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Measuring U.S. Sustainable Urban Development

A background paper on current and proposed research with special reference to the work of the U.S. Departments of Housing and Urban Development and Transportation and the U.S. Environmental Protection Agency's Partnership for Sustainable Development

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Introduction

In response to global warming, resource depletion, economic downturns, high levels of poverty, wasteful settlement and urbanization patterns, and a scarcity of adequate, affordable housing and services, twenty-first century public and private decision-makers are fashioning sustainable development policies and programs. In doing so, they assume that human settlement activity has lasting effects on the well-being of individuals and society and understand that sustainable development is an ongoing process, not a “fixed state of harmony” (Hardy and Zdan 1997, 9; Morel 2003, 615). In their choices of policies and programs, they adhere to the so-called Brundtland Commission’s interpretation of sustainable development, to improve the human condition to meet current needs without compromising the ability of future generations to meet their needs, an idea refined at the Rio Earth Summit (1992) and captured in *Agenda 21*. This foundational manifesto presented principles, an action plan, and a mandate to evaluate progress with indicators. Its preamble articulated the approach: the removal of disparities (especially poverty) and environmental degradation by integrating environment, social, and economic approaches in order to secure a better future (WCED 1987, 23, UN 1993).

Humanity stands at a **defining moment** in history. We are confronted with a **perpetuation of disparities** between and within nations, a **worsening of poverty**, hunger, ill health and illiteracy, and the **continuing deterioration of the ecosystems** on which we depend for our well-being. However, **integration of environment and development concerns** and greater attention to them will lead to the fulfillment (sic) of basic needs, improved living standards for all, better protected and managed ecosystems and **a safer, more prosperous future** (UN 1993, 12). (Emphasis added)

In the twenty years since this declaration, much work has been done to strengthen the research, policy, practice, and subsequent evaluation of this form of sustainable development, with efforts to be reviewed at the upcoming United Nations Conference on Sustainable Development (Rio+20) in June 2012. However, some believe that progress has been sluggish, and attribute the

slow adoption of the paradigm to political resistance, limited financial resources and technical issues as the absence of scientifically valid and credible indicator systems (UNCTAD 2011, Evans and Stevens 2011).

Experts agree that “sustainable development is perhaps the most challenging policy concept ever developed,” noting that it receives support generally when characterized broadly as “not cheating your kids,” but less agreement when it comes to putting it into operation with a working definition (Hak 2007,2; Bell and Morse, 2008,11). Competing views emerge. Some hold that sustainable development “is like truth and justice,” ideas “not readily captured in precise definition” because their meanings “can vary greatly from individual to individual and between societies,” therefore preventing its implementation; others insist that despite its being a complex concept where the interplay of various factors have a wide variety of outcomes, it is manageable. They reference physical and social scientists who regularly deal with value-affected, complex systems by breaking them down to individual components, examining how each component works, first, in isolation and, later, together (Bell and Morse 2008,11). For the latter group, the sustainable development can have clear, workable definitions, be implemented through congruent and coherent policy and programs and evaluated via transparent, evidence based measures.

Until 2009, the United States had a spotty record in these matters, not only did it lack a national sustainable development agenda but it also had no associated evaluation system. Consequently, many municipalities, some states, several advocacy groups, and a number of private corporations undertook their own sustainable development programs and assessments. But the lack of

guidance meant their conceptual framing and definitions ranged widely, with some emphasizing the environment (e.g. Siemens, Baltimore) and others giving weight to other factors (ICLEI 2009, Epstein 2008, Lynch 2011, New York City 2011).

The Partnership for Sustainable Communities

In 2009, the U.S. federal government acted to devise a national sustainable development agenda by forming the Partnership for Sustainable Communities (Partnership), an innovative, inter-agency agreement among the U.S. Departments of Housing and Urban Development and Transportation, and the Environmental Protection Agency (Office of Sustainable Communities 2010). The Partnership defined its vision of sustainable development through iteration and use of six Livability Principles for policy and program guidance (Donovan 2009).

To advance this work, the agencies publicized the work in digital and print media (e.g. DOT's dedicated section of its website <http://www.dot.gov/livability/>) or created special offices (EPA's Office of Sustainable Communities [OSC] and HUD's the Office of Sustainable Housing and Communities [OSHC]). Within two years, the effort became more tangible through the awarding of funding based on the Livability Principles, issuing publications/supporting research, and advances in communication (e.g. creation of a dedicated website <http://www.sustainablecommunities.gov/>). For example, OSHC, in pursuit of its mission, "to create strong, sustainable communities by connecting housing to jobs, fostering local innovation, and helping to build a clean energy economy," instituted a Sustainable Communities Initiative that, in 2010, issued grants of \$100 million to 45 localities (for regional planning) and \$40 million in Community Challenge grants to several places (to revise local codes to allow coordinated land use and transportation). The Department of Transportation dedicated a portion of its ARRA (American Recovery and Reinvestment Act) funding (\$1.5 billion) in TIGER grants

(Transportation Investment Generating Economic Recovery to 20 livability projects. The EPA used a portion of State Revolving Funds for Water Infrastructure (\$3.3 billion) to support livability trials in Maryland, New York and California and issued Smart Growth Implementation Assistance grants to 8 communities that met Livability Principles standards (Office of Sustainable Communities 2010).

As implied by the Livability Principles, with their call for transportation alternatives, walkable communities, economic competitiveness, and support for existing communities, the Partnership's sustainable development agenda focuses on *urban* sustainable development. It favors dense, mixed-use settlement patterns underpinned by economic agglomeration, qualities that decades of research (and continuing research) by urban planners and economists show are key elements of sustainability and lend themselves to measurement and evaluation (Birch and Wachter 2006, Kahn 2006, Ewing and Cervero 2010, Ewing et al (in press), Boarnet et al (in press), Feiden, W. and E. Hamin, 2011). While other agencies are engaged in sustainable development projects, the Partnership stands out for its clear framing of a specific, comprehensive, and *operationalized* sustainable development agenda.

However, the Partnership's approach has one weakness: it does not have an associated, easily employed, mechanism for evaluation. Such an evaluation tool is particularly critical in allowing HUD, and participating entities at the state, regional and local levels, to assess progress effectively, set policy, and inform policy-makers and the public about sustainable development.

Gauging Progress in Sustainable Development: Indicators

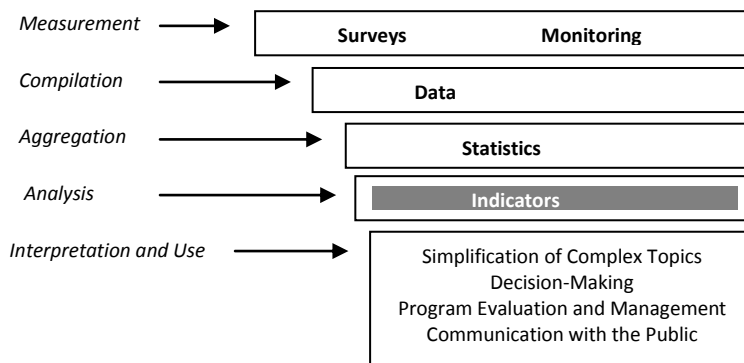
The globally accepted standard for gauging progress in sustainable development is the indicator system. But many nations, including the United States, have not adopted one (Bell and Morse 2008, Hak 2007, United Nations 2007).¹ Such systems can include single or multiple indicators (core, headline or short list), an index, dashboard, or a reference framework, many focused on sustainable development (or one of its elements) are in use around the world today. Examples are: Yale Center for Environmental Law and Policy, *2005 Environmental Sustainability Index*; Bertelsmannn Stiftung, *ELLI IndexEuropean Lifelong Learning Indicators* (2010); Forum for the Future (Britain) *The Sustainable Cities Index* (2010) and World Health Organization's Indicators to Improve Children's Health (2003). And recently, the EU began beta testing its Reference Criteria for Sustainable Cities (2011). Further, in America, as the number of organizations recognizing the importance of sustainable development grows, so does the number of indicator systems (Lynch et al 2011). Many local, regional, and national governments have developed their own, as have numerous private and non-profit organizations.

Public policy evaluation helps define and refine a common vision, encourages the creation and regular updating of information, underlines and reinforces progress or demonstrates weaknesses, failings, or false (null) hypotheses/assumptions of a given policy or program and supports a wider public understanding of the enterprise under consideration (Hak 2007, xix). Although many evaluation techniques exist (e.g. quasi-randomized studies, case studies, benchmarks, surveys and questionnaires), the use of indicators, has become the commonly accepted approach in assessing sustainable development (Hak 2007,1; Morse and Bell 2008). Figure 1 illustrates the

¹ An indicator is a simple measure that signals whether a policy or program is on target to reach a pre-determined goal Analysts distinguish benchmarks (a pre-determined milestone to measure progress to a goal) from indicators.

place of indicators in public policy, employed correctly, they perform the functions listed below in the bottom box.

Figure 1 Place of Indicators in Public Policy



Source: Adapted from David Briggs, *Making a Difference Indicators to Improve Children's Environmental Health* (Geneva: WHO, 2003)

As mentioned earlier, the use of indicators in evaluating of sustainable development dates from *Agenda 21*(1992).² For the past 15 years, the U.N. Commission on Sustainable Development (CSD), the agency created to implement *Agenda 21*, has worked to develop model indicators for nations to adapt and adopt (UN 2007: 3). In a broadly consultative process, it has incorporated evidence-based research from the physical and social sciences to test and refine its recommendations, now in their third iteration, a of list of 50 “core” indicators nested in a larger [96] number, and is one of the systems reviewed by Penn IUR (See Lynch “Sustainable Development Indicators for the United States, 2011 (UN 2007:3). Other entities (e.g. OECD, EU, Commonwealth Organization of Planners, a number of Chinese national agencies) are initiating their own indicator systems).

² “Methods for assessing interactions between different sectoral environmental, demographic, social and developmental parameters are not sufficiently developed or applied. Indicators of sustainable development need to be developed to provide solid bases for decision-making at all levels and to contribute to a self-regulating sustainability of integrated environment and development systems” (UN 1993,273).

In the United States, government and non-government entities have long employed indicators (or indicator systems) to measure important policy goals or progress in particular areas (e.g. health [life expectancy], economics [gross domestic product] and social conditions [poverty rate]. More recently, the Office of Management and Budget published 62 social and economic indicators and advocated them “as quantitative measures of the progress or lack of progress toward some ultimate ends that Government policy is intended to promote” as a means of promoting high-performance government, one whose decision-making and policies are based on evidence of “the Nation’s greatest needs and challenges and of what strategies are working”) (OMB 2010, 95-101).

Thus, while indicators have limitations (see below), scholars and practitioners in policy arenas continue to advance the work of testing selected indicators against policy goals and actual behavior, consulting users about their improvement and sharpening the underlying data to achieve uniformity and comparability. For example, to judge the level of economic growth and well-being, the US, along with the rest of the world, employs a single indicator, the “gross domestic product” indicator (from which cities and states have derived their own gross state product, gross city product figures), to assess economic development. While this measure has much discussed limitations such as its inability to account for the value of unpriced activities or natural resources, it has become the standard and “truly among the inventions of the 20th century, a beacon that helps policy makers steer the economy towards key economic objectives (Lequellier,2004-2005, x). Since its adoption, international bodies have worked to improve it, laying out conventions for data collection via the *System of National Accounts* (2008) published by the United Nations, International Monetary Fund, World Bank and Organization of Economic

Cooperation and Development (OECD) and Eurostat, now in its fifth edition after first being published fifty years ago. A second example, the United Nations' widely adopted the Millennium Development Goals (2000) with its eight goals, 18 targets and 48-element indicator system is representative of the multiple indicator systems approach. The choice and number of indicators is always related to the conceptual framework (discussed in 2xxx) and purposes for which it is to be used.

As work on indicators has evolved, extensive research and discussion from academics, civic leaders and development practitioners has accompanied it, building a robust field of knowledge around the topic. Inquiries have focused on conceptual and definitional issues and indicator selection including data-collection, relevance and timeliness. Further, researchers have distinguished among different kinds of indicators (pressure, state and response). They have examined single indicators, pooled indicators, indices and weighting factors. In the end, they have come to the conclusion that indicators should be tailored to the user(s)' conceptual framework of sustainable development and that "there is no perfect indicator that fully encompasses all the desired qualities. There are always trade-offs...the goal is to make them transparent." (Hak 2007, x).

Challenges and Opportunities of Employing Sustainable Urban Development Indicators

While the trend toward awareness of sustainable development, as represented by the emergence of indicator systems, is encouraging, their proliferation also presents a number of challenges. With so many indicator systems proposed or in use (each with different goals, objectives, and definitions of sustainable development), understanding broad, national trends is difficult, if not

impossible. For HUD and the Partnership, the lack of standardization hampers the ability to assess needs and progress. (Today, HUD and the Partnership rely on individual cities' or region's monitoring systems to understand policy results, which may or may not be comparable or include robust measures of movement toward sustainability. In March, DOT and the Office of Management and Budget [OMB] put forth a Scorecard on Sustainability/Energy with a series of indicators, but they deal only with part of the Sustainable Development agenda (DOT 2011). For cities and regions interested in engaging in the federal sustainable development programs, the lack of more generalized standardization is a major drawback, marking an absence of clarity on federal priorities and operations in this area.

In the broader federal policy arena, the recent passage of the Government Performance and Results Modernization Act of 2010 has led to the OMB's adoption of "three mutually reinforcing strategies" to measure performance and a call for agencies to: 1. use performance information to lead and learn to improve outcomes; 2. communicate performance coherently and concisely; and 3. strengthen problem-solving networks (Office of Management and Budget 2010, 77). For HUD and the Partnership, having an operational U.S. Sustainable Development Indicator System it would: 1. place the United States among the leaders of sustainable development worldwide; 2. provide an evidence-based performance measure for HUD, the Partnership, and other federal units to use in monitoring progress in cities and regions and in developing or refining supportive policy and programs; 3. give cities and regions clear guidance and tools relating to national sustainable development priorities; and 4. offer a means of communicating the federal government's interpretation of sustainable development to the public.

Developing a U.S. Sustainable Development Indicator System

Thinking about developing a sustainable development indicator system for the United States has at least two sources. First, from its inception, the Partnership has devoted attention to this topic (Argilagos 2010). Second, exchanges at UN-HABITAT's World Urban Forum (WUF) in Rio de Janeiro, Brazil (March 2010), the associated launch of the World Urban Campaign (WUC), (an effort to bring attention to best practices in sustainable urban development, including the use of model tools for measurement) and the upcoming Rio + 20 Summit in June 2012 has stimulated interest at HUD on the topic. Following WUF, HUD Deputy Assistant Secretary Ana Marie Argilagos, Director, Office of International and Philanthropic Affairs and member, U.S. WUF delegation, along with the White House Office of Urban Affairs and others, spearheaded a study group to explore the development of urban sustainable development indicators for the U.S.. The group, which met regularly through 2010-2011, posited that for the most part, individual sustainability indicators existed but the issue was how to select ones that would be appropriate for *urban* places in the *United States* in the 21st century.

To this end, representatives from the American Planning Association (APA) and the University of Pennsylvania's Institute of Urban Research (Penn IUR) volunteered to undertake preliminary research, an effort whose results are detailed by Amy Lynch et al in "Urban Sustainability Indicators for the United States" (2010, 2011a, 2011b, 2011c). In summary, the Lynch report narrates the methodology and results of the researchers' inventory and analysis more than 20 representative indicator systems. It shows how they measured evaluated individual indicators via several assessment tools (SMART, demand, pressure response, multi-factor vs. single factor) and

against two metrics: the traditional dimensions of sustainability (equity, economics and environment) and later against the Partnership's Livability Principles.

A simple question drove the research, one which later led to the formulation of a hypothesis (See Figure 2) that the researchers began to test through a multi-step research design (See Figure 3).

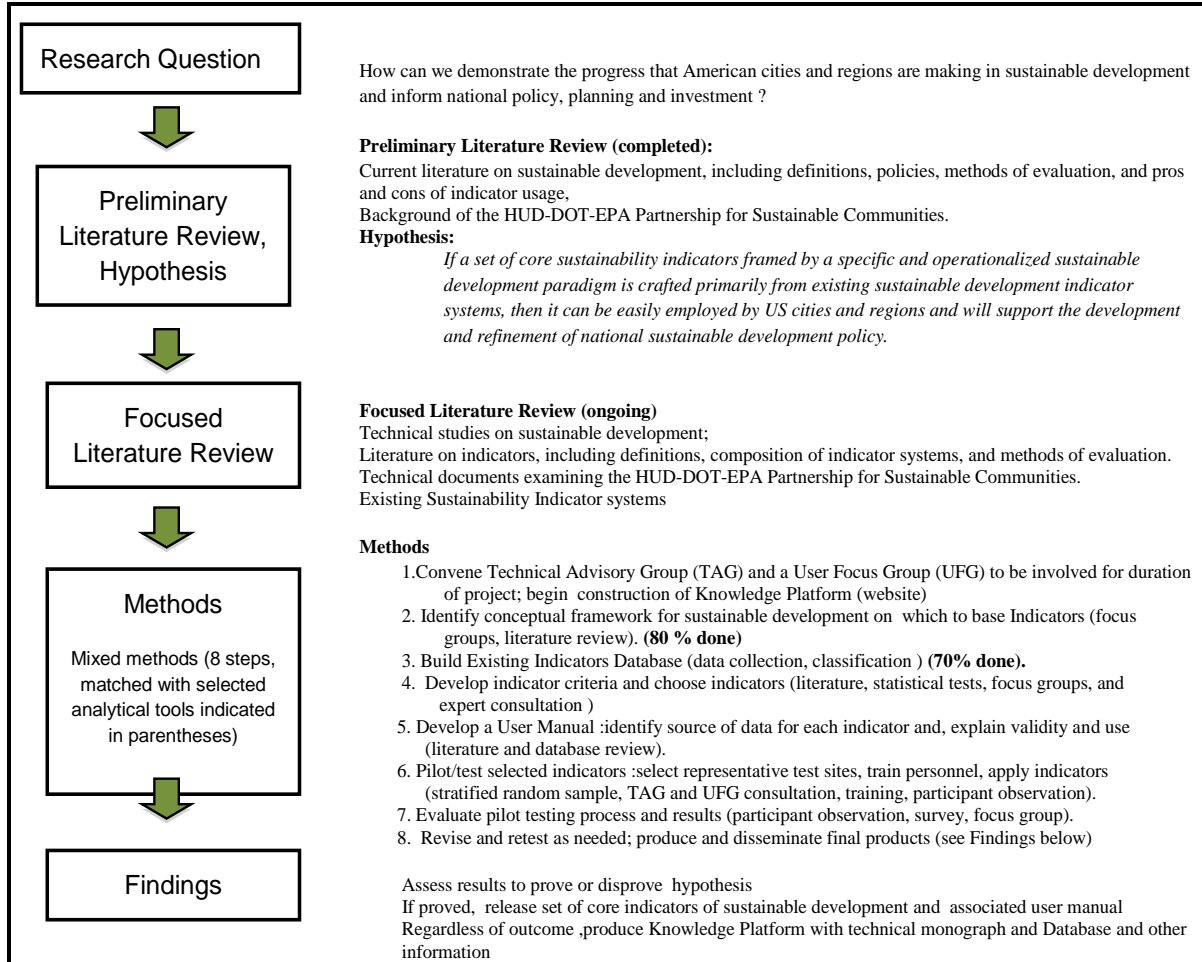
Figure 2 Research Question and Hypothesis for the Urban Sustainable Development Indicator Project

Question: *How can we demonstrate the progress that American cities and regions are making in sustainable development and inform national policy, planning and investment?*

Hypothesis *If a set of core sustainability indicators framed by a specific and operationalized sustainable development paradigm is crafted primarily from existing sustainable development indicator systems, then it can be easily employed by U.S. cities and regions and used to support the development and refinement of national sustainable development policy.*

As Figure 3 illustrates, the research design encompasses finalizing the conceptual framework/variables, one based on the Partnership's Livability Principles through an expert consultation process in order to verify that the proposed framework captures sustainable urban development values. It calls for developing rigorous criteria for indicator selection (e.g. credible, and scientifically valid), selecting indicators and measures (testing them either for their statistical significance or other measures of validity). Next comes creating and testing a pilot system, and associated training program, evaluating and revising the system. The final step is designing a communications plan for dissemination of the research.

Figure 3 Research Design for Developing a U.S. Sustainable Urban Development Indicator System



This design combines scholarship, use of analytical tools, product development (indicator system/user manual) and testing (and associated training in the system’s use). To move the system beyond an simple exercise, the design also includes methods for disclosure and explanation (technical paper) and dissemination (web-based knowledge platform, presentations at professional meetings and other venues). Extensive consultation, built into the methodology, is a critical ingredient in the research design. Researchers involved in indicator systems worldwide attest to the necessity of consultation at multiple levels (Scerri and James 2009, 2010, Holden 2006, Innes and Booher 2000).

The researchers believe that, after following the research design, if the hypothesis proves true, then the core indicators or sustainable urban development system can be devised that could have several uses. It could fill an evaluation gap for HUD and the Partnership, offering an evidence-based tool to measure its progress toward sustainable development at the national level or for those places that it has and will provide grant support for sustainable development planning and projects. It could be used by localities (cities and regions) to judge their own sustainable development progress, gauge what efforts have been successful and which ones need strengthening and to compare themselves to peer cities, providing a basis for knowledge exchange and learning among the peers.

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