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Sustainability indicator systems within urban governance: Usability analysis of sustainability indicator systems as boundary objects

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ABSTRACT

While sustainability indicator systems (SIs) have proven to be valuable rational tools for improving the availability of information related to the relationship of cities and communities to natural limits, the indicators movement has achieved limited instrumental uptake in policy. This paper begins from a recognition that instrumental use of sustainability indicator systems is rare. Greater potential impact exists for SIs designed to be much more attentive to their conceptual and political values within their particular social and political context. In other words, greater attention to what has been called the governance of indicator systems, or the ways in which SIs fit as policy tools within a multilevel and multiactor governance context, is key to increasing their utility. This is particularly true given the need for decisive policy change, or even the introduction of a new development path, which is asserted within the sustainability agenda.

Understanding the real and potential utility of indicator systems within multiactor governance processes, in which their roles are primarily rhetorical, conceptual and political, is facilitated by thinking about indicator systems as boundary objects, tools which open up dialogue, information sharing, learning and consensus-building across different policy boundaries: between experts and nonexperts, formal government and different nongovernment actors, higher-order governments and lower-order governments. This paper offers a comparative analysis of three sustainability indicator systems in the North American context – Vancouver's Vital Signs (Vancouver Foundation), Seattle's Happiness Initiative, and LEED-ND (US Green Building Council) – all of which have shown some success in operationalizing a new policy boundary as a means of making conceptual and political contributions to governance practices. The specific boundaries operationalized, the different approach taken by each project, and the usability demonstrated by each project at that boundary in terms of salience, legitimacy and credibility, are assessed comparatively. In general, the trajectory in design and use of ecological and sustainability indicators demonstrates an increase in appetite, aptitude and numbers of channels for use in processes of governance; however, these factors vary with the local social–political opportunity structure. This analysis presents the advances made as well as the tradeoffs evident in these cases across the gamut of different forms of usability of nongovernmental indicator systems designed for use as boundary objects, and suggests a path forward for indicator work which aims to change policy, from a governance perspective.

1. Introduction: sustainability indicators are positively normative!

Within the indicators movement, the end is near for the age of indicators crafted in laboratories, shielded by password protected spreadsheets and cryptic formulae. In its place, a true social theory of indicators is dawning. Social critique of indicators, of course, is nothing new (Mitchell, 2002; Hacking, 1990). What is new to this dawn is the normative position of cautious confidence being taken by social scientists seeking to stake out a socially and environmentally useful policy space for indicators.

Turning to sustainability indicator systems specifically, whereas these were originally designed to alert people to approaching limits of our environmental life support systems, they are currently hitting limits in terms of promoting the social and political change that is recognized as necessary for a sustainability shift. Since its origins in the early 1990s, the sustainability indicators movement has produced considerable "MRV" value – that is, value in terms of providing new input to decision making that is measurable, reportable and verifiable (Hak et al., 2012). However, while these attributes are sufficient for the instrumental use of indicators by policymakers "directly to improve the policy outcomes in the given policy area,"

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(Bell et al., 2011, 10), this kind of linear or instrumental uptake of indicators has been limited to rare cases of sectoral focus "with binding goals or objectives that are monitored and/or evaluated" (Bell et al., 2011, 9). Nor has instrumental use of sustainability indicators proven conducive to policy *change* through normative reconstruction of policy goals (Rinne et al., 2013; Rametsteiner et al., 2011; Weaver and Jordan, 2008).

Quite aside from their mostly undemonstrated instrumental roles when used as positivist tools, indicators may play conceptual and political roles at new boundaries of knowledge and action, as tools in communication, understanding and engagement (Cash et al., 2003). In conceptual terms, indicators may help in learning, understanding, and structuring the definition of policy problems and interpretation of trends and solutions in fostering change readiness through learning to think about policy problems and sustainability trends from different perspectives suggested by interpretations and relations offered within the indicator system. By exposing the subjectivity and bias inherent in interpreting any trend and presenting alternative interpretations as well as opportunities for dialogue on these, indicator systems play "a conceptual role by helping to diffuse such visions and ideas and to support alternative thinking and new concepts rather than leading to political action [directly]" (Bell et al., 2011, 11). At the same time, indicator systems can serve political roles in terms of legitimizing existing policies or policy actors or disrupting these dynamics through confrontation and conflict (Bell et al., 2011).

These conceptual and political roles for indicators speak to the potentially valuable position of indicator systems within contemporary governance as 'boundary objects' (Star and Griesemer, 1989) – intermediary between different policy actors, operating at new policy boundaries; between formal and informal policy roles; policy design and implementation; data inputs and trend outputs. Boundary objects are policy tools used to create a forum at the dynamic interface between different social arenas by organizations that come together to coproduce knowledge and decisions (Turnhout, 2009). In order to serve effective conceptual and political roles towards policy change, indicator systems must work as boundary objects. This is due to the conditions for change in the contemporary governance context, which are driven not by the force of rational argument and evidence so much as knowledge translation to different discourses, suggestive of connecting multiple goals and objectives, and the engagement of different actors. Indicator systems as boundary objects thus are collaborative efforts that "are both sufficiently stable and ambiguous enough to be able to connect different social worlds and allow for different meanings in each of them" (Turnhout, 2009, 410).

Cash et al. (2003, 8086) refer to the important 'boundary work' needed to facilitate a sustainability transition "at the interface between communities of experts and communities of decision makers." Here, our interest is in the fine-grained and broader base of research and action by the diverse groups of experts and nonexperts with different stakes and different limited decision making powers involved in the domain of participatory urban governance. Such indicator systems work at new boundaries within and across different institutional types, producing different priorities and weaknesses for indicators work and policy impact. We lack an adequate understanding of or approach to using indicator systems as such boundary objects. What this points to is a need, and perhaps a readiness within the field, more explicitly to develop "the governance of indicator processes" (Bauler, 2012, 41; Moreno Pires and Fidélis, 2012; Rametsteiner et al., 2011; Scerri and James, 2010; Ramos and Caeiro, 2010; Holman, 2009; Eckerberg and Mineur, 2003). Beginning from an observation of a commitment in the indicators field to find conceptual and political uses for indicator systems, a governance approach invites analysis of indicator systems as boundary objects, which in turn demands explicit understanding of their usability.

In the interest of advancing this agenda, this paper presents an analysis of three indicator projects in terms of their utility within a reflexive politics of urban governance. Recent research by Bauler (2012) has advocated just such a path, focusing on evaluation of indicator systems' "usability profile." Usability is defined as: "the inherent, mostly implicit, potential of indicators to be considered by policy actors during their decision activities" (Bauler, 2012, 39). Usability analysis is proposed as a deliberative process of determining this utility of indicators at different boundaries between interacting groups in the policy realm. Building upon Cash et al. (2003), there are three core analytical elements[1]: legitimacy, credibility and salience. Each of these elements may be assessed differently by actors from different positions, such that a usability analysis may produce different results at particular policy boundaries being operationalized by an indicator system.

The operationalization of a politics of sustainability indicator systems in this context of multilevel governance will be demonstrated here through a comparative usability analysis of three systems in North America: Vancouver's Vital Signs, Seattle's Happiness Initiative, and the LEED-ND (Leadership in Energy and Environmental Design for Neighborhoods) system.[2]

A sizeable body of European research – all with interesting acronyms like PASTILLE Consortium (2002), MATISSE (Weaver and Jordan, 2008), IN-STREAM (2011), and POINT (Bell et al., 2011) – has dug into the questions of how indicators are used in policy, and how to improve their disappointing track record. The LIAISE (2009–2013) project is creating and maintaining communication and improved understanding between experts involved in impact assessment and the policy makers working on the EU Sustainable Development Strategy. Summarizing the perspective of these projects together, Weaver and Jordan (2008, 24) recommend that what is needed for more effective use of sustainability indicators and assessment is: "a cyclical, participatory process of scoping, envisioning, experimenting, and learning through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner." Other European projects, like PETUS (2005), INSURE (2007), and SENSOR (2009), designed indicator frameworks and models to substantiate our understanding of the future impacts of our decisions, thus hinging the impact of the work on the assumptions of instrumental use: if "you" forecast the harm, using reliable data and modelling, and a better interface, "they" will make decisions to avert the harm.

In North America, no comparable research trail exists. The North American context also offers a different political opportunity structure for policy impact of indicator systems, compared to that of Europe. This is generally characterized by an absence of legislatively supported national or state/provincial sustainability indicators, and a relative abundance of purpose-built, sectorally and regionally focused systems, largely operating at arm's length from government.[3] By contrast, Rinne et al. (2013, 5) found that

[1] Additional components to a complete usability analysis offered by Bauler include participation, science and governance (how are assessments conducted, by whom and in what forms of interaction), and focus (what is within/beyond scope). In the initial usability analysis of the systems offered here, these criteria are considered subsidiary to salience, credibility and legitimacy, in overlapping ways.

[2] The usability analysis offered here is preliminary, given that it has not been subject to a deliberative process. Methods employed in this analysis include primary and secondary research, including participant observation in each year of the Vital Signs initiative, in which the author was a research advisor, and of Sustainable Seattle at various points since 2002, in which the author is an interested observer, and three key informant interviews.

[3] This refers to the situation in Canada and the United States. In Mexico, by contrast, a limited top-down approach has been taken to the development of comprehensive sustainability indicator systems (INEGI and INE, 2000).

across Europe, a "group identified that could potentially use indicators in a political manner was . . . non-governmental organisations, pressure groups, and media. However, almost no use by these groups was detected." This situation must certainly contribute to the "paradox of conservatism" identified in the instrumental use of indicators in Europe, where in some cases "long-standing consensus on goals, measures, and indicator sets for policy evaluation could constitute a barrier to the adoption of new 'best practice', new evidence, and new paradigms. Likewise, indicators whose quality was repeatedly called into question, were sometimes used nevertheless for political purposes" (Bell et al., 2011, 14). Indicator systems positioned outside traditional data sectors, crafting new policy boundaries parallel or tangential to government, thus may constitute an opportunity for the advancement of conceptually and politically useful indicator systems in the task of sustainable development transitions.

2. Indicator system usability within participatory urban governance for sustainability

Effective research into the politics of sustainability indicators entails the search for a deeper understanding of the different roles that indicator systems may play as we insert them into different governance contexts, layered upon claims, policies, and actors specific to sustainability. The abundance and complexity of information related to any sustainability agenda implies that indicators audiences always have options about whether to accept the information on offer. More than options, this situation entails an expectation that indicators audiences will make judgments to reconcile the multiple and often conflicting pieces of information that constitute their own understanding of the context. From the point of view of those offering the indicator system up as new information, this situation demands that rhetorical and political strategies, rather than solely scientific authority, be employed in order to secure the usability of the system. An approach focused on usability recognizes the conditions of freedom of choice and diversity of life conditions and aspirations and aims to communicate effectively in this context. Specific to the challenges of a sustainability shift, rhetorical devices like ozone holes, hockey stick curves, and drowning polar bears convey meaning with a force that the weight of evidence, in and of itself, never could (Dryzek and Niemeyer, 2010, 69–73).

The current global debate around GDP and alternative measures of progress is not "just a technical debate" (Hak et al., 2012, 1) but a debate about the fundamentals of how societies and communities define and move towards greater human well-being, starting from where we are now. If they are to contribute to this debate, in its local through to global manifestations, indicator systems must be seen as rhetorical, conceptual and political tools; it is in this context of a globally vital debate that usability analysis takes on its full significance.

Moreover, the rhetorical, conceptual and political usability of indicator systems varies depending on the policy boundary at which it is inserted, which determines the boundary object it is crafted to be. Each of the three projects analyzed here represents innovation in terms of characterization and operationalization of the most effective policy boundary. None is within government; each represents a different new governance actor – a philanthropic foundation, an environmental nongovernment organization, and a professional organization – and all operate at multiple scales, local or regional, national or international, and places in between. Importantly, while each project has a clear view to social change, none sees government as the primary audience target of their work: for Vital Signs and the Happiness Initiative, the primary audience is the public at large, with local government consulted or engaged to different lesser degrees; for LEED-ND, the primary audience is the building industry, although the public and local government are key additional audiences. Depending on one's perspective, this could be seen as a neoliberal sleight of hand, bypassing the democratic governance system to our peril; or, alternately, bootstrapping across the growing gap between the limitations of government to respond to evolving community needs and desires and a maturing social movement and improving broad-based understanding of the mechanics of real social change (Scerri, 2012). We will consider here the way in which each project is, in this respect, crafting a new policy boundary, a new hybrid forum or meeting place between two sectors in the participatory governance realm, a new space for dialogue about social and policy change, about evidence and trends, with few formal rules or pre-existing habits of interaction. These policy boundaries, therefore, represent a high level of uncertainty of impact, with no track record, but at the same time, the potential involved in any new meeting of interested and empowered parties. Also, each initiative represents a completely separate and non-overlapping attempt to leverage change via an indicators-based approach: engagement from a basis of a community well-being report card, the assertion of happiness as core development goal, and a voluntary sustainability standard for physical development.

In addition to an analysis of the policy boundary being operationalized, the usability analysis will consider the following three core criteria, taken from Cash et al. (2003):

1. Salience: do the indicators refer to the questions deemed relevant by the policy actor and adequately assess the policy stakes?
2. Credibility: do policy actors view the indicators as robust?
3. Legitimacy: are the indicators configured with procedural fairness to meet political, societal and ethical standards?

2.1. Case: Vital Signs for Metro Vancouver (http://www.vancouverfoundationvitalsigns.ca)

Launched in 2006, the Vancouver Foundation's Vital Signs project is intended to bring together new, in-depth, critical and verifiable information about Vancouver's communities in an innovative process that includes region-wide engagement, primary and secondary research, web-based and print publication, and outreach. It represents the Vancouver region's contribution to the Vital Signs initiative which is headed by the umbrella organization for community-based philanthropic organizations in Canada, Community Foundations of Canada.[4]

The Vital Signs for Metro Vancouver project has been conducted five times. With an overall reporting theme expressed variably as liveability, wellness and community vitality, the initiative reports on indicators and trends in 12 theme areas (with some variations): children and youth, seniors, belonging, economy, housing, affordability, getting around, environmental sustainability, safety, learning, health and wellness and arts, culture and leisure. In 2010, the most recent year that the initiative was conducted, a total of 238 indicators were reported, along with public opinion survey results, based upon a representative sample of Vancouverites with subregional breakdowns, and citizen grades and priorities in each theme area.

Established in 1943, the Vancouver Foundation is the largest philanthropic community foundation in Canada, with endowment funds totalling over $750 million and which distributes $46 million annually (Vancouver Foundation, n.d.). As a step away from

[4] As of 2012, 22 communities across Canada had participated in Vital Signs, with considerable variation in the approach taken and results achieved. While Vital Signs is now led by the Community Foundations of Canada, it originated as a local project of the Toronto Community Foundation (TCF) in 2001, where the TCF was identified by other local leaders as the organization best situated to track and report on key metropolitan trends at a critical juncture for that city.

'front-line' engagement with grant recipients to lead a process in attaining a representative, research-based perspective on key trends, the project represents a first for the foundation.[5] In other words, the project presents a new *policy boundary* connecting the philanthropic organization not to front line people in need but to the strategic domain of participatory urban governance. Within this new boundary region, the foundation is actively seeking to gather new knowledge about the communities in which they work, with a view to this information improving their ability to assist these communities (Lyons, 2012).

One of the strategic objectives stated for the work is "to help us understand our community. By knowing where metro Vancouver does well and what challenges we face, we are able to put our funding and resources in the areas of most need and celebrate the accomplishments in our region as a community foundation" (Kubota, 2010). This role has been noted with interest as part of a larger move towards 'place-based' philanthropy in which funders seek to understand the places in which they offer funding with an intent to create the understanding needed to address the root causes of social and environmental problems (Murdoch et al., 2007). It has also been called into question by social researchers who, in effect, question who and what may be pushed out of this policy space as the philanthropic sector moves in, and are interested in the impact of devolving authority to intermediary organizations between government and citizens, leading in the delivery of policy where government once held exclusive authority (Ostrower and Stone, 2007).[6]

Although organizations involved in data and reporting throughout the region were initially unsure about the need for Vital Signs, the project's *salience* could be judged in terms of the eventual willingness of community leaders, from local and regional government, business, and nongovernment organizations, to participate, and indeed the willingness of several of these organizations to share data, distribute the report, and contribute in other ways to its success. There has been widespread recognition throughout the Vancouver region that Vital Signs has value, that Vancouver Foundation offers a service to the region in conducting it, and key connections with the major local newspaper, the *Vancouver Sun*, have ensured wide awareness of the report and key trends amongst the general public. The answer to the question of what to do with this information source, however, has not been so readily forthcoming. In 2010, the Foundation initiated deeper engagement with the project among Foundation staff, including organizing a 'dotmocracy' (Nabatchi, 2012) workshop in prioritizing indicators. Further specific connections between the report's findings and organizational funding priorities are more tenuous. Also in 2010, the Foundation took the report 'deeper' into the region's suburbs through a series of face-to-face events called Community Conversations. What may come of the Vancouver Foundation and Vital Signs taking on this kind of convening leadership role, in asserting its strategic position in a direct interface with the public, the question of developing *salience*, remains to be seen.[7]

Given that Vital Signs is a data-rich project driven by people with no particular knowledge of or affinity to data, ensuring a high level of *credibility* in terms of objective data validity and reliability has been key to project design. The work has been conducted by a project team within the Foundation, who have worked with external voluntary advisory groups, research organizations, and a communications firm, with overall guidance from the organization's Board of Directors. The report covers the geography of the metropolitan Vancouver area, but also includes many disaggregated indicators at municipal and subregional scales, allowing for intraregional comparisons. Additionally, Vital Signs features an opinion poll of a representative sample of Vancouverites, which probes residents' perceptions on different key questions within the realm of liveability and vitality.

Vital Signs for Metro Vancouver offers a number of significant innovations within community quality of life indicators practice, aimed at achieving high levels of *legitimacy*. Key among these is the pairing of indicators, based on secondary data and analysis, with thematic grades, and action priorities, which are gathered via a citizen survey. Innovations in report dissemination include a move towards more effective use of an animated web format for reporting, along with social media engagement in the process of the initiative.

2.2. Case: Seattle Happiness Initiative http://www.happycounts.org/

The Happiness Initiative began in 2011, as the fifth cycle of the Sustainable Seattle indicators of sustainable community project. Garnering inspiration both from the notion of the "unalienable right" of citizens to the "pursuit of happiness" within the American Declaration of Independence, as well as the Kingdom of Bhutan's Gross National Happiness Initiative,[8] the Sustainable Seattle Happiness Initiative quickly spun into a stand-alone national nonprofit organization, the Happiness Initiative. The Happiness Initiative has designed and tested a version of the happiness survey that can be completed in 15 min, and created 'Happiness Initiative Toolkits' to facilitate the work of groups conducting their own survey. About 2600 Seattle residents and a total 7200 respondents from across the US have responded to the voluntary or 'opt-in' web-based survey. Seattle's 2011 Happiness Report Card thus serves as a prototype for other areas initiating 'happiness work' across the US.

The *policy boundary* engaged by the Happiness Initiative sits at the civil society/local government nexus, with Seattle City Council offering an official proclamation of support for the initiative from its outset (SAHI, 2011).[9] While the organization is mostly arm's length from local government, funding from the city's Department of Neighborhoods and the help of local immigrant services organizations facilitated the participation of immigrants in the survey (Musikanski, 2012a).There is also a national and international civil society and social movement boundary being engaged, with Happiness Initiative participation in the United Nations High Level Meeting for Wellbeing and Happiness: Defining a new economic paradigm in New York on April 2–4, 2012 (Musikanski and de Graaf, 2011a). "Practical policy recommendations" regarding the emergence of a more holistic approach to development

[5] Although, beyond the Vital Signs initiative, philanthrophic foundations elsewhere, such as the Boston Foundation, have undertaken similar community indicators work.

[6] At the national level, Community Foundations of Canada has engaged somewhat at the policy boundary with the formal federal government, by organizing a letter-writing campaign to oppose cuts to Statistics Canada and the Canadian Census in 2010; also, CFC has been offering the Vital Signs brand and process internationally, with a view to connecting a global community foundation movement and a global Vital Signs movement (Lyons, 2012).

[7] In 2011, the Vancouver Foundation Board of Directors opted to shift its strategic focus towards an initiative in which they could demonstrate more direct impact, and thus not to update the Vital Signs report in 2012. The Foundation has, on the other hand, partnered with the City of Vancouver on a new $2 million granting program, the Greenest City Fund.

[8] The neighboring City of Victoria, BC, also launched a similar Happiness Index Partnership in 2008 (City of Victoria, 2008).

[9] As a point of interest regarding the porosity of the government/nongovernment boundary in this case, this proclamation was advanced by Seattle City Council president Richard Conlin, himself one of the founders of Sustainable Seattle in 1990 (Holden, 2006).

emerging from this conference were taken forward to the June 2012 Rio plus 20 Earth Summit (Astor, 2012). In the United States, the organization hopes to launch a Happiness Collaboratory with one or more specific demographic groups or sectors, in order to examine potential refinements to the survey, issues specific to happiness among, say, youth or business people, and to enrich the public conversation about shifting values around progress in that way (Musikanski, 2012a). The domain of entry into participatory governance is narrower than is the case with Vital Signs, guided here by an identified prospective solution – planning for happiness – rather than the need for better problem identification.The initiative is motivated by a perceived need to increase the *salience* of the sustainability-oriented and indicators-based approach pioneered by Sustainable Seattle. Cofounder Laura Musikanski expresses it this way: "Here we are, Sustainable Seattle, an organization that changed the world, and yet it hasn't created real change" (Musikanski, 2012b).[10] The salience of this initiative thus derives from identifying the unifying theme of happiness, with a high level of individual purchase, the underlying challenge to an economic paradigm that deprives people of happiness, added to the approach of a measurement and monitoring based upon crowd-sourced, subjective data.This approach means limitations to *credibility*, an intentional choice on the part of the initiative based on the underlying sense that "it isn't going to be experts who change the world." In looking back at the objective indicators selected and objective data reported by Sustainable Seattle, initiative founders' reflections were that: "This information was important and helpful to policy makers, but the sheer number of indicators and their 'objective' quality made them increasingly less engaging for the public and the media" (SAHI, 2011, 6). To fix this, they set out to design a model that was personally engaging across a diversity of members of the public. The notion of 'real' happiness, "not happiness in terms of instant feeling but in terms of overall satisfaction with life," connected this need for immediate personal relevance and identification with the need to reorient or rediscover values in a time that is challenging conventional understandings of economic success. The Happiness Initiative, thus, seemed to founders to offer an opportunity to facilitate, popularize, and defend a personal reformulation of happiness and the means to attain this enrichment, quite separately from income gains and material standard of living: "Across the world, 'happiness' means different things in different cultures, but some things are clear no matter what the culture: the influence of hyper-consumerism, poverty and resource depletion means deleterious effects to everyone's well-being, sustainability and happiness" (Musikanski and de Graaf, 2011b).While the sample size for the Seattle area on the initial run of the opt-in survey was large, it was biased towards women (two-thirds of respondents) and those with higher than average income and education. The project organizers offer the following defense of their approach: "While we acknowledge limitations in our data, we believe that the Happiness Initiative survey reveals important trends which will be valuable to Seattle residents and policy makers, and that further work on the Happiness Initiative, including ongoing opt-in surveying and a representative survey, is warranted" (SAHI, 2011, 7). The organization, however, does see inclusion of a representative and objective data source, via partnership with the City of Seattle in particular, to be critical to building its future *legitimacy*.

2.3. Case: LEED for neighborhood development (LEED-ND)

Developed as a new rating system for green neighbourhoods, LEED-ND was piloted in 2007 and launched in 2009.[11] It is the first standard in the LEED family to move beyond the scale of individual buildings, in recognition of the notion that "a building is only as green as its surroundings" (US GBC, 2012, 3). A rating system which "distills the experience of leading professionals in environmental policy and the building industry . . . into objective, measurable criteria," (US GBC, 2012, 5), LEED-ND includes three dimensions of evaluation, each of which has both prerequisites and optional point credits. The three domains are: smart location and linkage ('where to build,' disqualifying environmentally sensitive sites), neighbourhood pattern and design ('what to build,' prohibiting gated and low-density communities), and green infrastructure and buildings ('how to manage environmental impacts of building,' preventing pollution during construction). A review of the pilot phase found 205 certified projects in the United States, 24 in Canada, 6 in China and 1 each in Bahamas, South Korea, and Mexico; 91% were in urban areas (Criterion Planners, 2007).

The *policy boundary* at which LEED-ND operates is primarily the interface between the professional association and the building professions, as well as the (property buying) public. The LEED-ND rating system "is intended to capture the interest of both the public and private sector in looking beyond the individual building to the larger community" (US GBC, 2012, 3). LEED-ND offers a value proposition to the environmentally-concerned public, a case made in the Citizens' Guide to LEED for Neighborhood Development: "While LEED-ND is not a guarantee that you [the member of the public] will approve of every aspect of a project, it is a very good indication that a project's environmental performance will be superior to average development." This is followed up with the suggestion that "If [a development proposal] does not appear to be certifiable at any level, consider opposing it" (Welch et al., 2011, 17). The role envisioned for LEED-ND in the hands of an engaged public relies primarily on the personal responsibility accrued from investment of time and money rather than a traditional understanding of citizenship: "Community members involved in planning for a neighborhood's future are often more likely to invest in it, care for it, and maintain it. This sort of personal investment supports a neighborhood's long-term stability and sustainability. If new development or other major changes are proposed in a neighborhood, basic facets of community involvement should include meetings with surrounding property owners, residents, and businesses; modifying project designs to meet stated community needs; and maintaining open lines of communication throughout the project" (Welch et al., 2011, 13).

However, the obvious overlap with traditional planning activities of local governments has not been lost on the makers of LEED-ND. With the publication of a "white paper" for local government adoption in 2012, the Green Building Council has also turned towards the policy boundary it shares with local government: "LEED for Neighborhood Development allows local governments to achieve market transformation at a greater rate than ever before by making the "greenness" of a building as much about where it is as what it is." Citing the tool as a "ready-made set of environmental standards for land development" (Welch et al., 2011), the use of LEED-ND as a template for green development ordinances is promoted.

The *salience* of LEED-ND is clear, at least for those developers and communities interested in advancing green features of

[10] Sustainable Seattle is recognized as the organization which created the world's first sustainability indicator system, in preparation for the 1992 Rio Earth Summit (Holden, 2006).

[11] The first standard in the LEED family launched formally in 1998.

development, and sits as an obvious next step for the LEED building rating tools (Sharifi and Murayama, 2013). Applying LEED-ND to site planning and build out of precinct scale areas is expected to improve energy and water efficiency, to "revitalize existing urban areas, reduce land consumption, reduce automobile dependence, promote pedestrian activity, improve air quality, decrease polluted stormwater runoff, and build more livable, sustainable communities for people of all income levels" (US GBC, 2012, 1).

However, in terms of *credibility*, these high level claims are questionable. A key example is the very tentative relationship of LEED-ND to affordable housing: "When housing is available at affordability [sic] range of prices, people who earn less but are vital parts of the community – such as teachers, police officers and public sector employees, or artists – can live and work in the same community as those with higher incomes. This encourages economic opportunity and social diversity, and can sometimes reduce commute times by allowing people to live closer to work" (Welch et al., 2011, 8). The makers of LEED-ND have nothing to say about the importance of housing those who may not fit the bill of either essential workers or cultural creatives, accords little importance to considering locality-specific issues, and offers very little credit for affordable housing provision of any kind (Garde, 2009; Sharifi and Murayama, 2013).

In an academic evaluation of US pilot projects, developer respondents viewed the LEED-ND rating system as valuable for "verifying the sustainability of neighborhood development projects" (Garde, 2009), generating publicity, garnering market advantage, and brokering a sense of comfort among planners and local officials in the project approval process. Some also criticized the rigidity of the points-based system; one said "the costs greatly overshadow the benefits" with the award of certain points being entirely cost prohibitive (Garde, 2009). In this evaluation, most respondents said that they made no changes to their design or building plans to meet LEED-ND criteria.[12]

LEED-ND faces a *legitimacy* challenge in that it and other LEED rating systems are built and offered up on a voluntary basis by the sector that benefits the most from the construction of new developments: the design and building sector. LEED-ND confronts this challenge in some respects via its partnership with the Congress for the New Urbanism and the Natural Resources Defense Council. Still, from a strict materials throughput perspective, the most sustainable neighbourhood is one that is repurposed from existing stock rather than built anew, and new build is the only aspect addressed by LEED-ND. This bias, and other necessary biases in the selection of prerequisite and point items for certification, add to the cost of LEED certification and ensure the need for new channels of professionalization in order to support the certification process, leading some within the housing industry to refer to the "tyranny of LEED" (Rennie, 2011). In the Citizens' Guide, the intent of increasing the spread and use of LEED-ND as a standard in this way is not hidden: "(If you belong to an organization or agency that already maintains guidelines for which projects to support, it might be helpful to refine or augment those guidelines with standards from LEED-ND.)" (Welch et al., 2011, 17). There is an efficiency argument offered for this attempt to spread the reach of LEED-ND: "It can be a struggle for local citizens, designers, planners and governments to create feasible standards for sustainable development on their own. LEED-ND has the potential to fill this gap with criteria that have been developed in a consensus process and field-tested in various contexts" (Welch et al., 2011, 22).

[12] In response to the perception of a 'low-balling' approach to LEED certification in the design and construction industry, the Living Building Challenge was launched in 2010 as a much higher standard for sustainable building. This standard, now administered by the International Living Building Institute (https://ilbi.org/), currently has about 140 active registered projects and three fully certified living buildings.

3. Comparative usability analysis

In comparative perspective, we find that the three projects have crafted different policy boundaries and exhibit different usability profiles (Table 1). What each of these systems offers is, if not a new development path, at least the possibility of cracks in the dominant development path and a range of new ways to fill in gaps in the practice of participatory urban governance. Using the indicators project as a boundary object to activate governance work at new policy boundaries, each of these three cases offers the injection of a new proposition for moving forward towards some intentional social goal, which in its absence had little political hope or momentum.

Despite the dominant 'postecological' notion that no systemic alternatives exist to the political-economic system in which we find ourselves (Blühdorn and Welsh, 2007), the Happiness Initiative offers a straightforwardly value-based proposition that a shift away from affinity to this system can help individuals live better with less, in an environment where this is message has visceral local and international salience. Despite an increasingly blatant assault on government's ability to collect and use key social and environmental data for policy (Munro, 2013; Matas, 2012; Galloway, 2012; Curry and Grant, 2012; Paehlke, 2013), the philanthropic sector has stepped up and asserted through Vital Signs that this role is important and can be accomplished by other sectors and other means. Despite cynicism about the governmentalization, colonialization and commericalization intentions within standards such as those for sustainable building and neighbourhood development, we do see the green building standards system coming to terms with the need for engagement and adaptation by local people and local government as well as design and building professionals, and a variety of political as well as instrumental uses for the tool.

Recognizing the need for greater salience of its Vital Signs project, the Vancouver Foundation has a number of options to carve a greater role for itself at this policy boundary, from assuming the role of a provider of reliable, original research via its community surveys, to advancing policy recommendations or directions, to playing a "convening leadership" role, as it has begun via the Community Conversations. Key to making advances in any of these (or other) directions will be discussion related to the trade-offs involved in assuming new authority at this policy boundary: as a data provider in the community as well as engaged in the craft of policy recommendations. One of the things they may need to trade is the satisfaction of direct demonstrable value to grantees for indirect input to broader, but messier, and potentially contradictory, societal understanding. In fostering and convening public dialogue, the Foundation may also need to consider what key access points and channels it has at its disposal to access which groups of the public, and whether trade-offs exist in directly engaging the public at large. The Foundation faces the challenge of cultivating a sense of purpose, comfort, and legitimacy in operating at this new policy boundary, from which salience will flow. In the case of the Happiness Initiative, high levels of salience may have been won in a potentially disingenuous way, in terms of effort to foster conceptual level change in development paths, because the project can be viewed as either a quest for long-term well-being or as a kind of 'identity campaign' that hones in on individual hedonism to influence public opinion towards environmental attitudes and behaviours (Brulle, 2010). This could be a key move to integrate across political and value-based perspectives, but it is important for the keepers of this boundary object to recognize the ambiguity in interpretations of happiness may not pay off in

Table 1
Usability analysis of three nongovernmental indicator initiatives.

	Key operational policy boundary	Salience	Credibility	Legitimacy
Vital Signs for Metro Vancouver	Philanthropic foundation – local public	Low	High	High
Happiness Initiative	Nongovernment organization – local and global public (local government)	High	Low	Medium
LEED-ND	Professional association – building industry – local public (local government)	High	Medium	Low

the long run. Instead, 'self-maximizing' attitudes associated with short-term individual happiness may exist in inverse relation with 'self-transcending' attitudes and values, associated with long-term well-being (Crompton and Kaser, 2009).

With regard to credibility, we must agree that data accuracy, in and of itself, cannot be a significant problem when, for example, "the data errors that go into calculating the gross national product are larger than the fluctuations in GNP that most economists find significant" (Science, 1977, 649) yet economists remain perfectly willing to employ these national accounts. Moreover, indicators developed by local communities have been shown to be as accurate as (and sometimes easier to use than) indicators developed by experts (Reed et al., 2005, 2006; Holden, 2009; Zachary et al., 2010). Similarly, as the Happiness Initiative also reminds us in defense of its large but non-representative sample survey results, the validity added to the results of a process involving thousands of participants over one involving a much more restricted group may be small: "thousands probably produce results little different from the smaller forums" (Dryzek and Niemeyer, 2010, 74). In the case of indicator systems, we are interested not just in generating political rhetoric – although we must be much more sensitive to this – but also in generating "hybrid knowledge" or that which is shared across the policy boundary (Reed et al., 2006, 416).

The results of the usability analysis here also tell us something about the way in which the salience, credibility, and legitimacy features of usability interact. We find that salience can exist in a trade-off or negative feedback relationship with credibility (in the case of the Happiness Initiative) and that the three initiatives have a different approach to 'shallow' or 'deep' framing, in terms of connecting the initiative with a set of larger-than-self values (Lakoff, 2004; Crompton, 2010). The Happiness Initiative is the most 'deeply' framed, connecting the attainment of a richer sense of happiness, defined by subjective measures of well-being, with the eschewal of strict material well-being. The Vital Signs project, in and of itself, is framed 'shallowly,' offering no specific notion of what constitutes well-being or what should be done to improve it, and so no direct route to policy uptake. This may suggest a trade-off relationship between salience and legitimacy, with deeper framing offering more public salience, but with potential losses to policy legitimacy. LEED-ND is in an intermediate position regarding the depth of its framing, given that the measures do add up to a value that corresponds to a standardized level of achievement, and that level of achievement is associated with a particular vision of a sustainable community development, set apart from a typical new development. Beyond questions of site location, physical design, and technologies and materials used in construction, however, LEED-ND does not dip into the pool of human values explicitly in order to argue its position, faces a number of apparent contradictions in its position with regard to community sustainability, and may lose some amount of salience in this way.

4. Discussion and conclusion: new behaviours at the boundaries

The challenge to the use of indicators within the sustainability movement is a simultaneous challenge of salience, credibility and legitimacy. In the dimension of salience, there is considerable cultural bias in definitions of wellbeing, happiness, and sustainability, much of which is unspoken and not open for meaningful debate. Systems can be eternally questioned regarding their credibility, as no baseline or reference point for sustainability is accepted by all, trade-offs with immediate economic and social impact are often apparent, and widespread sophistication in manipulating numbers in different ways to derive different numerically credible results is rampant. The climate of legitimacy is fraught with extreme mistrust and confusion, and this accelerates as the need for social change becomes increasingly obvious, and increasingly resisted.

Agile adaptation and surprise need to be employed on all three fronts, and the operationalization of new policy boundaries is a key means to this end. At any given policy boundary, knowledge gaps emerge between arenas and actors, for instance between 'science knowledge' and 'policy action', which can make the first ineffective and unused, and the second not respond correctly to upcoming challenges. While indicators may fail in instrumental application because they do not belong to any particular policy sphere in multilevel governance scenarios, their boundary-crossing and boundary-crafting capacity may lend them specific utility at the gaps and overlaps between different policy spheres in terms of convening, translating and connecting different groups and different perspectives. As boundary objects, indicator systems "help to construct a web of commonly shared norms, conventions and rules across different policy arenas. How indicators are interacting with science, policy and society arenas depends on the way they are configured with regard to the different arenas" (Bauler, 2012, 43).

All three of the indicator system approaches examined here embed an understanding of the need to create demand for these indicators as part of the challenge of driving change. This is part of the wager involved in cultivating new policy boundaries for the creation and use of these systems. To the extent that these systems are employed in a way which does, in fact, cultivate demand both for the indicators and for the changes in policy and practice implied by the indicators, these systems address a common shortcoming of traditional indicator systems, namely the assumption of demand in situations where the same agency may be the primary creator and user of the information (Bell et al., 2011, 11). From the perspective of boundary objects, indicator systems can be thought of as the means to cross boundaries and carry discourses, information, and priorities across different divides of agency, language, power and perspective.

Boldness is required in order to make the leap between where we are and where we need to be in a wide range of domains of life. This is risk-taking work, not the forté of most statisticians; many non-governmental organizations, by contrast, are well poised for this (Brulle, 2010). Work in this sphere requires a more reflexive, connected understanding of the relation between the process of indicator system design and its use. Bauler (2012, 39), in this vein, has gone so far as to suggest that an indicator system's usability is dependent on "the intermediary moment between indicator construction and indicator use." In particular, this role for indicators work implies a need for openness and transparency and encourages the exposure of the mechanisms and patterns underlying the way in which different actors behave in policy contexts. The demand for open debate about values and core directions means that if indicators are to be part of a change in development trajectory, they need to be "used in terms of enlightenment, informing problem framing, informing world views or influencing values, or in other words in a

wider perspective of social or collaborative learning" (Bauler, 2012, 39).

The three systems examined here share some measure of success despite different usability profiles. While none offers a perfect process for emulation, each offers a response to the common challenge of operating in pursuit of policy change outside of formal government within a multilevel, multiactor governance system. Each also demonstrates certain advances in terms of engagement in the politics of contemporary urban sustainability discourse and debate. Explicit attention to the politics of sustainability indicator systems has the potential to improve the results of these and other systems in their further embedding as boundary objects. This, in turn, holds promise for the activation of governance work at a range of new policy boundaries, essential for advancing an agenda of progressive policy change.

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