Finding Suburbia in the Census

by

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Abstract

This study introduces a methodology that goes beyond the urban/rural dichotomy to classify areas into detailed settlement types: urban cores, suburbs, exurbs, outlying towns, and rural areas. Utilizing a database that provides housing unit estimates for census tracts as defined in 2010 for all decennial census years from 1940 to 2020, this research enables a longitudinal analysis of urban spatial expansion. By maintaining consistent geography across time, the methodology described in this paper emphasizes the era of development, as well as proximity to large urban centers. This broadly applicable methodology provides a framework for comparing the evolution of urban landscapes over a significant historical period, revealing trends in the transformation of territory from rural to urban, as well as associated suburbanization and exurban growth.

Keyword: suburb, exurb, statistical geography, methodology

[*] Any opinions and conclusions expressed herein are those of the authors and do not represent the views of the U.S. Census Bureau. This paper does not use any confidential Census Bureau data.

Introduction

Everyone seems to know a suburb when they see one. We intuitively understand the concept of residential areas spreading outward from a central city, offering a blend of urban and rural characteristics. Despite this common understanding, however, establishing a precise, universally accepted definition of a suburb has proven remarkably elusive. This ambiguity is perhaps best exemplified by the fact that the U.S. Census Bureau, the primary source of demographic data in the United States, does not employ the term "suburb" in its publications. The lack of a standard definition further complicates efforts to consistently identify and analyze these areas. This paper addresses this challenge by developing a methodology for identifying suburban areas as part of a broader typology classifying areas into a detailed array of settlement types from dense urban core to remote rural areas. The aim of this study is to provide a more rigorous and standardized approach to delineating these often vaguely defined spaces.

The only reference to suburbs in a decennial census publication is from 1910, when the Census Bureau was first experimenting with defining metropolitan areas. The section introducing the "Metropolitan District" concept in the 1910 census was entitled "Cities and Their Suburbs."[1] Metropolitan District population figures were given for "In city proper" and "Outside." Though not explicitly stated, the implication was that all territory outside the central cities would be the suburbs. A similar sort of distinction was made with Urbanized Area data from 1960 to 1980, where territory was classified as "central city" and "outside central city," and in 1990 as "central city" and "urban fringe." While "outside central city" and "urban fringe" were not specifically labeled "suburbs," data users regarded outside central city and urban fringe areas as suburban. Identifying suburbs as the territory outside the central city has been more or less accepted as a reasonable approach, but it falls short of a standardized definition of "suburb."

The only settlement type that the Census Bureau defines is "urban, and by extension "rural" as a residual category. This paper sets out to establish a settlement typology that offers more detail than a simple urban-rural dichotomy. Part of this effort is driven by the necessity to provide a standard definition of "suburb," but this work goes beyond that to establish a detailed settlement typology that can be reduced to categories comparable to established approaches, but offers a broader range of settlement types, as well. In addition, this paper attempts to provide a methodology that can meaningfully be applied across time using comparable geography.

Urban Definition Around the World

Every country defines urban areas in its own way.[2] The United Nations (UN) collects data on urban populations for each country but does not attempt to impose a standardized definition of "urban." Instead, the UN simply accepts each country's urban definition when presenting urban population figures. Urban definitions can vary widely, however, as indicated in the downloadable table provided by

[1] U.S. Census Bureau, *Population 1910, Volume I: Thirteenth Census of the United States Taken in the Year 1910* (U.S. Government Printing Office, 1913), p. 73.
[2] Urbanization - Our World in Data

the UN.[3] Most countries use a minimum population threshold for classifying settlements as urban, and Our World in Data provides a comparison of these values. In Germany a settlement is considered urban if there are at least 150 inhabitants, while in China the population threshold is 100,000.[4]

In the United States, the urban classification is a dichotomy—territory is either urban or rural—and the basic geographic unit is the census block. From 1960 to 2010 the Census Bureau used population density to delineate urban areas but changed to using housing unit density with the 2020 census.[5] The "initial urban core" consists of contiguous census blocks with at least 425 housing units per square mile, and the "remainder of urban area" are census blocks with at least 200 housing units per square mile. In order to be classified as an urban area, the contiguous census blocks must have at least one "high-density nucleus," with a housing unit density threshold of 1275 housing units per square mile, and there must be at least 2000 housing units or at least 5000 people in the delineated area.[6] The 2020 census counted 2611 urban areas in the United States, with 80 percent of the population residing in these areas.

The Global Human Settlement Layer (GHSL) is a data product from the Programme of the European Union that maps human settlements globally. GHSL provides the foundation for the Degree of Urbanization, which is a classification system that categorizes areas based on population size, density and contiguity. In order to measure progress toward the Sustainable Development Goals, in 2020 the United Nations Statistical Commission endorsed the Degree of Urbanization as a standard method for delineating area types ranging from cities to rural areas. The Degree of Urbanization classifies all territory into three general classes:

1. cities
2. towns and semi-dense areas
3. rural areas

The Degree of Urbanization then adds two "extensions":

> The first extension identifies: cities, towns, suburban or peri-urban areas, villages, dispersed rural areas and mostly uninhabited areas. The second extension adds a commuting zone around each city to create a functional urban area or metropolitan area.[7]

The Degree of Urbanization uses square kilometer grid cells, and classifies each cell based on population density, but also takes contiguity and population size into account. The highest density cells are classified

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[3] WUP2018-DataSource-UrbanPopulation.xls, "World Urbanization Prospects 2018: Sources and Documentation, United Nations Department of Economic and Social Affairs: Population Dynamics, World Urbanization Prospects - Population Division - United Nations

[4] Minimum number of inhabitants for a settlement to qualify as an urban area, 2018, Our World in Data, Minimum number of inhabitants for a settlement to qualify as an urban area, 2018

[5] Michael Ratcliffe, "Redefining Urban Areas following the 2020 Census," Redefining Urban Areas following the 2020 Census. The use of housing unit density thresholds rather than population density thresholds is actually a return to the methodology employed for the 1950 census. For a detailed examination of this history, see Michael Ratcliffe, "A Century of Delineating a Changing Landscape: The Census Bureau's Urban and Rural Classification, 1910 to 2010," A Century of Delineating A Changing Landscape: The Census Bureau's Urban and Rural Classification, 1910 to 2010

[6] U.S. Census Bureau, "Urban and Rural, Urban and Rural

[7] The Global Human Settlement Layer – Degree of Urbanization, Global Human Settlement - Degree of Urbanisation definitions - European Commission

as “Urban centre (or high-density cluster)” using a population density threshold of 1,500 persons per square kilometer. Contiguous clusters of high-density cells must have a population of at least 50,000 to be classified as an urban center. Contiguous cells with at least 300 persons per km^2 and have a population of at least 5,000 fall into the “Urban cluster (or moderate density clusters)” category. Generally speaking, this category accounts for towns and suburbs, but in the Degree of Urbanization settlement typology, these areas are classified as dense urban clusters, semi-dense urban clusters and suburban grid cells. Cells that are not high density or moderate density are classified as rural areas. Most rural cells have a population density below 300 persons per square kilometer, but this category also includes higher population density cells that are not part of an urban cluster. The Degree of Urbanization settlement typology divides rural areas into rural clusters, low density rural grid cells, and very low density grid cells. The settlement types, then, are as follows:

- cities
    - urban center
- towns and semi-dense areas
    - dense urban cluster
    - semi-dense urban cluster
    - suburban grid cell
- rural areas
    - rural cluster
    - low density rural grid cell
    - very low density grid cell

Grids cells offer a means to apply a universal standard for delineating urban areas. Using 1 km^2 grid cells provide a high degree of granularity, have stable boundaries over time, and are not dependent on any country’s political or statistical geography. The difficulty with using grid cells, however, is that very little statistical data exists for these units. Perhaps at some point in the future sufficient data will be available for grid cells to be the basic geographic unit for defining urban areas in the United States but that is not the case currently. The United States has a long history of gathering data for statistical geographic units, some of which offer a high degree of granularity. The main problem with US statistical geographic units is that the boundaries of these areas are redrawn with each decennial census, making comparability over time difficult. The challenge, then, is to make use of geographic units that offer a high degree of granularity, availability of data, and are comparable over time.

Methodology

The methodology used in this study uses housing unit density to establish settlement types. In that way it is similar to the approach employed by the Census Bureau, but population density is closely related to housing unit density, and the categories used in this study have more some overlap with those in the Degree of Urbanization. This study differs in a fundamental way from those approaches, however, in that it uses historical time-series data to establish settlement types. The basic dataset used in that effort is the Historical Housing Unit and Urbanization Database 2010 (HHUUD10).[8] Maintaining constant

[8] Scott Markley, Steven R. Holloway, Taylor Hafley, Matthew Hauer, “HHUUD10: Historical Housing Unit and Urbanization Database 2010, OSF | HHUUD10: Historical Housing Unit and Urbanization Database 2010

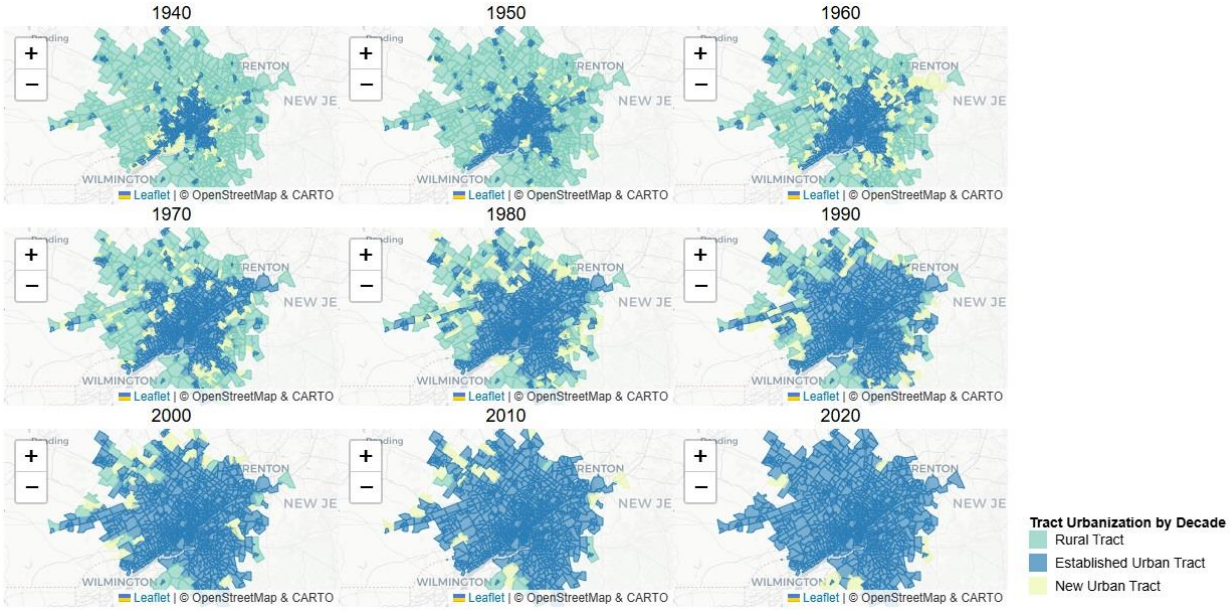
boundaries, using census tracts as they were defined in 2010, HHUUD10 provides an estimate of the number of housing units for each census tract for every decennial census year from 1940 to 2010, and for 2019 (HHUUD10 was released before 2020 decennial census data were available). HHUUD10 also provides an assessment of when census tracts become urban based on a combination of housing unit density (using a threshold of 200 housing units per square mile) and land cover. Using the 2010 Census Tabulation Block to 2020 Census Tabulation Block Relationship Files[9], I added 2020 housing unit data to the time series.

The HHUUD10 database does not provide a population estimate for census tracts but a population figure for each tract across all years was necessary for this project. Since the basic geographic unit for this study is census tracts as defined in 2010, the population of census tracts in 2010 is the actual population count from the 2010 census. I used the 2010-2020 block relationship files to provide the 2020 population estimate for each tract. For the years 1970 to 2000 I used the population estimates from the Longitudinal Tract Data Base (LTDB)[10]. The coverage of population estimates was complete for 1990 and 2000, but the LTDB does not provide a population estimate for many mostly rural counties in 1970 and 1980. For those counties, as well as the earliest years in this study, I used the housing unit estimates by tract from HHUUD10 to estimate the population for each census tract. Since we know the county population and we have housing unit estimates for each tract within the county, I distributed the county population proportional to the number of housing units in each census tract.

This work builds on the methodology I describe in "Applying Current Core Based Statistical Area Standards to Historical Census Data, 1940-2020,"[11] which uses a series of programs that apply the current rules for delineating Core Based Statistical Areas (CBSA) to historical data from 1940 to 2020. I broke up the process of delineating historical CBSAs into several steps, each in a separate program. The step most relevant to the effort to establish a settlement typology is step3_clusters.pl, which identified groups of contiguous urban census tracts and output the tract components of each cluster beginning with the 1940 data and proceeding decade by decade to 2020. The clusters delineated in each decennial year build on the clusters delineated in the preceding decades. Figure 1 illustrates how the program used the urban year and tract adjacency to build the urban area of Philadelphia from 1940 to 2020. In 1940 the urban area of Philadelphia was relatively compact, and small urban areas dotted the landscape in the vicinity of Philadelphia. The yellow areas in the maps in Figure 1 are the census tracts that urbanized in each decade, crossing the 200 housing units per square mile threshold. Each decade brought more extensive suburbanization, often absorbing established towns in the process.

[9] U.S. Census Bureau, "Relationship Files"
[10] John Logan, "Census geography: Bridging data for census tracts across time," Diversity and Disparities, Brown University, Diversity and Disparities
[11] Todd Gardner, "Applying Current Core Based Statistical Area Standards to Historical Census Data, 1940-2020," Center for Economic Studies (CES) Working Paper Series CES-25-10, January, 2025. Applying Current Core Based Statistical Area Standards to Historical Census Data, 1940-2020

Figure 1. The Growth of the Philadelphia Urban Area, 1940-2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 1 shows the distribution of metropolitan and micropolitan urban areas over the time span of this study, 1940 to 2020. An urban area becomes the core of a metropolitan area when it reaches a population of 50,000 or more. Micropolitan areas are delineated using the same rules as metro areas, but the urban areas are smaller, with populations of at least 10,000 but less than 50,000 inhabitants.

Table 1. Cores by Population Class, 1940-2020

	Cores with Population 50,000+ Metropolitan Cores				Cores with Population 10,000-49,999 Micropolitan Cores			
Year	Number	Tracts	Population	Pct	Number	Tracts	Population	Pct
1940	169	16,215	56,291,026	42.8	613	3,617	12,821,859	9.7
1950	208	20,485	72,462,333	48.1	683	3,933	14,274,562	9.5
1960	248	26,753	97,488,605	54.6	721	4,204	15,322,727	8.6
1970	260	31,543	113,622,605	56.1	714	4,442	15,695,636	7.8
1980	280	36,985	126,783,064	56.2	734	4,626	16,227,179	7.2
1990	307	41,368	148,296,840	60.0	723	4,253	15,357,927	6.2
2000	334	44,475	176,009,805	63.0	744	4,033	16,092,954	5.8
2010	357	46,944	200,655,862	65.4	747	3,742	15,885,055	5.2
2020	369	47,941	224,391,752	68.2	732	3,482	15,305,902	4.6

Source: Author's analysis of data from the HHUUD10 and LTDB databases

In "Applying Current Core Based Statistical Area Standards to Historical Census Data, 1940-2020" the clusters of urban census tracts were treated as a single unit without categorizing the tracts contained

within them. That is, I just used these units as "urban areas" for the purpose of delineating the CBSAs. This study, however, uses the historical information embedded in the process of delineating cores to establish a settlement typology that goes beyond the urban-rural dichotomy. Table 2 shows the categories used in this study. The core, suburban, and exurban categories appear only in metropolitan areas, where the cores have populations of 50,000 or greater. The rest of the categories (micropolitan core, town and rural) can be inside the bounds of a metro area but are also found in micropolitan areas and outside CBSAs, as well.

Table 2. Population by Settlement Type, 1940-2020

	Population (millions)								
Settlement Type	1940	1950	1960	1970	1980	1990	2000	2010	2020
Early Core	53.6	60.0	62.7	56.7	50.3	49.3	50.0	49.2	51.4
Postwar Core	-	2.2	4.9	6.0	7.8	10.3	11.1	11.3	11.6
Recent Core	-	-	-	-	-	-	1.7	3.8	5.2
Mid-20th Century Suburb	2.7	10.3	29.9	42.7	45.6	47.9	51.3	52.4	54.8
Late-20th Century Suburb	-	-	-	8.5	23.7	41.3	53.8	60.5	65.9
21st Century Suburb	-	-	-	-	-	-	8.6	24.2	36.1
Micropolitan core	12.8	14.3	15.3	15.4	15.6	14.7	15.6	15.3	14.8
Town	5.9	6.1	6.7	6.4	6.7	6.5	7.0	6.5	6.2
Early Exurb	-	-	0.4	0.8	1.0	1.2	0.7	0.5	0.4
Recent Exurb	-	-	-	-	-	-	1.7	2.5	4.0
Rural	56.6	57.9	58.5	65.9	74.7	75.8	78.1	80.7	79.0
National Total	131.7	150.7	178.5	202.4	225.4	247.3	279.6	306.7	329.3

Source: Author's analysis of data from the HHUUD10 and LTDB databases

All of the categories listed in Table 2 (except for exurban) are a direct result of the methodology for delineating contiguous urban clusters. The program begins with 1940, as that is the earliest year of available data, and loops through all census tracts in order of housing unit density. Starting with an unaffiliated urban tract, the program iteratively examines all adjacent census tracts and builds outward from the starting high-density census tract. The program continues this process until there are no more adjacent urban tracts and then moves on to the next unaffiliated urban census tract. The program repeats this process until all urban census tracts have been examined. In this study a new program examines all metropolitan cores and classifies the component tracts according to when they urbanized and were added to urban areas. The basic metropolitan categories are cores, suburbs and exurbs, and each of these basic categories is then classified by the era of development. In the case of cores, I divide them between early cores (urban areas with population of 50,000 or more by 1940), postwar cores (urban areas where the population crossed the 50,000 threshold between 1950 and 1990, and recent cores (urban areas crossing the 50,000 population threshold since 2000). A related category is micropolitan cores, which are urban areas with populations between 10,000 and 49,999. Suburbs are also classified in terms of the era of development—mid-20th century, late-20th century or 21st century. Exurbs are low-density tracts on the periphery of metro areas and are classified by era, where early exurbs are those meeting the criteria before 2000, and recent exurbs are those tracts included in this classification since 2000.

Cores

Early Metro Cores – Early cores are urban areas that have a population of 50,000 or more in 1940. Since 1940 is the first year of data available, I wanted to ensure that the cores identified had an urban character. For that reason I used a somewhat higher housing unit density threshold for inclusion into this category, so census tracts above 425 housing units per square mile in those clusters as "Early Core." Of the 72,537 census tracts in the continental United States, 13,890 census tracts fall into this category. The population of these census tracts, which was 53.6 million in 1940, increased through the 1940s and 1950s, peaking at 62.7 million in 1960. Table 3 shows that the population of early core census tracts declined after that but has been stable at around 50 million inhabitants in recent decades. In percentage terms, however, the early core population has been steadily declining. Accounting for just over 40 percent of the national population in 1940, the early core population accounted for only 15.6 percent of the population in 2020.

Metro Cores after 1940 – When a cluster of census tracts had a population below the metropolitan threshold in 1940, but later grew to exceed the population of 50,000 in the following decades, these are classified as either "Postwar Cores, if the urban crosses the threshold by 1990, or "Recent Cores" for those classified since 2000. The number of new cores has varied over the decades but the pace of census tracts being added to these categories has been slowing down in recent years. In 1990 632 census tracts in 44 cores were added to this category but only 220 new census tracts from 22 cores were designated as postwar cores in 2020, as shown in Table 3. Taken together postwar and recent cores accounted for just over five percent of the population in 2020.

Table 3. Postwar and Recent Cores, 1950-2020

			Population (Millions)							
Year	Number	Tracts	1950	1960	1970	1980	1990	2000	2010	2020
Postwar Cores										
1950	44	605	2.2	2.5	2.3	2.2	2.2	2.3	2.2	2.2
1960	49	610		2.4	2.3	2.2	2.2	2.3	2.2	2.2
1970	27	362			1.2	1.3	1.4	1.5	1.5	1.6
1980	38	571				1.9	2.0	2.2	2.3	2.4
1990	43	632					2.2	2.6	2.7	2.9
Recent Cores										
2000	35	424						1.7	1.9	2.0
2010	38	404							1.9	2.1
2020	22	220								1.1

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Secondary Cores – In some situations when two areas grow to become contiguous with one another, the smaller area crosses the 50,000 population threshold in the same year the clusters grow together. In most such cases one area is considerably larger than the other, but in a few cases the areas are of similar size. In cases where the population of the smaller area is at least one-third the size of the larger area, the smaller cluster is designated as a secondary core. From 1940 to 2020 this situation has occurred only six times, half of which were in California, as shown in Table 4. The largest of these secondary cores is Riverside, California. The area became contiguous in 1960 when each cluster had a population of under

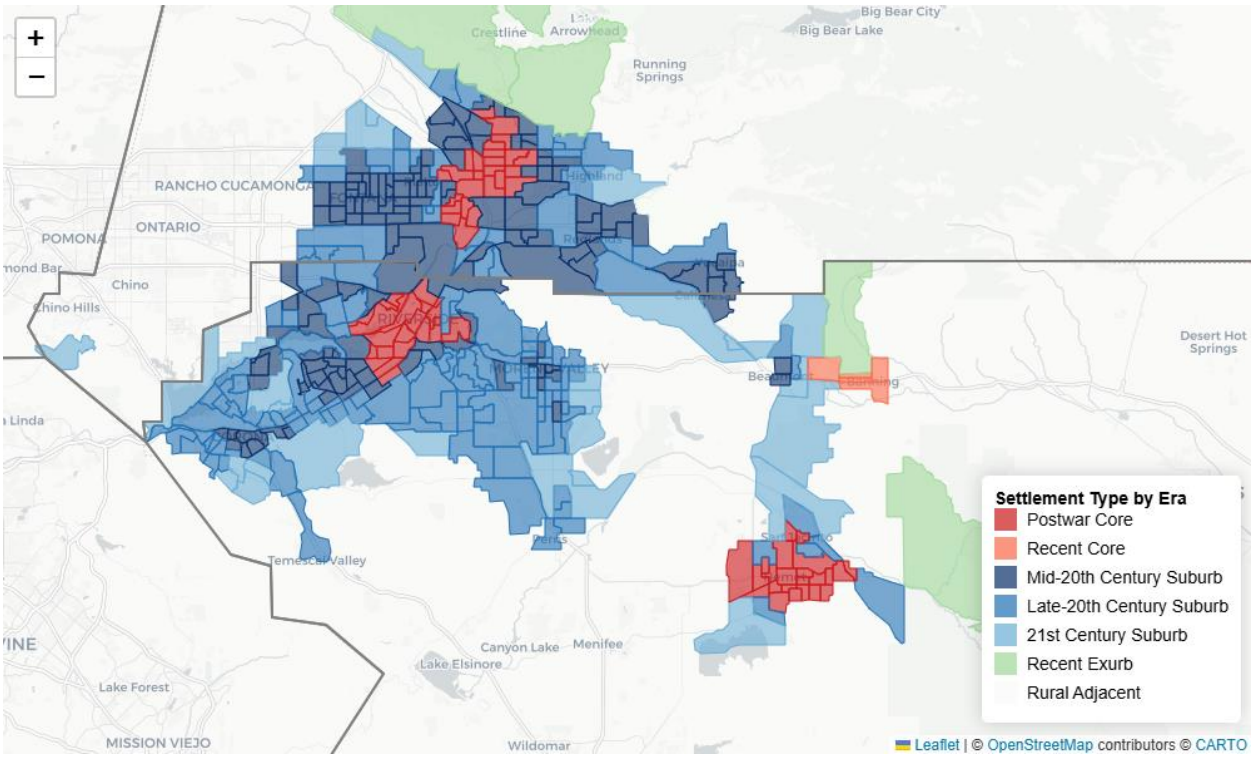
100,000 people but the area has since grown to become one of the largest clusters in the United States, with a population of over 2 million in 2020. This already multinucleated area has become even more complex as it has become contiguous with the Beaumont-Banning and Hemet-San Jacinto urban areas in recent decades, as showing in Figure 2.

Table 4. Secondary Cores

		Population			Population		
Year	Larger Core	Previous Decade	Current Decade	Smaller Core	Previous Decade	Current Decade	Pct
1960	San Bernardino, CA	80,245	128,804	Riverside, CA	37,236	57,125	44.4
1970	Poughkeepsie, NY	69,513	78,737	Newburgh, NY	45,770	53,578	68.0
1970	Lorain, OH	88,516	94,145	Elyria, OH	47,416	52,286	55.5
1970	Bradenton, FL	55,836	77,143	Sarasota, FL	49,617	69,283	89.8
1980	San Clemente, CA	33,738	64,793	Mission Viejo, CA	24,064	60,897	94.0
1990	Fairfield, CA	45,589	71,271	Vacaville, CA	36,389	50,522	70.9

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Figure 2. The Riverside-San Bernardino Urban Area, 2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Micropolitan Cores – When a cluster has a population of at least 10,000 people but less than 50,000 it is classified as a micropolitan core. The number of micropolitan cores has increased somewhat in the decades since 1940, but the population residing in micropolitan cores has remained rather stable at around 15 million people. Table 1 shows that the number of micropolitan core census tracts has declined somewhat in recent years. After peaking at 4486 in 1980, the number of micropolitan core tracts had

dropped to 3314 by 2020. Also, because the population of the United States has increased so much since 1940, the percentage of the population residing in micropolitan cores dropped from almost 10 percent in 1940 to 4.5 percent in 2020.

Suburbs

This study divides suburban tracts into three eras: mid-20th century suburbs, late-20th century suburbs, and 21st century suburbs. There are three ways a tract can be classified as a suburban tract: 1) tracts that are added to metropolitan cores as the suburban territory expands outward decade by decade, 2) tracts in early metro cores that have low housing unit densities, and 3) when a micropolitan core is absorbed by a larger nearby urban area when its suburban territory spreads to areas adjacent to that micropolitan core.

Tracts on the periphery of urban areas – The most straightforward cases are when tracts on the periphery of a large urban area are designated as urban and become part of the large urban area. Tracts added to urban areas in 1950 or 1960 are classified as mid-20th century suburbs, tracts added in 1970, 1980 or 1990 are classified as late-20th century suburbs, and tracts added in 2000 and later are classified as 21st century suburbs. Most of the tracts in this category had been classified as rural but then were reclassified as urban as these areas experienced rapid development associated with the outward expansion of large urban areas.

Low housing unit density tracts in early cores – Since the methodology for designating settlement types relies on change over time, I had to come up with a different method for designating suburban census tracts in 1940. In the case of urban areas that have populations of 50,000 or more in 1940, the census tracts that have housing unit densities above 425 housing units per square mile are classified as early core tracts, but those with housing unit densities of less than 425 housing units per square mile are classified as mid-20th century suburbs. For the most part these tracts are on the periphery of large urban areas.

Tracts added to newly established postwar cores – In all decades after 1940, any tracts that are added to the cluster in the decade where the population surpasses the 50,000 threshold are put into the suburban category. Only those tracts that have been in a core in the decade preceding are classified as postwar core tracts. Tracts added to emerging cores in this manner are classified by era depending on what year the core crosses the 50,000 population threshold.

Table 5 summarizes the distribution of population by suburban category using the three designations described above. The “Low Density Fringe” category is only used in 1940 because of the lack of earlier data to assess when each census tract crosses the urban housing unit density threshold. Identifying low-density (less than 425 housing units per square mile) fringe suburbs in the 1940 urban areas is used as an alternative for this reason. In later years the year of urbanization from the HHUUD10 database provides a consistent, comparable means to assess when a census tract becomes a suburb in a large urban area. This table, however, does not account for situations where an expanding urban area absorbs an established urban cluster.

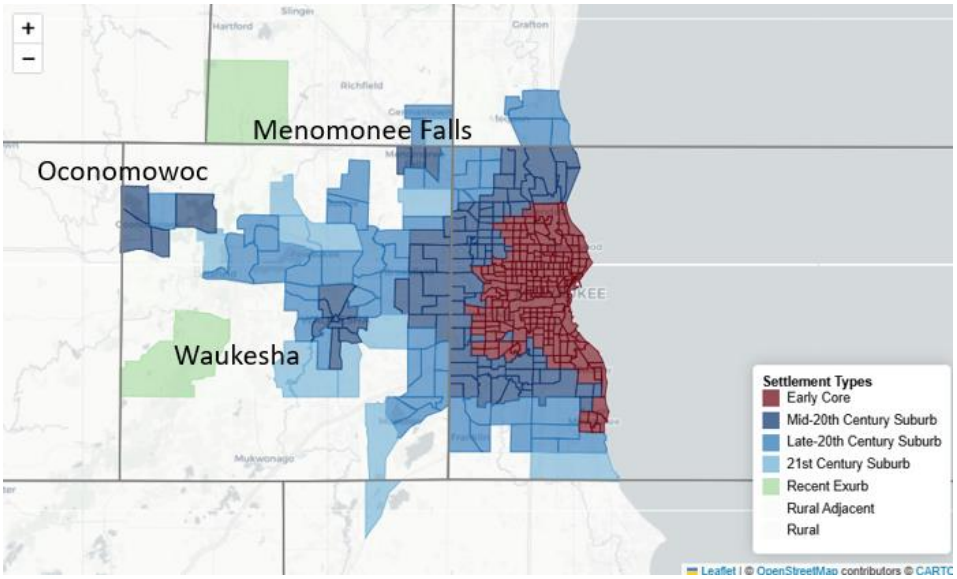
Table 5. Suburbs by Era

Category	Year	Tracts	Population (millions) 1940	1950	1960	1970	1980	1990	2000	2010	2020
Mid-20th Century Suburbs											
Low Density Fringe	1940	2325	2.7	4.9	7.6	9.1	8.8	8.6	8.8	8.9	9.2
Added to Established Core	1950	3022		4.2	8.9	11.5	11.5	11.6	12.2	12.3	12.7
Added to Established Core	1960	4956			9.8	16.7	18.8	19.7	21.1	21.4	22.4
Added to New Core	1950	392		0.5	1.0	1.2	1.4	1.5	1.6	1.6	1.7
Added to New Core	1960	363			0.7	1.1	1.3	1.4	1.5	1.6	1.6
Late-20th Century Suburbs											
Added to Established Core	1970	3986				8.2	12.8	15.3	17.3	18.1	19.3
Added to Established Core	1980	4260					9.3	14.4	18.5	20.2	21.8
Added to Established Core	1990	3142						8.4	13.1	16.0	17.7
Added to New Core	1970	161				0.3	0.5	0.6	0.7	0.7	0.7
Added to New Core	1980	260					0.6	0.8	1.1	1.2	1.3
Added to New Core	1990	175						0.5	0.7	0.9	1.0
21st Century Suburbs											
Added to Established Core	2000	2248							8.1	12.6	14.7
Added to Established Core	2010	1747								10.3	14.2
Added to Established Core	2020	602									5.1
Added to New Core	2000	125							0.4	0.6	0.7
Added to New Core	2010	50								0.3	0.4
Added to New Core	2020	15									0.1

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Micropolitan cores absorbed by a larger nearby core – In the case of micropolitan cores that are absorbed by the suburbanization of a large nearby urban core, the program takes account of what year the micropolitan core crossed the population threshold of 10,000. The formerly micropolitan core tracts are not classified by when they are added to the larger core, but by when each tract in the micropolitan core urbanized. If the tract in the micropolitan core urbanized in 1940, 1950 or 1960, it gets classified as a mid-20th century suburb regardless of when it is absorbed by a large nearby core. Tracts in micropolitan cores that urbanized in 1970, 1980 or 1990 and are then absorbed by a large nearby core are classified as late-20th century suburbs. Micropolitan tracts that urbanized after 1990 are classified as 21st century suburbs when they are absorbed. Figure3 provides an example of this, actually three examples, as the urban area of Milwaukee absorbed Menomonee Falls and Waukesha in 1980, and in 2020 absorbed Oconomowoc in 2000. As Figure 3 shows, however, the tracts in these micropolitan cores are classified mainly as mid-20th century suburbs because they urbanized much earlier than when they were absorbed into the Milwaukee urban area. Table 7 shows that micropolitan cores absorbed by larger urban areas has been common, though perhaps the pace of these events has slowed somewhat in recent years.

Figure 3. The Milwaukee Urban Area After Absorbing Micropolitan Cores, 2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 6. Micropolitan Cores by Year Absorbed into Larger Urban Area

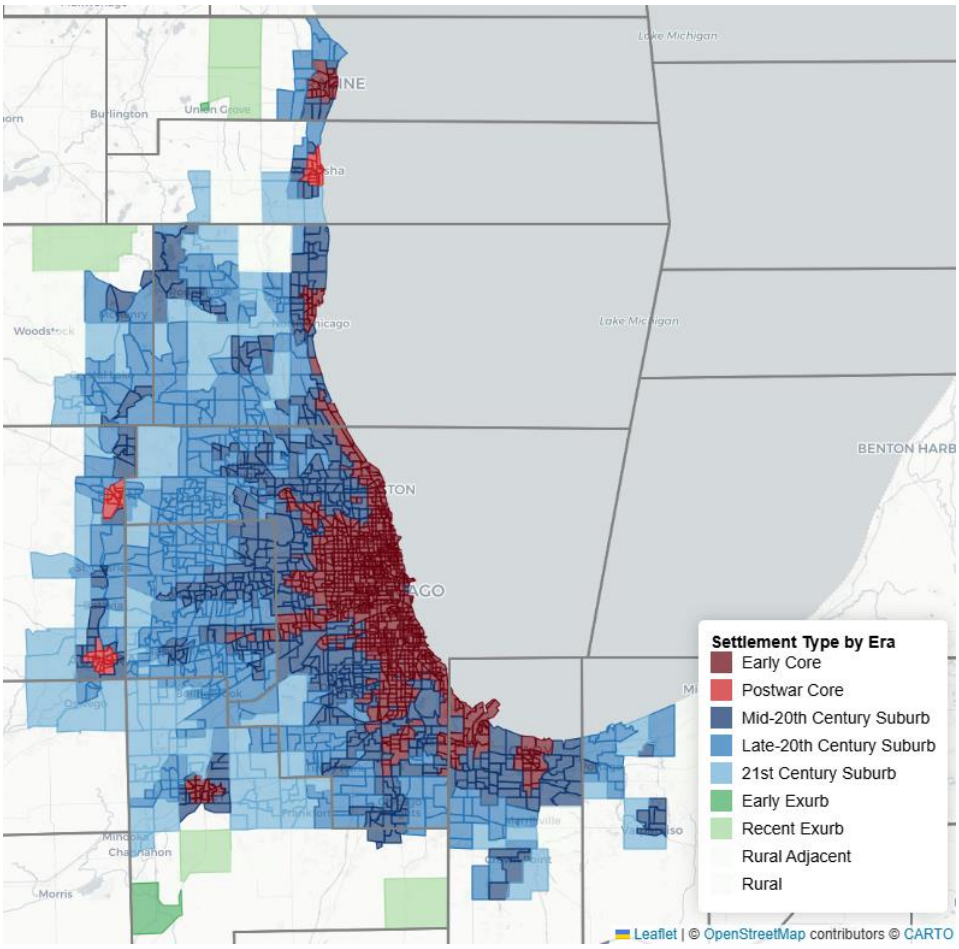
Year Micro Core Established	Number of Micropolitan Cores by Year Absorbed into Larger Urban Area							
	1950	1960	1970	1980	1990	2000	2010	2020
	Mid-20th Century Suburbs							
1940	23	17	12	10	5	2	7	1
1950		20	6	7	6	4	2	2
1960			17	8	4	4	4	5
	Late-20th Century Suburbs							
1970				21	7	2	3	
1980					23	4	9	3
1990						23	7	2
	21st Century Suburbs							
2000							21	3
2010								14

Source: Author's analysis of data from the HHUUD10 and LTDB databases

The Chicago urban area provides a more complex example of a large urban area absorbing smaller urban areas. From 1940 to 2020, the urban area around Chicago expanded a great deal and absorbed several outlying metropolitan and micropolitan cores in the process. The Illinois urban areas of Elmhurst, Wheaton, Fox Lake, St. Charles and Mundelein, as well as Valparaiso and Crown Point in Indiana had all attained a population of at least 10,000 and became classified as micropolitan cores by 1960. Even though these areas were absorbed into the Chicago urban area at different times, upon becoming part of the Chicago urban area they are all classified as mid-20th century suburbs. While Elmhurst and Wheaton

were absorbed by the Chicago urban area by 1950, all the areas in Indiana were not part of the Chicago urban area until 2000, when absorbed by the Chicago urban area all of these areas are classified as mid-20th century suburbs because they had achieved the status of micropolitan core decades earlier. In addition to these micropolitan cores, the Chicago urban area has absorbed smaller metropolitan cores, as well. The urban areas around Aurora, Elgin, Joliet, and Racine and Kenosha had all attained populations of over 50,000 before becoming part of the Chicago urban area.

Figure 4. The Chicago Urban Area, 2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Exurbs

After the core and suburban census tracts have been classified, a final step is to identify rural census tracts on the periphery of metropolitan urban areas that meet the criteria to be classified as exurban. As described in the Brookings report "Finding Exurbia: America's Fast-Growing Communities at the Metropolitan Fringe"[12] exurbs are fast growing areas that have close ties to a nearby urban center but have a low housing unit density, about 14 acres of land per home. This is roughly 50 housing units per

[12] Alan Berube, Audrey Singer, Jill H. Wilson, and William H. Frey, "Finding Exurbia: America's Fast-Growing Communities at the Metropolitan Fringe, Finding Exurbia: America's Fast-Growing Communities at the Metropolitan Fringe

square mile, so I looked for rural census tracts in metropolitan counties with housing unit densities between 33.33 and 66.67 housing units per square mile. Though I used the Brookings report as a starting point, rather than focusing on fast growing census tracts, this study's typology identifies areas with more stable housing unit densities. I would argue that those who choose to reside in exurbs are seeking low-density environments and they expect them to remain so. The program, then, identifies exurban tracts not only by their low housing unit density each year, but also looks at the previous two decades to establish that the housing unit density had been stable for at least 20 years.

Outlying metropolitan counties must have commuting ties to the urban core, so I only examined tracts in counties that were in the metropolitan area of the urban core. Even though tract-to-tract commuting data is not available, it is assumed that census tracts in these metropolitan counties have ties to the urban core. I did impose proximity rules to ensure that distant tracts in very large counties are not identified as exurbs. To be classified as exurban a tract has to be within 25 miles of the core (measuring from the tract centroid to the population center of the core) or that the closest points between the exurban tract and the core had to be within ten miles of each other.

Table 7. Exurbs, 1960-2020

Year Classified Exurban	Exurban Population (millions)						
	1960	1970	1980	1990	2000	2010	2020
Early Exurbs							
1960	0.43	0.25	0.11	0.08	0.05	0.04	0.04
1970		0.5	0.24	0.12	0.08	0.06	0.07
1980			0.62	0.35	0.18	0.11	0.09
1990				0.68	0.38	0.27	0.22
Recent Exurbs							
2000					1.67	1.11	1.02
2010						1.4	1.17
2020							1.78
Total	0.43	0.76	0.97	1.2	2.4	2.99	4.38
	Number of Exurban Census Tracts						
	1960	1970	1980	1990	2000	2010	2020
Early Exurbs							
1960	231	82	33	23	15	13	13
1970		211	69	32	20	16	18
1980			199	99	52	33	29
1990				208	100	69	61
Recent Exurbs							
2000					428	272	247
2010						310	266
2020							351
Total	231	293	301	362	615	713	985

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Tracts that are identified as exurban from 1960 to 1990 are classified as early exurbs and those classified as exurban since 2000 are classified as recent exurbs. Once a census tract is classified as exurban, it

remains exurban as long as the census tract maintains a housing unit density in the exurban range of 33.33-66.67 housing units per square mile. It is not uncommon for such census tracts to develop to much higher density levels as the urban core expands. Table 7 illustrates how the population of exurban census tracts has grown throughout this period, even though many census tracts drop out of this category as suburbanization increases. Only 13 census tracts maintained the exurban housing unit density through 2020 after being identified as exurban in 1960.

Towns and Rural Areas

Like most urban-rural classification systems, in this typology the classification "rural" is a residual category. The category of "Town" is a census tract or cluster of tracts that has a population of at least 1,000 but less than 10,000. Though the tracts are urban, they do not qualify to be included in a core because the population is insufficient. I make use of the spatial information associated with census tracts to assess the proximity of rural and town census tracts to metropolitan cores. The program calculates the distance to the closest core with a population of 50,000 or more. Tracts that are within 100 miles of a metro core are classified as "proximate" and more distant tracts are categorized as "remote." Table 8 shows the distribution of towns from 1940 to 2020, with and without the proximity distinction. While the number and population of towns proximate to large urban areas has been fairly steady throughout this period, the number of remote towns diminished significantly between 1940 and 2020.

Table 8. Towns by Proximity to Large Urban Areas, 1940-2020

	Clusters with Population 1,000-9,999 (Towns)							
	Proximate				Remote			
Year	Number	Census Tracts	Population (millions)	Pct	Number	Census Tracts	Population (millions)	Pct
1940	1,023	1,782	4.5	3.4	281	449	1.5	1.1
1950	1,116	1,811	4.9	3.2	249	378	1.2	0.8
1960	1,260	1,965	5.6	3.2	225	320	1.1	0.6
1970	1,128	1,858	5.3	2.6	229	332	1.1	0.6
1980	1,207	1,842	5.6	2.5	213	320	1.1	0.5
1990	1,199	1,716	5.6	2.3	183	271	0.9	0.4
2000	1,213	1,632	6.1	2.2	183	254	0.9	0.3
2010	1,128	1,481	5.7	1.9	152	218	0.8	0.2
2020	1,111	1,470	5.6	1.7	130	189	0.6	0.2

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 9 shows the distribution of rural census tracts from 1940 to 2020. Note that the rural category also has the subcategory of "adjacent," which includes rural tracts that share a boundary with a metropolitan urban area. These tracts are the most likely areas to urbanize in the near future and become suburban. Tables 8 and 9 demonstrate that as metropolitan areas have grown and become more numerous, remote towns and rural areas have become less common. In 1940 just under 15 percent of the population lived in a remote census tract, 13.7 percent in rural census tracts and 1.1 percent in towns. By 2020, however, only about two percent of the population lived in remote census tracts, the great majority of those in rural census tracts, as 1823 rural census tracts were more than 100 miles from a metropolitan urban area while only 189 tracts in towns were remote.

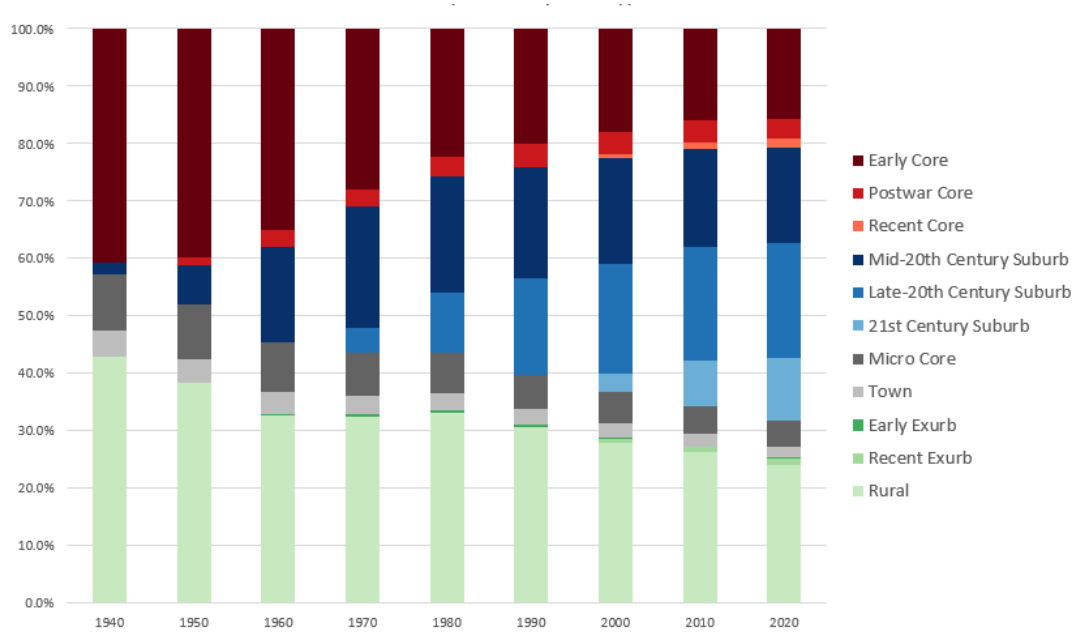
Table 9. Rural Areas by Proximity to Large Urban Areas, 1940-2020

	Rural Areas								
	Adjacent			Proximate			Remote		
Year	Census Tracts	Population (millions)	Pct	Census Tracts	Population (millions)	Pct	Census Tracts	Population (millions)	Pct
1940	3,235	2.3	1.8	36,870	36.3	27.6	10,369	18.0	13.7
1950	3,983	3.4	2.3	34,223	39.3	26.1	7,724	15.2	10.1
1960	4,835	5.4	3.0	28,962	41.6	23.3	5,267	11.5	6.4
1970	4,854	9.4	4.7	24,779	45.8	22.6	4,436	10.7	5.3
1980	5,068	12.2	5.4	19,875	52.2	23.2	3,520	10.3	4.6
1990	4,848	14.2	5.7	16,917	53.2	21.5	2,802	8.5	3.4
2000	4,565	15.8	5.7	14,426	54.1	19.3	2,537	8.2	2.9
2010	4,362	20.3	6.6	12,855	53.1	17.3	2,222	7.3	2.4
2020	4,433	23.2	7.1	12,214	49.9	15.2	1,823	5.8	1.8

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Where Table 3 showed the distribution of population from 1940 to 2020 using the basic settlement typology, Figure 5 displays this information in percentage terms. Some cells are empty because of the settlement type criteria: postwar cores are by definition defined beginning in 1950 and recent cores are defined since 2000. Late-20th century suburbs are defined starting in 1970, and 21st century suburbs since 2000. Exurbs must be census tracts in a metro area and have maintained an exurban housing unit density for at least twenty years before being designated as exurban, so the earliest they can be classified is in 1960.

Figure 5. Percent of Population by Area Type, 1940-2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Housing Unit Density

Table 10 shows the population density of cores and suburbs by era, making clear that density levels are tied to era of development. Table 10 shows that early cores are by far the most densely developed areas. After peaking at over 10,000 persons per square mile in 1960, these areas have maintained fairly constant population densities at around 8000 persons per square mile. Postwar cores, urban clusters that crossed the 50,000 population threshold between 1950 and 1990, have much lower population densities at about 3000 persons per square mile, roughly comparable to mid-20th century suburbs. Lower still are the population densities of recent cores, those that exceeded the 50,000 population density threshold since 2000. Recent cores have population densities of under 2000 persons per square mile, which is comparable to the population density of late-20th century suburbs.

Table 10. Population Density by Area Type, 1940-2020

	Population Density (persons per square mile)								
Settlement Type	1940	1950	1960	1970	1980	1990	2000	2010	2020
Early Core	8,678.3	9,726.8	10,162.8	9,197.5	8,159.5	8,002.0	8,119.3	7,973.8	8,342.5
Postwar Core	-	3,829.7	3,835.0	3,374.2	2,986.8	2,818.9	3,031.9	3,077.2	3,175.8
Recent Core	-	-	-	-	-	-	1,861.8	1,839.9	1,906.3
Mid-20th Cent. Suburb	979.2	1,522.3	2,046.2	2,859.5	2,974.5	3,058.6	3,231.4	3,255.2	3,390.0
Late-20th Cent. Suburb	-	-	-	1,181.9	1,368.7	1,499.2	1,910.5	2,110.7	2,291.2
21st Century Suburb	-	-	-	-	-	-	845.0	1,053.0	1,168.1
Micropolitan core	2,414.3	2,136.2	1,883.0	1,672.8	1,421.6	1,259.8	1,238.1	1,163.3	1,126.9
Town	1,444.9	1,290.9	1,175.6	1,041.8	933.1	854.3	897.9	863.9	829.4
Early Exurb	-	-	165.8	181.2	176.0	158.5	144.8	135.6	128.1
Recent Exurb	-	-	-	-	-	-	133.1	124.0	120.3
Rural	19.4	19.9	20.2	22.8	26.0	26.6	27.6	28.7	28.3
Total	44.8	51.3	60.8	68.9	76.8	84.3	95.3	104.5	112.2

Source: Author's analysis of data from the HHUUD10 and LTDB databases

We can use the HHUUD10 housing unit estimates to categorize census tracts by density of development. I have already described how housing unit density was used to distinguish core and suburban census tracts in 1940. Those tracts with a housing unit density of less than 425 housing units per square mile were designated as suburban, while those with greater housing unit densities were categorized as core tracts. The thresholds of 200 and 425 housing units per square mile are used by the Census Bureau currently delineate urban areas. As described in the article "Redefining Urban Areas following the 2020 Census," three density thresholds are used in delineating urban areas at the block level: cores are initially established using a housing unit density threshold of 425 housing units per square mile, and then the remainder of the core is built out using a threshold of 200 housing units per square mile. Finally, the urban area must contain at least one high-density nucleus of 1275 housing units per square mile to qualify as a core.[13] Though this study uses census tracts rather than blocks as the basic geographic unit, these thresholds can be used for tract-based urban areas. I add a fourth housing unit density threshold

[13] Michael Ratcliffe, "Redefining Urban Areas following the 2020 Census," Random Samplings (December 22, 2022), U.S. Census Bureau website, Redefining Urban Areas following the 2020 Census.

of 3825 housing units per square mile to distinguish very dense core and suburban areas from lower density areas in large urban clusters.

Table 11 shows the distribution of census tracts by housing unit density from 1950 to 2020 for the continental US. Population growth has occurred in all housing unit density categories, particularly in suburbs. Living in moderately dense areas has become more the norm for urban dwellers in recent years, with roughly half the population living in areas with housing unit densities between 425 and 3,825 housing units per square mile in core and suburban areas.

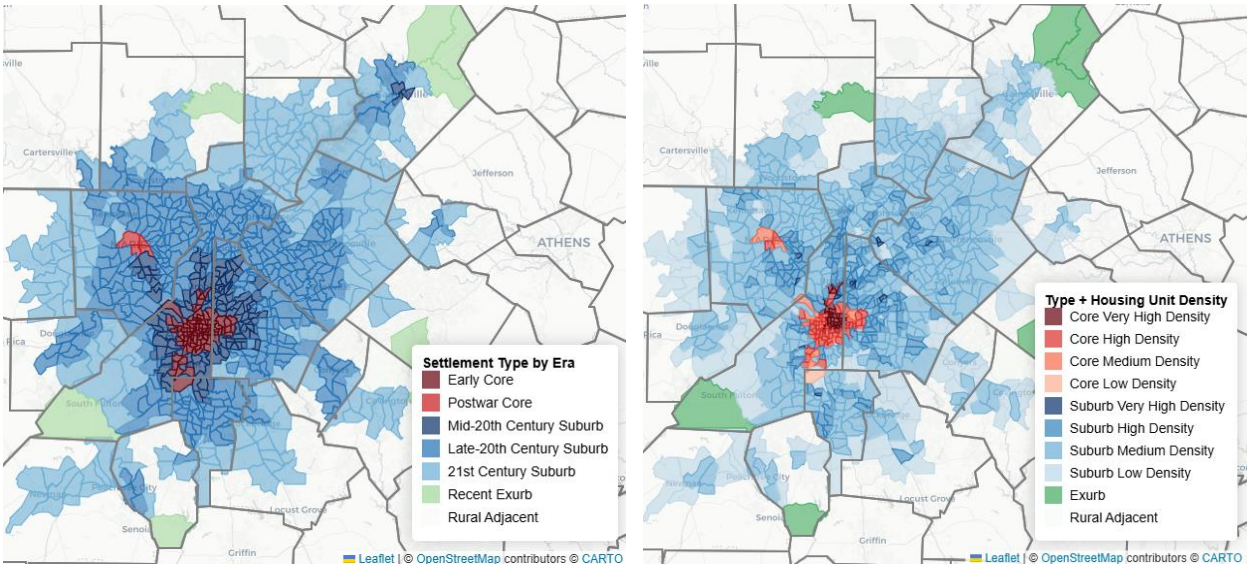
Table 11. Urban Area Housing Unit Density of Core and Suburban Census Tracts, 1950-2020

	Peak Density 3825+ hu/mi^2 Population			High Density 1275-3825 hu/mi^2 Population			Medium Density 425-1275 hu/mi^2 Population			Low Density 200-425 hu/mi^2 Population		
Year	Tracts	(millions)	Pct	Tracts	(millions)	Pct	Tracts	(millions)	Pct	Tracts	(millions)	Pct
Cores												
1950	6,344	31.9	21.2	5,874	23.7	15.8	2,160	6.4	4.2	117	0.2	0.1
1960	7,187	34.2	19.2	6,447	28.3	15.8	1,360	4.8	2.7	120	0.3	0.2
1970	7,427	30.1	14.9	6,605	27.4	13.6	1,354	4.8	2.4	153	0.4	0.2
1980	7,497	26.8	11.9	6,999	26.0	11.5	1,427	4.8	2.1	187	0.5	0.2
1990	7,460	27.0	10.9	7,361	26.5	10.7	1,668	5.5	2.2	253	0.7	0.3
2000	7,455	28.2	10.1	7,527	27.4	9.8	1,880	6.4	2.3	304	0.8	0.3
2010	7,570	28.5	9.3	7,663	27.5	9.0	2,009	7.2	2.3	328	1.0	0.3
2020	7,795	31.4	9.5	7,608	28.0	8.5	2,059	7.7	2.3	328	1.1	0.3
Suburbs												
1950	15	0.1	0.0	521	1.5	1.0	2,453	4.8	3.2	3,001	3.9	2.6
1960	102	0.4	0.2	2,965	10.4	5.8	5,042	13.1	7.4	3,539	6.0	3.3
1970	352	1.2	0.6	5,303	20.5	10.1	6,571	20.5	10.1	3,836	9.0	4.5
1980	828	2.7	1.2	8,035	29.5	13.1	7,949	26.0	11.5	4,203	11.0	4.9
1990	1,274	4.6	1.8	10,188	39.1	15.8	8,933	32.2	13.0	4,401	13.4	5.4
2000	1,487	6.4	2.3	11,806	51.1	18.3	9,741	40.3	14.4	4,417	15.9	5.7
2010	1,691	7.5	2.5	13,263	60.0	19.6	10,313	49.8	16.3	4,286	19.6	6.4
2020	1,876	9.1	2.8	13,988	68.7	20.9	10,313	56.8	17.3	4,142	22.1	6.7

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Figure 5 shows the Atlanta urban area in 2020. The left panel shows the core and suburban tracts by era, and the right panel shows the core and suburban tracts by housing unit density category. While density levels are related to the era of development, there is considerable variation in housing unit density throughout the urban area.

Figure 5. The Atlanta Urban Area by Era and by Housing Unit Density, 2020



Source: Author's analysis of data from the HHUUD10 and LTDB databases

Results

Combining the Settlement Typology with LTDB Data

The database used in this study incorporates information from the HHUUD10 database, as well as several of the variables from the Longitudinal Tract Data Base (LTDB)[14]. Where the HHUD10 database covers the period from 1940 to 2019, the LTDB database has a broad array of data covering the period from 1970 to 2020. The LTDB database provides estimates for census tracts as defined in 2010 for race and ethnicity, immigration, age, household structure, educational attainment, employment and income. The variables that have been incorporated into the database are listed in Table 12.

Using LTDB data we can look at characteristics of these area types. Table 13 shows the white non-Hispanic population and Table 14 shows the black non-Hispanic population by area type from 1970 to 2020. In general, the white non-Hispanic population is more likely to live in low-density areas. The white non-Hispanic population is in the minority in early cores and in mid-20th century suburbs and disproportionately underrepresented in postwar cores and late-20th century suburbs. This population is much more likely to reside in micropolitan cores, towns, exurbs and rural areas. The black population, by contrast, is disproportionately represented in the densest area types, particularly early cores, and underrepresented in low-density outlying areas.

[14] John Logan, "Census geography: Bridging data for census tracts across time," Diversity and Disparities, Brown University, Diversity and Disparities

Table 12. Variables available for 2010 census tracts with estimates from 1970 to 2020.

- General
  - Population
  - Housing Units
  - Area
  - Population Density
  - Housing Unit Density
- Race/Ethnicity/Nativity
  - White Population
  - Black Population
  - Hispanic Population
  - Native American Population
  - Asian Population
  - Other Population
  - Foreign-born Population
  - Immigrated in Last 10 Years
- Age
  - Population Under 18
  - Population 60 and Over
  - Population 75 and Over
- Households/Housing Units
  - Female Headed Households with Children
  - Housing Units 30+ Years Old
  - Median Home Value
  - Occupied Housing Units
  - Owner-Occupied Housing Units
- Education
  - College Degree
  - High School Education
- Employment
  - Employed Civilian Labor Force
  - Employed in a Profession
  - Employed in Manufacturing
- Income
  - Median Household Income
  - Income Per Capita
  - Living in Poverty

Table 13. The White Non-Hispanic Population by Area Type, 1970-2020

	Population (millions)						Percent					
Settlement Type	1970	1980	1990	2000	2010	2020	1970	1980	1990	2000	2010	2020
Early Core	41.2	30.6	26.6	22.8	20.9	20.3	72.6	60.7	53.8	45.6	42.5	39.6
Postwar Core	5.1	5.9	7.4	7.0	6.4	5.9	84.8	76.3	71.8	63.1	56.9	51.1
Recent Core	-	-	-	1.3	2.6	3.1	-	-	-	74.9	67.0	60.6
Mid-20th Cent. Suburb	39.1	37.0	35.3	32.3	28.9	26.7	91.5	81.1	73.7	62.9	55.2	48.7
Late-20th Cent. Suburb	8.0	20.7	33.6	38.4	37.1	35.2	94.5	87.4	81.4	71.4	61.4	53.4
21st Century Suburb	-	-	-	6.8	16.3	21.4	-	-	-	79.4	67.6	59.4
Micropolitan core	13.5	13.4	11.9	11.8	10.8	9.6	87.3	85.5	80.9	75.5	70.3	65.0
Town Proximate	4.7	5.0	4.9	5.0	4.5	4.1	89.3	89.5	85.9	81.2	78.1	72.7
Town Remote	0.9	1.0	0.8	0.7	0.6	0.4	82.2	90.1	85.6	79.4	73.9	67.2
Early Exurb	0.7	0.9	1.1	0.6	0.4	0.3	95.8	93.1	91.1	86.8	84.4	80.4
Recent Exurb	-	-	-	1.5	2.2	3.2	-	-	-	88.8	85.8	80.5
Rural Adjacent	8.8	10.9	12.4	13.4	16.1	17.1	93.4	89.4	87.2	84.5	79.4	73.6
Rural Proximate	39.7	45.9	46.3	45.6	43.5	39.2	86.7	88.0	87.0	84.3	82.0	78.6
Rural Remote	9.1	9.1	7.3	6.8	5.8	4.3	84.9	88.5	85.7	82.2	79.5	73.8
Total	170.7	180.4	187.5	193.9	196.0	191.0	84.3	80.0	75.8	69.3	63.9	58.0

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 14. The Black Non-Hispanic Population by Area Type, 1970-2020

	Population (millions)						Percent					
Settlement Type	1970	1980	1990	2000	2010	2020	1970	1980	1990	2000	2010	2020
Early Core	12.3	12.6	12.5	12.9	11.9	11.6	21.7	24.9	25.4	25.8	24.3	22.6
Postwar Core	0.6	0.9	1.1	1.3	1.4	1.5	10.7	11.7	11.0	11.8	12.3	12.8
Recent Core	-	-	-	0.2	0.4	0.6	-	-	-	9.7	11.4	12.1
Mid-20th Cent. Suburb	2.4	4.2	5.3	6.9	7.7	8.4	5.7	9.2	11.1	13.4	14.6	15.3
Late-20th Cent. Suburb	0.3	1.3	3.0	5.5	7.8	9.4	3.5	5.4	7.2	10.2	12.9	14.3
21st Century Suburb	-	-	-	0.6	2.4	4.3	-	-	-	6.6	10.1	11.8
Micropolitan core	1.2	1.3	1.4	1.6	1.6	1.6	7.7	8.5	9.8	10.1	10.5	10.9
Town Proximate	0.3	0.3	0.4	0.5	0.5	0.5	5.9	5.9	6.9	8.1	8.9	9.7
Town Remote	0.1	0.1	0.0	0.1	0.1	0.0	5.5	5.2	5.6	5.7	7.0	7.3
Early Exurb	0.0	0.0	0.1	0.0	0.0	0.0	2.2	3.0	4.2	6.2	6.3	7.3
Recent Exurb	-	-	-	0.1	0.1	0.0	-	-	-	5.1	5.8	6.2
Rural Adjacent	0.4	0.6	0.8	1.0	1.4	1.7	4.8	5.0	5.4	6.0	6.9	7.5
Rural Proximate	4.3	4.3	4.2	4.4	4.4	3.9	9.4	8.2	7.9	8.1	8.2	7.9
Rural Remote	0.7	0.5	0.4	0.4	0.3	0.3	6.2	5.3	4.4	4.4	4.2	4.6
Total	22.6	26.1	29.2	35.3	40.1	44.2	11.2	11.6	11.8	12.6	13.1	13.4

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 15. Population in Poverty by Area Type, 1970-2020

	Population (millions)						Percent					
Settlement Type	1970	1980	1990	2000	2010	2020	1970	1980	1990	2000	2010	2020
Early Core	8.3	8.7	9.4	9.6	10.4	9.4	14.7	17.8	19.6	19.7	21.8	19.2
Postwar Core	0.9	1.2	1.8	2.0	2.5	2.3	15.1	16.3	18.7	18.5	23.3	21.2
Recent Core	-	-	-	0.2	0.7	0.8	-	-	-	13.4	18.3	17.2
Mid-20th Cent. Suburb	2.9	3.5	4.6	5.6	7.7	7.3	6.9	8.1	9.9	11.1	15.0	13.7
Late-20th Cent. Suburb	0.5	1.3	2.6	3.8	6.6	6.6	5.6	5.8	6.4	7.1	11.0	10.3
21st Century Suburb	-	-	-	0.4	1.9	2.3	-	-	-	5.3	7.7	7.1
Micropolitan core	2.3	1.9	2.3	2.3	2.8	2.4	14.7	13.4	16.2	15.4	19.4	17.6
Town Proximate	0.8	0.7	0.8	0.8	1.0	0.9	14.2	12.4	15.1	13.8	17.7	17.5
Town Remote	0.2	0.2	0.2	0.1	0.1	0.1	19.3	14.9	18.2	16.0	18.5	17.0
Early Exurb	0.1	0.1	0.1	0.1	0.1	0.0	9.6	7.6	8.1	8.6	11.8	11.2
Recent Exurb	-	-	-	0.1	0.3	0.4	-	-	-	7.5	10.6	10.1
Rural Adjacent	0.7	0.8	1.1	1.1	1.9	1.9	7.7	7.2	7.6	7.3	9.6	9.0
Rural Proximate	7.8	6.5	7.3	6.4	7.6	6.7	17.3	13.7	14.0	12.2	14.9	13.9
Rural Remote	2.3	1.6	1.5	1.2	1.2	0.9	21.5	16.7	18.3	15.5	16.6	15.9
Total	26.8	26.4	31.6	33.7	44.6	42.3	13.3	12.5	13.1	12.4	14.9	13.4

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 15 shows the population in poverty by area type from 1970 to 2020. In the late-twentieth century, poverty was more common in small towns and rural areas, particularly those in remote areas. In recent decades poverty rates are generally higher in core areas, particularly postwar cores, and also in towns and micropolitan cores.

Table 16. Median Income (Standardized) by Area Type, 1970-2020

Settlement Type	1970 US=100	1980 US=100	1990 US=100	2000 US=100	2010 US=100	2020 US=100
Early Core	92.2	86.4	88.6	86.7	90.1	95.2
Postwar Core	85.9	84.4	82.1	79.5	75.2	74.7
Recent Core	-	-	-	94.0	89.4	85.4
Mid-20th Century Suburb	130.3	120.0	114.3	106.7	102.7	102.6
Late-20th Century Suburb	141.8	134.1	132.0	126.1	116.7	112.1
21st Century Suburb	-	-	-	146.2	139.6	134.9
Micropolitan core	89.9	89.3	82.4	81.1	78.2	76.2
Town Proximate	91.3	91.6	81.8	80.7	76.3	71.5
Town Remote	76.5	81.8	68.2	70.2	71.9	70.5
Early Exurb	104.6	108.1	108.9	102.3	92.7	89.0
Recent Exurb	-	-	-	111.9	105.4	100.8
Rural Adjacent	121.6	122.3	122.9	123.1	120.4	115.0
Rural Proximate	86.0	88.8	84.9	86.1	84.9	81.6
Rural Remote	73.7	77.9	69.9	73.6	77.1	75.7
National Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 16 shows the median income by area type from 1970 to 2020. The values have been standardized and the national median is set at 100. This table shows that suburban areas particularly those formed in recent years are areas of highest income in the United States. While mid-20th century suburbs have incomes above the national median, late-20th century suburbs have higher incomes and 21st century suburbs have incomes substantially above the national median. Also, somewhat surprisingly, exurbs do not have particularly high incomes. While recent exurbs have incomes somewhat over the national median, early exurbs no longer have that distinction. In fact, rural census tracts that are adjacent to urban areas have higher incomes than the national median, and higher than exurban areas.

Table 17. Population (Age 25+) with a College Degree or Higher by Area Type, 1970-2020

	Population (millions)						Percent					
Settlement Type	1970	1980	1990	2000	2010	2020	1970	1980	1990	2000	2010	2020
Early Core	3.3	4.9	6.7	8.2	10.3	12.7	10.1	16.1	21.1	25.6	31.7	36.6
Postwar Core	0.4	0.7	1.2	1.5	1.7	2.0	11.5	16.8	19.8	22.2	24.3	27.2
Recent Core	-	-	-	0.3	0.7	1.0	-	-	-	26.4	28.8	30.5
Mid-20th Cent. Suburb	3.2	5.1	7.1	8.7	10.2	12.1	14.4	19.1	22.7	25.9	29.2	32.7
Late-20th Cent. Suburb	0.8	3.2	7.7	11.5	14.1	16.8	18.4	24.8	29.3	33.0	35.1	38.0
21st Century Suburb	-	-	-	2.0	6.2	9.4	-	-	-	36.4	39.9	42.8
Micropolitan core	0.8	1.2	1.6	2.0	2.1	2.3	10.2	14.9	17.9	20.4	22.0	24.2
Town Proximate	0.2	0.4	0.5	0.7	0.7	0.8	8.4	12.3	15.3	17.8	20.0	21.2
Town Remote	0.0	0.1	0.1	0.1	0.1	0.1	7.8	11.9	14.9	17.3	19.2	23.1
Early Exurb	0.0	0.1	0.1	0.1	0.1	0.1	7.5	13.7	16.3	17.9	19.1	21.9
Recent Exurb	-	-	-	0.2	0.4	0.7	-	-	-	20.0	22.5	25.1
Rural Adjacent	0.6	1.2	2.0	2.6	3.9	4.7	12.7	18.6	21.9	25.6	29.0	31.1
Rural Proximate	1.7	3.1	4.3	5.4	6.4	6.9	7.5	11.1	12.7	15.1	17.7	19.9
Rural Remote	0.4	0.7	0.7	0.9	0.9	0.9	7.1	11.4	12.7	16.0	19.0	21.5
Total	11.5	20.6	32.1	44.2	57.8	70.4	10.7	16.2	20.3	24.4	28.5	32.1

Source: Author's analysis of data from the HHUUD10 and LTDB databases

Table 17 shows the population with a college degree or higher by area type from 1970 to 2020. By 2020 roughly one third of the population age 25 and older had attained at least a college degree. Inhabitants of early cores have disproportionately higher educational attainment than the national aver, as do all suburban area types. As with income, residents of recent suburbs stand out as having the highest levels of educational attainment. Low density and outlying area types have comparatively low levels of educational attainment.

One final note about exurbs. My assumptions were that exurbs would have high incomes and high levels of educational attainment, but that does not appear to be the case, at least by the definition of exurb that I employed in this study. What's interesting is that residents of rural tracts adjacent to urban areas appear to have higher incomes and higher levels of educational attainment than the population I identified as exurban. Either my assumptions about the characteristics that could be used to identify exurbia need to be reexamined or perhaps using census tracts as the basic geographic unit is not appropriate for identifying affluent pockets of low-density outlying developments. More work is needed on this in the future.

Conclusion

This paper introduces a settlement typology that moves beyond the urban/rural dichotomy, offering a nuanced classification of urban cores, suburbs, exurbs, and outlying cities and towns, as well as rural areas. The Historical Housing Unit and Urbanization Database 2010 (HHUUD10), with its consistent geography and longitudinal housing unit and urbanization estimates from 1940 to the present, offers a rich source of information from which to construct a detailed settlement typology with temporal comparability. The use of census tracts in 2010 provides several advantages for developing a broadly applicable settlement typology. The Longitudinal Tract Data Base (LTDB), which also uses census tracts as defined in 2010, complements HHUUD10 and increases the potential for analysis for various settlement types.

This study stands apart from other settlement typologies due to its distinctive use of longitudinal data to distinguish area types. The era in which a census tract urbanized proves to be closely linked to its housing unit and population densities. Census tracts that urbanized in earlier eras are more densely developed, while those that urbanized more recently are notably less dense. This pattern is clearly reflected in the decreasing density gradients radiating outward from urban cores.

Defining “exurbs” remains a complex endeavor, requiring consensus on their inherent characteristics—whether they are fast-growing or slow-growing, or if affluence should serve as a defining criterion. This study uses a combination of proximity to urban areas and low, stable housing unit densities within metropolitan census tracts as the defining criteria. A preliminary analysis suggests, however, that these areas are not meaningfully distinct from adjacent rural census tracts based solely on housing unit densities, indicating that perhaps census tracts are not the optimal geographic unit for this particular classification, or that alternative approaches warrant further exploration for a more robust definition of exurbs.

The unique strength of the methodology described in this paper lies in its harnessing of the rich, historical data embedded within HHUUD10 and LTDB, allowing for an unprecedented temporal depth in understanding urbanization patterns. This approach moves beyond the static classifications commonly employed and offers a dynamic framework that can be readily applied to future decennial data. By providing a consistent, historically informed, and broadly applicable settlement typology, this study provides a flexible and powerful analytical framework for researchers seeking to understand the evolving complexities of American settlement patterns.