

Rodino Associates

Urban Revitalization and Real Estate Services

**PROJECT TO DEVELOP INTEGRATED
ECONOMIC DEVELOPMENT AND COMMUNITY REDEVELOPMENT
STRATEGIES THROUGH INDUSTRY CLUSTERS**

TASK IV REPORT

**RECOMMENDATIONS AND IMPLEMENTATION
for
THE DEVELOPMENT of an ENVIRONMENTAL TECHNOLOGY INDUSTRY
BASED ECO-INDUSTRIAL PARK in LOS ANGELES**

**Prepared by:
RODINO ASSOCIATES**

**Submitted to:
THE COMMUNITY REDEVELOPMENT AGENCY
OF THE CITY OF LOS ANGELES**

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EXECUTIVE SUMMARY

The core redevelopment recommendations of this study are for the CRA, the Mayor's Business Team, and several key agencies and departments of the City of Los Angeles, to work together toward the following goals:

1. Upgrade the two industrial areas to the east of downtown Los Angeles, on the east and west sides of the Los Angeles River. The area on the west is bounded by Alameda Street, the 10 Freeway, the river, and 4th Street. The area on the east is bounded by the river and the semi-circle formed by the 10 and the 101 Freeways. The area on the east is in the Adleante-Easide Redevelopment area, and the westside is mostly in the proposed Central Industrial Redevelopment Project area.
2. Move toward incorporating eco-industrial principles into both areas through the work of environmental technology firms. The ETI firms can then inhabit the areas as a testimony to the success of their work.
3. Recruit environmental technology firms to locate within both areas, and promote the areas and Los Angeles as a major environmental technology center.

This focus on the two existing industrial areas east of downtown is somewhat of a modification of the findings described in the Task II and III report, and is based on information collected after that report was completed.

The overall purpose of this study has been conducted to demonstrate how economic development and redevelopment strategies may be integrated through a focus on industry clusters. The industry cluster selected is the environmental technology industry.

Three ways are advanced in the study to integrate economic development and redevelopment strategies. The first is simply to coordinate both economic and redevelopment efforts and implement appropriate policies roughly simultaneously. The process followed in preparing this study in itself has had an integrating effect by establishing and enriching the dialog between the CRA, the Business Team, the DWP, Environmental Affairs, Public Works, etc.

The second way is to foster the mutual impact that economic development and redevelopment strategies have on each other. The more effective are economic strategies the more businesses grow and the more space they need, arguing for the intervention of redevelopment at some point in time and geography. However the integration process is more powerful in the reverse direction. To the extent that redevelopment strategies can have an impact on the location and geographic distribution of businesses, and how their locations are designed, redevelopment can encourage or discourage economic growth. The proximate location of firms in the same or related industries conveys multiple benefits to firms in the geographic and industry cluster. Firms in these geographic clusters share a number of benefits that include high visibility and recognition by customers, investors and employees, easy networking for technical and market information exchange, greater potential for partnering, joint-venturing and subcontracting, more economical access by suppliers that may lead to reduced supply costs, and the increased potential to lobby the public sector for public improvements that serve the whole cluster. Workers similarly benefit from the exchange of information about job opportunities, the potential for centralized training, labor organizing efficiencies, and mentoring potentials.

Thus one of the integrating strategies being advocated in this report is for the CRA and the City's relevant economic development agencies to pursue the increased concentration of environmental technology businesses in redeveloped industrial areas, and to nurture the growth of the economic benefits of clustering.

There is an even more compelling way to integrate economic and redevelopment strategies that may be unique to the environmental technology industry. That way is through the application of eco-industrial principles to existing or newly developed industrial areas that environmental technology firms can eventually inhabit.

The essentials, then, for an integrated economic development and redevelopment strategy is to coordinate both strategies in time and place, encourage the geographic clustering of firms in related industries, nurture the attendant economic benefits, and pursue the implementation of eco-industrial principles.

Regarding core recommendation number one, above, a list of seventeen standard techniques for upgrading the targeted Los Angeles River industrial areas is provided, such as infrastructure improvement, removal of debris and dilapidated buildings, landscaping, better lighting, facade improvement, etc. Upgrading the areas will benefit the City of Los Angeles by making them attractive to a wide range of industrial firms, thus improving the City's economic base. This is the minimum of what needs to be accomplished if environmental technology firms are to be attracted to these areas.

Major benefits can accrue to the City of Los Angeles through upgrading the targeted industrial areas. The estimated available land for development is about 112 acres, permitting 1.23 million square feet of new developments. The city should receive property tax and sales tax increases through these development projects, and property tax increments can support bond offerings that can pay for a portion of the redevelopment activities.

The major benefit, however, is the potential to bring 3,500 good paying jobs into the downtown marketplace. Calculations are presented to demonstrate how this job estimate has been derived.

Another benefit could be the relocation of the jewelry industry to buildings that are designed to properly handle jewelry manufacturing. The new jewelry center can be located near the Artist's Loft District, providing an opportunity for artists to apply their design skills to jewelry making, while creating a retail/manufacturing district.

The pursuit of eco-industrial development, applied to the targeted areas, involves waste recycling and matching, energy conservation, green building designs and operations, the use of solar and other alternative energy sources, and the use of non-polluting forms of transportation within and to the site. Eco-industrial principles, (EIP), can be applied to new developments or retrofitted to existing older developments. Environmental technology firms would be employed to apply or retrofit environmentally sound practices to the design, development and operation of industrial sites and buildings. The environmental technology firms involved in this process would gain a significant amount of business and publicity, and could then inhabit the park they've helped to create. Promoting the environmental technology firms and Los Angeles as an eco-industrial environmental technology center is likely to attract worldwide attention.

Aggressive recruiting of firms in the environmental technology industry should be part of both the upgrading and the eco-industrial strategies. The recruiting process should be designed around sound leasing techniques.

Several economic development strategies are being pursued by the Mayor's Business Team and are not discussed in detail here. Two additional strategies are recommended and discussed: the creation of a venture capital fund for smaller companies and the development of two institutions serving the

environmental technology industry and the general public. The institutions are referred to as The Southern California Environmental Technology Institute for Research and Development; and the Museum of The Environment. The purpose of the research institute would be at minimum to bring new technologies to market faster, and at maximum be a place where research and development is conducted. The museum would combine public educational aspects with opportunities to promote legitimate issues and firms in the industry. Both could serve as environmental anchors of the targeted industrial areas.

Financing programs and techniques are discussed, particularly tax increment financing. An array of federal and state funded grant and loan programs are identified in the areas of infrastructure, brownfield development and the environment. It is recommended that a Task Force be convened consisting of city agency leaders, members of the business community and specialized consultants in areas required for pursuing issues of implementation and feasibility.

Rodino Associates wishes to thank the Mayor's Business Team, notably Jonathan Kevles and Basilia Yao, and CRA staff members Steve Andrews, Albert Santillanes, Daniel Rios, Robert Fazio and Lillian Burkenheim; Craig Tanby and Carol Armstrong of the city's Environmental Affairs Department; John Chen and Maria Sharma of the DWP Economic Development Department, and Mark Garcia of the DWP Real Estate Department; Lupe M. Vela of the City's Sustainability Partnership; former Governor of Massachusetts Michael Dukakis for sharing information on related issues in the biomedical arena in Massachusetts; Kevin O'Sullivan of the Massachusetts BioMedical Initiative; and Mark Goldberg of the venture capital firm BioVentures Investors. Finally, we thank Profs. Goetz Wolff and Allen J. Scott of the UCLA School of Public Policy for their guidance and James Spencer and Cheol-ho Lee, two Ph.D. students in Urban Planning at the UCLA School of Public Policy, for their help in the initial review of industries to be selected for this study.

I. INTEGRATION OF ECONOMIC AND REDEVELOPMENT STRATEGIES

The purpose of the study conducted has been to demonstrate how economic development and redevelopment strategies may be integrated to improve the effectiveness of both, by focusing on particular industry clusters. After reviewing numerous industry clusters the environmental technology industry was selected for reasons described in the study's previous reports. The specific task has therefore become one of developing strategies to assist firms in the environmental technology industry to grow and prosper, while identifying ways to induce them to locate in the City of Los Angeles, preferably within one or more CRA project areas.

The wider task that is being addressed, however, has broad implications for the economic and redevelopment policies of the City of Los Angeles, and for all governments concerned with urban policy, for that matter. That task is to identify what it means to have integrated economic development and redevelopment strategies, particularly as this meaning has been uncovered in this study, and how this integration may be applied to other industries.

There are conceptually several ways to integrate economic development and redevelopment strategies. The first is simply to coordinate both economic and redevelopment efforts and implement appropriate policies roughly simultaneously. For example, we will discuss the need to create a venture capital fund for smaller firms to grow financially and the need to provide available space for small businesses to grow in a physical sense. Such coordination is at minimum what should be pursued by redevelopment and economic development agencies. The fact that the CRA leadership and the Mayor's Business Team both recognize this and are talking to each other represents important progress. The process followed in preparing this study in itself has had an integrating effect by establishing and enriching the dialog between the CRA, the Business Team, the DWP, Environmental Affairs, Public Works, etc.

There is a second way to integrate economic development and redevelopment policy. It is less obvious but more profound in its reasoning and powerful in its results. Economic development and redevelopment strategies mutually impact each other. One direction is clear, the more effective are economic strategies the more businesses grow and the more space they need, arguing for the intervention of redevelopment at some point in time and geography. The other direction has been less obvious but perhaps even more important, and gets to the heart of what is being recommended in this study.

To the extent that redevelopment strategies can have an impact on the location and geographic distribution of businesses, and how their locations are designed, redevelopment can encourage or discourage economic growth. In the Task I report of this study the impact of geographic clustering was discussed. The work of contemporary researchers like Michael Porter of the Harvard Business School, Allen Scott, Goetz Wolff, and Michael Storper of the UCLA School of Public Policy (both Scott and Wolff have contributed to this study), Giacomo Becattini in Italy in the late 1980's, and of economist Alfred Marshall as far back as 1890, identified the important economic development aspects of geographic clustering of firms in related industry clusters. The proximate location of firms in the same or related industries conveys multiple benefits to firms in the geographic and industry cluster. The most prominent examples of this process are the Silicon Valley, the Torrey Pines bio-medical cluster in San Diego, and in our own region, the clustering of the jewelry, clothing, produce, and toy industries in and near downtown, and entertainment/media companies in Santa Monica and the west side of Los Angeles. Firms in these geographic clusters share a number of benefits that include high visibility and recognition by customers, investors and employees, easy networking for technical and market information exchange, greater potential for partnering, joint-venturing and subcontracting, more economical access by suppliers that may lead to reduced supply costs, and the increased potential to lobby the public sector for public improvements that serve

the whole cluster. Workers similarly benefit from the exchange of information about job opportunities, the potential for centralized training, labor organizing efficiencies, and mentoring potentials.

The economic logic of geographic clustering is also at work in the formation and growth of ethnic enclaves. Immigrants who share a common language and culture cluster together for reasons beyond familial connections and social camaraderie. The ability to have personal communication across small distances creates networks of information about jobs, provides opportunity for child care, creates markets for specialized foods and goods that can be economically served by suppliers and retailers, induces the creation of small businesses, and so on.

The point we are striving to make is that geographic clustering has embedded within it a powerful economic development dimension.

In our industry surveys of Task I it was found that for both the environmental technology and bio-medical industry clusters, the sprawl of the Los Angeles region was an economic detriment because it discouraged all of the external benefits that adhere to geographic clustering. Therefore decisions impacting the urban form at the regional and local level, made by key public sector agencies like the Community Redevelopment Agency, have a profound impact on regional and local economic development. The winners and losers are eventually all of us, but these decisions directly impact business growth and development, the ability to be recognized and attract venture capital, the cross fertilization of knowledge, and onward.

Thus one of the integrating strategies being advocated in this report is for the CRA and the City's relevant economic development agencies to pursue the increased concentration of environmental technology businesses in redeveloped

industrial areas, and to further nurture the growth of economic benefits of clustering.

Finally, there is an even more compelling way to integrate economic and redevelopment strategies that may be unique to the environmental technology industry. That way is through the application of eco-industrial principles to existing or newly developed industrial areas that environmental technology firms can eventually inhabit. Eco-industrial development is a complex process that involves a multitude of activities including waste recycling and matching, energy conservation, green building designs and operations, the use of solar and other alternative energy sources, and the use of non-polluting forms of transportation within and to the site. Through this approach, environmental technology firms would be employed to apply or retrofit environmentally sound practices to the design, development and operation of industrial sites and buildings. The environmental technology firms involved in the eco-industrial processes would gain a significant amount of business and publicity through implementing the process, enhancing their economic growth and to some degree their need for space. They can then inhabit the park they've helped to create because of all the positive aspects the redeveloped eco-industrial park provides. The effort and its results can become the focus of a major publicity campaign by the City of Los Angeles and all participating businesses, whether they are in the environmental technology field or not, to promote the firms, the eco-industrialized development, and to promote Los Angeles as the center of the environmental technology industry.

This is only part of the story. Evidence indicates that those firms that occupy the eco-industrial park and participate in this process, whether or not they are part of the environmental technology industry, can benefit significantly from this effort. The principles of eco-industrial development and how it might apply to industrial areas in the City of Los Angeles will be discussed in Section III-D and in the Appendix of this report. Suffice it to say at this point that evidence exists that

there is a double advantage. There are cost savings involved that can go right to the bottom line, and marketing the environmentally friendly businesses can boost sales.

Older existing industrial areas may be retrofitted and adapted to eco-industrial practices over a period of time, and newly developed industrial parks can incorporate these principles from the beginning.

The essentials, then, for an integrated economic development and redevelopment strategy is to coordinate both strategies in time and place, encourage the geographic clustering of firms in related industries, nurture the attendant economic benefits, and pursue the implementation of eco-industrial principles.

II. SUMMARY OF THE TASK II AND III FINDINGS

The key findings of our research as identified in the Task II and III report are summarized below.

A. Economic Development Needs of Environmental Technology Firms

1. Marketing and business referrals
2. Exporting and access to foreign markets
3. Access to venture capital and letters of credit, particularly for smaller firms.
4. General public awareness of environmental issues and technology
5. The development and use of an energy and environmental design rating system for building construction and operation (LEED)
6. Access to scientists and skilled labor
7. Use of the City of Los Angeles' buying and regulatory powers

8. Creation of a social network to exchange technical and business information.

B. Facility / Location Needs of Environmental Technology Firms

The building and locational needs of firms in the industry range from quality offices, quasi-office/industrial research and development space for scientists and engineers, to heavy industrial space for storing trucks that haul waste materials. The building size range of these needs was from 1,000 to 2,000 square feet on the low side to over 200,000 square feet, in locations that provide a range of lifestyles and housing affordability that can accommodate highly trained and paid scientific personnel and lower skilled labor. An important consideration for firms at the higher technical end of the industry was easy access to centers of scientific research in the environmental field such as Cal Tech and USC.

C. Qualities of Inspected Sites for Environmental Technology Firms

Of the nine sites inspected two of them were thought to be highly attractive candidates for environmental technology parks with eco-industrial principles incorporated into the park's design and development. These were:

1. Mission River Road District brownfield, in the Adelante-Eastside CRA area.
2. The DWP Valley Plant site in Pacoima in the Pacoima-Panorama City CRA area.

Two existing industrial sites were found to have significant potential for the application of eco-industrial principles as a process of clean-up and upgrading, and to be possible locations for individual environmental firms. These were:

3. The industrial area on the eastside of the LA River in the Adelante-Eastside redevelopment project area.

4. The industrial area on the westside of the LA River, to the east of Alameda Street, encompassing the newly proposed Central City East redevelopment project area.

Since the preparation of the Task II and III report further investigation has found sites 1 and 2 to be less attractive as candidates for environmental technology firms, and sites 3 and 4 to be much more attractive for this purpose. It is expected that negotiations with Union Pacific for the Mission River Road site will be very difficult for several reasons, not the least of which would be the difficulty of relocating the rail yard tracks and functions. Contrary to our previous understanding, the DWP site in Pacoima has little vacant land and the DWP has now repowered that plant.

At the same time our further investigations into the processes of eco-industrial development and additional field inspections of sites indicate that the industrial areas on both sides of the Los Angeles River can be prime sites for retrofitting these principles and attracting environmental technology firms.

The core recommendations of this study have been divided into Redevelopment Strategies and Economic Development strategies, as described in the next two sections.

III. REDEVELOPMENT STRATEGIES

A. Core Recommendations of the Study

The core redevelopment recommendations of this study is for the CRA, the Mayor's Business Team, and several key agencies and departments of the City of Los Angeles, to work together toward the following goals:

1. Upgrade the two industrial areas to the east of downtown Los Angeles, on both the east and west sides of the Los Angeles River;
2. Move toward incorporating eco-industrial principles into both areas through the work of environmental technology firms;
3. Recruit environmental technology firms to locate within both areas, and promote the areas and Los Angeles to the world at large.

This focus on the two existing industrial areas east of downtown is somewhat of a modification of the findings described in the Task II and III report, and is based on information collected after the report was completed that reduced the attractiveness of both the DWP site in Pacoima and the Union Pacific Railroad site to the northeast of downtown. These updated findings prompted a reinspection and evaluation of the sites on either side of the Los Angeles River and an additional investigation into the principles and practices of eco-industrial.

Other recommendations based on our findings shall be discussed in detail, but it shall be demonstrated that the three recommended goals combined have the potential to integrate several fundamental economic and redevelopment needs of the environmental technology industry in Los Angeles.

B. Los Angeles River Industrial Areas

1. Central Industrial Redevelopment Project Area and Environs

The existing industrial area on the west side of the Los Angeles River is partly coincident with the newly proposed Central Industrial Project of the CRA. The area we are recommending for upgrading begins at Alameda and 4th Street, goes east to the LA River, then south to the Santa Monica Freeway and west to Alameda again. This is somewhat different than the area identified in the findings under Task III. The upgrading for residential, office and retail that is underway in the Artist's Loft District to the north of 4th Street justifies this modification.

Through a very rough measurement utilizing a Thomas Guide map, this area is approximately 500 acres.

The west side area is in somewhat better condition than east of the river, but with similar land uses, businesses and overall characteristics. The area is mostly but not totally in the newly proposed CRA project area and is located in the Eastside Enterprise Zone, in Councilman Nick Pacheco's Council District 14. The area's land uses include industrial and warehousing ranging from garment manufacturing, toy and produce warehouses, machine shops, electrical assembly, auto repair and salvage yards. The area also contains many large parking lots that can be readily developed into light industrial office/R&D spaces. By and large, however, the area has many older industrial buildings and is in need of infrastructure improvements in terms of resurfaced roadways, landscaping, lighting and green space. Adjacency to the Los Angeles River presents an opportunity to create environmentally improved green space.

2. Adelante-Eastside Redevelopment Area

On the eastside, from the LA River to the semi-circle formed by the 10 and the 101 Freeways, is an industrial area of about 400 acres. The site is totally within

the Adelante-Eastside CRA project area and the State Enterprise Zone, affording the City of Los Angeles important tools for redevelopment. As in the case of the west side, its adjacency to the Los Angeles River can provide a potentially significant environmental and open space amenity, as well as the potential to integrate both areas through additional pedestrian river overpasses, the elimination of some barriers on the banks of each area, and an integration of river oriented green space. The area provides easy access to jobs by residents of Boyle Heights and East Los Angeles, and because of its freeway access, to the larger region as well. The area is not designated as a brownfield but there is likely to be contamination in the soil based on current uses, general appearance of the area, and its proximity to known Brownfields. As for the west side, the area is in Council District 14, Councilman Nick Pacheco.

C. Strategies and Benefits for Upgrading Both Industrial Areas

The map on the following page speaks volumes about the strategic location of both industrial areas. They are within a reasonable distance to walk, bike, train or bus ride to most parts of downtown Los Angeles, centrally located within the metropolitan region, within easy reach of a dense labor market with a wide range of skills, and a short drive to both Cal Tech and University of Southern California. Transportation access is excellent with Union Station a short distance to the north, freeways surrounding both areas, the Greyhound Bus Terminal within the boundaries of the west area, and light rail and bus service nearby. Aside from considerations of the environmental technology industry, the City of Los Angeles can reap an important opportunity to add industrial jobs and businesses to its economic base if these areas are upgraded and filled to their maximum capacity.

What does upgrading mean? Setting aside considerations of eco-industrial principles until later in this report, upgrading means turning both areas into modern, attractive industrial parks. A review of both areas has resulted in the following list of upgrading tasks:

Recommended Upgrading Activities:

- Repave roadways as needed
- Demolish all dilapidated buildings and other structures
- Remove debris from vacant sites, streets and other public spaces
- Improve street lighting
- Landscape and streetscape public streets
- Create several sites of open green space
- Green the Los Angeles River by converting it into a landscaped walkway instead of a concrete wash
- Connect the two areas through construction of additional pedestrian and vehicular bridges
- Enforce building codes
- Create and enforce a facade improvement program
- Add local serving retail and eating places where appropriate
- Develop an attractive, consistent and legible signage program
- Create street directories to identify the location of businesses
- Adopt architectural building and site design criteria
- Pursue the formation of a business improvement district to provide "safe and clean" services
- Promote the area to the industrial businesses and developers
- Recruit environmental technology industry firms

The latter two items will be discussed further in the section on recruiting environmental technology firms.

The recommended improvement list provided above contains standard upgrading techniques that can convert these strategically located older industrial areas into modern attractive industrial parks. Upgrading the areas will benefit the City of Los Angeles by making them attractive to a wide range of industrial firms, thus improving the City's economic base. It is the minimum of what needs to be accomplished if environmental technology firms are to be attracted to the areas,

save for those firms seeking locations for activities at the lower end of the technology spectrum.

As the upgrading proceeds a major promotional campaign should be implemented to promote the area to industrial businesses, developers, the real estate brokerage community, and the business community in general. More specific steps for accomplishing this promotional task will be discussed in the section on Implementation.

Consider the potential benefits. An upgraded industrial area of the size anticipated can create increased revenues to the City of Los Angeles through property tax increases and sales tax on qualified transactions. Tax increments may be sufficient to support industrial bond offerings that can pay for the redevelopment activities. Headlines in the business and real estate media would likely attract industrial firms and developers. But the major benefit is the potential to bring 3,500 good paying jobs into the downtown marketplace. There are many other benefits, but let's examine how an estimate of 3,500 jobs may be derived.

The two areas combined are approximately 900 acres, excluding the LA River. Based on our visual tours let us assume that 75% of the land is already spoken for and not available for new development or renovation. The remaining 225 acres is an ideal size for the purposes anticipated. Assuming 50% of this acreage is taken by streets, alleys and utility easements, there remains 112.5 acres of buildable land. At a 25% FAR level with all one-story buildings and surface parking, and assuming an average building space per employee of 350 square feet, the total development and employment potential would result as follows:

Total Acreage of both areas	900 acres
25% Available for Development or Renovation	225 acres
50% for Streets, Alleys and Utility Easements	112.5 acres
Area in Square Feet -112.5 X 43,560	4.9 mil sq. ft.

Floor-Area-Ratio assumed	25%
Buildable / Renovatable Space	1.23 million sq. ft.
Square feet per employee assumed	350 sq. ft/employee
Siemens Solar Indust	500 sq ft/empl
Air Instruments & Meas.	333 sq ft/empl
Weck Labs (need 340)	257 sq ft/empl
Earth Tech	100 sq ft/empl
Employment housed by 1.23 mil sq. ft.	3,500 employees
Surface Parking ratio assumed	3/1000
Number of Parking Spaces needed	3,690
Surface Parking Area @ 350 sq. ft./space	1.3 mil sq. ft.
Total Building and Parking Area Covered	2.53 mil sq ft
Remaining Area for Landscaping / Green Space	2.37 mil sq. ft.
Area for Landscaping / Green Space in Acres	54.4 acres

With this development housing 3,500 employees and an average business sales volume in the environmental technology industry in the Los Angeles region of \$143,000 per employee, attracting firms to the area would represent a sales volume of \$500 million coming into the downtown marketplace.

Clearly this would not represent net new business sales volume or employment for the City of Los Angeles since some of the firms recruited may be coming from other locations within the city. However, it is fair to expect that the economic benefits of clustering, and simply the considerable publicity received by the firms relocating to the newly upgraded areas would result in net new business. Further, it can be expected that property values in the target area would increase substantially, along with possible taxable sales and would provide the city with increased revenues

The upgraded industrial areas should not house only environmental technology businesses. One interesting scenario would be relocate the jewelry industry from its current downtown location in buildings that may be inadequately designed for jewelry making to buildings specifically designed to its needs. The industry could be located at the northern end of the west River area, near the Artist District with local artists possibly contributing to jewelry designs, in what could become a retail/manufacturing district. Relocating the jewelry businesses from Hill Street and Broadway can free up many buildings for adaptive re-use, quite possibly for residential and retail uses.

D. Applying Eco-Industrial Development Principles

As described earlier in this report, eco-industrial development is a complex process that involves a multitude of activities including waste recycling and matching, energy conservation, green building designs and operations, the use of solar and other alternative energy sources, and the use of non-polluting forms of transportation within and to the site. Eco-industrial principles, (EIP), can be applied to new developments or retrofitted to existing older developments. The key is developing a plan tailored to the targeted development and its industries, and getting the cooperation of the existing businesses and property owners.

Cornell University and the University of Southern California have teamed to form the National Center for Eco-Industrial Development (see Appendix). Researchers and practitioners from both universities, and others from throughout the North America, Europe and Asia have developed techniques for applying EIP to new and existing industrial parks. Numerous examples of successful EIP developments can now be found around the U.S. and around the world (see Appendix). Two researchers, Ernest Lowe and John Warren at the Pacific Northwest National Laboratory in Richland, Washington described an eco-industrial park succinctly in 1996:

An eco-industrial park is a community of manufacturing and service businesses seeking enhanced environmental and economic performance through collaboration in managing environmental and resource issues including energy, water, and materials. By working together, the community of businesses seeks a collective benefit that is greater than the sum of the individual benefits each company would realize if it optimized its individual performance only . . . The goal of an EIP is to improve economic performance of the participating companies while minimizing their environmental impact (Lowe and Warren, 1996: 7.8).

Industrial activity releases wastes into local, regional and eventually global ecosystems. Over the last three decades a large number of laws and regulations have been passed in much of the developed world to limit emissions to air and water and to regulate the handling and disposal of solid and hazardous waste and to design and operate buildings to conserve energy. Through this regulatory growth the common belief has been, at least among most business communities, that the choice is between business growth and environmental regulation, between economic development and a clean environment. The environmental technology industry has grown to its current size and sophistication largely as a technological response to resolving this dilemma.

Eco-industrial principles and developments turn that belief around and demonstrate that protecting the environment and economic development can not only go hand in hand but also may, under the proper conditions, actually reinforce each other. This is what is being recommended for the targeted industrial areas east of downtown Los Angeles.

It is recommended that the Los Angeles Community Redevelopment Agency form a Task Force to pursue the dual goal of upgrading the industrial areas as described in Section C and to determine the feasibility of retrofitting the areas with eco-industrial principles. Briefly, the basic activities of an eco-industrial park can be described as described below.

1. Waste Recycling

This is simply the standard recycling that goes on in our neighborhoods taken to a more detailed and sophisticated level. The waste products of all businesses located in the park, including the paper trash of an office as well as the industrial waste of manufacturers, would be systematically collected and recycled.

2. Waste / Resource Matching

The waste products of one industrial process can become the resource input of another industrial firm. The classic example is that of scrap metal being re-used by steel companies to forge new products. The key is to create an inventory of waste outputs and resource inputs for firms within the eco-industrial park as well as for those outside it. The ideal is for both output and input users to be located within the eco-industrial park. In fact this would be one of the criteria for recruitment of firms - matching input with output. The case may be, however, that a firm that can use the waste of a company within the park is at a completely different location, requiring transportation of the waste products. In fact there are some virtual eco-industrial parks that do not co-locate firms but merely match waste output with resource input. Waste matching provides an income source to the waste producer by selling a product that previously cost money for its disposal. The firm that consumes the material as an input resource can save money by purchasing the product more cheaply. There are complications in terms of quality and transportation, but this is the basic logic.

3. Reduction of Polluting Emissions

The maximum feasible application of state of the art pollution reduction and control equipment and manufacturing processes should become a goal of all participating businesses. An inventory of the polluting processes of businesses within the industrial areas as well as those planning to locate in the areas can be

developed with the goal of seeking feasible solutions to minimize their environmental impact. Zero emissions is a practical impossibility and not a realistic goal. To the degree possible, however, businesses in the eco-industrial development must be encouraged to work with environmental technology firms to implement reasonable solutions to pollution control.

4. Energy Conservation and Green Building

Both concepts are in the process of being adopted by the Los Angeles City Council for public buildings. Energy conservation involves the design and operation of buildings and sites to minimize energy consumption. Green building concepts go further by incorporating the use of recycled and environmentally friendly products into building and site development. The Department of Public Works of the City of Los Angeles has developed and sponsored the Sustainable Building Initiative (see Appendix), which has already been approved by the City Council's Public Works Committee at this writing, and is expected to be approved by the full City Council. Incorporating this initiative into the development and operation of buildings and sites in the eco-industrial park would be a basic requirement.

5. Use of Solar Energy and Other Alternative Energy Sources

The Los Angeles Department of Water and Power, working with solar and alternative energy production companies in the Los Angeles area is seeking to develop demonstration buildings and developments to promote solar technology as either an alternative to traditional fossil fuel sources of power or as an auxiliary power source. The eco-industrial park can become a major demonstration project for the use of solar and alternative energy sources.

6. Shared Resources

As part of minimizing the consumption of resources, and as a key money saving strategy, eco-industrial principles incorporate the sharing of building and site resources among participating firms. Such resources include, as appropriate, shared loading docks, shipping, receiving and storage, shared amenities for food, meeting space, childcare, health facilities, shared or phased use of parking, and so on. This process requires a rethinking of traditional development paradigms, but can result in reduced development and operating costs, with lower rent for tenants and higher property values for owners.

7. Non-Polluting Transportation

Transportation within the eco-industrial park as well as to and from key outside locations, such as mass transportation centers and remote parking, can be conducted by non-polluting electric vehicles.

8. Developing / Greening Open Areas

Green spaces for eco-industrial parks are as important to the environmentally friendly quality of the development as to the sheer attractiveness of the park to workers and employers. There is a doubly attractive opportunity to accomplish this in the targeted industrial areas by the Los Angeles River. Greening the river and converting it from a concrete wash to a landscaped riverbank would add attractiveness to the whole development and reclaim an important amenity for the environment and the enjoyment of people.

The list above is only an outline of the strategies that can be incorporated into the targeted industrial areas. Several papers and documents providing more detailed information on the process have been included in the Appendix of this report.

The whole process would be phased in over a period of several years along with

the general upgrading of the areas as described earlier. Cornell University has worked out a whole program to involve stakeholders, labor unions, the local community, the local business and political establishment. We'll refer to this a bit more in the section on Implementation.

E. Recruiting Environmental Technology Firms and Other Businesses

Successful recruitment of environmental technology firms, as well as those from other industries, assumes that effective efforts are made to upgrade the targeted industrial areas, as recommended in Section III-C above. Despite fundamentally excellent characteristics of both areas, including their central location and freeway access, the generally blighted conditions of each area seriously reduces their competitive potential versus other industrial locations in the region. If, beyond basic upgrading, eco-industrial principles can be retrofitted to the areas, it is our judgment that an excellent opportunity will exist for successful recruitment.

While recruitment should focus on the environmental technology industry, there is no need for this to be an exclusive focus. First, environmental technology firms rely on other industries such as precision instrument making, machine tool manufacturing, metal fabricating, and many others, some of which appear to be already located in the two industrial areas. Second, many other high-tech and low-tech industries would find both areas attractive because of reasons already cited.

Recruitment should follow standard leasing strategies:

1. Prepare an inventory of vacant land and buildings, and those for sale or lease, along with data on size, location, ownership, etc.
2. Prepare an informational and promotional document describing

the area, its amenities, the upgrading planned or underway, eco-industrial processes involved, etc.

3. Promote the area to targeted businesses, developers, to the real estate brokerage community, and to the business media.
4. Form a blue-ribbon welcoming committee of leading business people and political leaders from the area to contact firms and to be available to meet attractive prospects.
5. Streamline the approval process and provide a single point of contact within the CRA for solving problems encountered by firms or developers seeking to locate in the areas.
6. Stay on top of the leasing/sale/development process and solve problems along the way.
7. Consider some major inducements to the first major name businesses that can be recruited to the area.
8. Publicize progress in the upgrading, eco-industrializing process and in the recruitment effort.
9. Get feed back from companies and developers who do and don't choose to locate in the area and utilize it to improve the process.

An overall recruitment strategy to be pursued should combine a central role for industrial developers and real estate brokers, close coordination with the Mayor's Business Team and their contacts with environmental industry firms, and direct contact with environmental industry firms themselves.

IV. ECONOMIC DEVELOPMENT STRATEGIES

A. Overview

There are two specific economic development strategies we wish to address in this section. The first is the formation of a venture capital fund for smaller environmental technology firms. The second is to increase general public awareness of environmental issues and technology. This is not to minimize the importance of the other seven economic development needs identified in Task II, as outlined in Section II-A of this report. Strategies are being developed to address most of these. The Mayor's Business Team is addressing several. These include:

- Marketing and business referrals
- Exporting and access to foreign markets
- Creation of a social network to exchange technical and business information.

The Sustainable Building Initiative will provide for another (see Appendix):

- The development and use of an energy and environmental design rating system for building construction and operation (LEED)

Two others would be addressed by the CRA if it pursued the upgrading and/or eco-industrial principles for each of the targeted industrial areas:

- Access to scientists and skilled labor
- Use of the City of Los Angeles' buying and regulatory powers

Firms locating within the river industrial areas would have better physical access to the scientific communities at Cal Tech, USC and UCLA simply because the location of these areas is central to all three universities and freeway access is readily available. Regarding the city's buying and regulatory powers, these would necessarily be utilized in the upgrading and eco-industrialization strategies recommended. Therefore, let us address venture capital and public education.

B. A Venture Fund for Smaller Environmental Technology Firms

Small firms in any industry face similar issues over raising equity capital. Most venture capital firms seek investments that exceed \$3 million, while smaller firms need capital in the \$500 thousand to \$3 million range. While this may be thought of as a private sector issue, it has important public policy implications that merit the attention of public policy makers. Small firms are usually the innovators and the creators of the greatest job growth. Innovation is a key ingredient in economic growth, and its nurturing therefore is of greater implications than simply adding to the bottom line of small firms and entrepreneurs. Nurturing needs money. Therefore, public sector assistance in stimulating the development of small company venture capital is a wise public policy strategy.

An important model exists for this strategy in the Boston, Massachusetts area. Former Governor Michael Dukakis with whom we met to discuss this project directed us to this source. Several venture funds have been established in the Boston area focused on the bio-medical industry. BioVentures Investors has created two funds. Fund I raised \$18 million and provided venture capital to smaller companies, averaging \$1.3 million per company, with a total of ten companies in its portfolio. Fund II is larger and is currently raising \$100 million and will target somewhat larger investments. Brief descriptions of each Fund is provided in the Appendix of this report, from the BioVentures web site. Phone interviews were conducted with Kevin O'Sullivan, Director of the Massachusetts

Biomedical Initiative, and Mark Goldberg a principle of BioVentures, creator of both funds. Much of the information provided below came from these interviews.

Venture capital funds with multiple agendas, that is to create economic development in an area and provide high returns to their investors can be very tricky to operate. Normal funds seek the highest return to investors, which may be found in ventures outside the region being promoted. For this reason investors must agree up front that a dual purpose exists, and support this duality for economic gain in a larger sense.

Starting a venture capital fund for the environmental technology industry must begin with the recruitment of professionals that are highly knowledgeable in the industry and in corporate finance. They will organize the fund, raise and invest the equity, and supply technical assistance to the management of invested firms as appropriate. Such individuals are difficult to recruit since they are partly compensated by the returns they generate by the funds investments. If there are limitations placed on a fund's geographic scope and investment size, there is implicitly a limitation on the compensation available to the fund's managers. This is not an insurmountable limitation but one that must be recognized early in the process. A senior fund manager with an established track record may accept such a challenge for the greater benefits being created rather than simply than "the highest IRR".

A sufficiently large "critical mass" of deal opportunities needs to be available for the fund managers to avoid making poor investments merely to get the funds out the door. Limiting the fund to firms located within the City of Los Angeles would not work. A much larger region must be defined, perhaps as large as all of Southern California. Further, there must be a strict separation between investment decisions and political decisions. To do otherwise is a formula for disaster.

Equity funds will come from a variety of sources including large corporations, local foundations, university endowments, pension funds, banks and high net worth individuals. Initial seed money may come from federal government and foundation grants, donations, the Small Business Administration, the U.S. Department of Commerce, and the State of California. To get the fund started one or more "movers and shakers" in the Los Angeles business community must be involved to go to the initial money sources to make the fund happen.

Return rates, calculated as Internal Rates of Return (IRR'S) may range from 30% to 70%, depending on the risk, the staging of the investment in the firm's evolution, the timing of returns and going market.

The Southern California Biomedical Council is currently going through a similar effort and the Mayor's Business Team has been in communication with the director on this matter.

Finally, the State of California and the State of Massachusetts have programs to invest in the biomedical industry that may be adapted to the environmental technology industry. Information from the web sites of both states is provided in the Appendix.

C. The Southern California Environmental Technology Institute for Research and Development, and the Museum of The Environment

The conversion of technology research, the education of the general public, and the seeding of the downtown industrial areas for the environmental technology industry might be accomplished by the creation of two separate but related institutions, located within the targeted industrial areas. The institutions in mind shall be called the Southern California Environmental Technology Institute for Research and Development and the Museum of The Environment. We shall discuss the idea of each institution only briefly.

1. The Environmental Technology Institute

An effective strategy for encouraging the development of cutting edge technology and bringing such technology to market has been to create a collaboration of universities and industry under a research and development institute. With the intellectual power of three great universities, Cal Tech, USC and UCLA already involved in research on the environment a powerful coalition of minds and money could be created by joining all three with industry to create such an institute. This is precisely what has occurred in Massachusetts at the Central Massachusetts Technology Commercialization Center (see Appendix). An institute of this nature could vary in form from an actual research center to one that is primarily administrative in organizing efforts of the participating universities to bring new technologies to market.

2. The Museum of The Environment

An important dimension of economic assistance to the environmental technology industry is public education on environmental issues and their technological solutions. Similarly, an important element in the public's need for information is a better understanding of how the environment and its deterioration affects daily life, health and prosperity. Both sets of needs can be addressed through the development of a Museum of The Environment. The museum could be developed as a joint effort between the Museum of Science and the Museum of Natural History, as well as the three major universities involved in the study of environmental concerns, Cal Tech, USC and UCLA.

If located within the upgraded and eco-industrialized areas discussed, the museum would not only become one important anchor defining the area for the environmental technology industry, but the surrounding eco-industrial park would become a living, real-world part of the museum. Museum programs could deal

with a wide spectrum of environmental issues and with the evolution of the surrounding park, with field trips "down the road" so to speak, to the greened Los Angeles River, to the energy balanced buildings, and to some of the facilities of the environmental technology companies.

The museum can also become a place to showcase the latest research undertaken by local firms and research centers. Its facilities can include state of the art media presentation capabilities to be used for meetings with investors, world conferences and the press. The media attention created by the upgrading and eco-industrialization of the river industrial areas would create an opportunity to publicize the work and importance of the industry, and the proposed museum can be an effective educational vehicle for this publicity.

V. IMPLEMENTATION

A. Financing

A key issue is how can all of the proposed strategies be financed. Detailed financial plans and feasibility must be pursued by the Task Force to be discussed in the next Section V-B of this report. We wish to indicate several potentially constructive directions that a Task Force should pursue.

A myriad of financing options exist for financing the various elements involved in upgrading older industrial areas including infrastructure improvements, green space creation, environmental clean up and implementing the eco-industrial process. No one program currently provides enough funds to cover the costs of each element, therefore funding vehicles need to be pieced together in a coordinated manner. To adequately review the current funding availability of any one program is beyond the scope of this project and so we will simply indicate by

name those programs that merit investigation at the local, state, and federal government levels.

The obvious funding vehicle for a redevelopment agency is tax increment financing, and thus we have outlined its funding potential below, based upon very rough estimates of property values and tax increments. The remaining funding sources are described in the Appendix, and shall be listed in section 2 below.

1. Tax Increment Financing

The standard financing vehicle for redevelopment areas is to borrow through bond sales based on tax increments. Simple arithmetic is encouraging and of course is only intended to be indicative at this point. According to the calculations in Section III-C above it is estimated that 4.9 million square feet of land can be redeveloped. If each acre increases by \$10 per foot, (the current range of land values appears to be from a low of \$10 to around \$35 per foot, depending on location, allowable FAR, etc.), and 1.23 million square feet of building improvements are constructed at an average of \$75 per foot, the tax increment and bonding capability works out to be approximately \$22 million, supportable with tax increments over about a five year period. The \$22 million would not be available up front since the tax increment to service the debt would have to grow. It is also important that as many of the properties in the recommended industrial area as possible be included in the CRA project area to allow the capture of increased tax assessments. The estimates made are as follows:

Potential Tax Increment on New Developments

Land for redevelopment	4.9 mil sq.ft.
Assumed land value increase	\$10/sq.ft.
Land Value Increase	\$49,000,000
Building Improvements assumed	1.23 mil sq.ft.
Building improvements cost	\$75/sq.ft

Improvement Value Increase	\$92,250,000
Total Assessed Value Increase	\$141,250,000
Property Tax Increase @ 1%	\$1,412,500
Assume 60% is available for debt	\$847,500
Potential Tax Increment derived from the rest of the two CRA areas:	
Assume the rest of the areas provide	
an equal tax increment as the new	
developments	\$847,500
Total Tax Increment Available for Debt	\$1,695,000
Bond Interest and Amortization assumed	5.5%
Bonding Capability, approximately	\$22,000,000
(allowing for debt service reserve and cost of issuance)	

2. Potential Funding Sources (see Appendix for more details)

The various funding programs available at the state and federal government level are listed below by program issue as infrastructure, brownfields and environment. Details on each program, obtained from agency web sites, are provided in the Appendix. No attempt has been made to determine current operational funding levels.

Infrastructure Financing:

California:

Infrastructure and Economic Development Bank
 Infrastructure State Revolving Fund

Federal:

Public Works Development Facilities Program

Brownfields Redevelopment:

California:

CLEAN Brownfields Loan Program

Federal:

Region 9 Brownfields Partnership Action Agenda

Environmental:

California:

Recycling Market Development Zone (includes all of the City of LA)

California Pollution Control Financing Authority

Small Business Pollution Control Tax-Exempt Bond Financing

Innovative Clean Air Technologies Program

Department of Water Resources

Environmental Enhancement and Mitigation Program

Federal:

Sustainable Development Challenge Grant Program

Pollution Prevention Incentives for States Grants Program

The next phase of this project should be to organize a Task Force to pursue the detailed feasibility of all aspects of the recommendations made in this study, particularly the availability of financing, which will likely control what can and cannot be accomplished.

B. Feasibility Task Force

The work of this project has been necessarily policy and strategy oriented. A Task Force should be created to begin an implementation process by identifying priorities, developing a database on the areas, pursuing issues of cost, the phasing of objectives in accordance with financial and political feasibility, and promoting support from within the business community.

This Task Force should consist of city agency leadership, leading members of the business community, and consultants with a variety of appropriate skills and areas of specialization. Our recommendations of those to be considered, by category of participants is:

- City of Los Angeles
 - Councilman Nick Pacheco or designee
 - Administrator of the Redevelopment Agency, plus one or more senior staff members, and area project managers
 - Senior staff members of:
 - Mayor's Business Team
 - Public Works
 - Planning Department
 - Environmental Affairs
 - Department of Water and Power
 - Bureau of Sanitation
 - Bureau of Engineering

- LA Business Community
 - Los Angeles Area Chamber of Commerce
 - Los Angeles County Economic Development Corporation

- Consultant Team Specialties
 - Real Estate Development Analyst, with an understanding of the environmental technology industry
 - Redevelopment Plan Adoption and Policy Analyst
 - Public Sector Fiscal Impact Analyst
 - Sustainable Design Architect
 - Environmental Technology Generalist

Among the first tasks of the Task Force should be to prepare a detailed property and business inventory of both industrial areas, plus an "existing conditions" description of public space and infrastructure. It is critically important to know the content and condition of each area before a meaningful plan can be created. From here, a variety of tasks can be pursued. Tax increment projections can be prepared, and a preliminary idea concerning the compatibility of existing businesses with environmental technology firms can be developed. Discussions can begin with major property owners and businesses to start gaining input and developing consensus on strategies and tactics. A preliminary physical development plan can be created. A five-year timetable should be prepared for the phasing of major goals and objectives.

This first set of tasks should be funded for completion in one year. Considerable interaction should occur among the specialists of the Task Force, and between it and the city staff, the business community members, key leaders of the environmental technology industry, and university specialists in eco-industrial development. At some point the Task Force may wish to employ the services of the National Center for Eco-Industrial Development, operated jointly by Cornell University and the University of Southern California. The second and subsequent implementation years will be based on the findings and progress of the first year's work.

It is our hope that this study has provided constructive and realizable direction to the Los Angeles Community Redevelopment Agency and to related city agencies, in an effort to integrate economic development and redevelopment policies and strategies.