2020 Census Urban Areas: Considerations, Delineations, and Trends

Urban Areas Team

Geography Division

U.S. Census Bureau

United States® Census Bureau

Agenda

1. What, why, and how of urban area delineations.
2. Key criteria changes for 2020 Census Urban Areas.
3. Key 2020 Census Urban Area trends.
4. Recent updates.
5. What’s next for urban areas.

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What, why, and how of the Census Bureau's Urban Area delineation

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How does the Federal Government Define Urban and Rural?

It varies. There is no single “urban” or “rural” definition.

Tribal, federal, state, and local agencies and offices develop different urban and rural definitions depending on their programmatic needs and uses, including:

- allocating program funds,
- setting program standards, and
- implementing and measuring aspects of their programs.

Geographic Delineation + Agency/office criteria based on their programmatic needs = Urban or Rural definition used by the agency/office

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How does the Federal Government Define Urban and Rural?

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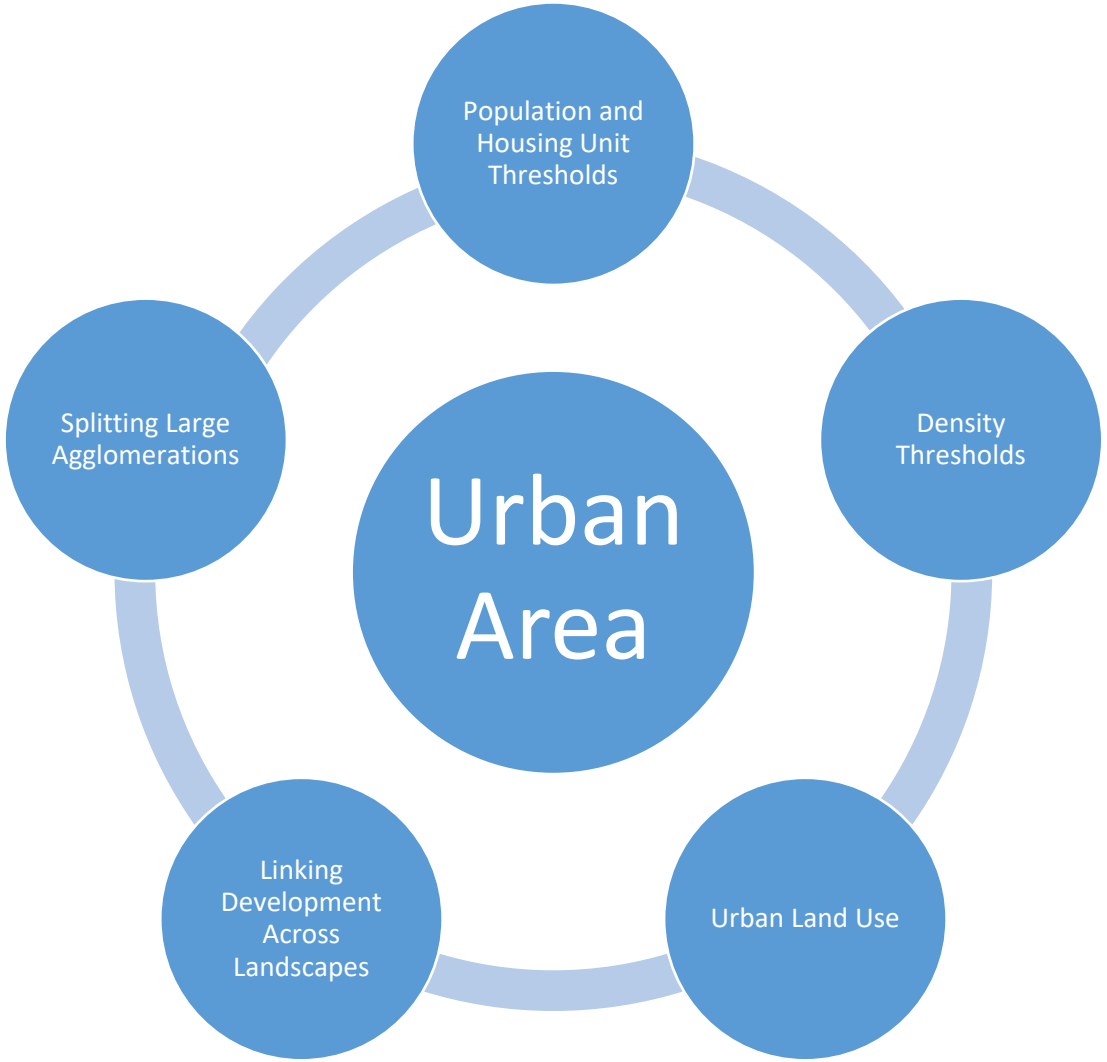
How does the Federal Government Define Urban and Rural?

Commonly used federal geographic delineation sources used by federal agencies in defining urban and rural:

Geographic Delineation	Unit of Geography	Primarily based on…
Census UAs and Rural Territory	Census Blocks	• Housing unit and population counts and densities. • Land use. • Commuting.
Metropolitan and Micropolitan Statistical Areas (Core Based Statistical Areas)	Counties	• Census UAs. • Commuting.
Rural-Urban Commuting Areas (RUCA)	Census Tracts	• Census UAs. • Commuting.

What are Census UAs?

- Census Bureau UAs:
  - Represent densely developed territory.
  - Encompass residential, commercial, and other non-residential urban land uses.



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Why does the Census Bureau delineate UAs?

The Census Bureau delineates UAs for statistical data tabulation, publication, and analysis.

However, the Census Bureau recognizes that many tribal, federal, state, and local governments define their program requirements based on the urban and rural delineation.

For this reason, the Census Bureau:

- Invites all stakeholders to actively participate in reviewing and commenting on proposed updates to the UA criteria via the *Federal Register* Notice leading up to the Decennial Census.
- Invites all stakeholders to ask questions. The Census Bureau works with tribal, federal, state, and local agencies as well as other stakeholders to ensure understanding of our classification.

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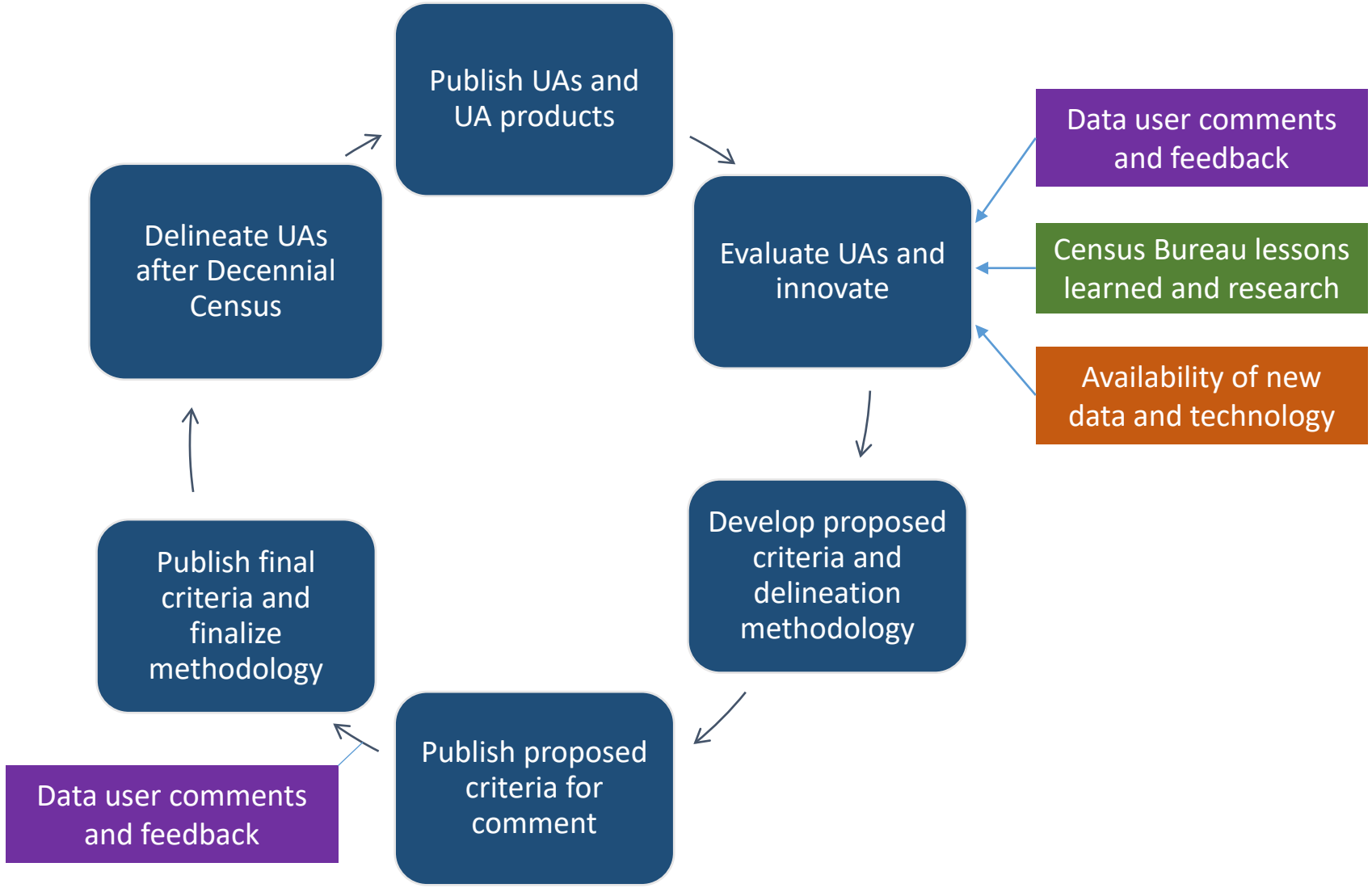
UA Program Cycle



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How are UAs Delineated?

The Census Bureau uses a nationally-consistent, objective approach, to create UAs and rural territory. These areas are designed to meet the needs of a broad range of analysts and users interested in the definition of and data for urban and rural communities for statistical purposes.

In 2020, the final delineation criteria were implemented using:

- Python-based delineation software.
- Census blocks and Decennial Census block-level housing unit and population data.
- Impervious surface, hydrography, and wetlands data.
  - Sources: Census MAF/TIGER System, National Land Cover Dataset, and Coastal Change Analysis Program.
- Commuting data.
  - Source: Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES).

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UA Delineation: Evolution Over Time

- The history of UA delineation is marked by change and re-evaluation of the thresholds and criteria for delineating UAs after each decennial census.
- The Census Bureau has delineated UAs since the late 1800s.
- Modern UA concepts began with the 1950 Census to capture growing suburban development.
- Census 2000 moved from primarily interactive to primarily automated process.
- Concepts have been refined each decade as technology and data availability has improved our ability to evaluate the nature of “urban” and "rural" settlement.

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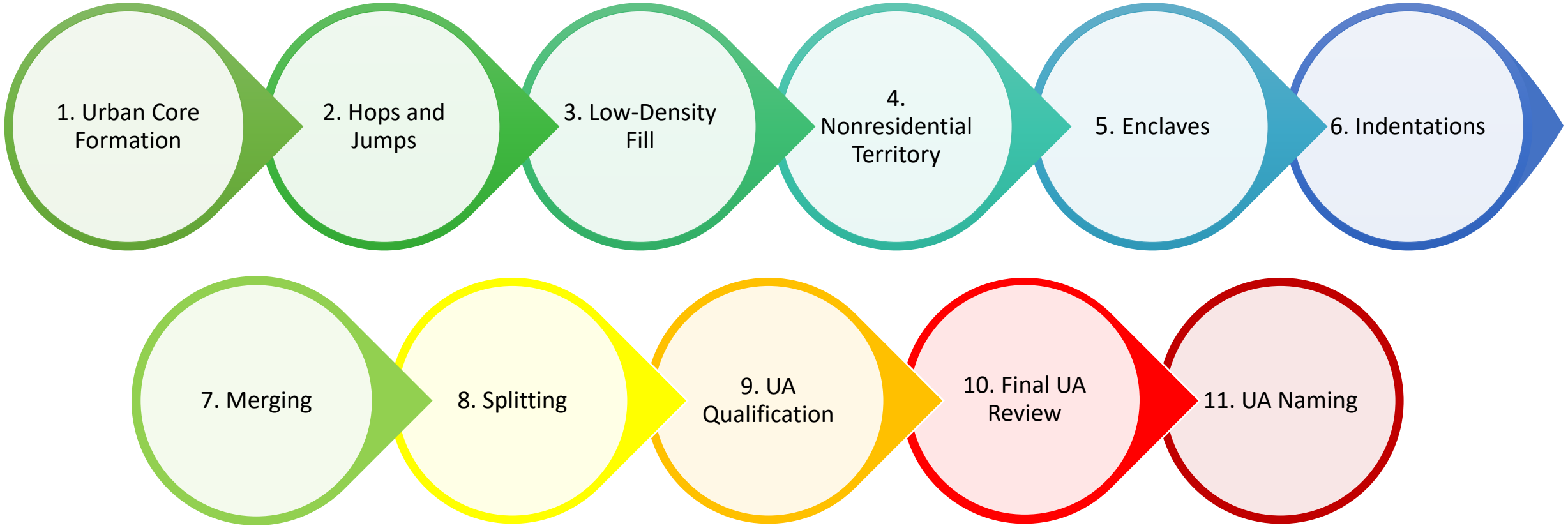
UA Delineation Steps



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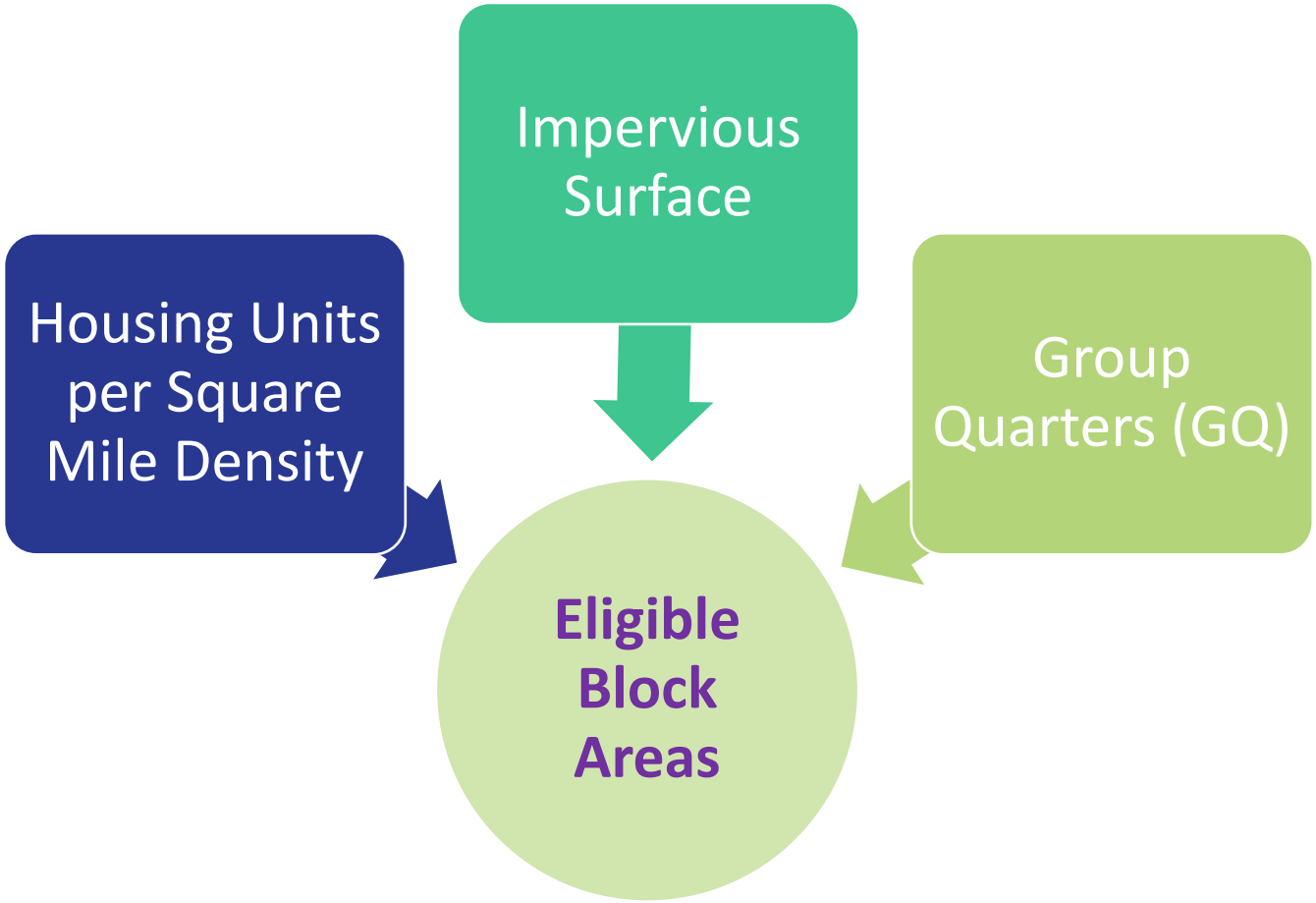
Step 1: Urban Core Formation



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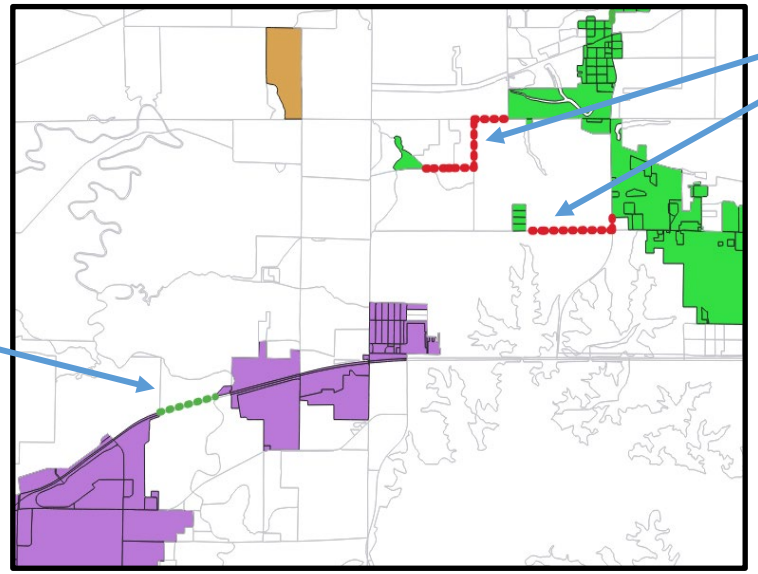
Step 2: Hops and Jumps

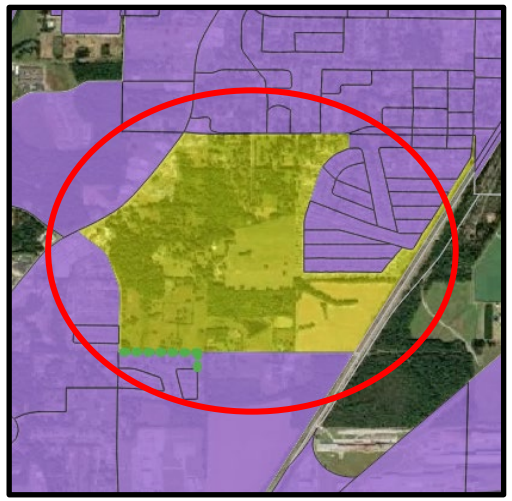
- Connect noncontiguous urban territory through road connections.
- Hops occur first.
  - Maximum hop distance is 0.5 miles.
  - Hops continue to propagate until there are no more qualified connections.
- Jumps occur after hops are completed.
  - Jump distance is between 0.5 and 1.5 miles.
  - Jumps only occur once, then stop.



Steps 3-6: Adding territory

Adding blocks with low housing density and nonresidential urban land uses (e.g., airports, commercial and industrial parks on the edges of **areas**).

Filling enclaves.



Filling indentations.

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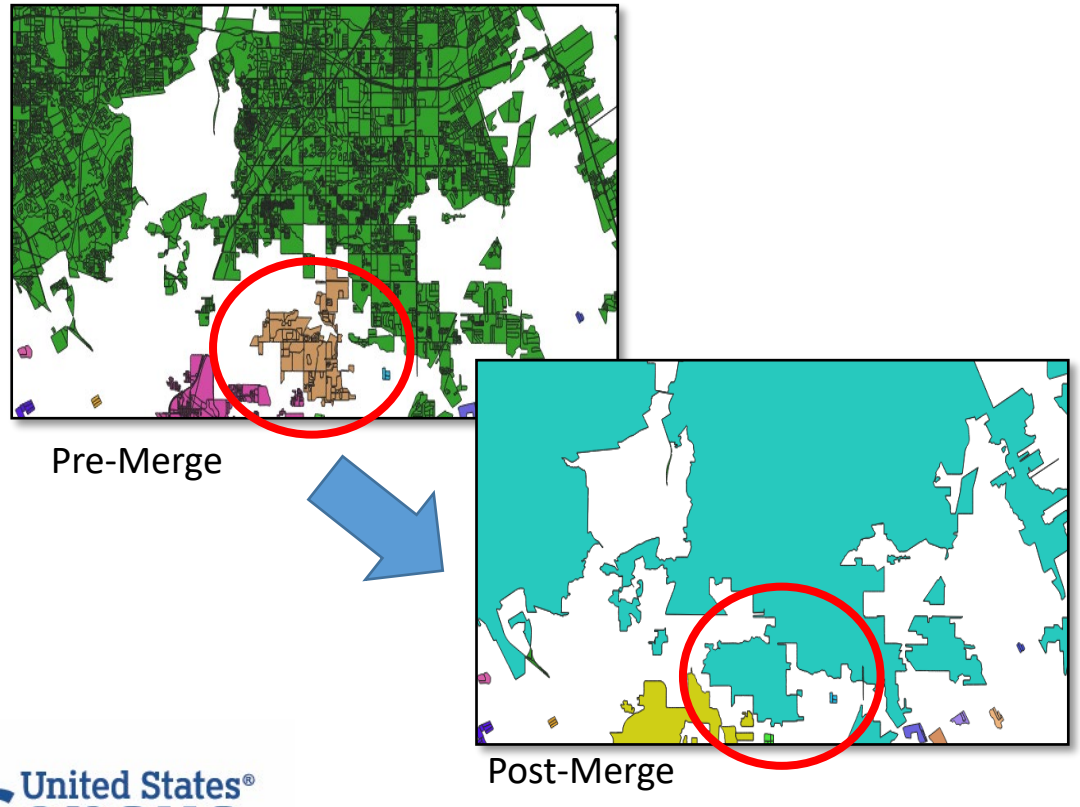
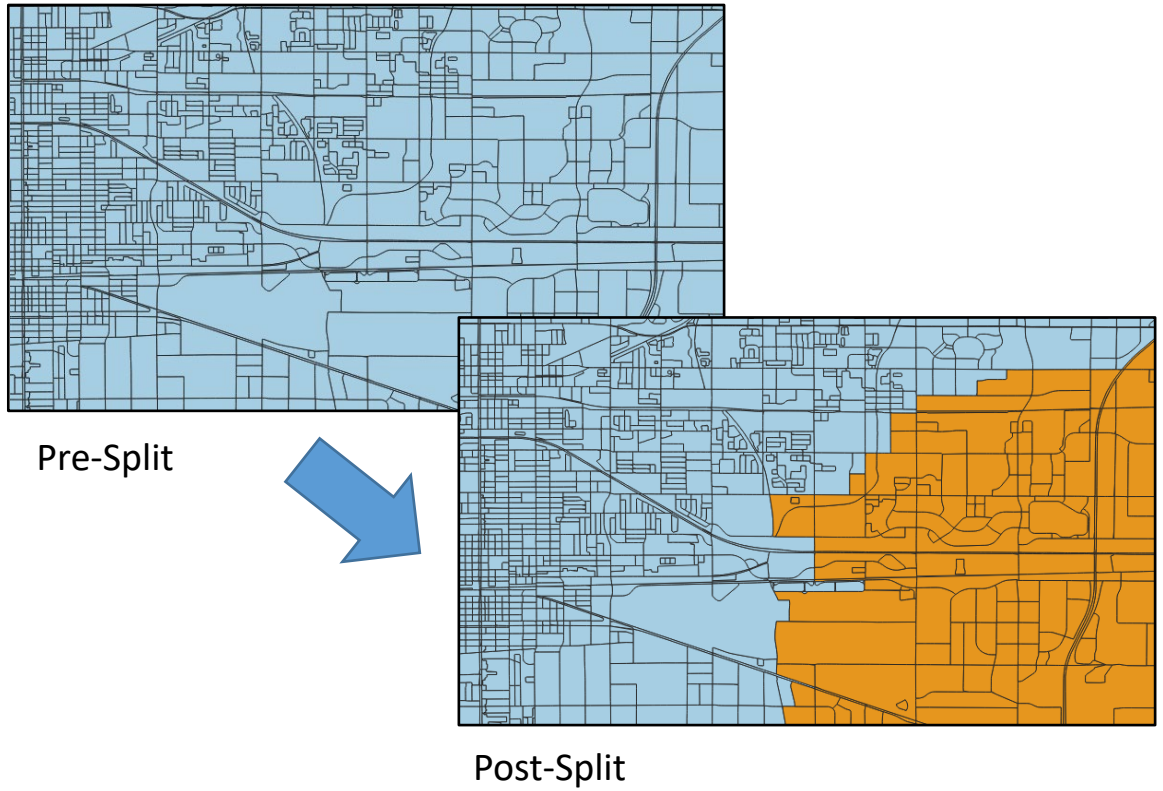
Step 7 and 8: Merging and Splitting

Merge eligibility: **Areas** that would not qualify as final UAs that are within 0.25 miles of qualifying **areas**.



Split eligibility: Separate UAs for the 2010 Census or **areas** connected via low-density fill (in step 4).

Split location: Determined using commuter data.



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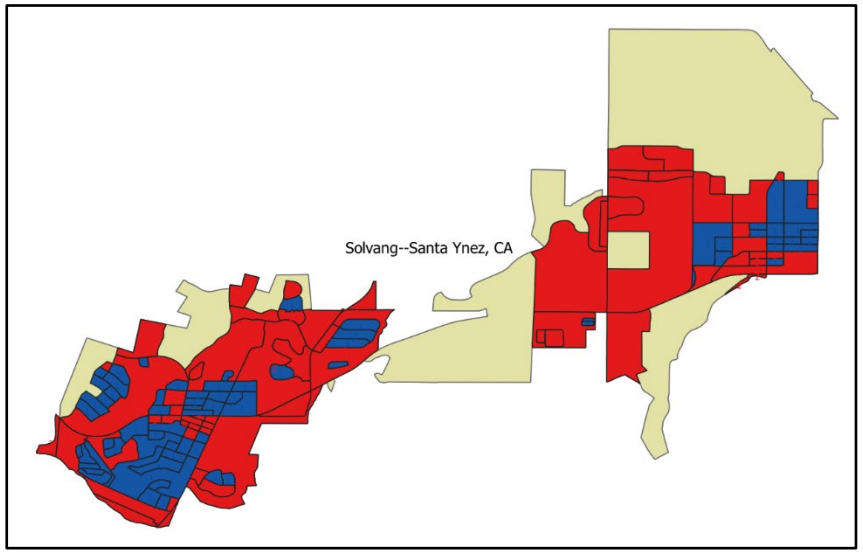
Step 9: Qualification

The **area** must contain:

- A set of blocks with ≥ 500 housing units surrounding a core made up of at least one block with ≥ 1,275 housing units per square mile.
- At least 5,000 people or at least 2,000 housing units.



This final UA contains 2 sets of qualifying cores (blue) with surrounding blocks (red).

The entire **area** (beige) has a total HU count of 4,330, and a total population of 10,295.

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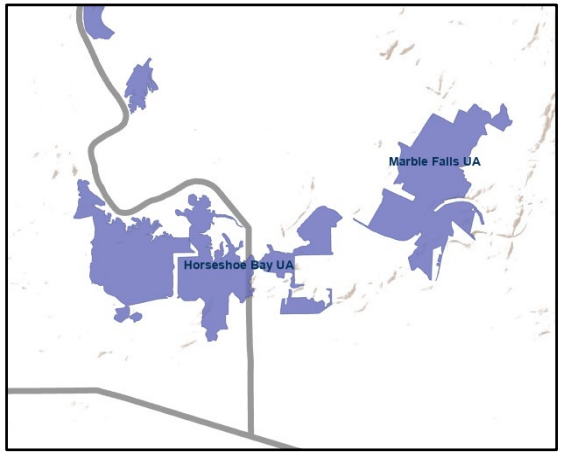
Step 10: Final Review and Naming

Census Bureau subject matter experts reviewed and added or removed individual blocks from the UA delineation where appropriate.

Incorporated Places

UAs



UAs are named primarily based on the most populous incorporated place(s) or census designated place(s) within the UA.

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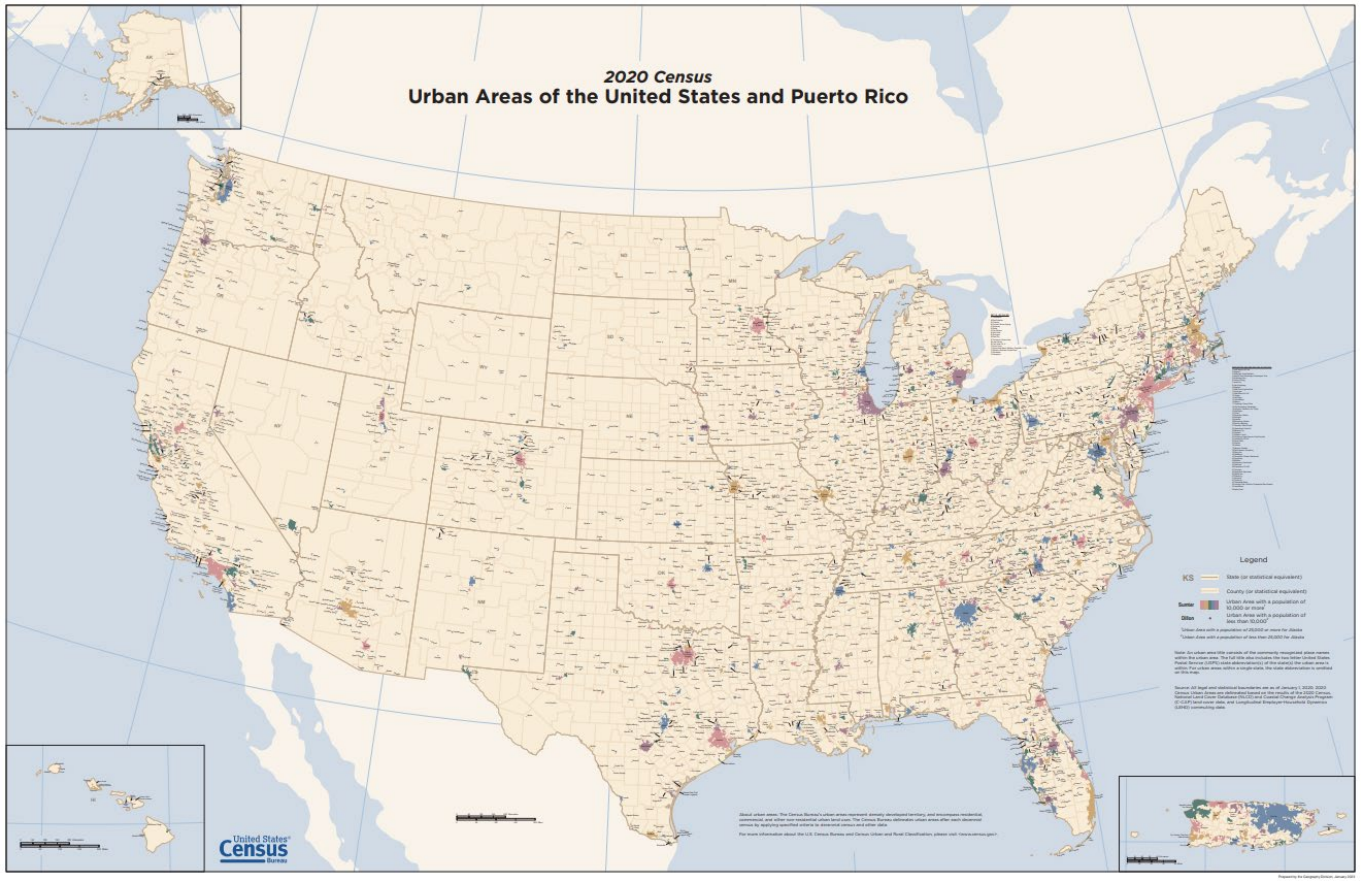
2020 Census UA Products

Urban and Rural Classification website:
[Urban and Rural (census.gov)]

TIGER/Line Shapefiles:
[TIGER/Line Shapefiles (census.gov)]

TIGERweb:
[TIGERweb (census.gov)]

Census Geocoder:
[Census Geocoder]



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Key 2020 Census UA Criteria Changes

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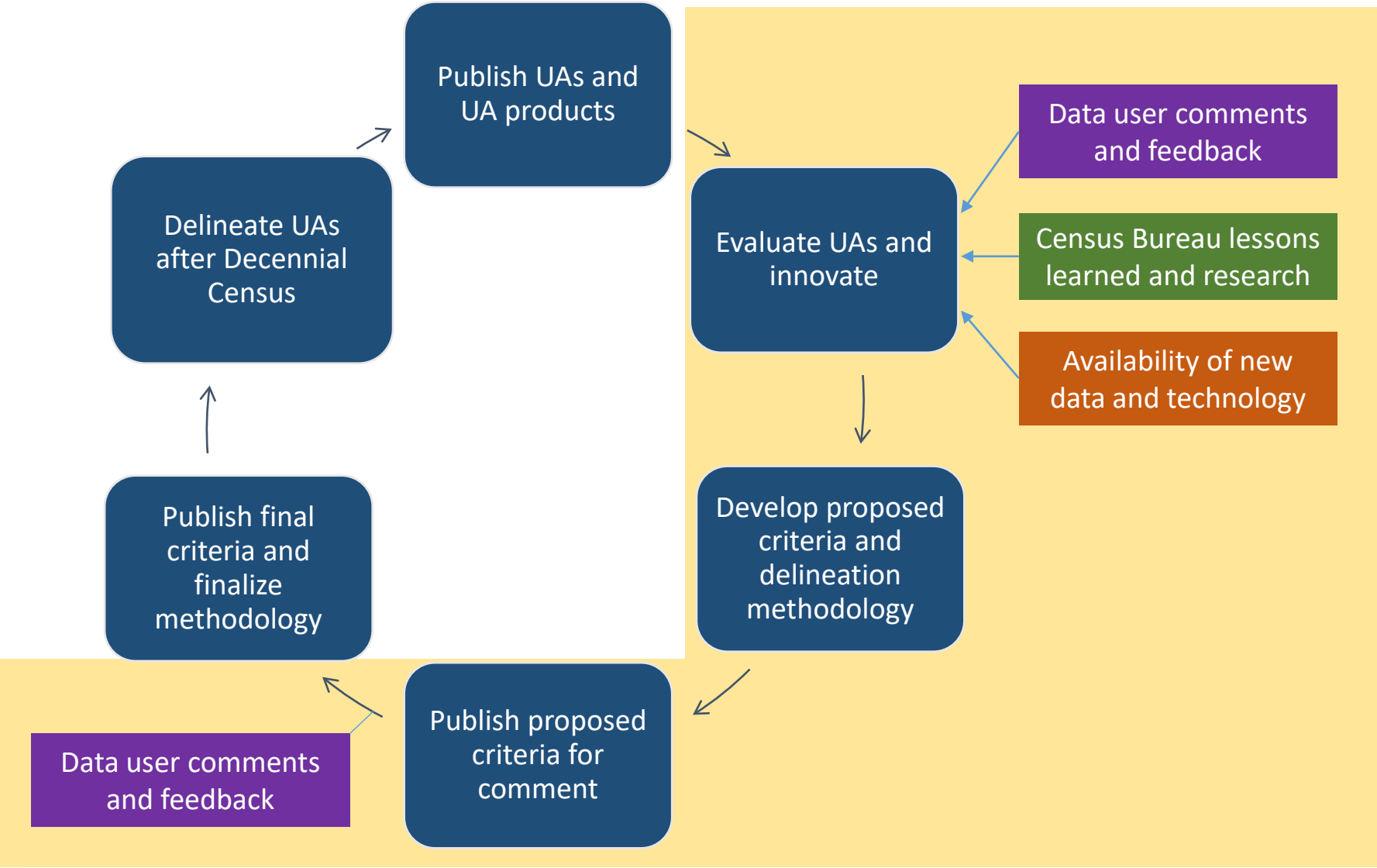
Origin of UA Criteria Changes



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2020 Census UA Delineation Key Criteria Changes

1. Minimum threshold for qualification as urban raised from at least 2,500 people in 2010 to at least 2,000 housing units or at least 5,000 people in 2020.
2. Delineation based primarily on housing unit data at only the census block level instead of only population data at various geographic levels.
3. Maximum jump distance reduced from 2.5 miles to 1.5 miles.
4. Introduced the use of commuter data to determine where to split large urban agglomerations.
5. No longer distinguish "urban areas" as "urbanized areas" or "urban clusters".

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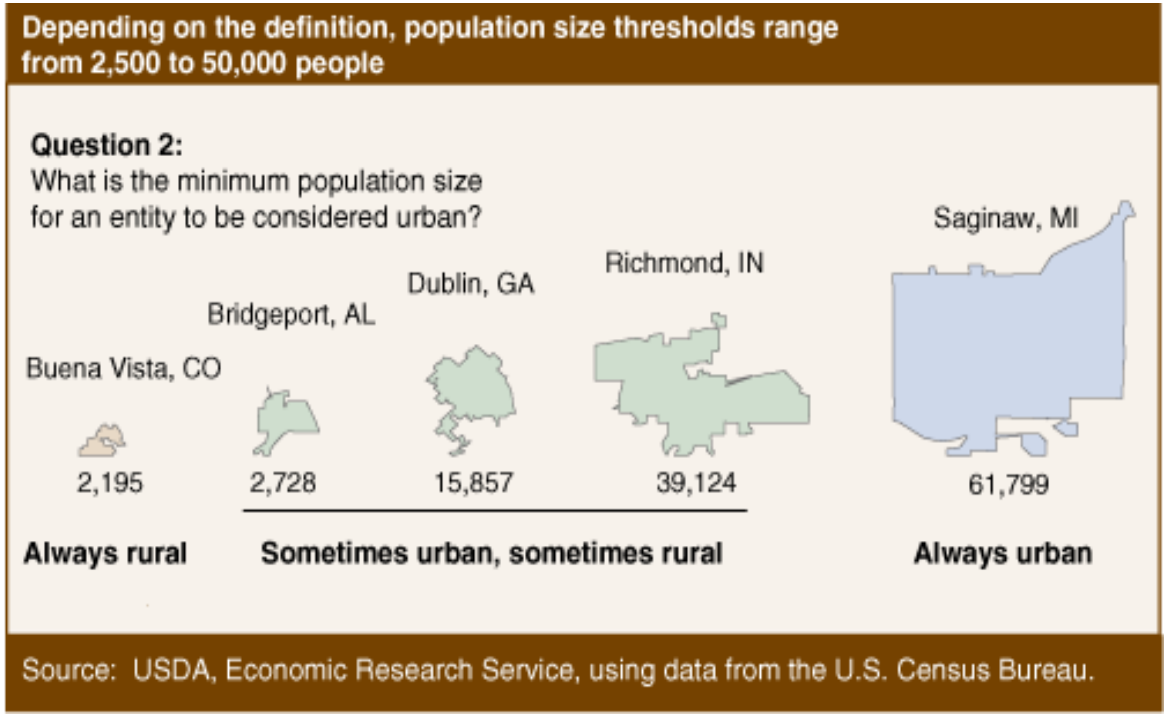
2020 Census UA Criteria Changes

Minimum threshold for qualification as urban raised from at least 2,500 people in 2010 to at least 2,000 housing units or at least 5,000 people in 2020.

- 2,500-person threshold had been in use since 1910.
  - Prior to 1910 the thresholds fluctuated from 2,500 to 8,000.
- Census Bureau's threshold was the lowest in use in various agencies' urban/rural definitions.
- Rural stakeholders and analysts have questioned the continued validity of the 2,500-person threshold and have routinely asked if we would consider an increase.



Source: Cromartie and Bucholtz (2008), "Defining the 'Rural' in Rural America."
USDA ERS - Defining the "Rural" in Rural America

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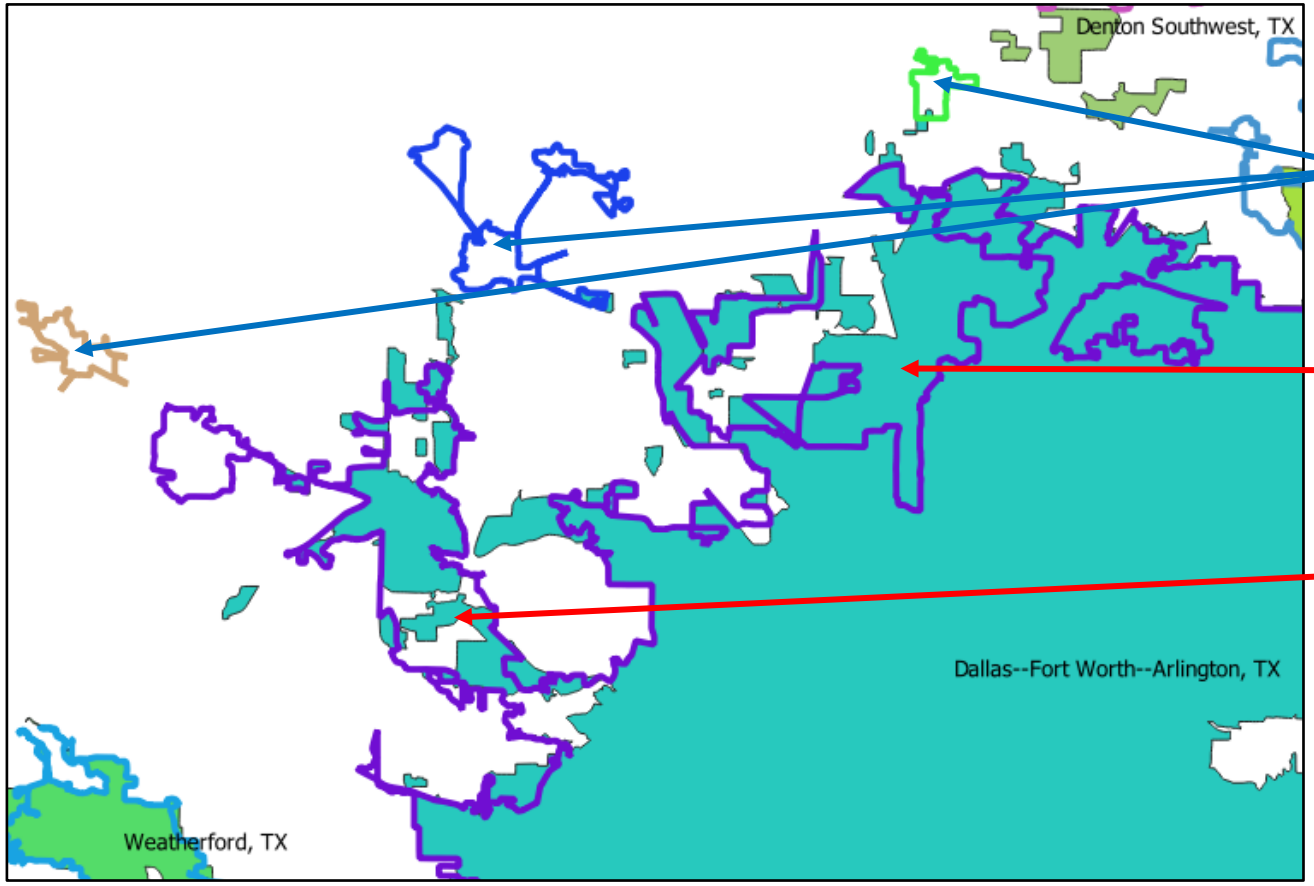
2020 Census UA Criteria Changes

Qualification Threshold Increase Example



2010 Census Urban Clusters of Springtown, TX, Pecan Acres, TX, and Justin, TX no longer qualify as 2020 Census UAs.

2020 Census UA Dallas--Fort Worth--Arlington, TX has expanded to a larger footprint.

Increase in noncontiguous portions of UAs.

Legend:

- 2020 UA *(shaded and labeled)*
- 2010 UA *(outlined)*

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2020 Census UA Criteria Changes

Delineation based primarily on housing unit data at the census block level instead of population data.

National Average:

200 housing units per square mile (HPSM) = 500 people per square mile (PPSM).

More direct measure of developed landscape

Ability to update extent of UAs between censuses

425 housing units per square mile (HPSM) for initial cores

200 HPSM to fill in extent of UAs

1,275 HPSM to ensure each UA has a high-density nucleus

Census block-level housing unit counts are invariant

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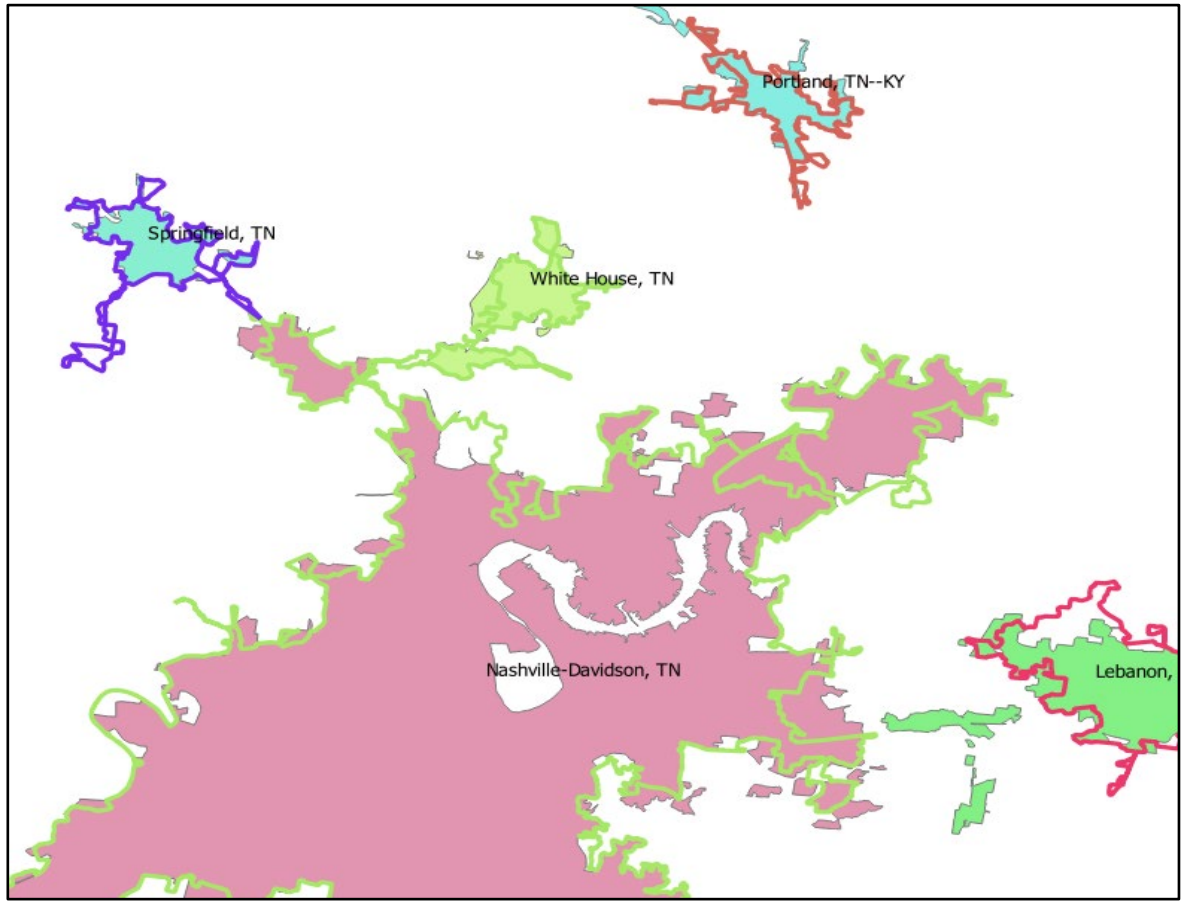
2020 Census UA Criteria Changes

2010 and 2020 UA Changes Example



Most 2020 Census UAs maintained a similar footprint to 2010 Census UAs with changes around the edges.

Legend:

2020 UA *(shaded and labeled)*

2010 UA *(outlined)*

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2020 Census UA Criteria Changes

Max jump distance to noncontiguous territory reduced from 2.5 miles to 1.5 miles.

Criteria:

- Maximum distance for “jumping” across low-density intervening territory reduced from 2.5 miles to 1.5 miles (return to the jump distance that was in effect from 1950 through 1990).
- Does not include the intervening low-density “hop” and “jump” corridor blocks in the UA.

Impact:

- Minimizes over-bounding caused by addition of impervious surface landcover in 2010.
- Reduces the amount of land area within individual UAs. Provides a truer measurement of the extent of urbanization and urban sprawl.
- More discrete UAs. Fewer connections to other UAs.
- More noncontiguous UAs.

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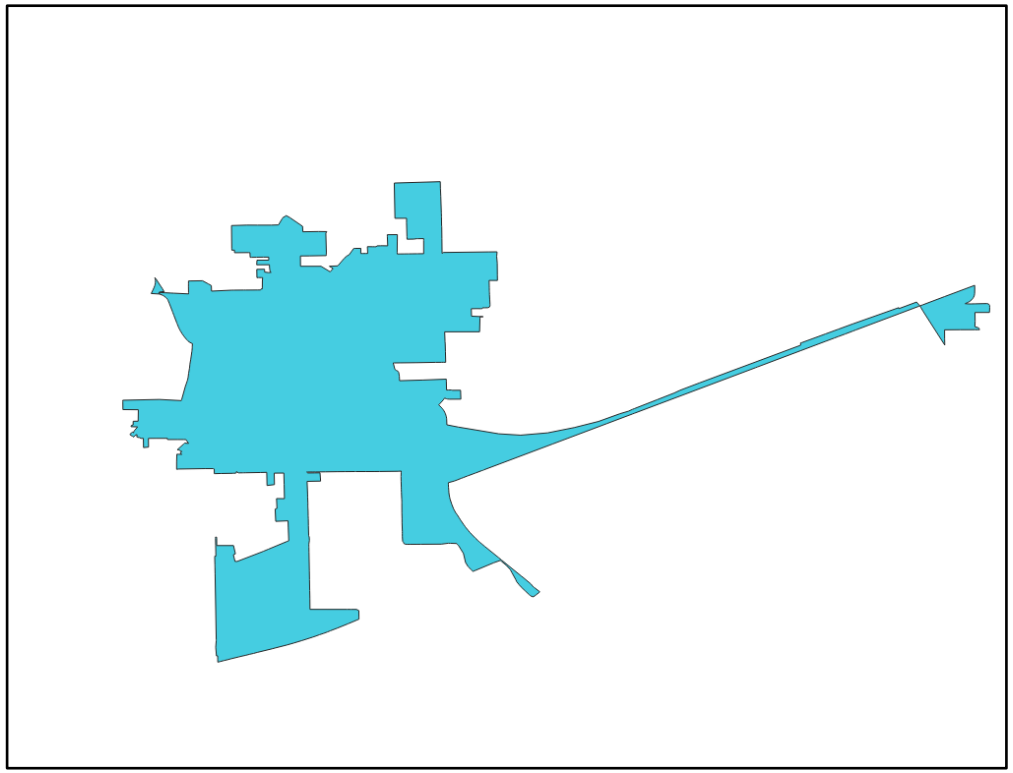
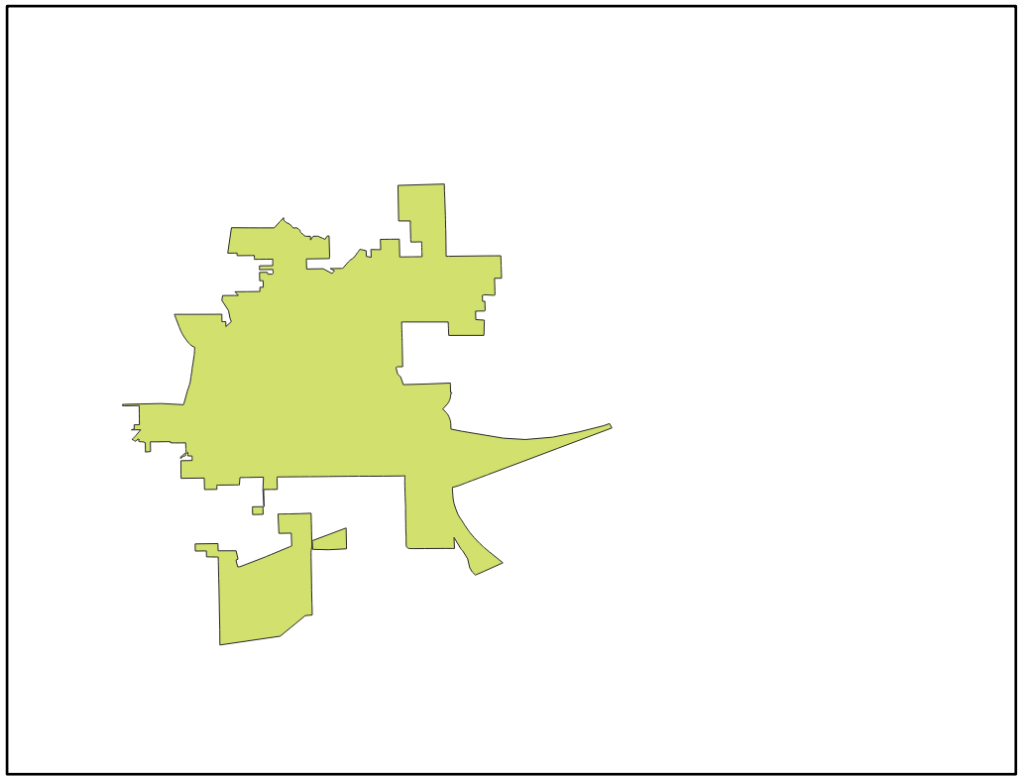
2020 Census UA Criteria Changes

Jump Distance and Intervening Low-Density Territory Example

2010 Census UA



2020 Census UA



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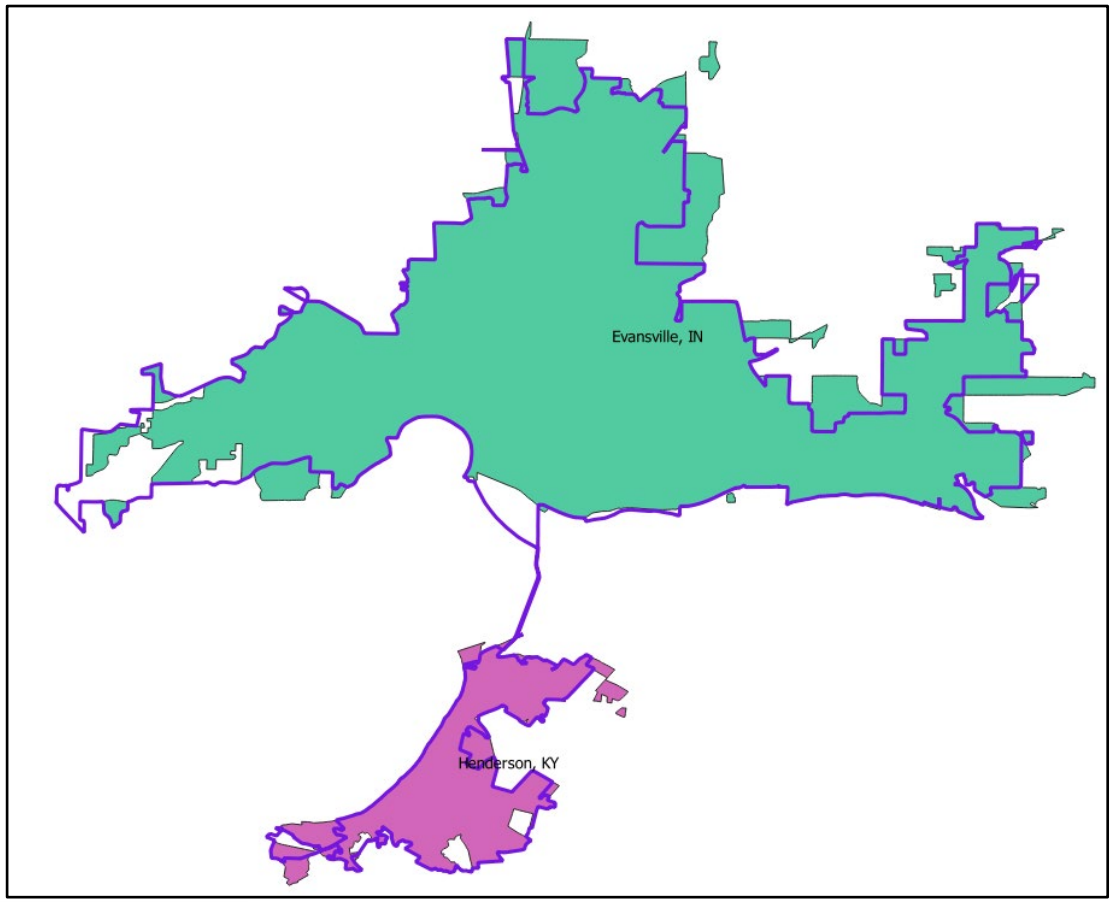
2020 Census UA Criteria Changes

Jump Distance Example



2010 Evansville, IN--KY UA became 2020 Evansville, IN UA and Henderson, KY UA.

Legend:

2020 UA *(shaded and labeled)*

2010 UA *(outlined)*

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2020 Census UA Criteria Changes

Introduced the use of commuter data to determine where to split large urban agglomerations.

- The delineation process results in large urban agglomerations encompassing multiple, individual UAs.
- For 2020 we introduced commuting data (LODES dataset) to better determine where to split the urban agglomerations.

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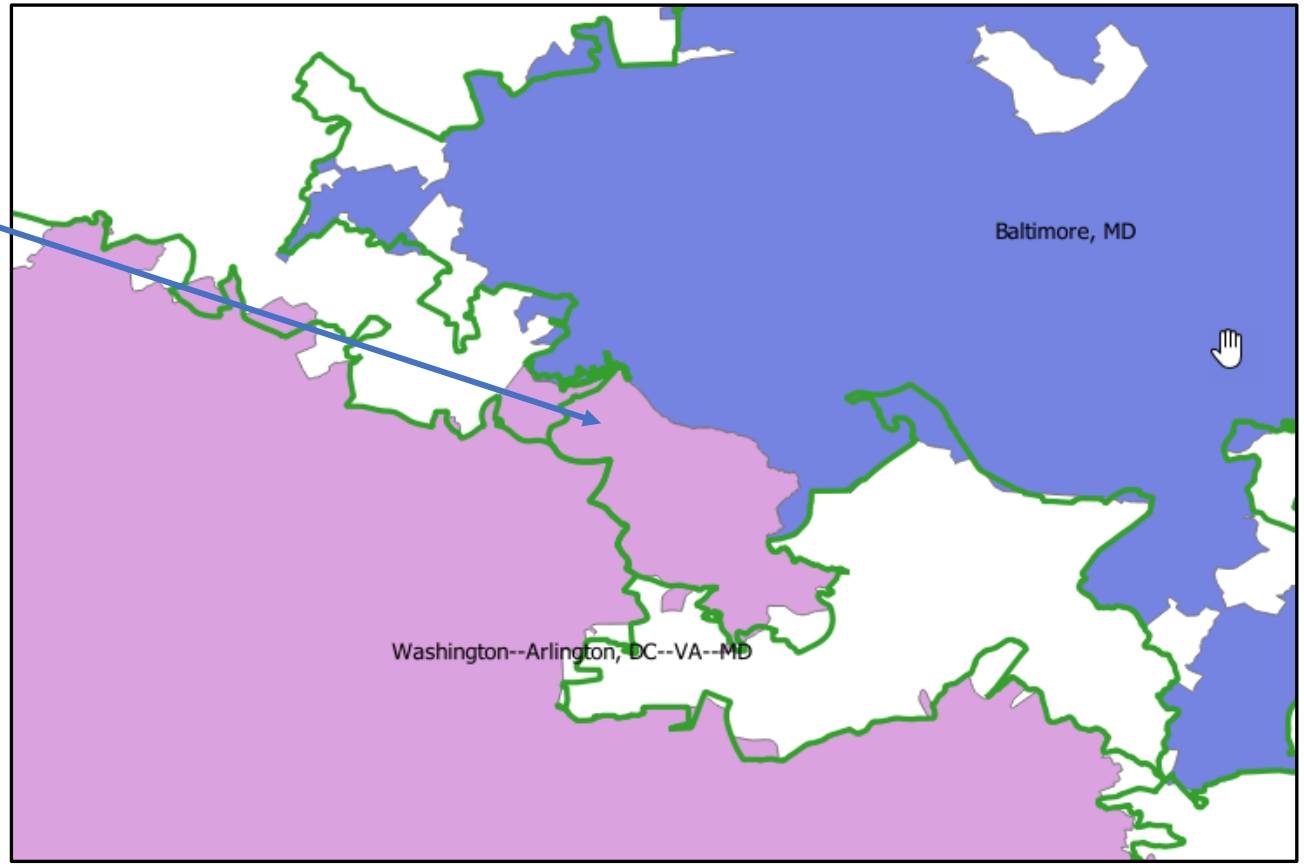
2020 Census UA Changes

Splitting Urban Agglomerations Example

Implementing the LODES commuter data shifts the Washington--Arlington, DC--VA--MD UA northeast.

2010 and 2020 Washington D.C. and Baltimore area UAs



Legend:

- 2020 UA *(shaded and labeled)*
- 2010 UA *(outlined)*

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2020 Census UA Changes

No longer distinguish between “urbanized areas” and “urban clusters”. All qualifying territory will be considered “urban” by the Census Bureau.

The Census Bureau no longer distinguishes between urbanized areas of 50,000 or more population and urban clusters of less than 50,000 population.

- No clear scientific basis for use of 50,000 population as a threshold distinguishing different types of UAs.
- The decision to adopt 50,000 population as a threshold for urbanized areas starting for the 1950 Census seems to have been based primarily on operational concerns and data availability than rooted in economic data, central place theory, or the importance of a place in a particular area.
- UAs above or below 50,000 population can be similar in terms of economic activity.
- Still possible for data users and agencies to identify areas based on population.

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Key urban area trends for the U.S. (2010 – 2020)

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Key 2020 UA Trends, As Compared to 2010 UAs

- Similar percent of population and housing units urban vs. rural.
- Decrease in total number of UAs; but an increase in the number of UAs ≥ 5,000 population.
- Decrease in many UAs' size/land area; increase in population and housing density of UAs.
- Some 2010 UAs became two UAs in 2020.
- Some 2020 UAs include areas with of densely developed seasonal housing.

Note: These are national-level trends, and trends vary by region and state.

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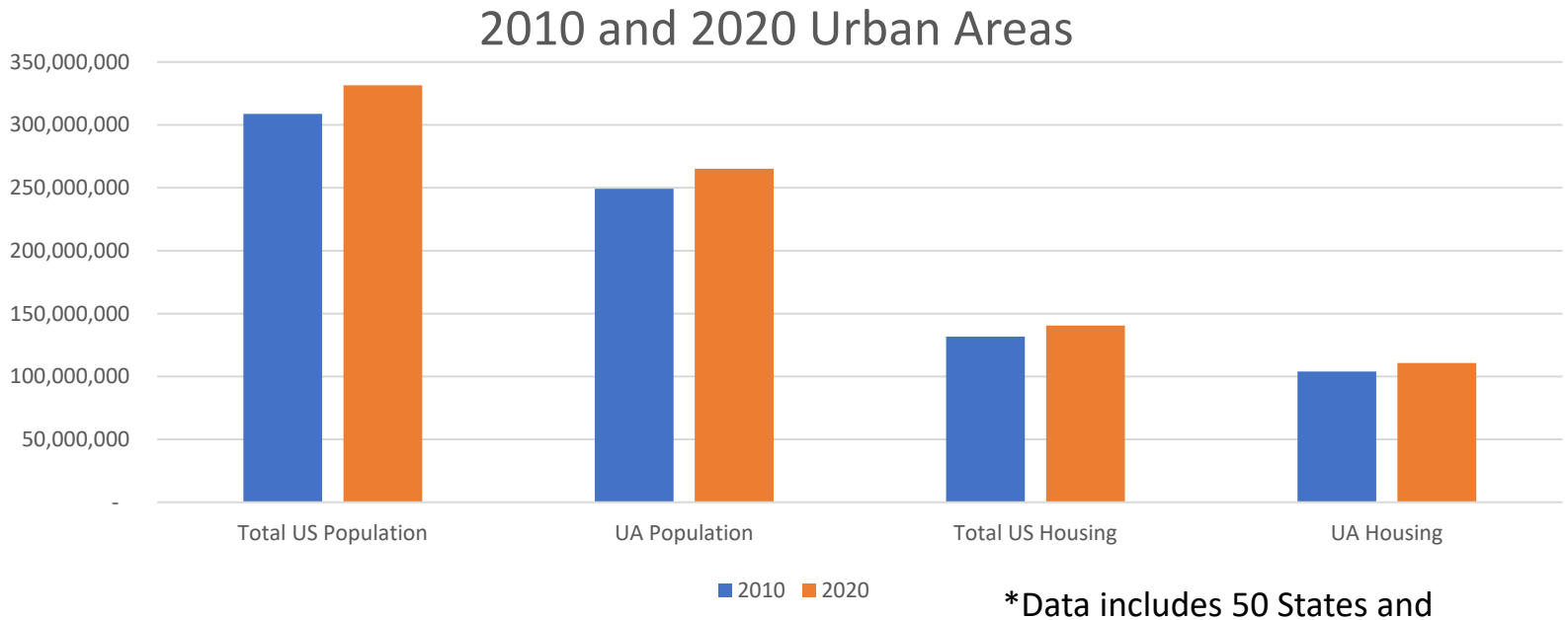
2010 and 2020 Census UAs

	2010				2020			
	Total Population	UA Population Percent	Total Housing	UA Housing Percent	Total Population	UA Population Percent	Total Housing	UA Housing Percent
Total*	308,745,538		131,704,730		331,449,281		140,498,763	
Urban	249,253,271	81%	104,019,731	79%	265,149,027	80%	110,692,318	79%
Rural	59,492,267	19%	27,684,999	21%	43,596,511	20%	29,806,418	21%



*Data includes 50 States and District of Columbia. Does not include UAs located in Puerto Rico and Island Areas.

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Percent Population and Housing Units

		2010		2020	
		Percent Population	Percent Housing	Percent Population	Percent Housing
U.S.*	Urban	81%	79%	80%	79%
	Rural	19%	21%	20%	21%

Sources: 2010 and 2020 Tabulation Block TIGER/Line Shapefiles

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*Data includes 50 States and District of Columbia. Does not include UAs located in Puerto Rico and Island Areas.

Decrease in Number of Discrete UAs?

		All UAs			UAs ≥ 5,000 Population		
		2010 Urban Areas	2020 Urban Areas	Percent Change	2010 Urban Areas	2020 Urban Areas	Percent Change
U.S.*	Urban	3,573	2,611	-27%	2,282	2,386	5%
	Urbanized Area	486	*NA*		486	*NA*	
	Urban Cluster	3,087	*NA*		1,796	*NA*	

Sources: 2010 and 2020 state-sorted lists of urban areas on Urban and Rural (census.gov)

Primarily resulting from criteria changes: Minimum threshold for qualification as urban raised from at least 2,500 people in 2010 to at least 2,000 housing units or at least 5,000 people in 2020.

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Decrease in UA Size/Land Area; Increase in Population Density

		2010 Urban Areas	2020 Urban Areas	Percent Change
U.S.*	Land Area (mi^2)	106,386	103,872	-2%
	Pop Density (people/mi^2)	2,343	2,552	9%

Sources: 2010 and 2020 state-sorted lists of urban areas on Urban and Rural (census.gov)

Primarily resulting from criteria changes:

- Max jump distance to noncontiguous territory reduced from 2.5 miles to 1.5 miles.
- Move from tract-based to only block-based delineation.

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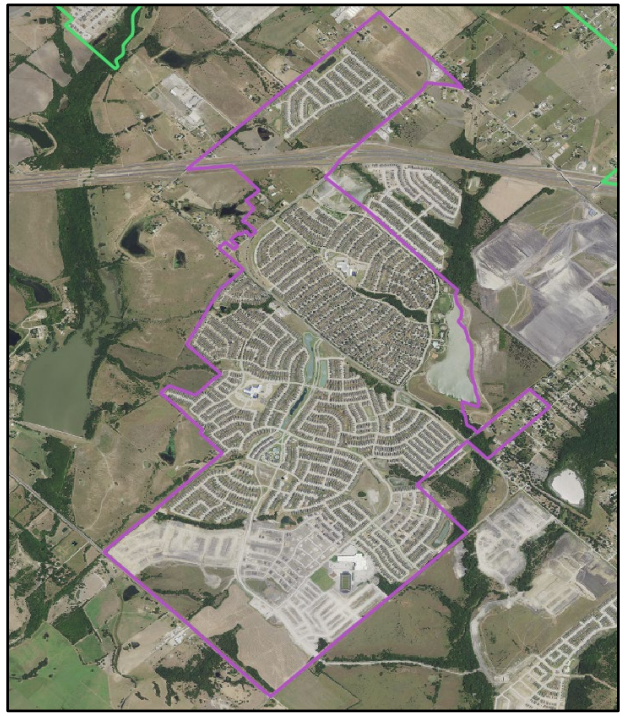
New 2020 UAs

36 new 2020 UAs

Heartland, TX



Sonterra, TX

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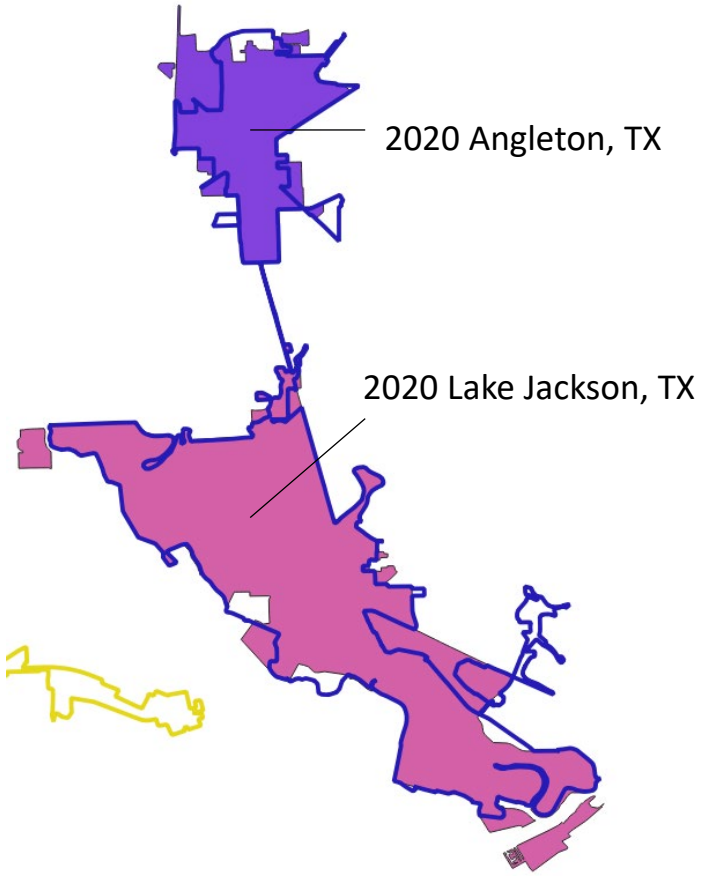
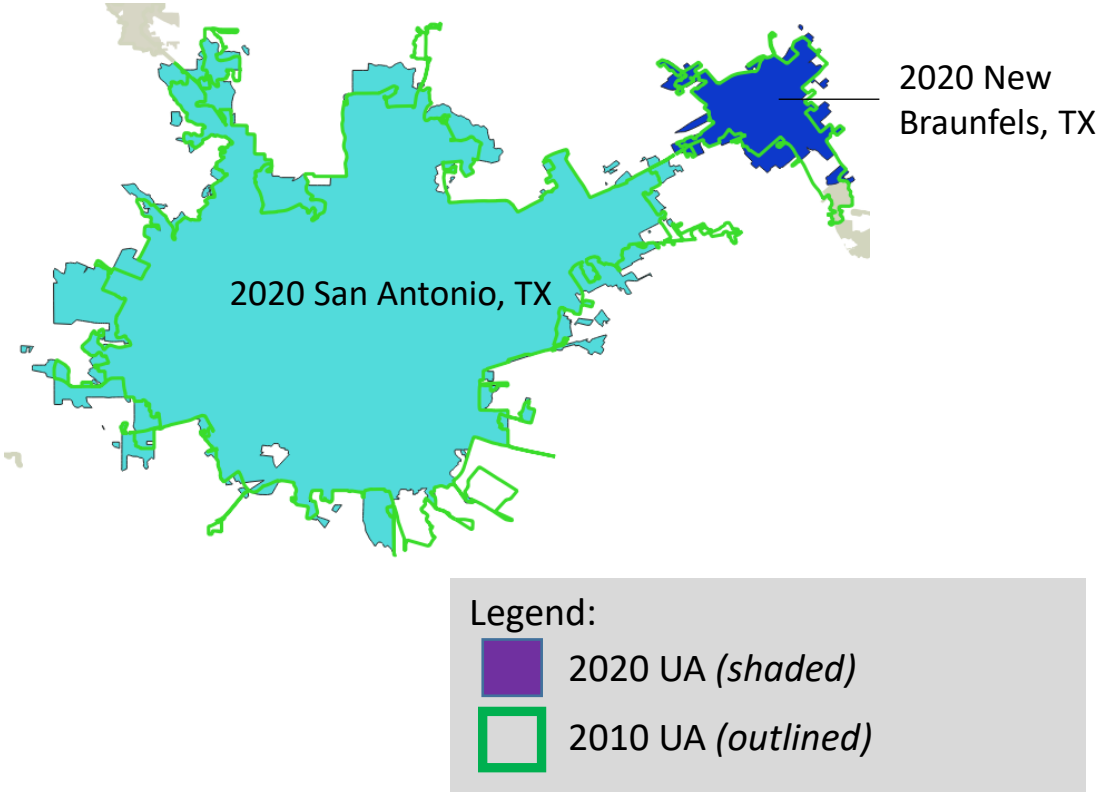
One 2010 UA Became Two 2020 UAs

2,030 2020 UAs were part of a different or larger 2010 UA

2010 Lake Jackson--Angleton, TX



2010 San Antonio, TX



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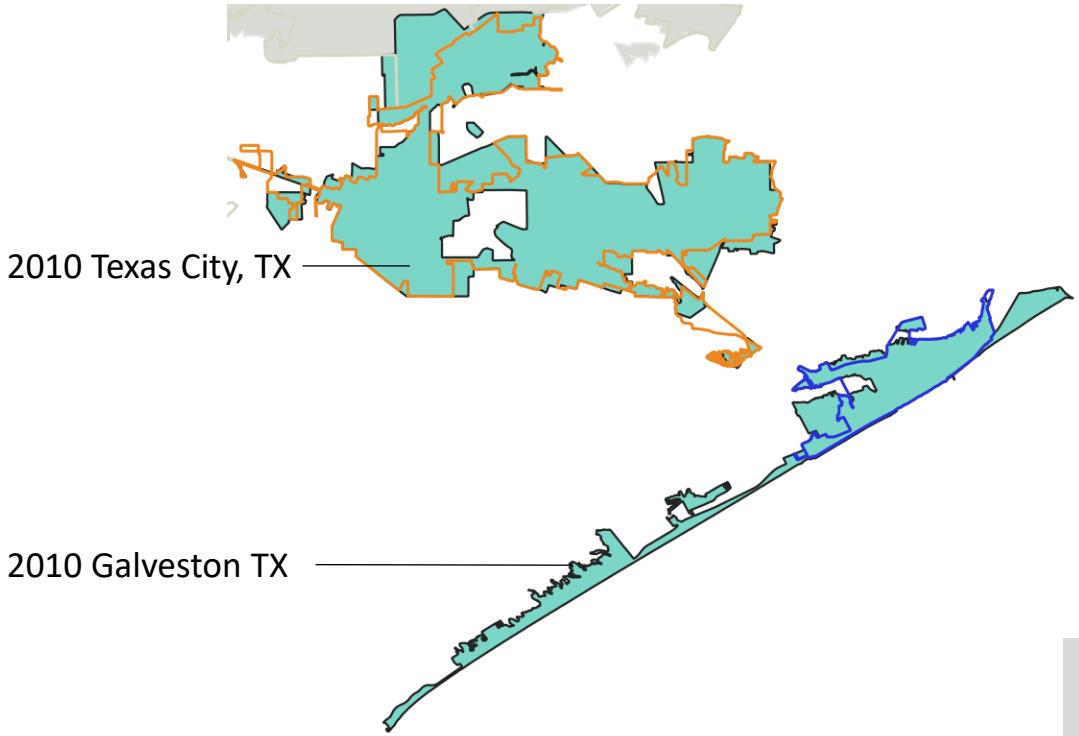
Two 2010 UAs Became one 2020 UA

2020 Galveston--Texas City, TX



Legend:

2020 UA *(shaded)*

2010 UA *(outlined)*

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2020 Census UA Highlights

10 Most Populated 2020 UAs compared to 2010

	2010 UA Name	2010 Population	2020 UA Name	2020 Population
1	New York--Newark, NY--NJ--CT	18,351,295	New York--Jersey City--Newark, NY--NJ	19,426,449
2	Los Angeles--Long Beach--Anaheim, CA	12,150,996	Los Angeles--Long Beach--Anaheim, CA	12,237,376
3	Chicago, IL--IN	8,608,208	Chicago, IL--IN	8,671,746
4	Miami, FL	5,502,379	Miami--Fort Lauderdale, FL	6,077,522
5	Philadelphia, PA--NJ--DE--MD	5,441,567	Houston, TX	5,853,575
6	Dallas--Fort Worth--Arlington, TX	5,121,892	Dallas--Fort Worth--Arlington, TX	5,732,354
7	Houston, TX	4,944,332	Philadelphia, PA--NJ--DE--MD	5,696,125
8	Washington, DC--VA--MD	4,586,770	Washington--Arlington, DC--VA--MD	5,174,759
9	Atlanta, GA	4,515,419	Atlanta, GA	5,100,112
10	Boston, MA--NH--RI	4,181,019	Boston, MA--NH	4,382,009

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2020 Census UA Highlights

Most Densely Populated UAs with 200,000 or More Population

	2010 UA Name	2010 People/ SQ MI	2020 UA Name	2020 People/ SQ MI
1	Los Angeles--Long Beach--Anaheim, CA	6,999	Los Angeles--Long Beach--Anaheim, CA	7,476
2	San Francisco--Oakland, CA	6,266	San Francisco--Oakland, CA	6,843
3	San Jose, CA	5,820	San Jose, CA	6,436
4	New York--Newark, NY--NJ--CT	5,319	New York--Jersey City--Newark, NY--NJ	5,981
5	Urban Honolulu, HI	4,716	Honolulu, HI	5,886
6	Las Vegas--Henderson, NV	4,525	Modesto, CA	5,077
7	Miami, FL	4,442	Las Vegas--Henderson--Paradise, NV	5,046
8	Oxnard, CA	4,352	Oxnard--San Buenaventura (Ventura), CA	4,910
9	San Diego, CA	4,037	Miami--Fort Lauderdale, FL	4,888
10	Stockton, CA	4,005	San Diego, CA	4,551

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2020 Census UA Highlights

UAs with the Densest Housing with 80,000 or more Housing Units

	2010 UA Name	2010 Housing Units / SQ MI	2020 UA Name	2020 Housing Units / SQ MI
1	San Francisco--Oakland, CA	2,556	San Francisco--Oakland, CA	2,709
2	Los Angeles--Long Beach--Anaheim, CA	2,429	Los Angeles--Long Beach--Anaheim, CA	2,660
3	New York--Newark, NY--NJ--CT	2,105	New York--Jersey City--Newark, NY--NJ	2,358
4	San Jose, CA	2,075	San Jose, CA	2,307
5	Miami, FL	1,973	Honolulu, HI	2,178
6	Las Vegas--Henderson, NV	1,935	Miami--Fort Lauderdale, FL	2,108
7	New Orleans, LA	1,697	Las Vegas--Henderson--Paradise, NV	2,031
8	Urban Honolulu, HI	1,694	Denver--Aurora, CO	1,745
9	Boulder, CO	1,579	Lexington-Fayette, KY	1,703
10	Mission Viejo--Lake Forest--San Clemente, CA	1,527	San Diego, CA	1,703

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2020 Census UAs: 50k Threshold Changes

Above 50,000 people in 2010; Below 50,000 people in 2020

2010 UA Name	2010 Population	2020 UA Name	2020 Population
Delano, CA	54,372	Delano, CA	44,410
East Stroudsburg, PA--NJ	54,316	East Stroudsburg, PA--NJ	47,891
Bloomsburg--Berwick, PA	53,618	Bloomsburg--Berwick, PA	39,212
Pine Bluff, AR	53,495	Pine Bluff, AR	46,683
Cumberland, MD--WV--PA	51,899	Cumberland, MD--WV--PA	46,296
Danville, IL	50,996	Danville, IL	40,044
New Bern, NC	50,503	New Bern, NC	47,988

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2020 Census UAs: 50k Threshold Changes cont.

Above 50,000 people in 2010; Below 50,000 people in 2020

2010 UA Name	2010 Population	2020 UA Name	2020 Population
Westminster--Eldersburg, MD	72,714	Eldersburg, MD	30,486
		Westminster, MD	40,040
West Bend, WI	68,444	Hartford, WI	23,757
		West Bend, WI	34,552
Carbondale, IL	67,821	Marion--Herrin, IL	39,391
		Carbondale, IL	31,482
Monessen--California, PA	66,086	California--Brownsville, PA	10,185
		Monessen, PA	49,962
Uniontown--Connellsville, PA	51,370	Connellsville, PA	30,777
		Uniontown, PA	32,560

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2020 Census UAs: 200k Threshold Changes

Population below 200,000 in 2010 and over 200,000 in 2020

UA Name	2010 Population	2020 Population
Amarillo, TX	196,651	205,860
Bremerton, WA	198,979	224,449
Clarksville, TN--KY	158,655	200,947
College Station--Bryan, TX	171,345	206,137
Deltona, FL	182,169	210,712
Fargo, ND--MN	176,676	216,214
Gainesville, FL	187,781	213,748
Livermore--Pleasanton--Dublin, CA	81,624	240,381
McKinney--Frisco, TX	170,030	504,803
Navarre--Miramar Beach--Destin, FL	191,917	226,213
Olympia--Lacey, WA	176,617	208,157
Phoenix West--Goodyear--Avondale, AZ	197,041	419,946
Rock Hill, SC	104,996	218,443
Santa Barbara, CA	195,861	202,197

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2020 Census UA Changes

Most Populous 2010 UAs No Longer Urban in 2020

2010 UA Name	2010 Population	2010 Housing Units
Sierra View--Indian Mountain Lake, PA	28,347	12,811
Hawaiian Paradise Park, HI	20,503	8,062
Kalaheo, HI	14,840	5,865
Chaparral, NM	12,328	3,854
Lake Los Angeles, CA	11,808	3,489
California City, CA	10,908	4,899
Shady Side--Deale, MD	10,784	4,831
McRae, GA	8,747	2,905
Colorado City, AZ--UT	8,233	1,006
Stuarts Draft, VA	8,168	3,337

United States® Census Bureau

Recent Updates

United States® Census Bureau

Corrections Made

Impacted 2020 Census Urban Areas

California

- San Francisco--Oakland, CA Urban Area
- San Rafael--Novato, CA Urban Area

February 2023

Georgia

- Atlanta, GA Urban Area
- Gainesville, GA Urban Area

July 2023

Louisiana

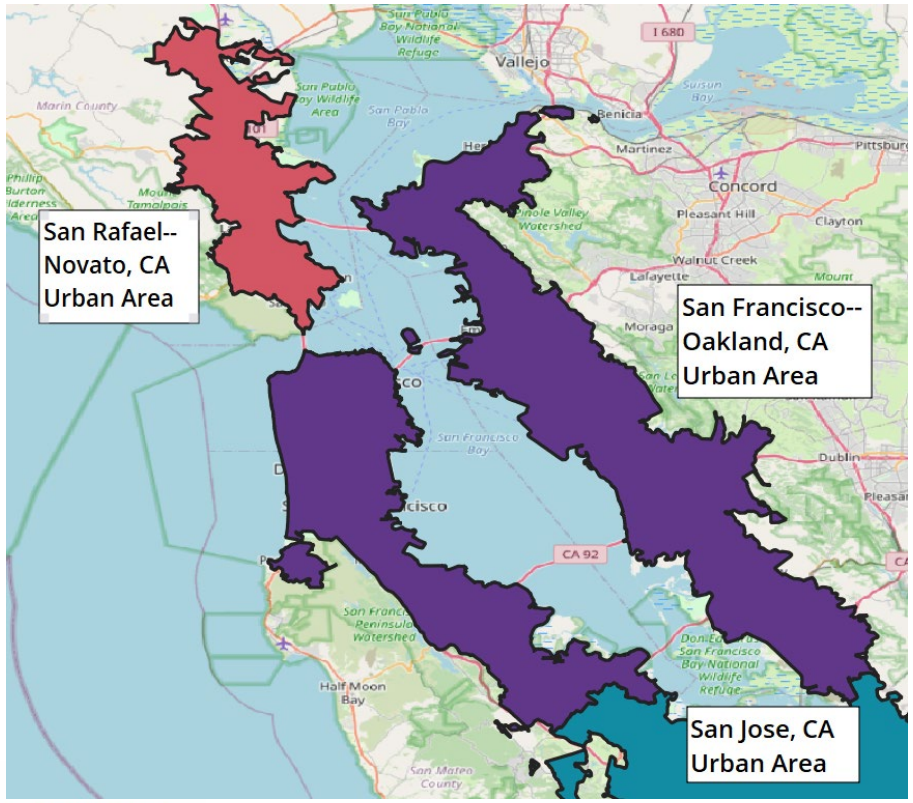
- New Orleans, LA Urban Area
- Laplace--Lutcher--Gramercy, LA Urban Area

July 2023

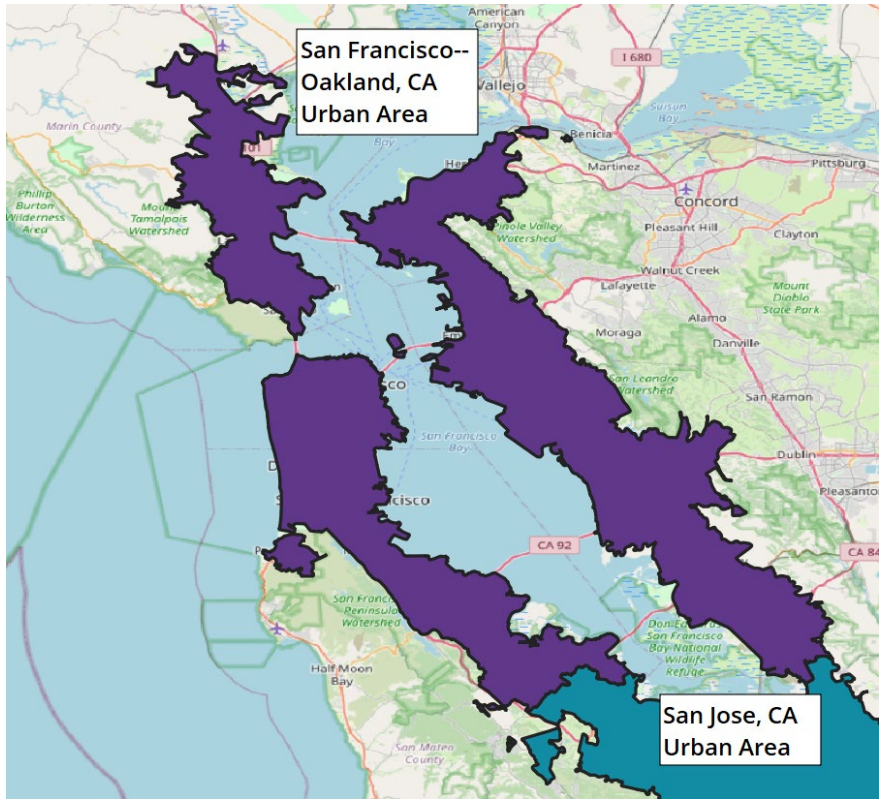
United States Census Bureau

San Francisco--Oakland, CA and San Rafael--Novato, CA Urban Areas

Original



Corrected

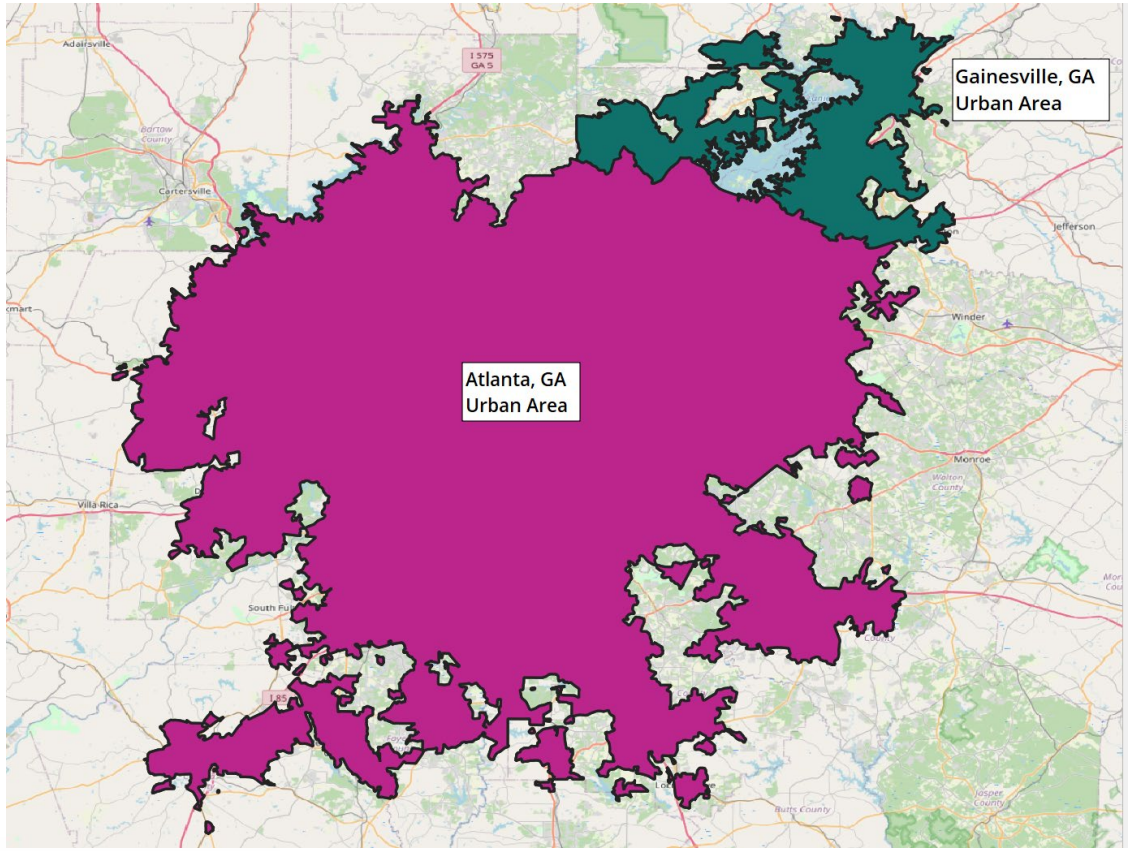


Base map source: OpenStreetMap

San Rafael--Novato, CA urban territory combined into San Francisco--Oakland, CA Urban Area.

Atlanta, GA and Gainesville, GA Urban Areas

Original



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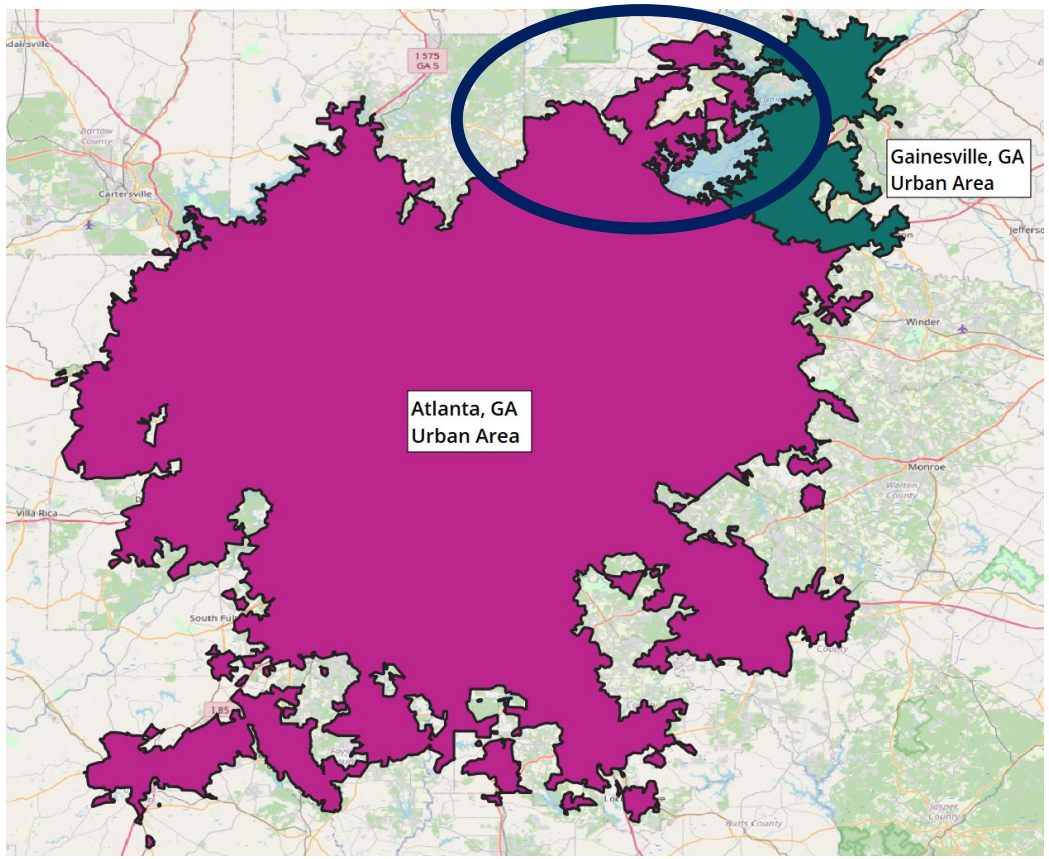
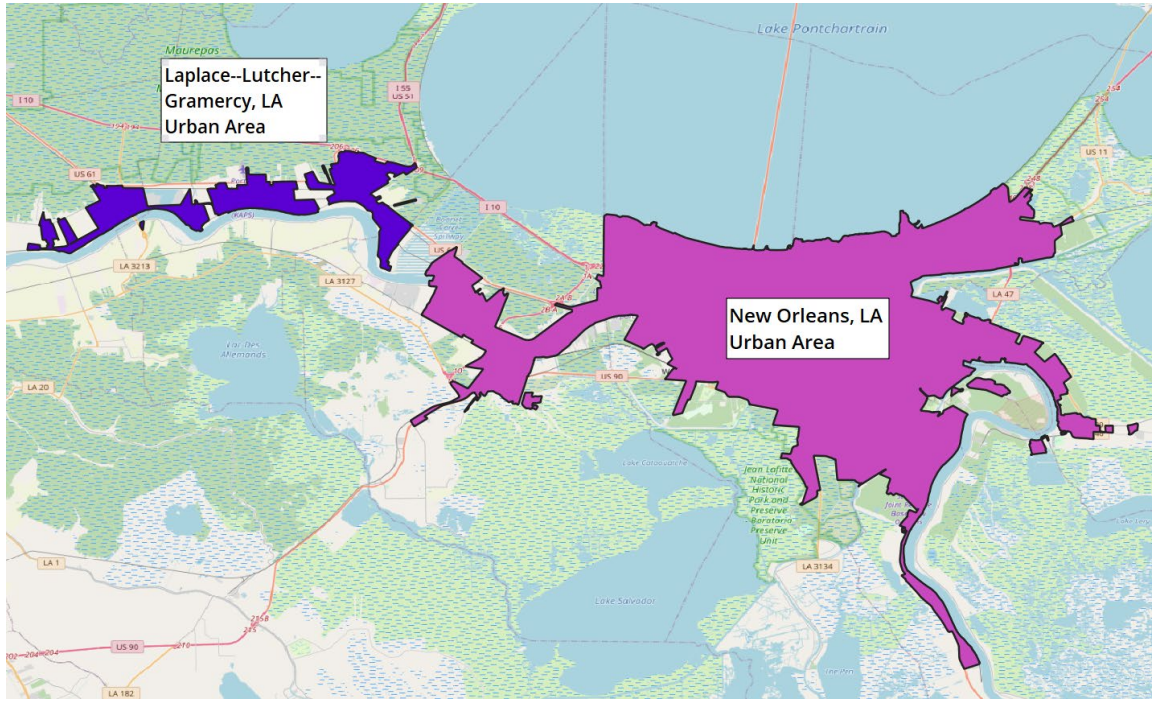


Some urban territory from Gainesville, GA Urban Area reassigned to Atlanta, GA Urban Area.

Base map source: OpenStreetMap

New Orleans, LA and Laplace--Lutcher--Gramercy, LA Urban Areas

Original



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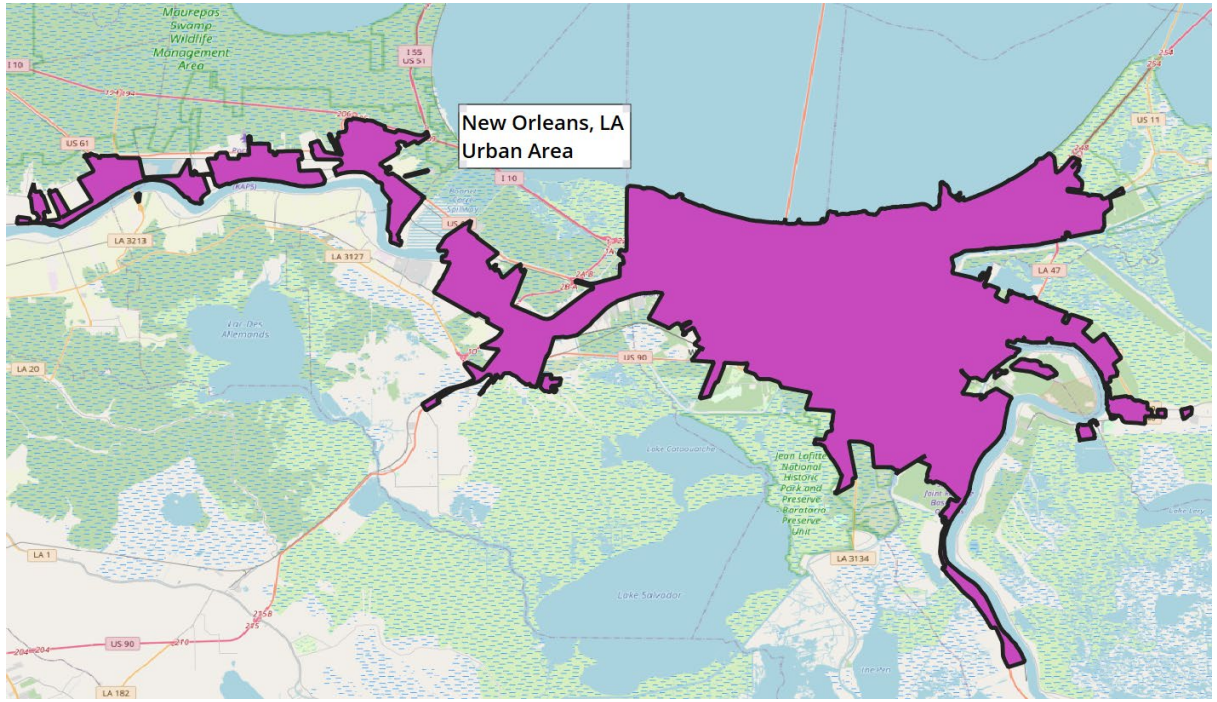

Urban territory combined into New Orleans, LA.

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Base map source: OpenStreetMap

Beyond 2020

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Beyond 2020: Next Steps

- Demographic data published in the Demographic and Housing Characteristics File (DHC).
  - Published May 25, 2023.
  - Subjects: Age, sex, race, Hispanic or Latino origin, household type, family type, relationship to householder, group quarters population, housing occupancy, and housing tenure.
  - Some tables are repeated by race and ethnicity.
- Continue working with stakeholders.
  - The Census Bureau works with tribal, federal, state, and local agencies as well as other stakeholders to ensure understanding of our classification.
  - There are different advantages and disadvantages to urban qualification based on each individual program or funding agency and often qualification for one program may equal a disadvantage in a different program for the same entity.

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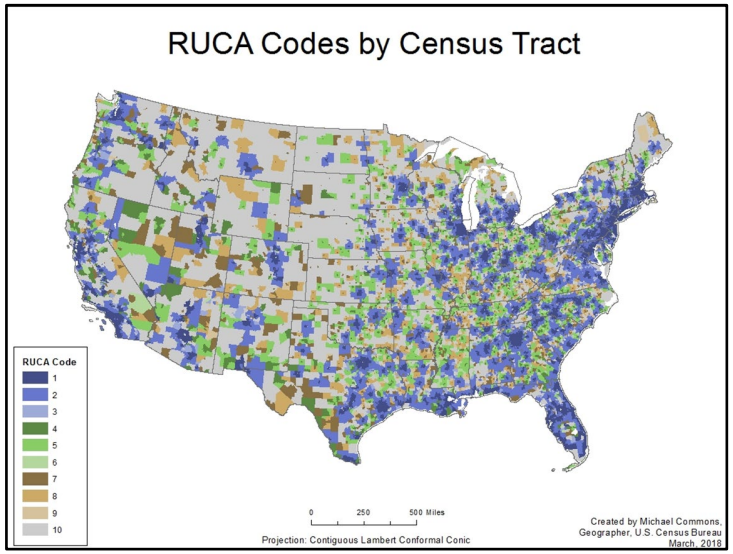
Beyond 2020: UA Criteria

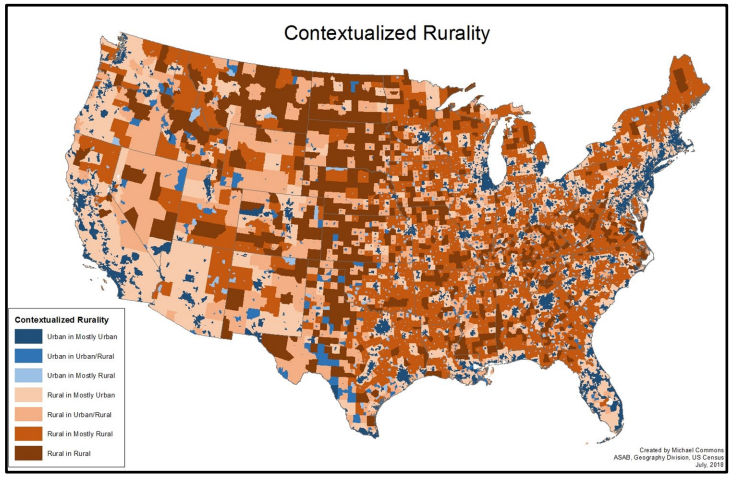
- Given data user feedback to date, the Census Bureau:
  - Does not anticipate significant UA criteria changes.
  - Will consider additional land use datasets to identify exempted territory.
    - Datasets must be nationally-consistent and freely-available sources.

United States Census Bureau

Beyond 2020: Investigating Urban-Rural Continuum

- Classifications tend to be dichotomous:
  - Urban/Rural; Metropolitan/Nonmetropolitan.
  - Rural and Nonmetropolitan are residual categories.
- Move towards additional categories:
  - USDA Economic Research Service Rural-Urban Commuting Areas, Rural Urban Continuum Codes.
  - National Center for Health Statistics County Classification.





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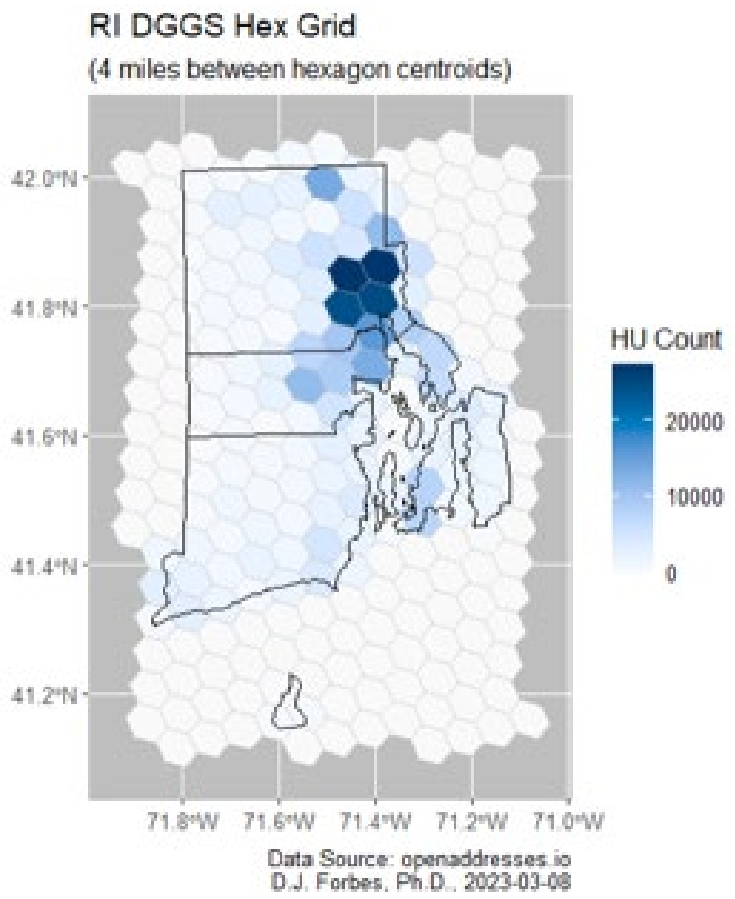
Beyond 2020: Investigating Grids

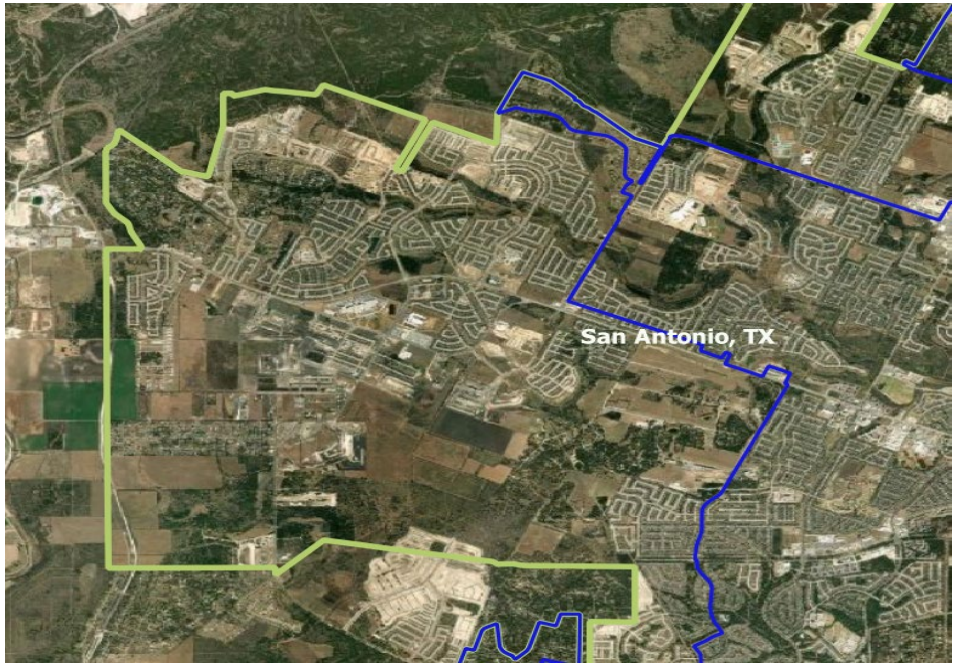
- Investigating UA delineation via grids:
  - Census blocks and other census geographies vary in size.
  - Possibility of a more uniform, close to equal geographic unit with less bias.



Beyond 2020: Additional Considerations

- Continuum and grid-based delineation in addition to "traditional" UA delineation?
  - Historical comparability.
  - Agency reliance on Census Bureau UAs for programmatic uses.
- Intercensal updates
  - Possibility post-2020 delineation since 2020 UAs are housing unit-based.
  - Options:
    - Additive update (most likely), e.g., "add urban" to the current delineation where development occurs.
    - Complete re-delineation.

Post-2010 development on the west side of the San Antonio, TX UA.



Legend:
2020 UA Boundary
2010 UA Boundary

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Questions?

U.S. Census Bureau

Geography Division

https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html

2020 Census UA Team: geo.urban@census.gov

2020 Census UAs: 200k Threshold Changes

Population above 200,000 in 2010 and under 200,000 in 2020

2010 UA Name	2010 Population	2020 UA Names	2020 Population
Norwich--New London, CT	209,190	Norwich--New London, CT	167,432
		Westerly, RI--CT	30,955
Visalia, CA	219,454	Visalia, CA	190,578
		Tulare, CA	70,628
		Exeter, CA	10,973

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