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Pillar Talk: Local Sustainability Initiatives and Policies in the United States—Finding Evidence of the "Three E's": Economic Development, Environmental Protection, and Social Equity

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Abstract

This article examines local sustainability initiatives in the United States through the lens of the "three pillars" of sustainability: economic development, environmental protection, and social equity. A comprehensive index is created using national-level survey data on local sustainability initiatives, then census and other data are used to examine local activities related to all three pillars of sustainability. Analysis of a series of correlations and means comparisons provides evidence that several factors are interrelated with local government engagement in sustainability initiatives, including population size, central city locations, diversity, ethnicity and race, political leanings of a community, and region. In addition, cities are ranked by their scores on this index creating a "best cases" list for future research.

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Introduction

"Sustainability" and "sustainable development" have found a place in many local political agendas. Although both are commonly used terms, they are not always consistently defined. For many, sustainability is simply another word for environmental policy or protection. However, across several academic disciplines, sustainability has a more complex and multifaceted meaning. In a recent literature, scholars have defined sustainability as being made up of three interrelated and equally important pillars: environment, economics, and social justice or equity. However, empirical research has not routinely examined sustainability practices through these three pillars; instead, research tends to focus singly on environmental sustainability or sustainable economic development.

One of the newest growing research areas related to the pursuit of sustainability is that of the initiatives pursued by American cities. Research cataloging and examining various aspects of local government sustainability efforts has become more prominent in the literature (Jepson 2004; Portney 2003; Saha 2009; Saha and Paterson 2008). The consistent lesson to be drawn from this research is that American cities place a greater emphasis on environmental or economic policies while minimizing—or outright ignoring—the social equity or justice dimension of sustainability. In fact, little empirical evidence or analysis exists that examines the efforts of American cities in pursuing all three dimensions of sustainability.

This article begins to explore some of the many unanswered questions related to municipal actions directed at pursuing sustainability. Using a large nationwide sample of local sustainability initiatives and policies, we create a comprehensive sustainability index to explore the patterns and relationships across the United States. To begin to understand sustainability efforts across the United States, this article first outlines the relevant academic literature on sustainability and sustainable development, then moves to a discussion of the data and method used to examine local sustainability initiatives and policies, and concludes with findings and lessons learned.

Sustainability and Sustainable Economic Development

The perceived dichotomy between economic development and environmental protection has existed for decades. A large portion of early scholarship examining the natural environment was rooted in a paradigm that viewed never-ending economic growth as detrimental to the natural environment. In fact, according to adherents of Thomas Malthus (so-called "neo-Malthusians"), population and economic growth were to *blame* for environmental degradation: "Neo-Malthusians fear the 'trap' of what they call overpopulation. They believe humanity will fall into it unless we undergo a change in values that will lead us to have fewer children and consume less" (Emmett 2006, p. 2). Similarly, from the economic perspective, some scholars posit that cities are rational actors that are ultimately subordinate to economic interests and will (and perhaps by some accounts should) promote policies that help capture new investment (Peterson 1981; Tiebout 1956). Under these related perspectives, a city should pursue what is best and most attractive for private business to improve a city's economic standing and ultimately increase tax revenues. The competition of cities for economic growth, and the residents who pay taxes, is theorized to lead to an efficient outcome for cities. However, under this perspective, environmental quality may not necessarily be viewed as being congruent with private business interests, leading to a race-to-the-bottom phenomenon in environmental protection.

However, with the emergence and widespread acceptance of sustainable development as a theoretical paradigm, economic growth/development and environmental protection began to be viewed as something that could be pursued simultaneously. Essentially, sustainable development theory says, "Continuous growth is possible if it is done in the right way" (Vig and Kraft 2013, p. 372). In addition to the concern with the environment and economy, many proponents of sustainable development also argue that engaging in sustainable development requires attention be paid to those in greatest social need (Vig and Kraft 2013). Communities that do not consider income inequalities, social injustices, and environmental equities will inevitably be unsustainable.

The idea of global sustainable development can be traced back to at least 1969 when the International Union for Conservation of Nature (IUCN) declared that it was possible to achieve economic growth without environmental harm (Adams 2006). Certainly, the 1987 Brundtland Report catapulted the concept of sustainable development into mainstream policy dialogues.

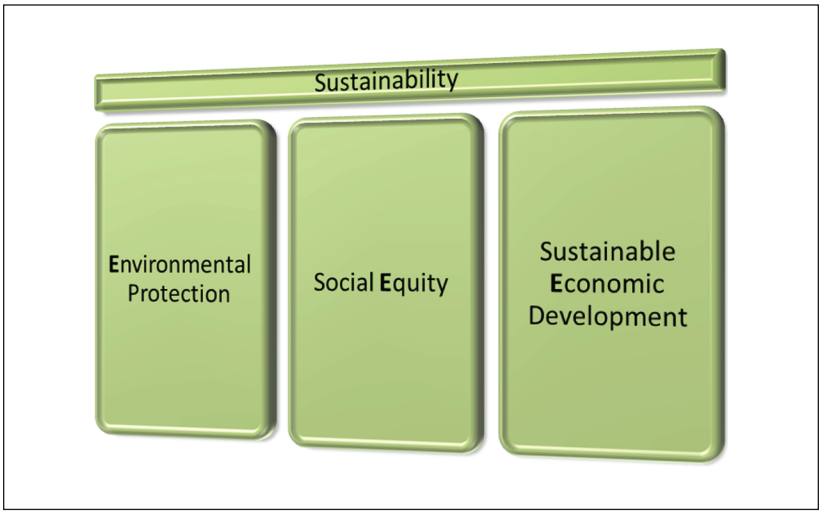

Figure 1. The three pillars of sustainability
Source: Adapted from Adams (2006).

However, in the years following the publication of this report, many were left with varying definitions and understanding of exactly what constitutes sustainability and sustainable development (Goodland 1995; Hopwood, Mellor, and O'Brien 2005; Mazmanian and Kraft 2009). Even with the lack of uniform definition of sustainability and/or sustainable development, many communities are currently attempting to integrate the basic principle into their day-to-day practices (Warner 2002).

Although many practitioners and policy makers do not always agree upon one definition of sustainability, scholarly literature has identified three interrelated dimensions (sometimes referred to as the "Three E's") important for the pursuit, and eventual success, of a sustainable future: *E*nvironmental Protection, *E*conomic Growth, and Social Progress or *E*quity (Adams 2006; Campbell 1996; Jepson 2004; Saha and Paterson 2008). Often illustrated as three pillars holding up, or supporting, sustainability (see Figure 1), the three dimensions are believed to be equally as important to achieving a sustainable future.

Of the Three E's of sustainability, social equity is the most ill understood and ill defined, and as such it is not examined in most sustainability studies. To a growing set of contemporary scholars, equity concerns are intimately related to the economic and environmental condition of the community and therefore must be considered to achieve perpetual sustainability (Saha 2009). Saha (2009, p. 18) stated, "While environmental protection has received

substantial attention in empirical research, it is now understood that social justice issues are intertwined with the economic and environmental health of the community." It has also been argued that although social justice has largely been absent or understudied in sustainability research, it has been directly linked to environmental issues for several decades under the environmental justice banner (Warner 2002).

Within the environmental justice literature, social justice is conceptualized as having both distributional and procedural elements (Pearsall and Pierce 2010). The distributional elements are of specific interest to sustainability research. Distributional justice deals with how benefits and burdens of the environment are distributed across people and places in a community. From this body of environmental justice literature, a *just sustainability* paradigm has begun to emerge (Agyeman 2008). This paradigm seeks to encourage and create sustainable communities for *all* people. More simply stated, a socially equitable distribution of environmental amenities or goods is important for sustainability and should therefore be part of a community's larger sustainability efforts (Alkon 2008). A number of contemporary scholars call for a consideration of social needs and equal economic opportunity in local sustainability efforts (Haughton 1999; Warner 2002).

Globally, sustainability efforts have been very diverse and widespread. Across the world, "[g]overnments, communities and businesses have all responded to the challenge of sustainability to some extent" (Adams 2006, p. 2). Various case studies and empirical evidence exists that begins to document the variety of laws, regulations, and efforts directed at some combination of the Three E's across the global community (see, for example, Chifos 2007; Heberle and Opp 2008; Jepson 2004; Lubell, Feiock, and Handy 2009; Nijkamp and Pepping 1998; Portney 2003; Wheeler and Beatley 2009; Zeemring 2009). Past research has also examined a variety of more specific environmental aspects of sustainability, such as climate change (Betsill and Rabe 2011) and clean energy (Slavin, Codiga, and Zeller 2011), among others. Specific economic aspects to sustainability have also been explored, mostly under the auspices of sustainable development or sustainable economic development (Fitzgerald and Leigh 2002; Heberle and Opp 2008). As discussed above, the third E of sustainability, social equity or justice, has remained underresearched in the sustainability literature (Saha 2009).

Sustainable Cities

Although the literature recognizes that American cities lag behind their international counterparts in their sustainability efforts, they are still important subjects for inquiry (Slavin 2011). Recognizing the importance of American

cities in the global quest for sustainability, scholarly attention has increasingly turned to American cities as subjects of research on sustainability initiatives (Anglin 2011; Pierce, Budd, and Lovrich 2011; Portney 2003; Saha and Paterson 2008). To date, the majority of the sustainable cities research involves case studies, prescriptive urban planning lessons, and attempts to measure the successes of individual-level sustainability initiatives (Conroy 2006; Jepson 2004; Portney 2003; Saha 2009). However, what is apparent from the literature is that most scholars working in this area focus primarily on the environmental aspect of sustainability while either outright ignoring or minimizing the other two components (Saha 2009). Of particular interest and relevance to this research are the scholars who have attempted to examine and catalog local sustainability programs and initiatives occurring throughout the United States (Conroy 2006; Jepson 2004; Portney 2003; Saha and Paterson 2008).

Prior Identification, Ranking, and Index Creation of Sustainability Initiatives in American Cities

Several contemporary scholars have explored local sustainability initiatives in the past decade. Probably, the most well known is Portney's (2003) book dealing with sustainable cities. In this seminal piece, Portney created a sustainability index to explore cities' activities related to sustainability. His index included several broad areas identified as being important to sustainability (see Appendix A for comparisons of several important past indices with our newly constructed index). When taking into consideration Portney's individual-level indicators, his index had a potential score of 0 to 34, with a score of 34 indicating a city that is the most serious about sustainability. Ultimately, Portney was able to catalog sustainability initiatives and rank 24 cities using his index. At the top of his rankings were Seattle (Washington), Scottsdale (Arizona), San Jose (California), Boulder (Colorado), and Santa Monica (California). Important to note is that Portney's primary focus is on the environmental aspect of sustainability and he does not explicitly take into consideration social equity or justice in his ranking of sustainability in cities. In addition, his selection of cities to examine is based upon prior knowledge of sustainability initiatives already in place in select cities.

While Portney is probably the most well-known sustainable cities scholar, others have followed in his path. In 2004, Jepson used the results from surveys of cities with at least 50,000 people to catalog what actions cities were taking related to 39 sustainability policies. Jepson received a response of 103 cases, or 26.4%, of his 390 surveyed cities. His findings indicated that there are "[f]airly high activity levels among communities of all sizes and in all parts of the country with respect to a wide range of policies and techniques"

(Jepson 2004, p. 237). In his limited rankings, Jepson found that Minneapolis (Minnesota), Oakland (California), Tacoma (Washington), Tucson (Arizona), St. Paul (Minnesota), and Elizabeth (New Jersey) were the most engaged cities in sustainability practices.

In 2008, Saha and Paterson used a survey of medium to large cities (defined as cities with more than 75,000 people) to examine how well local governments are promoting the Three E's of sustainability. This was the first notable attempt at cataloging and ranking that explicitly examines the three pillars of sustainability rather than focusing primarily on environmental policy adoption. The authors created an index of 36 initiatives based upon previous research and experts' input to examine sustainability. Based upon the 216 surveys that were returned, the authors were able to conclude that although cities are engaging in activities related to sustainability, many are not undertaking an explicit sustainability program. In addition, these authors find that cities are most commonly engaged in the environmental aspects of sustainability, whereas social equity is less frequently seen in their sustainability initiatives.

Other research has also been conducted to examine sustainability policy adoption across a smaller geographical scope. For example, in 2006, Conroy surveyed municipalities and counties in Indiana, Kentucky, and Ohio to examine sustainability understanding and adoption across the region. Using the data collected from the survey, Conroy was able to conclude that sustainability as a concept is well known, but not commonly adopted as a new planning paradigm across these three states. In a more recent example, in 2009, Lubell, Feiock, and Handy examined 100 cities in the Central Valley area of California. Using their index, these scholars were able to conclude that cities with better fiscal health and whose residents have higher socioeconomic status were more likely to engage in sustainability practices.

This article builds off of the previous sustainable cities research and seeks to improve the definition and the measurement of local sustainability practices. According to sustainable development theorists, a sustainable future is dependent upon the pursuit of the three dimensions of sustainability. However, past research in this area fails to adequately examine all three pillars of sustainability. To assess the progress, American cities are making toward a sustainable future, and measurement of sustainability practices must take into consideration all Three E's of sustainability.

Approach and Scope

Although some important lessons can be drawn from the previous research on local sustainability initiatives, most are limited in their examination and potential for generalizability. Portney (2003) simply examined 24 cities that

he identified from the extant literature as having sustainability initiatives. Jepson (2004) examined 103 cities with at least 50,000 people. Saha and Paterson (2008) examined 216 cities with populations of at least 75,000. To truly capture the breadth of sustainability initiatives, it would seem prudent to examine an available larger national-level sample of municipal and town/township governments in the United States without limiting examination to certain population sizes or a specific geographic scope.

Many of the research designs seen in the previous sustainability studies raise questions of the potential for case-selection bias in the results, as well as a lack of generalizability of the findings across the urban context of the United States. Moreover, for those who used surveys, the instruments were far less comprehensive and inclusive with respect to the "Three E's" than would be ideal for an examination of sustainability in a way that captures all three dimensions, and therefore more-validly measuring sustainability.

This article adds to the sustainable cities literature by examining what local characteristics help explain the engagement in sustainability initiatives when operationalizing sustainability in a way that captures all three important dimensions. As will be described in the following sections, we have created an index that equalizes all of the Three E's so that environmental commitment alone does not drive a finding of a higher commitment to sustainability. Important to note is that, if sustainability is made up of the three pillars described above, then measuring which cities are more sustainable requires an examination of more than just environmental policies a city has adopted. Sustainability is a broader concept and, as such, the measurement of sustainability must capture all three of the dimensions of sustainability.

The 2010 International City/County Management Association (ICMA) Survey Data

The analysis presented below is based upon a national-level survey conducted by the ICMA in 2010.[1] Rather than selecting cities from a small geographic scope or selecting cities based upon knowledge of sustainability initiatives, this survey draws upon all municipalities in the United States with at least 2,500 people. The data collected from this survey enable a wider examination of sustainability initiatives across the United States.

Although the comprehensiveness of the ICMA data is an improvement upon previous research, this is not to say that the ICMA data are not without problems. First, these data lack any measures of policy effectiveness; to be sure, to truly measure the impact of sustainability practices, more detailed information regarding various indicators and performance measurement data

is required. Unfortunately, this is not something our research can examine. In reality, progress on sustainability efforts is something that many local governments do not collect consistent or good information on and therefore would likely require a qualitative inquiry or a much smaller sample of cities. Second, as with any survey data, some self-selection bias exists in what cities elect to respond to the survey,[2] which can pose some problems with the sample not being perfectly representative of the population we are attempting to generalize to.[3]

The response rate for this instrument was 25.4%, yielding a total of 2,176 local governments that responded to the 2010 ICMA survey. Given the significant differences between county, district, and municipal units of government relative to its power and available resources, we made a decision to examine only municipal government units and eliminate the other types of local governments in this analysis. After dropping the county units of government and the two district respondents, 1,873 cases remained. The analyses reported here then exclude cities from the analysis that specified in answers to three questions about each of the three components of sustainability that at least one of the E's was "not a priority" for their city (the first value on a four-point Likert scale with answers ranging from "not a priority," "somewhat a priority," "a priority," and "a high priority")[4]; this resulted in a final sample size of 1,340 cases.[5]

Method and Measurement

One of the primary goals of this research was to design a more valid and comprehensive measure of the three pillars of sustainability. To accomplish this, we assembled 84 indicators of various components of these various policy areas from the 2010 ICMA survey data. We made measurement and categorization decisions based on past literature, including Portney (2003) and Saha and Paterson (2008).

Compared with previous research, our index, then, is created in a more inclusive and exhaustive manner relative to the Three E's of sustainability. First, unlike the vast majority of previous research, we explicitly identify and include indicators from all three dimensions of sustainability. We also weight each dimension equally to better capture a city's commitment to the "Three E's" definition of sustainability. Second, unlike all of the other research concerning local sustainability efforts, this research has a large sample of cities from across the United States and of all population sizes.

The Opp–Saunders Sustainability Practices Index (OSSPI)

We constructed an index for each of the three pillars of sustainability for our sample by treating each of the 84 valid indicators of an element of sustainability as equal in value.[6] The components of this index and its constituent subindices, as well as comparisons with other scholars' previous efforts, are summarized in Appendix A for ease of view. A table of corresponding scale reliability coefficients (Cronbach's Alpha [A_c]) is available for each index and subindex in Appendix B; all reliability measures exceed standard thresholds of acceptability ($A_c > .7$).

The components of each of four environmental policy constituent indices were summed and divided so as to obtain a standard indicator out of 1, and then these were summed together to form one larger environmental policy subindex. The other subindices, those for sustainable development and social equity,[7] had only one component. Finally, all of the indices were added together in equal proportion, accounting for one-third of the final index, which was then multiplied by 100 for ease of comparison. Therefore, a perfect score on the index was 100; the highest ranking city earned a score of 82.4 on the OSSPI (see Appendix C for rankings). Figure 2 demonstrates the distribution of the OSSPI over our 1,340 cases; the mean of our sample was 22.4, and the standard deviation was 16.2.[8]

Independent Variables

The ICMA survey contained many measures of demographic variables, including population, form of government, and geographic location. However, the goal of this article is to identify what variables help explain the engagement in sustainability. As such, it was necessary to include other data to demonstrate important comparisons in our dependent variable. Also, given that we are interested in overall patterns of sustainability commitment at the local level in the United States, we do not weight on population, treating each city equally.

To explore the factors that may be related to a city's engagement in sustainability, we included selected socioeconomic data from the 2005 to 2009 five-year American Community Survey (ACS) for each responding municipality so as to include measures for median household income and property value, race and ethnicity, and education data. It is important to note that the majority of the census data is retrieved from the five-year ACS average estimates (2005-2009), while the ICMA data were collected in 2010.[9] Theories on environmentalism, economic development, and social justice all inform

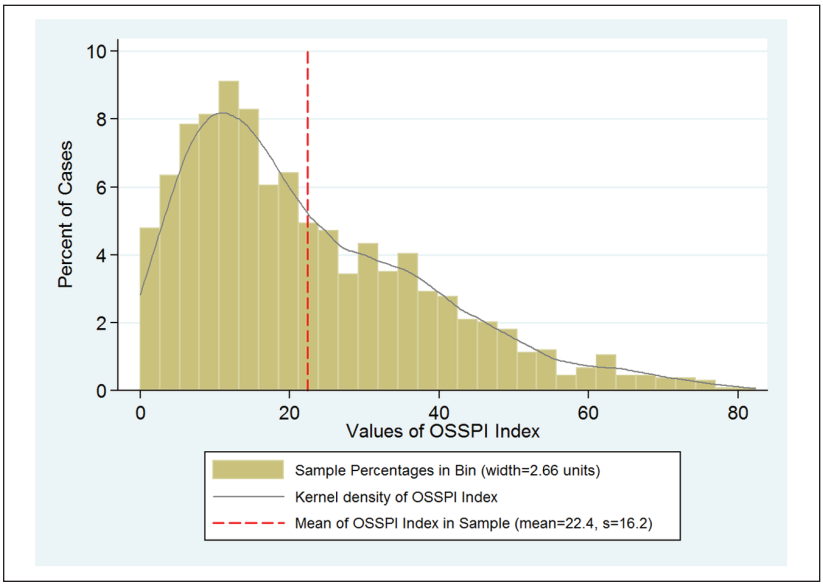

Figure 2. Distribution of OSSPI (*N* = 1,340)
Source: International City/County Management Association (ICMA) 2010 Survey.
Note: OSSPI = Opp–Saunders Sustainability Practices Index. Median of OSSPI is 18.27, skewness is .962.

our decisions on independent variable selection. First, race, poverty, and diversity variables are all thought to inform the social equity and economic development pillars of sustainability. Drawing connections from Peterson (1981) and environmental justice work indicates that higher percentages of minority and poor populations should be negatively associated with environmental amenities. Second, income and education variables are related to the environmental pillar of sustainability. Environmental literature tells us that wealthier, more educated, communities are more likely to engage in environmental protection. Finally, the presidential vote variable enables us to examine the connection[10] between political behavior (which results from political attitudes) and sustainability efforts in cities. Past research tells us that Republicans are less likely to trust government and embrace government solutions to perceived societal problems compared with Democrats (e.g., Abramson, Aldrich, and Rohde 2011; Lubell, Feiock, and Handy 2009; Newport 2011), therefore, even with these imperfect measures (county level vs. municipal level), we expect to see a relationship between presidential voting behavior and our measure of the sustainability efforts of cities.

While some of our independent variables are continuous, some are not. We made the decision that to present means comparisons in our research, we needed to create simple, relevant, and comparable independent variables to make these comparisons for the variables taken from the U.S. Census as well as the county-level diversity and political measure.[11] For the census variables, we used values to establish "more" or "less" values that appeared as natural cutpoints in the data. The proportions of the resulting independent variables using these distinctions can be seen as univariate percentages beside the value labels in Table 1.

Findings

Geographic and Structural Characteristics

Table 1 presents correlation coefficients and means comparisons across the aforementioned independent variables. Figure 3 plots the means of the statistically significant distinctions visually for ease of viewing and comparison of effects. Examining the relationships between the geographic and structural characteristics of a city and its engagement in sustainability initiatives yields some interesting but not totally unexpected findings. First, cities in the western region of the United States score higher on our sustainability index. This is not surprising and is well illustrated in previous research. Portland, Boulder, and San Francisco, among other communities located in the west, are all commonly profiled as leaders in sustainability efforts (Portney 2003; Saha and Paterson 2008; Slavin 2011).

The western region of the United States exhibits a few important characteristics that begin to offer insights about why cities in that region are more participatory in sustainability initiatives. First, western states are often listed as some of the most progressive in setting environmental policy. For example, in an examination of states and ambient air quality standards, 8 of the 11 states that had exceeded the national ambient air quality standards were in the west (Davis 2005). More broadly, California is often cited as the leader in state-level environmental policy making (Bettencourt 2002). In addition, many of the western states face water resource issues that may explain why western states are more progressive in setting environmental policy. Both regional- and state-level policy influences are likely part of the cause of this relationship.

Council-manager forms of government also tend to score higher on our sustainability index than do non-council-manager governments. This is also not entirely surprising. One of the perceived benefits of council-manager cities is the ability to "[b]ring a community-wide perspective to policy discussions and strive to connect the past and future while focusing on the present" and "[h]elp

Table 1. Correlations and Means Comparisons of OSSPI over Institutional, Demographic, and Political Characteristics (N = 1,340)

Characteristic Distinction (Percentage of Sample)	Bonferroni-Corrected Correlation with OSSPI[a]	OSSPI Subgroup *M* (*SD*)
Region	.272**[b]	
Northeast (19.1%)		21.8 (15.5)**
Midwest (31.6%)		19.6 (14.0)**
South (27.5%)		19.3 (14.8)**
West (21.9%)[c]		30.5 (18.2)**
Form of government	.216**	
Non-council manager (37.8%)		17.9 (14.1)**
Council manager (62.2%)[c]		25.0 (16.6)**
MSA type	.384**[b]	
Central (11.3%)[c]		39.8 (18.2)**
Suburb (57.5%)		20.7 (14.7)**
Independent (33.1%)		18.9 (13.8)**
Population (small)	−.463**	
Less than 25,000 (26.3%)[c]		17.9 (12.8)**
More than 25,000 (73.7%)		34.8 (17.9)**
Population (large)	.326**	
Less than 100,000 (94.5%)		21.1 (15.1)**
More than 100,000 (5.5%)[c]		43.8 (18.3)**
Median household income	.068	
Less than $50,000 (50.9%)		21.3 (15.7)*
More than $50,000 (49.1%)[c]		23.4 (16.5)*
Median home value	.260**	
Less than $175,000 (52.4%)		18.3 (14.2)**
More than $175,000 (47.6%)[c]		26.7 (17.0)**
% white	−.198**	
Less than 75% (25.9%)		27.6 (18.9)**
More than 75% (74.1%)[c]		20.5 (14.5)**
% black	.059	
Less than 10% (77.1%)		21.8 (15.9)*
More than 10% (22.9%)[c]		23.9 (16.8)*
% Hispanic	.175**	
Less than 15% (77.0%)		20.8 (15.1)**
More than 15% (23.0%)[c]		27.4 (18.3)**
% with a B.A. or higher	.207**	
Less than 25% (54.2%)		19.3 (14.7)**
More than 25% (45.8%)[c]		26.0 (16.9)**

(continued)

Table 1. (continued)

Characteristic Distinction (Percentage of Sample)	Bonferroni-Corrected Correlation with OSSPI[a]	OSSPI Subgroup *M* (*SD*)
2008 presidential vote[d]	.231**	
Democrat (59.2%)		25.4 (17.2)**
Republican (40.8%)		17.9 (13.1)**
USAToday diversity score[d]	.144**	
Less diverse (49.4%)		20.0 (14.3)**
Highly diverse (50.6%)		24.6 (17.4)**
Overall OSSPI mean		22.4 (16.2)

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: OSSPI = Opp–Saunders Sustainability Practices Index; MSA = metropolitan statistical area.
a. All correlations are Pearson's *r* and are calculated using a Bonferroni correction for multiple simultaneous hypothesis tests, which raises the *t*-value to achieve statistical significance to account for the 13.13% chance of falsely finding one or more significant differences in 14 simultaneous tests.
b. Noted correlations are calculated using largest effect category (Region = West; MSA type = Central) as 1, and the others 0 for ease of comparison with other effects.
c. This category is set equal to 1 and the others 0 to calculate the correlation coefficients in the middle column.
d. These correlations and means comparisons are calculated using county-level data (see Footnote 11 for more details).
*$p < .05$ level. **$p < .01$ level.

the governing body develop the long-term vision for the community" (ICMA n.d.). Finding that administrative cities score higher on a sustainability index supports the perceived benefit of a wider and more inclusive view on policies of the local government. Sustainability initiatives often require longer-range views as their benefits may not be seen immediately, providing a political risk for elected officials in mayor-council cities. Presumably, council-manager cities do not face the same political risk associated with more comprehensive and long-range policies related to sustainability initiatives.

Finally, the data indicate that central cities engage more in sustainability initiatives when compared with their suburban and independent counterparts. This finding, although interesting, is not surprising in many ways. Several aspects of central cities can explain why they would score higher on our sustainability index. First, central cities are generally older and have a higher population density than their suburban (and independent) counterparts. As these central cities age, they are often faced with declining economic and social conditions that can lead city leaders to explore options that relate to all Three E's of sustainability (see, for example, Fitzgerald and Leigh 2002). In addition, central cities are generally more racially diverse than suburban and

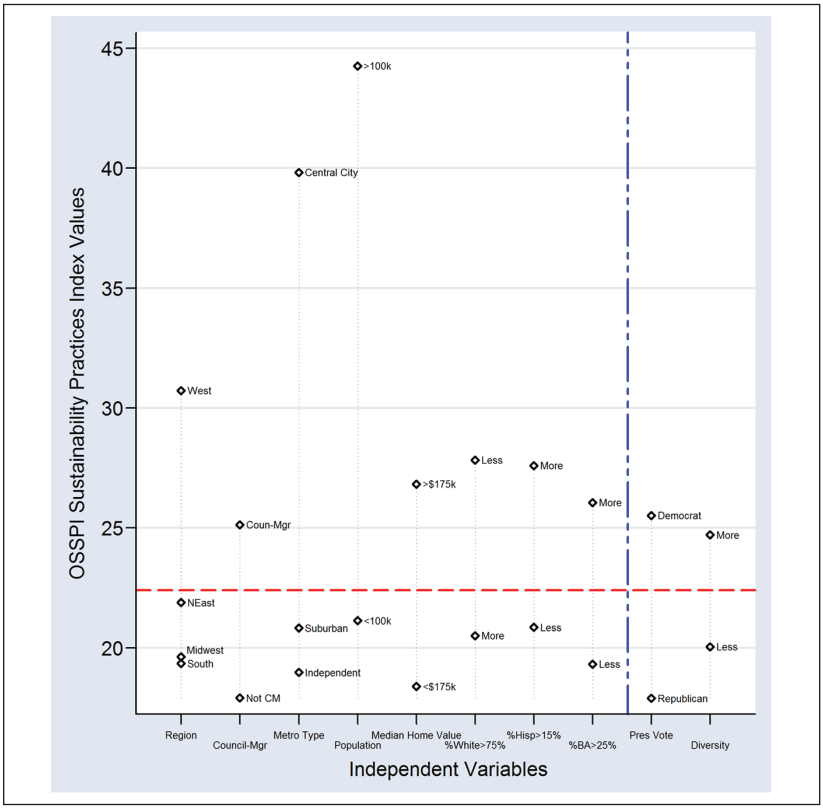

Figure 3. Means comparisons of OSSPI over institutional, demographic, and political characteristics
Source: ICMA 2010 Survey, N=1340; all variables to the right of the vertical reference line use county level data (see Footnote 11 for details)
Note: Overall OSSPI Mean (noted as horizontal reference line) is 22.4, sd=16.2. OSSPI = Opp–Saunders Sustainability Practices Index.

rural locations. With great diversity, it can be expected that social equity would be more of a concern than it would be for cities with less diversity.

Population, Demographics, and Politics

In examining the population size and demographic variables, some interesting findings emerge. First, and perhaps the least surprising, is that population matters. The larger the population of a community, the higher it scores on the sustainability index. Communities with larger populations will generally have both greater needs and greater resources for the pursuit of sustainability

policies and initiatives than less populated communities. For example, public transportation—one of the items in our index—is far more likely to be able to be supported (and needed) in larger municipalities than in smaller municipalities. Larger populations also provide for higher tax revenues and greater opportunity to pursue some of these sustainability initiatives.

Also not surprising is that political preferences matter. Municipalities that tend to vote Democratic as measured by the 2008 county-level presidential vote score higher on the sustainability index. Partisan differences in views on the environment and sustainability have long been identified (Leiserowitz et al. 2011). Democrats, or liberals, are generally viewed as being more supportive of sustainability policies and practices than their Republican counterparts.

Moving away from some of the more expected findings, perhaps most surprising in this analysis, are the relationships between diversity, race/ethnicity, and scores on the sustainability index. Cities with higher levels of diversity, and specifically higher percentages of Hispanic populations,[12] score higher on the sustainability index—and given that our sample comes from more diverse counties that are also more Democratic than the overall population (see Footnote 11), these findings should be considered even more surprising.

Relatedly, using the *USAToday* overall diversity measure,[13] more diverse cities score higher than less diverse cities. Certainly, this is also related to a number of other findings, including the aforementioned political behavior and central city findings, and to some degree the west region's tendency toward sustainability. First, racial and ethnic minorities tend to identify with the Democratic Party more than the Republican Party—and as seen above, political tendencies matter. Second, suburban and independent cities have traditionally been a haven for racial and social segregation (Banfield 1974). As a result, diversity and higher levels of black and Hispanic populations are more likely to be seen in the larger, central city locations—the same locations that score higher on our sustainability index. However, a closer examination of the Hispanic population is particularly interesting, as the difference in means between cities with high populations versus low populations is very striking. Although the causal chain cannot be fully uncovered in this initial research, future research will be directed at a deeper understanding of this aspect of sustainable cities. Possible explanations could center on culture, religion, and country of origin, among others.

Rankings on the OSSPI

Finally, in addition to the many important findings revealed in the correlations and means comparisons, we were able to rank cities on our sustainability

index (see Appendix B). In comparing the city rankings compiled from the OSSPI, a few patterns become evident. First, many of the top-ranking cities are located in the west, have high levels of diversity, and are homes to large universities. In addition, California is particularly well represented in the highest ranking cities.

Some of the cities that score highly in the OSSPI index are of interest and deserve much deeper explanation than we can engage in here. As an example, San Antonio, Texas, scores the highest on our index. Although past research has identified this city as being progressive in its sustainability efforts, San Antonio has not been previously identified in the Top 10 of any other prior ranking efforts. An inspection of the results throughout Appendix C demonstrates the impact of equally weighting the "Three E's" on how cities score on the overall OSSPI—while San Antonio scored near the top of each subindex, it did not lead in all of them and demonstrated a strong balance for all of the "Three E's." The other top cities, which included Fort Collins (Colorado), Hemet (California), Palo Alto (California), and Boulder (Colorado), respectively, also shared this relative balance to at least some extent.

Moving forward, a more detailed examination of the cities scoring highest on the OSSPI in future research could provide some excellent best practices case study research. Las Vegas, Nevada, with its inherent water and sustainability challenges, ranking at number 10 in overall sustainability practices was also an interesting finding. However, this finding makes some sense if you take into account the many initiatives that Las Vegas must engage in due to its environmental and resource limitations. This, in turn, raises the question of the impact of sustainability challenges on cities' sustainability practices, and how that varies across cities. The case of San Antonio could also provide some interesting insights. Texas, unlike California or Colorado, is not particularly well known for being progressive in its sustainability efforts. What it is in particular about San Antonio that allows it to pursue the three pillars of sustainability as comprehensively as it does in light of the political climate of the state? There seems to be little doubt that each of the top-ranking cities in the overall OSSPI, as well as the top ranking on each subindex, can provide interesting insights upon deeper examination for researchers interested in many components of sustainability practices.

Conclusion, Lessons Learned, and Future Research

Sustainability, particularly with reference to the Three E's, is a complex topic that makes large *N* quantitative study difficult; to that, it is rare to find

such a rich data source as the ICMA 2010 Survey. Our research takes a timely step forward by examining a large, geographically diverse sample with broad measures of local sustainability initiatives that allowed special attention in examining all dimensions of sustainability equally. Even in light of this important research, much remains to be done.

Previous research has failed to adequately examine sustainability through the lens of the Three E's. While a great deal is known about environmental initiatives at the local level, comparatively little is known about social equity and sustainable economic development as it relates to the global quest for sustainability. To be sure, economic activities of the public and private sectors relate to the environment in a number of important ways: Natural resources are needed from the environment to produce goods and provide services and environmental harms often stem from traditional consumption and production practices (Church 1992). Furthermore, large disparities in wealth, as well as the exposure to environmental *goods* and *bads*, are not sustainable. This fact will continue to become clear as the American demographics continue to shift. Ultimately, in the context of this research, complete explanation concerning *why* cities engage in sustainability efforts is a complex, multifaceted causal chain. Certainly, it is evident that several factors are interrelated to local government engagement in sustainability initiatives, including population size, central city locations, diversity, ethnicity and race, political leanings of a community, and region. Untangling these relationships will require additional quantitative modeling coupled with deeper qualitative inquiry—an approach that we hope to build upon from this initial research using this and other data sources.

The OSSPI lays the foundation for future researchers and analysts to be able to better analyze and evaluate sustainability efforts across the United States. Recognizing the importance of environmental protection, economic development, and social equity necessitates an analytical tool that adequately considers these three dimensions in balance. Rather than assessing sustainability only on environmental terms, it is necessary and proper to be more comprehensive in the measurement and analysis of local sustainability efforts. Looking forward to future research, scholars and public administrators can use this Three E's index framework to better assess the sustainability efforts of cities in their own research or city. Furthermore, each subindex can be further refined to include additional and important indicators of each dimension of sustainability as the needs and efforts continue to evolve.

In the near future, we anticipate that several questions prompted by this research will become important follow-up research topics. First, what is the relationship between cities with universities and local sustainability efforts? Second, why do cities with large Hispanic populations engage in sustainability

at higher rates than those with lower Hispanic populations? Third, what is the relationship between economic base of a community and sustainability efforts of that community? Fourth, what relationships exist across metropolitan areas? Finally, what impact does state-level policy have on the commitment to sustainability efforts at the local level?

As Kent Portney (2003, p. 31) said in his seminal book, "A part of any assessment effort must include the development of the standards and criteria by which cities may be judged." To date, several scholars have attempted to create an index that develops these standards and criterion of measuring sustainability. However, none have been as complete as the index created here. Certainly, the value of a complete index construction taking into consideration all three pillars of sustainability, and a ranking system on that index, is that it allows for comparison between cities based on a systemic set of criteria. Simply put, we need to understand what cities are doing with regard to sustainability through a comparable, rigorous instrument, and we need to understand what impediments exist that is preventing cities from engaging in sustainability initiatives. This research has taken a step forward by examining local sustainability initiatives through the lens of all three dimensions of sustainability and elucidates interesting patterns worthy of further study.

Appendix A

OSSPI Comparison to Extant Research

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	Opp and Saunders
E1: Environmental protection			
A. Energy efficiency/resource conservation measures			
1. Green building Program	1. Environmental site design regulations	1. Alternative energy offered to consumers	1. Fuel efficiency target for government vehicles
2. Renewable energy use by city government	2. Green building requirements	2. Energy conservation effort (other than green building program)	2. Increased purchase of fuel efficient vehicles
3. Energy conservation effort (other than green building program)	3. Heat island analysis	3. Environmental site design	3. Purchased hybrid electric vehicles

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
4. Alternative energy offered to consumers	4. Rehabilitation building codes	4. Green building program	4. Purchased vehicles that operate on compressed natural gas
5. Water conservation program	5. Solar access protection regulations	5. Renewable energy use by city government	5. Installed charging stations for electric vehicles
	6. Urban forestry program		6. Conducted energy audits of government buildings
	7. Wind energy development		7. Installed energy management systems to control heating and cooling
			8. Established policy to only purchase Energy Star equipment when available
			9. Upgraded or retrofitted facilities to higher energy efficiency office lighting
			10. Upgraded or retrofitted traffic signals to improve efficiency
			11. Upgraded or retrofitted streetlights and/or other exterior lighting to improve efficiency
			12. Upgraded or retrofitted facilities to higher energy efficiency heating and air conditioning systems
			13. Upgraded or retrofitted facilities to higher energy efficiency pumps in the water or sewer systems
			14. Use dark sky compliant outdoor light fixtures

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
			15. Installed solar panels on a government facility
			16. Installed a geothermal system
			17. Generated electricity through municipal operations such as refuse disposal, wastewater treatment, or landfill
			18. Actions to conserve the quantity of water from aquifers
			19. Use of gray water and/or reclaimed water-use systems
			20. Sets limits on impervious surfaces on private property
			21. Use water price structure to encourage conservation
			22. Other incentives for water conservation behaviors by city, residents, and businesses
B. Pollution prevention and reduction efforts			
6. Household solid waste recycling	8. Green procurement	6. Curbside recycling program	23. Greenhouse gas reduction targets for local government operations
7. Industrial recycling	9. Life cycle public construction	7. Environmental education programs for the community	24. Greenhouse gas reduction targets for businesses
8. Hazardous waste recycling	10. Low-emission vehicles	8. Green procurement	25. Greenhouse gas reduction targets for multifamily residences
9. Air pollution reduction program	11. Solid waste life cycle management	9. Water quality protection programs	26. Greenhouse gas reduction targets for single-family residences

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
10. Recycling product purchasing by city government			27. Locally initiated air pollution measures to reduce dust and particulate matter
11. Superfund site remediation			28. Plan for tree preservation and planting
12. Asbestos abatement program			29. Internal program that recycles paper and plastic and glass in your local government
13. Lead paint abatement program			30. Community-wide recycling collection program for paper and plastic and glass for residential properties
			31. Community-wide recycling collection program for paper and plastic and glass for commercial properties
			32. Recycling of household hazardous waste
			33. Recycling of household electronic equipment (e-waste)
			34. PAYT program with charges based on the amount of waste discarded
			35. Community-wide collection of organic material for compositing
			36. Require minimum of 30% postconsumer recycling content for everyday office paper use.
			37. Restriction on use of plastic bags by retail/grocery stores
			38. Incentive to reduce use of plastic bags by retail/grocery stores

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
			39. Locate recycling containers close to refuse containers in public spaces
C. Transportation planning programs and policies			
14. Operation of inner-city public transit	12. Bicycle access plan	10. Operation of inner-city public transit	40. Incentive to take mass transit to work
15. Limits on downtown parking spaces	13. Pedestrian access plan	11. Transportation demand management	41. Incentive to carpool to work
16. Car pool lanes	14. Transit-oriented development		42. Incentive to walk to work
17. Alternatively fueled city vehicle program	15. Transportation demand management		43. Incentive to bike to work
18. Bicycle ridership program			44. Locally initiated dedicated bike lanes on streets
			45. Locally initiated biking and walking trails
			46. Locally initiated bike parking facilities
			47. Locally initiated expanded bus routes
			48. Sidewalks required in new development
			49. Widened sidewalks in last five years
			50. Required charging stations for electric vehicles
			51. Required bike storage facilities
			52. Required showers and changing facilities for employees
D. Organization/administration			
19. Single governmental/ nonprofit agency responsible for implementing sustainability			53. Adoption by the governing body of a resolution stating policy goals

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
20. Part of a citywide comprehensive plan			54. Adoption by the governing body of a plan with specific targets or benchmarks
21. Involvement of a city/county/metro council			55. Establishment of a sustainability policy and/or plan by the chief executive
22. Involvement of mayor or chief executive officer			56. Appointment of a citizens committee, commission, or task force
23. Involvement of the business community			57. Provided a budget specifically for the sustainability effort
24. General public involvement in sustainable cities initiative			58. Dedicated staff to the sustainability effort
E. Tracking progress on environment			
25. Indicators project active in last five years	16. Ecological footprint analysis	12. Ecological footprint analysis	
26. Indicators progress report in last five years	17. Urban ecosystems analysis		
27. Does indicators project include action plan of policies or programs?			
E2: Sustainable economic development			
Sustainable economic development (smart growth)/land-use planning			
28. Eco-industrial park development	18. Agricultural district provisions	13. Agricultural protection zoning	59. Permit higher-density development near public transit
29. Cluster or targeted economic development	19. Agricultural protection zoning	14. Brownfield reclamation	60. Permit higher-density development where infrastructure already exists
30. Ecovillage project or program	20. Brownfield reclamation	15. Cluster or targeted economic development	61. Provide density incentives for sustainable development

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
31. Brownfield redevelopment	21. Eco-industrial park	16. Eco-industrial park development	62. Provide tax incentives for sustainable development
32. Tax incentives for environmentally friendly development	22. Infill development	17. Infill development	63. Reduce fees for environmentally friendly development
33. Zoning used to delineate environmentally sensitive growth areas[a]	23. Neotraditional development	18. Purchase of development rights and/or transfer of development rights	64. Fast track plan reviews and/or inspections for environmentally friendly development
34. Comprehensive land-use plan that includes environmental issues[a]	24. Purchase of development rights	19. Tax incentives for environmentally friendly development	65. Residential zoning codes to permit solar installations, wind power, or other renewable energy production
	25. Right-to-farm legislation	20. Urban growth boundary and/or urban service boundary	66. Residential zoning codes to permit higher densities through ancillary dwelling units or apartments
	26. Transfer of development rights	21. Environmentally sensitive area protection[a]	67. Zoning codes encourage more mixed-use development
	27. Urban growth boundary	22. Open-space preservation program[a]	68. Brownfields program
	28. Open-space zoning		69. Land conservation program
	29. Wildlife habitat/green corridor planning[a]		70. Program for the purchase or transfer of development rights to preserve open space
			71. Program for the purchase of transfer of development rights to create more efficient development
			72. Program for the purchase or transfer of development rights to preserve historic property

(continued)

Appendix A (continued)

Portney (2003)	Jepson (2004)	Saha and Paterson (2008)	OSSPI
			73. Incentives for using locally produced materials/products
			74. Incentives for using locally grown produce
			75. Program to support a local farmer's market
E3: Social equity/inclusion/justice			
	30. Community indicators program	23. Affordable housing provisions	76. Incentives for affordable housing
	31. Community gardening	24. Day care services for service sector and low-income employees	77. Provide supportive housing to people with disabilities
	32. Cooperative housing	25. Homeless prevention and intervention programs	78. Provide housing options for the elderly
	33. Incentive zoning	26. Inclusionary and incentive zoning	79. Provide housing within your community to homeless persons
	34. Living wage ordinance	27. Jobs-housing balance	80. Provide access to information technology for persons without connection to the Internet
		28. Living wage ordinance	81. Provide funding for preschool education
		29. Mass transit access with local-income subsidies	82. Provide after school programs for children
		30. Neighborhood planning	83. Report on community quality of life indicators
		31. Sustainable food systems	84. Program to support community gardens
		32. Women- or minority-owned business CDCs	
		33. Youth opportunity and antigang programs	

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: OSSPI = Opp–Saunders Sustainability Practices Index; PAYT = pay-as-you-throw. See Appendix B for reliability coefficients for each subindex.
a. Not an economic initiative. Environmental land-use planning initiative.

Appendix B

Scale Reliability Coefficients for OSSPI: Sustainable Development, Environmental Policy, and Social Equity Subindices

Sustainable development subindex
- Average interitem covariance: .017
- Number of items in the scale: 17
- Scale reliability coefficient: .744

Environmental policy subindex
- Average interitem covariance: .021
- Number of items in the scale: 58
- Scale reliability coefficient: .908

Transportation policy constituent index
- Average interitem covariance: .023
- Number of items in the scale: 13
- Scale reliability coefficient: .750

Pollution policy constituent index
- Average interitem covariance: .019
- Number of items in the scale: 17
- Scale reliability coefficient: .738

Energy policy constituent index
- Average interitem covariance: .031
- Number of items in the scale: 22
- Scale reliability coefficient: .829

Organized government venues constituent index
- Average interitem covariance: .057
- Number of items in the scale: 6
- Scale reliability coefficient: .759

Social equity subindex
- Average interitem covariance: .042
- Number of items in the scale: 9
- Scale reliability coefficient: .766

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: OSSPI = Opp–Saunders Sustainability Practices Index. All scale reliability coefficients are Cronbach's Alpha (A_c); see Appendix A for detailed listing of measures.

Appendix C1

Top 50 Cities Ranked per the OSSPI

Rank	City	Overall OSSPI Score
1	San Antonio, Texas	82.4
2	Fort Collins, Colorado	77.4
3	Hemet, California	77.0
4	Palo Alto, California	76.4
5	Boulder, Colorado	75.6
6	Hayward, California	75.3
7	Tracy, California	74.3
8	Anaheim, California	73.7
9	Ann Arbor, Michigan	73.1
10	Las Vegas, Nevada	72.0
11	Chula Vista, California	71.8
12	Richmond, California	70.3
13	New York, New York	69.7
14	Santa Monica, California	69.6
15	South San Francisco, California	69.4
16	Philadelphia, Pennsylvania	69.1
17	Santa Barbara, California	68.7
18	Casa Grande, Arizona	67.9
19	Fairfield, California	67.7
20	Durham, North Carolina	67.1
21	Maple Grove, Minnesota	67.1
22	Roanoke, Virginia	66.8
23	Falls Church, Virginia	66.1
24	Anacortes, Washington	65.9
25	Pasadena, California	65.0
26	Virginia Beach, Virginia	64.7
27	East Lansing, Michigan	64.0
28	Dallas, Texas	63.8
29	Marquette, Michigan	63.7
30	Amherst, Massachusetts	63.7
31	Mountain View, California	63.7
32	Council Bluffs, Iowa	63.3
33	Oxnard, California	63.2
34	South Windsor, Connecticut	63.1
35	Springfield, Massachusetts	62.8
36	Union City, California	62.7
37	Weston, Wisconsin	62.4

(continued)

Appendix C1 (continued)

Rank	City	Overall OSSPI Score
38	Glendale, California	62.3
39	Salem, Oregon	62.0
40	Dubuque, Iowa	61.9
41	Dover, New Hampshire	61.6
42	Fort Smith, Arkansas	61.1
43	Port Townsend, Washington	60.4
44	Fort Worth, Texas	60.0
45	West Palm Beach, Florida	60.0
46	Sonoma, California	60.0
47	New Haven, Connecticut	59.4
48	Warwick, Rhode Island	58.9
49	White Bear Lake, Minnesota	58.8
50	Maplewood, Minnesota	58.6
	Overall (N = 1,340)	M = 22.4 (16.2)

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: OSSPI = Opp–Saunders Sustainability Practices Index. Rankings are rounded to the nearest tenth.

Appendix C2

Top Tiers of the Opp–Saunders Sustainable Development Subindex

Sustainable Development Subindex Tier	City
Tier 1 (>12/17)	Marquette, Michigan (16)
	Chula Vista, California (15)
	Hemet, California (15)
	Lake Worth, Florida (14)
	South Euclid, Ohio (13)
	Fort Collins, Colorado (12)
	Highland, Illinois (12)
	San Antonio, Texas (12)
	Tracy, California (12)
	Weston, Wisconsin (12)

(continued)

Appendix C2 (continued)

Sustainable Development Subindex Tier	City
Tier 2 (10 and 11/17)	Anaheim, California
	Asheville, North Carolina
	Boulder, Colorado
	Casa Grande, Arizona
	Concord, North Carolina
	Conover, North Carolina
	Dover, New Hampshire
	East Lansing, Michigan
	Fairfax, California
	Grand Rapids, Michigan
	Islip, New York
	Lovington, New Mexico
	Maple Grove, Minnesota
	Maplewood, Minnesota
	Minotola, New Jersey
	North Kingstown, Rhode Island[a]
	Oakdale, California
	Port Townsend, Washington
	Roanoke, Virginia
	San Luis, Arizona
	South San Francisco, California
	South Windsor, Connecticut
	Spring City, Pennsylvania[a]
	Statesboro, Georgia
	Surprise, Arizona[a]
	Taylor, Arizona
	Warwick, Rhode Island
	Windsor, Connecticut
	Woolwich Township, New Jersey[a]

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: Parentheses indicate number of indicators fulfilled in the index out of 17 for each tier.
a. Not a candidate for overall index/rank because of response to priority question (see Footnote 5).

Appendix C3 (continued)

Top 50 Cities Ranked per the Opp–Saunders Environmental Protection Subindex

Rank	City	OSSPI Environmental Protection Subindex Score
1	Tracy, California	85.7
2	Burbank, California	82.8
3	Boulder, Colorado	79.0
4	Santa Monica, California	78.7
5	Port Townsend, Washington	78.0
6	Glendale, Arizona	77.7
7	Ann Arbor, Michigan	77.4
8	San Antonio, Texas	76.5
9	Palo Alto, California	76.3
10	Santa Barbara, California	76.0
11	Evanston, Illinois	75.8
12	Las Vegas, Nevada	74.1
13	Palm Springs, California	73.9
14	Anaheim, California	73.4
15	Hayward, California	73.1
16	New York, New York	73.0
17	Fort Collins, Colorado	72.8
18	Eugene, Oregon	72.6
19	Weston, Wisconsin	72.2
20	Dallas, Texas	71.8
21	Chula Vista, California	71.7
22	Grand Rapids, Michigan	71.6
23	Park City, Utah	70.9
24	Pasadena, California	70.7
25	Maple Grove, Minnesota	69.9
26	Richmond, California	69.8
27	Dublin, California	69.2
28	Union City, California	69.1
29	Roanoke, Virginia	69.0
30	Olympia, Washington	67.3
31	Lake Oswego, Oregon	66.8
32	Mountain View, California	66.2
33	Walnut Creek, California	66.2
34	Jackson, Wyoming	66.1
35	Portland, Maine	66.1

(continued)

Appendix C3 (continued)

Rank	City	OSSPI Environmental Protection Subindex Score
36	Durham, North Carolina	66.0
37	Missoula, Montana	65.6
38	Dedham, Massachusetts	65.3
39	Whitewater, Wisconsin	65.3
40	Hemet, California	64.9
41	Raleigh, North Carolina	64.6
42	Santa Rosa, California	63.8
43	White Bear Lake, Minnesota	63.3
44	Moab, Utah	63.2
45	Mountlake Terrace, Washington	62.9
46	Anacortes, Washington	62.5
47	Tacoma, Washington	62.5
48	Calistoga, California	62.5
49	Corvallis, Oregon	62.3
50	Silver City, New Mexico	61.9
	Overall (N = 1,340)	M = 26.2 (16.7)

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: Rankings are rounded to the nearest tenth.

Appendix C4

Top Tiers of the Opp–Saunders Social Equity Subindex

Social Equity Subindex Tier	City
Tier 1 (9/9)	Amherst, Massachusetts
	Anacortes, Washington
	Council Bluffs, Iowa
	Durham, North Carolina
	Hammond, Indiana
	Hayward, California
	New Haven, Connecticut
	Palo Alto, California
	Philadelphia, Pennsylvania
	Richmond, California
	Salem, Oregon
	San Antonio, Texas

(continued)

Appendix C4 (continued)

Social Equity Subindex Tier	City
Tier 2 (8/9)	Anaheim, California
	Ann Arbor, Michigan
	Boulder, Colorado
	Casa Grande, Arizona
	Crossville, Tennessee
	Dubuque, Iowa
	Duluth, Minnesota
	Easthampton, Massachusetts[a]
	Fairfield, California
	Falls Church, Virginia
	Fayetteville, North Carolina
	Fort Collins, Colorado
	Fort Myers, Florida
	Fort Smith, Arkansas
	Glendale, California
	Johnson City, Tennessee
	Las Vegas, Nevada
	New York, New York
	Oxnard, California
	Pasadena, California
	Provincetown, Massachusetts
	Rockland, Maine
	San Mateo, California
	Santa Barbara, California
	Santa Monica, California
	South San Francisco, California
	Springfield, Massachusetts
	Virginia Beach, Virginia
	Waco, Texas
	Winston Salem, North Carolina

Source: International City/County Management Association (ICMA) 2010 Survey.
Note: Parentheses indicate number of indicators fulfilled in the index out of 9.
a. Not a candidate for overall index/rank because of response to priority question (see Footnote 5).

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Notes

1. The survey was developed with the input of International City/County Management Association's (ICMA) Center for Sustainable Communities, the Center for Urban Innovation, Arizona State University's Global Institute of Sustainability (ASU GIOS), the Alliance for Innovation, and others. Survey distribution was conducted through a collaboration of ICMA, ASU GIOS, and the Sustainable Cities Network, a multijurisdictional partnership. The survey was provided in electronic and print formats because the local government response rate is both higher and more scientifically representative than for an electronic survey. The data can be purchased at the ICMA website at the following address: http://bookstore.icma.org/Local_Government_Sustainabilit_P2097C170.cfm. This address also provides further information about the study, including the survey instrument itself. Complete descriptive statistics can be found at the following address: http://icma.org/en/icma/knowledge_network/documents/kn/Document/301646.
2. Also of note is the fact that Portland (Oregon) and Seattle (Washington) did not respond to the survey. Both are often listed as leaders in sustainability initiatives in past studies.
3. Our case-selection strategy (see Footnote 5) only allows us to generalize to cities above 2,500 people that at least "somewhat prioritize" all three pillars of sustainability; because of this, it should be clearly noted then that inferences drawn from our sample do not necessarily generalize to the entire population of cities more than 2,500 people in the United States. Furthermore, we do not have the population parameters of our sampling condition to compare our sample to, in order to confirm its representativeness of this subpopulation we are attempting to generalize to. However, we do have the population parameters for *all cities* more than 2,500 people from the ICMA, which is available in ICMA's Inside

the YearBook (http://bookstore.icma.org/FreeDocs/43640_InsidetheYearbook.pdf). In comparing the proportions under our sampling condition (c2, defined in Footnote 5) using the various ICMA variables we report in Table 1 to those proportions using all cities, we do find some distinctions, which is not surprising given our sampling frame. Key findings include a higher relative proportion in our sample frame compared with all cities of (1) smaller cities less than 25,000 people (C2 = 26.3%, All = 19.4%) and larger cities more than 100,000 people (C2 = 5.5%, All = 3.3%), (2) council-manager forms of government (C2 = 62.2%, All = 48.8%), (3) central city metropolitan statistical area (MSA) types (C2 = 11.3%, All = 7.2%), and (4) cities in the west (C2 = 21.9%, All = 15.0%).

4. Boulder (Colorado) was the only city in our study in our "Top 50"overall ranking to report that any of the Three E's was "not a priority." We attempted to contact the responding official given in the ICMA survey as well as the city manager to allow them to amend their response, to no avail. We made the decision to continue to include Boulder in our analysis and rankings based upon its environmental and political record, as well as its very high score on the Opp–Saunders Sustainability Practices Index (OSSPI; see Appendix C), with the assumption that this was a misreport on their behalf.
5. We made the decision to exclude cities that responded that any of the Three E's were "not a priority" based on the simple idea that administrative units that did not prioritize or demonstrate at least a modicum of commitment to all three pillars of sustainability—a distinction important to our theoretical perspective and a conclusion drawn from the academic literature—could not be termed *sustainable*. However, while we made this decision in an attempt to be theoretically consistent, it is important to note that it is also possible that an administrator who may not like the term *sustainability* or *social justice* may still engage in policies that are in line with these concepts. So, as a compromise, we made the decision to include respondent cities that chose "(2) somewhat a priority," "(3) a priority," and "(4) a high priority" from the priority questions on all three pillars of sustainability to preserve enough cases for generalizable results to balance these concerns. This decision reduced our number of cases from 1,873 (Condition 1) to 1,340 (Condition 2). Had we gone further and only included responses that contained the two higher priority categories (Responses 3 and 4), the result would have yielded only 505 valid cases (Condition 3), with most of the loss coming from self-selection in the social equity priority question. Therefore, it seemed the methodologically balanced approach to include the "somewhat a priority" cases in our analysis (C2). We should also point out that we conducted all of the analyses presented in this article under all three sampling conditions specified here—at 1,873 cases (C1) without any filtering, at 1,340 cases (C2) with our compromise decision, and with 505 cases (C3) that seemed

too exclusive; the means and standard deviations in our dependent variable, the OSSPI, shifted in predictable ways (C1: $\overline{X}$ = 20.5, s =15.3; C2: $\overline{X}$ =22.4, s =16.2; C3: $\overline{X}$ = 26.2, s =18.2;) based on case selection. Results of correlations and means tests, reported in this article under C2, were very similar as those resulting under c1 and c3, once the differences in resulting distributions were taken into account. Therefore, we are comfortable with our compromise choice of C2, as that condition did not change the results in any meaningful fashion compared with the other possible conditions. Further discussion of the representativeness of the sample compared with available population parameters for all cities can be found in Footnote 3. It should also be noted that, with regard to our rankings (see Appendix C), all of our Top 50 cities, save the aforementioned Boulder (see Footnote 4), responded that they prioritized all of the "Three E's" with at least a response of "(2) somewhat a priority."

6. While some other studies have attempted to weight various components of their indices, with 84 components, to attempt to do something similar seemed an exercise in subjective futility, especially without performance measurement data it would be impossible to properly and objectively weight each indicator. It should also be noted that a large majority of the questions in the ICMA 2010 survey used in our sustainability index was simple yes–no answers. In any components that were not a simple yes–no, all recoding decisions regarding missing data were made to preserve as many cases as possible; therefore, missing data were coded to negative responses (zeros for that respective index component), which we deemed the methodologically conservative decision.
7. In the sustainable economic development and social equity subindices, there were too few questions to get a fair and discernible resulting continuous measure on that particular index, so we "tier" these results in our rankings in Appendix C, as there is not enough differentiation between cities available to allow interval ranking in that particular subindex.
8. The distribution has a significant amount of positive skewness to it (.962), which puts the median (18.3) notably below the mean.
9. In addition, two independent variables, the *USAToday* Diversity Index and Percent Democratic Vote 2008, are county-level data rather than municipal-level data, thereby presenting problems with mixed units of analysis—these are discussed in Footnote 11. We would obviously prefer to have used contextual data that matched on both time and unit of analysis, but we were forced to use the best data available to us to achieve our comparisons.
10. See Footnote 11 for further discussion of these measures.
11. As mentioned above, we also used two other measures of political and social context in our analysis. Matching these data with our survey of city sustainability allows a comparison of our sample with the overall population of counties given

by two different data sets with consistent measures, something only national data sets would facilitate. However and perhaps more importantly, the measures also allow analysis of important political and social effects that we could not otherwise do, as there are no national data sets with city-level data that validly measure these phenomena. The effects of these measures on the OSSPI are presented in Table 1 and Figure 3, and we are sure to remind the reader each time that they are based on county-level data, because mixed units of analysis present complications to any inferences drawn from the analyses presented here because of potential ecological inference problems. Others (e.g., Leiserowitz et al. 2011) have also used the presidential vote measure, as these are unfortunately the best political data available to use for city-level analysis, so there is precedent, but we wanted to make this distinction clear. The first measure we matched to the ICMA survey sample of cities uses 2008 county-level presidential election data to allow a comparison of the political leanings of an area. It is convention in the state and local politics literature to use these data as a surrogate city-level measure for nationwide samples; even though these are county-level data, they are often the most valid and exhaustive data available. Our data source for this political measure is Dave Leip's U.S. Election Atlas (http://www.uselectionatlas.org/). The dichotomous measure we constructed from these data to use for our means tests is a simple one; it uses the percentage who voted for each major party candidate, subtracting the Republican percentage (for John McCain) from the Democratic percentage (for Barack Obama). A positive result then reflects a Democratic-leaning constituency and vice versa. The average presidential vote score for our sample of cities (again, using their primary county as a match, N = 1,340) was .04 on this measure, whereas the overall score for all counties (N = 3,154) was −.152. In comparing these numbers, it is apparent that our sample is more Democratic leaning than the United States, at the county level, as a whole. Certainly, this reflects some bias in our sample concerning which cities elected to respond to the ICMA survey. For our means tests, we transformed this measure into a dichotomous variable, using a cutpoint of exactly 0. This yielded a measure where a value of 1 was a Democratic-leaning county in which the city resides and 0 a Republican-leaning county. The other measure matched to our survey was the 2010 *USAToday* Diversity Index, which is used by journalists and scholars across many disciplines. The measure, which has been in existence since 1991, uses data from the U.S. Census that captures each percentage of races and ethnicities to calculate the chance that any two people are from different groups in a particular geographic boundary; in this case, counties. The result varies from 0 to 100. The average diversity score for our sample of cities (using their primary county as the match, N = 1,340) was 39.8, which means that the chance of two people being different in race or ethnicity at the county level is slightly under

40%. The overall average diversity score for all counties (N = 3,143) was 29.5, which indicates that our sample is around one-third more diverse than the overall county-level average. From there, we used a dichotomous variable for our means tests, in which a cutpoint of 40 on the index was chosen to reflect the central tendency of the diversity measure. A value of 1, therefore, reflected a more diverse county than average in which the city resides and 0 a less diverse county.

12. Cities with higher percentages of African-Americans also had a higher score on the OSSPI, but the correlations were not statistically significant, and the means comparisons were only barely so.
13. Our thanks to Paul Overberg of *USAToday*, the creator of the index, for sharing the 2010 *USAToday* diversity data.

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