How Are U.S. Cities Doing Sustainability? Who Is Getting on the Sustainability Train, and Why?

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Abstract

Using information from a 2010 International City/County Management Association survey of 2,176 local governments, this article considers why and how counties, cities, and towns are pursuing sustainability objectives. The article first breaks down sustainability into 12 distinct areas, with discussion of the activities local governments are pursuing in each area, and then develops explanatory models to consider the factors that might motivate sustainability activities. Although most communities are participating in some sustainability activities, they are generally not taking advantage of the more innovative possibilities available to them. Multivariate analyses indicate that sustainability does not appear to be an issue associated with a "typical" division based on race, class, or community wealth. Our evidence also suggests that those communities that give a high priority to energy conservation achieve higher sustainability ratings than other communities.

Introduction

In 1987, the United Nations Brundtland Commission declared: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987a). The International City/County Management Association (ICMA) echoed this sentiment by noting that, for communities pursuing sustainability, the focus is on "development [that improves] quality of life, making a place more livable without harming the environment or creating financial burdens for future residents" (ICMA, 2007: 1).

Although sustainable development is a global concern, many reasons explain why it is pursued extensively at the local level. First, although growing international consensus indicates that *something* should be done, less consensus has been reached regarding *what* should be done to address sustainability concerns. Although its environmental impact is admittedly substantial, the United States has not signed on to any international agreement to reduce its footprint. In the absence of leadership at the national level, cities have emerged as both innovators pursuing broadly based environmental goals and efficient users of the reduced resources available to them as they seek to decrease their own energy consumption. Local executives are clearly aware of the importance of the effect they can have, because more than 1,000 mayors have signed on to the U.S. Conference of Mayors Climate Protection Agreement, in which signatories commit to pursuing Kyoto Protocol standards in their communities (United States Conference of Mayors, n.d.). Caitlin Geary, writing for the National League of Cities, further commented that "…local officials across the country are providing leadership and advancing economic strategies that incorporate environmental stewardship" (Geary, 2011: 1).

Pursuing sustainability at the local level also makes sense in terms of scope; the actions at this level significantly affect transportation, air quality, housing, water, and energy consumption. Because of the concentrated populations in cities, the activities that occur there have significant environmental ramifications that further motivate action at the municipal level. Konisky (2011) suggested that citizens desire that the level of leadership and responsibility for a particular policy area reflect the level of control the jurisdiction has over related issues. Individuals experience air quality, water quality, transportation, waste issues, and housing primarily in their daily lives, which might indicate that the local level of government is particularly well suited to addressing concerns in these areas. This emphasis on the importance of local activities undertaken in the pursuit of sustainability is not meant to minimize or dismiss the importance of federal and state regulation in ensuring that a consistent level of environmental protections is established and enforced, but it is to say that community members might seek stronger and more apparent leadership from their local government in areas related to sustainability because they experience the ramifications of sustainability initiatives (or lack thereof) in their daily lives. Although Young (2000) pointed out that typical governmental jurisdictions rarely encompass all the people affected by decisions they make, the local level is the most broad and consistent level at which decisions about sustainability might be made and evaluated, as Portney (2003) noted.

It is clear that efforts to promote sustainability have become important in local governments in the United States: "Sustainability is a familiar concept to local government professionals, many of whom trace its roots to the values and considerations inherent in the practice of community planning…" (ICMA, 2007: 1). The extent to which sustainability is pursued, the kinds of activities undertaken, and the reasons for pursuing them are not so clear, however. What sustainability efforts look like in practice, intent, implementation, and outcome appear to vary broadly. ICMA noted that, "For all the strong support for the broad principles, developing a consensus about what sustainability really means on the ground and how to reach agreement among community members with conflicting or competing goals can be something else altogether" (ICMA, 2007: 1). The adoption rate and the diffusion patterns of local sustainability policies vary widely. An indepth analysis of the variation in adoption levels must accompany an explanation of why some local governments have taken extensive sustainability actions, whereas others lag significantly behind what a typical innovation curve might suggest should be occurring.

Local government sustainability programs can be viewed in different ways depending on the scope of the program. Classic considerations of sustainability focus on the *three Es*: environment, economy, and social equity. ICMA extended this focus: "ICMA further defines the concept [of sustainability] as central to the professional management of local government, with four interdependent elements: balancing environmental stewardship, economic development, social equity, and financial and organizational viability" (ICMA, 2007: 2). Sustainability defined in this way requires a broad range of activities in which all levels of government, all sectors of the economy, and all members of the community must participate. City and county governments are well positioned to make a significant contribution to this effort for several reasons: (1) they are directly involved in providing or regulating many human activities that affect resource use, such as transportation, building construction, and land use; (2) they are actively involved in efforts to promote economic development; and (3) they provide services that help determine whether people from all socioeconomic levels and all racial and ethnic groups are protected and included. Whether, and how, all three classic aspects of sustainability are pursued, however, is a question that must be answered.

The effect of sustainability programs in local communities differs. Sustainability initiatives might be justified by their positive effect on the economy (Geary, 2011), and some activities produce immediate, tangible benefits to the locality in the form of reduced energy costs or commuting times. Other sustainability-related activities, such as reducing greenhouse gases (GHG) or improving air or water quality for those living downwind or downstream, have broader benefits that might help society as a whole but do not produce immediate or visible advantages for the government carrying out the activities. In addition, some activities might affect the general population within a jurisdiction and others might target particular groups with special needs. As a consequence, the perspectives on whether and how a sustainability program should be pursued differ widely. To some supporters, these programs are altruistic efforts to address a shared problem or advance a shared goal. Another view is that a commitment to sustainability can strengthen local economies and provide benefits to the jurisdiction. ICMA (2007) noted smart growth and conservation as two specific frames that different localities have used for pursuing sustainability. Mixed motivations are also possible, in two respects. Some local governments might explicitly seek to advance both local and broader goals, whereas others might pursue sustainability policies but address political opposition by stressing local benefits, even though the potential positive effects of actions they are taking extend beyond their jurisdictional boundaries.

Our analysis of the extent and kinds of sustainability activities that local governments have adopted is based on the ICMA Local Government Sustainability Policies and Programs survey, conducted in 2010, in which more than 2,000 local governments participated. This survey was a major effort to examine what local governments have done so far to address the sustainability challenge and how they partner with community members to change behaviors and advance shared goals.[1] The

[1] The survey was developed with input from ICMA's Center for Sustainable Communities, the Center for Urban Innovation at Arizona State University (ASU), ASU's Global Institute of Sustainability (GIOS), Alliance for Innovation, and others. Its distribution was conducted through a collaboration of ICMA, ASU GIOS, and the Sustainable Cities Network, a multi-jurisdictional partnership. The survey was provided in a print format because the local government response rate to print surveys is both higher and more scientifically representative than from an electronic survey. Approximately 12 percent of the responding governments chose to submit the form electronically. In total, 2,176 local governments responded, yielding a 25.4-percent overall response rate.

survey and additional data collected on the participating local governments covered 110 specific activities that the governments might have adopted and steps that they might have taken to plan and organize their sustainability efforts.

This article presents the analysis in two stages. The first stage examines what kinds of activities cities have adopted as they get on the sustainability train. The analysis groups the activities included in the ICMA survey into 12 areas, each of which is analyzed to determine the extent and range of their adoption. Activities are differentiated based on the nature of the benefit associated with the activity. The article footnotes report the analyses of the reliability of the indicators used in each area. Determining alpha scores for each area contributes to scale development for measuring sustainability policy.

The second stage develops and tests an explanatory model to investigate the influence of local institutions and community characteristics on the comprehensiveness of the sustainability efforts measured in the first stage. The analysis examines the effect of community characteristics such as education, number of young adults in the community, race, income, homeownership, housing value, and form of government. It then adds to the model survey-based indicators of the priority level assigned to environment, climate change, green jobs, and energy conservation. The community policy orientation and commitment indicate why governments get involved in sustainability. The analysis also controls for other factors likely to affect sustainability, such as population, density, metropolitan status, and region. Previous work summarized the ICMA survey results and reported bivariate relationships (Svara, 2011; Svara, Read, and Moulder, 2011). This more comprehensive model clarifies what kinds of communities are more active in sustainability and tests our explanation for why they get involved.

What Local Governments Are Doing To Advance Sustainability

The ICMA survey included specific indicators—policies, programs, and activities that local governments can take to advance sustainability—drawn from many sources.[2] A comprehensive set of 160 indicators was developed by the Alliance for Innovation and field tested by local governments in the Sustainable Cities Network of the Global Institute on Sustainability at Arizona State University. From that set, 110 indicators were included in the ICMA survey. The activities were chosen intentionally to cover commonly used techniques and rarely used activities. Following these choices, information about completion of Leadership in Energy & Environmental Design (LEED)-certified government buildings was added to the dataset. We grouped the specific activities into 12 areas by their purpose, and the percentage of activities adopted by the local government is the indicator

[2] The sources included SustainLane (http://grist.org/article/defining/), Visible Strategies: Framework Adapted from US Mayors (http://usmayors.visiblestrategies.com/), Portney (2003), Go Green Virginia Green Community Challenge (http://gogreenva.org/?/challenge/participate/id/1), and the ICMA Center for Performance Measurement.

of the level of commitment. The overall adoption rating—the average of the adoption rates for all 12 areas, which range from 0 to 100—captures both the amount and spread of activity across the major areas.[3] Exhibit 1 lists the 12 activity areas by average adoption rate.

The overall activity rating for all the responding governments is 18.1. Most governments are toward the low end on the rating scale, and 60 percent have an adoption rate that is less than the average for all the responding governments. On the other hand, some governments are undertaking many and a wide range of sustainability activities, with ratings reaching a high of 78.

We present each activity area with its component indicators in the following 12 exhibits. The graphs use the same scale to compare the relative levels of adoption within and across each area. We discuss the variation in adoption rates relative to (1) the nature of benefits; (2) focus on internal government operation versus activities that affect residents and the community; and (3) the effort level for residents, reflected in the political acceptance, commitment of resources, or change in behavior that the activity requires.

Exhibit 1

Major Sustainability Activity Areas

Major Activity Areas	Average Percent of Activities Used
Recycling	33
Water conservation	28
Transportation improvements	22
Energy use in transportation and exterior lighting	22
Social inclusion	21
Reducing building energy use	19
Local production and green purchasing	18
Land conservation and development rights	15
Greenhouse gas reduction and air quality	12
Building and land use regulations	12
Workplace alternatives to reduce commuting	8
Alternative energy generation	7
Overall adoption rating across all activity areas	**18**

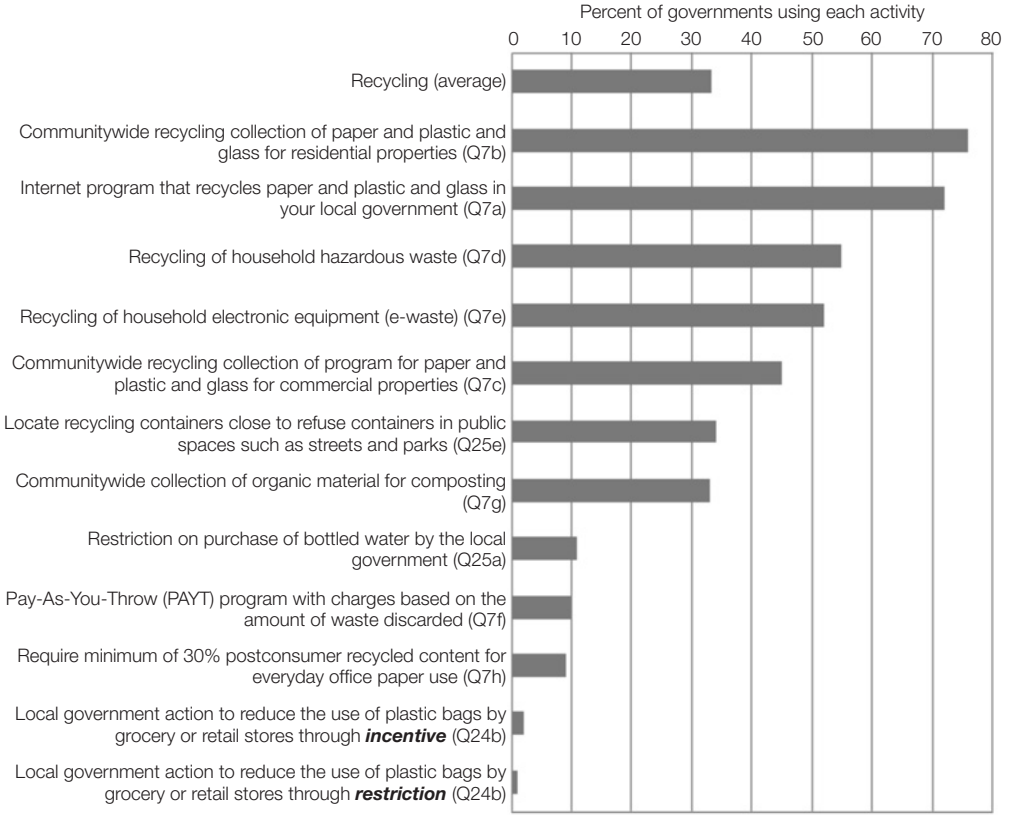
Recycling

The most commonly adopted activity area is recycling, which is important to sustainability because it reduces the amount of land devoted to landfills, eliminates hazardous materials from the waste stream, and recovers resources for reuse. Exhibit 2 indicates that most governments have community-wide residential collections of recyclable materials, collect internally, and offer recycling of hazardous

[3] Using a raw activity count as the measure of activity level would be somewhat misleading, because the number of specific measures differs across the activity areas. To provide an extreme example, a government that performed all 15 building energy activities but no other activities would have a rating of 13.8 (15/109). Performing 100 percent of the indicators in only 1 major activity area out of 12, on the other hand, would equal an overall activity rating of 8.3 (100/12), regardless of the number of activities in that area. Thus, governments that adopt activities across many areas have a higher rating than those with a concentrated effort in fewer areas.

Exhibit 2

Recycling



materials and e-waste.[4] One-third or more provide commercial recycling, colocation of trash and recycling containers, and collection of compostable materials. Other methods of promoting recycling directly and indirectly are still uncommon. Use of recycling methods has built up over a long period, but some methods are still rarely used. Although it seems conventional now, recycling was once dismissed as a noble goal that the public would never support. As Hopper and Nielsen (1991) noted, recycling was seen as costly and burdensome to individual residents. As pressure to find alternatives to landfills increased, cities worked to set up recycling centers, but residents still had to sort and transport their recyclables to them. The incentive for the individual to participate was minimal, and many studies pointed to altruism as the main motivator for those who did recycle. Over time, cities made the act of recycling second nature, particularly by improving the simplicity of the process and ease of accessibility for individual residents through residential collections.

[4] The alpha for recycling is .723, indicating that each activity listed in this category is contributing meaningfully to the overall score. The alpha increases to .726, however, if Pay-As-You-Throw (Q7f) or the reduction in plastic bags in grocery or retail stores through incentive (Q24b) is removed from the category. The alpha increases to .728 if the item regarding reduction of plastic bags through restriction (Q24b) is removed. The revised alpha eliminating these three activities is .739.

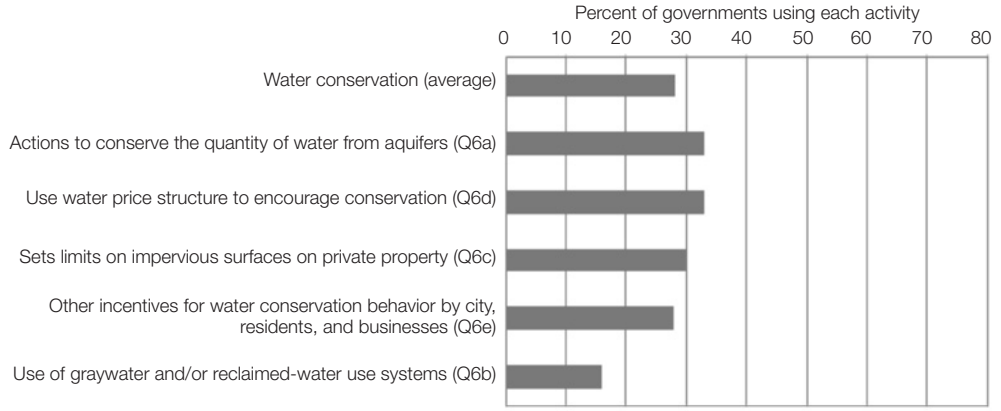
Six of the seven activities used by at least 30 percent of the responding local governments are services to residents, and the seventh is an internal program to recycle in government buildings. The scope of recycled materials and the range of collections from places where waste is generated continues to expand. As recycling has become more simple and convenient, residents no longer need an altruistic commitment to the greater good to participate. Still, the survey does not include use rates, and other sources of information need to be examined to determine whether charges for certain services and the extent to which residents are using them differ, especially for newer services such as collection of organic material.[5] Adoption of methods that involve requirements or restrictions, charges, or even incentives are still uncommon, used by no more than one in nine local governments. The limited adoption applies both to activities that affect residents, such as Pay-As-You-Throw and restrictions on the use of plastic bags, and to changes in governmental behavior, such as prohibiting the purchase of bottled water and requiring the purchase of office paper with recycled content. Recycling activities generally have benefits that are available to all residents and have a direct, immediate effect on the community in the form of improved appearance, some revenue generation from sale of recyclables, and reduced landfill costs, and they also have broader and longer term benefits that result from the reuse of materials.

Water Conservation

Approximately 30 percent of local governments use a cluster of activities to promote the conservation and quality of water resources, as exhibit 3 indicates.[6] These activities are conserving the quantity of water in aquifers, using water pricing to encourage conservation, setting limits on impervious

Exhibit 3

Water Conservation



[5] For example, some cities provide curbside recycling of household waste to all residents but require an additional fee for curbside pickup of yard waste.

[6] The alpha for water conservation is .663, which is not improved by removing any possible actions included in the survey. Although this alpha, in general, is high and indicates that each activity is contributing to the overall score, it is possible that this matrix of activities is incomplete, and perhaps the inclusion of other activities would improve the overall picture presented in this category.

surfaces on private property to reduce runoff, and other incentives for water conservation behaviors by city, residents, and businesses. Only one-half as many local governments have started using graywater or reclaimed-water use systems to expand water supply.

All these activities affect residents and the community and entail restrictions in behavior or require the expenditures of resources. Despite these characteristics, these water conservation measures have the second highest overall level of acceptance compared to other activity areas. The least accepted of these activities is reusing or reclaiming used water, which entails substantial front-end costs and therefore might generate resistance from residents. The benefits of water conservation apply to all residents and are both immediate and localized by protecting a community's water supply and having "downstream" and long-term benefits. The relatively high level of acceptance of these activities might be an extension of legally mandated water quality requirements.[7]

Transportation Improvements

Among a range of methods to improve and diversify transportation options in the local government, the most commonly adopted are related to expanded options for bicycling and walking, as exhibit 4 indicates. Of local governments, 20 percent expanded bus routes or provided transportation programs targeted at low-income groups. Other transportation improvements are rarely adopted.[8]

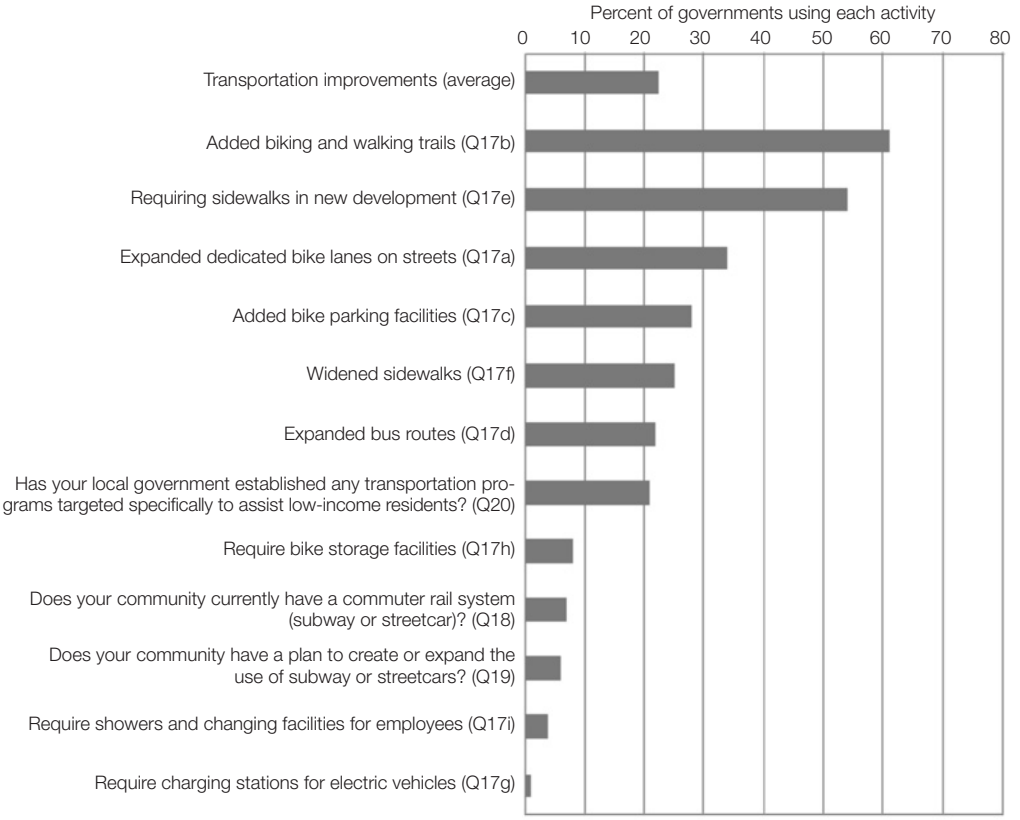
Most of the transportation improvements undertaken by those local governments surveyed yield internal benefits and can be described as beautification or livability improvements. Adding biking and walking trails and requiring or widening sidewalks increases the opportunities residents have to use nonmotorized transportation, but they also might be part of greater trends aimed primarily at traffic calming but also at reducing obesity through encouraging exercise (Project for Public Spaces, n.d.). Although any action taken by a local government that reduces the number of vehicles on the road might be considered positive in terms of sustainability, this example is an important illustration of the cross-collaborative nature of some sustainability activities and the multiple means by which some activities might be pursued and justified. Whereas removing motorized vehicles from the road yields both internal and external benefits, adding walking

[7] Federal regulations establish minimum guidelines for water quality, with states having some latitude in how they meet those guidelines. For details regarding federal guidelines, see http://water.epa.gov/scitech/swguidance/standards/handbook/index.cfm (accessed July 16, 2012). Because some uniform regulatory requirements are in place, cities presumably direct some attention to water conservation and quality issues, whether or not they are subsumed under a sustainability framework. With this assumption in mind, the more unusual conservation efforts (such as reclamation of gray water) that some cities undertake are of great interest.

[8] The alpha for transportation improvements is .701, indicating that each activity contributes to the overall score fairly evenly and, therefore, each is important in explaining the overall score. The alpha improves slightly (to .708) if the activity of transportation programs for low-income residents (Q20) is removed. It is interesting to note that removing consideration of whether the local government has a commuter rail system (Q18) increases the alpha to .704. Removing consideration of whether the local government requires a charging station for electric vehicles (Q17g) has no effect on the alpha. Overall, removing any activity from this category does not significantly affect the alpha, indicating that the overall scale is reliable. A reconsideration of the index yields an interesting result: if both transits (Q18) and charging stations (Q17g) are removed and the transportation programs for low-income groups (Q20) is moved to the social inclusion index, the alpha rises to .714. Although the alpha is reliable, it is clear that even greater reliability is gained through further refinement of the index.

Exhibit 4

Transportation Improvements



and bike trails and expanding sidewalks will yield greater benefits for those living in the locality and might reduce health costs.[9] The relative lack of adoption of more elaborate transportation initiatives might reflect community variation in resources and need; for example, mass transit is less necessary and feasible in small communities.

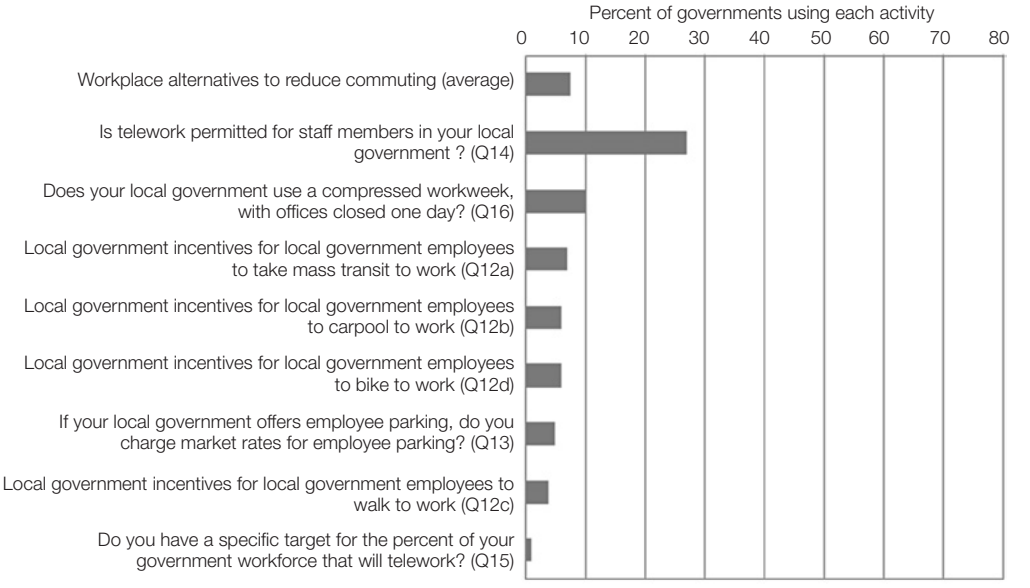
Workplace Alternatives To Reduce Commuting

Whereas certain transportation improvements are widely adopted for community benefit (as described previously), our survey indicates little provision of alternatives to traveling by car to worksites for government employees. Exhibit 5 indicates that working from home or another

[9] BlueCross BlueShield of North Carolina explained a contribution to biking and hiking trails in part to reduce health costs, claiming that the benefits exceed the cost of trail expansion by a three-to-one ratio. See http://mediacenter.bcbsnc.com/pr/bluecross/bcbsnc-invests-in-biking-and-greenway-236455.aspx (accessed July 20, 2012).

Exhibit 5

Workplace Alternatives To Reduce Commuting



location with an electronic connection to the office is permitted by only about 25 percent of governments, and other activities to encourage a change in the mode of transportation or commuting patterns for local government employees are still rarely used.[10]

It is somewhat remarkable that local governments use so few of the options for reducing employee commutes because they can adopt these activities internally by government action alone, without the need for public consent. It is not surprising, however, that teleworking is the most widely used activity in this category. Dubrin noted that "Flextime has grown in popularity because evidence suggests that it reduces turnover, improves morale, and helps recruit talent" (Dubrin, 2006: 120). As noted in the Transportation Improvements section, some activities are justifiable in many different ways, and teleworking is another example. The activities here primarily yield internal benefits, wherein the local government has the opportunity to reduce operating costs, improve employee morale, lead by example, and encourage a slight reduction in GHG emissions through modifying employee behavior by incentivizing desirable transportation choices.

[10] The alpha for workplace alternatives to reduce commuting is .675, which seems relatively high. Essentially, however, all activities in this category, except incentives for local government employees, could be removed to the benefit of the overall reliability of this measure. If telework for staff members (Q14) is removed, the alpha improves to .715; if compressed workweeks (Q16) is removed, the alpha improves to .696; if market rates for employee parking (Q13) is removed, the alpha improves to .692; if the establishment of a target percentage for government workforce that will telecommute is removed, the alpha improves to .689. Note in this circumstance that responses to Q12a through Q12d are correlated; if a city is providing incentives for alternative transportation in one area, it might be more likely to provide incentives in other areas, too. The other activities are likely also important, but their relative effects are more difficult to tease out given the high correlation among most of the incentive categories. If incentives for employees (to take mass transit, carpool, bike, or walk to work) are measured alone, the scale alpha is .862.

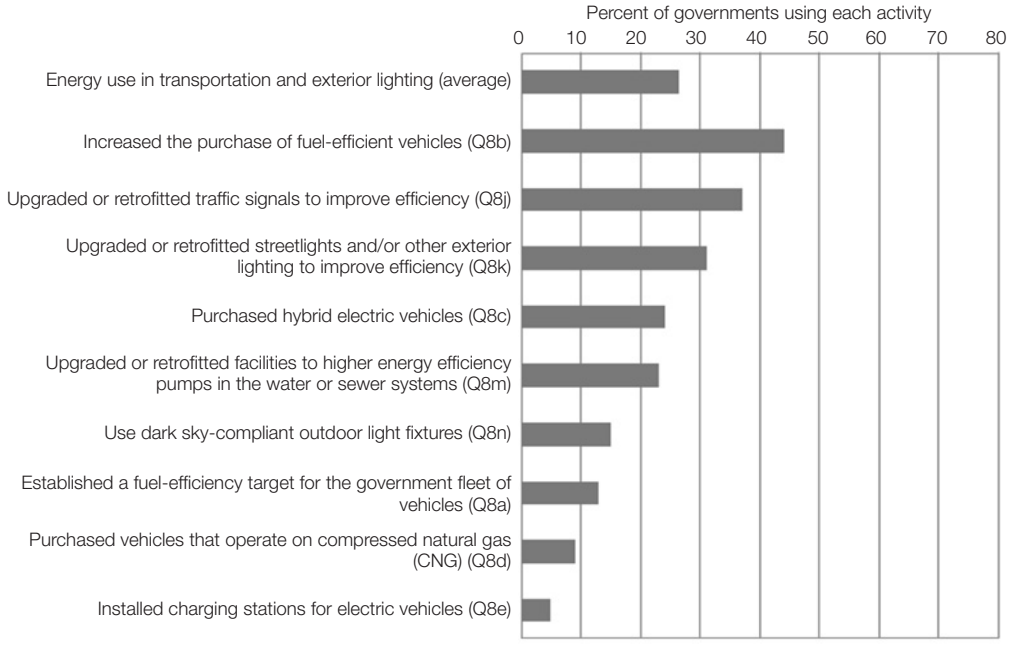
Energy Use in Transportation and Exterior Lighting

Exhibit 6 shows that a large proportion of local governments (44 percent) have taken the step of purchasing vehicles that are fuel efficient. This action has clear and immediately tangible benefits in the form of upfront cost savings, particularly as gas costs continue to be unstable. Of local governments, 37 percent have taken the step of improving their traffic signals to achieve greater efficiency, and 31 percent have upgraded their streetlights. These activities might be justified through cost savings, with sustainability as a side benefit. Fewer of the responding cities and counties have taken the more extensive activities of supporting hybrid vehicle purchase (24 percent) or upgrading their sewage pumps (23 percent), but these steps would seemingly also be justified through efficiency and cost-saving arguments. Very few local governments had established fuel-efficiency goals or chosen to use dark sky-compliant lighting. Supporting electric vehicle recharging was still an underdeveloped activity in 2010.[11] Whether this emerging technology is now beginning to spread more widely needs to be determined.

The benefits of using fuel-efficient vehicles and streetlights clearly span jurisdictional boundaries because air quality and traffic improvements are not neatly tied to one jurisdiction, but altruism is not the likely motivator in this case. Fuel and energy efficiency are very desirable in vehicles and lights, both in terms of cost savings over the life of the equipment and in emissions reduction.

Exhibit 6

Energy Use in Transportation and Exterior Lighting



[11] The alpha for energy use in transportation and exterior lighting is .716. The score is not improved by removing any activity listed, which indicates that the overall index of activities is reliable.

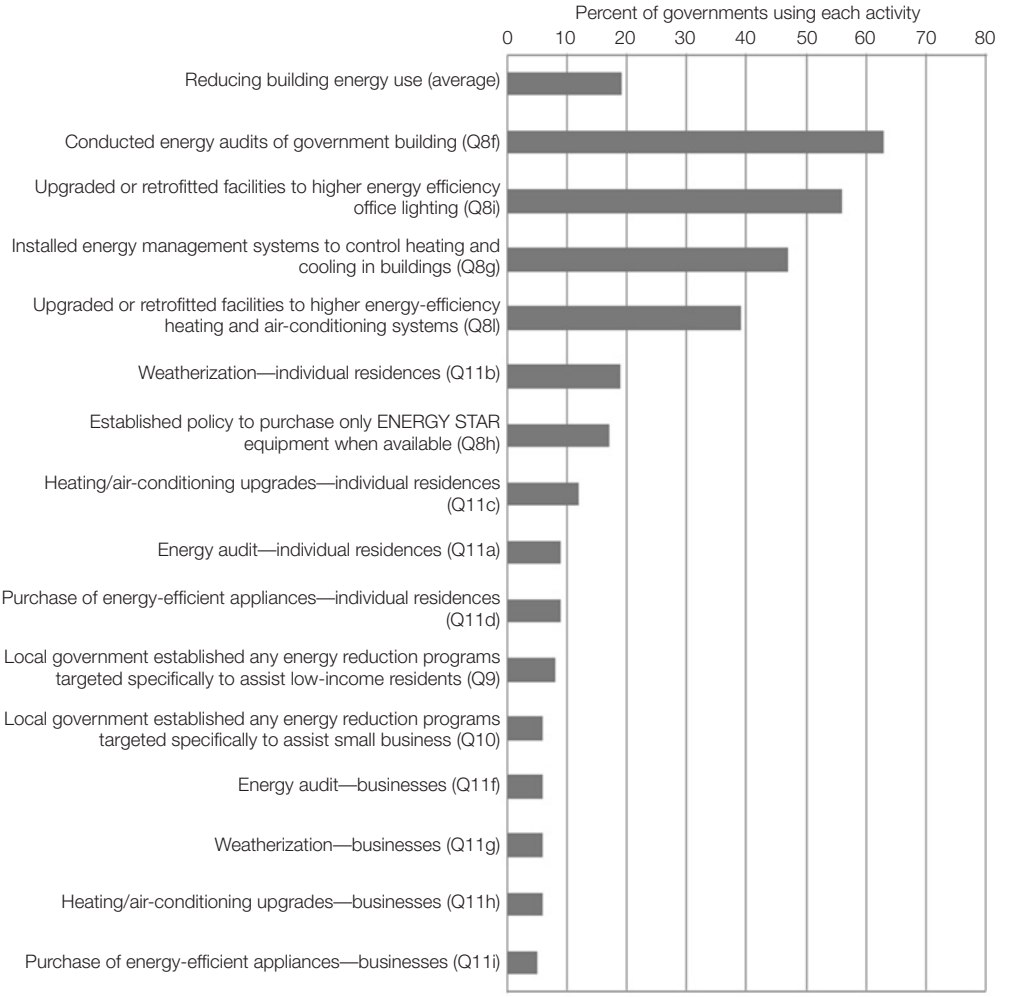
Despite the relatively common use of specific measures, broader strategic approaches and overarching targets are less common. As noted, emerging technologies have not been widely embraced. Dark sky-compliant fixtures that promote environmental objectives other than improved energy efficiency are also uncommon.

Reducing Building Energy Use

It is encouraging to see (exhibit 7) that 63 percent of the respondents have conducted an energy audit of government buildings, which seems to correspond with a high level of interest in both retrofitting lighting and more efficiently managing internal energy consumption. Only 9 percent

Exhibit 7

Reducing Building Energy Use



offer energy audit services for individual residences or assistance in the purchase of energy-efficient appliances, however. Only 6 percent offer energy audit services for local businesses, and 5 percent offer assistance for the purchase of energy-efficient appliances for businesses.[12]

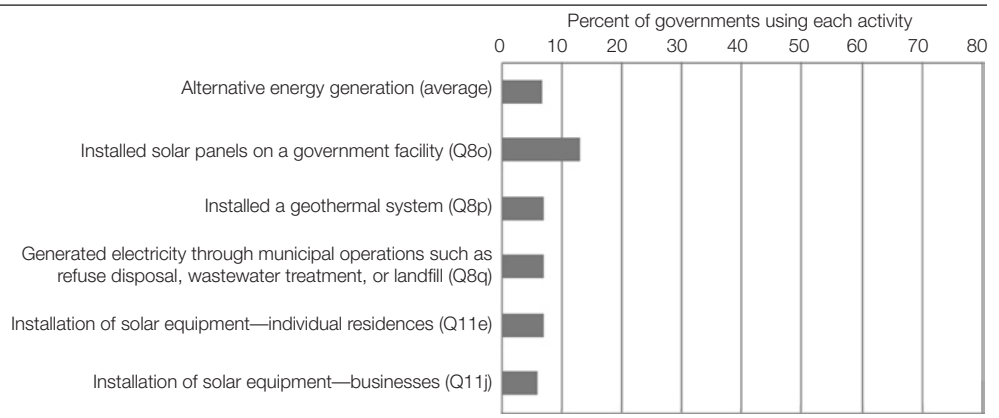
It is clear that the activities most frequently adopted by responding governments yield a direct, internal financial benefit. Focusing on internal energy efficiency reduces energy costs that the local government must pay. Beyond the limited scope of internal energy efficiency improvements, few governments are facilitating energy efficiencies for residents and fewer still are doing so for businesses. Although pursuing energy efficiency can deliver benefits beyond the boundaries of the jurisdiction, we can surmise from the kind of activities local governments are undertaking that their motivation is primarily to reap internal rewards. Subsidies and regulations entail greater fiscal and political costs, which is likely why they are underused.

Alternative Energy Generation

Only the most motivated cities and counties pursue alternative energy usage and development. Exhibit 8 shows that only 13 percent of local governments have installed solar panels on government facilities, and this activity was the most pursued of those listed. Less than 10 percent of respondents offer assistance to facilitate alternative energy usage for businesses, and the same number pursue geothermal energy usage for government facilities or the development of other alternative energy creation.[13]

Exhibit 8

Alternative Energy Generation



[12] The alpha for reducing building energy use is .812, which is extremely high. The score indicates that each activity is necessary in explaining the total score, which is underscored by the fact that if any activities are removed, the alpha varies from .792 to .809, indicating that no one activity contributes to the reliability of the index but, rather, that all activities taken together give this index its strength.

[13] The alpha for alternative energy generation is only .567, indicating that the reliability for this index is not very strong. The alpha improves to .583 if geothermal (Q8p) is not included and to .577 if generating electricity through municipal operations (Q8q) is removed. Each exclusion fails to bring the index into a high reliability range. Removing both exclusions yields a score of .629, which is a significant improvement. These results, however, seem to indicate the need for more research into how to accurately assess alternative energy generation activities cities are pursuing.

Alternative energy development can have high upfront costs that might be difficult to justify in times of recession. In addition, many anecdotes exist of public officials who misunderstand how alternative energy is created and used. (For example, an environmental commissioner in a local government reported in a recent interview that many of the commissioner's colleagues are suspicious of solar and wind energy because the sun does not shine and the wind does not blow all the time). With high upfront costs and a level of technical complexity that might be intimidating and difficult to explain, alternative energy development options remain mostly underused.

Building and Land Use Regulations

Zborel, writing for the National League of Cities, notes that "Nearly all stages of construction, operation and eventual disposal of buildings present significant financial investments and opportunities for savings. Employing green building principles during new construction or through retrofitting existing buildings can significantly reduce operating costs while increasing the overall property value" (Zborel, 2011: 6). Whether and how sustainability opportunities related to building development are pursued is of interest to those considering local sustainability efforts. More than one-third of the survey respondents have zoning codes that encourage mixed-use development (see exhibit 9), but the usage of regulations to pursue sustainability goals drops off sharply from that level. About 20 percent of respondents permit higher density development in existing infrastructure or near an existing transportation node. Only 3 percent of respondents offer reduced fees or tax incentives for environmentally friendly development, which is clearly a missed opportunity to encourage green economy in the locality. Only 12 percent require new government construction to be LEED or ENERGY STAR certified, and even fewer require this certification for government retrofits.[14]

Reviewing records of the U.S. Green Building Council reveals that 8 percent of the responding governments have a LEED-certified government building.[15] Among governments that have set a requirement to meet certification standards for their new buildings, 30 percent have a certified structure compared with only 5 percent of governments that have not set this requirement.

Although the benefits of building and land use regulations to facilitating a smart growth approach to development are primarily internal, external benefits would also accrue to the larger community as the regulations were implemented. Building restrictions that encourage more energy-efficient structures and denser development are meant to facilitate a more livable and efficient community for residents, but they would also produce benefits such as air pollution reduction through fewer single-passenger trips that exceed a jurisdiction's boundaries. Having noted that, communities that are pursuing building and land use regulations as part of a sustainability plan are likely motivated primarily by the local community benefits they expect it to yield.

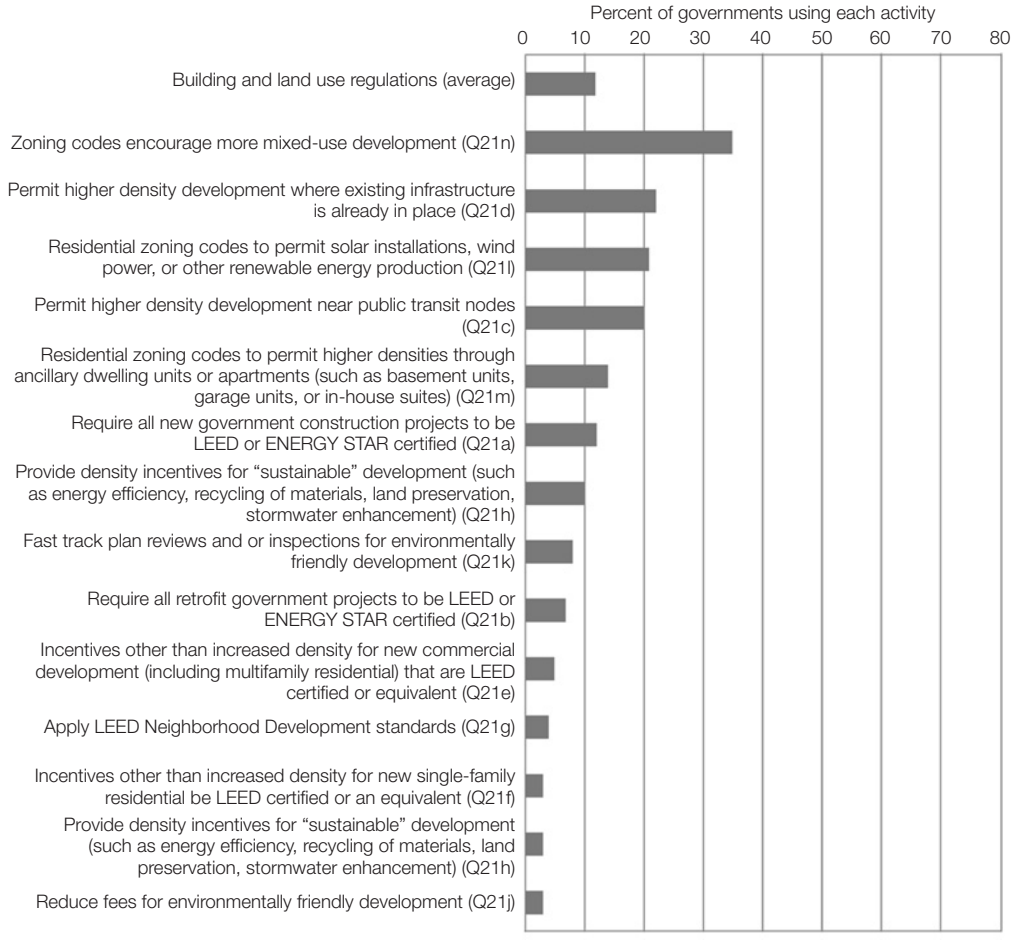
Nearly all the possible building and land use regulation activities included in this survey entail attempts to motivate activities desirable relative to sustainability goals; that is, they permit,

[14] The alpha for building and land use regulations is .761, and each activity area contributes to this score. Removing any activity area does not improve the overall alpha, indicating that this index of activities is reliable for addressing building and land use regulations for cities as regards their sustainability efforts.

[15] Sean Gause carried out the review of the U.S. Green Building Council inventory of certified buildings as part of his research for a senior honors thesis.

Exhibit 9

Building and Land Use Regulations



LEED = Leadership in Energy and Environmental Design.

encourage, or incentivize. Restrictions on activity are less popular; only 7 percent of governments require that all retrofits on their buildings be LEED certified, and (as noted previously) only 12 percent of local governments require that new government buildings be LEED certified. The incentives included in the survey demonstrate one means by which economic development and environmental sustainability can be achieved simultaneously. Mixed-use development might also facilitate the social equity goals that accompany a holistic sustainability perspective.

Land Conservation and Development Rights

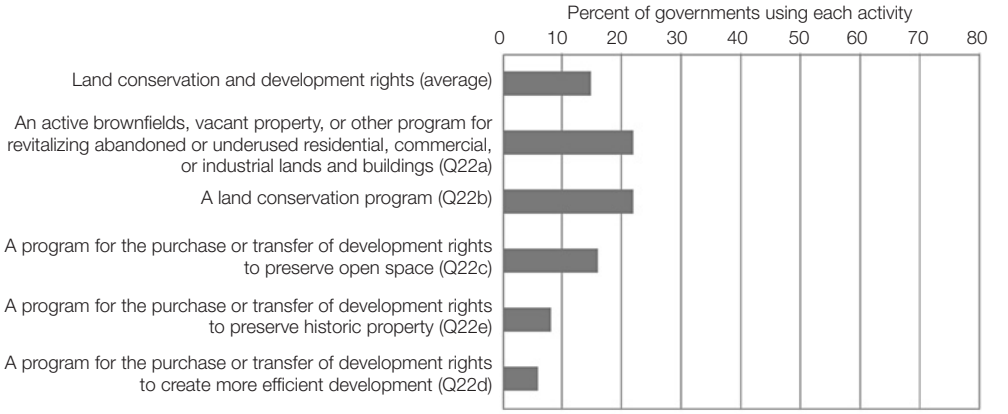
Land conservation is evidently not a priority for most survey respondents. Less than 25 percent of the respondents have a land conservation program or an active program for revitalizing underused

facilities, and only about 17 percent have a program for the purchase or transfer for development rights to preserve open space (see exhibit 10). Even fewer respondents have a similar program to preserve historic property or to acquire development rights to create more efficient development.[16]

By contrast to the immediacy of benefits that come from activities such as improved energy efficiency in buildings, sustainable land use policies and practices often take a long time to provide benefits, and they might generate opposition from affected interests in the short run. Similar to those of the building and land use regulations category, the benefits of pursuing land conservation through more efficient development or programs specifically meant to preserve some set-aside spaces will accrue internally and externally if pursued. A local government that is pursuing policies to conserve land over which it has jurisdiction is likely to be motivated primarily by the internal benefits that might accrue through smart growth strategies. The positive ramifications of those activities will exceed jurisdictional boundaries, however, either through reduced air pollution from fewer trips because of denser development or through public access to land set aside for recreational purposes. Each possible activities listed in this category requires a proactive approach to land management, and their rates of adoption tend to drop off sharply as the activities move to requiring a greater capacity to interface with the development community. For example, 22 percent of the governments offer programs for revitalizing abandoned and underused buildings, but only 6 percent have a program for purchasing or transferring development rights to create more efficient development.

Exhibit 10

Land Conservation and Development Rights



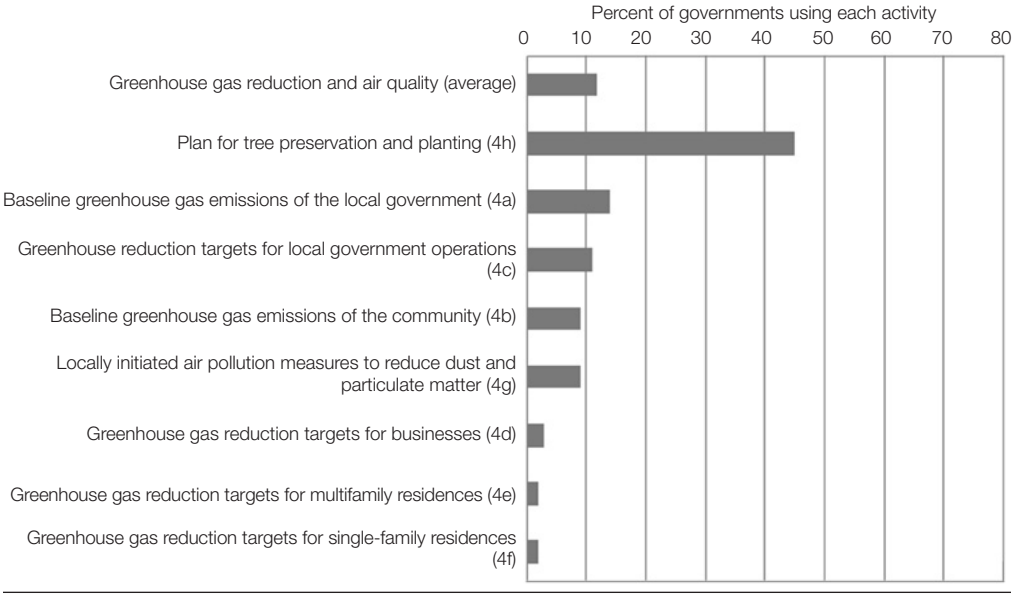
Greenhouse Gas Reduction and Air Quality

By far, the most commonly undertaken activity in the category of GHG emission reduction is a program for tree planting and preservation, with 45 percent of local government respondents pursuing this option (see exhibit 11). Such programs might be part of beautification or landscaping

[16] The alpha for land conservation and development rights is .565 but improves to .620 when the question regarding programs for revitalizing brownfields (Q22a) is removed. Removing any other activity area decreases the alpha.

Exhibit 11

Greenhouse Gas Reduction and Air Quality



projects that have been rolled into the locality's sustainability plan. With regard to measures explicitly related to GHG, only 14 percent of respondents have determined their baseline GHG emissions, 11 percent have established reduction targets for local operations, 9 percent have determined reduction targets for the community at large, 6 percent have established targets for businesses, and 2 percent have established targets for single-family and multifamily residences.[17]

The effort to reduce GHG emissions is one of the core foci of sustainability,[18] yet few responding governments have enacted strategies to catalog and decrease local emissions. One might legitimately question how a local government plans to assess the quality of its sustainability plan if it has not measured its baseline emissions. With what will future measurements be compared? If sustainability programs are to focus on results, measures of current conditions are needed. The reduction of GHG emissions is not the only goal of the move toward more sustainable practices, but it is a core area that, it appears, has been underaddressed thus far.

[17] The alpha for greenhouse gas reduction and air quality is .693. Although already high, this score improves dramatically, to .757, with removing the plan for tree preservation and planting (Q4h). A less impressive increase (to .698) results from removing the question regarding locally initiated air pollution measures (Q4g). The alpha for this category is strong overall, but the scores indicate that some tweaking might improve the reliability of this index. The alpha increases to .798 if locally initiated air pollution measures (Q4g) and tree preservation and planting (Q4h) are both removed.

[18] "The 'greenhouse effect', one such threat to life support systems, springs directly from increased resource use. The burning of fossil fuels and the cutting and burning of forests release carbon dioxide (CO2). The accumulation in the atmosphere of CO2 and certain other gases traps solar radiation near the Earth's surface, causing global warming. This could cause sea level rises over the next 45 years large enough to inundate many low lying coastal cities and river deltas. It could also drastically upset national and international agricultural production and trade systems" (United Nations, 1987b: 3.24).

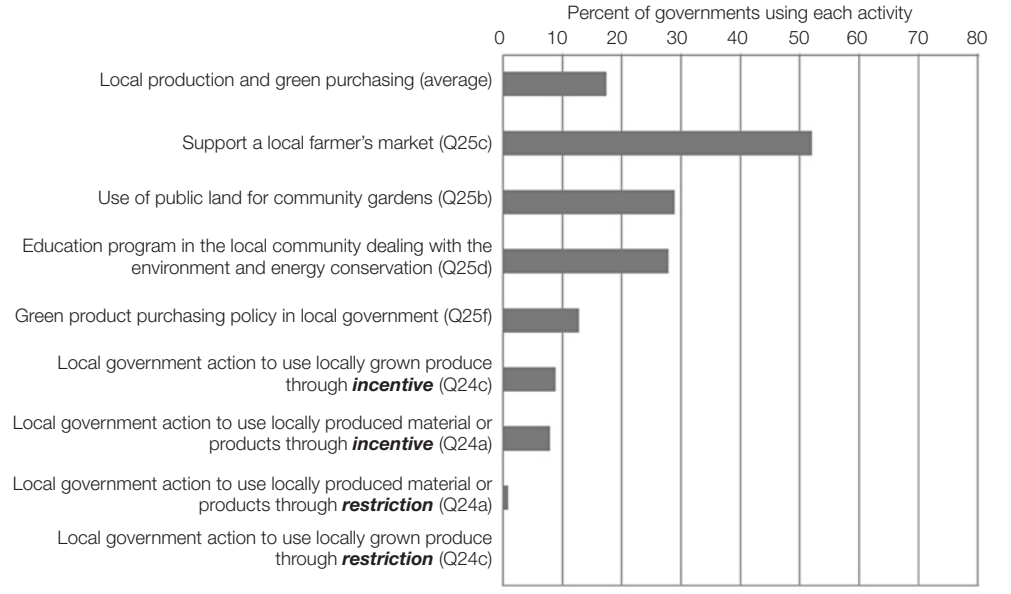
Local Production and Green Purchasing

More than one-half of the respondents indicated that they offer support for local farmer's markets (see exhibit 12). As with recycling and tree planting, this result might be a longstanding commitment by the local government rather than an action taken in response to the sustainability movement. On the other hand, community gardening seems to be a new idea, and nearly 30 percent of local governments are now engaging in it. About the same proportion offer community education regarding the local environment and energy conservation. Only 13 percent of responding governments have an internal green purchasing policy, however, and less than 10 percent use either incentive or restriction to encourage the use of locally sourced materials.[19]

The benefits of purchasing locally produced items and facilitating residents' ability to do so are numerous: supporting the local economy, reducing the requirement for transporting items across vast spaces, creating community through farmer's markets and community gardens, educating community members on many environmental issues, and so on. Farmer's markets often attract participants from beyond the local government's jurisdiction, whereas community gardens primarily seem to be based in particular neighborhoods.

Exhibit 12

Local Production and Green Purchasing



[19] The overall alpha for local production and green purchasing is .560, indicating room for improvement regarding the reliability of this index. The alpha increases to .570 when either of the restriction measures (Q24a or Q24c) is removed and to .591 if both are removed, but this slight increase does not yield a dramatic change to the reliability of the index. A different combination of activities might yield a better measure of local production and green purchasing activity. This list is more a collection of activities than a coherent scale.

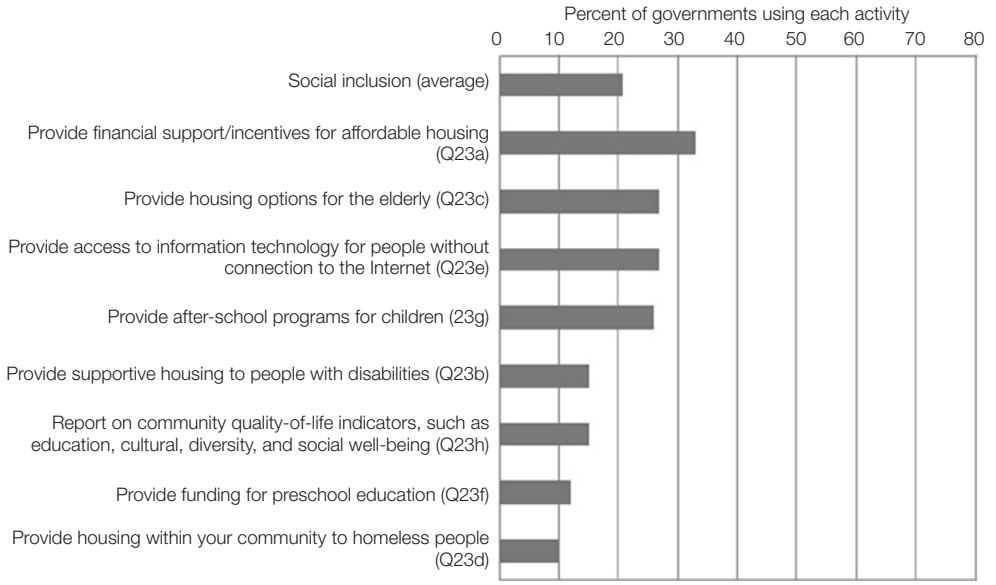
As local governments strive for financial savings, it is perhaps not surprising that they generally do not require those items that are purchased to be green, because these items often come with higher upfront costs. Because green items' benefits are often not immediate, they can become more difficult to justify. Also unsurprising given the likely reluctance of many communities to support high levels of local government regulation, efforts to incentivize or restrict individual behaviors are not commonly used. These activities are clearly underused but perhaps also the most politically difficult to develop and implement in this category.

Social Inclusion

In considering social inclusion, this survey asked questions about housing, access to technology, and education options for low-income individuals in the city. Exhibit 13 shows that more than 30 percent of responding local governments provide support or incentives for affordable housing, and about 27 percent provide housing options for elderly people, provide access to technology for those who do not have it, and offer after-school programs for children. Only 12 percent provide some sort of early preschool funding support, 15 percent provide supportive housing to people with disabilities, and 10 percent provide some sort of housing for homeless people.[20]

Exhibit 13

Social Inclusion



[20] The alpha for social inclusion is .783, which is very high. Furthermore, removing any activity does not improve the score but also does not drop it dramatically; the range of scores if an item is removed is from .747 to .771, indicating that each item in this category has an effect on the overall score and that the index is reliable. It is interesting to note that, although removing the low-income transportation assistance item (Q20) from the transportation improvements index yields a slight increase in the alpha, adding it to the social inclusion index results in a slight drop, to .777.

Social inclusion activities are clearly meant to facilitate greater equity among members of the local community, such that everyone's most basic needs are met. These activities might be classified under many different policy prerogatives, again demonstrating the cross-collaborative nature that sustainability activities can take. Although the benefit of many of these activities is local in the short term, it is generally understood that activities such as facilitating education attainment provide long-term benefits to society as a whole. Providing housing assistance to the most vulnerable populations in a community provides both economic and social benefits to that community (Norman-Major and Wooldridge, 2011). Still, these activities might be perceived as handouts that benefit only low-income people at the expense of relatively wealthy people. The activities listed in this category are explicitly services provided by the local government and do not restrict individual action in any way. One's preference for the kinds of social services provided by government are often tied to one's ideological preference, and further research will help determine the role ideology plays in the pursuit of social inclusion sustainability objectives.

Summing Up the Activities: Glass Still Empty or Starting To Fill Up?

This extended review of the general patterns and specific choices of activities reinforces the view that most governments are slow to commit to sustainability and are using only a small range of the possible approaches considered in this survey. As noted, some of the most commonly used activities might be longstanding and adopted for reasons other than a commitment to sustainability. Such activities are important as part of an integrated sustainability strategy, but they do not necessarily indicate a commitment to promoting sustainability as an explicit policy goal. This interpretation is reinforced by the fact that the lack of an overall sustainability program is typical of most of the survey respondents. Fewer than 3 in 10 governments have set goals, and only 19 percent have set targets.

When activities are divided into those with an internal or an external focus, it would seem intuitive that the internal activities that change governmental operations would be more commonly adopted than those that target residents or businesses or that affect the community generally. Our research shows this intuition to be accurate in some areas; for example, audits and energy-efficiency improvement are more common in government buildings than in residences and privately owned buildings. Still, many steps that governments could take to change staff behavior (for example, incentives for carpooling or using means other than cars to get to work) or operating practices (for example, use of recycled office paper) are still rarely used. When comparing the adoption rates of the 38 internally focused activities and the 72 community-focused activities, no difference emerges. The governments in the survey adopted approximately 20 percent of both sets of activities.[21]

[21] The rate for internal activities is 20.2 percent and the rate for external activities is 21.0 percent. Examples of internal activities are a recycling program in the local government, energy audits of government buildings, telework for government staff, requiring all new government construction projects to be LEED or ENERGY STAR certified, and having purchased hybrid electric vehicles. Examples of external activities are a communitywide recycling collection program for residential properties, charging stations for electric vehicles, energy audits of individual residences, incentives other than increased density for new commercial development (including multifamily residential) that are LEED certified or an equivalent, a land conservation program, and a program for the purchase or transfer of development rights to preserve open space.

Another indication of an explicit commitment to promoting sustainability is joining a national or international campaign. In 2005, the United States Conference of Mayors endorsed the Climate Protection Agreement.[22] To reduce global-warming pollution levels, the agreement urges action on the national and local government levels. Among the city governments responding to the International City/County Management Association's sustainability survey, 281 (13 percent) have adopted the agreement.[23] (Virtually no counties have signed it.) The signees have an overall sustainability rating of 30 compared with the rating of 18 for all governments (Svara, 2011). One association that local governments can join is ICLEI—Local Governments for Sustainability (formerly, the Council for Local Environmental Initiatives) with more than 1,200 local government members internationally.[24] ICLEI members become part of the Cities for Climate Protection (CCP) campaign by passing a resolution to reduce GHG emissions from their local government operations and throughout their communities by undertaking specific activities.[25] More than 600 local governments in the United States are ICLEI members. Among governments responding to the ICMA survey, 10 percent are members. The signees have an overall sustainability rating of 34 (Svara, 2011).

It appears that up to one-fourth of local governments have gotten on the sustainability train for the long haul with the intent of traveling to an explicitly chosen destination. Even these governments could do much more, but they are exploring a fairly wide range of options. The remaining local governments are adopting some prominent activities or identifying existing practices that are related to sustainability. In effect, they stay on the train for a few stops but have not yet committed to making the journey.

Who Is Adopting Sustainability Activities?

A previous study based on bivariate analyses of this survey revealed three factors associated with differences in the overall level of sustainability action: (1) form of government, (2) population, and (3) region. We build on this foundation by expanding the range of city characteristics to explain local government sustainability efforts and estimating multivariate models of their influence on the scope of sustainability programs that cities adopt.

We draw on the literature and previous studies to identify a more comprehensive set of factors that might explain why some local governments engage in more sustainability activities than others. The factors include community demographic and socioeconomic attributes, governmental institution, and local policy priorities. We also account for population, density, metropolitan status, and region. Exhibit 14 lists the variables included in our explanatory models.

[22] Available at http://usmayors.org/climateprotection/documents/mcpAgreement.pdf.

[23] In addition, 7 cities using commission, town meeting, and representative town meeting forms of government and 4 counties have signed the agreement.

[24] See http://iclei.org/.

[25] The organization was founded in 1990 as the "International Council for Local Environmental Initiatives." The CCP campaign was launched in 1993 as a successor to the organization's initial Urban CO2 Reduction Project. The five milestones of the CCP are (1) conducting a baseline emissions inventory and forecast, (2) adopting an emissions reduction target for the forecast year, (3) developing a local action plan, (4) implementing policies and measures, and (5) monitoring and verifying results. Information about CPP is available at http://iclei.org/index.php?id=810 (accessed January 14, 2011).

Exhibit 14

Measurements and Summary Statistics of Independent Variables

		Measurement	Mean (Standard Deviation)	Min/Max
Institution	Manager	1 = cities with council manager form of government, 0 = mayor-council or other form (ICMA, 2010)	0.62 (0.48)	0/1
Community Attributes	Education	Percentage of population with bachelor degree or higher (2006–2010 American Community Survey 5-Year Estimates)	28.0 (16.0)	3.3/86.1
	Young adults	Percentage of population age between 25 and 44 (2006–2010 American Community Survey 5-Year Estimates)	25.50 (4.58)	2.70/50.40
	White	Percentage of population that is White (2006–2010 American Community Survey 5-Year Estimates)	80.2 (17.6)	3.3/99.3
	Income	Median family income (2006–2010 American Community Survey 5-Year Estimates)	66,552 (28,651)	23,690/ 250,001
	Home-ownership	Percentage of owner-occupied housing (2006–2010 American Community Survey 5-Year Estimates)	65.4 (13.0)	20.3/97.5
	Housing value	Median housing value (2006–2010 American Community Survey 5-Year Estimates)	221,510 (181,335)	28,200/ 1,000,001
Policy priority	Environment	0 = not a priority, 1 = somewhat a priority, 2 = priority, 3 = high priority (ICMA, 2010)	1.75 (0.83)	0/3
	Climate change	0 = not a priority, 1 = somewhat a priority, 2 = priority, 3 = high priority (ICMA, 2010)	0.76 (0.87)	0/3
	Green jobs	0 = not a priority, 1 = somewhat a priority, 2 = priority, 3 = high priority (ICMA, 2010)	1.02 (0.87)	0/3
	Energy conservation	0 = not a priority, 1 = somewhat a priority, 2 = priority, 3 = high priority (ICMA, 2010)	1.89 (0.79)	0/3
Control variables	Metro	1 = central city, 0 = otherwise (ICMA, 2010)	0.09 (0.29)	0/1
	West	1 = West region, 0 = otherwise (ICMA, 2010)	0.21 (0.40)	0/1
	Density	Population density in square miles (2006–2010 American Community Survey 5-Year Estimates)	2,169 (1,971)	18.4 (27,012)
	Population	Log of total population (ICMA, 2010)	9.50 (1.15)	6.43/15.91

ICMA = International City/County Management Association.

Urban scholars argue that city policy adoptions are a response to the demands of residents, particularly if they entail high upfront investment cost from new program implementation, as is often the case with sustainability programs (Krause, 2010; Lubell, Feiock, and Handy, 2009; Saha, 2009; Sharp, Daley, and Lynch, 2010; Wang et al., 2012). This literature provides valuable insights into how community attributes affect the policy decisions of local governments. Hence, we argue that the cities with residents who perceive greater localized benefits relative to costs are more likely to pursue sustainability activities.

We expect that young adults and people with higher education levels will favor adoption of a broader set of sustainability programs (Lubell, Feiock, and Handy, 2009; Portney, 2003; Sharp, 2005). Race will also be an important factor affecting policy preference, with evidence that minorities support measures to advance sustainability (Pike and Herr, 2011). Income, homeownership, and housing value are socioeconomic characteristics that have been considered to capture community policy orientation and city interest (Peterson, 1995). Cities with strong homeownership might be disinclined to support sustainability policies of the investment of resources for achieving long-term benefits that will possibly be diffused without immediate localized benefits. We also acknowledge, however, that these factors can measure community financial resources to be used for long-term returns. In general, communities with greater resources are more likely to support the adoption of innovations (Kearney, 2005; Kearney, Feldman, and Scavo, 2000; Moon and deLeon, 2001).

Two additional variables included in the analysis warrant additional discussion: form of government and variations in policy priorities. First, we expect cities with professional city managers to have more sustainability adoptions. Council-manager cities have a track record of earlier and more extensive adoption of innovations than do mayor-council cities (Kearney, 2005; Kearney, Feldman, and Scavo, 2000; Moon and deLeon, 2001; Svara, 2011). Although newly elected executives in mayor-council cities are more likely than their counterparts in council-manager cities to initiate policy changes (Wolman, Strate, and Melchior, 1996), mayors in council-manager cities who provide visionary and facilitative leadership can strengthen goal setting (Nelson and Svara, 2012). With regard to sustainability, Bae and Feiock (in press) argue that council-manager cities exhibit a stronger internal focus and mayor-council cities exhibit a stronger community focus; that is, managers make changes within the administrative arena. When the activities covered in the ICMA survey were divided by internal versus community emphasis, however, council-manager cities and counties were conducting demonstrably more activities of both the internal and community types than were the governments with elected executives.[26] Still, it is not clear whether the importance of form of government will persist when the demographic and socioeconomic characteristics of the community are included in the analysis.

The motivations to undertake activities meant to advance sustainability presumably relate to policy priorities about the social, economic, and environmental concerns that underlie the

[26] See footnote 21 and the discussion of activities in the first part of the article. In general, internal activities focus on government operations, and community policies affect residents or organizations in the community. Mayor-council cities had an average of 4.6 internal and 12.8 community activities; council-manager cities had an average of 7.3 internal and 18.4 community activities. The difference is not as great in counties, but the council-manager governments are doing more in that setting, as well.

movement. The ICMA survey measured the priority assigned in the respondent's jurisdiction to eight policy areas that could be related to sustainability (Svara, 2011). We propose that the nature of the policy priorities established in a community make a difference in the level of sustainability action. Four areas are included in the analysis: environment, energy conservation, green jobs, and climate change. These issues differ in that energy conservation and green jobs are areas in which the locality can directly benefit from taking action, whereas improving the environment and undertaking activities to offset climate change might have broad effects but little direct benefit to the jurisdiction or its government in the short run. It is possible, however, that the priorities reflect the makeup of the population and other community characteristics.

We present two models of sustainability ratings. The first includes community characteristics and the second adds the four policy priorities to assess their effect on the sustainability activity level. For more meaningful interpretation of the effect of separate variables, we used the Clarify program of STATA to produce the predicted probabilities for each statistically significant independent variable from our second model of regression analysis (Tomz, Wittenberg, and King, 2001). Exhibit 15 reports the results of predicted probability of sustainability rating affected by the change in each independent variable from its minimum (or 25th percentile) to maximum (or 75th percentile) range.

The regression models fit the data well (R^2 = .44/.53). Adding the four policy priorities does not produce any substantial change in any of the coefficients from the first model, as exhibit 15 presents. Thus, the results of the coefficients and predicted probabilities confirm that the primary

Exhibit 15

Sustainability Rating Models of Regression Estimates and Predicted Probabilities

	1st Model (N = 1,612)		2nd Model (N = 1,519)			
	β	t	β	t	Predicted Probability	Difference
Manager	1.95***	3.73	2.139***	4.25	19.8 (manager)/ 17.2 (otherwise)	2.6
Education	.1173***	3.90	.0723**	2.47	17.8 (25p)/19.1 (75p)	1.3
Young adults	.1260*	2.16	.1000*	1.80	18.4 (25p)/18.9 (75p)	0.5
White	.0500**	3.19	.0482**	3.19	18.2 (25p)/19.3 (75p)	1.1
Income	– .0001***	– 4.27	– .00008**	– 3.27	20.0 (25p)/17.9 (75p)	– 2.1
Homeownership	– .0842**	– 3.14	– .0698*	– 2.68	19.2 (25p)/18.1 (75p)	– 1.1
Housing value	.00002***	6.59	.00001***	5.05	17.0 (25p)/19.1 (75p)	2.1
Environment	—	—	1.390***	3.98	16.2 (min)/20.40 (max)	4.2
Climate change	—	—	.681*	1.85	18.1 (min)/20.2 (max)	2.1
Green jobs	—	—	1.292***	3.68	17.3 (min)/21.2 (max)	3.9
Energy conservation	—	—	2.289***	6.29	14.4 (min)/21.2 (max)	6.8
Metro	3.88***	4.03	3.565***	3.90	21.8 (central)/ 18.3 (otherwise)	3.5
West	3.89***	5.63	3.669***	5.56	21.4 (West)/ 17.7 (non-West)	3.7
Density	– .0003*	– 1.83	– .0003**	– 2.10	19.9 (25p)/18.5 (75p)	– 1.4
Population	4.510***	15.62	4.148***	14.93	14.7 (25p)/21.8 (75p)	7.1
Constant	– 29.07***	– 8.78	– 39.10***	– 11.90	—	—
	R square = .44		R square = .53			
	Adj R square = .43		Adj R square = .52			

** p < 0.1. **p < 0.05. ***p < 0.01.*

factors in our framework predict the level of sustainability activities undertaken by a city.[27] The result demonstrates that form of government matters; cities with the council-manager form of government are more likely to engage in sustainability activities than cities with other forms. Our probability analysis reports the predicted probability of a sustainability rating is 19.8 if a city operates under council-manager form and drops to 17.2 if a city has a mayor-council form of government, when the other variables in the model are held at their mean.

In terms of community attributes, three demographic factors are associated with the level of sustainability activities. Consistent with the prediction, cities that have younger and more educated populations have a higher level of sustainability activity. Racially homogeneous communities with greater White populations give slightly greater support to sustainability. Race is a predictor of sustainability ratings, but contrary to expectations, our data suggest that a more homogeneous White population, not greater diversity, is linked to greater sustainability activity. The predictions about socioeconomic status are mostly confirmed. Moving from the 25th to the 75th percentile, median family income decreases the sustainability rating by 2.1. Sustainability initiatives are less in high-homeownership communities, although moving from the 25th to the 75th percentile of homeownership decreases the sustainability rating by only 1.1 points. The significant and negative effects of income and homeownership suggest that sustainability is not an approach limited to affluent communities. An affluent community with a high proportion of homeowners might resist sustainability programs, perhaps because of the high investment costs and diffused benefits. When it comes to housing value, the direction of the effect is positive and significant. Note also that these community characteristics make a difference but for the most part not a substantial one. Thus, future research will need to address the dynamic effect of community characteristics on the sustainability initiatives.

The estimates of the second model show interesting and potentially important results regarding the effect of the four policy priorities: (1) environment, (2) climate change, (3) green jobs, and (4) energy conservation. We found that after controlling for structural, demographic, and socioeconomic characteristics, each one of these policy priorities has a significant influence on the number of sustainability activities undertaken by local governments. In exhibit 15, the importance assigned to energy conservation affects the number of activities undertaken to a greater degree than the other three areas of policy preference. Those local governments that indicated that energy conservation is a high priority will achieve, on average, a 6.8-point higher sustainability rating than a local government that does not give the same importance to energy conservation, holding all other variables at their mean. The other policy priorities also have positive but lesser effects. Whereas bivariate analysis shows that emphasis on climate change has a stronger association with the sustainability rating than any other policy priority (Svara, Read, and Moulder, 2011), when other characteristics and priorities are held constant it has the least effect.[28]

[27] The socioeconomic variables are available only for cities and other municipal-type governments that are included in the American Community Survey.

[28] The atypical community that emphasizes climate change has a sustainability rating of more than 30. These communities are highly likely to also emphasize the other more widely accepted policy priorities and to share other characteristics linked to higher ratings. Holding these variables constant, a high priority for climate change does produce a very high predicted probability score.

In addition, the analysis indicates that a higher adoption rate of sustainability activities is significantly associated with population, density, metropolitan status, and region, as exhibit 15 indicates. Metropolitan status provides additional reinforcement to taking action on sustainability, as does being in the West region.

Conclusion

Local governments in the United States are taking a tentative and uneven approach to embracing sustainability. The general level of adoption of sustainability measures tends to be low, and most activities are not being pursued. Based on activities adopted through the year 2010, approximately one in six governments have relatively high overall sustainability adoption ratings, although those governments at the low end of the high group are adopting only 30 percent of the surveyed activities. This proportion is about what one would expect of earlier adopters and higher adopters in the population of local governments if sustainability matched the typical pattern of diffusion of innovations (Rogers, 2003). What is unusual is that three in five governments are below average in their adoption of sustainability activities. The later adopters and the laggards represent a supermajority that is holding down the extent of commitment for the local government sector as a whole. Perhaps the most blatant indicator of limited commitment is the absence of goals and targets for most local government sustainability programs.

The variation in use of activities from the 12 categories measured indicates that experience, control, resources, and the extent of local benefit influence the activities used most commonly undertaken. The most commonly used areas are recycling and water conservation—areas in which local governments have long records of involvement that presumably often preceded formulating a unifying sustainability goal. In these areas, 33 and 28 percent of the measured activities, respectively, are being used. Still, the implementation of new activities, such as the purchase of recycled products or reuse of gray water, are unusual. Four of the next five areas in frequency of adoption—18 to 22 percent of the activities are used—are mostly controlled by local governments and provide benefits to the local government in the short term. These areas are transportation improvements, energy use in transportation and exterior lighting, reducing building energy use, and local production and green purchasing. Local governments benefit from using these practices, which can be adopted without much public involvement or resistance. The final area in this group is social inclusion, which includes activities that are potentially controversial. More research is needed to determine whether the activities adopted in this area are recent decisions taken as part of a comprehensive sustainability plan or, rather, are longstanding government policies or programs. For the remaining five areas—workplace alternatives to reduce commuting, alternative energy generation, building and land use regulations, land conservation and development rights, and greenhouse gas reduction and air quality—15 percent or less of the activities have been adopted. Local governments must regulate the behavior of residents or businesses to adopt these activities and, in some cases, invest substantial resources to provide incentives for change. The exception is promoting alternatives to commuting for government employees, which need not be costly or difficult to implement. For these activities to be as rare as installing solar panels suggests that many governments have not explored their options in sufficient depth or have a limited commitment to sustainability.

The multivariate test of our explanation for why some cities adopt more sustainability policies than others confirms that form of government, community attributes, and policy priorities each play an important role. These factors explain differences in the level of sustainability activities even when controlling for important factors such as population, density, metropolitan status, and region. Demographic and socioeconomic characteristics influence sustainability in complex ways. Cities with homogeneous White populations and highly educated residents are more likely to pursue sustainability activities, but increasing income and homeownership rates has negative effects. Sustainability does not appear to be an issue associated with a "typical" division based on race, class, or community wealth. Strong homeownership in affluent communities might create an interest group that represents the reluctance of the community about spending on sustainability policies and regulations placed on their properties. On the other hand, higher education levels and higher populations of young adults produce a more favorable setting for sustainability initiatives. The results from multivariate analyses warrant further discussion of the dynamic effect of community characteristics on sustainability initiatives.

In addition, commitment to the larger issues addressed by the sustainability movement appears to be a key factor that distinguishes local governments that lead others in taking action to promote sustainability. It seems less important whether the issue entails policies that directly benefit the community or those that benefit the greater society. Assigning a high priority to promoting energy conservation has a direct and immediate benefit to the local government, but its effect on the level of sustainability action is similar to that of improving the environment, which has more general and long-term benefits. In a similar way, giving a very high priority to green jobs and reversing climate change both are associated with more sustainability action, although they differ in the nature of the benefits they generate. The second model estimation shows that the importance of each policy priority can increase the level of sustainability activities, controlling for other factors.

The presence of a group of early and extensive sustainability policy adopters that are not being followed by a larger group that would fill out the early majority suggests that motivational factors are particularly important in developing a broad and coherent commitment to sustainability. A substantial boost in sustainability action is linked to greater support for addressing issues related to sustainability—protecting the environment, economizing on the use of energy, promoting green jobs, and reversing climate change. Whereas the lower and the slower adopters might be acting primarily to derive local benefits,[29] the governments that adopt more activities sooner are likely to be influenced by a normative commitment to advance sustainability and provide benefits to people outside their jurisdiction. They are acting to promote the greater good in not only the present, but also the future. This explanation might offer insights regarding the difference between leaders and followers, in general, in the diffusion of innovation.

[29] These governments are also likely to be influenced by the other factors that influence governments to conform to emerging practices—coercive, mimetic, and normative isomorphism (DiMaggio and Powell, 1983).

Appendix

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (1 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
Internal program that recycles paper and plastic and glass in your local government (Q7a)	83	89	87	76	61	72
Communitywide recycling collection program for paper and plastic and glass for residential properties (Q7b)	78	80	81	79	71	76
Added biking and walking trails (Q17b)	86	81	73	65	50	61
Conducted energy audits of government buildings (Q8f)	97	89	81	68	48	63
Upgraded or retrofitted facilities to higher energy efficiency office lighting (Q8i)	100	86	72	60	41	56
Recycling of household hazardous waste (Q7d)	78	80	71	59	42	55
Support a local farmer's market (Q25c)	50	56	65	55	47	52
Increased the purchase of fuel-efficient vehicles (Q8b)	94	76	68	50	26	44
Recycling of household electronic equipment (e-waste) (Q7e)	69	73	70	54	42	52
Requiring sidewalks in new development (Q17e)	67	61	65	60	45	54
Installed energy management systems to control heating and cooling in buildings (Q8g)	97	76	66	49	32	47
Upgraded or retrofitted facilities to higher energy-efficiency heating and air-conditioning systems (Q8l)	94	71	58	40	26	39
Upgraded or retrofitted traffic signals to improve efficiency (Q8j)	72	59	58	42	22	37
Expanded dedicated bike lanes on streets (Q17a)	78	61	55	38	19	34
Provide financial support/incentives for affordable housing (Q23a)	81	60	56	33	20	33
Plan for tree preservation and planting (Q4h)	56	53	56	47	38	45
Purchased hybrid electric vehicles (Q8c)	81	65	50	25	7	24
Education program in the local community dealing with the environment and energy conservation (Q25d)	56	52	41	30	18	28
Communitywide recycling collection program for paper and plastic and glass for commercial properties (Q7c)	53	47	49	45	43	45
Upgraded or retrofitted streetlights and/or other exterior lighting to improve efficiency (Q8k)	53	42	46	31	23	31

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (2 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
Added bike parking facilities (Q17c)	61	46	46	29	18	28
Other incentives for water conservation behaviors by city, residents, and businesses (Q6e)	56	41	32	29	21	28
Is telework permitted for staff members in your local government? (Q14)	60	45	36	27	19	27
Provide housing options for the elderly (Q23c)	53	44	43	27	20	27
Provide access to information technology for people without connection to the Internet (Q23e)	53	43	34	26	23	27
Provide after-school programs for children (Q23g)	58	44	44	27	17	26
Upgraded or retrofitted facilities to higher energy efficiency pumps in the water or sewer systems (Q8m)	58	33	32	24	18	23
A land conservation program (Q22b)	58	41	32	23	15	22
An active brownfields, vacant property, or other program for revitalizing abandoned or underused residential, commercial, or industrial lands and buildings (Q22a)	50	42	30	22	16	22
Permit higher density development near public transit nodes (Q21c)	61	40	36	22	8	20
Established policy to purchase only ENERGY STAR equipment when available (Q8h)	53	30	29	17	11	17
Use of graywater and/or reclaimed-water use systems (Q6b)	64	35	28	16	9	16
Provide supportive housing to people with disabilities (Q23b)	53	35	28	16	7	15
Installed solar panels on a government facility (Q8o)	50	35	22	12	6	13
Require all new government construction projects to be LEED or ENERGY STAR certified (Q21a)	56	26	24	12	6	12
Provide housing within your community to homeless people (Q23d)	64	39	26	7	2	10
Purchased vehicles that operate on compressed natural gas (CNG) (Q8d)	64	31	17	7	2	9
LEED-certified building projects (added after survey)	67	32	18	4	1	8
Local government incentives for local government employees to take mass transit to work (Q12a)	69	28	14	5	1	7

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (3 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
Does your community currently have a commuter rail system (subway or streetcar)? (Q18)	59	14	11	7	3	7
Local government incentives for local government employees to carpool to work (Q12b)	64	23	15	4	1	6
Does your community have a plan to create or expand the use of subway or streetcars? (Q19)	58	22	13	5	1	6
Actions to conserve the quantity of water from aquifers (Q6a)	47	41	41	35	28	34
Report on community quality-of-life indicators, such as education, cultural, diversity, and social well-being (Q23h)	47	35	29	15	7	15
Baseline greenhouse gas emissions of the local government (Q4a)	47	36	32	13	6	14
Generated electricity through municipal operations such as refuse disposal, wastewater treatment, or landfill (Q8q)	47	26	14	6	2	7
Locate recycling containers close to refuse containers in public spaces such as streets and parks (Q25e)	44	45	46	37	26	34
Expanded bus routes (Q17d)	44	49	43	23	10	22
Permit higher density development where infrastructure is already in place (utilities and transportation) (Q21d)	44	35	37	24	14	22
A program for the purchase or transfer of development rights to preserve open space (Q22c)	44	29	19	16	10	16
Zoning codes encourage more mixed-use development (Q21n)	42	46	46	41	26	35
Use of public land for community gardens (Q25b)	42	46	41	30	21	29
Weatherization—individual residences (Q11b)	42	32	30	11	10	16
Green product purchasing policy in local government (Q25f)	42	35	26	12	6	13
Use water price structure to encourage conservation (Q6d)	39	35	37	33	32	33
Established a fuel-efficiency target for the government fleet of vehicles (Q8a)	39	31	18	13	6	13
Greenhouse gas reduction targets for local government operations (Q4c)	39	27	21	11	6	11
Baseline greenhouse gas emissions of the community (Q4b)	39	22	23	7	3	9

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (4 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
Residential zoning codes to permit solar installations, wind power, or other renewable energy production (Q21l)	36	31	26	22	16	21
Provide funding for preschool education (Q23f)	36	27	20	12	7	12
Locally initiated air pollution measures to reduce dust and particulate matter (Q4g)	33	20	11	9	5	9
Local government established any energy reduction programs targeted specifically to assist low-income residents (Q9)	33	23	14	6	5	8
Has your local government established any transportation programs targeted specifically to assist low-income residents? (Q20)	32	44	36	19	14	21
Local government incentives for local government employees to bike to work (Q12d)	31	18	14	4	2	6
Installed charging stations for electric vehicles (Q8e)	31	15	12	4	2	5
Communitywide collection of organic material for composting (Q7g)	28	36	35	34	30	33
Sets limits on impervious surfaces on private property (Q6c)	28	32	35	36	24	30
Widened sidewalks (Q17f)	28	28	35	27	19	25
A program for the purchase or transfer of development rights to preserve historic property (Q22e)	28	12	6	9	6	8
Residential zoning codes to permit higher densities through ancillary dwelling units or apartments (such as basement units, garage units, or in-house suites) (Q21m)	25	21	20	14	10	14
Restriction on purchase of bottled water by the local government (Q25a)	25	22	14	10	7	11
Require minimum of 30% postconsumer recycled content for everyday office paper use (Q7h)	25	24	17	8	5	9
Require all retrofit government projects to be LEED or ENERGY STAR certified (Q21b)	25	13	14	7	4	7
Use dark sky-compliant outdoor light fixtures (Q8n)	22	20	21	15	13	15
Installed a geothermal system (Q8p)	22	14	11	6	4	7
A program for the purchase or transfer of development rights to create more efficient development (Q22d)	22	11	6	6	4	6
Local government incentives for local government employees to walk to work (Q12c)	22	13	9	3	2	4

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (5 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
If your local government offers employees parking, do you charge market rates for employee parking? (Q13)	20	14	3	3	5	5
Fast track plan reviews and or inspections for environmentally friendly development (Q21k)	19	19	14	9	4	8
Does your local government use a compressed workweek, with offices closed one day? (Q16)	17	17	14	11	6	10
Energy audit—individual residences (Q11a)	17	18	16	6	5	8
Require bike storage facilities (Q17h)	14	14	23	8	3	8
Heating/air-conditioning upgrades—individual residences (Q11c)	14	17	13	8	6	8
Incentives other than increased density for new single-family residential to be LEED certified or an equivalent (Q21f)	14	9	5	3	1	3
Installation of solar equipment—individual residences (Q11e)	14	9	7	3	2	4
Local government established any energy reduction programs targeted specifically to assist small businesses (Q10)	13	15	8	5	4	6
Installation of solar equipment—businesses (Q11j)	11	8	6	2	2	3
Energy audit—businesses (Q11f)	11	10	8	4	4	5
Weatherization—businesses (Q11g)	11	10	8	4	4	5
Provide density incentives for “sustainable” development (such as energy efficiency, recycling of materials, land preservation, stormwater enhancement) (Q21h)	11	16	13	11	6	10
Heating/air-conditioning upgrades—businesses (Q11h)	11	14	12	5	5	6
Incentives other than increased density for new commercial development (including multifamily residential) that are LEED certified or an equivalent (Q21e)	11	12	8	6	2	5
Purchase of energy-efficient appliances—individual residences (Q11d)	8	14	10	5	5	6
Pay-As-You-Throw (PAYT) program with charges based on the amount of waste discarded (Q7f)	8	14	15	9	10	10
Local government action to use locally grown produce through incentive (Q24c)	8	9	10	9	9	9

Exhibit A-1

Sustainability Activities Used by Most Governments in At Least One Population Category (6 of 6)

	500,000 or More	100,000–499,999	50,000–99,999	10,000–49,999	Less Than 10,000	All
Local government action to use locally produced material or products through incentive (Q24a)	8	14	13	8	7	8
Purchase of energy-efficient appliances—businesses (Q11i)	8	13	7	3	4	5
Apply LEED Neighborhood Development standards (Q21g)	8	5	6	5	2	4
Provide tax incentives for "sustainable" development (such as energy efficiency, recycling of materials, land preservation, stormwater enhancement) (Q21i)	8	2	4	3	2	3
Reduce fees for environmentally friendly development (Q21j)	8	6	8	3	1	3
Require showers and changing facilities for employees (Q17i)	6	8	10	4	2	4
Greenhouse gas reduction targets for businesses (Q4d)	6	5	8	2	1	3
Require charging stations for electric vehicles (Q17g)	6	3	3	0	1	1
Greenhouse gas reduction targets for multifamily residences (Q4e)	3	2	6	1	1	2
Greenhouse gas reduction targets for single-family residences (Q4f)	3	3	7	2	1	2
Local government action to reduce the use of plastic bags by grocery or retail stores through restriction (Q24b)	3	0	1	1	1	1
Do you have a specific target for the percent of your government workforce that will telework? (Q15)	3	1	1	1	0	1
Local government action to use locally produced material or products through restriction (Q24a)	3	1	1	2	1	1
Local government action to reduce the use of plastic bags by grocery or retail stores through incentive (Q24b)	0	2	4	2	2	2
Local government action to use locally grown produce through restriction (Q24c)	0	0	0	0	0	0

LEED = Leadership in Energy and Environmental Design.

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