

3. About the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles

3.1 What is in the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles

The 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles contain 2020 and 2010 geographic extent and boundaries of both legal and statistical entities (which have no governmental standing) for the United States, the District of Columbia, and the Commonwealth of Puerto Rico. The 2020 vintage includes boundaries of governmental units that match the data from the surveys that use 2020 geography (e.g., 2020 Population Estimates and the 2020 American Community Survey). The 2010 vintage includes boundaries of governmental units that match the data from the surveys that use 2010 geography (e.g., 2010 Population Estimates and the 2010 American Community Survey).

In addition to geographic boundaries, the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles also include geographic feature shapefiles and relationship files. Feature shapefiles represent the point, line and polygon features in the MTDB (e.g., roads and rivers). Relationship files contain additional attribute information users can join to the shapefiles. Both the feature shapefiles and relationship files reflect updates made in the database through October 2020.

To see how the geographic entities relate to one another, please see our geographic hierarchy diagrams here:

<https://www.census.gov/programs-surveys/geography/guidance/hierarchy.html>

The legal entities included in these shapefiles are:

- American Indian Off-Reservation Trust Lands.
- American Indian Reservations – Federal.
- American Indian Reservations – State.
- American Indian Tribal Subdivisions (within legal American Indian areas).
- Alaska Native Regional Corporations.
- Congressional Districts – 113th and 116th congress.
- Consolidated Cities.
- Counties and Equivalent Entities (except census areas in Alaska).
- Hawaiian Home Lands.
- Incorporated Places.
- Minor Civil Divisions.
- School Districts – Elementary.
- School Districts – Secondary.
- School Districts – Unified.
- States and Equivalent Entities.
- State Legislative Districts – Upper.
- State Legislative Districts – Lower.
- Subminor Civil Divisions (Subbarrios in Puerto Rico).
- Urban Growth Areas.
- Voting Districts.

The statistical entities included in these shapefiles are:

- Alaska Native Village Statistical Areas.
- American Indian/Alaska Native Statistical Areas.
- American Indian Tribal Subdivisions (within Oklahoma Tribal Statistical Areas).
- Block Groups.
- Census Areas.
- Census Blocks.
- Census County Divisions (Census Subareas in Alaska).
- Unorganized Territories (Statistical County Subdivisions).
- Census Designated Places.
- Census Tracts.
- Oklahoma Tribal Statistical Areas.
- State Designated Tribal Statistical Areas.
- Tribal Designated Statistical Areas.

Shapefiles - Features

- All Lines (called Edges).
- All Roads.
- Area Hydrography.
- Area Landmark.
- Linear Hydrography.
- Point Landmark.
- Primary and Secondary Roads.
- Topological Faces (polygons with all geocodes).

Relationship Files

- Address Range-Feature Name.
- Address Ranges.
- Feature Names.
- Topological Faces – Area Landmark.
- Topological Faces – Area Hydrography.

[Table 1](#) shows the geographic entities and features available in state-based files for the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles.

[Table 2](#) shows the geographic entities and features available in county-based files for the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles. Note: Data is available for counties as they existed in 2010 and 2020. For example, Shannon County (46113) existed in 2010 but changed names and codes to Oglala Lakota County (46102). 2010 shapefile layers are available for Shannon County, and 2020 shapefile layers are available for Oglala Lakota County.

Table 1: 2020 state-based Shapefile availability

State-based Shapefile	2010 Version Included?	2020 Version Included?
American Indian/Alaska Native/Native Hawaiian Area	Y	Y
American Indian Tribal Subdivision	Y	Y
Alaska Native Regional Corporation	Y	Y
State and Equivalent	Y	Y
Block	Y	Y
Block Group	Y	Y
Census Tract	Y	Y
113th Congressional District	Y	N
116th Congressional District	N	Y
Consolidated City	Y	Y
County and Equivalent	Y	Y
County Subdivision	Y	Y
Place	Y	Y
Elementary School District	Y	Y
Secondary School District	Y	Y
Unified School District	Y	Y
State Legislative District Lower Chamber (Legislative Session Year [LSY] 2012)	Y	N
State Legislative District Lower Chamber (LSY 2018)	N	Y
State Legislative District Upper Chamber (LSY 2012)	Y	N
State Legislative District Upper Chamber (LSY 2018)	N	Y
Subbarrio (Subminor Civil Division)	Y	Y
Voting District	N	Y
Urban Growth Area	Y	Y
Primary and Secondary Roads	N	Y

Table 1: 2020 county-based Shapefile and Relationship File availability

County-based Shapefile	2010 Version Included?	2020 Version Included?
Block	Y	Y
Block Group	Y	Y
Census Tract	Y	Y
County Subdivision	Y	Y
Voting District	N	Y
All Lines	N	Y
All Roads	N	Y
Area Hydrography	N	Y
Linear Water	N	Y
Area Landmark	N	Y
Point Landmark	N	Y
Topological Faces (polygons with all geocodes)	N	Y
County-based Relationship File		
Address Range-Feature Name	N	Y
Address Ranges	N	Y
Feature Names	N	Y
Topological Faces-Area Hydrography	N	Y
Topological Faces-Area Landmark	N	Y

3.2 Structure and Format

3.2.1 Structure

The Census Bureau provides 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles and associated relationship files on DVD and the web. The files on the Census Bureau website are compressed. One zipped file is available for each layer, with a file extension of .zip. Each zipped shapefile consists of the following seven files:

Figure 1: Shapefiles File Types

File Type	Description
.cpg	Identify character encoding
.dbf	Tabular attribute information (database)
.prj	Coordinate System Information
.shp	Feature Geometry
.shx	Index of the Feature Geometry
.shp.iso.xml	International Organization for Standardization (ISO 191) metadata in Extensible Markup Language (XML) format.
.shp.ea.iso.xml	Entity and Attribute of ISO 191 metadata in XML format.

Each zipped relationship file consists of the following four files:

Figure 2: Relationship File Types

File Type	Description
.cpg	Identify character encoding
.dbf	Tabular attribute information (database)
.dbf.iso.xml	ISO 191 metadata in XML format.
.dbf.ea.iso.xml	Entity and Attribute of ISO 191 metadata in XML format.

3.2.2 File Naming Conventions

The name of each file is:

tl_YYYY_<extent>_<layer>.<ext>

Where:

Figure 3: File Naming Conventions

Name	Description
tl	TIGER/Line
YYYY	Year version of the files
<extent>	Parent geography entity ID code (variable length of two to five characters). The entity ID identifies the geographic extent by specific entity for which the file contains data (variable length depending on the type of file).
State-based	2-character state FIPS code
County-based	5-character state and county FIPS code
<layer>	Layer tag (variable length). The layer tag specifies the type of geography or feature the file contains.
<ext>	File extension

Examples:

State-based shapefile: State and Equivalent shapefile for Maryland

File Name: tl_YYYY_24_state.shp

County-based shapefile: All Lines shapefile for Montgomery County, Maryland

File Name: tl_YYYY_24031_edges.shp

3.2.3 Datum (GCS NAD 83)

Each shapefile contains a project (.prj) file that contains the GIS industry standard well-known text (WKT) format to describe the coordinate system/projection/datum information for each shapefile. All Census Bureau generated shapefiles are in Global Coordinate System North American Datum of 1983 (GCS NAD83). Each .prj file contains the following:

```
GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137,298.257222101]],PRIMEM["Greenwich",0],UNIT["Degree",0.017453292519943295]]
```

Figure 4: Datum Field definition list

Field	Description
GEOGCS	A coordinate system based on based on latitude and longitude.
DATUM	The horizontal datum, which corresponds to the procedure used to measure positions on the surface of the Earth.
SPHEROID	An approximation of the Earth's surface as a squashed sphere.
PRIMEM	The prime meridian used to take longitude measurements (from). The longitude units will match those of the geographic coordinate system.
UNIT	This describes units used for values elsewhere within the parent WKT clause. The physical dimension (i.e. type) of the units determined by context. For example, the type of the units is angular.

3.2.4 Metadata

Metadata describes the quality, purpose, spatial extent, and history of a particular dataset. The metadata files are compatible with a text editor, web browser, or Esri's ArcCatalog. The TIGER/Line Shapefiles metadata provide a detailed description of the TIGER/Line Shapefiles and relationship files. The metadata includes publication date, contact information, and all the valid attribute values and descriptions. Users should refer to the metadata files for extensive documentation about the contents of the shapefiles and relationship files. The all lines metadata also contains a Spatial Metadata Identifier (SMID), which identifies the source of the coordinates for each edge and the horizontal spatial accuracy information for a particular line. Please note that the horizontal spatial accuracy refers only to those edges identified as matched to the source with that accuracy. It is not the spatial accuracy of the all lines shapefile as a whole. For more information regarding the all lines shapefile, please refer to Section 4.11, Linear Features.

Note: TIGER/Line files are in ISO 19115-3 stylesheet, as required by data.gov. However, Esri's ArcCatalog needs to be in the ISO 19139 stylesheet (entire metadata element values).

<<https://community.esri.com/thread/228884-problem-with-tigerline-2018-metadata>>

3.2.5 Spatial Accuracy of Linear Features

In order to maintain a current geographic database from which to extract the TIGER/Line Shapefiles, the Census Bureau uses various internal and external processes to update the MTDB. While it has made a reasonable and systematic attempt to gather the most recent information available about the features each file portrays, the Census Bureau cautions users that the files are no more complete than the source documents used in their compilation, the vintage of those source documents, and the translation of the information on those source documents.

3.2.6 Coordinates

Coordinates in the TIGER/Line Shapefiles have six decimal places, but the positional accuracy of these coordinates may not be as great as the six decimal places suggest. The spatial accuracy varies with the source materials used. The Census Bureau cannot specify the spatial accuracy of features changed or added by its field staff or through local updates, features derived from the GBF/DIME Files (TIGER's predecessor in 1970 and 1980), or other map or digital sources.

3.2.7 Codes for Geographic Entities

The TIGER/Line Shapefiles includes the American National Standards Institute (ANSI) codes to identify both legal and statistical entities.

The ANSI publications include both the Federal Information Processing Series (FIPS) codes and the U.S. Geological Survey's Geographic Names Information System (GNIS) codes. The FIPS codes appear in the 2020 Census Redistricting Data (P.L. 94-171) TIGER/Line Shapefiles in fields (e.g., "STATEFP", where "FP" indicates that the field contains a FIPS code). The GNIS codes are a permanent numeric identifier of up to eight digits. The GNIS codes appear in fields (e.g., "STATENS", where "NS" [National Standard] indicates that the field contains a GNIS code). The Census Bureau stores the GNIS code as a fixed-width string; the official code is a numeric value without leading zeroes. The GNIS code is available beginning in the 2010 TIGER/Line Shapefiles. For geographic entities not covered by ANSI, the Census Bureau assigns a code and these appear in fields (e.g., "TRACTCE", where "CE" stands for Census). Finally, state-submitted codes end in "ST", (e.g., "SLDLST"), and local education agency codes end in "LEA", as in "ELSDLEA".

For more information about ANSI codes, please visit:

<<https://www.census.gov/library/reference/code-lists/ansi.html>>