

SUSTAINABILITY INDEX FOR SONOMA COUNTY

Strategies and Recommendations

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SUMMARY

The goal for this project, undertaken for the Sonoma County Waste Management Agency, is to help the County of Sonoma address a critical area of emerging public policy: ecological sustainability. This report reviews the most important strategies and tools available that are relevant to potential use by the County of Sonoma.

While there is much good work that the County can draw upon, there is nothing available that is adequate for the specific task of easily rating a wide variety of projects for conformance with principles of sustainability. We instead found related techniques – smart growth scoring systems, incentives, organizational development methods and the like – that represent important advances in the planning profession. The current packages of these techniques, however, do not appear able to deliver “sustainability” as advertised, for they are designed only to retard the rate by which resource consumption increases.

The ecological situation as we understand it is that on a global level, human activities already require more of nature’s services than are available over the long run. This imbalance is particularly acute in the United States. The need therefore is to reduce total resource consumption.

Developing the necessary action plan will require unusual creativity. Fortunately, this need has been on the minds of many of late. We draw on such thinking, and the good work of the precedent programs reviewed herein, and recommend a path to the next level: Restorative Development.

TASK

Study and recommend strategies for a sustainability index by conducting a nationwide search of municipalities using the Internet, review of relevant literature, and interviews with experts.

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CONTEXT

Sustainability, as used in the planning practice today, is an ambiguous term. The definition adopted by Sustainable Sonoma County was used to guide this work:

Sustainability secures people's quality of life within the means of nature in a way that is fair and equitable to all humanity, other species, and future generations. Sustainability recognizes the interrelatedness of the economy, society, and the environment. It requires that we not consume resources faster than they can be renewed, nor produce wastes faster than they can be absorbed.

The need to consider human development activities from a framework of sustainability is not new. The Greeks remarked on deforestation and soil loss in the eastern Mediterranean 2,000 years ago. Closer to home, civil engineer William Hammond Hall, creator of San Francisco's Golden Gate Park, warned of environmental costs in 1873:

"Our earth is not becoming ameliorated and better fitted for the habitation of the human race, except in so far as that race directly undertakes works of improvement with a view to such amelioration. The more direct wants of man are supplied by the most direct tax upon nature; and unless there be some compensation and systematic effort to restore her disturbed harmonies, there is a constant balance of drain upon her resources, and increased disturbance of her laws. Does he want wood: forests, which he takes no pains to restore, are annihilated, with the results just mentioned. There is a demand for lands: when swamps and marshes are diked and reclaimed, with scarcely a thought as to the influence these works may have upon adjacent river-channels and harbors. Water is required for some large city, and forthwith an area many times as great is robbed of its rivulets and brooks – and its fertility – to supply the demand, and the consequences are not seriously considered."²

Today, nearly 130 years later, although a "...systematic effort to restore her disturbed harmonies..." has not yet commenced, the required conceptual framework is in place. We find three areas of intellectual inquiry particularly useful: The Natural Step (TNS) as developed by Dr. Karl-Henrik Robèrt, which provides direction; William Rees and Mathis Wackernagel's Ecological Footprint, which suggests magnitude; and highly effective program delivery techniques, as represented by Judith Innes' work at the interface of planning and complex systems.

² Hall, "Influences of Parks and Pleasure Grounds," *Overland Monthly*, p. 527; found in Gray Brechin's *Imperial San Francisco: Urban Power, Earthly Ruin*. Berkeley: University of California Press, 1999: p. 84.

The Natural Step

The Natural Step (TNS) provides a compass toward a sustainable future that is profound for its ability to identify fundamental steps that will carry through to the goal. These steps include:³

1. Perceiving the nature of the unsustainable direction of business and society and the self-interest implicit in shifting to a sustainable direction;
2. Understanding the first-order principles for sustainability;
3. Strategic visioning through “back-casting” from a desired sustainable future; and
4. Identifying strategic steps to move from the current reality to the desired vision

At the core of TNS is a set of system conditions that describe the minimum criteria a society must meet to be sustainable. Based upon irrefutable scientific principles, these are:

“In order for a society to be sustainable, nature’s functions and diversity are not systematically:

1. ... subject to increasing concentrations of substances extracted from the earth’s crust;
2. ...subject to increasing concentrations of substances produced by society; or
3. ...impoverished by overharvesting or other forms of ecosystem manipulation; and
4. ...resources are used fairly and efficiently in order to meet basic human needs worldwide.”⁴

This means that all enterprises must systematically reduce use of fossil fuels and minerals, persistent synthetic substances, and their dependence upon activities that encroach on productive ecosystems. Attention must be given to constantly increase the value derived per unit of physical resource consumed so that opportunities for the majority of the world’s people will improve.

TNS is widely used by business and government in Sweden, where it was developed, and is now becoming adopted in the United States.⁵ This implementation strategy begins at

³ Brian Nattrass and Mary Altomare, *The Natural Step for Business: Wealth, Ecology, and the Evolutionary Corporation*. Gabriola Island: New Society Publishers, 1999: p. 18; hereafter cited as Nattrass & Altomare.

⁴ Nattrass & Altomare: p. 23.

the top of the management structure, where TNS principles are instilled and a creative problem-solving process is engendered. Specific action steps are thereafter developed by each organization. While these are often small steps at first that are justified purely in terms of rapid financial paybacks, their quality will deepen over time as the organization continues to move into alignment with the worldview of a sustainable future. This evolutionary shift away from the industrial paradigm inevitably evokes an entirely revised business model.

Ecological Footprint

Developed by Mathis Wackernagel and William Rees, Ecological Footprint Analysis is an accounting model that adds magnitude to the arrow of direction given by The Natural Step. It provides two performance measures: (1) how far one must travel to achieve sustainability, and (2) the magnitude of inequity between different populations.

All interactions between human behavior and the earth ultimately depend upon areas of nature from which resources are extracted, and other areas where wastes from the human economy are absorbed and decomposed. Sufficient information is now available to calculate the size of these areas. Such areas – an “ecological footprint” – may be determined for any part of the human economy ranging from something specific to all human activity on the earth. The modeling technique is powerful, for its use of a single common denominator – area of nature – enables the gross ecological impact to be estimated for any activity by a repeatable method.

Mathis Wackernagel calculated the human ecological footprint for 52 different countries, and the entire world, in a “Rio+5 Forum” study commissioned by The Earth Council of Costa Rica.⁶ This work produced two critically important findings. First, with data from the early 1990s, it is clear that the average American per capita ecological footprint exceeds that of every other large national group. Second, and more important, this work indicates that the global human ecological footprint, in 1993, exceeded global capacity. While consumption in excess of system capacity may occur over the short term by depleting sources and overloading sinks, it cannot be maintained. Furthermore, when global capacity has been exceeded, and some people use more than their fair share, other people (or members of other species) are eventually compelled to get by with less.

Figure 1 illustrates the situation. The average per capita ecological footprint in 1993 is estimated at 26.5 acres and 7.4 acres for citizens of the U.S. and the world, respectively. The average “Sustainable” ecological footprint available in 1993 is estimated at a maximum of 4.9 acres/capita. The latter is the quotient of the estimated 30.6 billion acre ecological capacity of the earth, divided by the 1993 human population of 5.5 billion, less

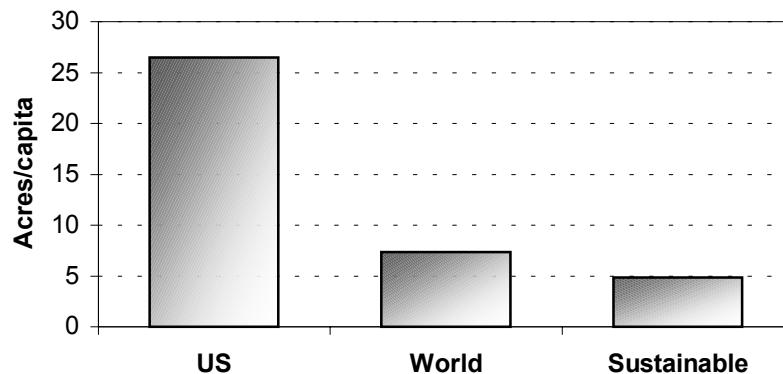
⁵ Although TNS is directed mostly to the business community, it is noteworthy that the American Planning Association’s 1998 Policy Guide on Sustainability, intended for city and regional planners, is framed around the TNS system conditions (<http://www.planning.org/govt/sustdvpq.htm>).

⁶ Mathis Wackernagel, et al., *Ecological Footprint of Nations*. Center for Sustainability Studies, Universidad Anáhuac de Xalapa: 1997.

the minimum 12% set-aside suggested by the Brundtland Commission to reserve capacity for all species with whom humans share the earth.⁷ This model, in other words, estimates that the average global and US per capita ecological footprint exceeds global carrying capacity by approximately 50% and 440%, respectively.

FIGURE 1

HUMAN ECOLOGICAL FOOTPRINT 1993 Data



This data also reflects the global connections of a modern economy. If we assume, for example, that Sonoma County residents have an ecological footprint equal to that of the average American in 1993, the County's current ecological footprint, for an estimated population in 2000 of 450,000, is nearly twelve million acres. Given an ecological footprint approximately twelve times larger than the County's geographical area of one million acres, the County's human economy is drawing upon ecological resources of larger extent than the County alone can provide. Just as automobiles purchased by its citizens have globally sourced parts and use globally sourced fuel, for example, their exhaust products are swept into the common atmosphere for deposition – or long-term circulation – around the globe.

The most important revelation from ecological footprint analysis is that ***total global human activity now demands more than nature can provide over the long run.*** Although pieces of this story have long been known – such as the well-documented accumulation of CO₂ in the global atmosphere, this is one of the first techniques to address human ecological impacts in a comprehensive and systematic manner. Versions of its startling conclusion were repeated by other reputable sources encountered during our research: the Dutch government's conclusion for the need to reduce resource use by

⁷ Ecological demands and global capacity in 1993 for the are those estimated by Mathis Wackernagel after introducing equivalency factors, new forest productivity and CO₂ absorption (after IPCC data): Wackernagel spreadsheet entitled Ranking.xls, dated Nov. 20, 1997. U.S. population data was obtained from <http://www.census.gov/population/estimates/nation/popclockest.txt>, and world population from <http://www.census.gov/ipc/www/worldpop.html>.

80 to 90% in their country,⁸ work stemming from the Wuppertal Institute,⁹ and a recent major report from the United Nations Environmental Program. The latter uses language that is uncharacteristically forceful for an official document:

“The continued poverty of the majority of the planet's inhabitants and excessive consumption by the minority are the two major causes of environmental degradation. The present course is unsustainable and postponing action is no longer an option.”

“A tenfold reduction in resource consumption in the industrialized countries is a necessary long-term target if adequate resources are to be released for the needs of developing countries.”¹⁰

Program Delivery

The magnitude of the ecological situation requires that programs offered in response should be designed with great attention to their delivery. Important contributions relative to our inquiry are noted below.

Judith Innes¹¹

“When information is most influential, it is also most invisible. That is, it influences most when it is part of policy participants’ assumptions and their problem definitions, which they rarely examine.”¹²

Prof. Innes explains how different types of information – technical, personal experience, and stories – can be embedded into the planning process at the level where it transforms the way institutions think.

She also connects complexity theory with planning and sustainability. She describes a complex system as one that is basically out of control; one that cannot be guided by top-down management. She argues that “...*We have no choice but to trust the intelligence and inventiveness of people everywhere to learn and to*

⁸ Senior Dutch scientist quoted in the *Green Plans* (video produced by John de Graaf and Jack Hamman in association with KCTS-TV. Distributed by The Video Project, 5332 College Avenue, Suite 101, Oakland, CA 94618. To order a copy of *Green Plans*, call Tel. 1-800-4-PLANET, Fax (510) 655-9115).

⁹ Weaver, P., with F Schmidt-Bleek, *Factor 10: Manifesto for a Sustainable Planet*. Sheffield, UK, Greenleaf Publishing: 1999.

¹⁰ United Nations Environment Programme, *Global Environmental Outlook 2000*, Earthscan, 1999: 416 pp. Material quoted is excerpted from the Overview (<http://grid2.cr.usgs.gov/geo2000/ov-e/0002.htm>).

¹¹ Professor of City and Regional Planning, and Director of the Institute of Urban and Regional Development at the University of California, Berkeley.

¹² Judith Innes, “Information in Communicative Planning,” *APA Journal*. Winter 1998: p. 54.

transform the system.”¹³ She therefore suggests three strategies for improving metropolitan system performance that not only keep the system on track, but also reassess goals, purposes, and processes:

- Development and use of indicators and performance measures that provide feedback to all agents in the system;
- Collaborative consensus-building among stakeholders who best understand the different aspects of the metropolitan system; and
- Creating new forms of leadership. Innes calls for leaders having vision and focus; who can translate that vision into meaning; who build trust through commitment, passion, and integrity; and who emphasize learning and risk-taking in themselves and others. She recommends Peter Senge as a source for learning about leadership amidst complexity.¹⁴

Innes reminds us:

*“Nothing can be assumed in the complex uncertain world we face. Those who can help manage it best are those who can bring out the creativity in themselves and others.”*¹⁵

Appreciative Inquiry

Appreciative inquiry provides new methods for inducing creativity within social systems to move them to their collective vision of their very best. Recent work by Gervase Bushe indicates five different ways of thinking about how appreciative inquiry can create change in social systems.¹⁶

- ***Socially Constructing Reality:*** the ability to create better organizations is limited only by the collective imagination and will. By tapping into people’s best intentions and noblest aspirations, new images can be brought into the discourse that determines the reality of social organizations.
- ***The Heliotropic Hypothesis:*** social systems evolve toward the most positive image they hold of themselves. Such images, often not discussed, become powerful when they are openly affirmed.

¹³ Judith Innes and David Booher, “Metropolitan Development as a Complex System: A New Approach to Sustainability,” Working Paper 699, University of California at Berkeley Institute of Urban and Regional Development (hereafter *Innes and Booher*).

¹⁴ Peter Senge, *The Fifth Discipline: The Art and Practice of The Learning Organization*. 1990.

¹⁵ Innes and Booher, p. 17.

¹⁶ Gervase Bushe, Ph.D., “Five theories of change embedded in appreciative inquiry.” *Proceedings of the 18th World Congress of Organization Development*, Trinity College, Dublin, Ireland, July 14-18, 1998. Reprinted in Cooperrider, D., Sorensen, P., Whitney, D. and Yeager, T (eds.) *Appreciative Inquiry: Rethinking Human Organization Toward a Positive Theory of Change*. Champaign, IL: Stipes, 1999.

- ***The Organization's Inner Dialogue:*** backroom stories that govern how a group really operates (often contrary to rational procedures). By changing these stories, the inner dialogue changes too.
- ***Resolving Paradoxical Dilemmas:*** new images that jostle conventional thinking can resolve dilemmas and allow change.
- ***Appreciative Process:*** one may create change by paying attention to what you want more of, instead of what you don't.

Innovation Diffusion

The process by which innovations diffuse through society is well known.¹⁷ They often begin with pioneers, the eccentrics who operate at the fringe of society. If the innovation proves worthy, it moves progressively and predictably through various sectors of society. The pace of its movement and success will be enhanced to the degree the following characteristics are present:

- ***Relative Advantage:*** senior business and institutional officers perceive that participation will be advantageous for their organizations.
- ***Simple:*** the innovation is simple to understand and easy to apply.
- ***Incremental:*** participation may occur in stages.
- ***Observable:*** results obtained by participants will be easily apparent and attractive to those who have not yet participated.
- ***Compatible:*** the innovation fits with existing operations.

FINDINGS

Methodology

E-mail, listservers, websites, and written documents were used to gain source material. Telephonic and face-to-face interviews were conducted with government employees, scholars, and other experts. The search commenced by posting a query on the Redefining Progress listserv, a web-based communication link among people working on hundreds of community indicator projects. Responses provided openings to a network of contacts and information throughout the nation and beyond. The objective was to locate the most recent and pertinent information.

¹⁷ This section is based upon the classic work in this area: Everett M. Rogers and F. Floyd Shoemaker, *Communication of Innovations: A Cross-Cultural Approach*. New York: The Free Press, 1971: 476 pp.

Emerging Sustainability Indices

Performance Indicators

There is considerable activity around the country given to the production of various Indicators of Sustainability (e.g. Florida). For the most part, however, such indicators measure the eventual output of development activities too far downstream (in time and place) to be relevant to our task, so were not examined.

Green Building Criteria

There is a growing body of well-organized and easily accessible information about locating structures, environmental aspects of construction methods and materials, sophisticated building energy modeling, and occupant comfort, among other aspects. Green building assessment tools may represent the most advanced contributions to the technology available today for reducing the ecological footprint of the industrial world. These tools were, however, largely unexamined for this study, as these are a subset of the task at hand (please refer to the Appendix for brief reviews).

Smart Growth

*“Growth is inevitable, growth is necessary, but how growth is accommodated can be good or bad. In setting the framework for land development and redevelopment, we must focus on practices that are environmentally sound, economically vital, and that encourage livable communities – in other words, smart growth.”*¹⁸

Smart Growth, a term coined by the US Environmental Protection Agency to cover various responses to sprawl development, represents the leading edge of the planning profession in North America.

*Smart Scorecard for Development Projects*¹⁹

Will Fleissig, a former Planning Director in Boulder, CO, and graduate planning student Vickie Jacobsen, are developing a Smart Project Scorecard (SPS) to “... incrementally make better project decisions that achieve the Smart Growth objectives.” SPS is presented as the latest in a natural progression of municipal land use planning tools such as zoning codes, performance codes, indicators, and design guidelines. It is intended to improve the consistency between individual projects and the intent of adopted plans. SPS is also recommended as a relatively

¹⁸ Jim Chaffin, ULI Chairman opening the Smart Growth Conference, Baltimore, 1998. Quote found in Will Fleissig and Vickie Jacobsen (in collaboration with the Congress for New Urbanism), *Smart Scorecard for Developmental Projects*. Working Draft: November 16, 1999 (hereafter *Fleissig and Jacoby*).

¹⁹ Fleissig and Jacoby.

rapid means for controlling sprawl, and for inducing more creative solutions than those that flow from the “thou shalt not” school of planning.

Ten critical areas are suggested for the Smart Project Scorecard, as are means for scoring projects within each of these areas. The higher the score a project earns, the more it will reflect the intent of a community’s plans. To the extent developers choose to participate with this process, the built environment will increasingly appear as desired. Development by this method envisions a partnership between a municipality and developers willing to commit to its planning criteria.

Austin, TX: Smart Growth Criteria Matrix

Austin, Texas, host of a 1998 Smart Growth Conference, developed and uses a “Smart Growth Criteria Matrix”²⁰ to assign a quantitative score to individual projects intended for the City’s urban core. Noted as the best example of a Smart Project Scorecard by Fleissig and Jacobsen, the existence of this tool, and the city’s 1996 Sustainable Communities Initiative (comparable to a local Agenda 21), reflects an environmental electorate that brought into power a green City Council.

The Matrix is organized around two Smart Growth goals (how and where development occurs, and improving quality of life). These are subdivided into several categories, which are explained by more than thirty elements. Projects are scored according to explicit performance criteria given for each element. Conformance with these criteria is encouraged by financial incentives (fee waivers, utility savings, and infrastructure assistance). As a voluntary program, it meets little resistance except from central city neighborhoods opposing infill and high density projects.

The Matrix has been used on three projects, and approximately six more are underway. Council members are pleased for this achieves their goals for the downtown and urban core, and enables them to help developers. Most of Austin continues to be developed conventionally, however, as the Matrix applies to a small portion (~5%) of development.

Austan Librach, Planning Director, noted that “*We developed the matrix in house and sold it to the Council without any citizen review or input. If we had gone the normal route of developing the matrix through an open public process, we never would have reached a conclusion.*” He suggests that municipalities considering such a process limit the community’s “*...debate on weighting, scoring, etc., or you will never reach consensus.*”²¹

²⁰ George Adams, 512.499.2146; or check: www.ci.austin.tx.us/smartgrowth/smartmatrix.htm

²¹ Telephone interview with Ann Hancock.

Sustainable Development

Programs that aspire to address a larger range of issues than sprawl management often have “Sustainable” in their title. These generally reflect a goal that appeared as Stage 5 of a five-stage company reporting model offered by UNEP in 1994.²² Stage 5, Sustainable Development, was presented as the most ambitious goal, where the aim is no net loss of carrying capacity. The most interesting programs discovered are noted below.

Austin, TX: CIP Sustainability Matrix

The City of Austin’s 1996 Sustainable Communities Initiative foresaw that public infrastructure projects should be consistent with the City’s sustainability perspective. Accordingly, a Multi Attribute Decision Utility Matrix, called the CIP Sustainability Matrix, was created to select capital improvement projects for funding. Buy-in by the City’s senior managers was achieved when the City Manager indicated that the matrix would be a requirement.

“The matrix has been designed to present a systematic basis of understanding for the social, economic, and environmental implications of projects. The matrix is integrated into a review process that offers extensive community input. The process of applying the matrix involves interaction with city departments, commissions and boards, and citizens proposing new projects.

“The use of the matrix in the process of selecting capital projects has generated a broader and deeper understanding of basic issues that affect the long-term viability of a community. This has been an important side benefit of the matrix’s existence aside from its benefit as a tool to help distinguish project costs, benefits, and impacts from a sustainability perspective.”²³

The 13-criteria, numerically scored matrix reflects a sustainability perspective organized around the “three E’s:” Equity, Economy, and Environment. For the City of Austin, the most important areas of emphasis within these areas are:

- Equity: invest in economically/socially disadvantaged areas
- Economy: maintain and optimize use of existing infrastructure
- Environment: minimize impact on ecologically sensitive areas by making appropriate strategic location decisions.

²² United Nations Environment Programme, *The UNEP Corporate Reporting Guide. Company Environmental Reporting: A Measure of Progress in Business and Industry towards Sustainable Development* (The UNEP Industry and Environment Activity Centre; Nairobi: 1994).

²³ W. Laurence Doxsey, City of Austin, *Sustainability Evaluation of Capital Improvement Projects*. http://www.ci.austin.tx.us/sustainable/matrix_paper.htm

Sustainability scores provided by the matrix do not yet supersede traditional considerations in terms of ultimate project approval. Nevertheless, it has stimulated greater respect for sustainability criteria as departments fight to advance pet projects.

Border Environment Cooperation Commission Project Certification

The BECC operates under the authority of a 1993 agreement between the US and Mexican governments. Its purpose is to help preserve, protect, and enhance the environment of the border region in order to advance the well-being of its human residents. BECC does this by helping sponsors prepare public works projects (primarily water supply, wastewater treatment, and municipal solid waste), and certifying them for funding, primarily by the North American Development Bank.

A 48-page document entitled *BECC Project Certification Criteria* (1996) includes mandatory sustainability criteria.²⁴ Projects must adhere to the definition and principles of sustainable development. This is accomplished by (1) noting how local authorities will support and maintain projects, (2) showing conformance with local plans, (3) demonstrating a “reasonable degree” of natural resource conservation, and (4) identifying a positive impact on community development.

The 1996 *BECC Project Certification Criteria* also includes a 10-page section defining the optional “High Sustainability Recognition.” Projects achieving such recognition may attract grant funds from sources interested in supporting sustainable development. Recognition is considered when applicants prepare a paragraph that demonstrates how the project effectively promotes sustainable development for each of at least two topics under each of the five project evaluation categories, and when public comment is sought. Topics that contribute to high sustainability include such things as “*Landscape the project with native species*” and “*Incorporate measures to reduce energy consumption by means of efficient operation and energy saving devices.*”

Notes posted at the BECC website indicate additional supporting activity to move projects in the direction of sustainability. This includes staff training regarding methods for reviewing sustainable elements of projects, a search for funding to support sustainability, and various means to encourage project sponsors to apply for High Sustainable Development.

²⁴ All information reported herein was found at: www.cocef.org/englishbecc.html

Alan AtKisson: Prototype Rating System for Comparative Evaluation

Alan AtKisson and Michael LaFond developed a subjective rating system in 1994 to compare the sustainability of different programs.²⁵ This employs three categories, each having ten points:

- Sustainability: extent to which the project or program promotes long-term cultural, economic, and environmental health;
- Institutionalization: extent to which the project is firmly embedded in civic life (thereby indicating its ability to make a difference if implemented); and
- Comprehensiveness and Integration: how well the project integrates, in practical terms, the idea that “everything is hitched to everything else.”

This rating system is intended to help evaluators determine the ability of a project to contribute to sustainability. This is best used to rank competing projects, for a stand-alone score has little meaning. It is also useful for comparing programs, for technical details are not required.

We met with Alan AtKisson in November, 1999. He told us that the system has been little used. A doctoral student used it for a rain forest assessment project in Brazil, and Alan used it to evaluate the City of Olympia’s (WA) Water Comprehensive Plan. Alan will soon commence work with the City of Pittsburgh, PA, and plans to develop the system further at that time.

Emmet Dobey, Division Manager of Policy and Program Development, Department of Public Works, City of Olympia, reported finding AtKisson’s system difficult. “*It’s foreign, especially the terms it uses. It’s good for educating people, but takes time to fully utilize.*”²⁶

Vancouver, B.C.: Southeast False Creek

The Vancouver City Council directed the 80-acre Southeast False Creek site to be developed to model sustainable development principles. Work to date represents one of the most ambitious efforts in North America for a project of this magnitude.

²⁵ AtKisson and LaFond, *Assessing Sustainability Projects: A Prototype Rating System for Comparative Evaluation (Version 1.2)*. Unpublished. Alan AtKisson, founder and president of AtKisson & Associates, Inc. (800.404.4208; AtKisson@aol.com), is the former executive editor of *In Context*, a quarterly journal of sustainability issues, a co-founder of Sustainable Seattle, and former director of the National Indicators Program at ReDefining Progress, a policy institute in San Francisco. Michael LaFond is an architect, and in 1994 was a doctoral candidate at the University of Washington, writing a dissertation on sustainability and community.

²⁶ Telephone interview with Ann Hancock.

Derelict industrial land will be converted into a high-density family-oriented “complete community” for 4,000 to 6,000 people that includes a highly livable mix of residential, commercial, office, clean industry, parks, and open space; all with an extraordinary level of environmental sensitivity. A policy statement, the most comprehensive ever created by the City of Vancouver, guides the project. This features:

- Environmentally Sustainable Development Guidelines prepared expressly for the project;
- a comprehensive, multi-layered, professionally facilitated public policy process; and
- a design charette.

The development guidelines were prepared for the City by a multi-disciplinary consulting team led by The Sheltair Group, Inc.²⁷ These guidelines, intended as a resource for those engaged in the planning process, provide:

- A succinct definition of sustainable development relevant to SEFC;
- A ranking of economic, ecological, and social parameters for SEFC;
- Feasible yet challenging performance targets for priority ecological aspects of sustainable development;
- Analysis of technical and economic feasibility of performance targets based upon actual precedents; and
- A framework and methodology for “full-cost accounting” that includes “environmental externalities” in life cycle benefit/cost analyses.

The Guidelines provide an exceptionally useful and comprehensive framework for this development. This is organized like a tree with the general definition of sustainability at its top, and ever increasing specificity of categories, goals, objectives, and performance indicators appearing as branches below. Within the ecological sphere, the guidelines address a primary set of 17 goals, which reduce 23 objectives, for which 26 indicators are recommended. An example of the reasoning and support given for each indicator follows:

- Goal: Maximize the efficient use of fresh water
- Objective: Increase the efficient use of municipal potable water indoors and outdoors
- Discussion Paragraphs: why important; possible indicators; previous relevant local policy initiatives; other economic, social, and ecological objectives this supports; policies, strategies, and programs that will help achieve the objective

²⁷ The Sheltair Group, Inc., *Visions, Tools, and Targets: Environmentally Sustainable Development Guidelines for Southeast False Creek*. Prepared for the City of Vancouver, April 18, 1998 (~240 pp.).

- Keystone Indicator: average residential municipal potable water use (liters per capita per day)
- Further Discussion: why this indicator is appropriate; what kind of performance has been achieved – or proposed – for other communities (four examples are given ranging from zero (CMHC Toronto Healthy House demonstration project) to the current Vancouver residential average consumption of 315 l/capita-day).
- Feasible target for Southeast False Creek: **100 l/capita-day**

The target for this objective, at 32% of present Vancouver residential consumption, is challenging but not impossible, given the reference examples; and worthy, given the discussion of benefits, and compatibility with related objectives. While the Sheltair Group concedes that not all performance targets are likely to be met, they note that the project goals will be less well served if the targets do not require a stretch. The targets, intended as guides rather than standards, should help motivate and direct the efforts of many people towards sustainability. Special funding is suggested for monitoring so performance may be evaluated.

The entire planning process is also marked by an exceptional level of public participation. This occurred on four levels:

- Advisory Group: Biweekly facilitated meetings at the beginning of the process involving land owners, community representatives, urban youth workers, development consultants, and academics. Purpose: help city staff prepare and refine the initial draft of the SEFC Policy Statement.
- Community and Interest Group Consultations: detailed discussions with stakeholders as above, but from neighboring areas, and including environmental groups. Meetings were early in the process, and later to receive comments on the draft SEFC Policy Statement.
- Public Meetings: held in an accessible, downtown location, throughout the process (beginning with creating the “terms of reference for the sustainability consultant”).
- Information Access: via information packages, website, and much local media coverage.

Minnesota: Ecosystem-Based Management

Top-down state government reform around sustainability changed the way the Minnesota Department of Natural Resources does business, and led to breakthrough forestry and river basin initiatives. This demonstrates the

transformative power sustainability has for changing the approach to problems, and the value of engaging citizens in more meaningful ways.²⁸

Governor Arne Carlson, elected in 1990 with a firm commitment to reform, invited public review of state operations that led to a state-level sustainable development initiative. State agencies responded with a strategy called Ecosystem-Based Management (EBM). Despite internal resistance to change, this was implemented with organizational development methods.

The Department of Natural Resources was transformed from a collection of separate fiefdoms into a single group united by a common strategy. Authority was intentionally delegated to employees at the lowest level of the organization who were in touch with local situations. Teamwork, required of all employees, gradually introduced efficiency through integration and cooperative problem solving. At the same time, experimentation revealed that locally driven management with strong involvement by citizen leaders and local government was far more efficient than previous management methods. Accordingly, DNR began to shift its role from an agency with total responsibility for the issues to that of a supporting partner.

Two examples establish the significance of Eco-Based Management.

- Sustainable Forest Resources Act of 1995: provided voluntary guidelines for sustainable forest management. Audits revealed 90% compliance. Forest industry established training programs to certify loggers in best management practices. DNR and Aitken County cooperated and jointly received green certification for 600,000 acres in a process supported by industrial, environmental, and other groups. Increased markets are expected in the future for products from these forests.
- Governor's Minnesota River Initiative: this river, the most polluted tributary of the Mississippi, is fed by an eleven million acre watershed that is mostly agricultural. The Governor declared a goal of making the river swimmable and fishable within ten years. A joint powers board encompassing 37 counties and other local governments was created to address soil and nutrient flows into the river. After five years, sediment load declined by 25%, local governments are beginning to champion the cleanup, and 200,000 acres of farmed flood plain are scheduled for reforestation to reduce erosion, increase wildlife habitat, and support the forest industry.

²⁸ Information for this section was obtained from an article by Rod Sando, Commissioner, Minnesota Department of Natural Resources, posted on the Resource Renewal Institute website in early 1999. Current information may be found at: <http://www.rri.org/bestpractices/minnesota.html>

SEkom: The Association of Swedish Ecomunicipalities

The person with arguably the most experience with eco-municipalities in industrialized nations is Torbjörn Lahti, President of Esam, The Human Ecological Corporation in Umeå, Sweden. Mr. Lahti has been working with municipalities in Sweden to induce sustainable development continuously since 1983, first as a city employee, and now in educational and consulting roles. Torbjörn is directly involved with the ~57 Swedish cities organized in SEkom, The Association of Swedish Ecomunicipalities, and has taught in more than 150 Swedish municipalities during the 1990s.

Torbjörn's experience indicates demonstration projects are essential for establishing credibility (many small ones are better than one big one); the Natural Step is valuable for setting the vision, explaining the challenge, and gaining support from skeptics; and cities that have put the greatest effort into educating civil servants, politicians, business people and others have been the most successful.

Torbjörn reports that the "fourth generation" of ecomunicipalities systematically approaches sustainable development by having each department follow the Natural Step's compass. For this purpose, Torbjörn developed a special tool called "The Agenda 21 Guide." This follows TNS, but considers values such as human needs, democracy, and engagement. Torbjörn suggests these values are more important for municipalities than the business community at which TNS is primarily directed. This process was written in a report in 1996 entitled "The Eco-municipality – a Concept for Changing the Spirit of Agenda 21." An English translation is being prepared that will be available early in 2000.

ANALYSIS

Public distaste for sprawl development and interest in sustainability is increasingly being reflected by new approaches to development. Quality of life and environmental stewardship issues are gradually becoming embedded into public policy procedures. Nevertheless, we found surprisingly few sustainability indices being used by municipalities to assess potential projects, and none that we recommend that Sonoma County use without modifications. A reason for the lack of indices was offered in an interview with former Seattle Planning Director Gary Lawrence, now with Sustainability Strategies and Solutions, Inc., an international consultant.²⁹ Lawrence noted:

- U.S. governments have not progressed far in developing sustainability-based performance criteria; more can be found in Britain and Canada.
- Most governments avoid measures that might make them self-critical.

²⁹ Telephone interview with Ann Hancock. Lawrence's clients include organizations such as the International Council on Local Environmental Initiatives and the World Business Council.

- Most governments “count widgets” rather than determine outcomes.

Although there is no model in existence for the sustainability index desired by the County, elements that it might draw upon are being demonstrated today. These include:

- Quantitative scorecard techniques that focus attention on desired instead of undesired attributes are effective, especially when coupled with incentives
- Work by AtKisson and others indicates that programs must be broadly supported and well financed if they are to make a difference
- Organizational development and social marketing techniques are increasingly sophisticated, and are valuable, if not essential, for this work
- Public participation is vital if systemic change is desired
- The Natural Step methodology offers significant assistance to municipal efforts, as validated by a “pre/post” test in Sweden
- The overarching theme of sustainability may stimulate synergy across groups, cohesion within groups, and individual vigor. Those involved with work that is making a difference speak with uncommon enthusiasm.

The methods surveyed above represent early work that is establishing a foothold on ground where it has not been invited, for they challenge the established mechanisms, if not belief systems, attendant to untrammelled physical growth. For all the enthusiastic trappings that accompany much of this work, however, there is an eerie silence about the stark contrast between what this offers - a slower rate of physical growth - and what Ecological Footprint Analysis demands - negative physical growth. The latter, supported up by UNEP’s *GEO 2000* report, indicates that the human ecological footprint, especially in the United States, is already far larger than may be sustained.

It is of course understandable that we “...*should first take our foot of the accelerator pedal before we begin to apply the brake,*”³⁰ as public interest planner Eben Fodor says. Coming to a halt is insufficient, however: we must make a U-turn and reduce our footprint to at least a size that is sustainable. This basic fact seems completely absent from the municipal planning literature that addresses sustainability.

This absence surely will not be for long, for “negative” physical growth - that which shrinks our ecological footprint – is where the juicy rewards of restoring nature’s abundance and providing improved quality of life await. When new projects are designed carefully and are linked by simultaneous investment in work that reduces the footprint of existing activity, these new projects will generate a *negative* footprint and nature will incrementally regain lost capacity. The act of using natural resources more wisely will also generate substantial economic benefits.³¹ Simultaneous care given to

³⁰ Eben Fodor, *Better Not Bigger: How to Take Control of Urban Growth and Improve Your Community*. Gabriola Island: New Society Publishers, 1999: p. 107.

³¹ For copious, meticulously documented evidence, see: Paul Hawken, Amory Lovins, and L. Hunter Lovins, *Natural Capitalism: Creating the Next Industrial Revolution*. Little, Brown: 1999.

improving quality of life, as now being directed by Smart Growth initiatives, or more significantly, as recommended at events such as the Cairo International Conference on Population and Development, will complement environmental improvements to provide genuine movement toward a sustainable future.³²

The fact that our institutional responses have not yet acknowledged the magnitude of the challenge indicates its profundity. It seemingly lies beyond our ability to comprehend. This conjures Einstein's famous statement:

"The world we have created today as a result of our thinking thus far, has problems that cannot be solved by thinking the way we thought when we created them."

More direct is Gandhi's assessment of the social malaise he saw in industrial societies. Of the seven ailments he diagnosed, this could be *knowledge without character*. Eknath Easwaren explains:

*"...[this] traces all our difficulties to a simple lack of connection between what we know is good for us and our ability to act on that knowledge."*³³

A relatively painless current example is the Y2K issue. Author and academic Margaret Wheatley noted that solutions to Y2K were discussed at high levels in the 1970s, but were shelved due to the excessive cost of \$12 million. Today the cost is estimated at more than \$800 billion.³⁴ In comparison, the cost of living beyond the means of nature, and with enormous social inequity, is incalculable.

The lack of a seemingly adequate response may also reflect the time required for a contemplative instead of just reactive response to emerge. Margaret Wheatley says challenges of this magnitude call for "*dwelling consciousness*:" a skill few have developed. Hopefully the time spent pulling this report together, and mulling over the collected data, constitutes sufficient dwelling consciousness to offer, with appropriate humility, useful recommendations.

³² This landmark 1994 conference called for reforms in the global economy to place greater emphasis on social development and to support the most vulnerable members of society, including the poor, and especially women, who represent the majority of the world's poor. For the first time, the reproductive rights of women were central to an international agreement on population. This transformation of the meaning of "population" was due in large part to the influence exerted by non-governmental organizations (NGOs), especially women's groups from all over the world. Source: <http://www.iwhc.org/bcintro.html>

³³ Eknath Easwaren, *The Compassionate Universe: The Power of the Individual to Heal the Environment*. Petaluma: Nilgiri Press, 1989: p. 23. Easwaren, an internationally acclaimed teacher of meditation, devoted his life to teaching how to act in accordance with the highest standards of leadership.

³⁴ Interview between Meg Wheatley and Michael Toms, New Dimension Radio, 29 Dec 99. Ms. Wheatley's latest book: *Leadership and the New Science: Discovering Order in a Chaotic World*, San Francisco: Berrett-Koehler, 1999.

RECOMMENDATIONS

A reactive recommendation would be to say yes, an Index can be constructed, and its elements should include X, Y, and Z. However, it appears that to do so would be of limited value. First, it is doubtful the Index would find sufficient political and institutional support to effect change, given its mid-level point of entry. Second, to proceed without a public process, especially one so useful as with Vancouver's South False Creek, would be to forego the most important developmental step. Third, even if brought into use, such a device cannot accomplish much in a vacuum. Nevertheless, criteria for a Sustainability Index were developed, and are provided in the Appendix.

Our contemplative recommendation is based upon considering what the goal of sustainability means for Sonoma County, how the County government can best support that goal, and how the County's efforts may evolve in partnership with interacting parties. Evidence gathered during our research suggests the following:

- The present models of Smart Growth / Sustainable Development do not go far enough: there is a need to create the next level: genuine sustainable development at the whole system level. To avoid confusion, we will call this Restorative Development, for this has as its result incremental restoration of natural capital from a planetary perspective.
- Education: The Natural Step, combined with Ecological Footprint findings, can be used to generate the social will to approach Restorative Development. This reflects a strategy of moving as far upstream in the development process as possible, to the point Judith Innes describes where these findings become part of the bedrock assumptions and problem definition used by policy participants.
- The means for moving toward Restorative Development may be created with a combination of professional advisors and a facilitated public process, drawing upon TNS to organize the approach (perhaps as modified by Esam for use with municipalities), and the Vancouver experience to develop specific action plans. It is out of the latter work that the Index, if appropriate, will appear, in a form suited to a purpose that is clear to all.
- Following the example in Minnesota, the County's role (probably in concert with other public agencies) will gradually shift from total control and responsibility towards partnership and technical support.

The concept we refer to as Restorative Development is much like Sustainable Development, except for the recognition that even projects with zero net carrying capacity impact – that is, that are sustainable by themselves – will not contribute directly to sustainability of the whole of human society. The ecological footprint of the whole must be reduced. One way to make this happen is to develop new projects to achieve a *negative* ecological footprint. For example, with regard to water, new projects would be designed to *reduce* a community's total water demand. This may be accomplished by requiring from each new project a connection fee that is sufficient to lower existing

community water usage by more than the new project will increase it.³⁵ Instead of using connection fees to enlarge infrastructure capacity, and the incurring the incremental bite out of nature such enlargement entails, these fees would have a restorative effect. Similar strategies could be applied to reduce the consumption (or emission) of every other natural resource. The Index device sought by the County might therefore provide a means for measuring the impacts of various projects and coordinating restorative activities.

Restorative Development is, in its broadest sense, beneficial. As the human economy begins to more closely resemble the natural economy, there will be less waste. Simultaneously, as stress is removed from the natural economy, its abundance will increase, and the threat of change that may be catastrophic to the human economy will recede.

The effort of moving toward Restorative Development deserves respect for what it is: a conscious commitment to produce evolutionary change. This, an effort to reach beyond conventional ways of knowing and doing, respects Einstein's dictum. As such, the search for people to involve in the process must go beyond the traditional list of "stakeholders." Those whose counsel is sought might include those qualified to represent the majority of our world who are burdened by actions of the minority, and by Native American elders who can speak for the fishes and the trees. In this way, a restorative economy may be knowingly approached, and its benefits immediately sensed.

Evolutionary change requires evolutionary methods. We must aim high. Kevin Starr, the state librarian and California's most prominent historian, is drawn upon for a concluding thought:

*"The reconciliation of growth and environment... is the vast and grand work of the 21st century."*³⁶

³⁵ The rate at which a Sonoma County community decides to reduce its resource throughput will determine the time required for that community to achieve ecological "sustainability."

³⁶ Dan Walters, "The bottom line on growth," *The Press Democrat*, 2 Feb 99.

APPENDIX

Sustainability Index Criteria

The following table presents characteristics that will support an effective sustainability index.

SUSTAINABILITY INDEX CRITERIA	
Absolute Framework	<i>Projects are assessed according to a science-based methodology that is foundationally linked to a widely accepted definition of sustainability.</i>
Systemic Approach	<i>Index encourages project designs that recognize and embrace the complex interconnectedness of the web of life.</i>
Simple	<i>The tool is easy to administer and relies upon existing data.</i>
Transparent	<i>Calculations or other forms of data manipulation are fully explained and easily understood.</i>
Replicable	<i>Scoring techniques are objective and governed by standard techniques.</i>
Continuous Improvement	<i>The Index is dynamic. It is designed to induce steadily increasing performance over time with regard to its goal.</i>
Embedded	<i>The Index is accepted as a matter of practice. All affected parties understand that it will be used, and plan accordingly.</i>
Focuses Public Attention	<i>The Index provides critical information that focuses public attention on a leading indicator of sustainability: performance of current projects.</i>

This Index should be developed with stakeholders on terms that allow free participation. One of their great challenges is to create an Index that will work for many types of projects. This is relatively easy for things like new buildings, but more difficult for more complex activities, such as transportation systems. For this reason it is important to combine the development of an Index with education about first-order principles (e.g. TNS), for action in accordance with those principles will move any project toward sustainability.

Green Building

- **International Green Building Challenge:** a consortium of 19 countries (including the US), managed by a unit of the Canadian government, that is developing a performance rating and labeling system for buildings. Next event: Sustainable Buildings 2000 conference in Maastricht, the Netherlands, in Oct. 2000.

“Why is there so much interest in this area? The main reason appears to be that researchers and government agencies are viewing performance rating and labeling systems as one of the best methods of moving the performance benchmarks in the marketplace towards a higher level of performance. There is a growing realization that a major jump in performance levels, at least in

market economies, will depend on changes in market demand, and that such change cannot occur until building investors and tenants have access to a relatively simple method that allows them to identify buildings that perform to a higher standard” (see: <http://greenbuilding.ca>).

➤ **Leadership in Energy and Environmental Design (LEED)**
(<http://www.usgbc.org/programs/leed.htm>)

The LEED Green Building Rating System™ is a priority program of the US Green Building Council. It is a voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a "whole building" perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building".

LEED™ is based on accepted energy and environmental principles and strikes a balance between known effective practices and emerging concepts. Unlike other rating systems currently in existence, the development of LEED Green Building Rating System™ was instigated by the US Green Council Membership, representing all segments of the building industry. and has been open to public scrutiny.

LEED™ is a self-certifying system designed for rating new and existing commercial, institutional, and high-rise residential buildings. It is a feature-oriented system where credits are earned for satisfying each criteria. Different levels of green building certification are awarded based on the total credits earned. The system is designed to be comprehensive in scope, yet simple in operation.

➤ **Minnesota Sustainable Design Guide and Rating System:** Hennepin County, Minnesota, ©1998, 1999. Contact: John Carmody, Senior Research Fellow, School of Architecture, University of Minnesota, Minneapolis (612 624-1351). This point system provides approximately 45 strategies organized according to six environmental topics (site, water, energy, indoor air quality, human factors, materials, and waste). 100 points are possible. Within each strategy are a series of actions organized by design phases – pre-design, design and construction – and a performance indicator for scoring. Although not put into practice yet, the points system and matrix demonstrates the type of index tool envisioned for Sonoma County.

➤ **Santa Monica Green Building Development Guidelines:** City of Santa Monica, CA November 1998 (80% draft). This is an initiative to fulfill the goals of the Sustainable City Program in building and site development. The Guidelines are intended to aid future City-owned construction projects, and for the use by private sector developers, designers and contractors. Some of the guidelines will be mandatory (related to energy performance, urban runoff

and solid waste) and other will be voluntary. The guidelines include many recommended practices that can reduce the ecological and resource impacts of buildings, and enhance the health and satisfaction of their occupants.

- **Boulder, CO:** “Green Points: Guidelines for Resource Conservation Ordinance,” City of Boulder, 1997. The Green Points program identifies cost effective options to facilitate the construction of healthier and more energy-efficient building in the City of Boulder. All residential building permit applicants for new construction and for additions which add at least 501 square feet to existing residences must earn points according the program’s schedule.

City of Austin Scoresheets

Sheets used for the City of Austin’s *Smart Growth Matrix* and *CIP Matrix* are attached.