Participation in the Census Boundary Quality Assessment and Reconciliation Project (BQARP)

What is BQARP?

The Boundary Quality Assessment and Reconciliation Project (BQARP) is a project to assess, analyze, and improve the spatial quality of legal and administrative boundaries within the Census Bureau's MAF/TIGER Database (MTDB). Ensuring quality boundaries is a critical component of the geographic preparations for the 2020 Census and the Census Bureau's ongoing geographic partnership programs. In addition, the improvement of boundary quality is an essential element of the Census Bureau's commitment as the responsible agency for legal boundaries under the Office of Management and Budget (OMB) Circular A-16.

Preceding the BQARP, there was a three-year assessment of legal boundary quality in the MTDB and boundary data availability nationwide, and a pilot project to investigate how to operationalize assessment and reconciliation. From the results of this Cadastral Data Pilot Project, the Census Bureau's Geography Division (GEO) Division has established the BQARP Program to first assess the quality of all State, County, Municipal, and School district boundaries and then correct boundaries as necessary to register them to cadastral data, surveyed point locations, and physical features. The emphasis of the BQARP is to do a one-time boundary correction and then tag updated boundaries to their appropriate related feature. The tagging process will ensure the boundaries remain in place unless annexations, de-annexations, or boundary changes occur.

The BQARP represents the first effort to systematically target and assess boundary quality within the GEO. Historically, the GEO has relied exclusively on the BAS to obtain corrections to legal boundaries. While the BAS has played an essential role in improving boundary quality, it is primarily a boundary *maintenance* project, not a comprehensive boundary *quality improvement* process. The goal of the BQARP is to *establish* a new accurate baseline for boundaries within an entire state or county, which the BAS would then *maintain* by collecting individual annexations and de-annexations on a transaction basis as they occur over the years. *Please note that participation in the BQARP* ***DOES NOT*** *affect participation in the BAS. Participants will still be able to submit updates via the BAS.*

What are the benefits?

The BQARP will provide the Census Bureau with a nationally consistent presentation of boundary data based on local sources. The Census Bureau representation may have some boundary generalizations and may register to Census Bureau physical features, but the Census Bureau does strive to have the best representation of the legal boundaries.

Additionally, the Census Bureau presentation will assure that all households, residences, and businesses are in their correct Census Block and Tract. This will improve the quality of demographic statistics and assure that subsequent funding and fund allocation through the Census Bureau counts are accurately distributed. The boundary correction process will strive to reduce the number of zero population polygons.

Furthermore, having an accurate boundary representation tied to its description source will improve the speed and accuracy of future annexations, de-annexations, and boundary changes. Reducing the need for inter-decade boundary corrections and improving the efficiency of boundary updates will reduce the work effort in future years.

Who will participate?

Prior to initiating BQARP, the Census Bureau completed an in depth assessment of available cadastral and boundary data from state and local sources. This assessment determined that there was sufficient available data nationwide to undertake the project. The participants will be state level cadastral or GIS coordinators who can assist in assembling available boundary and cadastral data across the state. This is the preferred mode of participation since the state coordinators will be closer to the local data producers and will have an understanding of the nuances of local cadastral and boundary information. If state coordinators are not available, then the Census Bureau may rely on regional or local producers to participate. This will depend on available resources.

What are the Census Bureau's expectations of BQARP participants?

Based on the results of the pilot project, the participants are expected to provide the following data sets for BQARP use. Data provided to the Census Bureau via the BQARP will be secured and not publically available. A secure data upload access point is provided to all BQARP participants.

The following are the optimum data set provisioning.

> ***Parcel Data*** - Polygons or lines with sufficient attribution to determine which jurisdiction including incorporated place or minor civil division, county, and school district contains the parcel. Owner and assessment information is not used and is not required. A parcel site address is optional but may assist in assessment and reconciliation.
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> ***Administrative and Legal Boundaries*** - Polygons or lines that delineate the state and/or local representation of incorporated places, minor civil divisions, counties, and school districts. The attribution will identify the place or feature represented.
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> ***Legal descriptions for Administrative and Legal boundaries*** - If these are available they are helpful for reconciling boundaries and provide supporting documentation for boundary changes.
>
> ***State Managed Lands*** - If there is a separate data set or data layer that identifies state managed lands with the name of the land unit, if applicable, and number of housing units in the lands, if available.
>
> ***Road Centerlines and Address Points*** – If the participant has road centerlines with road names and site address points, the BQARP will accept this data on behalf of other Census Bureau programs and assure the data are secured and available to other internal programs. This should reduce the number of data share contacts for the participant.

Participants are expected to provide this data at the state level. The Census Bureau does not have the resources to assemble the data for all jurisdictions in a state, so relying on the state participant to assemble the information is critical to the success of the BQARP. Assemble or aggregate the data as best you can. The data may be in separate files and there may be some gaps in the data sets, notably in areas without digital parcel polygon data, but it is expected at some level. The Census Bureau can assemble and review the data. In addition, boundary information should be a state or locally prepared data set and not a copy of the existing Census Bureau data unless the state accepts the Census Bureau boundary representations as they are currently presented and does not expect to change or update the Census Bureau boundaries.

Participants will play an active role with the Census Bureau staff to identify areas in need of reconciliation. To complete the boundary reconciliation, the Census Bureau has a process in place to update boundaries as necessary and to tag boundaries with their associated feature. This is particularly important for the non-visible features. For example, if a county boundary follows a PLSS line, the Census Bureau will use the available PLSS features to register the updated boundary location and all associated polygons in MAF/TIGER to sustain the vertical alignment required by the Census Bureau. The boundary is tagged, so the source of the geometry is known and the line location can be managed correctly in the future.

One commonly occurring event is that a boundary may intend to follow a parcel, road or PLSS line. In some cases, the description may even call for that feature as the boundary, but as GIS data sets are assembled or updated, the boundaries are no longer coincident with the features. This has been a common occurrence in the early stages of the BQARP. Participants may want to review the data before submission to verify that the alignment is as expected.

When State coordinators receive a final confirmation, agreement or communication related to a local entity agreeing to boundaries, a copy of the documentation should be provided to the Census Bureau. The Census Bureau stores the legal documentation.

Ideally, participants will assist the Census Bureau by identifying the feature coincidence for the boundaries. For example, if all of the boundaries of an incorporated place are to follow parcel lines, the reconciliation process can follow the identified parcel lines and tag the updated boundary in MAF/TIGER, accordingly.

What is the anticipated workload for the participant?

The workload will depend in large part on (1) if the data are currently available to the state coordinator and (2) the quality of the participant boundary information. The workload estimate below *does not* account for initial assembly, creation, and maintenance of the requested data sets. For example, if there is not a state or county assembled representation of the municipal boundaries, these workload estimates do not reflect the level of effort to locate legal descriptions, capture the boundary polygon, and reconcile the boundary. The level of effort to assemble and maintain this data will vary widely by state and would be difficult to estimate on a national basis.

Parcel Data Sets - This is the aggregation or assembly of locally sourced parcel information. Many states have ongoing programs that collect or assemble parcel boundaries from local producers.

> 1 to 2 hours: If data needs to be assembled and provided to the Census Bureau. Some data documentation may be necessary and typically a

teleconference with the Census Bureau to describe the available data and its source, currency, and quality. In some cases, data may already be published and available, but there may still be a need to connect with the Census Bureau to review available content.

Boundary Data Aggregation - This is the assembly of School District, County boundary, and Municipal boundaries. During the pilot project, the Census Bureau discovered that county and school district boundaries were already held at the state level and in some cases actively managed by the state. The municipal boundaries were less likely to be available as an actively managed statewide data set.

1 hour: If the data is already compiled at the state and there has been active participation between the state and local entities on boundary change reporting.

10 to 40 hours: If the data is assembled at the state level but there has not been active participation between local entities and the state to keep boundaries current and accurate. The Census Bureau can provide a listing of known recent annexations, de-annexations, and boundary changes.

1 hour average per county or its equivalent if the county has aggregated municipal boundaries and needs to assemble it into a statewide data set.

Boundary Clarification - The state coordinator will review the boundary and cadastral data to verify the coincidence of the representations. If the boundaries of municipalities are intended to follow parcel lines, they should be reconciled before submitting the boundaries to the Census Bureau. Boundaries that are not coincident with physical features or cadastral boundaries (parcels, PLSS) should be noted in the data set if possible.

1 hour: If the boundary data set has been consistently updated and maintained. Documentation on data currency and quality may need to be completed before submitting.

40 to 80 hours: In some cases, it may be necessary to research and reconcile a boundary coincidence. Based on the pilot experiences the majority of this time will be used to resolve boundaries in a few municipalities.

Total estimated workload including project coordination

6 to 8 hours: Cadastral and boundary information is available and is actively managed and tracked. This includes time for data questions, project management and data review.

12 to120 hours: Cadastral data is available but municipal boundary information is of varied quality and has not been routinely maintained and assembled at the state level.

Where are the most current Census Bureau data?

There are two primary sources for the Census Bureau data related to the BQARP. The Partnership shapefiles and the TIGER/Line shapefiles.

The Partnership shapefiles are used in the Census Bureau partner programs to share data with and capture data from Census Bureau partners. These files contain the Census Bureau representations of various boundaries as defined from the Boundary and Annexation Survey (BAS) benchmarks and have a subset of data intended to support boundary activities.

The TIGER/Line shapefiles are created from the Spring American Community Survey ("ACS") benchmark and are updated in the June-July-August timeframe. These contain the complete TIGER/Line data sets in shapefile format organized by data set type by state.

The partnership shapefiles are updated after each benchmark and TIGER/Line shapefiles are generated once per year.

Each of these data sources is described in more detail in the following sections.

What and where are the partnership files?

Partnership shapefiles are used in the Census Bureau programs to share data with and capture data from Census Bureau partners. These files contain the Census Bureau representations of various boundaries as defined by the Boundary and Annexation Survey (BAS) benchmarks and have a subset of data intended to support boundary activities. The partnership shapefiles are updated after each benchmark and TIGER\Line shapefiles are generated once per year. The partnership shapefiles can be found at the Partnership Shapefiles page.

Select your state and then most recent year. Selecting the first county listed for your state will also provide you with the statewide partnership data. The following is a listing of the contents of the partnership zip file.

Census Partnership Files - File Content Decoder

PVS_14_v3_aial_<state_FIPS>.shp - AIAL – American Indian Area Legal
PVS_14_v3_aias_<state_FIPS>.shp - AIAS - American Indian Reservation State
PVS_14_v3_aitsl_<state_FIPS>.shp - AITSL -American Indian Tribal Subdivision Legal
PVS_14_v3_aitss_<state_FIPS>.shp - AITSS - American Indian Tribal Statistical State
PVS_14_v3_cbsa_<state_FIPS>.shp - CBSA - Core Based Statistical Area
PVS_14_v3_cd_<state_FIPS>.shp - CD - Congressional District
PVS_14_v3_cdp_<state_FIPS>.shp - CDP - Census Designated Place
PVS_14_v3_county_<state_FIPS>.shp - **COUNTY - County Boundary**
PVS_14_v3_elsd_<state_FIPS>.shp - **ELSD - Elementary school districts**
PVS_14_v3_mcd_<state_FIPS>.shp - **MCD - Minor Civil Division**
PVS_14_v3_necta_<state_FIPS>.shp - **NECTA - New England City and Town Area**
PVS_14_v3_place_<state_FIPS>.shp - **PLACE – Incorporated Place**
PVS_14_v3_puma_<state_FIPS>.shp - PUMA - Public Use Microdata Area
PVS_14_v3_scsd_<state_FIPS>.shp - **SCSD – Secondary School District**
PVS_14_v3_sldl_<state_FIPS>.shp - SLDL - State Legislative District Lower
PVS_14_v3_sldu_<state_FIPS>.shp - SLDU – State Legislative District Upper
PVS_14_v3_state_<state_FIPS>.shp - **STATE - State Boundaries**
PVS_14_v3_tbg_<state_FIPS>.shp - TBG - Tribal Block Group
PVS_14_v3_tct_<state_FIPS>.shp - TCT - Tribal Census Tract
PVS_14_v3_tracts_<state_FIPS>.shp - TRACTS - Census Tract
PVS_14_v3_uac_<state_FIPS>.shp - UAC - Urban Area Census
PVS_14_v3_unsd_<state_FIPS>.shp - **UNSD - Unified School District**

**The bolded items are those files in scope for the Census Bureau BQARP efforts. Please note that there is a difference between the Census Bureau School districts and attendance zones. Additionally, not all data types in scope for the BQARP are available in each state. Some locations also have an addr file that has road centerline address range information.*

What and where are the TIGER/Line Shapefiles?

The core TIGER/Line Files and shapefiles do not include demographic data, but they do contain geographic entity codes (GEOIDs) that can be linked to the Census Bureau's demographic data. For more information about these files, please visit our TIGER/Line Shapefiles and TIGER/Line Files page.

The TIGER/Line shapefiles are created from the American Community Survey ("ACS") benchmark and are updated annually. The TIGER/Line files can be downloaded from our FTP site by state, using the file type and state FIPS.

The quick description of TIGER/Line shapefile data sets is found in the brochure Downloading TIGER/Line Shapefiles.

The file names and abbreviations are similar to those listed in the partnership files. The files that are part of the BQARP are bolded. Note that MCDs are in the COUSUB files and are the non-statistical features. To extract the MCD data for BQARP remove the features that have a functional status (FUNCSTAT) of S (Statistical).

2014 TIGER/Line Shapefile file name definitions	
ADDR	Address Range Relationship File
ADDRFEAT	Address Range Feature
ADDRFN	Address Range-Feature Name Relationship
AIANNH	American Indian / Alaska Native / Native Hawaiian Areas
AITSN	American Indian Tribal Subdivision National
ANRC	Alaska Native Regional Corporation
AREALM	Area Landmark
AREAWATER	Area Hydrography
BG	Block Group
CBSA	Metropolitan Statistical Area / Micropolitan Statistical Area
CBSAEC	Metropolitan Statistical Area / Micropolitan Statistical Area (2012 Economic)
CD	Congressional District
CNECTA	Combined New England City and Town Area
COASTLINE	Coastline
CONCITY	Consolidated City
CONCITYEC	Consolidated City (2012 Economic)
COUNTY	County
COUNTYEC	County (2012 Economic)
COUSUB	County Subdivision - MCDs are non statistical features in this data set
CSA	Combined Statistical Area
CSAEC	Combined Statistical Area (2012 Economic)
EDGES	All Lines
ELSD	Elementary School District
ESTATE	Estate
FACES	Topological Faces (Polygons with All Geocodes)

FACESEC	Topological Faces (Polygons with All Geocodes) (2012 Economic)
FACESAH	Topological Faces-Area Hydrography Relationship File
FACESAL	Topological Faces-Area Landmark Relationship File
FACESMIL	Topological Faces-Military Installation Relationship File
FEATNAMES	Feature Names Relationship File
LINEARWATER	Linear Hydrography
METDIV	Metropolitan Division
METDIVEC	Metropolitan Division (2012 Economic)
MIL	Military Installation
NECTA	New England City and Town Area
NECTADIV	New England City and Town Area Division
PLACE	Place
PLACEEC	Economic Place (2012 Economic)
PLANRGEC	Planning Region (2012 Economic)
POINTLM	Point Landmark
PRIMARYROADS	Primary Roads
PRISECROADS	Primary and Secondary Roads
PUMA	Public Use Microdata Area
RAILS	Rails
ROADS	All Roads
SCSD	Secondary School Districts
SLDL	State Legislative District – Lower Chamber
SLDU	State Legislative District – Upper Chamber
STATE	State and Equivalent
STATE	State and Equivalent (2012 Economic)
SUBBARRIO	SubMinor Civil Division (Subbarios in Puerto Rico)
TABBLOCK	Tabulation (Census) Block
TBG	Tribal Block Group
TRACT	Census Tract
TTRACT	Tribal Census Tract
UAC	Urban Area/Urban Cluster
UNSD	Unified School District
ZCTA5	5-Digit ZIP Code Tabulation Area