Handbook on Codes, Covenants, Conditions, and Restrictions for Eco-Industrial Parks

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With the financial support of the Environmental Protection Agency (EPA), National Association of Industrial and Office Properties (NAIOP) and the Green Institute, the Work and Environment Initiative (WEI) developed this handbook on boundaries and practices, both public and private, that promote environmental responsibility and business performance in eco-industrial parks.

The Eco-Industrial Development Program (EIDP) Roundtable was instrumental in generating issues and ideas for this Handbook. Two of the meetings included specific discussions regarding the Handbook. On October 27 - 28, 1998, the Eco-Industrial Roundtable met in Cape Charles Virginia for an initial discussion of the contents of the Handbook.

On February 15-17, 1999, the Work and Environment Initiative (WEI) held a workshop in Albuquerque, New Mexico to consider alternative economic development possibilities for the region. It consisted of two and half days of intense small group sessions examining various sectors of the economy. At the gathering were local community members and people from around the U.S. working on eco-industrial development. Represented were developers, local government, federal agencies, state agencies, non-profit organizations, citizens, students, technical experts, and academics. EIDP members presented their experiences and used the site as a testing ground for the development of codes and covenants for eco-industrial activities.

Lastly on June 22, 1999, EIDP members met in Minneapolis to discuss the draft of the Handbook and provided constructive suggestions.

We would like to give special thanks to Suzanne Giannini-Spohn, Michael Krause, Jon Feinstein, and Dan Slone. While we are grateful for the assistance from Ray Cote, the Eco-Industrial Roundtable and the individuals listed above, we accept the full responsiblitiy for the contents of this report and any inaccuracies or misstatements within.

ACRONYMS USED IN THIS HANDBOOK

CC&Rs	Codes, Conditions and Restrictions
EIDP	Eco-industrial development program
WEI	Work and Environment Initiative
NAIOP	National Association of Industrial and Office Properties
EPA	U.S. Environmental Protection Agency
LEED	Leadership in Energy and Environmental Design Green Building Rating System developed by the US Green Building Council
HVAC	Heating, Ventilation and Air Conditioning
CO2	Carbon Dioxide
AIA	American Institute of Architects
DOE	U.S. Department of Energy
EIP	Eco-industrial park
EMS	Environmental Management System
STIP	Sustainable Technology Industrial Park (Cape Charles, VA)
IDA	Industrial Development Authority (Cape Charles, VA)
UNEP	United Nations Environment Programme

SECTION I: INTRODUCTION TO THE HANDBOOK

A. PURPOSE OF THE HANDBOOK

The purpose of this handbook is to assist communities and developers considering eco-industrial development as an economic development strategy. Eco-industrial development seeks a partnership between businesses and communities to define, recruit and support the best possible development — one that brings quality jobs and enhances the community and the environment.

Often the biggest issue for communities interested in alternative economic strategies is working with existing regulations and restrictions geared toward traditional economic development strategies. One of the goals of this handbook is to provide ways to revisit conventional zoning and regulatory approaches as well as private agreements that lead to environmentally responsible community development providing positive incentives to attract businesses and jobs. Higher value operations and more valuable real estate serves a broad goal of quality economic development while leading to higher tax income streams. Hence from a variety of perspectives it is in the interest of all parties to insure standards that lead to the best possible practice.

There is a growing sustainable communities movement in this country, as evidenced by the 3,500 attendees at the National Town Meeting for a Sustainable America sponsored by the President's Council on Sustainable of Development in Detroit in May, 1999, and the additional 60,000 local participants throughout the country who registered in local events. Many communities are working towards becoming sustainable communities, and eco-industrial development (eid) is one approach communities are considering. Over 25 communities are in various stages of planning for eco-industrial parks in the United States. Since eid is a relatively new activity in this country, very little in the way of formal incorporation of values and goals into codes and regulations and CC&Rs has been accomplished.

This handbook is also for developers. Developers have at least two interests in reviewing the alternatives presented in this handbook. First, many of the suggestions can actually lead to lower costs—short term and long term—and add to the value of the property in ways that are profitable for the developer. Also since most developers want to be part of a sustainable community, this resource provides ideas for how to structure their projects to lead to occupant benefits, community support and reduced environmental impact. Everyone benefits when there is a partnership seeking the best possible outcomes rather than a battle between developers and the community.

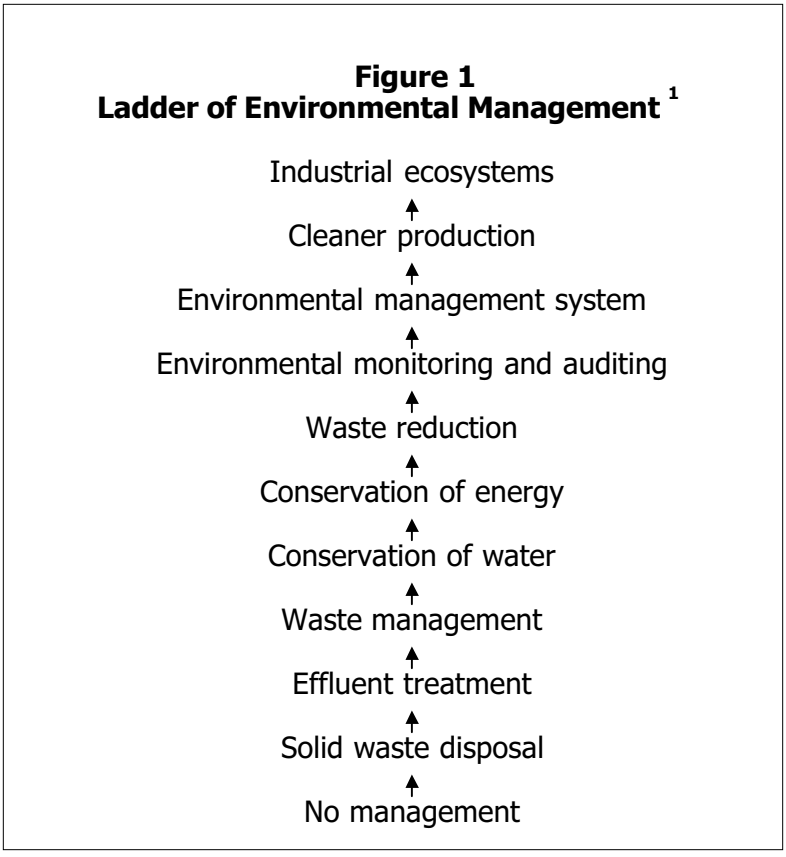
Businesses that choose to locate in an eco-industrial area (or are already sited there) also have a strong interest in making sure that the value of their properties and operations are protected and enhanced. Therefore, having a reasonable set of foundation agreements serves business interests as well.

1 United Nations, 1997

Some businesses would prefer to have no restrictions, but in the real world that does not occur. Some communities would like to have ironclad control on development, but prescribing specific actions to prevent all possible negative impacts may hinder innovative solutions from developing. The challenge, then, is identifying restrictions that are reasonable and help to create a win-win situation.

Communities are realizing that while economic development is crucial to their economic health, they can and should also be developing partnerships with their business sectors to foster responsible and sustainable practices. Communities are discovering that not all recruits are desirable, nor do all deals pay off in the end. Eco-industrial parks provide an opportunity for communities to foster "the best possible" industrial development. That development can range from no management to highly managed "campus" environments. In light of that, the following management range has been developed for industrial parks. A "Ladder of Environmental Management" is shown in Figure 1. The ladder ranges from the lowest rung - no management to the highest rung - industrial ecosystems. We hope this handbook will help communities to create a framework for developing industrial parks at the highest rung on the ladder, industrial ecosystems.

Figure 1
Ladder of Environmental Management [1]



B. Background on Eco-Industrial Development

Here we provide a brief overview of eco-industrial development for communities and developers. This concept is relatively new in the United States and as such is evolving in definition. There are, however, some baseline definitions of eco-industrial parks that most of this type of activity attempts to meet.

Eco-industrial park definitions

"A community of businesses that cooperate with each other and with the local community to efficiently share resources (information, materials, water, energy, infrastructure and natural habitat), leading to economic gains, gains in environmental quality, and equitable enhancement of human resources for the business and local community."

"An industrial system of planned materials and energy exchanges that seeks to minimize energy and raw materials use, minimize waste, and build sustainable economic, ecological and social relationships."

- *President's Council on Sustainable Development (1996)*

The overall concept is that eco-industrial park development integrates business and environmental excellence to create economic opportunities and improved ecosystems. It opens innovative new avenues for managing businesses and conducting economic development. It rejects the trade-off between the environment and jobs by seeking to enhance both.

As more businesses understand that proactive environmental strategies pay off and citizens demand environmentally responsible new development, eco-industrial development becomes increasingly viable. Benefits to communities and businesses for adopting eco-industrial development strategies are potentially numerous, depending on the local conditions. The lists below provides some of the potential benefits to communities, the environment, and businesses.

Potential Benefits of Eco-Industrial Development

Communities	**Environment**	**Business**
Expanded local business opportunities	Continuous environmental improvement	Higher profitability
Larger tax base	Better resource use	Enhanced market image
Community pride	Reduced waste	High performance workplaces
Reduced waste disposal costs	Innovative environmental solutions	Improved environmental efficiency
Improved environmental health	Increased protection of natural ecosystems	Access to financing
Recruitment of higher quality companies	More efficient use of natural resources	Regulatory flexibility
Improved health for employees and community		Higher value for developers
Improved environment and habitat		Reduction of operating costs (energy, materials and water)
Partnership with business		Reduction in disposal costs
Minimized impact on infrastructure		Income from sale of by-products
Improved tax base		Reduction of environmental liability
Enhanced quality of life in area near eco-industrial development		Improved public image
Improved aesthetics		Increased employee productivity
Good jobs		

The benefits of eco-industrial development comes from the connections among local "resources", including businesses, non-profit groups, governments, unions, educational institutions, and communities. Its goals are to foster practical connections between wastes and resources and to promote a networked approach to doing business and interacting with communities.

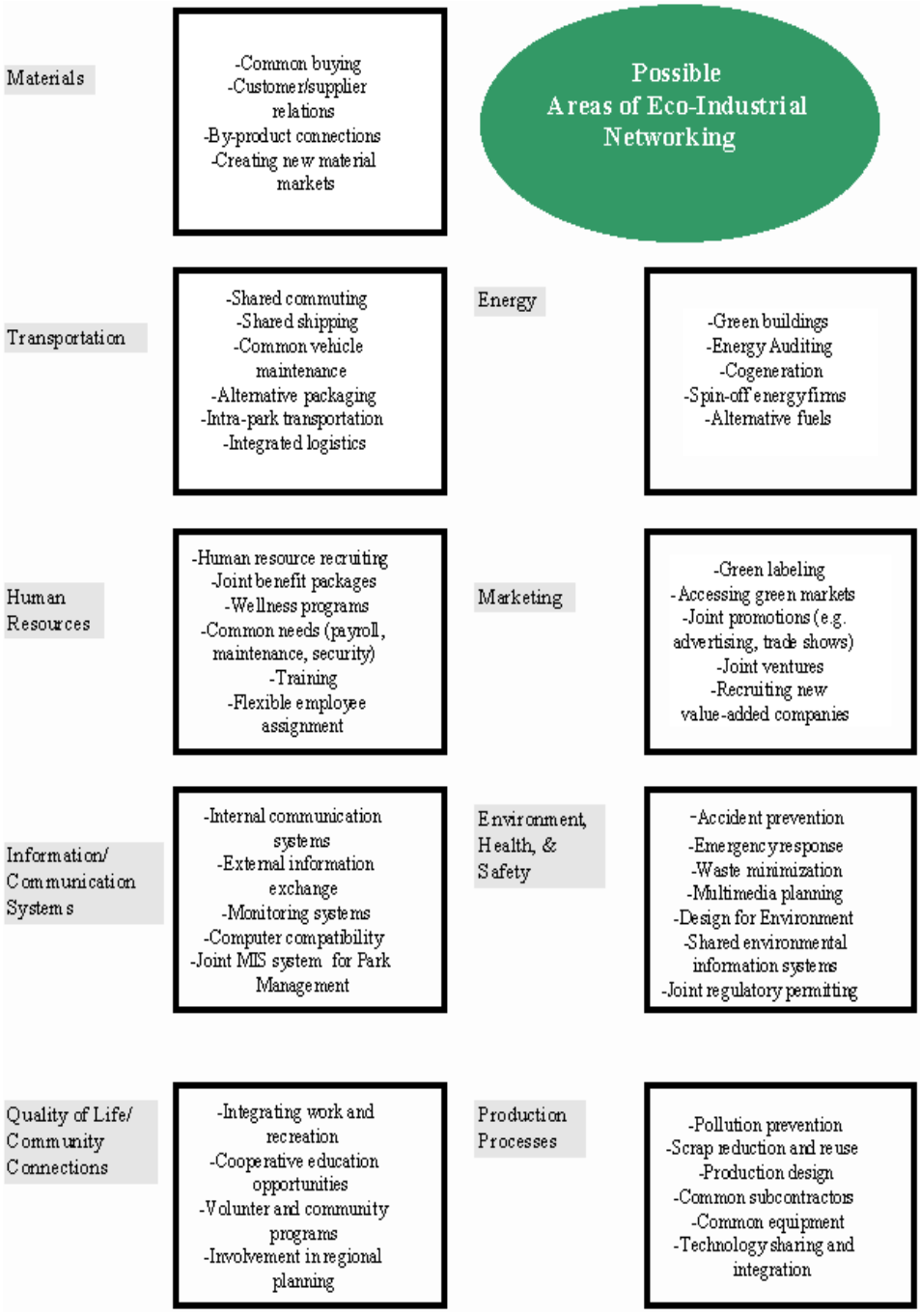
Co-location vs. Virtual Park

Eco-industrial development can take one of two forms — a co-located eco-industrial park or a virtual eco-park. The most commonly recognized is the co-located eco-industrial park. An eco-industrial park is a specific property that has co-located businesses that implement eco-industrial principles with one another. Virtual eco-park development does not involve co-locating companies. By linking materials flows and exploring other regional connections, this latter approach allows communities with large existing industrial bases to apply eco-industrial principles to create a more sustainable business practices without having to relocate companies. A combination of both is also a likely combination.

Figure 2 provides a list of areas where eco-industrial connections can be facilitated for either type of eco-industrial development. Resources available to explain eco-industrial development, industrial ecology, and alternative economic development strategies are listed in Appendix B

Economic development takes many forms such as; industrial parks, industrial districts, industrial zones, export processing zones, industrial clusters, industrial processing zones, industrial development zones, business parks, office parks, science and research parks, high-tech centers, bio-technology parks, and eco-industrial parks. Eco-industrial development principles can be applied to all of these types of economic development activities.

Figure 2
Potential Areas of Eco-Industrial Networking[2]



2 Cohen-Rosenthal, 1996.

C. WHY ARE CODES AND COVENANTS IMPORTANT?

Planning bodies, legislative groups (e.g. City Councils), regulators, community activists and developers want to encourage eco-industrial development in their communities but are not sure how. Traditional economic development approaches have been either regulatory or incentive based for individual businesses. We advise expanding or revising those approaches to include increasing networks and promoting continuous environmental improvement within industries. Codes and covenants provide a means to achieve this goal.

Codes and covenants are important because they often set parameters for development. They serve a useful function in the development and management of industrial areas. Codes, covenants, conditions, and restrictions are defined as follows:

> Codes are regulations established by state and local governments pursuant to their authority to ensure public health and safety. Zoning regulations, historic preservation standards, environmental regulations, and building codes are examples of "Codes". Codes also often require prospective developers to present their plans for public comment and review by particular governmental agencies or boards. For instance, a developer is usually required to go through a site plan review with the planning board of a governing body.
>
> Covenants, Conditions and Restrictions (CC&Rs) are established by property owners with respect to a parcel of land they own. The CC&Rs are a part of the deed to the land and affect all subsequent purchasers of the land. CC&Rs are usually employed by developers who intend to subdivide and/or lease portions of a large tract of land and want to protect the value of the land for the developer and the subsequent owners and tenants of the land collectively through specifically prohibiting certain activities (e.g. unauthorized uses) and requiring others (e.g. maintenance) by subsequent owners and tenants. CC&Rs usually provide for enforcement of the CC&Rs through a board representing all the subsequent owners and/or the developer. In addition, most CC&Rs require that the same CC&Rs be written into leases between subsequent owners and tenants leasing space from them.

Codes and CC&Rs that support eco-industrial development should also respond to the purposes stated above, but should be evaluated as to how these regulations can promote continuous and best business and environmental improvement and community development instead of achieving minimum compliance.

D. PRINCIPLES AND APPROACHES FOR CODES AND COVENANTS

As stated before, codes and covenants can take many different forms for different communities and developers. The United Nations Environment Programme (UNEP) has developed some guiding principles and approaches to environmental management of an industrial park.[3] These principles can serve as guidelines for developing codes and covenants for eco-industrial parks. Though the principles of industrial ecology serves as the primary principle for eco-industrial parks, other principles and approaches are relevant to creating an overall approach to this type of industrial development. The principles identified are:

- The Precautionary Principle
- Integration
- Environmental Planning
- Ecological Design
- Total Quality Management
- Cleaner Production and Resource Recovery
- Industrial Ecology

The Precautionary Principle
The "precautionary principle" focuses on the prevention of environmental damage by an industrial park. Action is taken before all the definitive evidence is in and mandatory governmental regulations are in place to require particular action.

Integration
Integration ensures that the solution to one environmental problem does not create or contribute to another environmental problem. This approach requires a large amount of communication and cooperation between industries and agencies.

Environmental Planning
Environmental planning evaluates the impacts that an industrial park will have on the "carrying capacity" of a given area. This evaluation is based on sound assessment tools such as environmental impact assessments.

Ecological Design
Ecological design takes the environmental impact assessment and planning to the next step by designing the "footprint" of the industrial park around the environmental constraints and opportunities of an area. This process can include the actual building footprint, materials uses, energy required, transportation, and industry needs. This process often utilizes "life cycle analysis" as part of the evaluation of figuring out the costs and benefits of utilizing certain approaches or materials.

Total Quality Environmental Management
Total Quality Environmental Management combines Total Quality Management with Environmental Management activities. TQEM combines efficiency improvements with cleaner production methods. Environmental management systems like ISO 14000 provides standards for environmental policies, life cycle analysis, environmental auditing, waste management, and emergency planning and prevention.

Cleaner Production and Resource Recovery
Cleaner Production and Resource Recovery focuses on reducing pollution to avoid the costs of cleanup, protect human health and minimize impact on the environment. These activities include eco-efficiency, waste reduction, waste minimization, pollution prevention and cleaner production.

Industrial Ecology
Industrial Ecology considers designing an industrial park like an eco-system. Industrial ecology identifies the connection between one industry's waste or by-products and another industry's raw materials.

By choosing a set of principles or guidelines, a community or developer can set the tone for economic development in their communities and can provide a direction for the specific codes and covenants that they want to develop.

E. HOW TO USE THIS HANDBOOK

This report is not meant to be comprehensive for any particular community, but to serve as a general tool for all communities and developers considering this type of development. Eco-Industrial Development Program (EIDP) roundtable meetings held in Cape Charles, VA (October, 1998), Albuquerque, NM (February, 1999) and Minneapolis, MN (June, 1999) inform this document. The EIDP is an association of communities and individuals interested in eco-industrial development hosted by Cornell's Work and Environment Initiative. Communities working on eco-industrial development meet regularly through the year to discuss common issues that the groups are dealing with.

This report contains two case studies of codes and covenants developed by Cape Charles Industrial Development Authority (VA) and Londonderry (NH). Each of these groups has chosen a different way to approach the management of an eco-industrial park. Cape Charles is a public/private venture in a relatively economically depressed region. Londonderry's codes were developed in an economically healthy environment through a public task force and with a private developer who then took over the ownership and management of the park. These case studies review how each group developed its codes and covenants and discusses difficulties encountered with existing regulations.

This *Handbook* is meant to help local government officials, industrial park developers, and community members considering eco-industrial park development in their communities. The report is divided into a brief overview of the role of government codes (Section 2) and private CC&Rs (Section 3) in eco-industrial park development. Section 4 provides a look at the development of two eco-industrial parks in Cape Charles, VA and Londonderry, NH. Section 5 identifies issue areas that individuals working on developing eco-industrial parks have considered or encountered during their development processes. In this Section, examples of sustainable codes and covenants are given by topic area. Additional resources can be found as an attachment to the Handbook.

SECTION II: GOVERNMENT CODES

Government codes and regulations seek to ensure public health and safety, promote compatible land uses, and protect a community's values. In spite of these good intentions, codes can also have the effect of hindering creative approaches to development, even when the end goal is to achieve greater environmental, worker and public health and safety. Most codes and regulations set the absolute maximum impact allowed. Noise levels, pollution levels, and air quality levels all involve maximum levels of emissions established by government. Individuals and companies are penalized when caught exceeding the maximum levels set by the government. But at the same time, they are not usually rewarded for reducing pollution levels well beyond compliance.

Sustainable development tries to minimize the environmental impact of development well beyond the regulatory requirements. As a result, sustainable projects can produce results that exceed existing codes and regulations. In some cases, codes and regulations can become a hindrance to developing sustainable projects. For example, regulatory codes set runoff requirements that often lead to major infrastructure development solutions to capture stormwater runoff. This regulation is usually set without regard to the type of development being proposed or the other options that are available because this is the way it's always been done. Developers are beginning to explore other solutions such as wetland ponds, marshes, and grey water reuse to capture runoff. Mandated infrastructure solutions can add unnecessary costs to a project and use up greenspace while increasing runoff pollution. In this regard, the regulations act as a disincentive for creative design and planning.

Examples of Codes that Discourage Environmental Development

Most communities' codes were created piecemeal over time. As a result they are not always based on the most environmentally sound development principles. When zoning was developed its purpose was to protect the various land users by separating land uses. What has evolved is that zoning codes allow the basic suburban subdivisions "by right" and industrial zoned areas have become undesirable areas.

If a developer wants to cluster units on smaller lots and leave agricultural lands or common open space (i.e. habitat, forest, etc.) or created a "mixed use" community then the developer must go through an expensive and lengthy Planned Unit Development (PUD) process. The codes should be turned around to allow "doing it right" as a use by right and require a variance for traditional subdivision development.

The other primary example of requiring a larger "footprint" than necessary is through parking requirements. Many communities require commercial, retail and food establishments to have two parking spaces for every 100 square feet of footage, including space used for kitchens and restroom. Shopping malls provide an example of requiring parking that accommodate "peak" usage (the day after Thanksgiving) rather than for "regular" usage. This results in large swaths of

asphalt paving with large impacts on the environment (particularly loss of habitat and storm water runoff).

Exemplary Codes

A number of communities have developed codes and approaches to sustainable development. Sometimes economic development issues are included in these local activities. Often they are not an explicit part of a sustainable development strategy. In this handbook we do not intensively cover codes in areas such as transportation, housing, etc. The Joint Center for Sustainable Communities sponsored by the National Association of Counties and US Conference of Mayors has examined the broader context. The resources section of the document lists several websites and organizations that focus on the community level.

A. SANTA MONICA, CA

The City of Santa Monica adopted a sustainable development approach when it developed a Sustainable City Program in 1994. The program's mission statements:

> *The City of Santa Monica recognizes that we live in a period of great environmental crisis. As a community, we need to create the basis for a more sustainable way of life both locally and globally through the safeguarding and enhancing of our resources and by preventing harm to the natural environment and human health. We are resolved that our impact on the natural environment must not jeopardize the prospects of future generations.*
>
> *—Santa Monica Sustainable City Program, Adopted September 20, 1994*

A list of the City of Santa Monica's guiding principles is found in Appendix B. From these principles, the City of Santa Monica started its sustainable city program, and as of June 1, 1999, it will be the first city in the world to be powered 100% by green energy. While the City of Santa Monica has not completely revised its codes, understanding its role in the "environmental crisis" and developing a vision were essential in Santa Monica's movement towards sustainability.

B. AUSTIN, TEXAS

Austin, Texas also has a sustainable community's initiative underway. "Rapid growth in the Austin region is increasing pressures on both fiscal and natural resources. In response to concerns about declining resources and environmental quality, the City of Austin implemented a Sustainable Communities Initiative

(SCI). In July 1996, the City Council identified the Initiative as a way of bringing together diverse views to plan for the needs of the future as well as the needs of the present."[4]

The City of Austin, Texas has created a different approach to sustainability. They have created a sustainability matrix for evaluating all Capital Improvement Projects.

> … an educated appraisal of trends and patterns and intent focused toward sustainability are preferable to "muddling through" without vision. Many members of the community are interested and supportive of City projects being examined through a sustainability perspective.[5]

The major goals of Austin's sustainability for evaluating CIPs include:

- Improved stewardship of the environment
- Equitable treatment of all societal groups
- Reduced dependence on non-renewable resources
- Establishing life enhancing economic activities and opportunities
- Improving long term viability of the economy, environment, and social structures with future generations in mind
- Promoting synergistic regional relations and interdependence - economically, socially, and environmentally

C. BURLINGTON, VERMONT

The City of Burlington, Vermont is creating the Riverside Eco-Industrial Park about one mile from downtown Burlington on the last remaining agricultural land in the city. The Community and Economic Development Office (CEDO) develops, funds, and conducts economic development activities based on six principles of sustainable development[6]:

1. Encourage economic self-sufficiency through local ownership and maximum use of local resources;
2. Equalize the benefits and burdens of growth;
3. Leverage and recycle scarce public funds;
4. Protect and preserve fragile environmental resources;
5. Encourage full participation by populations normally excluded from the political and economic mainstream; and
6. Nurture a robust third sector of private, non-profit organizations capable of working in concert with government to deliver essential goods and services.

4 City of Austin
5 Ibid.
6 City of Burlington

These cities have begun to take a look at sustainability in a comprehensive way. They have chosen different approaches, but have all created sustainable development principles to guide the development of codes and regulations that support sustainability.

SECTION III: COVENANTS, CONDITIONS, AND RESTRICTIONS (CC&RS)

Covenants, Conditions and Restrictions (CC&Rs) are used by private developers and public/private development authorities "to promote the long-term viability of the park in the marketplace".[7] The intention is very similar to the deed restrictions found in residential subdivisions. The value being protected in this instance is not only for the benefit of the original developer and its investors, but also all the owners of any subdivided portion of the original parcel (or the beneficiaries of any long-term lease of a portion of the original parcel).

CC&Rs protect the value of property in an industrial park over the long term by virtue of being written into every deed and lease transferring any rights to the parcel of land in the park. In legal terms, the CC&Rs "run with the land," and affect the rights and obligations of all future owners and tenants.

CC&Rs vary greatly, but in general they provide standards for certain activities, or they require or prohibit certain activities on the part of owners and tenants. Typical CC&Rs include detailed design and siting standards for buildings, procedures for architectural review, and prohibitions on environmentally unfriendly activities. CC&Rs must be unambiguous and very specific in order to be enforceable. Conversely, once attached to the deed of the original property, they are very difficult to remove. In eco-industrial parks, CC&Rs are often written in order to maintain the environment and aesthetics of the park and discourage wasteful practices.

A crucial part of the CC&Rs is the process by which they can be modified or exemptions made. The decisionmaking process should include all stakeholders and should be identified in the CC&Rs.

CC&Rs usually contain the elements identified below. Appendix C provides examples of traditional codes for industrial and office parks.

Box 1
Covenants, Conditions, and Restrictions for Industrial Parks

Title. Some typical titles include "Declaration of Covenants, Conditions, and Restrictions", "Protective Covenants," and "Covenants and Restrictions".

Recitals, Declaration of Intent, Statement of Purpose. As used in many CC&Rs, these terms are almost synonymous. The recital or declaration of intent provides a legal introduction that identifies the owner and the property and requires adherence to CC&R requirements by all future tenants and owners. Sometimes a statement of purpose is included, either briefly in the recital or greater length in a separate section.

7 Urban Land Institute, 1986.

Legal Description and/or Map. Often referred to in the recital, this section states an exact location of the property, using standard boundary survey language. A map may or may not be included as an appendix or exhibit.

Definitions. This section contains a list of terms found in the CC&Rs and their definitions.

Creation and Responsibilities of an Association. Found in many CC&Rs, this section spells out the establishment and duties of an association or board of directors that will oversee management of the park. Usually the statement defines membership and voting rights as well as general procedures.

Maintenance Assessments. This section contains requirements and procedures for assessing owners and lessees for costs incurred in maintaining common spaces.

Permitted and/or Prohibited Land Uses. Like zoning provisions, these requirements identify the types of land use permitted and/or prohibited in the park. Relatively few CC&Rs contain these provisions.

Nuisance Restrictions. Performance standards are incorporated in many CC&Rs to restrict amounts of noise, glare, vibration, and other nuisances that may be created by occupants of the park.

Design Guidelines. Usually the most detailed and lengthy section, design guidelines provide standards for building height, setbacks and coverage, parking, and other physical aspects of the development. Sometimes they are extensive enough to require a separate document.

Design or Architectural Review Procedures. In most CC&Rs, a review committee or board and review procedures are established to judge each owner's or lessee's site and building plans.

General Provisions. Various legal statements regarding transfer of ownership, easements, enforcement and severability of the provisions, and other matters are found in this section. Sometimes these provisions occur in the beginning section.

Source: Urban Land Institute, *Covenants and Zoning for Research/Business Parks*, 1986.

CC&Rs for eco-industrial parks should address these areas, but have the potential to become a stronger influence in the development of the industrial park. The CC&Rs can create an industrial park that is reflective of the interests and values of the community, businesses, and developers.

In the two EIDP meetings, held in Cape Charles, VA and in Albuquerque, NM, it was agreed that eco-industrial development should have at a minimum the following goals:

1. Strive for continuous business and environmental improvement.
2. Establish networks to accomplish objectives.
3. Establish links to the local community and eco-system.
4. Achieve beyond compliance levels with federal, state, and local regulations.

Eco-industrial parks, much like traditional industrial parks, will have CC&Rs that uniquely reflect the developer, businesses, and the community, however, the CC&Rs should reflect these larger goals. Section V provides a list of issues developed during the EIDP meetings mentioned above that can be considered while preparing CC&Rs. The list should also serve as a starting point for identification of other criteria appropriate for your community.

SECTION IV: NEW APPROACHES - CASE STUDIES

This section contains two case studies of eco-industrial parks that are in the planning stages. The projects are in Cape Charles, VA and Londonderry, NH. The purpose of these case studies is to provide an overview of what processes communities are engaged in when implementing eco-industrial parks. Cape Charles is an example of a public-private partnership to bring responsible and sustainable jobs to their community. Londonderry is an example of private enterprise seeing a business opportunity that also had community support and was environmentally sensitive.

A. Port of Cape Charles Sustainable Technologies Industrial Park, Cape Charles, VA (www.esva.net/~northampton/stip.html)

Site Plan

The Cape Charles Sustainable Technologies Industrial Park is located in a generally depressed economic climate in Northampton County on the Eastern Shore of Virginia. The County has addressed their economic decline through a unique Sustainable Development Action Strategy, initiated in 1993. Since its conception, this strategy has won national acclaim as a model of comprehensive public-private partnership for small-town, rural development. This partnership has resulted in the Port of Cape Charles Sustainable Technologies Industrial Park, "developed to showcase businesses and the products of businesses, which exemplify the highest commitment to profitability with environmental and social integrity."[8]

8 Cape Charles Sustainable Technology Park Overview Publication.

Department of Energy Sustainable Business Success Story

Northampton County is undergoing a striking metamorphosis. It is transforming itself from an economically depressed community into a twenty-first century model of cohesive sustainable development. The county still suffers economic hardship, with a declining population and steep job losses resulting from reversals in its dominant seafood and agricultural industries. According to the 1990 census, 27 percent of the County's 13,000 inhabitants live below the poverty line. Underlying this transformation is Northampton's refusal to accept these conditions. In choosing an eco-industrial development model it also refuses to accept the tradeoff of natural and cultural resources for short-term economic gains. Further, it has refused to incur debt to finance infrastructure development.[9]

The Sustainable Technologies Park (STIP)

The heart of Northampton's sustainable economic redevelopment strategy is the Port of Cape Charles Sustainable Technologies Industrial Park (STIP). The STIP plans to attract businesses committed both to profitability and to environmental and social integrity. It will house facilities that boast advanced features to reduce pollution and use resources efficiently.

To make their strategy work, Northamptonians needed to know the obstacles for sustainable economic development. Problems addressed included:[10]

Labor constraints

- Limited professionally-skilled labor
- Low educational level of population
- Out-migration of young people and accompanying loss of skill, energy, and talent

Infrastructure constraints

- Limited freshwater supply and wastewater treatment facilities
- Substandard housing stock and lack of adequate housing
- Limited amenities, including restaurants and lodging, shopping facilities, and conference and meeting facilities

9 U.S. Department of Energy
10 Ibid.

Working with the Community to Develop the STIP

The Joint Industrial Development Authority (IDA), comprised of the Town of Cape Charles and Northampton County, has been the impetus for the Sustainable Technologies Industrial Park. The IDA has been dedicated to including local residents in the design process. In 1995, the IDA initiated a design charrette with the help of architectural firm William McDonough and Partners. This design process was highly participatory, involving city planners, environmentalists, businesspeople, politicians, technical specialists, and interested members of the local community. The charrette resulted in *The Cape Charles Principles*, establishing the requirement that the general principles of social, economic, and environmental sustainability were to be written into the deed for the land.

General specifications of *The Cape Charles Principles* include[11]:

- Foster the growth of environmental industry
- Preserve the historic quality of the Cape Charles region
- Restore the coastal watershed's natural systems
- Create "family wage" local employment, training, and opportunities for advancement
- Support agricultural and manufacturing industries
- Encourage walking and bicycling as convenient modes of local transportation.

While the vision for the STIP was clear, limited economic resources hampered Northampton County's ability to finance the infrastructure improvements needed for development. The next immediate challenge was to find funding for the Park.

Finding Funding for the Sustainable Technologies Industrial Park

While initially the Northampton County Board of Supervisors thought of funding the STIP through a public bond of $4.6 million, they later decided to fund the project without raising taxes or incurring debt. To do so, Northampton County was forced to rework current government expenditures to cut costs. Some of the cost saving measures taken included:

- Prioritizing service and programs
- Reorganization of service delivery

11 Espey, Huston & Associates

- Developing more cost-effective solid waste management practices
- Reducing government positions through attrition
- Securing regional, state, and federal technical assistance, loans, and grants.

An initial target for Northampton County was set to create a reserve fund equal to 7.5% of the County's operating budget, or $1.5 million. Northampton's cost-cutting measures have also generated funds from federal and state sources, including support for the Northampton County Sustainable Development Action Strategy from the Virginia Department of Environmental Quality's Coastal Resources Management Program and the National Oceanic and Atmospheric Administration. Funding support from the latter also helped fund a new staff position for Northampton County: Director of Sustainable Development. Buoyed by these grant moneys, Northampton County itself has invested $620,000 for the project. Northampton's economic strategy to fund the STIP has earned national praise from the Department of Energy[12]:

> "By choosing a fiscally conservative path, Northampton has successfully commuted a potential debt note of $4.6 million to a debt-free investment of $620,000. The county leaders, acting as stewards of their community, made a difficult short-term decision to cut spending. By doing so they created a reserve of funds to be invested in the STIP that will repay their constituents rich dividends: no increased debt, a sustainable future, and - perhaps most important—an unprecedented feeling of community ownership."

DOE has also praised Cape Charles for the community involvement with the project[13]:

> "Without community buy-in, Northampton's development efforts would resemble those of Anywhere, America. The community's commitment to capitalizing on and protecting Northampton's world-class natural and historic assets for the ongoing benefit of all citizens—and government's resolve to act on that commitment—ensure the STIP's ultimate success."

12 U.S. Department of Energy
13 Ibid.

Developing the Covenants and Restrictions

After meeting with the community to develop a vision for the Cape Charles Sustainable Technologies Industrial Park, the Joint Industrial Development Authority arranged several citizen meetings to discuss covenants and restrictions for the STIP. The vision and goals established by the community during the visioning process were used as the starting point for the CC&Rs. In this way, the community ideas were translated into real outcomes and processes for the development of the eco-industrial park.

The Application Process

Cape Charles established a number of criteria for park entry and designed an application form to determine whether an applicant for tenancy would be desirable. The task at hand was to turn the Cape Charles Principles into specifics in order to decide whether a particular tenant would be appropriate for the Park in terms of sustainability. To do this, the IDA created a set of covenants and restrictions for prospective companies in the Park.

> … all park occupants must meet certain fundamental environmental operating and design standards, and must also achieve a satisfactory ranking on the C&Rs' sustainability matrix, which is comprised of over fifty environmental, social and economic sustainability criteria.[14]

To ascertain whether an individual applicant met these criteria, Cape Charles established three independent sliding scales:

- Social (e.g. local employment, high benefits, employee retention above regional average)
- Environmental (e.g. encourage materials reuse)
- Economic (e.g. locals demanded economic success–sustainability)

An application form was designed for potential companies with self-assessment scoring. For example, a company willing to hire more than 50% of its workforce locally and pay above-average wages for the Eastern Shore area would score high on the social equity scale. Using these scales will also provide incentives for tenants through lower leasing costs. A company must achieve a minimum set score to be admitted to the park. The contract is an organic document, binding for 20 years. Because there will certainly be changes in technology, an amendment process makes the application process flexible for change over time.

14 McGuire, Woods, Battle & Boothe, LLP, (3)

Management of the Park

Northampton County owns the entire site. The eco-park is then leased to the Joint Industrial Development Authority who manages the park.

About the Park Itself

Although some 20 eco-parks are being planned nationwide, Cape Charles had the first completed building and is fully leased. Energy Recovery Inc. (ERI) has chosen Cape Charles Sustainable Park for its manufacturing and research operations. The company plans to hire 50 people and invest $2.5 million in a research, manufacturing and development facility. ERI was formed in 1992 and is commercializing its proprietary pressure exchanger technology, which improves the efficiency of several liquid pumping processes including water desalinization. ERI has leased Building One in the park.


Building One

Building One demonstrates the design standards that will distinguish all the buildings in the Park. Building One is a 30,930 square foot industrial facility. Advanced design features include:

- "silver" rating by the U.S. Green Building Council,
- photovoltaic panels to produce 50 kilowatts of solar power,
- indoor air quality monitoring,
- energy efficiency/high R value,
- skylights for natural daylighting,
- porous pavers to reduce stormwater runoff,
- boardwalks and nature trails,
- and common areas for conferences and meetings.

Rents are competitive with other new construction and leases include an incentive lease rate of up to a 12% reduction from the standard rate for occupants exceeding the minimum Sustainability Criteria established in the Park's covenants.

Building One is designed to blend naturally with the existing historic town of Cape Charles, and it is located next to a Chesapeake Bay Natural Area Preserve. The setback from the street is small and parking is in the rear. The architecture recalls industrial buildings from the era when much of the town of Cape Charles was built. Building One was completed in early 1999.[15]

Building Specifications[16]:

- Lease Price: $7.50 per square foot annual, with opportunities to reduce the rent by meeting sustainable operating standards
- Size:
  30,930 total square feet
  27,200 sq. ft manufacturing space
  1,600 sq. ft incubator space
  1,600 sq. ft meeting/conference space
  530 sq. ft of mezzanine space
- Subdividable: Yes, into 4,800 square foot sections
- Doors: 4 dock-height doors and 2 drive-in doors
- Ceiling Height: 16 feet clear
- Walls: Tilt-up concrete
- Electric Power Supplier: Conectiv
- Water Supplier: Town of Cape Charles
- Waste Water Treatment Provider: Town of Cape Charles
- Telecommunications Supplier: Bell Atlantic, with digital switching
- Zoning Classification: STI (sustainable technologies industrial)
- Ownership: Industrial Development Authority

B. Londonderry Eco-Industrial Park, Londonderry, New Hampshire (www.londonderry.org/)

The Londonderry Eco Industrial Park began in 1991 when the Town of Londonderry in southern New Hampshire took approximately 100 acres of land zoned for industry adjacent to Stonyfield Farm for back taxes. In 1995, Stonyfield was working with a recycling company with the hopes of using the yogurt company's waste water to rinse plastics and cut costs. Stonyfield approached the town of Londonderry with the prospect of developing the site as an Eco Park. In the spring of 1996, the Town of Londonderry organized the Advisory Group of stakeholders including Londonderry business, government and local representatives to guide the Eco Park process. Since

15 Cape Charles Sustainable Technology Park (webpage)
16 Ibid.

then, the Advisory Group has created the guiding vision statement and management structure for the Park. As envisioned by the Town, the site was sold to a private developer in 1998 who is planning the Londonderry Eco Park anchored by a natural gas fired, co-generation power facility which will produce high pressure steam and hot water for use by other tenants in the park.

Eco-Industrial Development in an Economically Healthy Region

The Town of Londonderry in southern New Hampshire is an economically growing region one-hour from Boston. Londonderry boasts one of the fastest growing economies in New England and has a large cargo airport that facilitates shipping and handling. Currently, Londonderry is going through the process of deciding how to encourage development while protecting the rural quality of the area. The Town of Londonderry tried to accomplish this task by forming the Advisory Board to help shape Stonyfield's idea of an Eco Park into reality. The board represents a cross-section of stakeholders including Londonderry residents, Londonderry government officials, local business members, private and non-profit environmental organizations, state and federal agencies and universities. As an enthusiastic and diverse group committed to the Eco Park process, the Advisory Board's first task was to complete the vision statement for the park.

The Londonderry Vision Statement[17]
"The Eco Park recognizes as its primary function developing systems and processes which minimize the impact of industry and business on the environment, improve the economic performance of the member companies and strengthen the local economy. Through modeling the Park's industrial systems on natural eco-systems, decreased environmental impact will be realized."

The Vision Statement also outlined several major goals for the Eco Park:

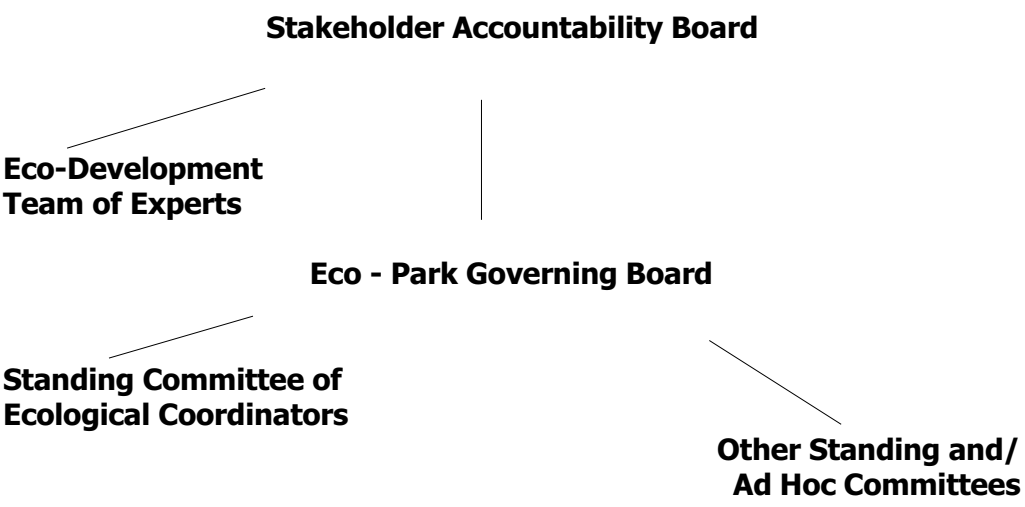
· *Sharing a Common Mission Through Long-Term Partnerships*: Looking for long-term connections and synergies between Eco Park occupants.
·*Accountability*: Including land stewardship and ecological performance assessment.
·*Striving for Continuous Improvement and Innovation*: Involving business competitiveness and environmental performance.
·*Land Stewardship*: Focusing on ecological integrity and biological diversity.

17 Town of Londonderry, New Hampshire, 1996

·*Serving the Local Community*: For economic benefit as well as educational and outreach programs.
·*Serving One Another*: Including Eco Park businesses, employees, and members of the community.

Creating the Management Structure for the Park[18]

The Advisory Board for the Eco Park then created a draft of the management system for the park. Initially, the Board constructed a first draft that outlined major issues to be addressed. As the Town of Londonderry negotiated with a private developer, many additional issues were raised. An environmental lawyer mediated the issues and wrote up a subsequent draft. They used this public accountability process as a public feasibility test, asking businesses like Stonyfield and others to participate on the board. The Advisory Board created a schematic model of the Eco Park's management structure, outlining both the role of the Stakeholder Accountability Board to assure adherence to the Eco Park's Vision Statement and the Eco Park Governing Board to serve as the tenants and owners association for the Park.



18 Town of Londondery, New Hampshire, 1998

The Stakeholder Accountability Board

The Stakeholder Accountability Board largely serves an advisory function for the Eco Park. Its membership includes local citizens, business, organized environmental groups, local government, and members from the Eco Park Governing Board. The Stakeholder Accountability Board must approve the Eco Park Governing Board's annual goals. Overall, the Stakeholder Board is concerned with the environmental integrity and compliance of the Eco Park. In the end, the Stakeholder Accountability Board has to sign off on the report and vote to make it available to the public.

The role of the Stakeholder Accountability Board is to[19]:

- Assure public accountability/disclosure by means of reviewing and releasing to the public the Eco Park's Governing Board's Annual Report.
- Assure adherence to the Eco Park's Vision Statement.
- Facilitate effective communication between the Eco Park Governing Board and the community and disseminate the approved Eco Park Annual Report.
- Act as a consultative/advisory board for the Eco Park Governing Board.

The Eco Park Governing Board

The Eco Park Governing Board is comprised of the Chief Executive Officers of the companies at the Park. It is in charge of the day-to-day administration of the Park and will review and approve new tenants. The Board is also responsible for writing an annual review for the Eco Park and its member companies. The Board will also enforce the Eco Park covenants, performance requirements and guidelines.

Basic Performance Requirements[20]

The Basic Performance Requirements make up the minimum standards to which companies shall agree to in writing to become members of the Eco Park. These baseline standards are as follows:

- There must be compliance with applicable Federal, state and local environmental, health and safety laws and regulations.
- Each member of the Eco Park must participate in an Environmental

19 Town of Londonderry, 1998
20 Ibid.

Management System pursuant to which it will address its own specific environmental aspects/impacts and will set its own targets and objectives.

- The members of the Eco Park must adhere to the basic Vision Statement.
- The members of the Eco Park must participate in the public accountability procedures, including the annual reporting process.
- Members of the Eco Park must be committed to seeking synergies.

Ecological Guidelines and Recommended Practices

In addition to the baseline performance requirements, the Advisory Board established the Ecological Guidelines and Recommended Practices for the Eco Park. The Advisory Board found little advantage putting these CC&Rs in the deed because guidelines cannot be changed without the approval of the Stakeholder Advisory Board. A better solution was to provide incentives for any member company meeting set guidelines for sustainability. Therefore, these incentives for member companies are used as overall ecological standards enforced by the Eco Park Governing Board. The Ecological Guidelines and Recommended established covenants and restrictions fall under ten major categories:

1. Design and Construction
2. Land Stewardship
3. Energy
4. Water Conservation
5. Pollution Prevention
6. Transportation
7. Regulatory Commerce
8. Environmental Management
9. Serving the Community
10. Reporting and Accountability

Continuing the Eco Park Process

The Londonderry Eco Industrial Park was acquired in 1998 by Sustainable Design & Development (SSP, Inc.), a private development company formed to coordinate and implement the design, planning, marketing and development of the Eco Park. As planned, the focus of the Eco Park will be the natural gas fired power plant owned by AES. This plant is going through the regulatory approval process and will cover 44 acres, "of which 30 acres will be devoted

to interpretive nature trails and will be held as permanent conservation land".[21] Treated wastewater from the City of Manchester will cool the gas-fired generators of the power plant, and in turn the plant will provide hot water and high pressure steam for use by Londonderry Eco-Park tenants.

In early 1999, Gulf Southern, a 70,000 sf Medical Supply Distribution firm located within the park. A review of the firm's operations and proposed site and building design by the park's Eco-Development Team of experts produced design changes estimated to save the firm over $8,000 a year in operating costs. In a highly competitive sector of the economy like medical supplies, savings in operating costs translate directly into company profit.

Currently, SSD is in the process of recruiting other prospective tenants for the Eco Park and is optimistic about full leasing of the park.

21 Town of Londonderry Eco-Industrial Park brochure

SECTION V ISSUE AREAS FOR ECO-INDUSTRIAL DEVELOPMENT

This section is divided into several issue areas for consideration when developing or reviewing CC&Rs, codes, and regulations. This list of considerations should in no way be considered exhaustive. The lists were created during the course of several Eco-Industrial Development Program roundtable meetings with individuals working on this type of development. These lists are meant to identify the types of issues to consider when creating or revising codes, regulations, and CC&Rs.

For each issue area examples from existing codes, covenants, conditions, and restrictions are provided from groups who are looking at developing sustainable communities. Also provided are professional recommendations from groups pursuing a sustainability agenda within their profession. Examples are from the following sources:

Covenants
Cape Charles Sustainable Technologies Park - the Cape Charles Sustainable Technologies Park completed its first building in its eco-park in the winter of 1998. The building is fully leased and they are beginning to develop the next phase of the park.

Town of Londonderry Eco-industrial Park - The Londonderry eco-industrial park began with a stakeholder accountability group made up of members of the community, city, developers, businesses, and elected officials. The group established the criteria under which the Park would operate and then found a developer amenable to that vision. The first tenant of the park is AES Londonderry LLC, a combined-cycle co-generation power company.

Codes
City of Santa Monica - The City of Santa Monica has been considering how to become a sustainable community and have developed codes to support sustainable activities in the city.

Professional Recommendations
U.S. Green Building Council - The US Green Building Council is the building industry's coalition promoting the understanding, development and accelerated implementation of "Green Building" policies, programs, technologies, standards and design practices.

American Institute of Architects, Committee on the Environment - The Committee on the Environment (COTE) of the American Institute of Architects (AIA), is the Institute's organization for the compilation, exchange, and dissemination of environmental information in design and the practice of

architecture.

A. Design

Design issues are considered by many to be a key feature in any development's ability to act sustainably on the environment and workers. The participants in the EIDP Roundtable felt that this area was essential when considering developing an eco-industrial park. Design refers largely to the physical layout of the facility itself. It includes both interior and exterior design elements. Incorporating sustainable design principles like energy efficiency and indoor workspace quality has been shown to increase productivity by 2-4%, which can quickly offset higher rent costs. A list of elements to consider when developing codes and CC&Rs is provided below.

Site/Building Plan

1. Design for flexibility and for other future uses.
2. Build recycling facilities/capacity into the facility.
3. Consider indoor air quality (IAQ) with regard to paint, carpet, and other building material.
4. Encourage alternative transportation facilities; such as showers, bicycle racks, paths, and access to transit.
5. Comply with the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, which is a priority program of the US Green Building Council.
6. Evaluate environmental performance from a "whole building" perspective over a building's life cycle.
7. Use maximum passive heating and cooling design techniques.
8. Achieve 100% daylighting (e.g. use of mirror technology called "light pipes").
9. Design for use of renewable energy systems.
10. Connect to alternative transportation options; such as bus lines and trail systems.
11. Consider community design input.
12. Minimize building footprint.

Materials and Equipment

1. Use energy conserving lights.
2. Use materials and equipment that are beyond compliance for energy conserving programs or standards.
3. Consider materials type for building shell and interiors (e.g. energy efficient, locally available).
4. Use a flexible heating, ventilation, and air conditioning (HVAC) system

(e.g. solar ready, adaptability to other new technology).
5. Consider paving materials to reduce impervious surface.
6. Use water conserving plumbing fixtures.
7. Use sophisticated energy control systems (e.g. HVAC is triggered by CO^2 content in the air, not a timer).
8. Use maximum feasible recycled and/or reused materials (e.g. steel beams from an old building).

Construction
1. Minimize disruption of natural fauna, flora, hydrology and topography.
2. Minimize runoff potential.
3. Separate construction wastes for on-site reuse and recycling.

Landscape
1. Use climate and topologically appropriate landscaping.
2. Use low maintenance landscaping and materials.
3. Utilize native plants.
4. Utilize environmentally friendly materials (e.g. porous paving, limited fertilizers, herbicides)
5. Consider limiting the amount of lawn.
6. Consider creating habitat to mitigate for loss of habitat from development (e.g. either on-site or consider becoming a habitat mitigation bank).

Box 2: Examples of Design Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

· *General suggestions for architectural design:* "A harmonious architectural theme shall be used in the Sustainable Technologies Industrial Park with consistent landscaping, signage, and building materials. ... The architecture shall reflect the historic building types or elements of Cape Charles and Northampton County."

·*Specific building design restrictions:* "Materials shall be chosen to encourage and promote energy efficiency and ecologically responsible materials."

·*Restrictions for open space design:* "Common areas like parking lots, sidewalks, and trails need to be integrated into the architectural scheme..."

·*Suggestions for parking lots:* "Pervious surfaces such as pervious asphalt, aggregates, pavers, or like materials, shall be used in the common areas as much as feasible and prudent. .... Parking lots should utilize as many existing trees as is feasible; should include transplanted trees of larger calipers where feasible, should be planted with trees which will mature into large specimens, and in general should be designed to maximize the amount of surface covered by tree canopy."

Londonderry, New Hampshire
(Ecological Guidelines and Recommended Practices for The Londonderry Eco-Industrial Park)

· *General criteria for construction:* "Establish and maintain procedures for communication between design and construction professionals, and the Eco-Development Team and the organization's ecological coordinator or representative. Develop criteria and specifications to "design-in" water, energy and building material conservation; ease of recyclability; and the utilization of low maintenance and low embodied energy building materials and non-toxic materials in construction."

· *Energy use suggestions:* "Optimize natural day lighting, passive solar gain and natural cooling."

· *Building material suggestions*: "Choose wood products from salvage operations and/or certified as sustainably managed."

"Prioritize building materials that are non-toxic, made from recycled materials, manufactured with low embodied energy."

Professional Recommendations

American Institute of Architects, Committee on the Environment
(http://www.e-architect.com/pia/)

· *Sustainable Architecture:* "*The* strategy for sustaining a business, or any endeavor worth undertaking, can be stated simply: minimize resource requirements, maximize production efficiency, and control waste. Plan first to do it right or pay later to fix it. Those are the goals of sustainable architecture that extend from the spaces within a building to the community, region, and, ultimately, the globe. Those goals extend over time as well, from the life cycle of a piece of equipment to the building

itself; from your life on to the lives of people not yet born. This does not mean giving anything up; it does mean improving the building we inhabit."

· *Site Planning:* "Through thoughtful consideration of site conditions, you can create comfortable, light-filled buildings requiring less electrical and mechanical energy.

This process includes design responses to solar orientation, wind patterns, climate, and other natural energy resources. There are also physical design elements—including landscaping, berms, and water—to complement natural conditions. Research and expertise gained in this field over the past 20 years have demonstrated the dramatic energy-saving rewards of proper siting and land planning. Community-wide considerations, such as transportation, infrastructure, and reuse of existing buildings, are other important site factors."

· *Indoor Environment:* "Over the past several years, sick building syndrome and indoor pollution have become common in our vocabulary. They have reduced productivity, increased absenteeism, and resulted in litigation. These problems could be avoided with careful attention to building design, including choice of materials, design of mechanical systems, and use of ventilation, all of which contribute to the project's overall quality.

According to a National Bureau of Standards study, the labor cost of employees in typical office facility is 13 times the cost of the facility itself over its life cycle, including construction, furnishings, maintenance, and interest. The cost of design alone is only about 1/150th of the cost of the people who will work within that design every day. A personnel productivity gain of only one- percent would offset the entire design fee. Yet research indicates that user-friendly office designs have increased productivity.

B. Resource Usage

The goal of an eco-industrial park is to maximize efficient use of resources in all aspects of the eco-industrial park. Resources take the form of the raw material used for construction of facilities, used as inputs for production processes, and the energy required for maintenance and operation of the facilities. For example the construction and maintenance of the building stock in the U.S. represents one-third (1/3) of all primary energy usage and two-

thirds of all electricity. Thus, establishing goals to increase resource use efficiency and to increase the use of renewable energy sources in new development is essential to the reduction in energy usage.

Energy

1. Minimize overall energy use (e.g. electricity, natural gas, oil, etc.).
2. Promote use of renewables and energy sharing.
3. Increase metabolic efficiency of resource use.
4. Look into the potential for energy cascading (e.g. waste steam can be used for heating system).
5. Use insulation.
6. Use energy efficient lighting and equipment.

Raw Materials

1. Decrease use of raw materials, e.g. find "used" materials to use as inputs.
2. Create linkages between industries for input and output materials.
3. Incorporate used and recycled materials, and processing of materials so they can be reused.
4. Address water use issues.
5. Create incentives that avoid or minimize infrastructure needs (e.g., New York City pays upstate NY to maintain the watershed so the City doesn't have to invest in a huge water treatment plant).
6. Consider opportunities for water reuse; such as gray water options.
7. Consider water cascading.

Waste Reduction

1. Require environmentally responsible construction.
2. Create incentives for waste reduction.
3. Aggregate smaller amounts of materials for reuse or recycling (i.e. aluminum can recycling).
4. Conduct waste audits.
5. Measure value of input to product output.

Box 3: Examples of Resource Usage Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

·*General suggestions for recycling and reuse measures*:
"Percentage of Occupant's product utilized by other Occupants within the Sustainable Technologies Industrial Park." and " Percentage of other Occupants' by-products which Occupant re-uses in its operations."

"The ratio of unrecyclable materials (including heat waste) to recycled materials."

"Percentage of resources and materials consumed by Occupant that are generally considered scarce."

"Occupant utilizes an inventory system to categorize and separate wastes in order to facilitate re-use by the Occupant or other Occupants."

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *General resource usage:* "Implement a continuous improvement process to evaluate and minimize the energy use (and water use) associated with the products, activities or services that the organization controls or over which it can be expected to have an influence."

"Define packaging design material specifications for minimum recycled content and reusability or recyclability."

· *Water use practices:* "Reuse greywater where feasible."

· *Heating and cooling suggestions:* "Install high-efficiency heating and cooling equipment where natural heating/cooling design is inadequate to meet energy needs."

"Monitor and maintain water quality during construction or changes in activity or operations that have the potential to cause changes to water quality."

Codes

City of Santa Monica
(http://www.ci.santa-monica.ca.us/environment/policy/energy/policies.html

· *Administrative Instruction Pertaining to Office Paper.*[22] These policies provide purchasing specifications for office paper products; require that waste reduction specifications be included in all requests for submittals from outside contractors; and require that all City employees incorporate waste reduction measures into their operations and recycle mixed waste paper.

· *Water Conservation Ordinance.*[23] This ordinance promotes water conservation and reduces runoff to the stormdrain system. The ordinance prohibits hosing down of sidewalks, parking areas and alleys, and restricts washing of vehicles and the watering of lawns and landscaping.

Professional Recommendations

American Institute of Architects, Committee on the Environment
(http://www.e-architect.com/pia/)

· *Energy in Architecture:* "…Nearly every architectural design choice has energy consequences. A goal of reducing energy costs by 60 percent through innovative design is achievable in most cases. According to the U.S. Department of Energy, systematic approaches to quality improvement and cost effectiveness have reduced energy and operating costs anywhere from 30 to 80 percent compared to conventional buildings."

· *Materials*: "Choose materials that do not contribute to indoor pollution and avoid wasteful resource depletion. A carefully designed building also reduces long-term maintenance and operations costs."

· *Recycling and Waste Management:* "The construction, operation, renovation, and demolition of buildings produce great quantities of waste, the disposal of which is already expensive and is only becoming more so.

22 City of Santa Monica
23 Ibid.

Recycling is one part of the solution, which requires planning. For instance, 20 percent of the aluminum in building is not recoverable because it is locked into systems with other materials, which makes separation impractical."

U.S. Green Building Council
(LEED Green Building Rating System ™ Pilot Version, January 1999)

·"Obtain a score of 75 or greater on the Environmental Protection Agency (EPA)/Department of Energy (DOE) Energy Star Benchmarking Tool using predicted (simulated or calculated) or actual annual energy consumption. Or meet California's Title 24 lighting requirements."

·"Use natural ventilation and passive energy design to accomplish all heating and cooling requirements for a minimum of 8 months of the year."

Example of Developing an Energy Efficiency Strategy

City of Santa Monica's Energy Efficiency Strategy[24]

In 1993, the City began development of a long-term energy efficiency strategy for Santa Monica as part of the Sustainable City Program. City staff and an outside consultant conducted a preliminary analysis of the energy efficiency potential of the residential, commercial, institutional, and industrial sectors of Santa Monica which led to the establishment of a 16 percent reduction in citywide energy use by the year 2000 as an indicator target for the Sustainable City Program. The goals of the City's energy efficiency strategy are outlined below:

- Optimize cost-effective energy efficiency investments in all sectors of the community.
- Ensure energy supply reliability and price stability.
- Reduce the environmental and public health impacts created by energy generation and consumption both globally and locally.
- Increase the use of renewable resources.
- Ensure equitable distribution of the costs and benefits created by the restructuring of the electric utilities in California.
- Use the Total Energy Services approach to gain greater control of the city's energy future and retain more financial investment within the community.

24 City of Santa Monica

C. Transportation and Infrastructure

For any industrial development, transportation for the movement of goods and people is critical for successful business. Transportation often relies on fossil fuels and significant infrastructure investment for roads and related transport activities; such as, road maintenance. Facilitating effective transportation includes the use of multi-modal options and freight and employee traffic management to minimize local neighborhood impacts. Incorporating some codes and covenants to minimize the transportation impact of new development can be very instrumental in the purposeful reduction of dependence on fossil fuels. All new development usually requires additional infrastructure capacity for sewer, water, and roads, which can become a burden on the existing taxpayers or make new development financially unfeasible. Also an additional cost is infrastructure maintenance.

Transportation Systems

1. Ensure convenient public and private transportation for employees, customers, goods and materials.
2. Link to public infrastructure including roads, sewers, utilities and other services such as police and fire protection.
3. Review parking requirements.
4. Consider ways to minimize truck traffic through community (e.g. truck sharing, re-routing, integrated logistics, multi-modal stations).
5. Maximize truck transport sharing between industries.
6. Consider a common vehicle fleet for those who utilize alternative transit options.
7. Encourage more efficient cars/trucks, utilized in transport of goods and materials.
8. Provide daycare/personnel services on-site to minimize car trips required.
9. Consider a property tax credit, if an industrial park generates ridership within so many feet of a transportation corridor.
10. Allow broader latitude of choices by regulatory bodies (e.g., transportation infrastructure, parking set-asides, etc.).
11. Encourage the use of alternative-fueled vehicles.
12. Minimize impervious area, utilize porous paving.

Water, Sewer, and Parks

1. Adjust infrastructure requirements based on reduction in loads.
2. Consider onsite storm water management.
3. Recreational access for workers and/or for the community.
4. Use shared trenching for easier maintenace and upgrades of infrastructure.

Transit

1. Encourage bicycle use, possibly common bicycles (i.e., in Copenhagen—have special color and racks).
2. Provide access to public transportation and carpools.
3. Provide universal bus passes/bike racks.

Box 4: Examples of Transportation Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

· *Provide incentives for employee commuting:* "Percentage of employees who...commute to and from Occupant's facility by way of alternative transportation facilities."

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *Incentives for employee and material transport:*
"Implement an incentive-based program to minimize both the environmental impacts, and the cost associated with employee's commute to work and the transportation of materials to and products from the site."

"Provide priority parking to those employees that car pool."

"Provide readily accessible showers and bike racks for employees."

Codes

Santa Monica - Sustainable Development Policies
(http://www.ci.santa-monica.ca.us/environment/policy/construction/policies.htm#Sustainable Development)

· *Urban Runoff Pollution Control Ordinance*. This ordinance requires specific best management practices designed to keep hazardous materials and sediments out of the stormdrain system and reduce the volume of runoff from existing developments, new developments and projects under construction. The ordinance requires developers to incorporate design

elements that reduce runoff by 20% for all new development projects in Santa Monica. In addition, building contractors are required to follow certain good housekeeping rules to reduce runoff from sites under construction.

· *Water Demand Mitigation Fee*. These fee charges an amount sufficient to mitigate twice the estimated daily water consumption rate projected for the development. The collected revenues fund the City's water conservation programs.

· *Transportation-Related Development Requirements.*[25] The City's Zoning Ordinance contains standard transportation-related requirements for new developments such as off-street parking, and bicycle, carpool and vanpool requirements. For large developments within the city additional site-specific requirements are often included in the development agreements. These requirements were developed to provide parking in proportion to the needs generated by the various types of land use and to reduce traffic congestion and hazards related to the new development.

· *Plumbing Code*. The plumbing code has required low flush fixtures in all new construction and certain categories of remodels.

· *Wastewater Mitigation for Large Development Projects*. The City has been requiring developers of very large projects to install onsite wastewater treatment plants in an effort to reduce or eliminate additional flows generated by the development project to the sewer system. These requirements are negotiated with the developer on a site-specific basis and are included in the development agreement for the project.

· *Water and Wastewater Rate Structure*. The Water and Wastewater rate structure encourages the efficient use of water by altering the level of fixed and variable charges. The structure was developed following completion of a rate study by a consultant that included an extensive public input process.

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Professional Recommendations

U.S. Green Building Council
(LEED Green Building Rating System ™ Pilot Version, January 1999)

· *Transit suggestions*: "Locate building within 1/2 mile of a fixed rail station (commuter rail, light rail, or subway) or within 1/4 mile of 2 or more bus lines"

"Provide suitable means for securing bicycles for at least 5% of building occupants"

"Provide shower and changing facilities for cyclists"

· *Transportation alternative suggestions:* "Install refueling facilities for alternative-fuel vehicles that use, for example, electricity, natural gas, or methanol/ethanol. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors."

D. Emissions/Pollution

There are a number of ways to handle waste emissions issues. An effective environmental management system in individual companies and/or in the eco-industrial network as a whole can address these issues. Handling safely the movement of hazardous wastes and potentially transporting them to other EIP facilities for safe use can be addressed in a set of codes and may require regulatory shifts. Emergency management plans for the EIP for possible releases are required by federal law. While a well-run EIP should have less likelihood of these problems, systems need to be in place to address their possible deployment. Regulatory integration across federal, state and local requirements can be a significant part of EIP activities that seeks a more rational, less timely and higher protective set of requirements. Programs such as EPA's XL may provide a framework or model for seeking new regulatory approaches that provide more flexibility and cross-media coverage.

Design
1. Incorporate consideration of end waste in design and recruitment process.
2. Encourage source reduction of hazardous wastes.
3. Create separate wastestream infrastructure.

Beyond Compliance
4. Maintain or improve air quality.
5. Maintain or improve watershed quality and related water body quality.
6. Establish a goal for reducing % of waste stream going to the landfill.

7. Provide a staff person for the eco-park to prepare forms and assist with compliance and beyond compliance regulations especially for smaller businesses.
8. Consider establishing a citywide or parkwide electronic filing system for forms.
9. Determine which entity is regulated (park as a whole or tenants individually).

Reuse/Recycling of by-products

10. Reuse of materials produced or brought on site.
11. Establish a goal for recycling of the waste stream.

Box 5: Examples of Emission/Pollution Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

·*Wastewater restrictions:* "No Occupant shall discharge industrial waste water which cannot be processed by the Town waste water facility as it then exists."

"Occupant, through its process or pretreatment, discharges water to the Cape Charles treatment system exceeding the quality of the average plant intake."

· *Air pollution suggestions:* "Occupant's regulated air emissions are at least 25% less than the Occupants projected emissions using the control technology typically required for comparable facilities."

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *General emission and pollution suggestions:* "Implement a continuous improvement process to reduce toxic and hazardous materials, byproducts and wastes associated with products, activities or operations using such techniques as raw materials substitution, production process modifications, finished product reformulation, operational improvements,

training or reuse/recycling."

· *Pollution prevention strategies:*
"Identify and quantify waste streams."

"Implement pre-purchasing screens and/or purchasing specifications to achieve pollution prevention goals."

Professional Recommendations

U.S. Green Building Council
(LEED Green Building Rating System ™ Pilot Version, January 1999)

· *Hazardous material suggestions:* "Design all chemical storage and mixing areas for housekeeping products (central storage facilities and janitors closets, where appropriate) to allow for secure product storage spaces that have water in chemical concentrate mixing areas, with drains plumbed for the appropriate disposal of liquid waste, separate outside venting, and negative pressure."

E. Social/Community

Too often industrial development does not fully consider the community in which they are locating creating a gap between community and business interests. The eco-industrial development approach attempts to bridge this gap by fostering community-oriented development, or development that is good for community members, employees and employers. By bridging this gap, mutual benefits can occur. A community that feels responded to will be good for business by either supporting that business directly through the purchase of goods and services or by not needlessly protesting the actions of the corporation saving money and time. The following criteria begin to address this issue area.

Work Environment and Employment
1. Create jobs (good and living wage jobs).
2. Train minorities.
3. Provide jobs for residents.
4. Encourage employee participation in civic organizations.
5. Hire local.
6. Provide full-time jobs, benefits packages, and employee compensation exceeding average comparable compensation in the region.
7. Establish a bike fund.

8. Ensure indoor workspace quality.
9. Encourage family-friendly policies.
10. Encourage the inclusion of companies committed to addressing race and gender issues.

Environment

1. Improve aesthetics of local community through the eco-industrial park.
2. Maintain or improve local environmental health or conditions and workplace health and safety.
3. Promote beyond compliance environmental performance.
4. Improve wildlife habitat and natural environment.

Good Neighbor

1. Minimize demands on public utilities/infrastructure.
2. Minimize impacts on traffic through community.
3. Improve tax base.
4. Enhance quality of life of surrounding community.
5. Establish good neighbor agreements between industry and community groups.
6. Evaluate secondary impacts of development (e.g., higher property values) so that existing residents share in enhanced value from eco-industrial parks.
7. Create connections to community schools, internships, summer jobs, etc.
8. Local government should work to reduce housing loan interest rates so employees and community members can buy houses. Look into EPA's location efficient mortgage program.
9. Support services like daycare, drug/alcohol rehabilitation, etc.
10. Consider a community stock option.
11. Offer a payroll deduction program for local community charities through a community foundation
12. Purchase electricity in bulk and offer it to residents and park tenants at same rate.
13. Consider setting up a credit union.
14. Consider off-hours use of facilities by community. There could be reductions in security costs.
15. Provide community celebrations.
16. Review possibilities for providing infrastructure to nearby community when putting in infrastructure (e.g. fiberoptics).
17. Provide an aggregation system for wastes not already recycled by the community that serves tenants and is available for use by the community.

Participation

1. Encourage active citizen involvement and input.
2. Create a baseline of public information—companies prepare annual reports, employee right-to-know materials, and significant water uses reports available to the community.

Box 6: Example of Social/Community Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

· *General social/community suggestions:*

"Occupant engages in one or more Community Service Activities."

"Percentage of employees who are full-time employees."

"Occupant provides a complete benefits package to all full-time employees."

"Employee compensation exceeds average comparable employee compensation in (the) region."

"Percentage of employees in the Park who are residents of the Town or County."

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *Education suggestions:*

"Develop and implement educational and informational programs designed to physically and intellectually engage the community, both workers and citizens, in the mission of the Eco-Park and the environmental performance of Eco-Park organizations and to demonstrate the ecological and economic value of the Eco-Park to the community."

"Implement on-site educational programs and tours to learn about the Eco-Park, owners/tenants and associate members and its benefits."

"Incorporate education with functional and operational characteristics of the building/site such that recycling facilities, composing areas or environmental technologies are used as teaching platforms."

· *Community interaction suggestion:* "Identify an individual to act as a liaison with the community."

F. Management

All industrial parks have some form of management for the day-to-day activities of the industrial park. Management structures take many different forms. Professional management companies privately manage some, other are tenant-run, while others are managed through private/public partnerships. Eco-industrial parks have similarly diverse structures.

Industrial parks traditionally provide a means for input or decision making on the management of common elements. These include common facilities, signage, maintenance of roads, adjustments for construction obstructions, and sewage use as examples. Since Eco-Industrial parks seek broader connections and reduction in overhead through shared facilities, materials and/or energy these areas of overlap will likely be broader. In some places these can be commonly contracted services such as hazardous waste removal, trash collection. An eco-park would also look for ways to recycle waste by seeking common solutions among its participants.

In fact, management may become more crucial in eco-parks, since there is an overall goal of continuous environmental improvement, community connections and business success. Hence identifying the precise management structure is extremely important.

When looking for total resource productivity in an eco-industrial park/network organizing groups around the core drivers identified in Section 1 (page 6) makes sense.

The degree of community representation on an EIP management group is also an area with a variety of solutions. In Cape Charles there is an oversight group through the Industrial Development Authority while there is an internal

group equivalent to a tenants association of businesses in the Park. To some degree community participation is shaped by who originates the idea. If it emerges from a locality there is usually one degree of accountability compared to those that emerge from private developers. In either instance developers would be wise to provide significant community input in an ongoing way and communities should be careful not to smother the businesses with elaborate regulations.

The issue of environmental management is dealt with in the emissions/ pollution section. A sound environmental strategy at the firm and park level can address a variety of environmental media focused on continuous improvement and transparent information.

Park Level Management

1. Require the development of environmental management systems within and between firms.
2. Reward longevity of companies through rent reductions or other methods (the longer the company stays in a community, the more invested it becomes).
3. Establish standards and process of entry into an EIP.
4. Require environmentally sustainable construction materials and techniques.
5. Provide incentives for businesses for sharing of internal space. Open office space costs half as much as individual.
6. Provide tenant incentives to utilize "environmentally friendly" supplies (e.g. through a coordinated purchasing arrangement).
7. Provide pooled services (e.g. payroll).
8. Develop a more efficient procurement system (e.g. "the gatekeeper of Rutgers", who switched the waste hauling payment method from pounds to contract. The less pounds they generated, the lower the tipping fees. They held waste reduction seminars on campus and one day a week they came and picked up truckloads of empty pallets).
9. Create a system where companies that are good performers do less reporting for governmental agencies.
10. Consider rent reductions for beyond compliance tenants.
11. Ask businesses to file copies with park management of forms they are filing with agencies. This could be used for data analysis and setting up exchanges. (e.g. Significant Industrial Water Users Reports are useful because they give insight into production processes)
12. Require filing a listing of anticipated waste types and designated disposal practices to park management to assist in identifying by-product connections both within and outside the Park.
13. Make efforts at Toxic Resources Inventory (TRI) reductions.

14. Require tenants to have a documentable Environmental Management System, such as ISO 14000.

Outside Network Development

1. Commit to community input and information access and involvement.
2. Minimize transportation distance through links to local market and use of least impact transportation and warehousing practices.
3. Consider a community cooperative form of ownership
4. Consider a community based stakeholder board.
5. Consider community stock options.

Box 7: Example of Management Codes and Covenants

Covenants

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *Suggestions for creating an environmental management system:* "Develop, implement and maintain an environmental management system (EMS) appropriate to the nature, scale and ecological impacts of the organization's activities, products, or services. The EMS will include, at a minimum, an ecological policy, defined roles and responsibilities, a documented "Plan, Do, Check, Act" program and written objectives and targets consistent with the Eco-Park vision statement."

"Identify the ecological impacts of the organization's activities, products, or services that it can control and over which it can be expected to have an influence."

· *Gauging industry trends for best management practices:* "Evaluate and consider best management practices of leaders in same industrial sector."

· *Procurement suggestions:* "Consider the environmental performance of suppliers, contractors, and vendors in addition to cost, quality, dependability and other factors considered when negotiating contractual relationships."

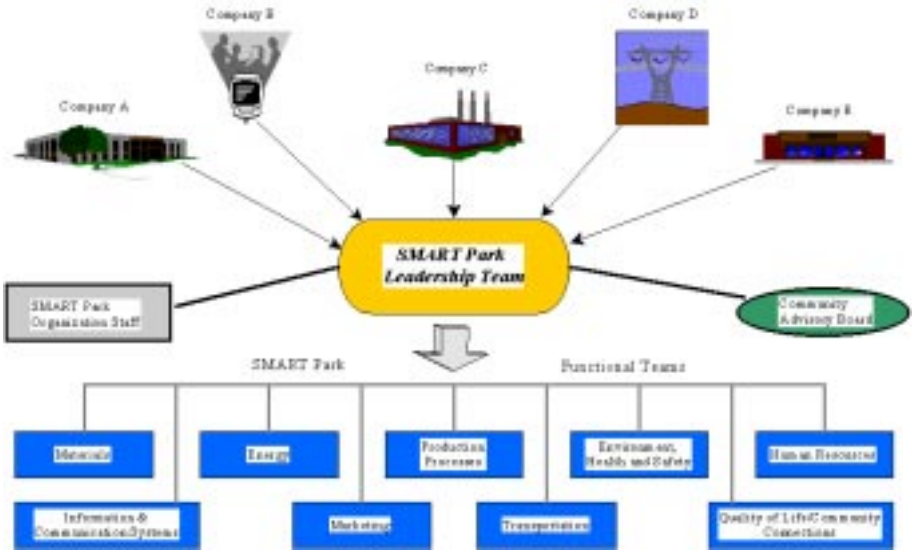
Management Case Study: Chattanooga, Tennessee

SMART Park in Chattanooga is a proposed eco-industrial park that would utilize district heating and cooling along a business corridor. A set of principles was set out in the Management Plan for the Chattanooga SMART Park.

- Participation in the SMART Park aims towards lowering overall costs of doing business, increased revenue yields, and responsible community interactions.
- Beyond minimum requirements set by the SMART Park constituents or local ordinances, participants are independent companies who create or do not create alliances in areas that make sense to them. Meeting particular needs for quality, quantity, timeliness and cost are among the parameters that will govern relationsamong all or subsets of SMART Park companies.
- The goal is to stretch each participant's practice of mutually beneficial interactions.
- Flexibility in system response is the key to adapt to changes in the environment of individual enterprises and the SMART Park as a whole.
- Consensus based action is the preferred mode of operation for the SMART Park. Aclear dispute resolution process will be developed.
- Specific performance indicators of the SMART Park will be publicly known and measured. These help inform a commitment to continuous business and environmental improvement.

In operational terms these principles could be manifested like the following suggested approach for the Smart Park in Chattanooga.

Figure 2--SMART Park Business Network



Smart Park Leadership Team

In the SMART Park project the following leadership team is proposed:

The primary responsibility for operating the Park is vested in the Leadership Team composed of senior executives from each of the companies involved. The purpose is to assure that the Park remains connected to core business concerns of the companies involved and that decision-makers are at the table to avoid lengthy delays in obtaining agreement. The value of the interconnection will produce results in direct proportion to the degree that business leaders invest themselves in the connections. The Leadership Team should have representation from the Community Advisory Group in an ex-officio capacity and they may add other ex officio members to the group based on the value they would bring.

There is a question as the degree to which tenants/participants can/should be required to participate. In most cases, the agreements for cooperation are among various subsets of tenants (or other parties) for particular shared activities and needs. These would be subject to normal contractual conditions. It is imaginable that the tenant group may want to set some standards that apply to everyone in the EIP. What is the threshold for these kinds of decisions and what proportion of the tenants are required need to be decided locally. It is recommended that maximum flexibility for tenants be retained while assuring meeting agreed upon activities at reasonable quality and cost effectiveness level. There will be times when there are different perspectives on these relationships and methods should be adopted to mediate differences by trying to make sure that exchanges are mutually satisfactory.

Community Advisory Board

A *Community Advisory Board* (CAB) that provides community input and oversight of the SMART Park will be organized to represent the interests of the local community. They would meet on a quarterly basis or more frequently as deemed necessary. They also may recommend participants for the Integration Teams discussed below.

The primary emphasis of the group should be on ways to contribute to the success of the SMART Park as an asset to the community. As such, ideas that they have that would improve the performance of the Park should receive serious attention. The CAB serves as a bridge to the local community in order to facilitate communication with and involvement in the local community. The SMART Park should serve to enhance the local community by increasing access to services and providing job opportunities. The CAB also has an important role in assuring environmental excellence. They need to be involved in emergency management issues, traffic planning and overall review and feedback on environmental plans and performance. They should have access to all information necessary to carry out that role and an ability to tour the facilities.

— Work and Environment Initiative, *Chattanooga SMART Park Development Project: Organizational, Managerial, and Community Issues for a SMART Park Eco-Industrial Network and SMART Park CMERF,* July 1998.

G. Monitoring/Reporting Performance

Developing methods to measure the success of an eco-industrial park at contributing sustainably to a community is a critical effort of an eco-park. Traditional monitoring and reporting techniques often do not measure success at sustainability, instead they measure bottom line gains exclusively or minimum compliance with regulations. Developing sustainability indicators has received growing national attention. These indicators might include creating livable communities, health benefits, and increasing jobs. But how do communities quantify the value of livable communities, trees, grass, reduced air emissions, etc.? How do communities quantify the costs of the burden a traditional development would place on infrastructure?

The Center of Excellence for Sustainable Development defines a sustainable indicator as[26]:

> The well-being of a community or nation can be measured in many ways. Traditional measurements often analyze a single issue by itself, such as the number of new jobs in a particular community. But such an approach is one-dimensional, and does not reveal the quality of those jobs or their impact on the local economy.
>
> New measurements called "Indicators of Sustainability" are designed to provide information for understanding and enhancing the relationships between the economic, energy use, environmental, and social elements inherent in long-term sustainability.
>
> The following table shows a comparison between traditional indicators and sustainable indicators.

26 U.S. Department of Energy (2)

Traditional vs. Sustainable Indicators[27]

Traditional Indicators	Sustainable Indicators	Emphasis of Sustainable Indicators
Economic Indicators		
· Median income · Per capita income relative to U.S. average	· Number of hours of paid employment at the average wage required to support basic needs	· What wage can buy · Need to define basic needs in terms of sustainable consumption
Environmental Indicators		
· Ambient levels of pollution in air and water, generally measured in parts per million of specific pollutants	· Biodiversity · Number of individuals of key species, such as salmon in a stream or birds in a given area	· Ability of the ecosystem to process and assimilate pollutants
Social Indicators		
· SAT and other standardized test scores	· Number of students trained for jobs that are available in the local economy · Number of students who go to college and come back to the community	· Matching job skills and training to needs of the local economy

Londonderry has set up under a congestion mitigation air quality grant a program wherein the extra trips the power plant is taking off the road are traded for fossil fuel emissions. This gives Londonderry a local source pollution reduction method. Cape Charles gives incentives for bike trips, but is not quantifying CO^2 emissions.

Data Collection/ Reporting Requirements

1. Establish reporting requirements for sustainable indicators.
2. Consider electronic filing.
3. Consider public access and participation in data collection and monitoring.
4. Develop multi-media reporting to determine overall impact.
5. Develop integration of monitoring/reporting across various levels of government and across various agencies.
6. Establish goal setting for continuous improvement.
7. Consider monitoring technologies.
8. Create enforcement procedure.

27 Hart, 1999.

Encourage Beyond Compliance

1. Establish performance review criteria.
2. Establish management incentives for beyond compliance.
3. Establish beyond compliance inspection recommendations.
4. Begin to develop a set of basic indicators—those are the numbers needed to support these projects politically.
5. Develop measurement for productivity. Are these strategies producing a bottom-line improvement? (Sick leave is one of the things the Green Institute is considering)
6. Develop a measurement for the percent of services or goods that are used in local economy.
7. Provide a green inspector linked to the local municipality (e.g., Is water being treated as you said it would be?)
8. Consider an outside audit in addition to a community inspector.

Box 8: Example of Monitoring/Reporting Performance Codes and Covenants

Covenants

Cape Charles Sustainable Technologies Park
(Schedule D-2 of the Cape Charles Covenants and Restrictions)

· *Air Monitoring suggestions*: "Occupant has installed a permanent air monitoring system with the capability to monitor supply and return air for carbon monoxide, carbon dioxide, total volatile organic compounds and particulates."

Londonderry, New Hampshire
(The Ecological Guidelines and Recommended Practices for Londonderry Eco-Industrial Park)

· *Annual reporting suggestions:* "Provide annually to the Eco-Park Governing Board an environmental performance summary including, but not limited to, performance against Park objectives and targets, performance against organizational objectives and targets, regulatory compliance and Environmental Management System review data and a self-certification statement, signed by the CEO or President, attesting to

the accuracy and truthfulness of the report."

· *Provide peer company information:* "Provide information comparing environmental performance to those of peer companies and leading international management practices."

· *Environmental auditing suggestions:* "Conduct Environment Management System audits consistent with professional environmental management system auditing."

· *Public availability suggestion:* "Make publicly available the organization's environmental performance report."

Professional Recommendations

U.S. Green Building Council
(LEED Green Building Rating System ™ Pilot Version, January 1999)

· *Air monitoring suggestion:* "Install a permanent air monitoring system. The systems should have the capability to monitor supply and return air, and ambient air at the fresh air intake, for carbon monoxide (CO), carbon dioxide (CO2), total volatile organic compounds (TVOCs), and particulates (including PM10)."

SECTION VI SUMMARY

Eco-industrial parks are a promising type of alternative economic development. Business and community do not have to be in conflict, they can flourish together. Both have a stake in directing economic growth in a sustainable manner. Businesses benefit from an invested, satisfied and interested labor force and supportive community. The community benefits from having good jobs and a healthy economy. Both have a role in ensuring sustainable economic development through the development of codes and CC&Rs.

This Handbook provides guidelines and identifies particular issues that other communities have discussed while considering how to develop an eco-industrial park in their communities. Each community and developer and site is different and should not be expected to fit into a "cookie cutter" mold of an eco-industrial park. Since eco-industrial park development is really about connections between businesses, community, organizations, and government each should manifest itself in different ways.

This form of development can only be successful when a community (both citizen and business) have come to consensus on an agenda for the type of development that they are committed to. There are movements throughout the country that reflect variations of sustainability from SMART Growth, New Urbanism, Transit-Oriented Development, and Healthy Communities. Often, the codes and CC&Rs do not reflect the stated goals of a community. As a result individuals and communities that try to meet those stated goals often have to go through elaborate processes to "get around" existing codes and CC&Rs, while others are allowed by "right" to continue to do development that does not respond to the goals and vision of a community. For communities serious about doing a different type of development, revising their codes and developing CC&Rs that respond to vision and stated goals is essential to promoting this type of development.

One of the primary goals of eco-industrial development is continuous environmental improvement. As such, the codes and covenants should be flexible enough to adapt to changes in the connections that are formed. This flexibility should fall under an established review process ensuring input by ALL stakeholders.

By creating new codes, communities take responsibility for fostering an economic development climate in their communities that draws sustainable industry practices. By creating eco-industrial CC&Rs, developers ensure long-term the character of the industrial development in a particular industrial park. Both are essential for effective, long-lasting eco-industrial development.

APPENDIX A REFERENCES

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APPENDIX B RESOURCES FOR ECO-INDUSTRIAL DEVELOPMENT

Books, Journals, Papers

This list includes a number of books, journals, and papers on sustainable codes and CC&Rs, design guidelines:

Smart Development Code Handbook and Appendix. Presents common obstacles to smart development, as well as provides guidance to communities in determining whether their local codes and standards encourage, support, or impede smart development.

1996 Municipal Development Plan, City of Burlington, Vermont—presents a vision for sustainable land use and development over the next ten to twenty year period in Burlington. Aims to prepare the city for sustainable development, provide a reliable basis for public and private investment, and will guide the city into the twenty-first century.

"Smart Growth" and Neighborhood Conservation, Maryland Senate Bill 389
Establishes priority funding areas in the State so as to preserve existing neighborhoods and agricultural, natural, and rural resources; prohibits State agencies from approving specified projects that are not in priority funding areas; provides for specified exceptions; establishes a certification process for the designation of eligible priority funding areas; requires municipal corporations to adopt specified development standards and assist counties in the collection of fees to finance specified school construction; etc.

The Growing SmartSM Legislative Guidebook: Model Statutes for Planning and the Management of Change, Phase I Interim Edition (PDF format). Provides model statutes for smart growth planning.

Statewide Planning Goals and Guidelines—State of Oregon; 1996
Presents 19 planning goals expressing state policies on land use and related topics along with suggestions on how to apply goals.

Cityshape 2020—Scottsale, Arizona; 1995
Presents sustainable guiding principles, prepared in a citizen-driven process, for land use decisions in Scottsdale.

Ahwahnee Principles—Sacramento, California; 1991
Offers a set of sustainable community planning principles.

Minnesota's Community-Based Planning Act — 1997 (PDF format)
Legislation building on the state's sustainable development statutes. The Act

sets 11 goals for community-based planning, creates an advisory council to refine program details, and funds pilot projects.

Web Resources

Eco-Industrial Development

The SMART Growth Network. This provides a guide to financial resources for Eco-Industrial Parks. (http://www.smartgrowth.org/)

Proceedings of the President's Council on Sustainable Development Eco-Industrial Park Workshop (February 17-18, 1996). Includes profiles of current eco-industrial park projects, critical issues, and resources. (www.whitehouse.gov/PCSD/Publications/Eco_Workshop.html#ack)

Environmental Management of Industrial Estates. This site lists upcoming workshops, references, and "eight actions to improve environmental performance of your industrial estate." (www.unepie.org/ipman/estates.html)

Eco-Industrial Parks Offer Sustainable Base Redevelopment. Suzanne G. Spohn presents four SMART GROWTH case studies (Plattsburgh NY, Chattanooga TN, Oakland CA, and Alameda CA). These four communities, all impacted by defense conversion, are evaluating a new option for sustainable re-development— the eco-industrial park. (www.smartgrowth.org/casestudies/spohn_icma.html)

Work and Environment Initiative. This webpage offers links to most eco-industrial development occurring in the United States and provides links to resources about eco-industrial development. (www.cfe.cornell.edu/WEI/)

Eco-Industrial Park Developments

Burnside Industrial Park is located in Dartmouth, Nova Scotia. The Park contains over 1,200 businesses, representing a wide range of industry sectors, and has a working population of over 18,000 employees. (www.mgmt.dal.ca/sres/eco-burnside/index.htm)

The Cabazon Resource Recovery Park, developed by the Cabazon Band of Mission Indians, has the promise of becoming a national leader and national center for eco-industrial development. (www.cabazonindians.com/recoverypark.html)

Cape Charles. The United States' first fully leased eco-industrial park. For additional information, see a Department of Energy case study of Cape Charles.

Chattanooga's SMART PARK Eco-Industrial Initiative. For more information, see the Chattanooga Institute's web site. (www.csc2.org/page14.html)

Civano. A planned community outside of Tucson, AZ with mixed residential and business planned. Strong focus on energy conservation and residential friendly development. (www.civano.com/)

Eco-Industrial Park in the East San Francisco Bay, California involves a group or network of businesses working together to cooperatively manage their key resources and by-products, including energy, water, and raw materials. (www.edab.org/ecopark.html)

The Green Institute. A non-profit economic development and education organization that creates sustainable, community-based models. (www.greeninstitute.org/)

Kalundborg, Denmark. For the past 25 years some of Kalundborg´s largest companies and the five cooperating municipalities of the Kalundborg Region have developed a new and revolutionary concept for industrial growth on environmental terms : The Industrial Symbiosis. (www.symbiosis.dk/)

The Triangle J Council of Governments Industrial Ecosystem Development Project will provide information to business and institutions in the Triangle region of North Carolina by designing and implementing a mechanism to identify complementary inputs and outputs of neighboring enterprises. (www.tjcog.dst.nc.us/TJCOG/indeco.htm)

Industrial Ecology

Connecting Business and the Environment, Seminars in Industrial Ecology (1997-1998) presented by Cornell University's Johnson Graduate School of Management, and The Center for the Environment, Work and Environment Initiative. (www.people.cornell.edu/pages/akm3/industrial.html)

Indigo is a consulting firm on industrial ecology with links to other industrial ecology sites and a manual on eco-industrial parks. (www.indigodev.com/index.html#parks)

Linking Industrial Ecology to Public Policy. A site devoted to improving the policy relevance of industrial ecology. (www.policy.rutgers.edu/projects/ie.htm)

Developing Environmental Indicators. A site prepared by the WRI Material Flows project to stimulate discussion on key issues in developing materials flow indicators and how they might be used in EPA policy-making. (www.wri.org/wri/sdis/indictrs/)

The Industrial Ecology Universe. A site created by the AT&T Environment, Health and Safety (EH&S) Organization. The site includes an introduction to industrial ecology, articles, other links, and updates on the field of industrial ecology. (www.att.com/ehs/brad/)

The Interagency Workgroup on Materials and Energy Flows, established as a result of the work of the President's Council on Sustainable Development (PSCD), provides a forum for collaboration between agencies of the federal government on information about the materials and energy used in the United States. (www.oit.doe.gov/mattec/img.htm)

"Planet Neighborhood", a multimedia project produced WETA-TV in Washington, DC, examines the way people across the nation are using down-to-earth concepts and innovative technologies in their quest to preserve the environment. (www.pbs.org/weta/planet/)

The Eco-indicator 95, developed by PRe Product Ecology Consultants, is a tool for designers to measure the environmental impact of a material, or process. An Eco-indicator is a value that expresses the total environmental load of a material or process in a single figure. (www.pre.nl/eco-ind.html)

Environmental Management of Industrial Estates. Featured topic of the United Nations Environment Programme Industry and Environment Quarterly Review (Vol. 19 No. 4). (www.unepie.org/publi/ieqr/ieqr194.html#contents)

Industrial Ecology: An Introduction, by Andy Garner and Gegory A. Keoleian, published in the National Pollution Prevention Center for Higher Education's Pollution Prevention and Industrial Ecology Journal. (www.umich.edu/~nppcpub/resources/compendia/INDEpdfs/INDEintro.pdf)

Journal of Industrial Ecology is an international, multi-disciplinary quarterly designed to foster both understanding and practice in the emerging field of industrial ecology. (mitpress.mit.edu/journal-home.tcl?issn=10881980)

The International Human Dimensions Programme on Industrial Transformation (IHDP-IT) is a new way of organizing research, which aims at understanding the societal mechanisms and human driving forces that could facilitate a transformation of the industrial system towards sustainability. (ohrid.cca.vu.nl/english/o_o/instituten/IVM/projects/research/ihdp-it/fb_index.html)

APPENDIX C: SANTA MONICA SUSTAINABLE CITY PROGRAM GUIDING PRINCIPLES

The Concept of Sustainability Guides City Policy

Santa Monica is committed to meeting its existing needs without compromising the ability of future generations to meet their own needs. The long-term impacts of policy choices will be considered to ensure a sustainable legacy.

Protection, Preservation, and Restoration of the Natural Environment is a High Priority of the City Santa Monica is committed to protecting, preserving and restoring the natural environment. City decision-making will be guided by a mandate to maximize environmental benefits and reduce or eliminate negative environmental impacts.

Environmental Quality and Economic Health are Mutually Dependent
A healthy environment is integral to the long-term economic interests of the City. In achieving a healthy environment, we must ensure that inequitable burdens are not placed on any one geographic or socioeconomic sector of the population.

All Decisions Have Environmental Implications
The City will ensure that each of its policy decisions and programs are interconnected through the common bond of sustainability as expressed in these guiding principles. The policy and decision-making processes of the City will reflect our environmental objectives.

Community Awareness, Responsibility, Involvement and Education are Key Elements of Successful Programs/Policies
Individual citizens, community-based groups and businesses must be aware of their impacts on the environment, must take responsibility for reducing or eliminating those impacts, and must take an active part in community efforts to address environmental concerns. The City will therefore be a leader in the creation and sponsorship of environmental education opportunities in cooperation with schools, colleges and other organizations in the community.

Santa Monica Recognizes Its Linkage with the Regional, National, and Global Community
Local environmental problems and ameliorative actions cannot be separated from their broader context. This relationship between local issues and regional, national and global issues will be recognized and acted upon in the City's programs and policies. The City's environmental programs and policies should therefore be developed as models, which can be emulated by other communities. The City must also act as a strong advocate for the

development and implementation of model programs and innovative approaches by state and federal government which embody the goals of sustainability.

Those Environmental Issues Most Important to the Community Should be Addressed First, and the Most Cost-Effective Programs and Policies Should be Selected

The financial and human resources which are available to the City are limited. The City and the community should reevaluate its environmental priorities and implemented programs and policies annually to ensure that the best possible investments in the future are being made. The evaluation of a program's cost-effectiveness should be based on a complete analysis of the associated costs and benefits, including environmental and social costs and benefits.

The City is Committed to Procurement Decisions which Minimize Negative Environmental and Social Impacts

The procurement of products and services by the City results in environmental and social impacts both in this country and in other areas of the world. The City must develop and abide by an environmentally and socially responsible procurement policy which emphasizes long-term values and will become a model for other public as well as private organizations. The adopted procurement policy will be applicable to City programs and services in all areas.

Last Updated August 1997. For more information, contact the Environmental Programs Division. (source: http://pen.ci.santa-monica.ca.us/environment/policy/guiding2.html)

APPENDIX D: EXAMPLES OF EXISTING COVENANTS FOR INDUSTRIAL PARKS

The following examples of existing covenants were taken from the Urban Land Institute's Covenants and Zoning for Research/Business Parks.

Recitals, Declaration of Intent, Statement of Purpose

This section can vary in length and detail. Often there is at least a paragraph clearly identifying the agreement between the developer and the occupant like the one that follows.

> This DECLARATION, made this 2nd day of January, 1879, by ARVIDA CORPORATION (the "Developer"), a Delaware corporation, which declares that the real property hereinafter described, which is owned by Developer (hereinafter referred to a "Arvida Park of Commerce") is and shall be held, transferred, sold, conveyed, and occupied subject to the covenants, restrictions, easements, charges, and liens (sometimes hereinafter referred as "Covenants and Restrictions") hereinafter set forth. The purpose of these Covenants and Restrictions is to establish uniform standards of development quality for the light industrial, research, and office park known as Arvida Park of Commerce.
>
> *—Arvida Park of Commerce, Boca Raton, Florida, "Declaration of Covenants and Restrictions," p. 1*

This section can be much longer and incorporate a more formal legalese. This section can also include a statement of purpose that identifies the goals and objectives of the industrial park.

> **Purpose of Covenants.** The purpose of these Conditions, Standards, and Covenants is to ensure proper development and use of the Property, to protect the investment of the Owner of each parcel against such improper development and use of surrounding parcels as will depreciate the value of his parcel, to prevent the erection on the Property of structures built of improper design or materials, to encourage the erection of attractive improvements at appropriate locations, to prevent haphazard and inharmonious improvements, to secure and maintain proper setbacks from streets and adequate free spaces between structures, and, in general, to provide adequately for a high-type and quality of improvement of the Park Property in accordance with a general master plan.
>
> *—Northland Park, Minneapolis, Minnesota, "Declaration of Protective Covenants," p.1*

Legal Description

The Legal Description is used to provide a detailed legal description of the property itself. It can also include a map of the property.

> **Legal Description.** The real property that is and shall be held, transferred, sold, conveyed, and occupied subject to this Declaration is located in the City of Boca Raton, Palm Beach County, Florida, and comprises all the parcels, platted or unplatted, within or upon the property legally described as:
>
> The north 1,540 feet of the following described real property:
>
> A parcel of land lying in Section 6, Township 47 South, Range 43 East, Palm Beach County, Florida, being more particularly described as follows:
>
> From the Northwest Corner of Section 6, Township 47 South, Range 43 East, Palm Beach County, Florida, run S89º28' 45"E, 990.00 feet to the Point of Beginning; thence S00º29'15"W, 1,070.02 feet, along the Easterly Right-of-Way line of Congress Avenue to a point; thence N89º28'45"W, 990.00 feet; thence S00º30'15"W, 1,723.09 feet to a point 15 feet south of the Northerly Right-of-Way line of the L.W.D.D. Canal Lat. No. 41; thence N89º05'10"W, 996.92 feet; thence S00º30'12"W, 1,994.23 feet; thence S88º28'47"E, 998.12 feet; thence N00º35'28"E, 515.97 feet; thence S89º24'32"E, 440.00 feet; thence S00º35'28"W, 520.00 feet; thence N89º24'32"E, 550.00 feet to a point on the Easterly Right-of-Way line of Congress Avenue; thence N00º35'28"E, 265.35 feet along the Easterly Right-of Way line of Congress Avenue to a point; thence S89º36'26"E, 506.60; thence S00º35"28"W, 430.00 feet; thence N89º36'26"W, 506.60 feet to a point on the Easterly Right-of Way line of Congress Avenue; thence S00º35'28"W, 540.00 feet along the Easterly Right-of-Way line of Congress Avenue to a point on the Northerly Right-of-Way line of N.W. 51st Street; thence S89º36'17"E, 259.47 feet along the Northerly Right-of-Way line of N.W. 51st Street to a point of curve; the arc of a curve concave to the right (said curve has a central angle of 05º14'42" and a radius of 2,814.79 feet) a distance of 257.67 feet to the Point of Curvature of a curve concave to the right (said curve has a central angle of 05º05'18" and a radius of 2,813.56 feet) a distance of 249.87 feet to the Point of Tangency; thence N79º25'29"E, 206.68 feet; thence N82º32'06"E, 74.02 feet; thence N00º30'45"W, 4,816.21 feet

to a point on the Southerly Right-of-Way line of Clint Moore Road; thence S00º51'45"W, 595.01 feet; thence S89º28'45"E, 958.91 feet to the POINT OF BEGINNING; lying east of the Easterly Right-of-Way line of Congress Avenue and west of the Westerly Right-of-Way line of the Lake Worth Drainage District E-4 Canal.

Said land situate, lying, and being in Palm Beach County, Florida, and being subject to easements and Rights-of-Way of record.

—Arvida Park of Commerce, Boca Raton, Florida, "Declaration of Covenants and Restrictions" (§1), p.2

Definitions

The Definitions are a list of definitions of important words or phrases used in the CC&Rs. A few examples of definitions are provided below.

Definitions. The following words, when used in this Declaration (unless the context shall prohibit), shall have the following meanings:

A."Association" shall mean and refer to Arvida Park of Commerce Association, Inc., a Florida corporation not for profit. This is the Declaration of Covenants and Restrictions to which the Articles of Incorporation (the "Articles") and Bylaws (the "Bylaws") of the Association make reference. Copies of the Articles and Bylaws are attached hereto and made a part hereof as Exhibits A and B, respectively.

B. "Developer" shall mean and refer to Arvida Corporation, a Delaware corporation, or its successors or assigns if any such successor or assign acquires any undeveloped portion of Arvida Park of Commerce from the Developer for the purpose of development and is designated as such by Arvida Corporation.

C. "Arvida park of Commerce" or "Property" shall mean and refer to all such existing properties and additions thereto as are subject to this Declaration, or any supplemental Declaration under the provisions of Article II and initially shall include the real property described in said Article II, Section 1.

—Arvida Park of Commerce, Boca Raton, Boca Raton, florida, "Declaration of Covenants and Restrictions," pp.1-2

Management Associations

If the developer intends on selling all or part of the sites to the occupants, they will usually establish a management association to oversee the operation of the park. These associations are usually made up of property owners and a board of directors. They manage the common property and serve as the mediator and overseers of actions within the park. The CC&Rs usually define the mechanism to develop the association and to transfer the management from the developers to the members.

Article 9. Association Membership and Voting.

9.1 Upon acceptance of a Deed to a Lot, each Owner shall automatically become a Member of the Association and shall be a Member for so long as he shall hold legal title to his Lot, subject to all provisions of these Covenants, the Articles of Incorporation, and the Bylaws (including paragraph 2.(b) hereof) and Rules and Regulations…now or hereafter…established for or by the Association. The Declarant shall be a Member of the Association with respect to all Lots owned by it, which Membership shall commence upon the recording of these Covenants.

9.2 Members in the Association will have the right to vote on Association matters in accordance with the provisions set forth in the Bylaws.

—Giralda Farms, Morris County, New Jersey, "Declaration of Covenants, Conditions, and Restrictions," p. 13

Association's Responsibilities.

Section 2. Duty of the Association. In addition to the powers and authority granted to it by its Articles of Incorporation or this Declaration, and without limiting the generality thereof, the Association shall have the duty to operate, maintain, or otherwise manage or provide for the operation, maintenance, or management of the Common Landscaped Areas and the Common Landscape Facilities. Such responsibilities shall include, but not be limited to, mowing, pruning, fertilizing, preservation, and replacement of the landscaping and the upkeep and maintenance of sprinklers, irrigation mains and laterals, sprinkler heads, equipment, water pumps, signs, lighting, planting boxes, and other landscape amenities and improvements, comprising or located on the Common Landscape Facilities and

Common Landscaped Areas.

— Valwood Park, Farmers Branch, Texas, "Declaration of Covenatns, Restrictions, and Development Standards," §5, pp.8-9

Maintenance Assessments

Fees are typically assessed on each owner or occupant of the park to provide funds for the maintenance of the common areas of an industrial park.

V. Covenants for Maintenance Assessments. Section 1. Creation of the Lien and Personal Obligation of Assessments. The Developer, for each Lot owned by it within Arvida Park of Commerce, hereby covenants, and each Owner of any Lot (by acceptance of a deed therefor, whether or not it shall be so expressed in any such deed or other conveyance), including any purchaser at a judicial sale, shall hereafter be deemed to covenant and agree to pay to the Association any annual assessments or charges, and any special assessments for capital improvements or major repair; such assessments to be fixed, established, and collected from time to time as hereinafter provided. All such assessments, together with interest thereon from the due date at the rate of ten percent (10%) per annum and costs of collection thereof (including reasonable attorney's fees), shall be a charge on the Lot and shall be a continuing lien upon the Lot(s) against which each such assessment is made, and shall also be the personal obligation of the Owner. No Owner of a Lot may waive or otherwise escape liability for the assessments provide for herein by nonuse of the Common area or by abandonment.

—Arvida Park of Commerce, Boca Raton, Florida, "Declaration of Covenants and Restrictions," §5, p.4

Permitted and/or Prohibited Land Uses

Usually CC&Rs do not specify land uses within the park deferring to the local land use plans and zoning ordinances. Those that do identify land uses will usually list research and manufacturing uses.

A. The only uses allowed within Block 5, Block 8, and Block 10 of the Park Property shall be as follows:

1. Office/showroom.
2. Restricted light industrial uses.
3. Sale at wholesale warehousing, or storage, except that the outdoor storage of any commodity is expressly forbidden. Mini storage warehouses or garages are not permitted uses.
4. Sale at retail of the following:
   a) Hardware.
   b) Any commodity manufactured, processed, fabricated, or warehoused only on the premises, not including large construction and industrial equipment.
   c) Equipment, supplies, and materials (except commercial explosives). Not more than twenty (20) percent of the floor area may be devoted to retail operations.
5. Governmental and public facilities.
6. Laboratory.
7. Office.
8. Clubs, lodges, and fraternal organizations.
9. Repair, rental, and servicing of any commodity for which the manufacture, processing, fabrication, warehousing, or sale is permitted in this area. Must be conducted within a completely enclosed building.

B. The uses permitted in the remaining portions of the Park Property shall be those uses allowed by the applicable sections of the Aurora Zoning Code.

C. It is intent of this Declaration that Building Sites be used for high-quality rail-served and non-rail-served commercial, office, and industrial puposes. This intent shall not, however, prevent the Grantor from constructing, owning, operation, leasing, or conveying real property for support or service facilities consistent with the purposes of this Declaration.

— Upland Park II, Aurora Colorado, "Covenants and Landscape Design Guidelines," §4, pp. 6-7

Nuisance Restrictions

Most CC&Rs contain restrictions on nuisances, such as noise, odor, vibration, smoke, gases, wastes, animals, livestock, and dust.

6.. No uses shall be made of the premises except such light

manufacturing, processing, storage, light fabrication, packaging, assembly, wholesale warehouse, office laboratory, professional, and research and development uses (and minor service and retail uses for accommodation of those employed therein) as are not offensive to the neighborhood by reason of odor, fumes, dust, smoke, noise, or pollution, nor hazardous by reason of danger of fire or explosion.

— Westborough Business Park, Westborough, Massachusetts, "Protective Covenants," p.2

Design Guidelines

CC&Rs often include design guidelines to provide a standard for the current and future site and building development within the park. These guidelines can include specific requirements for building material, signage, type of lighting, site layout, use of landscape, building height, and lot setbacks.

> The architectural character of each building and/or structure shall be of contemporary design and style. No commercial statements of the occupants' products or services shall be allowed as a part of the building façade or elevation. Design of buildings will be evaluated in terms of professional standards and in regard to the sensitive integration of form, textures, and colors with the particular landscape and topographical character of each site.
>
> The exterior walls of each building are to be constructed of durable, permanent architectural materials…compatible with campuslike standards. Buildings proposed to be fabricated of or to predominately utilize metal siding generally will be disapproved.
>
> Building roofs are to be uncluttered, and when flat roof surfaces are visible from roads and adjacent areas, pitched roofs should be utilized.
>
> Cooling towers, rooftop and ground-mounted mechanical units, and ventilating fans are to either be integrated into the design of the structure or screened from view.
>
> *—University of Wisconsin Research Park, Madison, Wisconsin, "Declaration of Covenants, Conditions, and Restrictions (Draft)," p. 7*

Exterior Appearance. The architectural character of each proposed building or structure shall be contemporary, rather than traditional, in style; eclectic styles, such as gothic or colonial, will not be permitted. Architectural designs will be evaluated in terms of the sensitive integration of form, textures, and colors with the particular landscape and topographical character of each site.

Lighting. Well-designed soft lighting of the building exterior will be permitted, provided that the light source is not visible and that it complements the architecture. The lighting should not draw inordinate attention to the building.

Signs. One identification sign will be erected at the entrance to each parcel in an area to be designated by the Design Review Committee. The design, format, and materials of the sign will be consistent with the site architecture in the development. No flashing or moving elements will be permitted. All necessary details will be provided by the Committee prior to final approval of tenants' plans.

Preservation of Existing Major Trees. A premium will be placed on the preservation of the natural tree cover and other unique characteristics of the landscape in order to:

1. Maintain a sense of natural amenity, which will distinguish the property as a unique and attractive setting for business and research.
2. Take advantage of the natural subdivision of the total property into precincts or 'exterior rooms' created by the juxtaposition of windows and wooded areas with open fields.
3. Preserve the intrinsic environmental values and continuity of mature, native tree cover as a wildlife habitat and as protection against erosion and contamination by runoff to streams on the site.

—Princeton Forrestal Center, Princeton, New Jersey, "Design and Development Criteria," pp.7-13

Design or Architectural Review

One of the purposes of an industrial park setting is an environment that is aesthetically and socially pleasing. Most CC&Rs provide a mechanism for design review of all proposed development within the park property boundaries. Often a review board is established.

Designation of Committee. The Association shall have an Architectural Control Committee, which shall consist of three (3) members, who shall be natural persons, and who shall be appointed by the Board of Directors of the Association. Until December 31, 19__, the appointment of the members of the Architectural C ontrol Committee must be approved by Declarant, and any and all members of such committee may be removed by the Board of Directors and /or the Declarant without cause. After such date, the Board of Directors shall have the exclusive right and power at any time and from time to time to create and fill vacancies on the Architectural Control Committee.

Function of Architectural Control Committee. No improvement, as that term is hereinafter defined, shall be erected, constructed, placed, or altered (by addition or deletion), maintained, or permitted to remain on any portion of The Properties until plans and specifications, in such form and detail as the Architectural Control Committee may deem necessary, shall have been submitted to and approved in writing by such committee. The Architectural Control Committee shall have the power to employ professional consultants to assist it in discharging its duties. The decision of the Architectural Control Committee shall be final, conclusive, and binding upon the applicant.

—University Office Park, Richardson, Texas, "Declaration of Covenants and Restrictions," §4, pp.6-7

General Provisions

The general provisions usually mention the timeframe of the CC&Rs, rules for enforcement, and miscellaneous legal statements.

Miscellaneous Provisions.

Section 1. Duration. This Declaration and the covenants, restrictions, charges, and liens set out herein shall run with and bind the land, and shall inure to the benefit of and be enforceable by the Association, and every owner of any part of The Properties, including Declarant, and their respective legal representatives, heirs, successors, and assigns, for a term beginning on the date this Declaration is recorded, and continuing through and including December 31, 20__, after which time said covenants shall be automatically extended for successive periods of five (5) years unless a change (the word

"change" including additions, deletions, or modifications thereto, in whole or in part) is approved by a majority of the total eligible votes of the membership of the association as defined in Article II hereof, voting in person or by proxy at a meeting duly called for such purpose, written notice of which shall be given to all members at least thirty 930) days in advance and shall set forth the purpose of such meeting; PROVIDED, HOWEVER, that no such change shall be effective until one (1) year following the vote referred to above, nor shall any such change be effective prior to the recording of a certified copy of such resolution in the Deed Records of Dallas County, Texas.

Section 2. Amendment. Article V and VI of this Declaration may be amended or terminated at any time by sixty percent (60%) of the total eligible votes of the membership of the Association as defined in Article II hereof, with both classes of the membership voting together. All other Articles may be amended or terminated prior to January 1, 19__ , by sixty percent (60%) of the total eligible votes of each class of voting members voting separately. Thereafter, all Articles may be amended or terminated at any time by sixty percent (60%) of the total eligible votes of the membership voting together. Members may vote in person or by proxy at a meeting duly called for such purpose, written notice of which shall be given to all members at least thirty (30) days in advance and shall set forth the purpose of such meeting, provided that Declarant must consent thereto if such amendment or termination is to be effective prior to December 31, 19__. Any such amendment or termination shall become effective when an instrument is filed for record in the Deed Records of Dallas County, Texas, with the signatures of the requisite number of the owners of The Properties (and the signature of Declarant if prior to December 31, 19__).

—University Office Park, Richardson, Texas, "Declaration of Covenants and Restrictions," p.10