Taking Sustainable Cities Seriously:

*A Comparative Analysis of Twenty-Three U.S. Cities**

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Abstract

After exploring the conceptual lineage of sustainable cities from sustainability, sustainable development, and sustainable communities, this paper analyzes and compares sustainable cities initiatives in 23 U.S. cities. The central question addressed in the paper is why some cities seem to take sustainability more seriously than others. Numerous demographic, socio-economic, and other characteristics of the cities are correlated with an Index of Taking Sustainability Seriously, which is a composite of some 34 different variables indicating whether each city engages in specific sustainability programs, policies, or activities. Many of the standard explanations, such as the income and wealth of the community, the liberalness of the city, and the growth pressures placed on the city, are found to exhibit no correlation with the seriousness of the sustainability effort. What does correlate with the Index is reliance on manufacturing, where having more residents employed in manufacturing industries is associated with less seriousness, and the age of the population, where cities with older populations take sustainability more seriously. This has three implications for the future development of sustainable cities. First, some of the cities that might be said to need sustainability programs the most -- cities with heavy manufacturing that are more prone to pollution production -- are the least likely to take such programs seriously. Second, as cities' manufacturing base declines, they should find it increasingly feasible to engage in sustainability initiatives. And third, as the populations of cities age, policy makers should also find it easier to support, develop, and take seriously sustainability programs.

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Why do some cities seem to take the pursuit of sustainability more seriously than others? That is the essential question that underlies this paper. The concepts of sustainable communities and sustainable cities have blossomed over the last ten years, promising a permanent alteration in the way people see themselves and their communities in relation to their physical and social environments. Before this central question can be addressed, there are other related questions that also need to be raised. For example, what exactly is a sustainable community? What are the conceptual roots of the idea of sustainable communities? Is the concept of a sustainable community applicable to relatively densely populated urban areas, such as a city? Are there cities in the U.S. that are engaged in efforts to become sustainable? If so, what are these cities actually doing? And most important for this paper, what distinguishes cities' sustainability efforts, and why do some cities seem to take the pursuit of sustainability more seriously than others? These are the kinds of questions asked by scholars and practitioners alike, and they are the kinds of questions that animate debate about whether sustainable cities can, and do, work.

This paper focuses on twenty-three cities in the United States that have been identified in the literature of sustainable communities as having significant initiatives. Cities do not, by any means, constitute the only kind of place where sustainability has become important. Units such as counties, metropolitan planning districts, watershed districts, eco-systems, and many others have begun to adopt the concepts and language of sustainability in their activities. As will be discussed later, the focus here is specifically on cities in order to understand the potential and the limitations that these governmental entities face in the pursuit of sustainability. Skeptics suggest that there is little that a single city can do to achieve, or even contribute to, sustainability. Advocates, however, suggest that cities are among the more important building blocks necessary to help construct a foundation on which sustainable development can occur. Ultimately, this is an empirical argument that w ill not be addressed here, and may not be addressable for some years to come. Suffice it to say that some cities are working awfully hard to make their best contributions to sustainability, and this paper serves as a beginning point to understand these contributions.

The Conceptual Foundations of Sustainable Cities

The broad concept of sustainability has caught the attention of policy makers and citizens the world over. It has evolved over time, and much of what the term conveys today is considerably different from what it conveyed a decade ago. As the broad concept of sustainability has evolved, so too have several of its derivatives, sustainable communities, livable communities, and sustainable cities. Even so, these are not concepts that are susceptible to easy or quick definitions. As Beatley and Manning (1997: 3) point out, "there is a general sense that sustainability is a good thing (and that being unsustainable is a bad thing), but will we know it when we see it?" As appropriate as this question is, there apparently are a number of cities around the U.S. that feel sanguine enough about what sustainability means that they are willing to try to move forward to achieve it. Without offering a fully developed definition of a sustainable city at this point, suffice it to say here that a sustainable city is a city that is working hard to promote some operational version of sustainability.

This paper offers a brief review and an assessment of sustainable cities in the U.S. It starts with general conceptions of sustainability that serve as the underpinnings of sustainable cities, and explicitly links emerging practices to these conceptual underpinnings. It does not attempt to determine whether cities are, or are becoming, sustainable. The conceptual foundations of sustainable cities inevitably prescribe a very long-term process, perhaps taking decades to achieve substantial results. Are sustainable cities activities actually making a difference in terms of economic development and environmental quality? As important as this question is, this paper does not try to answer it. Since the work toward creating sustainable cities in the U.S. is, by any yardstick, early in its gestation period, it would be unproductive to try to determine whether this work has succeeded.

However, it is not too early to identify what cities are doing to try to become more sustainable, to assess the extent to which some cities seem to be taking sustainability more seriously than others, and to conduct a preliminary examination into the correlates of the degree of seriousness of cities' sustainability efforts. In short, any sort of assessment of how serious sustainability efforts are needs to examine what kinds of activities – policies, programs, organizations, and practices – are being used in U.S. cities in their purported efforts to achieve greater sustainability. So this research examines what cities actually seem to be doing in their respective pursuit of sustainability, and compares and contrasts these activities to the kinds of activities that purport to be consistent with various theoretical conceptions of sustainability. Moreover, once there is a clear sense of the range and types of these activities, questions about

whether it is reasonable to apply the same yardstick of seriousness across cities, and why some cities seem, at least on the surface, to be taking sustainability more seriously than others, can begin to be addressed. Are there some general patterns that suggest reasons why the pursuit of sustainable cities is taken more seriously in some places than in others? If this paper does not definitively answer the many questions it raises, at least begins the process of framing the questions in ways that they can be addressed in future research. However, before these questions and issues are addressed, the concepts of sustainability, sustainable economic development, sustainable communities, and sustainable cities, need to be clarified.

The Concepts of Sustainability, Sustainable Development, and Sustainable Communities

The concepts of sustainable cities and sustainable communities have their genetic roots in the general concept of sustainability and its close cousin sustainable economic development, and in particular conceptions of what constitutes a "community." Ever since the term "sustainable communities" was first brought into the lexicon of environmentalism, scholars and practitioners have seized upon it to promote and facilitate various kinds of pro-environmental change. While the term obviously seems to convey great meaning to a wide array of people, the fact is that, as a matter of practice, it has come to mean so many different things to so many different people that it probably does as much to promote confusion and cynicism as positive environmental change. Sustainability is a concept that is fairly abstract and broad, subject to a variety of understandings and meanings. When the concept of sustainability is coupled with the idea of community, which is itself an abstract, and, some would say, almost meaningless concept, finding meaning in the idea of sustainable communities seems hopeless.

But as a matter of practice, the idea of sustainable communities has evolved in such a way as to provide greater meaning than would initially appear. As originally envisioned, the concept of sustainable communities was derived in an attempt to account for a large number and variety of environmental and inter-personal impacts of economic growth, broadly defined, not comfortably accommodated by neo-classical economic theory or practice. In short, sustainable communities have been thought of as mechanisms that can be used to redress the often negative or deleterious environmental and social effects of adherence to mainstream approaches to economic development. In contemporary applications of the concept of sustainable communities, key elements of the original vision are frequently omitted, overlooked, or substantially modified. Before attempting to provide a specific definition of sustainable communities, it is necessary to explore the broader underlying concepts of sustainability.

Sustainability, and its close cousin sustainable development, are perhaps best thought of as general concepts whose precise definitions have yet to be fully explicated. Charles Kidd argues that there are at least six different historical intellectual strains of thought that underlie the contemporary concept of sustainability, each with its own "slant" or articulation of particularly important foundational issues. He discusses the "ecological/carrying capacity" root, the "natural resource/environment" root, the "biosphere" root, the "critique-of-technology" root, and the "ecodevelopment" root. (Kidd, 1992) Becky J. Brown and colleagues suggest that in contemporary usage, the term sustainability has some six different definitions that relate to "sustainable biological resource use," "sustainable agriculture," "carrying capacity," "sustainable energy," "sustainable society and economy," and "sustainable development." (Brown, Hanson, Liverman, and Meredith, 1987: 713-719). Each of these intellectual roots and definitions suggests its own set of yardsticks that could be used to measure how seriously a city takes sustainability, and to some degree each can be found in sustainability efforts across cities. Whether, and the extent to which, a particular city's initiatives are built on the base of any one set or combination of definitions is determined by a variety of local social and political factors.

Without going into great detail about each of these conceptions of sustainability, suffice it to say that there is considerable overlap among them. These concepts and definitions of sustainability have been used to convey many different expressions of environmental priorities, each emphasizing some particular aspect or set of values concerning what it is that should be sustained. Ultimately, they all have, in some direct or indirect way, their primary roots in biology, the biophysical environment, and ecology, particularly in the notion of "ecological carrying capacity." This is certainly true of what Kidd calls the "ecological/carrying capacity" intellectual root of the concept of sustainability, and what Brown et al. call "carrying capacity" definition, but it is also deeply embedded in other definitions as well.

Carrying capacity focuses on the idea that the earth's resources and environment have a finite ability to sustain or carry life, particularly animal life. Similarly, a particular ecosystem has a finite ability to sustain the life contained there. When the demands move beyond the carrying capacity of the earth or of a particular ecosystem, i.e. when populations of animals exceed the capacity to support them, species collapse will occur. A central problem concerning the earth's carrying capacity is the fact that population growth itself inevitably leads, in a Malthusian sense, to increasing scarcity of the very resources needed to sustain life, including life of humans. Efforts have been made to distinguish the "maximum carrying capacity" and the "optimum carrying capacity," where the former refers to the largest population size that, while

theoretical sustainable, would place the earth at a threshold that is vulnerable to even small changes in the environment. The latter is defined as a smaller, more desirable population size that is less vulnerable to environmental disruptions. (Odum, 1983). Of course, not everyone accepts the notion that the earth's carrying capacity is indeed finite. Optimists suggest that technology makes possible, and even likely, expansion of the earth's carrying capacity.

Coupled with the notion of a limited carrying capacity is the idea that human activity, as currently practiced, is largely unsustainable. In other words, most of human activity depletes rather than replenishes or sustains the earth's resources that contain the capacity to carry life. When people engage in rational economic behavior, they contribute to the depletion of those resources. Markets, as the argument goes, more often than not, create incentives for resource depletion, and thereby undermine the earth's carrying capacity. Nowhere is this more true than in areas involving "commons" resources, including much of the earth's air and water. But human behaviors, whether market-driven or not, often contribute to diminishing carrying capacity of the earth. Even for those who believe that technology can intervene, there is concern that the net balance between what technology can do to enhancing the earth's carrying capacity is more than offset by humans' abilities to deplete it.

This idea of carrying capacity applies most directly to issues involving renewable resources, such as forests, ocean fisheries, and perhaps the use of soil. In this context, efforts are made to define uses of these resources such that they are not depleted faster than they can be replenished. For example, in an ocean fishery, efforts are made to limit the quantity of fish removed to an amount that does not exceed the ability of the fish to reproduce, maintain, or even grow their populations. Efforts to achieve at least some sort of steady state are examples of efforts to achieve environmental sustainability. Sustainability efforts are not, in principle, particularly new. Contemporary agricultural practices evolved to become more sustainable in the U.S. since the days of the "dust bowls" during the 1920s and 1930s, when severe drought conditions coupled with poor agricultural practices depleted the soil and decimated the farm industry. Today, conceptions of sustainability are quite common across a wide array of renewable resource types.

Sustainability, then, is most frequently associated with maintaining the earth's carrying capacity, usually through alteration of individual and collective human behavior. Behaving in ways that reduce the rate of population growth, and that find alternatives to depleting natural resources, is certainly consistent with the idea of sustainability. In terms of human behavior, what may be required to maintain the earth's carrying capacity is not well understood or agreed

upon, and may in fact be inconsistent with basic values that are prevalent in the industrialized and industrializing worlds. In arguing that sustainability is as much an ethical principle as a set of environmental results, Robinson *et al*. suggest that "sustainability is defined as the persistence over an apparently indefinite future of certain necessary and desired characteristics of the socio-political system and its natural environment." (Robinson, Francis, Legge, and Lerner, 1990: 39) What this means is that maintaining the earth's carrying capacity is in large part a function of the social and political values that define and prescribe human behaviors. Achieving sustainability, then, according to this line of reasoning, apparently requires some types of socio-political characteristics and values rather than others. This suggests an hypothesis that will be touched upon later.

The idea of *sustainable development* bears a close relationship to that of *sustainability*, although as the term is used, it brings elements of economic activity more explicitly into the equation. Sustainable development, or its sibling sustainable economic development, a frequent variant, reflects concern for the ways that nations develop and grow their economies. This concern suggests that pursuit of maximum and rapid economic growth, as it is traditionally defined, particularly for developing countries, places extreme burdens on the ecological carrying capacity of the earth. To be sure, over the last decade the concept of sustainable development has provided the foundations for the idea that the pursuit of economic growth must be accompanied by significant consideration to the ecological impacts.

The concept of sustainable development, to a large degree, shifts the emphasis away from mere concern about the environment to include explicit concern about economic development. The argument often put forth is that the wrong kind of economic develop will not only deplete the earth's resources and damage the earth's ecological carrying capacity, in the long run it will also undermine achievement of economic growth itself. Unsustainable economic development is just as much about being unable to sustain economic growth as it is about exceeding the earth's ecological carrying capacity.

The linkage between sustainability and economic development writ large began to emerge as central issues through the 1970s, when a number of international development programs, including those operated by, or with the assistance of, the World Bank, the International Monetary Fund (IMF), and U.S. Agency for International Development (USAID) came under fire for using their extensive financial resources to inadvertently promote environmental degradation under the guise of economic development in Third World and developing nations. Many nongovernmental organizations took great issue with these

development programs, suggesting that they needed to become much more sensitive to the indigenous environments and peoples where their financial resources were being used. (Fox and Brown, 1998) By the late 1970s, the idea of pursuing this kind of environmentally-sensitive economic growth, or ecodevelopment, as it was termed by Ignacy Sachs, had found its way into the works of the United Nations Environmental Program. (Kidd, 1992: 18)

Sustainable development achieved elevated recognition and legitimacy in the late 1980s, when in 1987 the United Nations' World Commission on Environment and Development (WCED), also commonly known as the Brundtland Commission after its Chair, former Norwegian Prime Minister Gro Harlem Brundtland, issued its report *Our Common Future*. This report was designed to create an international agenda focusing on how to protect the global environment, or as stated in the report, to sustain and expand the environmental resource base of the world. In the process, it put forth the very general notion that sustainable development consists of economic development activity that "…meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987: 8) Beyond this, the report is rather short on details and specifics. Its contribution clearly comes out of its focus on what might be called cross-generation concerns, and the idea that economic development needs to be viewed over a longer period of time than is usually practiced.

Capturing this cross-generation concern in the U.S. context, the National Commission on the Environment (NCE) put forth a similar set of conceptual definitions. The 1993 report of this Commission suggested the need for the U.S. to pursue a:

> strategy for improving the quality of life while preserving the environmental potential for the future, of living off interest rather than consuming natural capital. Sustainable development mandates that the present generation must not narrow the choices of future generations but must strive to expand them by passing on an environment and an accumulation of resources that will allow its children to live at least as well as, and preferably better than, people today. Sustainable development is premised on living within the earth's means. (NCE, 1993: 2)

These discussions of sustainable development provide a basic conceptual framework for organizing thinking about sustainability, but of course there are many questions left unanswered – questions whose answers are critical for formulating specific applications or measuring results. For example, what exactly is included under the rubric of "natural capital." In other words, what is it that needs to be sustained? Is it just natural resources, and if so, which resources? Is it human resources? Is it environmental quality, more broadly defined? Is it ecosystem health? Is

it some even more broadly defined quality-of-life? Does it matter who owns the natural capital? Are there necessarily distributional considerations, e.g. does it have to apply to all people? Other questions arise, such as whether sustainability initiatives are really anti-growth. In other words, does advocacy of sustainability really mean the same as promoting no growth? Is it really a position in opposition to economic growth, as commonly defined?

In the conceptual literature, there is a clear sense that sustainability is not anti-growth, *per se*. Although there is a distinct element of no-growth sentiment in at least one of the intellectual foundations of sustainability (Kidd, pp. 9-12), sustainability is more about the search for peaceful coexistence between economic development and the environment. It is about finding ways to promote growth that are not at the expense of the environment, and that do not undermine future generations. Although much of the conceptual literature on sustainability does not directly address many of these issues, sustainable communities initiatives and practices implicitly provide answers to their underlying questions. The working definitions of sustainability that cities develop themselves provide hints as to what they see as important. In Seattle, sustainability has been defined as "long-term cultural, economic, and environmental health and vitality." In Santa Monica, the sustainable communities initiative seeks "…to create the basis for a more sustainable way of life both locally and globally through the safeguarding and enhancing of our resources and by preventing harm to the natural environment and human health." And in Cambridge, MA, sustainability means the pursuit of "…the ability of [the] community to utilize its natural, human, and technological resources to ensure that all members of present and future generations can attain high degrees of health and well-being, economic security, and a say in shaping their future while maintaining the integrity of the ecological systems on which all life and production depends." (Zachary, 1995: 8) These working definitions may well provide the foundational frameworks for more elaborate definitions. Indeed, as many cities move through the process of developing some sort of sustainable communities initiatives, they inevitably provide their answers based on what they believe to be appropriate for their own cities.

In the context of the global concern for sustainable development of nations, it may seem somewhat incongruous to think of the geographically more narrow idea of sustainable communities. After all, isn't one of the central reasons for the global concern about the environment that small geographic areas are subject to externalities that they cannot control? Yet even in the international context, attention to sustainable development has focused on the local level. When the Brundtland Commission stated that "…cities [in industrialized nations] account for a high share of the world's resource use, energy consumption, and environmental

pollution," (WCED, 1987: 241) it is arguing that serious attention needs to be given to urban sustainability.

The Brundtland Commission report served as the foundation for the discussions and negotiations on sustainable development that took place among nations in the "Earth Summit," held in Rio de Janeiro in June of 1992. One of the results of the Earth Summit was the passage of a resolution often referred to as "Agenda 21," a statement of the basic principles that should guide nations in their quest of economic development in the 21st century. As part of the Agenda 21 resolution, significant attention was given to the relationship between national policies and the activities of local governments particularly in Chapter 28 of the Agenda 21 resolution. In this section, entitled "Local Authorities' Initiatives in Support of Agenda 21," the link is made clearer. As Agenda 21 states:

> Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social, and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing, and responding to the public to promote sustainable development. (United Nations Environmental Programme, 2000)

Thus, the idea of sustainable communities is borne out of an understanding of the importance of individual human behavior, and the local governance context in which that behavior takes place.

The idea of sustainable communities undoubtedly grew out of this particular understanding of the concept of sustainability, one that is grounded in the need to address environmental and livability issues as they affect individual people. But it has also grown out of particular understandings of "community." The concept of community is one that has come to so mean many different things to so many different people that it has been suggested that the term ought to be avoided altogether. (Bell and Newby, 1973). Community has come to mean everything from neighborhoods, to voluntary organizations, to professional associations, to civic groups, to online internet chat rooms, and more. In the context of sustainability the idea of community appears to correspond more to geographic areas where problems and issues exist, but it still carries multiple meanings. As a consequence, the idea of sustainable communities itself has come to mean many different things, and encompasses an enormous array of different kinds of activities and types of geographic areas. Sustainable communities are not just about relatively small geographically confined groupings of people. Indeed, as the term has been used, a

sustainable community can be anything from a small neighborhood, to a group of people who share some interest, to a program operated by a governmental or non-governmental organization, to a rather localized ecosystem, to a multi-state region encompassing numerous ecosystems.

More typically, however, in common usage the term sustainable communities does seem to encompass or embrace a range of geographically small areas. When the Clinton administration's National Science and Technology Council (NSTC) presented its 1995 National Environmental Technology Strategy, entitled "Bridge to a Sustainable Future," great emphasis was placed on the role of "community" in achieving greater sustainability. Without ever really defining what a community is, the report states that:

> Our nation's future strength will in large part be built on the viability of our nation's communities. We must make choices today that increase the sustainability and desirability of our cities, towns, and rural areas if we are to preserve our natural environment and build a strong domestic economy.… The largest and most complex class of environmental technologies are those supporting our communities: technologies that transport people or goods, produce and deliver energy, treat water supplies and waste products, provide food, and route and process information. To achieve sustainability, technological solutions must be integrated with the unique economic, social, political, and cultural circumstances of each community. (NSTC, 1995: 52, 69-70)

Clearly, the implied meaning of a sustainable community in this report relates to small geographic areas where various new "sustainable" technologies can effectively be integrated with economic, political, and cultural practices that vary from place to place.

In 1999, the U.S. Environmental Protection Agency issued its "Framework for Community-Based Environmental Protection" (CBEP), its version of sustainable communities, which carried a somewhat more explicit statement of what "community" means. This document emphasized a functional, but flexible, definition. According to the EPA,

> Intrinsic to CBEP is an understanding of "community." The definition of community endorsed by EPA for CBEP efforts includes places that are associated with an environmental issue(s). The community may be organized around a neighborhood, a town, a city, or a region (such as a watershed, valley, or coastal area). It may be defined by either natural geographic or political boundaries. The key factor is that the people involved have a common interest in protecting an identifiable, shared environment and quality of life. (USEPA, 1999: 5)

As one might expect from the EPA's definition, a brief perusal of activities identified under the rubric of sustainable communities turns up a variety of different kinds of activities and related geographic areas, from the clean water initiative in the Fox-Wolf Basin area of

Wisconsin, to regional sustainability initiatives in the Great Lakes Basin (Kraft and Mazmanian, 1999), to the creation of affordable housing and brownfields development (Beatley and Manning, 1997), to eco-industrial parks, to all of the eco-villages, such as EcoVillage at Ithaca (NY) and Eco-Village Cleveland (Gilman and Gilman, 1991), eco-neighborhoods (Barton, 1998), and coastal zone management initiatives in Virginia (Lachman, 1997), to name a few. Suffice it to say that the idea of sustainable communities has come to embrace an enormous array of activities and initiatives. Yet, as the idea has expanded, it has become increasingly difficult to know whether any particular set of activities or initiatives really seem to be consistent with a serious intent to sustain or improve a place's ecological carrying capacity. Much the same issues arise in international conceptions of sustainable communities, which embrace such projects as the Annapurna Conservation Cooperative Project in Nepal, the Pallisa Community Development Trust in Uganda, and the Second Livestock Project in Mauritania, to name a few (Pye-Smith and Feyerabend, 1994).

Some cities have adopted a different set of terminology, that of "livable communities," although the underlying concepts are very nearly the same. (Cassidy, 1980) Indeed, the livable communities movement and many cities' initiatives predated the sustainable communities movement and cities' initiatives. In most respects, however, the concept of livable communities appears to be virtually the same as its sustainable communities. In 1999, when the Clinton administration announced its new livable communities initiative, the substance of the initiative was very much oriented around sustainability. In *Building Livable Communities: A Report from the Clinton-Gore Administration* (1999), the initiative is described as having the objective of helping to empower communities to sustain prosperity and expand economic opportunity, to enhance the quality of life, and to build a stronger sense of community, all goals that are very much a part of almost any sustainable communities definition. Partners for Livable Communities (2000) describe such communities in much the same way. The point is, however, regardless of whether the preferred terminology involves that of sustainable communities or livable communities, the substantive differences between the two appear to be slight at best.

From Sustainable Communities to Sustainable Cities

Partly in order to provide definitional clarity, and to facilitate comparisons (comparing apples to apples rather than apples to oranges), this paper focuses not on the "community," however that may be defined, but rather on the city. Although the city may not constitute the most germane geographic unit in terms of ecology or environmental concerns, it is a basic

jurisdictional unit in American government. Here, the term city is used in a formal sense, referring to the legally defined jurisdicational unit. As a general rule, cities are relatively small divisions of government that nonetheless possess the authority to affect environmental and ecological results. Cities are not coterminous with metropolitan areas except in those few areas around the country in which there has been city-county or metropolitan-wide consolidation. Of course, all cities exist in some larger metropolitan context, and understanding the relationship between the formally defined city and its surroundings must represent an integral part of any examination of specific cities sustainability efforts.

As diverse as the composition of U.S. cities are, they are considerably more comparable units than other kinds of communities. Although there may be considerable differences between and among cities in the U.S., they share the basic characteristic that they are legally defined entities that have the legitimacy and authority to address issues and problems within their borders. As the Brundtland report states, "local authorities usually have the political power and credibility to take initiatives and to assess and deploy resources in innovative ways reflecting unique local conditions. This gives them the capacity to manage, control, experiment, and lead urban development" for the good of the environment. (WCED, 1987: 242) Implicit in this statement is the notion that in order to have an impact, government must be involved, and that there needs to be some degree of congruence between the geographic area in which sustainability is to be achieved and the political jurisdiction trying to achieve it. Cities share this important trait. As Agenda 21 noted, "…local authorities construct, operate, and maintain economic, social, and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies." Indeed, despite enormous differences, cities share many more characteristics, including a wide array of governmental and policymaking processes, than are typically acknowledged. (Waste, 1989).

Much has been written about the fact that, in terms of sustainability, ecosystems or species habitats are the appropriate levels at which the environment should be viewed, but in practice there is little correspondence between the geographic area of an ecosystem and the boundaries of governmental jurisdictions. Ecosystems rarely conform to the boundaries of cities or towns, counties, states, election districts, or even nations. This means that no single governmental jurisdiction may possess the authority to deal completely with a particular environmental problem or to achieve sustainability results. Clearly, larger, more encompassing, jurisdictions have advantages in terms of fewer externalities, but there may not be the political

will to address sustainability at such higher levels. In the United States, there are many ways in which the federal government could act to work toward greater sustainability, but the contemporary ideological mood, the distribution of power and influence among competing interests in national politics in recent times, and the historical culture of the nation (including the culture of decentralized government and deference to smaller rather than larger units of government, as reflected in U.S. federalism) present significant impediments.

Often, advocates of sustainable development propose reorganizing government to make it conform to environmental needs. Such proposals may take many forms, including efforts at metropolitan consolidation, i.e. the merger of central cities with surrounding suburbs. But it is difficult to imagine wholesale re-definitions of our political jurisdictions to conform to ecosystem boundaries. Instead of making political jurisdictions conform to ecosystems, is it possible to address issues of sustainability within existing political jurisdictions? If the focus on cities as sustainable units represents a concession to political realities, is it, in fact, possible to develop the political will to address issues of sustainability in cities, even if it cannot be done at the state or national level? To the degree this is possible, cities undoubtedly constitute important government jurisdictions.

From the perspective of early twentieth century political history, progressive advocates once concluded that the power of local business and entrenched political machines precluded the pursuit of their agenda at the city level. This produced an increasing tendency for the progressive agenda to be pushed toward national politics, where progressive interests could find a critical mass of people to mobilize. Perhaps ironically, by the latter part of the 20th century, the tables had been turned. Two concomitant events have very likely altered the political landscape. In national politics, there has been a secular trend toward election of, and in 1994 control by, conservative Republicans in Congress. Although this has not necessarily foreclosed advocacy opportunities for environmental citizen groups (Berry, 1999; Bryner, 2000; Shaiko, 1999), it has made the pursuit of a sustainability agenda more challenging.

At the same time, U.S. national policy has advocated globalization of the economy, including the development of various free-trade agreements (such as the North American Free Trade Agreement and the Free Trade Agreement of the Americas) that have altered the economies of local communities everywhere. The long-term trend has been toward the decline of manufacturing industries in the U.S., and the rise of the service sector. Cities where manufacturing companies once served as the foundation of the local economy now must rely on other sectors to provide needed jobs and employment. Perhaps more important for this

discussion, corporations which once dominated local politics and stood in the way of progressive achievements are gone or transformed. Businesses with long-term local ties are frequently no longer locally owned, often now divisions of larger multinational corporations with little or no interest in local politics and policies. Other once powerful locally or family owned businesses have succumbed to the vagaries of economic competition. To the extent that sustainability can be thought of as progressive (Milbrath, 1984), potentially this has profound implications for the political feasibility of sustainability in cities.

But, with this said, how does the concept of sustainability specifically apply to such a small geographic area as a city? Is it reasonable or appropriate to even consider using the term sustainability in the context of cities and not just in terms of ecosystems, sectors of the economy, or whole nations? Is it appropriate to apply the concept of sustainability to cities in industrialized nations, including those in the U.S., when it more clearly applies to the rapidly growing cities in industrializing nations? Certainly, the Brundtland Commission report asserts that urban sustainability is important in industrialized nations if for no other reason than because cities are the places where large and growing proportions of the environmental and social problems reside. (WCED, 1987: 241-243).

For a variety of reasons, a substantial amount of attention has become focused on the potential for small geographic areas, including cities, to be primary contributors to achieving sustainability. This has given rise to what Marvin and Guy (1998) call a "new localism" of environmental policy. This new localism represents a philosophy that asserts the primacy of local areas and local governments for affecting sustainability. (Selman, 1996) This philosophy suggests that ordinary people are most likely to pay attention to the physical environment where they see and experience it, and that the governance mechanisms in cities are most likely to be responsive to the environmental concerns of their citizens. Marvin and Guy argue that the tenets of this new localism are essentially flawed, leading to prescriptions for change that they believe are confused and distorted, and ultimately will fail to contribute to increased sustainability. Indeed, there is no shortage of critics and skeptics who dismiss the idea that there can be such a thing as a sustainable city. (Girardet, 1999; Rees, 1997) Perhaps the most optimistic view of the role of cities in achieving sustainability prescribes a contributory role for local government. (Satterthwaite, 1997)

But are there solid reasons to believe that cities can constitute efficacious mechanisms for achieving great sensitivity to the health of the environment? Whatever conceptual reasons there might be to suggest that cities can potentially become such mechanisms, these reasons must

confront the experience that American cities have long been held to constitute what Harvey Molotch [1976] calls economic "growth machines." In the face of this conception of cities, is it still possible that there can be such a entity as a sustainable city? John Dryzek expands upon the notion that cities and other local jurisdictions offer great opportunities for taking sustainability seriously in his discussion of "radical decentralization." (Dryzek, 1987: 216-229). Particularly with respect to the issue of the size of the place that should deal with ecological and environmental issues, he contends that "one central feature of smallness of scale is that a locality both relies upon and has exclusive jurisdiction over the productive, protective, and waste assimilative functions of the ecosystems in its immediate vicinity….Local self-reliance…means…that communities and their members must pay great attention to the life-support capacities of the ecosystem(s) upon which they rely." (Dryzek, 1987: 217-218). Largely because the consequences of not paying attention to the health of the environment are so quickly and completely visible at the local level, Dryzek argues that decentralization of environmental decision-making offers great promise.

Even if decentralization of sustainability activities seems conceptually sound, there is no guarantee that residents of any particular area necessarily are, or will become, serious contributors to achieving specific sustainable results. Are there frameworks that are capable of providing clearer pictures of sustainability -- frameworks that would seem to tie localized environmental decision making more directly to issues of sustainability? Advocates of local sustainability have proffered several analogies that help to visualize elements of sustainable cities. For example, some suggest that a sustainable city is one that achieves something of a "closed loop," where human activity in one arena is conditioned on, and conditions, activity in other arenas. Alternatively, imagine a "bubble" being placed over a city or a metropolitan area, and the human activity and its consequences are confronted within this bubble. These analogies essentially imply that what goes on within small geographic areas is indeed relevant to achieving greater sustainability.

Perhaps the single most important analogy to suggest that sustainability at the local level is relevant, even in industrialized nations, comes from the work of Rees (1992; 1996) and Rees and Wackernagel (1994), who developed and applied the idea of "ecological footprint" to urban areas. Ecological footprint refers largely to the size of the environmental impact that is imposed on the earth and its resources. Rees and Wackernagel suggest that the demands that humans place on the earth can be translated into an amount of land necessary to meet those demands. According to them, the average American resident has an ecological footprint that requires about

5 hectares of land (over 12 acres) to provide the shelter, food, and energy to support his/her lifestyle. Just as individual people produce an ecological footprint, so too do aggregations of people, including people who live in cities. They suggest that sustainable places seek to purposely reduce and minimize their ecological footprint, i.e. reduce their impacts on the environment. As Beatley and Manning state it, "a sustainable community is a place that seeks to contain the extent of the urban 'footprint' and strives to keep to a minimum the conversion of natural and open lands to urban and developed uses." (Beatley and Manning, 1997: 28)

A central element of a sustainable city is how self-sufficient it is. Since the average human apparently needs over 12 acres of land to support his/her levels of consumption, and since no city is so large as to allocate 12 acres per resident, this means that cities are far from being self-sufficient. What this also means is that consumption demands in cities can only be met by drawing on the resources of areas outside of the city. Thus, by definition, cities impose their ecological footprints on areas external to the city, and perhaps in many ways areas outside the city impose ecological footprints inside the city. For example, when a city contracts with a company to dispose of its solid waste, and that company trucks the solid waste outside the boundaries of the city, the city is essentially imposing its footprint on some other place. The residents of Virginia became acutely aware of these externalities when the City of New York contracted to ship much of its solid waste to the south after the City decided to close its own landfill on Staten Island. Of course, the size of the footprint depends on such facts as how much solid waste is produced and transported, what kinds of wastes are transported, and what happens to the waste when it is disposed (is it landfilled, incinerated, etc?). When residents of areas outside of a city drive their cars to work inside that city, they impose an ecological footprint on the city. The point is that cities are not self-sufficient, and it is difficult to imagine a way to make them so. Rees argues that the lack of correspondence between the geographic area of a city and the geographic area needed to support its population makes the city a less-than-ideal level at which to pursue sustainability. As he warns, "…we should remember that cities as presently conceived are incomplete systems, typically occupying less than 1% of the ecosystem area upon which they draw. Should we not be reconsidering how we define city systems, both conceptually and in spatial terms?" (Rees, 1997: 308)

As developed in the literature on sustainable communities, this fact does not prescribe that cities should appropriate more land, as many cities do, through annexation or consolidation. This might seem to make a city more self-sufficient because it gives a single set of policy-makers legal authority over an area that encompasses the source of many environmental challenges. But

of course, it merely expands some aspects of a city's ecological footprint and promotes sprawl, clearly not an optimum use of natural resources (Bank of America, 1995; Diamond and Noonan, 1996; Dunphy, 1997; Calthorpe, 2001; Moe and Wilkie, 1997). Presumably, a city's ecological footprint can only be reduced by reducing the amount of land necessary to support that city's consumption and production. Although the common prescription for accomplishing this is to convince people to consume less, there are many other kinds of actions and activities that can be undertaken to reduce the overall ecological footprint of a city. Rees lists five broad areas where city policymakers can work to incrementally reduce the ecological footprints of cities. These include integrated city planning to minimize energy, materials, and land use requirements, increased use of green areas, integrated open space planning, protecting the integrity of local ecosystems, and striving for economic development that has zero net impact on ecosystems. (Rees, 1997: 308-309) Others have suggested that, while annexation itself may not be the answer to reducing a city's ecological footprint, metropolitan-wide planning and government might be. (Calthorpe and Fulton, 2001) Of course, defining specific activities and policies that can accomplish these goals is where the real challenge lies. Many of these kinds of activities will be discussed later.

Conceptually, the idea that there is an ecological footprint, and that sustainable cities are places that seek to minimize this footprint, makes great sense. It may be difficult to imagine a city that is completely self-sufficient, but making efforts to become more self-sufficient, particularly where the costs of doing so are relatively low, seems almost commonsense. In practice, simply trying to pin down how large any specific city's ecological footprint is, and consequently how it can reduce its size, is no small task. How much solid and hazardous waste comes into a city or leaves a city often cannot be known at any given time. How many goods are imported into and exported from a city is not known in practically any U.S. city. Getting an accurate picture of the environmental impacts of all human activity, including that of people working in the private sector, is almost impossible. However, some cities are making a much more concerted effort to understand the full range of environmental impacts they produce, and work toward reducing those impacts even if the impacts are external to the city itself. If a sustainable city is one that has the smallest possible ecological footprint, then a city that takes sustainability seriously is one that seeks to minimize that footprint. Suffice it to say here that a city which attempts to understand, and subsequently takes steps to reduce, its ecological footprint is more serious about sustainability than one that does not. As a practical matter, many cities that wish to move toward sustainability treat the process somewhat incrementally, focusing on

new economic development rather than existing economic activity, trying to make sure that new industries meet a higher standard for the size of their respective ecological footprints. Presumably, the relatively recent trend for cities to define growth boundaries as part of their comprehensive planning represents an effort to pursue economic growth while reducing or minimizing the added increment to their ecological footprints.

The focus on cities is not meant to imply that they are the most appropriate governmental unit to address sustainability issues. Indeed, many issues that sustainability activities and initiatives attempt to address may not be able to be adequately or fully addressed within the context of a single city. But underlying the concept of sustainable communities is the notion that it is possible to make significant strides toward creating healthy and livable places by focusing attention on small geographic areas. In the most sincere terms, sustainable communities put into practice the old adage "think globally, act locally." The prescription to "act locally," is meant, in part, to suggest that advocacy and collective action are important elements, and cities provide a critical mass of people and governmental authority to make collective action possible and effective.

What is perhaps more important than the conceptual argument concerning the appropriateness of focusing on the city is the fact that many cities around the world, including many in the U.S., have developed programs that purport to work toward becoming sustainable, that appear to be working toward reducing the size of their ecological footprints. Indeed, the International Council for Local Environmental Initiatives, an international organization headquartered in Toronto, established a pilot project called the Local Agenda 21 Model Communities Programme to spearhead sustainable cities efforts in fourteen world cities, including Buga, Columbia, Durban, Johannesburg, and Cape Town, South Africa, Hamilton, New Zealand, Jinja, Uganda, Santos, Brazil, Johnstone Shire, Australia, and Hamilton-Wentworth, Canada, among others. (ICLEI, 2000)

In the U.S. context, cities such as Seattle, WA, San Francisco, CA, Austin, TX, Chattanooga, TN, Santa Monica, CA, Boulder, CO, Jacksonville, FL, and many others have begun governmental or non-profit programs to work toward achieving important sustainability results. A list of the twenty-three cities that have developed some sort of sustainability initiative is found in Table 1. There are other identifiable municipal-based programs, often in smaller cities or towns, such as Burlington, Vermont, Stuart, Florida, Grant, Utah, Annapolis, Maryland, and Ithaca, New York, to name a few. But this list represents a nearly comprehensive list of major U.S. cities that currently have active sustainability initiatives under way. There is quite a

bit of variation in these programs -- in how they are designed and operate, in how involved the city government is, and even in how they define sustainability. Sometimes they operate out of single governmental agencies (an environmental department, a department of public works, a planning department, etc.), sometimes they integrate a variety of governmental activities, and sometimes they operate completely independent of government departments (i.e. a local non-profit organization). In any case, sustainable communities initiatives have emerged and exist in cities, counties, planning districts, and other areas all around the country. What these initiatives do – how they define and attempt to achieve their objectives -- in U.S. cities is what this research is all about. As stated earlier, it is quite premature to try to provide any systematic assessment of whether these initiatives have made their cities more sustainable. Undoubtedly, that will be an appropriate issue to study in the years to come. But, perhaps it is not premature to assess whether there are cities that do seem to be taking urban sustainability seriously, and that is what this research will attempt to do here.

Taking Sustainability Seriously: Operationalizing the Concept

The empirical analysis of sustainable cities requires some method of measuring the extent to which cities seem to take sustainability seriously. Although at some point it might be desirable and possible to determine how sustainable cities have actually become, the assumption of this analysis is that such assessments are probably premature. The analysis here, by contrast, focuses on the policies, programs, and activities of cities, including sustainable indicators initiatives, which would seem to be consistent with an overall effort for cities to become more sustainable. In order to capture the essence of cities' efforts, the analysis here focuses on whether they have adopted or engaged in some 34 different specific activities in seven different categories, as summarized in Table 2.

The Elements of "Taking Sustainable Cities Seriously:"

►Perhaps the single most frequently cited element in any sustainable cities initiative is the "sustainable indicators project." (AtKisson, 1996; Zachary, 1995) Sustainable indicators consist of efforts to devise specific measures of how sustainable the city is, to establish benchmarks, goals, and timetables for improvements, and to periodically assess progress toward achieving these improvements. Sometimes these indicators projects are developed within city government, usually by a planning agency, as in Portland, Oregon, and sometimes they are developed by independent non-profit organizations, such as the Sustainable Community Roundtable in

Olympia, Washington. In a few cities, these projects are the joint effort of a non-profit and one or more city agencies, as in Seattle. The present analysis focuses on three aspects of these projects: 1) does the city have such a project; 2) if so, has the project issued a progress report within the last five years; and if so, 3) does the indicators project contain an explicit "action plan" delineating the steps to be taken to achieve the specified goals within the desired time periods.

►The second category of activity focuses on cities' adoption of "smart growth" programs or policies. (ICMA, 2001) Smart growth simply refers to any of a number of programs designed to help the city manage growth to avoid or eliminate suburban sprawl, and to direct economic development and population growth in ways that minimize their impacts on the physical environment. Here the focus is on 4) whether the city has managed development by developing eco-industrial parks; 5) has committed to cluster or targeted economic development; 6) has established one or more eco-villages; and 7) has established a local brownfield redevelopment initiative.

►Central to the issue of sustainability is the broad issue of land use planning and the use of zoning. Increasingly, cities endeavor to use zoning to manage their growth, and just as with other smart growth initiatives, to try to take a comprehensive view of how the land in the city is developed into the future. The focus here is on 8) whether the city engages in comprehensive land use planning that explicitly delineates environmentally-sensitive growth areas; 9) whether the city uses zoning as a mechanism to influence the directions of development, e.g. does the city's zoning ordinance establish environmentally-sensitive areas; and 10) does the city attempt to use local tax incentives or other financial incentives, such as fee waivers, to influence development toward less environmentally-sensitive areas.

►Partly as an extension of smart growth efforts and environmentally sensitive land use planning, transportation planning has become an important element of sustainable cities initiatives. While much of what goes on in sustainable public transportation planning is captured in the "cluster development" approach to smart growth, it also includes other elements that are not. In the simplest case, cities can operate their own mass transit systems (buses or subways), and work to encourage more commuters to opt to use them. The focus here is on whether the city: 11) operates a system of mass transit; 12) establishes limits on the availability of downtown parking spaces (creating incentives for commuters to seek means of transportation other than the personal automobile); 13) has defined car pool programs, including the use of car pool lanes on local roadways; 14) establishes a program for the city's fleet of vehicles to use alternative fuels

(such as LNG, propane, or electric hybrid vehicles); and 15) operates a bicycle ridership program, with defined bicycle lanes and paths for commuters.

►Sustainability requires explicit attention to issues of pollution remediation, reduction, and prevention. (Lachman, 1997) Cities vary greatly in the extent to which they engage in activities, programs, or policies that are designed to address issues of pollution. The focus here is on whether cities have programs dedicated to: 16) household solid waste recycling; 17) industrial or commercial solid waste recycling; 18) hazardous waste recycling; 19) air pollution reduction, e.g. VOC reduction programs; 20) city purchasing of recycled products; 21) Superfund or other hazardous waste site remediation; 22) Asbestos abatement; and 23) lead paint abatement.

►Energy and Resource Conservation initiatives typically define programs to either reduce energy or resource consumption, or to change the forms of energy consumed to move away from the use of fossil fuels toward renewable energy sources. Many cities have developed "green building" programs to assist developers with technical issues on design and construction of energy efficient buildings. In some cities, such as Boulder, specific green building elements must be included in the plans of new construction in order to obtain a building permit. The focus here is on whether the city has: 24) a green building program, either voluntary or mandatory; 25) a program of renewable energy use by city government; 26) any type of energy conservation program other than that found in a green building initiative; 27) made provisions for residential consumers to purchase electricity generated from alternative renewable sources (solar, wind, biogas, etc.), as in Austin, Texas, and Santa Monica, California; and 28) established a water conservation initiative of any sort.

►Although most discussions of sustainable cities place little emphasis on organizational, administrative, and governance issues, increasingly these are treated as important elements in the seriousness of cities' efforts. (Brugmann, 1997) A city that purports to operate a sustainability initiative, but where the responsibility for making progress toward sustainability is undefined or dispersed around the city usually means that sustainability will be subordinated to some other administrative goals. A city that designates a single department or administrative unit whose success is directly determined by the success of the sustainability initiative would seem to take the issue more seriously. Additionally, the level of involvement of key policymakers in the process of defining the initiative reflects the level of commitment of the city. In Boston and San Francisco, for example, those who have worked on their respective sustainability programs lament the lack of involvement of their mayors, and attribute their limited successes to this factor. The focus here is on whether the city: 29) has a single governmental or non-profit

organization that is responsible for implementing the program; 30) has made sustainability part of its overall comprehensive management plan; 31) has involved members of the city council or planning council; 32) has involved the mayor or chief executive officer (such as a city manager) in the deliberations and development of the initiative; 33) has involved the business community, either through involvement of specific businesses or business leaders, or through the local chamber of commerce; and 34) has involved the general public in some fashion, through public hearings, the oft-practiced "visioning" process, or through engagement with existing neighborhood associations and organizations.

These 34 elements are summarized into a single index representing the total number of elements practiced in each city. Creating a simple index of this sort has the advantage that it is easy to understand and interpret. In some respects, the exercise is much like the "Green Metro Index" computed for U.S. metropolitan areas by the World Resources Institute (1993) in the early 1990s, or the more recent efforts by Dan Esty and colleagues (2001) to develop an "Environmental Sustainability Index" for nations. A major difference between those measures and the index developed here is that the former mix programmatic elements with actual environmental quality measures. The other indexes include whether there is a water conservation program, for example, as well as measures of the actual quality of the air. The Index developed here focuses just on the programmatic elements found in the cities. The downside is that it assumes that each element is equally important in contributing to taking sustainability seriously. One might argue that these elements are not equal, and that some are far more important than others. For example, a city that has only pursued sustainability within the context of comprehensive planning is taking sustainability far more seriously than one that has established a solid waste recycling program. Yet there is no way of knowing how these elements should be weighted, at least not in terms of their overall contribution to making the city more sustainable in fact. At some point in the future, we may be able to determine the relative importance of each element in creating greater sustainability, but until better data exist to measure sustainability directly, there may be no way to weight the index elements.

The computed index value for a specific city could theoretically range from 0 to 34, although the fact that a city has undertaken a sustainability initiative makes a 0 score highly unlikely among the 23 cities examined here. The cities' actual index values range from 6 in Milwaukee to 30 in Seattle, as shown in Table 3. This Table also provides a full list of the elements and how each city was coded on them. The average Index score is 16.6, with a

standard deviation of 7.2. Clearly, some program elements appear to be easier to achieve than others. One element, solid waste recycling, exists in all 23 cities. Another element, water conservation programs, exists in 22 cities. On the other hand, the creation of eco-villages and the programs to operate car pools and car pool lanes on the roadways were each achieved only by three cities, respectively.

Why Some Cities Take Sustainability More Seriously Than Others: Some Basic Correlates

If it is possible to imagine that cities can take sustainability seriously, and if it is also possible that cities can vary in the extent to which they do so, it is also possible to contemplate why some cities are more serious about pursuing sustainability than others. In general, the literature on sustainable communities and sustainable cities provides virtually nothing in the way of conceptual guidance on what might explain this variance. The following analysis develops some basic information about possible correlates of the effort cities put into their sustainability initiatives. The rationale for some of these correlates comes mainly from logic and intuition, and for others comes from extension of existing conceptual work.

The focus of this research is on the nature of sustainable cities initiatives among those cities that have elected to develop them. It is to determine, among the 23 cities that have developed such programs, why some of them appear to take the endeavor more seriously than others. Perhaps an equally important question is why cities decide to develop sustainable cities initiatives in the first place. Answering such a question would require a different sample of cities, one that compares the 23 cities examined here to some collection of cities without such initiatives. So the focus here is on a comparison of 23 cities all of which have already initiated some type of sustainability effort.

Intuition, perhaps, tells us that the scale of a city's environmental challenges might play a role, but the opposite may hold true as well. While very large cities might have a greater need to pursue sustainability, the scale of that need might constitute an immense obstacle as well. Smaller cities might be able to avoid the impediments posed by the large scale that our biggest cities face, but they also tend to lack the critical mass of interests to push issues of sustainability onto the public agenda. The variables that come the closest to tapping these issues are population size, population growth, land area (in square miles), and gross population density (residents per square mile). Among the 23 cities with sustainability initiatives, the 2000 population size ranges from a little over 42,000 in Olympia to over 1.3 million in Phoenix, with

an average population size of 413,000 people, and without a doubt, the kinds of environmental issues faced by Phoenix are very different, by virtue of its size, than those confronted in Olympia. This leads to hypothesis:

H1: Among the 23 cities that have sustainability initiatives, those that are larger, that have experienced the greatest population growth, that have the smallest land area, and that have the highest population density will be the cities that take sustainability most seriously.

Table 4 shows the relationship between population size, along with other demographic variables, and the Index of Taking Sustainability Seriously. While the direction of the relationships is in the predicted direction, none of these correlations approaches statistical significance. Examination of scatterplots of the relationship between population size and the Index (not shown here) reveals that there is no curvilinear relationship either.

Another plausible explanation for why some cities take sustainability more seriously focuses on the nature of the local resources and needs of the city. Although the empirical literature on public support for environmental programs reports very little in the way of a relationship between personal income and such support, there remains the possibility that cities with greater resources will be better able to afford the "luxury" of pursuing sustainable development. Cities with serious social and economic problems, so the argument goes, would be less apt to place a high priority on sustainability, instead worrying about other high priority issues. For example, a city facing high unemployment would be more likely to opt for any kind of economic development they can get, while cities with lower unemployment may find it easier to be choosy about the kind of economic development they will allow. This leads to hypothesis:

H2: Among the 23 cities with sustainability initiatives, those with higher median family incomes, higher median house values, lower rates of poverty, lower unemployment rates, and higher per capita governmental spending will be the cities that take sustainability most seriously.

Table 5 shows the correlations with these variables. The only statistically significant correlation is that between the Index and the 1990 poverty rate, suggesting that among the 23 cities, those with greater poverty have had the most difficulty taking sustainability seriously. The cities with higher median family incomes, lower unemployment rates, and higher median house values tend to be the cities that take sustainability more seriously, although the coefficients are not statistically significant. The government spending variables, total and per capital local

government expenditures, show little correlations with the Index. There does seem to be a tendency for cities with greater resources and fewer economic problems, such as a high unemployment rate, to take sustainability more seriously.

These patterns suggest that the resource character of the local population plays a role in determining how seriously the city will take the pursuit of sustainability. This issue can be examined a little more closely with reference to additional population characteristics. Does the racial or ethnic character seem to play a role? Is there reason to think that the age structure of the city's population influences the pursuit of sustainability? If cities adhere to the logic of the Brundtland Commission's concern for future generations, then cities with larger populations of children should pursue sustainability more aggressively than those with older populations. How about the employment structure in the city? Does the presence of a significant manufacturing base mean that the city will experience a greater need to be environmentally sensitive by virtue of the fact that manufacturing industries often place greater burdens on the environment? Or does reliance on manufacturing as a base of employment mean that the city will be hesitant to go too far for fear that pursuing sustainability might threaten the very source of economic well-being? The education of the local populace may also play a role, where we might expect a more educated population to be more attuned to the desirability of pursuing sustainability. This leads to the hypothesis:

H3: Among the 23 cities with sustainability initiatives, those with higher employment in manufacturing and lower employment in service industries, with high African American and Hispanic populations, less well educated populations, and larger contingents of older people will be the cities that take sustainability less seriously.

Table 5 presents the correlations for these variables. Here we see that cities with large African American and Hispanic populations are indeed the cities that take sustainability less seriously. Whether it is because these cities face what they consider to be more pressing problems, or because members of these populations simply do not place a high value on trying to

achieve sustainability is impossible to say here. The age of the populations of cities also seems to make a difference, but not necessarily in the predicted direction. Cities with larger proportions of their populations under the age of 18 are much less likely to take sustainability seriously, and cities with higher median aged populations are far more likely to take sustainability seriously. Education does work in the predicted direction; cities with better-educated populations tend to take sustainability more seriously. Finally, cities that are reliant on manufacturing for the employment of their residents are far less likely to vigorously pursue sustainability than cities less reliant on manufacturing.

Is there a pattern where cities that are predisposed to look favorably upon the environment and environmental protection are more likely to pursue sustainability? There are no direct measures of such predispositions, but three proxy measures might help to provide a little insight into this type of issue. For example, some cities are very much oriented toward the use of public transportation, and others are heavily reliant on the automobile, particularly for commuting to work. We might expect those cities more reliant on the automobile (cities with large proportions of commuters who drive to work alone) to be the cities that are less interested in pursuing sustainability, and those that are more oriented toward public transit to take sustainability more seriously. Additionally, cities with local governments that tended to spend greater amounts of money environmentally-related activities (water quality, parks and recreation, sanitation, etc.) should be cities that have opted to take sustainability more seriously. Another proxy measure might be how the local electorate votes. For example, in the last two presidential elections, one might expect cities that tend to vote more for the Democratic candidate, Clinton in 1996 and Gore in 2000, would be more concerned about environmental issues, and more attuned to sustainability. One of the first reactions people seem to have when they see a list of the 23 cities is to take particular note of the cities that are located on the west coast. Indeed, the list contains a healthy dose of such cities, from Seattle and Portland in the Pacific Northwest, to San

Francisco, San Jose, Santa Barbara, and Santa Monica further down the coast. If these cities are disproportionately likely to take sustainability seriously, then this would suggest that sustainable cities is largely a west coast phenomenon, raising the question of whether the concept is feasible elsewhere in the U.S. This leads to:

H4: Among the 23 cities with sustainability initiatives, those with higher proportions of their populations using public transportation to get to work, those with fewer people who drive to work alone, those that traditionally have spent more money (per capita) on their environments, cities on the west coast, and those that tend to vote disproportionately for Democratic presidential candidates will be the cities that take sustainability more seriously.

These correlations are presented in Table 7, and they show that there is little tendency for these "predisposition" variables to be related to the Index. The only variable with statistically a significant correlation is the location on the west coast (which is just barely significant). Perhaps just as interesting is the fact that the correlation between the amounts of money the city government spends per capita on sustainability (crudely measured by the sum of spending on health, sewerage, water quality, and parks and recreation) and the Index is negative (but insignificant). A simple OLS multiple regression analysis, including five of the independent variables that are more highly correlated with the Index, as presented in Table 8, shows significant correlations with only two variables. The median age of the city's population and the percentage of the labor force employed in manufacturing industries persist as significant correlates, with older populations and fewer manufacturing employees being associated with cities that take sustainability more seriously. Controlling for these variables, the size of the African American population, the level of education, and location on the west coast appear to not be significantly correlated with the Index.

Discussion and Summary

Surprisingly few of the independent variables developed here were correlated with cities' level of seriousness of sustainability. Many of the variables that would seem to offer the most

plausible explanations were but weakly correlated with the number of sustainability programs and activities in the city. Population size and rapid growth in population, variables often believed to put pressure on local governments to manage, limit, or stop future growth, were not related to the seriousness of sustainability. The resource base of cities, measured by median family income, median house value, total and per capita local government spending, and the unemployment rate, were not related to the seriousness of the sustainability effort. The poverty rate did reveal a modest bivariate relationship, but in multivariate analysis, never emerged as significant. The general lack of a pattern suggests that there really is not a single kind of city that finds sustainability particularly appealing. It isn't just liberal Democrat kinds of cities that take sustainability seriously, although there is a healthy dose of such cities among the 23 studied here. It isn't just west coast cities that are serious about sustainability, although there is a healthy dose of those among the 23 as well. It isn't just affluent, predominantly white, well-educated cities that have the greatest interest in local sustainability.

The variables that did emerge as significant correlates were a couple of demographic characteristics -- median population age, the percentage of the population below 18 years of age, the percentage high school graduates, and the percentage of African Americans residing in the city -- and one indicator of the local economy -- the percentage of the labor force employed in manufacturing industries. What this probably means is that the cities that need sustainability the most -- cities that are reliant on relatively more polluting manufacturing industries as the base of employment, and cities with younger populations -- are the cities that tend to take sustainability less seriously. If efforts to achieve sustainability through cities in the U.S. are to succeed, then greater attention will need to be paid to defining the conditions under which the most needy cities can take the idea seriously. To some degree, this may be a problem that will resolve itself over time, at least in the sense that cities may find it increasingly possible to develop serious sustainability initiatives as their manufacturing based diminishes, as it has in most U.S. cities.

The analysis presented here is somewhat limited by virtue of the small number of cases available for analysis. With just twenty-three cases, the scope of the empirical analysis is, by its very nature, rather limited. But the fact is that this number essentially represents the population of cases pursuing sustainability in the country. The population of cases can be expanded by venturing outside of the U.S., particularly to Canada, where numerous cities such as Toronto, Winnipeg, Hamilton, and Vancouver, among others, have established sustainability initiatives, and to Western Europe, where the idea of sustainable cities really got its start. Future research will begin to do this. Additionally, future analysis will expand it scope to compare these 23 early adopter cities to others around the country to determine why some cities pursue sustainability at all, while most cities in the U.S. do not.

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Table 1: List of Twenty-Three Cities with Sustainability Initiatives

City	Name of Sustainability Initiative
Chattanooga, TN	Sustainable Chattanooga
Jacksonville, FL	Jacksonville Indicators Project, Jacksonville Community Council
Orlando, FL	Sustainable Communities
Tampa, FL	The Tampa/Hillsborough Sustainable Communities Demonstration Project
Seattle, WA	Sustainable Seattle/The Comprehensive Plan
Olympia, WA	Sustainable City Indicators/Sustainable Community Roundtable
Portland, OR	The Comprehensive Plan
Milwaukee, WI	Campaign for Sustainable Milwaukee
Santa Monica, CA	Santa Monica Sustainable City Program
San Francisco, CA	The Sustainability Plan
San Jose, CA	Sustainable City Programs (Sustainable City Major Strategy, part of San Jose 2020)
Santa Barbara, CA	The South Coast Community Indicators Project
Austin, TX	Sustainable Communities Initiative and Sustainability Indicators Project of Hays, Travis, and Williamson Counties
Indianapolis, IN	IndyEcology
Boulder, CO	The Sustainability Program
Cambridge, MA	Sustainable Cambridge, Cambridge Civic Forum
Boston, MA	Sustainable Boston Initiative
Brookline, MA	Comprehensive Plan
Scottsdale, AZ	Scottsdale Seeks Sustainability
Phoenix, AZ	Comprehensive Plan, Environmental Element
Brownsville, TX	Eco-Industrial Park
Cleveland, OH	Sustainable Cleveland Partnership, EcoCity Cleveland
New Haven, CT	Vision for a Greater New Haven

Table 2: The Elements of “Taking Sustainable Cities Seriously”

Sustainable Indicators Project
1. Indicators project active in last five years
2. Indicators progress report in last five years
3. Does indicators project include “action plan” of policies/programs?
"Smart Growth" Activities
4. Eco-industrial park development
5. Cluster or targeted economic development
6. Eco-village project or program
7. Brownfield redevelopment (project or pilot project)
Land Use Planning Programs, Policies, and Zoning
8. Zoning used to delineate environmentally sensitive growth areas
9. Comprehensive land use plan that includes environmental issues
10. Tax incentives for environmentally friendly development
Transportation Planning Programs and Policies
11. Operation of public transit (buses and/or trains)
12. Limits on downtown parking spaces
13. Car pool lanes (diamond lanes)
14. Alternatively fueled city vehicle program
15. Bicycle ridership program
Pollution Prevention and Reduction Efforts
16. Household solid waste recycling
17. Industrial recycling
18. Hazardous waste recycling
19. Air pollution reduction program (i.e. VOC reduction)
20. Recycled product purchasing by city government
21. Superfund site remediation
22. Asbestos abatement program
23. Lead paint abatement program
Energy and Resource Conservation/Efficiency Initiatives
24. Green building program
25. Renewable energy use by city government
26. Energy conservation effort (other than Green building program)
27. Alternative energy offered to consumers (solar, wind, biogas, etc.)
28. Water conservation program
Organization/Administration/Management/Coordination/Governance
29. Single gov/nonprofit agency responsible for implementing sustainability
30. Part of a citywide comprehensive plan
31. Involvement of city/county/metropolitan council
32. Involvement of mayor or chief executive officer
33. Involvement of the business community (e.g. Chamber of Commerce)
34. General public involvement in sustainable cities initiative (public hearings, "visioning" process, neighborhood groups or associations, etc.)

Table 3: Twenty-Three Cities' Scores on the "Taking Sustainable Cities Seriously" Index

Sustainable Cities Initiative Program Elements*

City	**Score**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Seattle	**30**	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Scottsdale	**26**	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y
San Jose	**26**	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y
Boulder	**26**	Y	Y	Y	N	Y	N	N	Y	Y	N	Y	N	N	Y	Y	Y	Y
Santa Monica	**25**	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y
Portland	**25**	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	Y	N	Y	Y
San Francisco	**23**	Y	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Tampa	**19**	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	Y	Y
Chattanooga	**18**	Y	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	N	Y	Y
Austin	**17**	Y	Y	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	Y	N
Phoenix	**15**	N	N	N	N	Y	N	Y	Y	Y	N	Y	N	N	Y	Y	Y	N
Jacksonville	**15**	Y	Y	N	N	Y	N	Y	Y	Y	N	Y	N	N	Y	N	Y	Y
Cambridge	**14**	Y	N	N	N	Y	N	Y	Y	Y	N	N	Y	N	N	Y	Y	N
Cleveland	**14**	Y	N	N	Y	N	Y	Y	N	N	N	Y	N	N	Y	N	Y	Y
Brookline	**14**	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	N	N	Y	Y	N
Boston	**14**	Y	Y	N	N	Y	N	Y	N	N	N	Y	Y	N	N	N	Y	Y
Orlando	**11**	N	N	N	N	Y	N	N	Y	Y	N	Y	N	N	Y	Y	Y	N
Santa Barbara	**10**	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	Y	Y	Y	N
Indianapolis	**9**	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	Y	Y
Olympia	**8**	Y	Y	Y	N	Y	N	N	N	N	N	Y	N	N	N	N	Y	N
New Haven	**8**	N	N	N	N	Y	N	N	N	Y	N	Y	N	N	N	N	Y	N
Brownsville	**7**	N	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N
Milwaukee	**6**	N	N	N	N	N	N	Y	N	N	N	Y	N	Y	N	N	Y	N
# of cities	**--**	17	12	10	4	20	3	17	14	14	4	20	5	3	14	13	23	12

* See Table 2 for Initiative Program Element Listing.

Y signifies that the city has this program element; N signifies that the city does not have this program element.

Table 3, continued

Sustainable Cities Initiative Program Elements*

City	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Seattle	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Scottsdale	Y	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
San Jose	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Boulder	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Santa Monica	Y	N	Y	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Portland	Y	Y	Y	N	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
San Francisco	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y
Tampa	N	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	N	N	Y	Y
Chattanooga	Y	Y	N	Y	N	N	N	N	N	Y	Y	N	N	Y	N	Y	Y
Austin	N	Y	N	N	N	N	Y	Y	N	Y	Y	Y	Y	N	N	N	N
Phoenix	Y	Y	Y	N	Y	N	N	N	N	N	Y	Y	Y	N	N	N	N
Jacksonville	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	Y	Y
Cambridge	N	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	Y
Cleveland	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	Y	Y
Brookline	N	N	Y	N	N	N	N	Y	N	N	Y	Y	Y	N	N	N	Y
Boston	Y	N	N	Y	N	Y	N	N	N	N	Y	Y	N	N	N	N	Y
Orlando	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	Y
Santa Barbara	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y
Indianapolis	Y	Y	N	N	Y	N	N	N	N	N	Y	Y	N	N	N	N	Y
Olympia	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y
New Haven	N	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	Y	Y
Brownsville	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	Y	N
Milwaukee	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y
# of cities	12	10	11	6	5	5	8	10	6	6	22	16	13	8	6	12	20

* See Table 2 for Initiative Element Program Listing.

Y signifies that the city has this program element; N signifies that the city does not have this program element.

Table 4: Correlations Between the Index of Taking Sustainability Seriously and Demographic Characteristics in Twenty-Three Cities

Independent Variable	Pearson Correlation Coefficient	Significance
Total Population, 2000	.135	.54
Total Population, 1990	.110	.62
Total Population, 1980	.067	.76
Population Change %, 1980 to 1990	.161	.46
Population Change %, 1980 to 2000	.138	.53
Total Land Area (square miles)	-.014	.95
Population Density (Population per sq mile)	.132	.55

Table 5: Correlations Between the Index of Taking Sustainability Seriously and Local Resource Characteristics in Twenty-Three Cities

Independent Variable	Pearson Correlation Coefficient	Significance
Median Family Income, 1990	.326	.13
Poverty Rate, 1990	**-.399**	**.05**
Average Unemployment Rate, 1994-96-99	-.271	.21
Median House Value, 1990	.301	.15
Total City Government Spending, 1990	.070	.75
Per Capita Government Spending, 1990	-.122	.59

Table 6: Correlations Between the Index of Taking Sustainability Seriously and Population and Employment Characteristics in Twenty-Three Cities

Independent Variable	Pearson Correlation Coefficient	Significance
Percent African American, 2000	**-.389**	**.06**
Percent African American, 1990	-.338	.12
Percent Hispanic, 2000	-.292	.17
Percent Hispanic, 1990	-.252	.25
Percent Under 18 Years Old, 1990	**-.503**	**.01**
Percent Over 65 Years Old, 1990	.147	.50
Median Age of the Population, 1990	**.630**	**.00**
Percent High School Graduate, 1990	**.502**	**.02**
Percent Employed in Manufacturing, 1990	**-.549**	**.01**
Percent Employed in Service Sector, 1990	.122	.58

Table 7: Correlations Between the Index of Taking Sustainability Seriously and Measures of Environmental Predisposition in Twenty-Three Cities

Independent Variable	Pearson Correlation Coefficient	Significance
Percent Drivers Driving Alone to Work, 1990	.012	.96
Percent of Commuters Using Public Transportation, 1990	.081	.71
Total Government Spending on Environment, 1997	.228	.31
Per Capita Spending on Environment, 1997	-.173	.44
Location on the West Coast (CA, OR, WA)	**.415**	**.05**
Average Percent Democratic Presidential Vote, 1996-2000 +	.207	.37

+ Based on data for 21 of 23 cities

Table 8: OLS Regression Results Showing Correlates of the Taking Sustainability Seriously Index

	β	**SE β**	**Beta**	**T**	**Significance**
Percent African American, 2000	-.180	.090	-.372	-1.999	.063
Median Age, 1990	**1.258**	**.423**	**.544**	**2.972**	**.009**
Percent Employed in Manufacturing, 1990	**-.0050**	**. 002**	**-.473**	**-3.110**	**.007**
Percent High School Graduates, 1990	.0399	.125	.059	.320	.753
Location on the West Coast	-3.606	3.04	-.233	-1.184	.253
Constant	- 20.085	12.86		-1.561	.138

Multiple R .832
R Square .692
Adjusted R Square .596

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	789.55	157.91
Residual	16	351.21	21.95

F = 7.19 Significance of F = .0011