Identifying Indicators of Sustainable AND Livable Communities

Indicators Research Team
Amy Lynch
Stuart Andreason
Eugenie Birch

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Efforts and Approaches

- Sustainable Urban Development Indicators Project (2010-2011): Selecting Indicators
  - Stage 1: Sector-based → Selecting amongst “environmental” indicators
  - Stage 2: Sustainability-based → Selecting the most multi-dimensional indicators
  - Stage 3: Livability-based → Selecting indicators that best match HUD/EPA/DOT Livability Principles

- Sustainable Communities Indicator Catalog (2012-2013): Sharing Indicator Information
  - Stage 4: Action and Information-based → Approaching the natural environment from a built environment perspective. BYO-frame.
• March 2010: **World Urban Forum in Rio de Janeiro**

• July 2010: **First SUD Working Group Meeting**
  - **Meeting objective:** To gauge interest in developing refining North American-oriented approaches to evaluating sustainable urban development
  - **Project Goals:**
    1. To scan North American indicators and outcomes which evaluate successful sustainable urban development and revitalization strategies.
    2. To map these metrics in the context of global best practices.
    3. To submit suggestions on potential common language, normative principles, and universal benchmarks around sustainability to the World Urban Campaign.

• August 2010: **Second SUD Working Group Meeting**
  - **Definition of sustainable development:** Adapted from the 1997 PCSD
  - **Project Purpose:** To develop indicators that demonstrate the progress that American cities are making toward sustainable urban development and inform supportive policy, planning and investment.
  - **Sustainable Urban Development Framework**
  - **Role of Penn IUR:** To undertake background research on indicators, existing indicator systems (with APA assistance), and to help identify and test indicators of sustainable urban development.

• September 2010
  - **Annotated List of 22 Existing Indicator Systems:** Developed by APA with assistance from Penn IUR and the SUD Working Group.
2011 Study Objectives, Approach, and Methods

- **Objectives:**
  1) Explore the characteristics of existing indicator systems;
  2) Examine whether a standard set of sustainable urban development indicators could be drawn or adapted from existing systems; and
  3) Identify challenges and make recommendations in moving forward.

- **Approach:** Expert Guidance, Literature Review, and Analysis of Existing Indicator Systems

- **Methods:**
  1) Review Literature
     - Identify indicator assessment and organization tools
  2) Create a Database of Existing Indicators
  3) Analyze and Organize Database Indicators
     - Apply tools from literature review
     - Test coverage of conceptual frameworks
2011 Literature Review

• Definitions:
  – **Indicator**: “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.” (Bauer 1966)
  – **Benchmark**: “A reference point in determining the current situation or position relative to the stated objective.” (University of Missouri Extension, 2000).

• What makes a ‘good’ indicator?
  – S.M.A.R.T (Hametner and Steurer 2007, Shen et al. 2010, UNESCO, UN Statistical Institute for Asia and the Pacific, etc)
    – **Specific**: *Clear and simple?*
    – **Measurable**: *Scientifically sound and verifiable?*
    – **Achievable**: *Doable?*
    – **Relevant**: *Meets sustainability goals?*
    – **Time-Related**: *Timely?*
  
  – Expert Advisory Group (SUD Working Group) recommended that indicators:
    • **Adhere largely to political jurisdictions, i.e. cities.**
    • **Be informed by international research and understandings, but tailored to domestic needs.**
    • **Apply broadly, to American cities of all sizes and locales.**
    • **Relate primarily to data that cities already collect and/or are interested in and motivated to collect over the long term.**
    • **Be simple, few, and succinct, but supplemented with contextual information.**
# Broad Analysis: Sources of Data

## Institutional (1)
- Columbia Univ. + Yale Univ. – 2010 Environmental Performance Index

## Non-Profits / NGO (9)
- CAP, ICLEI + USGBC – STAR Community Index
- GBCA (Australia) – *Green Star*
- Global Reporting Initiative – *Sustainability Reporting Guidelines*
- International Institute for Sustainable Development
- Urban Ecology Coalition – *Neighborhood Sustainability Indicators Guidebook*
- USGBC – *LEED ND*
- The World Bank – *Global City Indicators Facility*
- ACSE – *Sustainability Action Plan*
- International Sustainability Indicators Network
- The World Bank – *Sustainable Development*

## Private Organizations (3)
- ASLA + Lady Bird Johnson Wildflower Center – Sustainable Sites Initiative
- PricewaterhouseCoopers – *Cities of Opportunity*
- Siemens – *European Green City Index*

## National / Municipal Governments (9)
- Abu Dhabi – *Estidama*
- European Foundation – *Urban Sustainability Indicators*
- Central Texas Sustainability Indicators Project
- Houston Sustainability Indicators
- Minneapolis Sustainability Indicators
- Portland Planning and Sustainability
- Santa Monica Sustainability Plan
- Whistler Monitor Program
- *Sustainable Seattle*
<table>
<thead>
<tr>
<th>System Type</th>
<th>Indicator System</th>
<th>1988</th>
<th>2000</th>
<th>2009</th>
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<td>NGO</td>
<td>International Institute for Sustainable Development (IISD)</td>
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<td>Public</td>
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<td>Public</td>
<td>Portland Planning and Sustainability</td>
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<td>Public</td>
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<td>Light yellow</td>
<td>Light yellow</td>
</tr>
<tr>
<td>Private</td>
<td>ACSE - Sustainability Action Plan</td>
<td>Orange</td>
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<td>Light yellow</td>
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<tr>
<td>NGO</td>
<td>Neighborhood Sustainability Indicators Guidebook</td>
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<td>Public</td>
<td>Minneapolis Sustainability Indicators</td>
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<td>Public</td>
<td>Urban Sustainability Indicators - Euro. Foundation</td>
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<td>Private</td>
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<td>NGO</td>
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<tr>
<td>Private</td>
<td>PWC - Cities of Opportunity</td>
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<tr>
<td>Institutional</td>
<td>2010 Environmental Performance Index</td>
<td>Orange</td>
<td>Light yellow</td>
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</tbody>
</table>

- Orange: Program Initiation
- Light yellow: Major changes to program or release of significant reports
## Stage 1: Sector-based Dimension of Sustainable Urban Development

<table>
<thead>
<tr>
<th>Dimension of Sustainable Urban Development</th>
<th>Elements Necessary for Sustainable Urban Development</th>
</tr>
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</table>
| **Social Wellbeing**                       | • Health  
• Safety  
• Local or civic identity/sense of place  
• Access to decent – affordable – housing and services  
• Access to public recreation and open space  
• Access to a variety of transportation options |
| **Economic Opportunity**                   | • A diversified and competitive local and regional economy  
• Transportation and other infrastructure coordinated with land use  
• Growth plans that leverage existing assets  
• Access to capital and credit  
• Access to education, jobs, and training |
| **Environmental Quality**                  | • Efficient land use  
• Efficient resource use  
• Waste/pollution minimization and management  
• Climate change and natural disaster mitigation, adaptation, and resilience  
• Carbon efficient, environmentally sound, transportation  
• A diverse natural environment and functional ecological systems |

Framework developed August 2010 by the SUD Working Group.
2011 Existing Indicator Database

- Initial scan of 22 indicator systems: **377 indicators**

- Removing ‘non-indicators’: **304 indicators**
  - 137 Environmental Quality
  - 116 Social Wellbeing
  - 51 Economic Opportunity

- Removing duplication and refining to SMART indicators: **145 indicators**
  - 60 Social Wellbeing
  - 49 Environmental Quality
  - 36 Economic Opportunity

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>SMART?</th>
<th>Rationale</th>
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<td>Local Consumption</td>
<td>Percentage of residents consuming food produced within 150 miles</td>
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<tr>
<td>Green Cities Ranking</td>
<td>City’s score/rank in Reader’s Digest’s 2007 Green Cities Index</td>
<td>No</td>
<td>Not Time-Related</td>
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Stage 2: “Sustainability”-based

SUSTAINABLE DEVELOPMENT AND ITS CONFLICTS

- Social Justice, Economic Opportunity, Income Equality
- Overall Economic Growth and Efficiency
- Environmental Protection
- "green, profitable and fair" (sustainable development?)

Conflicts:
- Property conflict
- Development conflict
- Resource conflict

Multi-dimensionality?

• Economic Opportunity + Environmental Quality + Social Wellbeing = Broad movement toward sustainability.

• Approximately 50% of database indicators have some degree of multi-dimensionality:
  – 11 Economic Opportunity (31%)
  – 39 Environmental Quality (80%)
  – 22 Social Wellbeing (37%)

• Most multi-dimensional indicators are environmental quality & health (social wellbeing?)

• Lack of economically linked indicators:
  – economic opportunity & social wellbeing
  – economic opportunity & environmental quality
Stage 3: Livability-based

1. **Provide more transportation choices.** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

2. **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

3. **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.

4. **Support existing communities.** Target federal funding toward existing communities—through strategies like transit-oriented, mixed-use development and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

5. **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

6. **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

HUD/EPA/DOT Partnership for Sustainable Communities Livability Principles
2010-2011 Lessons Learned

• 377 indicators is not a large enough sample.
• Few indicators are multi-dimensional
• Fitting sector-based indicators to the built-environment framework of the Livability Principles is challenging. Requires interpretation.
• General issues with ‘selecting’ indicators for a broad audience. Different needs/goals = different frame = different indicators.
2011 Study Implications

• A standard set of SUD indicators could be drawn PRIMARILY from existing indicators, BUT challenges related to:
  – Reducing the measurement of progress towards a sustainable future to a handful of metrics.
  – Integrating the way that we measure environmental success (quality-oriented) with the way that we approach livability (built environment-oriented).

• Two NEW goals:
  1. Create a framework for identifying indicators that measure how the built environment impacts the sustainability of communities, but with a clearer environment-economy-society balance.
  2. Integrate flexibility into the process.
PennIUR, in partnership with the Ford Foundation and the Partnership for Sustainable Communities, is developing a web-based knowledge-sharing platform where users will be able to learn how to use indicators to measure progress towards a sustainable urban future.
Relationships to Other Indicator Efforts

- Communities, governments, and other organizations across the country have developed methods and metrics to evaluate progress.

- The SCIC addresses performance measurement, with information on a variety of sustainable community indicators that are currently in-use and links to their users.
Goals of the Project

- Compile a searchable catalog of indicators that provide information on sustainable communities.

- Connect disparate efforts on indicators and performance measurement.

- Assist communities and the PSC in evaluating the value of their investments and prioritizing future investment.

- Provide a platform to introduce performance measurement and indicators to new users.

- Share information on how to implement indicators.
OECD’s *How’s Life?* provides a roadmap for measuring success from different dimensions.

The SCIC hopes to build capacity so cities and regions can create measurement systems that meet their goals.
Framework

• This project approaches sustainability from a built environment perspective (housing, land use, and transportation) and emphasizes the PSC’s Livability Principles:

1. Provide more transportation choices
2. Promote equitable, affordable housing
3. Enhance economic competitiveness
4. Support existing communities
5. Coordinate and leverage federal policies and investment
6. Value communities and neighborhoods
Livability Framework

Transportation
- Equity and Access
  ~ Ex. Percentage of low-income households/housing within ¼ mile of transit stop.
- Healthy Communities, Neighborhoods, and Individuals
  ~ Ex. Percentage walking or biking to work.
- Economic Competitiveness and Efficiency
  ~ Ex. Transit expenditures per capita.
- Environmental Quality and Resilience
  ~ Ex. Percentage of city/town vehicles using hybrid or alternative fuel.
Livability Framework

Housing
- Equity and Access
  ~ Ex. Percentage of housing stock available to low-income individuals.

- Healthy Communities, Neighborhoods, and Individuals
  ~ Ex. Households within ¼ mile of a town or neighborhood center.

- Economic Competitiveness and Efficiency
  ~ Ex. Percentage of infill development as a percentage of total development.

- Environmental Quality and Resilience
  ~ Ex. Percentage of buildings with energy efficiency rating as a percentage of total development.
Livability Framework

Land Use Planning
- Equity and Access
  ~ Ex. Percentage of population within ½ mile of green space.
- Healthy Communities, Neighborhoods, and Individuals
  ~ Ex. Farmers markets per 1000 population.
- Economic Competitiveness and Resilience
  ~ Ex. Average commute distance.
- Environmental Quality
  ~ Ex. Change in impervious surface coverage in the past year.
Process

1. Identify Users
2. Develop “Tags” to describe indicators
3. Develop Catalog of Indicators
   a) Identify and assess instances
   b) Aggregate into indicators
   c) Connect with other groups, stakeholders, and experts to ensure coverage and refine
4. Draft guidebook and website
5. Pilot program
1. Identify Users ✔
2. Develop “Tags” to describe indicators ✔
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Identify Users

**Method:** Analysis of all PSC grants (2009 through 2012).

**Results:**
- A preponderance of grants funded land use planning and interventions.
- Many of the potential users of the knowledge-sharing platform are small or resource-limited communities.
Example Use Case

**Organization Type:** Sub-Municipal Organization

**User:** Planner in a Community-based Healthy Neighborhoods Coalition

**Areas of Interest:** Promoting Biking and Walking

**Scenario:**
The community planner for a Healthy Neighborhoods Coalition is developing a program to promote walking and biking as healthy, inexpensive, and sustainable modes of transportation. To that end, the planner is interested in measures that will provide a baseline and allow the organization to track bike and pedestrian travel and infrastructure in the future. The organization is relatively small, with a low technical capacity, and the planner has many other programs and responsibilities. Indicators need to be easy to understand and the data easy to collect at the neighborhood level.
Developing “Tags”

Tags are key words/phrases that link indicators to the interests of users. They are a key part of database architecture and organization.

**Method:** Further analysis of the users/grantees to identify the most important characteristics and aspects of projects, followed by testing from the perspective of different types of users.

**Results:** Area of interest, type of project, geographic scale, and level of development are the tags that best match users and indicators.
Current Tags

Area of Concern
• Access and Equity
• Health
• Economic Competitiveness and Efficiency
• Affordability
• Environmental Quality and Resilience
• Community and Sense of Place

**Additional tags for geographic scale and level of development**

Land Use
• Compact Development
• Redevelopment
• Growth Management

Housing

Transportation
• Rail, Subway, Light Rail
• Fixed Route Bus
• Demand Response Transit
• Non-motor Transportation
• Auto-oriented transportation
Identifying the preliminary database of Indicators is a two step process:

1. Identify *instances* of indicator use
   - For example VMT measurement in New York, Seattle MPO, Chattanooga

2. Analyze *instances* into catalog of searchable *indicators*. 
Instances

• Identify indicator instances
  – Key Sources:
    • Reports by individual municipalities, communities, and regions
    • Previous PennIUR research
    • The PSC Performance Measurement Capacity Building Program
    • The Community Indicators Consortium
    • ICLEI

• Assess each instance for a) use and b) calculation/data source

• Identify individual calculation methods and link to data sources and reports
  – Ex. Government Surveys (Census, BLS, EPA, BEA)
Indicators

Aggregate *instances* into catalog of searchable *indicators*.

**Example:**

**Indicator:** Vehicle Miles Traveled

**Instances:** Geographic Boundary Approach (12), Generated Trips Approach (8)

**Tags:** Environment, Transportation, Auto-Transportation, Urban, Suburban, Rural, Regional, Municipal, County, Neighborhood
Next Steps

• Stakeholder and expert meetings in early 2013.

• Draft guidebook to sustainable community indicators and performance available for review early 2013

• Piloting the SCIC begins in 2013
Thank You

Penn Institute for Urban Research
University of Pennsylvania

Amy J. Lynch, Doctoral Candidate,
Project Director
amyly@design.upenn.edu

Eugenie L. Birch, Ph.D.,
Penn IUR Co-Director
elbirch@design.upenn.edu

Stuart Andreason, Doctoral Candidate
stuartan@design.upenn.edu

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