More Active Living-oriented County and Municipal Zoning is Associated with Increased Adult Leisure Time Physical Activity—United States, 2011

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Abstract

Although zoning is recognized for its role in facilitating healthy communities, no study has examined whether active living-oriented zoning codes are associated with adult leisure time physical activity (PA). This study sought to fill this gap and hypothesized that adult leisure time PA would be greater in communities with more progressive zoning code reforms and more active living-oriented zoning. Zoning codes for 1,617 county and municipal jurisdictions located in 30 states (covering ~40% of the U.S. population) were evaluated for code reform zoning and 11 active living markers. County-aggregated zoning measures were created for linking with five adult PA behaviors obtained from the 2011 Behavioral Risk Factor Surveillance System controlling for individual and county sociodemographics. Zoning elements most associated with adult PA included requirements for mixed use, active and passive recreation, bike parking/street furniture, and bike-pedestrian trails/paths. This study provides new insights as to the role that zoning can play in facilitating adult PA.

Introduction

Environmental and policy factors play an important role in influencing people's lifestyles and physical activity (PA) (Sallis et al., 1998; Sallis et al., 2006; Aytur et al., 2008; US Department of Health and Human Services, 2001; Institute of Medicine, 2005; Sallis et al., 2015; Heath et al., 2006). *The Community Guide* concluded that community-scale and street-scale urban design and land use policies (including zoning) and practices promoted PA (Heath et al., 2006). Community characteristics that facilitate active living and PA include mixed-use (MU) developments and traditional neighborhood design that provide street and sidewalk connectivity, transportation infrastructure, and proximity to parks/recreational areas/facilities (Saelens et al., 2003b; Saelens et al., 2003a; Ewing et al., 2003; Davison & Lawson, 2006; Handy et al., 2002; Sallis & Glanz, 2006; Heath et al., 2006; Sallis et al., 2015). And, compact neighborhoods with dense street connectivity and MU are associated with increased adult walking (Berrigan & Troiano, 2002; Saelens et al., 2003b; Ewing et al., 2003; Li et al., 2005; Ewing & Cervero, 2010; Ewing et al., 2014b). Compact development has also been shown to have a positive effect on reducing obesity and chronic disease trends (Ewing et al., 2014a). In contrast, sprawling communities requiring automobile use to get to destinations and communities with limited transportation infrastructure, poor street/sidewalk connectivity, lack of sidewalks or bike paths, single use zoning, and high traffic volume tend to have lower PA rates (Booth et al., 2005; Saelens et al., 2003b; Day, 2006; Handy et al., 2002; Ewing et al., 2003; Davison & Lawson, 2006; Powell et al., 2004; Schilling & Mishkovsky, 2005; Slater et al., 2010).

Land use decisions largely rest with local governments (Steel & Lovrich, 2000). Traditional, *Euclidian* zoning approaches created decades ago have contributed to sprawling, automobile-reliant communities (Handy et al., 2002; Schilling & Linton, 2005; Schilling

& Mishkovsky, 2005; Levine, 2010; Fischel, 2004; Leinberger, 2007). With traditional zoning, permitted land uses are assigned based on a zoning map which divides land into specific uses, typically single use districts/zones (e.g., only allowing residential uses in residential zones as opposed to a mix of residential and commercial uses) (Schilling & Mishkovsky, 2005; American Planning Association, 2006). Traditional zoning also prescribes minimum lot sizes, building setbacks, and height limitations that determine the permitted land development pattern in a community (Elliott et al., 2012). Land use changes have the ability to affect the development of land patterns (Fischel, 2004; Geneletti, 2013) and have been shown to affect people's behaviors over time (Anderson et al., 2013; Sallis et al., 2015).

Land development regulations have multiple layers. Local development plans serve as a guide to inform local officials through land use decisions. Plans are implemented through changes to zoning regulations and provide a vision and supporting evidence for policies and regulations that are to be adopted (Norton, 2008). Zoning changes are often first addressed through plans. In addition to plans and zoning, design guidelines, impact fees, and capital improvement programs direct development in a community (American Planning Association, 2006).

Spurred in part by the SmartGrowth and New Urbanism movements (Schilling & Mishkovsky, 2005; O'Connell, 2008; Norton, 2008), communities throughout the United States (U.S.) have been reforming their zoning codes. The code reforms seek to create pedestrian-friendly neighborhoods with increased street connectivity, MU and higher density, open space, transportation infrastructure, and a traditional neighborhood structure (Schilling & Linton, 2005; Schilling & Mishkovsky, 2005; American Planning Association, 2006).

Among the most common types of active living-oriented code reforms are Traditional Neighborhood Developments (TND), form-based codes, the SmartCode, and pedestrian-/transit-oriented developments (POD and TOD) (Schilling & Linton, 2005; Schilling & Mishkovsky, 2005). The code reforms emphasize walkability and pedestrian access and they seek to promote MU areas that provide easy walking access to shopping, transport, entertainment, parks, and recreational areas and a number of amenities including street furniture, bike lanes, and crosswalks (Schilling & Mishkovsky, 2005; Schilling & Linton, 2005; Schilling & Mishkovsky, 2005; Form-Based Codes Institute, 2008; Sitkowski & Ohm, 2006; American Planning Association, 2006; Duany & Plater-Zyberk, 2005; Davidson & Dolnick, 2004). Specifically, form based codes focus on creating compact urban forms that allow for a diversity of land uses and construct their regulations based on locational intensity; while conventional zoning regulations contribute to sprawl by promoting single use areas with little variation in form or spatial relationships (Talen, 2013). Code reforms have emerged as a way to implement more predictable development that supports walkable communities (Talen, 2012).

Searches of PubMed and Web of Science revealed that no study has explored the relationship between zoning and PA behaviors. One study examined MU zoning (MUZ) requirements in 22 California cities and found that MUZ was correlated with the mix, breadth, and depth of walking destinations in the mixed use zones within the cities (Cannon et al., 2013). Another study examined the relationship between zoning and crime rates in Los Angeles' high-crime neighborhoods and found that neighborhoods undergoing a zoning change to allow for residential uses in commercial areas experienced a significant decline in crime (Anderson et al., 2013). However, neither study examined the relationship between zoning and PA behaviors. This study seeks to fill the gap in the literature by examining the association between zoning code reforms and more active living-oriented zoning elements (including MUZ) for

jurisdictions located in the most populous 96 counties in the U.S. and adult leisure time PA. We hypothesized that adult leisure-time PA would be greater in jurisdictions with code reform zoning and in jurisdictions with more active living-oriented zoning requirements.

Method

This was a cross-sectional study conducted between May 2012 and April 2015. The University of Illinois at Chicago (UIC) Institutional Research Board deemed that this study did "not involve human subjects" (research protocol #2011-0880).

Sample

The sample included adults residing in the 96 most densely populated counties, located in 30 states in the continental U.S. Zoning codes were compiled for all 96 counties which cover approximately 40 percent of the U.S. population, and 1,521 municipal jurisdictions or unincorporated areas located in those counties with populations greater than 0.5 percent of the given county population (total jurisdictional sample=1,617 county and municipal jurisdictions).

Table 1 presents descriptive information on the 96 counties studied for this analysis. The average number of jurisdictions within a county was 15.84 with a minimum of 1 and a maximum of 79. On average, the counties were comprised of 96% urban areas and spanned an average of 1,444 square miles with a population density of 3707 persons per square mile. Nearly 13 percent of households in the counties were in poverty. At least one-half of the county populations were non-Hispanic White; only 20.9% of the county

populations were Hispanic and 15 percent were non-Hispanic Black. The median county-level household income was over $60,000 and the median resident age was 36. Thirty-two percent of the sampled counties were located in the South. The average county-level walkability scale was 1.58 (with a max of 17.97).

Insert Table 1 about here

Data Sources

   Zoning codes. Two Master's level urban planners collected the zoning codes for each county and municipal jurisdiction via Internet research with telephone follow-up. Although the zoning codes were compiled between 2013 and 2014, only codes that were effective as of 2010 (and, in many cases several years earlier) were used for this study. In cases where a more recent version of a jurisdiction's zoning code was available, we also obtained an earlier version (from 2010 or earlier).

   Behavioral Risk Factor Surveillance System (BRFSS). The adult PA and individual level control data were obtained from the Centers for Disease Control and Prevention's 2011 BRFSS. BRFSS collects data from adult residents ages 18 and older in all 50 states, the District of Columbia (DC) and three U.S. territories. Since its inception, BRFSS has collected data on behavioral risk factors including PA, which was the focus of this study. A recent systematic review assessed the reliability and validity of BRFSS estimates for a range of topics including PA and found that BRFSS reliability was higher among physically active groups and that BRFSS reliability on the measures was highly consistent with other adult self-reported PA measures (Pierannunzi et al., 2013).

Validity of the BRFSS PA measures when compared to physical (observed) PA measures was considered moderate (Pierannunzi et al., 2013).

We were able to match policy data from our 96 sampled counties to BRFSS data using the state and county Federal Information Processing Standard (FIPS) codes included in the 2011 file. After removing cases with missing PA outcomes or missing control variables, the final BRFSS sample included 56,262 adults residing in the 96 counties located in 30 states.

American Community Survey (ACS). County-level contextual controls were obtained from the Census Bureau's American Community Survey (ACS) 2007-2011 5-year year estimates (US Census Bureau, 2015a). The ACS is an annual survey that helps communities to plan investments and services and includes socio-demographic characteristics for each community. We used the 5-year ACS estimates because they include all jurisdictions nationwide, which was necessary because the policy measures are based on all jurisdictions within each county that represented >0.5% of the given county population, including very small jurisdictions that are not captured in the 1- and 3-year data files. The 5-year estimates represent the most precise estimates (US Census Bureau, 2015b).

NAVTEQ. ArcGIS 9.1 software was used to access NAVTEQ 2011 data with 3rd quarter updates. NAVTEQ data provided information for each county regarding the number of 4-way street level intersections and a count of all street level intersections. These measures were used in combination with other density measures to create a walkability scale described below.

Measures

Online Appendix 1 defines key terms and measures used in this study. The following discussion briefly describes the construction of the zoning, PA, and individual and county-level control measures.

Zoning elements. Each jurisdiction's zoning code was evaluated by trained Master's level urban planners using an in-depth coding tool created by the research team (see Online Appendix 2). A detailed protocol guided all coding and is available from the corresponding author. Each coder was tested for inter-rater reliability and no coder was allowed to independently code until achieving at least 90 percent agreement with the other coders. The coding protocol was continuously refined to clarify coding ambiguities or new language encountered and the coding team met weekly to discuss and reach consensus on unique coding situations. Two Research Electronic Data Capture (REDCap) databases (UIC Center for Clinical and Translational Science, 2014) were developed for this project to capture data collection and coding data entry, respectively.

For each jurisdiction, separate variables were compiled for whether the zoning code was a "code reform" type of zoning code, a traditional Euclidian zoning code, or a unified development code. As noted earlier, code reforms include TNDs, form-based codes, the SmartCode, PODs, and TODs. (See discussion in the introduction for an explanation of the intent of these code reforms). Unified development codes integrate all land development procedures and regulations (i.e. zoning, subdivision regulations, and circulation standards) into one document to allow for a consistent way of controlling development (American Planning Association, 2006). In addition, each zoning code was evaluated for eight types of zones/districts: code reform, commercial, MU, park/recreation/open space, planned unit development, public/civic/ government, residential, and general zoning elements. Each zone/district was then evaluated for 11 active living-oriented markers: sidewalks; crosswalks; bike-pedestrian connectivity; street connectivity; bike lanes; bike parking

(proxy for street furniture); bike-pedestrian trails/paths; MU; other walkability (e.g., traffic calming, pedestrian orientation); active recreation (i.e., parks with sports fields, playgrounds, equipment); and passive recreation (i.e., open space and greenways). A dichotomous variable (yes/no) was created for each marker to reflect whether there were any requirements (_REQ) for the marker across the districts/zones (e.g., any requirements for MU) within the given jurisdiction.

County-aggregated zoning _REQ variables were created for linking with the BRFSS and control measures. Each _REQ variable was multiplied by the percentage of the county population represented by the given jurisdiction to generate a population-weighted measure for each marker. For each _REQ variable, a county-aggregated measure was created by summing the municipal and unincorporated area population-weighted measures to create a continuous measure of the proportion of the county covered by each zoning element. Online Appendix 3 provides a county-by-county summary of the number of jurisdictions in each county and the county-aggregated, population-weighted zoning requirement measures.

PA outcomes. The PA outcomes were obtained from BRFSS. First, respondents were asked, "What type of physical activity or exercise did you spend the most time doing during the past month?" Respondents were able to select up to two activities. We selected individuals who said they walked, ran, jogged, and/or biked as these activities could be done outside. To determine intensity levels, the BRFSS calculated variable of estimated activity intensity for first and second activity was used. This variable is derived from respondent's answers to whether each reported activity was: (1) neither moderate nor vigorous, (2) moderate, or (3) vigorous. For biking and running/jogging, we created separate dichotomous indicators of vigorous activity (with 1=yes and 0=moderate or neither moderate or vigorous).

Individual-Level Demographics. Age, gender, race, Hispanic origin, marital status, annual household income, education, employment status, having a child in the home, and body mass index (BMI) were assessed using items adapted from the 2011 BRFSS. Race was categorized as White (omitted reference), Black, Asian, and other race. Marital status was divided into three categories: married (omitted reference), never married, widowed/separated/divorced. Annual household income was examined across six categories: income less than $20,000/year (omitted reference), $20-24K, $25-34K, $35-49K, $50-74K, and greater than or equal to $75,000/year. Employment status included those respondents who were currently employed at the time of the interview compared to all other statuses. Education was classified as respondents with a high school degree, those with some college, and those with a college degree or higher, compared with those who had less than a high school diploma (omitted reference). Body mass index (BMI; kg/m^2) is calculated from self-reported height and weight. Due to human error in reporting, for the continuous measure of BMI only those cases with a BMI of 12 to 60 were examined.

County-Level Demographics. Percentages of households in poverty, % non-Hispanic White, % non-Hispanic Black, % Hispanic, median household income, median age of the total population, and southern region of the U.S. were generated from data from the ACS 2007-2011. Additionally, to at least partially account for the on-the-ground built environment that individuals within a given county were exposed to, a measure of walkability was calculated using a combination of NAVTEQ 2011 data and ACS 2007-2011 data. The walkability scale is a standardized scale adjusted by a factor of one to reduce negative scale values and is a summated scale of four density measures that divide the given variable by the county land area. These measures include the proportion of four-way intersections to all intersections (NAVTEQ), intersection density or the total number of intersections in the county divided by the

county land area (NAVTEQ), housing unit density (ACS), and population density (ACS). The walkability scale is based on the scale created by Slater and colleagues (Slater et al., 2010) which was adapted from the scale created and updated by Reid Ewing and colleagues (Ewing & Hamidi, 2014).

Statistical Analysis

All analyses were conducted in Stata S.E. version 13. The policy, BRFSS, and control measures were linked using county geocodes. Because the study was restricted to only 96 counties included in BRFSS, all analyses were run using the unweighted BRFSS data.

Separate logistic regression models were used to examine the associations between each county-aggregated zoning element (i.e., code reform zoning and each required active living-oriented zoning marker) and PA outcome. Standard errors were adjusted using robust clustering at the county level. All regression models controlled for the individual and county characteristics included in Table 2.

Results

Sample Characteristics

Table 2 contains descriptive statistics for the sample, including the policy predictors, PA outcomes, and individual and county-level control variables. More than one-third (39%) of the sample was exposed to code reform zoning. The most prevalent active living-oriented zoning requirements were for: sidewalks (59%), bike parking (street furniture) (52%), active recreation (49%), other

walkability (e.g., pedestrian orientation, traffic calming) (45%), and bike-pedestrian connectivity (37%). The least prevalent zoning

elements were requirements for bike lanes (8%), MU development (13%), and crosswalks (13%). The most prevent PA behavior was

walking (49%) followed by running/jogging (12%). Six percent or fewer adults in the sample engaged in vigorous running/jogging,

biking, or vigorous biking.

The sample was comprised of predominantly non-Hispanic, White adults who were married and had a college degree, and

included slightly more females (57%) than males (43%). Two in five adults in the sample had an income of $75,000 or greater with

68% of the sample reporting an income of greater than $35,000. The mean BMI was 27.54.

Insert Table 2 about here

Relationship between Zoning Codes and Adult PA

The logistic regression models are presented in Table 3. The table includes separate odds ratios and 95% confidence intervals (CI)

for each regression model run (i.e., 12 zoning predictors x 5 outcomes=60 separate regressions). Each model controlled for the

individual and county controls included in Table 2 and each model was clustered on county with robust standard errors.

As Table 3 indicates, the zoning elements were most likely to be associated with biking, vigorous biking, and walking; a few

elements were associated with running/jogging and only one element was associated with vigorous running/jogging at the p<.05 level.

Code reform zoning was associated with increased odds of biking and vigorous biking but was not associated with walking,

running/jogging, or vigorous running/jogging. Zoning for sidewalks was associated with increased odds of running/jogging but not walking, and zoning for bike lanes was associated with increased odds of walking and running/jogging but not with the biking-related outcomes. Zoning for bike parking (which served as a proxy for street furniture in our coding), was associated with increased odds of biking, vigorous biking, and walking. Zoning for bike-pedestrian trails/paths was associated with increased odds of biking and vigorous biking. Zoning requirements for MU were associated with increased odds of each of the five adult PA outcomes. Zoning for active recreation (e.g., parks with sports fields, playgrounds, equipment) features was associated with increased odds of biking, vigorous biking, and walking; while zoning for passive recreation (e.g., greenways, open space) features was associated with increased odds of biking, vigorous biking, and running/jogging.

Insert Table 3 about here

Discussion

To our knowledge, this is the first nationwide study to examine the association between zoning codes and adult leisure time PA. We hypothesized that code reform zoning and more active living-oriented zoning codes would be associated with increased adult leisure-time PA. Overall, we did find positive associations between code reform and active living-oriented zoning and adult PA, particularly with biking, vigorous biking and walking behaviors and particularly for zoning for mixed use and active and passive recreation.

Although walking was the most prevalent leisure time PA behavior (49%) and code reform zoning is intended to lead to pedestrian-oriented communities and land use (Schilling & Linton, 2005; Schilling & Mishkovsky, 2005; American Planning Association, 2006), the association between code reform zoning and the active living-oriented zoning markers was not as strong with walking as it was with biking and vigorous biking. It may be that the walking infrastructure in the communities has been in place for some time and code reform or active living-oriented zoning was not necessary to improve walking behaviors. At the same time, the odds of adult walking were greater in counties with a higher proportion of the population covered by zoning requirements for bike lanes, bike parking (street furniture), MU, and active and passive recreation. The MU finding was consistent with the literature which has found associations between mixed land uses and more walkable communities (Heath et al., 2006; Ewing et al., 2014b; Ewing et al., 2011; Sallis & Glanz, 2006; Handy et al., 2002; Davison & Lawson, 2006; Ewing et al., 2003; Saelens et al., 2003b; Saelens et al., 2003a; Ewing & Cervero, 2010; Sallis et al., 2015). Changing zoning classifications (such as mixed use) through passing a new ordinance is much easier than changing the actual use for a parcel (Anderson et al., 2013). Therefore, an ordinance change is an easy tool for policy makers to promote MU which is strictly regulated by zoning. The association between walking and bike lanes may suggest that such policy elements are more prevalent in active living-oriented and more compact communities given their low prevalence overall. One possible explanation for the association between walking and bike parking/street furniture may suggest that such amenities help to encourage walking behaviors (Ewing et al., 2006). And, by their nature, active recreation (e.g., parks with playgrounds, sports fields, equipment) and passive recreation (e.g., greenways and open space) areas are intended to facilitate walking and PA generally.

At the same time, however, we found positive and significant associations for both code reform zoning and several active living zoning markers with biking or vigorous biking even though only 6% and 5% of the adults sampled engaged in these activities. These findings are consistent with previous research (Pucher et al., 2010) showing the association between supportive biking infrastructure and bicycling. This suggests that zoning codes may provide the policy foundation to facilitate infrastructure development that is supportive of biking-related behaviors, particularly bike parking, trails/paths, MU development, and active and passive recreation.

The findings in this study are subject to several limitations. First, this was a cross-sectional study limited to one year of data. Hence, the findings should be interpreted as associations rather than causation. During the course of the study, BRFSS changed the public use file geocodes to remove county identifiers in the 2013 dataset (only odd years of BRFSS could be used for this study given the nature of the PA questions asked). Future studies should include multiple years of BRFSS data if accessible. Second, we believe that zoning may be both exogenous and endogenous to adult leisure time PA. It is likely that individuals who regularly engage in leisure time PA may purposefully seek to live in communities with more active living-oriented zoning and built environments (exogenous effect). Additionally, as hypothesized herein, zoning can lead to improvements in the built environment which can then lead to more leisure time PA (endogenous effect). We were unable to effectively test endogeneity and exogeneity herein and future studies should aim to do so using alternative study designs. Third, although we attempted to include a policy lag, we were limited by our data collection timeline. We can note based on the information compiled that the majority of communities' zoning codes were on-the-books well before our January 2010 cutoff; however, it was not possible to tease out exactly which elements were enacted at a given point in time (e.g., was MUZ permitted as of 2005). Fourth, the PA outcomes were based on self-reported data rather than

objectively measured behaviors. As noted earlier, BRFSS has been shown to be highly reliable and moderately valid on the PA measures (Pierannunzi et al., 2013). Given the nationwide nature of this study and the number of jurisdictions included, BRFSS provided the best available data to answer the study questions. Fifth, because some jurisdictions' zoning would only apply to a portion of a city or as an overlay within a specific area, we were unable to assess the extent of coverage for the zoning measures within each jurisdiction. Because of this limitation, we decided to review all zoning districts that fit under our established categories by evaluating the intent statements for each district included in a code to determine their inclusion. Thus, the zoning measures may overstate the extent to which a given zoning provision applies within a given county. Sixth, although our sample of counties spans the U.S., it focuses entirely on the largest counties in the U.S. which cover approximately 40% of the U.S. population; therefore, our results cannot be generalized beyond the sample of counties studied. The counties sampled are all very large, densely populated urban counties which limited our ability to further test the differential strength of associations between policies and PA in less densely populated or rural areas. Future studies would be well-served to try to address this limitation which we were unable to address given the scope of this study. Seventh, we recognize that zoning is not solely responsible for changes to the built environment. Infrastructure (i.e. sidewalks, bike lanes, etc.) changes can also be developed through capital improvement plans, impact fees, and design guidelines (American Planning Association, 2006). However, zoning is a key policy lever available to support active living-oriented community design and should not be overlooked. Finally, although we controlled for community walkability using proven and reliable methods (Slater et al., 2010), we did not have objective measures of the built environment to directly correspond to our zoning measures (e.g., trails, bike lanes, sidewalks, parks, etc.). Future studies should compile such measures using regional, state and local GIS data

combined with objective assessments such as those obtained through direct observation or using innovative methods such as Google Street View photography which the study team is currently exploring using a sample of the communities from this study (Kelly et al., 2013; Wilson et al., 2012).

Yet, even with these limitations, this study breaks new ground in making a linkage between zoning policymaking and adult PA. We found code reform and more active living-oriented zoning to be associated with adult PA. These findings may provide a useful starting point for cross-sector discussions between the public health and planning and zoning communities. Given that adult PA remains relatively stagnant, such conversations may provide a useful tool for communities seeking to plan for a future that includes communities where people want to live by virtue of their built environment and PA-supportive infrastructure and zoning.

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On-line Appendix 1: Definitions, terminology, and acronyms

Term	Definition/Acronym
Zoning code types	
Traditional/Euclidian Zoning	Traditional as-of-right zoning in which district regulations are explicit; residential, commercial, and industrial uses are separated; and bulk and height controls are established.
Unified Development Code	A land use ordinance that combines zoning, subdivision regulations, site plan controls, and administrative and hearing procedures into a single unified code.
Code Reform Zoning	Code reform districts emphasize walking, biking, pedestrian orientation, connectivity, mixed use, or other active-living elements. For this study we specifically evaluated common code reform codes/districts including: form-based codes, SmartCodes, transect-based codes, New Urbanist districts, pedestrian-oriented districts/developments, transit-oriented districts/developments, and traditional neighborhood districts.
Zoning categories/districts	
District categories	Typical zoning districts included in the code were categorized and active living policy elements were evaluated within them. The categories included code reform, commercial, mixed use, park/recreation/open space, planned unit development, public/civic/government, residential, and general zoning elements.
Code reform categories	
Form based codes	Zoning that regulates building form rather than, or in addition to, land use. The focus of form based codes is to create compact, connected, mixed use, pedestrian-friendly areas.
SmartCode	A SmartCode is a model form-based unified land development ordinance that utilizes transects. This code is used to discourage sprawl and promote development of walkable areas.
Transect-based code/district	A transect is a series of zones that categorize development from rural to urban areas. A transect district/code is considered form-based because the regulations are tailored to each place to reflect local character and form.
New Urbanist districts	New Urbanism promotes the creation and restoration of diverse, walkable, compact, vibrant, mixed-use communities. The principles of New Urbanism include walkability, connectivity, mixed use and diversity, mixed housing, quality architecture and urban design, traditional neighborhood structure, increased density, sustainability, and increased quality of life.
Pedestrian-oriented districts/developments (POD)	Pedestrian-oriented districts/developments foster a safe pedestrian environment by utilizing design guidelines that promote compact development, a variety of dwelling types, streets with traffic calming features, interconnected streets, and pedestrian-scale design.
Transit-oriented districts/developments (TOD)	An area usually within one-quarter of a mile from a transit stop that is characterized by compact development, higher density, and a mixture of land uses.
Traditional Neighborhood districts (TND)	A style of development that emulates the style of walkable development that occurred in urban areas up until about the 1940s. It encourages mixed uses and is often characterized by grid street patterns, pedestrian-orientation, and a focus on civic uses.

Term	Definition/Acronym
Active-living zoning code/district elements	
Active-living policy element	A zoning policy that promotes active-living. The active-living policies evaluated specifically address the development of sidewalks, crosswalks, bike/pedestrian connectivity, street connectivity, bike lanes, bike parking, bike/pedestrian trails, mixed use, active recreation, passive recreation, or other items that would promote walking such as traffic calming measures or pedestrian-oriented buildings/landscapes.
Element strength	The strength assigned (required, encouraged, no strength) for each active-living policy element (sidewalk, bike lane, bike parking, ect.) mentioned in each district category. For this paper we specifically examined the association between **requirements** for markers across districts/zones and physical activity outcomes. A required element will include language such as: will, shall, must, is mandatory. For example a code might state: "Sidewalks shall be required on both sides of a street."
Common terms and acronyms	
Physical activity	PA
Mixed use	MU
Mixed use zoning	MUZ
Traditional Neighborhood Development	TND
Pedestrian-oriented development	POD
Transit-oriented development	TOD
Policy requirements	_REQ
Body mass index	BMI
Most definitions quoted or derived from: Davidson, M., & Dolnick, F. (2004). A Planner's Dictionary (PAS Report 521/522). Chicago, IL: American Planning Association. *American Planning Association. (2006). Planning and Urban Design Standards (1st ed.). Hoboken, NJ: John Wiley & Sons, Inc.* New Urbanism. Retrieved July 30, 2015, from: http://newurbanism.org/	

On-line Appendix 2. Instrument for Evaluating Code Reform and Active Living Components of County/Municipal Zoning Codes (Source: Chriqui et al., University of Illinois at Chicago, 2013)

NCI Code Reform Project: Policy Coding Instrument

A. Community Identification Information

FIPS15: __ __ __ __ __ __ __ __ __ __ __ __ __ __ __

Summary Level Code: ___ ___ ___

Place Name:

County Name:

State Name:

Keep Level:

B. Coder and Zoning Code Information

Coder ID Number: 1 0 ___ ___

Coding Date: ___ ___ / ___ ___ / 2 0 ___ ___

Community Type	
County	1
Place	2

Zoning Code Status	
Zoning code exists	1
No zoning code (verified)	0
Missing zoning code (non-responder)	9

If "Zoning code exists" is selected, continue to next column

B. Coder and Zoning Code Information (Cont.)

Policies Coded	
County	1
Place	2
Place and County	3

Zoning Code Adoption Date
__ __ / __ __ / __ __ __ __

Zoning Code Most Recent Amendment Date
__ __ / __ __ / __ __ __ __

Zoning Code Source(s)	Y	N
Online code publisher	1	0
Other code publisher	1	0
Community website	1	0
Planning/Zoning Office website	1	0
Community mail/email	1	0
Other (specify):	1	0

Zoning Code Type(s)	Y	N
Traditional/Euclidean	1	0
Code Reform	1	0
Unified Development Code (UDC)	1	0

If "Code Reform" is selected, provide dates below

Code Reform Adoption Date
__ __ / __ __ / __ __ __ __

Code Reform Most Recent Amendment Date
__ __ / __ __ / __ __ __ __

If "Code Reform" is selected, continue to next column

B. Coder and Zoning Code Information (Cont.)

Code Reform Type		*Full SC?	
		Y	N
SmartCode*	1		
Full Form-Based Code (non-SmartCode)	2	1	0
Code Reform District(s)/Regulations Only	3		

Code Reform District(s)/Regulations Present in Overall Zoning Code	Present?		Overlay?		Optional?	
	Y	N	Y	N	Y	N
Form-Based District(s)/Regulations	1	0	1	0	1	0
Transect-Based Zone(s)/District(s)/Regulations	1	0	1	0	1	0
New Urbanist District(s)/Regulations	1	0	1	0	1	0
Pedestrian-Oriented Development (POD) District(s)/Regulations	1	0	1	0	1	0
Transit-Oriented Development (TOD) District(s)/Regulations	1	0	1	0	1	0
Traditional Neighborhood Development (TND) District(s)/Regulations	1	0	1	0	1	0
Other Code Reform District(s)/Regulations (specify):	1	0	1	0	1	0

ZONING DISTRICT CATEGORY DEFINITIONS
Code Reform = Form-Based, Transect-Based, New Urbanist, POD, TOD, or TND districts/regulations
Commercial = Commercial, Downtown, or Highway districts
Mixed Use = Mixed Use districts
Park, Rec, Open Space = Park, Recreation, or Open Space districts
Planned Unit Development (PUD) = all PUD (residential, commercial, and/or mixed) regulations
Public, Civic, Gov't = Public, Civic, Government, School, or Institutional districts
Residential = Residential districts
General Zoning Provisions = Overall Zoning Code or UDC (non-Code Reform)
STRENGTH OF PROVISION DEFINITIONS
Req (Required) = strongest provision found in district category has strength of required
Enc (Encouraged) = strongest provision found in district category has strength of encouraged
No = strongest provision found in district category has no strength
TYPE OF USE DEFINITIONS
Allow (Allowed)= permitted, conditional, or accessory use
None= use not specified
[**Prohib** (Prohibited)= prohibited use; *only applicable to mixed use markers*]
[**Mixed**= both allowed and prohibited uses for districts within category; *only applicable to mixed use markers*]

C. Zoning District Category Coding

ZONING DISTRICT CATEGORIES PRESENT	Yes	No	Community Districts Coded
1. CODE REFORM CATEGORY	1	0	
2. COMMERCIAL DISTRICTS CATEGORY	1	0	
3. MIXED USE DISTRICTS CATEGORY	1	0	
4. PARK, REC, OPEN SPACE DISTRICTS CATEGORY	1	0	
5. PLANNED UNIT DEVELOPMENT (PUD) CATEGORY*	1	0	
6. PUBLIC, CIVIC, GOV'T DISTRICTS CATEGORY	1	0	
7. RESIDENTIAL DISTRICTS CATEGORY	1	0	
8. GENERAL ZONING PROVISIONS	1	0	

*PUD Type(s)	Y	N
Primarily Commercial	1	0
Primarily Residential	1	0
Mixed	1	0
General or Unknown	1	0

Answer if PUD category is present

Category Present? Y / N — 1. Code Reform Category

1. Code Reform Category	Addressed? Yes	Addressed? No	Strength Req	Strength Enc	Strength No	Type of Use Mixed	Type of Use Allow	Type of Use Prohib	Type of Use None	Citation(s)
A. Sidewalks	1	0	2	1	0	-	-	-	-	
B. Crosswalks	1	0	2	1	0	-	-	-	-	
C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
D. Street Connectivity	1	0	2	1	0	-	-	-	-	
E. Bike Lanes	1	0	2	1	0	-	-	-	-	
F. Bike Parking	1	0	2	1	0	-	-	-	-	
G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
H. Other Walkability	1	0	2	1	0	-	-	-	-	
I. Mixed Use	1	0	2	1	0	2	1	-1	0	
J. Active Recreation	1	0	2	1	0	-	1	-	0	
K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Category Present? Y / N — 2. Commercial Districts Category

2. Commercial Districts Category	Addressed? Yes	Addressed? No	Strength Req	Strength Enc	Strength No	Type of Use Mixed	Type of Use Allow	Type of Use Prohib	Type of Use None	Citation(s)
A. Sidewalks	1	0	2	1	0	-	-	-	-	
B. Crosswalks	1	0	2	1	0	-	-	-	-	
C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
D. Street Connectivity	1	0	2	1	0	-	-	-	-	
E. Bike Lanes	1	0	2	1	0	-	-	-	-	
F. Bike Parking	1	0	2	1	0	-	-	-	-	
G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
H. Other Walkability	1	0	2	1	0	-	-	-	-	
I. Mixed Use	1	0	2	1	0	2	1	-1	0	
J. Active Recreation	1	0	2	1	0	-	1	-	0	
K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Category Present? Y / N — 3. Mixed Use Districts Category

3. Mixed Use Districts Category	Addressed? Yes	Addressed? No	Strength Req	Strength Enc	Strength No	Type of Use Mixed	Type of Use Allow	Type of Use Prohib	Type of Use None	Citation(s)
A. Sidewalks	1	0	2	1	0	-	-	-	-	
B. Crosswalks	1	0	2	1	0	-	-	-	-	
C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
D. Street Connectivity	1	0	2	1	0	-	-	-	-	
E. Bike Lanes	1	0	2	1	0	-	-	-	-	
F. Bike Parking	1	0	2	1	0	-	-	-	-	
G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
H. Other Walkability	1	0	2	1	0	-	-	-	-	
I. Mixed Use	1	0	2	1	0	2	1	-1	0	
J. Active Recreation	1	0	2	1	0	-	1	-	0	
K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Category Present? Y / N — 4. Park, Rec, Open Space Districts Category

4. Park, Rec, Open Space Districts Category	Addressed?		Strength			Type of Use				Citation(s)

4. Park, Rec, Open Space Districts Category	Addressed?		Strength			Type of Use				Citation(s)
	Yes	No	Req	Enc	No	Mixed	Allow	Prohib	None	
A. Sidewalks	1	0	2	1	0	-	-	-	-	
B. Crosswalks	1	0	2	1	0	-	-	-	-	
C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
D. Street Connectivity	1	0	2	1	0	-	-	-	-	
E. Bike Lanes	1	0	2	1	0	-	-	-	-	
F. Bike Parking	1	0	2	1	0	-	-	-	-	
G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
H. Other Walkability	1	0	2	1	0	-	-	-	-	
I. Mixed Use	1	0	2	1	0	2	1	-1	0	
J. Active Recreation	1	0	2	1	0	-	1	-	0	
K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Y	N	5. Planned Unit Development (PUD) Category	Addressed?		Strength			Type of Use				Citation(s)
			Yes	No	Req	Enc	No	Mixed	Allow	Prohib	None	
		A. Sidewalks	1	0	2	1	0	-	-	-	-	
		B. Crosswalks	1	0	2	1	0	-	-	-	-	
		C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
		D. Street Connectivity	1	0	2	1	0	-	-	-	-	
		E. Bike Lanes	1	0	2	1	0	-	-	-	-	
		F. Bike Parking	1	0	2	1	0	-	-	-	-	
		G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
		H. Other Walkability	1	0	2	1	0	-	-	-	-	
		I. Mixed Use	1	0	2	1	0	2	1	-1	0	
		J. Active Recreation	1	0	2	1	0	-	1	-	0	
		K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Y	N	6. Public, Civic, Gov't Districts Category	Addressed?		Strength			Type of Use				Citation(s)
			Yes	No	Req	Enc	No	Mixed	Allow	Prohib	None	
		A. Sidewalks	1	0	2	1	0	-	-	-	-	
		B. Crosswalks	1	0	2	1	0	-	-	-	-	
		C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
		D. Street Connectivity	1	0	2	1	0	-	-	-	-	
		E. Bike Lanes	1	0	2	1	0	-	-	-	-	
		F. Bike Parking	1	0	2	1	0	-	-	-	-	
		G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
		H. Other Walkability	1	0	2	1	0	-	-	-	-	
		I. Mixed Use	1	0	2	1	0	2	1	-1	0	
		J. Active Recreation	1	0	2	1	0	-	1	-	0	
		K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Y	N	7. Residential Districts Category	Addressed?		Strength			Type of Use				Citation(s)
			Yes	No	Req	Enc	No	Mixed	Allow	Prohib	None	
		A. Sidewalks	1	0	2	1	0	-	-	-	-	
		B. Crosswalks	1	0	2	1	0	-	-	-	-	
		C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-	
		D. Street Connectivity	1	0	2	1	0	-	-	-	-	
		E. Bike Lanes	1	0	2	1	0	-	-	-	-	
		F. Bike Parking	1	0	2	1	0	-	-	-	-	
		G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0	
		H. Other Walkability	1	0	2	1	0	-	-	-	-	
		I. Mixed Use	1	0	2	1	0	2	1	-1	0	
		J. Active Recreation	1	0	2	1	0	-	1	-	0	
		K. Passive Recreation	1	0	2	1	0	-	1	-	0	

Y	N	8. General Zoning Provisions	Addressed?		Strength			Type of Use				Citation(s)
			Yes	No	Req	Enc	No	Mixed	Allow	Prohib	None	

A. Sidewalks	1	0	2	1	0	-	-	-	-		
B. Crosswalks	1	0	2	1	0	-	-	-	-		
C. Bike-Pedestrian Connectivity	1	0	2	1	0	-	-	-	-		
D. Street Connectivity	1	0	2	1	0	-	-	-	-		
E. Bike Lanes	1	0	2	1	0	-	-	-	-		
F. Bike Parking	1	0	2	1	0	-	-	-	-		
G. Bike-Pedestrian Trails-Paths	1	0	2	1	0	-	1	-	0		
H. Other Walkability	1	0	2	1	0	-	-	-	-		
I. Mixed Use	1	0	2	1	0	2	1	-1	0		
J. Active Recreation	1	0	2	1	0	-	1	-	0		
K. Passive Recreation	1	0	2	1	0	-	1	-	0		

D. Complete Streets Policy

COMPLETE STREETS POLICY	Addressed?	
	Yes	No
Complete Streets Policy Addressed?	1	0

Complete Streets Policy Coded	
County	1
Place	2
Place and County	3

Strength			CS Policy Adoption Date	Citation(s)
Req	Enc	No		
2	1	0	__ __ / __ __ / __ __ __ __	

E. Record Notes

Notes for this record:

Form Status	
Incomplete	0
Unverified	1
Complete	2

On-line Appendix 3. Proportion of the county population exposed to municipal/county-level code reform zoning or any zoning requirements for specific land use elements, 2010

County Name	State	Number of Jurisdictions* in County	Code Reform	Sidewalks	Crosswalks	Bike-Ped Connectivity	Street Connectivity	Bike Lanes	Bike Parking	Bike-Ped Trails	Other Walkabiilty	Mixed Use	Active Recreation	Passive Recreation
New York County	New York	1	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
San Francisco County	California	1	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Kings County	New York	1	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Bronx County	New York	1	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Queens County	New York	1	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Philadelphia County	Pennsylvania	1	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00
Baltimore County	Maryland	1	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Bernalillo County	New Mexico	3	0.82	0.82	0.00	0.82	0.82	0.00	0.99	0.82	0.83	0.00	0.17	1.00
Marion County	Indiana	4	0.93	1.00	0.00	1.00	1.00	0.00	0.93	0.00	1.00	0.00	1.00	1.00
Suffolk County	Massachusetts	4	0.90	0.86	0.86	0.86	0.86	0.00	0.86	0.00	0.86	0.00	0.93	1.00
Hillsborough County	Florida	4	1.00	1.00	0.70	1.00	1.00	0.00	1.00	0.70	1.00	0.03	0.73	1.00
Hartford County	Connecticut	4	0.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.07	0.00	0.21	0.29
Davidson County	Tennessee	4	0.97	0.98	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.98
Fairfax County	Virginia	5	0.96	1.00	0.00	1.00	0.96	0.00	0.01	1.00	0.96	0.00	1.00	1.00
Montgomery County	Maryland	5	0.99	0.99	0.00	0.93	0.00	0.00	0.93	0.87	0.93	0.87	0.99	1.00
Norfolk County	Massachusetts	5	0.00	0.05	0.00	0.00	0.00	0.00	0.08	0.00	0.14	0.00	0.00	0.24
Travis County	Texas	5	0.80	0.80	0.05	0.76	0.80	0.00	0.80	0.80	0.76	0.76	0.77	0.77
El Paso County	Texas	5	0.81	0.83	0.00	0.00	0.82	0.00	0.81	0.00	0.81	0.00	0.81	0.83
Duval County	Florida	5	0.95	1.00	0.95	0.96	0.97	0.95	0.97	0.96	0.95	0.01	1.00	1.00
Pima County	Arizona	6	0.00	0.99	0.00	0.61	0.60	0.04	0.96	0.99	0.89	0.00	0.47	0.46
Clark County	Nevada	6	0.87	0.99	0.44	0.98	0.58	0.00	0.24	0.85	0.86	0.11	0.85	1.00
Fairfield County	Connecticut	6	0.39	0.29	0.00	0.13	0.13	0.00	0.00	0.00	0.38	0.00	0.38	0.52
Worcester County	Massachusetts	6	0.08	0.10	0.02	0.02	0.00	0.00	0.05	0.00	0.07	0.00	0.32	0.37
Monroe County	New York	7	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.30
Harris County	Texas	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.03
Essex County	New Jersey	7	0.00	0.09	0.00	0.00	0.02	0.00	0.00	0.00	0.09	0.00	0.02	0.10
Sacramento County	California	7	0.77	0.82	0.00	0.10	0.10	0.33	1.00	0.05	0.00	0.00	0.44	0.53
Providence County	Rhode Island	7	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.19	0.27
Suffolk County	New York	7	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cobb County	Georgia	7	0.04	0.25	0.07	0.10	0.13	0.07	0.23	0.07	0.00	0.08	0.86	1.00
San Joaquin County	California	8	0.00	0.75	0.00	0.21	0.63	0.00	0.97	0.75	0.64	0.30	0.74	0.78
Shelby County	Tennessee	8	0.09	1.00	0.06	0.03	0.82	0.86	0.86	0.87	0.98	0.00	0.13	0.95
Multnomah County	Oregon	9	0.93	0.97	0.14	0.98	0.98	0.18	0.98	0.95	0.16	0.95	0.98	1.00
Jefferson County	Kentucky	9	0.97	1.00	0.00	0.97	0.97	0.97	0.97	0.97	0.97	0.97	1.00	1.00
Bexar County	Texas	9	0.80	0.81	0.00	0.80	0.80	0.80	0.81	0.80	0.80	0.80	0.80	0.82
New Haven County	Connecticut	9	0.10	0.19	0.00	0.26	0.00	0.00	0.15	0.19	0.26	0.11	0.40	0.53
Hudson County	New Jersey	10	0.20	0.52	0.00	0.08	0.00	0.00	0.50	0.02	0.00	0.10	0.27	0.35
Erie County	New York	10	0.29	0.04	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.02	0.02
Essex County	Massachusetts	11	0.10	0.11	0.00	0.16	0.00	0.00	0.00	0.14	0.25	0.08	0.51	0.63
Ventura County	California	11	0.37	0.73	0.24	0.28	0.41	0.37	0.97	0.83	0.79	0.13	0.72	0.89
DeKalb County	Georgia	11	0.94	0.99	0.92	0.94	0.92	0.80	0.99	0.07	0.05	0.09	0.94	0.95
Mecklenburg County	North Carolina	11	0.91	0.95	0.00	0.89	0.11	0.05	0.84	0.06	0.91	0.04	0.12	0.94
Jackson County	Missouri	12	0.71	0.54	0.09	0.27	0.45	0.00	0.26	0.08	0.14	0.08	0.28	0.36
Kern County	California	12	0.00	0.54	0.00	0.43	0.03	0.00	0.48	0.02	0.02	0.00	0.12	0.57
Montgomery County	Pennsylvania	13	0.04	0.07	0.01	0.05	0.03	0.00	0.04	0.04	0.01	0.01	0.05	0.11
Middlesex County	Massachusetts	13	0.22	0.11	0.21	0.14	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.46
Fulton County	Georgia	14	0.48	1.00	0.60	0.93	0.65	0.55	0.92	0.66	0.57	0.42	0.92	0.96
Orange County	Florida	14	0.88	0.99	0.07	0.93	0.98	0.00	0.98	0.96	0.98	0.07	0.99	1.00
Fresno County	California	14	0.02	0.91	0.00	0.02	0.02	0.01	0.69	0.03	0.62	0.54	0.68	0.84
Santa Clara County	California	14	0.72	0.67	0.04	0.10	0.07	0.06	0.84	0.11	0.14	0.12	0.67	0.31

County Name	State	Number of Jurisdictions* in County	Code Reform	Sidewalks	Crosswalks	Bike-Ped Connectivity	Street Connectivity	Bike Lanes	Bike Parking	Bike-Ped Trails	Other Walkabiilty	Mixed Use	Active Recreation	Passive Recreation
Wake County	North Carolina	15	0.74	0.79	0.23	0.46	0.53	0.37	0.70	0.44	0.45	0.27	0.30	1.00
Macomb County	Michigan	15	0.00	0.45	0.00	0.19	0.34	0.16	0.00	0.03	0.02	0.04	0.42	0.39
Oklahoma County	Oklahoma	15	0.08	0.87	0.00	0.78	0.72	0.00	0.11	0.00	0.66	0.00	0.05	0.76
Franklin County	Ohio	15	0.76	0.92	0.03	0.15	0.07	0.00	0.81	0.77	0.14	0.03	0.18	0.99
Gwinnett County	Georgia	15	0.00	0.17	0.02	0.05	0.01	0.00	0.10	0.03	0.00	0.00	0.03	0.14
Alameda County	California	15	0.65	0.48	0.00	0.24	0.05	0.05	0.77	0.29	0.19	0.10	0.21	0.82
Prince George's County	Maryland	15	1.00	1.00	0.03	1.00	1.00	0.00	0.97	0.97	0.97	0.97	1.00	1.00
Middlesex County	New Jersey	15	0.03	0.28	0.00	0.04	0.13	0.01	0.02	0.08	0.26	0.00	0.19	0.26
Milwaukee County	Wisconsin	16	0.09	0.15	0.05	0.12	0.05	0.00	0.73	0.10	0.76	0.00	0.05	0.11
Maricopa County	Arizona	16	0.51	0.74	0.12	0.18	0.14	0.05	0.73	0.09	0.64	0.03	0.59	0.87
Salt Lake County	Utah	17	0.32	0.82	0.43	0.66	0.43	0.14	0.76	0.45	0.69	0.27	0.31	0.83
Hidalgo County	Texas	17	0.10	0.15	0.00	0.10	0.10	0.00	0.10	0.10	0.10	0.10	0.10	0.12
San Diego County	California	17	0.56	0.66	0.00	0.08	0.50	0.08	0.75	0.53	0.50	0.50	0.76	1.00
Palm Beach County	Florida	18	0.67	0.88	0.60	0.73	0.82	0.49	0.86	0.69	0.80	0.62	0.95	0.96
Collin County	Texas	19	0.16	0.68	0.06	0.07	0.27	0.00	0.22	0.18	0.28	0.16	0.30	0.67
Miami-Dade County	Florida	20	0.84	0.98	0.00	0.83	0.77	0.48	0.81	0.62	0.86	0.01	0.79	0.99
San Mateo County	California	20	0.63	0.30	0.00	0.09	0.09	0.00	0.62	0.20	0.24	0.00	0.35	0.62
Hamilton County	Ohio	20	0.38	0.51	0.00	0.40	0.06	0.00	0.39	0.00	0.42	0.39	0.08	0.53
Contra Costa County	California	20	0.23	0.51	0.00	0.05	0.00	0.07	0.66	0.07	0.17	0.02	0.70	0.91
Tarrant County	Texas	21	0.69	0.85	0.25	0.51	0.46	0.42	0.53	0.52	0.50	0.25	0.35	0.86
Snohomish County	Washington	21	0.43	0.95	0.42	0.83	0.50	0.05	0.74	0.56	0.55	0.01	0.96	0.96
Dallas County	Texas	21	0.78	0.84	0.52	0.62	0.66	0.00	0.63	0.68	0.58	0.48	0.23	0.78
Pinellas County	Florida	22	0.27	0.97	0.05	0.37	0.71	0.12	0.44	0.46	0.72	0.00	0.92	0.98
Denton County	Texas	22	0.39	0.49	0.04	0.35	0.46	0.18	0.61	0.35	0.42	0.36	0.37	0.66
Pierce County	Washington	24	0.33	0.43	0.01	0.13	0.31	0.00	0.94	0.31	0.33	0.06	0.35	0.41
San Bernardino County	California	24	0.02	0.83	0.03	0.24	0.21	0.00	0.84	0.49	0.39	0.13	0.97	0.92
Hennepin County	Minnesota	24	0.43	0.38	0.05	0.27	0.03	0.00	0.73	0.27	0.26	0.18	0.89	0.88
Monmouth County	New Jersey	25	0.02	0.29	0.05	0.00	0.03	0.00	0.00	0.02	0.08	0.00	0.22	0.23
Nassau County	New York	25	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.08
Will County	Illinois	25	0.08	0.21	0.01	0.19	0.08	0.00	0.11	0.08	0.24	0.00	0.33	0.41
Westchester County	New York	27	0.11	0.27	0.02	0.01	0.03	0.00	0.09	0.01	0.03	0.01	0.23	0.46
Riverside County	California	27	0.00	0.40	0.14	0.17	0.00	0.00	0.55	0.03	0.31	0.09	0.76	0.84
Allegheny County	Pennsylvania	27	0.05	0.41	0.00	0.01	0.01	0.00	0.29	0.01	0.32	0.00	0.44	0.54
Broward County	Florida	27	0.30	0.81	0.28	0.40	0.50	0.17	0.45	0.20	0.76	0.09	0.82	0.91
Jefferson County	Alabama	29	0.55	0.43	0.00	0.64	0.19	0.00	0.52	0.40	0.36	0.07	0.40	0.90
Wayne County	Michigan	31	0.40	0.24	0.05	0.08	0.10	0.00	0.05	0.06	0.61	0.01	0.23	0.32
Oakland County	Michigan	32	0.03	0.50	0.01	0.22	0.10	0.01	0.11	0.13	0.08	0.01	0.24	0.33
DuPage County	Illinois	33	0.02	0.14	0.00	0.10	0.12	0.00	0.17	0.05	0.06	0.00	0.53	0.76
Orange County	California	34	0.31	0.60	0.04	0.18	0.02	0.04	0.68	0.38	0.22	0.11	0.75	0.93
Cook County	Illinois	34	0.08	0.76	0.00	0.02	0.01	0.01	0.76	0.00	0.02	0.00	0.09	0.82
Lake County	Illinois	37	0.07	0.30	0.00	0.10	0.17	0.00	0.09	0.22	0.17	0.04	0.49	0.71
Cuyahoga County	Ohio	38	0.00	0.78	0.02	0.16	0.18	0.00	0.40	0.03	0.12	0.00	0.67	0.78
King County	Washington	40	0.53	0.86	0.22	0.72	0.44	0.41	0.80	0.48	0.73	0.00	0.91	0.87
St. Louis County	Missouri	42	0.02	0.82	0.00	0.10	0.51	0.00	0.01	0.07	0.08	0.40	0.31	0.38
Bergen County	New Jersey	55	0.01	0.41	0.00	0.00	0.16	0.00	0.01	0.02	0.09	0.00	0.17	0.34
Los Angeles County	California	79	0.63	0.76	0.01	0.08	0.05	0.00	0.80	0.66	0.71	0.00	0.82	0.94

*Number of municipal jurisdictions in the county with population >0.5% of the county population