Just How Rural or Urban are Tennessee's 95 Counties?

Finding a Measure for Policy Makers

Staff Report to Members of the
Tennessee Advisory Commission on Intergovernmental Relations

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Purdue University's Index of Relative Rurality—A Useful Measure of the Rural or Urban Character of Tennessee's 95 Counties

Sound public policy is never a one-size-fits-all proposition. State and federal agencies that work with local governments especially need to understand the different challenges that local officials face and tailor their programs to fit conditions that differ across jurisdictions. Even within a region, conditions may vary enough that the same programs will not be as effective—or even as necessary—in one locality as they are in another.

One condition that varies widely across Tennessee is how rural or urban the locale is. Programs and policies that work well for the state's urban areas may be irrelevant or counterproductive in its more rural areas, and vice versa. Serving such diverse areas effectively requires, at a minimum, an objective way to determine how urban or rural they are. But deciding how rural or urban any particular county is for public policy purposes is a daunting task. That determination may make the difference between being eligible or ineligible for many state or federal programs.

A number of measures of urbanicity or rurality have been developed by federal agencies; some are used to determine whether or how to make various programs available in particular communities. A couple of measures have been developed by academicians and used in research. Of all those available, the one developed by Dr. Brigitte S. Waldorf at Purdue University is the most flexible and, therefore, the most useful. Dr. Waldorf's methodology produces indexes of rurality (and by implication, urbanicity) for all US counties. It has a number of advantages, not the least of which is that it avoids the "threshold trap" that most of the other measures fall into.

"Ignoring the need to define rural and program eligibility carefully can compromise a program's purpose by unintentionally disqualifying targeted people and places and undermine a program by increasing its costs by entitling people and places not intended to be its beneficiaries."

Andrew M. Isserman in *In the National Interest: Defining Rural and Urban Correctly in Research and Public Policy* (2005)

The Threshold Trap

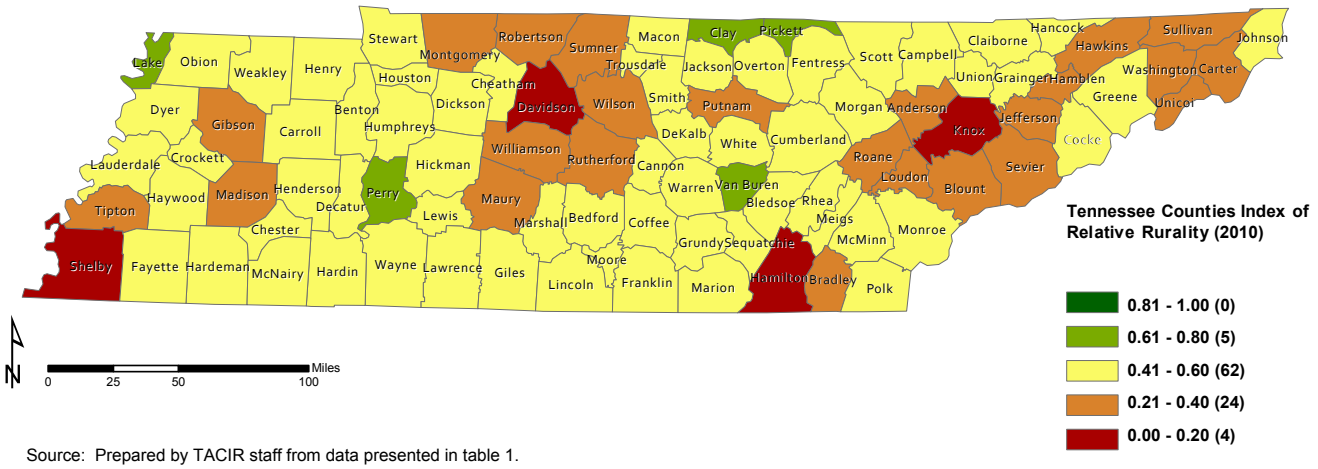
The threshold trap occurs with indexes that group counties or what have you rather than recognizing that they exist along a continuum. Breaks—or thresholds—between categorical groups imply that each county in a particular category is more similar to every other county in that category than to any county in any other category. That would rarely be the case. To understand why, review the index values for Tennessee's 95 counties in table 1 on pages 3 and 4. Focus on the list on the right side of the table where the counties are sorted based on the index. Where would you draw lines to separate counties into discrete groups? After the obvious break

between the big four counties (Shelby, Davidson, Knox, and Hamilton) and the other 91, where would the next break be? And how many breaks would you make?

Pick any break point and compare the difference between the indexes of the counties on each side of the break with the indexes of other counties within the groups created by the break. Many counties close to the break point are more similar to the counties just on the other side of the break than they are to other counties that would be in the same group. For example, say we made the next break between Sumner and Blount counties. Sumner's index is certainly closer to Bradley's than to Blount's. Likewise, Blount's index is closer to Anderson's than to Sumner's. Breaking between Sumner and Blount would seem to make sense. But looking in both directions, up the scale and down, Blount's index is closer to Madison's (three counties away, on the other side of the break) than to Carter's (three counties away on the same side of the break). If a policy or program were available only to counties on one side of the break, then counties similar to those included would be excluded. That's the threshold trap. Why break the counties into discrete categories when it's possible to create a scale that reflects the subtle differences between similar counties? Eligibility for a particular program could be based on a sliding scale rather than being a yes/no decision.

Tennessee's 95 counties sort out on Dr. Waldorf's scale, called the Index of Relative Rurality (IRR), as shown in table 1 and illustrated in maps 1a and 1b below and following table 1. A comparison of map 1a to map 1b demonstrates the "threshold trap," including how the number of thresholds matters. Counties in map 1a are divided into five groups from green (most rural) to red (most urban). In map 1b, the counties are arrayed along a continuum of 256 colors, the largest number possible with the software used to produce the maps.

Map 1a. Index of Relative Rurality for Tennessee Counties: 2010
Presented in Five Ranges from Green (Most Rural) to Red (Most Urban)



Source: Prepared by TACIR staff from data presented in table 1.

Two thirds of Tennessee's 95 counties are colored yellow in map 1a, all falling into the middle range between urban and rural, and only five are light green, the second most rural range on the IRR scale. But in map 1b (page 4), it is clear that the yellow counties in map 1a run the gamut from nearly as urban as the orange counties in map 1a to nearly as rural as the green counties in map 1a. Compare Coffee (Manchester/Tullahoma) and Moore (Lynchburg), neighboring counties in southeastern Middle Tennessee. They're the same color in map 1a but rank 8th most rural (Moore) and 66th most rural (Coffee).

A look at table 1 confirms that Coffee County's IRR is little different from 68th-ranked Hawkins County's (Rogersville; upper East Tennessee), which is orange in map 1a, the same color as Montgomery County (Clarksville), the 5th most urban (91st most rural) county in the state. These comparisons illustrate the threshold trap that occurs when counties are grouped into discrete categories. Again, the breaks between groups imply greater differences than may exist when the actual indexes for the counties are compared.[1] The color scale used in map 1b depicts the similarities and differences more accurately.

Table 1. Index of Relative Rurality for Tennessee Counties, 2010

Sorted Alphabetically						*Sorted from Most Rural to Most Urban*					
County	Index	Rank	County	Index	Rank	Rank	County	Index	Rank	County	Index
Anderson	0.316	81	Lauderdale	0.451	55	1	Pickett	0.633	49	Lawrence	0.465
Bedford	0.431	61	Lawrence	0.465	49	2	Perry	0.611	50	Lincoln	0.465
Benton	0.522	25	Lewis	0.506	33	3	Clay	0.609	51	Cheatham	0.462
Bledsoe	0.568	12	Lincoln	0.465	50	4	Lake	0.605	52	Claiborne	0.460
Blount	0.307	82	Loudon	0.353	78	5	Van Buren	0.605	53	Franklin	0.459
Bradley	0.283	84	McMinn	0.407	65	6	Jackson	0.598	54	Chester	0.451
Campbell	0.414	63	McNairy	0.514	30	7	Fentress	0.589	55	Lauderdale	0.451
Cannon	0.527	23	Macon	0.509	32	8	Moore	0.584	56	Rhea	0.450
Carroll	0.505	35	Madison	0.276	85	9	Decatur	0.577	57	Cumberland	0.448
Carter	0.345	79	Marion	0.477	40	10	Hancock	0.574	58	Warren	0.447
Cheatham	0.462	51	Marshall	0.468	47	11	Trousdale	0.571	59	Cocke	0.439
Chester	0.451	54	Maury	0.369	77	12	Bledsoe	0.568	60	Dickson	0.432
Claiborne	0.460	52	Meigs	0.554	20	13	Grundy	0.567	61	Bedford	0.431
Clay	0.609	3	Monroe	0.476	42	14	Hickman	0.565	62	Haywood	0.420
Cocke	0.439	59	Montgomery	0.237	91	15	Houston	0.565	63	Campbell	0.414
Coffee	0.405	66	Moore	0.584	8	16	Wayne	0.563	64	Greene	0.411
Crockett	0.465	48	Morgan	0.560	18	17	Stewart	0.563	65	McMinn	0.407
Cumberland	0.448	57	Obion	0.469	46	18	Morgan	0.56	66	Coffee	0.405
Davidson	0.143	94	Overton	0.556	19	19	Overton	0.556	67	Dyer	0.401
Decatur	0.577	9	Perry	0.611	2	20	Meigs	0.554	68	Hawkins	0.400
DeKalb	0.517	29	Pickett	0.633	1	21	Polk	0.546	69	Tipton	0.389
Dickson	0.432	60	Polk	0.546	21	22	Union	0.533	70	Gibson	0.389
Dyer	0.401	67	Putnam	0.375	76	23	Cannon	0.527	71	Roane	0.388
Fayette	0.478	39	Rhea	0.450	56	24	Humphreys	0.524	72	Jefferson	0.388

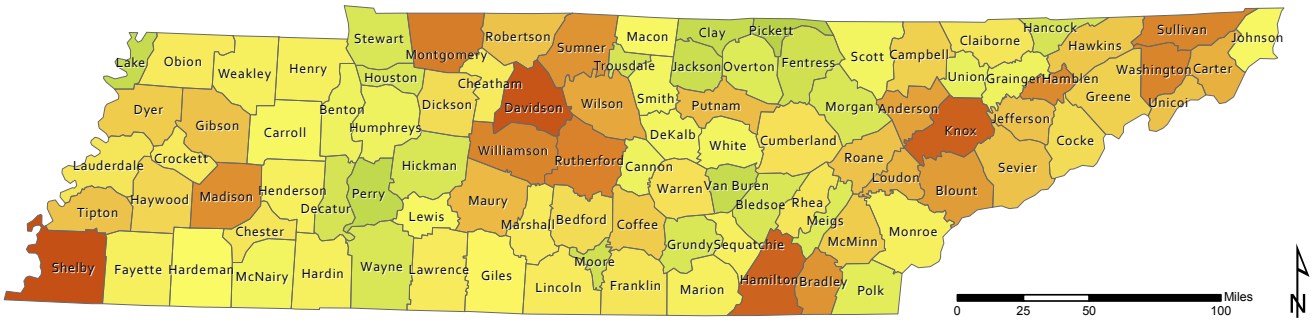
[1] A similar problem occurs with rankings, which imply the same difference between each rank (first, second, third, etc.) when differences vary, sometimes widely. Note the difference between the IRRs for Hamilton and Montgomery counties, which are only one rank apart. The difference between those two (0.051) is much greater than the difference between Montgomery and the county above it on the IRR scale (Rutherford, a difference of 0.011). Rankings obscure the variations in data and so are rarely useful for policy purposes.

Table 1. Index of Relative Rurality for Tennessee Counties, 2010

Sorted Alphabetically						*Sorted from Most Rural to Most Urban*				
County	Index	Rank	County	Index	Rank	Rank	County	Index	Rank	County	Index
Fentress	0.589	7	Roane	0.388	71	25	Benton	0.522	73	Sevier	0.385
Franklin	0.459	53	Robertson	0.384	74	26	Grainger	0.521	74	Robertson	0.384
Gibson	0.389	70	Rutherford	0.248	90	27	Smith	0.519	75	Unicoi	0.384
Giles	0.487	37	Scott	0.517	28	28	Scott	0.517	76	Putnam	0.375
Grainger	0.521	26	Sequatchie	0.480	38	29	DeKalb	0.517	77	Maury	0.369
Greene	0.411	64	Sevier	0.385	73	30	McNairy	0.514	78	Loudon	0.353
Grundy	0.567	13	Shelby	0.133	95	31	White	0.511	79	Carter	0.345
Hamblen	0.261	86	Smith	0.519	27	32	Macon	0.509	80	Wilson	0.329
Hamilton	0.186	92	Stewart	0.563	17	33	Lewis	0.506	81	Anderson	0.316
Hancock	0.574	10	Sullivan	0.251	89	34	Johnson	0.505	82	Blount	0.307
Hardeman	0.498	36	Sumner	0.289	83	35	Carroll	0.505	83	Sumner	0.289
Hardin	0.472	45	Tipton	0.389	69	36	Hardeman	0.498	84	Bradley	0.283
Hawkins	0.400	68	Trousdale	0.571	11	37	Giles	0.487	85	Madison	0.276
Haywood	0.420	62	Unicoi	0.384	75	38	Sequatchie	0.48	86	Hamblen	0.261
Henderson	0.477	41	Union	0.533	22	39	Fayette	0.478	87	Washington	0.258
Henry	0.475	43	Van Buren	0.605	5	40	Marion	0.477	88	Williamson	0.257
Hickman	0.565	14	Warren	0.447	58	41	Henderson	0.477	89	Sullivan	0.251
Houston	0.565	15	Washington	0.258	87	42	Monroe	0.476	90	Rutherford	0.248
Humphreys	0.524	24	Wayne	0.563	16	43	Henry	0.475	91	Montgomery	0.237
Jackson	0.598	6	Weakley	0.474	44	44	Weakley	0.474	92	Hamilton	0.186
Jefferson	0.388	72	White	0.511	31	45	Hardin	0.472	93	Knox	0.177
Johnson	0.505	34	Williamson	0.257	88	46	Obion	0.469	94	Davidson	0.143
Knox	0.177	93	Wilson	0.329	80	47	Marshall	0.468	95	Shelby	0.133
Lake	0.605	4				48	Crockett	0.465			

Source: Center for Rural Development, Department of Agricultural Economics, Purdue University. https://ag.purdue.edu/agecon/Pages/CRD.aspx.

Map 1b. Index of Relative Rurality for Tennessee Counties: 2010
Presented on a Continuous Scale from Green (Most Rural) to Red (Most Urban)



Tennessee Counties: Index of Relative Rurality (2010)

More Rural (1.0) ← → More Urban (0.0)

Source: Prepared by TACIR staff from data presented in table 1.

It should be noted that these maps are simply an illustration. We recommend using the entire scale as shown in table 1 and avoiding the thresholds suggested by either map. Lines may have to be drawn when determining eligibility for publicly funded programs, but those lines should be drawn independently for each program based on their characteristics and goals, not based on rigid, arbitrary thresholds between counties.

Limitations of the OMB's Metro-Micro System

Another advantage the index developed at Purdue has over measures produced, for instance, by the US Department of Agriculture (USDA), is that it is not based on the White House's Office of Management and Budget's (OMB) metro-micro system. The OMB itself cautions that its statistical area standards "do not equate to an urban-rural classification."[2] The OMB's metropolitan and micropolitan statistical areas are based on population concentration and commuting patterns. Each statistical area includes a core county or counties based on population concentration, and outlying counties are added based solely on commuting patterns. The outlying counties may be as sparsely populated—and as rural—as counties that are not attached to any metro- or micropolitan statistical area. Nevertheless, the USDA's Economic Research Service bases its county-level rurality codes on the OMB's statistical areas and uses the results to determine eligibility for federal programs.[3]

Starting with the OMB's definitions complicates attempts to define rural by separating similarly rural counties at the outset into metro- or micropolitan areas or non-metro/micro areas. For example, according to the OMB, Hickman County in Middle Tennessee is part of the OMB's Nashville-Davidson–Murfreesboro–Franklin Metropolitan Statistical Area. Is Hickman County, with only one incorporated town and only 40.3 people per square mile truly metropolitan? Few who live or work there would consider it so in the usual sense of a large, busy, sophisticated city. Likewise, Morgan County, with a population density of only 42.1 people per square mile but now part of the Knoxville Metropolitan Statistical Area, would not otherwise be considered metropolitan in nature. See map 2. In fact, each of these counties ranks among those with the highest or most rural IRRs in Tennessee (see table 1 and map 1b).

Clearly, inclusion in one of the OMB's metropolitan statistical areas is not, by itself, an indication of how urban a county is. More importantly, making the first cut based on inclusion in one of the OMB's metro areas when sorting counties based on how rural they are creates nonsensical

Programs that seek to strengthen rural economies by focusing solely on counties located outside Metropolitan Statistical Areas could ignore a predominantly rural county that is included in a Metropolitan Statistical Area because a high percentage of the county's residents commute to urban centers for work. Although the inclusion of such a county in a Metropolitan Statistical Area indicates the existence of economic ties, as measured by commuting, with the central counties of that Metropolitan Statistical Area, it may also indicate a need to provide programs that would strengthen the county's rural economy so that workers are not compelled to leave the county in search of jobs.

[2] Executive Office of the President, Office of Management and Budget. 2009.
[3] For more information about the ERS rurality measures, see explanations online at http://www.ers.usda.gov/topics/rural-economy-population/rural-classifications.aspx.

Map 2. Metropolitan and Micropolitan Statistical Areas of Tennessee, 2010

2010 Census Urban and Rural Classification

- Urban: Urbanized Areas (UAs) of 50,000 or more people and Urban Clusters (UCs) of at least 2,500 and less than 50,000 people
- Rural: Encompasses all population, housing, and territory not included within an urban area
- Metropolitan Statistical Areas
- Micropolitan Statistical Areas

Source: Prepared by TACIR staff from US Census Bureau and Office of Management and Budget data.

distinctions. Given the OMB's own caution about not equating its standards to an urban-rural classification, we think that should be avoided. Even so, the inclusion of a particular rural county in an OMB-designated metro area may be useful information when establishing policies based on access to the amenities of central cities and, therefore, should not be ignored.

Choosing a Measure of Urban or Rural Character for Tennessee's 95 Counties

Determining how rural or urban any particular county is for public policy purposes is a daunting task. Yet that determination may make the difference between being eligible or ineligible for many state or federal programs. The purpose of this report is not to criticize eligibility decisions that hinge on classifications based on the OMB's metro/micro system but to evaluate those classifications and alternatives in hopes of finding a more satisfactory alternative. For this report, TACIR staff evaluated several approaches, four federal and two academic. The federal approaches include the US Census Bureau's urban and rural population estimates plus three classification schemes developed by the USDA's Economic Research Service to measure rurality and assess the economic and social diversity of rural America. The two academic measures are the rural-urban density typology developed by Dr. Andrew Isserman at the University of Illinois and the index of relative rurality created by Dr. Brigitte S. Waldorf at Purdue University's Center for Regional Development. Staff also reviewed the OMB's delineation of statistical areas, which are the basis of several of the urban-rural measures.

"That an entirely rural county is integrated economically with nearby cities is an important fact, but it cannot negate another important fact: the county is rural."

Andrew Isserman in *In the National Interest: Defining Rural and Urban Correctly in Research and Public Policy* (2005)

Federal Approaches to Determining Urbanicity and Rurality

The Office of Management and Budget's Metro-Micro System

The OMB defines metropolitan and micropolitan statistical areas, combined statistical areas, and New England city and town areas to provide a nationally consistent set of geographic areas for collecting, tabulating, and publishing federal statistics. As map 2 illustrates, these areas often cross state lines. The OMB explicitly states that its statistical area standards "do not equate to an urban-rural classification; many counties included in metropolitan and micropolitan statistical areas, and many other counties, contain both urban and rural territory and populations." The OMB further cautions that

> Metropolitan Statistical Area and Micropolitan Statistical Area definitions should not be used to develop and implement federal, state, and local non-statistical

> programs and policies without full consideration of the effects of using these definitions for such purposes. These areas are not intended to serve as a general-purpose geographic framework for non-statistical activities, and they may or may not be suitable for use in program funding formulas. . . . In cases where there is no statutory requirement and an agency elects to use the Metropolitan, Micropolitan, or Combined Statistical Area definitions in non-statistical programs, it is the sponsoring agency's responsibility to ensure that the definitions are appropriate for such use.[4]

The general concept of the OMB's metropolitan and micropolitan statistical areas is that they contain a recognized population nucleus plus adjacent communities that are highly integrated with that nucleus. More specifically, these areas consist of "at least one core of 10,000 or more population plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties." These core-based statistical areas (CBSAs) may be deemed metropolitan if they have a Census-Bureau-defined urbanized area with 50,000 or more residents or micropolitan if they have a Census-Bureau-defined urban cluster with at least 10,000 residents.

Included in these CBSAs are central counties and outlying counties. Central counties have either

- at least 50% of their population in urban areas with at least 10,000 residents or
- a population within their boundaries of at least 5,000 in a single urban area with at least 10,000 residents.[5]

Some OMB statistical areas, like the Nashville-Davidson–Murfreesboro–Franklin Metropolitan Statistical Area, have multiple cores. See table 2.

Additional counties are deemed part of the statistical area if 25% or more of their employed residents commute to the core counties for work or if 25% or more of their workforce lives in the core counties.[6] These counties may or may not have a substantial urban population. In fact, they may have no urban population at all. This is the case with Hickman County, which is part of the Nashville-Davidson–Murfreesboro–Franklin Metropolitan Statistical Area because approximately 70% of its employed residents commute to the core counties for work.

Additional counties are deemed part of the statistical area if 25% or more of their employed residents commute to the core counties for work or if 25% or more of their workforce lives in the core counties. These counties may or may not have a substantial urban population. In fact, they may have no urban population at all.

[4] Executive Office of the President, Office of Management and Budget. 2009.
[5] Executive Office of the President, Office of Management and Budget. 2000.
[6] Executive Office of the President, Office of Management and Budget. 2010.

Table 2. Tennessee's Metropolitan and Micropolitan Statistical Areas, 2013

	Principal Cities	Counties
Metropolitan Statistical Areas (42 Tennessee counties)		
Chattanooga, TN-GA	Chattanooga, TN	Catoosa, GA; Dade, GA; Walker, GA; Hamilton, TN; Marion, TN; Sequatchie, TN
Clarksville, TN-KY	Clarksville, TN	Christian, KY; Trigg, KY; Montgomery, TN
Cleveland, TN	Cleveland	Bradley, Polk
Jackson, TN	Jackson	Chester, Crockett, Madison
Johnson City, TN	Johnson City	Carter, Unicoi, Washington
Kingsport-Bristol-Bristol, TN-VA	Kingsport, TN; Bristol, TN; Bristol, VA	Hawkins, TN; Sullivan, TN; Scott, VA; Washington, VA; Bristol City, VA
Knoxville, TN	Knoxville	Anderson, Blount, Campbell, Grainger, Knox, Loudon, Morgan, Roane, Union
Memphis, TN-MS-AR	Memphis, TN	Crittenden, AR; DeSoto, MS; Marshall, MS; Tate, MS; Tunica, MS; Fayette, TN; Shelby, TN; Tipton, TN
Morristown, TN	Morristown	Hamblen, Jefferson
Nashville-Davidson-Murfreesboro-Franklin, TN	Nashville-Davidson, Murfreesboro, Franklin	Cannon, Cheatham, Davidson, Dickson, Hickman, Macon, Maury, Robertson, Rutherford, Smith, Sumner, Trousdale, Williamson, Wilson
Micropolitan Statistical Areas (20 Tennessee counties)		
Athens, TN	Athens	McMinn
Cookeville, TN	Cookeville	Jackson, Overton, Putnam
Crossville, TN	Crossville	Cumberland
Dayton, TN	Dayton	Rhea
Dyersburg, TN	Dyersburg	Dyer
Greeneville, TN	Greeneville	Greene
Lawrenceburg, TN	Lawrenceburg	Lawrence
Lewisburg, TN	Lewisburg	Marshall
Martin, TN	Martin	Weakley
McMinnville, TN	McMinnville	Warren
Newport, TN	Newport	Cocke
Paris, TN	Paris	Henry
Sevierville, TN	Sevierville	Sevier
Shelbyville, TN	Shelbyville	Bedford
Tullahoma, TN	Tullahoma	Coffee, Franklin, Moore
Union City, TN-KY	Union City, TN	Fulton, KY; Obion, TN

Source: Prepared by TACIR staff from US Office of Management and Budget data.

The Census Bureau's Urban Areas

So what is an urban area, the starting point for the OMB's metro-micro system? The US Census Bureau classifies the nation's population as urban or rural based mainly on population density determined at the census block and tract level. Counties may include both urban and rural populations, and most do. Even the two most densely populated counties in Tennessee, Davidson and Shelby, are not entirely urban, though 20 Tennessee counties are entirely rural.

Map 3 illustrates the density of Tennessee's 95 counties with colors ranging from orange for the most densely populated counties to dark green for the most sparsely populated counties. Throughout this report, the scales and legends used for maps are based on all US counties in order to show how urban or rural Tennessee's counties are when compared with all counties in the country. Map 3 is an exception because the extreme density of the counties that make up the city of New York would make most US counties appear to be rural. For map 3, the upper end of the scale is based on the most densely populated county or county equivalent as defined by the US Census Bureau in the states adjacent to Tennessee, which is Alexandria, Virginia. Figure 1 on page 11 more clearly illustrates the range and variation of Tennessee counties and demonstrates that most are not very densely populated. Table 3, which follows that chart, lists the counties and their populations per square mile, the measure of density displayed in map 3.

Unfortunately, county-area density obscures the settlement patterns within counties and gives no indication of how many people within each county live in densely populated areas. As a result, most of Tennessee is depicted in map 3 as almost uniformly green, or rural. Even the big four

Map 3. Population Density of Tennessee Counties, 2010
Presented on a Continuous Scale from Green (Less Dense) to Red (Denser)

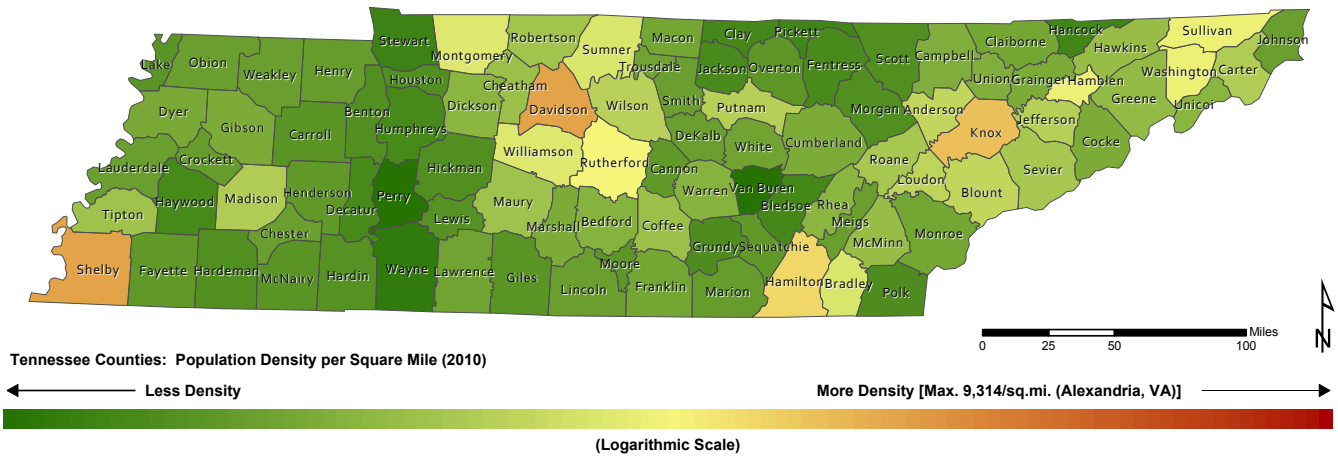
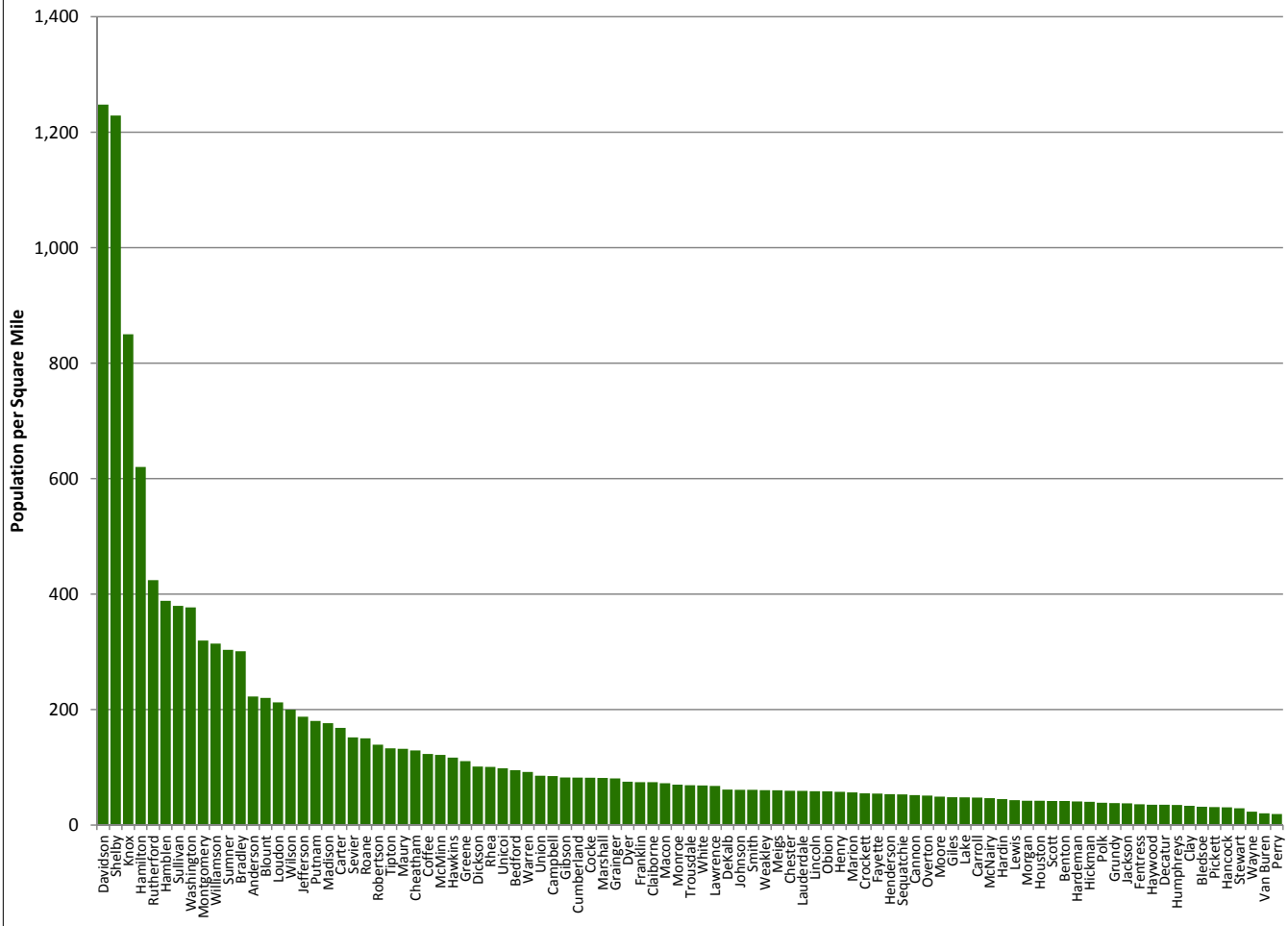


Figure 1. Population per Square Mile of Tennessee Counties, 2010*



Source: Prepared by TACIR staff from US Census Bureau data.
* Table 3 lists the counties and their populations per square mile.

counties appear not to be very urban. Fortunately, the Census Bureau has a method for distinguishing urban areas at the sub-county level. For the 2010 Census, an urban area comprises

> a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core.

To qualify as an urban area, the territory identified according to the criteria must include at least 2,500 residents at least 1,500 of whom live outside

Table 3. Population per Square Mile of Tennessee Counties, 2000 and 2010

County	Population Density				Change in Density			
	2000	Rank	2010	Rank	Number	Rank	Percent	Rank
Anderson	211.3	13	222.6	13	11.3	26	5.3%	57
Bedford	79.3	38	95.1	34	15.8	21	19.9%	11
Benton	41.9	74	41.8	78	-0.1	88	-0.3%	88
Bledsoe	30.4	90	31.7	89	1.3	75	4.1%	65
Blount	189.5	14	220.2	14	30.8	14	16.2%	15
Bradley	267.6	9	301	12	33.5	12	12.5%	23
Campbell	83.0	35	84.8	37	1.8	71	2.2%	77
Cannon	48.3	66	51.9	66	3.7	53	7.6%	44
Carroll	49.2	63	47.6	71	-1.6	93	-3.2%	93
Carter	166.4	16	168.4	20	2.0	70	1.2%	80
Cheatham	118.6	23	129.2	26	10.5	29	8.9%	37
Chester	53.9	62	59.4	56	5.5	42	10.2%	29
Claiborne	68.8	44	74.2	45	5.4	43	7.9%	42
Clay	33.8	86	33.3	88	-0.5	89	-1.4%	89
Cocke	77.3	39	82.1	40	4.8	45	6.2%	52
Coffee	111.9	27	123.1	27	11.1	27	10.0%	31
Crockett	54.8	61	55.0	62	0.2	83	0.4%	84
Cumberland	68.7	45	82.2	39	13.6	23	19.8%	12
Davidson	1,134.7	2	1,247.7	1	113.1	2	10.0%	30
Decatur	35.1	85	35.2	86	0.1	86	0.2%	86
DeKalb	57.2	55	61.5	51	4.3	51	7.5%	46
Dickson	88.1	34	101.4	31	13.3	24	15.1%	18
Dyer	73.0	41	75.1	43	2.1	69	2.8%	73
Fayette	40.9	75	54.5	63	13.6	22	33.4%	3
Fentress	33.3	88	36.0	84	2.7	61	8.0%	41
Franklin	71.0	43	74.2	44	3.2	58	4.5%	61
Gibson	79.9	36	82.4	38	2.5	62	3.2%	72
Giles	48.2	67	48.3	69	0.1	87	0.1%	87
Grainger	73.7	40	80.8	42	7.1	37	9.7%	33
Greene	101.2	30	110.7	30	9.5	32	9.4%	34
Grundy	39.7	78	38.0	82	-1.7	94	-4.4%	94
Hamblen	360.9	6	388.4	6	27.4	15	7.6%	45
Hamilton	567.6	4	620.2	4	52.7	7	9.3%	35
Hancock	30.5	89	30.7	91	0.1	84	0.5%	83
Hardeman	42.1	73	40.8	79	-1.3	92	-3.0%	92
Hardin	44.3	70	45.0	73	0.8	79	1.8%	78
Hawkins	110.1	29	116.8	29	6.7	38	6.1%	53
Haywood	37.1	81	35.2	85	-1.9	95	-5.1%	95
Henderson	49.1	64	53.4	64	4.3	49	8.8%	38
Henry	55.4	59	57.6	60	2.2	65	3.9%	67

Table 3. Population per Square Mile of Tennessee Counties, 2000 and 2010

County	Population Density				Change in Density			
	2000	Rank	2010	Rank	Number	Rank	Percent	Rank
Hickman	36.4	83	40.3	80	3.9	52	10.7%	28
Houston	40.4	76	42.1	76	1.7	73	4.2%	64
Humphreys	33.7	87	34.8	87	1.1	76	3.4%	70
Jackson	35.6	84	37.7	83	2.1	66	6.0%	55
Jefferson	161.8	18	187.7	17	26.0	16	16.1%	16
Johnson	58.6	53	61.1	52	2.5	64	4.3%	63
Knox	751.3	3	850.0	3	98.7	3	13.1%	22
Lake	48.7	65	47.9	70	-0.7	90	-1.5%	90
Lauderdale	57.6	54	59.1	57	1.5	74	2.6%	75
Lawrence	64.7	47	67.8	50	3.1	59	4.9%	59
Lewis	40.3	77	43.1	74	2.8	60	7.0%	49
Lincoln	55.0	60	58.5	58	3.5	55	6.4%	51
Loudon	171.0	15	212.4	15	41.4	10	24.2%	7
McMinn	113.9	25	121.5	28	7.6	35	6.6%	50
McNairy	44.0	71	46.6	72	2.5	63	5.8%	56
Macon	66.4	46	72.4	46	6.1	40	9.1%	36
Madison	164.8	17	176.4	19	11.6	25	7.0%	48
Marion	55.6	58	56.5	61	0.9	77	1.7%	79
Marshall	71.3	42	81.6	41	10.3	31	14.4%	20
Maury	113.4	26	132.1	25	18.7	20	16.5%	14
Meigs	56.9	56	60.3	55	3.4	57	6.0%	54
Monroe	61.3	49	70.1	47	8.7	34	14.3%	21
Montgomery	250.0	10	319.6	9	69.7	5	27.9%	5
Moore	44.4	69	49.3	68	4.8	46	10.8%	27
Morgan	37.8	80	42.1	75	4.3	50	11.3%	26
Obion	59.5	52	58.4	59	-1.2	91	-2.0%	91
Overton	46.4	68	51.0	67	4.5	48	9.8%	32
Perry	18.4	95	19.1	95	0.7	80	3.7%	68
Pickett	30.4	91	31.2	90	0.8	78	2.7%	74
Polk	36.9	82	38.7	81	1.8	72	4.8%	60
Putnam	155.4	20	180.4	18	25	17	16.1%	17
Rhea	89.9	32	100.7	32	10.8	28	12.0%	24
Roane	143.8	21	150.1	22	6.3	39	4.4%	62
Robertson	114.2	24	139.1	23	24.9	18	21.8%	10
Rutherford	294.1	8	424.3	5	130.2	1	44.3%	2
Scott	39.7	79	41.8	77	2.1	68	5.2%	58
Sequatchie	42.8	72	53.1	65	10.3	30	24.1%	8
Sevier	120.2	22	151.8	21	31.6	13	26.3%	6
Shelby	1,188.9	1	1,228.90	2	40.0	11	3.4%	71
Smith	56.3	57	61.0	53	4.6	47	8.2%	40

Table 3. Population per Square Mile of Tennessee Counties, 2000 and 2010

County	Population Density				Change in Density			
	2000	Rank	2010	Rank	Number	Rank	Percent	Rank
Stewart	27.0	92	29.1	92	2.1	67	7.7%	43
Sullivan	370.5	5	379.7	7	9.1	33	2.5%	76
Sumner	246.4	11	303.5	11	57.0	6	23.1%	9
Tipton	111.6	28	133.0	24	21.4	19	19.1%	13
Trousdale	63.5	48	68.9	48	5.3	44	8.4%	39
Unicoi	94.9	31	98.4	33	3.5	56	3.7%	69
Union	79.7	37	85.5	36	5.8	41	7.3%	47
Van Buren	20.1	94	20.3	94	0.1	85	0.7%	82
Warren	88.5	33	92.1	35	3.6	54	4.1%	66
Washington	328.6	7	377.0	8	48.4	8	14.7%	19
Wayne	22.9	93	23.2	93	0.2	81	1.1%	81
Weakley	60.1	51	60.4	54	0.2	82	0.4%	85
White	61.3	50	68.6	49	7.3	36	11.9%	25
Williamson	217.3	12	314.4	10	97.0	4	44.7%	1
Wilson	155.6	19	199.8	16	44.1	9	28.4%	4
Tennessee	**138.0**		**154.0**		**15.9**		**11.5%**	

institutional group quarters.[7] The Census Bureau identifies two types of urban areas:

- urbanized areas (UAs) of 50,000 or more people
- urban clusters (UCs) of at least 2,500 and less than 50,000 people

The bureau defines rural as, well, everything else.[8] A note of warning about this similar to the OMB's warning about its metro/micro area classifications was posted on the bureau's 2000 urban and rural classification page:

> The Census Bureau identifies and tabulates data for the urban and rural populations and their associated areas solely for the presentation and comparison of census statistical data. If a federal, state, local, or tribal agency uses these urban and rural criteria in a non-statistical program, it is that agency's responsibility to ensure that the results are appropriate for such use. It also is that agency's responsibility to ensure that it has provided the necessary tools for use in that agency's programs.[9]

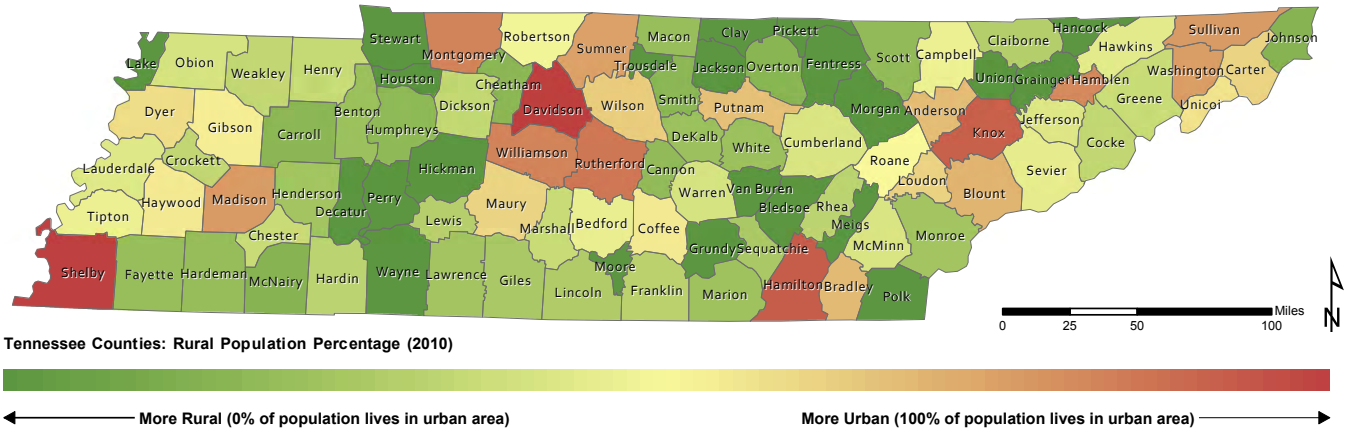
[7] Group quarters are places where people live or stay other than the usual house, apartment, or mobile home. Two general types of group quarters are recognized: institutional (for example, nursing homes, mental hospitals or wards, hospitals or wards for chronically ill patients, hospices, and prison wards) and non-institutional (for example, college or university dormitories, military barracks, group homes, shelters, missions, and flophouses). https://www.census.gov/popest/about/terms/housing.html accessed online 5 July 2016.

[8] See 2010 Census Urban and Rural Classification and Urban Area Criteria at http://www.census.gov/geo/reference/ua/urban-rural-2010.html accessed online 18 March 2014.

[9] See Census 2000 Urban and Rural Classification at http://www.census.gov/geo/reference/ua/urban-rural-2000.html accessed online 18 March 2014.

As map 4 indicates, most Tennessee counties remained primarily rural even in 2010. In fact, the entire population of 20 Tennessee counties was rural in 2010 according to the US Census Bureau. Another 21 were more than three quarters rural, and all told, the populations of some 70 counties were more than 50% rural. Only eight counties are more than three-quarters urban: Shelby, Davidson, Hamilton, Knox, Rutherford, Williamson, Montgomery, and Hamblen. Only Shelby and Davidson were more than 90% urban. The chart on the following page illustrates the full range of rural population percentages for all 95 counties.

Map 4. Percent Rural Population of Tennessee Counties, 2010
Presented on a Continuous Scale from Green (More Rural) to Red (More Urban)

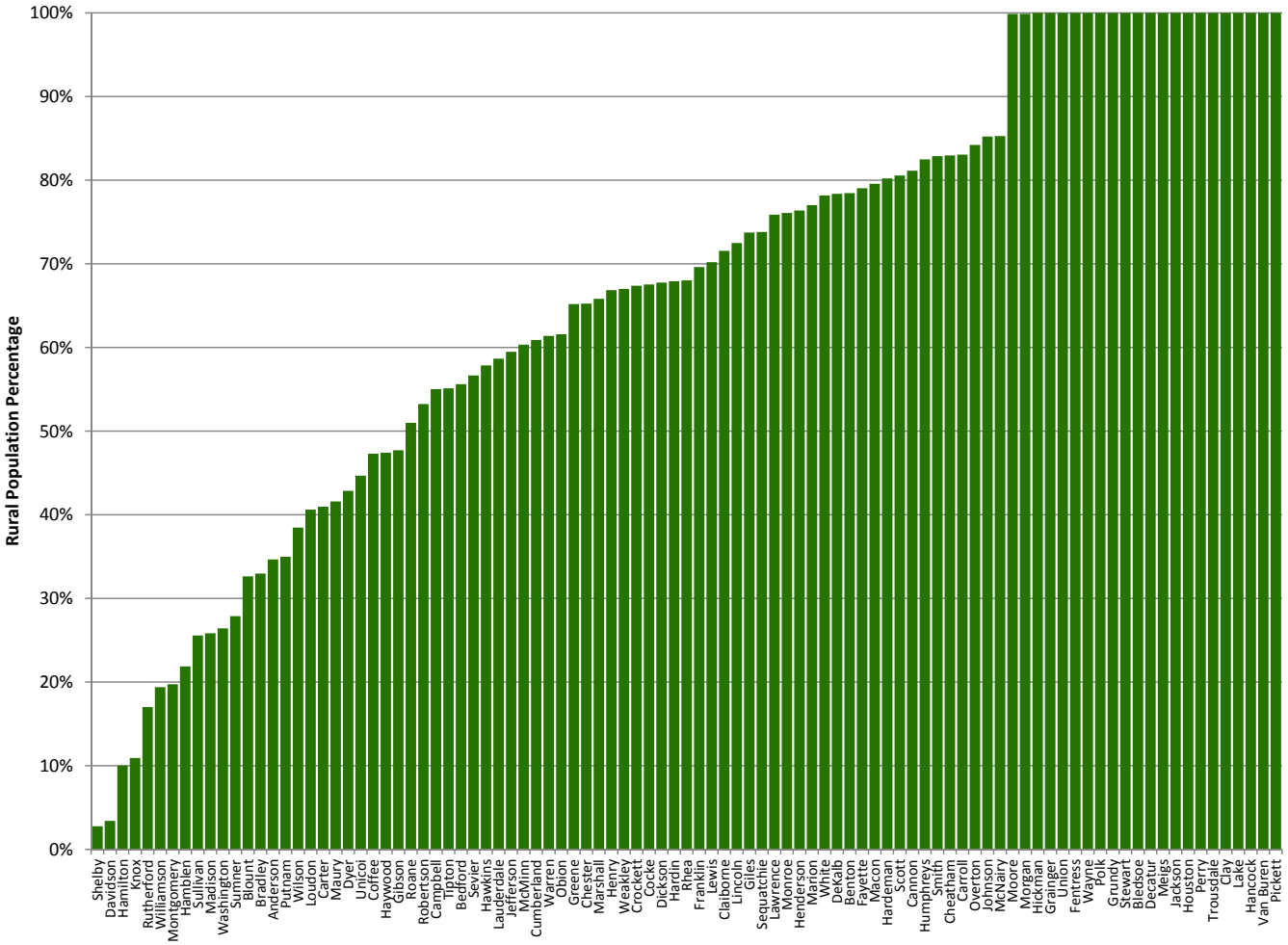


Source: Prepared by TACIR staff from US Census Bureau data.

Comparing maps 3 and 4 brings home the point made earlier about settlement patterns within counties, that county-area density obscures them and gives no indication of how many people within each county live in densely populated areas. The urban nature of the big four counties is more clearly apparent in map 4 as is the relatively urban nature of many of the counties adjacent to them as well as the counties that are home to Tennessee's medium-sized cities such as Madison (Jackson) and Montgomery (Clarksville). The remainder of the counties are not as uniformly green because, although they are generally sparsely populated, many have small urban populations within them.

Even though most of the state's 95 counties remain largely rural, only about a third of Tennessee's total population is rural, decreasing slightly from about 36.4% of the state total in 2000 to 33.6% in 2010, as 90% of the population growth during the past decade occurred in what are now defined as urban or urbanizing areas. Seventeen counties became more rural in that decade, and 20 remained entirely rural. The two biggest increases in the rural population percentages, those in Hardeman and Morgan counties, resulted at least partly from definitional changes that

Figure 2. Rural Population Percentage of Tennessee Counties, 2010*



Source: Prepared by TACIR staff from US Census Bureau data.
*Table 4 lists the counties and their urban and rural population percentages.

now exclude prison populations when defining urban areas.[10] At the same time, the urban percentages for seven counties—Crockett, Sequatchie, Fayette, Cannon, Jefferson, Tipton, and Cheatham—grew more than ten points. All seven are part of metropolitan areas because 25% or more of their employed residents commute to the core counties of those metro areas for work. Yet despite these large increases and their location within metro areas, all seven remain predominately rural by the Census Bureau's definition. See table 4 and map 5.

[10] For changes in the Census Bureau's criteria for urban and rural areas, see http://www2.census.gov/geo/pdfs/reference/ua/2000_2010uadif.pdf, accessed online 17 July 2014.

Table 4. Urban and Rural Population of Tennessee Counties, 2000 and 2010

County	2000 Population				2010 Population				Change in Urban Share of County	
	Total	Urban	Rural	% Rural	Total	Urban	Rural	% Rural	Percentage Points	Rank
Anderson	71,330	42,056	29,274	41.0%	75,129	49,088	26,041	34.7%	6.4%	14
Bedford	37,586	15,312	22,274	59.3%	45,058	20,005	25,053	55.6%	3.7%	26
Benton	16,537	3,654	12,883	77.9%	16,489	3,552	12,937	78.5%	-0.6%	82
Bledsoe	12,367	0	12,367	100.0%	12,876	0	12,876	100.0%	0.0%	59
Blount	105,823	67,114	38,709	36.6%	123,010	82,870	40,140	32.6%	3.9%	23
Bradley	87,965	58,439	29,526	33.6%	98,963	66,333	32,630	33.0%	0.6%	48
Campbell	39,854	17,478	22,376	56.1%	40,716	18,313	22,403	55.0%	1.1%	39
Cannon	12,826	0	12,826	100.0%	13,801	2,604	11,197	81.1%	18.9%	4
Carroll	29,475	4,957	24,518	83.2%	28,522	4,832	23,690	83.1%	0.1%	58
Carter	56,742	34,081	22,661	39.9%	57,424	33,900	23,524	41.0%	-1.0%	85
Cheatham	35,912	2,432	33,480	93.2%	39,105	6,663	32,442	83.0%	10.3%	7
Chester	15,540	5,244	10,296	66.3%	17,131	5,954	11,177	65.2%	1.0%	42
Claiborne	29,862	8,920	20,942	70.1%	32,213	9,163	23,050	71.6%	-1.4%	87
Clay	7,976	0	7,976	100.0%	7,861	0	7,861	100.0%	0.0%	59
Cocke	33,565	10,918	22,647	67.5%	35,662	11,579	24,083	67.5%	-0.1%	79
Coffee	48,014	25,175	22,839	47.6%	52,796	27,829	24,967	47.3%	0.3%	55
Crockett	14,532	0	14,532	100.0%	14,586	4,758	9,828	67.4%	32.6%	1
Cumberland	46,802	14,547	32,255	68.9%	56,053	21,921	34,132	60.9%	8.0%	11
Davidson	569,891	543,955	25,936	4.6%	626,681	605,299	21,382	3.4%	1.1%	38
Decatur	11,731	0	11,731	100.0%	11,757	0	11,757	100.0%	0.0%	59
DeKalb	17,423	3,678	13,745	78.9%	18,723	4,050	14,673	78.4%	0.5%	50
Dickson	43,156	13,453	29,703	68.8%	49,666	16,016	33,650	67.8%	1.1%	41
Dyer	37,279	20,673	16,606	44.5%	38,335	21,903	16,432	42.9%	1.7%	36
Fayette	28,806	0	28,806	100.0%	38,413	8,050	30,363	79.0%	21.0%	3
Fentress	16,625	0	16,625	100.0%	17,959	0	17,959	100.0%	0.0%	59
Franklin	39,270	11,737	27,533	70.1%	41,052	12,473	28,579	69.6%	0.5%	52
Gibson	48,152	24,267	23,885	49.6%	49,683	25,977	23,706	47.7%	1.9%	35
Giles	29,447	7,632	21,815	74.1%	29,485	7,741	21,744	73.7%	0.3%	54
Grainger	20,659	0	20,659	100.0%	22,657	0	22,657	100.0%	0.0%	59
Greene	62,909	19,443	43,466	69.1%	68,831	23,957	44,874	65.2%	3.9%	25
Grundy	14,332	0	14,332	100.0%	13,703	0	13,703	100.0%	0.0%	59
Hamblen	58,128	43,131	14,997	25.8%	62,544	48,864	13,680	21.9%	3.9%	24

Table 4. Urban and Rural Population of Tennessee Counties, 2000 and 2010

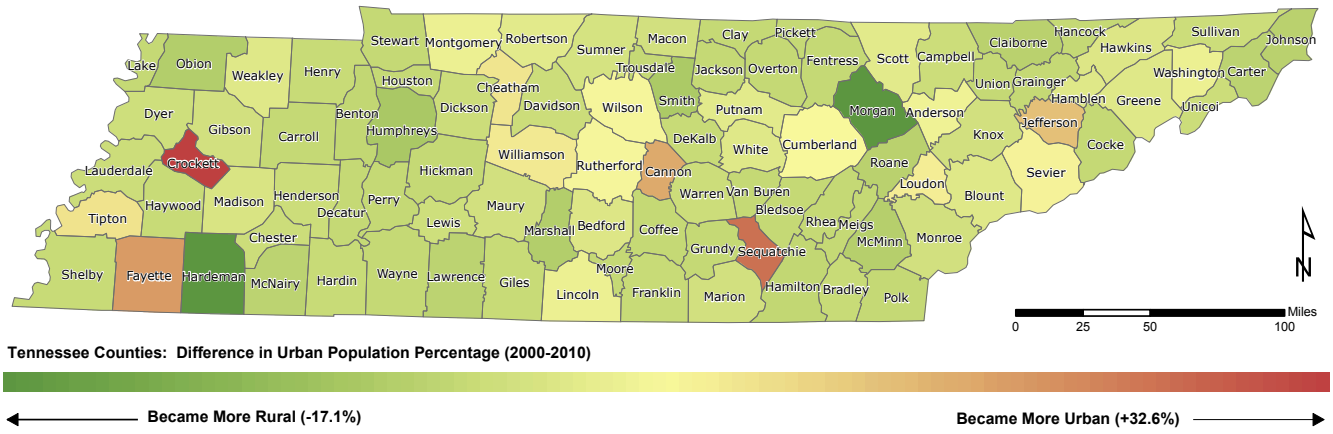
County	2000 Population				2010 Population				Change in Urban Share of County	
	Total	Urban	Rural	% Rural	Total	Urban	Rural	% Rural	Percentage Points	Rank
Hamilton	307,896	277,882	30,014	9.7%	336,463	302,742	33,721	10.0%	-0.3%	81
Hancock	6,786	0	6,786	100.0%	6,819	0	6,819	100.0%	0.0%	59
Hardeman	28,105	10,305	17,800	63.3%	27,253	5,394	21,859	80.2%	-16.9%	94
Hardin	25,578	8,002	17,576	68.7%	26,026	8,347	17,679	67.9%	0.8%	47
Hawkins	53,563	20,671	32,892	61.4%	56,833	23,949	32,884	57.9%	3.5%	27
Haywood	19,797	10,309	9,488	47.9%	18,787	9,879	8,908	47.4%	0.5%	51
Henderson	25,522	5,799	19,723	77.3%	27,769	6,560	21,209	76.4%	0.9%	46
Henry	31,115	10,209	20,906	67.2%	32,330	10,718	21,612	66.8%	0.3%	53
Hickman	22,295	0	22,295	100.0%	24,690	0	24,690	100.0%	0.0%	59
Houston	8,088	0	8,088	100.0%	8,426	0	8,426	100.0%	0.0%	59
Humphreys	17,929	3,814	14,115	78.7%	18,538	3,246	15,292	82.5%	-3.8%	93
Jackson	10,984	0	10,984	100.0%	11,638	0	11,638	100.0%	0.0%	59
Jefferson	44,294	10,951	33,343	75.3%	51,407	20,826	30,581	59.5%	15.8%	5
Johnson	17,499	2,857	14,642	83.7%	18,244	2,698	15,546	85.2%	-1.5%	88
Knox	382,032	332,094	49,938	13.1%	432,226	385,021	47,205	10.9%	2.2%	31
Lake	7,954	0	7,954	100.0%	7,832	0	7,832	100.0%	0.0%	59
Lauderdale	27,101	10,946	16,155	59.6%	27,815	11,498	16,317	58.7%	0.9%	44
Lawrence	39,926	9,987	29,939	75.0%	41,869	10,100	31,769	75.9%	-0.9%	83
Lewis	11,367	3,201	8,166	71.8%	12,161	3,625	8,536	70.2%	1.6%	37
Lincoln	31,340	6,746	24,594	78.5%	33,361	9,178	24,183	72.5%	6.0%	16
Loudon	39,086	19,568	19,518	49.9%	48,556	28,836	19,720	40.6%	9.3%	9
McMinn	49,015	20,333	28,682	58.5%	52,266	20,728	31,538	60.3%	-1.8%	89
McNairy	24,653	3,875	20,778	84.3%	26,075	3,840	22,235	85.3%	-1.0%	84
Macon	20,386	3,765	16,621	81.5%	22,248	4,545	17,703	79.6%	2.0%	34
Madison	91,837	65,531	26,306	28.6%	98,294	72,908	25,386	25.8%	2.8%	28
Marion	27,776	5,749	22,027	79.3%	28,237	6,490	21,747	77.0%	2.3%	30
Marshall	26,767	9,755	17,012	63.6%	30,617	10,464	20,153	65.8%	-2.3%	90
Maury	69,498	39,174	30,324	43.6%	80,956	47,284	33,672	41.6%	2.0%	33
Meigs	11,086	0	11,086	100.0%	11,753	0	11,753	100.0%	0.0%	59
Monroe	38,961	8,509	30,452	78.2%	44,519	10,651	33,868	76.1%	2.1%	32
Montgomery	134,768	100,263	34,505	25.6%	172,331	138,309	34,022	19.7%	5.9%	17
Moore	5,740	0	5,740	100.0%	6,362	8	6,354	99.9%	0.1%	57

Table 4. Urban and Rural Population of Tennessee Counties, 2000 and 2010

County	2000 Population				2010 Population				Change in Urban Share of County	
	Total	Urban	Rural	% Rural	Total	Urban	Rural	% Rural	Percentage Points	Rank
Morgan	19,757	3,400	16,357	82.8%	21,987	25	21,962	99.9%	-17.1%	95
Obion	32,450	13,249	19,201	59.2%	31,807	12,219	19,588	61.6%	-2.4%	91
Overton	20,118	3,149	16,969	84.3%	22,083	3,485	18,598	84.2%	0.1%	56
Perry	7,631	0	7,631	100.0%	7,915	0	7,915	100.0%	0.0%	59
Pickett	4,945	0	4,945	100.0%	5,077	0	5,077	100.0%	0.0%	59
Polk	16,050	0	16,050	100.0%	16,825	0	16,825	100.0%	0.0%	59
Putnam	62,315	37,816	24,499	39.3%	72,321	47,026	25,295	35.0%	4.3%	20
Rhea	28,400	9,108	19,292	67.9%	31,809	10,174	21,635	68.0%	-0.1%	80
Roane	51,910	26,088	25,822	49.7%	54,181	26,553	27,628	51.0%	-1.2%	86
Robertson	54,433	22,979	31,454	57.8%	66,283	30,994	35,289	53.2%	4.5%	18
Rutherford	182,023	137,004	45,019	24.7%	262,604	217,905	44,699	17.0%	7.7%	12
Scott	21,127	3,162	17,965	85.0%	22,228	4,322	17,906	80.6%	4.5%	19
Sequatchie	11,370	0	11,370	100.0%	14,112	3,697	10,415	73.8%	26.2%	2
Sevier	71,170	24,887	46,283	65.0%	89,889	38,969	50,920	56.6%	8.4%	10
Shelby	897,472	867,801	29,671	3.3%	927,644	902,043	25,601	2.8%	0.5%	49
Smith	17,712	3,633	14,079	79.5%	19,166	3,282	15,884	82.9%	-3.4%	92
Stewart	12,370	0	12,370	100.0%	13,324	0	13,324	100.0%	0.0%	59
Sullivan	153,048	112,474	40,574	26.5%	156,823	116,737	40,086	25.6%	0.9%	43
Sumner	130,449	90,592	39,857	30.6%	160,645	115,853	44,792	27.9%	2.7%	29
Tipton	51,271	17,265	34,006	66.3%	61,081	27,410	33,671	55.1%	11.2%	6
Trousdale	7,259	0	7,259	100.0%	7,870	0	7,870	100.0%	0.0%	59
Unicoi	17,667	9,580	8,087	45.8%	18,313	10,133	8,180	44.7%	1.1%	40
Union	17,808	0	17,808	100.0%	19,109	0	19,109	100.0%	0.0%	59
Van Buren	5,508	0	5,508	100.0%	5,548	0	5,548	100.0%	0.0%	59
Warren	38,276	14,436	23,840	62.3%	39,839	15,386	24,453	61.4%	0.9%	45
Washington	107,198	72,263	34,935	32.6%	122,979	90,486	32,493	26.4%	6.2%	15
Wayne	16,842	0	16,842	100.0%	17,021	0	17,021	100.0%	0.0%	59
Weakley	34,895	10,031	24,864	71.3%	35,021	11,555	23,466	67.0%	4.2%	21
White	23,102	4,080	19,022	82.3%	25,841	5,640	20,201	78.2%	4.2%	22
Williamson	126,638	89,512	37,126	29.3%	183,182	147,670	35,512	19.4%	9.9%	8
Wilson	88,809	47,868	40,941	46.1%	113,993	70,143	43,850	38.5%	7.6%	13
Tennessee	**5,689,283**	**3,618,968**	**2,070,315**	**36.4%**	**6,346,105**	**4,213,245**	**2,132,860**	**33.6%**	**2.8%**	

Source: Prepared by TACIR staff from US Census Bureau data.

Map 5. Change in Percent Urban Population of Tennessee Counties, 2000 to 2010
Presented on a Continuous Scale from Green (Largest Shift Toward Rural) to Red (Largest Shift Toward Urban)



Tennessee Counties: Difference in Urban Population Percentage (2000-2010)

Became More Rural (-17.1%) — **Became More Urban (+32.6%)**

Source: Prepared by TACIR staff from US Census Bureau data.

Note: For 2010, the US Census Bureau excluded those living in group quarters such as correctional facilities and college residence halls in determining whether an area was urban or not, reducing slightly the change in percent of urban population in some counties.

The US Department of Agriculture's Rural and Urban Measures

The Economic Research Service (ERS) within the US Department of Agriculture measures rurality at the county, census tract, and zip code levels. The ERS has developed three major classification schemes for counties:

- Rural-Urban Continuum Codes—this nine-point scale is based in part on metropolitan and nonmetropolitan distinctions made by the OMB, population, urbanization, and proximity to metropolitan areas.
- Urban Influence Codes—this twelve-point scale begins with the OMB's metropolitan, micropolitan, and nonmetropolitan distinctions and is likewise based on population, urbanization, and proximity to metropolitan areas.
- County Typology Codes—these codes rate counties according to their economic and social characteristics. Each county is assigned one economic type plus one or more policy themes based on its social characteristics.

Rural-Urban Continuum Codes

The ERS bases its Rural-Urban Continuum Codes (RUCCs) on the OMB's designation of metropolitan and nonmetropolitan counties and assigns each US county one of nine codes. Metropolitan counties are divided into three groups based on the total population of the metro area, and nonmetropolitan counties are divided into six groups depending on the size of the urban population and adjacency to a metropolitan area. The classification scheme is described in table 5; Tennessee counties are listed for each classification:

Table 5. Definition of USDA/ERS Rural-Urban Continuum Codes and Attribution to Tennessee Counties, 2013

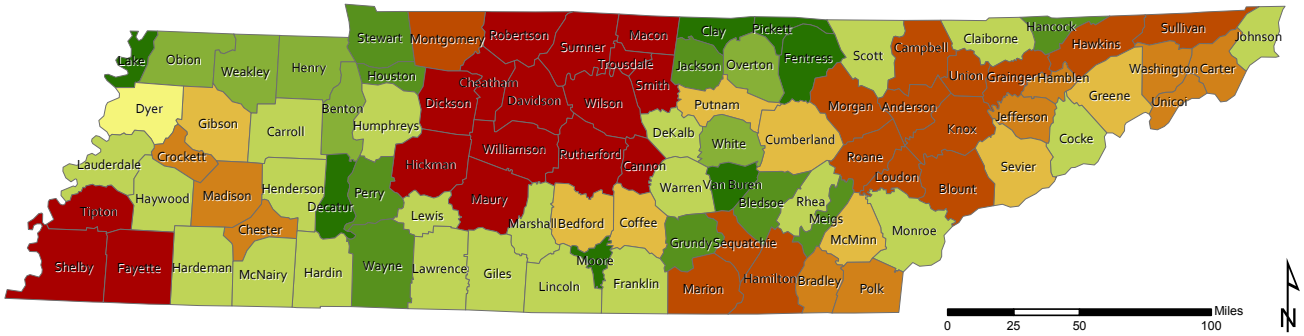
	Counties
Metropolitan Counties—those in metro areas with total populations of	
(1) one million or more	Cannon, Cheatham, Davidson, Dickson, Fayette, Hickman, Macon, Maury, Robertson, Rutherford, Shelby, Smith, Sumner, Tipton, Trousdale, Williamson, Wilson
(2) 250,000 to one million	Anderson, Blount, Campbell, Grainger, Hamilton, Hawkins, Knox, Loudon, Marion, Montgomery, Morgan, Roane, Sequatchie, Sullivan, Union
(3) less than 250,000	Bradley, Carter, Chester, Crockett, Hamblen, Jefferson, Madison, Polk, Unicoi, Washington
Nonmetropolitan Counties—	
those with an urban population of 20,000 or more and	
(4) adjacent to a metro area *and* 2% or more of workers commute to central metro county	Bedford, Coffee, Cumberland, Gibson, Greene, McMinn, Putnam, Sevier
(5) not adjacent to a metro area *or* adjacent but less than 2% of workers commute to central metro county	Dyer
those with an urban population between 2,500 and 19,999 and	
(6) adjacent to a metro area *and* 2% or more of workers commute to central metro county	Carroll, Claiborne, Cocke, DeKalb, Franklin, Giles, Hardeman, Hardin, Haywood, Henderson, Humphreys, Johnson, Lauderdale, Lawrence, Lewis, Lincoln, McNairy, Marshall, Monroe, Rhea, Scott, Warren
(7) not adjacent to a metro area *or* adjacent but less than 2% of workers commute to central metro county	Benton, Henry, Obion, Overton, Weakley, White
completely rural counties and those with less than 2,500 urban population	
(8) adjacent to a metro area *and* 2% or more of workers commute to central metro county	Bledsoe, Grundy, Hancock, Houston, Jackson, Meigs, Perry, Stewart, Wayne
(9) not adjacent to a metro area *or* adjacent but less than 2% of workers commute to central metro county	Clay, Decatur, Fentress, Lake, Moore, Pickett, Van Buren

Source: Rural-Urban Continuum Codes, Economic Research Service, US Department of Agriculture, http://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx.

Map 6 illustrates the 2013 RUCCs for Tennessee counties. Because the ERS starts with the OMB's geographic statistical area definitions, all three counties in the Memphis metro area are coded the same despite the very real differences in density and percent rural shown in maps 3 and 4. The population of Shelby County, the area's central county, is less than 3% rural, but Tipton County to the north is 55% rural, and Fayette County to the east is 79% rural. Likewise, the 14 counties in the Nashville-Davidson–Murfreesboro–Franklin metro area are all treated the same despite stark differences in density and percent rural. For example, Davidson

County's population is less than 4% rural, but eight of the remaining thirteen counties are more than half rural, and two—Hickman and Trousdale—are entirely rural and would be coded 8 or 9 if they were not part of Davidson County's metro area. Instead, they are coded as more urban than Knox and Hamilton counties. Likewise, the counties in the Knoxville and Chattanooga metro areas are all treated the same, and so on.

Map 6. USDA Rural-Urban Continuum Codes for Tennessee Counties, 2013



Tennessee Counties: USDA Rural-Urban Continuum Codes (2013)

1. Counties in a Metro Area with a population of one million or more (17)
2. Counties in a Metro Area with a population between 250,000 and one million (15)
3. Counties in a Metro Area with a population less than 250,000 (10)
4. Urban Population of 20,000 or more; adjacent to a Metro Area (8)
5. Urban Population of 20,000 or more; NOT adjacent to a Metro Area (1)
6. Urban Population between 2,500 and 19,999; adjacent to a Metro Area (22)
7. Urban Population between 2,500 and 19,999; NOT adjacent to a Metro Area (6)
8. Completely Rural or <2,500 Urban Population adjacent to a Metro Area (9)
9. Completely Rural or <2,500 Urban Population; NOT adjacent to a Metro Area (7)

Note: to be "adjacent" a county must also have 2% of its employed labor force commuting to central metro counties.

Source: Prepared by TACIR staff from US Department of Agriculture, Economic Research Service data.

Not surprisingly, map 6 aligns well with map 2, the OMB metro-micro area map on page 6. The trouble with the RUCC scheme is that some very rural counties are included in these MSAs because of the commuting connections between them, not because they are "metropolitan" in the usual sense of the word. For example, it cannot reasonably be said that Cannon and Davidson counties are similarly urban, suburban, or rural and so should be treated the same for policy purposes. Consequently, this classification scheme is not very useful. Moreover, despite the word "continuum" in its name, this scheme falls into the threshold trap.

Continuing with the Cannon County example, based on its population density (48.3 people per square mile in 2000 and 51.9 people per square mile in 2010; see table 3) and percent rural (100% in 2000 and 81% in 2010), it is much more similar to neighboring Warren (61% rural in 2010) and DeKalb (78% rural in 2010) counties. Grouping it instead with Davidson and giving it a code of one on this scale makes little sense outside policies related to commuting patterns. In fact, DeKalb County, with 61.5 people per square mile in 2010, and Warren County, with 92.1 people per square mile in 2010, are both less rural and more densely populated than Cannon County yet are coded 6 on this nine-point scale, indicating that they should be treated as far more rural. The problem is not just that the scheme is outdated or based on old data; the concept itself is questionable for many policy purposes.

Urban Influence Codes

The ERS' urban influence codes are structured similarly based on the counties' metropolitan status according to the OMB. Using this method, the ERS divides metropolitan counties into two groups, combining the RUCC codes 2 and 3 into one group, and nonmetropolitan counties into ten groups for a total of twelve groups. In this system, micropolitan counties are placed in separate groups, and size of town rather than size of urban area is used to differentiate the non-metro groups. The classifications are described in table 6; Tennessee counties are listed for each classification:

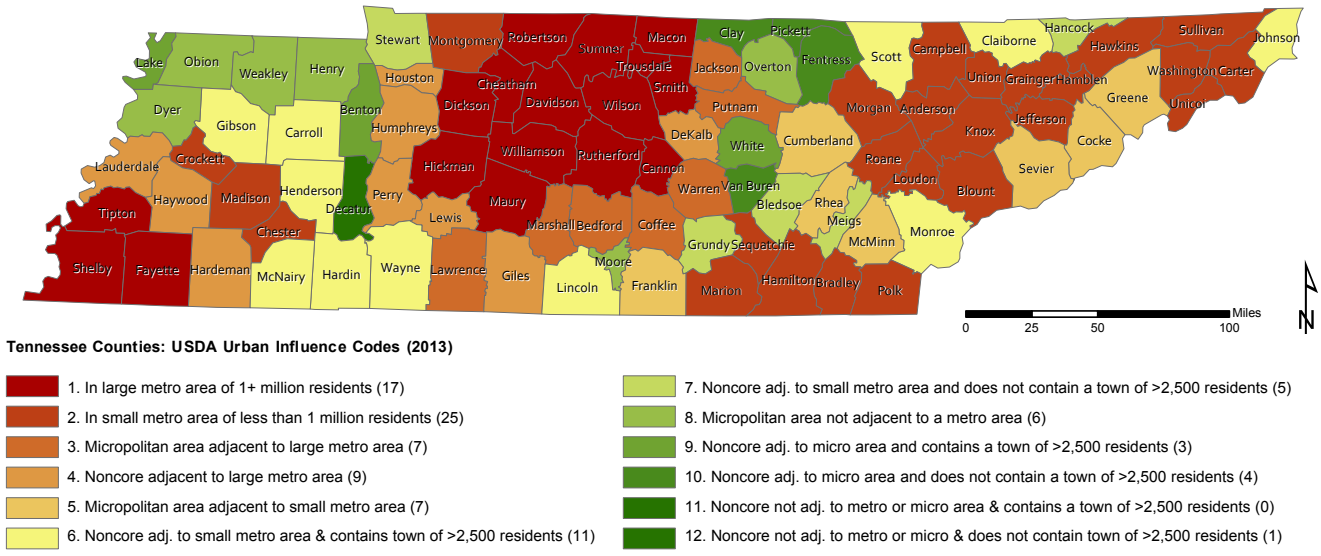
Table 6. Definition of USDA/ERS Urban Influence Codes and Attribution to Tennessee Counties, 2013

	Counties
Metropolitan counties—those in metro areas with	
(1) one million residents or more	Cannon, Cheatham, Davidson, Dickson, Fayette, Hickman, Macon, Maury, Robertson, Rutherford, Shelby, Smith, Sumner, Tipton, Trousdale, Williamson, Wilson
(2) less than one million residents	Anderson, Blount, Bradley, Campbell, Carter, Chester, Crockett, Grainger, Hamblen, Hamilton, Hawkins, Jefferson, Knox, Loudon, Madison, Marion, Montgomery, Morgan, Polk, Roane, Sequatchie, Sullivan, Unicoi, Union, Washington
Nonmetropolitan counties—	
adjacent to large metro area (one million residents or more) and	
(3) micropolitan	Bedford, Coffee, Jackson, Lawrence, Marshall, Putnam, Warren
(4) non-micropolitan	DeKalb, Giles, Hardeman, Haywood, Houston, Humphreys, Lauderdale, Lewis, Perry
adjacent to small metro area (less than one million residents) and	
(5) micropolitan	Cocke, Cumberland, Franklin, Greene, McMinn, Rhea, Sevier
(6) non-micropolitan with a town of at least 2,500 residents	Carroll, Claiborne, Gibson, Hardin, Henderson, Johnson, Lincoln, McNairy, Monroe, Scott, Wayne
(7) non-micropolitan without a town of at least 2,500 residents	Bledsoe, Grundy, Hancock, Meigs, Stewart
not adjacent to a metro area and	
(8) micropolitan	Dyer, Henry, Moore, Obion, Overton, Weakley
(9) non-micropolitan with a town of at least 2,500 residents	Benton, Lake, White
(10) non-micropolitan without a town of at least 2,500 residents	Clay, Fentress, Pickett, Van Buren
not adjacent to a metro or a micro area and	
(11) with a town of at least 2,500 residents	none
(12) without a town of at least 2,500 residents	Decatur

Source: Urban Influence Codes, Economic Research Service, US Department of Agriculture, http://www.ers.usda.gov/data-products/urban-influence-codes.aspx.

The following map illustrates the urban influence codes for Tennessee's 95 counties. Again, this map aligns well with map 2, the OMB metro-micro area map on page 6. The redder areas match up exactly. Contrast this and the preceding map with the population density map on page 10 and the urban/rural population map on page 15. Both USDA/ERS maps suggest a much more urban state than the two population maps presented earlier.

Map 7. USDA Urban Influence Codes for Tennessee Counties, 2013



Tennessee Counties: USDA Urban Influence Codes (2013)

1. In large metro area of 1+ million residents (17)
2. In small metro area of less than 1 million residents (25)
3. Micropolitan area adjacent to large metro area (7)
4. Noncore adjacent to large metro area (9)
5. Micropolitan area adjacent to small metro area (7)
6. Noncore adj. to small metro area & contains town of >2,500 residents (11)
7. Noncore adj. to small metro area and does not contain a town of >2,500 residents (5)
8. Micropolitan area not adjacent to a metro area (6)
9. Noncore adj. to micro area and contains a town of >2,500 residents (3)
10. Noncore adj. to micro area and does not contain a town of >2,500 residents (4)
11. Noncore not adj. to metro or micro area & contains a town of >2,500 residents (0)
12. Noncore not adj. to metro or micro & does not contain town of >2,500 residents (1)

Source: Prepared by TACIR staff from US Department of Agriculture, Economic Research Service data.

Although it more finely tunes the distinctions among the non-metropolitan counties, this scheme suffers from the same problems as the RUCC scheme. Again, one has only to look at a clearly rural but "metropolitan" county like Cannon compared with its neighbors to see the effect both of starting with the OMB's metro-micro system and of the threshold trap when a scheme that divides counties into discrete groups is used. It's hard to imagine a program directed at rural issues that included DeKalb and Warren counties but excluded Cannon or one designed for urban areas that included Cannon with Davidson.

County Typology Codes

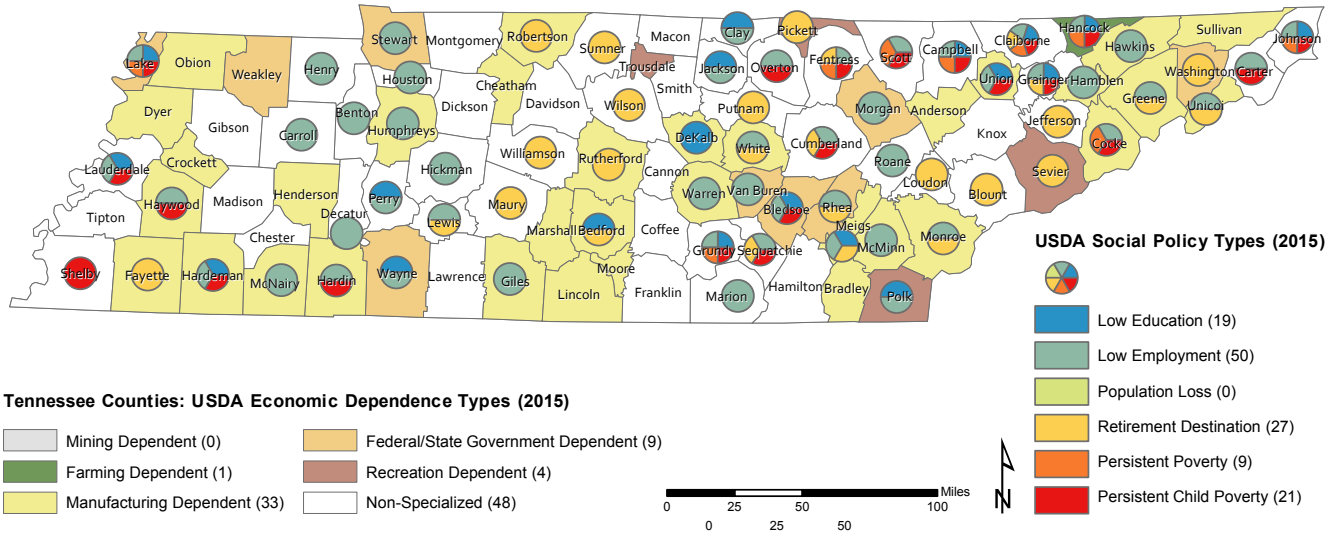
The ERS's county typology codes are designed to capture a range of economic and social characteristics. This system is not an alternative way to determine how urban or rural a county is. Instead it's designed to supplement urban-rural determinations made using other methods and so does not resolve problems with those methods. This method divides counties into six discrete groups based on their economies and assigns them one or more of six policy-relevant themes. The six economic-dependence types along with the classification of Tennessee counties are shown in the following table and illustrated in map 8.

Table 7. Definition of USDA/ERS County Economic-Dependence Types and Attribution to Tennessee Counties, 2015

	Counties
Farming Dependent—either 25% or more of average annual labor and proprietors' earnings derived from farming during 2010-12 or 16% or more of county jobs were in farming in the same period	Hancock
Mining Dependent—13% or more of average annual labor and proprietors' earnings derived or 8% or more of total employment during 2010-12	none
Manufacturing Dependent—23% or more of average annual labor and proprietors' earnings derived from manufacturing or 16% of total employment during 2010-12	Anderson, Bedford, Bradley, Cheatham, Cocke, Crockett, DeKalb, Dyer, Fayette, Giles, Greene, Hamblen, Hardeman, Hardin, Hawkins, Haywood, Henderson, Humphreys, Lincoln, McMinn, McNairy, Marshall, Meigs, Monroe, Moore, Obion, Robertson, Rutherford, Sullivan, Unicoi, Union, Warren, White
Federal/State Government Dependent—14% or more of average annual labor and proprietors' earnings derived from Federal and State government or 9% of total employment during 2010-12	Bledsoe, Lake, Morgan, Rhea, Stewart, Van Buren, Washington, Wayne, Weakley
Recreation Dependent—scored at least two-thirds of a standard deviation above the mean weighted index calculated based on the percentage employed; the percentage of total earnings in entertainment, recreation, accommodations, eating and drinking places, and real estate; and the percentage of vacant housing units intended for seasonal of occasional use reported in the 2010 Census of Population	Pickett, Polk, Sevier, Trousdale
Non-Specialized—did not meet the dependence criteria for any other economic type	Benton, Blount, Campbell, Cannon, Carroll, Carter, Chester, Claiborne, Clay, Coffee, Cumberland, Davidson, Decatur, Dickson, Fentress, Franklin, Gibson, Grainger, Grundy, Hamilton, Henry, Hickman, Houston, Jackson, Jefferson, Johnson, Knox, Lauderdale, Lawrence, Lewis, Loudon, Macon, Madison, Marion, Maury, Montgomery, Overton, Perry, Putnam, Roane, Scott, Sequatchie, Shelby, Smith, Sumner, Tipton, Williamson, Wilson

Source: County Economic Types, Economic Research Service, US Department of Agriculture, http://www.ers.usda.gov/data-products/county-typology-codes/descriptions-and-maps.aspx.

Map 8. USDA County Typologies for Tennessee Counties, 2015



Source: Prepared by TACIR staff based on data from the US Department of Agriculture, Economic Research Service.

The six policy themes of the ERS's county typology codes are described in table 8; the Tennessee counties to which these themes apply are listed there. It is worth noting the nine Tennessee counties listed under "persistent poverty" in 2015 are the exact same nine listed there in 2004; all nine are also listed in the new category "persistent child poverty" along with twelve more. Fifty of Tennessee's 95 counties are now listed as low employment counties, up from 17 in 2004, despite narrowing the age range by trimming three years off the bottom, raising it from 21 to 24. On a positive note, the number of "low education" counties is down from 44 to 19.[11]

Again, counties are assigned a single economic type but may have multiple policy types. This makes for a much more informative classification scheme, one that does not suffer from being framed by the OMB's metro-micro system. But it does suffer from the threshold effect. None of these indicators reflect the degree to which they characterize a particular county. Based on this system, they either do or they don't. Moreover, each county is characterized as being economically dependent on only one major industry. It cannot be both manufacturing and services dependent or both farming and mining dependent.

Applying these indicators to Tennessee counties, the ERS classifies Hancock County, for example, as the only farming-dependent county in Tennessee. None are dependent on mining. Four—Pickett, Polk, Sevier, and Trousdale—are dependent on recreation, and nine—Bledsoe, Lake, Morgan, Rhea, Stewart, Van Buren, Washington, Wayne, and Weakley—are government dependent. A third are considered manufacturing-dependent

[11] Id. 2004 County Typology Codes last updated 1 July 2008.

Table 8. Definition of USDA/ERS County Policy Types and Attribution to Tennessee Counties, 2015
(counties newly listed are indicated in bold type)*

	Counties
Low Education—20% or more of residents 25 to 64 years old had neither a high school diploma nor GED in 2008-12 (5-year average)	Bedford, Bledsoe, Campbell, Claiborne, Clay, DeKalb, Grainger, Grundy, Hancock, Hardeman, Jackson, Johnson, Lake, Lauderdale, Meigs, Perry, Polk, Union, Wayne
Low Employment—less than 65% of residents 25 to 64 years old were employed in 2008-12 (5-year average)	Benton, **Bledsoe**, Campbell, **Carroll**, **Carter**, Claiborne, **Clay**, Cocke, Cumberland, **Decatur**, Fentress, **Giles**, **Grainger**, **Greene**, Grundy, **Hamblen**, Hancock, **Hardeman**, **Hardin**, Hawkins, **Haywood**, **Henry**, **Hickman**, **Houston**, **Humphreys**, Jackson, Johnson, Lake, **Lauderdale**, **Lewis**, **Marion**, **McMinn**, **McNairy**, Meigs, **Monroe**, Morgan, **Overton**, **Perry**, **Polk**, **Rhea**, **Roane**, Scott, **Sequatchie**, **Stewart**, **Unicoi**, Union, **Van Buren**, **Warren**, Wayne, **White**
Persistent Poverty—20% or more of residents were poor as measured by each of the 1980, 1990, 2000 censuses, and 2007-11 American Community Survey 5-year average	Campbell, Claiborne, Cocke, Fentress, Grundy, Hancock, Johnson, Lake, Scott
Persistent child poverty—20% or more of related children under 18 years old were poor as measured by each of the 1980, 1990, 2000 censuses, and the 2007-11 American Community Survey 5-year average	Bledsoe, Campbell, Carter, Claiborne, Cocke, Cumberland, Fentress, Grainger, Grundy, Hancock, Hardeman, Hardin, Haywood, Johnson, Lake, Lauderdale, Overton, Scott, Sequatchie, Shelby, Union
Population Loss—number of residents declined both between the 1990 and 2000 censuses and between the 2000 and 2010 censuses	none
Retirement Destination—number of residents 60 and older grew by 15% or more between 2000 and 2010 because of in-migration	**Bedford, Blount**, **Claiborne**, Cumberland, **Fayette**, Fentress, **Grainger**, **Greene**, Jefferson, **Lewis**, Loudon, **Maury**, Meigs, Monroe, **Pickett**, Putnam, **Rhea**, **Robertson**, Rutherford, Sequatchie, Sevier, **Sumner**, **Unicoi**, **Washington**, **White**, **Williamson**, **Wilson**

* Persistent child poverty is a new category; no counties are bolded because whether they would have been included there in 2004 is not known.

Source: County Typology Codes, Economic Research Service, US Department of Agriculture, http://www.ers.usda.gov/data-products/county-typology-codes/descriptions-and-maps.aspx.

according to this classification scheme, and the rest—more than half—are deemed non-specialized as though no type of industry were significant there. The system is too absolute, too all or none.

The policy types are not mutually exclusive, but they are all or none. It is impossible, for instance, to distinguish among the 50 Tennessee counties identified as having populations with low employment. For instance, we may know from looking at other data that the percentage of persons 25 to 64 years old who are employed ranged from less than 35% to almost 65% for 2008 through 2012 for these counties[12] but not by looking at these lists. Still, it is useful for policy purposes to see that all nine counties with persistent poverty are also among those with low employment, and six are among those with low education, but that 33 other counties with low employment are not among those with low education, three of which suffer from persistent poverty.

Academic Measures of Rurality

Dr. Andrew Isserman and the Rural-Urban Density Typology

To address some of the shortcomings associated with the federal measures, the late Dr. Andrew Isserman of the International Regional Science Review created a rural-urban density typology (RUDT) for his study of rural prosperity. Dr. Isserman's concerns were threefold, as laid out in his 2007 report *Getting State Rural Policy Right*:

- *A very common way of defining rural ignores the majority of rural people.*
  Recommendation: Pay attention to defining rural so that state policies and programs reach the people and places you intend them to serve.
- *Most rural people live in growing counties, although hundreds of rural counties are declining in population.*
  Recommendation: Recognize the great diversity of rural policy contexts and that growth, not decline, is the most common policy context for rural people.
- *Program eligibility rules vary greatly.*
  Recommendation: Craft program eligibility rules that recognize the goals of specific programs, the unique geographic landscape of the state, and its evolving blend of cities, towns, and countryside.

[12] US Census Bureau American Community Survey Table S2301: EMPLOYMENT STATUS, 2008-2012.

In that report, Dr. Isserman critiqued the common practice of equating the OMB's metropolitan and micropolitan classifications with "urban" and everything else with "rural," noting that doing so "ignores the fundamental distinction between OMB's system for linking together economically integrated urban and rural areas into metropolitan and micropolitan areas and the Census' system for separating the nation into urban and rural areas" and that "the majority of rural people, as defined by the Census Bureau, live in metropolitan areas."[13]

Dr. Isserman developed his own typology, which starts with the US Census Bureau's population and density-based rural-urban system and establishes thresholds to assign counties to one of four categories as defined in table 9. Tennessee counties are listed in the table.

Table 9. Isserman's Rural-Urban Density Typology and Application to Tennessee Counties, 2010

	Counties
Urban county (2 Tennessee counties)	
• The county's population density is at least 500 people per square mile, • 90% of the county population lives in urban areas, and • the county's population in urbanized areas is at least 50,000 or 90% of the county population.	Davidson, Shelby
Rural county (52 Tennessee counties)	
• The county's population density is less than 500 people per square mile, and • 90% of the county population is in rural areas or the county has no urban area with a population of 10,000 or more.	Benton, Bledsoe, Cannon, Carroll, Cheatham, Chester, Claiborne, Clay, Crockett, Decatur, DeKalb, Fayette, Fentress, Gibson, Giles, Grainger, Grundy, Hancock, Hardeman, Hardin, Haywood, Henderson, Hickman, Houston, Humphreys, Jackson, Johnson, Lake, Lauderdale, Lewis, Lincoln, McNairy, Macon, Marion, Meigs, Monroe, Moore, Morgan, Overton, Perry, Pickett, Polk, Scott, Sequatchie, Smith, Stewart, Trousdale, Unicoi, Union, Van Buren, Wayne, White
Mixed rural county (35 Tennessee counties)	
• The county meets neither the urban nor the rural county criteria, and • its population density is less than 320 people per square mile.	Anderson, Bedford, Blount, Bradley, Campbell, Carter, Cocke, Coffee, Cumberland, Dickson, Dyer, Franklin, Greene, Hawkins, Henry, Jefferson, Lawrence, Loudon, McMinn, Madison, Marshall, Maury, Montgomery, Obion, Putnam, Rhea, Roane, Robertson, Sevier, Sumner, Tipton, Warren, Weakley, Williamson, Wilson
Mixed urban county (6 Tennessee counties)	
• The county meets neither the urban nor the rural county criteria, and • its population density is at least 320 people per square mile.	Hamblen, Hamilton, Knox, Rutherford, Sullivan, Washington

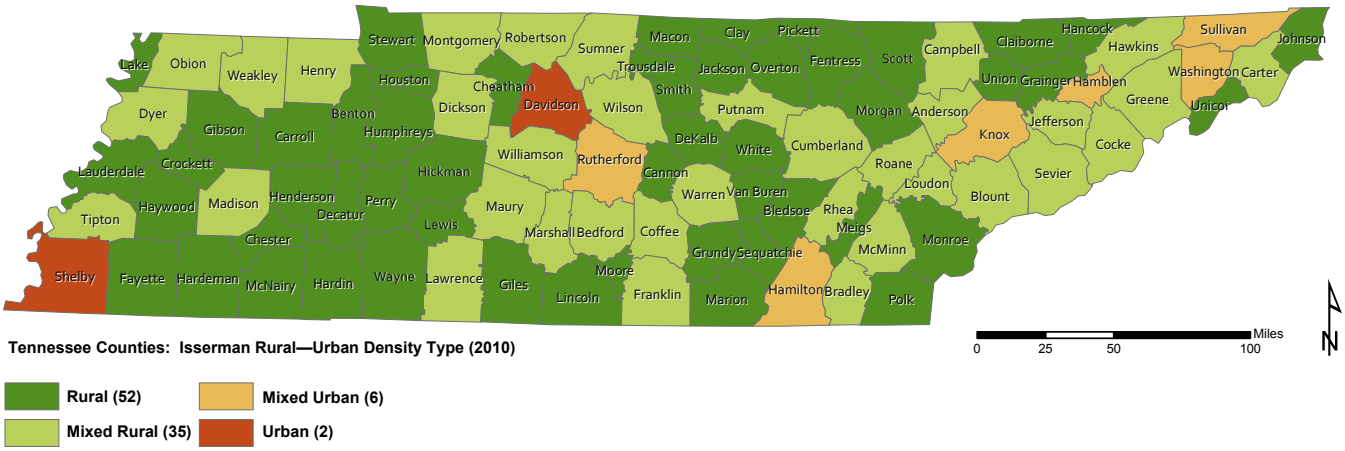
Source: Isserman, In the National Interest (2005), and TACIR analysis of 2010 US Census Bureau data.

[13] Isserman 2007 p. 74.

According to the 2010 Census, only two Tennessee counties, Shelby and Davidson, meet Isserman's criteria for urban. Knox and Hamilton fall just below Isserman's 90% urban population threshold (see table 4; Hamilton rounds to 90% but is slightly below that figure) and, as a result, are grouped with Hamblen, Rutherford, Sullivan, and Washington—despite the obvious gap in population density between the top four counties (Shelby, Davidson, Knox, and Hamilton in order) and the remaining counties illustrated in figure 1—and classified along with those four counties as mixed urban. See map 9. The results of his method are far different from the results of methods created within the framework of the OMB's metro-micro system. For instance, of the 52 Tennessee counties that would be classified as rural by Isserman's method, 16 are in metropolitan statistical areas, and 3 are in micropolitan statistical areas. All of the 35 counties classified as mixed rural are in either metro areas or micro areas.

Although Isserman's system avoids the constraints of the OMB's metro-micro system, it explicitly suffers from the threshold effect as clearly illustrated by map 9. The contrast between this map, with its four discrete groups of counties, and the population density and urban/rural population maps on pages 15 and 20, with their continuous scales, is stark. Even if the density thresholds were modified to sort counties differently, counties that are very much alike would always fall on opposite sides of the lines between rural and mixed rural, mixed rural and mixed urban, etc.

Map 9. Isserman's Rural-Urban Density Typology, Tennessee Counties in 2010



Tennessee Counties: Isserman Rural—Urban Density Type (2010)

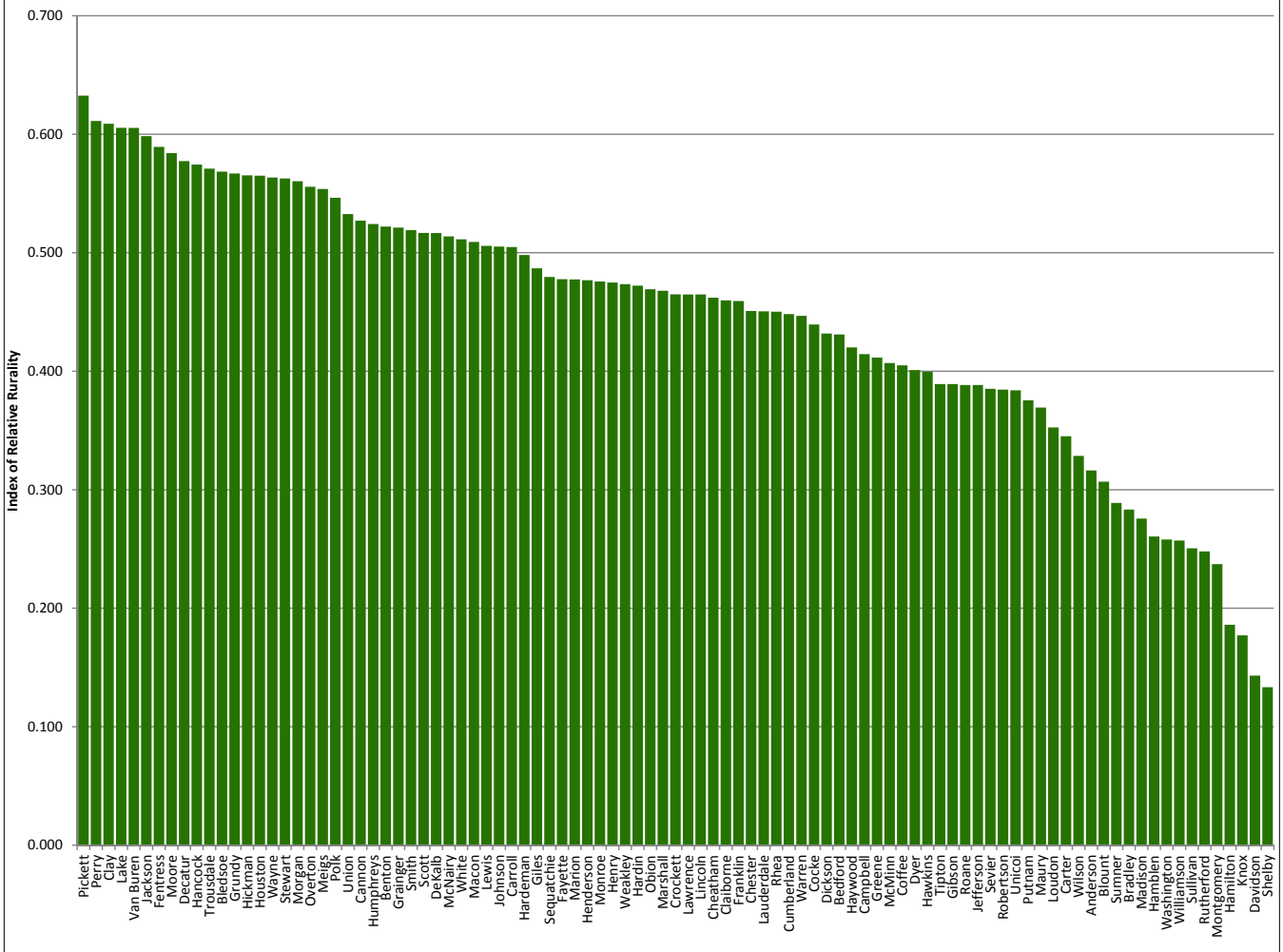
Rural (52)
Mixed Urban (6)
Mixed Rural (35)
Urban (2)

Source: Prepared by TACIR staff from information in table 9.

Purdue Center for Regional Development and the Index of Relative Rurality

Avoiding both the tie to the OMB's metro-micro system and the threshold effect, the Index of Relative Rurality (IRR), developed for the Purdue Center for Regional Development by Dr. Brigitte Waldorf, is based on a continuous scale and answers the question of how urban or rural each county is rather than simply designating it either urban or rural or sorting it into a category in between. The IRR ranges from 0 (most urban) to 1 (most rural). The relative rurality of all Tennessee counties is illustrated by the heights of bars in figure 3 below (the indexes are listed in table 1 on pages 3 and 4).

Figure 3. Index of Relative Rurality for Tennessee Counties, 2010



Source: Prepared by TACIR staff from data in table 1.

"... had I argued in 1950 that rural America had certain key comparative advantages, and it would grow faster over the next half-century than urban America, I probably would not have been taken seriously. But I would have been right! How can that be? The explanation is simple. Between 1950 and the present, the Office of Management and Budget took 552 counties out of rural America and reclassified them as metropolitan. Today some 71 million people, one-fourth of the U.S. population, live in what was rural America in 1950 but is considered urban America today."

Andrew Isserman in *Creating new economic opportunities: The competitive advantages of rural America in the next century* (2000, p. 126).

The shape of the graph in figure 3 demonstrates the gradual decline in rurality from the most rural Tennessee counties through around Maury County after which the decline steepens on through to Madison County and then plateaus before dropping steeply after Montgomery County through the top four (Hamilton, Knox, Davidson, and Shelby in that order). It's this gradual decline through the more rural counties that makes clear the difficulty of dividing them into groups for policy purposes.

The index is based on four factors: total population, population density, percentage of residents living in urban areas, and distance to metropolitan areas (see the appendix). All three population-based factors are used in other methods described in this report[14] but the fourth factor clearly distinguishes this measure by severing the tie to commuting patterns that characterizes the OMB-based methods and substituting a measure of distance to what are essentially job centers. This distinction is important because it does not reflect actual economic ties between counties, as commuting patterns do, and therefore allows researchers and policy makers to investigate those ties.

By this measure, Pickett County is the most rural county in Tennessee with an IRR of 0.633, and Shelby County is the most urban with an IRR of 0.133. Pickett is the 386th most rural county in the nation; Shelby ranks 3,058th out of 3,108 counties nationally. The most rural county in the nation is Daniels County, Montana, with an IRR of 0.891. Only 50 of the country's more than three thousand counties are more urban than Shelby. The most urban county in the nation is Kings County, New York, which has an IRR of 0.042. Of Tennessee's 95 counties, 18 are in the most urban quarter of counties nationally (Shelby, Davidson, Knox, Hamilton, Montgomery, Rutherford, Sullivan, Williamson, Washington, Hamblen, Madison, Bradley, Sumner, Blount, Anderson, Wilson, Carter, and Loudon in order of most to least urban) by this measure.

Although we may think of Tennessee as a rural state, compared with the entire country, it is not. By definition, the average county nationally has an IRR of 0.500. Most Tennessee counties are not that rural. In fact, only 35 of the 95 have below-average IRRs; nearly a third of those (12) are in one or another of the OMB's metropolitan or micropolitan areas (see table 10).

This group of counties demonstrates the problem created by using the OMB's metro-micro system to sort counties for rural policy purposes. Eight of the twelve counties in table 10 fall into the top two most urban categories of the USDA/ERS' rural-urban continuum and its urban influence scale. Five are as metropolitan as Shelby and Davidson and more metropolitan

[14] Data for these factors is presented in tables 1 and 4. Population density is shown in map 3 and plotted in figure 1. Rural population percentages are shown in map 4.

Table 10. Tennessee Counties with Above-Average Indexes of Relative Rurality (IRR) Located in Metropolitan or Micropolitan Statistical Areas, 2010

	County	IRR
Cleveland Metropolitan Statistical Area		
	Polk	0.546
Knoxville Metropolitan Statistical Area		
	Grainger	0.521
	Morgan	0.560
	Union	0.533
Nashville-Davidson–Murfreesboro–Franklin Metropolitan Statistical Area		
	Cannon	0.527
	Hickman	0.565
	Macon	0.509
	Smith	0.519
	Trousdale	0.571
Cookeville Micropolitan Statistical Area		
	Jackson	0.598
	Overton	0.556
Tullahoma-Manchester Micropolitan Statistical Area		
	Moore	0.584

Source: Prepared by TACIR staff from OMB information in table 2 and IRR data in table 1.

than Knox and Hamilton according to the USDA/ERS measures. Three are rated the same as Knox and Hamilton. See table 5 and map 6. In effect, the fact that as few as 25% of workers in a county commute to a metropolitan central county could make it ineligible for rural programs based on either of these methods despite the fact that it's among the most rural counties in Tennessee and, like Macon, Smith, and Trousdale counties, two counties away from the central county of the metro area. The fact that so many of its residents commute that far for work could be exactly the rural issue the county needs help with.

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Appendix—Factors Included in Purdue University's Index of Relative Rurality (IRR) for Tennessee's 95 Counties

County	2010 Population						Distance to Nearest Metro Area		IRR	Rank
	Total		Per Square Mile		Percent Urban					
	Number	Rank	Density	Rank	Percentage	Rank	Miles	Rank		
Anderson	75,129	17	222.6	13	65.3%	15	16.6	14	0.316	15
Bedford	45,058	33	95.1	34	44.4%	30	50.8	80	0.431	35
Benton	16,489	76	41.8	78	21.5%	61	47.8	76	0.522	71
Bledsoe	12,876	82	31.7	89	0.0%	76	30.4	50	0.568	84
Blount	123,010	10	220.2	14	67.4%	13	22.3	24	0.307	14
Bradley	98,963	13	301	12	67.0%	14	0	1	0.283	12
Campbell	40,716	37	84.8	37	45.0%	28	31.9	52	0.414	33
Cannon	13,801	79	51.9	66	18.9%	66	46.5	75	0.527	73
Carroll	28,522	51	47.6	71	16.9%	70	33.6	56	0.505	61
Carter	57,424	23	168.4	20	59.0%	19	18.6	18	0.345	17
Cheatham	39,105	39	129.2	26	17.0%	69	17.4	15	0.462	45
Chester	17,131	73	59.4	56	34.8%	40	18.1	16	0.451	42
Claiborne	32,213	46	74.2	45	28.4%	51	28.7	47	0.460	44
Clay	7,861	90	33.3	88	0.0%	76	60.1	90	0.609	93
Cocke	35,662	42	82.1	40	32.5%	45	22.6	26	0.439	37
Coffee	52,796	27	123.1	27	52.7%	23	53.6	85	0.405	30
Crockett	14,586	77	55	62	32.6%	44	21.8	22	0.465	48
Cumberland	56,053	25	82.2	39	39.1%	36	56.4	86	0.448	39
Davidson	626,681	2	1,247.70	1	96.6%	2	0	1	0.143	2
Decatur	11,757	84	35.2	86	0.0%	76	39	62	0.577	87
DeKalb	18,723	68	61.5	51	21.6%	60	52.3	83	0.517	67
Dickson	49,666	31	101.4	31	32.2%	46	25.4	36	0.432	36
Dyer	38,335	41	75.1	43	57.1%	21	44.8	72	0.401	29
Fayette	38,413	40	54.5	63	21.0%	62	25.8	38	0.478	57
Fentress	17,959	72	36	84	0.0%	76	59.7	89	0.589	89
Franklin	41,052	36	74.2	44	30.4%	49	37.7	60	0.459	43
Gibson	49,683	30	82.4	38	52.3%	25	28.8	48	0.389	26
Giles	29,485	50	48.3	69	26.3%	53	39.8	66	0.487	59
Grainger	22,657	60	80.8	42	0.0%	76	13.6	11	0.521	70
Greene	68,831	19	110.7	30	34.8%	39	20.3	20	0.411	32
Grundy	13,703	80	38	82	0.0%	76	33.5	55	0.567	83
Hamblen	62,544	21	388.4	6	78.1%	8	0	1	0.261	10
Hamilton	336,463	4	620.2	4	90.0%	3	0	1	0.186	4
Hancock	6,819	92	30.7	91	0.0%	76	22.5	25	0.574	86
Hardeman	27,253	55	40.8	79	19.8%	64	30.3	49	0.498	60
Hardin	26,026	57	45	73	32.1%	47	35.8	58	0.472	51
Hawkins	56,833	24	116.8	29	42.1%	32	23.5	28	0.400	28
Haywood	18,787	67	35.2	85	52.6%	24	23.8	30	0.420	34

County	2010 Population						Distance to Nearest Metro Area		IRR	Rank
	Total		Per Square Mile		Percent Urban					
	Number	Rank	Density	Rank	Percentage	Rank	Miles	Rank		
Henderson	27,769	54	53.4	64	23.6%	57	24.3	34	0.477	55
Henry	32,330	45	57.6	60	33.2%	42	49.9	79	0.475	53
Hickman	24,690	59	40.3	80	0.0%	76	45.2	73	0.565	82
Houston	8,426	87	42.1	76	0.0%	76	23.5	27	0.565	81
Humphreys	18,538	69	34.8	87	17.5%	67	39.2	64	0.524	72
Jackson	11,638	86	37.7	83	0.0%	76	60.4	91	0.598	90
Jefferson	51,407	29	187.7	17	40.5%	34	15.4	13	0.388	24
Johnson	18,244	71	61.1	52	14.8%	72	24.2	33	0.505	62
Knox	432,226	3	850	3	89.1%	4	0	1	0.177	3
Lake	7,832	91	47.9	70	0.0%	76	63.4	92	0.605	92
Lauderdale	27,815	53	59.1	57	41.3%	33	43.6	69	0.451	41
Lawrence	41,869	35	67.8	50	24.1%	55	26.8	43	0.465	47
Lewis	12,161	83	43.1	74	29.8%	50	46.3	74	0.506	63
Lincoln	33,361	44	58.5	58	27.5%	52	27.5	45	0.465	46
Loudon	48,556	32	212.4	15	59.4%	18	27.4	44	0.353	18
McMinn	52,266	28	121.5	28	39.7%	35	23.6	29	0.407	31
McNairy	26,075	56	46.6	72	14.7%	73	34.7	57	0.514	66
Macon	22,248	61	72.4	46	20.4%	63	48.8	77	0.509	64
Madison	98,294	14	176.4	19	74.2%	10	0	1	0.276	11
Marion	28,237	52	56.5	61	23.0%	58	24.8	35	0.477	56
Marshall	30,617	49	81.6	41	34.2%	41	51	82	0.468	49
Maury	80,956	16	132.1	25	58.4%	20	43.1	68	0.369	19
Meigs	11,753	85	60.3	55	0.0%	76	26.1	40	0.554	76
Monroe	44,519	34	70.1	47	23.9%	56	38.7	61	0.476	54
Montgomery	172,331	7	319.6	9	80.3%	7	0	1	0.237	5
Moore	6,362	93	49.3	68	0.1%	74	39.2	65	0.584	88
Morgan	21,987	64	42.1	75	0.1%	75	39.1	63	0.560	78
Obion	31,807	48	58.4	59	38.4%	38	57.1	88	0.469	50
Overton	22,083	63	51	67	15.8%	71	75.9	95	0.556	77
Perry	7,915	88	19.1	95	0.0%	76	52.3	84	0.611	94
Pickett	5,077	95	31.2	90	0.0%	76	72.8	94	0.633	95
Polk	16,825	75	38.7	81	0.0%	76	18.3	17	0.546	75
Putnam	72,321	18	180.4	18	65.0%	16	68.3	93	0.375	20
Rhea	31,809	47	100.7	32	32.0%	48	33.3	54	0.450	40
Roane	54,181	26	150.1	22	49.0%	26	32.9	53	0.388	25
Robertson	66,283	20	139.1	23	46.8%	27	26.4	41	0.384	22
Rutherford	262,604	5	424.3	5	83.0%	5	30.8	51	0.248	6
Scott	22,228	62	41.8	77	19.4%	65	43.7	70	0.517	68
Sequatchie	14,112	78	53.1	65	26.2%	54	19.1	19	0.480	58
Sevier	89,889	15	151.8	21	43.4%	31	26.7	42	0.385	23
Shelby	927,644	1	1,228.90	2	97.2%	1	0	1	0.133	1
Smith	19,166	65	61	53	17.1%	68	44.1	71	0.519	69

County	2010 Population						Distance to Nearest Metro Area		IRR	Rank
	Total		Per Square Mile		Percent Urban					
	Number	Rank	Density	Rank	Percentage	Rank	Miles	Rank		
Stewart	13,324	81	29.1	92	0.0%	76	24	32	0.563	79
Sullivan	156,823	9	379.7	7	74.4%	9	0	1	0.251	7
Sumner	160,645	8	303.5	11	72.1%	12	27.8	46	0.289	13
Tipton	61,081	22	133	24	44.9%	29	23.9	31	0.389	27
Trousdale	7,870	89	68.9	48	0.0%	76	36.9	59	0.571	85
Unicoi	18,313	70	98.4	33	55.3%	22	13.7	12	0.384	21
Union	19,109	66	85.5	36	0.0%	76	22.1	23	0.533	74
Van Buren	5,548	94	20.3	94	0.0%	76	40.5	67	0.605	91
Warren	39,839	38	92.1	35	38.6%	37	48.8	78	0.447	38
Washington	122,979	11	377	8	73.6%	11	0	1	0.258	9
Wayne	17,021	74	23.2	93	0.0%	76	25.7	37	0.563	80
Weakley	35,021	43	60.4	54	33.0%	43	50.8	80	0.474	52
White	25,841	58	68.6	49	21.8%	59	56.4	87	0.511	65
Williamson	183,182	6	314.4	10	80.6%	6	21	21	0.257	8
Wilson	113,993	12	199.8	16	61.5%	17	25.9	39	0.329	16
Tennessee	**6,346,105**		**154**		**66.4%**					

Source: Prepared by TACIR staff from US Census Bureau data (population) and the Indiana Business Research Center at Indiana University's Kelley School of Business (distance to metro areas at http://www.statsamerica.org/innovation/interactive.asp?dpage=74 accessed online 23 July 2014).