation Survey
Respondent Guide: Digital BAS**

Issued June 2007

USCENSUSBUREAU

Helping You Make Informed Decisions

<u>SECTION NUMBER</u>	<u>SECTION TITLE</u>	<u>PAGE</u>
1	Introduction to the Digital Boundary and Annexation Survey (BAS)	3
1.1	Overview of the BAS	3
1.2	State Specific Arrangements and Agreements	3
1.3	Legal Disputes	3
1.4	Key Dates for Digital BAS Participants	3
2	MAF/TIGER Accuracy Improvement Project (MTAIP)	4
3	Topological Relationships and Spatial Accuracy	5
3.1	Topological Relationships in the MAF/TIGER Database	5
3.2	GIS and Spatial Accuracy	6
4	Census Bureau Provided Shapefiles	8
5	Census Bureau Geocoding	8
6	Updating the Census Bureau Shapefiles	8
6.1	General File Setup Guidelines	9
6.2	Changing Our Coordinate System to Match Yours	9
6.3	Annexations, Deannexations, and Boundary Corrections	9
6.4	Linear Feature Updates	10
6.4.1	<i>Address Range Break Updates</i>	12
6.5	Area Landmarks, Hydro Areas, and Point Landmarks	13
6.5.1	<i>Area Landmark and Hydro Area Updates</i>	13
6.5.2	<i>Point Landmark Updates</i>	14
6.6	Reviewing Changes to the Census Bureau Shapefiles	14
6.6.1	<i>Geographic Offsets and Corridors</i>	17
6.6.2	<i>Boundary Corrections</i>	19
6.6.3	<i>Linear Feature Changes</i>	19
6.6.4	<i>Additional Review Information</i>	20
6.7	Submitting Metadata with the Digital File	20
6.8	Submitting Digital Data	22
6.8.1	<i>Consolidated County & Individual Entity Submissions (Change Polygons)</i>	22
6.8.2	<i>Consolidated County & Individual Entity Submissions (Whole Entity Polygons)</i>	23
6.8.3	<i>Linear Feature, Area Landmark / Hydro Areas & Point Landmark Updates</i>	24
6.8.4	<i>Compressing the Digital Files</i>	24
6.8.5	<i>Submitting Digital Files via File Transfer Protocol (FTP)</i>	25
6.8.6	<i>Additional Information</i>	25
Appendix 1	Paperwork Reduction Project	26
Appendix 2	State Specific Notes	27
Appendix 3	Census Bureau Regional Offices – Contact Information	32
Appendix 4	Required Fields and Coding Scheme	33
Appendix 5	Data Dictionary	35
Appendix 6	Example Processes 1 & 2	40

1. Introduction to the Digital Boundary and Annexation Survey (BAS)

Overview of the BAS

The Census Bureau conducts an annual survey called the Boundary and Annexation Survey (BAS) to collect information about selected legally defined geographic areas, such as counties (and equivalent areas), incorporated places, minor civil divisions (MCDs), as well as federally recognized American Indian reservations, including off-reservation trust lands and tribal subdivisions. The BAS also provides an opportunity for participants to review the names and geographic relationships for these areas. Title 13, U.S. Census Code authorizes this survey.

BAS information is used to provide a record for reporting the results of the decennial and economic censuses, and to support the Population Estimates Program and the American Community Survey. Maintaining correct boundaries and boundary-to-feature relationships through the BAS helps ensure that the appropriate population is assigned to each entity. In compliance with the Office of Management and Budget Circular A-16, the BAS supports the Census Bureau's spatial data steward responsibilities for the Federal Geographic Data Committee and the Geospatial One-Stop by updating the inventory of, and boundaries for, governmental units. In addition, the BAS is the source of up-to-date information on boundaries, codes, and names for the U.S. Geological Survey's (USGS) National Map and the Geographic Names Information System. The BAS is also the source for changes in the boundary of incorporated places, minor civil divisions (MCDs), counties (and equivalent areas), and federally recognized American Indian areas, which include reservations and off-reservation trust lands.

1.2 Specific State Arrangements and Agreements

The Census Bureau has established a number of arrangements or agreements with states for reporting boundary changes. It is very important that you review Appendix 2 to see if your state has special requirements.

1.3 Legal Disputes

If it comes to our attention that areas of land are in dispute between two or more jurisdictions, we will not make annexations or boundary corrections until the parties come to a written agreement, or there is a documented final court decision regarding the matter/dispute. If you have questions concerning this, please contact the Census Bureau Legal Office at 301-763-2918.

1.4 Key Dates for Digital BAS Participants

All changes received by **April 1st**, will be reflected in the Population Estimates Program and the American Community Survey. If the Census Bureau receives your updates by **May 31st**, they will be included in your BAS materials next year.

To change your method of participation in BAS from Digital BAS to MTPS or paper, you must notify the Census Bureau by February 15th. You can contact the Census Bureau by phone at (800) 972-5651 or by email at **geo.bas@census.gov**.

Additionally, to participate in the Digital BAS your entity must meet the following requirements:

1. Your county must have completed the realignment process for the MAF/TIGER Accuracy Improvement Project (MTAIP). The current list of counties that have

completed the realignment process is posted on our Web site at:
<http://www.census.gov/geo/www/bas/bashome.html>.

2. You must have the ability to edit a Census Bureau shapefile¹ extract of your entity. We require that you update the Census Bureau shapefile with boundary and boundary-related feature changes, rather than submit a shapefile from your own local Geographic Information System (GIS).
3. You must provide information for the BAS point of contact, the person updating the shapefiles, and the highest elected official for your entities.
4. You must provide legal documentation numbers, and effective dates for all legal boundary changes (annexations and deannexations).

If you have any questions or concerns about the participation requirements, please contact the Geography Division Legal Areas Team at 301-763-1099 or email geo.bas@census.gov.

2. MAF/TIGER Accuracy Improvement Project (MTAIP)

The principle requirement for participating in Digital BAS is that your entity must have completed the MTAIP process. The Census Bureau is spatially improving the street features and boundaries in the MAF/TIGER database. The Census Bureau is using, wherever possible, digital files submitted by state, local, and tribal governments. Many state, local, and tribal governments have a spatial database (GIS) that maintains a level of positional accuracy which meets our minimum accuracy requirements, of 7.6 meters, for improving the location of streets in MAF/TIGER. Once acquired, the Census Bureau evaluates the various layers associated with the file(s) submitted and determines whether the file(s) can be used for the MTAIP process. Because we are improving feature and boundary coordinates based on state, local, and tribal MTAIP submissions, there is a greater likelihood that Digital BAS submissions from governments who have provided spatial files will closely align with improved TIGER making both boundary corrections and legal changes easier to identify. This will also create a solid common geographic foundation for future boundary exchange for governments that have participated in the MTAIP process. If you have additional questions about the MTAIP process, please contact a geographer at your Census Bureau Regional Office. The contact information is located in Appendix 3, on page 32.

3. Topological Relationships and Spatial Accuracy

The Geography Division of the Census Bureau is responsible for developing geographic applications and executing the geographic and cartographic activities needed to support the Census Bureau in collecting and disseminating census data. For the past twenty years, the

¹ The use of brand names does not represent an endorsement of a company or its products by the U.S. government. Due to the wide use of ESRI products by our partners in the GIS community, and the ubiquitous use of the shapefile format as a medium for GIS data exchange, the Census Bureau is providing this data in shapefile format. You should encounter no problems when importing these shapefiles into your local GIS software. However, if you are using GIS software that does not contain a shapefile translator, please contact the Census Bureau for further instructions (301-763-1099) or e-mail geo.bas@census.gov.

Census Bureau’s TIGER and Master Address File (MAF) have become the two most critical geographic resources for supporting the Census Bureau in its collection and dissemination of data.

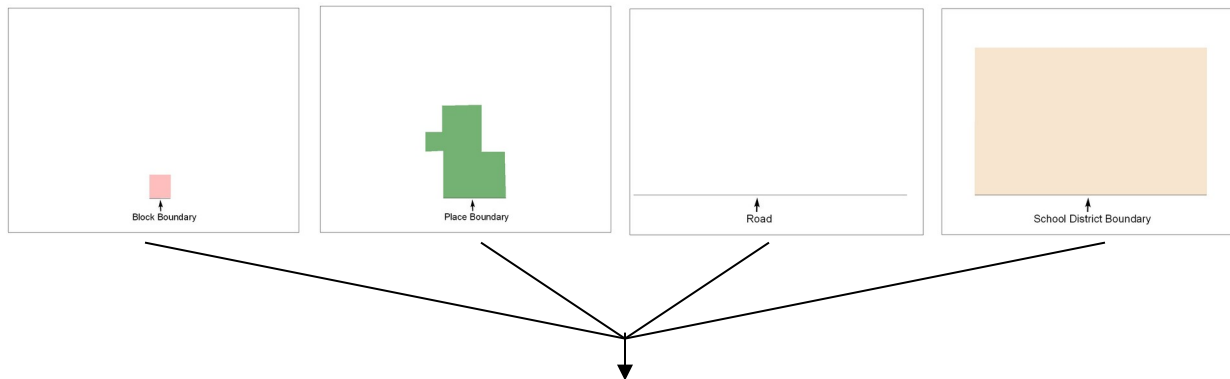
The following section will describe how the Census Bureau uses a topologically integrated system and how this differs from a traditional GIS system using separate layers of data.

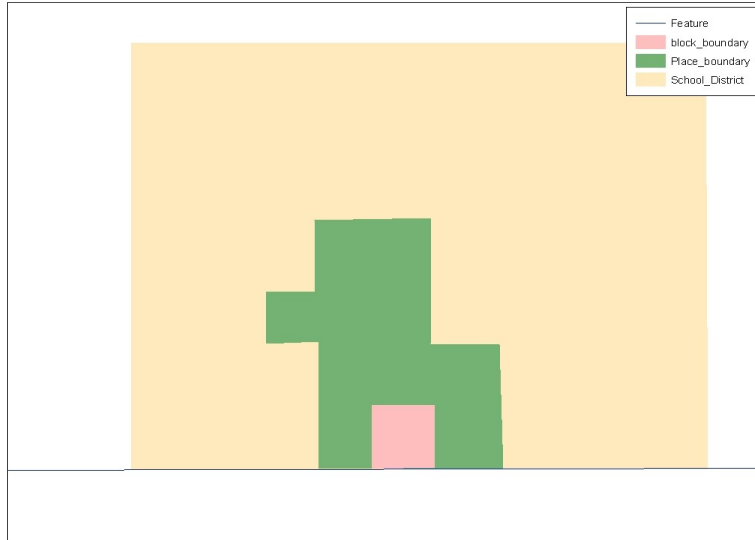
3.1 Topological Relationships in the MAF/TIGER Database

For its use in MAF/TIGER, topology can be described as the relationship between different levels of geography. MAF/TIGER is a topologically integrated geographic database in which the topological structures define the location, connection, and relative relationship of streets, rivers, railroads, and other features to each other, and to the numerous geographic entities for which the Census Bureau tabulates data for its censuses and sample surveys. Instead of having a layer for each feature class (i.e. roads, block boundary, place boundary, and school district boundary) all information is stored in one layer or file. Examples 3.1.1 and 3.1.2 provide a visual interpretation of how a file is topologically integrated in MAF/TIGER.



Example 3.1.1: This example shows how a road in MAF/TIGER can also represent a block boundary, place boundary and a school district boundary.



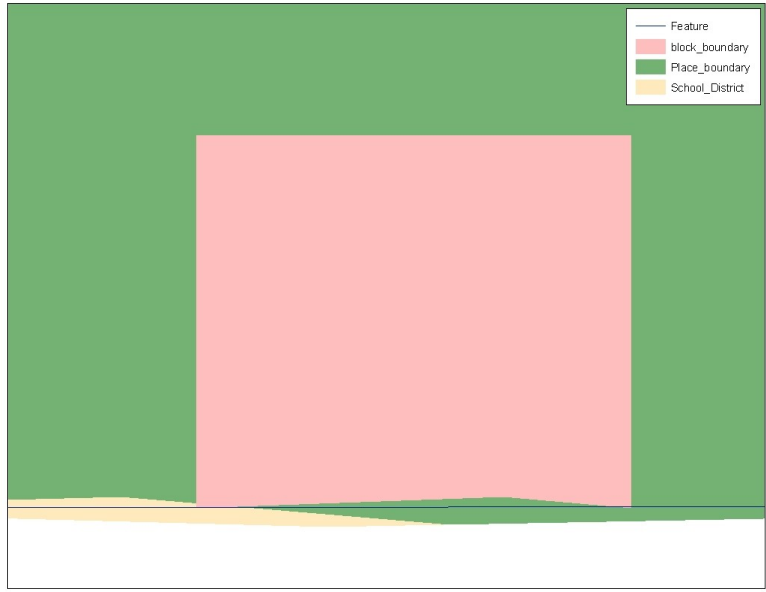


Example 3.1.2: This example shows four different feature classes are topologically integrated into one layer. The file is topologically integrated so that the one road represents not only a road, but also a block boundary, place boundary, and a school district boundary.

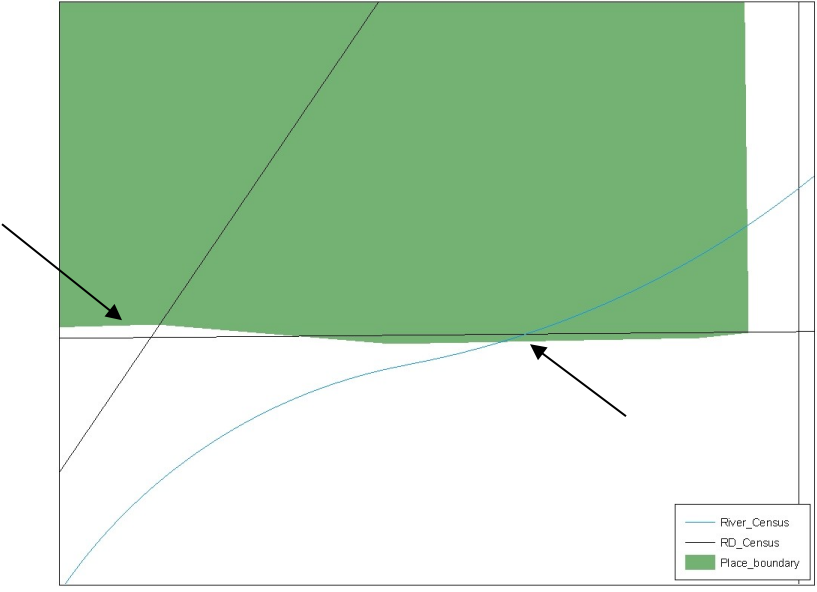
3.2 GIS and Spatial Accuracy

In a GIS, feature classes are not often topologically integrated. Instead feature classes stand alone in separate layers that contain a high level of spatial or coordinate accuracy. When overlaying these layers in a GIS one may find that the layers may not be coincident with one another as they are in the MAF/TIGER database. Examples 3.2.1 and 3.2.2 show how files that are not integrated may appear in a GIS when they are overlaid on top of one another.

The spatial differences found between the local GIS file and the Census Bureau’s integrated file are often very small (i.e. often less than five or ten feet) and can create boundary-to-feature relationship issues for the Census Bureau. Section 6.7 provides instructions on how to review your digital submission for small spatial boundary corrections, as well as some of the potential consequences of making spatial boundary corrections that dissolve the topological relationships present in the MAF/TIGER database. Example processes detailing suggested methods on how to make your boundary changes correctly can be found in Appendix 6.



Example 3.2.1: This example shows four different feature classes, each with a high level of spatial accuracy are overlaid, and how the topological relationship is compromised. The block, place, and school district boundaries, which are supposed to be coincident with the road feature, are now offset in several instances.



Example 3.2.2: This example depicts a situation where a local GIS place boundary is not coincident (topologically related) with a road feature. Assuming that the Census Bureau boundary is coincident with the road feature, making the changes represented by the arrows would dissolve the topological relationship in MAF/TIGER. Later sections will describe how to review these spatial boundary corrections, as well as discuss some of the consequences of dissolving the relationships in MAF/TIGER.

4. Census Bureau Provided Shapefiles

The Census Bureau is providing all Digital BAS participants with entity layers in ESRI shapefile format. The number of polygon-based shapefiles that the Census Bureau sends to each Digital BAS participant depends on the type of entities contained within each county. However, each participant, regardless of the number of geographic entities, receives only one shapefile for the linear feature network for the county.

All shapefiles provided by the Census Bureau are in the following unprojected geographic based coordinate system:

- GCS_NAD83
- Angular Unit: Degree (0.017453292519943299)
- Prime Meridian: Greenwich (0.000000000000000000)
- Datum: D_North_American_1983
- Spheroid: GRS_1980
- Semi-major Axis: 6378137.0000000000000000
- Semi-minor Axis: 6356752.314140356100000000
- Inverse Flattening: 298.257222101000020000

5. Census Bureau Geocoding

Knowledge of two Census Bureau's geocoding methods is critical for your Digital BAS submission. These two methods include using a MAF structure point to geocode an address, and geocoding addresses based on the street centerline (feature matching).

When a MAF structure point is available, the Census will geocode to the location of the structure point which was originally captured using GPS during an earlier Census Bureau operation. However, if there is no structure point available, the Census Bureau will geocode to the street centerline.

Based on the methods in which the Census Bureau geocodes, it is very important to review your Digital BAS submission to ensure that your changes are topologically related to features where appropriate, and to create and code geographic offsets and corridors wherever necessary.

6. Updating the Census Bureau Shapefiles

The following section will describe how to update the Census Bureau shapefiles to reflect any annexations, deannexations, boundary corrections, or linear feature changes that have occurred since the last BAS survey. There will also be a brief discussion on the procedures that should be followed to submit boundary changes and associated documentation. Two examples can also be found in Appendix 6 to supplement the brief discussion on the procedures to submit changes and documentation. Furthermore, there will be a short section on steps that should be taken to review your digital file before submitting it to the Census Bureau.

If the Census Bureau has any problems processing the submitted boundary or feature file, you will receive a feedback document, by email, requesting clarification of the issue. If we cannot clarify the problem prior to our project deadline, your updates will not be incorporated into MAF/TIGER. We will continue to work with you to try and resolve these issues before the next BAS cycle.

6.1 General File Setup Guidelines

When you receive your shapefile, follow these guidelines before beginning actual updates:

- Open the CD and enclosed ZIP file to ensure that it contains the correct shapefiles for the entity that you will be updating.
- Copy and decompress the shapefiles into a directory on your server/hard drive.
- Open the shapefiles in a GIS.

6.2 Changing Our Coordinate System to Match Yours

Our files are in GCS NAD83 format. Please feel free to project these files into your local coordinate system/projection. Most GIS software packages contain projection wizards, or something similar, that allows the user to transform file coordinate systems and projections. For example, if your office uses ArcView to update files, please activate and utilize ArcView's 'Projection Utility Wizard' extension. If using ArcGIS, please use its 'Projection Utilities' in ArcToolbox. MAF/TIGER shapefile extracts contain defined projection information in the *.PRJ file. Both ArcView and ArcGIS access the *.PRJ file for projection information; therefore, there is no need for you to define these parameters before changing the file coordinate systems.

After completing your updates, you may submit the boundary shapefile using your local coordinate system/projection provided that the shapefile's coordinate system contains a defined projection file (i.e., *.PRJ file) and spatial reference materials (i.e., metadata).

6.3 Annexations, Deannexations, and Boundary Corrections

In order to update MAF/TIGER, a separate change polygon layer must be created for each updated entity type (i.e., county, MCD, and place). The change polygons must be created in relation to the current MAF/TIGER boundary.

Attribute information is also required for each change polygon. Using a place as an example, Table 6.3.1 provides an explanation of the fields that must be populated in the attribute table for each change polygon type.

-Required Attributes (Change Polygons)-

	NAME	CHNG_TYPE	EFF_DATE	DOCU (Not Required in GA)	OFFSET	AREA (Required in GA)	RELATE
Annexation	X	X	X	X		Georgia	
Deannexation	X	X	X	X		Georgia	
Boundary Correction	X	X					X (IN / OUT)
Geographic Offset		X			X		
Geographic Corridor		X			X		
New Entity ²	X	X	X	X			

Table 6.3.1

Please see Appendix 4 for the change type coding schemes. The data dictionary in Appendix 5 provides you with field definitions and naming conventions used for updating the attribute table with the appropriate information.

Appendix 6 provides two example processes for making the boundary updates. In addition, the Census Bureau requests that you review any annexations, deannexations, or boundary corrections that you create. Section 6.6 presents information on what to look for when reviewing your change polygons. It is also important to note that the Census Bureau will snap any annexation, deannexation, or boundary correction to a MAF/TIGER feature when it exists within ten feet of that feature.

If a boundary update crosses into a new county and additional shapefiles are needed, please contact the Legal Areas Team at 301-763-1099 or e-mail geo.bas@census.gov.

6.4 Linear Feature Updates

If you have reviewed your features using our linear feature network, and have determined that the Census Bureau needs to add, remove, rename, recode a linear feature, or add address breaks you may submit your modifications in a separate linear feature update layer. Attribute information is required for each linear feature update. Please be sure to reference Appendix 4 for change type codes required for feature updates. Table 6.4.1 provides an explanation of the fields that must be populated in the attribute table for each change type.

-Required Attributes (Linear Feature Updates)-							
	CHNG_TYPE	FENAME	MTFCC	LTOADD	RTOADD	LFROMADD	RFROMADD

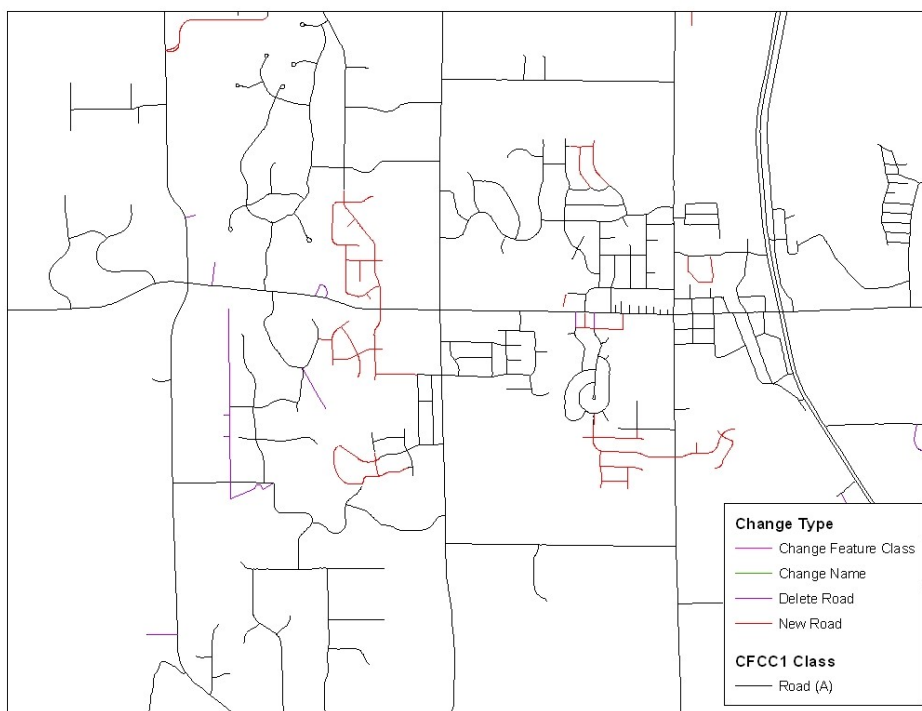
² Only county participants may submit new entities (i.e. new incorporated places or minor civil divisions).

Add Feature	X	X	X				
Delete Feature	X						
Rename Feature	X	X					
Recode Feature (MTFCC)	X		X				
Address Break Updates	X			X	X	X	X

Table 6.4.1

The Census Bureau will accept and process any linear features that establish or maintain linear feature-to-boundary relationships (i.e. any linear feature that is coincident boundary). In addition, we will also accept feature updates which stand independent of boundaries (i.e. new subdivisions, etc.). All linear feature updates will be processed to appear on next year’s BAS maps.

Examples 6.4.2 and 6.4.3 show how to update the Census Bureau’s “Edges” layer, as well as how to update the attribute table appropriately.



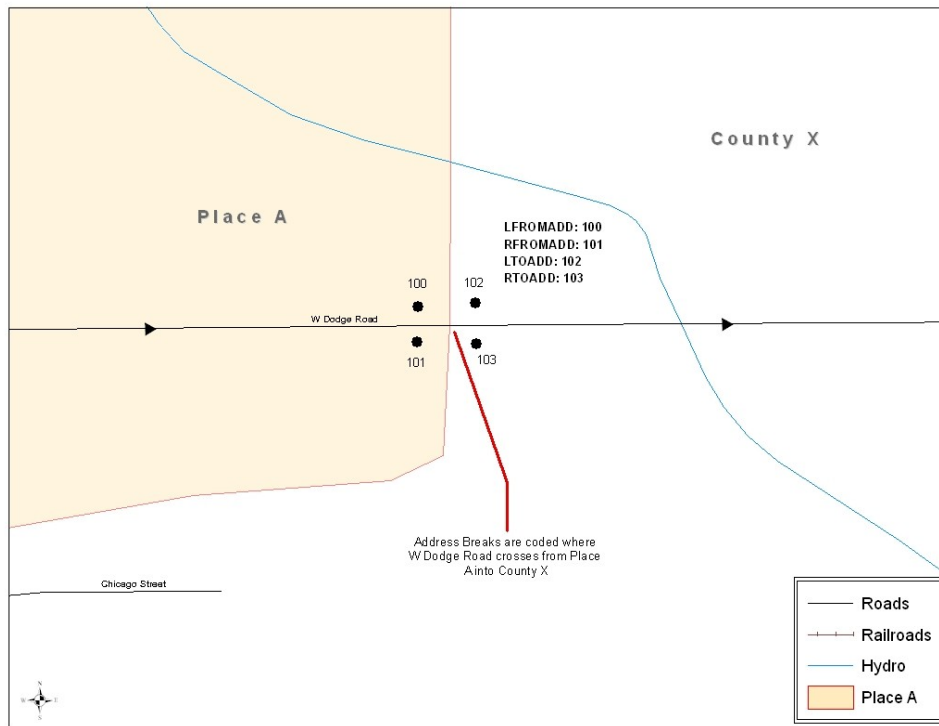
Example 6.4.2: This example shows new road features being added or modified from the Census Bureau’s ‘Edges’ layer. Please create a separate layer with all features that were added, deleted, renamed, recoded or added address breaks.

FID	Shape*	OBJECTID	TLID	CFCC	CFCC1	FIDELITY	FENAME	CHNG_TYPE
433	Polyline	0	97770058	A41	A	0	Queen Street	DL
434	Polyline	0	97770065	A41	A	0	Naples Street	DL
435	Polyline	0	97770061	A41	A	0	214th Avenue	DL
436	Polyline	9704	0	A41	A	0	244TH AVE NW	AL
437	Polyline	8737	0	A41	A	0	245TH AVE NW	AL
438	Polyline	8738	0	A41	A	0	140TH ST NW	AL
439	Polyline	8740	0	A41	A	0	140TH CT NW	AL
440	Polyline	8747	0	A41	A	0	242ND AVE NW	AL
441	Polyline	8748	0	A41	A	0	143RD ST NW	AL
442	Polyline	8749	0	A41	A	0	143RD ST NW	AL
443	Polyline	8751	0	A41	A	0	244TH AVE NW	AL
444	Polyline	1597	97770023	A41	A	0	245TH AVE NW	CN

Example 6.4.3: This example is an extract of an attribute table submitted as part of the feature update layer. Please be sure to fill in the required fields for features that were added, deleted, renamed, recoded, or added address breaks as indicated by Table 6.4.1.

6.4.1 Address Range Break Updates

An address range break is a notation indicating the addresses that fall within the boundaries of a government. This information will not be displayed on your map but should be inserted when you move a boundary that intersects a street or you add a street that intersects a boundary. This will help the Census Bureau to assign the correct addresses to your jurisdiction. Please see Example 6.4.1.1 for more information. Attribute information is required for each address break update. Reference Appendix 4 for change type codes required for address breaks. Table 6.4.1 provides an explanation of the fields that must be populated in the attribute table for an address break update.

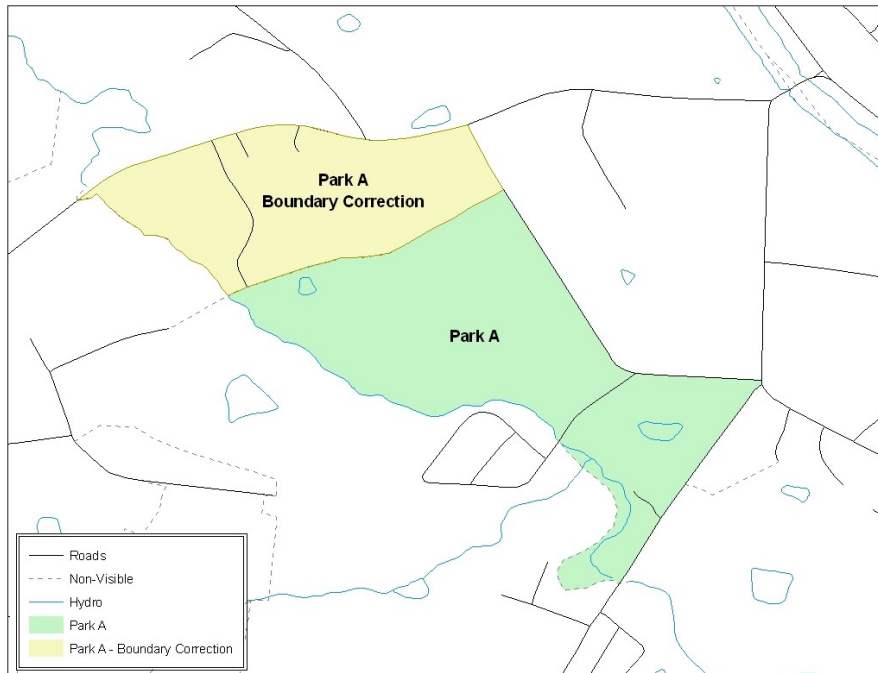


Example 6.4.1.1: This example depicts where a participant would record an address break. In the Census Bureau’s ‘Edges’ layer please be sure to fill in the correct attribute fields to show the location of the address range break. This would include the CHNG_TYPE, LTOADD, RTOADD, LFROMADD, and RFROMADD fields.

6.5 Area Landmarks, Hydro Areas, and Point Landmarks

6.5.1 Area Landmarks / Hydro Area Updates

Area landmarks and hydro areas are updated in a similar manner to legal boundary changes (i.e. annexations, deannexations, etc.). However, area landmarks and hydro areas are not legal entities. In order to submit area landmark and hydro area updates please create a separate change polygon layer. Updates that can be made to area landmarks and hydro areas include: boundary corrections (adding and removing area), creating a new area landmark or hydro area, removing an area landmark or hydro area, or changing the name. Refer to Example 6.5.1.1 for what a sample boundary correction to an area landmark would look like. Please review the example processes in Appendix 5 for information on how to create change polygons. Change polygons for area landmarks and hydro areas may be created in the same manner as annexations and deannexations.



Example 6.5.1.1: This example shows an example boundary correction to Park A. Please refer to the example processes in Appendix 5 for more information on how to create change polygons for area landmark and hydro area updates. *Note: While the sample processes in Appendix 5 refer to legal boundary changes (annexations, deannexations); the process to create the change polygons for area landmarks and hydro areas is the same.*

Table 6.5.1.2 displays the attribute fields that are required to be filled for area landmarks and hydro areas. The change type coding scheme for area landmarks and hydro areas can be found in Appendix 4.

-Required Attributes (Area Landmark and Hydro Areas)-			
	FULLNAME	CHNG_TYPE	RELATE
Boundary Correction	X	X	X
Deletion		X	
Change Name	X	X	
New Area Landmark / Hydro Area	X	X	

Table 6.5.1.2

6.5.2 Point Landmark Updates

Updates to point landmarks may also be made. In order to submit point landmark updates, please create a separate point landmark layer with only the changes. The updates to point landmarks include: adding a new point landmark, deleting an existing point landmark, and renaming a point landmark. Please see Table 6.5.2.1 for the required attributes for point landmarks. In addition, the change type coding scheme for point landmarks can be found in Appendix 4.

-Required Attributes (Point Landmarks)-		
	FULLNAME	CHNG_TYPE
New Point Landmark	X	X
Delete Point Landmark		X
Change Name	X	X

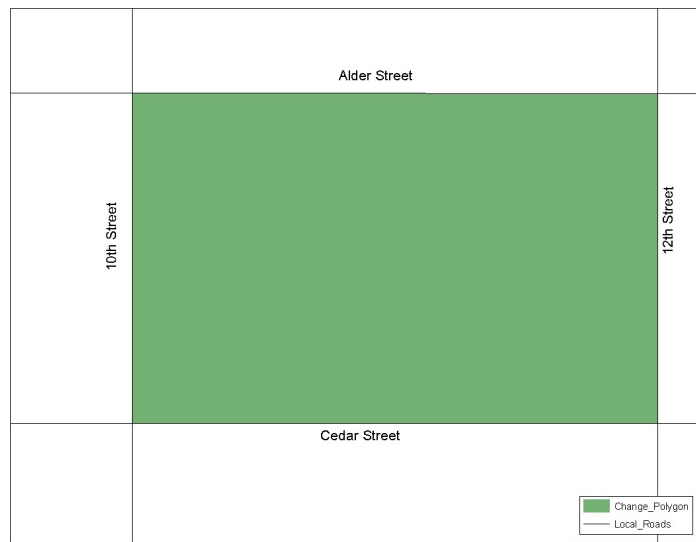
Table 6.5.2.1

6.6 Reviewing Changes to the Census Bureau Shapefiles

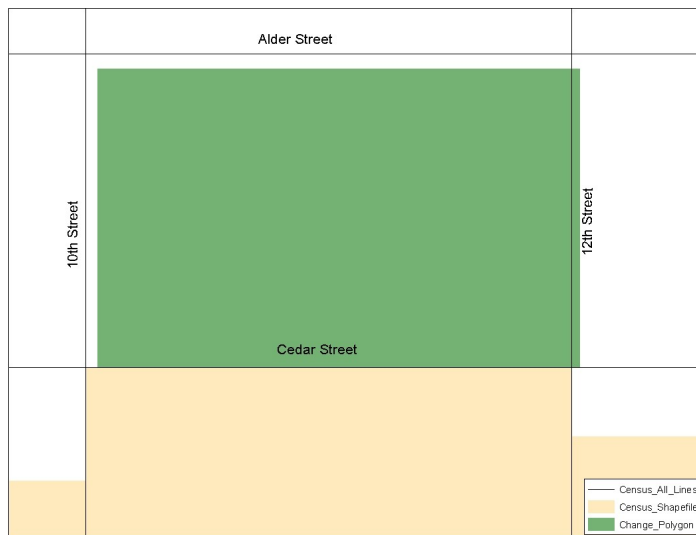
It is important to review your change polygon and feature layers relative to the current Census Bureau boundary and feature network. To complete this review, display the following layers of data:

- Change polygon layer
- Feature update layer (if one is being submitted)
- Area Landmark / Hydro Area update layer (if one is being submitted)
- Point Landmark update layer (if one is being submitted)
- Census Bureau boundary layer (i.e. place if you are submitting change polygons for a place; or MCD if you are submitting change polygons for an MCD)
- “Edges” layer

The review of the change polygons ensures that the correct boundary-to-feature relationships are maintained in the MAF/TIGER database after changes have been made. Among other things, these boundary-to-feature relationships make certain that the appropriate population is assigned to your entity. A comprehensive review is important no matter how you choose to create change polygons. Any annexation, deannexation, or boundary correction must be reviewed to ensure that it is an intentional change. This review will identify any annexations, deannexations, and boundary corrections that do not align to the correct feature in the Census Bureau’s ‘Edges’ layer. This often occurs if there are small spatial differences between the location of your boundary in your local GIS file and the location of the feature in MAF/TIGER. Below are several examples of situations that need to be reviewed and revised prior to submission (Examples 6.6.1 - 6.6.3).



Example 6.6.1: This annexation is coincident with all roads in a local GIS.



Example 6.6.2: After the change polygon is created and compared with the Census Bureau shapefiles, it is discovered that the change polygon is not coincident with 10th, 12th, and Alder Streets in the Census Bureau shapefile.

If such spatial differences occur, and your boundary should be coincident with the centerline, snap the boundary of the change polygon to the Census Bureau feature. The Census Bureau geocodes its address, and establishes its population counts based on the centerline of a road. Snapping the change polygon to features (or creating geographic offset and corridor polygons) will ensure that the correct population is assigned to your entity.



Example 6.6.3: The participant snapped the change polygon to 10th, 12th, and Alder Streets after determining that the change polygon should be coincident with them.

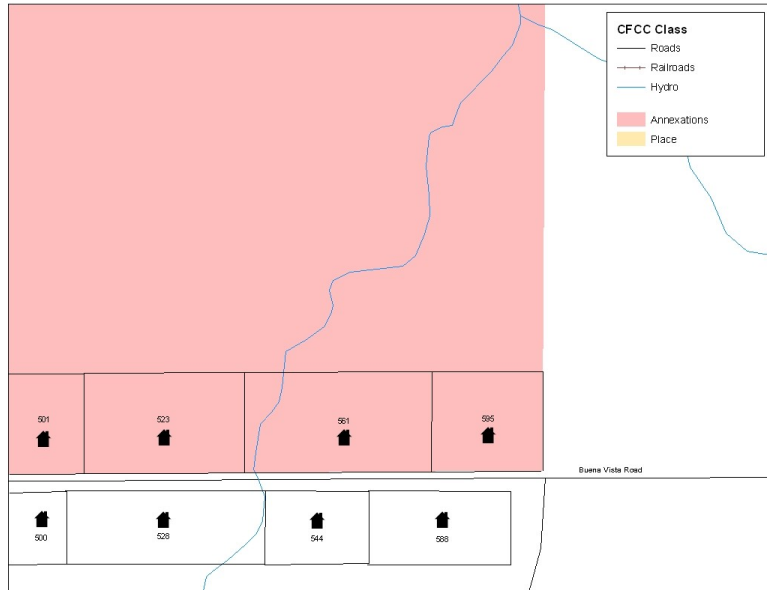
6.6.1 Geographic Offsets and Corridors

In some cases the boundary is not coincident with the road centerline, and a change polygon should be created and coded as either a geographic corridor or geographic offset. The Census Bureau defines a geographic offset and a geographic corridor as follows:

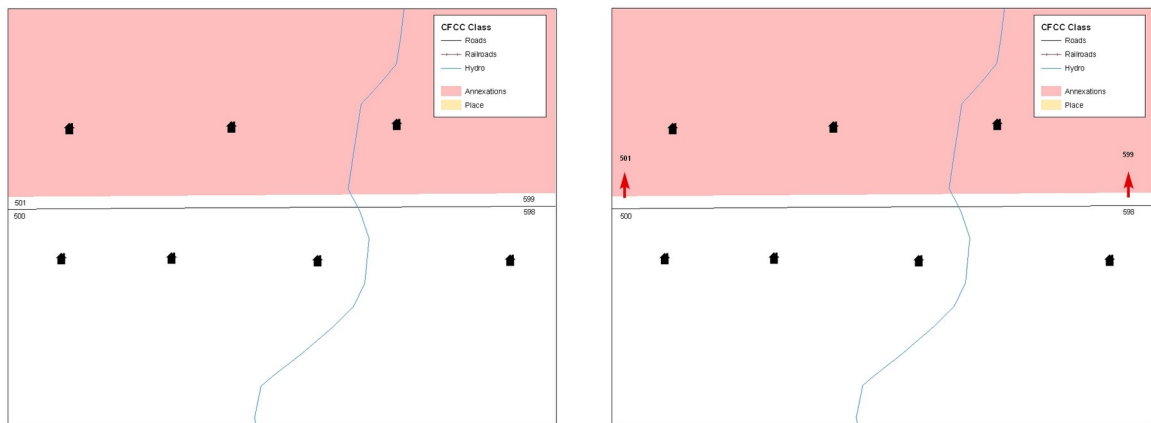
- **Geographic Offset:** An area that is claimed by an entity that is only on one side of the road and does not contain any structures addressed to *that* side of the road
- **Geographic Corridor:** An area that includes only road right-of-way and does not contain any structures addressed to *either* side of the road.

Because many entities use parcel based GIS files to maintain their boundaries, it is critical that you review your change polygons to identify situations where geographic offsets and corridors occur. If these are not identified correctly as part of your Digital BAS submission, the Census Bureau may not accurately assign the addresses to the correct geographic areas (and therefore

population counts and estimates may be affected). When a geographic offset or corridor is identified please be sure to create and appropriately code change polygons to represent these offsets and corridors. For instructions on how to create geographic offset and geographic corridor change polygons you may refer to both example processes in Appendix 6. Furthermore, change type coding schemes and required attribute fields can be found in Appendix 4. Doing so will help to eliminate confusion as to where offsets and corridors occur in relation to both annexations and boundary corrections. Please refer to Examples 6.6.1.1 through 6.6.1.3 for a visual description of a geographic offset and corridor.

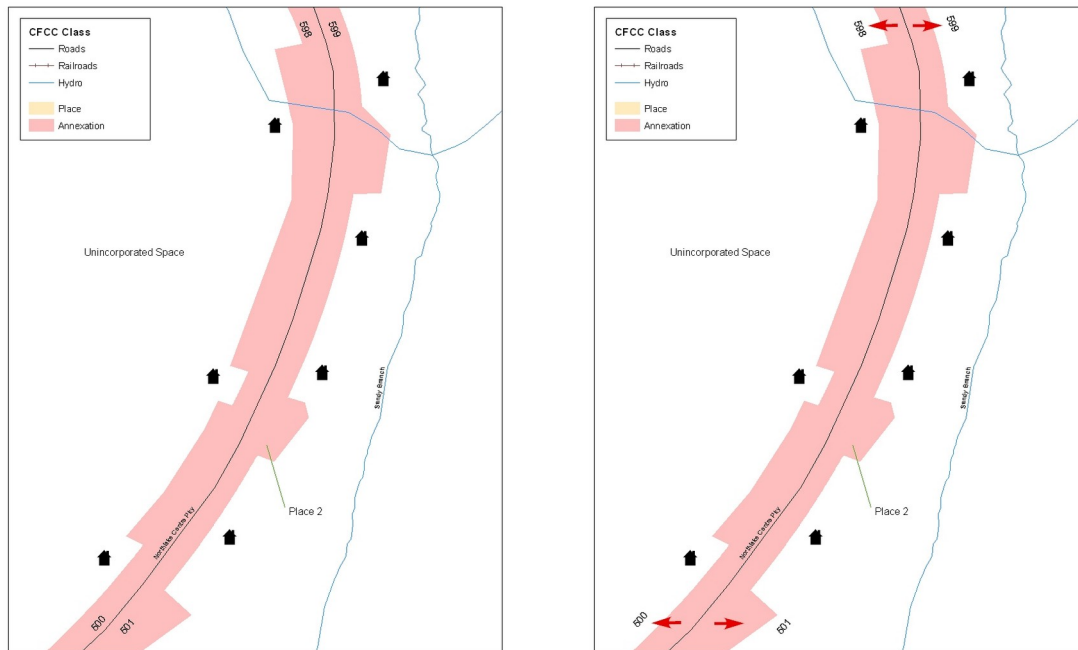


Example 6.6.1.1: This example depicts an annexation made to a Census Bureau shapefile that is not coincident with the feature (Buena Vista Road). This annexation was created in accordance with a local GIS boundary file that is parcel based.



Example 6.6.1.2: The image on the left shows that the Census Bureau geocodes its addresses and establishes its population counts based on the centerline. Without creating a geographic offset polygon, the residential structures on the north side of the road will be assigned to unincorporated area rather than the place to which they belong. The image on the right depicts how the Census Bureau will handle the addresses if the participant creates a geographic offset polygon. A geographic offset can be identified by creating and coding a change polygon appropriately. After

creating a geographic offset change polygon, residential structures on the north side of the road would be assigned to the place rather than to unincorporated area.



Example 6.6.1.3: The images above depict a geographic corridor. For the example on the left, if no geographic corridor change polygon is created, the addresses are geocoded to Place 2, even though the housing units are located outside of the place in unincorporated area. The example on the right shows a geographic corridor change polygon that is created and attributed correctly. Because of this, the addresses will be assigned to unincorporated space to match the correct location of the housing units. The residential structures and associated population are then assigned to the correct place.

6.6.2 Boundary Corrections

A thorough review of all boundary corrections also is crucial. It is especially important if the method in which you choose to extrapolate your change polygons includes overlaying the Census Bureau shapefile with the local GIS boundary file. This method often creates many small sliver polygons. Oftentimes these small sliver polygons are simply a by-product of very small spatial differences

For example, the Census Bureau boundary file and the local GIS file have a boundary that runs coincident with Main Street. However, there is a spatial difference of less than ten feet between the Census Bureau and local GIS boundary file. This small difference will create a very tiny sliver change polygon. This is a change polygon that you may want to delete because it will dissolve the feature to boundary relationship in MAF/TIGER. If this change were incorporated, and not identified as a geographic offset, the Census Bureau may assign the residential structures and associated population to the incorrect jurisdiction. It is also important to note that the Census Bureau will automatically snap the change polygon to the feature if the distance to that

feature is less than ten feet. If the change polygon should exist within ten feet of a feature, please inform us of this.

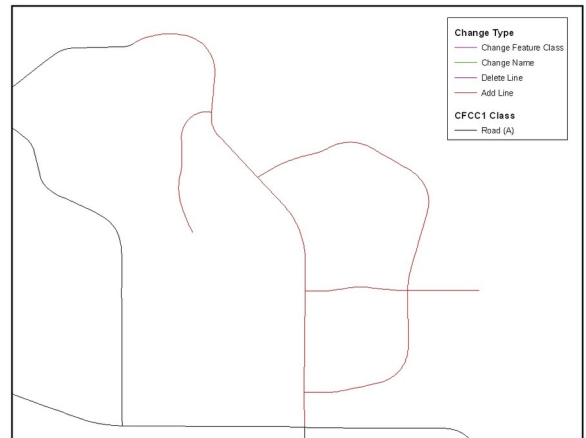
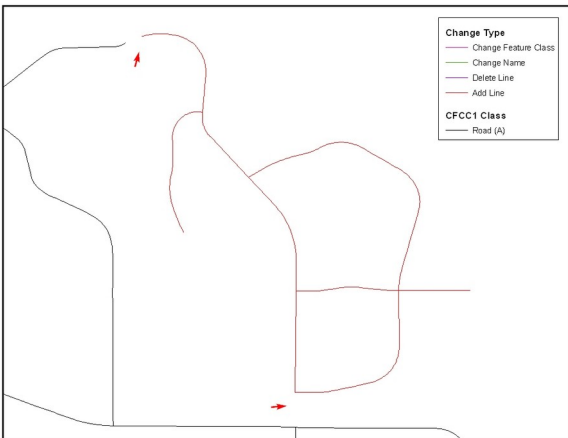
Example 6.6.2.1 shows an instance of a small sliver boundary correction that should be deleted because it dissolves the topological relationship between a feature and boundary.



Example 6.6.2.1: This example shows boundary corrections (in green) that will dissolve the topological relationship with the road. In this instance the small sliver polygon boundary correction needs to either be deleted, or identified as a geographic offset. Dissolving the feature to boundary relationship in this scenario may affect the residential structure to place relationship.

6.6.3 Linear Feature Updates

The Census Bureau also asks you to review your feature changes to ensure that all changes align with the features currently in the MAF/TIGER database. As a reminder, the Census Bureau has improved the feature network using a locally provided source to assure connectivity and topology through MTAIP (See Section 2). If your linear feature changes do not align with current MAF/TIGER linear features, the Census Bureau may not be able to incorporate the linear feature changes that you have submitted. Example 6.6.3.1 shows what you should look for when reviewing your feature changes.



Example 6.6.3.1: The image on the left depicts a new road feature that was added to the existing feature network, but does not connect to existing road features. The image on the right shows the correction and how the new roads now connect to the existing road features.

6.6.4 Additional Review Information

The Census Bureau will not make any annexation or boundary correction that affects an adjacent legal entity without confirmation from the affected entity. We ask that you please review any change polygon that affects an adjacent entity to determine if this is an intentional, legal change.

The Census Bureau also requests that you review the attribute data to ensure that the required legal documentation and change type codes are included. The list of required of change type codes are found in Appendix 4.

Again, it is important to emphasize that the Census Bureau will snap any annexation, deannexation, or boundary correction to a MAF/TIGER feature when it exists within ten feet of that feature. This helps to maintain the feature-to-boundary relationships in MAF/TIGER and will ensure correct housing tabulation counts for your entity.

6.7 Submitting Metadata with the Digital File

Metadata that describes the data content, coordinate system/projection, author, source, and other characteristics of GIS files is critical for Census Bureau staff to efficiently and accurately process files for Digital BAS. The Census Bureau requires that a metadata text file accompany every GIS file and layer submitted.

The Federal Geographic Data Committee's (FGDC) Content Standard for Digital Spatial Metadata provides a national standard that enables the data-sharing public to easily locate critical information about a file and ensure that no critical information is omitted inadvertently when creating metadata. For this reason, the Census Bureau requests that metadata submitted as part of Digital BAS is submitted using this standard. For information about the FGDC and its geospatial metadata standards, please visit the following site:

<http://www.fgdc.gov/metadata/metadata.html>

The Census Bureau requires that the following sections of the FGDC metadata form be completed:

- Citation (information about the originator, publication date, title edition, and other publications or information)
- Description (a section that contains an abstract describing your data set)
- Time Period of Content (a section that describes the vintage of the data)
- Spatial Domain (information about the bounding coordinates)
- Point of Contact (general contact information for the BAS contact)
- Data Quality Information (information about attribute accuracy)

- Spatial Reference Information (a section on the coordinate system / projection of the data set)
- Entity and Attribute Information (a section that describes the contents of your table)

To help you fulfill the requirement of filling out and submitting metadata, the Census Bureau suggests visiting the USGS Web site. This site contains useful information about the FGDC compliant metadata, from which one can read about metadata frequently asked questions, view FGDC metadata examples, and connect to other FGDC-related Web pages. For this information please visit:

<http://geology.usgs.gov/tools/metadata>

Furthermore, if you are using ArcInfo, the FGDC link related to metadata creation tools contains a useful Arc Macro Language (AML) (i.e., fgdcmeta.aml) that when executed, completes most of the aforementioned required sections of the metadata form automatically. This AML is a product of the Illinois State Geological Survey.

<http://www.FGDC.gov/metadata/toollist/fgdcmeta.html>

Note: ESRI's ArcCatalog also has an embedded program that uses the FGDC standard in its creation of geospatial metadata.

6.8 Submitting Digital Data

The Census Bureau requires that the participant submit at least two shapefiles with the potential of more. These layers are described below:

- *Change Polygon Layers (County, Minor Civil Division, Incorporated Place, and Consolidated City)*
 - These layers consist of the changes that you would like the Census Bureau to make to your entity(s).
 - A layer of change polygons should be created for each level of geography that changes are being created for.
- *Whole Modified Entity Layer (County, Minor Civil Division, Incorporated Place, and Consolidated City)*

- These layers should only contain the complete and current boundary for the entity being updated.
- A whole entity layer should be created for each level of geography that changes are being created for.
- *Feature Update Layer (required only if there are feature additions, deletions, name changes, or recodes)*
 - If you have feature updates that you would like the Census Bureau to make, include a feature update layer with only the feature segments that you would like us to adjust.
- *Area Landmark Layer (required only if there are area landmark updates)*
 - If you have area landmarks changes that you would like the Census Bureau to make, please include an area landmark update layer with only the area landmark changes that you would like us to update.
- *Point Landmark Layer (required only if there are point landmark updates)*
 - If you have point landmark updates that you would like the Census Bureau to make, please include a point landmark update layer with only the point landmark changes that you would like us to update.

6.8.1 Consolidated County Submissions and Individual Entity Submissions (Change Polygons)

Table 6.8.1.1 provides the change polygon naming conventions for consolidated county submissions, county subdivisions, incorporated places, and consolidated cities.

Participant	Changes Submitted For:	Shapefile Naming Conventions
<i>County</i>	County	bas<yy>_<basID>_changes
<i>County</i>	Minor Civil Division	bas<yy>_<basID>_changes_cousub
<i>County</i>	Incorporated Place	bas<yy>_<basID>_changes_incplace
<i>Minor Civil Division</i>	Minor Civil Division	bas<yy>_<basID>_changes
<i>Incorporated Place</i>	Incorporated Place	bas<yy>_<basID>_changes
<i>Consolidated City</i>	Consolidated City	bas<yy>_<basID>_changes

Table 6.8.1.1: The table above displays the change polygons naming conventions for all participants listed above. <yy> represents the BAS year, and <basID> represents your BAS entity ID, which can be found on the CD containing your data.

6.8.2 Consolidated County Submissions and Individual Entity Submissions (Whole Entity Polygons)

Table 6.8.2.1 provides the whole entity polygon naming conventions for consolidated county submissions, county subdivisions, incorporated places, and consolidated cities.

Participant	Changes Submitted For:	Shapefile Naming Conventions
<i>County</i>	County	bas<yy>_<basID>_WholeEntity
<i>County</i>	Minor Civil Division	bas<yy>_<basID>_WholeEntity_cousub
<i>County</i>	Incorporated Place	bas<yy>_<basID>_WholeEntity_incplace
<i>Minor Civil Division</i>	Minor Civil Division	bas<yy>_<basID>_WholeEntity
<i>Incorporated Place</i>	Incorporated Place	bas<yy>_<basID>_WholeEntity
<i>Consolidated City</i>	Consolidated City	bas<yy>_<basID>_WholeEntity

Table 6.8.2.1: The table above displays the whole entity polygon naming conventions for all participants listed above. <yy> represents the BAS year, and <basID> represents your BAS entity ID, which can be found on the CD containing your data.

6.8.3 Linear Feature, Area Landmark / Hydro Area, and Point Landmark Updates (Not Required)

Table 6.8.3.1 provides the update layer naming conventions for the edges, area landmark, and point landmark update layer.

Participant	Changes Submitted For:	Shapefile Naming Conventions
<i>All Participants</i>	Edges	bas<yy>_<basID>_LN_changes
<i>All Participants</i>	Area Landmarks	bas<yy>_<basID>_Alndk_Changes
<i>All Participants</i>	Pont Landmarks	bas<yy>_<basID>_Plndk_Changes

Table 6.8.3.1: The table above displays the naming conventions for the edges, area landmark, and point landmark update layers. <yy> represents the BAS year, and <basID> represents your BAS entity ID, which can be found on the CD containing your data.

6.8.4 Compressing the Digital Files

Please compress all updates materials including: change polygon shapefiles, whole entity shapefiles, feature updates, and metadata into a single ZIP formatted file named the following:

Participant	Shapefile Naming Conventions
<i>County</i>	bas<yy>_<basID>_return
<i>Minor Civil Division</i>	bas<yy>_<basID>_return
<i>Incorporated Place</i>	bas<yy>_<basID>_return
<i>Consolidated City</i>	bas<yy>_<basID>_return

Table 6.8.4.1: The table above displays the naming conventions for the edges, area landmark, and point landmark update layers. <yy> represents the BAS year, and <basID> represents your BAS entity ID, which can be found on the CD containing your data.

6.8.5 Submitting Digital Files via File Transfer Protocol (FTP)

In order to submit your file through FTP, you must obtain the FTP address. Contact a member of the Legal Areas Team at 301-763-1099, or email geo.bas@census.gov to obtain this information.

6.8.6 Additional Information

The Census Bureau recommends using FIPS codes to identify entities such as counties, minor civil divisions, and incorporated places. Using a standard coding scheme facilitates the digital exchange of data.

These codes can be obtained at: <http://geonames.usgs.gov/fips55.html>

If you have any questions or problems, please contact the Legal Areas Team at 301-763-1099 or email geo.bas@census.gov.

Appendix 1: Paperwork Reduction Project

The U.S. Census Bureau estimates that the BAS review will take most respondents from 1 to 6 hours to complete. This includes the time needed to read the instructions, assemble materials, organize and review the information, and report any needed changes. This estimate is based on 80 percent of all areas having few or no changes. However, for areas with many changes, it may take 20 hours or longer to complete the survey. Please send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to:

Paperwork Project 0607-0151
U.S. Census Bureau
4600 Silver Hill Road
Room 3K138
Washington, DC 20233

Or you may e-mail comments to:

paperwork@census.gov

Note: Use “Paperwork Project 0607-0151” as the subject.

Please include a copy of your message addressed to:

geo.bas@census.gov.

Appendix 2: State Specific Notes

The following the states have state specific notes. Please review them before completed your updates. If there are any updates to this section they will be posted on the BAS website (insert).

- 1. Alaska**
- 2. California**
- 3. Georgia**
- 4. Kentucky**
- 5. Louisiana**
- 6. Michigan**
- 7. Minnesota**
- 8. New York**
- 9. Puerto Rico**
- 10. Virginia**
- 11. West Virginia**
- 12. Wisconsin**

1. Alaska

Alaska Statutes (AS 29 and AS 44) stipulate the Local Boundary Commission be involved in the development of all boundary changes to incorporated places including annexations, incorporations, or dissolutions. The Local Boundary Commission within the Alaska Department of Commerce, Community and Economic Development has designated the Alaska Department of Labor and Workforce Development as the agency to provide the Census Bureau with boundary changes through the annual Boundary and Annexation Survey.

The Census Bureau and the Alaska Department of Labor and Workforce Development are working together to consolidate the updates of legal boundaries in Alaska. This ensures the Census Bureau will obtain the boundary information it needs from a single source.

Please note that any governmental boundary changes, incorporations, dissolutions, and mergers for your borough or city effective on or before January 1st, will be submitted by the Alaska Department of Labor and Workforce Development.

If you have any questions or concerns regarding legal boundaries for your borough or city you may contact Ingrid Zaruba at 907-465-2439 or by email at: ingrid_zaruba@labor.state.ak.us

2. California

The California State Board of Equalization serves as the Certifying Official for all local governments in California. The Board certifies to the Census Bureau the legality of boundary changes made by California municipalities. To assist them, please enter the final resolution number adopted by the city council as approved by the Local Agency Formation Commission (LAFCO) for each boundary change in the Authorization Number field on the BAS Entity Update Form. Please do not report the resolution number that initiated the action. Also, please enter the date on the certificate of completion issued by the LAFCO in the Effective Date field on the BAS Entity Update Form.

3. Georgia

The Georgia Code stipulates that all annexations and deannexations to incorporated places be reported to the Georgia Department of Community Affairs. The Census Bureau has an ongoing working relationship with this state agency to conduct the annual Boundary and Annexation Survey. A list of entities that reported boundary changes to the Georgia Department of Community Affairs is provided to the Census Bureau each year. The Census Bureau uses this list to determine who should get a BAS package.

Please ensure that all annexation and deannexation information has been reported to the Department of Community Affairs, per the Georgia Code. The Georgia Code is available at <http://www.legis.state.ga.us/>. You may report your boundary changes to the Department of

Community Affairs online or print a boundary change report form at <http://www.georgiaplanning.com/annex.htm>. Printed forms can be mailed to Annexation Reports- Georgia Department of Community Affairs- 60 Executive Park South, NE- Atlanta, Georgia- 30329-2231.

The Department of Community Affairs (DCA) serves as the Certifying Official for all local governments in Georgia. DCA certifies to the Census Bureau the legality of boundary changes made by Georgia municipalities. To assist them, please enter the final resolution or ordinance number adopted by the city for each boundary change, as it was reported to DCA. If no resolution or ordinance number was assigned by your city then use the DCA-ID number assigned by DCA to your annexation report. Enter the number in the Authorization Number field on the BAS Entity Update Form. Also, please enter the effective date, as officially recorded by DCA; into the Effective Date field on the same form. The DCA-ID number and official effective date for annexations can be obtained at <http://www.GeorgiaPlanning.com/annex.htm>. If you have any concerns about this data, contact Terry Jackson at 404-679-4946.

The Census Bureau has also entered into a cooperative agreement with the State of Georgia Municipal Association to provide two sets of maps to each government surveyed through the BAS. Please return one set of maps to the Census Bureau; the other set can be marked and retained for your records.

4. Kentucky

The Kentucky Revised Statutes stipulate that all boundary changes to incorporated places within Kentucky be reported to the office of the Secretary of State. Reports of boundary changes are forwarded by the Secretary of State to the Division of Geographic Information for mapping. The Census Bureau has an ongoing working relationship with this state agency to conduct our annual Boundary and Annexation Survey. The Kentucky Division of Geographic Information provides a list of incorporated places, which reported boundary changes, to the Census Bureau each year. The Census Bureau uses this list to determine who should get a BAS package.

Please ensure that boundary change information has been reported to the Office of the Secretary of State, per the Kentucky Revised Statutes. The Kentucky Revised Statutes are available at <http://www.lrc.ky.gov/statrev/frontpg.htm>. All boundary changes should be submitted to The Land Office Division, Secretary of State, Room T40, Capitol Annex, 700 Capital Ave., Frankfort, KY, 40601.

If you would like to review the data, which the Kentucky Division of Geographic Information has for your entity, please visit <http://kygeonet.ky.gov/>. If you have any concerns about this data, contact Kim Anness at 502-564-1450.

5. Louisiana

The MCD used in Louisiana for Census Bureau data tabulations is the parish governing authority district. These districts are the same as the Police Jury Districts or the Parish Council Districts used for the election of members of the police jury or parish council. Please review the

boundaries of the parish subdivisions in your parish carefully to ensure that the names and boundaries conform to these districts. Do not report election precincts or election districts or any other areas that are not used in apportioning the representatives of the police jury or parish council. If you have a question about which MCDs you are to report, please contact:

Bill Blair
Director of Demographic Services (House and Senate)
P.O. Box 44486
Baton Rouge, LA 70804
Telephone: 225-342-2591
Fax: 225-342-0768
E-mail: blairb@legis.state.la.us

If you report changes or corrections to the districts in your parish, please ensure that you also report the effective date of the change.

6. Michigan

Michigan law stipulates that all boundary changes to incorporated places and minor civil divisions within Michigan be reported to the office of the Secretary of State. The Census Bureau has an ongoing working relationship with a state agency to conduct our annual Boundary and Annexation Survey. The state agency provides a list of incorporated places and minor civil divisions, which reported boundary changes, to the Census Bureau each year. The Census Bureau uses this list to determine who should get a BAS package.

7. Minnesota

Minnesota statutes stipulate that all boundary changes to incorporated places and minor civil divisions within Minnesota be reported to the office of Strategic and Long-Range Planning. The Census Bureau has an ongoing working relationship with a state agency to conduct our annual Boundary and Annexation Survey. The state agency provides a list of incorporated places and minor civil divisions, which reported boundary changes, to the Census Bureau each year. The Census Bureau uses this list to determine who should get a BAS package.

8. New York

The New York Department of State, Division of Corporations and State Records serves as the Certifying Official for all local governments in New York. The Division certifies to the Census Bureau the legality of boundary changes made by New York municipalities. Please be advised that the state can certify only those boundary change actions enacted by Local Law pursuant to Section 714 of the General Municipal Law. To assist them, please enter select “L – Local Law” from the Authorization Type drop down to indicate that this action is a local law. Enter the final Local Law number for each boundary change in the Authorization Number field on the BAS Entity Update Form, rather than the municipal ordinance or resolution number that initiated the action. Finally, please enter the date the annexation was filed with the Secretary of State in the Effective Date field on the same form.

9. Puerto Rico

Under Puerto Rico law, boundary changes to municipios and barrios are reported to the Census Bureau by the Puerto Rico Planning Board only. The Puerto Rico Planning Board will report all boundary changes, approved by the Puerto Rico Government, effective on or before January 1 of each year

The Census Bureau and the Puerto Rico Planning Board collaborate to consolidate the updating of legal boundaries at the commonwealth level, after they have been approved by the Puerto Rico Legislature. The Planning Board maintains the most up-to-date boundary information for all municipios and barrios in Puerto Rico.

If you would like to review the boundary data that the Puerto Rico Planning Board has for your municipio and/or barrios, please visit <http://www.jp.gobierno.pr>. If you have any concerns about this data, contact Ms. Lillian Torres-Aguirre at 787-723-6200 ext. 2501.

10. Virginia

The MCD used in Virginia for Census Bureau data tabulations is the district used for the election of a representative to the County Board of Supervisors. These districts usually are termed magisterial districts, but can have other designations, such as election or supervisor districts. Please review the boundaries of the county subdivisions in your county carefully to ensure that the names and boundaries conform to the areas functioning as districts for the election of county supervisors. Do not report taxing districts, districts used for the recording of land titles, or any other type of district that is not used in apportioning the representatives of the county board. If these districts are not called magisterial districts, put the correct description of the areas above the first data line showing the "NAME OF MUNICIPALITY OR MINOR CIVIL DIVISION" in Question 3. If you have a question about which MCDs you are to report, please contact:

U.S. Census Bureau
Geography Division
Geographic Entity Programs Branch
Legal Areas Team
Washington, DC 20233-7400
Telephone: 301-763-1099
Fax: 301-457-4710
E-mail: geo.bas@census.gov

If you report changes or corrections to the districts in your county, please ensure that you also report the effective date of the change.

11. West Virginia

The MCD used in West Virginia for Census Bureau data tabulations is the magisterial district. Magisterial districts are the divisions of the county used for the election of county commissioners and members of the school board. Please review the boundaries of the county subdivisions in

your county carefully to ensure that the names and boundaries conform to the areas called magisterial districts. Do not report taxing districts, districts used for the recording of land titles, or any other type of district that is not used in apportioning the representatives of the county board. If you have a question about which MCDs you are to report, please contact:

Patricia Hamilton
 Certified Association Executive
 West Virginia Association of Counties
 2211 Washington Street East
 Charleston, WV 25311
 Telephone: 304-346-0591
 Fax: 304-346-0592
 E-mail: wvaco@wvaco.org

If you report changes or corrections to the districts in your county, please ensure that you also report the effective date of the change.

12. Wisconsin

Wisconsin law stipulates that all boundary changes to incorporated places and minor civil divisions within Wisconsin be reported to the office of Secretary of State. The Census Bureau has an ongoing working relationship with a state agency to conduct our annual Boundary and Annexation Survey. The state agency provides a list of incorporated places and minor civil divisions, which reported boundary changes, to the Census Bureau each year. The Census Bureau uses this list to determine who should get a BAS package.

Appendix 3: Census Bureau Regional Offices - Contact information

	<p>Atlanta Regional Office 101 Marietta Street, N.W., Ste. 3200 Atlanta, GA 30303 (404) 730-3832 or (800) 424-6974 TDD: (404) 730-3964 FAX: (404) 730-3835 E-mail: atlanta.regional.office@census.gov</p>	<p>Detroit Regional Office 1395 Brewery Park Blvd., Ste. 100 Detroit, MI 48207-2635 (313) 259-1158 or (800) 432-1495 TDD: (313) 259-5169 Fax: (313) 259-5045 E-mail: detroit.regional.office@census.gov</p>	
	<p>Boston Regional Office 4 Copley Place, Ste. 301 P.O. Box 9108 Boston, MA 02117 (617) 424-4500 or (800) 562-5721 TDD: (617) 424-0565 FAX: (617) 424-0547 Email: boston.regional.office@census.gov</p>	<p>Kansas City Regional Office 1211 North 8th Street Kansas City, KS 66101 (913) 551-6728 or (800) 728-4748 TDD: (913) 551-5839 Fax: (913) 551-6789 E-mail: kc.regional.office@census.gov</p>	

	<p>Charlotte Regional Office 901 Center Park Drive, Ste. 106 Charlotte, NC 28217 (704) 424-6400 or (800) 331-7360 TDD: (704) 344-6114 Fax: (704) 424-6944 E-mail: charlotte.regional.office@census.gov</p>	<p>Los Angeles Regional Office 15350 Sherman Way, Ste. 400 Van Nuys, CA 91406 (818) 267-1700 or (800) 992-3530 TDD: (818) 904-6249 Fax: (818) 267-1711 E-mail: la.regional.office@census.gov</p>	
	<p>Chicago Regional Office 1111 W. 22nd Street, Ste. 400 Oak Brook, IL 60523-1918 (630) 288-9200 or (800) 865-6384 Fax: (630) 288-9288 TDD: (630) 288-9320 E-mail: chicago.regional.office@census.gov</p>	<p>New York Regional Office 395 Hudson Street, Ste. 800 New York, NY 10014 (212) 584-3400 or (800) 991-2520 TDD: (212) 478-4793 Fax: (212) 478-4800 E-mail: new.york.regional.office@census.gov</p>	
	<p>Dallas Regional Office 8585 N Stemmons Fwy, Ste. 800 S Dallas, TX 75247 (214) 253-4401 or (800) 835-9752 TDD: (214) 655-5363 Fax: (214) 655-5362 E-mail: dallas.regional.office@census.gov</p>	<p>Philadelphia Regional Office 833 Chestnut Street, Ste. 504 Philadelphia, PA 19107-4405 (215) 717-1800 or (800) 262-4236 TDD: (215) 717-0894 Fax: (215) 717-0755 E-mail: philadelphia.regional.office@census.gov</p>	
	<p>Denver Regional Office 6900 W. Jefferson Avenue, Ste. 100 Denver, CO 80235 (303) 264-0202 or (800) 852-6159 TDD: (303) 969-6767 Fax: (303) 969-6777 E-mail: denver.regional.office@census.gov</p>	<p>Seattle Regional Office 601 Union Street, Ste. 3800 Seattle, WA 98101-1074 (206) 381-6200 or (800) 233-3308 TDD: (206) 381-6318 Fax (206) 381-6310 E-mail: seattle.regional.office@census.gov</p>	

Appendix 4 – Required Fields and Coding Scheme

-Required Attributes (Change Polygons)-							
	NAME	CHNG_TYPE	EFF_DATE	DOCU (Not Required in GA)	OFFSET	AREA (Required in GA)	RELATE
Annexation	X	X	X	X		Georgia	
Deannexation	X	X	X	X		Georgia	
Boundary Correction	X	X					X (IN / OUT)
Geographic Offset		X			X		
Geographic Corridor		X			X		
New Entity	X	X	X	X			

-Required Attributes (Linear Feature Updates)-							
	CHNG_TYPE	FENAME	MTFCC	LTOADD	RTOADD	LFROMADD	RFROMADD

Add Feature	X	X	X				
Delete Feature	X						
Rename Feature	X	X					
Recode Feature (MTFCC)	X		X				
Address Break Updates	X			X	X	X	X

-Required Attributes (Area Landmark and Point Landmark)-			
	FULLNAME	CHNG_TYPE	RELATE
Boundary Correction	X	X	X
Deletion		X	
Change Name	X	X	
New Area Landmark / Hydro Area	X	X	

-Required Attributes (Point Landmarks)-		
	FULLNAME	CHNG_TYPE
New Point Landmark	X	X
Delete Point Landmark		X
Change Name	X	X

-Change Type Codes for Boundary Updates-	
CHNG_TYPE	TRANSLATION
A	Annexation
B	Boundary Correction
C	Geographic Corridor
D	Deannexation
E	New Entity
F	Geographic Offset

-Change Type Codes for Feature Updates-	
CHNG_TYPE	TRANSLATION
AL	Add Feature
DL	Delete Feature
CA	Change Feature Name
CA	Change Feature Class
CA	Add Address Break

-Change Type Codes for Area Landmarks and Hydro Areas-	
CHNG_TYPE	TRANSLATION
D	Deletion
B	Boundary Corrections
E	New Area Landmark / Hydro Area
G	Name Change

-Change Type Codes for Point Landmarks-	
CHNG_TYPE	TRANSLATION
D	Deletion
E	New Point Landmark
G	Name Change

Appendix 5 – Data Dictionary

-County and Equivalent Areas Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
COUNTYNS	8	String	ANSI Feature Code for the County or Equivalent Feature
NAMELSAD	120	String	Name with translated LSAD code
LSAD	2	String	Legal/Statistical Area Description code
FUNCSTAT	1	String	Functional Status
CLASSFP	2	String	FIPS 55 Class Code describing an entity
CHNG_TYPE	1	String	Type of area update
EFF_DATE	8	String	Effective Date or Vintage
DOCU	120	String	Supporting Documentation
FORM_ID	4	String	(MTPS / Web BAS only)
AREA	10	Double	Acreage of Area Update
RELATE	120	String	Relationship description

-County Subdivisions Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
COUSUBFP	5	String	FIPS County Subdivision Code
COUSUBCE	4	String	Census County Subdivision Code
NAMELSAD	120	String	Name with translated LSAD
COUSUBNS	8	String	ANSI feature code for the county subdivision
LSAD	2	String	Legal/Statistical Area Description
FUNCSTAT	1	String	Functional Status
CLASSFP	2	String	FIPS 55 Class Code describing an entity
CHNG_TYPE	1	String	Type of Area Update
EFF_DATE	8	String	Effective Date or Vintage
DOCU	120	String	Supporting Documentation
FORM_ID	4	String	(MTPS and Web BAS only)
AREA	10	Double	Acreage of Update
RELATE	120	String	Relationship Description

-Incorporated Place Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
PLACEFP	5	String	FIPS 55 Place Code
PLACECE	5	String	Census Place Code
NAMELSAD	120	String	Name with translated LSAD
PLACENS	8	String	ANSI feature code for the place
LSAD	2	String	Legal/Statistical Area Description
FUNCSTAT	1	String	Functional Status
CLASSFP	2	String	FIPS 55 Class Code describing an entity

CHNG_TYPE	1	String	Type of Area Update
EFF_DATE	8	String	Effective Date or Vintage
DOCU	120	String	Supporting Documentation
FORM_ID	4	String	(MTPS and Web BAS only)
AREA	10	Double	Acreage of Update
RELATE	120	String	Relationship Description

-Consolidated City Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
CONCITYFP	5	String	FIPS 55 Place Code
CONCITYCE	4	String	Census Consolidated City Code
NAMELSAD	120	String	Name with translated LSAD
PLACENS	8	String	ANSI feature code for the place
LSAD	2	String	Legal/Statistical Area Description
FUNCSTAT	1	String	Functional Status
CLASSFP	2	String	FIPS 55 Class Code describing an entity
CHNG_TYPE	1	String	Type of Area Update
EFF_DATE	8	String	Effective Date or Vintage
DOCU	120	String	Supporting Documentation
FORM_ID	4	String	(MTPS and Web BAS only)
AREA	10	Double	Acreage of Update
RELATE	120	String	Relationship Description

-Edges Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>

TLID	10	Integer	Permanent Edge ID
STATEFPL	2	String	State FIPS Code (Left)
STATEFPR	2	String	State FIPS Code (Right)
COUNTYFPL	3	String	County FIPS Code (Left)
COUNTYFPR	3	String	County FIPS Code (Right)
TFIDL	10	Integer	Permanent Face ID (Left)
TFIDR	10	Integer	Permanent Face ID (Right)
MTFCC	5	String	MAF/TIGER Feature Class Code
FIDELITY	1	String	Indication to a respondent when their entity boundary has changed through spatial enhancement
FULLNAME	120	String	Prefix qualifier code, prefix direction code, prefix type code, base name, suffix type code, suffix qualifier code
BbspFLG	1	String	Redistricting data project participant's submitted request of an EDGE for selection as a block boundary
CBBFLG	1	String	Indicates the status of an EDGE for a selection as a block boundary
2010_BBSP	1	String	New BBSP flag
CHNG_TYPE	2	String	Type of linear update
LTOADD	10	String	Left To Address
RTOADD	10	String	Right To Address
LFROMADD	10	String	Left From Address
RFROMADD	10	String	Right From Address
ZIPL	5	String	Left Zip Code
ZIPR	5	String	Right Zip Code

-Area Landmark Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
MTFCC	5	String	MAF/TIGER Feature Class Code

FULLNAME	120	String	Prefix direction code, prefix type code, base name, suffix type code, suffix direction code
AREAID	10	Integer	Landmark identification number
ANSICODE	8	String	ANSI code for area landmarks
CHNG_TYPE	1	String	Type of Area Landmark update
EFF_DATE	8	String	Effective Date or Vintage
RELATE	120	String	Relationship description
BAG	3	String	Block Area Grouping

-Hydro Area Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
ANSICODE	8	String	ANSI code for hydrography area
MTFCC	5	String	MAF/TIGER Feature Class Code
FULLNAME	120	String	Prefix direction code, prefix type code, base name, suffix type, suffix type code, suffix direction code
CHNG_TYPE	1	String	Type of Area Update
HYDROID	10	String	Hydrography Identification Number

-Point Landmarks Shapefile-			
<u>ATTRIBUTE FIELD</u>	<u>LENGTH</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
STATEFP	2	String	FIPS State Code
COUNTYFP	3	String	FIPS County Code
POINTID	10	Integer	Point Landmark Identification Number
MTFCC	5	String	MAF/TIGER Feature Class Code
FULLNAME	120	String	Prefix type code, base name, suffix type code
CHNG_TYPE	1	String	Type of Area Update

Appendix 6 – Example Processes 1 & 2

-Outline – Example Process 1-

1. Copy the Census Bureau shapefiles to your computer or server.
2. Open the following files in your GIS:
 - bas_<ST><COU>_incp_2008.shp
 - bas_<ST><COU>_lines_2008.shp
3. Display all Roads, Railroads, Hydrography, and Invisible Features using the first character in the MTFCC code. Listed below is the recommended symbology and coloring scheme.
 - S: Roads – solid black line
 - R: Rail – hatched brown line
 - P: Invisible Features – light gray, dashed line
 - H: Hydrography – solid blue line
4. Create change polygons using the following methods:
 - Using ArcGIS's 'Select Feature' tool, select already existing lines from the Census Bureau's 'Edges' layer. If a line does not already exist in the 'Edges' layer, create a new line using editing tools in ArcGIS. Also, lines that need to be split can be split using the 'Split' lines tool in ArcGIS with help from snapping in the Editor toolbar.
5. After edges that comprise a single change polygon (or all change polygons) have been selected, export the selected features into a new feature layer.
6. After all features have been exported for each change polygon, use the 'Feature to Poly' tool in ArcGIS to create the change polygons.
7. Add required fields to the attribute table. Detailed instructions for this step can be found in Sample Process 1. After adding the required fields, these fields should be populated with the appropriate attribute information.
8. Review each of the change polygons in accordance with the guidelines described in Section 5.6. *Note: If you are editing multiple levels of geography (i.e. incorporated place and county subdivision) please be sure to create a separate change polygon layer for each.*
9. Review Section 5.8 to determine proper naming conventions for shapefiles. Please zip the shapefiles together (Section 5.8.4) and FTP to the Census Bureau (Section 5.8.5).

Review Example Process 1 for Detailed Procedures

-Outline – Example Process 2-

1. Copy the Census Bureau shapefiles from the CD to your computer or server.
2. Open the following files in your GIS:
 - bas_<ST><COU>_incp_2008.shp
 - bas_<ST><COU>_lines_2008.shp
10. Display all Roads, Railroads, Hydrography, and Invisible Features using the first character in the MTFCC code. Listed below is the recommended symbology and coloring scheme.
 - S: Roads – solid black line
 - R: Rail – hatched brown line
 - P: Invisible Features – light gray, dashed line
 - H: Hydrography – solid blue line
3. Overlay your local GIS boundary file with the Census Bureau boundary file.
4. Use the ‘Symmetrical Difference’ tool in ArcGIS to create change polygons using the Census Bureau’s boundary file and your local GIS boundary file.
5. If necessary create change polygons for any geographic offsets or corridors that are necessary for annexations, deannexations, or boundary corrections. Merge this layer with the change polygon layer.
6. Populate the required BAS-related fields in the change polygon attribute table. The change polygon coding scheme can be found in Appendix B. Please be sure to include only the fields listed in Section 5.6.
7. Review each of the change polygons in accordance with the guidelines described in Section 5.6. *Note: If you are editing multiple levels of geography (i.e. incorporated place and county subdivision) please be sure to create a separate change polygon layer for each.*
8. Review Section 5.8 to determine proper naming conventions for shapefiles. Please zip the shapefiles together (Section 5.8.4) and FTP to the Census Bureau (Section 5.8.5)

Review Example Process 2 for Detailed Procedures 2007 Digital BAS – Example Process 1

-Selecting Lines to Form Change Polygons-

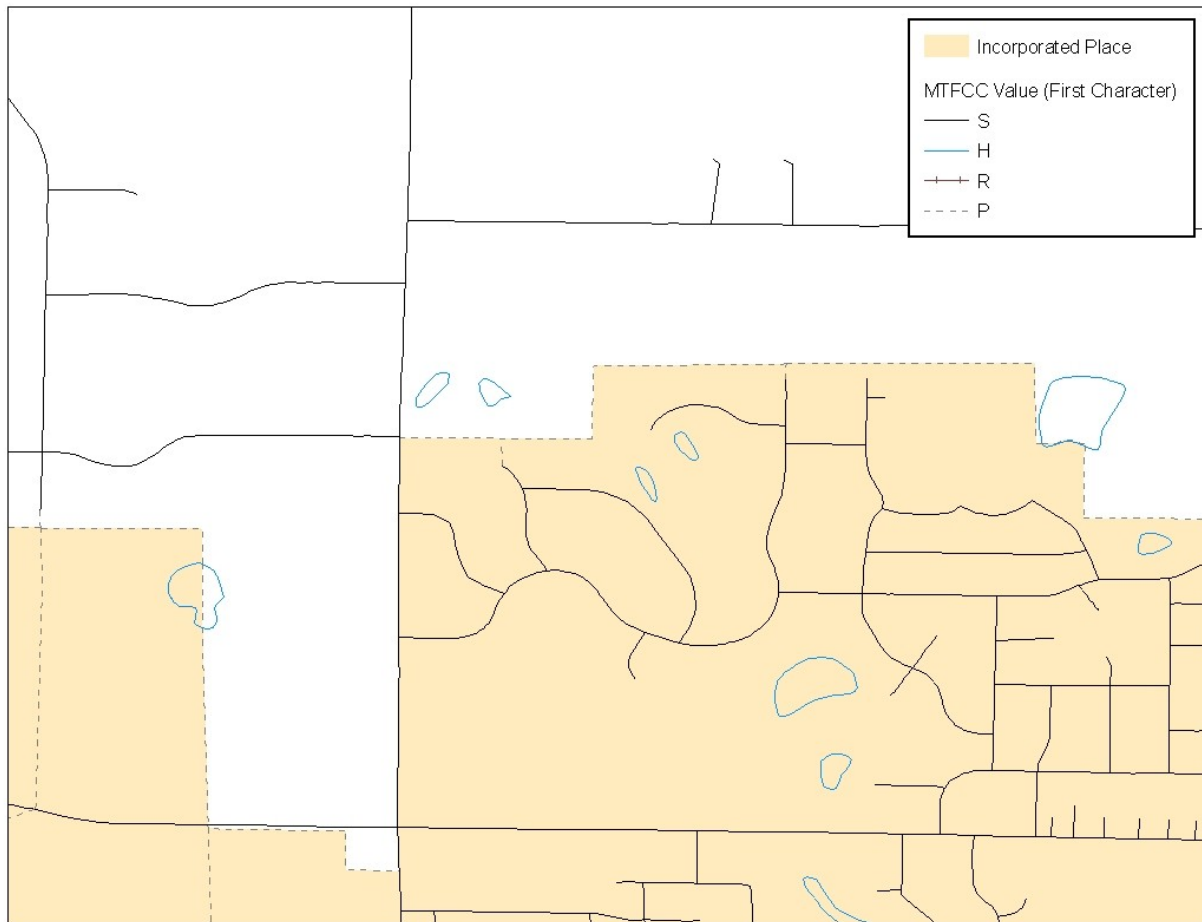


Image 1.1

Opening Census Bureau Shapefiles: Image 1.1 shows the original Census Bureau shapefiles that you will be receiving for editing in Digital BAS. Because this example is at the place layer, the **bas_<ST><COU>_incp_2008** layer should be opened. In order to create change polygons by selecting lines it is also very important to have the **bas_<ST><COU>_lines_2008** shapefile open. The Census Bureau suggests that certain first characters of MTFCC values be displayed for selecting lines to create change polygons. These values include S (roads), R (railroads), P (invisible), and H (hydrography). The image above can be used as a guide for the most effective symbolization methods.

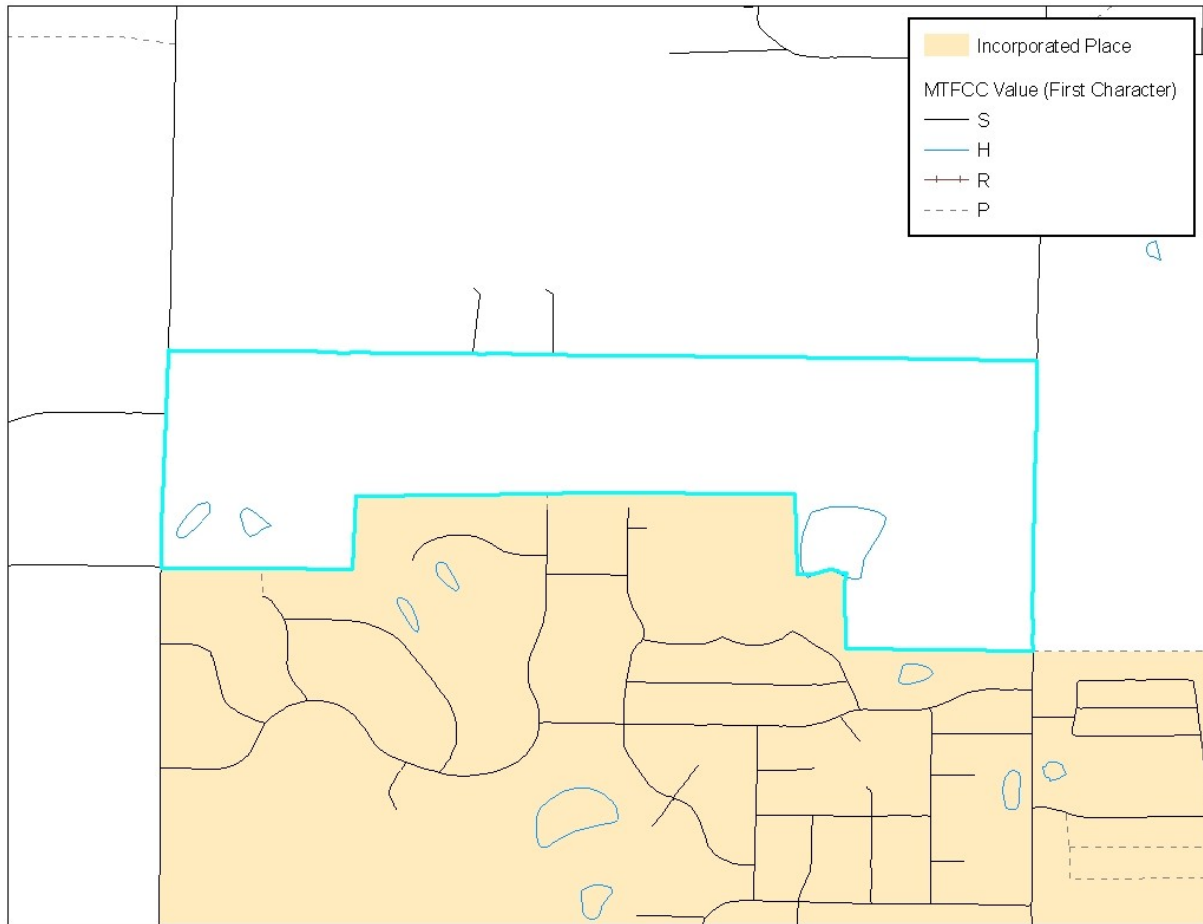

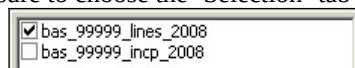


Image 1.2

Selecting Lines from Existing Features in the Edges Layer: In order to create change polygons, lines must be selected from the 'Edges' layer. In this image, each line can be selected from existing lines in the 'Edges' layer using the 'Select Features' tool.  When selecting lines please be sure to choose the 'Selection' tab at the bottom

of the Table of Contents (ArcGIS), and check only the 'Edges' layer.



In this simple situation, there are no lines that need to be added or split in the 'Edges' layer. Image 1.3 will cover how to create, split, and select lines for creating additional change polygons.

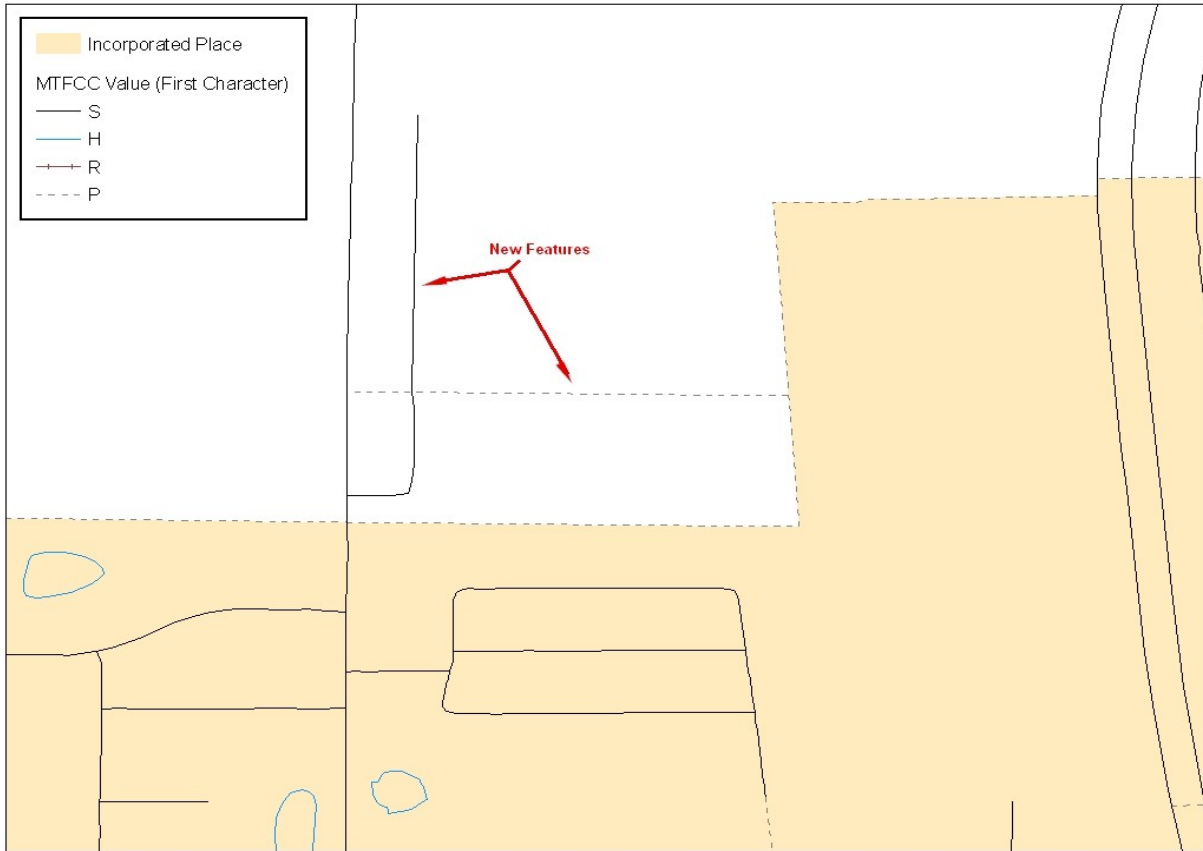


Image 1.3

Creating New Features to Form an Annexation: When creating change polygons there are many situations where lines need to be created so that they may be selected and converted into a polygon. It is best to make a copy of the `bas_<ST><COU>_lines_2008` layer so that the original may be used for feature changes in a later process.

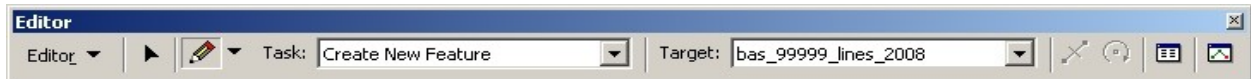
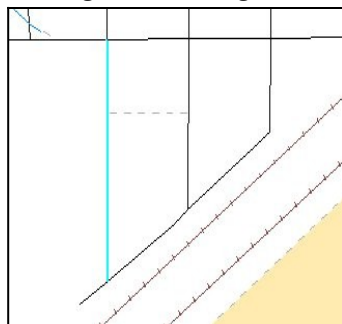


Image 1.4

In ArcGIS, use the Editor Tool (Image 1.4) to create new features that can be selected to form new polygons. In the 'Task' dropdown select Create New Feature and in the Target dropdown select the copied version of the 'Edges'

layer. In the Editor Toolbar set the snapping to vertex, edge, and end, and begin creating features using the Pencil tool shown above.

Layer	Vertex	Edge	End
bas_99999_lines_2008	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
bas_99999_incp_2008	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>




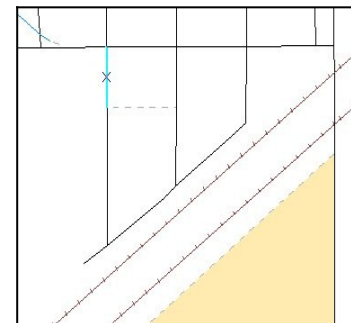
It may also be necessary to split lines to select the appropriate features for creating change polygons. With snapping set, the Manual Split tool  can be used to split an existing feature at the intersection point with the new feature. Then the appropriate lines can be selected to create polygons.

Image 1.5



Constructing Change Polygons: After creating, splitting, and selecting both new and existing features a change polygon (Image 1.5) can be created from these selected features. After selecting all the appropriate features from the 'Edges' layer for a change polygon, the selected lines must be exported to a new layer so that they may be converted to a polygon shapefile (*Note: You may choose to export selected lines individually or as a whole*).

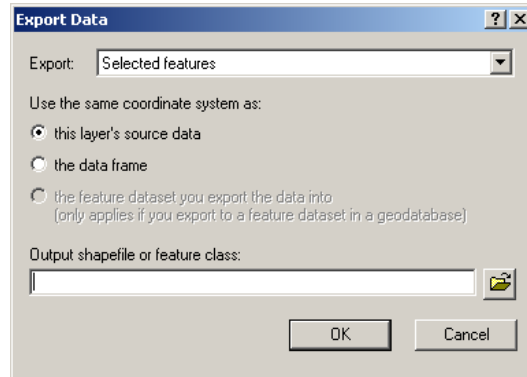


Image 1.6

After selecting all the appropriate features from the 'Edges' layer for a change polygon, the selected lines must be exported to a new layer (Image 1.6) so that they may be converted to a polygon shapefile.

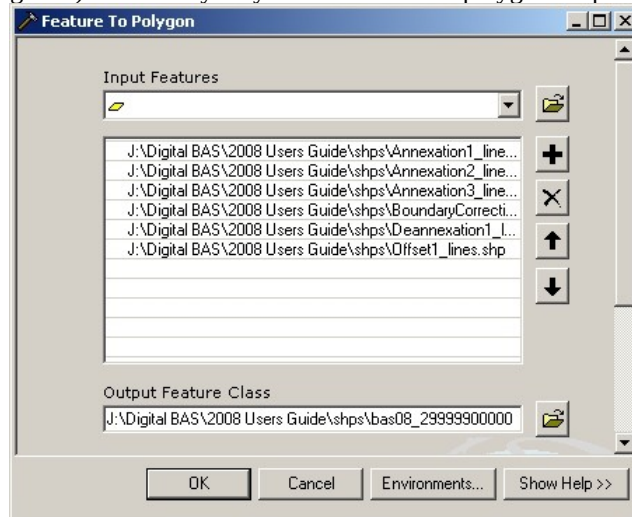



Image 1.7

Creating Polygons From Features: After creating and exporting all features for annexations, deannexations, and boundary corrections use the 'Feature to Polygon' tool (Image 1.7) in ArcToolbox.  Each set of features that were earlier selected and exported to a new layer can be put into the 'Feature to Polygon' tool to create a change polygon layer.

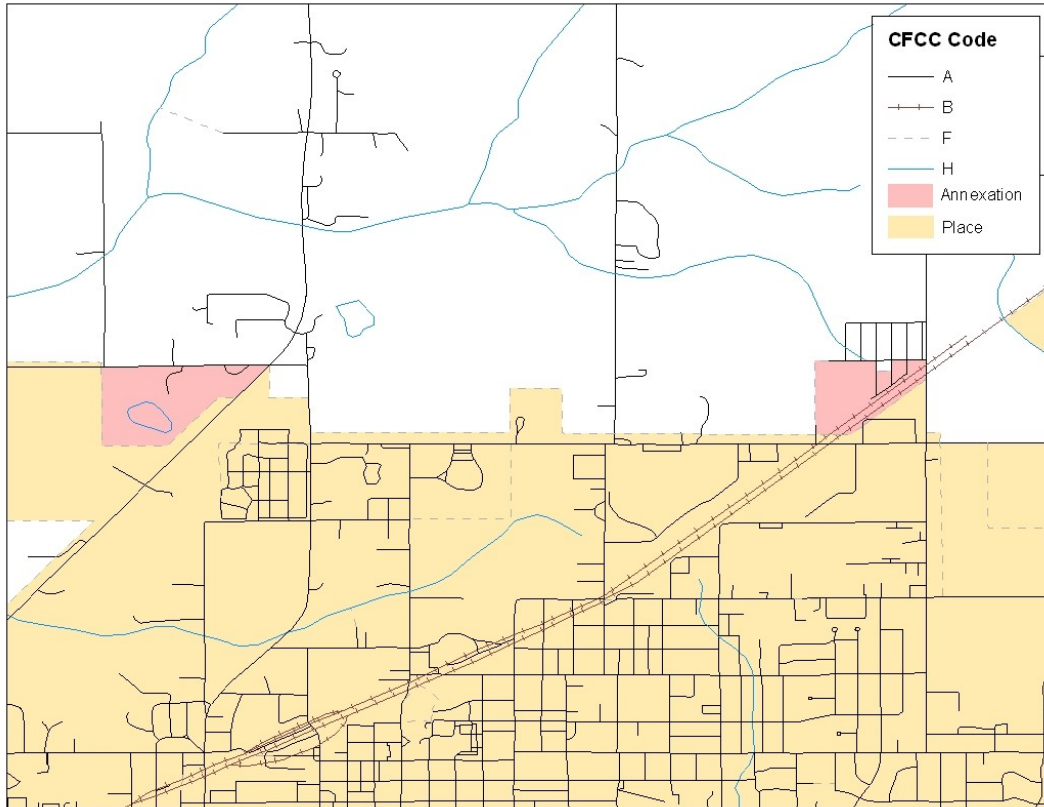


Image 1.8

Creating and Attributing Change Polygons: After creating a change polygon layer, the attribute table must be updated to reflect information that is required by the Census Bureau.

FID	Shape ^a	Id
0	Polygon	0
1	Polygon	0
2	Polygon	0
3	Polygon	0
4	Polygon	0

When change polygons are created the attribute table only contains three fields (FID, Shape, ID). The Census Bureau requires that additional fields be added (State FIPS Code, County FIPS Code, Place FIPS Code, Place Name, Change Type, Legal Documentation, Effective Date, Area, and Relate). Table A provides additional information.

Name	Attribute Table Name	Character Type	Length
<i>State FIPS Code</i>	STATEFP	Text	2
<i>County FIPS Code</i>	COUNTYFP	Text	3
<i>Place FIPS Code</i>	PLACEFP	Text	5
<i>Place Name</i>	NAMELSAD	Text	120
<i>Change Type</i>	CHNG_TYPE	Text	2
<i>Legal Documentation</i>	DOCU	Text	120
<i>Effective Date</i>	EFF_DATE	Text	8
<i>Area</i>	AREA	Double	10
<i>Relate</i>	RELATE	Text	120

Table A

FID	Shape'	Id	statefp	countyfp	placefp	namelsad	chnge_type	docu	eff_date	area	relate
0	Polygon	0								0	
1	Polygon	0								0	
2	Polygon	0								0	
3	Polygon	0								0	
4	Polygon	0								0	

Image 1.9

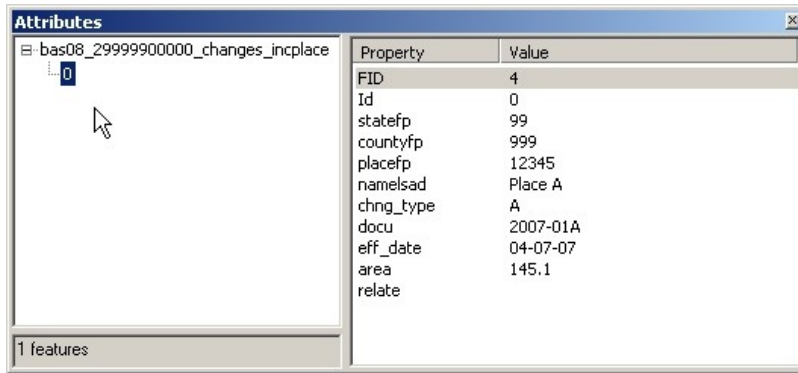




Image 1.10

In order to populate the required field in the attribute table, the Editor Toolbar is again necessary. After Start Editing is selected, select your change polygon layer as the Target. Using the Edit Tool  select a change polygon and add attribute information by pressing the Attributes button.  (Image 1.9) This step must be completed for each change polygon that you have created.

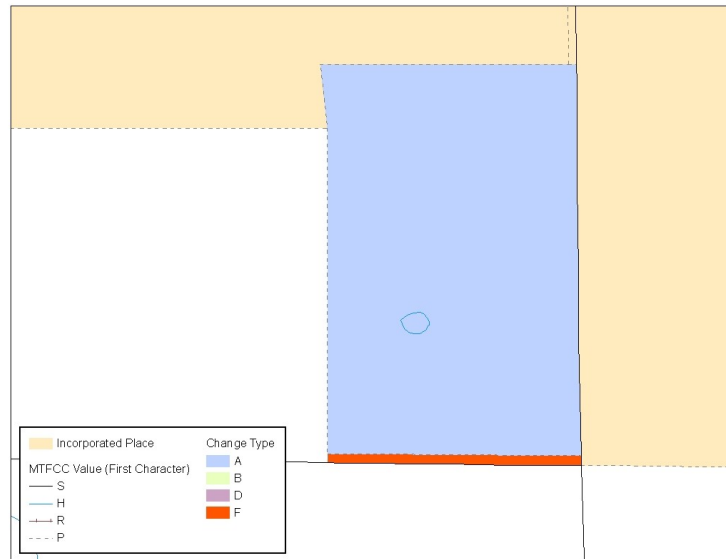


Image 1.10

Annexation with Geographic Offset (Image 1.10): Often times change polygons are created that have geographic offsets or corridors. Like previous change polygons, participants are asked to create, split, and select lines to form change polygons. In addition, the Census Bureau requests that you create a change polygon for the geographic offset and code it with the appropriate coding scheme.

Geographic Offset / Corridor Change Polygon: A separate change polygon should be created whenever a geographic offset or corridor is necessary. These change polygons can be created using similar methods to those shown for creating and coding annexation polygons. The only attribute information for geographic offset and corridor polygons are change type and place name. (Geographic Offset – F and Geographic Corridor – C)

Boundary Correction Change Polygons (Image 1.11): In addition to annexations or deannexations, your entity may have boundary corrections that it wishes to make. Change polygons for boundary corrections can be created and coded using the same techniques for creating annexation polygons. The only attribute information required for boundary corrections are change type and place name.

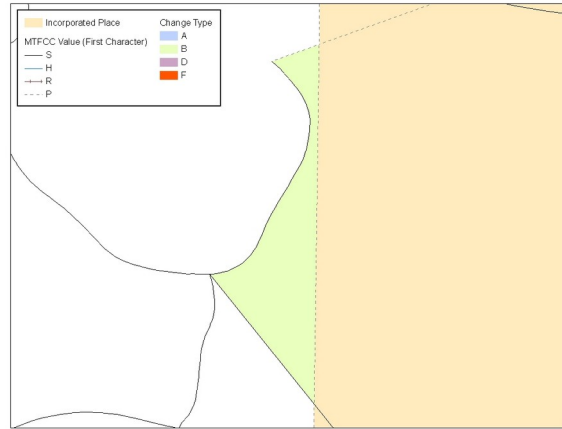


Image 1.11

FID	Shape'	Id	statefp	countyfp	placefp	namelsad	chnge_type	docu	eff_date	area	relate
2	Polygon	0	99	99	12345	Place A	B			0	IN

Image 1.12

Forming a Single Change Polygon Layer: When all change polygons have been created (annexations, deannexations, boundary corrections, offsets, and corridors) they should be merged into a single change polygon layer for each level of geography named according to the naming conventions outlined in Section 5.8. Using the 'Merge' tool (Image 1.12) in ArcGIS will allow you to enter any number of change polygon layers as an input and receive a single change polygon layer as an output.

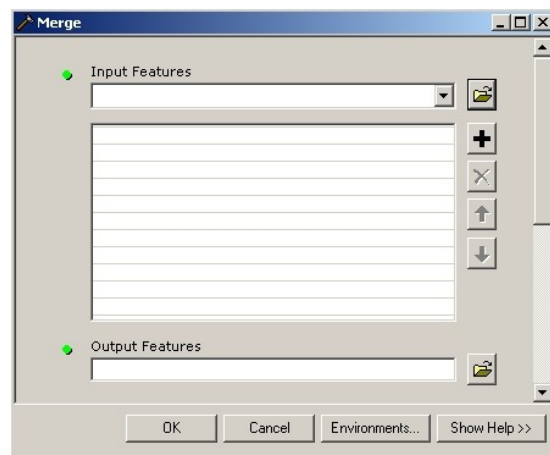


Image 1.12

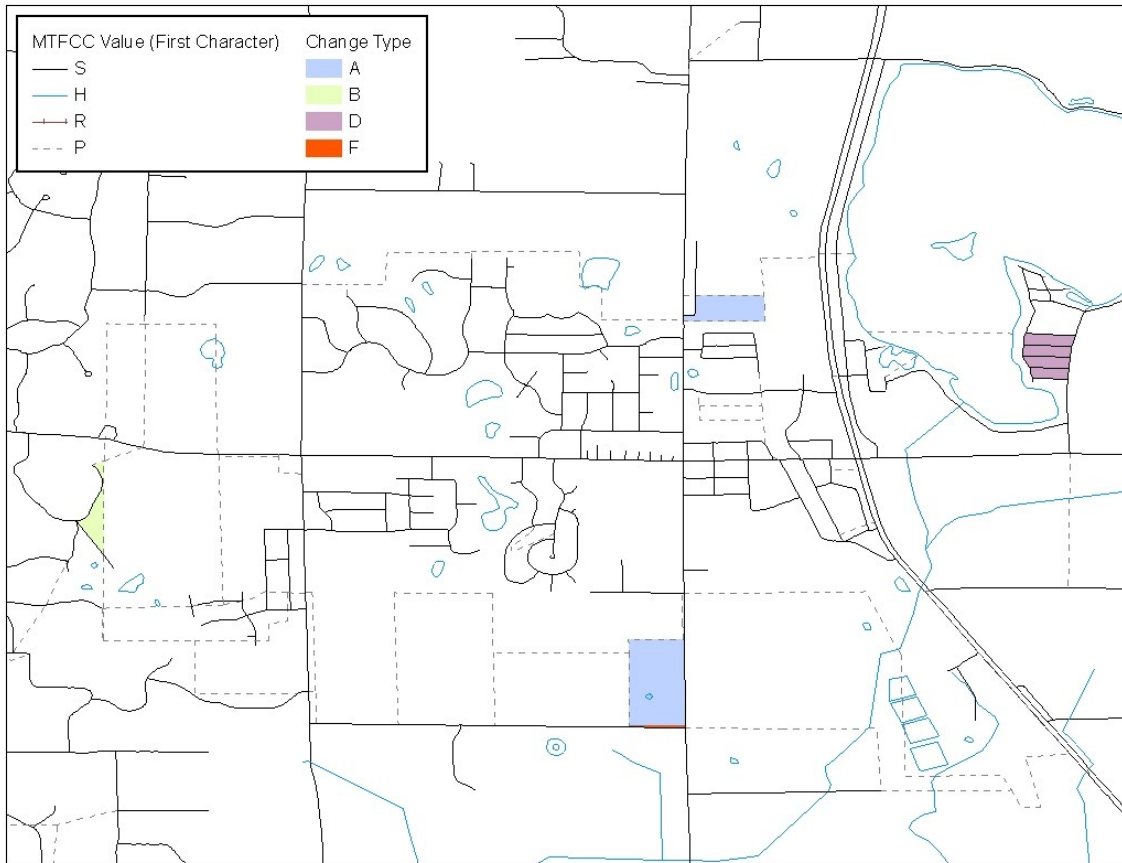


Image 1.13

FID	Shape'	Id	statefp	countyfp	placefp	namelsad	chnge_type	docu	eff_date	area	relate
0	Polygon	0	99	99	12345	Place A	F			0	.30 foot offset
1	Polygon	0	99	99	12345	Place A	A	2007-331-Y	09-23-07	753.2	
2	Polygon	0	99	99	12345	Place A	B			0	IN
3	Polygon	0	99	99	12345	Place A	D	2007-45D	06-12-07	23.1	
4	Polygon	0	99	99	12345	Place A	A	2007-01A	04-07-07	145.1	

Image 1.14

After finalizing your change polygons and attribute table, the Census Bureau requests that you review your change polygons to ensure that these are changes you intend on making, and that these changes contain the required attribute data (Image 1.13 and 1.14). Section 5.6 describes, in depth, how to review your change polygons.

2007 Digital BAS – Example Process 2

-Overlaying Census and Local Shapefiles to Form Change Polygons-

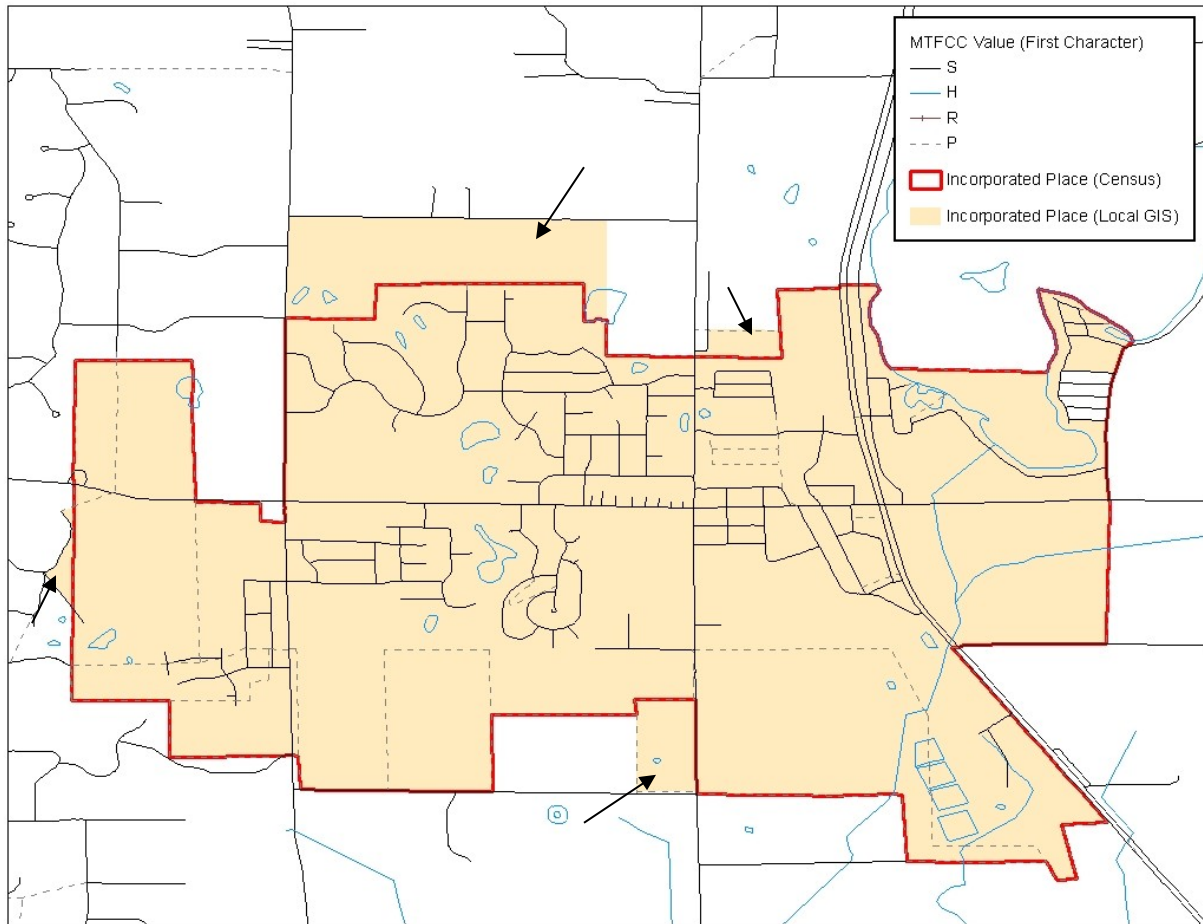


Image 2.1

Opening Census Bureau and Local Shapefiles: This example provides a process that could be used to overlay the Census Bureau and local GIS shapefiles. Because this example is at the incorporated place layer, the **bas_<ST><COU>_incp_2008** layer should be opened. In addition, your local GIS place layer should be opened for the comparison and overlay process.

Image 2.1 shows the differences between the Census Bureau and local place as indicated by the arrows. These differences will be the ones extrapolated as changes for the change polygon layer.

For reference it is also important to have the **bas_<ST><COU>_lines_2008** layer open. The Census Bureau suggests that certain first characters of MTFCC values be displayed for selecting lines to create change polygons. These values include S (roads), R (railroads), P (invisible), and H (hydrography). The image above can be used as a guide for the most effective symbolization methods.

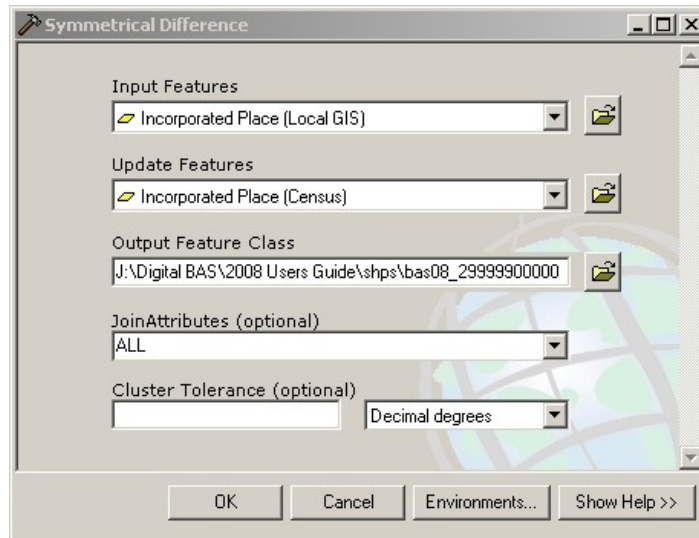


Image 2.2

Overlay the Census Bureau and Local Place Layers: The differences between the Census Bureau and local place layers can be found using the ‘Symmetrical Difference’ overlay tool (Image 2.2) in ArcGIS. The ‘Input Features’ and ‘Update Features’ dialog in the tool can be populated by either the local or Census Bureau place layer. Which layer goes in which dialog is not important. This process creates a change polygon layer with one record for all of the changes that have been made. It is important that this record is split so that each individual polygon has its own unique record in the attribute table.

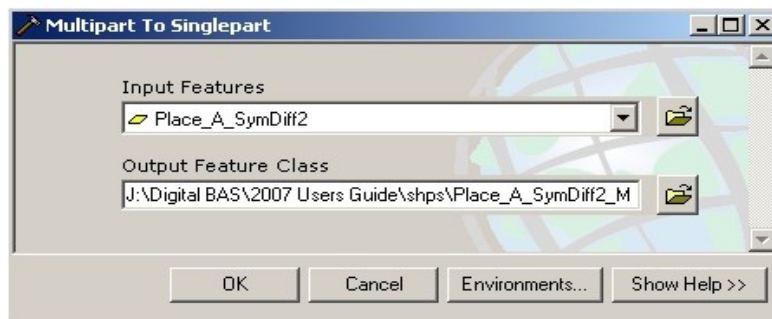



Image 2.3

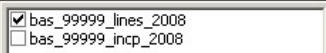


Splitting Change Polygons for Individual Records: It is important that each has its own record in the attribute table. The ‘Multipart To Singlepart’ tool (Image 2.3) in ArcGIS allows you to split the polygons so that each has its own record in the attribute table. The change polygons can then be coded appropriately.



Image 2.4

Creating Geographic Offset and Corridor Polygons: A geographic offset or corridor change polygon is necessary wherever an offset or corridor should exist. Section 5.6.1 provides definitions of both geographic offsets and corridors.

Selecting Features to Form Geographic Offset / Corridor Polygons: In order to create change polygons, lines must be selected from the 'Edges' layer. In image 2.4, each line can be selected from existing lines in the 'Edges' layer using the 'Select Features' tool.  When selecting lines please be sure to select the 'Selection' tab at the

bottom of the Table of Contents (ArcGIS) and check only the 'Edges' layer.  In this simple situation, there are no lines that need to be added or split in the 'Edges' layer. If lines need to be added or split, utilize the sketch tool  and the split line tool. 

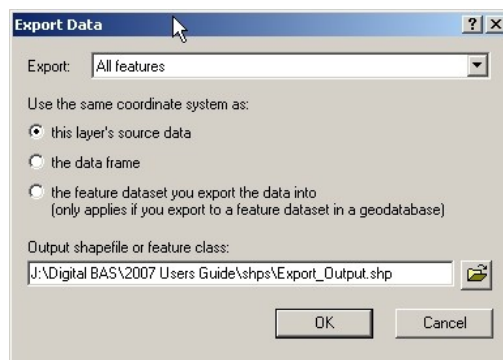


Image 2.5

Exporting Selected Features (Image 2.5): After selecting all the appropriate features from the 'Edges' layer for an offset polygon, the selected lines must be exported to a new layer so that they may be converted to a polygon shapefile. You may select and export all line features for offsets and corridors individually or all together (if you have more than one offset or corridor).

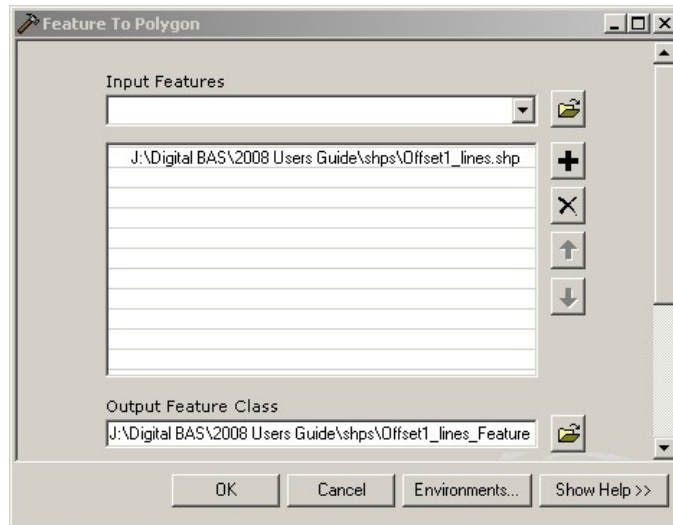



Image 2.6

Converting Features to Polygons: After creating and exporting all features for geographic offsets and corridors use the 'Feature to Polygon' tool (Image 2.6) in ArcToolbox.  Each set of features that were earlier selected and exported to a new layer can be put into the 'Feature to Polygon' tool to create an offset and corridor polygon layer.

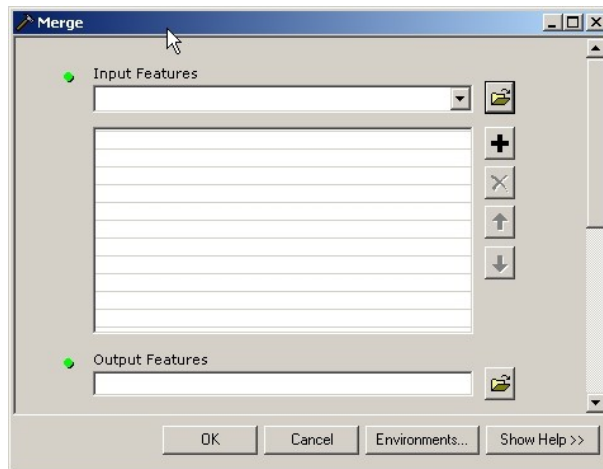


Image 2.7

Merging the Offset / Corridor Polygons with Change Polygon Layer (Image 2.7): After creating polygons for offsets and corridors it is important to merge these polygons with your annexation, deannexation, and boundary correction layer. Please create separate change polygon layers for each level of geography that you edit (i.e. place, MCD, and county) using the naming conventions below:

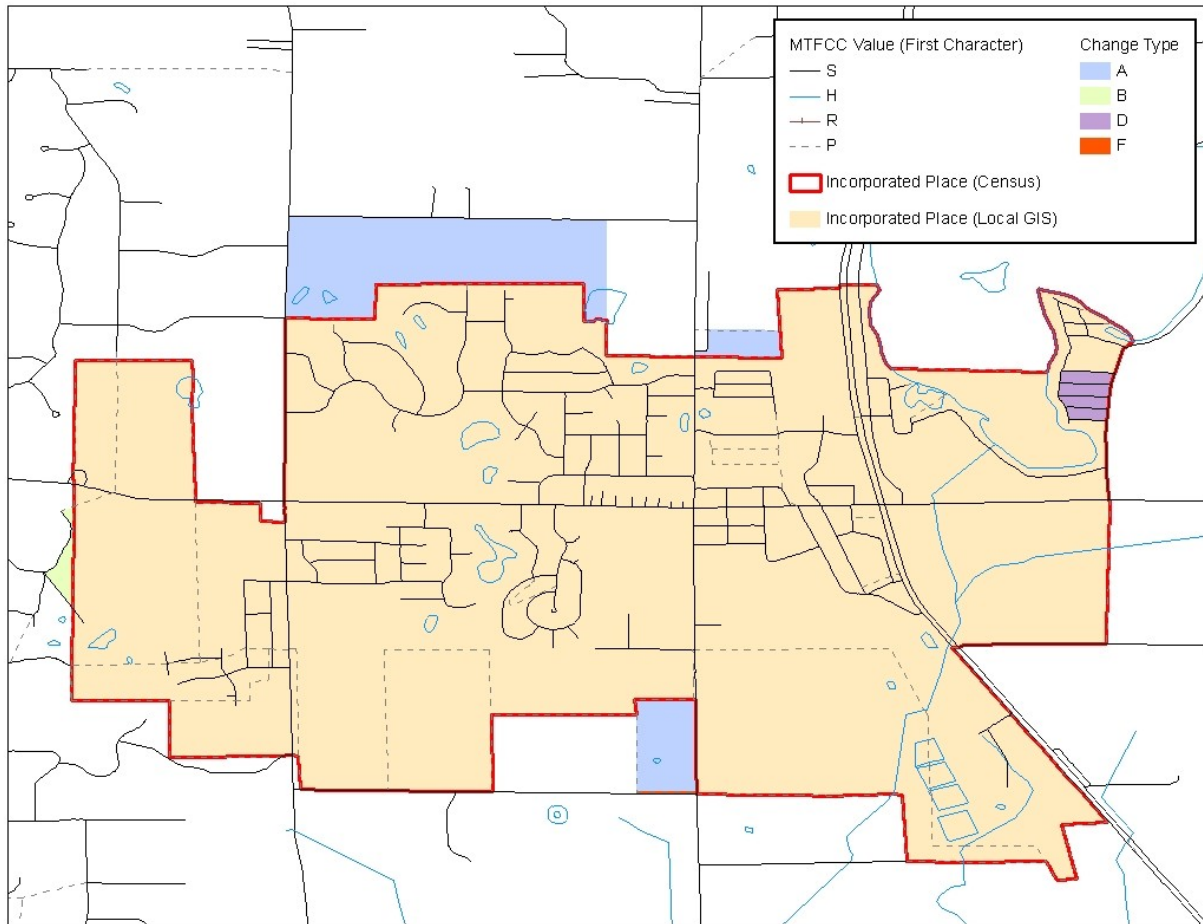


Image 2.8

FID	Shape	statefp	countyfp	placece	placefp	namelsad	placen	lsad	funcstat	classfp	partfg	chnge_type	eff_date	docu	form_id	area	relate	
0	Polygon	99	999		12345	Place A						F					0	30 foot offset
1	Polygon	99	999		12345	Place A						A	03-12-07	2007-12A		23.5		
2	Polygon	99	999		12345	Place A						A	04-06-07	2007-65C		12.7		
3	Polygon	99	999		12345	Place A						B				0	IN	
4	Polygon	99	999		12345	Place A						A	08-31-07	2007-91T		7.8		
5	Polygon	99	999		12345	Place A						D	01-01-08	2008-6A		13.5		

Image 2.9

Updating the Attribute Table (Image 2.8 and 2.9): Information for coding the attribute table with the appropriate change types can be found in Appendix B. In addition, Section 5.3 and Appendix B detail the fields that are required to be populated for annexations, deannexations, boundary corrections, offsets and corridors.

After finalizing your change polygons and attribute table, the Census Bureau requests that you review your change polygons to ensure that these are changes you intend on making, and that these changes contain the required attribute data. When using this method to update your boundaries there are often small spatial corrections between the local file and the Census Bureau shapefile. These changes may dissolve a topological relationship between a road feature and a boundary which potentially could affect population counts. Please review Section 5.6 for information on how to adequately review your change polygons.