Assessing Sustainability:
A Guide for Local Governments

Wayne M. Feiden, FAICP, with Elisabeth Hamin

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Wayne M. Feiden, FAICP, is director of planning and development for the City of Northampton, Massachusetts. His work in Northampton earned that city the highest Massachusetts Commonwealth Capital score for municipal sustainability and smart growth efforts. Feiden has led six American Institute of Architects Regional/Urban and Sustainable Design Assessment Teams and served on an additional seven teams. Portions of this report grew out of Feiden's work with AIA. Feiden's Eisenhower Fellowship to Hungary and Fulbright Scholarship to South Africa both focused on sustainability issues. He is an adjunct lecturer at the University of Massachusetts and Westfield State University. He teaches Planning Law, Planning Tools and Techniques, and Community Preparedness Planning. He is the author of two other PAS Reports, no. 508, *Performance Guarantees for Government Permit Granting Authorities,* and no. 542, *Planning Issues for On-site and Decentralized Wastewater Treatment*, as well as other research papers, monographs, and planning studies. Feiden is an honorary member of the Western Massachusetts American Institute of Architects.

Elisabeth Hamin is associate professor of regional planning and director of the PhD program in regional planning at the University of Massachusetts. Hamin teaches Growth Management, Regional Planning Studio, and Advanced Planning Theory, among other classes. She is a co-editor, along with Priscilla Geigis and Linda Silka, of *Preserving and Enhancing Communities: A Guide for Residents, Planners and Government Officials* (Amherst: University of Massachusetts Press, 2007). Her current research centers on climate adaptation planning; she has published articles, reports, and book chapters on this topic and speaks on it frequently.

Michael Cote is an environmental urban-planning consultant specializing in climate adaptation, sustainability, and smart growth. He has published several articles covering the intersection of land-use law and climate adaptation policy. *Kurt Gaertner*, AICP, is acting director of the grants office of the Massachusetts Executive Office of Energy and Environmental Affairs. *Kim Gilhuly* is project director of Human Impact Partners, where she collaborates on and researches health impact assessments for land-use projects and a variety of policy initiatives. *Joel Mills* is the director of American Institute of Architects Center for Communities by Design, with expertise and experience in governance and international democratization initiatives. *Bob Mitchell*, FAICP, is special assistant for planning initiatives in the Massachusetts Executive Office of Housing and Economic Development. *Erin Simmons* is director of design assistance at the American Institute of Architects. *Wendy Sweetser* is the director of the Highland Communities Initiative of the Trustees of Reservations. She has a special interest in using social networks to support environmental and planning campaigns. *Jeffrey P. Treiber* is dean for strategic learning partnerships at the National Graduate School of Quality Management, Falmouth, Massachusetts. *Nathan A. West*, AICP, is director of community and economic development for the City of Port Angeles, Washington. Previously, he managed the policy development section of the Cayman Islands government planning department, where he helped develop a sustainable development strategy.

At the American Planning Association, Ann F. Dillemuth, AICP, copyedited the manuscript.

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E-mail: pasreports@planning.org

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My initial interest in exploring the diffusion of sustainability concepts came during an Eisenhower Fellowship to Hungary a few short years after Hungary became democratic. I watched many local governments embrace participatory planning, but I also saw reluctance to involve Roma minorities and the practical challenges of a paradigm shift. For me, it was a lesson in the challenges of diffusing new ideas.

The seed for this publication was planted during a Fulbright Scholarship to teach at the University of Venda in South Africa. South Africa has made a huge commitment to sustainability and social equity by providing new quality housing for those in desperate need. To keep the projects affordable and minimize land costs, however, many of the projects are in large single-use, low-income projects that are not integrated into the economic lifeblood of the cities they serve. It seemed to my South African colleagues and to me that the strong focus on the social equity aspect of sustainability (which is certainly needed) may come at the cost of economic sustainability. Sustainability in the South African context is certainly different from that in the U.S. context, but that begs the question of how we assess what is sustainable in the first place. This report is written to help answer that question for local governments and local government planners.

Special thanks are due to the many people who helped give me the chance to think about sustainability in different contexts: the American Planning Association; Eisenhower Fellowships; Fulbright Program; Erin Simmons, Joel Mills, and Erica Gees, American Institute of Architects; Peter Bikam and Matthew Dayomi, University of Venda; Carolyn Misch and Mayor Clare Higgins, City of Northampton; my editor-sister, Karyn Feiden, and, of course, my exceedingly patient family, Denise Green and Lisa Feiden.

—*Wayne M. Feiden*, FAICP

CHAPTER 1

The Challenge of Assessing Sustainability

There are many definitions of sustainability and sustainable development. Google the phrase "sustainable development" and the search returns millions of hits. Everyone wants sustainability; it's the new—or now even not so new—buzzword. Sustainability is the new black.

Some people speak of the rise of sustainability as a paradigm shift. In response, skeptics can rightly point out that much of this "new" sustainability paradigm is taken from the modern environmental movement that dates to the 1960s and 1970s, the conservation movement from the turn of the 20th century, the best of planning over the past century, and the best of urbanism over the past couple of millennia.

Unfortunately, the word "sustainability" is so overused that sometimes it means nothing, especially when so many new comprehensive plans and private-sector projects are all claiming to be models of sustainability. Sustainability does not consist simply of a series of accepted actions, however, making it extremely difficult to reach an agreement on its definition, much less on how to measure it.

As a result of this imprecision, greenwashing—or unwarranted green or sustainability claims—is common, and examples abound. When Home Depot created its "Eco Options" label, its suppliers nominated more than 60,000 of Home Depot's 176,000 products for it. As a result, one commenter noted, "Plastic-handled paint brushes were touted as nature-friendly because they were not made of wood. Wood-handled paint brushes were promoted as better for the planet because they were not made of plastic." Only 2,500 products made the final cut. Of course, regardless of whether these products are wood or plastic, they are not sustainable if they are tossed out after one use (Krauss 2007). Similarly, from 2004 to 2007, when the U.S. Green Building Council studied the use of polyvinyl chloride (PVC) as a building material as part of its Leadership in Energy and Environmental Design (LEED) program, the Vinyl Institute lobbied to have PVC listed as a green product. The Vinyl Institute argued that PVC is in many green buildings, the process for generating PVC has been modified to reduce waste, and PVC has less embedded energy than many alternatives. But given that PVC releases highly toxic dioxin when burned, others argued that it is not a sustainable product and should be discouraged or banned (ICLEI 2008 and Altshuler et al. 2007).

Even more common than greenwashing is a lack of clarity about when policies and actions are actually sustainable. When Northampton, Massachusetts, began encouraging LEED certification for local development projects, one of the early adopters was Yum! Brands, which opened its first LEED Gold Taco Bell/KFC restaurant in the United States in Northampton in 2008 (Yum! Brands 2009). Earning LEED Gold is seen as an accomplishment, and it indicates to many that the company is "greener" than other fast-food chains in the city. However, with the building's location on a highway commercial strip, most of its customers remaining in idling vehicles in the drive-through lane, a food chain that extends far from Northampton, payroll and employment opportunities that will not raise low-income residents out of poverty, and a nondurable building that will probably not be reused by the next tenant on the site, it is hard to argue that this achievement makes Taco Bell/KFC a sustainable enterprise.

Even if we can satisfactorily define sustainability, implementation further complicates matters. As planners, we know that each community needs to identify its own solutions to common problems. What works for one community may not work for another. Just as this is true for land-use and economic development challenges, it is true for sustainability challenges. Different solutions, however, require different methods of assessing how well those solutions work. A one-size-fits-all assessment tool may not be ideal for all communities.

Since as planners we cannot—as Senator George Aiken once suggested America do in Vietnam—"declare victory and leave," we need to do a better job of defining sustainability in qualitative, if not quantitative, terms. Taking

the lead in defining sustainability will allow planners to better serve their publics and to clarify the public debate over what new policies ought to be implemented and why.

Many other publications discuss and define sustainability in far greater detail. Some of this literature focuses on sustainability from the standpoint of a practicing planner, such as PAS Report no. 467, *A Planners Guide to Sustainable Development* (Krizek and Power 1996). There is less information available, however, on the benefits of assessing local government sustainability and how local governments can actually make such assessments in a meaningful and productive way.

WHAT IS SUSTAINABILITY?

The term "sustainable development" was first defined in 1987 by the United Nations' Brundtland Commission, which was charged with addressing the deterioration of the human environment, natural resources, and economic and social development. With very minor changes, this definition was subsequently adopted by the UN (United Nations 1987): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This has become the most commonly used definition of sustainability in the United States and worldwide.

Though the concept of sustainability may suggest a sense of stability to some, it does not mean that in the future we will, or should, function the way we function today. Communities evolve, and much change is good (although some residents will always fight for their community to remain exactly as it was the day that they moved in).

There have been many variations created from the original Brundtland Commission definition. Some examples include the following:

- In its simplest form, sustainable progress means making sure that our actions today will provide us with the kind of life we want to live in the future (New Jersey Future n.d.).
- The value added of the concept of sustainability, above and beyond the social, economic, and environmental concerns that make it up, is that it forces us to recognize links and trade-offs, rather than dealing with each concern independently. To achieve sustainability, we need to sustain our economy, protect our environment, *and* achieve our social goals—ideally without trading off one goal for another (Hecht 2007).

Although the term "sustainability" has been applied to human settlements only since 1987, it builds on a much older ecological concept of carrying capacity. Carrying capacity is the level at which a stable population in a certain area can be supported indefinitely into the future, whether in a natural system or in a system altered by human environmental manipulation, since such manipulation may increase or decrease carrying capacity. Planners and ecologists have applied the concept of carrying capacity to human settlements for many decades. The term was used by such figures as Aldo Leopold, the father of wildlife management; Garrett Hardin, author of "The Tragedy of the Commons" (1968); Paul Ehrlich, author of *The Population Bomb* (1968; see Sayre 2008); and Ian McHarg, author of *Design with Nature* (1969).

Others have couched discussions of sustainability in terms of economics, suggesting that financial performance, especially in the short term, is not an adequate measure of a company or any public or private entity. The concept of a "triple bottom line," which encompasses the "three Ps" of people, profit, and planet, is an attempt to create a fuller accounting of an organization's

THE ROLE OF THE ECONOMY IN SUSTAINABILITY

Economy and prosperity are widely accepted as being a key leg of the three-legged stool that describes sustainability. But, at a local level, the debate as to what makes an economy sustainable can be dramatically different from community to community. Some questions you might ask in your community include:

- Is a sustainable economy one that creates prosperity for its citizens?
- Does a sustainable economy require a focus on what you make (green products and jobs)?
- Does a sustainable economy require a focus on how you make a product (green techniques), including the location of facilities, their energy use and natural resource consumption, and so on?
- Is a community sustainable when every job and facility is green but the community imports things made unsustainably elsewhere?

Assessing the economy is a part of measuring sustainability. But members of a community must come to a consensus on the answers to these questions and set local sustainability goals before they will be able to agree on how to effectively do this assessment.

overall performance by measuring financial, environmental, and social performance (Elkington 1994).

Individual actions and policies that are typically referred to as sustainable—recycling, water conservation, green buildings, compact land-use patterns, healthy downtowns, healthy communities, certain kinds of jobs, balanced budgets, and opportunity for all—are all critically important. Sustainability, however, involves a more holistic balancing and combining of three equally important goals: the "three Es" from the sustainability literature or the "three Ps" mentioned above.

Environment–Planet: Conserving natural systems and minimizing ecological impacts. This is not a "do-not-touch" preservation concept but a conservation concept. Sustainable practices means working with natural systems in a way that supports human activities (the other two Es or Ps), while allowing the natural systems to serve future generations. For many, the term "environment" can include aspects of both the natural and built environments that are important to preserve for future generations. Since it is inevitable that human activities will harm some natural systems, mitigation of such harm is part of sustainable practices.

Equity–People: Focusing on people and communities and their needs. This does not mean that every action benefits all people, which is an impossible goal. Sustainable practices, however, mean that we consider the needs of our communities in our actions and ensure that overall we are having a positive impact on our communities, especially including diverse populations and subcommunities. Social equity can encompass participatory processes and equitable outcomes that help the members of the community who have the fewest resources. It is important to be clear what definition is in use, since the term "equity" can imply different things, depending on social, economic, and political context.

Economy–Prosperity/Profit: Creating a vibrant economy through the creation of wealth, prosperity, and jobs. Balancing short-term economic gains with the other two Es or Ps creates a long-term vibrant economy and prosperity and profit for our cities, our businesses, and our people.

Ideally, the most sustainable policies will be those that simultaneously advance all three of the goals—those that lie at the intersection of the three Es. Ultimately, however, there is no quantifiable unified theory of sustainability; "sustainable development is not a fixed state of harmony and the concept is value-based" (Devuyst, Hens, and De Lannoy 2001). Any operational definition of sustainability will reflect, at least in part, someone's values of what is right for our society. This makes any agreement on what sustainable development is and what tools should be used to measure it much more difficult, albeit much more interesting.

As Scott Campbell (1996), in a classic *JAPA* article on the inherent contradictions of sustainability, speculates,

> Two interpretations of the bandwagon for sustainable development suggest themselves. The pessimistic thought is that sustainable development has been stripped of its transformative power and reduced to its lowest common denominator. Yet there is also an optimistic interpretation. . . . It has shifted from being a variable to being the parameter of the debate, almost certain to be integrated into a future scenario of development. We should therefore neither be surprised that no definition has been agreed upon, nor fear that this reveals a fundamental flaw in the concept.

A key point for our purposes is that urban areas are essential to sustainability. Urbanization, which is one of the most significant demographic trends in the world today, is also potentially one of the most sustainable.

Urbanizing populations have lower birth rates, higher educational attainments, and smaller carbon footprints. As Bettencourt and West (2010) say, "To combat the multiple threats facing humanity, a 'grand unified theory of sustainability' with cities and urbanization at its core must be developed." They go on to demonstrate that urban areas create infrastructure efficiencies and carbon footprint reductions of 15 percent. Glaeser and Kahn (2008) likewise document significantly lower generation of carbon dioxide (CO_2) per capita in central cities in comparison to their suburbs.

In the same way that cities are essential to sustainability, planning is essential to creating the sustainable city. As noted by the World Planners Congress Vancouver Declaration of 2006, "We assert that there can be no sustainable development without sustainable urbanization and no sustainable urbanization without effective planning: political will and investment is required for effective planning." (See Figure 1.1.)

World Planners Congress
2006 VANCOUVER, CANADA
Congrès mondial de l'urbanisme

June 17–20, 2006 / Du 17 au 20 juin 2006
Sustainable Urbanization: Turning Ideas into Action
L'urbanisation viable : Mettre les idées en pratique

WORLD PLANNERS CONGRESS

VANCOUVER DECLARATION 2006

We, representatives of the planning profession of the world, dedicate ourselves to working together, and with others, to tackle the challenges of rapid urbanization, the urbanization of poverty and the hazards posed by climate change and natural disasters.

We hold that urbanization must become more sustainable if the global community is to realize the aspirations in the United Nations Millennium Development Goals especially that which seeks to "ensure environmental sustainability".

We have a responsibility, along with others, to future generations for custodianship of this planet and its habitats, and to those within our own generation who are disadvantaged, especially the poor and those who lack adequate shelter.

We stand for Planning as an inclusive process. Planning is both strategic and local, integrative, participatory, creative, embracing cultural diversity and rooted in concerns for equity.

We advocate that Planning must underpin any approach to managing rural, urban and regional development. It is practiced in the private sector, the public sector, by voluntary bodies and community organizations.

We will build the capacity for creating safe, healthy and sustainable settlements by mobilizing, sharing and developing the knowledge and skills of planners.

We advocate that Planning, and its values and ethics, are fundamental to good governance and a means to deliver more equal access to the benefits cities have to offer.

We assert that there can be no sustainable development without sustainable urbanization and no sustainable urbanization without effective planning: political will and investment is required for effective planning.

Figure 1.1. *The Vancouver Planning Congress declaration on sustainability*

The American Planning Association, in its *Policy Guide on Planning for Sustainability* (2000), sums up these issues this way:

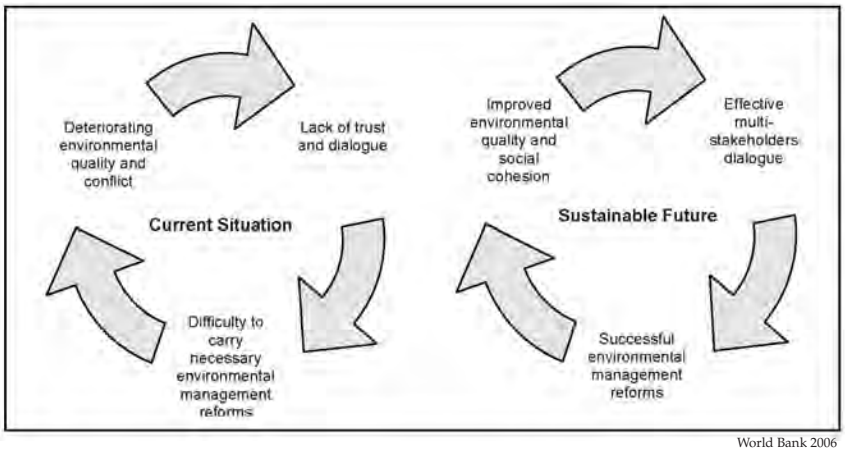
> Patterns of human development—physical, social, and economic—affect sustainability at the local and the global level. City and regional planning is integrally related to defining how, where, and when human development occurs, which affects resource use. Planners can therefore play a crucial role in improving the sustainability of communities and the resources that support them.

There are several dimensions to the "sustainability" issue:

- We want to sustain communities as good places to live, and as places that offer economic and other opportunities to their inhabitants.
- We want to sustain the values of our society—such as individual liberty and democracy.
- We want to sustain the biodiversity of the natural environment, both for the contribution that it makes to the quality of human life and for its own inherent value.
- We want to sustain the ability of natural systems to provide the life-supporting "services" that are rarely counted by economists but which have recently been estimated to be worth nearly as much as the total gross human economic product.

A sustainable community is one that is consistent with all of these dimensions of sustainability.

When a community does not agree on which policies and actions will make it more sustainable, it is more difficult to have a healthy dialogue. Assessment of policies and actions, when embraced by a community, can help foster that dialogue. The "Vicious Circle of Confrontation to a Virtuous Circle of Sustainability" (Figure 1.2), illustrates the ideal transformation when there is greater agreement on what our choices actually mean.



World Bank 2006

Figure 1.2. *Moving from a Vicious Circle of Confrontation to a Virtuous Circle of Sustainability*

WHY ASSESS SUSTAINABILITY?

Arguably a city's most important role is to supply as good a quality of life as possible for its current and future residents. Cities do this with varying degrees of success, and this success is not always predicated on a city's affluence. Two neighboring cities, of similar economic means, can provide very different qualities of life for their residents (Hoornweg et al. 2007).

If we don't have a means to compare and contrast, how do we learn about our options for improving sustainability, and how can we do things better the next time around?

- Communities might want to assess sustainability for a number of reasons:
- Communities, planners, and decision makers want to be able to compare themselves with their peers.
- Citizens increasingly are demanding that their governments be leaders in sustainability.
- State, federal, and nongovernmental grant agencies and policy makers want to be able to compare different communities.
- Communities want to be able to evaluate competing policies and actions.

In the next chapter, we will provide some guidance about how the answers to these questions can be reflected in the sustainability indicators chosen for a particular place. We understand that measuring sustainability can be a daunting task. As Campbell notes, "We also might be able to *define* sustainability yet be unable to ever actually measure it or even know, one day in the future, that we had achieved it" (1996).

WHO IS MORE SUSTAINABLE?

Supreme Court Justice Potter Stewart, in a seminal case that attempted to define pornography, could have been writing about sustainability, not obscenity, when he wrote, "I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it." (See Figure 1.3 for a related perspective.)

Urban Edge Studio

Figure 1.3.

As planners, we are often asked which communities are the most sustainable. What are the models of sustainability we should emulate? We know that we want policies where the three Es (or the three Ps) overlap, but in practice balancing these elements is often quite difficult.

Many parts of rural America have an environmentally stable natural resource–based economy. While many natural resource–based economies are still extractive and nonsustainable, in our postindustrial economy, there are probably more examples of such sustainable economies, especially those based on timber resources, than at any time since before the Industrial Revolution. Many of these communities, however, do not have a healthy economy, and, with unmet human needs, many are not socially equitable places. Coos County, Oregon, for example, has achieved sustainable forest yields, but key aspects of its economy have weakened significantly since the days when residents didn't worry about sustainable yields, and its young people are leaving in alarming numbers. Although the reasons for these changes go far beyond timber practices, Coos County and other examples all over the country demonstrate that environmental stability is not enough to make a community both sustainable and habitable. Vast stretches of the northern Midwest, the Great

Plains, the rural South, and the rural Pacific Northwest are losing population and have social and economic dislocations that cause much human suffering, yet these environments are arguably the cleanest they have been in decades. For example, soil erosion rates from agriculture are unsustainable and are far higher than the rate of creation of new soil, yet the U.S. Department of Agriculture's Natural Resources Conservation Service (2010) found that soil erosion rates from U.S. cropland decreased 43 percent from 1982 to 2007. Likewise, the USDA's Forest Service (2001) found that over the past century, total U.S. forest cover has remained virtually unchanged and the amount of carbon sequestered in U.S. forests is increasing, although exotics and nonnative flora and fauna are growing threats to those forests.

At the same time, some areas that are not models of environmental sustainability have economies that seem to be all but recession-proof. In this category are certain communities with a very strong and stable military presence (e.g., Virginia Beach, Virginia) and oil and natural gas extraction–based communities (e.g., much of North Dakota), especially during times of high energy prices, as well as communities that found an economic niche that made them strong even during the 2007–2009 recession. Some of these communities will need to diversify and become more environmentally sustainable, or they may find that their economic success may not ultimately be sustainable.

Even communities that many planners would identify as models of sustainability often tell a mixed story. Santa Monica, California, for example, is a municipal innovator in organizing planning and implementation around sustainability and in using sustainability metrics, yet residents commute in single-occupancy vehicles to the same degree as do people in Los Angeles and in the United States as a whole (U.S. Census 2009). Portland, Oregon, on almost everyone's list as one of the most successful sustainability stars, was hit harder by the Great Recession than many other communities. San Francisco, a popular city and an extremely sustainable one, has one of the least affordable housing markets in the country, with a major deficiency in workforce housing—hardly a model of social equity.

Unfortunately, every community, even those that are currently leading the way in sustainability, sometimes falls short. How then do we measure success? Which is most important: economy, equity, or environment? Or should we expect perfect balance and harmony, a perfect three-way yin-yang? (See Figure 1.4.)

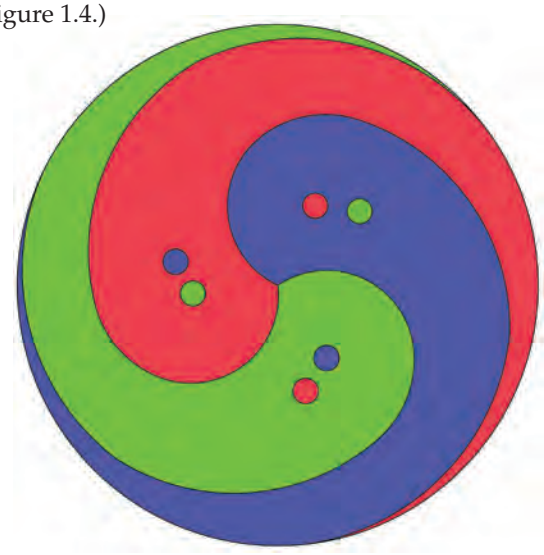


Figure 1.4. *A perfect three-way yin-yang?*

These challenges are significant. And they make it all the clearer how important it is that we clearly understand what it means to be sustainable and how we might best create clear and measurable paths to get there.

CHAPTER 2

The Holy Grail: Quantitative and Qualitative Measures of Sustainability

To understand what is being done within communities to move toward a more sustainable future, we need to look at community visions, approaches, concrete programs, and concrete results. In an ideal world, it would be extremely useful to have agreed-upon, powerful sustainable-development indicators or, even better, a simple assessment instrument to score each community's sustainability in a host of areas and to score specific projects and compare them to some defined norm.

The problem, of course, is that no norm defined outside of a local community can perfectly reflect that community's values or political and social opportunities. Planners must understand local precedents, trends, needs, and opportunities to make their communities more sustainable places and to assess that sustainability, and they should not adopt or use just any tool. Every community needs to develop its own approach and take ownership of that approach.

Fortunately, there is a growing body of research and practice to help understand and measure what is happening in our communities that allows comparison among peer communities and with communities we might wish to emulate. By understanding what works and doesn't work, we can help craft our own customized solutions.

INDICATORS

Indicators are one of the most commonly used approaches to measuring progress. When 100 angry people walk into a public hearing on an expansion of a house, it might be an indicator that the evening will not go well.

Indicators are not raw data, but rather data that tell a story. In this case, the story is about some aspect of sustainable cities and sustainable development. Different indicators are designed for different purposes. Some appeal to the scientific and technical communities, some better engage the general public, and some are designed to provide overall assessment—a sort of "headline." These three categories provide useful ways to think about indicators:

- *Scientific/technical indicators.* These indicators are based on solid data that are likely gathered by professional staff, and they also likely measure the fairly specific, incremental sorts of things that are most amenable to validation. Examples might include literacy rates or parts per million of a pollutant in the water. These are very important in terms of reporting, applying for grants, and influencing policy makers but may not be very exciting to the public.

- *Publicly oriented indicators.* These indicators are what we might call "white tennis shoe" indicators (see below, page 15). They may not be as scientific as the previous examples, but they may better engage the community in data gathering and reporting and so have an important place in terms of generating interest and public support. Examples might include resident counts of how many people are walking in town on a given day or reports of sightings of favorite bird species. The data gathered may not be rigorous enough to help with applying for grants or reporting, but they can resonate strongly and be more meaningful to residents and politicians, as well as potentially to newspaper reporters.

- *Headline indicators.* These indicators are well known to the general public, and they include such measures as gross domestic product and the inflation rate. Media outlets headline these indicators because the public can understand the story behind the indicator—for example, is the economy getting better or worse? Are our streets getting safer or less safe?—even if it doesn't understand the actual numbers (Patterson 2002).

It is crucial to consider goals when choosing indicators and to select those indicators that will best resonate with your intended audiences. If a local government is working to reduce its energy consumption below some base year, energy consumption indicators can be presented in amount of energy consumed, in percent of base year's energy use, in dollars saved versus the base year, in carbon dioxide emissions, or in other ways, depending on the story that is being shared. It also can be helpful to design a portfolio of indicators that includes some from each of these three categories (Hamin 2007).

It would be much easier to create indicators or assessment tools if we could agree on a set of solutions, especially if the same solutions worked for every community. However, as planners we know that this can never be the case. For instance, we may all agree that urban density is critical to sustainability, but a density that would be inappropriately low and unsustainable in Manhattan could be much too high for a medium-sized or small city or rural community. The challenge, then, is to figure out how to assess sustainability when, to paraphrase former Speaker of the House Tip O'Neill, all planning is local.

Sustainability Indicators

Sustainability indicators are quantitative or qualitative measurement tools that allow comparison of sustainability efforts over time, among government units, among projects, and against common objectives.

The PASTILLE (Promoting Action for Sustainability Through Indicators at the Local Level in Europe) project was convened in 2000 to study the implementation of local sustainability indicator programs in the United Kingdom, France, Austria, and Switzerland. While noting that the use of sustainability indicators does not in and of itself result in policy changes, the PASTILLE Consortium did find that

> Indicators indeed can and do serve a purpose in the continuing debate about sustainable development. They can help organisations assimilate and better understand stakeholders' views regarding sustainable development; they can add to the process of governance; and, when local context is considered, they can help guide and mold policy decisions. What is important for both practitioners and academics alike is to understand that indicators function **inside** the governance process; they are not exogenous factors parachuted in, which can act like a magic bullet causing decision-making to become instantly objective and scientific. Creating successful indicators relies far more on focusing on how they are integrated into the processes of urban governance and far less on devising, designing, and tweaking particular indicator sets. (PASTILLE Consortium 2002)

Indicators can be used for many purposes, only some of which affect decision-making and policy changes (Hezri, cited in Pintér, Swanson, and Barr 2004):

- Political: to support, not inform, a position
- Symbolic: to provide "ritualistic assurance" for a position
- Tactical: as a delaying tactic or a substitute for action
- Conceptual use for enlightenment: to illustrate concepts and educate
- Instrumental: as instruments to inform the decision making process

Table 2.1. *Sustainable development indicators*

Benefits	Limits
Provide a *holistic picture* of progress toward or away from sustainability, at lower cost than trying to measure too much.	*Indicators tell a partial story.* While an indicator might be moving in the "right" direction, other aspects of sustainability may be moving in the opposite direction
More easily absorbed than large quantities of data and so *capture the attention* of the public and decision makers.	*Focus attention only on what can be measured.* There are always indicators that are missed because of data problems, while some important issues are virtually immeasurable.
Focus attention on *what matters.*	*Managers and politicians may become very sensitive to indicator trends and overreact* when an indicator moves in the wrong direction, pulling resources from other important areas.
Raise early alarms, allowing policy revisions before it is too late.	*Too much effort is focused on monitoring*, to the detriment of efforts to improve sustainability. Monitoring can sometimes become a substitute for implementing sustainability policies and plans.

Adapted from CAG Consultants 2006

The consulting firm Sustainable Measures presents a 14-question checklist, summarized here, to evaluate potential sustainable community indicators (Hart 1999):

1. Does the indicator address the carrying capacity of the natural resources—renewable and nonrenewable, local and nonlocal—that the community relies on?
2. Does the indicator address the carrying capacity of the ecosystem services upon which the community relies, whether local, global, or from distant sources?
3. Does the indicator address the carrying capacity of esthetic qualities—the beauty and life-affirming qualities of nature—that are important to the community?
4. Does the indicator address the carrying capacity of the community's human capital—the skills, abilities, health and education of people in the community?
5. Does the indicator address the carrying capacity of a community's social capital—the connections between people in a community: the relationships of friends, families, neighborhoods, social groups, businesses, and governments and their abilities to cooperate, work together, and interact in positive, meaningful ways?
6. Does the indicator address the carrying capacity of a community's built capital—the human-made materials (buildings, parks, playgrounds, infrastructure, and information) that are needed for quality of life and the community's ability to maintain and enhance those materials with existing resources?
7. Does the indicator provide a long-term view of the community?

8. Does the indicator address the issue of economic, social, or biological diversity in the community?
9. Does the question address the issue of equity or fairness—either between current community residents (intragenerational equity) or between current and future residents (intergenerational equity)?
10. Is the indicator understandable to and usable by its intended audience?
11. Does the indicator measure a link between economy and environment?
12. Does the indicator measure a link between environment and society?
13. Does the indicator measure a link between society and economy?
14. Does the indicator measure sustainability that is at the expense of another community or at the expense of global sustainability?

Ganser (2008) identified several principal requirements for indicators. They must be sensitive to social, ecological, and economic changes; allow for simple, sound, and economic data collection, either by empirical means or by measurements of status quo or progress; be readily understandable, yet allow adequate measuring; and include specific thresholds (targets or limits) that highlight important changes. In addition, clear-cut targets and clearly defined links to indicators are essential for transparency and implementation. To ensure a good overview of current status and avoid distractions from important changes, the absolute number of indicators should be limited. Finally, the set of indicators used should equally include quantitative as well as qualitative indicators to avoid an unbalanced emphasis on fields that allow easy (quantitative) measuring.

BENCHMARKS

While indicators are a tool to help illustrate what is happening, benchmarks are targets of where a community wants to be. An indicator might, for example, illustrate the density of new housing development. A benchmark, on the other hand, is focused on a specific objective—for example, did a community receive the density that it was looking for?

ASSESSMENTS

Principles of Policy Assessment

Indicators and benchmarks are just two tools in the assessing sustainability toolbox. All such tools should adhere to a few key guiding principles for any policy assessment (Clark and Majone, cited in Pintér, Swanson, and Barr 2004): Saliency: will anyone care? Legitimacy: can people trust it? Credibility: can people believe it? Usability: can people understand it?

A good performance measurement system of any kind should:

- Produce knowledge, not just consume information;
- Be collaborative, in that it allows ownership;
- Lead to collective learning and action, and hence empowerment;
- Communicate with internal and external stakeholders;
- Be scalable to provide multilevel evaluation; and
- Support iterative learning and fine-tuning (Osama 2006).

USING THE TRIPLE BOTTOM LINE TO QUANTIFY SUSTAINABILITY

Jeffrey P. Treiber

A paradox exists in today's society. Organizations must generate enthusiasm from their internal teams and from stakeholders in order to thrive. Optimum performance requires self-generating metrics, which motivate the team and ensure the mission is executed. If external stakeholders are ignored, however, such efforts are short-lived. How does one use metrics to create consensus with the internal team and the stakeholders?

A triple bottom line (TBL) approach to analyzing investments shares key characteristics with a balanced scorecard approach—namely, it has an action-based focus that looks at all aspects of an operation. First, financial and nonfinancial goals are given equal weight. Second, the process of development and support of the TBL metrics changes organizational behavior (Kaplan and Norton 2005). This approach has already been used successfully to implement social and environmental strategies in major organizations (Epstein and Wisner 2001) and shape economic development strategies (Osama 2006). Economic development organizations that work within this framework will find it conceptually fulfilling, able to serve multiple constituencies, and able to support an appropriate emphasis on a sustainable index of investment.

Differences do exist between a balanced scorecard approach and a TBL analysis of economic development investment. Much of the scholarly work on TBL focuses on the application of TBL to for-profit companies (Wang 2005; Sneirson 2009). According to a German study of the effectiveness of a variety of measurement systems to drive environmental stewardship, "It was repeatedly emphasized that environmental management had become more matter of course. Before EMAS (measurement system), environmental protection was something unique and now it is part of the daily routine" (Loew and Clausen 2005).

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Measuring the Triple Bottom Line

As discussed in Chapter 1, the "triple bottom line" (TBL) is one more way of defining sustainability. Just as businesses use the bottom line for accounting (how much money are they making or losing), TBL as an accounting approach can be expanded to ensure that the key measures of sustainability—people/social equity and planet/environment—are as important as prosperity/profit.

In theory, like any accounting system, TBL can be used to quantitatively measure the sustainability of specific programs as well as overall systems. The federal Economic Development Agency (EDA) is working to encourage local governments to use TBL to quantify the success of economic development efforts:

> While the triple bottom line concept is becoming an increasingly common formula for corporations to utilize to assess their bottom line, it is rarely utilized by local jurisdictions to determine the impact economic development efforts have on a region. Instead, most economic development efforts are exclusively evaluated based on the impact that the initiative will have on the local tax base and the number of jobs that will be created. While these are undoubtedly important considerations, local decision-makers also should consider a range of other factors, such as whether the project will contribute to sprawl, whether jobs will go to the local population or whether labor will be in-sourced, and whether the economic development project utilizes existing vacant properties or will deplete additional natural resources.

In large part, development practitioners' and policy makers' lack of utilization of the triple bottom line concept is due to a lack of research on how the concept could be adapted from its original corporate focus to fit the needs of local governments. (Economic Development Agency 2010)

See the sidebar for a discussion of why this is both important and possible.

Environmental Impact Assessment and Strategic Environmental Assessment

The U.S. National Environmental Policy Act (NEPA) of 1969 created the environmental impact assessment (EIA) as the tool for a systematic analytical approach to assessing environmental impacts of proposed projects. The basic concepts have been copied into equivalent laws—so-called mini-NEPAs—at many state and some local government levels.

Although the terms are sometimes used interchangeably, strategic environmental assessments (SEAs) are in essence a cousin of EIAs. SEAs focus on the policy or plan level and not specific projects.

The basic building blocks of such assessments are well known to most practicing planners, at least as practiced under the NEPA and state mini-NEPA processes: identification of the project, alternative assessments, systematic interdisciplinary analysis of the project and alternatives, identification of environmental effects, and consideration of mitigation measures.

Environmental impact assessments, especially as established under NEPA, create procedural requirements but do not create substantive requirements dictating any given decision, nor do they prevent "bad" environmental decisions (for an example, see the discussion in *Calvert Cliffs' Coordinating Com. v. US Atomic Energy Com.*, 449 F.2d 1109, 1971). They do, however, require full understanding of the consequences of actions and a good-faith consideration of that information. In essence, EIAs represent an optimistic view of the political and decision-making system that assumes that if the information exists, is considered, and

is public, a proper weighing of options will occur. Given the inherent value-laden nature of the decision process, it would be hard to create a statute or regulation that determines what the outcome should be.

Environmental impact assessments do not generally use a sustainability lens, but they do consider many of the issues that make up sustainability (Devuyst, Hens, and De Lannoy 2001). The process also continually evolves, so the federal government, California, and Massachusetts have been moving forward on requiring that environmental impact assessments consider effects on climate change.

"White Tennis Shoe" Assessments

> Bernie Fowler, a Maryland state senator . . . tried to illustrate the deteriorating state of the river by recalling his experience as a young man in the 1940s. "Why, I can remember being able to walk out into the bay until I was up to my chest in water and still see my feet," he would say. . . .
>
> Tom Wisner, a sixth-grade science teacher . . . first suggested a real live tennis shoe test to Senator Fowler. "That story you tell about wading into the water is such a good story. It really resonates with people. Why don't you do it again? Why don't you wade into the water now until your feet disappear? It would be a great way to illustrate how polluted the river has gotten. If you did it yearly, you could show how much progress is being made in cleaning up the river."
>
> On the second Sunday in June 1988, Wisner and his colleague Betty Brady joined Senator Fowler in putting on white tennis shoes and wading into the Patuxent River. When the event made the local paper more townspeople began to reflect on the critical state of the river. . . .
>
> Since then, every year on the second Sunday in June, with great pomp and ceremony, now former-Senator Fowler laces up his white tennis shoes and wades in to the Patuxent River. He invites local activists, the media, and others to bring their picnic baskets and to join in a barbecue. While he could only see his shoes through eight inches of river water in 1989, in 1990 he waded into water 16 inches deep before the white tennis shoes disappeared. . . . The test is done as accurately and honestly as possible. The progress is, in fact, incremental. (Gasteyer and Flora 2000)

iStockphoto.com/Mary Weldon

The Patuxent River, site of the "white tennis shoe" test

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However, for-profit enterprises, especially those publicly held, have the practical constraint of financial accounting standards that do not support TBL measurement in their operating system (Wang 2005). The degree of "social responsibility" they choose to adopt usually comes from the expense side of their ledgers and is in potential competition with stockholder demands. Many of the corporate TBL efforts are therefore internally focused, such as promoting employee development or civic involvement. Not until the recent development of Certified B Corporations that openly commit to solving social and environmental problems "has there been a fundamental movement toward changing corporate governance to focus on sustainable behavior" (Clark 2007).

Some governments have begun to use the TBL. Australia commissioned a TBL analysis of segments of their entire economy (Foran, Lenzen, and Dey 2005). The University of British Columbia analyzed its ecosystem restoration program using TBL criteria "with the premise that social, economic, and natural capital could be boiled down to common elements, measurable with indicators" (Gagne 2002). The development of an economic framework for valuation of social returns, named (ironically) the "economic rate of return," was examined in the context of investment by the International Finance Corporation and the European Bank for Reconstruction and Development (Global Reporting Initiative 2010).

If TBL is to serve the public sector, the metrics must serve public stakeholders. The U.S. Interagency Working Group on Sustainable Development Indicators examined public sector metrics and processes. The group reported: "A critical component of future indicator work will be public outreach. One of the challenges in developing a set of sustainable development indicators is that it involves not only scientific data and objective information, but values and subjective judgments. Broad input from a variety of stakeholders, both within and outside the Federal government, is essential if we are to develop a set of indicators that will be widely accepted and used by policy makers and the public" (Berry 1998; see also ICLEI 2010a).

A study of how well sustainability and sustainable development principles were integrated by public-sector leaders in Seattle and King County, Washington, found "leaders were somewhat aware of the sustainability principals and directly incorporated triple bottom line sustainable development into their respective governance responsibilities" (Etsy, Lisy, and Ferman 2003). The President's Council on Sustainable Development observed collaboration is critical, and "collaborations have to overcome a long history of distrust and fragmentation among groups within regions" (Jhaveri 2006).

Currently, the prevailing system of measurement, in this country and most others, is dictated by the Generally Accepted Accounting Principles (GAAP) standards of financial accounting. It gives us what we have today—the desirable and the not so desirable. If we want change, we must look to the basic system that gives us our current state. Without balancing this paradigm, change will be temporary at best, and more undesirable as time goes on.

THE MASSACHUSETTS SUSTAINABLE DEVELOPMENT SCORECARD: COMMONWEALTH CAPITAL

Bob Mitchell, FAICP, and Kurt Gaertner, AICP

In 2003, the Massachusetts Office for Commonwealth Development was created to lead state efforts on sustainable development and smart growth. In order to coordinate plans, policies, and programs and otherwise carry out that mandate, the Commonwealth Development Office was given oversight of the state agencies responsible for housing, transportation, energy, and the environment.

The Commonwealth Capital Policy's premise was that commonwealth capital investments should be made in projects that are consistent with smart growth and in partnership with those communities that plan, zone, and act to advance the state's Sustainable Development Principles.

This resulted in the creation and implementation of a sustainable development scorecard that was used by local communities to assess their consistency with smart growth principles. Actions related to housing, economic development, open space, water protection, and transportation were reviewed using criteria that focused on community planning and zoning. A point system, with 140 being the maximum a community could achieve, was used, with points awarded for each action a municipality had taken or had committed to take. (Greater weight was given to actions already taken.) An electronic system was created to allow communities to report to the state online. In addition, a smart growth grant program with an annual budget of $1 million was created to help communities improve their smart growth consistency and therefore increase their scores.

After the 2006 election and with a new governor, the Commonwealth Development Office was abolished. However, the Sustainable Development Principles were revised to reflect the new governor's priorities and were endorsed in 2007. In addition, the Commonwealth Capital Policy was continued and the scorecard was amended to expand the number of questions and increase the emphasis on planning, clean energy, and equity. There are now 10 major topics, within which 34 criteria are used to evaluate local actions.

The breakdown of topics by percentage of points available is:

- Plan for and promote livable communities and plan regionally: 14%
- Zone for and permit concentrated development and mixed use: 19%
- Expand housing opportunities: 14%
- Make efficient decisions and increase job and business opportunities: 8%
- Protect land and ecosystems: 15%
- Use natural resources wisely: 5%
- Promote clean energy: 8%
- Provide transportation choice: 6%
- Advance equity: 4%
- Promote sustainable development via other actions: 8%

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Fowler's "white tennis shoes" experience is a reminder that the best metrics are often those the community can easily understand. To be broadly effective, metrics should be about more than just cold facts. They need to tell a compelling story.

The sustainability indicators literature is not always relevant to practicing planners, who need to identify what works for their communities. Indicators allow for easy, albeit shallow comparisons (who is "better" at something), but they don't always help a community understand what sustainability is, nor do they inform the debate about trade-offs between different approaches (Zeemering 2009).

WHO DEVELOPS THE INDICATORS AND BENCHMARKS?

> There is always tension around who develops indicators and benchmarks. Third-party national and regional efforts (e.g., ICLEI's STAR Community Index, discussed in Chapter 6) do not typically include community members and so may lack local knowledge and community buy-in. Community-driven indicators can take a very long time to develop [e.g., the Boston Indicators Program, page 17] and may not always be relevant. Indicators and benchmarks established by third parties allow easy comparison among communities, but leaving local stakeholders out of the planning process may limit the usefulness of the process. There are dangers to having these values specified by an intellectual elite whose concerns may not reflect those of the larger community.… Establishing stakeholder involvement … provides stakeholders with a range of interest, opinions and experience with an opportunity to understand and explain issues of importance to them…. Combining stakeholder involvement with information from experts . . . in an iterative fashion allows various viewpoints to be considered effectively and differences to be better negotiated. (Toman, Lile, and King 1998)

An outside rating program that is effective, at least for creating financial rewards for good actions, is the Massachusetts Commonwealth Capital program. This is a state-administered program to evaluate municipal smart growth and sustainable development efforts. It ranks communities overall and allows for comparisons between communities overall and in each individual category. The program may not be a "white tennis shoe" program, but because the rankings are a key factor in scoring and funding many state grant programs, Commonwealth Capital has high visibility and sometimes sparks community debates. The program is a top-down model with no significant local participation in the crafting of the scoring system, and yet it seems to work because its audience is local and state officials and not necessarily the larger community. (See sidebar.)

DEVELOPING SUSTAINABLE DEVELOPMENT INDICATORS

As with most things in planning, the best sustainability indicators and assessment tools are those that are developed through working with the community. Assessment tools that are developed with the participation of the public, community boards, and elected officials will most likely be meaningful to the largest number of stakeholders.

There is obviously much hard, and theoretically indisputable, data that can and should be collected (e.g., amount of energy use per household, vehicle-miles traveled per land use, percentage of population within easy walking distance of services, ratio of fast-food restaurants to providers of healthy food). The data can tell a story that people will listen to, however, only if the story is in a form that rings true and that the community can embrace and understand. Part of this is how the data are packaged (e.g., the white tennis shoes example).

More important than how the story is told, however, is whether the community feels that the story is theirs and one that they have a part in. The Boston Indicators Project (www.bostonindicators.org) was an effort to involve the community in the development of indicators and to use that process to inform and encourage positive change. Elizabeth Kline (2001) reported the following lessons learned from the project that can be useful for new efforts to develop sustainable development indicators:

- *Focus on core concerns rather than symptoms.* A core concern might be poverty, with substance abuse and domestic violence being symptoms of the core concern.
- *Define issues as "integrated systems," not limited to urban boundaries.* Although communities typically look within their political boundaries, they are engaged in regional and local issues and dynamics as well.
- *Measure community outcomes in addition to process improvements and program accomplishments.* Outcomes (e.g., healthy population) are more important than the intermediate steps (e.g., removing soda machines from schools).
- *Measure progress at the neighborhood and regional levels as well as citywide*. Looking at a citywide level may cover up huge discrepancies within the population. Average income levels in New York, or any other large U.S. city, for example, do not reflect the huge discrepancies within the city and can hide social equity issues.
- *Respond to a community's own sense of its priorities.* As shown by the white tennis shoe story, indicators that touch the soul of a city are more effective than what an outsider might identify as important.
- *Promote a clear bottom line and encourage flexible implementation choices.* Performance—that is, what we want—is more important than the implementation method we used to get there.
- *Convert deficits into assets.* As in every planning effort, the focus should be on opportunities instead of weaknesses.
- *Pay attention to maintenance, replacement, and reuse.* Sustainability is not about building new cities but about building on the ones we have, and the indicators should reflect that.
- *Address equity concerns*. A strong focus on environmental justice and other equity issues, as well as a focus that will highlight and not hide those issues, is critical for sustainability and building broad community trust in the indicators.
- *Include qualitative as well as quantitative measures.* Perception is often as important as reality. Quantitative measurements may not create the community buzz that changes how people think about their community. The tipping point to perception is when everyone is talking about something, not when a new number is posted on a website.

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A municipality's Commonwealth Capital score is used, in part, to evaluate grant applications for infrastructure programs. Over the life of the program, grants have been available for open space acquisition, economic development, road projects, water and sewer improvements, affordable housing, TOD, coastal zone remediation, and parkland acquisition and improvements. The more consistent a community is with the principles, the more likely it is to be awarded grants and loans distributed by the state annually.

Beyond establishing a statewide smart growth baseline, results to date include:

- 314 of the state's 351 communities have participated at least once over the six years of the program, and 40 percent have applied four times or more;
- Municipal smart growth consistency as measured by Commonwealth Capital is up 10 percent since 2005 (the average score has increased from 62 to 76);
- More than $500 million in grants and $2.5 billion in low-interest loans have been distributed based in part on municipal smart growth consistency; and
- Municipalities have taken more than 525 actions to improve their smart growth consistency. These have included completion of new plans related to master planning, open space, downtown revitalization, economic development, housing, agriculture, and other topics; adoption of enhanced zoning; housing production; land acquisition; water conservation; and investment of capital funds.

For more information about the Commonwealth Capital program and scorecard and the Sustainable Development Principles, go to www.mass.gov/smartgrowth.

- *Realize that communities have distinctive collective personalities and are in different states of community development.* Indicators need to work for the community at the present time. Involving the community in the creation of the indicators makes this much easier.

DIFFERENT APPROACHES

Systems Approaches

The biggest challenge to planning, and its biggest intellectual joy and opportunity, is that it is an interdisciplinary field with different perspectives and different players often in conflict with one another. A systems approach to assessing sustainability includes consideration of institutional structural elements to identify how they promote or retard sustainability efforts, and it focuses on the interdependent nature of economic, social, and environmental systems (Devuyst, Hens, and De Lannoy 2001). Planners often bring a systems approach to the table, managing complex systems with many and diverse stakeholders.

A healthy sustainable development system requires that planners understand their dual, and sometimes competing, roles: bringing technical solutions and a vision to the table while managing conflict in order to build a community consensus. Planners "have to decide whether they want to remain outside the conflict and act as mediators, or jump into the fray and promote their own visions of ecological-economic development, sustainable or otherwise. Both planning behaviors are needed" (Campbell 2006).

Carrying Capacity Approaches

Carrying capacity is at the core of natural systems environmental approaches. In an urban context, carrying capacity can be used as an excuse to fight against development, good or bad, or as a not-in-my-backyard approach. When residents testify that just one more project will destroy all that is good about their neighborhood, they are often implicitly claiming that the carrying capacity of the drainage systems, traffic systems, and school systems have been reached. Assessing sustainability involves considering what the limits to all systems, natural and human-built, are, and whether those limits can be changed to increase their ability to accommodate new needs and opportunities.

MEASURING SUSTAINABILITY

A lot of effort can go into measurement that may not in the end have any effect. Using quantitative measurements to convince people to be more sustainable ignores the fact that facts play only a small role in setting many public policies—and in any case there is almost certainly more than one interpretation of any set of facts. We should have "the recognition that decisions are not make in a rational way" (Collins and Flynn 2008).

The problem with measuring sustainability is that in sustainability, "the whole is greater than the sum of the parts" (Hecht 2007). If the strength of the sustainability approach is that it allows us to consider trade-offs, any system of measurement has to be undertaken carefully so that the inherent trade-offs are not lost in the rush to get points or check boxes for each of the components (economy, environment, and social equity).

Measuring sustainability fits the adage "What gets measured gets done." It is critical to understand what you are trying to manage. As Albert Einstein said, however, "Not everything that can be counted counts, and not everything that counts can be counted."

CHAPTER 3

Guiding Principles of Sustainability

There is an enormous body of literature on what sustainability is and what its guiding principles are. However, the literature and the labeling of sustainability is so varied that evaluating it is like taking a Rorschach test, with each definition and discussion creating a different projection or interpretation. If we want to create sustainable communities and assess our efforts along the way, an agreement on sustainability principles is critical. How can we assess something if we don't agree on what it is? This chapter summarizes some of the most important principles that planners use on a day-to-day basis.

There are many attempts to define sustainability in operative terms that apply to planning. These range from international efforts (e.g., World Planners Conference), national efforts (e.g., President's Council on Sustainability), professional organizations (e.g., APA and AIA), to academia. Some of the sustainability definitions most interesting to planners are described below. Not surprisingly, within these discussions of sustainability there is a strong focus on cities, urban areas, and urban form, although many other efforts, discussed later in this report, also engage the other areas of the environment, social equity, and economy with which planners are involved.

The President's Council on Sustainable Development (http://clinton2.nara.gov/PCSD), a federal advisory committee established in 1993 by President Bill Clinton to provide guidance on sustainability, provides the following definition (1997):

> Sustainable communities are cities and towns that prosper because *people work together to produce a high quality of life that they want to sustain and constantly improve. They are communities that flourish because they build a mutually supportive, dynamic balance between social wellbeing, economic opportunity, and environmental quality.* While it is not possible today to point to a list and say, "These communities are sustainable," the emerging ideal of sustainable communities is a goal many are striving to achieve. And while there is no single template for a sustainable community, cities and towns pursuing sustainable development often have characteristics in common. (Emphasis added)

This is a nearly perfect description of what sustainability should mean for local communities. Some use the sustainability concept to criticize aspects of the status quo, but that may miss the essential point. The essence of sustainability and planning in local governments lies in how they work to create a high quality of life and a mutually supportive balance among the three Es.

The President's Council defined the common characteristics of sustainable communities as the following, all of which are applicable to urban and regional planning:

- *Long-term impacts and consequences:* Sustainable development requires the use of a long-term horizon for decision making in which society pursues long-term aspirations rather than simply making short-term, reactive responses to problems. Keeping an eye out for the long-term, sustainable development ensures that options for future generations are maintained, if not improved.
- *Interdependence:* Sustainable development recognizes the interdependence of economic, environmental, and social well-being. It promotes actions that expand economic opportunity, improve environmental quality, and increase social well-being all at the same time, never sacrificing one for another.
- *Participation and transparency:* Sustainable development depends on decision making that is inclusive, participatory, and transparent. It recognizes the importance of process and decision making that includes the input of the stakeholders who will be affected by decisions.
- *Equity:* Sustainable development promotes equity among generations and among different groups in society. It recognizes the necessity of equality and fairness, and it reduces disparities in risks and access to benefits.
- *Proactive prevention:* Sustainable development is anticipatory. It promotes efforts to prevent problems as the first course of action.

Many of the sustainability principles used by planners are defined in terms of the concrete elements that should be included for a sustainable community or state. To planners, these are likely to sound familiar, as they are

quite similar to the principles of smart growth. For example, the Liveability Principles of the federal Partnership for Sustainable Communities among the U.S. Department of Housing and Urban Development, Department of Transportation, and Environmental Protection Agency, which most planners probably embrace, read as follows:

- *Provide more transportation choices.* Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- *Promote equitable, affordable housing.* Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- *Enhance economic competitiveness.* Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs for workers, as well as expanded business access to markets.
- *Support existing communities.* Target federal funding toward existing communities—through strategies like transit-oriented, mixed use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- *Coordinate and leverage federal policies and investment.* Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy
- *Value communities and neighborhoods.* Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban. (HUD-DOT-EPA Partnership for Sustainable Communities 2010)

The American Planning Association's Principles of Planning for Sustaining Places (APA Sustaining Places Task Force 2011) identifies eight sustainability planning principles. The last of these principles, accountable implementation, is the focus of this report:

- *Livable built environment.* Plans for sustainable places set frameworks for transportation, land use, and housing that not only integrate goals for walkable neighborhoods, accessible and multimodal travel systems, and a range of housing types but also address new topics, such as community health and wellness, energy conservation and efficiency, food supply, climate change adaptation, and others.
- *Harmony with nature.* Plans for sustaining places employ environmental inventories and analyses to adopt sustainability standards, incorporate best practices approaches to the management of systems that are needed to support development, and prepare land-use plans and regulations to maintain the health of natural systems as a primary priority.
- *Resilient economy.* Plans for sustainable places document the underlying economic conditions and provide a vehicle for community response to either growth or decline. They also work to align economic plans and strategies with other community goals and to build public-private partnerships aimed at developing economies that can weather the impacts of changing situations.

- *Interwoven equity*. Plans for sustainable places advocate for the needs of other affected groups, especially those that lack the power or resources to ensure that their needs are met, by imposing criteria for fairness and equity in the development process.
- *Healthy community.* Plans for sustainable places promote healthy eating and physical activity by protecting agricultural land, encouraging local food production, and enacting land-use plans that support walking and other outdoor activities.
- *Responsible regionalism.* Plans for sustainable places work within the context of regional resources and facilities to coordinate goals and programs across jurisdictional boundaries.
- *Authentic participation.* Plans for sustaining places bring representatives of all affected stakeholder groups (including those who do not typically participate) to the planning table throughout the process, from vision setting to implementation and monitoring for accountability.
- *Accountable implementation.* Plans for sustainable places build in benchmarks, indicators, targets, and other metrics that track progress and adjust strategies on an ongoing basis. They assign, and monitor performance on, specific responsibilities for meeting targets to ensure that the public and elected officials understand both achievements and shortfalls.

PAS Report no. 479, *The Principles of Smart Development* (Oregon Transportation and Growth Management Program 1998), focuses on some of the principles of smart growth and sustainability that are applicable for planners working at local government levels and elsewhere. These include the efficient use of land, full use of urban services, mixed use, multimodal transportation options, and human-scale design. The Smart Growth Network's *Getting to Smart Growth: 100 Policies for Implementation* (2002) and *Getting to Smart Growth II: 100 More Policies for Implementation* (2003) put the policies in terms easily accessible to the public (e.g., zone areas by building type, not use; offer incentives that encourage local communities to increase density; require building design that make commercial areas more walkable; and adopt a "fix-it-first" policy that sets priorities for upgrading existing facilities).

The American Institute of Architects 10 Principles for Livable Communities focus on a subset of sustainability dear to most planners and dwellers of all kinds of settlements:

- *Design on a human scale:* Compact, pedestrian-friendly communities allow residents to walk to shops, services, cultural resources, and jobs and can reduce traffic congestion and benefit people's health.
- *Provide choices:* People want variety in housing, shopping, recreation, transportation, and employment. Variety creates lively neighborhoods and accommodates residents in different stages of their lives.
- *Encourage mixed-use development:* Integrating different land uses and varied building types creates vibrant, pedestrian-friendly, and diverse communities.
- *Preserve urban centers:* Restoring, revitalizing, and infilling urban centers takes advantage of existing streets, services, and buildings and avoids the need for new infrastructure. This helps to curb sprawl and promote stability for city neighborhoods.
- *Vary transportation options:* Giving people the option of walking, biking, and using public transit, in addition to driving, reduces traffic congestion, protects the environment, and encourages physical activity.

- *Build vibrant public spaces:* Citizens need welcoming, well-defined public places to stimulate face-to-face interaction, collectively celebrate and mourn, encourage civic participation, admire public art, and gather for public events.
- *Create a neighborhood identity:* A "sense of place" gives neighborhoods a unique character, enhances the walking environment, and creates pride in the community.
- *Protect environmental resources:* A well-designed balance of nature and development preserves natural systems, protects waterways from pollution, reduces air pollution, and protects property values.
- *Conserve landscapes:* Open space, farms, and wildlife habitat are essential for environmental, recreational, and cultural reasons.
- *Design matters:* Design excellence is the foundation of successful and healthy communities. (AIA n.d.)

The ICLEI Local Governments for Sustainability's STAR Community Index (see Chapter 6) has developed a more conceptual definition of sustainability that differs in several ways from the smart growth–related principles in the examples above. ICLEI promotes these 10 sustainability guiding principles (ICLEI 2010b):

- *Think—and act—systemically:* Sustainable communities take a systems perspective and recognize that people, nature and the economy are all affected by their actions. Local governments in these communities consider the broader implications before embarking on specific projects, and they look for ways to accomplish multiple goals rather than default to short-term, piecemeal efforts.

THE MASSACHUSETTS SUSTAINABLE DEVELOPMENT PRINCIPLES

The Massachusetts Office for Commonwealth Development issued 10 Sustainable Development Principles to guide state and local actions (Massachusetts n.d.). Those principles, as currently adopted, read:

1. *Concentrate development and mix uses.* Support the revitalization of city and town centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources, and integrates uses. Encourage remediation and reuse of existing sites, structures, and infrastructure rather than new construction in undeveloped areas. Create pedestrian friendly districts and neighborhoods that mix commercial, civic, cultural, educational, and recreational activities with open spaces and homes.
2. *Advance equity.* Promote equitable sharing of the benefits and burdens of development. Provide technical and strategic support for inclusive community planning and decision making to ensure social, economic, and environmental justice. Ensure that the interests of future generations are not compromised by today's decisions.
3. *Make efficient decisions.* Make regulatory and permitting processes for development clear, predictable, coordinated, and timely in accordance with smart growth and environmental stewardship.
4. *Protect land and ecosystems.* Protect and restore environmentally sensitive lands, natural resources, agricultural lands, critical habitats, wetlands and water resources, and cultural and historic landscapes. Increase the quantity, quality, and accessibility of open spaces and recreational opportunities.
5. *Use natural resources wisely.* Construct and promote developments, buildings, and infrastructure that conserve natural resources by reducing waste and pollution through efficient use of land, energy, water, and materials.
6. *Expand housing opportunities.* Support the construction and rehabilitation of homes to meet the needs of people of all abilities, income levels, and household types. Build homes near jobs, transit, and where services are available. Foster the development of housing, particularly multifamily and smaller single-family homes, in a way that is compatible with a community's character and vision and with providing new housing choices for people of all means.
7. *Provide transportation choice.* Maintain and expand transportation options that maximize mobility, reduce congestion, conserve fuel, and improve air quality. Prioritize rail, bus, boat, rapid and surface transit, shared-vehicle and shared-ride services, bicycling, and walking. Invest strategically in existing and new passenger and freight transportation infrastructure that supports sound economic development consistent with smart growth objectives.
8. *Increase job and business opportunities.* Attract businesses and jobs to locations near housing, infrastructure, and transportation options. Promote economic development in industry clusters. Expand access to education, training, and entrepreneurial opportunities. Support the growth of local businesses, including sustainable natural resource–based businesses, such as agriculture, forestry, clean energy technology, and fisheries.
9. *Promote clean energy.* Maximize energy efficiency and renewable energy opportunities. Support energy conservation strategies, local clean power generation, distributed generation technologies, and innovative industries. Reduce greenhouse gas emissions and consumption of fossil fuels.
10. *Plan regionally.* Support the development and implementation of local and regional, state and interstate plans that have broad public support and are consistent with these principles. Foster development projects, land and water conservation, transportation and housing that have a regional or multicommunity benefit. Consider the long-term costs and benefits to the Commonwealth.

- *Instill resiliency:* Sustainable communities possess a strong capacity to respond to and bounce back from adversity. Local governments in these communities prepare for and help residents and institutions prepare for disruptions and respond to them swiftly, creatively, and effectively.
- *Foster innovation:* Sustainable communities capture opportunities and respond to challenges. Local governments in these communities cultivate a spirit of proactive problem solving to provide access to futures otherwise unobtainable and to enable the risk-taking inherent in innovation.
- *Redefine progress:* Sustainable communities measure progress by improvements in the health and well-being of their people, environment, and economy. Instead of focusing on GDP (throughput of dollars), local governments in these communities use a broad set of indicators.
- *Live within means:* Sustainable communities steward natural resources so that future generations have as many opportunities available to them as we do today. They also recognize that resources exist for the benefit of life forms other than humans. Local governments in these communities assess resources, track impacts, and take corrective action when needed so that they meet the needs of today without depleting what they leave for future generations.

- *Cultivate collaboration:* Sustainable communities engage all facets of society in working together for the benefit of the whole. Local governments in these communities bring government representatives, community members, and organizations together and create a culture of collaboration that encourages innovation, sharing of resources, and jointly shared accountability for results.
- *Ensure equity:* Sustainable communities allocate resources and opportunities fairly so that all people who do the full range of jobs that a community needs can thrive in it. Local governments in these communities actively eliminate barriers to full participation in community life and work to correct past injustices.
- *Embrace diversity:* Sustainable communities feature a tapestry of peoples, cultures, and economies underpinned by a richly functioning natural environment. Local governments in these communities celebrate and foster ethnic, cultural, economic, and biological diversity and encourage multiple approaches to accomplish a goal.
- *Inspire leadership:* Sustainable communities provide leadership through action and results. Local governments in these communities recognize their opportunity to effect change by backing visionary policies with practices that serve as an example for citizens and businesses to emulate.
- *Continuously improve:* Sustainable communities engage in continuous discovery, rediscovery, and invention as they learn more about the impacts of their actions. Local governments in these communities track both performance and outcomes, are alert for unintended consequences, and modify strategies based on observed results.

A cynic could say that sustainability is no different than good planning practice and is just a new buzzword. There are, after all, hundreds of other definitions of sustainability, sustainable development, and related principles; at the time of this writing, for example, the Sustainable Development Principles Database compiled by the International Institute for Sustainable Development (www.iisd.org) listed 104 statements of sustainable principles from many different countries and a wide range of economic sectors.

In reality, however, the new focus on sustainability represents a different mind-set and a way to bring all of the disparate goals of the planning profession together. There may not be consensus on all of the issues, and perhaps we can never exactly assess sustainability, but the concepts represented by these sustainability principles tell a compelling story for those who want to listen.

CHAPTER 4

Model Indicators, Benchmarks, and Metrics

Most large cities and counties and many governmental and nongovernmental organizations have some type of performance measures in place to assess different aspects of city management and city performance. There are literally thousands of these indicators in use. They can cover all aspects of urban operations and the urban condition, including many of the components that make up sustainability.

Traditionally, the indicators used by each city have been based on local context and their specific uses within that city, often as part of budgeting, scheduling and managing capital improvements, planning, and selling government bonds. Not surprisingly, the focus of different instruments is driven in part by the agendas of the initiating entities. As a result, it can be difficult to compare data between one city and another, and there tend to be huge gaps in the types of data collected.

Many efforts have been made to improve these urban instruments to help in government operations, governance, and sustainability. Many of the efforts described in this chapter are out of the reach of all but the most sophisticated communities, but the concepts are still useful to most planners. PAS Report no. 517, *Community Indicators*, highlights some of the pioneering work done in Seattle, Santa Monica, and elsewhere (Phillips 2003). These efforts focus on creating clear and measurable ways for policy makers and the public to select indicators and then allow the community to track progress, or lack of progress, toward reaching sustainability and good government objectives. PAS Report no. 512, *Smart Growth Audits*, covers audits of smart growth and sustainability measures, which represent specialized types of community indicators (Weitz and Waldner 2002). These indicators can be used by planners, consultants, and community members to look at existing efforts and programs to understand how sustainable a community is, as well as to allow similar assessment of different communities.

TYPES OF SUSTAINABILITY INDICATORS

At least some key aspects of sustainable development are addressed in many existing environmental and community indicator instruments (Kates, Parris, and Leiserowitz 2005). Some examples include the following:

- The United Nations Commission on Sustainable Development (56 indicators) evaluates UN environmental and development goals (specifically Agenda 21 and the Rio Declaration on Environment and Development).
- The Consultative Group on Sustainable Development Indicators (46 indicators) was convened by the International Institute for Sustainable Development with a goal of creating internally accepted sustainable development indexes and eventually a comprehensive index.
- The Well-being Index (88 indicators) is a creation of NEF, a European think tank, aimed at compiling a National Account of Well-being that would be more informative about quality of life and well-being than more commonly used economic development tools (e.g., gross domestic product).
- The Environmental Sustainability Index (66 indicators) was a 2005 effort to create a method to benchmark environmental sustainability and stewardship efforts. The effort was led by the Yale Center for Environmental Law and Policy and the Columbia University Center for International Earth Science Information Network, in collaboration with others.
- The Genuine Progress Indicator (26 indicators) is similar to the Well-being Index in that it is an effort to create better indicators of the progress of humankind than traditional economic measures.
- The Global Scenario Group (65 indicators) is a collaborative international effort to encourage a more sustainable future by examining different scenarios, good and bad, for the future, to understand different paths the world could take.
- The Ecological Footprint (6 indicators) is a broader effort than traditional carbon footprints; it measures the amount of land and water needed to feed, house, and absorb the waste and carbon from the world's population.

- The U.S. Interagency Working Group on Sustainable Development Indicators (40 indicators) was a past effort of 12 United States federal agencies to select indicators for monitoring U.S. sustainability.
- Costa Rica's System of Indicators for Sustainable Development (255 indicators) is an effort to organize traditional statistical data (demographic, economic, etc.) in a format to support sustainable development efforts.
- The Boston Indicator Project (159 indicators), Boston's community-driven indicator project, was discussed in more detail in Chapter 2.
- The State Failure Task Force (75 indicators) is the U.S. Central Intelligence Agency's effort to track leading indicators that may show when states or their major institutions are likely to fail.
- The Global Reporting Initiative (97 indicators) is an effort to measure the sustainability of the private sector or any institution using a standard reporting format.

The indicators discussed below should be of special interest to many planners because they provide some baseline data for comparisons and community discussion.

UN–Habitat Urban Indicators

Among efforts to collect and distill community indicator data, the urban indicators database developed by the United Nations Human Settlements Program is the largest worldwide (UN–Habitat 2010). It includes 2001 data on 13 U.S. cities, ranging from New York and Seattle to Birmingham, Alabama, and Des Moines, Iowa, with the data structured to allow comparisons with non-U.S. cities.

The Habitat data is collected from governments and nongovernmental sources, including censuses, surveys, official records, and studies by governments, NGOs, and financial institutions, as well as from expert estimates. Because of the variable sources and accuracy of data, a great deal of caution must be used in comparing indicators from one city to another. Each of the indicators is multipart (that is, multiple data points are collected for each indicator) and includes broad and often in-depth questions. For example, to understand whether housing is adequate, data are collected on durable structures, overcrowding, whether there is an accepted right to adequate housing, and housing price and rent-to-income ratios. (See the Appendix for a table of UN–Habitat Urban Indicators.)

A generation ago, UN–Habitat Urban Indicators were used to understand the developing world and compare one developing-world city to another. Now, as competitors for everything from economic activity to world sporting events to the status of being a "world-class city" emerge all over the globe, it becomes all the more important to compare great and potentially great U.S. cities to their international counterparts. Most small and medium-size American cities may not need to use UN–Habitat Urban Indicators because they have more complete data (using federal, state, and local sources) in other formats, but it behooves any city striving for world-class status to understand how it compares to other cities and to use these indicators and the Global Cities Indicators (below) to do so.

World Bank and Global City Indicators

One of the most ambitious proposals for comprehensive urban indicators is the World Bank's Global City Indicators Program (GCIP; www.cityindicators.org). As described in a World Bank policy research paper project, this project is designed to

> build on existing indicators and to help facilitate the development of (somewhat) standardized city indicators. These indicators would only capture a part of what is happening in any participating city. Measurements would be sufficiently standardized to allow cross-city comparisons and third-party verification. The indicators should be sufficiently simple and inexpensive to collect. Furthermore, results should be published annually in order maximize usefulness. (Hoornweg et al. 2007)

The World Bank research stresses the opportunity to use indicators and measurements to identify global city trends:

- "Greater competition for the best managed cities." The competition for many events and projects, from sporting events to corporate headquarters is now a world competition. New York, Cape Town, Mumbai, Shanghai, Rio de Janeiro, and Auckland are often competing with one another more than they are competing with provincial cities in their own countries. As such, the need to compare cities across the globe and to create world-class cities is stronger than ever before.
- "Growing importance of service and creative industries." Services from investment banking, management consulting, creative services, and other aspects of the new economy are among the fastest growing and least geographically constrained sectors of the economy. They can and do demand a quality of life and an educated workforce that will vote with its feet if not satisfied.
- "Changing demographics have a significant influence on many cities." Rapid urban population growth—especially outside of the United States—aging populations throughout the developed world, and new young workers in the developing world are creating dramatic changes in urban areas.
- "Growth of small and intermediate cities . . . will be the source of most future urban growth." These smaller areas are growing rapidly in many parts of the United States and around the world, but they may never become huge cities.
- "Megacities will grow as well." In much of the developing world, megacities grow around an existing urban center or megacity (e.g., the outer rings around Beijing). In the United States, megacities are urban areas that have grown together (e.g., the Boston to Washington, D.C., corridor). Managing and measuring these urban areas is very different than understanding a freestanding smaller city.
- "The vanishing urban-rural divide: The old city-rural dichotomy is increasingly disappearing." Many rural areas around the world, from the United States to China, continue to lose population, but at the same time some rural areas are growing smaller cities that serve as the urban centers for those regions. Cities that were barely known in their own countries are now regional population and economic powerhouses, albeit at a much smaller scale than larger cities (e.g., Provo, Utah, or Maoming, China).
- "Increasing informal sectors. . . . This economy is likely to grow faster than the formal economy, especially in the cities of developing countries." By definition hard to measure and often with fewer public revenue benefits, the informal sector is critical for jobs and economic activity.
- "Unmanaged city growth can fuel discontent." This is especially an issue in developing countries, but water supply, traffic snafus, infrastructure limits, crime, and limited education opportunities are certainly U.S. issues as well.

- "Cities will face increased diversity." Social diversity can build vibrancy and economic diversity but also lead to social pressures and governance challenges.
- "Cities are becoming key political players." Cities are increasingly the economic engines and population centers, and with that political power is shifting.
- "In many countries, cities are demanding more powers and financing authority from state and national governments." As cities, or at least a few key cities, grow in political power and economic importance, they are in better positions to demand the tools commensurate with their needs. In some communities, local governments are more responsive to their citizens, while in others good governance lags behind. Indicators of governance and transparency become more important than ever before.
- "Climate change and cities: City indicators may also play an important role in upcoming climate change programs. In some countries the majority of upcoming greenhouse gas emission reductions are expected to come from cities." This is especially true in the United States, where many cities have taken leads ahead of the federal government and many state governments in addressing both climate mitigation and climate adaptation.

In order to assess sustainability, in other words, we must assess many aspects of the urban condition. The World Bank research, however, emphasizes that the biggest challenges are reaching a political consensus on what to measure and what geographic area to consider—that is, the political boundaries of a city or the economic and functional boundaries of a metropolitan area—and then finding the resources to do that and do it accurately. Any such assessment is extremely complex and resource intensive. Ultimately, it will still be a challenge to compare diverse communities around the United States or, in the case of GCIP, diverse communities around the globe.

The Global City Indicators Program was initially extremely ambitious in that it hoped to create comprehensive tools measuring many aspects of city performance and allowing for robust intercity comparisons. The initial research identified the challenges in comparing incredibly diverse data sets around the world (Graham and Voight 2008). The project has continued to move forward but with a more realistic pace and approach, focusing on a smaller number of indicators, not a comprehensive program. It works to define indicators for diverse cities and a methodology that allows those cities to be compared to others throughout the world with a user-friendly interface and an approach that could be appealing for even midsized cities. See the Appendix for a list of GCIP indicators.

Today, as with the UN–Habitat indicators, the GCIP indicators are of most use to U.S. cities that want to compete with global cities everywhere. If the number of U.S. cities using these indicators grows, the resulting standardized data set will be of increasing interest to small and midsize cities that wish to make constructive comparisons.

Sustainability Indicators in U.S. Cities

Many major U.S. cities and urban counties, and some smaller communities as well, have added a focus on sustainability to their performance indicators. For example, several local governments already participate in the World Bank's Global City Indicators Program (e.g., Dallas and Fort Worth, Texas; King County, Washington; Davidson County/Nashville, Tennessee; and Peoria, Arizona). As these efforts grow, domestic comparisons will become much easier.

King County, Washington, in particular, has a noteworthy performance and urban indicator program through its Office of Strategic Planning and Performance Management. Its Benchmark Program (www.kingcounty.gov/exec/strategy/PerformMgmt/BenchmarkProgram.aspx) collects data in an easily retrievable format that can be used for static and longitudinal tracking of performance in many areas—such as land use, economics, transportation, affordable housing, and the environment—key to evaluating sustainability.

Minneapolis has an exemplary Sustainability Indicator program that includes detailed indicators and 10-year numerical targets set by the City Council. Each year, the City publishes the current indicators, so communities can see what the City is trying to achieve and watch the progress toward the targets.

Like Minneapolis, Seattle (a part of King County) has an indicator program designed to assess local sustainability efforts. Both programs are built around the three core tenets of sustainability—environment, equity, and economy. Each program is built to track each city's own sustainability vision, not to foster comparisons with other communities, but both address the UN-sponsored Agenda 21 sustainability framework, an internationally adopted comprehensive agenda of actions designed to address human impacts on the environment (Harmon 2008).

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Efforts such as the Seattle, King County, and Minneapolis programs are very effective at building community interest in sustainability by using transparent and readily accessible systems of indicators and public targets, evaluating the return on public investment, and understanding longitudinal sustainability changes. The main disadvantages of such programs are the costs and energy it takes to do such assessments. The political and community payoffs of showing the benefits of addressing sustainability can be huge. The differences in data used in customized local assessment programs can make it difficult to compare one community with another, though that is not the primary purposes of these programs.

Media Reports

Many cities and urban counties have been on "best of" lists of one kind or another, usually compiled by a consultant or media outlet. Most media efforts take a very broad view (e.g., *U.S. News*'s and *CNN Money*'s "best places to retire," *CNN Money*'s "best places to live," and *Offspring Magazine*'s "best school systems"), but some focus in part on sustainability (e.g., *Popular Science*'s "greenest cities," *Men's Journal*'s "best places to live," and *Corporate Knights*'s "most sustainable cities in Canada").

These lists run the gamut from those supported by some defensible methodology, which may therefore be useful to planners, to those that seem based simply on the whims of editors or writers. For all their flaws, these types of lists can be useful for economic development or self-esteem purposes, and they often tell good stories. The lay public can readily understand these straightforward media results, but these sound-bite approaches can eclipse better-researched and -executed indicator or benchmark programs of greater depth.

A variety of consultants, NGOs, and businesses have also developed their own approaches to assessing some component of sustainability. Despite the limits of most such assessments, these, too, provide useful, if not always completely rigorous, frames of reference. Examples include the following (see also Hoornweg et al. 2007):

- The Mercer Quality of Living survey (www.mercer.com/qualityofliving), based on consumer goods, economic environment, housing, medical and

health considerations, natural environment, political and social environment, public services and transport, recreation, schools and education, and sociocultural environment. Mercer is a human resources consulting firm.

- *The Economist*'s Economist Intelligence Unit Global Liveability Survey (http://store.eiu.com/product/455217630.html) for 140 cities worldwide, based on stability, health care, culture and environment, education, and infrastructure. The Economic Intelligence Unit is a research and advisory consulting firm.
- The Milken Institute Best-Performing Cities Index of U.S. Metropolitan Areas (http://bestcities.milkeninstitute.org), based on creating and sustaining jobs and economic growth, including job, wage and salary, and technology growth. The Milken Institute is a nonprofit independent think tank focused on a "more democratic and efficient global economy."
- The League of American Bicyclists' Bicycle Friendly America program (www.bikeleague.org/programs/bicyclefriendlyamerica) identifies bicycle-friendly communities, states, businesses, and university (on a scale of platinum, gold, silver, bronze, and honorable mention).
- The Pedestrian and Bicycle Information Center's Walk Friendly Communities (www.walkfriendly.org) rates pedestrian-friendly communities (also on a scale of platinum, gold, silver, bronze, and honorable mention).

The report *Cities of Opportunity*, published annually by the Partnership for New York City and PricewaterhouseCoopers LLP (www.pwc.com/us/en/cities-of-opportunity), examines 21 economic-powerhouse world cities to understand trends. Many of the measures involve pure economic activities (e.g., capital investment and amount of skyscraper construction), but some also examine sustainability through measures of green cities, livability, per capita carbon footprint, miles of mass transit, air quality, recycling, and natural disaster risk. The green city composite index is defined as "an index based on raw data as well as qualitative analysis such as garbage production per capita, gasoline price, price of electricity, recycling laws, private vehicles per capita, public transit's share of energy consumption, and smoking laws" (Partnership for New York City and PricewaterhouseCoopers LLP 2011). See the Appendix for a summary of Cities of Opportunity rankings for the top-scoring green and low-carbon footprint cities.

The Natural Resources Defense Council (NRDC) Smarter Cities Project (http://smartercities.nrdc.org) rates the sustainability of U.S. cities for three population sizes: small (under 100,000 residents), medium (100,000 to 249,999 residents), and large (more than 250,000 residents). While these ratings are not especially sophisticated and do not allow for in-depth policy analysis, they do provide quick score sheets and an ability to compare communities. As the program grows and builds a track record, these ratings allow for examination of longitudinal change. The ratings are based on a number of community factors:

- Air Quality
- Energy Production and Conservation
- Environmental Standards and Participation
- Green Building
- Green Space
- Recycling
- Transportation
- Standard of Living
- Water Quality and Conservation

SustainLane (www.SustainLane.com) rates the sustainability of the 50 largest U.S. cities. The SustainLane city ranking system allows for easy comparisons between communities, both overall and in each of 16 categories (Table 4.1). While SustainLane rates fewer cities than the NRDC Smarter Cities Project, its program provides more detail about its criteria and justifications.

TABLE 4.1. SUSTAINLANE U.S. CITY INDEX OF SUSTAINABILITY INDICATORS

City Commuting (Bureau of the Census data)
Regional Public Transportation Ridership (Texas Transportation Institute's Urban Mobility Study)
Metro Street and Freeway Congestion (Texas Transportation Institute's Urban Mobility Study)
Air Quality (EPA data on average Air Quality Indexes)
Tap Water Quality (Environmental Working Group December 2005 study on city tap water quality)
Solid Waste Diversion (how much solid waste is recycled and diverted from landfills and incinerators)
Planning and Land Use (Sprawl Ranking-Smart Growth America, and Park Percentage per total city land – Trust for Public Land)
City Innovation (research on green building incentives, purchasing programs, residential green building initiatives, carpooling coordination, car-sharing programs, etc.)
Housing Affordability (Census data on average housing prices and average income levels)
Natural Disaster Risk (research and data from Risk Management Solutions)
Energy and Climate Change Policy (greenhouse gas tracking, carbon emission goals, overall renewable energy use, percentage alternative fuel vehicles in city fleet)
Local Food and Agriculture (U.S. Department of Agriculture data on farmers markets and research on community gardens)
Green Economy (LEED buildings per capita, farmers markets per capita, presence of city business incubator for clean-tech industries, presence of a green business directory)
Knowledge Base and Communications (existence of a sustainability plan, existence of sustainability department or environmental department, partnerships with research universities, partnerships with NGOs on citywide sustainability)
LEED Building (number of LEED-certified buildings of each level in existence and planned)
Water Supply (data on distance from primary source of untreated drinking water, dependence of water on snowpack, level of drought or other conflict, population growth rate, and gallons of water consumed per person per day)

SustainLane

Procurement and Certification Approaches

Public, private, and nonprofit organizations are increasingly using sustainability assessment measures to improve the sustainability of their products. While some of these efforts no doubt represent greenwashing and may not address the core aspects of sustainability, many organizations have taken some aspects of the sustainability mantra to heart. The sustainability efforts

of local government obviously benefit greatly when other organizations also embrace sustainability. Examples include:

- Procter & Gamble Sustainability Guidelines for Supplier Relations (2009), which address human rights, bribery, employment practices, and environment.
- Department of Defense Green Procurement Strategy (2008), which focuses on defining products made with various green measures.
- The Institute for Sustainable Development's Green Plus Certification program (www.gogreenplus.org), which helps businesses and organizations assess, improve, and certify their organizations on green principles. The program is built around an in-depth assessment that follows the three sustainability/triple bottom line principles, in this case People (Human Resources), Planet (Environment), and Performance (Operations).
- The Audubon International Sustainable Communities Program (http://scp.audubonintemational.org) for communities and the private sector, which uses a standard methodology, provides technical assistance, and requires third-party verification.

These and other efforts are moving fast enough that both nonprofit rating firms and private-sector consulting firms are now offering a variety of measurement tools that can be customized to a business's needs. Sustainable Measures (www.sustainablemeasures.com), for example, develops indicators that measure progress toward a sustainable economy, society, and environment. Reeve Consulting (www.reeveconsulting.com), PPI Consulting Limited (www.ppiprocurementconsulting.com), IBM (www.ibm.com/smarterplanet/us/en/green_and_sustainability/overview), and many other firms help entities that want to increase their focuses on sustainability in their procurement processes.


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These media, consultant, and third-party certifications typically do not have the level of depth necessary to truly assess sustainability. They can be very effective, however, at spreading the word; building a brand for businesses, governments, and other organizations who are trying to do it right; and creating incentives for greater organizational participation.

Other Noteworthy Indicator Projects

There are other efforts to assess sustainability throughout the world. In New Zealand, for example, there has been an excellent national government effort to explore options (Patterson 2002). While this is a countrywide effort, certain elements are of interest to cities:

- Creating an ecological footprint assessment to allow for at-a-glance analysis—for example, planners can compare the carbon and natural-resource footprints of cities (see Chapter 6)
- Creating a General Progress Indicator (GPI) "to cover in one index the economic, social, and environmental dimensions of Sustainable Development"
- Creating a "composite index of Sustainable Development . . . which explicitly measures the economic, social, and environmental aspects of progress"

Because of the lack of uniformity on sustainability indicators, the Consultive Group on Sustainable Development Indicators (www.iisd.org/cgsdi) is working to coordinate internationally accepted sustainability indexes "to supplement indices like the GDP or GNP and other measures of progress" (International Institute for Sustainable Development 2011). See the Appendix for examples of other interesting indicator programs.

SUMMARY OF FINDINGS: INDICATORS, CHECKLISTS, METRICS

National, international, and NGO indicators, checklists, and metrics help allow easy comparisons with national and international norms, especially for larger communities. Many indicators of interest to planners are not readily available, so the need remains for other third-party or customized measurements (e.g., for such things as asthma rates, access to healthy food within walking distance, transitional housing for people at risk of homelessness, and governance indicators).

More interesting, and most important, are the indicators, checklists, and metrics that judge how a community is implementing its own sustainability planning. These measures should help identify how the community rates on measures of community health as defined by its residents in terms that they can understand—and if collected over time, they can allow for longitudinal comparisons.

CHAPTER 5

Ecological and Carbon Footprinting

Elisabeth M. Hamin

In the 1990s, William Rees and Mathias Wackernagel published their first proposal for a somewhat simple, widely comparable, fairly comprehensive measure of the impact of individual nations on the overall environment—the ecological footprint—and an industry was born (Rees 1992; Wackernagel and Rees 1996).


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Wackernagel and Rees's insight was that one could calculate the amount of biomass, or land, that a country uses to produce all the bits and pieces of its consumption—its energy supply, agriculture, manufactured goods, everything. Because of global trade, the percent of the earth that a particular person or nation uses is not limited by that person or nation's actual owned land area, and in fact it almost always exceeds it (except in very low-consumption, high-resource countries). When I buy shoes made in Brazil, the logic goes, I am borrowing the piece of their biosphere used to grow the materials as well as the land area needed to manage the wastes from the production process. So we can take the sum total biosphere production of the earth, calculate the energy and resources used for a particular country, average these per capita or present it as a total, and demonstrate the overall impacts that lifestyle and consumption choices have on the global environment.

Over the years since the first publication of the footprint idea, quite a few articles have examined it for rigor, and the general concept has held up remarkably well (see, for example, the articles in *Ecological Economics*, vol. 32, 2000). The general idea has been adopted into a variety of other footprinting measures, each serving particular purposes. Footprinting has proved so popular because it reduces a wide variety of data points to a single number, allowing people to easily consider, discuss, and compare their results. The footprints also allow for "what if" analyses so that people can see the potential impacts of various changes they may make.

There are two key limitations of the footprint calculators, however. The first is the lack of specific local data behind their calculations, which limits their credibility. The second is that their focus is on the environment—only one of the Es of sustainability. For example, these measures do not speak to the equity impacts of purchasing from local or fair-trade versus global sources. They also do not measure access to economic value, the third E of the overall equation. For this reason, it is better to view these as what they are: environmental indicators, not sustainability indicators. They belong as part of a sustainability indicator portfolio, but on their own they cannot be considered accurate indicators of sustainability.

EXISTING FOOTPRINT CALCULATORS

There is a wide range of existing footprint-type calculators, and they can be categorized in several different ways. The first major division among footprint analysis models is between those that measure just carbon impacts and those that use a broader "ecological" perspective. Carbon footprints are more important for informing carbon mitigation efforts. These tend to gather data on sources of energy, efficiency of appliances and housing, and driving habits to determine the amounts of carbon produced by the activities of individuals, households, or city governments. Several of the carbon footprint models are discussed below.

Ecological footprint models, on the other hand, are better suited for broader measures of impact. The focus of these will include items such as diet (meat requires more biosphere to produce than the same calories of vegetarian diet), amount of consumption in general (how often you buy a new couch, for example), and other lifestyle issues that influence overall use of biosphere resources. Individual-level ecological-footprint calculators are available through the Global Footprint Network (www.footprintnetwork.org/en/index.php/GFN/page/calculators), among other sources.

The second major division among footprint calculators is the scale of the analysis, whether individual, community-level, or national. A quick web search will mostly yield calculators designed to help residents (or consumers) judge their individual or their family's footprints and suggest ways to reduce them. Again, the footprint may account for just carbon or

broader ecological outcomes. These on-line calculators can be extremely helpful in teaching people what they can do to reduce their impacts by allowing them to test a variety of actions and see the resulting differences in their footprints.

The Low Impact Living Index (LILI) provides an interesting individual-level approach (www.lowimpactliving.com). This methodology measures a wide variety of lifestyle and housing choices, and it provides information on suggested home improvement projects to further reduce one's overall ecological impact. But the goal here is both providing information and selling services, as the site links to green-marketed shopping sites. In addition, the calculator is very much a "black box"—there is almost no background provided on how LILI is calculated.

Better indicators have more specific data as their starting points. The Nature Conservancy carbon calculator (www.nature.org/initiatives/climatechange/calculator), for instance, is based on data from U.S. state averages, rather than from the country as a whole, and thus is more precise. (See Table 5.1.) It is also quite thorough and easy to use.

Table 5.1. *Footprint analyses*

Best calculator for:	Sponsor	Site
Individual carbon footprint, with better precision and state-by-state data	The Nature Conservancy	www.nature.org/initiatives/climatechange/calculator
Individual ecological footprint, with high-impact graphics and global comparisons	Global Footprint Network	www.footprintnetwork.org/en/index.php/GFN/page/calculators
Specific housing and purchasing impacts	Low Impact Living	www.lowimpactliving.com
New construction project carbon impact	Build Carbon Neutral	http://buildcarbonneutral.org
National footprint information	Global Footprint Network	www.footprintnetwork.org/en/index.php/GFN/page/calculators

Calculators designed to estimate the footprint of a new building or development project are of greater use to city planners than individual footprint calculators. Unfortunately, the calculators of this type that are free tend to be "teasers" designed to encourage the purchase of a customized calculation, which is perhaps necessary due to the unique details of every project. An exception is the calculator provided by the organization Build Carbon Neutral (http://buildcarbonneutral.org), which estimates the embodied energy and carbon released during construction of a new project from both building materials and landscape impacts. Town boards could easily use this tool, but because it suffers from the same limits in the quality of the data behind the "black box," it has a fairly high estimated error rate (+/– 25 percent, according to the calculators' designers).

At the other end of the scale are the national footprints. These are not interactive calculators but rather academically researched and documented findings. The Global Footprint Network, Wackernagel and Rees's group, provides probably the most widely used set of national footprints. The

calculator has great graphics and a friendly user interface, fairly detailed questions that allow the user to accept defaults or drill down partially into the data, and a credible approach ability (see the Build Carbon Neutral website and Wackernagel et al. 2006).

At the intermediate scale of most use to cities, information is much less available. The most widely used footprint models here are greenhouse gas emissions–inventory calculators that use data restricted to the city government's own operations; indeed, this has been the focus of the ICLEI Clean Air and Climate Protection software for years (www.icleiusa.org/action-center/tools/cacp-software). This is not technically footprinting software; instead, it provides a full emissions inventory, though at a significant membership cost and requiring a great deal of energy and attention to detail. The ICLEI tool creates a highly individualized, rigorous inventory. While it is a lot of work to create this emissions baseline, having one really is the first step in determining what changes will have the most impact on a community's sustainability. By implication, however, the ICLEI tool demonstrates the limits of an off-the-shelf footprint calculator that is not customized to the real on-the-ground conditions in a community.

DEVELOPING FOOTPRINT MODELS

Attempting to develop ecological, or even carbon, footprints for not just city government but residents and businesses as well becomes very complicated. The reasons are methodological. First, it is very difficult to determine what set of boundaries should be used for the city or region. How much hinterland is included? Second, at the national or individual level there are many accounts for imports, exports, quality of life, and so on, upon which the calculators can be based. But these same data sets are for the most part not differentiated at the local or regional level.

Perhaps the most promising and ambitious effort to develop city footprint indicators is occurring through the Clinton Climate Initiative, a program of the William J. Clinton Foundation in cooperation with ICLEI and Microsoft. The Clinton Foundation set out to develop footprinting software accessible to a wide variety of cities, only to find that the methodological challenges were too great to continue in the effort or publish any results. Instead, for the 40 megacities included in the Clinton initiative, the foundation is collaborating with the Climate Disclosure Project to create a new carbon footprint calculator and on-line emissions tracking tool. The tool will be available only to the 40 selected cities, but the methodology developed should eventually trickle down to other communities.

There are some commercial and nonprofit groups that are eager to work with cities to develop individualized footprints. The Global Footprint Network has done some high-profile work with a variety of major cities, for example, which is referenced in articles; frustratingly, however, the literature does not yet describe the actual results (Wackernagel et al. 2006). Several other organizations offer these services for a fee, as well, with Best Foot Forward being a good example (www.ecologicalfootprint.com). On its website one can run a very basic footprint analysis using U.K. data, but its real goal is to land business or government contracts for individualized, complete calculations.

There has been some interesting work on municipal ecological footprinting in Oslo, Norway (Aall and Norland 2002). (See Table 5.2.) This calculation considered greenhouse gas emissions, energy consumption, direct land use for buildings, indirect effects for all local consumption, and the local share of responsibility for protecting world biological diversity. As the authors point out, "Although the footprint may turn out to be inadequate as a tool for comparing municipalities internally and nationally, it might still be of great interest within a given municipality."

ECOLOGICAL FOOTPRINT OF OSLO

Activities	Land Types (in hectares per capita)						Total Hectares	Total Acres
	Energy	Arable	Pasture	Forest	Built	Sea		
Local Production	0.261				0.022		0.28	0.6919
Food consumption	1.139	0.798	0.831		0.104	0.614	3.486	8.61409
Goods Consumption	0.251	0.002	0.059	0.211			0.522	1.28989
Housing Consumption	0.356			0.059	0.047		0.944	2.33267
Transport Consumption	1.569				0.014		1.583	3.91168
Local Waste Treatment	0.014				0.001		0.014	0.03459
Subtotal	3.590	0.799	0.890	0.752	0.187	0.614	**6.83**	**16.87**
Biological Diversity	+12% to cover local share of global responsibility (a definition of a developed county's "fair share" of preserving biodiversity around the globe)						0.93	2.02
TOTAL							7.77	**18.89**

Source: Aall and Norland 2002

Table 5.2. *Municipal ecological footprinting in Oslo, Norway.*

The concept of the ecological or carbon footprint is extraordinarily helpful in making impacts more visceral, more real, and, when extended into "what if" analyses, quite helpful in choosing more sustainable life paths. Unfortunately for city planners, the complexities of city-scale footprint analysis have not been resolved in a way that is widely available—yet.

CONCLUSIONS

Ecological and carbon footprinting are close cousins of other sustainability indicators. Like them, these can be prepared regionally or nationally and allow for national norming so that one user can compare itself to the nation as a whole, or they can be prepared locally and allow more in-depth assessments. Thus far, the technology is not available to use footprinting on a wide scale for decision making. For the purposes of assessing sustainability, footprinting is a way to engage students and the community at large and to build interest and knowledge of sustainability issues. The degree of use of footprint calculators and the community discussions that they engender may be a useful way to gauge public interest in taking concrete actions to mitigate and adapt to climate change.

CHAPTER 6

Comprehensive Instruments: LEED for Neighborhood Development and ICLEI STAR Community Index

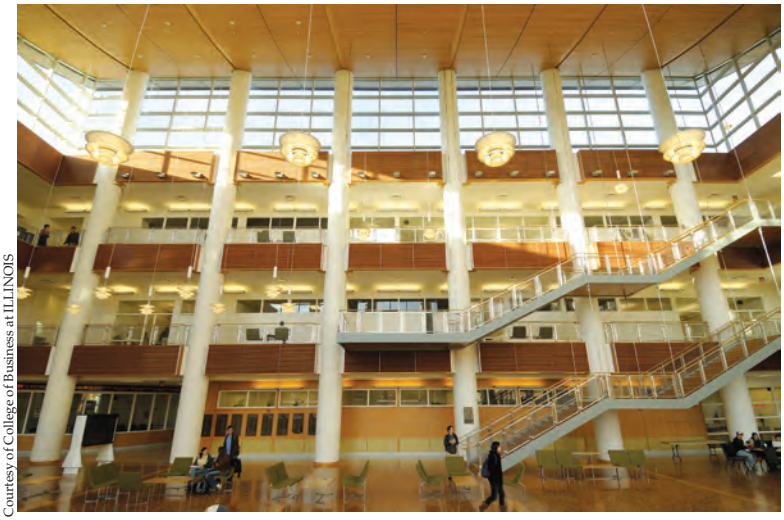
Indicators and benchmarks provide planners and the public with simple metrics to indicate trends and demonstrate progress toward goals. Comprehensive instruments, however, are unified systems of measurement that provide sophisticated but easy-to-read report cards combining many indicators and creating overall scores that allow comparisons both between communities and within one community over time.

Two comprehensive sustainability-assessment instruments, LEED for Neighborhood Development (LEED-ND) and ICLEI's STAR Community Index (STAR), deserve special mention. They are likely to be the most widely adopted comprehensive assessment instruments, carving out different sectors of the market and gaining wide attention from local government planners in communities throughout the United States.

LEED FOR NEIGHBORHOOD DEVELOPMENT (LEED-ND)

The U.S. Green Building Council's (USGBC) family of Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ products has already cornered the market for certifying green buildings. Available rating systems include LEED New Construction and Major Renovations, LEED for Homes, LEED Existing Buildings Operation and Maintenance, LEED for Core and Shell, LEED for Schools, LEED for Retail New Construction, LEED for Retail Commercial Interiors, and LEED for Healthcare. The USGBC offers certification for LEED Accredited Professionals and Green Associates through a third-party certification association.

In order to be LEED certified, a project must meet minimum thresholds (e.g., it must be willing to share building and water use data). Projects are then scored on a point system calculated using a series of checklists, which vary depending on the LEED program. Checklists include such things as innovation and design process, location and linkage, sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, awareness and education, and so on. Most of the individual items are optional, with building designers and property owners customizing their projects to meet their own needs and opportunities. The point total is calculated by a third-party independent rater, with the final evaluation submitted to USGBC for review and certification (whether certified, silver, gold, or platinum).



Courtesy of College of Business at ILLINOIS

The LEED Platinum–rated Business Instructional Facility at the University of Illinois

Other programs (e.g., Florida Green Building Certification, Green Advantage Certified Practitioners, Earth Advantage Certification, and Minnesota Green Star) have much smaller niche markets, often because they are developed by state governments or regional NGOs. The U.S. Environmental Protection Agency's ENERGY STAR for New Homes is one well-known alternative green building certification program, although its focus is solely on energy and not other aspects of green buildings (www.energystar.gov/index.cfm?c=new_homes.hm_index). This program allows new home construction to earn the EPA's ENERGY STAR rating. This arguably uses

more of a mass-market approach than LEED for Homes. ENERGY STAR is very easy to evaluate because it focuses only on energy performance, there is only one level, and the standards are not that hard to meet for new construction, although they do provide greater energy performance than in many new buildings. LEED for Homes, on the other hand, covers more issues and provides more options, but those options and complexity give it a narrower role in the marketplace.

Many communities now require public buildings to be LEED certified at the basic level or higher, and some have adopted requirements or incentives for private buildings to be LEED certified or at least LEED certifiable (e.g., Boston, for buildings above a certain size). The USGBC has been successful at building the LEED brand, not necessarily by outcompeting other certification programs, many of which are very strong programs in their own rights, but rather by growing the market and building interest in third-party verification of green building claims. The cachet of LEED has certainly grown in the popular press and in many communities, and so has the appeal of it to property owners and developers.

Although the LEED program has been a great success, some planners, architects, conservation advocates, and others have criticized LEED building certifications in at least four areas:

- While designers and builders decide what points they want to go after and can customize their buildings, the overall scoring system is a one-size-fits-all approach. USGBC has been working on regional approaches, but many communities wish for a more local approach.
- A standardized program will always provoke debate about what is emphasized. Many energy-efficiency advocates complain that buildings that are not models of energy efficiency can be certified. Further, some planners, while acknowledging the points given for urban and brownfield redevelopment, disagree that buildings accessible only by single-occupancy vehicles should be eligible for gold or even platinum ratings.
- Neither the rental or sales market nor the value of political acceptance may offer sufficient incentive for pursuing LEED certification.
- The program does not address the overall equity issue of fair share use of energy, carbon dioxide emissions, and natural resources. An owner of a 5,000-square-foot LEED-certified gold house with a Hummer probably uses far more energy and has a much larger ecological footprint than the owner of a 1,200-square-foot apartment adjacent to transit that may not be LEED certifiable.

(See also Knack 2010, Lstiburek 2008, and the *Gifford vs. US Green Building Council* lawsuit filed by an energy conservation professional that alleges that USGBC exaggerates the performance of LEED-certified buildings.)

Nonetheless, given the strength of the program, USGBC has built on its success to create the site-scale LEED for Neighborhood Development (LEED-ND) rating system in cooperation with the Congress for New Urbanism and the Natural Resources Defense Council. According to USGBC, LEED-ND represents an effort to certify smart growth, urbanism, and green building efforts for an entire neighborhood (Congress for the New Urbanism, Natural Resources Defense Council, and the U.S. Green Building Council 2011). While these concepts clearly represent a subset of sustainability, however, USGBC does not call LEED-ND a sustainability certification program.

The LEED-ND rating system comprises five general categories:

- *Smart location and linkage* focuses on standard planning principles. This includes factors such as care around sensitive environmental receptors (e.g.,

drinking water aquifers, wetlands), appropriate locations for development and especially redevelopment, and alternatives to single-occupancy cars. Ideally, these issues would be addressed in local plans and regulations, but often they are not.

- *Neighborhood pattern and design* focuses on walkable communities and quality neighborhoods following good design principles and urbanism. This includes walkable neighborhoods; mixed use; access to transit; appropriate densities; quality streetscapes; mixed income communities; access to parks, recreation, and schools; and other quality urban and village features.
- *Green infrastructure and buildings* focuses on the traditional green-building and green-site principles emphasized in other LEED certification programs.
- *Innovation and design process* provides bonus credits for innovations and extra measures.
- *Regional priority* provides for a very limited focus (a possible four points out of a total 110 points in the scoring system) on local priorities and local environmental issues.

Arguably, social equity and economic sustainability issues are not addressed in the LEED scoring. Even within the environmental sustainability arena, some issues do not receive the attention they might deserve in the LEED-ND program. A project can earn a LEED-ND certification, for example, and not be especially sustainable in terms of total energy use or location in a sprawling suburb. In the words of one commentator, "Once you abandon compact development patterns near existing transit and infrastructure, anything you do to be 'sustainable' is like putting lipstick on a pig. The contribution and the energy wasted in long commutes trumps the value of greener buildings" (Elliott 2010). While a LEED-ND certified project may not be all it could be, it is typically far more "green" than a typical project in the same location. Many in the planning community can identify the limits in LEED, but it is still one of the best indicators of a green building, and those of us who find fault may still lobby our communities to build LEED-certified public buildings and may want to live in LEED-certified homes ourselves.[1]

As with other LEED certifications, LEED-ND has an important market niche and can be a helpful tool, especially for new projects and redevelopment projects. It is clearly not a panacea for the challenge of assessing sustainability. While LEED-ND should never be a replacement for quality local planning (as the USGBC points out), it does create a basic set of standards that, even with disagreement about individual scoring options, will appeal strongly to many planners.

ICLEI STAR COMMUNITY INDEX

The STAR Community Index™ (STAR) is an off-the-shelf instrument for assessing and certifying the sustainability of U.S. communities. It is a program of ICLEI–Local Governments for Sustainability (ICLEI) in cooperation with the U.S. Green Building Council, the Center for American Progress, and the National League of Cities. The 10 STAR guiding principles are listed in Chapter 3.

Communities will sign up to be part of the STAR Community Index and will participate in a checklist-type evaluation of their performance in a variety of "sustainability" measures. As of spring 2011, STAR is going through a pilot stage, and the actual checklists and evaluations will evolve as this phase progresses. Since participating communities will use the same checklist, community scores can be compared.

ICLEI is positioning STAR as the dominant sustainability assessment tool for local governments. ICLEI compares the potential impact of STAR to that of LEED and expects that STAR "will transform the way local governments set priorities and implement policies and practices to improve their sustainability performance… and 'certify' their achievements" (2010b).

According to ICLEI, STAR is a rating rather than a ranking system, intended to allow "cities, towns and counties to evaluate their own progress against a series of standardized performance and best practice benchmarks" (2010b). Any program, however, that gives a standardized scoring system will be used as a ranking system by the media and the public, even if that is not its intended use—and indeed, ICLEI has praised competition among cities for sustainable status as one reason for LEED's success (Peterson 2008).

STAR does not allow the customization and community involvement in its creation that is critical for a sustainability framework that, by definition, needs to include the community. What it does do, however, is create a national framework that allows a shared vocabulary and a sense of shared mission across communities (Peterson 2008).

The STAR Community Index approach offers several benefits for local communities:

- The instrument is complete and will not require staff and consultant time to create.
- The instrument will allow national comparisons.
- There is likely to be market acceptance and credibility of the approach.
- The community may better trust the accuracy of the data used.
- The system relies on a framework of goals agreed upon by diverse stakeholders nationwide.

However, this approach also has some significant disadvantages:

- The cost may be high and implementation may use resources that could be better applied elsewhere.
- The instrument is not customized for local needs, values, and opportunities.
- There is no community involvement in creating the instrument and as a result community buy-in may be minimal.

CONCLUSIONS

Comprehensive approaches built using tested and established third-party rating systems are appealing for those with the resources to participate, the desire to understand how they compare to established norms or targets, and a wish for the credibility that a standardized rating system provides. The STAR Community Index will undoubtedly be used by many communities, but just as LEED is only one way to measure green building performance (and, some would argue, it undervalues energy performance), there will be other ways to measure sustainable communities that will cater to different community resources and values.

By creating a transparent system where checklists are public, ranking systems can be very useful, in theory, to understand different approaches used in different communities, focus community energy, and keep political pressure on decision makers, if the media and communities are sophisticated enough to look at more than the final score. On the other hand, local indicator programs (such as the Boston Indicators Project discussed in Chapter 2) and local sustainability metrics (such as the Seattle and

iStockphoto.com/David Liu

King County projects that use locally generated scoring systems, as noted in Chapter 4) can be customized to meet local conditions and build local consensus in ways that state, national, or international ranking systems cannot.

The STAR Community Index may be the best approach for those desiring simplicity. As more and more communities use this program and national norms are more fully established, comparisons will become easier. However, the program's fees and data collection costs may limit the ability of small communities to adopt it (which may, of course, bias the national sample). Communities should not rely solely on STAR to address all sustainability assessment needs. Being able to compare one's community to others is useful, but it is at least as important to be able to reflect how a community's planning program is meeting local needs, as defined by the community, and address all aspects of sustainability that are relevant to it. If sustainability is ultimately about values, the values that drive our communities should come from them.

LEED-ND has a much narrower, but critical, niche. As a certification tool, LEED-ND can help encourage the incorporation of sustainability elements within subdivisions, mixed use developments, and redevelopment projects. In a community with good planning, policies and regulations that are conducive to good projects should already be in place, but planning is further served if certification supports a market push toward such projects. LEED-ND, however, should not substitute for good planning or for customizing solutions that work in particular communities.

ENDNOTE

1. Full disclosure: The lead author of this report, who is happy to identify the faults of LEED, is building a home that will soon be LEED certified. He is working to make sure it comes in at the gold, instead of the silver, level because it is still a statement of values and represents a real improvement.

CHAPTER 7

Ad Hoc Sustainability Assessment Approaches

Erin Simmons

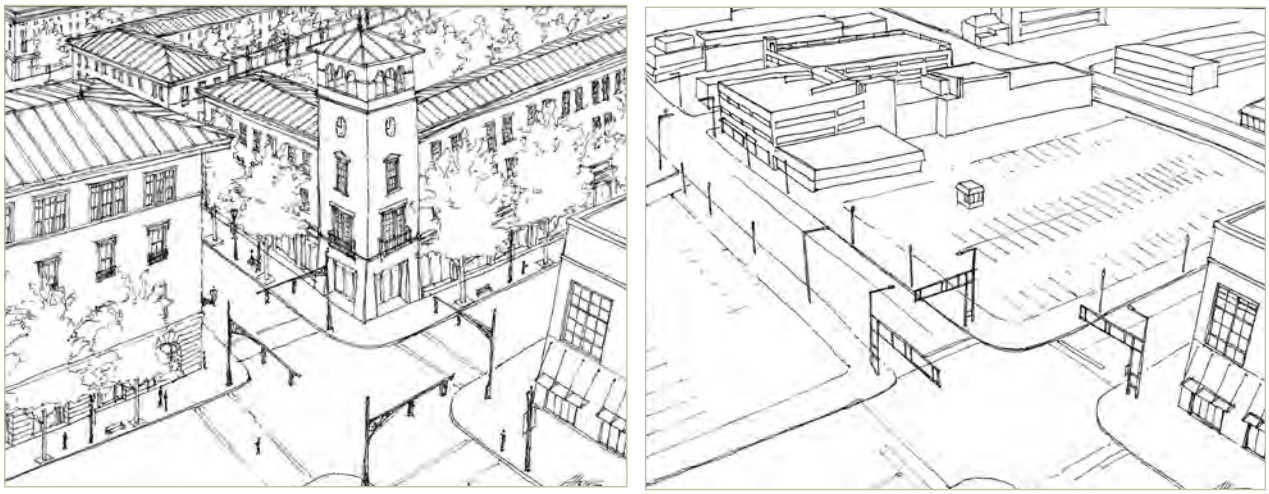
Ad hoc sustainability assessments are unscripted assessments by appropriate experts, or usually panels of experts, in the field that focus on sustainability but do not rely on formal metrics or assessment tools to drive the process. Many consultants and professional associations working in the sustainability arena use ad hoc approaches. In a typical ad hoc assessment, a community or consultant conducts an initial assessment of the design challenge or a forensic analysis of existing conditions. An outside multidisciplinary team of professionals then descends on the community for a few days to complete a detailed assessment and charrette. The team then provides its assessment and its recommendations to the community.

Although ad hoc, these efforts can be extremely effective. Because they are tailored to meet local needs and rely on diverse teams, they can focus more directly on addressing communities' needs identifying short-, medium-, and long-term actions and pursuing paradigm-changing approaches.

There are many notable examples of this type of assessment. One of the oldest models (1967) is the American Institute of Architects (AIA) Regional/Urban Assistance Team, with a focus on the built environment and a long history of addressing some of what we now call sustainability issues. Its more recent companion Sustainable Design Assessment Team (SDAT; see http://aiawebdev2.aia.org/liv2_template.cfm?pagename=liv_sdat) specifically targets sustainability challenges. APA's similar efforts in this area grew out of its Community Assistance Program and now include the Community Planning Assistance Team (CPAT) at the national level, sponsored by AICP and by some of the chapters (e.g., Washington and Iowa). CPATs focus on a variety of sustainability challenges with an emphasis on social equity, economic development, consensus building, and urban design. Also in this field, the Urban Land Institute has the oldest nongovernment organization panels in the land-use arena (dating to 1947), and sustainability is now part of their assessments. In addition, other national and state associations and consulting firms use this kind of approach.

AIA SUSTAINABLE DESIGN ASSISTANCE: AN AD HOC MODEL

Well before the words "sustainability" and "smart growth" achieved ubiquity in public parlance, groups of professionals were making ad hoc efforts to create healthy, livable communities by balancing the environmental, economic, and social equity systems present in those communities. In 1967, the AIA loosely formalized these endeavors by creating the Design Assistance Team (DAT) Program, ultimately pioneering the early form of the modern charrette process.



AIA

Figure 7.1. *Before and after, Virginia Beach proposed revitalizations. In an urban context, sustainability has to include urban design and whatever it takes to make urban centers thrive.*

In 2005, in response to the growing national interest in community sustainability, the AIA launched a new program called the Sustainable Design Assessment Team (SDAT) program, which focuses on the importance of developing sustainable communities through design. As with all DAT programs, the mission of the SDAT is to provide technical assistance and process expertise to help communities develop visions and frameworks for sustainable futures. The SDAT program provides not specific design solutions but broad assessments to help frame future policies or design solutions in the context of sustainability and help communities plan the first steps of implementation. In the six years of the SDAT program, more than

50 communities in 29 states have participated in it.

The SDAT program relies on three simple tenets—multidisciplinary expertise, objectivity, and public participation—and it provides communities with the following services and deliverables:

- *Customized design assistance.* Each SDAT is designed as a customized approach to community assistance that incorporates local realities and the unique challenges and assets of each community.
- *Objective technical expertise.* The SDAT is assembled to include a range of technical experts (e.g., planners, architects, engineers, landscape architects, economists) from across the country. Team members participate in a volunteer capacity and refrain from accepting business in a partner community for at least one year. As a result, the SDAT has enhanced credibility with local stakeholders and can provide unencumbered technical advice.
- *Inclusive and participatory processes.* More than 40 years of experience in community design assistance has shown that public participation is the foundation of good community design. The SDAT involves a wide range of stakeholder viewpoints and utilizes short feedback loops, resulting in sustainable decision making that has broad public support and ownership.
- *Results.* The SDAT combines multidisciplinary expertise with highly interactive, participatory public involvement processes to condense normal planning tasks (which typically take months) into a three-day period. The intense process and compressed schedule allows a community to capitalize on SDAT information quickly and build momentum for implementation of its plan. The SDAT includes the delivery of a formal report and recommendations as well as a follow-up assessment.

SDAT IN ACTION: DUBUQUE, IOWA

In 2006, the City Council of Dubuque, Iowa, decided to prioritize the creation of a green, sustainable city. A community of approximately 60,000 located on the bluffs of the Mississippi River, Dubuque is the oldest city in Iowa and for many years enjoyed a thriving industrial- and manufacturing-based economy. However, the recession of the 1980s hit Dubuque particularly hard, resulting in population flight. Over the last 25 years, Dubuque has implemented significant improvements to make downtown a desirable place to live, work, and play, and it now enjoys a stable population base and renewed economic commitments. The City Council has shown its commitment to continuing this trend. Its first step was to establish a Green City Task Force of nearly 50 community members charged with creating a vision for a sustainable Dubuque. Its second step was to apply for a SDAT.

Among its many other assets, Dubuque boasts a wealth of historic resources, including blocks of intact historic warehouse buildings, a charming downtown commercial district, and breathtaking residential developments on the bluffs. The city's commitment to historic preservation is evident through both its policy directives as well the physical evidence of its many still-standing structures. A downtown revitalization plan attracted hundreds of millions of dollars' worth of improvements between 1985 and 2006, including façade renovations, building rehabilitation, new construction, and public improvements. Even with these significant investments, however, Dubuque still faced unchecked demolition of historic resources, a lack of downtown residents and 24/7 activity, and swaths of vacant properties, particularly in the extensive warehouse district by the river.

The preliminary SDAT visit to Dubuque identified five specific focal issues, which AIA then assembled a team to address: urban sprawl versus planned and managed growth; bluff development versus conservation; stormwater runoff versus management; traditional development versus sustainable design; and neighborhood disinvestment versus revitalization. The team of architects, planners, landscape architects, scientists, and preservationists descended upon Dubuque in October 2007 to tackle these issues. SDAT recommendations included encouraging the city to develop a coordinated management and educational outreach program to monitor and enforce the use of low impact development tools, to adopt a more formalized approach to planning for sustainability and growth by adopting a unified development code, to focus on infill rather than demolition and redevelopment, and to implement preservation guidelines that promote understanding and encourage incorporation of traditional building systems.

Following the SDAT, Dubuque moved ahead with impressive speed and acumen in implementing the SDAT recommendations. The city's numerous innovations and successes include the creation of a historic millwork district revitalization strategy, which puts a premium on the preservation of historic industrial buildings while providing strategies for the creation of a vibrant multiuse neighborhood with a solid employment and residential base, and the preparation of a unified development code (UDC) that combines updated zoning, subdivision, sign, and historic preservation regulations. The UDC provides regulations, standards, and guidelines for sustainable design.

In 2009, Dubuque's inclusion in the National Trust for Historic Preservation's Green Lab Cities program (www.preservationnation.org/issues/sustainability/green-lab) was announced at Dubuque's local Growing Sustainable Communities conference (www.cityofdubuque.org/index.aspx?NID=1079). Joined by only Seattle and San Francisco in its inaugural year, Dubuque's acceptance into the fledging program was a direct result of its demonstrated commitment to both sustainability and historic preservation. The City of Dubuque continues to amass recognition for its innovative sustainable planning, including a Planning Excellence Award for Best Practice from the Iowa Chapter of the American Planning Association for the UDC. Dubuque directly credits the SDAT as the catalyst that prompted its ascendancy to the upper echelons of American green cities.

Communities apply to AIA for an SDAT. Once AIA awards a SDAT to a community, AIA's Communities by Design program appoints a team leader from its roster of outside experts. AIA and the team leader conduct a preliminary reconnaissance visit. The preliminary visit allows the team leader and AIA staff to tour the community and gain more in-depth knowledge of the issues facing the SDAT. Once the preliminary visit concludes, AIA's Communities by Design and the team leader recruit individuals who can specifically address the pertinent issues for involvement on the team. Team members are provided with relevant maps, plans, reports, and other resources well before the SDAT visit to familiarize themselves with the community as well as with its existing planning framework. This step is critical for giving team members necessary information and helping to avoid duplicative efforts during the project.

While each SDAT process is tailored to the specific needs of the project community, all follow a general three-day format. The first day of the project begins with an extensive, if condensed, tour of the community and project area, followed by small-group stakeholder meetings with community activists and leaders who have specialized knowledge pertaining to the issues at hand. It concludes with a town hall–style public meeting that is open to all members of the community and provides the team with the opportunity to hear from a large and varied constituency of residents. The format of the stakeholder meetings and the town-hall meeting varies depending on the most effective method in a community to collect information and engage multiple publics.

On the second day, the small-group stakeholder meetings continue until midday, at which time the SDAT team members begin to work as a group, synthesizing the information they've received and formulating recommendations. Team sessions continue into the third day and involve the integration of both design and policy recommendations.

The visit culminates in a public presentation of these recommendations on the evening of the third day. In addition, the community receives a written report several months later that elaborates on the recommendations. Ideally, these documents provide the community with actionable recommendations and a plan for successful implementation. The team remains in contact with the community as it begins the task of implementation, and the team is available to assist with any hurdles or questions the community encounters throughout that implementation.

The SDAT program is designed to bring together all of the individual discussions that are happening within a community. Issues of economic development, affordable housing, energy conservation, heritage preservation, and livability (among others) exist in every community. However, if the community does not recognize the interconnected nature of all of these matters, success in addressing them will inevitably be limited. The SDAT applies a systems approach to community sustainability, examining cross-cutting issues and the relationships among those issues while still allowing for a flexible process that lets participants define the scope of their projects, ultimately designing opportunities for public participation that integrate national expertise with local traditions and culture.

The SDAT program is an encapsulation of the process of creating a sustainability plan. Three days in a community is not enough time to formulate a detailed comprehensive planning document, but that is not the goal. The program is designed to serve as a step in a long process that will ultimately result in widespread community sustainability. The creation of an implementation committee, an inclusive group that is often an expanded version of the initial project's steering committee, is vital to maintaining the forward momentum of the project once the SDAT team leaves town.

AD HOC ASSESSMENT APPROACH

The primary benefit of utilizing an outside entity for a sustainability assessment is the objective and clear-eyed evaluation it can provide of the community's past, present, and future plans. Outsiders can work without the biases that residents are bound to feel about their communities; their recommendations should be free of any tinges of political suspicion that can result from similar endeavors conducted by local groups or firms. The converse of this benefit is that these outside assessments are only as comprehensive as the information provided to the team. An outside group of professionals must rely on the integrity and thoroughness of the local organizers, and without careful planning and diverse constituent representation on the local steering committee teams face the very real danger of making recommendations based on only selected portions of the truth.

Another drawback of relying upon an outside group for an assessment is that the final recommendations are just that. Without local champions, assessments are doomed to languish as yet more planning exercises without tangible results. Ideally, these types of ad hoc assessments would be attempted only in those communities that already have structures in place to allow local residents to move quickly and smoothly into the implementation process.

Ad hoc assessments, whether they are performed by NGOs, consultants, or in-house teams, create strategic assessments customizable in ways that off-the-shelf indicators and assessment instruments are not. This approach is probably most useful in giving a community a blueprint to move forward in a few strategic areas. It may be less useful in providing an opportunity to compare one community with another or to evaluate the progress of a community over time. Multidisciplinary teams of professionals from around the country can provide communities with specific examples of successes and failures elsewhere, but that evidence is largely anecdotal. Local governments or organizations that conduct nationwide surveys or research on the status of comparable communities can do a much better job of illustrating communities' respective standings within the proven

PORT ANGELES, WASHINGTON: AD HOC SUSTAINABILITY ASSESSMENT

Nathan A. West, AICP

Since the late 1990s, the City of Port Angeles, Washington, has been hard hit by a significant transition in its local economy. As in much of the Pacific Northwest, the declining natural resource industries, mill closures, and reduced access to local timber supplies left a once-thriving community in need of revitalization. The city needed a spark to enable a revival and transition to a new economy.

In 2008, a city council subcommittee known as Port Angeles Forward applied for an SDAT for outside expertise to help community become vibrant and sustainable once again. Port Angeles Forward understood that complacency can hinder progress toward sustainability. Only an outside perspective would have the unbiased vision to correctly assess the city's development and investment potential.

The SDAT brought that perspective. It pointed to the specific improvements that could make the city a better place. At a preliminary site visit, the team leader and AIA design assistance staff evaluated local challenges and identified a team with expertise broad enough to resolve those challenges in a holistic manner. The SDAT process fostered participation by private businesses, citizens, local governments, and agencies and was embraced by those groups as a call to action. The result was fortified interest in the future of the city. Caring about the future and making a commitment to success are what sustainability is all about.

Just two weeks after the SDAT presented more than 30 recommendations, the Port Angeles Forward committee unanimously agreed to recommend 10 of those items for immediate action. Swift council action the following week directed staff to proceed with implementation. This initiated the first stages of public investment in the city's future. Public investment and commitment inspired private investment, and, less than a month later, the community joined together in an effort to revamp the entire downtown, starting with a physical face-lift. Community members donated paint and equipment, and residents picked up their paintbrushes to start the transformation.

By the end of summer, at least 43 buildings in the downtown had been given face-lifts with new paint and other improvements. The City continued these efforts by dedicating $115,000 of community development block grant income to a new façade improvement program. This incentive-based program and several other private-sector actions represented an investment in the community for future generations, and it has been a catalyst for additional investment and long-term community improvements.

Investment in a community, whether from the public or private sectors, makes others take note and want to invest as well. Some may notice the improved quality of the area as they pass through on their way to Canada and decide they want to come back and visit. Others may be so affected that they want to settle down in the community. This excitement that Port Angeles has experienced over the last year and its addictive attributes has contributed to the community's sustainability. The by-products have been the building blocks of a vibrant downtown, a core ingredient of any truly sustainable community. These components include attractive buildings, complete streets, functional urban design, new business and job growth, appealing landscapes, vibrant tourism, and inspired citizens young and old.

echelons of sustainable planning. For example, if a community would be best served by the creation of a benchmarking system by which it could measure its own progress against the best practices of other communities, an ad hoc sustainability assessment would likely not constitute the best use of resources for that community.

CONCLUSION

The potential of an ad hoc strategic assessment cannot be overstated, regardless of how many formalized assessment mechanisms exist. Comprehensive planning, national framework assessments, and indicator projects are all exciting and critical, but they can also be unwieldy and slow. This type of assessment provides the ability to take an independent snapshot of the community, identify strategic areas, challenge assumptions, think about paradigm shifts, and, most important, engage and hopefully inspire.

CHAPTER 8

Emerging Issues: Public Health, Governance, Social Networks, and Climate Change

Sustainability indicators have been used by planners and communities for long enough that many of these tools have been widely tested and disseminated. But there are other areas of sustainability assessment that are still being explored, with promising instruments currently under development. A few of these are discussed in this chapter.

PUBLIC HEALTH AND HEALTHY COMMUNITIES

Public health—especially environmental health, access to healthy food, and actions that create healthy communities—is a critical sustainability issue. Dramatic social inequities underlie health disparities, with the data clearly supporting the hypothesis that where one lives is one of the most significant determinants of one's health. This is partially due to factors such as socioeconomic status and access to health care, but other significant considerations include neighborhood safety, the availability of healthy lifestyle choices, and access to healthy food. Any commitment to social equity demands reducing the health gaps among different segments of the population.

The Centers of Disease Control and Prevention's Community Health Assessment and Group Evaluation (CHANGE; www.cdc.gov/healthycommunitiesprogram/tools/change.htm) is quickly becoming the standard tool to help planners effect the marriage of planning and public health (Centers for Disease Control and Prevention 2010). It has become a successful instrument partially because of its comprehensive nature and the lack of other similar tools and partially because CDC funding for community health assessments has helped propel it into planning and public health offices. Its focus on active living and access to healthy food can, and should, be part of any sustainability assessment or self-assessment

Public health interventions necessary to support healthy eating and active living overlap with related planning interventions. For example, planners can use the Robert Wood Johnson Foundation's Leadership for Healthy Communities action strategies to create a sustainability assessment instrument in this area (Leadership for Healthy Communities 2011):

1. Active Transportation
   - *Are roads and paths safe for bicycles and pedestrians?*
   - *Do local transportation policies support the expansion of bicycle lanes and trail connections?*
2. Land Use for Active Living
   - *Do urban design and comprehensive land-use plans improve active living?*
   - *Do community design features encourage physical activity?*
3. Open Spaces, Parks, and Recreation
   - *Is there sufficient access to recreation facilities and open spaces, including parks and community gardens?*
4. Quality Physical Activity in and near Schools
   - *Do schools offer quality physical activity daily?*
   - *Do schools require standards-based physical education classes by certified PE teachers?*
   - *Does the school district support walk-to-school and Safe Routes to School (SRTS) programs?*
   - *Do schools have joint-use agreements for public use of school recreation facilities?*
5. Safety and Crime Prevention
   - *Does the community have active programs for community safety and crime prevention in order to encourage outdoor activity?*
6. Quality Nutrition in Schools
   - *Do students have appealing, healthy food and beverage choices in schools?*
   - *Do schools have farm-to-school and school garden programs?*
   - *Do schools use standards-based health education programs taught by teachers certified in health education?*

7. Supermarkets and Healthy Food Vendors
   - *Are there grocery stores that provide high-quality, healthy affordable foods in lower-income neighborhoods?*
   - *Do convenience stores and bodegas offer healthy food?*
   - *Are there healthy mobile markets?*
8. Farm-Fresh Local Foods
   - *Are farmers markets accessible to all citizens?*
   - *Are community gardens accessible to all citizens?*
   - *Does the community support procurement of locally grown food?*
9. Restaurants
   - *Do restaurants offer reasonably sized portions and low-fat and low-calorie menus?*
   - *Do restaurant menus offer clear nutritional and health labeling?*
10. Food and Beverage Marketing
    - *Do regulations restrict the marketing of unhealthy food in or near schools and other youth facilities?*

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While the Robert Wood Johnson Foundation's strategies focus on a wider variety of designing communities for healthy living, the National Academy of Sciences report *Local Government Actions to Prevent Childhood Obesity* (Parker, Burns, and Sanchez 2009) is more tightly focused but provides more detail on actions for promoting healthy eating and increasing physical activity. Planners can use these recommendations to create a community sustainability assessment instrument similar to the one above:

1. Improve Access to and Consumption of Healthy, Safe, and Affordable Foods
   - *Retail outlets:* Is there sufficient community access to healthy foods through supermarkets, grocery stores, and convenience or corner stores?
   - *Restaurants:* Is there availability and identification of healthful foods in restaurants?
   - *Community food access:* Are there efforts to provide fruits and vegetables in a variety of settings, such as farmers markets, farmstands, mobile markets, community gardens, and youth-focused gardens?

- *Public programs and worksites:* Do publicly run entities such as after-school programs, child-care facilities, recreation centers, and local government worksites implement policies and practices to promote healthy foods and beverages and reduce or eliminate the availability of calorie-dense, nutrient-poor foods?
- *Government nutrition programs:* Are there opportunities for increased participation in federal, state, and local government nutrition-assistance programs?
- *Breastfeeding:* Is breastfeeding encouraged and is the community breastfeeding-friendly?
- *Drinking water access:* Is there easy access to free, safe drinking water in public places to encourage consumption of water instead of sugar-sweetened beverages?
- *Policies and ordinances:* Are there fiscal policies and local ordinances in place to discourage the consumption of calorie-dense, nutrient-poor foods and beverages?
- *Media and social marketing:* Are there media and social marketing campaigns on healthy eating and childhood obesity prevention?

2. Encourage Physical Activity and Decrease Sedentary Behavior
   - *Built environment:* Is walking and bicycling for transportation and recreation encouraged through improvements in the built environment?
   - *Programs for walking and biking:* Are programs that support walking and bicycling for transportation and recreation promoted?
   - *Recreation and physical activity:* Are other forms of recreational physical activity promoted?
   - *Routine physical activity:* Are there policies that support the incorporation of physical activity into daily routines?
   - *Screen time:* Are there policies and programs to reduce sedentary screen time?
   - *Media and social marketing:* Are there social marketing programs that emphasize the multiple benefits of sustained physical activity for children and families?

Health Impact Assessments (HIAs) are becoming increasingly popular in both the public health and planning communities. HIAs are used to assess the public health consequences of public or private policy and actions. These assessments can help shed light as to whether policies are sustainable.

Health Impact Assessment

Kim Gilhuly

Sustainable development includes economic, environmental, and social sustainability (Harris 2009). The practices of sustainable development and public health intersect across many domains—including transportation, housing, agriculture, and energy—and share many of the same goals. For example, research indicates that unsustainable growth and development patterns (e.g., sprawl) contribute to higher rates of chronic illnesses such as diabetes, obesity, and heart disease (Frumkin, Frank, and Jackson 2004).

Given these common goals and concerns, it is important that planners consider health metrics and indicators when assessing sustainability. For example, when reviewing a proposed infill housing development project, a planner could use a sustainability assessment to examine how the project

could promote walking or access to healthy food retail. Conversely, if the proposed housing is near a heavily trafficked roadway, the assessment should examine potential air quality and noise impacts on residents.

Ideally, health indicators are directly incorporated into sustainability assessments. Alternatively, the practice of Health Impact Assessment (HIA) can be used to complement sustainability assessments. As defined by the International Association for Impact Assessment,

> Health Impact Assessment is a combination of procedures, methods, and tools by which a policy or a project may be systematically judged as to its potential effects on the health of a population, and the distribution of those effects within the population. HIA also identifies appropriate actions to mitigate negative health effects or maximize beneficial health effects. (2006)

The practice of HIA can provide planners with tools to measure and compare social indicators (e.g., access to educational opportunities), economic indicators (e.g., access to healthy food retail), and environmental indicators (e.g., conservation of water). HIA considers these social, economic, and environmental indicators to be determinants of health—factors that influence health status and health inequities (Blas and Kurup 2010).

The practice of HIA relies heavily on scientific literature that proves the correlation between the built environment and individuals' health. For example, HIAs have assessed air quality and respiratory disease impacts from projects designed to increase use of public transit and from the placement of housing near freeways; social, economic, and health impacts of rezoning to allow construction of accessory dwelling units; impacts on affordable housing and social cohesion of rezoning cities to allow more residential uses in areas formerly zoned industrial; and health impacts of freeway expansion.

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HIA guiding principles include equity, democracy, sustainability, ethical use of evidence, and a comprehensive approach to health (North American HIA Practice Standards Working Group 2010). In practice, this means identifying inequities in health outcomes for different populations, ensuring transparency in methodology and communications, and committing to a robust stakeholder input process.

How Can HIAs Advance and Help Assess Sustainability? HIAs often use indicators of sustainable development, such as the proportion of people paying less than 30 percent of their incomes for housing, the proportion of city residents employed locally, or vehicle-miles traveled. Showing the association of an indicator with health, measuring the existing conditions related to that indicator, and predicting how that indicator might change given a land-use development project or plan provides evidence of the health impacts of a project, as well as a ready-made way to evaluate and, over the long term, monitor the project's sustainability.

Unlike the National Environmental Policy Act's environmental impact assessment (EIA), HIA is not a mandatory or regulatory practice. HIA is typically initiated by organizations, agencies, or individuals that want to highlight the positive or negative quality-of-life outcomes that may result from land use and that are interested in offering ways to mitigate elements of a development or development policy that may not produce healthy outcomes. While NEPA requires EIAs for projects using federal funding, the act does not require assessments of health impacts. HIA arose to address this gap, and HIA findings can be integrated into an EIA.

HIAs are used in many ways for land-use and transportation planning, and the incidence of their application within official planning processes is growing. For example, a municipality may require an analysis of health impacts as part of a request for proposals for development or as part of an EIA. HIAs have been conducted on all levels of land-use and transportation

planning: proposed development projects, specific plans or projects, area plans, transit-oriented development plans, regional transportation plans, and general or comprehensive plans.

HIAs are typically used prospectively, before a decision-making process has taken place. The hope is that the HIA can identify design changes that can lead to both short- and long-term healthier outcomes and will encourage decision makers to change those designs or decisions. Commonly, the collaboration building and communication required by HIA can identify issues early on that might otherwise lead to public outcry later in the process, thus allowing for smoother completions of healthier projects.

Steps in HIA. There is no single right way to practice HIA, but there is a common framework that practitioners can be encouraged to follow:

1. *Screening* determines the need, feasibility, and value of a HIA.
2. *Scoping* determines which health impacts to evaluate, methods for analysis, and a work plan.
3. *Assessment and recommendations* provides profiles of existing health conditions, evaluations of potential health impacts, and strategies to manage identified adverse health impacts.
4. *Reporting* includes development of the HIA report and communication of findings and recommendations.
5. *Monitoring* tracks impacts on decision-making processes and the decision, as well as impacts of the decision on health determinants.

GOVERNANCE

Wayne M. Feiden, FAICP

Understanding governance is critical to assessing sustainability, both because transparency and inclusiveness are essential elements of sustainability, but equally because no sustainable system can be effective with ineffective governance.

Measuring Governance

Joel Mills

While economic and social indicator programs have existed for decades, the idea of measuring governance is a more recent phenomenon that has been growing in popularity over the last 20 years. In the field of international development, several institutions have been working for years to quantify national government performance. The World Bank has developed a Worldwide Governance Indicators project (http://info.worldbank.org/governance/wgi/sc_country.asp), which uses more than 300 aggregate and individual governance indicators for more than 200 countries. It covers six components of governance:

- Voice and Accountability
- Political Stability and Lack of Violence
- Government Effectiveness
- Regulatory Quality
- Rule of Law
- Control of Corruption (World Bank n.d.)

The World Bank also applies a governance survey as a country-level assessment tool that captures information concerning performance from citizens and from the private and public sectors. These processes produce the

consolidated World Governance Index, a public-measurement data system that includes components on peace and security, rule of law, human rights and participation, sustainable development, and human development. In 2009, the Bertelsmann Foundation released its Sustainable Governance Indicators (www.sgi-network.org), which measure reform and national capacity for reform within the nations of the Organization for Economic Co-operation and Development (OECD) in Europe. The indicators are designed to measure "a government's capacity for reform mainly by its executive capacity and the level of public participation in its processes" (Bertelsmann Stiftung 2011).

National Measures. Interest in measuring our nation's democratic health and governance has been ongoing for years. The National Commission on Civic Renewal considered this issue under the Clinton administration in the late 1990s; more recently, the Obama administration has created a White House Office of Public Engagement (www.whitehouse.gov/administration/eop/ope), signaling its intent to prioritize the executive office's interaction with the public. In December 2010, President Obama signed an executive order creating the White House Council for Community Solutions (www.serve.gov/council_home.asp), which is tasked to "encourage the growth and maximize the impact of innovative community solutions and civic participation by all Americans" (White House 2010).

In the U.S. Congress, new initiatives are also being developed to expand beyond the mission of the Governmental Accountability Office—improving the performance of the U.S. government—to consider broader measures on outcomes and results. In December 2010, Congress appointed the first bipartisan Commission on Key National Indicators (www.stateoftheusa.org/content/commission-on-key-national-ind.php). The commission will oversee implementation of a Key National Indicator System to help measure national progress. It is funded through a public-private partnership that includes $70 million in public funds to implement a decade-long indicator-development process. The system will be administered by the National Academy of Sciences in partnership with State of the USA (www.stateoftheusa.org), a nonprofit organization.

Regarding civic health, the National Conference on Citizenship's Civic Health Index Indicators Working Group (www.ncoc.net) has been publishing "America's Civic Health Index" since 2006. In 2009, the Edward Kennedy Serve America Act included a provision directing the Corporation for National and Community Service to partner with the National Conference on Citizenship to produce a civic health assessment. In September 2010, *Civic Life in America: Key Findings of the Civic Health of the Nation* (http://civic.serve.gov) was released. (See Figure 8.1.) It is a national civic-health index designed to "measure America's civic habits across a wide range of indicators in an effort to strengthen citizen participation in our communities, states, and nation" (Corporation for National and Community Service and the National Conference on Citizenship 2010).

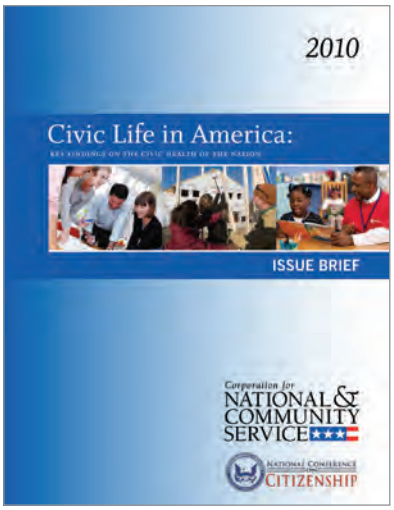

Figure 8.1

Measuring Community Governance. Measuring governance effectively at the local level has been somewhat problematic. While local government has continued to grow and expand in the United States, and interest in good governance has been increasing, measurement has remained a difficult endeavor for any jurisdiction. Part of the reason why it is so challenging is that the nature of local governance has changed so much during recent decades. As a result, there are several key considerations in evaluating potential approaches to measuring local governance:

- *Traditional indicators are insufficient.* Local governance has evolved considerably in recent decades. Questions about how we govern our cities have taken on increasing importance as a result of two trends in local

governance: increasing professionalization of government management and broader devolution of local governance. More cities are moving toward nonpartisan government management, devolving some aspects of governance from a centralized executive, and sharing some aspects of governance within city administration and with decentralized community structures. For instance, an average of 63 local governments per year adopted the council-manager form of government between 1984 and 2000, with switches to strong mayor forms of government rare, and dozens of cities implemented neighborhood council systems in the 1990s (Fahim 2005). Citizens expect and demand a level of public engagement that did not exist 50 years ago. Therefore, the traditional measures of government performance, voter participation, and citizen satisfaction levels alone are insufficient.

- *There is no standard for governance measurement.* The United States has a democratic vernacular, with more than 20,000 municipalities that have particular local contexts, including varying systems of government, different traditions of participation, and wide arrays of civic cultures. Governance is therefore subject to considerable local variation. Those jurisdictions that do measure governance tend to employ a place-based strategy. Most of them utilize a systems approach, developing indexes that attempt to capture a range of indicators.
- *Measuring the "civic."* Measuring governance is not just about measuring the health and vitality of government. It is about measuring a community's capacity to engage in shared governance. Therefore, more comprehensive indicators that measure and track communities' collective civic capacities are necessary. Developing comprehensive indicators to capture civic capacity requires focusing on both formal and informal aspects of community governance.

The two main realms in which governance can be measured concern civic infrastructure and public process.

Measuring Civic Infrastructure. Civic infrastructure is the web of formal and informal institutions, assets, processes, and relationships in a community. It provides the platform for effective community governance and can be measured with a host of indicators. Mapping and measuring the density and connectivity of existing community institutions and resources can be a step in establishing a more holistic measurement of governance.

- *Guiding frameworks.* The National Civic League's report *The Civic Index: Measuring Your Community's Civic Health* provides important guidance for communities that are considering measurement options and new models of governance. It identifies the foundational importance of communitywide visions to any considerations about governance. As the guide states, "Communities that deal successfully with the challenges they face have a clear sense of their past and also have developed a shared picture of where they want to go" (National Civic League 1999).

  In some communities, an assessment of community planning efforts can be an important indicator of deliberate efforts to engage in shared governance. Officials in Yampa Valley, Colorado, reference a communitywide vision as the basis for their indicators approach, and they have included community planning as a component of their civic indicators process (www.yampavalleypartners.com/community_indicators). Indicators allow the community to monitor and understand the implementation of the community plans. As the officials observe, "A community depends on the ability of its local government to execute

a variety of plans. Community plans provide direction to government officials, policy makers, organizations and private entities to accomplish their objectives" (Yampa Valley Partners 2010). Plans that involve substantial community involvement can be effective mechanisms to measure outcomes and degrees of implementation toward shared community goals.

- *Devolution and shared governance.* Another critical area of measurement that can be captured by indicators concerns the degree of devolution and shared governance in a community. Pertinent indicators include the presence of neighborhood council systems and the number, breadth, and density of neighborhood organizations. In the late 1990s, a "second wave" of neighborhood council systems and other governance structures were formed, in cities as diverse as Los Angeles, Houston, Roanoke, and Santa Rosa (Leighninger 2008). The very existence of these systems, their levels of citizen participation, and their impacts on neighborhood planning and city government functions are important qualities to measure. Measurements may be simple—Do neighborhood governance structures exist? What percent of the community participates?—or sophisticated evaluations of the effectiveness of such approaches.

  City government structures can also provide important indicators regarding shared governance. The presence of community engagement staff, departments of neighborhoods, and other structures are principal indicators, in combination with data on community participation. Many communities also incorporate information on the number of nonprofit organizations working in the community. Measuring this independent sector—the philanthropic funds in use provided by community foundations and other nonprofit funders, and levels of volunteerism and donated time—provides important indicators of public work outside of formal government action.

  A key related item concerns the level of partnership that can be measured in a community. Quantifying the existence of public-private partnerships, as well as the number of cross-agency and cross-sector collaborations involving broad representation from public, private, and nonprofit organizations, provides baseline data on collective community agency.
- *Measuring the local information infrastructure.* Access to information is a key governance indicator. The presences of libraries, universities, community data centers, community newspapers, online media, schools, and social media forums can be used as indicators of the quality of available community information and its use.
- *Social capital as a component of civic infrastructure.* Measuring social capital is another important component of community governance. Since the 1995 publication of Robert Putnam's essay "Bowling Alone," interest in measuring community social capital has skyrocketed. Social capital refers to the social-trust connections within and between networks of relationships across a community and the ability to leverage those networks for the public good. In 2000, with a follow-up in 2006, researchers affiliated with Harvard University's Saguaro Seminar (www.hks.harvard.edu/saguaro) implemented a survey of more than 40,000 Americans to establish baseline data on social capital in America (Saguaro Seminar n.d.). The survey provides a template for community-level survey measurements.

Measuring Public Process. Traditional measures of governance focus on the most accessible data on citizen participation, including voter registra-

tion and participation as well as attendance at public hearings and other formal government meetings. Some communities also measure volunteerism rates to attempt to incorporate more informal participation and civic engagement. It is important to create indicators regarding these less formal types of civic participation in order to capture a more complete assessment of community governance.

- *Measuring formal and informal participation.* In a recent survey of more than 300 localities, the National League of Cities reported that 81 percent of respondents claimed that their municipalities now use public engagement processes often (60 percent) or sometimes (21 percent). Many jurisdictions are formally codifying public participation as well—28 percent of respondents reported that they have formal public engagement plans. When asked to identify how likely their city was to design a deliberative public engagement process to address specific issues, the top "very likely" or "likely" issues for responding cities included zoning and land use (82 percent), downtown development (78 percent), and neighborhood planning (76 percent; Barnes and Mann 2010).

  These engagement processes imply important elements that move beyond formal public hearings toward shared-governance models, and these can be captured as important indicators for measuring participation in the community governance process. For instance, the Boston Foundation's 10-point index for civic health includes the measurement of "Opportunities for Civic Dialogue and Deliberation," which it describes as including both formal and informal "free public lectures, panel discussions, structured settings for small group dialogue, live broadcasts, interactive web sites and email distribution lists" (Boston Foundation 2002).

  Data on the demographics of participation are another important indicator with which to measure the inclusiveness of a governance process. For instance, the National Conference on Citizenship's *2010 Civic Health Assessment Report* found that African-Americans had the highest voting rates, Caucasians had the highest rates of volunteerism, and Latinos had the highest rates of social capital (National Conference on Citizenship 2010).

- *Civic intermediaries and processes.* The presence of civic intermediaries—organizations that can play facilitative roles in informal public processes by serving as neutral conveners for the whole community—is an essential ingredient for community success. In Salt Lake City, Envision Utah engaged 20,000 residents in a two-year regional visioning process on growth (Envision Utah n.d.). In Tennessee, Chattanooga Stand attracted more than 26,000 participants in the "largest survey-based visioning campaign" in the world (Chattanooga Stand 2010). These civic leaders are transforming local governance and developing new community leadership.

  Community indicator processes can also provide effective mechanisms to measure shared governance. The National Neighborhood Indicators Partnership (NNIP; www2.urban.org/nnip) is one collaborative effort by the Urban Institute and 35 local partner organizations to further the development and use of neighborhood-level information systems in local policy making and community building. For instance, the Jacksonville Community Council, Inc. (JCCI) has been engaged in participatory community indicator work for 35 years. As part of its development of civic indicators, JCCI surveyed residents and found healthy civic engagement among the respondents:

- 35 percent felt that they had "moderate" or "great influence" over local government decision making.
- 67 percent reported volunteering time in the community, a rate exceeding the national average.
- 56 percent said that they kept up with local government news "frequently."
- 7 percent rated the quality of Jacksonville city government elected leadership as "good" or "excellent."
- 28 percent rated the quality of Duval County School Board elected leadership as "good" or "excellent" (Jacksonville Community Council, Inc. 2002).

The community indicator data-collection process can also itself be used as an indicator of community participation in the governance process. Many communities now incorporate substantial community participation within their community indicator initiatives, including both goal setting as well as data collection. The Fund for the City of New York created ComNET (Computerized Neighborhood Environment Tracking; www.fcny.org/cmgp/comnet.htm), a program that has been replicated in cities across the country. ComNET uses simple data interfaces on handheld computers to provide residents and community organizations the tools to record and monitor neighborhood conditions; this information can then be integrated into government agency reporting processes and addressed by the responsible agencies (Berman 2008). Private-sector applications, especially for iPhones and other smart phones, are also increasingly providing the opportunities for residents to easily report problems, but they are less focused on engaging the community (e.g., SeeClickFix and Community Fix).

The National Center for Civic Innovation's Center on Government Performance houses the Government Trailblazer Program (www.civicinnovation.org), through which more than 70 municipal governments have used market-research methods to gather feedback from their publics about their performance measures and reports. The community input was used to produce revised annual performance reports that reflected public desires (National Center for Civic Innovation n.d.).

- *Processes for accountability.* The presence of systems for public accountability is also an important component in measuring governance. For instance, the CitiStat system in Baltimore (www.baltimorecity.gov/Government/AgenciesDepartments/CitiStat.aspx) is a performance-management system that leverages key data in combination with GPS mapping and accountability processes. The combination of CitiStat with the 311 call system and the Baltimore Neighborhood Indicators Alliance (www.bniajfi.org) provides an integrated approach that ties citizen-led indicators to government-led accountability. Information on a host of indicators, including response times for pothole abatement, trash collection, and snow removal, as well as on issues such as vacant buildings and crime statistics, is analyzed to identify areas of underperformance. Department directors meet with the mayor's office biweekly to address progress and accountability issues.

  CitiStat has been replicated and adapted for dozens of communities across the country. In Washington, D.C., during the 1990s, the Williams administration created a system of neighborhood councils which were connected with city coordinators, held election processes, and implemented neighborhood visioning and planning. Neighborhood councils

came together in a citywide summit involving thousands of city residents on an annual basis, where the mayor would address community progress and seek input on the city's direction from residents. Outcomes from the city summits were tied to departmental directors' performance contracts. Measuring participation in the ongoing community conversation about progress, and ongoing public work toward progress, can provide information about the quality of local governance.

Conclusion. As with all indicator processes, governance indicators are effective only if the data are used to reform and improve the collective civic capacities of communities. Many communities focus heavily on developing the correct metrics and data and then clarifying what data are valid indicators, but in many cases less focus has been placed on how the information should be used to achieve community success. The central principle beyond performance measurement is the idea that "what gets measured gets done." Therefore, the critical connection lies in measuring not just processes and activities but outcomes. Too many communities wind up with great plans that sit on shelves and collect dust. Indicator processes should be an integral component of ongoing governance improvement processes. Jane Jacobs's notions about governance, expressed 50 years ago in *The Death and Life of Great American Cities*, captures the spirit behind this work. As Jacobs wrote, "Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody" (Jacobs 1993 [1961]).

ASSESSMENT OF SOCIAL NETWORKING

Wayne M. Feiden, FAICP

Arguably, a community is not truly sustainable, regardless of the actions taken by governments, the private sector, and nongovernmental organizations, if community members do not embrace sustainability. In theory, although we hope not in practice, this could be measured by spying on dinner conversations at every home in town and assessing how often sustainability concepts come up. Assessing the chatter in social networks is a more benign way to identify a community's interest in sustainability and to introduce new approaches or topics into the conversation. Most planners and politicians already informally test new ideas in their own social networks and in the community, but sometimes their networks are disconnected from those of many in their communities. (For more on new social-networking tools, see PAS Report no. 564, *E-Government*, revised edition.)

Tapping Social Networks for Sustainability

Wendy Sweetser

Sustainability concerns and efforts have received increased national attention in recent years, but they have been part of some communities' cultures and traditions for decades. Growing your own food, cutting energy demands, and reducing automobile dependence are very much in vogue, but the collective knowledge about these and other sustainable solutions may exist in a community without the mayor or the local paper ever knowing about it. This knowledge is present and visible in backyard potlucks and families' basements and garages, and it is passed on through invisible yet powerful social networks that exist outside of any formal programs or structures. In order to get a true sense of how sustainable a community already is, it helps to assess the existence and vitality of the area's social networks (sets of personal or professional relationships among people) and the conversations going on in them.

Our virtual social networks and ties are growing with astronomical speed and now play central roles in everything from advertising to political action. While it is tempting to focus on the quickly evolving state of online social-networking sites, the networks and resulting social capital from old-fashioned face-to-face social ties and connections have the most relevance and utility for improving local sustainability.

Social networks have benefits for participating individuals and also create positive externalities for their broader environments (Saguaro Seminar 2000). Social networks have been found to play positive roles in fighting crime and spreading improvements in health care, education, and agriculture (Seabrook 2009; Tuhus-Dubrow 2009; Warner 2007). High levels of social capital, or the collective impacts of active social networks, have been shown to improve worker productivity, as well as business and national prosperity, and to reduce the rates of suicide, colds, heart attacks, strokes, cancer, teenage pregnancy, child abuse, drug abuse, and welfare dependency (Saguaro Seminar 2000).

Not only does tapping into grassroots social networks give planners and community leaders better senses of local concerns and evolving solutions, but applying the potentials of these networks to sustainability efforts can help shape and ensure the implementation of local and regional plans. Social networks may provide better access to funding, improve communication, and increase community knowledge, and they can also lead to increased collaboration (Lauber, Decker, and Knuth 2008). Moreover, participants in social networks are more likely to participate in collaborative environmental decisions (Shome and Marx 2009).

Like any organic structures, social networks are constantly in flux as people enter and exit and as relationships grow and fade (Henry 2009). Further, humans tend to gravitate toward others who share their underlying belief systems, which often creates uniform or homogenous social networks (ibid.). An in-depth social network analysis will map out the varieties and types of connections that constitute local networks and identify opinion leaders who serve as nodes or bridges to other networks. These people are the jackpots for those seeking to access and influence networks. They can quickly identify opportunities, know precisely where to find the right people for given situations, and can control the flows of information between and among networks (Hulst 2009). Social networks can be mapped by hand or with computer software, some of which is available for free (search for "social network analysis"), but the process can be extremely time consuming.

Even without the time and funding to conduct a social network analysis, it is still possible to begin identifying and accessing existing community networks. Some are already known (though not necessarily liked!) by planners or elected officials. Who are the people who consistently attend hearings, write letters to the editor, or collect signatures for petitions? Where are they sharing and shaping their opinions? At the morning coffee klatch at a local café? At a church, synagogue, mosque, or community center? These are likely places to find groups that meet regularly and care about quality of life, land use, and environmental or public safety issues.

In addition to the more obvious environmental groups, land trusts, or "friends of" groups, other resources include social-service providers—senior centers, child care facilities, immigrant service and health care providers, the clergy, community development organizations, educators, and the fire, police, and public works departments. As sustainability efforts increasingly turn toward building community resilience and being prepared for weather-related emergencies, public safety officials are natural partners to seek.

From even a very short list of existing networks or interested players, it's easy to begin snowballing: initial leads can reveal participants' other profes-

sional and personal ties to organizations or people that are involved in any of the issues surrounding sustainability. Online searches can reveal additional resources: sustainability groups, groups that focus on community resilience and climate change (e.g. www.TransitionUS.org and 350.org), meet-ups, as well as neighborhood groups, local barter groups, and groups on Facebook that may have stakes in local agendas.

This collection of names and groups can be a good indicator of a community's social capital. Unfortunately, collecting this information does not equate with using it effectively, and that step may take even more time and effort. But understanding which types of actors are most likely to engage in constructive discussion will help inform decisions about whom to invite to participate in collaborative planning efforts (Henry 2009).

If a planning process entails gathering together individual members of different networks, it can help to emphasize the smallest possible units of affiliations or network memberships that participants may have or may identify with—such as neighborhoods or houses of worship—rather than municipalities or political parties. Closely shared affiliations increase the likelihood of cooperation and the embracement of the goals of a planning process (Shome and Marx 2009). Local messengers are also key to building strong connections with an audience and in generating strong responses. Last, and most important for utilizing the social networks represented in the room, participants must perceive that information they receive through these processes is salient, timely, and legitimate for them to effectively share it with their networks (Cash et al. 2003; Mitchell et al. 2006).

Understanding and using local social networks will not solve public participation challenges by themselves, nor will they ensure that a sustainability plan will be embraced and implemented. It is becoming increasingly clear that social networks are effective means of instigating behavioral changes, but individual experiences and direct observations are also heavily relied upon (Henry 2009). Given how influential and helpful they are proving to be, however, exploring and tapping local social networks may pay untold dividends in enhancing a community's communication, resilience, and sustainability long into the future.

CLIMATE CHANGE: A REALITY FOR THE FUTURE

Wayne M. Feiden, FAICP

Any comprehensive sustainability assessment should assess whether a community is ready for climate change. If sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs, then a sustainable community must address anything that puts that future at risk. Whether climate mitigation (reductions in greenhouse gases) and adaptation (preparation for climate change) are considered in community policies and infrastructure planning is an essential benchmark in itself. Mitigation and adaptation can work together to create more vibrant, livable communities (Hamin 2011).

Greenhouse gas mitigation strategies can be assessed and implemented using the carbon footprinting instruments described in Chapter 5 and using ICLEI's baseline greenhouse gas–emission analysis protocol and related Clean Air Climate Protection software. For benchmarking, it is essential to establish a baseline and then conduct audits and footprint assessments regularly to chart progress. Policy actions need to be reassessed regularly to ensure that they are working to reduce greenhouse gas emissions.

Adaptation involves preparing for changing climates. In most regions, the most significant impacts from these changes will be more volatile weather—stronger storms, more frequent and significant flooding, more droughts,

more extreme heat days. Safe growth audits "can be used to evaluate the extent to which a jurisdiction is growing safely relative to the natural [and man-made] hazards it faces" (Godschalk 2010). Safe growth audits highlight what a community is doing to address, or not address, potential risks from any natural or man-made hazards, including new or intensified existing hazards resulting from climate change. Assessing a community's sustainability must include such an assessment.

Assessing Climate Adaptation Plans

Michael Cote

Climate adaptation planning prepares communities for the inevitable impacts of climate change. Arguably, a community cannot be considered sustainable if it will not be ready for those changes as they occur.

Adaptation planning is the persistent mitigation of risks from natural hazard impacts on human health, property, economies, and ecosystems. Risks for planners range from significant sea-level rise, intense hurricanes, increased incidence of wildfires to the more nuanced, such as increased pesticide runoff from longer growing seasons, higher incidents of vector-borne diseases, and aquifers becoming more saline. Communities are more resilient and therefore more sustainable if they are able to recover quickly from natural hazard events, have lowered economic burdens during rebound, and are generally prepared for and less prone to uncertainties.


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Traditional natural hazards and disaster mitigation planning assumes ecological "stationarity"—that is, that "the past is the key to the future" (Craig 2010). With inevitable, unpredictable impacts from climate change, traditional hazards methodologies require modification to accommodate higher levels of risk and physical changes to our socioecological systems.

Adaptation planning shares three components with hazard mitigation planning: risk assessment, cost assessment, and implementation and review. Both types of planning utilize the historic record and use computer-simulated modeling to make projections about potential future impacts. For example, planners can combine data on past flooding events with watershed analysis to model risks from various storm events. Adaptation planning has a greater emphasis on the projection and modeling aspects because certain historical trends may not hold true in the future. For instance, flood-frequency modeling might need to include more variable weather, including more intense precipitation events and more intense drought conditions, than the historical record would indicate.

Some communities consolidate climate mitigation plans and adaptation strategies into one document. However, it is possible to adapt to measurable climate impacts without committing to CO_2 reduction strategies. (For stand-alone adaptation plans, see Mukheibir and Ziervogel 2007; for a mature adaptation plan that integrates mitigation, see New York City Department of Environmental Protection 2008.) Below are some key points planners should keep in mind when developing climate assessment frameworks for their jurisdictions.

There are several adaptation models. Assessment should be driven by deciding which type of plan is most effective for a given community. Any assessment must measure the capacity, depth, and effectiveness of climate adaptation policies. As in any planning process, assessments may be conducted in-house, by a consultant, or with both. The Pew Center on Global Climate Change (www.pewclimate.org) analyzes and reports on a wide range of adaptation frameworks at the federal, state, local, and business levels.

Assessment must conceptualize the two categories of climate impacts—major events with low probability and high impact, and minor events with

high probability and low impact. Both events are familiar, but the intensity projections from climate models reveal increased potentials for destructiveness. Major events are hydrometeorological hazards (e.g., hurricanes) that require systemwide coordination, much preplanning, nimble first-responder mobility, and tight communications networks. These events are not limited by political boundaries and recovery will almost always require external assistance. Minor events are incremental (e.g., movement of certain tick-borne diseases farther north) or have periodic impacts (e.g., increases in the severity of the peak annual rainstorm) that can generally be regulated locally with proper planning.

Some planners may unknowingly already be helping their jurisdictions adapt to climate change. Many communities, for example, are increasingly restricting risky development by rezoning floodplains, employing ecosystem services such as using wetlands for flood control, and deploying rolling easements in coastal areas due to erosion. The NY-NJ-CT-PA Regional Catastrophic Planning Team process (http://regionalcatplanning.org), for example, looks at a host of catastrophes that could affect the New York metropolitan region and has considered the effects of climate change as part of risk assessment and planning processes.

Adaptation planning can be difficult. This is still an emerging field with few tested models and approaches; political support is often weak and the public reluctant. Incremental approaches are often easier than comprehensive approaches, even if they address only portions of the challenges. For example, a community not ready to undertake large-scale climate-change planning might still require a climate assessment as part of development review. This can incrementally bring staff and the community up to speed on the issues as they review alternatives based on climate projections and impacts. The downside, of course, is that climate impacts are not isolated events and affect large swaths of land, ignoring parcel and political boundaries and often requiring regional approaches. A holistic approach is preferred, which integrates adaptation into both comprehensive and budget planning processes at both the local and regional levels.

No matter what the approach to adaptation planning, communities must address information overload, the need for constant reassessment, the need to balance climate adaption with other projects, and the need to move forward on planning and implementation even in the face of scientific uncertainty. In this as in other areas of planning practice, "the perfect" can be the enemy of "the good" that planners can do even as the field continues to evolve.

Incorporating science into planning processes is the foundation of adaptation planning. Ideally, at least for larger departments or regional planning agencies, planning agencies should have the computational and staffing capability to use and apply climate modeling software. Open-source climate modeling software packages are now available and may be downloaded from the International Research Institute for Climate and Society (http://portal.iri.columbia.edu) and also from Educational Global Climate Modeling (http://edgcm.columbia.edu).

Identifying physical vulnerabilities is the primary purpose of modeling. Planners can determine the probable impacts of various climate scenarios on particular geographic or economic areas through modeling and then recommend appropriate policy changes to mitigate these impacts. For example, if, in a rural community, the growing season is projected to lengthen, policy changes should address higher pesticide runoff, species impacts, and irrigation demands.

There are three areas of law that need to be assessed for effective policy. Decision makers should review plans for quality due diligence, evaluate

local trends in judicial capacity, and stay within the bounds of relevant enabling legislation.

Sound adaptation planning ensures that decisions and decision-making processes are legally defensible. For example, urban planners are quite familiar with avoiding "arbitrary and capricious" claims by writing defensible decisions and generally conducting sound due diligence. Planners should document everything. Not only does this strengthen departmental defenses when decisions are challenged, but it is required when adjustments to plans or policy are needed as the climate science improves.

Courts often lag behind the curve in the application of the new techniques required of adaptation planning. In other words, the capacity of the courts to evaluate science may be lacking, and this could cause difficulties and perhaps require a robustness in regulatory systems to address judicial uncertainty. Compounding this problem, courts have been shifting toward closer scrutiny of decisions based on science (John F. Kennedy School of Government 2001; Craig 2010; Cote 2011). Even when local government staff and political leaders are well-trained and educated in adaptation planning, the justice system is still early in its learning curve. Relying on the traditional deference given to local governments is not always wise, and it is critical to diligently document the reasoning behind adaptation policy decisions, in order to demonstrate to a court that the regulatory system is rational.

Finally, it may be possible that specific adaptation actions exceed state-delegated police powers. Adaptation policy creates some new legal issues and in some cases more questions than answers. For example, if climate models show that sea-level rise will engulf certain private properties along a beach, a community might use eminent domain to take all or a portion of those properties. The valuation of the land theoretically should be discounted because it will be underwater or eroded in the future, but would any appraisal based on a model with inherent uncertainties withstand a challenge? Does the action meet the public purpose use test for a taking? Should the land be held in trust or in perpetuity? Does the adaptation justification for such actions exceed the purview of the regulatory enabling statutes? It is inevitable that policy implications from adaptation planning will set new legal precedents. There are no easy answers, but decision makers must be acutely aware of the far-reaching nature of their policies.

Analysis must be performed across several economic sectors. Climate change may affect local economies in many ways, from fluctuations in tourism, to tax implications of population migration, to collapses in climate-dependent agriculture. The best tool for the task, with off-the-shelf methodologies readily available, is cost-benefit analysis as it relates to land use.

Cost-benefit analysis (CBA) assigns monetary value to the benefits of avoided impacts. The core principle of CBA is straightforward: for an action to be justified, the costs of the action should be less than the benefits derived. The difference with adaptation planning is that risk analysis is applied to existing land uses, not just new proposals. It is uncontroversial to incorporate the mitigation of risks into projects upfront for the simple fact that it saves money over time. Retroactive engineering of known infrastructure vulnerabilities is likely to be considerably more expensive than incorporating preparations for newly understood risks at the design stage of a project. Cost assessments, therefore, will need to be adjusted for the traditionally low value assigned to early preventive action. This helps identify the margin between the costs and benefits of averting climate impacts that would have not been otherwise taken into account (Pearce et al. 1996).

Additionally, the ends are not always as important as the means. Cost-benefit analysis forces decision makers to compare the consequences of

alternative actions, including no action, on a quantitative basis. The most important benefit of applying CBA, therefore, is the process itself—it forces a rigorous approach to decision making and oftentimes exposes unforeseen vulnerabilities.

The thrust of adaptation planning is to create proportionate responses to high-impact, yet uncertain, risks. Large coastal communities threatened by rising sea levels are leading the field. However, some communities may be less inclined to take proactive measures to prevent damage or losses, especially if state and federal governments guarantee postdisaster bailouts and continued economic assistance (e.g., FEMA-subsidized insurance). The following actions can help communities assess the appropriate adaptation planning responses for their local contexts:

- *Form a climate task force.* Committees can be ad hoc, appointed, or required by ordinance. Committees identify climate impacts and advise decision makers with deadline-oriented recommendations. Members should be experts in their fields, which could include academia, law, elected office, law enforcement, sciences, energy, telecommunications, transportation, architecture, and so on.
- *Decide early whether or not to incorporate expected climate impacts into comprehensive plans and zoning ordinances.* In addition to providing clear development guidance, such integration is more likely to weather political cycles by cementing the importance of adaptation and mitigation. Adaptation experts advocate for full integration into comprehensive plans. However, not all communities will experience persistent impacts or highly elevated risks. Regardless of the degree of the risk, communities should include their analysis of the risk and proposed response in their comprehensive and other plans, and they should amend regulations and policies to include any necessary changes to site- or sector-specific engineering.
- *Review for flexibility in updating land-use maps.* Most difficult in adaptation planning is to create the vision, and political will, to change long-range land-use plans and adjust building and zoning regulations to address the new realities.
- *Follow insurance industry trends.* Insurers are aggressively reevaluating portfolios for asset impacts by adjusting rates and pulling out of coastal zones and floodplains (Mills 2009, 17–20). Communities need to avoid getting stuck with developments that may become uninsurable. (See http://insurance.lbl.gov/opportunities.html.)
- *Choose the right plan type and scale for your community.* Adaptation planning methodologies range from full integration of climate science into all aspects of comprehensive planning down to the simple monitoring of a few aging culverts. For most communities, updating natural hazards–response procedures (e.g., to address increased duration and frequency of flooding or drought) and requiring certain permit types to include climate projections and subsequent mitigation and adaptation elements may be enough.
- *Learn from the processes and procedures used by other communities to implement zoning, review, and development changes.* The following list provides just a few examples:
  - The City of Bainbridge Island, Washington, added an Environmental Element to its comprehensive plan in 2004 (www.ci.bainbridge-isl.wa.us/comprehensive_plan.aspx). This comprehensive natural-

resources guidance document aims to avoid, reduce, and compensate for unavoidable impacts to the island's natural resources. Sea-level rise is a substantial component, and the plan recommends that development be steered away from vulnerable areas.

- The Miami–Dade County Climate Change Advisory Task Force (www.miamidade.gov/derm/climatechange/taskforce.asp) was formed by Ordinance 06-113 in 2006 and reports quarterly and annually. A diverse board makes recommendations to the mayor and board of county commissioners on both mitigation and adaptation measures, such as requiring all county agencies to assess and incorporate climate impacts into master planning; updating elevation maps; leveraging federal funds (especially those from the American Recovery and Reinvestment Act); complying with the sustainable buildings ordinance; and mitigating saltwater intrusion into groundwater.
- The New York City Climate Change Adaptation Task Force and Panel on Climate Change is heavily weighted toward institutional, staff, and public capacity building. Projects include upstream watershed land acquisitions; relocation of underground pumps; assessment of fiber optic and telecommunications systems; training all DEP staff for climate change knowledge; and ensuring new development permits have included climate projections.
- The Town of Duck, North Carolina, adopted a code chapter, "Rebuilding and Reconstruction; Damaging Storms," that sets out procedures for assessing damage, declarations of building moratoriums, and definitions of moratorium types in the aftermath of storm damage.
- The City of Malibu, California, adopted development standards in its Coastal Zone Shoreline and Bluff Ordinance requiring consideration of sea-level rise and mandating setbacks of a sufficient distance landward and elevations to a sufficient finished floor height, which will "eliminate or minimize to the maximum extent feasible hazards associated with anticipated sea level rise over the expected 100 year economic life of the structure" (Malibu 2002).

Further information can be found in PAS Report no. 560, *Hazard Mitigation.*

CHAPTER 9

Going Forward: Advice for the Trenches

Communities can choose many different approaches to assessing sustainability. Each approach has its own opportunities and costs. The gold standard—or perhaps the platinum standard these days—is an appropriate combination of:

- *Comprehensive sustainability assessment instruments*, usually utilizing tested and established third-party rating systems providing instant market-tested credibility, to allow for comparisons with other communities;
- *Indicators and checklists* that provide instant understanding of trends and also allow for comparisons with other communities;
- *Ad hoc strategic assessments* to identify low-hanging fruit, easy opportunities, and possible paradigm-changing approaches;
- *Benchmarks, metrics, indicators, and assessments* created locally with community participation and buy-in;
- *Ecological and carbon footprinting* to educate the community and potentially allow assessments of different policy and lifestyle options;
- *Systems approaches and analysis* to consider economic, equity, environment systems, and more generally the role of planning in a community; and
- *Carrying capacity approaches* to help understand what sustainable development means in a local context.

For some communities, the decisions on what methods to use for sustainability assessments will be based on local financial resources. For others, state targets and mandates may drive the process. Elsewhere, these decisions may be driven by desires to involve community residents in the development of locally tailored sustainability metrics, rather than or in addition to the use of standardized approaches.

Some communities, of course, will not assess their sustainability efforts. Some may simply have no local interest or political support to focus on sustainability; others may see good planning and good governance as encompassing sustainability but do not see the value in spending resources on assessments. This is especially likely to be true for small communities with very limited resources. However, informal ad hoc assessments—or even simple retreats of staff or citizen boards and staff to brainstorm about what sustainability means and what the local opportunities are—can still be useful measures for even the smallest communities.

Given resource constraints, the full suite of approaches described above is simply not appropriate for most communities. Besides the obvious financial and staffing implications, focusing too much energy on assessments might shortchange the efforts that should go into the sustainability programs themselves.

Any assessment program should include both community participation and local customization. Community participation is a core aspect of sustainability and social equity; residents and stakeholder groups should be involved in creating any local metrics, benchmarks, or other sustainability assessment elements. According to ICLEI, "Public involvement and vetting are considered key to the integrity and authority of a [framework to assess sustainability]. Sustainability programs and designation systems showed the most evidence of thorough community involvement, as did indicator initiatives. Community involvement appears less important to ranking projects" (ICLEI 2008). Other commentators have underscored the importance of local connections, emphasizing that "defining sustainability is difficult without explicit reference to a particular problem and place" (Pincetl and Bunje 2009). A more customized approach allows this focus.

SUMMARY OF ASSESSMENT TOOLS

In the preceding chapters, we evaluated many of the classes of assessment tools available to help planners assess local government sustainability. The following list summarizes the pros, cons, and major points of each tool discussed.

- Indicators, checklists, and metrics developed by state, national, and international agencies and nongovernmental organizations (e.g., Global City Indicators Facility, CDC Community Health Assessment and Group Evaluation, and New Jersey Future's Smart Growth Scorecards)
  - Easy comparisons with state, national, or international norms
  - Useful for specific areas (e.g., access to healthy food or governance)
  - Does not provide for local customization or buy-in
- Locally developed indicator programs (e.g., Boston Indicators Project, Seattle, and King County):
  - Customized to meet local conditions
  - Can build local consensus in ways that out-of-the-box products cannot
  - Enable communities to assess their own sustainability planning implementation efforts
  - Costs to develop sophisticated comprehensive systems can be high

- Ecological and Carbon Footprinting
  - Can be out of the box, with the ability to compare across communities
  - Can be prepared locally to serve local needs
  - Not very fine grained, so perhaps more useful for educational purposes than policy development (although may be useful for some limited policy assessments)
- Out-of-the-box comprehensive approaches (e.g., STAR Community Index and LEED-ND):
  - Easy to use, especially compared to developing a local system
  - Focus on a defined number of measurable variables
  - Provide the credibility of standardized rating systems
  - Allow ranking and comparison of different communities (if the approach is well developed enough to have many participating communities)
  - Fees may limit use by some communities
  - STAR is an especially useful out-of-the-box system allowing comparisons between communities and providing instant credibility, but at a cost and without the ability to customize to local needs or allow significant community participation.
  - LEED-ND is designed to evaluate large development projects and is perhaps less useful for evaluation of an existing community; it also is not customizable to local needs and does not take community input into account.
- Ad Hoc Strategic Assessments
  - A critical part of any planning program
  - Can identify strategic opportunities, challenge assumptions, inspire paradigm shifts
  - Very useful to engage the community
  - Serves as a strategic tool but is not a comprehensive approach
- Systems Approaches
  - Opportunity to examine how institutional structural elements promote or retard sustainability
  - Help manage and resolve conflict
  - Help promote creative solutions
  - Address one portion of sustainability but are not, by themselves, a comprehensive approach
- Carrying Capacity Approaches
  - Identify the limits to natural and human-built systems
  - Build a community conversation on how to increase carrying capacity by healthy adaptations and changes to natural and human-built systems.
  - May be misused by some not-in-my-backyard approaches to development

Regardless of which existing tools communities adopt, many will want to customize their approaches to deal with local issues, emerging issues, and issues that may be neglected in existing instruments.

Assessments of sustainability, especially at the local government level, must incorporate concrete, measurable items, including important components of sustainability, such as the governance and social networks discussed in Chapter 8.

Concrete measurable items reduce the risk of greenwashing. Greenwashing happens at the local level when decision makers talk about sustainability in nonmeasurable or nonrational terms while creating two-acre lots (other than near sensitive environmental resources or receptors), or providing free parking to municipal employees but not free bus passes or bicycle infrastructure, or perpetuating street design that is friendly only to cars.

PLANNING TOPICS AND SUSTAINABILITY

Many approaches that planners already use can be useful in performing assessments. The following sections highlight several aspects of planning that are especially important to sustainability and therefore to sustainability assessments.

Many assessments evaluate all the basic zoning, regulatory, investment, public works, tax incentive and policy, and planning tools to identify whether they help or hinder sustainability efforts These include, for example, most ad-hoc assessments, New Jersey Future's Smart Growth Scorecards, and most planners' day-to-day strategic and comprehensive planning efforts. Regardless of the formal or informal assessment measures used, if a sustainability assessment is a concrete tool that will result in policy changes, this type of review is critical.

Economic Health and Prosperity

The economy is one of the three Es of sustainable development, and it is an area of great interest to planners. Unfortunately, in many communities, alleged conflicts between economic health and the environment—and in some cases between economic health and social equity—can block consensus on sustainability. However, these are false choices: mediating these apparent conflicts represents the essence of sustainability. How well a community embraces, not merely balances, all three issues is a core of any assessment.

For many years, planners and local economic-development professionals have emphasized that sustainable economies need to focus on export-based activities that bring in new money to communities, as well as on retaining and multiplying locally generated dollars to minimize the leakage of those dollars. There is a healthy debate as to the proper balance of emphasis between these two elements and their appropriate mix in a sustainability strategy (e.g., Shuman 2006). Any sustainability analysis must consider local government economic development activities and evaluate these twin foci.

There are countless economic assessment diagnostic tools, including some that evaluate communities and allow comparisons to a norm. For example, the Economic Development Partnership between the National League of Cities and the Dukakis Center for Urban and Regional Policy at Northeastern University has created the Economic Development Self-Assessment Tool (EDSAT; www.economicdevelopment.neu.edu). The self-assessment allows communities to compare themselves to similar communities using the tool, and it provides benchmarks for economic strengths and weaknesses in 10 categories:

- Access to customers/markets
- Concentration of businesses and services
- Real estate and infrastructure
- Labor market factors

- Municipal permit processes
- Community quality of life
- Site-related amenities
- Business incentives
- Local tax rates
- Access to local information

Downtown and Urban Revitalization Sustainability

Most planners would agree that a community cannot be considered sustainable if it neglects its downtown. All three Es of sustainability—economy, environment, and social equity—are compromised when downtowns are neglected or nonexistent. Sustainability assessments must include measures of downtown health to be comprehensive. Dozens of diagnostic tools are available to measure downtown health; one example is offered here.

The Oregon Downtown Development Association (2006) identified five "rules for a well-designed downtown" that have a lot in common with the National Trust for Historic Preservation's Main Street Program principles and many other efforts. The rules can be rewritten as a diagnostic tool:

- Does downtown have a sense of place that draws on the area's natural and cultural heritage and makes downtown a place that people remember in positive ways?
- Is downtown designed for pedestrian scale, with building details and signage for pedestrians, as well as enjoyable sidewalks and public spaces?
- Does downtown have a variety of uses, both vertical and horizontal, with some that keep downtown active after 5 p.m. and with local complementary uses adjacent to one another?
- Are downtown parking lots to the side or behind buildings, with on-street parking to reduce the need for parking lots, as well as parking that is attractive for both cars and people?

- Are the ingredients for a strong downtown—storefronts, sidewalks, public space, and parking that work together and complement one another—connected?

Local and Sustainable Agriculture

Agriculture is a critical sustainability issue in many communities and should be part of any sustainability assessment. In communities with farmland, assessing actions to preserve both farmland and farming as an economically viable occupation is essential. In other communities, focusing on community gardens, farmers markets, and economic connections to nearby farmland becomes important. As with any assessment, it is not enough to consider only the obvious (e.g., are there farmers markets in the community?); all potential obstacles need to be considered (e.g., do farmers have places to park when they bring produce to market?).

Planners, especially those in larger cities, have not traditionally focused on food and agriculture. When urban residents think of food, they often think of the grocery store and not its supply chain, and they tend to view agriculture as a rural issue (Pothukuchi and Kaufman 1999). However, there is more interest now, possibly more than ever before, from planners about preserving farmland and ensuring healthy food for urban residents. There is also an increasing interest in farmers markets, as urban residents are asking for local food, although other aspects of supporting farming as an occupation may still be lacking, such as support for some of the other needs of farmers (e.g., access to capital and land).

Local contexts for agriculture vary by community, but every community of any size should have policies for supporting agriculture that feeds residents, and this should be part of any sustainability assessment.

Affordable and Fair Housing

Affordable and fair housing is another bedrock component of social equity and sustainable development. While there are many different private sector, government, and NGO approaches, and enormous disagreement over how to address these issues, any assessment of sustainable development, especially at the local government level, must include housing.

The Massachusetts Fair Housing Mission Statement and Principles (2006) and New Jersey Future's Smart Growth Scorecard, discussed in the Appendix, provide examples of how affordable and fair housing issues can be assessed as part of sustainable development. As with most aspects of equity, integration into an overall planning program is critically important and should be considered in any assessment.

Community Character

Community character includes those concrete and nebulous things that make a community look and feel desirable, while building on unique local strengths and not trying to be a knockoff of some other community. Community character includes a strong focus on architecture, building vibrancy, historic preservation, streetscapes, public parks, and the physical façades of a community. Self-assessments and other kinds of audits can be used to cover a host of sustainability-related issues. The PAS Report *Smart Growth Audits* (Weitz and Waldner 2002), mentioned in Chapter 4, describes a number of such approaches to consider smart growth, with an especially strong focus on community character. Given that community character is a basic building block of any sustainable community, this remains one of the most critical aspects of any sustainability assessment. There is no shortage of community-character assessment tools. The challenge is finding those

"white tennis shoes" (Chapter 2) that make assessments come alive for community members.

The report *Saving Place: A Guide and Report Card for Protecting Community Character* (Herr 1991) provides a community-character self-assessment audit for small communities, summarized here:

- Does the town have an adequate organizational framework to protect community character (e.g., organizational focus on history, environment, planning, and funding, involvement in decision making, and regional focus)?
- Has the town laid the planning base for well-considered and coordinated actions to protect community character (e.g., public process, current comprehensive plan, broad citizen involvement, plan implementation, and clear vision)?
- Has the town acted to carry out its shared vision or plan (e.g., regulations to implement the plan, regulations that allow high densities and walkable centers)?
- Does the town go beyond the above to actively encourage development to concentrate in its center?
- Are the town's goals and efforts in economic development and housing diversity consistent with protecting community character?
- Has the town adopted controls over actions that alter community appearance and character?

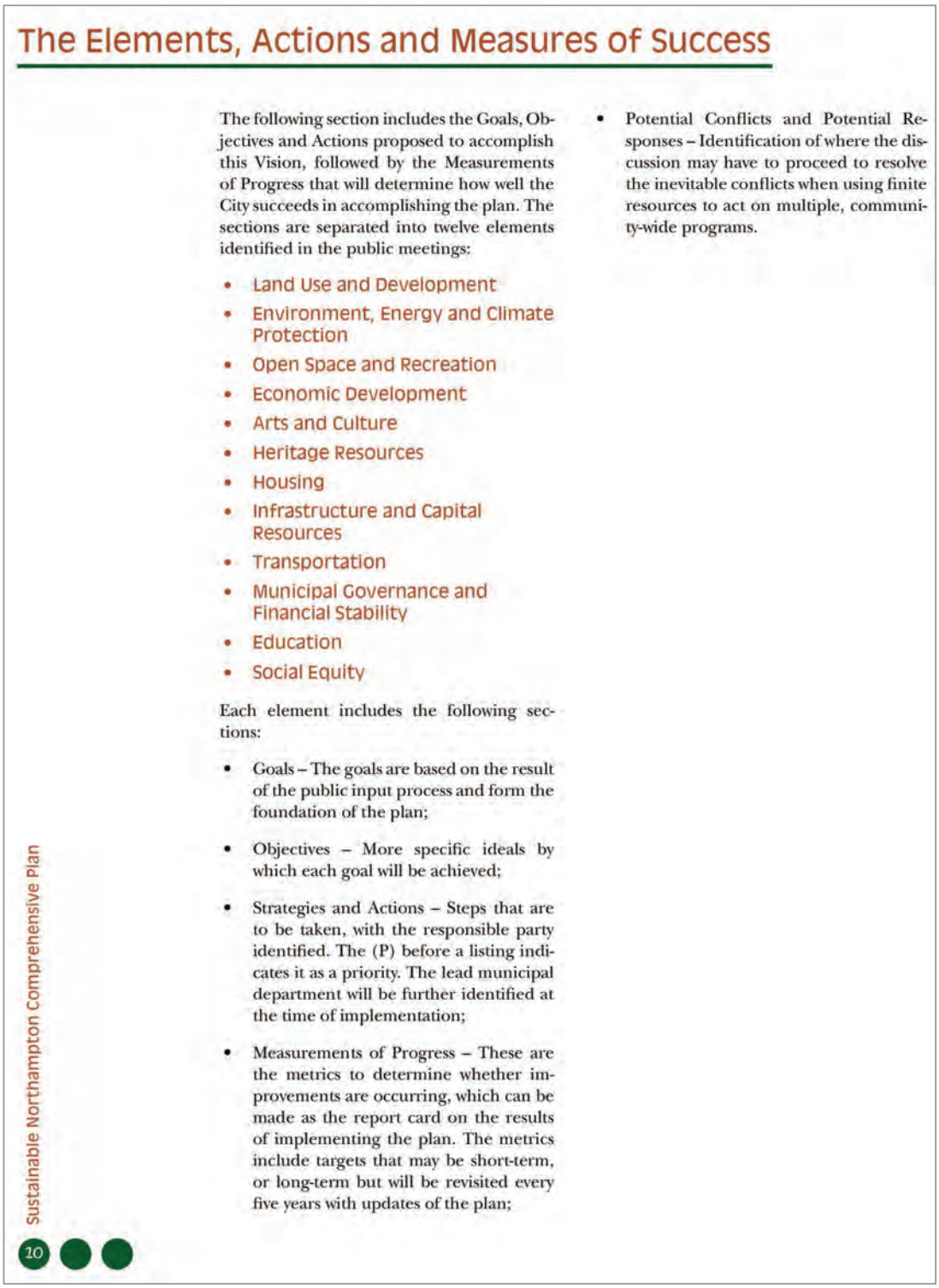
TYING SUSTAINABILITY ASSESSMENT TO THE COMPREHENSIVE PLAN

One of the challenges of any sustainability assessment is to make it relevant so the results inform policy making. This is also a challenge for comprehensive planning. Integrating these two processes can help both. In the same way that businesses include goals and benchmarks in their strategic plans, comprehensive plans can incorporate indicators and sustainability benchmarks into each chapter to assist with implementation and track desired results and any unintended consequences. An excellent time to undertake a benchmarking project is during the revision of the comprehensive plan, but indicators can also be retrospectively designed for an existing plan.

Perhaps the most important piece of advice to remember is to not let the perfect be the enemy of the good. There are so many possible indicators of sustainability that attempting to develop the perfect portfolio may net an endless, unmanageable list. It may be helpful to start close to home, choosing indicators that complement an existing set of goals and tying them into the comprehensive plan. The important thing is to create indicators that represent community values and that can and will be acted upon. The best portfolios include both "white tennis shoe" and technical measures, plus some headline indicators to engage members of the public. But the most important attribute of a successful indicators project is that it occurs not just once but each year. The real benefit of indicators comes when progress can be measured year by year, policy by policy; for that to happen, indicator data must be collected regularly. (For an example, see Figure 9.1, page 82.)

The APA Sustaining Places Initiative is a good source of information on the role of planning and comprehensive planning in addressing sustainability (see www.planning.org/sustainingplaces/index.htm and APA Sustaining Places Task Force 2011). The APA Sustaining Places Task Force report emphasizes the need for any effective sustainability comprehensive planning to incorporate a strong feedback loop and "to measure progress toward plan goals and objectives and to inform decision makers and communities about sustainability issues and needs."

Introducing sustainability practices is a natural companion to traditional planning. As an example, the Brookings Institution's set of recommended steps for turning around a downtown (Leinberger 2005) can be used to create an assessment tool to determine whether a downtown is moving toward sustainability (Table 9.1). The key point is that sustainability indicators can be developed alongside existing economic growth–oriented indicators to provide a fuller picture of the health of the community and its role in public health.



The Elements, Actions and Measures of Success

The following section includes the Goals, Objectives and Actions proposed to accomplish this Vision, followed by the Measurements of Progress that will determine how well the City succeeds in accomplishing the plan. The sections are separated into twelve elements identified in the public meetings:

- Land Use and Development
- Environment, Energy and Climate Protection
- Open Space and Recreation
- Economic Development
- Arts and Culture
- Heritage Resources
- Housing
- Infrastructure and Capital Resources
- Transportation
- Municipal Governance and Financial Stability
- Education
- Social Equity

Each element includes the following sections:

- Goals – The goals are based on the result of the public input process and form the foundation of the plan;
- Objectives – More specific ideals by which each goal will be achieved;
- Strategies and Actions – Steps that are to be taken, with the responsible party identified. The (P) before a listing indicates it as a priority. The lead municipal department will be further identified at the time of implementation;
- Measurements of Progress – These are the metrics to determine whether improvements are occurring, which can be made as the report card on the results of implementing the plan. The metrics include targets that may be short-term, or long-term but will be revisited every five years with updates of the plan;
- Potential Conflicts and Potential Responses – Identification of where the discussion may have to proceed to resolve the inevitable conflicts when using finite resources to act on multiple, community-wide programs.

City of Northampton, Massachusetts

Figure 9.1. *Sustainability themed comprehensive plan with measurements of progress or metrics built into plan*

In many ways, an assessment of sustainability is an assessment of planning best practices. However, a sustainability assessment might have two critical differences. First, a sustainability assessment might include a narrow focus on specific sustainability issues that a community identified as key sustainability issues (e.g., downtown vibrancy, public and private energy use, sustainable economic development, or public health), while a planning assessment might examine all aspects of a comprehensive plan (including, for example, the health of a nonsustainable strip

Steps	Sustainability Indicators
Capture the Vision	Inclusiveness of visioning process; number of times vision is referenced in other documents
Develop a Strategic Plan	Existence of a clearly defined strategy and implementation plan; actions taken to implement the plan
Forge a Healthy Private/ Public Partnership	Number of times the partnership meets; inclusiveness of the private businesses in the partnership; number of actions taken by the partnership; awareness of partnership in neighborhoods
Make the Right Thing Easy	Zoning, building, and other code changes made to support sustainability and vibrancy; new policies or funds with sustainable criteria
Establish Business Improvement Districts and Other Nonprofits	Inclusion of local, small, or minority owned businesses in BID; support for BID actions from broad spectrum of members
Create a Catalytic Development Company	Existence of a development company able to do complex downtown projects; ability to demonstrate how downtown projects can pan out in the long term
Create an Urban Entertainment District	Number of locally owned business start-ups; number of entrepreneurship training programs for service workers
Develop a Rental Housing Market	Demand for rental residential properties; community efforts to encourage rental housing
Pioneer an Housing and Commercial Affordability Strategy	Development of inclusionary programs to link affordable space to projects; development of other affordability techniques (e.g., community land trust, location-specific mortgages)
Focus on For-Sale Housing	Marketing efforts; focus on schools for residents; other community support
Develop a Local-Serving Retail Strategy	Farmers markets; marketing and buy-local programs; regulatory changes; streetscape and façade programs
Re-Create a Strong Office Market	Government commitment to downtown office space; number of new jobs; employment percentages among most vulnerable populations

Source: Steps are from Leinberger 2005, indicators are noncomprehensive examples by the authors.

Table 9.1. *Recommended steps for turning around a downtown*

or measurements of planning office productivity). At the same time, such an assessment takes a very wide systems approach, identifying how interrelated sustainability issues come together and challenging us to mediate apparent conflicts, while a traditional planning assessment is less likely to look at issues from a systems approach.

Planners have been the leaders for many years in bringing sustainability concepts to the table, even before sustainability became such a common term. Unless communities embrace sustainability in every aspect of what they do and create rigorous systems to ensure that sustainability is going to be considered in every action, however, many citizens are going to perceive sustainability as a set of discrete actions—energy efficiencies, increased recycling, and maybe a few others—instead of as a new lens through which to view human settlements and judge public policy. Developing a comprehensive and locally appropriate set of sustainability indicators and implementing a regular data-collection and reporting schedule can serve to highlight the ways that the three Es of sustainability are integral to the wide variety of plans and policies that each town and city undertakes.

Other Indicators and Measures

GLOBAL CITY INDICATORS PROGRAM

Global City Indicators Facility (2009) consists of 22 categories of standardized indicators. Its goal is to serve as a method of comparing cities, or at least large cities, worldwide, with the hope that the results will allow cities to learn from their peers what works and doesn't work.

CORE INDICATOR	SUPPORTING INDICATOR
City Services: Education	
Student/teacher ratio	Percentage of school-aged children enrolled in schools by gender
Percentage of children completing primary and secondary education: survival rate	
City Services: Energy	
Percentage of city population with authorized electrical service	Total electrical use per capita (kilowatt/hour)
Total residential electrical use per capita	Average number of electrical interruptions (in hours)
	Average length of electrical interruptions (in hours)
City Services: Finance	
Debt service ratio (debt service expenditure as percent of a municipality's own-source revenue)	Tax collected as percentage of tax billed
	Own-source revenue as a percentage of total expenditures
	Capital spending as a percentage of total expenditures
City Services: Fire and Emergency Response	
Number of firefighters per 100,000 population	Response time for fire department from initial call
Number of fire-related deaths per 100,000 population	
City Services: Governance	Percentage of women employed in the city government workforce
City Services: Health	
Number of in-patient hospital beds per 100,000 population	Number of nursing and midwifery personnel per 100,000 population
Number of physicians per 100,000 population	
Average life expectancy	
Under-age-five mortality per 1,000 live births	
City Services: Recreation	Square meters of public indoor recreation facility space per capita
	Square meters of public outdoor recreation facility space per capita

CORE INDICATOR	SUPPORTING INDICATOR
City Services: Safety	
Number of policy officers per 100,000 population	Violent crime rate per 100,000 population
Number of homicides per 100,000 population	
City Services: Solid Waste	
Percentage of city population with regular solid waste collection	Percentage of the city's solid waste that is disposed of in an incinerator
Percentage of city's solid waste that is recycled	Percentage of the city's solid waste that is burned openly
	Percentage of the city's solid waste that is disposed of in an open dump
	Percentage of the city's solid waste that is disposed of in a sanitary landfill
	Percentage of the city's solid waste that is disposed of by other means
City Services: Transportation	
Kilometers of high-capacity public transit system per 100,000 population	Number of two-wheel motorized vehicles per capita
Kilometers of light passenger transit system per 100,000 population	Commercial air connectivity (number of nonstop commercial air destinations)
Number of personal automobiles per capita	Transportation fatalities per 100,000 population
Annual number of public transit trips per capita	
City Services: Urban Planning	
Jobs/housing ratio	Area size of informal settlements as a percentage of city area
	Green area (hectares) per 100,000 population
City Services: Wastewater	
Percentage of city population served by wastewater collection	Percentage of the city's wastewater receiving primary treatment
Percentage of the city's wastewater that has received no treatment	Percentage of the city's wastewater receiving secondary treatment
	Percentage of the city's wastewater receiving tertiary treatment
City Services: Water	
Percentage of city population with potable water supply service	Total water consumption per capita
Domestic water consumption per capita	Percentage of water loss
Percentage of city population with sustainable access to an improved water source	Average annual hours of water service interruption per household
Quality of Life: Civic Engagement	
Voter participation in last municipal election (as a percent of eligible voters)	Citizens representation: number of local officials elected to office per 100,000 population
Quality of Life: Culture	
	Percentage of jobs in the cultural sector
Quality of Life: Economy	
City product per capita	Percentage of persons in full-time employment
City unemployment rate	

CORE INDICATOR	SUPPORTING INDICATOR
Quality of Life: Environment	
PM10 concentration	Greenhouse gas emissions measured in tons per capita
Quality of Life: Shelter	
Percentage of city population living in slums	Number of households that exist without registered legal titles
	Number of homeless people per 100,000 population
Quality of Life: Social Equity	Percentage of city population living in poverty
Quality of Life: Technology	
Number of Internet connections per 100,000 population	Number of telephones (landlines and cell phones) per 100,000 population
	Number of new patents per 100,000 per year
	Number of higher education degrees per 100,000

Note: Adapted from www.cityindicators.org/Deliverables/Indicators%20revised%20-core%20and%20supporting_8-31-2009-1743191.pdf

UN HABITAT URBAN INDICATORS

UN–Habitat 2004 uses 20 categories of indicators. The data are collected to track progress and to inform UN–Habitat's State of World Cities assessments.

ISSUE	GOAL	MULTIPART INDICATORS COLLECTED
Shelter	Adequate housing	•durable structures •overcrowding •housing price and rent-to-income •right to adequate housing
	Security of tenure	•secure tenure •authorized housing •evictions
	Equal access to credit	•housing finance
	Equal access to land	•land price–to-income
	Access to basic services	•access to safe water •access to improved sanitation •connection to services
Social development and eradication of poverty	Equal opportunities for a safe and healthy life	•under-five mortality •homicides •urban violence •HIV prevalence
	Social integration and support for disadvantaged groups	•poor households
	Gender equality in human settlements development	•literacy rates •school enrollment •women councillors •gender inclusion

ISSUE	GOAL	MULTIPART INDICATORS COLLECTED
Environmental Management	Geographically balanced settlement structures	•urban population growth •planned settlements
	Effective supply and demand management for water	•price of water •water consumption
	Urban pollution reduction	•wastewater treated •solid waste disposal •regular solid waste collection
	Disaster prevention and settlement rebuilding	•houses in hazardous locations •disaster prevention and mitigation
	Effective and environmentally sound transportation systems	•travel time •transport modes
	Local environmental plans and local Agenda 21 initiatives	•local environmental plans
Economic Development	Small- and micro-enterprises, particularly those developed by women	•informal employment
	Public-private sector partnership and productive employment opportunities	•city product •unemployment
Governance	Decentralization and strong local authorities	•local government revenue •decentralization
	Participation and civic engagement	•voters participation •civic associations •citizens participation
	Transparent, accountable, and efficient governance of towns, cities, and metropolitan areas	•transparency and accountability

Note: Adapted from www.unhabitat.org/downloads/docs/Urban_Indicators.pdf

ASSESSING DOWNTOWN

Oregon Downtown Development Association 2006 was designed as a standardized checklist for assessments of downtowns throughout Oregon, although it is applicable in any community.

Market Place	Growing population base
	Average or above-average incomes
	Diverse, growing employment base
	Strong visitor market
	New commercial development is planned or occurring
	Available quality shopping for a range of incomes available
	Business anchors/attractors bringing repeat shoppers to town
Real Estate	High occupancy rate
	Quality commercial space with good signage, parking, accessibility, and small flexible space options
	Overall commercial space supply
	An up-to-date inventory of available commercial buildings and sites for sale and for lease

Shopping Environment	Inviting, landscaped, well-signed and appealing shopping environment that entices auto travelers to stop and shop
	Quality built environment creating interest and appeal
	Attractive city entrances with good signage and shopping
	Storefronts reflect pride and ownership
	Concentrated nodes or linkages of development creating a critical mass or dense shopping environment, attracting more shoppers
Access	Parking to support stores and services
	Walkable shopping center to encourage browsing and impulse shopping
Incentives	Financial assistance
	Façade improvement program or sign assistance
	Landscape design/assistance
Business Environment	Local entrepreneurship
	A streamlined, one-stop regulatory process that is clearly articulated in planning documents and that is consistently administered
	Business ombudsman to help new and expanding commercial businesses
	A coordinated network of organizations and resource providers that provide a comprehensive array of technical assistance and financing for business
	Networking
	Ongoing business recognition program
Marketing	Special events: frequency, mix
	Business promotions
	Public relations
	Positive community outlook and salesmanship
	Website
	Community newsletter/newspaper
	Design, logo, slogans
Business Attraction	Specific types of businesses or merchandise identified to target
	Commercial recruitment campaign/business lead-generating activities

ECOCITY CLEVELAND

EcoCity Cleveland, now known as GreenCityBlueLake, created a "Score your community! Design principles for great places" assessment (2003). The assessment (briefly adapted here) helps evaluate whether the existing or planned neighborhood is failing, deficient, good, or great.

1. ***Walkable Neighborhoods.*** Within a 3,000-foot radius of the center of the neighborhood or town, is there a mixture of uses (residential, commercial, retail, civic, recreational)?
2. ***Do the street proportions*** (ratio of building height to street width) conform to urban walkable standards (generally minimum of 1:1 to 1:3)?
3. ***Mixed Uses.*** Have buildings that support a mix of uses (e.g., apartments above shops) been included in the neighborhood?
4. ***Town Center.*** Is there a town center that includes offices, retail, residential, and mixed use buildings?

5. ***Compact Development.*** Does the town center have the greatest concentration of development (density and intensity) located at the center using at least two-story buildings, with a lower concentration of development at the periphery? And, where possible, are vacant lots infilled first before building on virgin land?
6. ***Connected Streets.*** Does the interior street system create an interconnected network where each street connects to at least two other streets and where blocks do not exceed 1,000 feet?
7. ***Rural Roads.*** Have rural roads been kept free of commercial development, residential subdivisions, sidewalks, power lines, and street trees?
8. ***Efficient Avenues.*** Are heavy-traffic streets designed as avenues with two or three lanes in each direction, limited curb cuts, planting strips at both edges, street trees, underground utilities, and continuous sidewalks on both sides?
9. ***Shady Boulevards.*** Are medium-traffic streets designed as boulevards with one or two lanes in each direction, a central landscaped median (minimum width 10 feet) with integral turning lanes, limited curb cuts, planting strips at both edges, street trees, underground utilities, and continuous sidewalks on both sides?
10. ***Main Streets.*** Are central commercial streets designed as Main Streets with one travel lane in each direction, on-street parking (angled or parallel), large parking lots behind the buildings, street trees, underground utilities, continuous sidewalks on both sides (10-foot minimum width), and two-story buildings brought to the edge of the sidewalk on one or both sides? Are Main Streets no wider than 36 feet with parking on both sides?
11. ***Quiet Residential Lanes.*** Are residential streets designed with one travel lane in each direction, on-street parallel parking on one or both sides, six-foot planting strips at both edges, street trees, underground utilities, and at least five-foot-wide sidewalks on both sides? Are the Quiet Residential Lanes no wider than 28 feet with parallel parking on one side, or 34 feet with parallel parking on both sides?
12. ***Convenient Alleys.*** Are alleys used to access garages in areas that accommodate bungalows, town homes, and apartments? Are the alleys no wider than 18 feet (preferably 12 feet)?
13. ***Hidden Parking.*** Is the majority of off-street parking for retail, commercial, and civic uses located to the rear and side of buildings?
14. ***On-Street Parking.*** Is on-street parking allowed for on all residential streets and on all Main Streets?
15. ***Planting Strips.*** Are planting strips (minimum six feet wide) located between the curb and sidewalk on all quiet residential lanes, shady boulevards, and efficient avenues?
16. ***Sidewalks.*** Is pedestrian circulation encouraged through the provision of sidewalks connecting uses with one another? And are these sidewalks at least five feet wide in residential areas and 10 feet wide in commercial areas? Are crosswalks raised with curb extensions and turning radii designed for pedestrians and not trucks?
17. ***Street Trees.*** Does the plan include street trees every 30 feet or so when practical?
18. ***Public Transit.*** Is a well-appointed bus or transit stop with shelter and good signage provided?
19. ***Prominent Government Buildings, Churches, and Schools.*** Are these structures located to terminate major streets, built as durable buildings, in walking distance of homes, and welcoming?
20. ***Town Squares.*** Do communities have a common green, square, or central open space near the town center with attractive gazebos?
21. ***Public Seats.*** Do communities have public seats and benches in the town square, main streets, government buildings, and shopping streets?
22. ***Shopping Streets.*** Are retail establishments designed to fit within a shopping street that is configured like a Main Street, and do these shopping streets have mixed use buildings with offices or apartments above shops?
23. ***Neighborhood Offices.*** Are offices designed as part of a Main Street?
24. ***Entertainment Centers.*** Are entertainment centers with theaters, bars, and restaurants designed as part of a Main Street?
25. ***Local Industry.*** Are nonhazardous industries (e.g., automotive shops, wood shops, metal shops, etc.) that employ fewer than 50 people located in facilities within walking distance (3,000 feet) of residential and commercial areas?
26. ***Corner Buildings.*** Are prominent corners designed with buildings adjacent to the sidewalk (sidewalk buildings), welcoming entries, and hidden parking?
27. ***Sidewalk Cafés.*** Are sidewalk cafés with outdoor seating, low walls or fences, and some overhead protection provided in entertainment centers and as part of a Main Street?

28. ***Homes.*** Are homes located near village and urban centers with appropriate urban density and sidewalks?
29. ***Welcoming Entries.*** Are entries to all buildings visible and accessible from the street?
30. ***Human Scale.*** Are buildings designed to be at the human scale, based on the use of windows, small-scale materials, texture, etc.?
31. ***Storefront Windows.*** Are ground-level retail functions designed with traditional storefront windows that run the length of the façade?
32. ***Architecture, Texture, Windows.*** Are windows in buildings vertically oriented (as opposed to unbroken bands of horizontal windows)? Are buildings designed to give texture and depth to the façade?
33. ***Hidden Garages.*** Are garages in residential neighborhoods along an alley, the rear, side, or front of the house?
34. ***Sidewalk Buildings.*** Are all buildings oriented parallel to the sidewalk and, in commercial areas, brought directly to the edge of the sidewalk?
35. ***Porches and Balconies.*** Do residential buildings have either porches or balconies that are at least six feet deep?
36. ***Visible Roofs.*** Are all residential buildings, except village and city apartments, built with visible roofs with at least a 6:12 slope?
37. ***Protected Natural Areas.*** Are natural areas like wetlands, prime agricultural land, viewsheds, and watersheds preserved?
38. ***Lakefront Access.*** Are public lakes provided with numerous points of access for private citizens?
39. ***Preserved Rural Character.*** Are prime farmlands, rural roads, and historic farm structures preserved?

SMART GROWTH SCORECARD

Another excellent diagnostic is New Jersey Future's (undated) Smart Growth Scorecard for municipal planning. This helps communities understand and quantify what smart growth is, including some of the elements of sustainable development. While written for the New Jersey context, most of this approach is relevant elsewhere. As with any attempt to quantify sustainable development, the scoring system could be tinkered with to meet local needs. The municipal planning scorecard is shown below, slightly edited. New Jersey Futures also has a scorecard for proposed projects.

MUNICIPAL PLANNING	ANSWER	POINTS
Master Plan is current (new or revised within six years)	Yes	2
	No	0
Master Plan incorporates state plan concepts such as planning areas and centers	Yes	2
	No	0
Town has a designed center (defined area to accommodate growth) or plan endorsed by state planning commission	Yes	1
	No	0
Town actively engages the public in its planning activities	Yes	2
	No	0
Town has affordable housing plan certified by NJ Council on Affordable Housing or judgment of repose from the courts	Yes	1
	No	0
NEAR EXISTING DEVELOPMENT AND INFRASTRUCTURE	**ANSWER**	**POINTS**
New development does NOT require the extension of new roads and sewer lines into previously undeveloped lands	Yes	5
	No	0
New development is occurring within ½ mile (walking distance) of existing development in a town center.	Yes	5
	No	0
Public facilities (schools, libraries, etc.) are located centrally, within walking distance for most users	Yes	4
	No	0
Town has looked into the capacity of its infrastructure and environment to accept new growth (carrying capacity and build-out analysis)	Yes	3
	No	0
Town has redeveloped, or has plans to redevelop, vacant, underutilized, or brownfield properties	Yes	2
	No	0

RANGE OF HOUSING OPPORTUNITIES	ANSWER	POINTS
Zoning allows for a mix of housing types, including single-family homes, affordable housing, multifamily housing, apartments, and senior housing	A good mix Limited mix No mix	2 1 0
Town encourages affordable housing as a fixed percent (at least 15%) of new development	Required Encouraged Not mentioned	2 1 0
Town has an affordable housing strategy with inclusionary zoning and new construction/rehabilitation programs for low- and moderate-income households	Yes No	2 0
Affordable housing opportunities are distributed throughout the community, integrated into market-rate communities	Yes No	1 0
MIX OF USES	**ANSWER**	**POINTS**
Most daily shopping and services can be met in a central location or business district, without the use of a car to get between shops and services	All needs met Some needs met No needs met	4 2 0
Zoning code encourages mixed use development (commercial and residential in same building or district), especially in a town center	Required Encouraged Allowed Not mentioned	6 4 2 0
Local parking regulations allow shared parking, credit for parking provided off-site, reduced parking requirements for mixed use development, and credit for on-street parking	Yes No	3 0
Town has a Special Improvement District or economic development plan to attract new business and housing options to a town center	Yes No	2 0
CHOICES FOR GETTING AROUND	**ANSWER**	**POINTS**
Town encourages multiple modes of transportation, as evidenced by on-street parking, bike lanes, sidewalks, and frequent crosswalks	Yes No	4 0
Town has convenient access to public transit (bus, rail, jitney)	Yes No	3 0
Town has a recent circulation plan element as part of its Master Plan	Yes No	2 0
Zoning encourages more compact, higher-density development within ½ mile of transit stops (bus, train, shuttle, etc.)	Yes No	4 0
Streets are interconnected, in a clear pattern for getting around, with few cul-de-sacs or dead-end streets that encumber traffic flow	Yes No	3 0
WALKABLE, DESIGNED FOR PERSONAL INTERACTION	**ANSWER**	**POINTS**
Town has good network of sidewalks and safe pedestrian/bike paths, interconnecting the town	Yes No	4 0
Zoning requires buildings to be close enough to one another to encourage walking and pedestrian activity	Yes No	5 0
Town is designed with the pedestrian in mind, curb cuts favoring vehicular access are minimized, parking lots in front of buildings are avoided, and there are many crosswalks	Yes No	4 0
PROTECTS OPEN SPACE, FARMLAND, CRITICAL ENVIRONMENTAL AREAS	**ANSWER**	**POINTS**
Zoning regulations limit growth in critical environmental areas	Yes No	3 0
Town has regulations that steer development away from unsuitable land	Yes No	2 0
Town has adopted an open space plan to strategically identify and preserve open lands	Yes No	2 0
Town has plans to clean up brownfield and unused industrial sites	Yes No	2 0

Town requires that all new development exceed the standards in NJ's energy code	Yes No	4 0
Town has an active environmental commission	Yes No	1 0
RESPECTFUL OF COMMUNITY CHARACTER AND DESIGN	**ANSWER**	**POINTS**
Zoning has specific design guidelines, including graphic images, to encourage new development in keeping with community character, especially in historic districts	Yes No	4 0
Town has historic district or historic preservation commission to protect important structures	Both Commission None	4 2 0
Town has pedestrian-friendly amenities such as benches, lighting, street trees, and trash cans, as well as windows at street level	Yes No	1 0
Town has clean, well-lit community spaces, such as public plazas, squares, parks, etc.	Yes No	1 0
Final score: 100–90 = A; 89–80 = B; 79–70 = C; 69–60 = D; 59–0 = F		

Note: Adapted from www.njfuture.org/index.cfm?fuseaction=user.contentsubcat1&ContentCat=3&ContentSubCat1=17&ContentCatName=Scorecards and www.njfuture.org/Media/Docs/development_card.pdf

ANNUAL GOALS AND INDICATORS FOR A SUSTAINABLE CITY

Newman and Kenworthy (1999) propose a series of indicators that can be used to track progress toward certain sustainability goals.

Energy and Air Quality

- Reduce total energy use per capita
- Decrease energy used per dollar of output from industry
- Increase proportion of bridging fuels (natural gas) and renewable fuels (wind, solar, and biofuels)
- Reduce total quantity of air pollutants per capita
- Reduce total greenhouse gases (e.g., Kyoto's goals of "demonstrable progress" by 2005 and 5 percent reductions by 2008–2012 from 1990 levels and then further reductions annually)
- Achieve zero days not meeting air-quality health standards
- Reduce fleet average and new vehicle average fuel consumption
- Reduce number of vehicles failing emission standards
- Reduce number of households complaining of noise

Water, Materials, and Waste

- Reduce total water use per capita
- Achieve zero days not meeting drinking-water quality standards
- Increase proportion of sewage and industrial waste treated to reusable quality
- Decrease amount of sewage and industrial waste discharged to streams or ocean
- Reduce consumption of building materials per capita (including declining proportion of old-growth timber to plantation timber)
- Reduce consumption of paper and packaging per capita
- Decrease amount of solid waste (including increasing recycle rates)
- Increase amount of organic waste returned to soil and food production

Land, Green Spaces, and Biodiversity

- Preserve agricultural land and natural landscape at the urban fringe
- Increase amount of green space in local or regional parks per capita, particularly in "green belt" around the city
- Increase proportion of urban redevelopment to new development
- Increase number of specially zoned transit-oriented locations
- Increase density of population and employment in transit-oriented locations

Transportation

- Reduce car use (VMT) per capita
- Increase transit, walk/bike, and carpooling and decrease sole car use
- Reduce average commute to and from work
- Increase average speed of transit relative to cars
- Increase service miles of transit relative to road provisions
- Increase cost recovery on transit from fares
- Decrease parking spaces per 1,000 workers in central business district
- Increase miles of separated cycleways

Livability, Human Amenities, and Health

- Decrease infant mortality per 1,000 births
- Increase educational attainment (average years per adult)
- Increase local leisure opportunities
- Decrease transport fatalities per 1,000 population
- Decrease crimes per 1,000 population
- Decrease deaths from urban violence
- Decrease proportion of substandard housing
- Increase miles of pedestrian-friendly streets (based on specific indicators) in city and subcenters
- Increase proportion of city/suburbs with urban design guidelines to assist communities in redevelopment
- Increase proportion of city allowing mixed use, higher-density urban villages

FAIR AND AFFORDABLE HOUSING

Massachusetts Department of Housing and Community Development 2006 is a mission statement that can be used as a scorecard for fair and affordable housing, one important component of sustainability. The full mission statement and principles have been condensed here into checklist format.

FAIR HOUSING MISSION STATEMENT AND PRINCIPLES

1. ***Encourage Equity:*** Support public and private housing and community investment proposals that promote equality and opportunity for all residents. Increase diversity and bridge differences among residents, regardless of race, disability, social, economic, educational, or cultural background, and provide integrated social, educational, and recreational experiences.
2. ***Be Affirmative:*** Direct resources to promote the goals of fair housing.
3. ***Promote Housing Choice:*** Create quality affordable housing opportunities that are geographically and architecturally accessible to all residents. Establish policies and mechanisms to ensure fair housing practices in all aspects of marketing.
4. ***Enhance Mobility:*** Enable all residents to make informed choices about the range of communities in which to live. Target high-poverty areas and provide information and assistance to residents with respect to availability of affordable home ownership and rental opportunities.
5. ***Promote Greater Opportunity:*** Utilize resources to stimulate private investment that will create diverse communities that are positive, desirable destinations. Foster neighborhoods that will improve the quality of life for existing residents. Make each community a place where any resident could choose to live, regardless of income.
6. ***Reduce Concentrations of Poverty:*** Ensure an equitable geographic distribution of housing and community development resources. Coordinate allocation of housing resources with employment opportunities, as well as availability of public transportation and services.
7. ***Preserve and Produce Affordable Housing Choices:*** Encourage and support rehabilitation of existing affordable housing while ensuring that investment in new housing promotes diversity and economic, educational, and social opportunity. Make housing preservation and production investments that will create a path to social and economic mobility.

8. ***Balance Housing Needs:*** Coordinate the allocation of resources to address local and regional housing needs, as identified by state and community stakeholders. Ensure that affordable housing preservation and production initiatives and investment of other housing resources promote diversity and social equity and improve neighborhoods while limiting displacement of current residents.
9. ***Measure Outcomes:*** Collect and analyze data on households throughout the housing delivery system, including the number of applicants and households served.
10. ***Rigorously Enforce All Fair Housing and Antidiscrimination Laws and Policies:*** Direct resources only to projects that adhere to the spirit, intent, and letter of applicable fair housing laws, civil rights laws, disability laws, and architectural accessibility laws.

CITIES OF OPPORTUNITY

Top Scoring Green and Low Carbon Footprint Cities (Partnership for New York City and PricewaterhouseCoopers LLP 2011) is a list of green cities and their carbon footprints. This project was part of an assessment of New York City, but because New York is competing in many arenas with world-class cities both in and outside the United States, it is critical to understand what is happening throughout the world. Many locational decisions for world headquarters, multinationals, sporting events, and international conferences consider these factors, so any major healthy sustainable city must as well. This table ranks cities in descending order, by combined green and carbon footprint rank.

CITY	GREEN CITIES RANK	CARBON FOOTPRINT RANK	TOTAL
Stockholm	21	16	37
Sydney	13	21	34
Frankfurt	19	14	33
Paris	20	12	32
Tokyo	16	15	31
New York	18	10	28
London	14	14	28
Santiago	10	18	28
Hong Kong	17	9	26
São Paulo	6	20	26
Johannesburg	7	19	26
Mexico City	5	17	22
Chicago	15	5	20
Singapore	12	7	19
Seoul	10	8	18
Toronto	11	6	17
Mumbai	4	11	15
Los Angeles	8	4	12
Shanghai	3	3	6
Beijing	2	2	4
Dubai	2	1	3

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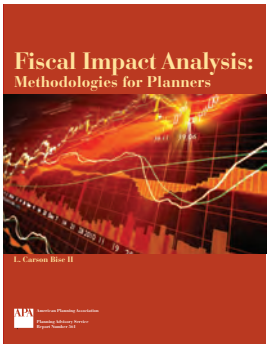

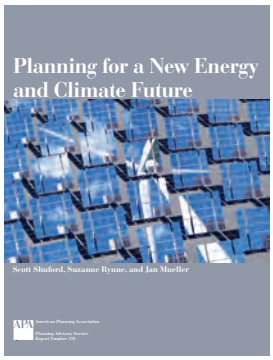

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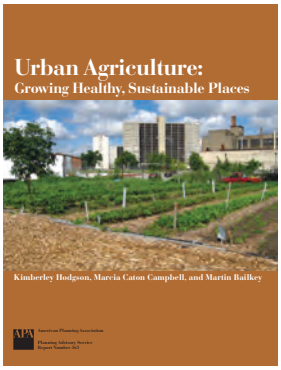

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