
The Boston Indicators Project:
The role of indicators in supporting environmental efforts
in the Boston metropolitan region.

by

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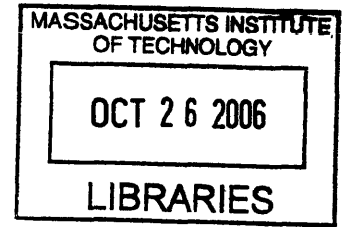
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ABSTRACT

Community indicators projects are an increasingly popular way to measure, track, and, advocates claim, make progress. The commonly held belief is that indicators provide residents, governments, private entities, and community groups with the information they need to make “wise choices.” Many studies have documented the benefits that can arise from indicators projects as a function of community members coming together to choose indicators and discuss ideas of “sustainability” or “quality of life.” However, it is unclear whether the information contained in the indicators influences decisions, actions, or policy in ways that improve performance on the indicator.

This thesis examines the environmental sector of the Boston Indicators Project, in Boston, Massachusetts. First, I examine previous studies of indicators project outcomes, two competing theories of information use in behavior change and decision-making, and emerging strategies for fostering pro-environmental behavior. Then, through interviews with participants in and coordinators of the Boston Indicators Project as well as decision/policy-makers in local organizations who could be influenced by the project, I investigate whether and how the information contained in the indicators has prompted them to change their perceptions, behavior or policy. I argue that people are not necessarily learning from or becoming informed by the indicators, but rather use the indicators to tell stories to bolster their existing claims or desired policy interventions.

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INTRODUCTION

Indicators have appeared around the globe in many forms in the past few decades – community indicators, performance indicators, report cards, and others – as a way to measure, track, and – advocates claim – make progress forward on social and environmental issues. The United Nations, the World Bank, and the Organization for Economic Cooperation and Development each compile and publish social indicators; the United States Environmental Protection Agency and the Government Accountability Office advocate for and use national indicators; and scores of states, regions, cities and neighborhoods measure economic, social or environmental conditions using indicators. At the local level, groups have begun to initiate *indicators projects* to formulate and publish *indicators* – numerical measures that aim to capture the state of a complex social, economic, or physical condition. Many practitioners and investigators believe that “community indicators don’t just monitor progress; they help make it happen” (Tyler Norris Associates and Redefining Progress 1997, p. 1). In this claim lies the essence of this thesis.

Supporters believe that indicators projects provide residents, governments, private entities, and community groups with the information they need to make “wise choices.” An indicators project designed to do exactly this has been going on in Boston, Massachusetts since 1997. Three organizations have collaborated on this project, which they hope will help improve the quality of life in the region: The Boston Foundation (TBF), the Boston Redevelopment Authority (BRA), and the Metropolitan Area Planning Council (MAPC). The “Boston Indicators Project” (BIP) measures and publishes indicators of performance across ten sectors: the economy, civic health, the environment, public health, public safety, transportation, housing, arts and culture, education, and technology. Project directors and supporters hope the project will “expand Bostonians’ capacity to make wise choices in order

to create a more just, prosperous and sustainable future for all residents of the city and region” (Kahn 2006, p. 1). The project aims to accomplish this goal in two ways: first, by promoting collaboration and communication among individuals and groups in the Boston area; and second, by sharing the indicators, in the hope that community members and decision-makers will use the information as a basis for their actions and decisions. The two aspects of the project come together, in the words of the Boston Indicators Project’s director Charlotte Kahn, to form a “data-driven civic agenda”.

To achieve their first objective of improved collaboration and communication, the project has solicited participation from practitioners, academics, policymaker, and leaders across sectors such as the arts, education, the environment, health, transportation, and others. In early 1997, just a few dozen people representing agencies and organizations concerned with the quality of life in Boston were participating. Within a few months, the initial group of participants grew to seventy-five, and a few months later, 150 people were involved. These participants were tasked with deciding in which sectors data would be gathered and with developing goals and indicators across these categories. They chose ten sectors: the Economy/Jobs, Civic Health, Environment, Public Health, Public Safety, Transportation, Housing, Arts/Culture/Leisure, Education, and Technology/Communications/Media. By early 1998, the group, working in subcommittees, turned its focus to narrowing the number of proposed indicators from around 150 down to a “meaningful” set of six to ten indicators per sector category. By the fall of 1998, the bulk of the data gathering and analysis was completed.

The project then turned to its second objective of information-sharing. The project released a draft of the report *Indicators of Progress, Change and Sustainability* at a Boston

Citizens Seminar¹ in mid-1999. The 250 attendees deliberated and gave feedback on the draft indicators report. Project organizers then distributed the draft report to 750 additional residents, public agency staff, academics, and civic and community leaders for review and comment. The project's director and other staff incorporated the combined feedback into the report, and released it in its final form at the 2000 Boston Citizens Seminar under the title *The Wisdom of Our Choices: Boston's Indicators of Progress, Change and Sustainability*. The project also released reports in 2002 and 2004, and will continue to publish them biennially until 2030, the four hundredth anniversary of the City of Boston.

The report is “designed to guide change and to measure progress along the way” (The Boston Foundation 2000, 9). They contain many city-wide figures, such as the number of religious institutions per 1,000 residents and the ratio of students to teachers in Boston's public schools, as well as some neighborhood-scale information, such as acres of open space per 1,000 residents by neighborhood.² As stated in the preface, the goals of the report are:

[1] to provide information to assist with community planning and problem-solving;

[2] to help business, government, community, and civic leaders find effective points of intervention and collaboration;

[3] to build relationships across traditional boundaries: sectors, races, neighborhoods, generations, levels of government, and between Boston and its metropolitan neighbors;

[4] to tell the story of Boston's successes and challenges in ways obscured by conventional measures, so that problems can be assessed within the context of our social, economic and environmental assets; and

¹ Boston Citizens Seminars, begun by Boston College in 1954, “bring together leaders from academia, business, government, labor and private non-profits for the purpose of discussing and debating some of the pressing issues facing the City of Boston and the region in which it is located. The Seminars serve the role of catalyst to bring about cooperative efforts to affect positive change and creative solutions to the many problems and opportunities facing the city and the region” (<http://www.bc.edu/schools/csom/cga/citizen>). Each seminar hosts between two hundred-fifty and three hundred people.

² For a complete list of “environment sector” and “sustainable development” indicators measured by the Boston Indicators Project see Appendix A.

[5] to market Boston not only to newcomers but to Bostonians, who with the help of the media, tend to see our glass as only half full when we compare ourselves with other cities and regions. (The Boston Foundation 2000, 11)

Also in that first report, the authors write, “Local groups and academic institutions have begun to actively use the indicators to guide and evaluate their work” and that “[p]roject participants have begun incorporating the indicators into their own work at the community and institutional levels” (The Boston Foundation 2000, 296).

It is unclear, however, whether and in what ways this is happening. The project spends considerable time, energy and financial resources researching, generating, and reporting the indicators, but does that information, once published, influence decisions or behavior? If so, by what mechanisms and at what levels is this occurring? Many studies posit that the benefits from indicators projects are a function of community members coming together to choose indicators and discuss ideas of “sustainability” or “quality of life.” It remains unclear, however, whether the information contained in such indicators influences decisions, actions, or policy in ways that improve performance on the indicator.

In this essay I assess the ways in which “democratization of data” or “information sharing” helps with community planning and problem-solving. Based on interviews with individuals involved in the BIP and decision/policy-makers in local organizations whose work might be influenced by the project, I examine how these actors are using, acting on, or incorporating into their work the information contained in the indicators to help in environmental planning and problem-solving. I focus on environmental quality (air and water quality, quality and abundance of green and natural areas, etc.), the environmental outcomes of people’s actions, and environmental policies. For example, the BIP reports that recycling rates in Massachusetts are declining and that Boston’s recycling rate ranks fourth from last among the 23 “inner core” communities (The Boston Foundation 2004). Is the City

of Boston therefore taking action to increase its recycling rates? Or as another example, the BIP website reports that emissions from the transportation sector significantly contribute to poor air quality, and that air quality is projected to get worse due to these emissions. What steps are being taken to address these issues, now that the Project has raised them?

I argue that people are not necessarily learning from or becoming informed by the indicators, as is hoped by indicators project organizers; rather, people use the indicators to tell stories to bolster their existing claims or desired policy interventions. None of the groups I interviewed increased or refocused their environmental efforts based on the indicators and none used the indicators in deciding what issues to pursue or how to craft policies based on the project's information-sharing component. Only one interviewee reported that the information contained in the indicators guides her group's work or shapes their agenda. Respondents did report other benefits from the project, however, suggesting that the project is worthwhile despite the observed lack of environmental improvements or decision-making.

In the remainder of this essay I elaborate on these results and show that they are consistent with (1) studies of the outcomes of indicators projects in other locations, (2) studies of the results of analogous "data democratization" efforts (disclosure, right-to-know, eco-labeling, etc.), and (3) studies of the role of information in behavior change and decision- and policy-making, specifically pro-environmental behavior or decisions.

INDICATORS ORIGINS: Defining the concept

The *indicators* concept is a fairly simple one, though over time, different researchers have defined it in different ways. Use of social indicators dates at least back to the 1830s, when social reformers wanted to understand the nature of epidemics in industrial cities. Using the social components of census data, they formulated causal models that linked disease to poverty and other social conditions by establishing geographical correlations. During the same decade, the temperance movement in the US used data from poorhouses and jails to attempt to prove that alcohol was the cause of poverty and crime, and statistics about the acreage of grain devoted to alcohol production to attempt show that production was economically wasteful (Cobb and Rixford 1998).

In the beginning of the twentieth century, it was primarily the government that collected measures of economic and social trends in the United States. Herbert Hoover advanced the gathering of national statistics both as Secretary of Commerce from 1921 to 1929 and as President from 1929 to 1933. Hoover's interest in indicators was to uncover major social problems by gathering and examining data, which he believed would be objective, rather relying on subjective opinion (Sawicki and Flynn 1996). As Secretary, Hoover commissioned a report entitled *Recent Economic Changes in the United States*, and during his presidency, he set up the Research Committee on Social Trends, headed by William Ogburn. The committee ultimately issued a 1,500 page report entitled *Recent Social Trends* in 1933. Unfortunately, neither volume offered much insight into how to understand or solve the problems brought on by the Great Depression, as was hoped, because the documents were descriptive rather than prescriptive. The relevance of the reports was further diminished as the nation's attention quickly turned to the effects of World War II, and thence to economic indicators. Prior to Hoover's unproductive venture

into social statistics, economic indicators were the preferred way to measure well-being, and they regained their favor during and after World War II; it was during this period, in fact, that government economists devised the Gross Domestic Product, one of the most popular and well-known indicators (Cobb and Rixford 1998).

In the 1960s and 1970s, the pendulum swung back again to social indicators, however, as politicians and social scientists began to perceive the limitations of economic indicators in providing a full and accurate picture of societal conditions. This awareness, coupled with the “success of economic indicators in influencing policy” (Innes 1990), led to a renewed interest in social indicators. Raymond Bauer, often referred to as the father of the social indicators movement, defined social indicators as “statistics, statistical series, and all other forms of evidence – that enable us to assess where we stand and are going with respect to our values and goals, and to evaluate specific programs and determine their impact” (1967, p. 1). A more precise, though controversial description appears in the U.S. Department of Health, Education and Welfare’s (USDHEW) *Toward a Social Report*:

“[an indicator is] a statistic of direct normative interest which facilitates concise, comprehensive, and balanced judgments about the conditions of major aspects of society. It is in all cases a direct measure of welfare and is subject to the interpretation that, if it changes in the ‘right’ direction, while other things remain equal, things have gotten better, or people are ‘better off’. Thus, statistics on the number of doctors or policemen could not be social indicators, whereas figures on health or crime rates could be” (p. 97, cited in Rossi and Gilmartin 1980, p. 16).

This definition drew criticism from indicators researchers Sheldon and Freeman (1970). They claimed that requiring social indicators to be immediately prescriptive and normative restricts their use. They argued that because a social indicator’s normative significance –

and therefore relevance to policy – is likely to change over time, an inductive approach is more appropriate: first gather descriptive data, then develop the categories that allow generalization and eventually work towards analysis of social change (Sheldon and Freeman 1970).

INDICATORS PROJECTS TODAY

Despite criticism from prominent indicators researchers, proponents of contemporary indicators projects largely subscribe to the view put forth by Bauer (1966) and the USDHEW (1969): indicators should describe observed societal problems or assets and should represent a normative stance on those issues. In order to best “describe” societal conditions, contemporary indicators projects consciously strive to use more measures than just economic to quantify the typically qualitative phenomena associated with community well-being or quality-of-life. The projects create and publish indicators for a combination of economic, environmental, public health and other social attributes, tending to focus on “sustainability indicators” or “quality of life indicators.”

Contemporary indicators projects grew out of changes in national social and urban policy in the 1980s and 1990s, in which responsibility and decision-making devolved from federal to state, and in turn to local officials (Wallis 1994). Partly as a byproduct of reduced Federal involvement, a host of non-governmental institutions and partnerships emerged to spearhead local urban social and development initiatives. These groups increasingly collaborate with each other and with local governments to develop comprehensive strategies for urban improvement that cut across traditionally separate functional specialties (e.g. various social services, crime prevention, education, job creation, housing, environmental protection). As local government and non-profit organizations became responsible for designing and carrying out these strategies, they sought improved local information on which to base decisions (Gahin and Paterson 2001).

Indicators project outcomes and pathways

The ultimate goal of any indicators project is to help improve the quality of life for community residents. Project supporters hope that this will come about as a result of one or a combination of three types of activities (Gahin 2001). First, they hope that the *process of indicator development* will bring together diverse constituent groups, foster communication between them, and spur them to collaborate, which, in turn, will build their capacity to do their work. In the process of indicator development, people in the community come together to discuss the indicators, identify shared goals and values, and define terms like “sustainability” (or in the case of Boston, “quality-of-life”) for their community. Communities come together in different ways to decide what should be measured, but typically, representatives of public and non-governmental groups, as well as unaffiliated citizens, attend multiple meetings or discussion groups, or submit written comments to reach agreement on a common set of indicators. This process fulfills a major principle of modern indicators projects: that a community should define its own values.

Second, by *publishing* measures of community performance, proponents of indicators projects hope to catch the attention of individuals, groups, or policy makers, who will then alter their behavior (in the case of individuals and groups) or introduce policies (in the case of regulators) that will help improve the condition measured by each indicator. To facilitate this outcome, projects distribute reports, present the indicators to the community, and try to get coverage of the indicators by the media. These first two pathways of indicator development and publishing represent the phases, as well as the types of outcomes from, indicators projects. Many indicators projects, including Boston’s, focus their work in cyclical phases depending on their reporting cycle; one year concentrating on bringing

parties together to communicate about indicators and priorities, and the next focusing on publishing indicator data.

Finally, indicators projects take *next steps*, such as ongoing forums based around the indicators, focusing on specific issues raised by the indicators, linking the indicators to action steps, engaging in efforts to get local government to adopt the indicators, and mobilizing or organizing citizen action (Gahin, Veleva, and Hart 2003; Gahin 2001).

The types of outcomes from indicators projects can be classified along at least two spectra: one is from the *intangible* to the *concrete* to the *measurable* (Gahin, Veleva, and Hart 2003; Gahin and Paterson 2001; Gahin 2001); second is the parallel spectrum of *political outcomes*, *policy outcomes*, or *change* (Besleme, Maser, and Silverstein 1999). Intangible or political outcomes – so called because they are the “potential building blocks for a political base” (Besleme, Maser, and Silverstein 1999, p. 3) – include building awareness of community characteristics and interests, increasing understanding of the linkages between issues, shaping perceptions, forming new coalitions or institutional relationships, and improving communication between constituencies. The ultimate goal here is to build social and organizational capital and to increase the community’s capacity to solve problems (Gahin, Veleva, and Hart 2003; Gahin 2001).

By contrast, concrete or policy outcomes are action-oriented steps taken to address an issue raised by indicators. Concrete outcomes include making decisions based on the information. The information could be incorporated into or guide a planning process. The information could lead to items being added to an agenda. The indicators may dictate what new programs or policies a group adopts or how a group decides to allocate resources, increasing funding to work on a pressing need highlighted by the indicators. Alteration of

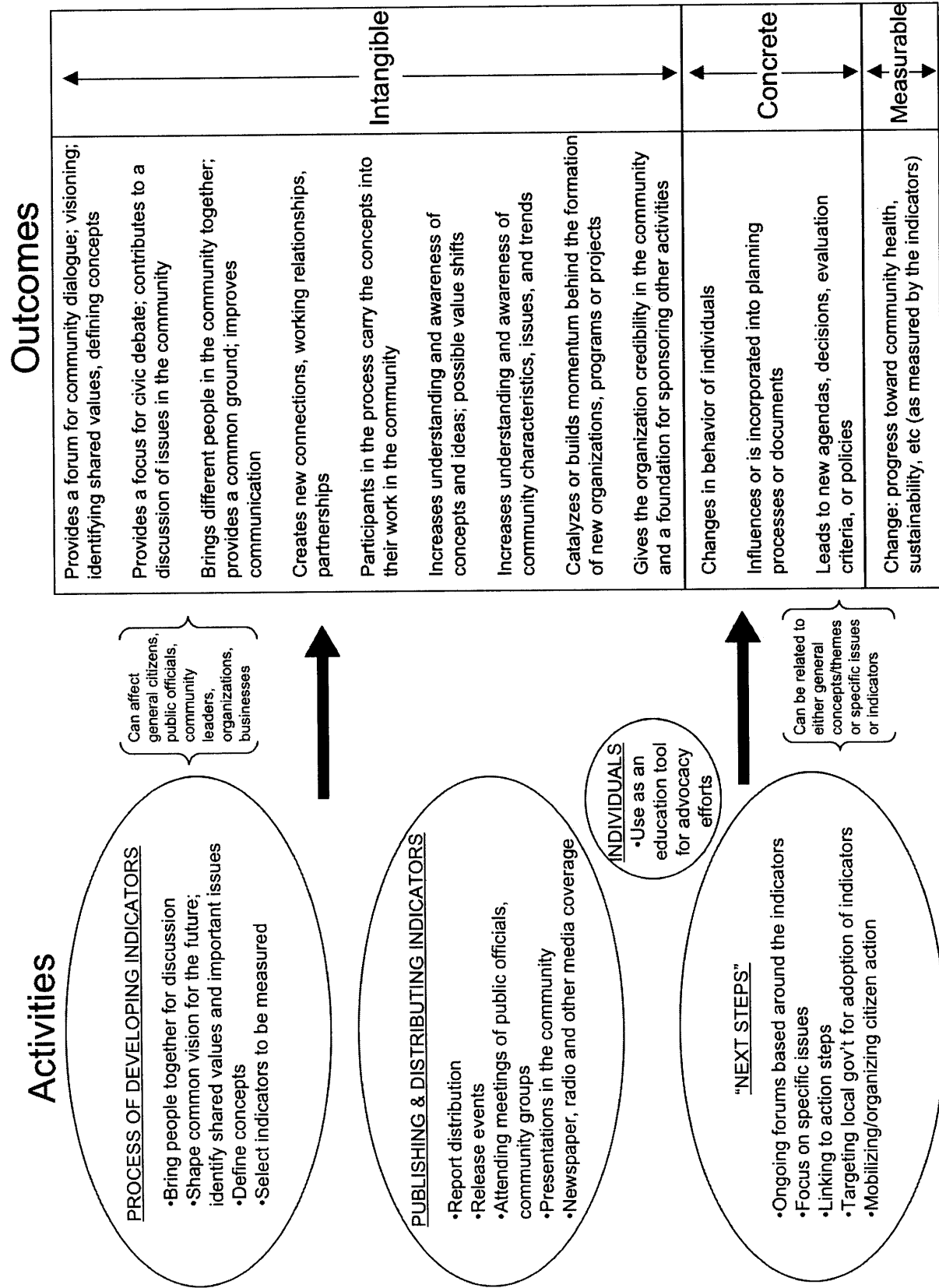


Figure 1. The spectrum of indicators projects outcomes. Gahin (2001) classifies indicators projects outcomes on a spectrum from intangible to concrete to measurable. (source: Gahin 2001)

individual behavior to meet needs highlighted by indicators is also a concrete outcome (Gahin, Veleva, and Hart 2003; Gahin 2001; Besleme, Maser, and Silverstein 1999).

Finally, all indicators projects ultimately strive for measurable outcomes or change. This refers to movement of the indicator in such a direction that it reflects improvement in the target state, whether it is quality of life, sustainability, or some other target state. Because establishing causal relationships between performance of the indicators and the indicators project itself is difficult, if not impossible, many researchers consider any change in conditions to be in this category, whether or not it is directly attributable to the indicators (Gahin, Veleva, and Hart 2003; Gahin 2001; Besleme, Maser, and Silverstein 1999).

Most outcomes are “intangible” and result from the indicator development phase

Given the popularity of indicators projects and the widely held high hopes that they will improve quality of life or achieve sustainability, one might expect that community indicators receive widespread attention, highlight a city’s most pressing problems, and encourage people to address them. Though researchers and practitioners observe some intangible or political outcomes and a few policy or concrete outcomes, it remains unclear whether and how the information captured in the indicators themselves may influence behavior or decisions in such a way as to improve performance (Brugmann 1997, 1997b; Rydin, Holman and Wolff 2003; Gahin, Veleva and Hart 2003; Gahin 2001; Besleme, Masur and Silverstein 1999; Cobb and Rixford 1998; Gahin and Paterson 2001).

Recent research shows that the bulk of benefits from indicators projects stems from the indicator formation phase and that those benefits are largely intangible or political in nature. Some policy or concrete outcomes have been documented, but as of yet, very little measurable change has been found to result from the projects. Nor have researchers determined what types of outcomes result from publishing the indicators themselves and how these outcomes arise (Gahin, Veleva, and Hart 2003; Gahin 2001) (Besleme, Maser, and Silverstein 1999).

For example, Gahin (2001) examines the outcomes from indicators projects in five different communities across the nation: Sustainable Seattle – *Indicators of a Sustainable Community*, Sierra Business Council – *Sierra Nevada Wealth Index*, Vital Communities of the Upper (Connecticut River) Valley – *Valley Vital Signs*, Boulder County Civic Forum – *Quality of Life in Boulder County Community*, and Sustainable San Mateo County – *Indicators for a Sustainable San Mateo County*. She concludes that, “[a]s might be expected,

the majority of outcomes found through the case study research lie in the intangible range of the spectrum... Concrete results were less frequent... Actual change as measured by the indicator, as a result of the influence of the indicator, was found in only a single isolated case” (p.142).

Commonly cited intangible outcomes include raised awareness of concepts like sustainability and of community issues, increased community dialogue, formation of new personal and professional relationships, increased capacity and credibility of organizations, outreach, and coverage by the media (though most indicators organizers report difficulty with getting press attention between printings). Awareness was raised mostly of general concepts or general information about the community, rather than specific issues. In many cases, people felt the indicators provided a “broad, holistic perspective and increased understanding of the linkages between issues” (Gahin 2001, p. 144). In very few instances did the indicators bring any new issues to the forefront. Many people thought that the indicators had not reached enough people, and had only affected a small group who mostly already knew about the major issues.

The indicators had direct impacts on decision-making only in isolated cases, and this occurred most often when an individual involved in the indicator development process brought that influence into their work as a public official, business leader, or non-profit leader. Aside from a few cases, “the indicators have had little or no impact” (Gahin 2001, p. 146). In many of the cases, people thought the indicators “might” be influencing local activities, but were not able to provide concrete examples or cite evidence that this was happening. For all case studies, responses were mixed as to how much people thought the indicators projects were helping to achieve the overall goals of community sustainability or

quality of life. “Program administrators had more positive responses than other respondents” (Gahin 2001, p. 151), whose replies were mixed.

In one or two instances, Gahin (2001) found that the influence of the indicators led to changes in resource allocation. In Boulder County, for example, the indicators were used to determine funding priorities for grant making by the Community Foundation and other philanthropic donors (but had little or no effect on public decisions). In the Sierra Region, the indicators “bolstered support for funding a grants and support program for the arts council, the children’s council, the women’s services organization, senior services, and other programs” (p. 84).

In three of the case studies, the indicators projects catalyzed the formation of new groups or programs. In the Upper Connecticut River Valley, the process of developing the indicators led different interest groups advocating for better trails in the region to come together to form a coalition called the Trails Alliance. In Boulder County, the visioning and community involvement process led to the creation of the “Neighborhood Initiatives” program, designed to help neighborhood organizations and provide them with support, as well as indirectly helping to form partnerships to encourage residents to invest in alternative energy sources and a warehouse for recycled building supplies. And in Seattle, the advocacy of a participant in the indicators process led to the formation of a new division, the Office of Sustainability and the Environment, in the City’s government (Gahin 2001).

And in three of the cases, the indicators influenced or were incorporated into planning processes. In one case they “validated the need for a county visioning process”; in another, the indicators indirectly influenced Seattle’s Comprehensive Plan, as participants in the Sustainable Seattle indicators process also worked on the comprehensive plan; and in the

third case, the indicators provided a “conceptual guide and model” for a visioning process (Gahin 2001, 148).

The indicators projects of Jacksonville, Florida (Quality of Life for Jacksonville: Indicators for Progress, QLJIP) and the Truckee Meadows region of Nevada (Truckee Meadows Tomorrow, TMT) are considered examples of outstanding projects in the indicators field, producing high-quality information and achieving considerable public attention and credibility. Yet researchers have found that these, too, have produced benefits primarily toward the intangible or political end of the spectrum. Some concrete outcomes were observed, but not much measurable change (Besleme, Maser, and Silverstein 1999).

In Jacksonville, the indicators process “brings diverse interests to the table to forge and commit to a clearly articulated and measurable agenda for the community” (Besleme, Maser, and Silverstein 1999, p. 18). The indicator process in Truckee Meadows “functioned as a vehicle for generating the political support necessary to ensure that selected indicators would represent the diverse views of the community” (p. 35). The TMT indicators process also highlighted the need and provided a basis for a community visioning process to be undertaken by TMT.

Another political or intangible outcome of Jacksonville’s project may be increased public awareness: Jacksonville’s major daily newspaper, the *Florida Times-Union*, and the *Jacksonville Business Journal* have carried articles featuring quotes from the project organizers and/or used data, graphics, reports, and information in their coverage of local issues. However, the study authors do not cite specific examples (Besleme, Maser, and Silverstein 1999).

Some concrete outcomes also resulted from these projects, though it is still impossible in many cases to link these concrete outcomes to measurable change. The United

Way of Northeast Florida, a funder of the Jacksonville project, as well as “many local human-services agencies” (Besleme, Masur and Silverstein 1999, p. 19) reports that they use the indicators to guide funding allocations. The Jacksonville Chamber of Commerce, another major sponsor of the project, has also responded to conditions described by the indicators in its annual work plan. For example, they established a stewardship group to improve water quality in the St. Johns River, and attracted a government grant to involve citizens in cleaning up the river. However, “although the results are not scientifically measurable, the grant *seems* to have had the desired effect on *public knowledge and attitudes* about the river” (p. 20, emphasis added).

QLJIP was indirectly responsible for a major public education reform process in Jacksonville. The Jacksonville Community Council, Inc. (JCCI), the organization in charge of QLJIP, conducted a study on improving the quality of public education. JCCI was concerned by the continued negative trend in the education indicators in the face of the high priority placed on education by the community. JCCI also undertook activities to curb teen pregnancy and to limit the proliferation of billboards. In all these cases, the indicators helped to focus the attention of the group responsible for the indicators project onto specific issues they perceived to be important. JCCI then carried out specific efforts, usually the release of reports followed by lobbying state and local governments, to target that issue (Besleme, Maser, and Silverstein 1999).

The authors of the Jacksonville and Truckee Meadows study cite few examples of concrete outcomes or measurable change. In the Jacksonville case, the only outcomes they present for this project are intangible, political or policy changes, and they do not tie any movement of the indicators to change brought on by the indicators project. In the Truckee Meadows case, the link is more explicit. TMT received a large gift (\$500,000) from the

Washoe Medical System (an early founder and supporter of the project), which TMT regrants to collaborative projects they believe will demonstrably improve performance on quality of life indicators. These grants have led to some measurable change, and some perceptions of positive results, though the change was not measured in terms of the indicators. For example, as a direct result of a grant to the Affordable Housing Resource council to train members in tax-exempt financing, over 260 affordable units were built using the financing method in 1998, with 400 projected for the following year. In the areas of youth behavior and educational success, people report positive outcomes, but these are not supported with data (Besleme, Maser, and Silverstein 1999).

A few important points are worth noting in these two cases that are likely responsible for many of the observed concrete outcomes. First, in Truckee Meadows, the indicators project was an outgrowth of a governmental regional planning process as a way to broadly consider quality of life issues. The indicators, therefore, explicitly inform the Truckee Meadows Regional Planning Agency (TMRPA) and the policies within the Regional Plan. Beginning in 1994 the Planning Commission (part of the TMRPA) must prepare a memo for every significant development proposal detailing the probable impact on quality of life indicators. This explicit link to informing policy, in essence an institutionalized concrete outcome, is likely to increase the project's impacts.

In addition, one of TMT's endeavors in particular promotes action on the indicators. TMT has initiated an "Adopt-an-Indicator" program, by which corporations, nonprofit organizations, and individuals commit to devoting resources to improve the performance of a particular indicator or set of indicators. As of 1999, over a dozen businesses and organizations had adopted indicators. This commitment to providing resources guarantees that action at some level will be taken based on the indicators. Having made the

commitment, TMT can hold businesses and organizations to follow through, and if they cannot, TMT will seek a commitment from another source.

Finally, in the Jacksonville case, the project is run in close partnership with two influential, active, and resource-rich organizations: the Jacksonville Chamber of Commerce and the United Way of Northeast Florida. The relationship to these active and influential groups, like TMT's structural relationship to the regional planning agency, likely increases the impacts of the project.

THE BOSTON STORY

Though the projects reviewed above have led to some positive intangible outcomes and may even have contributed to concrete change in the communities in which they operate, these outcomes are mostly associated with the initial indicator formation phase of the projects, or with subsequent activities taken on by the indicators project organizing entity itself. Because extensive time and resources are spent researching, generating, and reporting the indicators, it is worthwhile to ask how the indicators are being used. Do groups use them to “guide and evaluate” their work, as written in the first Boston Indicators Project Report? Do indicators “guide change,” as is hoped? If so, who is using them and in what ways?

To get a sense of whether and how the indicators in the Boston Indicators Project reports are used to support environmental efforts in and around Boston, I conducted open-ended interviews with the director of the BIP and several leaders of non-profit organizations and governmental entities in the Boston area that are concerned with the environment.³ Based on studies of other indicators projects, I expected people to report that the Boston Indicators Project has had mostly intangible benefits, such as building relationships between community groups or governmental agencies, aligning their goals, perhaps initiating dialogue between them, and building their capacity. I anticipated that the bulk of these outcomes would result from the process of indicator development, as has been documented in other indicators projects, rather than from the publication of the indicators. To maximize the likelihood of detecting influence, however, I interviewed people who had been involved

³ For a complete list of interviewees and their titles, please see Appendix B.

in the Boston Indicators Project and so would be more likely to have been influenced by the indicators.⁴

How do people use the indicators?

People's responses were decidedly mixed as to how the indicators had or had not influenced their work. The spectrum of responses ranged from an organization not using the indicators at all to an organization setting their agenda based solely the indicators. The most common response was that people use the indicators to help substantiate a program or bolster a report. In other words, the indicators do not shift a group's attention to new issues or play a part in setting their agenda. Rather, people use the indicators to gain support for their existing work.

For example, Dan Ruben, Executive Director of the Coalition for Environmentally Responsible Conventions, used the indicators in a concept paper to support his notion of enhancing Greater Boston's status as a green convention and tourism destination (Ruben 2005). As a resident of the region, he already knew that Boston has many attributes that could make that effort successful, such as access to nature, outdoor recreation, local organic food, and good public transit. He used facts and figures from the indicators report and other sources to support his efforts to form a coalition to promote green conventions and tourism. He was successful in forming this coalition, so it is possible that the indicators lent his position credibility.

Valerie Burns of The Boston Natural Areas Network reports a similar use for the indicators. The BNAN's mission is to preserve, protect, increase, and expand access to open

⁴ All of the people I interviewed had direct experience with the Boston Indicators Project. All but one respondent participated in the 2004 Environment Sector Convening, held in preparation for the release of the report covering the 2002-2004 period, but she had attended more than one "What's Next" seminar.

space in Boston, and Burns reports that they have used data from the indicators reports to support or bolster their existing goals in reports or proposals. Lois Adams of the EPA uses the indicators as a source of data to validate “why the resources she is requesting should go to this city, over city X, because this city values it, this city is tracking it, and sometimes in terms of Federal and State agencies, being able to tell the story is very much a part of how you justify your budget.”

Those who did not themselves consult or use the indicators assumed that other groups were using the indicators as a resource for writing grants, though they could not provide examples of this. Though she did not report specific instances of having used the indicators, Rosanne Foley, coordinator of the Dorchester Environmental Health Coalition (DEHC), felt that a potential use of the indicators reports would be for non-profits as a resource for information with which to write grant proposals. Foley said that given her organizational focus, she would more likely go directly to the City’s Public Health Department for pertinent information, rather than the indicators website.

Bryan Glascock, the Director of Boston’s Environment Department believes that citizens and other non-profit groups are, in fact, using the indicators to inform themselves of issues facing the city and the region, but could not cite any specific examples. He thought that these constituent groups were then raising issues to the city, and that in that way the indicators are having an indirect impact on the City’s decision making. Given the responses from the other groups interviewed, however, this is not likely the case. Groups may indeed be raising issues to the city, but likely they have used the indicators similarly to those groups interviewed here: to support their claims and goals, rather than to identify and become informed of new issues. Glascock’s comment also reveals how, at least in part, the City

prioritizes its work: by the raising of issues by constituent groups, not by consulting a set of indicators.

I received responses on both ends of the spectrum of indicator use. For one group, an indicator was the primary piece of information used to set an agenda, while for another, the indicators were not used at all nor perceived as useful. In the one instance an organization had entirely shifted its focus based on the condition the indicators conveyed, the operating model of the organization is to explicitly seek out issues facing Boston. This is therefore an exceptional case. Sarah Sherblom, Assistant Director of the GreenLight Fund, reported that the issues their work has focused on primarily stem from information contained in the indicators. The GreenLight Fund is a non-profit organization that matches problem areas in Boston with programs that have been successful in other cities, and which they think, for various reasons, are likely to be successful in Boston. To aid in starting a version of the program they find elsewhere in Boston, GreenLight provides and seeks outside funding, recruits staff and board members, and provides start-up planning, community outreach and early-stage operational management and support. Though the GreenLight Fund is not an environmental organization (they are dedicated to supporting organizations that address urban issues affecting primarily low-income families and children, such as education, youth development, workforce development, and healthcare), one could easily envision a similar model for environmental issues.

The other case in which the indicators identified a trend that was subsequently addressed by a group was at the EPA, but it was not within my focus of environmental preservation or remediation. The indicators showed that there is a disparity between the numbers of minorities in leadership positions in the environmental arena versus the number of young minorities who were working in smaller, local environmental organizations.

Consequently the EPA began to work on bridging that gap, attempting to broaden the diversity of their intern program, so that ultimately minorities would have a better chance at a position at the EPA.

On the other hand, Meagan Amundsen, a policy analyst at the Environmental League of Massachusetts (ELM), reports that the ELM does not use the BIP's indicators in its work at all. Further, she was not able to recall any larger environmental organizations participating in the project, and she does not believe that the larger environmental community is using the indicators, though, she adds, there may be some exceptions. In fact, ELM is preparing its own set of environmental indicators specific to their work. An indicator set designed by an organization or governmental entity to measure their own performance and support their own work is more likely to influence and be incorporated into that group's work (Metzenbaum 2002). This is due both to characteristics of the data set (it is specific to their interests), and because groups tend to prefer internal sources of information.⁵ Furthermore, a group would only create indicators or performance measures specialized to its own work if it planned to use that data to gauge performance and alter its course if necessary to improve performance.

Though my conversations focused on educating concrete or measurable outcomes, respondents did report a common intangible outcome: the meetings and reports of the indicators project helped them to step back, see the big picture, see how things are interconnected with each other, and be reminded of the fact that each person is working toward the shared goal of a better quality of life. Lois Adams, of the Environmental

⁵ Kingdon (1989, 1995) and Rich and Oh (2000) write, for example, that decision-makers and policymakers, when they do seek out new information in making decisions, prefer sources of information that are internal to their agency or branch of government. Among members of Congress, for instance, the most commonly cited source of information is the either the *Congressional Record* or other committee materials pertinent to the decision at hand (Kingdon 1989).

Protection Agency's (EPA) New England Regional division, says that the indicators project, in its beginning stages as a project of Sustainable Boston, helped to broach environmental issues and the issue of sustainable development in Boston at a time when it was not a mainstream concept. She believes that the project also helped unite the various organizations at the City level working on environmental issues, with a long-ranging, holistic vision for what the city should look like in the future. Similarly, Rosanne Foley, coordinator of the DEHC and Valerie Burns of BNAN, both said that the project reminds them that the work of their individual organization is in the name of a higher goal, namely sustainability or quality of life. For one respondent, Lois Adams, the indicators project verifies that her work is focusing on the right issues. The EPA has been involved with the Charles River cleanup and efforts to decrease lead poisoning and asthma rates, conditions on which the indicators report. Seeing these things measured in indicators, and that the indicators reflect improvement, she says, "is an affirmation that you're working on the right issues and that it's important to the City that these issues be worked on."

It is unclear, however, what, if any, concrete (policy) outcomes or measurable change could be attributable either to thinking with sustainability in mind, or to a group's work being supported by the indicators. The EPA gathers its own information as part of the Clean Charles 2005 initiative, with which it creates its own Report Card for the Charles River. The EPA's performance measurements and its Charles River Report Card were part of a successful cleanup effort, at least until 1999 (Metzenbaum 2002).⁶ However, because the EPA gathers its own data and has its own performance measurement system, one would not expect the EPA to consult the BIP reports. In fact, the relationship is the inverse: BIP

⁶ The Charles River steadily earned a better grade between 1995 and 1999, after which time improvement has not been steady.

bases their indicator of “swimmable days and violations of safe swimming standards in Boston’s rivers and harbor” on data from the EPA (The Boston Foundation 2000, 2002, 2004). The City of Boston also provides data for the BIP, which may explain at least some of why the Environment Department reports not to use the indicators to become informed of new issues or set priorities.

No one reported that the indicators helped set priorities in their work or put issues on their agenda. In fact, when I suggested in some interviews the possibility of consulting the indicators to determine the most pressing problems and then target them, most respondents said that they had not considered this use. The Vice President of Programs at The Boston Foundation, where the BIP is based, said that such a linear description (“the indicator says this, therefore we do that”) is not an accurate interpretation of how they use the information. She said that the foundation had been making grants for twenty-five to thirty years, and that they set priorities based on important issues that arise through that process.

The Boston Indicators Project and The Boston Foundation may be focusing more at this point on the intangible or political outcomes of the project, for example, on helping people to “see the big picture” or how things are “interconnected,” than on the concrete, policy, or measurable outcomes. Yet, another intangible outcome, the awareness-building function of indicators, was hard to detect, as the indicators were difficult to find in news media sources; the project seems to be featured by name only about once a year in Boston’s two largest papers, *The Boston Globe* and *The Boston Herald*.

Charlotte Kahn, the director of the BIP, explained that the project is made up of two equal parts: a “data democratization” effort, and an effort to define a “Civic Agenda”. This “Civic Agenda” sets a vision for the future of Boston, and is organized under four broad rubrics: A Dynamic and Open Civic Culture, World Class Human Resources, 21st Century

Jobs and Economic Strategies, and 21st Century Infrastructure. The Civic Agenda has adopted milestones in each sector so as to judge progress towards the goals. Neither the Civic Agenda nor the BIP reports include action steps for the environmental indicators. While not discounting the importance of visioning or goal setting, the most successful indicators programs are ones that are linked to specific action steps for making concrete, measurable change.

The Civic Agenda contains only goals, without attention to who specifically should be targeting those goals and how. The project includes quarterly “What’s Next” seminars, designed to keep dialogue open among individuals, groups and project organizers. These meetings may be designed to elicit these action steps, but this is not made explicit either on the project’s website, in printed materials, or in conversation with the director. In addition, they are missing a necessary step in determining how to solve problems: determining the cause of the problem and linking it to human action. In fact, “difficult conditions become problems only when people come to see them as amenable to human action. Until then, difficulties remain embedded in the realm of nature, accident, and fate – a realm where there is no choice about what happens to us” (Stone 1989, p. 281). If The Boston Indicators Project is truly concerned with making progress on their goals, and getting the issues onto their own and others’ agendas, creating “causal ideas” (Stone 1989, p. 282) will be a crucial step. An important future area of exploration of the Boston Indicators Project is to examine the effects and outcomes of the What’s Next sessions.

One concrete outcome has stemmed directly from the Boston Indicators Project. Kahn and others at the BIP and TBF have identified and begun to target one problem: the competitiveness of the Boston region. The BIP has tied this issue to the business community, and has started, in conjunction with the Federal Reserve Bank and Sovereign

Bank, the John Laware Leadership forum.⁷ This is an example of a concrete outcome from a next step activity – the formation of a new ongoing event, but again – it is unclear whether any measurable change can be attributed to this new forum.

Kahn was unable to confirm whether the indicators have informed people not directly involved in the indicators project. Kahn feels strongly, though, that the indicators website is successful in its role as a “one-stop shop” for information for those seeking it. She reported that through the use of counters on the Boston Indicators website, they know that usage of the indicators website is increasing, and people are spending more time on each page.⁸ These facts indicate to her that people are using the information.

Kahn also shared the results of a 2005 Boston Foundation survey of their grantees. Of 268 TBF grantees, a population one might expect to be most aware of the details of the Boston Indicators Project, 72% knew of it. Of the 72% that were aware of the project, 65% (or about 129 of the 268 grantees) visit the Boston Indicators Project website once every few months or more. About 10% visit monthly and 8% visit a few times a month. About 10% had never visited the site. The grantees rated the usefulness of the data and information in the Boston Indicators reports and website a 4.9 out of 7 (where 1 = not at all useful and 7= very useful). They similarly rated the success of framing the issues facing the greater Boston community a 4.9 on a scale of 1 to 7. Thirty-six percent of respondents rated the project as very successful in framing the issues (rating it a 6 or 7), and only 5% rated the project as not at all successful (rating it a 1 or 2) (The Boston Foundation 2005).⁹

⁷ The John Laware Leadership Forum is a series of conversations among business and civic leaders about the competitive challenges facing Greater Boston and the Commonwealth of Massachusetts. It “stimulates cross-sectoral dialogue, and aims to align the region’s civic, business, government and community leadership on shared goals and strategies” (The Boston Foundation 2005).

⁸ These are figures internal to TBF, for which I have no documentation.

⁹ Though we do not know whether grantees subsequently act on the information once viewing it,

Though these results appear to be positive, there is much the survey does not show. For example the survey results do not indicate the reason the grantees visited the site, nor whether the grantees act on the information from the website in making decisions or determining a course of action. Nor do the terms “usefulness” of the data and “framing” of the issues reveal much about whether the grantees act on the information or incorporate it into their planning or decision-making, though framing is an important step in drawing attention to issues. Nonetheless, a respondent may rate the indicators highly on both usefulness and successful framing if the information is simply interesting to him or her, without necessarily having used that information. It is also important to consider the possibility that TBF grantees may want to appear informed so as to maintain their funding.

While much remains unknown about the precise use of indicators in supporting environmental efforts in the Boston region, these interviews provide some clarity about the ways indicators are and are not being used by environmental groups. One frequent general use of the indicators is to support political claims, such as requests for funding or creation of a new program. Groups generally do not use the information captured in the Boston Indicators to become informed of new issues or as a basis upon which to focus on one issue over another in their work.

framing issues is a crucial step in drawing attention to them and in suggesting how issues should be defined (and therefore solved). This issue of framing will be taken up in a subsequent section of this essay.

CONTRASTING THEORIES OF INFORMATION USE

The assumption that people (individuals both as independent actors and as leaders of groups) will shape agendas, set priorities, or otherwise base their actions on information contained in the indicators is based on a theory that is incorrect for two reasons. First, the underlying theory inaccurately describes the role of information in shaping individual decisions and behavior. Moreover, this theory does not apply to group decision-making and behavior determination, though groups constitute a significant portion of the target audience for the indicators.

Rational-behavior theory: how information is thought to lead to change

Traditional theories of environmental behavior determination and decision-making are based on a rational, linear model: providing information leads to knowledge, which in turn leads to environmental awareness and concern, and therefore to pro-environmental behavior. The long-standing assumption has been that educating people about environmental issues automatically results in more pro-environmental behavior (Kollmuss and Agyeman 2002). The idea is, in other words, that “information, knowledge, concern, and awareness – all of which can be fostered by educational efforts – will lead to behavior change” (Finger 1994, 141).

Personal, organizational, and political decision-making is most often conceptualized in the same way. The assumption is that human beings are rational actors, evaluating and choosing among all available alternatives so as to maximize the “utility” of the expected outcome. Rational actors seek information from a variety of sources in an attempt to reduce the uncertainty of the outcomes of their choices, and to provide a basis for choosing among alternatives (Stone 2002; Rich and Oh 2000). The model has its roots in microeconomic

theory, but some scholars argue that “the economic approach is one that is applicable to all human behavior” (Becker 1986, p. 112, cited in Jones 1994, p. 31).

Rational actor theories further assume that “all available information about possible consequences of alternative options will be gathered from a variety of sources so that individual decision-makers are completely informed of decision situations” (Simon 1987 cited in Rich and Oh 2000, p. 176). Rational actor theories of behavior and decision-making also assume “automatic linkage” (Rich and Oh 2000, 177): that the acquisition of information automatically leads to its use in a proportional relationship (Rich and Oh 2000; Jones and Baumgartner 2005). Simply put, the theories assume that people seek out all the information they possibly can, from every source possible, and that each piece of information acquired is not only used, but also equally weighted in making a decision.

A practical extension of the rational actor theory is that providing information about the conditions of a place will lead private citizens or policy actors to change their perceptions and/or behavior to improve those conditions (Innes 1990). The initial popularity of social indicators in the late 1960s came at a time when social scientists nearly exclusively applied the positivist or scientific model of knowledge use in policy, in which policy-makers use formal information (in the form of statistics or data) to aid decisions, much like a scientist tests hypotheses on the basis of evidence (Innes 1990). “The basic idea [behind social indicators] was that if governments regularly reported on social conditions, these conditions would not only have more salience in policy making, but policies would be more accurately designed to address problems and more quickly responsive to social change” (Innes 1990, p. 7). The rational actor theory, if only by default, remains the dominant assumption in all of the major social science disciplines (Innes 1990; Jones 1994). There is,

as of yet, no “convincing interconnected body of theory that can challenge rational choice as an integrating perspective in social science” (Jones 1994, p. 12).

Based on rational actor theories, program and policy planners largely assume that by educating people about an issue, people will alter their behavior. Rational theories translate into educational campaigns

...to get people to stop littering and smoking; to use seat belts and drive safely; to conserve energy and join carpools; to limit population growth, prevent forest fires, finish high school, exercise, recycle trash, and donate their organs. To aid individuals in making informed choices, we have imposed mandatory disclosure requirements on people and institutions who might otherwise conceal information. Thus, we have food labels, cigarette warnings, fiber content labels, financial disclosure rules for issuers of stock, “plain English” requirements for insurance policies, “truth-in-lending” requirements for banks and other lenders, fuel-economy ratings of cars, energy-efficiency ratings of appliances, tire grading, octane rating, and milk and meat grading. (Stone 2002, p. 307)

The rational actor assumption applies equally to programs directed at mitigating environmental problems. The belief is, therefore, that if the public is informed about an environmental issue, such as global warming or a local water shortage, they will alter their behavior and make choices so as to remedy the problem or to be more environmentally sensitive. Most programs attempting to foster pro-environmental behavior are thus information-intensive, in the form of booklets, info-sessions, workshops, posters and traditional advertising (McKenzie-Mohr 2000b; Ester and Winett 1982).

These behavioral theories underpin community “right-to-know” programs about hazardous substances, food and drug labeling, and eco-labeling. Archon Fung and Dara

O'Rourke (2000), for example, claim that publicizing information about industrial pollution via the Toxics Release Inventory (TRI) has prompted industries to reduce their emissions. In 1996, the United States Environmental Protection Agency (EPA), the specialty pesticide industry, environmental groups, and state and local governments founded the Consumer Labeling Initiative (CLI). This initiative is designed to “foster pollution prevention, empower consumer choice, and improve consumer understanding by presenting clear, consistent, and useful safe use, environmental, and health information on household consumer product labels” (United States Environmental Protection Agency 1996, p. 1).

These behavioral and information-based theories are one of the bases upon which most communities undertake indicators projects. “Democratization of data” is the common goal of all twenty-six projects in the National Neighborhood Indicators Partnership (National Neighborhood Indicators Partnership n.d.). The directors and supporters of these projects believe that “indicators can serve to inform the public and policymakers by providing statistical information about a condition that might otherwise be overlooked,” and that “indicators can influence policy outcomes by expanding awareness and focusing attention” (Cobb and Rixford 1998, 2).

Reports and websites of many community indicators projects, including the Boston Indicators Project, confirm that indicators projects strive to share data with the intent of encouraging behaviors, decisions, or policies that improve community conditions: the Boston Indicators Project’s first goal is to “provide information to assist with community planning and problem-solving” (The Boston Foundation 2000, 11); Sustainable Seattle strives to “enable citizens to be better informed and empowered to improve their neighborhoods and communities” (Sustainable Seattle 2005); and The West Oakland Community Indicators Project claims that, “Through the use of compelling neighborhood

information, local communities can better articulate their concerns and understand challenges, while also gaining the tools they need to influence and coordinate with wider planning efforts” (Pacific Institute for Studies in Development 2002).

A “political” model of information use

In recent years, scholars have begun to criticize rational-behavior theory – that knowledge leads to awareness, and awareness to behavior change or to a particular decision. Many researchers have begun to observe and document a disconnect between information and awareness, as well as a gap between awareness and behavior. Studies conducted worldwide over the past two decades show that even though the majority of citizens consider environmental harms among the most serious problems confronting society today, most people do not display the corresponding pro-environmental behavior (Finger 1994; Kollmuss and Agyeman 2002; McKenzie-Mohr 2000b).

A 1992 study of the Swiss population (Finger 1994) showed that “there is indeed little causal relationship between environmental value orientations, awareness, concern, information and knowledge acquisition on the one hand, and behavior on the other” (p. 158). A 2006 Gallup poll found that 62% of Americans believe that the Government is doing too little to protect the environment. In 2004, 49% of people living in the United States, 67% in Canada, and 67% in Great Britain said that protecting the environment should be given priority “even at the risk of curbing economic growth”. Fifty-eight percent of Americans, 59% of Canadians, and 52% of Britons believed that environmental conditions in their country were “getting worse” rather than “getting better,” perceptions which are supported by reports such as the Millennium Ecosystem Assessment and several global and national-level United Nations Environment Programme reports (Millennium Ecosystem Assessment

2005; United Nations Environment Programme 2002; United Nations Environment Programme and GRID-Arendal 2006).

Despite these professed concerns and the environmental reality, only 14% of Americans, 18% of Canadians, and 12% of Britons considered themselves active participants in the environmental movement. On the other hand, considerably more people acknowledged that they were “sympathetic, but not active” in the environmental movement: 47% of Americans, 48% of Canadians, and 59% of Britons (Winseman 2004). In the face of the actual and perceived persistence and worsening of environmental problems, fostering pro-environmental behavior and decision-making, especially given an increasing population, deserves much effort and attention.

Recent behavioral literature has shed light on the many conflicting and competing factors that shape decisions and actions, particularly pro-environmental ones. Information or knowledge is certainly among these factors, but “the possession of environmental knowledge is a necessary but not sufficient condition” for pro-environmental behavior (Laurian 2003, p. 258). Behavior is extremely complex; many factors in addition to information or knowledge figure into changing behavior or influencing a decision. Demographic, institutional, economic, social and cultural factors all influence a person’s decision to act pro-environmentally. Several internal factors also affect pro-environmental behavior, such as motivation, environmental knowledge, values, attitudes, environmental awareness, emotional involvement, responsibility and priorities (Kollmuss and Agyeman 2002). Stone (2002) writes that, “we rely on habit, stereotypes, and cultural norms for the vast majority of decisions...In our various social and political roles, we act largely according to prior attitudes and beliefs rather than new information” (p. 314). So many factors influence a person’s behavior or decisions that it is nearly impossible to predict how

a person will act or decide a particular issue, or to determine precisely the impact of information on that decision or action.

We do know, however, that information or knowledge plays only a small part. *Antecedent* strategies, such as info-sessions, workshops, posters and traditional advertising, are the most common form of interventions because they tend to be easier to implement than *consequence* strategies, though they have been found to be quite ineffective. *Consequence* strategies on the other hand, such as feedback, rewards, fines, or penalties, occur after the target behavior and are intended to increase or decrease that behavior. Consequence strategies have been found to be more effective than information provision or information intensive strategies alone in promoting pro-environmental behaviors (Ester and Winett 1982). Some studies have shown that “providing consumers with frequent feedback on their energy consumption and rewarding them for conserving energy is far more effective than giving consumers information on how to reduce energy consumption or prompting them to conserve” (Ester and Winett 1982, p. 203).

Studies have found, for example, that “energy-related information is seldom sufficient to increase energy-conserving behaviors” (Geller 1992). Knowing of the environmental risks that continue if one does not recycle, or even believing in the importance of recycling is not enough to induce recycling (DeYoung 1989). Some people know that their behavior contributes to degradation of the environment, yet continue those behaviors. Some people, on the other hand, will act pro-environmentally without necessarily needing to know the reasons for doing so or the consequences of their actions. The fact that people know the consequences of their actions does not mean that they will automatically behave or make choices so as to mitigate those consequences. A linear, rational model – in

which information automatically leads to awareness, and awareness automatically to behavior change – does not adequately describe these cases.

The rational-behavior model not only inaccurately describes individual behavior, it does not apply to political or group decision making either, for several reasons. First, individuals, as part of groups, make different decisions and act differently than individuals acting purely in their own self-interest, as the rational-behavioral model predicts. Political decisions are collective. Policy decisions “are not made by abstract people, but by people in social roles and organizations, addressing audiences of people in social roles and organizations...” (Stone 2002, p. 28). Therefore, to view people only as individuals overlooks facets of their motivation and action essential to an understanding of policy (Stone 2002).

Furthermore, remember that rational actors seek out all the information they possibly can, from every source possible, and that each piece of information acquired is not only used, but also equally weighted in making a decision. In reality, however, “policymakers often selectively acquire information from specific sources...and use only the information that can validate or confirm their policy positions” (Rich and Oh 2000, p. 174). Furthermore, decision-makers and policymakers tend not to seek out new information when making decisions, and if they do, they prefer internal sources of information (i.e., from within their agency or branch of government) (Kingdon 1989; Rich and Oh 2000). Finally, information is processed disproportionately; in other words, decision-makers and policymakers do not treat each piece of information equally in making their decisions (Jones 1994; Jones and Baumgartner 2005; Kingdon 1989; March 1994; Rich and Oh 2000; Kingdon 1995).

Kingdon (1989), for example, finds that members of Congress avoid extended searches for information unless they face some sort of “problem” in making a decision. A

member of Congress will not search for information if there is not a conflict in her constituency or among her party on the issue; if she has “an intense, fixed opinion on the issue” (p. 230); or if she has an established voting history on the issue. In this last case, the Congressperson will rely on her previous voting history without a new search for information.

In the rare case that a Congressperson does seek new information to aid in making a decision, in print media, for example, “much of the reading that is done simply reinforces the congressman’s opinion” (Kingdon 1989, p. 211). In fact, congressmen often consciously select their reading precisely in order to reinforce their original position. Kingdon believes that this is due partly to the “human tendency to selectively perceive what [one] reads, noticing that which agrees with [one’s] point of view and discarding that which disagrees” (1989, p. 211). And Deborah Stone (2002) expresses a similar view: “[i]n our various social and political roles, we act largely according to prior attitudes and beliefs rather than new information” (p. 314). Furthermore, the sources that a Congressperson seeks tend to be internal to Congress, such as the *Congressional Record* or other committee materials pertinent to the decision at hand (Kingdon 1989).

These patterns of information use in decision-making are of course partly due to the sheer number of decisions members of Congress must make on a regular basis. It would be too time consuming to gather and read all information from all sources about an issue. However, given the frequency of selective use of information in debates, such as in those over global warming or the Iraq War (Jones and Baumgartner 2005), these patterns also indicate that something other than the “rational-behavioral” model is driving action or decision-making. As Jones and Baumgartner (2005) suggest, “policymakers, interest groups,

media outlets, and government agencies all have vested interests, ideological blinders, short attention spans, and self-interested motivations” (Jones and Baumgartner 2005, p. 3).

This holds true when evaluating information dissemination programs intended to bring about change. For example, studies of the TRI show that information dissemination alone is not enough to alter behavior or influence corporate decisions. Though studies show that publicizing information about hazardous substances as part of the TRI is effective in improving environmental quality (i.e., reducing pollution), “the achieved reductions are largely the result of companies who seek to reduce toxic use because they want to be one step ahead of conflicts with environmental organizations or citizens, a decrease in shareholder value, a bad reputation, unfavorable news-coverage, etc.” (Van Den Burg 2004, p. 374). If the actors involved in decisions about use and release of toxic chemicals were acting according to the “rational” model – seeking all information about toxic releases, using it all in their decision making, and weighing it all equally – many would have long ago altered their production patterns to be at least somewhat more efficient and less polluting, as this (including pollution cleanup) is the least costly way to do business. Instead, companies (and their CEOs) make these changes largely in anticipation of the stigmatization of their corporate reputation (Van Den Burg 2004). The link between information dissemination and pollution-reduction action is not direct. Companies do not simply internalize information and act on it because it is the “right thing to do” for the community in which they operate. Companies (and their CEOs) principally consider their reputation and their smooth operations (in terms of shareholders) in deciding whether and how to act to reduce pollution.

Additionally, experience with eco-labeling or full disclosure in labeling indicates first, that, in many instances and for various reasons, consumers do not pay attention to product labels (United States Consumer Product Safety Commission 2003). The EPA, for

instance, after several years of research with consumers to learn how to make labels better on household pesticide and cleaning products, shifted the focus of the CLI to a “Read the Label *First!*” campaign in 2000, based on the understanding that “no label can do its job if no one pays attention to it” (United States Environmental Protection Agency 2000). Though the pertinent information consumers needed to protect their health and safety was available on product packaging, the EPA discovered in examining the CLI that consumers did not necessarily or automatically read the labels.

Second, even if consumers are able to access the information, pay attention to the message, and are able to comprehend the information provided, this does not necessarily guarantee a change in their purchasing patterns. In other words, considerations other than their health or safety (such as cost, perception of risk, convenience, etc.) often take precedence in making a product choice (United States Consumer Product Safety Commission 2003).

IMPLICATIONS AND DIRECTIONS FOR FURTHER RESEARCH

Research and experience show that the linear, rational-behavior model of information use does not describe the way in which people make decisions, make policy, or change their behavior. Instead, a more complex, “political” model is a better predictor of how people actually use information: selectively to reinforce their policy or program goals. My findings in examining the Boston Indicators Project are consistent with this “political” model. First, if they use them at all, non-profit and governmental agencies use the indicators to bolster their existing programs or proposals, rather than to become informed of new issues or set priorities in their work. Although one of the major goals of the Boston Indicators Project is to disseminate information so that it is used in decision-making, most of the people I interviewed had not necessarily thought of the Boston Indicators Project in those terms. Rather, the primary activity of the project thus far has been to promote open communication and collaboration, using information-gathering in the form of indicators reports as a context in which to do this. It appears that the information contained in the indicators of the Boston Indicators Project has limited or no influence on environmental behavior and decision-making in Greater Boston, even among groups whose leaders had attended at least one meeting of the Boston Indicators Project.

The “political ammunition” model of information use (Nelson et al. 1987, p. 571) is not surprising, as it fits with the currently accepted model of behavior and decision-making described above, which are neither linear nor “rational” (Jones 1994; Jones and Baumgartner 2005; Kingdon 1989, 1995; Kollmuss and Agyeman 2002; March 1994; Rich and Oh 2000). But even with this use, it is unclear whether the indicators lend credibility to those programs and proposals, and make them more likely to be supported or funded.

Second, figures show that the number of web hits to the Boston Indicators Project website is increasing. However, web hits to the site is an imperfect proxy for use or influence of the indicators. Similarly, the numbers of TBF grantees visiting the website and the ratings of how useful they find the data do not shed light on whether the indicators subsequently influence their decisions or behaviors. Furthermore, these figures say nothing of organizations that are not funded by The Boston Foundation, which may not even be aware of the indicators project.

Third, there are isolated instances, such as in the case of the GreenLight Fund or the EPA, in which the indicators appear to have directly influenced decisions made about priorities and new efforts to pursue. However, the GreenLight Fund does not work in the environmental field, and the issue addressed at the EPA was a social issue, not an environmental one. This may have to do with the absence of causal stories associated with the indicators. It may be easier for people to see that social issues are within human control, whereas for some people, environmental conditions may seem removed from the human realm. Many people also see environmental problems, particularly large scale issues, such as global warming and resource depletion, as caused by complex, perhaps unknowable, chains of action, which individuals, or even individual groups cannot affect.

The question remains, is this a satisfactory use of the indicators? If the BIP were only publishing the indicators, the answer to that question would be no. However, the indicators are the pretext for many meetings of active Boston citizens and non-profit leaders. The indicators are thereby valuable in the eyes of the project's organizers and other active groups as a device for drawing people together around matters of the common good and promoting discussion. Despite a lack of emphatic statements from interviewees that they frequently use the indicators as a guide or that the indicators are the primary source of data

to drive their operations, no interviewees commented that the project was not valuable to them in some way.

The Boston community now has, literally at its fingertips, a consolidated source for information about the city and region. The Boston Foundation could and should be doing much more with this information. First, they should more widely publicize the existence of the reports to organizations that are not already involved in or aware of the project, and help them tell their stories and support their programs with the indicators. Though I acknowledge that one of the purposes behind an indicators project is to paint a broad-brush picture of the city, some of the interviewees, for example Megan Amundsen of ELM and Rosanne Foley of DEHC, nonetheless responded that the indicators are not specific enough to their work to be useful, so they seek information from other sources. This question of detail versus more general information is one that the BIP should bear in mind in considering how to make the information as useful as possible to those who are using it or those who might.

Second, The Boston Foundation has the reputation, financial and human resources, and now the database with which to form and publicize the causal stories necessary to make “difficult conditions become problems...amenable to human action” (Stone 1989, p. 281). If TBF is truly concerned with taking action on environmental issues, then this is an avenue they should pursue.

Third, TBF should use the indicators to set priorities in their own work in the environmental sector. They have already done so primarily in the economic and education sectors through the John Laware Leadership Forum and the recent “What’s Next” seminars focusing on talent retention and leadership. They could and should also do so in the environment and transportation sectors.

Finally, TBF should endeavor to address the conditions in the report with new tools

for social and environmental change, such as social marketing or community-based social marketing (CBSM). The realization that antecedent or information-intensive strategies are unsuccessful in changing behavior, specifically in fostering pro-environmental behavior, has led experts to turn to strategies such as social marketing. Social marketing involves the application of commercial marketing concepts to change behavior. CBSM uses many of the same principles, but takes them a bit further, as detailed below.

The most common application of social marketing is in promoting healthy behaviors (such as healthy eating habits, regular medical exams, inoculations, etc.), but is also increasingly being adopted to promote environmental behavior. Social marketing campaigns do not attempt to change attitudes or beliefs with the ultimate goal of changing behavior. Rather, social marketing targets behavior directly, relying on at least five principles from commercial marketing, known as “The Five Ps”: product, price, place, promotion, and positioning (Weinreich 1999; Alcalay and Bell 2000).

The social marketing *product* is the pro-environmental behavior or environmentally friendly product one wishes to promote. *Price* refers to what the “consumer” must do in order to obtain the marketed product. This can be a monetary cost, or it can be intangible sacrifices, such as the time, effort, or risk of embarrassment or disapproval that results from obtaining the product. Social marketers attempt to minimize the cost in relation to the perceived benefits when setting the price for the product. *Place* is the way the consumer accesses the product, whether it is the method and location of distribution for a physical good or the channels by which intangibles, such as information or training reaches consumers (for example doctors offices, shopping malls, or their own homes). Part of successful social marketing is determining the “activities and habits of the target audience, as well as their experience and satisfaction with the existing delivery system,” so that

“researchers can pinpoint the most ideal means of distribution for the offering” (Weinreich 1999). The ease with which the consumer obtains the healthy or environmentally friendly product, or can accomplish the healthy or environmentally friendly behavior, as well as competition of the product or behavior with non-healthy or environmentally damaging products or behaviors is central to social marketing. *Promotion* encompasses all efforts taken to ensure that the target audience is aware of the availability of the product. This consists of any combination of advertising, public relations, promotions, media advocacy, person-to-person sales, entertainment media, coupons, or vouchers. Finally, *positioning* involves the way in which the product is pitched to the consumer. This can be the physical location of the product relative to other products with which it competes, or it can be a psychological positioning of a product, such as positioning physical activity as relaxation instead of exercise, or serving one’s family healthy meals as an act of love, rather than a dietary choice (Alcalay and Bell 2000; Weinreich 1999).

In addition to using commercial marketing concepts, a principle of social marketing is tracking the process to ensure implementation and provide feedback based on which the program can be revised. For example, different segments of the population may require different placement, promotion, or positioning based on their characteristics and responses in order for the marketing to be successful. Social marketers may also alter the product itself to increase the response (Alcalay and Bell 2000; Weinreich 1999).

Researchers and practitioners have high hopes that applying social marketing techniques to promote both healthy and pro-environmental behaviors will be more effective than publishing information alone. A survey of fifty social marketing campaigns, however, finds that the majority of them had been poorly designed, ill-conceived, and incorrectly implemented (Alcalay and Bell 2000). For this reason, “although social marketing has

proven to be an effective means of altering some kinds of behaviors, the overall impact of nutrition and physical activity campaigns has been quite unimpressive... These interventions typically increased the knowledge of study subjects, but seldom, if ever, had meaningful behavioral effects” (Alcalay and Bell 2000, p. 53).

Consequently, another technique, community-based social marketing (CBSM), builds upon the strategies of social marketing, tailoring the concept further to meet the need of a particular community. Advocates hope that this technique will have benefits over social marketing by virtue of its community-based process. The CBSM process involves choosing a behavior to encourage based on three factors: the impact that behavior will have; the internal and external barriers to that behavior; and the resources available to overcome those barriers. Once a target behavior is chosen, program planners design strategies to remove the barriers to it. For example, a community may want to reduce the amount of material entering their waste stream by encouraging household composting of organic waste. Some of the barriers to doing so may be inconvenience (both of obtaining a composting unit and of carrying out the ongoing activity of composting) or cost of a composting unit (McKenzie-Mohr et al. 1995). The barriers may be different in different communities or even neighborhoods. In a CBSM process, program planners would carry out research to determine the barriers of composting specifically for the community. The results of that research would then determine precisely what sort of program to implement to overcome the barriers. CBSM also calls for piloting the program to fine-tune it, if necessary, before implementing it widely, and finally for evaluation of its effectiveness once it is implemented more widely. Though CBSM has not been systematically researched to determine its general effectiveness over information-intensive strategies, preliminary studies of individual

efforts indicate that CBSM can be very successful in changing behaviors to be more pro-environmental (McKenzie-Mohr 2000a, 2000b; Frahm et al. 1996).

Though neither social marketing nor CBSM have been systematically evaluated in order to quantify their effects or to determine their effectiveness over other strategies, these techniques, if properly implemented, could be a tremendous complement to the Boston Indicators Project. The Boston Foundation is uniquely situated to consider adopting a CBSM process, given the position of respect they hold in the Greater Boston community, because of the resources available to them, and because they house the Boston Indicators Project. Alternatively, another organization or the City of Boston could carry out CBSM to address issues highlighted by the indicators. In either case, CBSM could be used to target individual behaviors or decisions, to encourage better industry, business, and government practices through publicity, or both.

In addition to these recommendations, I would like to call attention to a few aspects of the BIP that deserve to be explored in future research. First, because it has been found that the majority of benefits from indicators projects involve increased communication and collaboration between organizations, and therefore capacity to solve problems, the impacts of the “What’s Next?” seminars on the functioning of organizations should be examined. Second, when I began work on this thesis, I wanted to understand how the indicators might influence individuals as well as public and private groups. It did not take long to realize, however, that this would be beyond the scope of this thesis. This is clearly a limitation of this study, and an obvious area for future exploration, as the general public would almost certainly see the BIP differently than do organizations or the public sector.

CONCLUSIONS

Dozens of cities all across the country have initiated indicators projects as a way to define and measure what they value. A major operating assumption of these projects is that people will become informed by and act on the information contained in the indicators. However, past research has not determined whether this happens. Though the process of indicator development has been shown to foster communication between constituencies, enable a city to formulate a vision for its future, and in a few cases, to bring attention to pressing issues as a first step towards measurable change, it is unclear who is paying attention to the indicators and what specific actions they take in response to that information.

Therefore, in this research, I sought to isolate the impacts of information, shared in the form of indicators reports, on groups working in the environmental field in Greater Boston. I found that the indicators are primarily being used to support these groups' positions and ideas. The use of indicators in this way is not surprising, given that the expectation for their use is based in a theory that describes how neither groups nor individuals use information, and that it fits a "political" model of information use.

All of this is not to discount the usefulness of indicators projects or sharing of information, however. Certainly, political or selective use of information can be valuable. It is pertinent, however, to understand the ways in which information is being used so that the methods of dissemination and the information itself can be tailored to make the information most useful to those who are using it.

APPENDIX A – “Environment Sector” and “Sustainable Development Crosscut” goals and indicators measured by the Boson Indicators Project

Environment Sector

Goal	Indicators
1	<p>Environmental Stewardship</p> <p>The ecological footprint: per capita consumption of the Earth’s resources</p> <p>Household recycling rates and solid waste generated – Boston versus other Massachusetts Cities</p> <p>Friends groups for parks and greenspaces</p>
2	<p>Clean Energy and Climate Stability</p> <p>Trends in climate change – local, national and global</p> <p>Per capita greenhouse gas or CO₂ emissions from residential and commercial energy use, transportation, and solid waste disposal</p> <p>Energy from renewable sources</p>
3	<p>Productive and Efficient Use of Land</p> <p>Smart growth measured by trends in development and effects on Boston and the region</p> <p>Housing density and services within ¼ mile of transit nodes in Metro Boston</p>
4	<p>Clean Air</p> <p>Changes in air quality – level of PM10 and PM2.5 micron particles in the air at selected Boston sites</p> <p>Regional ozone (smog)</p> <p>Alternative fuel vehicles</p>
5	<p>Clean and Plentiful Water</p> <p>Aquifer/water table depletion caused by water runoff from impervious surfaces and combined sewer overflows (CSOs)</p> <p>Swimmable days and violations of safe swimming standards in Boston’s rivers and harbor</p> <p>Efficient and sustainable use of fresh water supplies within available means</p>
6	<p>Sustainable and Healthy Ecosystems</p> <p>Acres of protected and restored urban wilds and natural areas in Boston</p> <p>Biodiversity: number and volume of bird species in Boston</p> <p>Harvestable shellfish beds in the Boston Harbor area</p>
7	<p>Environmental Justice and Equity</p> <p>Public health stresses on children by neighborhood</p> <p>Toxic emissions from smokestacks and tailpipes</p>
8	<p>Accessible Green and Recreational Space</p> <p>Green space distribution, acres/1,000 children by Boston neighborhood</p> <p>Access to and public use of Harborwalk and Harbor Islands National Park</p>
9	<p>Beautiful Walkable Communities</p> <p>Tree cover and number of trees and bulbs/flowers planted in Boston</p> <p>Community gardens in Boston</p>
10	<p>Sustained Public Support for Environment and Open Space</p> <p>Funding for the environment and open space in Boston and Massachusetts</p>

Sustainable Development Crosscut Filter

Sector	Indicators
Economy	Income disparities between top and bottom quintile of population – the GINI Index, Boston and US
Education	Students who qualify for free or reduced price lunch in Boston and the region
Environment	The ecological footprint: per capita consumption of the Earth's resources
	Household recycling rates and solid waste generated – Boston versus other Massachusetts Cities
	Trends in climate change – local, national and global
	Per capita greenhouse gas or CO ₂ emissions from residential and commercial energy use, transportation, and solid waste disposal
	Energy from renewable sources
	Smart growth measured by trends in development and effects on Boston and the region
	Housing density and services within ¼ mile of transit nodes in Metro Boston
	Changes in air quality – level of PM10 and PM2.5 micron particles in the air at selected Boston sites
	Regional ozone (smog)
	Aquifer/water table depletion caused by water runoff from impervious surfaces and combined sewer overflows (CSOs)
	Efficient and sustainable use of fresh water supplies within available means
	Acres of protected and restored urban wilds and natural areas in Boston
	Harvestable shellfish beds in the Boston Harbor area
	Toxic emissions from smokestacks and tailpipes
	Green space distribution, acres/1,000 children by Boston neighborhood
Housing	Housing units within a 10-minute walk of rail transit, Boston
	Growth in population, households, housing units and jobs, Metro Boston
Public Health	Percentage of Boston residents who engage in healthy behaviors
	Obesity by age, gender and racial/ethnic group
Technology	Number of neighborhoods/communities with available broadband and wireless access
Transportation	Trends in rapid-transit ridership
	Residents within a 10-minute walk or short drive from transit nodes by race, income, age group and transit dependency
	Car ownership and vehicle miles traveled, Boston and Metro Boston
	Vehicular greenhouse gas emissions
	Use of low-emission vehicles
	Miles of bike and pedestrian ways, people walking and biking to work
	Traffic and parking volume in Boston
Hours spent stuck in traffic	

APPENDIX B – Interviews

	Organization/Agency	Name	Position
1	The Boston Foundation	Charlotte Kahn	Director, The Boston Indicators Project
2		Terry Lane	Vice President for Program
3	Dorchester Environmental Health Coalition	Rosanne Foley	Coordinator
4	The Environmental League of Massachusetts	Meagan Amundsen	Policy Analyst
5	The GreenLight Fund	Sarah Sherblom	Assistant Director
6	Coalition for Environmentally Responsible Conventions	Dan Ruben	Executive Director
7	Boston Natural Areas Network	Valerie Burns	President
8	City Of Boston Environmental Department	Bryan Glascock	Director
9	Environmental Protection Agency, Region 1 (New England)	Lois Adams	

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