Metropolitan Research Center

MEASURING URBAN SPRAWL AND VALIDATING SPRAWL MEASURES

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Abstract

Across the nation, the debate over metropolitan sprawl and its impacts continues. A decade ago, Smart Growth America (SGA) and the U.S. Environmental Protection Agency (EPA) sought to raise the level of this debate by sponsoring groundbreaking research on sprawl and its quality-of-life consequences (Ewing et al. 2002; Ewing et al. 2003a, 2003b, 2003c). The original sprawl indices were made available to researchers who wished to explore the various costs and benefits of sprawl. They have been widely used in outcome-related research, particularly in connection with public health. Sprawl has been linked to physical inactivity, obesity, traffic fatalities, poor air quality, residential energy use, emergency response times, teenage driving, lack of social capital, and private-vehicle commute distances and times (Ewing et al. 2003a; Ewing et al. 2003b; Ewing et al. 2003c; Kelly-Schwartz et al. 2004; Sturm and Cohen 2004; Cho et al. 2006; Doyle et al. 2006; Ewing et al. 2006; Kahn 2006; Kim et al. 2006; Plantinga and Bernell 2007; Ewing and Rong 2008; Joshu et al. 2008; Stone 2008; Trowbridge and McDonald 2008; Fan and Song 2009; McDonald and Trowbridge 2009; Trowbridge et al. 2009; Lee et al. 2009; Nguyen 2010; Stone et al. 2010; Schweitzer and Zhou 2010; Zolnik 2011; Holcombe and Williams 2012; Griffin et al. 2013; Bereitschaft and Debbage 2013).

In this study for the National Cancer Institute, the Brookings Institution, and Smart Growth America, we begin in Chapter 1 by updating the original county indices to 2010. As one would expect, the degree of county sprawl does not change dramatically over a 10-year period. Also, given their fixed boundaries, most counties become more compact (denser and with smaller blocks) over the 10-year period. Sprawl occurs mainly as previously rural counties (in 2000) outside metropolitan areas become low density suburbs and exurbs of metropolitan areas (in 2010).

In Chapter 2, we develop refined versions of the indices that incorporate more measures of the built environment. The refined indices capture four distinct dimensions of sprawl, thereby characterizing county sprawl in all its complexity. The four are development density, land use mix, population and employment centering, and street accessibility. The dimensions of the new county indices parallel the metropolitan indices developed by Ewing et al. (2002), basically representing the relative accessibility provided by the county. The simple structure of the original county sprawl index has become more complex, but also more nuanced and comprehensive, in line with definitions of sprawl in the technical literature.

In Chapter 3, we develop metropolitan sprawl indices that, like the refined county indices, have four distinct dimensions-- development density, land use mix, population and employment centering, and street accessibility. Compared to metropolitan sprawl indices from the early 2000s, these new indices

incorporate more variables and hence have more construct validity. For example, the earlier effort defined density strictly in terms of population concentrations, while this effort considers employment concentrations as well. The reason for developing metropolitan sprawl indices, rather than limiting ourselves to counties, is that metropolitan areas are natural units of analysis for certain quality-of-life outcomes.

In Chapter 4, we conduct one of the first longitudinal analysis of sprawl to see which areas are sprawling more over time, and which are sprawling less or actually becoming more compact. To conduct such as analysis, we need to employ a new level of geography, the census urbanized area. In contrast of counties and metropolitan areas, urbanized areas expand incrementally as areas grow and rural tracts are converted to urban and suburban uses. The analysis shows that, on average, urban sprawl in the U.S. increased between 2000 and 2010, but that there are many exceptions to this generalization.

Finally, in chapter 5, we develop compactness indices for census tracts within metropolitan areas. We know from the travel and public health literatures that there is a demand in the research community for built environmental metrics at the sub-county level, what might be described as the community or neighborhood scale.

The appendices provide values of compactness/sprawl indices for census tracts, counties, metropolitan areas, and urbanized areas. Data are available in electronic form at http://gis.cancer.gov/tools/urban-sprawl/

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Chapter 1. Updated County Sprawl Index

Ewing et al. (2003b; 2003c) originally estimated a single county sprawl index for each of 448 metropolitan counties or statistically equivalent entities (e.g., independent towns and cities). These counties comprised the 101 most populous metropolitan statistical areas, consolidated metropolitan statistical areas, and New England county metropolitan areas in the United States as of the 1990 census, the latest year for which metropolitan boundaries were defined as that study began. Nonmetropolitan counties, and metropolitan counties in smaller metropolitan areas, were excluded from the sample. More than 183 million Americans, nearly two-thirds of the United States population, lived in these 448 counties in 2000.

Six variables were part of the original county sprawl index (as shown in Table 1). U.S. Census data were used to derive three population density measures for each county:

- gross population density in persons per square mile (popden)
- percentage of the county population living at low suburban densities, specifically, densities between 100 and 1,500 persons per square mile, corresponding to less than one housing unit per acre (lt1500)
- percentage of the county population living at medium to high urban densities, specifically, more than 12,500 persons per square mile, corresponding to about 8 housing units per acre, the lower limit of density needed to support mass transit (gt12500)

In deriving population density measures, census tracts were excluded if they had fewer than 100 residents per square mile (corresponding to rural areas, desert tracts, and other undeveloped lands). Ewing et al. were only concerned with sprawl in developed areas where the vast majority of residents live.

A fourth density variable was derived from estimated urban land area for each county from the National Resources Inventory of the U.S. Department of Agriculture.

- net population density of urban places within the county (urbden)

Data reflecting street accessibility for each county were also obtained from the U.S. Census. Street accessibility is related to block size since smaller blocks translate into shorter and more direct routes. A census block is defined as a statistical area bounded on all sides by streets, roads, streams, railroad tracks, or geopolitical boundary lines, in most cases. A traditional urban neighborhood is composed of intersecting bounding streets that form a grid, with houses built on the four sides of the block, facing these streets. The length of each side of that block, and therefore its block size, is relatively small. By contrast, a contemporary suburban neighborhood does not make connections between adjacent cul-de-sacs or loop roads. Instead, local streets only connect with the street at the subdivision entrance, which is on one side of the block boundary. Thus, the length of a side of this block is quite large, and the block itself often encloses multiple subdivisions to form a superblock, a half mile or more on a side. Large block sizes indicate a relative paucity of street connections and alternate routes.

Two street accessibility variables were computed for each county:

- average block size (avgblk)
- percentage of blocks with areas less than 1/100 square mile, the size of a typical traditional urban block bounded by sides just over 500 feet in length (smlblk).

Blocks larger than one square mile were excluded from these calculations, since they were likely to be in rural or other undeveloped areas.

The six variables were combined into one factor representing the degree of sprawl within the county. This was accomplished via principal component analysis, an analytical technique that takes a large number of correlated variables and extracts a small number of factors that embody the common variance in the original data set. The extracted factors, or principal components, are weighted combinations of the original variables. When a variable is given a great deal of weight in constructing a principal component, we say that the variable loads heavily on that component. The greater the correlation between an original variable and a principal component, the greater the loading and the more weight the original variable is given in the overall principal component score. The more highly correlated the original variables, the more variance is captured by a single principal component.

The principal component selected to represent sprawl was the one capturing the largest share of common variance among the six variables, that is, the one upon which the observed variables loaded most heavily. This one component accounted for almost two-thirds of the variance in the dataset. Because this component captured the majority of the combined variance of these variables, no subsequent components were considered.

To arrive at a final index, Ewing et al. transformed the principal component, which had a mean of 0 and standard deviation of 1, to a scale with a mean of 100 and standard deviation of 25. This transformation produced a more familiar metric (like an IQ scale) and ensured that all values would be positive, thereby allowing us to take natural logarithms and estimate elasticities.

The bigger the value of the index, the more compact the county. The smaller the value, the more sprawling the county. Scores ranged from a high of 352 to a low of 63. At the most compact end of the scale were four New York City boroughs, Manhattan, Brooklyn, Bronx, and Queens; San Francisco County; Hudson County (Jersey City); Philadelphia County; and Suffolk County (Boston). At the most sprawling end of the scale were outlying counties of metropolitan areas in the Southeast and Midwest such as Goochland County in the Richmond, VA metropolitan area and Geauga County in the Cleveland, OH metropolitan area. The county sprawl index was positively skewed. Most counties clustered around intermediate levels of sprawl. In the U.S., few counties approach the densities of New York or San Francisco.

For these counties, the original sprawl index was validated against journey to work, adult obesity, and traffic fatality data (Ewing et al. 2003a; Ewing et al. 2003b; Ewing et al. 2003c). Later, the same county sprawl index was used to model the built environment in a study of youth obesity (Ewing et al. 2006). For this study, the index was computed for additional counties or county equivalents in order to have

sprawl data for more National Longitudinal Survey of Youth (NLSY97) respondents. The 954 counties or county equivalents in the expanded sample represented the vast majority of counties lying within U.S. metropolitan areas, as defined by the U.S. Census Bureau in December 2003. Almost 82% of the U.S. population lived in metropolitan counties for which county sprawl indices were now available. Most recent research on sprawl and its impacts has made use of this expanded dataset.

Update to 2010

In updating the original county sprawl index to 2010, five of the six variables were derived in the exact same way as for 1990 and 2000. U.S. Census files for summary levels 140 (census tracts) and 101 (census blocks) were downloaded from American FactFinder. Population data were extracted for all census tracts in all metropolitan counties. Land area data were extracted for all census blocks in all metropolitan counties. Ninety-nine metropolitan counties were lost to the sample because they had no census tracts averaging 100 persons per square mile or more. They were deemed to be rural.

The sixth variable, net density of urban areas within the county, was originally computed using data on "urban and built up uses" from the National Resources Inventory of the U.S. Department of Agriculture. The most recent NRI (2007) does not provide data at the county level. Therefore the U.S. Geological Survey's National Land Cover Database (NLCD) was used instead. NLCD serves as the definitive Landsat-based, 30-meter resolution, land cover database for the Nation. It is a raster dataset providing spatial reference for land surface classification (for example, urban, agriculture, forest). It can be geo-processed to any geographic unit.

For the current work, the urban land area was generated at the county level using NLCD 2006 (the latest product) and county geography (2010) for the entire U.S. Using the "Tabulate Area" spatial analyst tool within ArcGIS, urban land areas within each county were calculated. The noncontiguous areas in the same county were aggregated resulting in total urban area in square miles. The value codes treated as urban were:

> 21. Developed, Open Space - Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
>
> 22. Developed, Low Intensity - Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
>
> 23. Developed, Medium Intensity – Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.

24. High Intensity - Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.

The NRI and NLCD datasets are fairly comparable (see Appendix A), making the county sprawl indices for 1990, 2000, and 2010 fairly comparable. However, NLCD is only available for the continental U.S. Therefore counties and county equivalents from Alaska, Hawaii, and Puerto Rico, 72 in total, were lost to the sample.

Once again, principal component analysis was used to reduce the six variables to a single index. This index accounts for 59 percent of the variance in the original six variables. Factor loadings are shown in Table 1.1.

Table 1.1. County Sprawl Index Variables and Factor Loadings in 2010

Observed variable	Factor loading*
popden	0.858
lt1500	-0.658
gt12500	0.821
urbden	0.876
avgblk	-0.664
smlblk	0.711
Eigenvalue	3.56
Explained variance	59.3%

* Correlation with county sprawl index

We transformed the overall compactness score into an index with a mean of 100 and a standard deviation of 25. This was done for the sake of consistency and ease of understanding. With this transformation, the more compact counties have index values above 100, while the more sprawling have values below 100.

Appendix A contains county sprawl (compactness) indices for 994 county and county equivalents in 2010. The 10 most compact and 10 most sprawling counties are shown in Tables 1.2 and 1.3. The most compact counties are as expected, central counties of large, older metropolitan areas. The most sprawling counties are outlying counties of large metropolitan areas, or component counties of smaller metropolitan areas. Values range from 54 for Jackson County outside Topeka, Kansas, the most sprawling county in 2010, to 464 for New York County (Manhattan), the most compact county in 2010. Appendix A also contains estimates of county sprawl in 2000, derived by applying the 2010 component score coefficient values to data for counties in 2000. Finally, the appendix presents changes in county sprawl, measured equivalently, between the two census years.

Table 1.2. 10 Most Compact Counties in 2010 According to the Six Variable Index

	County	Metropolitan Area	Index
1	New York County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	463.9
2	Kings County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	341.4
3	Bronx County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	331.5

4	Queens County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	272.1
5	San Francisco County, CA	San Francisco-Oakland-Fremont, CA	247.8
6	Hudson County, NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	228.8
7	Suffolk County, MA	Boston-Cambridge-Quincy, MA-NH	217.1
8	Philadelphia County, PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	216.8
9	District of Columbia, DC	Washington-Arlington-Alexandria, DC-VA-MD-WV	193.3
10	Richmond County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	190.1

Table 1.3. 10 Most Sprawling Counties in 2010 According to the Six Variable Index

		Metropolitan Area	Index
985	Ford County, IL	Champaign-Urbana, IL	67.3
986	Osage County, KS	Topeka, KS	66.9
987	Jasper County, IN	Chicago-Joliet-Naperville, IL-IN-WI	66.8
988	Grant County, AR	Little Rock-North Little Rock-Conway, AR	66.8
989	Tipton County, IN	Kokomo, IN	66.4
990	Chester County, TN	Jackson, TN	65.4
991	Morrow County, OH	Columbus, OH	63.4
992	Greene County, NC	Greenville, NC	63.3
993	Polk County, MN	Grand Forks, ND-MN	61.1
994	Jackson County, KS	Topeka, KS	54.6

Figure 1.1 is a plot of 2010 sprawl index values vs. 2000 sprawl index values computed with the same component score coefficient values. As one would expect, the degree of county sprawl does not change dramatically over a 10-year period. Figure 1.2 is a histogram of changes in county sprawl values between 2000 and 2010, where 2000 sprawl values are computed using the 2010 component score coefficient values. As one would expect, given their fixed boundaries, most counties become more compact (denser and with smaller blocks) over the ten-year period. Sprawl occurs mainly as previously rural counties (in 2000) outside metropolitan areas become low-density suburbs and exurbs of metropolitan areas (in 2010).

Figure 1.1. Scatterplot of 2010 Sprawl Index vs. 2000 Sprawl Index (Estimated Equivalently)

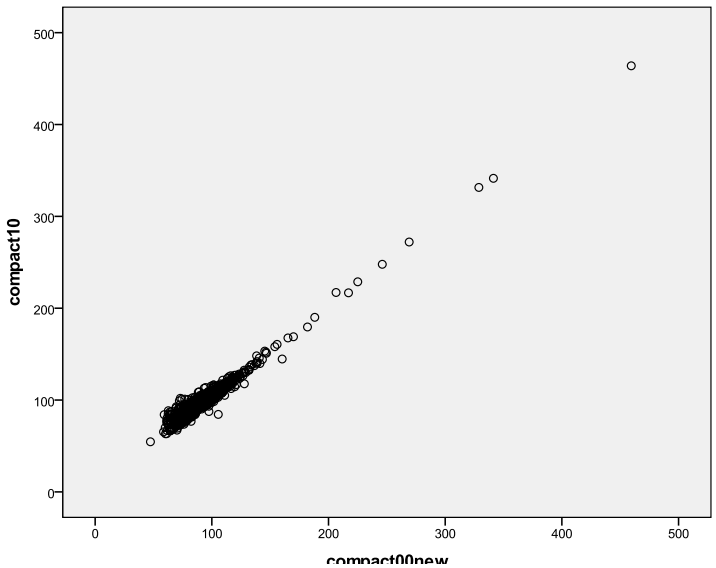
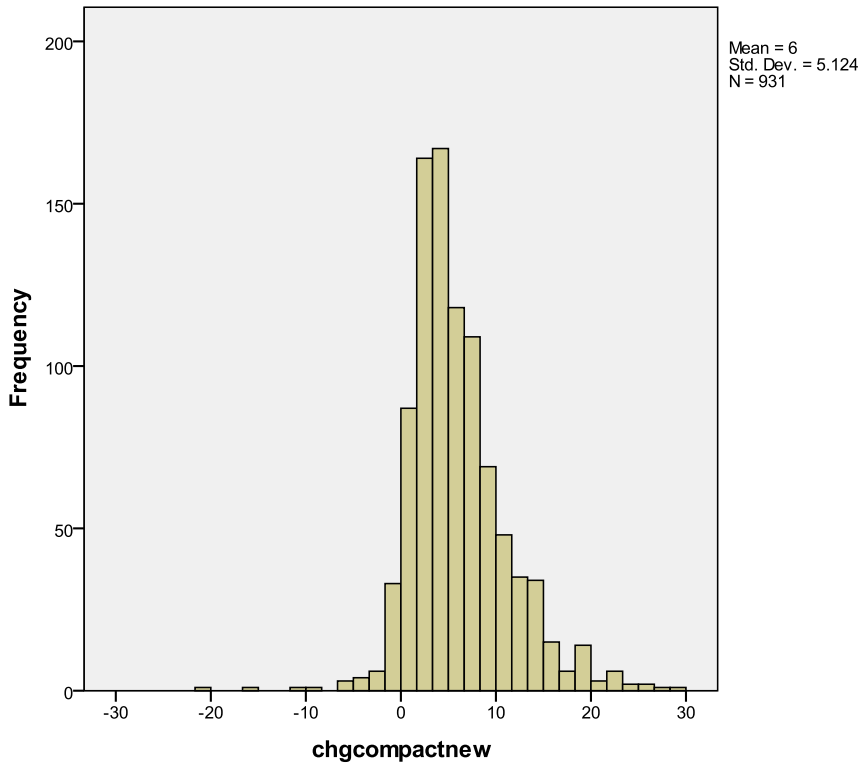


Figure 1.2. Histogram of Changes in County Sprawl Index Between 2000 and 2010 (Estimated Equivalently)



Chapter 2. Refined County Sprawl Measures

A literature review by Ewing (1997) found poor accessibility to be the common denominator of sprawl. Sprawl is viewed as any development pattern in which related land uses have poor access to one another, leaving residents with no alternative to long distance trips by automobile. Compact development, the polar opposite, is any development pattern in which related land uses are highly accessible to one another, thus minimizing automobile travel and attendant social, economic, and environmental costs. The following patterns are most often identified in the literature: scattered or leapfrog development, commercial strip development, uniform low-density development, or single-use development (with different land uses segregated from one another, as in bedroom communities). In scattered or leapfrog development, residents and service providers must pass by vacant land on their way from one developed use to another. In classic strip development, the consumer must pass other uses on the way from one store to the next; it is the antithesis of multipurpose travel to an activity center. Of course, in low-density, single-use development, everything is far apart due to large private land holdings and segregation of land uses.

While the technical literature on sprawl focuses on land use patterns that produce poor regional accessibility, poor accessibility is also a product of fragmented street networks that separate urban activities more than need be. When asked, planners now routinely associate sprawl with sparse street networks as well as dispersed land use patterns.

The original county sprawl index operationalized only two dimensions of urban form—residential density and street accessibility. Our grant from the National Institutes of Health (NIH) provides for the development of refined measures of county compactness or, conversely, county sprawl. These measures are modeled after the more complete metropolitan sprawl indices developed by Ewing et al. (2002). The refined indices operationalize four dimensions, thereby characterizing county sprawl in all its complexity. The four are density, mix, centering, and street accessibility. The dimensions of the new county indices parallel the metropolitan indices, basically representing the relative accessibility provided by the county.

The full set of variables was used to derive a refined set of compactness/sprawl factors using principal component analysis. One principal component represents population density, another land use mix, a third centering, and a fourth street accessibility. County principal component values, standardized such that the mean value of each is 100 and the standard deviation is 25, are presented in Appendix B. The simple structure of the original county sprawl index has become more complex, but also more nuanced and comprehensive, in line with definitions of sprawl in the technical literature.

Density

Low residential density is on everyone's list of sprawl indicators. Our first four density variables are the same as in the original sprawl index, gross density of urban and suburban census tracts (popden), percentage of the population living at low suburban densities (lt1500), percentage of the population

living at medium to high urban densities (gt12500), and urban density based on the National Land Cover Database (urbden).

The fifth density variable is analogous to the first, except it is derived with employment data from the Local Employment Dynamics (LED) database rather than population data from the 2010 Census. The LED database is assembled by the Census Bureau through a voluntary partnership with state labor market information agencies. The data provide unprecedented details about America's jobs, workers, and local economies. The LED data, available from 2002 to 2010, are collected at census block geography level and can be aggregated to any larger geography, in this case block groups. LED variables include total number of jobs, average age of workers, monthly earnings, and as of 2009 sex, race, ethnicity, and education levels. In this case, LED data were processed for the year 2010. The data were aggregated from census block geography to census block group geography to generate total jobs by two-digit NAICS code for every block group in the nation, except those in Massachusetts, which doesn't participate in the program. The density variable derived from the LED database is:

- gross employment density of urban and suburban census tracts (empden)

Principal components were extracted from the five density-related variables, and the principal component that accounted for the greatest variance became the county density factor. Factor loadings (that is, correlations of these variables with the density factor) are shown in Table 2.1. The eigenvalue of the density factor is 3.56, which means that this one factor accounts for more of the variance in the original dataset than three of the component variables combined. In other words, the density factor accounts for more than 70 percent of the total variance in the data set. As expected, one of the variables loads negatively on the density factor, that being the percentage of population living at less than 1,500 persons per square mile. The rest load positively. Thus, for all component variables, higher densities translate into higher values of the density factor.

Table 2.1. Variable Loadings on the County Density Factor for 2010

Observed variable	Factor loading*
popden	0.983
lt1500	0.848
gt12500	-0.440
urbden	0.850
empden	0.977
Eigenvalue	3.56
Explained variance	71.1%

* Correlation with the density factor

Mixed Use

Three types of mixed-use measures are found in the land use-travel literature: those representing relative balance between jobs and population within subareas of a region; those representing the diversity of land uses within subareas of a region; and those representing the accessibility of residential

uses to nonresidential uses at different locations within a region. In this study, all three types were estimated for counties in our sample and became part of a mix factor.

The first two variables were calculated for each block group using block-level population data from the 2010 Census, and block-level employment data from the 2010 LED database. For the first variable, each block group centroid was buffered with a one-mile ring, and jobs and population were summed for blocks within the ring. One-mile rings were used to standardize geography for census block groups, which vary widely in size, making balance easier to achieve in the larger block groups. The resulting job and population totals were used to compute a job-population balance measure. [1] This variable equals 1 for block groups with the same ratio of jobs-to-residents within the one-mile ring as the metropolitan area as a whole; 0 for block groups with only jobs or residents within the one-mile ring, not both; and intermediate values for intermediate cases. All values were weighted by the sum of block group jobs and residents as a percentage of the county total to obtain:

- countywide average job-population balance (jobpop).

For the second mixed-use variable, each block group centroid was again buffered with a one-mile ring, and jobs by sector were summed for blocks within the ring. An entropy formula was then used to compute a measure of job mix. [2] The variable equals 1 for block groups with equal numbers of jobs in each sector within the ring; 0 for block groups with all jobs in a single sector within the ring; and intermediate values for intermediate cases. The sectors considered in this case were retail,

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[1] The equation used to calculate job-population balance was:

$$\sum_{i=0}^{i=n}(1-(ABS(J_i - JP * P_i))/(J_i + JP * P_i)) * ((BJ_i + BP_i)/(TJ + TP))$$

where:

i = census tract number (excluding those with fewer than 100 persons per square mile)
n = number of census tracts in the county
J = jobs in the census tract
P = residents in the census tract
JP = jobs per person in the metropolitan area
TJ = total jobs in the county
TP = total residents in the county

[2] The equation for this measure is:

$$\sum_{i=1}^{n}\sum_{j}((P_j * LN(P_j))/LN(j)) * ((BJ_i + BP_i)/(TJ + TP))$$

where:

i = census tract number (excluding those with fewer than 100 persons per square mile)
n = number of census tracts in the county
j = number of sectors
P_j = proportion of jobs in sector j
JP = jobs per person in the metropolitan area
TJ = total jobs in the county
TP = total residents in the county

entertainment, health, education, and personal services. Values were weighted by the sum of block group population and employment as a percentage of the county total to obtain:

- countywide degree of job mixing (jobmix).

A third mixed-use variable uses data from Walk Score, Inc. to measure proximity to amenities, with different amenities weighted differently and amenities discounted as the distance to them increases up to one mile and a half, where they are assumed to be no longer accessible on foot.[3] Classic Walk Score data were acquired for all urban census tracts in the United States. Year 2012 data were purchased to reduce the cost of data acquisition. Values were weighted by the sum of block group population and employment as a percentage of the county total to obtain:

- countywide average Walk Score (walkscore)

Principal components were extracted from the three mix-related variables, and the principal component that accounted for the greatest variance became the mix factor. Loadings of these variables on the mix factor are shown in Table 2.2. The eigenvalue of the mix factor is 2.30, which means that this one factor accounts for more than two-thirds of the total variance.

Table 2.2. Variable Loadings on the County Mix Factor for 2010

Observed variable	Factor loading*
jobpop	0.891
jobmix	0.942
walkscore	0.784
Eigenvalue	2.30
Explained variance	76.6%

* Correlation with the mix use factor

Centering

Urban centers are concentrations of activity that provide agglomeration economies, support alternative modes and multipurpose trip making, create a sense of place in the urban landscape, and otherwise differentiate compact urban areas from sprawling ones. Centeredness can exist with respect to population or employment, and with respect to a single dominant center or multiple subcenters. The technical literature associates compactness with centers of all types, and sprawl with the absence of centers of any type.

Ewing et al. (2002) measured metropolitan centering, in part, in terms of concentrations of development in or around historic central business districts (CBDs) of metropolitan areas. This concept of centering does not make much sense when applied to the individual counties that make up a metropolitan area, only one of which can contain the historic central business district. Other counties have their own subcenters in the polycentric metropolitan areas of today, and the existence of and proximity to these

[3] A grocery store, for example, gets three times the weight of a book score. The distance decay function starts with a value of 100 and decays to 75 percent at a half mile, 12.5 percent at one mile, and zero at 1.5 miles.

are what distinguish counties with concentrations of activity from those without. Four measures of centering were derived for metropolitan counties:

The first centering measure came straight out of the 2010 census:

- coefficient of variation in census block group population densities, defined as the standard deviation of block group densities divided by the average density of block groups. The more variation in densities around the mean, the more centering and/or subcentering exists within the county (varpop)

The second centering measure was derived from the LED database and is analogous to the first measure, except for its use of employment density by block group rather than population density to compute:

- coefficient of variation in census block group employment densities, defined as the standard deviation of block group densities divided by the average density of block groups. The more variation in densities around the mean, the more centering and/or subcentering exists within the county (varemp)

The last two centering variables measure the proportion of employment and population within CBDs and employment sub-centers. We first identified the location of CBDs and employment sub-centers for all metropolitan areas. For identifying CBDs, we ran a local spatial autocorrelation procedure using the local Moran's I statistic (Anselin, 1995).[4] With this procedure, it is possible to quantify the degree of clustering of neighboring zones with high levels of density. This method has been used by Baumont & Le Gallo (2003) and Riguelle et al. (2007).

[4] Local Moran's I is defined as:

$$I_i = \frac{(x_i - \bar{x})}{\sum_{i=1}^{n}(x_i - \bar{x})^2/n}\sum_{j=1}^{n} w_{ij}(x_j - \bar{x})$$

where I_i is the local Moran's I coefficient, X is the value of the employment density, w_{ij} is the matrix of spatial weights, and n is the number of observations. Through calculating z-values of the local Moran statistic (see Anselin, 1995; Getis and Ord, 1996) it is then possible to identify two types of spatial clusters, two types of outliers :

- High-high High values around neighbors with high values (cluster)
- Low-low Low values around neighbors with low values (cluster)
- High-low High values around neighbors with low values (outlier)
- Low-high Low values around neighbors with high values (outlier)

Using LED data of block groups, the Moran's I analysis was done for all Metropolitan areas. The High-High clusters with the highest employment density in each metropolitan statistical area (MSA) were considered as CBD candidates. However not all of them are CBDs. We excluded the hot spots containing large firms such as hospitals, malls and university campuses by applying the threshold of having employment share of no more than 75 percent in each sector. We identified CBD for a total of 356 Metropolitan areas.

Having CBDs for 356 metropolitan areas, we identified employment sub-centers as the positive residuals estimated from an exponential employment density function using Geographically Weighted Regression method (GWR).[5] In the literature, urban sub-centers are areas with significantly higher employment density than the surrounding areas (McDonald 1987). To identify sub-centers, researchers have used several types of procedures: a minimum density procedure (Giuliano and Small 1991), identification of local peaks (Craig & Ng, 2001), and a nonparametric method (McMillen 2004). The last of these methods works best, according to literature review by Lee (2007). Using this procedure, we found 224 metropolitan areas to be monocentric (have only one center), 132 to be polycentric (have more than one center), and 18 metropolitan areas to be dispersed (have no CBD and no sub-center). This procedure resulted in two new centering variables. These findings were validated by inspecting Google Earth satellite images to identify concentrations of activity, and see whether they corresponded to our findings with GWR.

- Percentage of county population in CBD or sub-centers (popcen)
- Percentage of county employment in CBD or sub-centers (empcen)

Principal components were extracted from the set of centering variables, and the principal component that accounted for the greatest variance became our centering factor. All component variables loaded positively on the centering factor (see table 2.3). The eigenvalue of the centering factor is 1.96, which means that this one factor accounts for just under half of the total variance in the data set.

Table 2.3. Variable Loadings on the County Centering Factor for 2010

Observed variable	Factor loading*
varpop	0.085
varemp	0.642
popcen	0.820
empcen	0.932
Eigenvalue	1.96
Explained variance	49.1%

* Correlation with the centering factor

[5] GWR estimates a smoothed employment density surface using only nearby observations for any data point (block groups), with more weights given to closer observations. The dependent variable of the GWR estimations is employment density by block groups and the independent variable is the distance of the block group centroid from the CBD. We used the Adaptive kernel type with 30 numbers of neighbors. The block groups with highest positive residual (if residual is 4 times greater than predicted) are candidates for employment sub-centers. As with CBD identification, we excluded the block groups containing large firms such as hospitals, regional malls, and university campuses by applying the requirement that the employment share be no more than 75 percent in each sector. Finally we excluded cases when their ratio of employment to population was less than 2.5 (Gordon et al 1986). We identified a total of 451 sub-centers in 132 metropolitan areas.

Street Accessibility

In the refined sprawl indices, two street variables are the same as in the original county sprawl index: average block size excluding rural blocks of more than one square mile (avgblk) and percentage of small urban blocks of less than one hundredth of a square mile (smlblk). To these two street accessibility variables were added. The two new street variables are:

- intersection density for urban and suburban census tracts within the county, excluding rural tracts with gross densities of less than 100 persons per square mile (intden)
- percentage of 4-or-more-way intersections, again excluding rural tracts (4-way)

Intersection density captures both block length and street connectivity. Percentage of 4-or-more-way intersections provides a pure measure of street connectivity, as 4-way intersections provide more routing options than 3-way intersections.

Starting with a 2006 national dataset of street centerlines generated by TomTom that ships with ArcGIS, we produced a national database of street intersection locations, including for each intersection feature a count of streets that meet there. The TomTom dataset includes one centerline feature for each road segment running between neighboring intersections; i.e. every intersection is the spatially coincident endpoint of 3 or more road segments.[6]

The resulting national intersection database contains 13.1 million features; 77% of these are three-way intersections, and the remaining 23% are four- or more-way intersections. Total counts of 3- and 4-or-more-way intersections were tabulated for census tracts, and census tracts were aggregated to obtain county-level data. For each county, the total number of intersections in urban and suburban tracts was divided by the land area to obtain intersection density (intden), while the number of 4-or-more-way intersections was multiplied by 100 and divided by the total number of intersections to obtain the percentage of 4-or-more way intersections (4way).

[6] Intersection features were created as follows: Using Census Feature Class Code (CFCC) values, we filtered out all freeways, unpaved tracks, and other roadways that don't function as pedestrian routes. Divided roadways, which from a pedestrian mobility perspective function similarly to undivided roadways of the same functional class, were represented in the source data as pairs of (roughly) parallel centerline segments. These were identified by CFCC value and merged into single segments using GIS tools. Streets intersecting the original divided roadways were trimmed or extended to the new merged centerlines, and the new merged centerlines were split at each intersection with side streets such that centerline features only intersect each other at feature endpoints. Roundabouts were assumed to function similarly to single 4+-way intersections, rather than close-set clusters of intersections joining the roundabout proper and the incoming streets. As such, centroids of roundabout circles were located and assigned an assumed count of four incoming streets; endpoints of incoming street features were ignored.

With the corrected street centerline data prepared, we generated point features at both endpoints of each street segment. Points closer together than 12m were adjusted to be spatially coincident in order to control for any possible remaining geometric errors related to divided roadways. We then used GIS tools to count the number of points (representing ends of street segments) coinciding at any location. Locations with point counts of one (dead ends) or two (locations where a roadway changes name, functional class, or other attribute) were discarded as non-street intersections. Remaining locations were flagged with attributes indicating whether a point was a three-way or a four- or more-way intersection.

Principal components were extracted from the full set of street-related variables, and the principal component that accounted for the greatest variance became our street accessibility factor. Loadings of these variables on the street factor are shown in Table 2.4. The eigenvalue of the street factor is 2.39, which means that this one factor accounts for more than half of the total variance in the data set. As expected, one of the variables loads negatively on the street accessibility factor, that being the average block size. The rest load positively. Thus, for all component variables, more accessibility translates into higher values of the street factor.

Table 2.4. Variable Loadings on the County Street Factor for 2010

Observed variable	Factor loading*
avgblk	-0.764
smlblk	0.901
inden	0.836
4-way	0.545
Eigenvalue	2.39
Explained variance	59.8%

* Correlation with the street factor

Relationship Among Compactness Factors

It has been said that measures of the built environment are so highly correlated that they should not be represented separately, but instead should be combined into a single index. Thus, for example, overall measures of walkability have been advanced as an alternative to individual measures.

This position is not borne out by this study, at least not at the county level. While correlated, as one might expect, the four compactness factors seem to represent distinct constructs. Their simple correlation coefficients are shown in Table 2.5. The highest is 0.647, which means that each factor explains less than 42 percent of the variation in the other.

Table 2.5. Simple Pearson Correlation between four factors

	density factor	mix factor	centering factor	street factor
density factor	1	0.399**	0.523**	0.583**
mix factor	0.399**	1	0.421**	0.647**
centering factor	0.523**	0.421**	1	0.438**
street factor	0.583**	0.647**	0.438**	1

Composite Index

The next issue we had to wrestle with was how to combine the four factors into a single sprawl index. A priori, there is no “right” way to do so, only ways that have more or less face validity.

Should the four factors be weighted equally, or should one or another be given more weight than the others? Density has certainly received more attention as an aspect of sprawl than has, say, street accessibility. However, beyond play in the literature, we could think of no rationale for differential weights. The first three factors all contribute to the accessibility or inaccessibility of different

development patterns, none presumptively more than the others. Depending on their values, all move a county along the continuum from sprawl to compact development to sprawl. Thus they were simply summed, in effect giving each dimension of sprawl equal weight in the overall index.

As with the individual sprawl factors, we transformed the overall compactness score into an index with a mean of 100 and a standard deviation of 25. This was done for the sake of consistency and ease of understanding. With this transformation, the more compact counties have index values above 100, while the more sprawling have values below 100.

Appendix B contains compactness factors and refined county sprawl (compactness) indices for 967 county and county equivalents in 2010. Note that Massachusetts counties are missing from the mix factor and overall index for lack of LED data. The ten most compact and ten most sprawling counties are shown in Tables 3.6 and 3.7. The rankings are similar to those with the original county sprawl index. The most compact counties are central counties of large, older metropolitan areas. The most sprawling counties are outlying counties of large metropolitan areas, or component counties of smaller metropolitan areas. Values range from 42 for Oglethorpe County, GA outside Athens, the most sprawling county in 2010.

Looking at Tables 1.2 and 2.6, it would seem that the original and new compactness indices are measuring the same construct, but that is not quite true. Just compare Tables 1.3 and 2.7, where there is no overlap in the most sprawling counties according to the two indices. The original compactness index is dominated by density variables (four of six variables in the index) and only slightly diluted by street variables (two of the six), which correlate strongly with density. The new compactness index dilutes the role of density by adding two new factors (mix and centering). The simple correlation coefficient between original and new indices is 0.865, which means that about 25 percent of the variance in each index is unexplained by the other. We would expect that they have similar but not identical relationships to outcome variables, and similar but not identical predictive power.

Table 2.6. 10 Most Compact Counties in 2010 According to the Four-Factor Index (excluding Massachusetts counties)

	County	Metropolitan Area	Index
1	New York County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	425.2
2	Kings County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	265.2
3	San Francisco County, CA	San Francisco-Oakland-Fremont, CA	251.3
4	Bronx County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	224.0
5	Philadelphia County, PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	207.2
6	District of Columbia, DC	Washington-Arlington-Alexandria, DC-VA-MD-WV	206.4
7	Queens County, NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	204.2
8	Baltimore city, MD	Baltimore-Towson, MD	190.9
9	Norfolk city, VA	Virginia Beach-Norfolk-Newport News, VA-NC	179.6
10	Hudson County, NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	178.7

Table 2.7. 10 Most Sprawling Counties in 2010 According to the Four-Factor Index (excluding Massachusetts counties)

	County	Metropolitan Area	Index
960	Spencer County, KY	Louisville/Jefferson County, KY-IN	60.4
961	Morrow County, OH	Columbus, OH	58.8
962	Brown County, IN	Indianapolis-Carmel, IN	58.5
963	Blount County, AL	Birmingham-Hoover, AL	56.6
964	Greene County, NC	Greenville, NC	56.6
965	Harris County, GA	Columbus, GA-AL	55.1
967	Macon County, TN	Nashville-Davidson--Murfreesboro--Franklin, TN	54.3
966	Elbert County, CO	Denver-Aurora-Broomfield, CO	54.3
968	Grant Parish, LA	Alexandria, LA	53.8
969	Oglethorpe County, GA	Athens-Clarke County, GA	45.5

Greater Validity of New Index

Compared to the original county compactness index, the new four-factor index has greater construct and face validity. It has greater construct validity because it captures four different dimensions of the construct "compactness" (density, mix, centering, and street accessibility), whereas the original index captures only two dimensions (density and street accessibility).

The greater face validity of the new four-factor index requires some explanation. The very first county compactness indices were derived for only 448 counties in the largest 101 metropolitan areas. The most sprawling counties, such as Geauga County outside Cleveland, have classic sprawl patterns of low-density suburban development.

Expanding to 994 counties and adding smaller metropolitan areas, the picture becomes more complicated. Tables 1.2 and 2.8 list the most compact counties as measured by both indices. The ten most compact counties based on the original index largely overlap with the top ten based on the new index (with the notable exception of Suffolk County (Boston), for which we don't have all required variables). New York County (Manhattan) is the most compact according to both indices (see Figure 2.1). Kings County (Brooklyn) is the second most compact according to both indices (see Figure 2.2).

Figure 2.1. Most Compact County According to Both Indices (New York County, NY)

Figure 2.2. Second Most Compact County According to Both Indices (Kings County, NY)

However, the ten most sprawling counties are entirely different when measured by different indices (see Tables 1.3 and 2.9). Which index has greater face validity? We reviewed satellite imagery for the ten most sprawling counties, according to both indices, and found that the development patterns for the new index are much more representative of classic suburban sprawl (see Tables 2.8 and 2.9). While all 20 counties are part of metropolitan areas, many of the counties rated as most sprawling according to the original index have different development patterns than expected. They would best be described as exurban counties with small towns surrounded by farmlands (see Figures 2.3 and 2.4). The small towns have moderate densities and gridded streets. The fact they are part of larger census tracts, our

units of analysis, depresses their densities and compactness scores. They are not examples of classic suburban or exurban sprawl. On the other hand, the counties rated as most sprawling according to the new four-factor index have census tracts with very low-density residential development.

Table 2.8. 10 Most Sprawling Counties in 2010 According to the Six-Variable Index

	Development Pattern	Index
Ford County, IL	**Small town surrounded by rural development**	67.3
Osage County, KS	**Small town surrounded by rural development**	66.9
Jasper County, IN	Continuous low density suburban development	66.8
Grant County, AR	Continuous low density suburban development	66.8
Tipton County, IN	**Small town surrounded by rural development**	66.4
Chester County, TN	Continuous low density suburban development	65.4
Morrow County, OH	Continuous low density suburban development	63.4
Greene County, NC	Continuous low density suburban development	63.3
Polk County, MN	**Small town surrounded by rural development**	61.1
Jackson County, KS	**Small town surrounded by rural development**	54.6

Table 2.9. 10 Most Sprawling Counties in 2010 According to the Four-Factor Index (excluding Massachusetts counties)

County	Metropolitan Area	Index
Spencer County, KY	Louisville/Jefferson County, KY-IN	60.4
Morrow County, OH	Columbus, OH	58.8
Brown County, IN	Indianapolis-Carmel, IN	58.5
Blount County, AL	Birmingham-Hoover, AL	56.6
Greene County, NC	Greenville, NC	56.6
Harris County, GA	Columbus, GA-AL	55.1
Macon County, TN	Nashville-Davidson--Murfreesboro--Franklin, TN	54.3
Elbert County, CO	Denver-Aurora-Broomfield, CO	54.3
Grant Parish, LA	Alexandria, LA	53.8
Oglethorpe County, GA	Athens-Clarke County, GA	45.5

Figure 2.3. Most Sprawling County According to Six-Variable Index (Jackson County, KS)

Figure 2.4. Second Most Sprawling County According to Six-Variable Index (Polk County, MN)

Figure 2.5. Most Sprawling County According to Four-Factor Index (Oglethorpe County, GA)

Figure 2.6. Second Most Sprawling County According to Four-Factor Index (Grant Parish, LA)

Chapter 3. Derivation of Metropolitan Sprawl Indices

Sprawl is ordinarily conceptualized at the metropolitan level, encompassing cities and their suburbs. When we say Atlanta sprawls badly, we are probably referring to metropolitan Atlanta, not the city of Atlanta or Fulton County. The focus up to this point in the report has been on counties, because counties are typically smaller than metropolitan areas and more homogeneous than metropolitan areas. They more closely correspond to the environment in which individuals live, work, and play on a daily basis, and hence are affected by the built environment. But certain phenomena are manifested at the regional or metropolitan level, such as ozone levels and racial segregation. So in this chapter we derive metropolitan sprawl indices.

Methods

Sample

The unit of analysis in this study is the metropolitan area. A metropolitan area is a region that consists of a densely populated urban core and its less-populated surrounding territories that are economically and socially linked to it. The criteria of defining metropolitan areas changed in 2003. Smaller MSAs remained the same, but larger metropolitan areas, previously referred to as consolidated metropolitan statistical areas (CMSAs) are now defined as MSAs. Different portions of CMSAs, previously referred to as primary metropolitan statistical areas (PMSAs), have been redefined and reconfigured as metropolitan divisions. For example, the old New York CMSA consisted of eleven counties in two states and four PMSAs: New York PMSA, Nassau-Suffolk PMSA, Dutchess County PMSA and Newburgh, NY-PA PMSA. The current New York MSA consists of twenty-three counties in three states and four metropolitan divisions. The New York MSA now is strikingly heterogeneous, whereas the old New York PMSA contained only the five boroughs that make up New York City. Metropolitan divisions do not perfectly substitute for PMSAs, as they have different size thresholds (2.5 million vs. 1 million population), but they come as close to representing homogenous units as we can come with current census geography. Metropolitan divisions are designated for each of the eleven largest MSAs.[7]

The sample in this study is limited to medium and large metropolitan areas, and metropolitan divisions where they are defined. It initially included a total of 228 areas with more than 200,000 population in 2010. The rationale for thus limiting our sample is simple: the concept of sprawl has particular relevance to large areas where the economic, social, and environmental consequences of sprawl can be significant. The concept of sprawl does not have much relevance to small MSAs such as Lewiston, ID and Casper, WY.

Parenthetically, a total of seven metropolitan areas and divisions were ultimately dropped from our sample due to the lack of local employment dynamics (LED) data, a key data source for measuring sprawl. These metropolitan areas, or a portion of them, are located in Massachusetts, which does not participate in the LED program. This reduces the final sample size to 221 MSAs and metropolitan divisions.

[7] The metropolitan divisions, as components of MSAs, somewhat resemble PMSAs under the old system. However, PMSAs were much more common. The higher population threshold for establishing metropolitan divisions (at least 2.5 million), opposed to the threshold of at least 1 million to establish PMSAs, means that the new system contains twenty-nine metropolitan divisions within eleven MSAs, compared to seventy-three PMSAs within eighteen CMSAs under the old system.

Variables

Development Density

Our first five density variables are the same as in the original sprawl index (Ewing et al., 2002): gross density of urban and suburban census tracts (popden), percentage of the population living at low suburban densities (lt1500), percentage of the population living at medium to high urban densities (gt12500), and urban density based on the National Land Cover Database (urbden). These variables are measured the same way for metropolitan areas as for counties (see Chapter 2).

A fifth variable is the estimated density at the center of the metropolitan area derived from a negative exponential density function (dgcent). The function assumes the form:

$$Di = Do \exp(-b\, di).$$

where:

Di = the density of census tract i
Do = the estimated density at the center of the metropolitan area
b = the estimated density gradient or rate of decline of density with distance
di = the distance of the census tract from the center of the principal city

The higher the central density, and the steeper the density function, the more compact the metropolitan area (in a monocentric sense).[8]

The sixth density variable, which is new, is analogous to the first, except it is derived with employment data from the Local Employment Dynamics (LED) database (empden). The LED data were aggregated from census block geography to generate total jobs by 2-digit NAICS code for every block group in the nation. This was then divided by land area to produce a density measure.

The last two variables are related to employment centers identified by the authors as a part of this study. For more information on how the centers were identified for MSAs see "Activity Centering" in Chapter 3.The two variables are weighted average population density (popdcen) and weighted average employment density (empdcen) of all centers within a metropolitan area. The average densities were weighted by the sum of block group jobs and residents as a percentage of the MSA total.

Land Use Mix

The two mixed-use variables were calculated for each block group's buffer using block-level population data from the 2010 Census, and block-level employment data from the 2010 LED database. The first variable is a job-population balance measure (jobpop). This variable equals 1 for block groups with the same ratio of jobs-to-residents within the one-mile ring as the metropolitan area as a whole; 0 for block groups with only jobs or residents within the one-mile ring, not both; and intermediate values for

[8] The function was estimated as follows. The principal cities of the metro areas were identified as the first-named cities in the 1990 definitions of those areas. Their centers were determined by locating central business district tracts within the principal cities as specified in the 1980 STF3 file. 1980 designations were adopted because central business districts have not been designated since then. The means of the latitudes and longitudes of the centroids of those central business district tracts were taken as the metropolitan centers. The distances from the centers to all tracts were calculated using an ArcGIS. Finally, a negative exponential density function was fit to the resulting data points to estimate the intercept and density gradient.

intermediate cases. All values were weighted by the sum of block group jobs and residents as a percentage of the MSA total. [9]

We also derived a job mix variable (jobmix). The variable, an entropy measure, equals 1 for block groups with equal numbers of jobs in each sector; 0 for block groups with all jobs in a single sector within the ring; and intermediate values for intermediate cases. The sectors considered in this case were retail, entertainment, health, education, and personal services. Values were weighted by the sum of block group population and employment as a percentage of the MSA total.

A third mixed-use variable is metropolitan weighted average Walk Score (walkscore). It was computed using data from Walk Score, Inc. to measure proximity to amenities, with different amenities weighted differently and amenities discounted as the distance to them increases up to one mile and a half, where they are assumed to be no longer accessible on foot.[10] Classic Walk Score data were acquired for all urban census tracts in the United States. Values were weighted by the sum of census tract population and employment as a percentage of the MSA total.

Activity Centering

The first centering variable came straight out of Ewing et al. (2002) and the 2010 census. It is the coefficient of variation in census block group population densities, defined as the standard deviation of block group densities divided by the average density of block groups (varpop). The more variation in population densities around the mean, the more centering and/or subcentering exists within the MSA. The second centering variable is analogous to the first, except it is derived with employment data from the LED database. It is the coefficient of variation in census block group employment densities, defined as the standard deviation of block group densities divided by the average density of block groups (varemp). The more variation in employment densities around the mean, the more centering and/or subcentering exists within the MSAs.

The third variable contributing to the centering factor is the density gradient moving outward from the CBD, estimated with a negative exponential density function. The faster density declines with distance from the center, the more centered (in a monocentric sense) the metropolitan area will be (dgrad).

The next two centering variables measure the proportion of employment and population within CBDs and employment sub-centers. For computing them, we first identified the location of CBDs and employment sub-centers for all metropolitan areas (see “Activity Centering” section on Chapter 3). This procedure resulted in two new centering variables as the percentage of MSA population (popcen) and employment (empcen) in CBDs and sub-centers.

Street Accessibility

Street accessibility is related to block size since smaller blocks translate into shorter and more direct routes. Large block sizes indicate a lack of street connections and alternate routes. So, three street accessibility variables were computed for each MSA based on blocks size: average block length (avgblklngh), average block size (avgblksze) and the percentage of blocks that are less than 1/100 square mile, which is the typical size of an urban block (smlblk).

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[9] See “land use mix” section for the formula used for computing job-population balance and job mix measures.

[10] A grocery store, for example, gets three times the weight of a book score. The distance decay function starts with a value of 100 and decays to 75 percent at a half mile, 12.5 percent at one mile, and zero at 1.5 miles.

These three variables were part of Ewing et al.'s original sprawl metrics. To them, we have added two new variables. They are intersection density and percentage of 4-or-more way intersections. Intersections are where street connections are made and cars must stop to allow pedestrians to cross. The higher the intersection density, the more walkable the city (Jacobs, 1993). Intersection density has become the most common metric in studies of built environmental impacts on individual travel behavior (Ewing and Cervero, 2010).

Another common metric in such studies is the percentage of 4-or-more-way intersections (Ewing and Cervero, 2010). This metric provides the purest measure of street connectivity, as 4-way intersections provide more routing options than 3-way intersections. A high percentage of 4-way intersections does not guarantee walkability, as streets may connect at 4-way intersections in a super grid of arterials. But it does guarantee routing options.

For each MSA, the total number of intersections in the urbanized portion of MSA was divided by the land area to obtain intersection density (intden), while the number of 4-or-more-way intersections was multiplied by 100 and divided by the total number of intersections to obtain the percentage of 4-or-more way intersections (4way).

Results

Individual Compactness/Sprawl Factors

For each dimension of sprawl, we ran principal component analysis on the measured variables, and the principal component that captured the largest share of common variance among the measured variables was selected to represent that dimension. Factor loadings (the correlation between a variable and a principal component), eigenvalues (the explanatory power of a single principal component), and percentages of explained variance are shown in Table 3.1.

The eigenvalue of the density factor is 5.82, which indicates that this one factor accounts for about three quarters of the total variance in the dataset. As anticipated, the percentage of the population living at less than 1,500 persons per square mile loads negatively on the density factor. The rest load positively.

The eigenvalue for the mix factor is 2.30, which indicates that this one factor accounts for more than three quarter of the total variance in the dataset. All component variables load positively on the mix factor.

The eigenvalue of the centering factor is 1.90, which indicates that this factor accounts for about 38% of the total variance in the datasets. The density gradient loads negatively on centering factor as expected. The rest load positively.

The eigenvalue of the street factor is 2.51, which indicates that this factor accounts for more than a half of the total variance in the dataset. As expected, the average block size and average block length load negatively on the street accessibility factor. The rest load positively.

Table 3.1: Variable Loadings of Four Factors for 2010

Component Matrix		Data Sources	Factor Loadings
Density Factor			
popden	gross population density	Census 2010	0.900
empden	gross employment density	LED 2010	0.898
lt1500	percentage of the population living at low suburban densities	Census 2010	-0.597
gt12500	percentage of the population living at medium to high urban densities	Census 2010	0.879
urbden	net population density of urban lands	NLCD	0.925
dgcent	estimated density at the center of the metro area derived from a negative exponential density function	Census 2010, Tiger 2010	0.948
popdcen	weighted average population density of centers	Census 2010	0.810
empdcen	weighted average employment density of centers	LED 2010	0.817
Eigenvalue			**5.82**
Explained variance			**72.80%**
Mix use Factor			
jobpop	job-population balance	LED 2010	0.834
jobmix	degree of job mixing (entropy)	LED 2010	0.921
walkscore	weighted average Walk Score	Walk Score Inc.	0.870
Eigenvalue			**2.30**
Explained variance			**76.72%**
Centering Factor			
varpop	coefficient of variation in census block group population densities	Census 2010	0.495
varemp	coefficient of variation in census block group employment densities	LED 2010	0.313
dgrad	density gradient moving outward from the CBD	Census 2010, Tiger 2010	-0.375
popcen	percentage of MSA population in CBD or sub-centers	Census 2010	0.833
empcen	percentage of MSA employment in CBD or sub-centers	LED 2010	0.847
Eigenvalue			**1.90**
Explained variance			**37.89%**
Street Factor			
smlblk	percentage of small urban blocks	Census 2010	0.871
avgblksze	average block size	Census 2010	-0.804
avgblklng	average block length	NAVTEQ 2012	-0.649
intden	intersection density	TomTom 2007	0.729
4way	percentage of 4-or-more-way intersections	TomTom 2007	0.380
Eigenvalue			**2.51**
Explained variance			**50.03%**

Overall Compactness/Sprawl Index for 2010

Although density has received more attention as a dimension of sprawl than have other factors, similar to Ewing et al. (2002) we could think of no rationale for giving different weights to the four factors. All four factors affect the accessibility or inaccessibility of development patterns. Each factor can move a MSA along the continuum from sprawl to compact development. Thus the four were simply summed, in effect giving each dimension of sprawl equal weight in the overall index.

The second and more difficult issue was whether to, and how to, adjust the resulting sprawl index for MSA size. As areas grow, so do their labor and real estate markets, and their land prices. Their density gradients accordingly shift upward, and other measures of compactness (intersection density, for example) follow suit. The simple correlation between the sum of the four sprawl factors and the population of the MSA is 0.575, significant at .001 probability level. Thus, the largest urbanized areas, perceived as the most sprawling by the public, actually appear less sprawling than smaller urbanized areas when sprawl is measured strictly in terms of the four factors, with no consideration given to area size.

We used the same methodology as Ewing et al (2002) to account for metropolitan area size. We regressed the sum of the four sprawl factors on the natural logarithm of the population of the MSAs. The standardized residuals became the overall measure of sprawl. As such, this index is uncorrelated with population. However, the overall index still has a high correlation (r=0.866) with the sum of four factors before adjustment.

We transformed the overall sprawl index into a metric with a mean of 100 and a standard deviation of 25 for ease of use and understanding. More compact metropolitans have index values above 100, while the more sprawling have values below 100. Table 3.2 presents overall compactness scores and individual component scores for the 10 most compact and the 10 most sprawling large metropolitan areas. By these metrics, New York and San Francisco are the most compact large metropolitan divisions (see Figures 3.1a&b), while Hickory, NC and Atlanta, GA are the most sprawling metropolitan areas (see Figure 3.2a&b). These figures are at the same scale, and is clear that the urban footprints of the former are more concentrated than those of the latter. Again all metropolitan areas and divisions in Massachusetts, including the Boston metropolitan division, are not in the list due to the lack of available employment data (LED) for this state.

Table 3.2. Compactness/Sprawl Scores for 10 Most Compact and 10 Most Sprawling metropolitan areas and divisions in 2010

Rank		index	denfac	mixfac	cenfac	strfac
Ten Most Compact Metropolitan Areas						
1	New York-White Plains-Wayne, NY-NJ Metro Division	203.4	384.3	159.3	213.5	193.8
2	San Francisco-San Mateo-Redwood City, CA Metro Division	194.3	185.9	167.2	230.9	162.8
3	Atlantic City-Hammonton, NJ Metro Area	150.4	112.3	148.9	109.5	122.1
4	Santa Barbara-Santa Maria-Goleta, CA Metro Area	146.6	100.8	93.7	137.3	94.1
5	Champaign-Urbana, IL Metro Area	145.2	160.2	136.4	117.9	166.9
6	Santa Cruz-Watsonville, CA Metro Area	145.0	96.3	100.1	154.5	130.7

7	Trenton-Ewing, NJ Metro Area	144.7	98.9	146.2	107.9	112.2
8	Miami-Miami Beach-Kendall, FL Metro Division	144.1	100.0	123.3	153.6	82.8
9	Springfield, IL Metro Area	142.2	142.1	105.0	136.4	114.3
10	Santa Ana-Anaheim-Irvine, CA Metro Division	139.9	104.8	117.8	96.1	149.9
Ten Most Sprawling Metropolitan Areas						
212	Kingsport-Bristol-Bristol, TN-VA Metro Area	60.0	85.2	60.7	88.5	73.9
213	Augusta-Richmond County, GA-SC Metro Area	59.2	88.1	60.6	100.8	82.5
214	Greenville-Mauldin-Easley, SC Metro Area	59.0	91.1	71.7	72.6	71.8
215	Riverside-San Bernardino-Ontario, CA Metro Area	56.2	97.9	110.3	70.5	96.2
216	Baton Rouge, LA Metro Area	55.6	88.2	80.6	84.9	70.7
217	Nashville-Davidson--Murfreesboro--Franklin, TN Metro Area	51.7	91.3	72.0	69.7	80.4
218	Prescott, AZ Metro Area	49.0	84.5	39.7	74.5	60.8
219	Clarksville, TN-KY Metro Area	41.5	86.7	72.9	81.1	71.4
220	Atlanta-Sandy Springs-Marietta, GA Metro Area	41.0	97.8	85.5	89.9	75.9
221	Hickory-Lenoir-Morganton, NC Metro Area	24.9	78.6	40.5	67.0	56.9

Figure 3.1. Most Compact Metropolitan Areas (New York and San Francisco)

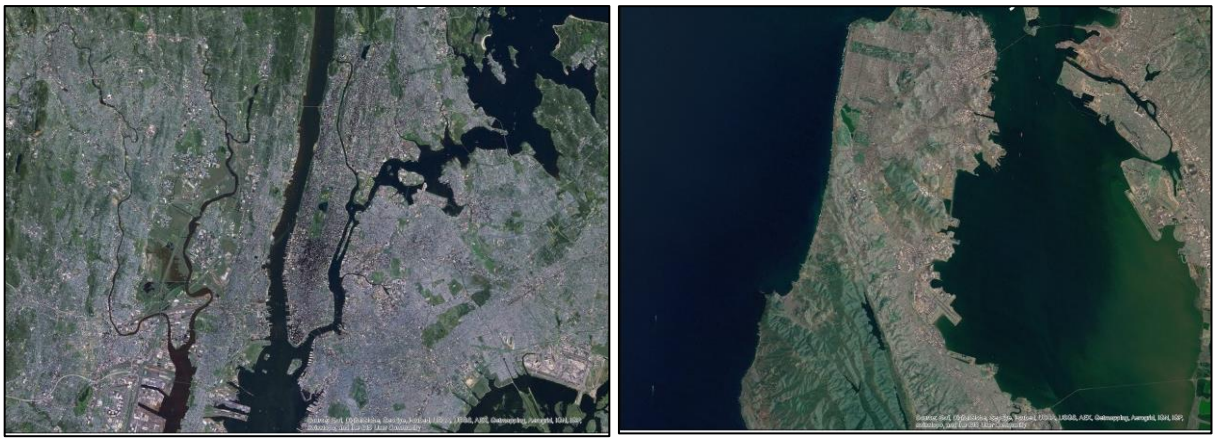
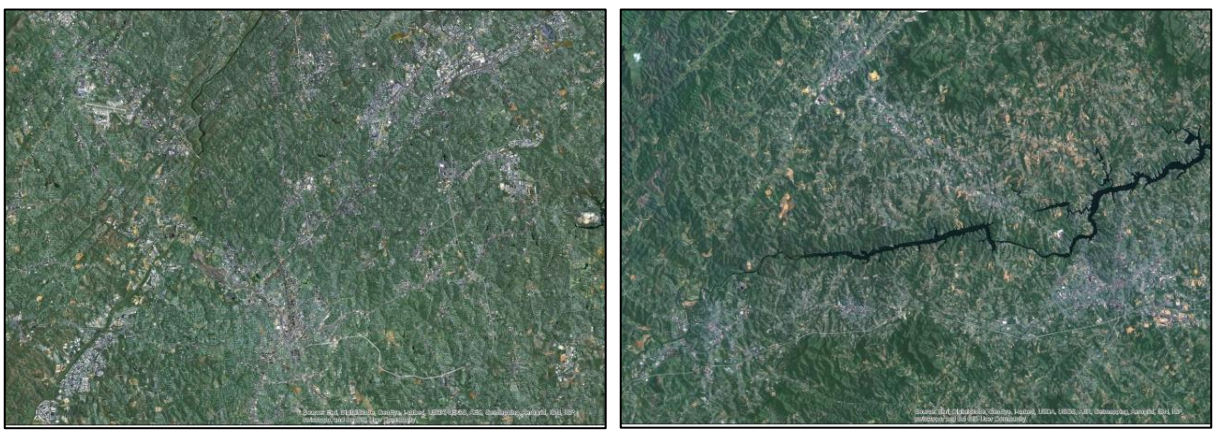


Figure 3.2. Most Sprawling Metropolitan Areas (Atlanta and Hickory, NC)



Discussion

This study used the same basic methodology as Ewing et al. (2002) to measure the sprawl for medium and large metropolitan areas and divisions in 2010. We also expanded the sample size from 83 metropolitan areas in Ewing et al. (2002) to the 221 MSAs in this study.

For the 76 areas that are included in both studies, the compactness rankings are generally consistent across years. The Spearman correlation between the compactness rankings in 2000 and 2010 is 0.635, significant at .001 probability level which indicates, in general, the compact areas in 2000 are found to be still compact in 2010; and the sprawling areas in 2000 are still sprawling. New York is the most compact region followed by San Francisco in both years. Atlanta is the fourth most sprawling area in 2000 and the most sprawling area in 2010. Riverside-San Bernardino-Ontario, CA is the most sprawling in 2000 and the third most sprawling area in 2010.

There are, however, metropolitan areas with significantly different ranking in 2010 than 2000. One of the surprising cases is the Las Vegas-Paradise, NV metropolitan area. Its ranking rises from the 30th most compact area in 2000 to the 16th in 2010 due to its moderate to high score in all four dimensions. This is consistent with Fulton et al. (2001) study that found Las Vegas is getting more compact. “Las Vegas led the nation with an increase in its metropolitan density of 50 percent, thus rising in the overall density rankings from 114th in 1982 to 14th in 1997” (Fulton et al. 2001, p: 7).

Refinements in operationalizing sprawl, is another reason for differences in rankings between years. Land use mix and activity centering are the two dimensions with the most significant changes. As contributors to centering, we now consider not only central business districts (CBDs) but employment sub-centers. The existence of sub-centers is what distinguishes polycentric regions from monocentric regions. The Washington DC metropolitan division is an example of polycentric region. As shown in Figure 3.3, we identified 11 sub-centers (yellow color) in the metropolitan division. Out of 76 metropolitan areas with rankings in both years, the Washington DC metropolitan division has the 27th highest score for activity centering in 2010 while it had the 41st highest score in 2000. Its overall compactness ranking rises from 52nd most compact in 2000 to 27th most compact in 2010 due to its change on the centering score.

We also standardized the unit of analysis for mix use metrics by measuring them in half mile buffers from the centroid of block groups. Out of 76 areas that are included in both years, Phoenix has the 19th highest mix factor score in 2000 while it has the 24th lowest mix score in 2010. As a result, the Phoenix metropolitan area’s overall ranking drops from 18th most compact in 2000 to 14th most sprawling in 2010.

Finally, the changes in compactness score in some areas are due to changes in metropolitan boundaries. Out of 76 metropolitan areas in both samples, Detroit moved up from 14th most sprawling in 2000 to 5th most compact in 2010. The 2010 Detroit, MI metropolitan division covers only about a fifth of the area of the 2000 Detroit PMSA. The division is mostly limited to the Detroit’s downtown and surroundings. The lowest density portions of Detroit PMSA are not included in 2010 metropolitan division (see Figure 3.4). In particular, Warren-Troy-Farmington Hills, MI is now its own metropolitan division, and a very sprawling one, the 20th most sprawling out of 221 metropolitan areas in 2010.

Figure 3.3. Central Business District and Employment Sub-centers in Washington DC Metropolitan Division

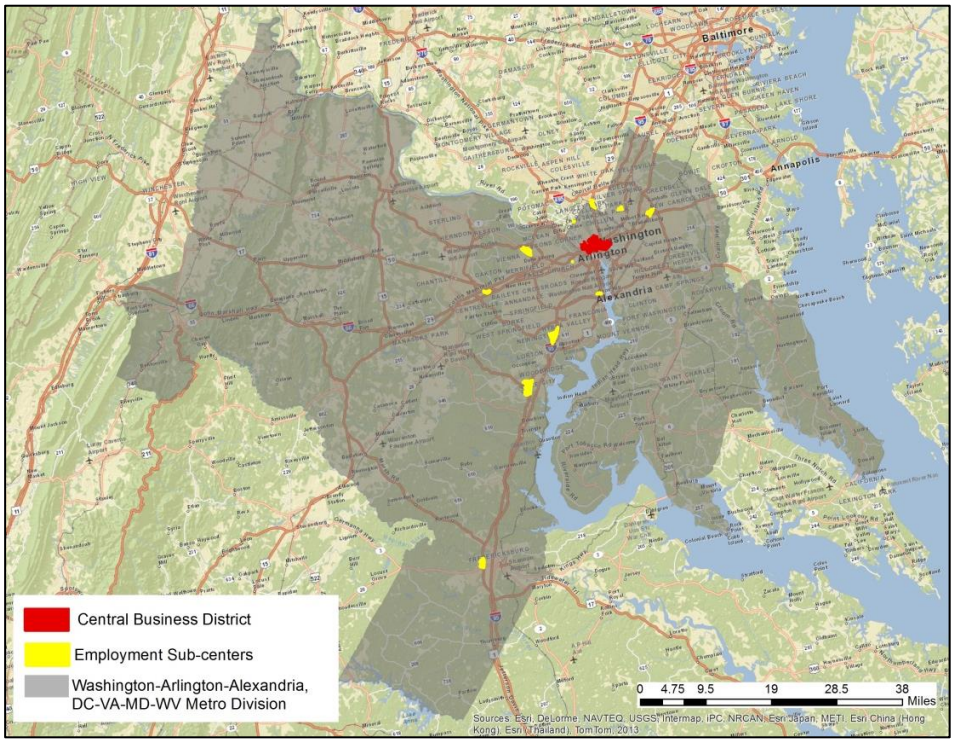
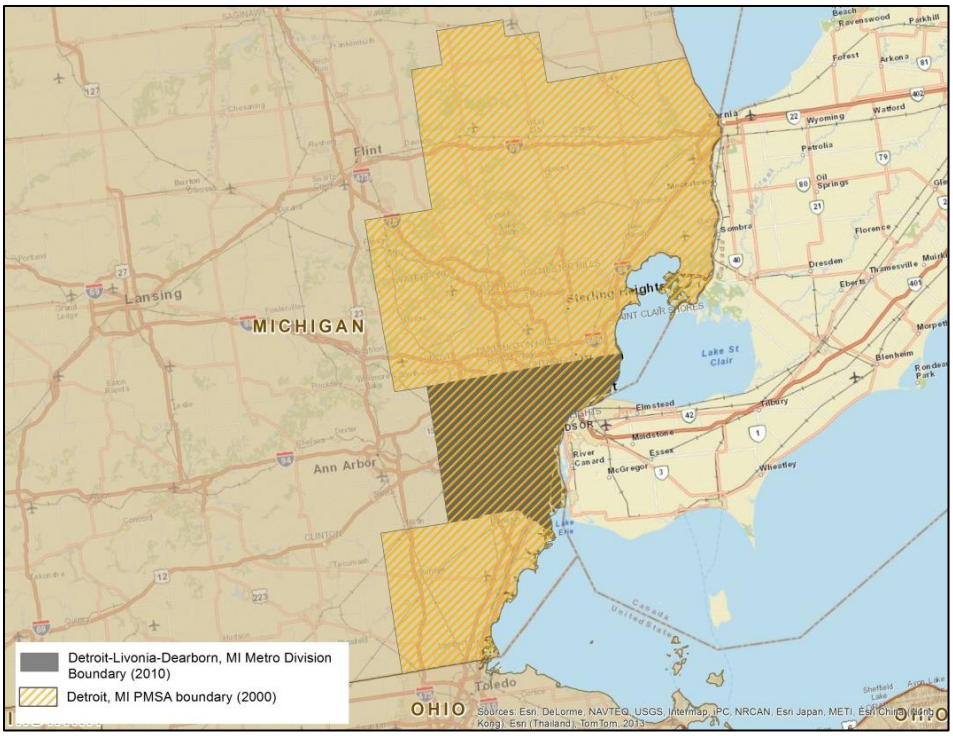


Figure 3.4. Detroit 2010 Metropolitan Division (dark) versus Detroit 2000 PMSA Boundary (light)



Chapter 4. Urbanized Areas: A Longitudinal Analysis

In this chapter we seek to measure changes in sprawl by developing refined and enhanced compactness/sprawl indices for 2000 and 2010 based on definitions and procedures in Ewing et al. (2002, 2003), but refined and applied this time to urbanized areas (UZAs) rather than metropolitan areas or counties. We chose census UZAs as our units of analysis because UZAs are the only census geographies that expand systematically with urban development over time. Counties have fixed boundaries and hence tend to appear more compact over time (except when counties are losing population as in Detroit or New Orleans after Katrina). Metropolitan areas expand in large increments as entire counties, both urban and rural portions, are added to core counties to reflect changing commuting patterns and social and economic integration.

Methods

Sample

The term "urbanized area "as defined by the U.S. Census Bureau denotes an urban area of 50,000 or more people. Urban areas are defined by core census block groups or blocks with population densities of at least 1,000 people per square mile and surrounding census blocks with densities of at least 500 people per square mile. Urbanized areas often provide a more accurate gauge of city size than do the incorporated political boundaries of cities.

This investigation is limited to large urbanized areas. Our sample consists of the 162 largest urbanized areas in the United States, those with more than 200,000 population in 2010. The rationale for thus limiting our sample is simple: the concept of sprawl has particular relevance to large areas where the economic, social, and environmental consequences of sprawl can be significant. The concept of sprawl does not have much relevance to small urbanized areas such as Pine Bluff, AR and Monroe, MI.

Variables

Development Density

Our first four density variables are the same as in the original sprawl index, gross density of urban and suburban census tracts (popden), percentage of the population living at low suburban densities (lt1500), percentage of the population living at medium to high urban densities (gt12500), and urban density based on the National Land Cover Database (urbden). The fifth density variable is analogous to the first, except it is derived with employment data from the Local Employment Dynamics (LED) database rather than population data (empden). In this case, LED data were processed for the years 2005 and 2010. Year 2005 is the earliest year that LED data is available for all states (except Massachusetts).

Land Use Mix

Although using the same variables as Ewing et al. (2002) to operationalize mixed use, we computed them differently using one-mile buffers around the centers of block groups rather than computing them within the boundaries of block groups.

The two mixed use variables were calculated for each block group's buffer using block-level population data from the 2010 Census, and block-level employment data from the 2010 LED database. The resulting job and population totals were used to compute a job-population balance measure (jobpop). This variable equals 1 for block groups with the same ratio of jobs-to-residents within the one-mile ring as the urbanized area as a whole; 0 for block groups with only jobs or residents within the one-mile ring, not both; and intermediate values for intermediate cases. All values were weighted by the sum of block group jobs and residents as a percentage of the UZA total.

For the second mixed-use variable, each block group centroid was again buffered with a one-mile ring, and jobs by sector were summed for blocks within the ring. An entropy formula was then used to compute a measure of job mix (jobmix). The variable equals 1 for block groups with equal numbers of jobs in each sector within the ring; 0 for block groups with all jobs in a single sector within the ring; and intermediate values for intermediate cases. The sectors considered in this case were retail, entertainment, health, education, and personal services. Values were weighted by the sum of block group population and employment as a percentage of the urbanized areas total. [11]

Unlike the mixed use factors at the county and metropolitan levels, the mixed use factor at the urbanized area level does not include a third variables, Walk Score. The reason is simple. This is longitudinal comparison of sprawl in 2000 and 2010, and Walk Score data were not available until 2007.

Activity Centering

The first centering variable came straight out of Ewing et al. (2002, 2003) and the 2010 census. It is the coefficient of variation in census block group population densities, defined as the standard deviation of block group densities divided by the average density of block groups (varpop). The more variation in population densities around the mean, the more centering and/or subcentering exists within the urbanized areas.

The second centering variable is analogous to the first, except it is derived with employment data from the LED database. It is the coefficient of variation in census block group employment densities, defined as the standard deviation of block group densities divided by the average density of block groups (varemp). The more variation in employment densities around the mean, the more centering and/or subcentering exists within the urbanized areas.

[11] See "land use mix" section for the formula used for computing job-population balance and job mix measures.

The next two centering variables measure the proportion of employment and population within CBDs and employment sub-centers. We first identified the location of CBDs and employment sub-centers for all metropolitan areas (see Chapter 3). This procedure resulted in two new centering variables as the percentage of UZA population (popcen) and employment (empcen) in CBDs and sub-centers.

Street Accessibility

Street accessibility is related to block size since smaller blocks translate into shorter and more direct routes. Large block sizes indicate a relative paucity of street connections and alternate routes. So, two street accessibility variables were computed for each urbanized area: average block size (avgblk) and percentage of blocks with areas less than 1/100 square mile, the size of a typical traditional urban block bounded by sides just over 500 feet in length (smlblk).

These two variables were part of Ewing et al.'s original sprawl metrics. To them, we have added two new variables. They are intersection density and percentage of 4-or-more way intersections. For each UZA, the total number of intersections in the UZA was divided by the land area to obtain intersection density (intden), while the number of 4-or-more-way intersections was multiplied by 100 and divided by the total number of intersections to obtain the percentage of 4-or-more way intersections (4way).

Statistical Methods

In this study we use two statistical methods. Principal component analysis (a type of factor analysis) is used to derive individual compactness indices that represent the built environments of UZAs. Then linear regression analysis is used to relate these indices to transportation outcomes, controlling for influences other than the built environment.

For each dimension of sprawl, principal components were extracted from the component variables. The principal component selected to represent the dimension was the one capturing the largest share of common variance among the component variables, that is, the one upon which the observed variables loaded most heavily. Because, in this study, the first component captured the majority of the combined variance of these variables, no subsequent components were considered.

The other statistical method used in this study is linear regression (ordinary least squares or OLS). Our dependent variables were logged so as to be normally distributed and hence properly modeled with regression analysis. As for the independent variables (control variables), we transformed all variables into log form to achieve a better fit with the data, reduce the influence of outliers, and adjust for nonlinearity of the data. The transformations have the added advantage of allowing us to interpret regression coefficients as elasticities. An elasticity is a percentage change in one variable that accompanies a one percent change in another variable. Elasticities are the most common measures of effect size in both economics and planning.

Results

Individual Compactness/Sprawl Factors

Factor loadings (that is, correlations of these variables with each factor), eigenvalues, and percentages of explained variance are shown in Table 4.1. The eigenvalue of the density factor is 3.82, which means that this one factor accounts for more of the total variance in the datasets than three component variables combined, more than three quarters of the total variance. As expected, one of the variables loads negatively on the density factor, that being the percentage of population living at less than 1,500 persons per square mile. The rest load positively. Thus, for all component variables, higher densities translate into higher values of the density factor.

The eigenvalue of the mix factor is 1.54, which means that this one factor accounts for more than three quarters of the total variance in the dataset. Both component variables load positively on the mix factor. The eigenvalue of the centering factor is 2.20, which means that this one factor accounts for just over half of the total variance in the datasets. All component variables load positively on the centering factor. The eigenvalue of the street factor is 2.75, which means that this one factor accounts for two-thirds of the total variance in the dataset. As expected, one of the variables loads negatively on the street accessibility factor, that being the average block size. The rest load positively. Thus, for all component variables, more street accessibility translates into higher values of the street factor.

Table 4.1. Variable Loadings on Four Factors for 2010

Component Matrix		Data Sources	2010 Factor Loadings
Density Factor			
popden	gross population density	Census 2010	0.970
empden	gross employment density	LED 2010	0.891
lt1500	percentage of the population living at low suburban densities	Census 2010	-0.806
gt12500	percentage of the population living at medium to high urban densities	Census 2010	0.745
urbden	net population density of urban lands	NLCD	0.941
Eigenvalue			**3.82**
Explained variance			**76.5%**
Mix use Factor			
jobpop	job-population balance	LED 2010	0.879
jobmix	degree of job mixing (entropy)	LED 2010	0.879
Eigenvalue			**1.54**
Explained variance			**77.2%**
Centering Factor			
varpop	coefficient of variation in census block group population densities	Census 2010	0.661

varemp	coefficient of variation in census block group employment densities	LED 2010	0.749
popcen	percentage of UZA population in CBD or sub-centers	Census 2010	0.757
empcen	percentage of UZA employment in CBD or sub-centers	LED 2010	0.790
Eigenvalue			**2.20**
Explained variance			**54.8%**
Street Factor			
smlblk	percentage of small urban blocks	Census 2010	0.844
avgblksze	average block size	Census 2010	-0.947
intden	intersection density	TomTom 2007	0.726
4way	percentage of 4-or-more-way intersections	TomTom 2007	0.784
Eigenvalue			**2.75**
Explained variance			**68.8%**

Overall Compactness/Sprawl Index for 2010

Some of the technical literature on sprawl includes size in the definition. Certainly, sheer geographic size is central to popular notions of sprawl. Despite their relatively high densities, urbanized areas such as Los Angeles and Phoenix are perceived as sprawling because they "go on forever." A sprawl index that disregarded this aspect of urban form would never achieve face validity.

Accordingly, we sought a method of transforming the sum of the four sprawl factors into a sprawl index that would be neutral with respect to population size. In this study, we use the exact same procedure used with metropolitan area sprawl in the early 2000s (Ewing et al. 2002). The transformation was accomplished by regressing the sum of the four sprawl factors on the natural logarithm of the population of the urbanized area. The standardized residuals (difference between actual and estimated values divided by the standard deviation of the difference) became our overall measure of sprawl. Given the way it was derived, this index is uncorrelated with population. Urbanized areas that are more compact than expected, given their population size, have positive values. Urbanized areas that are more sprawling than expected, again given their population size, have negative values. This adjustment for population size still leaves the sprawl index highly correlated with the sum of the four component factors ($r = 0.87$).

As with the individual sprawl factors, we transformed the overall sprawl index (index) into a metric with a mean of 100 and a standard deviation of 25. This was done for the sake of consistency and ease of understanding. With this transformation, the more compact urbanized areas have index values above 100, while the more sprawling have values below 100. Table 4.2 presents overall compactness scores and individual component scores for the ten most compact and the ten most sprawling large urbanized areas. By these metrics, San Francisco is the most compact large urbanized area, and Atlanta is the most sprawling.

Table 4.2. Compactness/Sprawl Scores for 10 Most Compact and 10 Most Sprawling UZAs in 2010

Rank		comfac	denfac	mixfac	cenfac	strfac
Ten Most Compact UZAs						
1	San Francisco-Oakland, CA	180.94	205.69	129.92	164.34	153.38
2	Reading, PA	169.32	127.71	150.87	124.45	147.46
3	Madison, WI	152.87	118.16	121.82	182.19	99.33
4	Eugene, OR	152.54	114.84	134.37	134.15	123.07
5	Laredo, TX	151.80	123.87	131.21	81.56	166.54
6	Oxnard, CA	146.19	147.55	137.14	82.42	135.08
7	Atlantic City, NJ	144.25	93.87	91.07	157.06	143.86
8	Los Angeles-Long Beach-Anaheim, CA	143.42	212.21	144.75	102.23	138.92
9	Lincoln, NE	143.38	118.63	127.46	97.02	141.77
10	New York-Newark, NY-NJ-CT	142.71	197.50	106.80	179.10	125.06
Ten Most Sprawling UZAs						
153	Baton Rouge, LA	64.38	81.92	75.30	77.21	77.61
154	Fayetteville, NC	61.05	79.40	73.65	67.16	64.43
155	Chattanooga, TN-GA	60.96	68.92	54.18	97.03	70.33
156	Greenville, SC	60.57	67.92	75.26	89.88	57.88
157	Nashville-Davidson, TN	60.27	87.51	47.43	111.18	70.03
158	Charlotte, NC-SC	57.41	82.95	64.56	115.94	53.01
159	Winston-Salem, NC	55.56	66.31	68.97	88.15	54.29
160	Victorville-Hesperia, CA	54.15	82.38	67.79	57.01	61.88
161	Hickory, NC	48.64	46.92	78.41	72.20	44.94
162	Atlanta, GA	37.45	84.64	75.63	107.29	36.84

Overall Compactness/Sprawl Index for 2000

To make apples to apples comparisons between two years (2000 and 2010), we applied the factor coefficient matrices for four principal components in 2010 to built environmental variable values for 2000. This resulted in compactness factors for 2000 that are consistent with those for 2010.

Table 4.3 presents overall compactness scores and component scores for the ten most compact and the ten most sprawling large urbanized areas in 2000. As one would expect, rankings did not change dramatically in most cases over the ten years. San Francisco was the most compact in 2000, and has remained so. Atlanta was the most sprawling in 2000, and has remained so.

Table 4.3 Compactness/Sprawl Scores for 10 Most Compact and 10 Most Sprawling UZAs in 2000

Rank		**comfac**	**denfac**	**mixfac**	**cenfac**	**strfac**
Ten Most Compact UZAs						

1	San Francisco-Oakland, CA	184.06	219.66	128.39	162.41	149.84
2	Laredo, TX	174.12	134.65	148.02	86.2	189.55
3	Reading, PA	155.74	119.44	157.15	126.12	118.53
4	Eugene, OR	151.42	121.5	141.47	130.73	114.89
5	New Orleans, LA	149.64	161.24	106.84	95.97	181.06
6	Stockton, CA	147.55	134.42	145.18	104.41	124.09
7	Madison, WI	147.2	122.06	126.86	158.37	101.3
8	Visalia, CA	145.05	116.84	142.48	107.53	108.93
9	New York-Newark, NY-NJ-CT	141.75	197.18	115.6	170.57	120.19
10	Lincoln, NE	141.19	118.03	133.12	97.15	135.15
Ten Most Sprawling UZAs						
153	Fayetteville, NC	64.13	78.97	98.97	62.63	56.65
154	Baton Rouge, LA	61.39	83.46	72.66	85.07	64.16
155	Palm Bay-Melbourne, FL	58.18	76.29	75.93	62.16	77.64
156	Nashville-Davidson, TN	58.11	89.26	67.83	106.22	46.1
157	Victorville-Hesperia, CA	55.43	74.79	84.24	56.75	51.04
158	Winston-Salem, NC	53.49	66.67	68.56	93.67	44.02
159	Bonita Springs, FL	52.49	76.78	77.85	61.38	46.22
160	Chattanooga, TN-GA	49.7	65.83	55.21	92.3	53.9
161	Hickory, NC	48.76	49.14	81.34	75.33	42.67
162	Atlanta, GA	39.5	88.54	90.28	106.29	19.9

Discussion

This chapter developed and sought to validate an overall measure of compactness/sprawl for U.S. urbanized areas in 2010. By these measures, San Francisco is the most compact urbanized area in the nation, and Atlanta is the most sprawling.

Once we had measures of compactness for 2010, we were able to apply the same factor coefficients to data for 2000, thus generating consistent measures of compactness for 2000 and allowing longitudinal comparisons. Generalizing across the entire universe of large urbanized areas, compactness decreased and sprawl increased between the two census years, but only slightly. Summing the four indices of compactness (each with an average score of 100 in 2010), the average combined score was 405.8 in 2000, dropping to 400 in 2010, a relatively small change. This means that that on average, urbanized areas became less compact between 2000 and 2010. The compactness/sprawl measures have the additional quality of face validity. They paint a plausible picture of sprawl in the U.S.

Chapter 5. Derivation of Census Tract Sprawl Indices

The concept of sprawl naturally brings to mind large geographic areas. When we say Atlanta sprawls badly, we are referring to the Atlanta Metropolitan Area, or perhaps if we are a transportation planner, to the Atlanta Urbanized Area. From the earliest writings on sprawl, sprawl was said to occur primarily at the periphery of urbanized areas moving outward. An individual street or block may contribute to sprawl, but we would not say it is sprawl. This distinction seems particularly poignant when we talk about population and employment centering, which is defined by interrelationships among block groups. If one block group or a group of them has a significantly higher density than those surrounding it, we can say the former serves as a center for the block groups surrounding it.

Yet, we know from the travel and public health literatures that there is a demand in the research community for built environmental metrics at the sub-county level, what might be described as the community or neighborhood scale. Most of the built environment-travel studies, and most of the built environment-obesity studies have related individual outcomes to such smaller areas. Therefore, we have derived sprawl-like metrics for census tracts within metropolitan areas, and posted them along with metropolitan area, urbanized area, and county sprawl metrics on the NIH website ((http://gis.cancer.gov). We have used the same type of variables as in larger area analyses, extracted principal components from multiple variables using principal component analysis, and once again, transformed the first principal component to an index with the mean of 100 and a standard deviation of 25. The component variables are:

Table 1.1: Variable Loadings on the Census Tract Compactness Index for 2010

Component Matrix		Data Sources	Factor Loadings
Density Factor			
popden	gross population density	Census 2010	0.596
empden	gross employment density	LED 2010	0.207
jobpop	job-population balance	LED 2010	0.374
jobmix	degree of job mixing (entropy)	LED 2010	0.620
walkscore	weighted average Walk Score	Walk Score Inc.	0.864
smlblk	percentage of small urban blocks	Census 2010	0.778
avgblksze	average block size	Census 2010	-0.785
intden	intersection density	TomTom 2007	0.827
4way	percentage of 4-or-more-way intersections	TomTom 2007	0.730
Eigenvalue			**4.11**
Explained variance			**45.63%**

Chapter 6. Conclusion

This study has updated a county and metropolitan compactness/sprawl indices, widely used by planning and public researchers since their release in 2002 and 2003. The updated indices reflect conditions on the ground circa 2010.

This study has also developed new measures of compactness/sprawl that incorporate additional dimensions of the construct "sprawl," and used additional variables to operationalize these dimensions. The four dimensions, measured individually and with a composite index, are development density, land use mix, activity centering, and street accessibility. Measures, presented in the Appendices, are immediately available to study the costs and benefits of different urban forms.

Using updated and enhanced measures of compactness/sprawl, this study has validated both the original and new indices, and largely validated the individual measures representing the four dimensions of sprawl. These new results mirror and confirm the earlier findings of Ewing et al. (2002, 2003a, 2003b, 2003c). If anything, relationships of sprawl to important quality-of-life outcomes are stronger than in the original studies.

An obvious question is whether the new measures have more face, construct, and internal validity than the original compactness/sprawl indices, and thus should substitute for the original indices in future research. They have more face validity because places that fit the definition of sprawl in satellite imagery rank lowest on compactness. They have more construct validity because they capture more aspect of sprawl. As for internal validity, they generally outperform the original county sprawl indices as predictors of negative outcomes.

The new multi-dimensional factors representing density, mix, centering, and streets are somewhat correlated, of course, but still quite distinct in their relationships to outcomes. We can see these being used to determine which specific aspects of sprawl result in costs and benefits.

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Appendix A. County Compactness Indices for 2010, 2000, and Changes

New compactness index 2010 is the county compactness/sprawl index for 2010, using the six variables that make up the original county sprawl index. New compactness index 2000 is the analogous county sprawl index for 2000 obtained by applying component score coefficient values for 2010 to data for 2000. Change in new compactness index is the change in the index between 2000 and 2010 measured as above. Original compactness index is the county sprawl index for 2000 based on component score coefficient values for 2000. And change in original compactness index is the change in the index between 2000 and 2010 using the indices for each year respectively, based on component score coefficient values for each year.

fips	county	new compactness index 2010	new compactness index 2000	change in new compactness index	original compactness index	change in original compactness index
1009	Blount County, AL	76.9				
1015	Calhoun County, AL	93.9	88.8	5.0	95.0	-1.1
1021	Chilton County, AL	74.2	64.4	9.8	74.1	0.1
1033	Colbert County, AL	103.6	97.6	5.9	103.2	0.3
1051	Elmore County, AL	89.9	79.4	10.5	84.6	5.3
1055	Etowah County, AL	92.9	89.0	3.9	94.7	-1.8
1069	Houston County, AL	89.0	83.0	6.0	90.1	-1.1
1073	Jefferson County, AL	113.9	108.9	5.0	113.1	0.8
1077	Lauderdale County, AL	90.5	80.4	10.1	87.3	3.2
1079	Lawrence County, AL	75.7	64.9	10.8	72.2	3.4
1081	Lee County, AL	93.6	85.4	8.3	91.1	2.5
1083	Limestone County, AL	85.2	75.2	9.9	81.6	3.6
1089	Madison County, AL	108.9	89.2	19.7	95.4	13.5
1097	Mobile County, AL	109.9	98.8	11.0	103.4	6.5
1101	Montgomery County, AL	105.3	101.6	3.7	107.3	-1.9
1103	Morgan County, AL	100.0	89.6	10.5	95.1	4.9
1113	Russell County, AL	92.9	86.2	6.7	92.8	0.1
1115	St. Clair County, AL	89.7	82.2	7.5	87.5	2.1
1117	Shelby County, AL	96.1	85.4	10.7	91.5	4.6
1125	Tuscaloosa County, AL	105.0	94.4	10.5	99.9	5.0
1127	Walker County, AL	89.2	83.1	6.1	89.1	0.1
4005	Coconino County, AZ	87.3	74.0	13.4	88.5	-1.1
4013	Maricopa County, AZ	116.5	111.8	4.7	119.4	-2.8
4015	Mohave County, AZ	91.3				
4019	Pima County, AZ	104.0	103.2	0.9	106.6	-2.6
4021	Pinal County, AZ	100.7	79.8	21.0	87.5	13.2
4025	Yavapai County, AZ	93.5	83.1	10.4	90.5	3.1
4027	Yuma County, AZ	104.7	92.6	12.1	101.1	3.6

5007	Benton County, AR	94.0	86.9	7.0	92.8	1.2
5031	Craighead County, AR	87.4	79.6	7.8	87.1	0.2
5033	Crawford County, AR	84.9	81.1	3.8	88.9	-4.0
5035	Crittenden County, AR	91.6	89.7	1.9	100.2	-8.6
5045	Faulkner County, AR	87.4	81.1	6.3	88.0	-0.6
5051	Garland County, AR	94.5	91.6	2.9	95.7	-1.2
5053	Grant County, AR	66.8	64.3	2.5	73.6	-6.8
5069	Jefferson County, AR	100.2	98.1	2.1	104.4	-4.2
5079	Lincoln County, AR	72.3	70.9	1.4	81.4	-9.1
5085	Lonoke County, AR	82.4	77.6	4.7	85.9	-3.5
5087	Madison County, AR	79.2				
5091	Miller County, AR	98.9	98.8	0.1	106.4	-7.5
5111	Poinsett County, AR	73.6	67.9	5.7	80.8	-7.3
5119	Pulaski County, AR	114.1	108.7	5.4	112.6	1.5
5125	Saline County, AR	85.3	80.1	5.2	86.0	-0.7
5131	Sebastian County, AR	102.8	100.4	2.4	105.1	-2.4
5143	Washington County, AR	101.1	90.7	10.5	98.3	2.8
6001	Alameda County, CA	153.3	145.3	7.9	152.4	0.9
6007	Butte County, CA	97.5	95.5	2.0	103.7	-6.2
6013	Contra Costa County, CA	121.7	118.1	3.6	123.6	-1.9
6017	El Dorado County, CA	89.7	85.0	4.7	90.0	-0.3
6019	Fresno County, CA	100.0	96.0	4.0	104.2	-4.3
6025	Imperial County, CA	89.7	88.1	1.6	95.8	-6.1
6029	Kern County, CA	96.6	92.4	4.3	100.8	-4.2
6031	Kings County, CA	96.8	85.2	11.6	95.6	1.3
6037	Los Angeles County, CA	160.6	155.9	4.7	161.5	-0.9
6039	Madera County, CA	82.6	80.3	2.3	88.5	-5.9
6041	Marin County, CA	115.9	111.8	4.1	119.2	-3.3
6047	Merced County, CA	94.1	89.7	4.4	99.2	-5.1
6053	Monterey County, CA	110.6	108.7	1.8	120.3	-9.7
6055	Napa County, CA	110.7	107.0	3.7	112.3	-1.6
6059	Orange County, CA	145.8	140.6	5.1	146.2	-0.4
6061	Placer County, CA	102.3	94.6	7.6	100.5	1.7
6065	Riverside County, CA	105.8	100.2	5.7	107.3	-1.5
6067	Sacramento County, CA	124.4	118.0	6.5	124.5	-0.1
6069	San Benito County, CA	101.5	97.0	4.5	107.5	-5.9
6071	San Bernardino County, CA	102.4	99.2	3.2	106.7	-4.2
6073	San Diego County, CA	126.0	122.6	3.4	130.7	-4.6
6075	San Francisco County, CA	247.8	246.1	1.7	257.6	-9.8
6077	San Joaquin County, CA	117.3	110.1	7.2	118.3	-1.0
6079	San Luis Obispo County, CA	100.6	94.2	6.4	101.8	-1.2
6081	San Mateo County, CA	141.8	138.6	3.2	146.0	-4.2

6083	Santa Barbara County, CA	124.8	117.3	7.5	125.7	-0.9
6085	Santa Clara County, CA	138.1	133.5	4.6	140.5	-2.4
6087	Santa Cruz County, CA	113.1	111.9	1.3	118.1	-5.0
6089	Shasta County, CA	94.1	82.3	11.7	88.6	5.4
6095	Solano County, CA	114.9	110.9	4.0	117.5	-2.6
6097	Sonoma County, CA	104.2	102.1	2.1	106.6	-2.4
6099	Stanislaus County, CA	111.0	108.6	2.4	117.4	-6.5
6101	Sutter County, CA	92.6	86.0	6.6	95.1	-2.5
6107	Tulare County, CA	99.0	91.7	7.3	103.1	-4.1
6111	Ventura County, CA	119.6	112.5	7.1	121.6	-1.9
6113	Yolo County, CA	108.8	105.8	3.0	113.1	-4.3
6115	Yuba County, CA	93.6	89.5	4.2	96.5	-2.9
8001	Adams County, CO	117.7	127.9	-10.2	130.3	-12.6
8005	Arapahoe County, CO	122.3	117.3	5.0	122.0	0.3
8013	Boulder County, CO	114.7	111.3	3.4	113.9	0.8
8014	Broomfield County, CO	117.9				
8019	Clear Creek County, CO	96.0	93.4	2.6	97.2	-1.2
8031	Denver County, CO	144.4				
8035	Douglas County, CO	104.1	95.7	8.4	99.0	5.1
8039	Elbert County, CO	68.4				
8041	El Paso County, CO	117.7	107.4	10.3	110.2	7.5
8059	Jefferson County, CO	115.0	115.9	-0.9	117.8	-2.9
8069	Larimer County, CO	105.0	100.2	4.9	105.2	-0.1
8077	Mesa County, CO	104.8	97.5	7.3	105.7	-0.9
8101	Pueblo County, CO	107.6	103.1	4.5	110.7	-3.1
8119	Teller County, CO	97.1	91.9	5.2	93.6	3.5
8123	Weld County, CO	97.3	88.9	8.4	99.6	-2.3
9001	Fairfield County, CT	115.0	111.3	3.8	115.0	0.0
9003	Hartford County, CT	107.5	104.5	3.0	110.1	-2.5
9007	Middlesex County, CT	93.1	90.0	3.0	94.6	-1.6
9009	New Haven County, CT	112.2	108.9	3.3	113.7	-1.5
9011	New London County, CT	95.7	93.0	2.7	98.9	-3.2
9013	Tolland County, CT	84.3	80.9	3.4	86.4	-2.1
10001	Kent County, DE	93.0	85.9	7.1	92.1	0.9
10003	New Castle County, DE	119.4	117.4	1.9	122.3	-2.9
11001	District of Columbia, DC	193.3				
12001	Alachua County, FL	106.6	105.7	0.9	109.6	-2.9
12003	Baker County, FL	72.7	70.0	2.7	77.4	-4.8
12005	Bay County, FL	102.1	103.0	-0.9	107.4	-5.3
12009	Brevard County, FL	108.4	105.1	3.3	109.6	-1.2
12011	Broward County, FL	133.0	131.6	1.3	136.5	-3.6
12015	Charlotte County, FL	100.3	96.1	4.2	100.1	0.2
12019	Clay County, FL	98.7	85.2	13.5	92.0	6.7
12021	Collier County, FL	104.5	93.9	10.6	99.2	5.2

12031	Duval County, FL	117.4	116.0	1.4	120.3	-2.9
12033	Escambia County, FL	106.4	106.3	0.2	111.0	-4.5
12035	Flagler County, FL	99.2				
12039	Gadsden County, FL	91.0	86.6	4.4	91.8	-0.9
12053	Hernando County, FL	98.7	94.1	4.6	98.6	0.1
12057	Hillsborough County, FL	119.1	115.9	3.2	119.6	-0.5
12061	Indian River County, FL	111.1	103.6	7.5	107.5	3.5
12069	Lake County, FL	108.0	101.6	6.5	105.1	2.9
12071	Lee County, FL	107.0	100.5	6.5	104.8	2.2
12073	Leon County, FL	102.8	97.0	5.8	102.0	0.7
12081	Manatee County, FL	116.3	114.2	2.2	118.0	-1.7
12083	Marion County, FL	93.5	92.1	1.4	96.0	-2.5
12085	Martin County, FL	108.1	100.6	7.4	105.3	2.7
12086	Miami-Dade County, FL	152.1	146.4	5.7		
12089	Nassau County, FL	92.9	79.3	13.7	84.1	8.9
12091	Okaloosa County, FL	101.3	102.9	-1.6	108.5	-7.2
12095	Orange County, FL	119.4	115.8	3.6	121.2	-1.8
12097	Osceola County, FL	106.9	105.1	1.7	109.6	-2.7
12099	Palm Beach County, FL	114.2	112.4	1.8	115.8	-1.6
12101	Pasco County, FL	110.8	110.1	0.7	114.9	-4.0
12103	Pinellas County, FL	133.1	131.6	1.5	134.0	-0.9
12105	Polk County, FL	110.0	104.9	5.1	109.2	0.8
12109	St. Johns County, FL	104.1	99.9	4.2	103.0	1.1
12111	St. Lucie County, FL	110.1	100.0	10.1	104.5	5.6
12113	Santa Rosa County, FL	84.6	77.5	7.1	84.0	0.6
12115	Sarasota County, FL	111.0	110.2	0.8	114.0	-3.1
12117	Seminole County, FL	116.8	113.8	3.0	117.5	-0.7
12127	Volusia County, FL	107.4	105.0	2.4	109.2	-1.8
12129	Wakulla County, FL	83.9	73.8	10.1	80.7	3.2
13013	Barrow County, GA	81.6	75.8	5.9	81.8	-0.2
13015	Bartow County, GA	86.6	79.0	7.7	85.2	1.5
13021	Bibb County, GA	105.2	103.6	1.6	107.1	-1.9
13029	Bryan County, GA	80.9	70.0	10.9	77.2	3.7
13035	Butts County, GA	79.9	76.9	3.0	82.9	-2.9
13045	Carroll County, GA	75.3	71.9	3.4	77.9	-2.6
13047	Catoosa County, GA	88.5	84.4	4.1	89.5	-1.0
13051	Chatham County, GA	113.3	113.0	0.3	115.8	-2.5
13053	Chattahoochee County, GA	92.0				
13057	Cherokee County, GA	94.9	84.0	11.0	90.0	4.9
13059	Clarke County, GA	100.6	96.6	4.1	100.4	0.2
13063	Clayton County, GA	107.2	101.2	6.0	105.1	2.1
13067	Cobb County, GA	111.8	102.8	9.0	106.4	5.4
13073	Columbia County, GA	88.1	87.2	0.9	91.5	-3.4

13077	Coweta County, GA	84.0	79.7	4.2	84.7	-0.7
13083	Dade County, GA	81.5	75.1	6.4	81.3	0.2
13085	Dawson County, GA	80.4	72.5	7.9	79.9	0.4
13089	DeKalb County, GA	112.0	107.4	4.6	110.3	1.7
13095	Dougherty County, GA	102.7	95.3	7.4	99.9	2.7
13097	Douglas County, GA	86.3	79.5	6.7	84.4	1.9
13103	Effingham County, GA	83.2	79.6	3.6	85.8	-2.7
13113	Fayette County, GA	85.2	74.8	10.4	79.8	5.4
13115	Floyd County, GA	91.7	89.5	2.2	94.3	-2.6
13117	Forsyth County, GA	84.9	70.6	14.4	76.2	8.7
13121	Fulton County, GA	112.3	107.6	4.7	111.3	1.0
13127	Glynn County, GA	99.2	96.7	2.5	100.0	-0.8
13135	Gwinnett County, GA	104.0	94.5	9.5	98.9	5.1
13139	Hall County, GA	93.3	87.6	5.6	91.7	1.6
13143	Haralson County, GA	85.1	76.4	8.7	82.5	2.6
13145	Harris County, GA	78.6				
13151	Henry County, GA	87.2	72.5	14.7	78.5	8.7
13153	Houston County, GA	100.2	95.9	4.3	99.6	0.5
13169	Jones County, GA	73.6	70.8	2.8	77.6	-4.0
13171	Lamar County, GA	77.0	69.7	7.3	77.0	0.0
13177	Lee County, GA	77.8	74.0	3.8	80.9	-3.1
13179	Liberty County, GA	97.8	88.9	8.9	93.4	4.5
13185	Lowndes County, GA	95.4	92.7	2.6	97.1	-1.7
13189	McDuffie County, GA	80.3	75.7	4.7	81.8	-1.5
13195	Madison County, GA	74.7	62.8	11.9	73.5	1.2
13199	Meriwether County, GA	74.1	69.2	4.9	76.3	-2.2
13207	Monroe County, GA	76.4	73.3	3.0	79.9	-3.5
13213	Murray County, GA	77.9	74.8	3.1	80.6	-2.7
13215	Muscogee County, GA	108.0	108.3	-0.3	113.0	-5.1
13217	Newton County, GA	88.9	78.7	10.2	83.4	5.5
13219	Oconee County, GA	79.2	72.6	6.6	78.9	0.3
13221	Oglethorpe County, GA	67.7				
13223	Paulding County, GA	85.6	80.9	4.7	86.4	-0.8
13227	Pickens County, GA	76.5	74.7	1.8	80.8	-4.3
13231	Pike County, GA	71.5				
13245	Richmond County, GA	105.7	102.2	3.5	106.9	-1.2
13247	Rockdale County, GA	94.5	82.4	12.1	86.9	7.6
13255	Spalding County, GA	87.7	85.4	2.3	88.9	-1.2
13273	Terrell County, GA	76.8	82.2	-5.4	90.7	-13.9
13295	Walker County, GA	83.6	79.7	3.8	85.1	-1.6
13297	Walton County, GA	73.0	67.2	5.7	74.0	-1.0
13313	Whitfield County, GA	94.7	92.5	2.2	97.4	-2.7
13321	Worth County, GA	73.3	64.8	8.5	73.8	-0.4
16001	Ada County, ID	109.3	103.1	6.2	108.0	1.3

16005	Bannock County, ID	112.3	100.2	12.1	111.5	0.8
16019	Bonneville County, ID	105.1	95.0	10.0	102.6	2.4
16027	Canyon County, ID	104.6	92.2	12.4	99.4	5.2
16045	Gem County, ID	94.7	72.4	22.3	81.3	13.4
16051	Jefferson County, ID	83.0	63.6	19.4	79.0	4.0
16055	Kootenai County, ID	101.1	94.9	6.2	98.8	2.2
16069	Nez Perce County, ID	98.3	101.7	-3.3	107.9	-9.6
17003	Alexander County, IL	89.3				
17005	Bond County, IL	83.4	77.9	5.6	86.3	-2.9
17007	Boone County, IL	92.4	89.7	2.7	97.5	-5.1
17019	Champaign County, IL	109.0	101.1	7.8	111.4	-2.4
17027	Clinton County, IL	83.2	82.6	0.6	91.2	-8.0
17031	Cook County, IL	167.6	165.2	2.4	171.3	-3.6
17037	DeKalb County, IL	97.8	90.8	7.0	100.2	-2.3
17043	DuPage County, IL	118.8	117.0	1.8	121.3	-2.5
17053	Ford County, IL	67.3	70.1	-2.9	82.3	-15.0
17063	Grundy County, IL	100.4	84.7	15.8	92.2	8.3
17073	Henry County, IL	79.9	79.2	0.7	88.3	-8.4
17083	Jersey County, IL	82.2				
17089	Kane County, IL	113.1	109.9	3.2	115.1	-1.9
17091	Kankakee County, IL	92.0	90.4	1.6	98.7	-6.7
17093	Kendall County, IL	95.5	87.8	7.7	95.2	0.3
17097	Lake County, IL	112.9	110.6	2.3	114.5	-1.6
17111	McHenry County, IL	100.9	99.9	1.0	104.7	-3.8
17113	McLean County, IL	102.8	100.8	2.0	110.1	-7.3
17115	Macon County, IL	93.3	97.4	-4.1	104.3	-11.0
17117	Macoupin County, IL	93.2	88.6	4.7	99.1	-5.9
17119	Madison County, IL	105.5	101.2	4.3	107.4	-1.9
17123	Marshall County, IL	88.9	77.7	11.1	87.7	1.1
17129	Menard County, IL	78.8	78.6	0.2	97.4	-18.6
17131	Mercer County, IL	74.9	72.2	2.7	82.5	-7.7
17133	Monroe County, IL	87.9	81.6	6.2	90.2	-2.3
17143	Peoria County, IL	104.3	104.6	-0.2	110.0	-5.6
17147	Piatt County, IL	76.4	75.8	0.6	87.8	-11.4
17161	Rock Island County, IL	107.8	107.0	0.8	111.9	-4.1
17163	St. Clair County, IL	104.7	103.4	1.3	109.0	-4.3
17167	Sangamon County, IL	103.1	101.3	1.8	108.8	-5.8
17179	Tazewell County, IL	103.0	94.7	8.3	100.8	2.2
17183	Vermilion County, IL	98.1	85.1	13.1	93.8	4.3
17197	Will County, IL	103.9	98.7	5.2	103.5	0.4
17201	Winnebago County, IL	110.1	106.1	4.0	111.3	-1.1
17203	Woodford County, IL	88.7	77.5	11.1	87.3	1.4
18003	Allen County, IN	101.3	96.4	4.8	102.8	-1.6
18005	Bartholomew County, IN	106.2	92.7	13.5	99.0	7.2

18011	Boone County, IN	91.8	73.4	18.4	84.0	7.8
18013	Brown County, IN	80.8	81.0	-0.2	86.1	-5.3
18015	Carroll County, IN	81.3	67.2	14.1	76.9	4.3
18019	Clark County, IN	105.1	102.0	3.2	107.5	-2.3
18021	Clay County, IN	86.2	76.4	9.8	86.8	-0.7
18029	Dearborn County, IN	94.1	81.9	12.2	89.1	5.0
18035	Delaware County, IN	107.3	98.9	8.4	105.5	1.9
18039	Elkhart County, IN	104.8	92.2	12.5	98.7	6.1
18043	Floyd County, IN	105.2	100.5	4.6	102.1	3.0
18047	Franklin County, IN	82.2	78.0	4.2	87.0	-4.8
18051	Gibson County, IN	90.0	78.2	11.9	88.2	1.8
18055	Greene County, IN	78.3	79.2	-1.0	87.3	-9.1
18057	Hamilton County, IN	101.1	93.2	7.9	98.5	2.6
18059	Hancock County, IN	87.5	79.1	8.3	87.3	0.2
18061	Harrison County, IN	76.1	71.7	4.4	78.8	-2.8
18063	Hendricks County, IN	94.2	83.9	10.4	90.0	4.2
18067	Howard County, IN	105.1	93.2	11.9	101.1	3.9
18073	Jasper County, IN	66.8	61.7	5.1	72.8	-6.0
18081	Johnson County, IN	104.9	96.0	8.9	101.1	3.8
18089	Lake County, IN	115.4	112.5	2.9	116.9	-1.6
18091	LaPorte County, IN	92.9	90.4	2.5	96.8	-3.9
18095	Madison County, IN	101.5	99.8	1.7	105.7	-4.1
18097	Marion County, IN	116.5	114.6	1.9	119.2	-2.7
18105	Monroe County, IN	105.5	104.3	1.1	106.3	-0.8
18109	Morgan County, IN	99.4	86.4	13.1	93.0	6.4
18115	Ohio County, IN	88.0	80.1	7.9	89.0	-0.9
18119	Owen County, IN	90.0	71.0	19.0	81.8	8.2
18127	Porter County, IN	94.4	93.1	1.4	98.6	-4.2
18129	Posey County, IN	84.0	82.3	1.7	91.6	-7.6
18133	Putnam County, IN	75.5	72.3	3.1	80.8	-5.3
18141	St. Joseph County, IN	115.2	106.0	9.2	112.6	2.6
18145	Shelby County, IN	98.8	84.7	14.1	93.7	5.1
18153	Sullivan County, IN	74.1	71.9	2.2	80.8	-6.8
18157	Tippecanoe County, IN	106.1	104.1	2.1	110.0	-3.9
18159	Tipton County, IN	66.4	64.5	1.9	77.1	-10.6
18163	Vanderburgh County, IN	109.1	107.2	1.9	111.5	-2.4
18165	Vermillion County, IN	110.8	102.0	8.8	109.5	1.3
18167	Vigo County, IN	109.6	101.3	8.3	107.3	2.2
18173	Warrick County, IN	92.2	83.6	8.6	91.1	1.1
18175	Washington County, IN	89.6	77.4	12.2	87.9	1.7
18179	Wells County, IN	70.5	65.3	5.2	76.1	-5.6
18183	Whitley County, IN	68.6	67.4	1.2	77.7	-9.1
19011	Benton County, IA	80.1	66.9	13.3	78.2	1.9
19013	Black Hawk County, IA	104.1	101.6	2.5	108.1	-4.0

19017	Bremer County, IA	75.5	72.4	3.1	83.4	-7.9
19049	Dallas County, IA	87.0	76.2	10.8	87.1	-0.1
19061	Dubuque County, IA	102.0	101.7	0.3	108.2	-6.2
19085	Harrison County, IA	69.0	65.3	3.6	76.7	-7.8
19103	Johnson County, IA	97.8	94.0	3.8	102.6	-4.8
19105	Jones County, IA	83.9	70.1	13.9	81.6	2.4
19113	Linn County, IA	100.1	99.0	1.2	106.0	-5.8
19121	Madison County, IA	77.7	64.5	13.3	76.6	1.2
19129	Mills County, IA	81.6	68.2	13.4	81.0	0.7
19153	Polk County, IA	108.5	105.1	3.3	110.9	-2.4
19155	Pottawattamie County, IA	95.3	89.3	6.0	99.6	-4.3
19163	Scott County, IA	115.0	103.4	11.7	109.5	5.5
19169	Story County, IA	97.0	90.8	6.2	102.2	-5.2
19181	Warren County, IA	82.7	73.2	9.4	86.5	-3.8
19183	Washington County, IA	72.4	70.0	2.4	82.9	-10.5
19193	Woodbury County, IA	104.8	97.0	7.8	105.4	-0.7
20015	Butler County, KS	81.5	76.1	5.4	84.8	-3.2
20045	Douglas County, KS	99.1	93.7	5.4	100.8	-1.7
20059	Franklin County, KS	84.9	62.6	22.3	72.3	12.7
20061	Geary County, KS	107.6				
20079	Harvey County, KS	70.9	69.1	1.8	79.3	-8.4
20085	Jackson County, KS	54.6	47.4	7.2	61.5	-7.0
20091	Johnson County, KS	104.9	103.1	1.8	108.9	-4.0
20103	Leavenworth County, KS	92.8	91.4	1.3	100.2	-7.4
20121	Miami County, KS	87.8	65.7	22.1	76.1	11.7
20139	Osage County, KS	66.9	64.1	2.8	74.2	-7.3
20149	Pottawatomie County, KS	85.9				
20161	Riley County, KS	99.5				
20173	Sedgwick County, KS	108.0	106.4	1.6	111.3	-3.4
20177	Shawnee County, KS	102.3	99.5	2.8	105.4	-3.1
20191	Sumner County, KS	77.9	61.6	16.3	73.3	4.6
20209	Wyandotte County, KS	114.9	111.7	3.2	116.4	-1.5
21015	Boone County, KY	95.6	92.0	3.6	96.3	-0.7
21017	Bourbon County, KY	95.7	80.3	15.4	88.7	7.0
21019	Boyd County, KY	101.5	101.0	0.5	106.0	-4.4
21029	Bullitt County, KY	95.4	86.1	9.3	90.3	5.1
21037	Campbell County, KY	112.6	110.7	1.9	115.5	-2.9
21047	Christian County, KY	100.1	86.2	13.9	93.5	6.6
21049	Clark County, KY	97.3	91.0	6.4	97.3	0.0
21059	Daviess County, KY	103.9	99.3	4.7	107.7	-3.8
21067	Fayette County, KY	115.7	105.6	10.1	109.2	6.5
21081	Grant County, KY	87.1	78.3	8.8	84.0	3.1
21089	Greenup County, KY	102.0	97.3	4.7	103.3	-1.3

21093	Hardin County, KY	95.9	85.7	10.3	92.4	3.6
21101	Henderson County, KY	93.9	87.1	6.8	94.9	-1.1
21103	Henry County, KY	89.9	75.0	14.9	87.5	2.4
21111	Jefferson County, KY	118.4	112.4	5.9	115.9	2.4
21113	Jessamine County, KY	94.9	87.0	7.9	91.3	3.6
21117	Kenton County, KY	118.4	111.0	7.4	114.2	4.3
21123	Larue County, KY	76.9				
21163	Meade County, KY	88.9	78.5	10.4	83.7	5.2
21179	Nelson County, KY	90.0	78.4	11.6	84.5	5.5
21185	Oldham County, KY	90.9	85.3	5.6	87.9	3.0
21209	Scott County, KY	99.4	88.9	10.5	96.3	3.1
21211	Shelby County, KY	94.7	85.4	9.3	92.1	2.6
21215	Spencer County, KY	86.5				
21227	Warren County, KY	106.1	94.7	11.4	101.3	4.8
21239	Woodford County, KY	91.2	82.5	8.7	89.0	2.2
22005	Ascension Parish, LA	91.4	85.7	5.6	91.2	0.2
22015	Bossier Parish, LA	94.9	93.7	1.2	100.0	-5.1
22017	Caddo Parish, LA	105.5	102.6	2.9	107.9	-2.4
22019	Calcasieu Parish, LA	95.4	94.0	1.3	101.5	-6.2
22031	De Soto Parish, LA	81.2	78.1	3.1	85.2	-4.0
22033	East Baton Rouge Parish, LA	110.9	106.1	4.8	111.0	-0.1
22043	Grant Parish, LA	76.4				
22047	Iberville Parish, LA	94.1	95.8	-1.7	101.8	-7.7
22051	Jefferson Parish, LA	130.5	128.0	2.5	132.7	-2.2
22055	Lafayette Parish, LA	105.3	101.3	4.1	105.9	-0.6
22057	Lafourche Parish, LA	95.7	92.0	3.7	98.7	-3.0
22063	Livingston Parish, LA	87.5	80.6	6.9	87.1	0.4
22071	Orleans Parish, LA	144.7	160.3	-15.6	165.7	-21.0
22073	Ouachita Parish, LA	102.9	99.8	3.1	104.8	-1.8
22075	Plaquemines Parish, LA	92.2	86.4	5.9	92.6	-0.3
22077	Pointe Coupee Parish, LA	83.2	79.0	4.2	86.4	-3.2
22079	Rapides Parish, LA	95.0	96.4	-1.4	103.4	-8.4
22087	St. Bernard Parish, LA	112.5	116.5	-4.0	119.9	-7.4
22089	St. Charles Parish, LA	100.6	88.8	11.9	95.8	4.8
22095	St. John the Baptist Parish, LA	105.3	96.7	8.5	103.0	2.3
22099	St. Martin Parish, LA	88.9	81.2	7.7	87.8	1.2
22103	St. Tammany Parish, LA	103.8	96.3	7.6	100.5	3.4
22109	Terrebonne Parish, LA	102.1	101.8	0.3	106.8	-4.7
22111	Union Parish, LA	75.6	67.1	8.5	76.8	-1.2
22121	West Baton Rouge Parish, LA	95.6	90.5	5.1	95.3	0.3
23001	Androscoggin County,	96.0	90.7	5.3	95.9	0.1

	ME					
23005	Cumberland County, ME	100.3	95.4	4.9	100.5	-0.1
23019	Penobscot County, ME	84.9	80.1	4.8	89.1	-4.2
23023	Sagadahoc County, ME	90.5	82.8	7.7	88.8	1.7
23031	York County, ME	88.4	84.9	3.5	91.3	-2.9
24001	Allegany County, MD	106.7	98.9	7.7	103.1	3.6
24003	Anne Arundel County, MD	115.6	109.3	6.3	113.3	2.3
24005	Baltimore County, MD	121.6	109.3	12.3	113.4	8.2
24009	Calvert County, MD	104.4	90.1	14.2	95.3	9.1
24013	Carroll County, MD	97.1	81.5	15.6	86.4	10.6
24015	Cecil County, MD	99.2	85.6	13.6	91.1	8.0
24017	Charles County, MD	108.6	88.4	20.2	94.6	14.0
24021	Frederick County, MD	103.1	85.5	17.6	92.2	10.9
24025	Harford County, MD	105.8	91.6	14.2	97.6	8.3
24027	Howard County, MD	113.7	94.7	19.0	98.9	14.8
24031	Montgomery County, MD	122.7	116.8	5.9	120.8	2.0
24033	Prince George's County, MD	125.4	114.7	10.7	120.5	4.9
24035	Queen Anne's County, MD	83.7	74.9	8.8	81.4	2.3
24039	Somerset County, MD	99.4	83.7	15.7	89.8	9.6
24043	Washington County, MD	99.1	92.7	6.4	98.7	0.4
24045	Wicomico County, MD	106.7	92.2	14.5	98.0	8.8
24510	Baltimore city, MD	179.6	182.0	-2.4	187.6	-8.1
25001	Barnstable County, MA	102.2	96.6	5.6	100.0	2.2
25003	Berkshire County, MA	97.6	86.9	10.7	93.6	4.0
25005	Bristol County, MA	121.5	117.5	4.0	121.6	-0.1
25009	Essex County, MA	128.3	123.4	4.9	127.7	0.6
25011	Franklin County, MA	91.5	83.5	8.0	90.0	1.5
25013	Hampden County, MA	116.5	110.4	6.1	114.5	2.0
25015	Hampshire County, MA	101.9	87.1	14.7	92.6	9.3
25017	Middlesex County, MA	132.5	127.7	4.8	132.3	0.2
25021	Norfolk County, MA	121.6	116.8	4.8	121.9	-0.3
25023	Plymouth County, MA	107.3	101.6	5.6	105.8	1.4
25025	Suffolk County, MA	217.1	206.5	10.6	212.7	4.4
25027	Worcester County, MA	107.4	100.4	7.0	105.8	1.6
26015	Barry County, MI	79.8	68.9	10.8	76.5	3.3
26017	Bay County, MI	96.5	92.5	4.0	100.2	-3.7
26021	Berrien County, MI	95.7	90.4	5.3	96.9	-1.2
26025	Calhoun County, MI	92.6	87.7	4.9	94.9	-2.3
26027	Cass County, MI	79.5	72.6	6.8	81.3	-1.8
26037	Clinton County, MI	75.3	61.7	13.6	72.0	3.3
26045	Eaton County, MI	82.5	74.6	7.9	82.2	0.3

26049	Genesee County, MI	101.4	98.7	2.7	103.7	-2.3
26065	Ingham County, MI	110.4	103.5	6.9	110.3	0.2
26067	Ionia County, MI	82.2	73.0	9.2	82.3	-0.2
26075	Jackson County, MI	91.7	84.2	7.4	90.6	1.1
26077	Kalamazoo County, MI	96.4	94.0	2.5	100.3	-3.8
26081	Kent County, MI	101.6	97.7	3.9	103.4	-1.7
26087	Lapeer County, MI	76.4	68.8	7.6	76.1	0.3
26093	Livingston County, MI	88.5	80.9	7.6	86.8	1.7
26099	Macomb County, MI	112.6	108.1	4.5	113.6	-1.0
26115	Monroe County, MI	83.9	80.6	3.2	87.9	-4.1
26121	Muskegon County, MI	100.7	98.3	2.4	104.1	-3.4
26123	Newaygo County, MI	80.2	65.3	14.9	74.6	5.6
26125	Oakland County, MI	108.3	106.2	2.1	111.2	-2.8
26139	Ottawa County, MI	92.2	85.0	7.2	92.3	-0.1
26145	Saginaw County, MI	96.9	93.6	3.2	101.5	-4.7
26147	St. Clair County, MI	89.6	87.1	2.6	92.9	-3.3
26159	Van Buren County, MI	77.1	72.3	4.7	80.1	-3.1
26161	Washtenaw County, MI	102.8	100.2	2.6	106.1	-3.3
26163	Wayne County, MI	126.3	126.6	-0.3	132.0	-5.7
27003	Anoka County, MN	106.7	96.9	9.8	100.5	6.2
27009	Benton County, MN	92.3	93.3	-1.0	102.3	-10.0
27013	Blue Earth County, MN	90.0				
27017	Carlton County, MN	83.3	75.8	7.5	83.4	-0.1
27019	Carver County, MN	98.4	84.3	14.1	90.0	8.4
27025	Chisago County, MN	84.0	77.0	7.0	83.6	0.5
27027	Clay County, MN	84.2	79.8	4.5	93.2	-9.0
27037	Dakota County, MN	106.2	98.5	7.7	103.6	2.7
27039	Dodge County, MN	80.3	61.6	18.7	73.2	7.1
27053	Hennepin County, MN	123.7	124.0	-0.3	128.0	-4.3
27055	Houston County, MN	88.3	82.9	5.4	91.5	-3.3
27059	Isanti County, MN	84.9	65.4	19.5	75.2	9.6
27103	Nicollet County, MN	93.8				
27109	Olmsted County, MN	100.1	90.1	10.0	97.2	2.9
27119	Polk County, MN	61.1				
27123	Ramsey County, MN	128.9	126.2	2.7	131.6	-2.7
27137	St. Louis County, MN	93.1	92.6	0.5	99.3	-6.2
27139	Scott County, MN	91.2	89.2	2.0	94.8	-3.6
27141	Sherburne County, MN	84.3	76.9	7.4	83.1	1.2
27145	Stearns County, MN	94.2	85.9	8.3	94.2	0.0
27157	Wabasha County, MN	93.8	84.4	9.4	93.5	0.3
27163	Washington County, MN	109.1	97.6	11.5	101.5	7.5
27171	Wright County, MN	81.6	77.8	3.8	84.1	-2.5
28029	Copiah County, MS	80.6	64.5	16.1	76.6	4.1
28033	DeSoto County, MS	89.1	80.2	8.9	86.3	2.7

28035	Forrest County, MS	99.0	91.1	7.9	97.5	1.4
28039	George County, MS	82.9	63.7	19.2	73.5	9.4
28045	Hancock County, MS	93.6	84.9	8.7	90.2	3.4
28047	Harrison County, MS	106.1	98.4	7.7	102.8	3.3
28049	Hinds County, MS	103.4	96.7	6.7	102.7	0.7
28059	Jackson County, MS	100.5	92.2	8.3	97.2	3.3
28073	Lamar County, MS	80.2	66.5	13.7	74.1	6.1
28089	Madison County, MS	92.8	76.7	16.1	85.4	7.4
28093	Marshall County, MS	84.7	71.3	13.3	78.7	6.0
28121	Rankin County, MS	87.6	79.2	8.4	86.3	1.3
28127	Simpson County, MS	83.3	69.5	13.8	78.5	4.8
28131	Stone County, MS	84.6	64.9	19.8	73.4	11.2
28137	Tate County, MS	87.1	64.1	23.0	73.6	13.5
28143	Tunica County, MS	74.7	65.5	9.2	74.9	-0.1
29003	Andrew County, MO	77.4	61.4	16.0	72.8	4.6
29013	Bates County, MO	84.6	72.1	12.5	83.9	0.8
29019	Boone County, MO	103.6	93.5	10.1	99.4	4.2
29021	Buchanan County, MO	115.7	107.2	8.5	112.8	2.8
29027	Callaway County, MO	84.9	71.6	13.4	79.8	5.1
29031	Cape Girardeau County, MO	98.0				
29037	Cass County, MO	87.3	80.5	6.9	88.5	-1.2
29043	Christian County, MO	92.0	79.9	12.1	87.2	4.8
29047	Clay County, MO	100.2	97.3	2.9	103.0	-2.9
29049	Clinton County, MO	88.7	79.0	9.7	86.5	2.2
29051	Cole County, MO	89.4	88.3	1.1	95.4	-5.9
29055	Crawford County, MO (pt.)*	82.6				
29071	Franklin County, MO	91.8	82.2	9.6	87.9	3.9
29077	Greene County, MO	108.1	96.1	12.0	101.6	6.5
29095	Jackson County, MO	115.1	113.4	1.7	119.7	-4.6
29097	Jasper County, MO	96.2	95.8	0.4	101.3	-5.1
29099	Jefferson County, MO	101.6	94.5	7.1	98.2	3.4
29107	Lafayette County, MO	87.9	80.8	7.1	89.5	-1.6
29113	Lincoln County, MO	92.4	78.7	13.7	86.3	6.0
29135	Moniteau County, MO	75.4	70.8	4.6	80.4	-5.0
29145	Newton County, MO	90.5	76.9	13.6	87.7	2.7
29165	Platte County, MO	97.4	88.6	8.8	94.7	2.6
29177	Ray County, MO	69.4	70.5	-1.1	79.2	-9.8
29183	St. Charles County, MO	116.8	108.6	8.2	113.7	3.1
29189	St. Louis County, MO	116.9	121.0	-4.1	124.2	-7.3
29219	Warren County, MO	89.8	77.8	12.0	83.8	6.0
29221	Washington County, MO	83.3	76.7	6.6	83.8	-0.5
29225	Webster County, MO	91.3	69.4	21.9	79.9	11.4

29510	St. Louis city, MO	145.7				
30009	Carbon County, MT	77.9	72.9	5.0	86.9	-9.0
30013	Cascade County, MT	101.9	99.6	2.4	106.0	-4.0
30063	Missoula County, MT	101.7	97.5	4.3	102.6	-0.9
30111	Yellowstone County, MT	103.5	99.8	3.6	105.4	-1.9
31025	Cass County, NE	84.7	70.4	14.3	81.2	3.5
31043	Dakota County, NE	104.9	97.8	7.1	105.1	-0.2
31055	Douglas County, NE	122.1	120.9	1.2	124.5	-2.4
31109	Lancaster County, NE	112.1	106.9	5.2	112.8	-0.7
31153	Sarpy County, NE	113.6	101.4	12.2	107.0	6.6
31155	Saunders County, NE	75.2	61.5	13.7	72.4	2.9
31159	Seward County, NE	73.2	62.6	10.6	112.0	-38.8
31177	Washington County, NE	86.8	71.7	15.2	81.6	5.2
32003	Clark County, NV	123.5	117.8	5.7	123.4	0.1
32031	Washoe County, NV	106.6	103.0	3.6	113.4	-6.8
32510	Carson City, NV	112.6	111.2	1.3	120.0	-7.5
33011	Hillsborough County, NH	103.8	102.3	1.5	106.8	-3.0
33015	Rockingham County, NH	90.4	87.0	3.3	92.3	-2.0
33017	Strafford County, NH	93.6	87.7	5.9	93.5	0.1
34001	Atlantic County, NJ	112.9	112.2	0.7	116.7	-3.8
34003	Bergen County, NJ	140.1	138.8	1.3	142.1	-2.0
34005	Burlington County, NJ	104.1	101.4	2.7	106.6	-2.5
34007	Camden County, NJ	130.0	129.2	0.9	132.2	-2.2
34009	Cape May County, NJ	115.6	114.1	1.6	116.4	-0.8
34011	Cumberland County, NJ	101.2	93.1	8.1	99.0	2.2
34013	Essex County, NJ	168.9	170.0	-1.1	175.4	-6.5
34015	Gloucester County, NJ	105.6	102.5	3.1	106.2	-0.5
34017	Hudson County, NJ	228.8	225.1	3.7	230.1	-1.3
34019	Hunterdon County, NJ	87.0	80.6	6.4	85.3	1.7
34021	Mercer County, NJ	123.8	121.4	2.4	124.9	-1.1
34023	Middlesex County, NJ	130.4	127.1	3.3	130.3	0.1
34025	Monmouth County, NJ	117.5	113.5	4.0	116.6	0.9
34027	Morris County, NJ	107.2	103.3	3.9	106.0	1.2
34029	Ocean County, NJ	119.0	114.1	4.9	117.6	1.4
34031	Passaic County, NJ	158.1	154.0	4.1	157.1	1.0
34033	Salem County, NJ	94.0	88.1	5.9	94.1	-0.1
34035	Somerset County, NJ	106.1	98.1	8.0	102.0	4.1
34037	Sussex County, NJ	95.0	92.2	2.8	95.9	-0.8
34039	Union County, NJ	151.0	146.8	4.2	150.7	0.3
34041	Warren County, NJ	98.6	97.0	1.7	100.7	-2.1
35001	Bernalillo County, NM	120.2	116.3	3.9	117.7	2.5
35013	Dona Ana County, NM	102.1	95.3	6.8	100.3	1.8
35043	Sandoval County, NM	91.5	86.7	4.8	95.6	-4.1
35045	San Juan County, NM	84.0	76.8	7.2	84.5	-0.5

35049	Santa Fe County, NM	97.6	93.7	3.9	97.9	-0.4
35061	Valencia County, NM	86.8	82.8	3.9	86.9	-0.1
36001	Albany County, NY	111.2	106.5	4.8	111.8	-0.6
36005	Bronx County, NY	331.5	328.8	2.7	322.7	8.8
36007	Broome County, NY	102.0	98.4	3.6	103.6	-1.6
36015	Chemung County, NY	99.9	97.0	2.8	103.2	-3.3
36027	Dutchess County, NY	94.0	87.2	6.8	92.2	1.8
36029	Erie County, NY	107.6	108.8	-1.1	114.9	-7.2
36043	Herkimer County, NY	88.5	85.4	3.2	92.5	-4.0
36047	Kings County, NY	341.4	341.3	0.1	341.5	0.0
36051	Livingston County, NY	73.9	71.8	2.1	82.2	-8.3
36053	Madison County, NY	77.8	73.6	4.2	80.4	-2.7
36055	Monroe County, NY	107.5	105.5	2.0	110.2	-2.7
36059	Nassau County, NY	144.2	143.4	0.9	149.4	-5.2
36061	New York County, NY	463.9	459.5	4.4	478.8	-14.9
36063	Niagara County, NY	100.3	99.1	1.2	104.5	-4.1
36065	Oneida County, NY	96.8	94.2	2.7	98.5	-1.6
36067	Onondaga County, NY	106.9	103.3	3.6	107.8	-0.9
36069	Ontario County, NY	80.7	77.0	3.7	84.8	-4.0
36071	Orange County, NY	101.7	98.1	3.6	104.2	-2.5
36073	Orleans County, NY	73.7	76.1	-2.5	85.1	-11.4
36075	Oswego County, NY	84.8	82.6	2.2	89.0	-4.2
36079	Putnam County, NY	95.1	93.2	1.8	96.6	-1.6
36081	Queens County, NY	272.1	269.1	2.9	272.6	-0.5
36083	Rensselaer County, NY	99.6	99.5	0.1	104.9	-5.4
36085	Richmond County, NY	190.1	188.2	1.9	188.4	1.7
36087	Rockland County, NY	123.6	113.3	10.3	117.3	6.3
36091	Saratoga County, NY	91.0	87.2	3.8	93.8	-2.8
36093	Schenectady County, NY	111.8	109.9	1.9	115.4	-3.6
36095	Schoharie County, NY	75.9	77.2	-1.3	85.5	-9.6
36103	Suffolk County, NY	113.7	111.2	2.6	115.5	-1.8
36107	Tioga County, NY	83.3	80.2	3.1	86.6	-3.3
36109	Tompkins County, NY	92.6	90.5	2.1	96.7	-4.1
36111	Ulster County, NY	92.5	88.8	3.8	94.0	-1.4
36113	Warren County, NY	94.2	92.1	2.1	97.5	-3.2
36115	Washington County, NY	78.0	75.1	2.9	83.7	-5.7
36117	Wayne County, NY	74.8	72.0	2.8	79.6	-4.8
36119	Westchester County, NY	140.2	138.0	2.2	141.6	-1.4
37001	Alamance County, NC	97.5	88.9	8.6	94.0	3.6
37003	Alexander County, NC	73.6	72.3	1.3	78.8	-5.1
37007	Anson County, NC	67.9	64.0	4.0	72.7	-4.8
37019	Brunswick County, NC	84.8	79.7	5.1	84.9	-0.1
37021	Buncombe County, NC	97.8	93.6	4.2	98.4	-0.6
37023	Burke County, NC	82.8	82.8	0.1	87.4	-4.6

37025	Cabarrus County, NC	94.2	88.5	5.7	93.6	0.6
37027	Caldwell County, NC	86.8	86.1	0.7	90.8	-4.0
37035	Catawba County, NC	92.1	90.0	2.1	93.9	-1.9
37037	Chatham County, NC	75.2	73.1	2.1	79.6	-4.4
37051	Cumberland County, NC	99.7	96.8	2.9	102.3	-2.7
37053	Currituck County, NC	87.0				
37059	Davie County, NC	76.1	68.0	8.1	75.4	0.7
37063	Durham County, NC	105.5	99.5	6.0	104.0	1.5
37065	Edgecombe County, NC	85.2	85.8	-0.6	91.7	-6.5
37067	Forsyth County, NC	98.7	95.9	2.8	101.2	-2.5
37069	Franklin County, NC	78.3	73.5	4.8	80.9	-2.6
37071	Gaston County, NC	96.3	92.6	3.7	97.2	-0.9
37079	Greene County, NC	63.3	60.3	3.0	70.2	-6.9
37081	Guilford County, NC	101.6	96.9	4.6	101.8	-0.2
37087	Haywood County, NC	95.4	95.5	-0.1	99.5	-4.1
37089	Henderson County, NC	93.7	92.6	1.1	96.5	-2.9
37093	Hoke County, NC	78.3	76.2	2.1	82.8	-4.5
37101	Johnston County, NC	77.7	78.1	-0.4	84.0	-6.3
37115	Madison County, NC	93.1	92.4	0.8	99.6	-6.4
37119	Mecklenburg County, NC	107.0	97.4	9.6	101.7	5.3
37127	Nash County, NC	83.2	81.1	2.1	87.8	-4.5
37129	New Hanover County, NC	113.3	106.0	7.3	108.7	4.6
37133	Onslow County, NC	90.2	91.2	-1.0	96.4	-6.2
37135	Orange County, NC	91.5	85.8	5.6	90.7	0.8
37141	Pender County, NC	75.5	71.3	4.3	79.5	-4.0
37145	Person County, NC	74.8	73.3	1.5	80.6	-5.8
37147	Pitt County, NC	95.1	93.9	1.2	98.7	-3.6
37151	Randolph County, NC	75.4	75.5	0.0	81.5	-6.1
37157	Rockingham County, NC	82.7	81.6	1.1	87.4	-4.7
37169	Stokes County, NC	78.4	67.7	10.7	75.9	2.5
37179	Union County, NC	91.8	73.8	17.9	80.4	11.4
37183	Wake County, NC	103.6	96.6	7.0	100.3	3.3
37191	Wayne County, NC	88.4	86.7	1.7	92.9	-4.5
37197	Yadkin County, NC	69.7	65.1	4.6	73.9	-4.1
38015	Burleigh County, ND	92.6	85.1	7.5	93.5	-0.9
38017	Cass County, ND	95.6	76.8	18.8	89.4	6.2
38035	Grand Forks County, ND	92.3	78.0	14.3	90.8	1.6
38059	Morton County, ND	85.0	80.3	4.7	89.4	-4.4
39003	Allen County, OH	104.8	89.5	15.3	96.4	8.5
39013	Belmont County, OH	103.6	93.8	9.8	100.7	2.9
39015	Brown County, OH	82.0	75.7	6.3	83.5	-1.5
39017	Butler County, OH	103.9	101.2	2.8	108.1	-4.1
39019	Carroll County, OH	76.0	75.0	1.0	83.8	-7.9
39023	Clark County, OH	100.8	95.0	5.8	100.9	-0.2

39025	Clermont County, OH	95.6	86.9	8.7	91.6	4.0
39035	Cuyahoga County, OH	114.5	119.6	-5.1	125.5	-11.0
39041	Delaware County, OH	95.7	79.9	15.8	86.3	9.4
39043	Erie County, OH	101.1	94.0	7.0	99.4	1.7
39045	Fairfield County, OH	93.0	84.7	8.4	90.2	2.8
39049	Franklin County, OH	123.2	119.5	3.8	123.5	-0.3
39051	Fulton County, OH	88.4	62.7	25.7	71.8	16.6
39055	Geauga County, OH	70.0	60.1	10.0	67.6	2.4
39057	Greene County, OH	97.7	89.2	8.5	95.8	1.9
39061	Hamilton County, OH	116.5	115.3	1.1	119.1	-2.6
39081	Jefferson County, OH	104.0	99.7	4.3	105.9	-1.9
39085	Lake County, OH	100.4	96.2	4.2	101.8	-1.4
39087	Lawrence County, OH	99.3	96.1	3.2	101.6	-2.3
39089	Licking County, OH	102.4	83.3	19.2	89.0	13.5
39093	Lorain County, OH	98.2	93.2	4.9	99.7	-1.6
39095	Lucas County, OH	113.3	112.8	0.6	117.2	-3.8
39097	Madison County, OH	86.3	79.9	6.4	87.7	-1.4
39099	Mahoning County, OH	101.7	97.2	4.6	103.2	-1.5
39103	Medina County, OH	78.3	74.7	3.6	81.1	-2.8
39109	Miami County, OH	91.1	84.9	6.2	91.5	-0.5
39113	Montgomery County, OH	111.3	109.1	2.1	113.9	-2.6
39117	Morrow County, OH	63.4	61.3	2.1	71.2	-7.8
39123	Ottawa County, OH	92.3	88.4	3.9	93.7	-1.5
39129	Pickaway County, OH	86.9	82.0	4.9	89.6	-2.7
39133	Portage County, OH	99.7	82.1	17.6	88.7	11.0
39135	Preble County, OH	91.9	72.4	19.5	81.1	10.8
39139	Richland County, OH	99.5	84.5	15.0	90.7	8.8
39151	Stark County, OH	108.5	106.5	2.0	111.3	-2.8
39153	Summit County, OH	108.4	107.2	1.3	111.8	-3.4
39155	Trumbull County, OH	95.8	92.4	3.4	98.1	-2.3
39159	Union County, OH	92.6	76.1	16.6	84.5	8.1
39165	Warren County, OH	96.9	89.2	7.8	94.2	2.7
39167	Washington County, OH	90.2	83.8	6.5	91.0	-0.8
39173	Wood County, OH	88.5	81.4	7.1	89.2	-0.7
40017	Canadian County, OK	94.8	77.2	17.7	86.9	7.9
40027	Cleveland County, OK	106.3	94.3	12.0	100.1	6.2
40031	Comanche County, OK	104.0	94.2	9.8	102.5	1.5
40037	Creek County, OK	94.3	88.6	5.7	95.4	-1.1
40051	Grady County, OK	87.9	78.4	9.6	89.1	-1.2
40079	Le Flore County, OK	88.9	81.8	7.1	90.0	-1.1
40083	Logan County, OK	84.6	76.9	7.7	85.5	-0.9
40087	McClain County, OK	83.1	76.2	6.9	84.5	-1.4
40109	Oklahoma County, OK	111.9	107.2	4.6	111.4	0.5
40111	Okmulgee County, OK	93.3	86.1	7.2	92.8	0.4

40113	Osage County, OK	97.1	95.9	1.2	104.3	-7.1
40117	Pawnee County, OK	87.8	79.4	8.4	88.8	-1.0
40131	Rogers County, OK	93.7	84.9	8.9	91.0	2.7
40135	Sequoyah County, OK	92.0	79.7	12.4	88.1	3.9
40143	Tulsa County, OK	110.5	109.6	0.9	113.6	-3.1
40145	Wagoner County, OK	95.3	86.4	8.9	93.2	2.1
41003	Benton County, OR	99.2	97.6	1.6	105.7	-6.5
41005	Clackamas County, OR	103.6	98.1	5.4	103.8	-0.3
41009	Columbia County, OR	90.1	86.8	3.3	95.8	-5.7
41017	Deschutes County, OR	86.7	77.1	9.5	85.5	1.2
41029	Jackson County, OR	96.8	90.1	6.7	96.2	0.5
41039	Lane County, OR	104.1	99.2	4.9	106.0	-1.9
41047	Marion County, OR	106.1	99.9	6.2	105.8	0.2
41051	Multnomah County, OR	138.5	134.4	4.1	140.8	-2.3
41053	Polk County, OR	91.5	87.0	4.5	95.4	-3.9
41067	Washington County, OR	115.9	109.1	6.7	114.7	1.1
41071	Yamhill County, OR	97.1	94.5	2.7	104.0	-6.9
42003	Allegheny County, PA	125.3	124.4	0.8	128.1	-2.9
42005	Armstrong County, PA	88.9	85.8	3.1	93.0	-4.1
42007	Beaver County, PA	103.0	105.4	-2.4	109.7	-6.8
42011	Berks County, PA	116.5	108.3	8.2	113.4	3.1
42013	Blair County, PA	111.2	110.0	1.1	115.4	-4.2
42017	Bucks County, PA	105.9	100.8	5.1	105.3	0.6
42019	Butler County, PA	87.0	85.2	1.8	91.0	-4.0
42021	Cambria County, PA	105.7	105.3	0.4	109.4	-3.7
42025	Carbon County, PA	95.2	93.3	1.9	97.6	-2.4
42027	Centre County, PA	109.1	101.4	7.7	108.2	1.0
42029	Chester County, PA	96.7	90.1	6.5	94.4	2.3
42041	Cumberland County, PA	109.3	97.0	12.3	102.4	6.9
42043	Dauphin County, PA	116.1	115.2	0.9	120.3	-4.2
42045	Delaware County, PA	132.5	131.9	0.6	135.0	-2.6
42049	Erie County, PA	103.0	99.8	3.2	104.7	-1.6
42051	Fayette County, PA	101.2	96.4	4.8	103.4	-2.2
42069	Lackawanna County, PA	114.8	113.9	0.9	116.0	-1.2
42071	Lancaster County, PA	103.5	94.8	8.7	100.4	3.1
42075	Lebanon County, PA	105.8	101.6	4.1	106.8	-1.0
42077	Lehigh County, PA	127.5	124.0	3.5	126.9	0.5
42079	Luzerne County, PA	108.5	107.6	0.9	112.1	-3.5
42081	Lycoming County, PA	105.0	96.0	9.0	102.7	2.3
42085	Mercer County, PA	91.0	87.1	3.9	93.7	-2.7
42091	Montgomery County, PA	112.1	108.4	3.6	113.4	-1.3
42095	Northampton County, PA	115.9	112.0	3.8	116.4	-0.5
42099	Perry County, PA	83.2	80.3	2.9	86.9	-3.7
42101	Philadelphia County, PA	216.8	217.1	-0.4	225.0	-8.2

42103	Pike County, PA	91.2	84.2	7.0	88.0	3.1
42125	Washington County, PA	98.1	99.3	-1.2	105.8	-7.8
42129	Westmoreland County, PA	103.9	100.4	3.5	104.9	-1.0
42131	Wyoming County, PA	84.2	74.7	9.5	83.5	0.7
42133	York County, PA	101.2	95.0	6.2	100.3	0.9
44001	Bristol County, RI	124.8	121.7	3.1	125.3	-0.5
44003	Kent County, RI	117.9	116.9	0.9	121.7	-3.9
44005	Newport County, RI	111.1	108.1	3.0	111.0	0.0
44007	Providence County, RI	137.5	136.5	1.0	141.5	-4.0
44009	Washington County, RI	98.2	91.4	6.8	96.8	1.4
45003	Aiken County, SC	92.3	85.3	7.0	90.3	2.0
45007	Anderson County, SC	86.4	80.4	6.0	85.8	0.6
45015	Berkeley County, SC	93.9	88.9	5.1	95.0	-1.0
45019	Charleston County, SC	113.6	111.5	2.1	115.3	-1.6
45031	Darlington County, SC	81.6	82.9	-1.4	88.3	-6.7
45035	Dorchester County, SC	98.1	87.0	11.2	92.8	5.3
45037	Edgefield County, SC	75.5				
45039	Fairfield County, SC	78.2	77.6	0.6	84.8	-6.6
45041	Florence County, SC	88.6	84.5	4.1	91.0	-2.4
45045	Greenville County, SC	97.2	93.9	3.2	98.9	-1.8
45051	Horry County, SC	96.5	92.1	4.5	97.8	-1.3
45055	Kershaw County, SC	72.8	73.1	-0.3	79.0	-6.2
45059	Laurens County, SC	82.7	77.2	5.4	84.3	-1.6
45063	Lexington County, SC	89.9	85.2	4.7	90.6	-0.7
45077	Pickens County, SC	86.9	82.9	4.0	87.8	-0.9
45079	Richland County, SC	107.2	102.0	5.2	106.6	0.6
45083	Spartanburg County, SC	91.8	85.8	6.0	90.7	1.1
45085	Sumter County, SC	90.3	84.9	5.4	90.0	0.3
45091	York County, SC	88.9	83.0	5.9	88.1	0.8
46083	Lincoln County, SD	81.5				
46093	Meade County, SD	89.1	85.9	3.2	91.3	-2.2
46099	Minnehaha County, SD	102.9	100.0	2.9	106.6	-3.7
46103	Pennington County, SD	95.5	94.1	1.4	99.5	-3.9
47001	Anderson County, TN	92.0	88.8	3.3	94.1	-2.1
47009	Blount County, TN	94.4	89.3	5.1	93.4	1.1
47011	Bradley County, TN	94.4	90.3	4.1	95.9	-1.5
47019	Carter County, TN	97.3	97.3	0.0	102.2	-4.8
47021	Cheatham County, TN	80.6	74.5	6.1	79.0	1.5
47023	Chester County, TN	65.4	58.6	6.7	68.4	-3.1
47037	Davidson County, TN	112.1	102.6	9.5	106.1	5.9
47043	Dickson County, TN	83.4	78.2	5.2	85.4	-2.0
47047	Fayette County, TN	70.7				
47057	Grainger County, TN	80.5	76.3	4.2	84.5	-4.0

47063	Hamblen County, TN	98.4	95.0	3.4	99.5	-1.1
47065	Hamilton County, TN	103.8	99.8	4.0	104.5	-0.7
47073	Hawkins County, TN	86.0	85.0	1.0	90.8	-4.8
47089	Jefferson County, TN	86.6	81.0	5.6	86.4	0.2
47093	Knox County, TN	100.8	99.0	1.8	103.9	-3.1
47105	Loudon County, TN	93.3	84.7	8.7	90.2	3.1
47111	Macon County, TN	68.3				
47113	Madison County, TN	91.0	79.6	11.5	87.6	3.5
47115	Marion County, TN	84.8				
47125	Montgomery County, TN	89.3	83.9	5.4	90.2	-0.9
47147	Robertson County, TN	77.7	72.8	4.9	82.5	-4.8
47149	Rutherford County, TN	93.6	84.4	9.1	89.6	3.9
47153	Sequatchie County, TN	72.3				
47157	Shelby County, TN	111.6	105.2	6.4	109.7	2.0
47159	Smith County, TN	82.9	81.7	1.2	89.5	-6.6
47163	Sullivan County, TN	97.8	93.1	4.7	97.3	0.5
47165	Sumner County, TN	91.3	86.2	5.1	91.5	-0.2
47167	Tipton County, TN	79.8	75.7	4.1	81.8	-1.9
47169	Trousdale County, TN	76.4	73.9	2.5	81.2	-4.8
47171	Unicoi County, TN	106.3	103.5	2.8	108.1	-1.8
47173	Union County, TN	82.7	81.2	1.5	88.5	-5.8
47179	Washington County, TN	96.5	92.2	4.3	96.4	0.1
47187	Williamson County, TN	94.7	81.8	12.8	87.4	7.3
47189	Wilson County, TN	83.8	77.3	6.5	82.7	1.1
48007	Aransas County, TX	101.2	100.9	0.2	104.4	-3.2
48013	Atascosa County, TX	87.2	85.3	1.8	93.4	-6.3
48015	Austin County, TX	82.8				
48019	Bandera County, TX	85.6	80.7	4.9	85.9	-0.2
48021	Bastrop County, TX	88.3	86.8	1.6	92.4	-4.0
48027	Bell County, TX	106.8	99.8	7.1	105.0	1.8
48029	Bexar County, TX	117.6	113.9	3.7	118.8	-1.3
48037	Bowie County, TX	92.9	89.5	3.4	95.3	-2.4
48039	Brazoria County, TX	99.2	95.7	3.5	99.8	-0.6
48041	Brazos County, TX	110.1	106.7	3.5	110.9	-0.8
48051	Burleson County, TX	90.5	83.6	6.8	89.8	0.7
48055	Caldwell County, TX	88.1	82.2	5.9	90.6	-2.5
48057	Calhoun County, TX	108.0	98.5	9.5	103.9	4.1
48061	Cameron County, TX	107.4	101.1	6.3	107.9	-0.5
48071	Chambers County, TX	84.1	85.7	-1.6	91.1	-6.9
48077	Clay County, TX	82.5	75.5	7.0	82.9	-0.4
48085	Collin County, TX	116.4	101.4	15.0	106.3	10.1
48091	Comal County, TX	94.1	91.3	2.8	96.7	-2.6
48099	Coryell County, TX	95.4	92.6	2.8	100.4	-5.0
48113	Dallas County, TX	126.9	119.4	7.5	122.9	4.0

48119	Delta County, TX	92.3	88.4	3.8	97.3	-5.1
48121	Denton County, TX	115.1	99.2	15.8	103.6	11.4
48135	Ector County, TX	101.9	100.3	1.6	103.2	-1.3
48139	Ellis County, TX	94.8	87.3	7.5	92.6	2.2
48141	El Paso County, TX	118.1	112.8	5.3	116.2	1.9
48157	Fort Bend County, TX	113.4	101.0	12.4	105.7	7.7
48167	Galveston County, TX	115.7	111.1	4.6	114.2	1.5
48181	Grayson County, TX	93.9	92.3	1.6	97.8	-3.9
48183	Gregg County, TX	99.4	95.1	4.3	100.0	-0.6
48187	Guadalupe County, TX	98.0	88.2	9.8	95.6	2.5
48199	Hardin County, TX	83.4	77.9	5.4	84.0	-0.6
48201	Harris County, TX	126.4	116.2	10.3	120.4	6.1
48209	Hays County, TX	93.6	88.6	4.9	92.7	0.9
48215	Hidalgo County, TX	106.1	98.8	7.3	105.7	0.5
48231	Hunt County, TX	91.7	86.4	5.3	92.4	-0.7
48245	Jefferson County, TX	114.8	111.6	3.2	115.6	-0.8
48251	Johnson County, TX	93.7	88.8	4.9	94.0	-0.4
48257	Kaufman County, TX	95.4	85.6	9.8	92.8	2.6
48259	Kendall County, TX	87.5	97.5	-10.0	101.9	-14.4
48281	Lampasas County, TX	85.4	85.9	-0.5	91.5	-6.1
48291	Liberty County, TX	82.0	82.8	-0.8	88.6	-6.6
48303	Lubbock County, TX	106.0	104.7	1.3	111.3	-5.2
48309	McLennan County, TX	101.8	99.6	2.2	106.4	-4.6
48325	Medina County, TX	81.2				
48329	Midland County, TX	109.3	109.9	-0.6	113.7	-4.4
48339	Montgomery County, TX	91.9	87.0	4.9	91.8	0.1
48355	Nueces County, TX	112.8	109.8	3.1	114.9	-2.0
48361	Orange County, TX	97.3	93.2	4.0	97.4	-0.1
48367	Parker County, TX	83.6	79.1	4.4	84.6	-1.0
48375	Potter County, TX	110.2	108.3	1.9	111.7	-1.5
48381	Randall County, TX	104.8	105.9	-1.1	111.6	-6.8
48397	Rockwall County, TX	98.8	90.2	8.7	95.1	3.8
48401	Rusk County, TX	75.3	72.1	3.1	79.2	-3.9
48409	San Patricio County, TX	94.2	92.0	2.2	97.1	-2.8
48423	Smith County, TX	99.5	93.4	6.1	98.7	0.8
48439	Tarrant County, TX	120.0	113.0	7.0	116.3	3.7
48451	Tom Green County, TX	97.3	91.3	6.0	98.5	-1.2
48453	Travis County, TX	114.6	109.6	5.0	112.6	2.0
48459	Upshur County, TX	81.0	73.1	7.8	81.2	-0.3
48469	Victoria County, TX	102.3	103.0	-0.7	108.3	-6.0
48473	Waller County, TX	99.8	94.2	5.6	98.6	1.2
48479	Webb County, TX	105.9	103.8	2.0	114.0	-8.1
48485	Wichita County, TX	100.4	98.6	1.8	103.5	-3.1
48491	Williamson County, TX	105.2	97.1	8.1	103.5	1.6

48493	Wilson County, TX	79.6	73.3	6.3	82.2	-2.6
48497	Wise County, TX	81.8	79.9	1.9	87.4	-5.6
49005	Cache County, UT	91.5	86.5	5.0	93.1	-1.6
49011	Davis County, UT	110.9	106.5	4.3	113.5	-2.7
49023	Juab County, UT	72.2	67.4	4.8	81.7	-9.4
49035	Salt Lake County, UT	118.3	118.0	0.4	121.5	-3.2
49043	Summit County, UT	83.4	77.9	5.5	84.2	-0.8
49045	Tooele County, UT	86.9	82.4	4.5	93.1	-6.2
49049	Utah County, UT	114.4	107.3	7.1	116.5	-2.1
49053	Washington County, UT	94.3	88.9	5.4	95.5	-1.1
49057	Weber County, UT	109.7	107.1	2.6	111.7	-2.0
50007	Chittenden County, VT	103.4	96.8	6.6	103.1	0.3
50011	Franklin County, VT	88.3	81.0	7.4	89.5	-1.2
50013	Grand Isle County, VT	91.4	72.4	19.1	79.5	12.0
51003	Albemarle County, VA	90.0	75.2	14.8	82.0	8.0
51009	Amherst County, VA	82.7	75.3	7.3	83.6	-0.9
51011	Appomattox County, VA	73.8				
51013	Arlington County, VA	176.8				
51019	Bedford County, VA	84.1	59.2	24.9	66.5	17.6
51023	Botetourt County, VA	86.4	80.1	6.3	88.1	-1.7
51031	Campbell County, VA	101.9	73.0	28.9	79.3	22.6
51033	Caroline County, VA	83.8	70.6	13.2	78.4	5.5
51041	Chesterfield County, VA	105.0	94.3	10.8	98.2	6.8
51043	Clarke County, VA	87.5				
51053	Dinwiddie County, VA	79.3	66.7	12.6	77.9	1.4
51059	Fairfax County, VA	120.5				
51061	Fauquier County, VA	84.7	68.5	16.2	75.4	9.3
51065	Fluvanna County, VA	81.0	71.8	9.3	77.6	3.4
51067	Franklin County, VA	87.2	73.9	13.3	80.3	6.9
51069	Frederick County, VA	92.7	69.5	23.2	75.6	17.1
51073	Gloucester County, VA	97.2	82.6	14.6	86.8	10.4
51075	Goochland County, VA	84.6	64.2	20.4	71.9	12.7
51079	Greene County, VA	85.6	72.2	13.4	78.2	7.4
51085	Hanover County, VA	91.3	73.8	17.5	79.0	12.3
51087	Henrico County, VA	114.6	102.1	12.5	105.9	8.7
51093	Isle of Wight County, VA	82.2	70.4	11.8	79.7	2.5
51095	James City County, VA	101.7	90.2	11.5	93.9	7.9
51101	King William County, VA	88.9	81.1	7.8	87.4	1.5
51107	Loudoun County, VA	112.8	93.4	19.4	99.6	13.2
51115	Mathews County, VA	90.4	78.3	12.0	82.0	8.3
51121	Montgomery County, VA	101.0	74.3	26.7	80.8	20.2
51127	New Kent County, VA	82.8	73.6	9.2	80.3	2.5
51143	Pittsylvania County, VA	79.5	66.1	13.4	73.1	6.4
51145	Powhatan County, VA	82.4	72.8	9.6	76.3	6.1

51149	Prince George County, VA	84.4	105.5	-21.1	108.6	-24.2
51153	Prince William County, VA	116.4	101.8	14.6		
51155	Pulaski County, VA	98.9	89.1	9.8	94.5	4.4
51161	Roanoke County, VA	101.0	76.8	24.2	82.0	19.0
51165	Rockingham County, VA	89.5	71.3	18.1	78.4	11.0
51169	Scott County, VA	88.9	86.6	2.3	93.5	-4.6
51177	Spotsylvania County, VA	99.2	72.2	27.0	78.0	21.2
51179	Stafford County, VA	98.7	87.3	11.4	92.4	6.3
51183	Sussex County, VA	87.2				
51187	Warren County, VA	96.5	90.1	6.5	96.1	0.4
51191	Washington County, VA	92.0	92.7	-0.7	97.7	-5.7
51199	York County, VA	105.1	111.0	-5.8	112.2	-7.1
51510	Alexandria city, VA	181.3				
51515	Bedford city, VA	100.5				
51520	Bristol city, VA	120.4				
51540	Charlottesville city, VA	138.2				
51550	Chesapeake city, VA	108.6	104.7	3.9	108.0	0.6
51570	Colonial Heights city, VA	121.8				
51590	Danville city, VA	109.0				
51600	Fairfax city, VA	115.8				
51610	Falls Church city, VA	134.6				
51630	Fredericksburg city, VA	137.2				
51650	Hampton city, VA	127.5				
51660	Harrisonburg city, VA	132.6				
51670	Hopewell city, VA	135.0				
51680	Lynchburg city, VA	118.6				
51683	Manassas city, VA	125.9				
51685	Manassas Park city, VA	134.2				
51700	Newport News city, VA	125.3				
51710	Norfolk city, VA	148.1	138.4	9.7	141.6	6.5
51730	Petersburg city, VA	118.0				
51735	Poquoson city, VA	106.4				
51740	Portsmouth city, VA	130.6	128.0	2.5	132.4	-1.8
51750	Radford city, VA	126.4				
51760	Richmond city, VA	135.9	132.1	3.8	135.8	0.1
51770	Roanoke city, VA	127.7				
51775	Salem city, VA	121.8				
51800	Suffolk city, VA	97.2	87.0	10.2	93.8	3.4
51810	Virginia Beach city, VA	124.5	117.4	7.1	120.6	3.9
51830	Williamsburg city, VA	123.3				
51840	Winchester city, VA	128.4				
53003	Asotin County, WA	113.9	107.6	6.2	113.0	0.8

53005	Benton County, WA	99.5	93.7	5.8	99.2	0.3
53007	Chelan County, WA	98.4	91.6	6.7	104.0	-5.6
53011	Clark County, WA	107.2	103.1	4.1	108.5	-1.3
53015	Cowlitz County, WA	96.6	88.3	8.2	96.9	-0.3
53017	Douglas County, WA	97.5	91.0	6.5	102.1	-4.7
53021	Franklin County, WA	103.2	94.5	8.6	102.1	1.1
53033	King County, WA	127.1	120.5	6.6	126.0	1.0
53035	Kitsap County, WA	100.9	96.7	4.2	102.3	-1.4
53053	Pierce County, WA	112.3	107.1	5.2	113.0	-0.7
53057	Skagit County, WA	98.1	91.9	6.1	98.3	-0.3
53061	Snohomish County, WA	107.2	99.9	7.3	106.3	0.9
53063	Spokane County, WA	111.9	109.9	2.0	113.8	-1.9
53067	Thurston County, WA	100.6	93.6	7.0	99.3	1.3
53073	Whatcom County, WA	98.6	91.3	7.3	97.9	0.8
53077	Yakima County, WA	94.2	90.4	3.9	100.4	-6.2
54003	Berkeley County, WV	97.1	89.2	7.9	92.4	4.7
54005	Boone County, WV	102.4	99.5	2.9	105.1	-2.7
54009	Brooke County, WV	104.2	99.1	5.1	104.0	0.2
54011	Cabell County, WV	113.0	110.2	2.8	115.5	-2.5
54029	Hancock County, WV	107.3	108.2	-0.9	112.2	-4.9
54037	Jefferson County, WV	95.5	89.8	5.6	94.4	1.1
54039	Kanawha County, WV	113.5	108.6	4.8	113.7	-0.2
54051	Marshall County, WV	105.9	98.1	7.9	104.1	1.8
54057	Mineral County, WV	96.6	90.3	6.3	96.9	-0.3
54061	Monongalia County, WV	110.8	105.6	5.2	110.6	0.2
54065	Morgan County, WV	83.3	77.4	6.0	83.2	0.1
54069	Ohio County, WV	114.8	111.3	3.6	116.2	-1.4
54077	Preston County, WV	84.7	75.3	9.4	82.5	2.2
54079	Putnam County, WV	100.7	95.8	5.0	100.7	0.1
54099	Wayne County, WV	102.2	98.4	3.8	108.4	-6.2
54107	Wood County, WV	111.9	102.7	9.2	108.8	3.1
55009	Brown County, WI	95.2	94.2	1.0	99.8	-4.7
55015	Calumet County, WI	87.6	74.5	13.2	83.1	4.5
55017	Chippewa County, WI	84.6	79.1	5.5	86.5	-1.9
55021	Columbia County, WI	85.7	74.2	11.5	82.7	3.0
55025	Dane County, WI	109.9	102.4	7.5	109.7	0.2
55031	Douglas County, WI	90.2	87.2	2.9	95.1	-4.9
55035	Eau Claire County, WI	97.1	99.7	-2.6	106.8	-9.7
55039	Fond du Lac County, WI	94.3	85.6	8.6	92.6	1.6
55049	Iowa County, WI	74.8	73.7	1.1	82.6	-7.8
55059	Kenosha County, WI	110.2	106.5	3.7	111.2	-1.0
55061	Kewaunee County, WI	67.8	65.3	2.5	76.4	-8.6
55063	La Crosse County, WI	108.2	105.2	3.0	110.5	-2.3
55073	Marathon County, WI	85.3	81.9	3.3	90.7	-5.4

55079	Milwaukee County, WI	139.8	141.2	-1.4	145.3	-5.5
55083	Oconto County, WI	72.1	68.6	3.5	77.1	-4.9
55087	Outagamie County, WI	99.5	96.7	2.8	102.9	-3.4
55089	Ozaukee County, WI	92.1	86.7	5.4	93.0	-0.9
55093	Pierce County, WI	87.5	80.5	7.1	90.5	-3.0
55101	Racine County, WI	105.5	103.7	1.8	108.1	-2.6
55105	Rock County, WI	97.7	95.2	2.5	100.5	-2.9
55109	St. Croix County, WI	77.5	72.1	5.4	81.4	-3.9
55117	Sheboygan County, WI	97.5	92.1	5.4	98.2	-0.7
55131	Washington County, WI	86.2	79.0	7.1	85.3	0.8
55133	Waukesha County, WI	99.5	90.3	9.2	94.5	5.0
55139	Winnebago County, WI	107.0	104.6	2.4	109.7	-2.8
56021	Laramie County, WY	99.4	95.7	3.7	102.0	-2.7
56025	Natrona County, WY	105.3	94.6	10.7	102.4	2.8

Appendix B. County Compactness Factors and Composite Indices for 2010

fips	county	density factor	mix factor	centering factor	street factor	composite index
1009	Blount County	90.36	37.85	74.28	60.14	56.6
1015	Calhoun County	91.58	86.7	117.7	104.38	100.11
1021	Chilton County	89.98	52.55	81.61	62.37	64.14
1033	Colbert County	95.11	104.27	76.99	124.68	100.33
1051	Elmore County	91.59	60.63	86.59	85.71	76.15
1055	Etowah County	93.78	91.28	116.86	93.1	98.43
1069	Houston County	94.83	102.37	98.64	88.97	95.2
1073	Jefferson County	99.01	110.72	122.44	126.81	118.64
1077	Lauderdale County	94.46	84.43	105.63	88.5	91.48
1079	Lawrence County	89.38	51.74	86.98	66.67	66.75
1081	Lee County	96.48	87.9	104.17	84.55	91.5
1083	Limestone County	91.62	58.45	89.78	82.64	75.51
1089	Madison County	97.61	98.59	103.31	114.82	104.53
1097	Mobile County	99.06	108.17	93.94	113.78	104.72
1101	Montgomery County	102.14	120.67	118.34	105.98	114.89
1103	Morgan County	96.47	95.35	116.51	101.04	102.96
1113	Russell County	94.83	90.91	78.65	93.54	86.71
1115	St. Clair County	91.04	55.96	81.95	84.47	72.65
1117	Shelby County, AL	94.43	91.33	88.2	92.91	89.53
1125	Tuscaloosa County, AL	96.71	101.44	136.82	110.56	114.39
1127	Walker County, AL	90.6	65.74	86.66	92.5	79.62
4005	Coconino County, AZ	95.58	105.89	159.7	80.11	113.04
4013	Maricopa County, AZ	110.5	118.07	118.48	118.04	120.56
4015	Mohave County, AZ	96.2	90.76	97.35	95.37	93.58
4019	Pima County, AZ	102.91	109.55	129.25	101.54	113.66
4021	Pinal County, AZ	96.42	74.63	93.08	100.74	88.9
4025	Yavapai County, AZ	96	89.71	88.28	86.4	87.49
4027	Yuma County, AZ	99.68	105.56	142.91	107.38	117.54
5007	Benton County, AR	95.22	95.05	104.81	89.33	95.07
5031	Craighead County, AR	95.83	97.46	113.68	76.68	94.83
5033	Crawford County, AR	92.25	90.19	82.88	80.03	82.74
5035	Crittenden County, AR	96.93	115.43	79.24	89.18	93.93
5045	Faulkner County, AR	95.11	92.1	83.67	74.78	82.83
5051	Garland County, AR	92.69	89.51	116.53	103.18	100.6

5053	Grant County, AR	89.11	79.34	77.98	60.72	70.67
5069	Jefferson County, AR	94.66	97.82	96.55	113.66	100.85
5079	Lincoln County, AR	88.97	51.59	72.47	62.71	60.74
5085	Lonoke County, AR	91.76	79.64	91.84	75.65	80.69
5087	Madison County, AR	88.44	61.16	73.67	72.44	67.05
5091	Miller County, AR	97.29	106.83	82.03	115.58	100.54
5111	Poinsett County, AR	89.31	105.78	77.99	71.03	82.34
5119	Pulaski County, AR	100.95	111.48	116.72	127.01	117.74
5125	Saline County, AR	92.78	80.99	106.43	75.8	86.1
5131	Sebastian County, AR	97.44	103.71	93.42	108.24	100.89
5143	Washington County, AR	98.58	104.46	109.89	91.83	101.5
6001	Alameda County, CA	137.65	143.4	115.28	151.09	146.57
6007	Butte County, CA	99.2	121.87	106.28	91.9	106.08
6013	Contra Costa County, CA	112.02	128.7	100.81	121.28	119.84
6017	El Dorado County, CA	96.18	88.17	84.58	77.8	83.17
6019	Fresno County, CA	103.35	127.85	104.03	94.25	109.31
6025	Imperial County, CA	99.38	132.78	99.61	82.71	104.58
6029	Kern County, CA	102.91	121.33	99.62	92.21	105.08
6031	Kings County, CA	100.77	115.21	108.98	90.98	105.04
6037	Los Angeles County, CA	152.55	145.2	121.62	141.02	150.67
6039	Madera County, CA	96.68	110.34	104.67	69.69	94.12
6041	Marin County, CA	109.25	141.52	96.85	111.15	118.57
6047	Merced County, CA	100.54	122.04	112.8	85.94	106.74
6053	Monterey County, CA	109.05	122.36	110.26	101.72	113.71
6055	Napa County, CA	102.69	135.45	131.01	110.28	125.09
6059	Orange County, CA	134.15	142.55	95.13	144.21	136.66
6061	Placer County, CA	101.97	116.93	90.93	98.05	102.49
6065	Riverside County, CA	105.36	117.55	108.49	98.38	109.41
6067	Sacramento County, CA	115.28	128.54	135.7	129.68	134.5
6069	San Benito County, CA	103.1	115.79	78.56	105.1	100.81
6071	San Bernardino County, CA	106.82	122.13	95.87	92.42	105.45
6073	San Diego County, CA	118.35	129.64	121.82	116.14	127.15
6075	San Francisco County, CA	250.84	153.79	258.47	215.72	251.27
6077	San Joaquin County, CA	106.5	132.92	104.79	118.62	119.85
6079	San Luis Obispo County, CA	97.52	124.79	111.43	102.74	111.53
6081	San Mateo County, CA	130.72	144.53	93.82	131.35	131.72
6083	Santa Barbara County, CA	116.62	139.7	112.02	116.13	126.69
6085	Santa Clara County, CA	131.02	139.68	107.58	132.85	135.11
6087	Santa Cruz County, CA	104.2	138.71	114.16	107.34	120.35

6089	Shasta County, CA	96	110.79	114.25	88.66	103.07
6095	Solano County, CA	106.86	130.6	103.94	114.95	117.8
6097	Sonoma County, CA	100.37	131.12	101.87	97.67	109.81
6099	Stanislaus County, CA	107.86	135.71	94.54	107.84	114.52
6101	Sutter County, CA	98.92	119.22	126.45	82.89	108.68
6107	Tulare County, CA	100.44	117.82	102.53	93.41	104.49
6111	Ventura County, CA	110.13	131.48	99.8	114.98	117.82
6113	Yolo County, CA	107.3	126.92	98.5	110.1	113.53
6115	Yuba County, CA	97.57	95.43	82.17	89.37	88.8
8001	Adams County, CO	106.63	122.25	82.26	122.37	110.59
8005	Arapahoe County, CO	114.44	124.3	102.43	134.2	123.81
8013	Boulder County, CO	107.71	122	111.33	115.52	117.87
8014	Broomfield County, CO	105.87	113.8	83.11	129.14	110.09
8019	Clear Creek County, CO	90.58	67.38		117.81	
8031	Denver County, CO	129.34	137.67	174.54	181.54	170.48
8035	Douglas County, CO	102.77	97.61	92.17	97.77	96.94
8039	Elbert County, CO	88.27	44.14	72.69	50.26	54.3
8041	El Paso County, CO	104.62	119.18	95.89	123.96	113.79
8059	Jefferson County, CO	106.94	125.25	90.89	112.99	111.4
8069	Larimer County, CO	100.68	117.76	111.95	103.05	110.57
8077	Mesa County, CO	101.69	113.73	124.35	107.33	114.88
8101	Pueblo County, CO	100.43	112.15	112.96	121.67	114.91
8119	Teller County, CO	94.68	82.25	81.88	108.04	89.53
8123	Weld County, CO	97.29	114.35	111.18	95.06	105.65
9001	Fairfield County, CT	110.88	131.47	125.41	101.99	122.04
9003	Hartford County, CT	107.85	126.56	138.02	92.46	120.5
9007	Middlesex County, CT	95.74	116.02	98.9	81.98	97.68
9009	New Haven County, CT	107.16	128.91	137.15	102.88	124.04
9011	New London County, CT	96.76	106.51	131.52	85.24	106.33
9013	Tolland County, CT	96.05	89.61	97.77	63.29	83.17
10001	Kent County, DE	94.72	97.37	102.26	89.82	95
10003	New Castle County, DE	108.44	126.15	111.75	121.39	121.4
11001	District of Columbia, DC	193.52	138.05	219.97	185.15	206.37
12001	Alachua County, FL	100.66	110.17	115.43	107.74	110.74
12003	Baker County, FL	89.21	63.21	89.68	61.02	69.39
12005	Bay County, FL	99.21	105.55	93.7	115.16	104.31
12009	Brevard County, FL	102.39	103.2	86.39	110.4	100.75
12011	Broward County, FL	120.61	133.24	95.43	148.86	131.01
12015	Charlotte County, FL	94.98	97.96	103.74	114.83	103.64

12019	Clay County, FL	97.16	92.55	98.14	95.4	94.71
12021	Collier County, FL	99.42	104.7	83.67	105.06	97.74
12031	Duval County, FL	106.31	113.1	118.71	125.06	119.96
12033	Escambia County, FL	99.94	109.08	100.14	116.67	108.16
12035	Flagler County, FL	96.82	82.32	79.96	99.05	86.78
12039	Gadsden County, FL	90.27	57.12	83.72	95.13	76.69
12053	Hernando County, FL	96.2	80.29	108.25	102.08	95.84
12057	Hillsborough County, FL	106.16	115.63	127.6	128.18	124.51
12061	Indian River County, FL	97.1	101.81	112.72	132.01	113.79
12069	Lake County, FL	95.53	87.32	121.33	116.84	106.64
12071	Lee County, FL	98.87	104.6	119.36	121.83	114.11
12073	Leon County, FL	102.05	106.83	149.96	99.11	118.31
12081	Manatee County, FL	102.17	114.33	112.33	129.01	118.27
12083	Marion County, FL	93.51	83.3	140.38	98.85	105.07
12085	Martin County, FL	98.62	110.16	106.69	113.84	109.26
12086	Miami-Dade County, FL	137.38	132.85	131.33	156.48	149.93
12089	Nassau County, FL	93.25	78.04	98.01	97.21	89.42
12091	Okaloosa County, FL	100.2	113.18	109.67	105.87	109.14
12095	Orange County, FL	108.01	110.76	118.48	124.47	119.5
12097	Osceola County, FL	98.45	86.64	87.23	114.77	95.92
12099	Palm Beach County, FL	107.77	125.08	107.06	118.32	118.4
12101	Pasco County, FL	99.18	100.48	84.02	117.84	100.48
12103	Pinellas County, FL	114.66	132.11	93.74	163.76	132.94
12105	Polk County, FL	96.76	90.29	115.86	120.94	107.53
12109	St. Johns County, FL	97.43	86.85	85.06	106.86	92.48
12111	St. Lucie County, FL	100.74	97.46	102.45	120.07	106.54
12113	Santa Rosa County, FL	92.28	93.99	81.78	80.59	83.78
12115	Sarasota County, FL	101.61	116.04	113.62	124.42	117.59
12117	Seminole County, FL	105.12	116.39	81.81	121.13	107.72
12127	Volusia County, FL	99.33	107.91	100.7	115.72	107.47
12129	Wakulla County, FL	89.66	45.54	78.68	79.41	66.29
13013	Barrow County, GA	92.36	70.78	85.3	72.18	74.92
13015	Bartow County, GA	90.76	77.69	86.6	80.47	79.63
13021	Bibb County, GA	98.07	113.15	103.59	112.7	108.69
13029	Bryan County, GA	89.84	61.04	81.95	71.54	69.79
13035	Butts County, GA	91.1	82.26	87.09	67.51	77.24
13045	Carroll County, GA	92.24	80.47	108.64	59.41	81.28
13047	Catoosa County, GA	93.34	79.45	88.25	78.55	80.91
13051	Chatham County, GA	99.64	117.03	126.17	126.88	122.03

13053	Chattahoochee County, GA	97.14	100.48	70.87	98.62	89.61
13057	Cherokee County, GA	97.06	94.58	80.91	83.44	86.1
13059	Clarke County, GA	100.91	115.76	98.31	92.89	102.49
13063	Clayton County, GA	106.35	106.15	84.62	98.1	98.49
13067	Cobb County, GA	106.99	116.91	91.39	107.76	107.28
13073	Columbia County, GA	96.83	95.43	80.24	72.04	82.48
13077	Coweta County, GA	92.69	85.33	81.74	72.61	78.64
13083	Dade County, GA	89.57	56.36	80.64	69.91	67.3
13085	Dawson County, GA	89.94	63.53	86.08	69.43	71.24
13089	DeKalb County, GA	111.99	120.73	96.18	100.65	109.34
13095	Dougherty County, GA	97.65	109.27	95.6	107.9	103.3
13097	Douglas County, GA	95.83	89.53	103.33	70.96	87.25
13103	Effingham County, GA	91.03	60.74	84.13	75.9	72.13
13113	Fayette County, GA	93.23	94.36	100.88	78.34	89.51
13115	Floyd County, GA	92.92	90.67	103.37	89.35	92.52
13117	Forsyth County, GA	96.31	91.93	97.11	68.48	85.41
13121	Fulton County, GA	107.63	122.6	146.48	108.57	126.94
13127	Glynn County, GA	92.87	102	95.73	111.38	100.62
13135	Gwinnett County, GA	106.36	111.94	88.7	89.68	98.95
13139	Hall County, GA	94.45	89.1	139.3	87.59	103.3
13143	Haralson County, GA	90.08	73.41	78.3	82.15	75.97
13145	Harris County, GA	89.51	34.28	71.89	62.25	55.12
13151	Henry County, GA	95.26	81.75	86.07	74.28	80.21
13153	Houston County, GA	99.67	97.7	89.66	91.56	93.23
13169	Jones County, GA	90.26	80.32	81.59	59.82	72.19
13171	Lamar County, GA	90.01	68.75	79.24	69.42	70.75
13177	Lee County, GA	90.74	63.81	80.13	67.38	69.06
13179	Liberty County, GA	96.95	85.66	100.72	88.85	91.21
13185	Lowndes County, GA	95.78	102.08	106.87	91.72	98.88
13189	McDuffie County, GA	89.94	68.85	78.49	72.18	71.4
13195	Madison County, GA	89.81	53.09	73.41	61.79	61.49
13199	Meriwether County, GA	89.17	52.92	79.4	65.55	64.31
13207	Monroe County, GA	89.72	49.47	77.43	66.44	63.06
13213	Murray County, GA	90.63	57.18	84.75	68.86	68.85
13215	Muscogee County, GA	103.92	119.01	133.98	108.41	120.64
13217	Newton County, GA	94.48	61.24	123.65	77.77	86.46
13219	Oconee County, GA	90.84	85.05	74.86	69.72	74.87
13221	Oglethorpe County, GA	88.61	22.76	70.81	45.28	45.49
13223	Paulding County, GA	93.49	68.19	83.49	74.96	74.76

13227	Pickens County, GA	90.19	68.61	81.67	61.08	68.89
13231						
13245	Richmond County, GA	99.09	111.4	124.13	104.91	112.49
13247	Rockdale County, GA	95.92	93.91	82.64	86.78	87.13
13255	Spalding County, GA	93.04	83.74	102.12	85.73	88.83
13273	Terrell County, GA	88.84	78.95	78.22	74.53	74.9
13295	Walker County, GA	91.84	77.95	88.88	75.62	79.24
13297	Walton County, GA	91.96	71.8	87.33	54.96	70.32
13313	Whitfield County, GA	94.64	87.29	115.72	88.51	95.63
13321	Worth County, GA	88.76	52.25	84.69	68.22	66.48
16001	Ada County, ID	103.58	124.6	102.02	108.68	112.28
16005	Bannock County, ID	101.28	123.06	128.18	124.04	124.18
16019	Bonneville County, ID	98.84	118.52	99.62	109.57	108.39
16027	Canyon County, ID	98.64	112.28	90.6	106.1	102.41
16045	Gem County, ID	92.23	83.41	76.44	113.29	89.06
16051	Jefferson County, ID	89.1	69.82	83.29	88.98	78.26
16055	Kootenai County, ID	97.55	113.96	122.32	101.44	111.14
16069	Nez Perce County, ID	99.34	116.89	92.82	113.12	107
17003	Alexander County, IL	89.05		70.12	121.33	
17005	Bond County, IL	91.76	87.79	129.58	109.49	105.89
17007	Boone County, IL	96.36	95.37	81.63	85.74	87.08
17019	Champaign County, IL	109.28	127.58	141.54	107.66	127.19
17027	Clinton County, IL	89.17	87.01	82.04	94.5	85.06
17031	Cook County, IL	151.4	141.34	155.66	170.12	169.04
17037	DeKalb County, IL	99.94	111.36	84.27	93.39	96.51
17043	DuPage County, IL	111.41	135.96	88.41	126.48	119.67
17053	Ford County, IL	90	136.48	78.31	83.16	96.19
17063	Grundy County, IL	92.99	101.16	86.63	110.27	97.17
17073	Henry County, IL	90.62	116.08	84.59	81.22	91.31
17083	Jersey County, IL	89.46	78.12	85.72	85.66	80.72
17089	Kane County, IL	108.34	120.57	90.86	109.06	109.11
17091	Kankakee County, IL	95.65	119.77	105.98	97.47	105.96
17093	Kendall County, IL	94.3	90.54	82.01	95.42	88.08
17097	Lake County, IL	103.98	121.02	97.08	118.15	112.71
17111	McHenry County, IL	98.53	105.24	83.23	95.57	94.49
17113	McLean County, IL	104.94	120.63	110.85	102.41	112.27
17115	Macon County, IL	95.56	114.15	112.75	97.28	106.24
17117	Macoupin County, IL	92.2	111.71	78.1	115.16	99.1
17119	Madison County, IL	96.83	119.34	103.17	114.28	110.62

17123	Marshall County, IL	89.56	95.57	68.03	113.51	89.47
17129	Menard County, IL	88.81	90.2	83.8	84.09	83.22
17131	Mercer County, IL	88.81	97.3	71.15	95.19	84.98
17133	Monroe County, IL	89.84	90.63	77.62	91.7	84.14
17143	Peoria County, IL	100.95	120.84	143.87	112.87	124.81
17147	Piatt County, IL	88.83	107.89	81.61	83.39	87.9
17161	Rock Island County, IL	101.09	128.28	104.97	116.1	115.93
17163	St. Clair County, IL	96.6	114.62	90.19	113.08	104.58
17167	Sangamon County, IL	97.54	115.25	157.52	108.44	124.88
17179	Tazewell County, IL	96.01	107.55	85.37	110.59	99.85
17183	Vermilion County, IL	91.84	99.84	112.75	117.88	107.05
17197	Will County, IL	101.35	114.01	92.55	100.58	102.68
17201	Winnebago County, IL	100.8	123.79	117.91	120.01	119.75
17203	Woodford County, IL	89.23	111.21	85.84	94.01	93.77
18003	Allen County, IN	100.69	113.3	110.06	100.51	107.76
18005	Bartholomew County, IN	96.38	101.42	108.25	114.65	106.54
18011	Boone County, IN	94.39	103.9	79.83	90.61	90.12
18013	Brown County, IN	92.73	36.11	76.3	63.42	58.47
18015	Carroll County, IN	89.42	86.26	86.24	85.98	83.54
18019	Clark County, IN	97.57	113.96	86.06	107.2	101.51
18021	Clay County, IN	91.51	101.15	76.58	109.38	93.25
18029	Dearborn County, IN	91.96	82.67	89.51	96.29	87.5
18035	Delaware County, IN	103.15	118.8	91.63	109.13	107.18
18039	Elkhart County, IN	94.95	104.81	89.66	114.82	101.34
18043	Floyd County, IN	101.1	121.02	86.15	99.15	102.35
18047	Franklin County, IN	90.85	54.82	78.33	95.48	74.56
18051	Gibson County, IN	92.92	109.39	77.46	124.54	101.36
18055	Greene County, IN	90.44	93.15	82.02	88.86	85.62
18057	Hamilton County, IN	99.85	104.3	81.69	94.95	93.93
18059	Hancock County, IN	93.31	95.1	82.93	84.8	86.14
18061	Harrison County, IN	91.11	56.7	85.5	61.31	66.71
18063	Hendricks County, IN	95.72	91.32	79.42	89.16	85.98
18067	Howard County, IN	98.37	114.28	95.94	109.61	105.75
18073	Jasper County, IN	89.52	90.18	73.22	51.82	69.9
18081	Johnson County, IN	98.31	116.23	81.08	102.48	99.4
18089	Lake County, IN	102.28	124.13	124.4	126.26	124.35
18091	LaPorte County, IN	95.04	104.81	108.11	96.11	101.29
18095	Madison County, IN	96.4	113.83	107.92	112.32	109.63
18097	Marion County, IN	108.62	123.19	125.02	127.04	126.5

18105	Monroe County, IN	104.36	112.59	163.85	98.52	125.06
18109	Morgan County, IN	94.61	85.99	85.6	99.46	89.15
18115	Ohio County, IN	91.06	97.13	78.9	99.39	89.41
18119	Owen County, IN	91.06	35.65	78.62	99.32	69.87
18127	Porter County, IN	96.95	108.4	88.88	87.95	94.37
18129	Posey County, IN	92.19	75.2	81.37	81.92	78.1
18133	Putnam County, IN	91.01	96.03	82.78	73.04	81.95
18141	St. Joseph County, IN	100.67	117.65	124.8	131.2	123.48
18145	Shelby County, IN	98.24	116	82.26	97.84	98.21
18153	Sullivan County, IN	89.97	94.33	85.42	79.03	83.81
18157	Tippecanoe County, IN	104.58	112.14	101.52	96	104.5
18159	Tipton County, IN	89.55	85.73	80.1	62.84	74.17
18163	Vanderburgh County, IN	101.79	119.7	120.43	116.35	118.41
18165	Vermillion County, IN	103.23	90.48	79.32	155.06	108.87
18167	Vigo County, IN	96.9	111.19	114.75	128.65	116.27
18173	Warrick County, IN	99.66	102.11	81.65	82.32	89.18
18175	Washington County, IN	94.15	67.81	80.3	87.16	77.7
18179	Wells County, IN	89.98	90.1	83.04	70.18	78.93
18183	Whitley County, IN	90.31	89.14	84.12	56.3	74.69
19011	Benton County, IA	88.87	108.97	90.6	97.81	95.65
19013	Black Hawk County, IA	99.1	129.91	94.2	118.5	113.18
19017	Bremer County, IA	89	112.79	82.24	77.7	87.91
19049	Dallas County, IA	95.45	106.94	79.89	91.67	91.77
19061	Dubuque County, IA	100.57	130.56	115.08	106.99	116.81
19085	Harrison County, IA	89.16	113.13	76.21	76.79	85.87
19103	Johnson County, IA	103.02	124.12	157.95	85.78	122.39
19105	Jones County, IA	89.77	115.53	71.55	95.83	91.37
19113	Linn County, IA	100.19	118.29	121.29	103.21	113.58
19121	Madison County, IA	90.62	124.56	70.25	103.16	96.4
19129	Mills County, IA	89.93	84.78	77.08	92.04	82.25
19153	Polk County, IA	102.96	129.31	116.94	112.82	119.6
19155	Pottawattamie County, IA	97.53	120.78	95.92	99.22	104.25
19163	Scott County, IA	100.21	128.03	85.19	130.22	113.79
19169	Story County, IA	96.6	115.01	125.73	97.63	111.05
19181	Warren County, IA	93.98	105.61	82.31	83.56	89.09
19183	Washington County, IA	90	104.89	78.56	86.53	87.36
19193	Woodbury County, IA	97.33	125.17	117.13	122.41	119.6
20015	Butler County, KS	95.93	116.69	81.59	76.86	90.86
20045	Douglas County, KS	100.21	127.37	99.68	98.22	108.05

20059	Franklin County, KS	89.92	101.1	85.19	101.84	93.07
20061	Geary County, KS	96.96		84.76	128.69	
20079	Harvey County, KS	90.56	115.17	75.64	73.36	85.7
20085	Jackson County, KS	88.64	77.77	79.63	44.65	65.47
20091	Johnson County, KS	104.45	125.43	86.47	101.88	105.76
20103	Leavenworth County, KS	95.13	99.39	87.24	93.72	92.25
20121	Miami County, KS	89.17	87.98	79.03	102.93	87.08
20139	Osage County, KS	89.37	97.03	68.66	75.02	77.91
20149	Pottawatomie County, KS	89		81.55	95.3	
20161	Riley County, KS	98.61		93.38	105.56	
20173	Sedgwick County, KS	102.93	118.91	117.57	112.3	116.34
20177	Shawnee County, KS	98.59	111.59	125.79	108.8	114.14
20191	Sumner County, KS	88.32	98.41	84.72	92.96	88.76
20209	Wyandotte County, KS	101.91	113.88	103.1	127.92	114.79
21015	Boone County, KY	99.7	101.93	95.37	84.83	94.26
21017	Bourbon County, KY	97.22	93.99	80.83	92.96	88.94
21019	Boyd County, KY	94.45	98.55	126.68	104.55	107.65
21029	Bullitt County, KY	95.94	83.26	81.17	86.62	83.25
21037	Campbell County, KY	102.73	124.27	85.29	109.72	106.95
21047	Christian County, KY	97.34	94.37	87.11	104.06	94.59
21049	Clark County, KY	93.45	102	79.27	98.84	91.64
21059	Daviess County, KY	99.18	109.86	121.56	106.12	111.6
21067	Fayette County, KY	110.05	128.66	134.26	116.37	128.22
21081	Grant County, KY	90.59	52.57	80.01	76.95	68.44
21089	Greenup County, KY	94.52	87.52	78.55	112.22	91.41
21093	Hardin County, KY	95.48	90.76	131.65	93.87	103.72
21101	Henderson County, KY	99.09	105.95	76.39	103.24	95.15
21103	Henry County, KY	89.37	76.6	77.64	85.73	77.68
21111	Jefferson County, KY	109.11	119.34	118.64	123.85	122.42
21113	Jessamine County, KY	94.35	102.5	84.93	91.02	91.41
21117	Kenton County, KY	104.06	117.51	88.49	119.32	109.28
21123	Larue County, KY	89.43	63.3	84.72	65.93	69.47
21163	Meade County, KY	93.39	46.63	84.9	78.41	69.46
21179	Nelson County, KY	91.95	66.86	78.24	89.54	76.81
21185	Oldham County, KY	94.48	74.42	80.9	81.7	78.36
21209	Scott County, KY	95.24	97.32	80.79	97.28	90.72
21211	Shelby County, KY	95.85	91.76	112.29	86.78	95.79
21215	Spencer County, KY	91.13	31.97	75.02	76.42	60.36
21227	Warren County, KY	101.86	102.72	124.59	100.77	109.46

21239	Woodford County, KY	93.43	105.61	79.51	90.95	90.36
22005	Ascension Parish, LA	92.32	90.2	93.22	86.92	88.2
22015	Bossier Parish, LA	95.13	94.84	83.39	90.35	88.54
22017	Caddo Parish, LA	98.39	108.22	98.44	110.2	104.82
22019	Calcasieu Parish, LA	95.68	105.58	123.81	94.14	106.07
22031	De Soto Parish, LA	89.07	61.88	140.34	77.66	90.19
22033	East Baton Rouge Parish, LA	103.91	113.92	97.85	114.04	109.39
22043	Grant Parish, LA	88.67	34.23	66.17	64.67	53.79
22047	Iberville Parish, LA	93.41	93.69	84.62	92.02	88.54
22051	Jefferson Parish, LA	113.17	132.12	84.47	148.19	124.62
22055	Lafayette Parish, LA	99.95	114.45	110.96	106.53	110.08
22057	Lafourche Parish, LA	95.04	99.35	143.72	98.05	111.43
22063	Livingston Parish, LA	93.18	62.05	84.88	75.38	73.3
22071	Orleans Parish, LA	121.91	137.94	153.63	214.43	172.01
22073	Ouachita Parish, LA	95.23	94.61	111.6	108.52	103.15
22075	Plaquemines Parish, LA	90.01	91.73	81.72	104.87	90
22077	Pointe Coupee Parish, LA	91.55	71.09		98.29	
22079	Rapides Parish, LA	93.23	98.11	100.74	101.17	97.87
22087	St. Bernard Parish, LA	100.03	121.48	80.94	130.72	110.48
22089	St. Charles Parish, LA	93.42	97.97	81.23	108.41	94.01
22095	St. John the Baptist Parish, LA	97.39	101.63	88.78	109.44	99.13
22099	St. Martin Parish, LA	90.6	70.42	94.32	86.13	81.51
22103	St. Tammany Parish, LA	95.66	94.37	97.06	109.33	98.87
22109	Terrebonne Parish, LA	96.62	103.72	99.01	107.65	102.21
22111	Union Parish, LA	89.87	71.18	70.25	78.43	71.48
22121	West Baton Rouge Parish, LA	92.8	93.51	81.41	106.35	91.81
23001	Androscoggin County, ME	94.76	103.78	136.26	91.39	108.27
23005	Cumberland County, ME	98.75	114.38	138.89	90.26	113.36
23019	Penobscot County, ME	92.4	98.83	131.29	77.32	99.95
23023	Sagadahoc County, ME	91.37	75.85	95.72	87.89	84.47
23031	York County, ME	92.68	89.8	93.72	78.52	85.7
24001	Allegany County, MD	94.56	117.81	106.32	116.79	111.21
24003	Anne Arundel County, MD	105.04	115.29	100.72	118.53	112.5
24005	Baltimore County, MD	109.47	130.43	100.71	118.19	118.58
24009	Calvert County, MD	95.09	73.94	82.27	107.81	87.08
24013	Carroll County, MD	95.33	95.07	100.64	94.25	95.35
24015	Cecil County, MD	93.63	88.61	89.42	100.5	91.2
24017	Charles County, MD	97.94	88.84	83.65	107.96	93.17
24021	Frederick County, MD	97.32	108.73	104.01	100.82	103.44

24025	Harford County, MD	100.16	109.82	96.6	99.78	102.01
24027	Howard County, MD	104.93	128.35	97.95	107.27	112.17
24031	Montgomery County, MD	117.8	129.94	123.29	116.7	127.72
24033	Prince George's County, MD	112.7	124.13	90.27	125.16	116.51
24035	Queen Anne's County, MD	91.01	67.98	77.17	76.61	72.44
24039	Somerset County, MD	91.18	73.8	82.53	110.34	86.69
24043	Washington County, MD	97.32	110.91	127.59	95.52	109.9
24045	Wicomico County, MD	96	106.22	124.92	114.15	113.05
24510	Baltimore city, MD	163.61	143.97	183.84	196.44	190.94
25001	Barnstable County, MA				119.45	
25003	Berkshire County, MA				95.18	
25005	Bristol County, MA		33.82		120.97	
25009	Essex County, MA		36.98		122.2	
25011	Franklin County, MA				83.51	
25013	Hampden County, MA		32.99		112.97	
25015	Hampshire County, MA				85.5	
25017	Middlesex County, MA		38.77		122.51	
25021	Norfolk County, MA		34.74		117.59	
25023	Plymouth County, MA				104.2	
25025	Suffolk County, MA		53.29		201.99	
25027	Worcester County, MA		30.9		98.17	
26015	Barry County, MI	90.18	57.23	87.88	75.47	71.8
26017	Bay County, MI	96.11	112.33	108.4	104.1	106.61
26021	Berrien County, MI	94.04	108.26	90.63	99.01	97.45
26025	Calhoun County, MI	95.5	103.98	103.91	94.09	99.21
26027	Cass County, MI	89.45	65.94	94.7	73.69	75.91
26037	Clinton County, MI	91.92	77.85	131.4	63.62	88.88
26045	Eaton County, MI	94.44	101.46	85.64	72.87	85.6
26049	Genesee County, MI	97.37	109.34	123.51	103.52	110.66
26065	Ingham County, MI	109.11	118.48	141.89	104.33	123.32
26067	Ionia County, MI	92.27	71.44	96.34	76.97	80.1
26075	Jackson County, MI	94.83	98.29	137.01	86.66	105.3
26077	Kalamazoo County, MI	97.5	106.35	113.21	90.33	102.33
26081	Kent County, MI	99.67	119.56	128.07	96.76	113.92
26087	Lapeer County, MI	92.22	70.09	131.99	63.03	86.52
26093	Livingston County, MI	92.3	81.87	104.2	80.88	87.13
26099	Macomb County, MI	107.83	131.48	92.09	106.26	111.9
26115	Monroe County, MI	92.58	95.56	109.24	75.47	91.42
26121	Muskegon County, MI	96.94	110.29	96.74	107.62	103.66

26123	Newaygo County, MI	89.64	63.71	82.85	79.68	73.43
26125	Oakland County, MI	103.79	122.43	99.39	107.48	110.46
26139	Ottawa County, MI	96.62	104.73	106.96	84.83	97.83
26145	Saginaw County, MI	96.26	111.36	121.05	101.28	109.46
26147	St. Clair County, MI	95.48	93.49	115.33	87.56	97.42
26159	Van Buren County, MI	90.64	78.99	85.3	71.88	76.88
26161	Washtenaw County, MI	105.17	117.06	155.39	87.03	120.43
26163	Wayne County, MI	112.5	126.5	136.09	148.34	139
27003	Anoka County, MN	101.07	111.72	98.03	105.23	105.07
27009	Benton County, MN	99.34	111.8	83.26	89.21	94.82
27013	Blue Earth County, MN	97.06		81.38	83.73	
27017	Carlton County, MN	89.72	89.44	86.19	89.97	85.88
27019	Carver County, MN	94.8	100.1	82.7	100.41	93.05
27025	Chisago County, MN	91.23	72.57	80.16	79.33	75.77
27027	Clay County, MN	101.35	118.95	84.41	81.24	95.56
27037	Dakota County, MN	104.83	115.9	86.85	107.32	104.71
27039	Dodge County, MN	90.15	114.35	78.13	95.81	93.19
27053	Hennepin County, MN	114.74	127.82	151.96	129.69	139.24
27055	Houston County, MN	89.84	94.39	70.75	100.51	85.94
27059	Isanti County, MN	91.07	89.01	80.16	86.9	83.3
27103	Nicollet County, MN	97.81		77.6	107.27	
27109	Olmsted County, MN	98.99	108.08	166.15	100.7	123.35
27119	Polk County, MN	89.65	106.65	85.6	58.59	81.2
27123	Ramsey County, MN	117.31	135.35	105.13	148.75	133.66
27137	St. Louis County, MN	95.96	113.02	140.27	103.63	116.7
27139	Scott County, MN	96.04	104.74	81.51	85.26	89.75
27141	Sherburne County, MN	92.57	80.55	85.4	79.35	80.37
27145	Stearns County, MN	95.49	112.29	109.13	96.54	104.25
27157	Wabasha County, MN	89.66	101.77	80.16	119.28	97.11
27163	Washington County, MN	100.91	108.44	82.51	109.35	100.38
27171	Wright County, MN	92.03	88.12	85.17	74.14	80.87
28029	Copiah County, MS	90.59	89.53	72.41	81.93	79.29
28033	DeSoto County, MS	95.25	88.58	99.48	78.18	87.83
28035	Forrest County, MS	95.34	105.53	96.31	100.75	99.35
28039	George County, MS	90.76	69.74	77.91	92.68	78.23
28045	Hancock County, MS	92.04	77.68	80.99	112.7	88.44
28047	Harrison County, MS	97.88	105.23	107.35	113.32	107.51
28049	Hinds County, MS	100.02	107.02	141.59	102.57	116.18
28059	Jackson County, MS	95.32	88.99	120.77	104.57	103.05

28073	Lamar County, MS	90.94	85.24	82.62	69.99	77.5
28089	Madison County, MS	96.21	91.29	91.18	87.79	89.4
28093	Marshall County, MS	89.58	45.7	77.07	80.95	66.29
28121	Rankin County, MS	94.27	82.77	81.61	77.7	79.89
28127	Simpson County, MS	89.83	72.44	81.01	94.49	80.34
28131	Stone County, MS	90.38	88.05	70.63	94.96	82.31
28137	Tate County, MS	92.63	63.13	71.62	95.88	75.76
28143	Tunica County, MS	88.41	60.42	81.24	70.41	68.56
29003	Andrew County, MO	88.73	86.17	72.6	76.11	75.86
29013	Bates County, MO	89.22	111.73	80.53	106.69	96.26
29019	Boone County, MO	98.98	107.9	126.76	103.07	111.6
29021	Buchanan County, MO	101.7	120.56	95.28	141.17	118.55
29027	Callaway County, MO	90.4	82.96	97.28	84.65	85.87
29031	Cape Girardeau County, MO	95.78		114.42	102.52	
29037	Cass County, MO	94.15	94.94	79.62	83.45	84.89
29043	Christian County, MO	91.93	89.25	81.1	90.63	85.12
29047	Clay County, MO	97.62	113.96	88.28	98.64	99.52
29049	Clinton County, MO	90.37	103.72	78.89	114.83	96.15
29051	Cole County, MO	94.77	101.06	122.96	85.07	101.22
29055	Crawford County, MO (pt.)*	89.11		71.96	88.13	
29071	Franklin County, MO	91.1	94.49	82.43	93.59	87.87
29077	Greene County, MO	100.74	119.9	88.95	115.29	107.86
29095	Jackson County, MO	105.14	126.53	136.74	127.96	130.44
29097	Jasper County, MO	94.9	113.72	88.44	114.86	103.76
29099	Jefferson County, MO	96.02	87.54	85.42	99.04	89.9
29107	Lafayette County, MO	89.16	87.92	74.98	94.53	83.13
29113	Lincoln County, MO	90.59	52.94	85.39	93.02	75.34
29135	Moniteau County, MO	90.4	117.93	68.41	89.59	89.37
29145	Newton County, MO	92.11	83.25	102.74	93.49	91.02
29165	Platte County, MO	98.15	104.96	79.77	94.12	92.73
29177	Ray County, MO	89.65	108.59	73.35	65.04	79.98
29183	St. Charles County, MO	104.37	118.4	86.54	121.39	109.7
29189	St. Louis County, MO	107.75	126.19	95.35	120.59	115.76
29219	Warren County, MO	90.25	65.09	88.5	88.94	78.76
29221	Washington County, MO	89.88	65.15	71.89	94.61	75.21
29225	Webster County, MO	89.7	58.65	78.35	95.58	75.45
29510	St. Louis city, MO	126.98	137.55	194.29	185.95	177.33
30009	Carbon County, MT	88.78	68.92	85.23	93.01	79.76
30013	Cascade County, MT	97.85	123.74	127.17	118.61	121.28

30063	Missoula County, MT	98.92	119.3	111.04	110.74	112.64
30111	Yellowstone County, MT	103.87	120.17	119.97	115.07	118.66
31025	Cass County, NE	89.1	86.96	86.25	95.22	86.59
31043	Dakota County, NE	98.92	114.43	75.16	122.4	103.44
31055	Douglas County, NE	110.08	132.45	125.37	138.38	133.58
31109	Lancaster County, NE	109.75	133.02	115.33	121.45	125.13
31153	Sarpy County, NE	101.37	112.49	87.29	118.08	106.08
31155	Saunders County, NE	88.71	95.5	88.74	85.06	86.74
31159	Seward County, NE	89.14	99.79	77.47	81.06	83.4
31177	Washington County, NE	89.99	86.51	117.82	94.88	96.59
32003	Clark County, NV	119.01	116.44	140.45	122.06	130.94
32031	Washoe County, NV	103.05	110.72	131.45	103.68	115.45
32510	Carson City, NV	104.88	133.53	80.1	118.62	111.73
33011	Hillsborough County, NH	101.22	116.91	121.07	97.04	111.45
33015	Rockingham County, NH	94	101.41	97.51	82.02	92.08
33017	Strafford County, NH	95.77	105.8	88.23	82.45	91.23
34001	Atlantic County, NJ	103	114.8	142.81	120.73	125.7
34003	Bergen County, NJ	128.56	150.29	86.86	143.25	134.43
34005	Burlington County, NJ	100.52	120.12	99.61	99.94	106.38
34007	Camden County, NJ	115.67	137.68	105.55	141.06	131.58
34009	Cape May County, NJ	97.81	117.44	101.22	145.73	119.65
34011	Cumberland County, NJ	99.51	113.21	119.51	98.78	109.8
34013	Essex County, NJ	161.02	146.99	128.46	148.71	158.5
34015	Gloucester County, NJ	100.59	121.22	87.46	104.71	104.41
34017	Hudson County, NJ	223.23	156.67	92.82	176.49	178.73
34019	Hunterdon County, NJ	93.84	90.14	95.2	74	85.21
34021	Mercer County, NJ	114.81	128.87	109.53	119.34	122.92
34023	Middlesex County, NJ	118.29	135.37	114.47	132.03	131.64
34025	Monmouth County, NJ	105.74	133.26	84.28	121.16	114.04
34027	Morris County, NJ	103	125.29	87.76	100.05	105.09
34029	Ocean County, NJ	105.44	110.28	91.35	129.32	111.5
34031	Passaic County, NJ	143.82	148.45	101.63	135.66	140.93
34033	Salem County, NJ	94.41	98	80.11	92.91	89.08
34035	Somerset County, NJ	101.83	120.78	86.24	103.35	103.86
34037	Sussex County, NJ	95.74	89.17	86.54	87.85	87.14
34039	Union County, NJ	140.17	153.96	89.87	148.9	141.99
34041	Warren County, NJ	95.86	119.17	85.21	97.52	99.29
35001	Bernalillo County, NM	110.26	122.46	113.45	131.01	124.38
35013	Dona Ana County, NM	99.2	106.04	114.72	103.66	107.46

35043	Sandoval County, NM	97.97	91.24	110.1	85.16	95.09
35045	San Juan County, NM	93.52	88.26	135.96	78.81	98.91
35049	Santa Fe County, NM	99.91	106.29	116.83	88.05	103.5
35061	Valencia County, NM	94.94	85.92	108.47	76.38	89.17
36001	Albany County, NY	107.1	128.39	135.96	104.63	124.04
36005	Bronx County, NY	336.7	143.95	100.25	211.61	224.01
36007	Broome County, NY	99.92	115.8	121.53	93.89	109.84
36015	Chemung County, NY	98.96	117.49	130.79	99.06	114.63
36027	Dutchess County, NY	97.07	110.29	128.55	81.19	105.4
36029	Erie County, NY	109.71	131.45	111.78	93.59	114.7
36043	Herkimer County, NY	96.91	100.82	82.72	80.37	87.62
36047	Kings County, NY	355.5	142.16	199.99	225.25	265.2
36051	Livingston County, NY	93.13	102.59	78.75	53.09	77.11
36053	Madison County, NY	94.67	96.7	85.84	57.89	79.49
36055	Monroe County, NY	106.45	123.67	121.06	93.28	114.04
36059	Nassau County, NY	128.98	149.38	111.6	160.85	147.65
36061	New York County, NY	654.01	144.57	400.25	230.33	425.15
36063	Niagara County, NY	100.04	115.62	92.59	94.32	100.81
36065	Oneida County, NY	101.65	107.32	112.12	84.48	101.76
36067	Onondaga County, NY	104.46	122.19	142.75	96.45	120.8
36069	Ontario County, NY	94.36	101.34	91.19	62.58	84.03
36071	Orange County, NY	101.31	113.59	90.33	87.33	97.65
36073	Orleans County, NY	94.19	97.46	78.22	53.47	75.78
36075	Oswego County, NY	96.64	90.83	108.43	70.57	89.4
36079	Putnam County, NY	94.19	95.77	83.82	88.92	88.21
36081	Queens County, NY	266.34	147.42	91.93	224.01	204.16
36083	Rensselaer County, NY	99.2	109.08	97.62	92.25	99.41
36085	Richmond County, NY	175.08	131.67	78.94	179.98	152.34
36087	Rockland County, NY	117.77	134.18	81.37	105.52	112.27
36091	Saratoga County, NY	95.36	98.37	102.26	80.9	92.7
36093	Schenectady County, NY	107.32	130.66	104.18	110.94	116.78
36095	Schoharie County, NY	90.59	78.79	84.01	56.05	71.39
36103	Suffolk County, NY	105.86	126.74	94.53	115.53	113.48
36107	Tioga County, NY	94.68	75.76	82.48	64.79	74
36109	Tompkins County, NY	102.44	95.84	144.53	72.43	104.82
36111	Ulster County, NY	95.12	96.8	124.18	81.42	99.22
36113	Warren County, NY	94.99	105.93	183.56	89.94	123.51
36115	Washington County, NY	92.47	80.23	80.51	59.21	72.33
36117	Wayne County, NY	92.68	85.72	85.91	55.37	74.62

36119	Westchester County, NY	129.24	146.99	93.74	123.66	129.58
37001	Alamance County, NC	95.78	102.85	94.52	96.28	96.66
37003	Alexander County, NC	91.03	78.52	79.96	55.54	70
37007	Anson County, NC	89.44	65.32	80.36	52.48	64.49
37019	Brunswick County, NC	90.81	69.18	88.65	85.96	79.34
37021	Buncombe County, NC	95.14	101.18	126.22	94.85	105.5
37023	Burke County, NC	90.8	78.73	87.53	75.57	78.72
37025	Cabarrus County, NC	96.2	97.46	88.76	88	90.65
37027	Caldwell County, NC	92.41	74.22	123.75	80.6	90.83
37035	Catawba County, NC	93.56	91.54	85.36	88.36	86.99
37037	Chatham County, NC	91.14	56.42	79.76	62.63	65.23
37051	Cumberland County, NC	100.01	104.64	91.45	90.81	95.86
37053	Currituck County, NC	90.42	69.81	77.63	76.98	73.1
37059	Davie County, NC	91.08	61.13	81.22	60.37	66.45
37063	Durham County, NC	102.68	108.43	103.83	103.7	105.89
37065	Edgecombe County, NC	91.45	83.77	99.4	93.79	90.02
37067	Forsyth County, NC	98.47	107.56	110.15	95.01	103.53
37069	Franklin County, NC	91.13	52.43	78.63	63.74	63.96
37071	Gaston County, NC	95.33	103.37	110.64	94.2	101.12
37079	Greene County, NC	90.47	47.46	83.61	40.96	56.56
37081	Guilford County, NC	100.36	113.56	102.77	95.45	103.84
37087	Haywood County, NC	91.09	79.15	80.84	102.68	85.39
37089	Henderson County, NC	92.12	98.21	84.83	93.59	90.13
37093	Hoke County, NC	91.51	57.98	83.07	70.19	69.27
37101	Johnston County, NC	93.03	70.6	103.97	64.44	78.53
37115	Madison County, NC	89.4	44.18	77.93	90.45	69.03
37119	Mecklenburg County, NC	105.91	115.35	135.51	101.84	118.52
37127	Nash County, NC	91.58	88.78	88.52	79.45	83.68
37129	New Hanover County, NC	102.34	118.86	107.7	121.5	115.92
37133	Onslow County, NC	94.97	82.72	104.59	82.75	88.95
37135	Orange County, NC	99.4	106.99	120.04	75.56	100.63
37141	Pender County, NC	91.15	64.41	81.67	60.61	67.72
37145	Person County, NC	91.24	74.11	81.98	61.12	71.08
37147	Pitt County, NC	98.36	104.23	117.55	87.14	102.3
37151	Randolph County, NC	92.22	84.74	100.63	57.18	79.39
37157	Rockingham County, NC	90.85	72.36	83.7	76.47	75.79
37169	Stokes County, NC	90.59	52.98	81.84	64.72	65.29
37179	Union County, NC	94.98	81.73	100.88	84.45	88.01
37183	Wake County, NC	103.07	115.17	134.61	96.6	115.62

37191	Wayne County, NC	93.55	78.79	130.76	84.88	96.2
37197	Yadkin County, NC	90.06	70.68	79.45	49.29	65.08
38015	Burleigh County, ND	96.52	118.46	128.76	90.68	110.87
38017	Cass County, ND	99.52	125.9	113.31	97.15	111.34
38035	Grand Forks County, ND	104.24	124.99	97.01	96.71	107.25
38059	Morton County, ND	91.13	108.21	82.17	85.86	89.69
39003	Allen County, OH	95.85	114.27	117.83	118.07	114.54
39013	Belmont County, OH	92.89	98.58	83.73	112.11	95.99
39015	Brown County, OH	90.42	54.19	85.62	78.68	71.22
39017	Butler County, OH	101.42	116.84	94.22	101.13	104.3
39019	Carroll County, OH	89.77	69.05	94.41	68.25	75.19
39023	Clark County, OH	96.98	111.55	97.15	102.52	102.6
39025	Clermont County, OH	98.23	97.66	83.05	84.14	88.34
39035	Cuyahoga County, OH	112.92	133.64	119.54	109.64	123.93
39041	Delaware County, OH	97.21	109.37	84.07	87.68	93.15
39043	Erie County, OH	96.77	121.77	104.84	102.29	108.11
39045	Fairfield County, OH	95.2	100.29	89.76	89.15	91.91
39049	Franklin County, OH	111.37	131.41	124.87	127.88	130.18
39051	Fulton County, OH	90.59	113.35	82.43	93.65	93.69
39055	Geauga County, OH	90.84	82.83	86.85	50.2	71.79
39057	Greene County, OH	97.09	114.93	85.08	94.01	97.19
39061	Hamilton County, OH	110.12	134.12	141.56	113.68	131.43
39081	Jefferson County, OH	95.1	103.84	109.52	107.8	105.14
39085	Lake County, OH	100.55	123.58	82.99	88.29	98.55
39087	Lawrence County, OH	93.75	81.53	83.82	104.35	88.45
39089	Licking County, OH	95.01	99.59	98.19	106.48	99.77
39093	Lorain County, OH	98.61	117.13	93.18	95.05	101.26
39095	Lucas County, OH	105.01	131.81	114.29	116.4	121.33
39097	Madison County, OH	92.38	85.12	84.52	84.97	83.25
39099	Mahoning County, OH	98.98	121.53	107.96	102.09	109.66
39103	Medina County, OH	96.03	105.54	93.2	57.23	84.83
39109	Miami County, OH	92.97	103.49	85.25	95.62	92.84
39113	Montgomery County, OH	102.99	130.21	114.82	117.4	120.67
39117	Morrow County, OH	89.85	49.6	83.41	46.82	58.82
39123	Ottawa County, OH	93.01	98.23	86.34	94.39	91.15
39129	Pickaway County, OH	95.16	82.72	83.74	78.2	80.99
39133	Portage County, OH	94.89	103.8	90.32	100.22	96.6
39135	Preble County, OH	90.05	70.46	86.69	100.99	83.63
39139	Richland County, OH	94.98	105.89	118.65	103.59	107.3

39151	Stark County, OH	98.73	120.66	98.8	120.61	112.26
39153	Summit County, OH	101.67	125.68	109.41	114.42	116.17
39155	Trumbull County, OH	95.85	111.81	91.49	95.52	98.31
39159	Union County, OH	94.04	77.41	81.94	86.51	81.01
39165	Warren County, OH	97.43	106.62	84.37	88.63	92.75
39167	Washington County, OH	93.06	88.2	86.67	83.86	84.77
39173	Wood County, OH	94.89	111.78	91.96	82.11	93.91
40017	Canadian County, OK	97.03	97.68	82.74	92.01	90.35
40027	Cleveland County, OK	101.04	107.98	106.44	102.24	105.59
40031	Comanche County, OK	99.03	118.45	98.2	116.33	110.11
40037	Creek County, OK	90.09	85.48	84.46	104.69	88.85
40051	Grady County, OK	91.37	75.37	86.82	102.85	86.23
40079	Le Flore County, OK	89.15	67.37	83.45	99.19	80.78
40083	Logan County, OK	89.7	68.27	90.56	98.34	83.21
40087	McClain County, OK	89.63	80.94	81.73	88.92	81.43
40109	Oklahoma County, OK	103.44	120.48	122.5	117.89	120.32
40111	Okmulgee County, OK	89.76	90.51	83.84	122.81	95.86
40113	Osage County, OK	93.63	66.07	86.07	96.84	81.87
40117	Pawnee County, OK	88.73	75.14	77.53	99.62	81.37
40131	Rogers County, OK	92.33	79.74	87.59	95.45	85.82
40135	Sequoyah County, OK	89.78	72.88	91.9	101.22	86.03
40143	Tulsa County, OK	102.6	121.46	117.13	113.15	117.17
40145	Wagoner County, OK	93.2	77.7	83.08	102.13	86.14
41003	Benton County, OR	100.72	123.18	126.52	95.34	114.46
41005	Clackamas County, OR	101.8	126.17	90.03	96.25	104.5
41009	Columbia County, OR	93.28	102.74	80.42	84.73	87.73
41017	Deschutes County, OR	95.73	115.65	115.3	80.19	102.17
41029	Jackson County, OR	97.76	122.2	122.65	91.71	110.84
41039	Lane County, OR	101.73	127.48	138.05	98.88	120.9
41047	Marion County, OR	101.62	130.36	123.77	101.1	117.96
41051	Multnomah County, OR	120.53	142.82	150.58	166.68	157.06
41053	Polk County, OR	94.97	105.79	80.13	83.85	88.86
41067	Washington County, OR	110.39	132.91	85.02	113.1	113.09
41071	Yamhill County, OR	99.08	122.85	81.32	93.49	98.97
42003	Allegheny County, PA	109.54	133.89	145.4	135.7	139.34
42005	Armstrong County, PA	92.89	85.75	101.54	84.86	88.95
42007	Beaver County, PA	95.17	110.16	84.42	111.13	100.28
42011	Berks County, PA	108.58	126.11	116	110.71	119.4
42013	Blair County, PA	97.22	121.95	124.31	123.01	121.01

42017	Bucks County, PA	102.39	126.03	79.87	99.58	102.49
42019	Butler County, PA	93.68	105.26	120.02	79.27	99.44
42021	Cambria County, PA	95.43	107.43	120.16	119.48	113.43
42025	Carbon County, PA	93.36	98.43	90.96	97.65	93.81
42027	Centre County, PA	110.1	115.7	149.49	91.83	121.21
42029	Chester County, PA	98.81	117.12	91.2	89.11	98.81
42041	Cumberland County, PA	98.59	111.24	85.52	112.72	102.55
42043	Dauphin County, PA	104.58	124.71	129.24	125.68	126.61
42045	Delaware County, PA	119.69	141.69	83.25	137.9	126.07
42049	Erie County, PA	102.74	130.88	122.48	102.4	118.48
42051	Fayette County, PA	93.03	102.25	96.86	108.42	100.17
42069	Lackawanna County, PA	101.86	133.13	134.53	123.5	129.39
42071	Lancaster County, PA	102.63	119.9	128.6	94.47	114.41
42075	Lebanon County, PA	96.31	122.77	84.72	116.98	106.56
42077	Lehigh County, PA	111.48	134.36	115.73	137.75	131.38
42079	Luzerne County, PA	99.44	121.47	93.27	114.55	109.08
42081	Lycoming County, PA	97.09	120.85	113.98	117.91	115.74
42085	Mercer County, PA	95.34	106.25	83.44	87.04	91.17
42091	Montgomery County, PA	107.67	136.32	85.84	109.26	112.35
42095	Northampton County, PA	103.88	133.01	101.8	124.28	119.89
42099	Perry County, PA	89.79	63.67	91.33	79.02	75.93
42101	Philadelphia County, PA	206.38	144.48	178.43	209.98	207.19
42103	Pike County, PA	91.08	56.19	144.75	90.61	94.51
42125	Washington County, PA	95.07	106.69	93.55	102.25	99.23
42129	Westmoreland County, PA	95.84	111.77	104.88	108.5	106.63
42131	Wyoming County, PA	90.4	51.38	86.24	74.76	69.28
42133	York County, PA	99.69	112.24	115.21	96.33	107.42
44001	Bristol County, RI	109.79	144.16	83.56	135.16	122.96
44003	Kent County, RI	103.82	122.09	81.7	122.57	109.54
44005	Newport County, RI	99.45	121.07	99.03	118.74	112.1
44007	Providence County, RI	121.1	142.01	141.75	134.74	144.11
44009	Washington County, RI	94.03	102.13	88.56	97.1	94.26
45003	Aiken County, SC	93.29	79.37	103.25	96.65	91.33
45007	Anderson County, SC	92.29	82.54	110.42	81.7	89.56
45015	Berkeley County, SC	98.3	88.34	80.72	78.85	83
45019	Charleston County, SC	103.2	119.32	138.48	116.56	124.5
45031	Darlington County, SC	91.78	86.08	84.55	73.08	79.62
45035	Dorchester County, SC	103.61	98.38	81.02	84.79	89.83
45037	Edgefield County, SC	89.95	55.96	76.27	60.96	63.08

45039	Fairfield County, SC	89.55	49.53	76.12	74.02	65
45041	Florence County, SC	96.07	90.47	109.63	83.71	93.64
45045	Greenville County, SC	98.68	106.59	100.39	91.07	98.97
45051	Horry County, SC	94.78	90.85	112.78	101.88	100.09
45055	Kershaw County, SC	90.43	61.7	129.24	61.49	81.95
45059	Laurens County, SC	89.91	59.53	87.21	79.89	73.63
45063	Lexington County, SC	94.92	94.04	88	80.44	86.54
45077	Pickens County, SC	92.45	92.02	97.27	82.26	88.63
45079	Richland County, SC	101.53	109.51	144.33	110.91	120.94
45083	Spartanburg County, SC	93.37	97.98	112.28	90.54	98.16
45085	Sumter County, SC	93.59	86.69	119.72	90.32	96.94
45091	York County, SC	95.01	95.83	94.28	80.22	89.05
46083	Lincoln County, SD	92.75	107.03	82.73	77.53	87.38
46093	Meade County, SD	89.23	75.07	81.4	103.16	83.84
46099	Minnehaha County, SD	102.86	120.06	105.9	107.25	111.4
46103	Pennington County, SD	96.18	101.49	117.26	95.04	103.15
47001	Anderson County, TN	92.32	81.1	121.37	89.51	95.04
47009	Blount County, TN	94.52	79.63	87.08	89.16	84.33
47011	Bradley County, TN	94.75	85.38	114.48	87.22	94.26
47019	Carter County, TN	93.3	77.41	129.08	96.48	98.82
47021	Cheatham County, TN	93.65	56.61	86.41	61.81	67.92
47023	Chester County, TN	91.73	79.08	69.11	55.42	66.93
47037	Davidson County, TN	104.68	111.86	121.78	111.57	115.76
47043	Dickson County, TN	91.19	65.43	90.57	73.7	75.01
47047	Fayette County, TN	89.34	50.43	89.51	51.46	62.32
47057	Grainger County, TN	89.49	45.66	74.08	70.51	62.01
47063	Hamblen County, TN	95.73	85	142.29	95.5	105.85
47065	Hamilton County, TN	98.48	101.33	119.36	103.4	107.13
47073	Hawkins County, TN	90.78	69.01	90.1	81.51	78.33
47089	Jefferson County, TN	91.49	63.63	91.38	79.72	76.69
47093	Knox County, TN	99.46	102.38	136.24	96.83	111.03
47105	Loudon County, TN	90.6	74.46	83.62	96.59	82.71
47111	Macon County, TN	90.08	45.11	73.25	47.03	54.34
47113	Madison County, TN	95.08	104.99	108.51	91.26	99.95
47115	Marion County, TN	89.77	69.94	73.16	87.72	74.91
47125	Montgomery County, TN	97.02	80.87	113.11	75.99	89.57
47147	Robertson County, TN	91.68	72.06	85.62	63.1	72.35
47149	Rutherford County, TN	97.98	90.6	108.29	83.25	93.72
47153	Sequatchie County, TN	90.25	76.45	78.98	57.33	69.36

47157	Shelby County, TN	105.33	109.94	122.61	114.9	116.68
47159	Smith County, TN	90.53	70.87	66.08	83.13	71.76
47163	Sullivan County, TN	93.76	86.37	119.66	101.34	100.36
47165	Sumner County, TN	97.36	86.46	115.6	76.15	92.28
47167	Tipton County, TN	92.75	59.76	87.84	64.39	69.9
47169	Trousdale County, TN	90.52	71.81	67.37	64.82	66.68
47171	Unicoi County, TN	94.94	90.3	80.78	113.03	93.38
47173	Union County, TN	89.52	50.58	82.78	73.69	67.32
47179	Washington County, TN	94.93	91.12	94.03	93.77	91.74
47187	Williamson County, TN	97	85.43	133.03	87.19	100.84
47189	Wilson County, TN	93.71	71.92	85.24	70.33	75.1
48007	Aransas County, TX	91.9	104.27	84.03	122.27	100.78
48013	Atascosa County, TX	89.05	79.5	85.77	94.63	83.87
48015	Austin County, TX	88.89	64.78	86.07	82.34	75.38
48019	Bandera County, TX	89.19	38.15	69.25	101.83	67.91
48021	Bastrop County, TX	89.76	76.25	87.26	96.1	84.01
48027	Bell County, TX	99.9	110.3	106.9	110.75	108.8
48029	Bexar County, TX	107.69	116.02	115.57	118.94	118.4
48037	Bowie County, TX	93.73	106.36	80.75	99.24	93.71
48039	Brazoria County, TX	96.54	96.26	92.15	97.38	94.42
48041	Brazos County, TX	105.72	112.86	101.13	110.13	109.43
48051	Burleson County, TX	89.32	100.91	77.93	109.68	93
48055	Caldwell County, TX	89.63	89.32	84.6	100.93	88.78
48057	Calhoun County, TX	97.89	104.62	74.17	145.39	106.98
48061	Cameron County, TX	100.34	102.76	87.93	110.32	100.42
48071	Chambers County, TX	88.91	43.66	75.63	77.45	63.87
48077	Clay County, TX	88.03	67.28	76.56	111.02	81.95
48085	Collin County, TX	106.24	114.06	85.45	118.59	107.69
48091	Comal County, TX	93.66	86.53	108.62	88.26	92.76
48099	Coryell County, TX	97.23	77.14	87.93	86.13	83.7
48113	Dallas County, TX	116.03	123.21	125.52	139.21	132.85
48119	Delta County, TX	88.85	80.3	68.73	127.14	88.95
48121	Denton County, TX	104.96	107.37	91.25	114.16	105.61
48135	Ector County, TX	101.41	123.37	112.23	111.89	115.45
48139	Ellis County, TX	92.65	86.97	84.65	100.12	88.75
48141	El Paso County, TX	109.16	113.33	102.45	125.22	115.85
48157	Fort Bend County, TX	104.19	96.2	101.96	111.59	104.41
48167	Galveston County, TX	100.94	113.67	106.27	130.51	116.24
48181	Grayson County, TX	93.05	103.96	92.14	102.59	97.39

48183	Gregg County, TX	96.1	114.14	103.02	99.15	103.92
48187	Guadalupe County, TX	96.53	93.38	84.13	94.73	90.14
48199	Hardin County, TX	89.38	75.62	84.66	83.17	78.78
48201	Harris County, TX	112.9	122.96	115.12	138.63	128.31
48209	Hays County, TX	95.58	87.83	131.77	84.13	99.78
48215	Hidalgo County, TX	100.21	101.69	104.76	109.1	104.98
48231	Hunt County, TX	91.85	76.8	100.17	94.77	88.5
48245	Jefferson County, TX	99.99	118.66	127.39	137.42	126.37
48251	Johnson County, TX	94.62	85	88.74	91.72	87.39
48257	Kaufman County, TX	91.56	77.63	83.06	108.05	87.46
48259	Kendall County, TX	94.46	97.53	79.63	72.72	82.42
48281	Lampasas County, TX	89.18	74.92	86.25	95.76	82.98
48291	Liberty County, TX	89.41	54.79	90.7	83.18	74.12
48303	Lubbock County, TX	101.82	123.12	97.75	110.77	110.57
48309	McLennan County, TX	96.64	112.13	100.28	109.99	106.02
48325	Medina County, TX	88.53	55.51	85.3	81.66	71.88
48329	Midland County, TX	103.45	123.85	110.9	119.62	118.27
48339	Montgomery County, TX	95.68	87.52	111.61	84.05	93.32
48355	Nueces County, TX	104.85	127.12	106.59	121.3	118.91
48361	Orange County, TX	90.28	87.97	84.52	104.13	89.54
48367	Parker County, TX	90.72	77.89	87.88	79	79.62
48375	Potter County, TX	101.4	118.2	99.33	132.71	116.32
48381	Randall County, TX	101.51	122.09	78.97	110.72	104.2
48397	Rockwall County, TX	97.13	97.42	79.27	94.18	89.89
48401	Rusk County, TX	89.28	80.54	82.05	67.69	74.59
48409	San Patricio County, TX	93.48	114.78	84.07	111.29	101.14
48423	Smith County, TX	95.5	100.31	119.02	100.6	104.88
48439	Tarrant County, TX	108.94	119.35	100.17	128.9	118.12
48451	Tom Green County, TX	97.73	119.81	103.96	106.9	108.97
48453	Travis County, TX	108.45	120.81	148.98	110.66	128.09
48459	Upshur County, TX	90.15	67.18	79.57	86.71	75.86
48469	Victoria County, TX	103.1	120.55	119.38	119.7	119.82
48473	Waller County, TX	95.59	60.29	82.16	92.14	77.94
48479	Webb County, TX	101.78	122.77	102.69	121.89	115.53
48485	Wichita County, TX	98.04	121.94	121.17	110.29	116.25
48491	Williamson County, TX	101.28	106.24	98.74	101.69	102.51
48493	Wilson County, TX	89.22	46.7	88.44	72.24	67.33
48497	Wise County, TX	89.07	68.46	80.23	80.04	74.03
49005	Cache County, UT	100.03	120.88	128.98	82.21	110.14

49011	Davis County, UT	103.45	125.21	80.47	105.19	104.52
49023	Juab County, UT	88.62	93.3	78.14	83.59	82.2
49035	Salt Lake County, UT	112.04	129.1	106.26	116.3	120.12
49043	Summit County, UT	90.7	90.55	91.28	75.6	83.61
49045	Tooele County, UT	97.75	102.75	79.12	75.88	85.94
49049	Utah County, UT	108.21	127.19	89.82	106.36	109.98
49053	Washington County, UT	95.06	98.96	84.85	91.6	90.67
49057	Weber County, UT	105.74	124.44	97.16	108.01	111.17
50007	Chittenden County, VT	101.56	121.65	152.59	89.97	120.78
50011	Franklin County, VT	92.87	95.99	82.45	75.67	83.25
50013	Grand Isle County, VT	89.13	86.07	69.37	90.87	79.6
51003	Albemarle County, VA	95.3	102.67	87.34	78.58	88.59
51009	Amherst County, VA	89.69	70.62	84.6	75.08	74.72
51011	Appomattox County, VA	89.68	39.87	90.05	58.37	61.45
51013	Arlington County, VA	174.41	153.2	95.54	177.13	163.28
51019	Bedford County, VA	89.97	55.41	91.02	73.51	71.54
51023	Botetourt County, VA	89.85	72	83.63	88.06	79
51031	Campbell County, VA	91.88	77.31	83.38	109.02	87.87
51033	Caroline County, VA	89.04	40.8	74.87	77.09	62.65
51041	Chesterfield County, VA	100.63	98.15	114.36	102.77	105.03
51043	Clarke County, VA	89.87	79.72	79.01	86.65	79.55
51053	Dinwiddie County, VA	90.02	49.1	78.23	71.08	64.75
51059	Fairfax County, VA	117.83	123.7	113.17	114.82	121.96
51061	Fauquier County, VA	90.61	73.98	90.24	80.5	79.57
51065	Fluvanna County, VA	92.01	71.24	75.82	69.22	71.02
51067	Franklin County, VA	91.3	47.21	88.85	77.48	69.94
51069	Frederick County, VA	93.79	81.33	87.14	85.85	83.61
51073	Gloucester County, VA	92.66	69.24	89.69	99.14	84.43
51075	Goochland County, VA	90.23	55.11	75.26	78.66	68.17
51079	Greene County, VA	90.55	59.72	70.1	78.44	68.03
51085	Hanover County, VA	94.37	84.41	82.56	88.35	84.1
51087	Henrico County, VA	105.97	114.27	86.41	123.03	109.38
51093	Isle of Wight County, VA	90.76	75.64	77.65	79.82	75.95
51095	James City County, VA	93.7	97.02	79.6	106.28	92.61
51101	King William County, VA	90.95	56.69	79.27	102.1	77.57
51107	Loudoun County, VA	102.68	116.85	81.49	113.55	104.6
51115	Mathews County, VA	92.2	52.08	72.32	78.22	66.77
51121	Montgomery County, VA	95.29	95.57	85.4	102.18	93.19
51127	New Kent County, VA	89.75	43.95	80.36	72.4	64.13

51143	Pittsylvania County, VA	89.61	42.72	80.8	66.85	62.08
51145	Powhatan County, VA	94.07	44.51	74.52	65.38	61.61
51149	Prince George County, VA	90.96	66.68	75.53	81.97	73.19
51153	Prince William County, VA	106.28	106.57	94.52	115.14	107.11
51155	Pulaski County, VA	91.55	84.58	83.02	103.9	88.33
51161	Roanoke County, VA	96.03	110.04	80.69	98.89	95.46
51165	Rockingham County, VA	90.09	73.51	86.01	88.97	80.6
51169	Scott County, VA	89.25	50.38	78.01	92.28	71.54
51177	Spotsylvania County, VA	97.94	84.86	88.47	92.55	88.57
51179	Stafford County, VA	98.78	84.11	81.07	88.85	85.09
51183	Sussex County, VA	102.08	63.8			
51187	Warren County, VA	93.5	92.21	88.78	94.07	90.07
51191	Washington County, VA	90.49	77.47	81.92	90.19	81.06
51199	York County, VA	97.29	99	86.14	108.5	97.13
51510	Alexandria city, VA	176.94	154.32	115.16	173.76	169.56
51515	Bedford city, VA	94.78	123.63	72.04	113.62	101.29
51520	Bristol city, VA	105	130.6	82.35	145.26	119.97
51540	Charlottesville city, VA	128.8	148.33	210.83	152.37	175.93
51550	Chesapeake city, VA	103.4	108.24	88.28	109.52	102.98
51570	Colonial Heights city, VA	108.95	135.66	77.65	153.6	123.97
51590	Danville city, VA	99.84	126.2	121.82	120.33	121.54
51600	Fairfax city, VA	116.97	152.84	73	131.05	123.34
51610	Falls Church city, VA	127.12	177.53	72.72	164.07	144.69
51630	Fredericksburg city, VA	120.16	145.13	97.72	154.28	137.06
51650	Hampton city, VA	110.55	123.19	114.92	150.96	131.48
51660	Harrisonburg city, VA	122.83	143.99	144.42	131.8	145.19
51670	Hopewell city, VA	112.29	124.58	79.39	185.81	132.25
51680	Lynchburg city, VA	104.8	130.42	104.85	132.31	122.87
51683	Manassas city, VA	115.54	140.36	76.57	150.36	126.17
51685	Manassas Park city, VA	129.66	128.88	82.19	133.5	123.45
51700	Newport News city, VA	112.21	121.94	86.53	137.18	118.28
51710	Norfolk city, VA	129.98	131.46	210.96	179.44	179.57
51730	Petersburg city, VA	101.48	127	104.35	144.23	124.34
51735	Poquoson city, VA	97.09	105.92	77.55	104.32	95.22
51740	Portsmouth city, VA	111.16	129.35	88.86	163.76	129.42
51750	Radford city, VA	105.79	135.4	81.24	156.21	124.84
51760	Richmond city, VA	120.46	133.06	160.69	172.23	158.9
51770	Roanoke city, VA	109.84	129.71	120.97	155.62	136.69
51775	Salem city, VA	107.3	128.88	76.93	140.41	116.91

51800	Suffolk city, VA	95.77	99.14	103.14	98.02	98.76
51810	Virginia Beach city, VA	111.75	123.1	86.61	137.93	118.77
51830	Williamsburg city, VA	108.92	118.37	158.9	136.03	138.61
51840	Winchester city, VA	114.03	135.13	133.91	150.19	142.1
53003	Asotin County, WA	106.62	134.33	77	134.97	116.72
53005	Benton County, WA	98.56	118.73	109.61	97.28	107.64
53007	Chelan County, WA	97.97	126.31	120.3	99.04	113.78
53011	Clark County, WA	102.63	123.4	89.55	105.28	106.59
53015	Cowlitz County, WA	96.07	103.4	128.01	99	108.37
53017	Douglas County, WA	103.94	116.98	82.17	91.3	98.23
53021	Franklin County, WA	101.59	119.22	82.23	111.14	104.48
53033	King County, WA	114.85	128.93	159.34	131.7	142.6
53035	Kitsap County, WA	98.92	107.82	115.62	96.04	105.81
53053	Pierce County, WA	103.02	117.02	126.32	119.43	120.78
53057	Skagit County, WA	96.68	112.71	101.76	99.87	103.48
53061	Snohomish County, WA	103.47	116.86	122.73	100.03	113.62
53063	Spokane County, WA	101.37	122.39	122.32	127.12	123.13
53067	Thurston County, WA	97.83	103.71	132.9	95.16	109.35
53073	Whatcom County, WA	95.83	110.62	115.26	99	106.54
53077	Yakima County, WA	98.64	124.46	128.18	89.38	112.84
54003	Berkeley County, WV	94.85	90.23	97.7	94.03	92.67
54005	Boone County, WV	90.83	61.03		123.52	
54009	Brooke County, WV	91.02	93.32	87.28	116.81	96.34
54011	Cabell County, WV	98.52	112.81	183.48	119.12	135.99
54029	Hancock County, WV	94.13	110.72	86.79	118.07	103.07
54037	Jefferson County, WV	91.79	75.67	87.64	98.81	85.44
54039	Kanawha County, WV	96.1	108.14	147.64	125.6	124.48
54051	Marshall County, WV	92.36	89.16	137.78	120.37	112.53
54057	Mineral County, WV	90.81	75.55	159.67	111.67	111.91
54061	Monongalia County, WV	98.42	117.16	120.1	115.01	116.02
54065	Morgan County, WV	89.5	67.7	90	74.66	75.31
54069	Ohio County, WV	95.76	115.77	150.91	129.79	129.14
54077	Preston County, WV	88.93	44.98	90.63	80.67	70.06
54079	Putnam County, WV	93.37	87.87	78.21	99.34	86.98
54099	Wayne County, WV	93.73	81.82	84.99	106.16	89.48
54107	Wood County, WV	96.66	116.84	107.75	121.08	113.37
55009	Brown County, WI	99.46	115.4	101.3	91.01	102.26
55015	Calumet County, WI	94.95	80.84	87.75	80.59	82.35
55017	Chippewa County, WI	92.19	85.15	89.4	88.5	85.86

55021	Columbia County, WI	90.01	92.46	87.63	90.9	87.68
55025	Dane County, WI	106.96	126.2	153.67	106.96	129.63
55031	Douglas County, WI	95.01	99.68	81.91	108.53	95.3
55035	Eau Claire County, WI	98.55	115.5	116.85	96.62	108.7
55039	Fond du Lac County, WI	95.54	109.78	153.06	94.09	116.57
55049	Iowa County, WI	89.19	78	83.48	83.09	79.07
55059	Kenosha County, WI	100.8	119.03	123.52	118.9	119.67
55061	Kewaunee County, WI	92.15	103.67	77.23	79.49	85.01
55063	La Crosse County, WI	98.49	119.38	88.95	117.4	107.65
55073	Marathon County, WI	94.14	102.58	121.29	83.21	100.38
55079	Milwaukee County, WI	128.75	139.35	178.96	155.69	164.06
55083	Oconto County, WI	88.82	49.35	77.77	66.91	62.99
55087	Outagamie County, WI	99.06	120.79	164.21	97.96	125.91
55089	Ozaukee County, WI	95.11	116.53	106.77	87.76	101.95
55093	Pierce County, WI	94.38	92.07	143.31	81.67	103.61
55101	Racine County, WI	100.48	122.63	111.62	107.68	113.4
55105	Rock County, WI	97.51	113.9	108.04	98.59	105.7
55109	St. Croix County, WI	92.02	87.72	93.45	67.27	81.19
55117	Sheboygan County, WI	97.6	115.59	94.01	98.77	101.88
55131	Washington County, WI	94.74	96.05	128.67	75.35	98.36
55133	Waukesha County, WI	96.89	112.13	147.79	101.06	118.28
55139	Winnebago County, WI	100.65	118.29	97.48	113.49	109.45
56021	Laramie County, WY	100.71	112.98	132.64	114.68	119.28

Appendix C. 2010 Metropolitan Indices

MSAc Code	Geoid	Name	Lsad 10	density factor	mix factor	centering factor	street factor	composite index
10420	10420	Akron, OH MSA	M1	94.55	113.13	90.69	106.81	103.15
10580	10580	Albany-Schenectady-Troy, NY MSA	M1	95.40	105.96	108.19	86.04	95.12
10740	10740	Albuquerque, NM MSA	M1	103.60	102.57	99.36	97.51	98.07
10900	10900	Allentown-Bethlehem-Easton, PA-NJ MSA	M1	98.76	128.59	101.10	135.97	124.40
11100	11100	Amarillo, TX MSA	M1	96.16	109.27	76.98	91.56	107.49
11460	11460	Ann Arbor, MI MSA	M1	103.27	105.04	123.11	89.95	122.76
11540	11540	Appleton, WI MSA	M1	90.65	99.81	156.72	79.92	132.69
11700	11700	Asheville, NC MSA	M1	80.71	64.12	97.61	88.53	76.52
12060	12060	Atlanta-Sandy Springs-Marietta, GA MSA	M1	97.80	85.47	89.89	75.92	40.99
12100	12100	Atlantic City-Hammonton, NJ MSA	M1	96.33	100.10	154.52	130.71	150.36
12260	12260	Augusta-Richmond County, GA-SC MSA	M1	85.25	60.69	88.47	73.85	59.18
12420	12420	Austin-Round Rock-San Marcos, TX MSA	M1	100.42	99.66	138.78	102.88	102.44
12540	12540	Bakersfield-Delano, CA MSA	M1	101.29	114.13	76.82	73.14	81.78
12580	12580	Baltimore-Towson, MD MSA	M1	115.97	123.21	123.12	136.35	115.62
12940	12940	Baton Rouge, LA MSA	M1	91.27	72.03	69.74	80.40	55.60
13140	13140	Beaumont-Port Arthur, TX MSA	M1	85.37	88.45	112.62	113.76	111.54
13380	13380	Bellingham, WA MSA	M1	85.29	92.75	113.43	96.89	118.01
13780	13780	Binghamton, NY MSA	M1	89.70	88.92	102.07	69.84	95.97
13820	13820	Birmingham-Hoover, AL MSA	M1	86.67	67.88	99.52	105.21	73.55
14260	14260	Boise City-Nampa, ID MSA	M1	95.80	110.45	75.15	91.88	91.06
14500	14500	Boulder, CO MSA	M1	106.89	115.32	100.09	118.95	133.68
14740	14740	Bremerton-Silverdale, WA MSA	M1	90.48	87.55	112.87	86.20	108.86
14860	14860	Bridgeport-Stamford-Norwalk, CT MSA	M1	110.63	132.86	118.02	100.81	121.64
15180	15180	Brownsville-Harlingen, TX MSA	M1	90.92	77.74	51.43	105.96	74.69
15380	15380	Buffalo-Niagara Falls, NY MSA	M1	107.94	127.67	102.46	95.10	106.36
15540	15540	Burlington-South Burlington, VT MSA	M1	88.32	102.21	168.79	70.68	135.06
15940	15940	Canton-Massillon, OH MSA	M1	90.54	106.64	76.45	117.92	106.99
15980	15980	Cape Coral-Fort Myers, FL MSA	M1	91.87	81.41	91.52	126.34	99.22
16300	16300	Cedar Rapids, IA MSA	M1	92.94	105.64	104.67	81.25	111.81
16580	16580	Champaign-Urbana, IL MSA	M1	100.00	123.27	153.64	82.81	145.16

16620	16620	Charleston, WV MSA	M1	83.81	67.01	136.80	112.05	115.68
16700	16700	Charleston-North Charleston-Summerville, SC MSA	M1	95.29	89.19	108.94	99.03	98.53
16740	16740	Charlotte-Gastonia-Rock Hill, NC-SC MSA	M1	94.55	84.71	103.05	86.93	70.45
16820	16820	Charlottesville, VA MSA	M1	91.16	86.08	141.81	71.77	119.08
16860	16860	Chattanooga, TN-GA MSA	M1	86.14	61.15	94.27	72.90	63.63
17020	17020	Chico, CA MSA	M1	91.18	114.46	88.79	79.93	109.94
17140	17140	Cincinnati-Middletown, OH-KY-IN MSA	M1	98.75	107.80	98.95	93.67	80.75
17300	17300	Clarksville, TN-KY MSA	M1	84.48	39.67	74.47	60.83	41.49
17460	17460	Cleveland-Elyria-Mentor, OH MSA	M1	105.11	123.72	95.54	84.96	85.62
17780	17780	College Station-Bryan, TX MSA	M1	102.49	94.65	91.03	91.47	111.72
17820	17820	Colorado Springs, CO MSA	M1	102.94	108.37	75.94	121.76	106.33
17900	17900	Columbia, SC MSA	M1	89.63	69.14	108.38	66.63	67.45
17980	17980	Columbus, GA-AL MSA	M1	94.45	84.78	125.19	77.79	108.38
18140	18140	Columbus, OH MSA	M1	101.58	112.24	95.56	112.19	93.00
18580	18580	Corpus Christi, TX MSA	M1	98.68	118.31	90.15	110.41	117.29
19340	19340	Davenport-Moline-Rock Island, IA-IL MSA	M1	91.78	121.21	70.03	102.95	105.59
19380	19380	Dayton, OH MSA	M1	93.65	114.40	95.13	105.55	101.48
19660	19660	Deltona-Daytona Beach-Ormond Beach, FL MSA	M1	91.35	88.02	66.48	116.35	89.68
19740	19740	Denver-Aurora-Broomfield, CO MSA	M1	118.31	119.44	109.11	125.16	107.10
19780	19780	Des Moines-West Des Moines, IA MSA	M1	97.68	120.63	99.46	82.83	104.90
20260	20260	Duluth, MN-WI MSA	M1	85.24	89.56	117.03	77.22	103.14
20500	20500	Durham-Chapel Hill, NC MSA	M1	91.59	74.84	80.27	84.98	73.84
21340	21340	El Paso, TX MSA	M1	114.90	99.42	73.41	128.66	105.64
21500	21500	Erie, PA MSA	M1	97.73	130.61	113.69	88.92	130.39
21660	21660	Eugene-Springfield, OR MSA	M1	95.35	125.70	116.84	91.29	125.63
21780	21780	Evansville, IN-KY MSA	M1	91.57	92.59	86.07	84.34	91.67
22020	22020	Fargo, ND-MN MSA	M1	99.18	118.65	106.96	73.56	121.82
22180	22180	Fayetteville, NC MSA	M1	91.13	71.69	72.57	71.77	66.02
22220	22220	Fayetteville-Springdale-Rogers, AR-MO MSA	M1	84.55	67.95	80.67	81.81	66.26
22420	22420	Flint, MI MSA	M1	89.57	90.58	114.82	97.49	106.48
22500	22500	Florence, SC MSA	M1	81.22	51.13	87.85	61.44	61.06
22660	22660	Fort Collins-Loveland, CO MSA	M1	94.53	106.30	96.44	100.59	115.15

22900	22900	Fort Smith, AR-OK MSA	M1	80.74	56.78	75.30	86.02	64.84
23060	23060	Fort Wayne, IN MSA	M1	92.42	93.70	89.90	73.85	86.67
23420	23420	Fresno, CA MSA	M1	101.75	126.18	81.45	82.42	92.24
23540	23540	Gainesville, FL MSA	M1	94.58	87.63	102.79	99.45	111.36
24340	24340	Grand Rapids-Wyoming, MI MSA	M1	91.39	91.78	99.15	74.75	79.18
24540	24540	Greeley, CO MSA	M1	87.33	99.05	94.05	85.82	103.61
24580	24580	Green Bay, WI MSA	M1	89.90	90.49	66.77	53.34	65.35
24660	24660	Greensboro-High Point, NC MSA	M1	88.22	80.57	84.94	70.70	63.50
24860	24860	Greenville-Mauldin-Easley, SC MSA	M1	86.69	72.89	81.15	71.40	58.98
25060	25060	Gulfport-Biloxi, MS MSA	M1	86.03	69.80	80.53	97.52	87.61
25180	25180	Hagerstown-Martinsburg, MD-WV MSA	M1	84.10	74.10	112.54	78.51	94.13
25420	25420	Harrisburg-Carlisle, PA MSA	M1	93.54	102.14	99.29	119.17	111.40
25540	25540	Hartford-West Hartford-East Hartford, CT MSA	M1	100.12	113.10	119.54	72.59	93.50
25860	25860	Hickory-Lenoir-Morganton, NC MSA	M1	78.64	40.46	67.00	56.95	24.86
26100	26100	Holland-Grand Haven, MI MSA	M1	86.45	81.52	78.64	71.71	78.17
26380	26380	Houma-Bayou Cane-Thibodaux, LA MSA	M1	83.73	75.47	106.77	86.11	100.13
26420	26420	Houston-Sugar Land-Baytown, TX MSA	M1	108.30	102.66	92.56	129.43	76.74
26580	26580	Huntington-Ashland, WV-KY-OH MSA	M1	84.25	67.73	142.77	108.91	118.43
26620	26620	Huntsville, AL MSA	M1	86.18	58.29	89.43	99.31	78.02
26900	26900	Indianapolis-Carmel, IN MSA	M1	98.11	99.65	98.42	102.31	83.89
27140	27140	Jackson, MS MSA	M1	87.35	64.41	105.46	73.80	72.30
27260	27260	Jacksonville, FL MSA	M1	96.81	82.50	90.17	111.76	80.85
28020	28020	Kalamazoo-Portage, MI MSA	M1	85.55	75.00	85.58	64.97	70.32
28140	28140	Kansas City, MO-KS MSA	M1	96.84	109.49	80.45	103.52	77.60
28420	28420	Kennewick-Pasco-Richland, WA MSA	M1	92.84	108.63	81.96	85.86	105.03
28660	28660	Killeen-Temple-Fort Hood, TX MSA	M1	89.16	79.86	78.17	94.80	83.12
28700	28700	Kingsport-Bristol-Bristol, TN-VA MSA	M1	78.73	40.53	89.67	82.87	60.00
28940	28940	Knoxville, TN MSA	M1	88.10	60.62	100.77	82.53	68.22
29140	29140	Lafayette, IN MSA	M1	95.46	90.63	94.82	83.10	106.55
29180	29180	Lafayette, LA MSA	M1	90.03	87.35	115.90	92.72	111.44

29420	29420	Lake Havasu City-Kingman, AZ MSA	M1	85.24	55.15	73.04	65.97	60.13
29460	29460	Lakeland-Winter Haven, FL MSA	M1	87.51	54.24	95.32	128.15	87.64
29540	29540	Lancaster, PA MSA	M1	95.61	110.05	124.31	84.74	112.64
29620	29620	Lansing-East Lansing, MI MSA	M1	101.03	92.21	141.56	72.80	111.61
29700	29700	Laredo, TX MSA	M1	104.20	117.12	99.89	106.87	131.25
29740	29740	Las Cruces, NM MSA	M1	89.33	84.27	108.16	89.06	109.17
29820	29820	Las Vegas-Paradise, NV MSA	M1	142.12	105.02	136.42	114.29	121.20
30460	30460	Lexington-Fayette, KY MSA	M1	99.56	110.42	115.34	95.11	116.76
30700	30700	Lincoln, NE MSA	M1	111.55	132.99	96.74	96.78	131.95
30780	30780	Little Rock-North Little Rock-Conway, AR MSA	M1	88.00	75.36	93.55	90.35	76.08
30980	30980	Longview, TX MSA	M1	81.66	71.62	81.06	68.46	73.06
31140	31140	Louisville/Jefferson County, KY-IN MSA	M1	98.44	89.48	93.12	102.87	82.92
31180	31180	Lubbock, TX MSA	M1	97.23	116.70	87.56	90.44	113.41
31340	31340	Lynchburg, VA MSA	M1	81.51	57.07	76.38	77.42	63.97
31420	31420	Macon, GA MSA	M1	84.72	71.90	86.32	74.47	79.92
31540	31540	Madison, WI MSA	M1	101.00	115.83	168.11	94.85	136.69
31700	31700	Manchester-Nashua, NH MSA	M1	95.10	104.38	114.15	89.28	112.19
32580	32580	McAllen-Edinburg-Mission, TX MSA	M1	94.43	76.78	90.99	104.60	83.89
32780	32780	Medford, OR MSA	M1	89.67	115.31	128.06	80.42	128.86
32820	32820	Memphis, TN-MS-AR MSA	M1	96.60	77.76	94.23	90.62	70.77
32900	32900	Merced, CA MSA	M1	93.90	114.76	96.48	66.25	105.86
33340	33340	Milwaukee-Waukesha-West Allis, WI MSA	M1	113.31	126.73	153.40	130.35	134.18
33460	33460	Minneapolis-St. Paul-Bloomington, MN-WI MSA	M1	105.92	110.34	111.41	108.60	88.69
33660	33660	Mobile, AL MSA	M1	92.43	88.23	78.79	112.30	97.48
33700	33700	Modesto, CA MSA	M1	109.91	140.69	62.32	102.89	113.28
33860	33860	Montgomery, AL MSA	M1	90.01	85.97	98.71	80.50	91.20
34820	34820	Myrtle Beach-North Myrtle Beach-Conway, SC MSA	M1	83.43	54.95	104.88	95.40	88.70
34940	34940	Naples-Marco Island, FL MSA	M1	91.57	81.95	55.19	90.69	75.23
34980	34980	Nashville-Davidson--Murfreesboro--Franklin, TN MSA	M1	91.54	63.92	96.17	77.00	51.74
35300	35300	New Haven-Milford, CT MSA	M1	106.86	127.52	113.51	97.82	116.29
35380	35380	New Orleans-Metairie-Kenner,	M1	104.84	117.83	96.09	149.94	119.74

		LA MSA						
35840	35840	North Port-Bradenton-Sarasota, FL MSA	M1	97.45	101.45	84.95	126.69	105.49
35980	35980	Norwich-New London, CT MSA	M1	87.22	84.71	137.44	71.04	108.85
36100	36100	Ocala, FL MSA	M1	80.80	41.30	105.49	91.78	74.67
36260	36260	Ogden-Clearfield, UT MSA	M1	100.96	120.39	62.22	103.52	99.58
36420	36420	Oklahoma City, OK MSA	M1	94.64	96.26	89.86	100.38	82.07
36500	36500	Olympia, WA MSA	M1	89.23	80.87	121.00	98.73	114.63
36540	36540	Omaha-Council Bluffs, NE-IA MSA	M1	102.64	120.53	99.67	103.54	108.42
36740	36740	Orlando-Kissimmee-Sanford, FL MSA	M1	102.40	85.79	89.29	129.14	83.97
37100	37100	Oxnard-Thousand Oaks-Ventura, CA MSA	M1	107.91	133.35	78.01	118.31	113.87
37340	37340	Palm Bay-Melbourne-Titusville, FL MSA	M1	96.94	79.64	60.02	105.42	77.91
37860	37860	Pensacola-Ferry Pass-Brent, FL MSA	M1	88.54	81.12	75.12	88.65	76.84
37900	37900	Peoria, IL MSA	M1	88.93	100.39	109.76	97.72	110.49
38060	38060	Phoenix-Mesa-Glendale, AZ MSA	M1	111.60	102.36	96.37	111.33	78.32
38300	38300	Pittsburgh, PA MSA	M1	96.16	115.14	107.78	119.33	95.45
38860	38860	Portland-South Portland-Biddeford, ME MSA	M1	86.06	79.09	157.47	80.24	107.72
38900	38900	Portland-Vancouver-Hillsboro, OR-WA MSA	M1	111.14	136.12	100.81	124.98	109.85
38940	38940	Port St. Lucie, FL MSA	M1	92.74	77.05	62.73	106.43	80.75
39100	39100	Poughkeepsie-Newburgh-Middletown, NY MSA	M1	89.38	95.38	97.49	70.30	79.51
39140	39140	Prescott, AZ MSA	M1	82.33	53.19	58.15	69.96	48.96
39300	39300	Providence-New Bedford-Fall River, RI-MA MSA	M1	105.40	83.28	112.77	141.95	104.34
39340	39340	Provo-Orem, UT MSA	M1	104.53	123.55	77.37	100.08	108.45
39580	39580	Raleigh-Cary, NC MSA	M1	96.99	87.30	109.43	88.16	84.25
39740	39740	Reading, PA MSA	M1	102.22	121.83	129.72	113.76	137.90
39900	39900	Reno-Sparks, NV MSA	M1	100.78	93.69	137.29	94.06	120.85
40060	40060	Richmond, VA MSA	M1	96.36	78.08	101.95	92.83	76.41
40140	40140	Riverside-San Bernardino-Ontario, CA MSA	M1	103.72	111.18	77.03	80.33	56.25
40220	40220	Roanoke, VA MSA	M1	90.65	85.88	83.67	93.21	93.77
40380	40380	Rochester, NY MSA	M1	96.12	103.86	96.77	62.00	74.50
40420	40420	Rockford, IL MSA	M1	94.78	110.04	91.83	107.05	114.98

40900	40900	Sacramento--Arden-Arcade--Roseville, CA MSA	M1	111.65	119.11	104.19	108.92	99.27
40980	40980	Saginaw-Saginaw Township North, MI MSA	M1	86.77	93.77	110.97	93.62	116.62
41180	41180	St. Louis, MO-IL MSA	M1	97.68	108.29	93.86	113.80	82.06
41420	41420	Salem, OR MSA	M1	93.11	123.48	113.50	98.10	123.35
41500	41500	Salinas, CA MSA	M1	101.65	116.00	102.94	90.70	115.19
41620	41620	Salt Lake City, UT MSA	M1	117.77	125.49	93.32	97.63	106.96
41700	41700	San Antonio-New Braunfels, TX MSA	M1	100.67	93.56	95.15	102.43	77.37
41740	41740	San Diego-Carlsbad-San Marcos, CA MSA	M1	125.08	130.37	100.90	119.95	105.18
41940	41940	San Jose-Sunnyvale-Santa Clara, CA MSA	M1	149.50	148.76	86.80	131.45	128.76
42020	42020	San Luis Obispo-Paso Robles, CA MSA	M1	89.90	119.80	103.87	88.53	118.90
42060	42060	Santa Barbara-Santa Maria-Goleta, CA MSA	M1	112.28	148.85	109.48	122.05	146.59
42100	42100	Santa Cruz-Watsonville, CA MSA	M1	98.88	146.15	107.90	112.18	145.02
42220	42220	Santa Rosa-Petaluma, CA MSA	M1	93.70	132.31	91.91	96.82	113.92
42340	42340	Savannah, GA MSA	M1	90.08	84.94	115.36	115.03	115.81
42540	42540	Scranton--Wilkes-Barre, PA MSA	M1	91.28	116.46	95.07	123.01	115.84
43340	43340	Shreveport-Bossier City, LA MSA	M1	87.79	76.94	72.39	84.53	72.63
43620	43620	Sioux Falls, SD MSA	M1	97.68	104.85	95.96	60.16	101.75
43780	43780	South Bend-Mishawaka, IN-MI MSA	M1	90.94	94.08	111.91	118.68	121.71
43900	43900	Spartanburg, SC MSA	M1	81.26	68.26	91.26	72.48	74.00
44060	44060	Spokane, WA MSA	M1	98.98	115.82	108.57	128.26	129.40
44100	44100	Springfield, IL MSA	M1	90.39	100.51	160.03	96.74	142.24
44180	44180	Springfield, MO MSA	M1	89.10	89.25	75.99	91.87	83.96
44700	44700	Stockton, CA MSA	M1	106.54	135.75	82.11	121.04	120.28
45060	45060	Syracuse, NY MSA	M1	94.75	100.93	122.57	69.91	96.65
45220	45220	Tallahassee, FL MSA	M1	91.64	68.25	130.77	79.80	98.95
45300	45300	Tampa-St. Petersburg-Clearwater, FL MSA	M1	105.18	105.35	93.00	150.09	98.49
45780	45780	Toledo, OH MSA	M1	95.30	120.34	85.46	95.85	100.90
45820	45820	Topeka, KS MSA	M1	88.98	83.12	102.18	71.38	94.82
45940	45940	Trenton-Ewing, NJ MSA	M1	115.88	128.00	97.36	139.06	144.71
46060	46060	Tucson, AZ MSA	M1	100.79	90.96	78.71	94.72	78.92

46140	46140	Tulsa, OK MSA	M1	90.54	92.40	93.54	103.35	86.65
46220	46220	Tuscaloosa, AL MSA	M1	85.85	68.60	154.72	92.03	122.18
46340	46340	Tyler, TX MSA	M1	85.76	72.48	122.62	93.19	110.66
46540	46540	Utica-Rome, NY MSA	M1	90.87	83.53	98.35	61.91	84.71
46700	46700	Vallejo-Fairfield, CA MSA	M1	105.38	132.03	79.32	115.90	124.16
47260	47260	Virginia Beach-Norfolk-Newport News, VA-NC MSA	M1	106.41	105.24	102.38	131.60	104.45
47300	47300	Visalia-Porterville, CA MSA	M1	91.94	106.37	79.64	83.98	91.55
47380	47380	Waco, TX MSA	M1	87.96	96.10	100.62	107.83	117.11
48620	48620	Wichita, KS MSA	M1	95.63	107.27	88.57	83.65	91.74
48900	48900	Wilmington, NC MSA	M1	85.89	73.12	83.92	84.13	77.27
49180	49180	Winston-Salem, NC MSA	M1	86.43	68.62	87.42	68.47	63.44
49420	49420	Yakima, WA MSA	M1	90.95	117.91	133.08	65.81	123.19
49620	49620	York-Hanover, PA MSA	M1	90.92	95.83	113.20	90.32	105.12
49660	49660	Youngstown-Warren-Boardman, OH-PA MSA	M1	87.36	100.76	74.10	81.52	78.08
1698016974	16980	Chicago-Joliet-Naperville, IL MD	M3	145.50	140.09	143.24	160.21	125.90
1698023844	16980	Gary, IN MD	M3	94.53	107.73	82.31	106.33	96.70
1698029404	16980	Lake County-Kenosha County, IL-WI MD	M3	101.65	112.39	67.78	132.08	103.10
1910019124	19100	Dallas-Plano-Irving, TX MD	M3	111.46	105.90	94.21	129.74	86.15
1910023104	19100	Fort Worth-Arlington, TX MD	M3	103.71	100.89	72.55	117.21	78.56
1982019804	19820	Detroit-Livonia-Dearborn, MI MD	M3	125.20	124.65	107.48	183.98	137.17
1982047644	19820	Warren-Troy-Farmington Hills, MI MD	M3	97.88	110.33	70.54	96.17	67.03
3110031084	31100	Los Angeles-Long Beach-Glendale, CA MD	M3	187.39	160.18	115.66	154.40	130.33
3110042044	31100	Santa Ana-Anaheim-Irvine, CA MD	M3	161.91	155.02	79.64	181.81	139.86
3310022744	33100	Fort Lauderdale-Pompano Beach-Deerfield Beach, FL MD	M3	140.93	136.53	61.79	153.66	121.41
3310033124	33100	Miami-Miami Beach-Kendall, FL MD	M3	160.18	136.41	117.91	166.90	144.12
3310048424	33100	West Palm Beach-Boca Raton-Boynton Beach, FL MD	M3	110.73	121.02	69.66	118.46	98.18
3562020764	35620	Edison-New Brunswick, NJ MD	M3	109.41	125.05	69.02	137.91	96.77
3562035004	35620	Nassau-Suffolk, NY MD	M3	123.33	144.75	81.01	155.85	117.04
3562035084	35620	Newark-Union, NJ-PA MD	M3	126.86	139.67	90.43	113.76	109.62
3562035644	35620	New York-White Plains-Wayne, NY-NJ MD	M3	384.29	159.34	213.49	193.80	203.36

3798015804	37980	Camden, NJ MD	M3	105.39	125.72	78.53	120.07	103.22
3798037964	37980	Philadelphia, PA MD	M3	141.01	142.25	115.95	140.06	122.42
3798048864	37980	Wilmington, DE-MD-NJ MD	M3	102.42	109.29	96.53	120.29	112.94
4186036084	41860	Oakland-Fremont-Hayward, CA MD	M3	136.28	145.75	88.11	159.44	127.24
4186041884	41860	San Francisco-San Mateo-Redwood City, CA MD	M3	185.97	167.17	230.92	162.83	194.28
4266042644	42660	Seattle-Bellevue-Everett, WA MD	M3	121.27	123.99	121.68	131.86	116.11
4266045104	42660	Tacoma, WA MD	M3	103.62	105.56	92.25	119.05	107.48
4790013644	47900	Bethesda-Rockville-Frederick, MD MD	M3	115.08	123.84	98.97	118.94	114.66
4790047894	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV MD	M3	122.35	117.61	133.16	125.91	107.21

Appendix D. Urbanized Areas Compactness Indices 2010

UA10 code	UA00 code	UZA name	density factor10	mix factor10	centering factor10	street factor10	composite index10
199	199	Aberdeen--Bel Air South--Bel Air North, MD	85.49	120.77	76.74	77.96	96
766	766	Akron, OH	81.39	116.43	93.24	89.2	92.2
970	928	Albany--Schenectady, NY	97.77	118.87	112.62	89.2	106.98
1171	1171	Albuquerque, NM	116.44	78.03	93.5	122.76	101.29
1495	1495	Allentown, PA--NJ	97.96	143.39	104.15	137.07	131.35
2602	2602	Ann Arbor, MI	97.99	79.81	147.32	63.7	102.94
2683	2683	Antioch, CA	114.41	159.21	55.47	116.28	126.73
2764	2764	Appleton, WI	95.15	115.28	129.16	109.29	131.07
3358	3358	Asheville, NC	60.41	95.23	103.73	77.43	83.12
3817	3817	Atlanta, GA	84.64	75.63	107.29	36.84	37.45
3898	3898	Atlantic City, NJ	93.87	91.07	157.06	143.86	144.25
4222	4222	Augusta-Richmond County, GA--SC	72.48	77.69	94.35	84.62	76.28
4384	4384	Austin, TX	113.28	81.33	134.13	86.92	96.11
4681	4681	Bakersfield, CA	125.2	121.55	76.44	116.2	116.85
4843	4843	Baltimore, MD	129.32	121.02	123.1	122.24	122.49
5680	5680	Baton Rouge, LA	81.92	75.3	77.21	77.61	64.38
7786	7786	Birmingham, AL	73.46	86.42	105.98	112.13	88.06
8785	8785	Boise City, ID	108.78	117.41	75.99	117.27	113.63
8974	8974	Bonita Springs, FL	77.33	82.83	62	76.13	66.52
10972	10972	Brownsville, TX	104.71	69.61	60.4	113.57	90.72
11350	11350	Buffalo, NY	108.69	129.82	93.58	79.29	98.81
13375	13375	Canton, OH	78.14	120.31	79.59	119.98	107.69
13510	13510	Cape Coral, FL	71.37	48.77	102.22	108.16	73.12
15508	15508	Charleston--North Charleston, SC	89.82	87.42	117.43	97.96	97.6
15670	15670	Charlotte, NC--SC	82.95	64.56	115.94	53.01	57.41
15832	15832	Chattanooga, TN--GA	68.92	54.18	97.03	70.33	60.96
16264	16264	Chicago, IL--IN	138.66	115.95	146.41	132.57	121.64
16885	16885	Cincinnati, OH--KY--IN	96.17	108.85	108.51	70.43	81.34
17668	17668	Cleveland, OH	98.46	119.6	95.01	56.7	74.58
18964	18964	Columbia, SC	77.26	72.43	117.99	80.39	79.72
19099	19099	Columbus, GA--AL	83.9	81.28	109.53	85.81	93.81
19234	19234	Columbus, OH	109.73	111.69	106.51	101.67	101.64
19504	19504	Concord, CA	117.87	127.75	88.56	108.39	116.23
19558	19558	Concord, NC	61.76	92.03	63.73	68.79	66.05
19755	87328	Conroe--The Woodlands, TX	84.06	74.6	90.9	55.55	72.27

20287	20287	Corpus Christi, TX	106.9	117.65	86.49	119	118.91
22042	22042	Dallas--Fort Worth--Arlington, TX	115.92	90.22	101.95	117.33	84.43
22366	22366	Davenport, IA--IL	90.86	140.14	73.06	128.02	121.31
22528	22528	Dayton, OH	87.21	126.45	89.21	95.11	96.47
23500	23500	Denton--Lewisville, TX	104.86	111.25	66.35	100.65	98.54
23527	23527	Denver--Aurora, CO	128.15	94.52	118.79	127.61	110.96
23743	23743	Des Moines, IA	99.26	110	92.79	100.45	103.87
23824	23824	Detroit, MI	106.01	112.41	91.65	109.31	85.73
25228	25228	Durham, NC	94.32	67.57	96.34	68.93	76.75
27253	27253	El Paso, TX--NM	118.51	78.44	78.15	123.97	95.69
28117	28117	Eugene, OR	114.84	134.37	134.15	123.07	152.54
28333	28333	Evansville, IN--KY	94.15	101.62	94.07	105.58	108.97
29440	29440	Fayetteville, NC	79.4	73.65	67.16	64.43	61.05
29494	29494	Fayetteville--Springdale--Rogers, AR--MO	81.99	95.85	95.95	69.57	85.16
30628	30628	Fort Collins, CO	101.36	112.13	97.17	104.12	115.05
31087	31087	Fort Wayne, IN	85.44	100.41	93.76	86.58	93.59
31843	31843	Fresno, CA	128.7	131.47	85.2	114.97	122.62
34300	34300	Grand Rapids, MI	91.17	108.19	107.46	74.4	92.57
34813	34813	Green Bay, WI	93.27	91.28	74.78	92.29	92.67
35164	35164	Greensboro, NC	87.97	98.75	92.59	69.88	86.85
35461	35461	Greenville, SC	67.92	75.26	89.88	57.88	60.57
35920	35920	Gulfport, MS	68.81	73.89	85.65	104.8	85.14
37081	37081	Harrisburg, PA	90.63	110.89	104.73	119.9	113.49
37243	37243	Hartford, CT	93.32	106.67	129.53	45.2	84.27
38647	38647	Hickory, NC	46.92	78.41	72.2	44.94	48.64
40429	40429	Houston, TX	114.84	88.59	100.16	121.05	84.54
40753	40753	Huntington, WV--KY--OH	78.77	114.67	141.6	119.14	133.96
40780	40780	Huntsville, AL	73.08	63.42	81.92	96.52	74.11
41212	41212	Indianapolis, IN	94.06	90.56	95.71	88.12	76.17
41347	41347	Indio--Cathedral City, CA	96.72	112.31	71.8	107.44	101.29
42211	42211	Jackson, MS	75.8	70.34	112	70.53	77.22
42346	42346	Jacksonville, FL	96.67	84.48	99.64	97.33	83.97
43723	43723	Kalamazoo, MI	76.6	86.21	104.69	69.49	86.63
43912	43912	Kansas City, MO--KS	98.85	105.06	92.38	103.91	88.64
44479	44479	Kennewick--Pasco, WA	89.99	107.69	89.25	89.51	102.36
44992	44992	Killeen, TX	95.9	100.91	69.3	101.84	98.59
45451	45451	Kissimmee, FL	87.75	49.1	60.42	104.82	67.9
45640	45640	Knoxville, TN	71.09	53.58	155.82	67.02	79.3
46045	46045	Lafayette, LA	81.01	94.51	92.99	88.43	92.42

46828	46828	Lakeland, FL	86.1	46.46	106.74	106.84	87.65
47530	47530	Lancaster, PA	90.53	127.52	132.24	79.34	116.07
47611	47611	Lancaster--Palmdale, CA	111.72	111.36	54.81	82.34	90.2
47719	47719	Lansing, MI	98.23	68.2	134.04	86.9	102.07
47854	47854	Laredo, TX	123.87	131.21	81.56	166.54	151.8
47995	47962	Las Vegas--Henderson, NV	147.64	63.47	121.83	107.58	102.24
49582	49582	Lexington-Fayette, KY	126.87	122.82	121.63	98.98	136.19
49933	49933	Lincoln, NE	118.63	127.46	97.02	141.77	143.38
50392	50392	Little Rock, AR	86.38	82.4	97.12	115.29	95.84
51445	51445	Los Angeles--Long Beach--Anaheim, CA	212.21	144.75	102.23	138.92	143.42
51755	51715	Louisville/Jefferson County, KY--IN	97.86	82.91	92.73	90.53	79.4
51877	51877	Lubbock, TX	107.82	127.9	75.58	130.09	126.98
52390	52390	McAllen, TX	88.19	63.8	85.12	99.04	71.63
53200	53200	Madison, WI	118.16	121.82	182.19	99.33	152.87
56116	56116	Memphis, TN--MS--AR	93.13	63.89	101.9	86.31	70.86
56602	56602	Miami, FL	143.68	108.89	109.46	134.49	112.06
57466	57466	Milwaukee, WI	112.66	116.03	164.62	112.47	132.07
57628	57628	Minneapolis--St. Paul, MN--WI	112.17	98.47	119.91	108.34	97.57
57709	57709	Mission Viejo--Lake Forest--San Clemente, CA	127.87	147.54	62.55	118.63	122.47
57925	57925	Mobile, AL	77.59	103.81	71.28	106.28	90.23
58006	58006	Modesto, CA	127.77	145.02	79.06	109.17	130
58600	58600	Montgomery, AL	85.32	118.52	97.11	76.74	100.22
60799	87004	Murrieta--Temecula--Menifee, CA	103.58	98.68	60.2	73.39	77.41
60895	60895	Myrtle Beach--Socastee, SC--NC	57	48.17	100.23	94.2	71.35
61273	61273	Nashville-Davidson, TN	87.51	47.43	111.18	70.03	60.27
62407	62407	New Haven, CT	90.04	111.59	139.46	58.5	100.08
62677	62677	New Orleans, LA	125.35	102.93	93.92	187.3	138.57
63217	63217	New York--Newark, NY--NJ--CT	197.5	106.8	179.1	125.06	142.71
64135	64135	Norwich--New London, CT--RI	72.73	88.4	132.22	60.7	93.49
64945	64945	Ogden--Layton, UT	98.34	117.46	63.46	87.66	87.35
65080	65080	Oklahoma City, OK	95.88	87.23	96.6	101.44	87.68
65269	65269	Omaha, NE--IA	110.48	110.3	98.07	128.31	116.15
65863	65863	Orlando, FL	109.38	78.11	92.26	109.72	84.41
66673	66673	Oxnard, CA	147.55	137.14	82.42	135.08	146.19
67105	67105	Palm Bay--Melbourne, FL	88.7	78.17	60.31	88.15	68.9
67134	22636	Palm Coast--Daytona Beach--Port Orange, FL	84.24	82.84	66.42	108.04	82.45
68482	68482	Pensacola, FL--AL	73.9	71.76	74.11	111.04	78.47

68509	68509	Peoria, IL	85.82	104.21	125.17	113.45	120.49
69076	69076	Philadelphia, PA--NJ--DE--MD	127.16	124.32	131.46	105.73	109.05
69184	69184	Phoenix--Mesa, AZ	119.2	79.12	99.99	106.59	80.27
69697	69697	Pittsburgh, PA	93.7	119.21	125.55	117.1	109.25
71263	71263	Portland, ME	88.48	123.43	148.13	85.12	130.27
71317	71317	Portland, OR--WA	127.64	129.26	107.58	135.17	126.14
71479	71479	Port St. Lucie, FL	78.65	57.1	76.99	103.04	71.26
71803	71803	Poughkeepsie--Newburgh, NY--NJ	75.26	112.65	121.96	43.25	84.82
72559	72559	Provo--Orem, UT	113.81	130.08	77.33	100.13	110.6
73261	73261	Raleigh, NC	90.27	77.3	112.47	54.9	68.86
73693	73693	Reading, PA	127.71	150.87	124.45	147.46	169.32
74179	74179	Reno, NV--CA	101.13	59.47	123.12	94.24	95.67
74746	74746	Richmond, VA	94.09	83.03	111.23	109.31	93.1
75340	75340	Riverside--San Bernardino, CA	119.16	112.94	81.81	82.29	84.2
75421	75421	Roanoke, VA	83.87	108.45	81.82	110.57	105.72
75664	75664	Rochester, NY	103	101.93	103.14	61.44	85.12
75718	75718	Rockford, IL	86.89	103.05	96.03	119.57	109.98
76474	76474	Round Lake Beach--McHenry--Grayslake, IL--WI	80.35	83.85	79.57	90.59	81.75
77068	77068	Sacramento, CA	125.63	104.85	109.31	107.52	106.02
77770	77770	St. Louis, MO--IL	100.04	114.26	104.27	110.7	96.18
78229	78229	Salem, OR	115.59	125.71	112.5	103.81	133.51
78499	78499	Salt Lake City--West Valley City, UT	130.73	116.64	84.13	99.9	105.81
78580	78580	San Antonio, TX	113.62	85.4	92.02	104.86	85.2
78904	78904	San Francisco--Oakland, CA	205.69	129.92	164.34	153.38	180.94
79039	79039	San Jose, CA	181.13	136.26	86.67	127.03	139.98
79309	79309	Santa Clarita, CA	120.29	129.69	81.81	93.51	119.53
79606	79606	Sarasota--Bradenton, FL	84.4	94.94	93.16	115.72	93.95
79768	79768	Savannah, GA	82.3	96.52	110.11	111.85	109.61
80227	80227	Scranton, PA	95.52	145.27	102.54	133.3	135.5
80389	80389	Seattle, WA	118.83	89.41	142.43	110.09	104.65
81739	81739	Shreveport, LA	80.89	74.13	70.96	102.49	79.07
83116	83116	South Bend, IN--MI	79.42	91.31	105.6	129.25	110.77
83764	83764	Spokane, WA	97.43	109.36	103.98	141.33	125.49
83953	83953	Springfield, MO	86.57	110.76	68.49	115.03	101.06
85087	85087	Stockton, CA	126.41	131.34	98.73	117.22	134.67
86302	86302	Syracuse, NY	100.81	110.01	133.54	85.98	116.05
86464	86464	Tallahassee, FL	97.65	71.33	144.71	84.14	109.39
86599	86599	Tampa--St. Petersburg, FL	103.05	92.69	93.15	122.73	87.63

87868	87868	Toledo, OH--MI	94.96	127.77	90.58	100.46	106.97
88462	88462	Trenton, NJ	123.71	121.54	106.59	108.84	132.08
88732	88732	Tucson, AZ	100	70.98	90.13	94.08	77.54
88948	88948	Tulsa, OK	90.85	97.81	96.64	99.33	92.29
90541	90541	Victorville--Hesperia, CA	82.38	67.79	57.01	61.88	54.15
90946	90946	Visalia, CA	118.08	126.58	92.94	127.07	137.22
92242	92242	Washington, DC--VA--MD	142.28	96.36	136.7	104.92	107.69
95077	95077	Wichita, KS	96.94	92.64	94.44	110.31	100.02
95833	95833	Wilmington, NC	81.25	102.01	89.16	96.91	99.02
96670	96670	Winston-Salem, NC	66.31	68.97	88.15	54.29	55.56
96697	96697	Winter Haven, FL	67.51	52.97	77.78	110.62	75.86
97750	97750	York, PA	91.8	129.86	121.89	103.78	129.62
97831	97831	Youngstown, OH--PA	76.37	134.31	77.47	90.73	96.18

Appendix E. Urbanized Areas Compactness Indices 2000

UA10 code	UA00 code	UZA name	density factor00	mix factor00	centering factor00	street factor00	composite index00
199	199	Aberdeen--Bel Air South--Bel Air North, MD	85.05	130.29	74.74	47.27	85.29
766	766	Akron, OH	83.56	124.2	91.55	81.39	89.78
970	928	Albany--Schenectady, NY	97.62	126.41	111.23	76.74	102.59
1171	1171	Albuquerque, NM	115.4	83.47	88.92	111.01	96.53
1495	1495	Allentown, PA--NJ	98.6	154.6	98.74	137.75	133.48
2602	2602	Ann Arbor, MI	109.06	89.82	125.09	58.53	98.12
2683	2683	Antioch, CA	112.73	162.91	50.78	108.2	122
2764	2764	Appleton, WI	109.95	136.48	103.75	115.15	135.96
3358	3358	Asheville, NC	56.51	112.01	102.96	63.14	81.59
3817	3817	Atlanta, GA	88.54	90.28	106.29	19.9	39.5
3898	3898	Atlantic City, NJ	93.52	86.06	158.52	140.57	139.23
4222	4222	Augusta-Richmond County, GA--SC	74.42	87.91	89.02	70.65	71.97
4384	4384	Austin, TX	121.77	113.65	133.13	82.98	113.25
4681	4681	Bakersfield, CA	121.27	134.54	78.88	118.03	122.72
4843	4843	Baltimore, MD	129.5	120.15	128.93	96.29	113.51
5680	5680	Baton Rouge, LA	83.46	72.66	85.07	64.16	61.39
7786	7786	Birmingham, AL	81.96	94.9	100.51	99.74	86.68
8785	8785	Boise City, ID	104.83	131.24	71.93	104.89	110.79
8974	8974	Bonita Springs, FL	76.78	77.85	61.38	46.22	52.49
10972	10972	Brownsville, TX	108.24	107.19	65.79	106.8	106.23
11350	11350	Buffalo, NY	114.62	131.15	103.32	75.28	101.45
13375	13375	Canton, OH	83.07	135.07	79.23	123	114.04
13510	13510	Cape Coral, FL	81.59	79.16	95.48	90.72	82.2
15508	15508	Charleston--North Charleston, SC	87.45	95.25	127.26	96.79	103.51
15670	15670	Charlotte, NC--SC	85.5	99.95	108.27	35.77	66.06
15832	15832	Chattanooga, TN--GA	65.83	55.21	92.3	53.9	49.7
16264	16264	Chicago, IL--IN	148.83	120.65	131.04	122.64	117.76
16885	16885	Cincinnati, OH--KY--IN	100.48	116.34	116.18	61.77	84.83
17668	17668	Cleveland, OH	111.72	122.33	112.13	56.21	86.01
18964	18964	Columbia, SC	82.21	84.52	125.63	77.91	88.92
19099	19099	Columbus, GA--AL	85.1	69	117.06	77.88	86.41
19234	19234	Columbus, OH	114.53	124.36	102.14	96.89	105.27
19504	19504	Concord, CA	123.25	126.99	82.93	82.12	104.03
19558	19558	Concord, NC	55.14	99.79	79.86	68.46	76.14
19755	87328	Conroe--The Woodlands, TX	94.53	92.36	86.68	54.45	88.85

20287	20287	Corpus Christi, TX	105.97	125.48	84.91	104.4	113.13
22042	22042	Dallas--Fort Worth--Arlington, TX	117.14	102.37	95.57	98.9	81.46
22366	22366	Davenport, IA--IL	96.81	152.84	73.58	114.3	120.78
22528	22528	Dayton, OH	89.73	123.77	101.57	88.21	96.56
23500	23500	Denton--Lewisville, TX	97.48	116.34	67.11	75.13	86.9
23527	23527	Denver--Aurora, CO	135.76	108.29	116.57	129.44	120.11
23743	23743	Des Moines, IA	111.38	121.97	97.25	101.92	115.33
23824	23824	Detroit, MI	113.29	112.29	106.16	100.28	89.38
25228	25228	Durham, NC	91.24	77.48	106.3	58.06	78.11
27253	27253	El Paso, TX--NM	118.39	84.76	79.51	111.2	93.22
28117	28117	Eugene, OR	121.5	141.47	130.73	114.89	151.42
28333	28333	Evansville, IN--KY	96.61	124.11	99.57	100.57	116.75
29440	29440	Fayetteville, NC	78.97	98.97	62.63	56.65	64.13
29494	29494	Fayetteville--Springdale--Rogers, AR--MO	86.95	121.68	115.49	60.4	104.38
30628	30628	Fort Collins, CO	105.79	111.9	89.91	95.01	109.69
31087	31087	Fort Wayne, IN	91.02	114.76	89.81	86.8	97.94
31843	31843	Fresno, CA	131.07	145.64	93.2	120.39	134.15
34300	34300	Grand Rapids, MI	94.4	120	102.39	61.32	89.35
34813	34813	Green Bay, WI	99.89	115.98	71.74	91.68	101.39
35164	35164	Greensboro, NC	92.19	125.19	96.01	67.38	98.07
35461	35461	Greenville, SC	75.59	101.55	89.54	59.56	74.82
35920	35920	Gulfport, MS	77.88	94.44	94.46	91.98	92.1
37081	37081	Harrisburg, PA	90.93	118.89	103.03	108.09	110.9
37243	37243	Hartford, CT	93.14	114.07	126.66	32.36	79.58
38647	38647	Hickory, NC	49.14	81.34	75.33	42.67	48.76
40429	40429	Houston, TX	115.73	98.06	94.99	97.43	79.22
40753	40753	Huntington, WV--KY--OH	82.45	124.09	152.46	109.9	138
40780	40780	Huntsville, AL	73.26	78.59	90.56	55.71	67.33
41212	41212	Indianapolis, IN	97.94	101.45	112.38	86.6	88.58
41347	41347	Indio--Cathedral City, CA	99.18	127.03	71.49	107.22	108.33
42211	42211	Jackson, MS	86.8	87.99	112.18	63.13	84.77
42346	42346	Jacksonville, FL	100.97	92.98	92.56	96.26	85.83
43723	43723	Kalamazoo, MI	82.13	111.47	99.11	64.66	92.53
43912	43912	Kansas City, MO--KS	101.66	115.2	90.55	99.55	90.81
44479	44479	Kennewick--Pasco, WA	84.2	126.72	99.02	89.04	111.45
44992	44992	Killeen, TX	99.15	110.93	77.07	98.45	105.12
45451	45451	Kissimmee, FL	85.68	66.13	58.9	106.74	76.56
45640	45640	Knoxville, TN	68.61	70.74	130.5	57.65	71.74
46045	46045	Lafayette, LA	78.58	104.29	100.28	74.01	93.04

46828	46828	Lakeland, FL	76.03	86.84	114.04	85.81	94.03
47530	47530	Lancaster, PA	96.79	132.28	126.42	65.11	112.02
47611	47611	Lancaster--Palmdale, CA	109.53	123.6	56.21	73.56	91.06
47719	47719	Lansing, MI	101.03	96.55	105.33	80.06	97.71
47854	47854	Laredo, TX	134.65	148.02	86.2	189.55	174.12
47995	47962	Las Vegas--Henderson, NV	155.61	69.07	127.05	105.4	111.38
49582	49582	Lexington-Fayette, KY	132.62	121.28	125.89	78.65	130.01
49933	49933	Lincoln, NE	118.03	133.12	97.15	135.15	141.19
50392	50392	Little Rock, AR	93	95.64	93.19	103.44	96.64
51445	51445	Los Angeles--Long Beach--Anaheim, CA	212.14	131.99	105.37	127.52	135.59
51755	51715	Louisville/Jefferson County, KY--IN	101.73	93.98	90.76	81.59	80.16
51877	51877	Lubbock, TX	112.3	132.03	74.66	124.18	126.23
52390	52390	McAllen, TX	76.58	79.91	84.37	90.18	70.76
53200	53200	Madison, WI	122.06	126.86	158.37	101.3	147.2
56116	56116	Memphis, TN--MS--AR	101.44	72.29	100.26	71.3	69.71
56602	56602	Miami, FL	142.94	107.92	93.37	131.01	104.22
57466	57466	Milwaukee, WI	118.7	128.61	125.45	106.94	120.5
57628	57628	Minneapolis--St. Paul, MN--WI	113.41	90.31	118.69	95.92	89.25
57709	57709	Mission Viejo--Lake Forest--San Clemente, CA	129.04	140.04	64.39	92.13	108.57
57925	57925	Mobile, AL	81.05	108.53	73.69	70.94	77.49
58006	58006	Modesto, CA	127.86	147.59	97.76	105.06	135.64
58600	58600	Montgomery, AL	95.52	130.65	103.01	80.25	112.96
60799	87004	Murrieta--Temecula--Menifee, CA	95.58	105.7	108.31	72.89	100.43
60895	60895	Myrtle Beach--Socastee, SC--NC	66.75	80.03	108.57	105.93	98.74
61273	61273	Nashville-Davidson, TN	89.26	67.83	106.22	46.1	58.11
62407	62407	New Haven, CT	88.44	119.87	132.78	47.06	93.54
62677	62677	New Orleans, LA	161.24	106.84	95.97	181.06	149.64
63217	63217	New York--Newark, NY--NJ--CT	197.18	115.6	170.57	120.19	141.75
64135	64135	Norwich--New London, CT--RI	70.09	97.16	133.84	48.33	90.23
64945	64945	Ogden--Layton, UT	98.24	124.92	64.85	76.93	86.84
65080	65080	Oklahoma City, OK	100.17	107.78	93.5	94.11	92.8
65269	65269	Omaha, NE--IA	113.56	122.98	98.8	124.72	120.65
65863	65863	Orlando, FL	106.07	87.13	94.04	96.83	83.39
66673	66673	Oxnard, CA	151.09	138.91	76.66	115.75	136.4
67105	67105	Palm Bay--Melbourne, FL	76.29	75.93	62.16	77.64	58.18
67134	22636	Palm Coast--Daytona Beach--Port Orange, FL	95.16	98.84	68.39	109.08	94.85
68482	68482	Pensacola, FL--AL	73.65	74.45	72.66	94.85	69.79

68509	68509	Peoria, IL	91.09	126.26	99.4	105.88	115.78
69076	69076	Philadelphia, PA--NJ--DE--MD	131.05	121.96	126.98	101.25	106.14
69184	69184	Phoenix--Mesa, AZ	130.95	100.13	97.92	103.57	92.82
69697	69697	Pittsburgh, PA	96.98	127.23	118.72	106.44	105.11
71263	71263	Portland, ME	89.38	134.9	155.27	66.41	128.14
71317	71317	Portland, OR--WA	124.3	134.07	102.05	128.07	121.95
71479	71479	Port St. Lucie, FL	71.15	72.97	75.25	94.03	70.87
71803	71803	Poughkeepsie--Newburgh, NY--NJ	78.28	112.78	115.34	22.28	74.14
72559	72559	Provo--Orem, UT	127.45	156.85	75.63	94.04	126.13
73261	73261	Raleigh, NC	85.53	110.35	75.3	52.22	67.3
73693	73693	Reading, PA	119.44	157.15	126.12	118.53	155.74
74179	74179	Reno, NV--CA	113.14	72	126.28	92.04	105.82
74746	74746	Richmond, VA	92.38	90.82	104.41	88.19	83.85
75340	75340	Riverside--San Bernardino, CA	116.92	113.99	91.49	83.23	89.17
75421	75421	Roanoke, VA	86.36	111.67	76.59	86.48	93.5
75664	75664	Rochester, NY	108.58	97.82	103.61	50.71	79.59
75718	75718	Rockford, IL	89.96	114.18	95.46	103.81	107.07
76474	76474	Round Lake Beach--McHenry--Grayslake, IL--WI	76.99	115.86	79.25	75.95	86.73
77068	77068	Sacramento, CA	124.59	120.43	124.87	98.6	115.3
77770	77770	St. Louis, MO--IL	103.99	123.85	101.53	96.97	93.99
78229	78229	Salem, OR	115.57	137.9	112.49	99.24	134.82
78499	78499	Salt Lake City--West Valley City, UT	133.2	130.41	88.53	99.2	113.34
78580	78580	San Antonio, TX	117.87	96.14	99.08	106.77	96.28
78904	78904	San Francisco--Oakland, CA	219.66	128.39	162.41	149.84	184.06
79039	79039	San Jose, CA	178.91	134.54	82.37	116.63	131.9
79309	79309	Santa Clarita, CA	118.24	137.68	79.83	67.1	111.89
79606	79606	Sarasota--Bradenton, FL	90.69	100.26	114.14	110.88	104.18
79768	79768	Savannah, GA	99.99	89.55	108.58	123.77	117.33
80227	80227	Scranton, PA	101.5	155.32	100.64	129.53	136.8
80389	80389	Seattle, WA	113.58	93.37	135.64	97.4	96.57
81739	81739	Shreveport, LA	86.6	82.72	74.56	93.39	80.28
83116	83116	South Bend, IN--MI	83	111.98	104.07	99.66	104.93
83764	83764	Spokane, WA	99.69	110.75	102.36	140.36	124.73
83953	83953	Springfield, MO	89.76	138.09	66.86	87.37	101
85087	85087	Stockton, CA	134.42	145.18	104.41	124.09	147.55
86302	86302	Syracuse, NY	104.93	115.92	130.6	76.08	112.42
86464	86464	Tallahassee, FL	93.87	68.08	112.12	61.01	82.66
86599	86599	Tampa--St. Petersburg, FL	106.59	94.04	89.98	122.04	88.57

87868	87868	Toledo, OH--MI	102.27	129.37	93.5	92.92	106.17
88462	88462	Trenton, NJ	130.68	138.84	103.24	106.32	137.57
88732	88732	Tucson, AZ	103.97	93.06	82.2	91.29	83.13
88948	88948	Tulsa, OK	96.26	101.83	93.07	96.58	92.84
90541	90541	Victorville--Hesperia, CA	74.79	84.24	56.75	51.04	55.43
90946	90946	Visalia, CA	116.84	142.48	107.53	108.93	145.05
92242	92242	Washington, DC--VA--MD	133.79	104.48	112.04	85.55	90.84
95077	95077	Wichita, KS	101.36	107.4	97.06	112.11	108.03
95833	95833	Wilmington, NC	74.31	109.17	91.78	77.06	92.18
96670	96670	Winston-Salem, NC	66.67	68.56	93.67	44.02	53.49
96697	96697	Winter Haven, FL	72.57	72.7	75.82	100.19	80.21
97750	97750	York, PA	84.59	139.34	129.88	93.59	128.45