



**University of Hawai`i at Manoa
Charter of Sustainability**



Stewardship Based on Island Values

July 2003

Acknowledgements

The University of Hawai`i at Manoa Charter of Sustainability is a set of principles and policies that was developed by faculty, staff, students and community members and coordinated by the University of Hawai`i Office of Sustainability.

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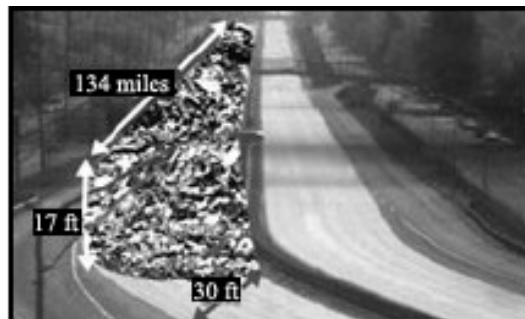


Hawai`i's Challenge:

Achieving sustainability in an unsustainable world

As we begin the 21st century, it seems that we hear about environmental damages being inflicted across the planet on a daily basis. From growing numbers of species becoming extinct to mounting evidence of global warming, it has become quite clear that humans are adversely affecting the ecological systems that we depend upon for air, water, food, fuel and material comfort. It is important that we keep these realities in mind, for they are the reason we are calling for change. Were the world able to function healthily under our current form of development and operation, there would be no compelling reason to alter our behavior. Indeed, were this the case, we would be operating in a sustainable manner. What must be emphasized is the fact that the operational *status quo* **cannot be sustained**, should we keep on doing what we have been doing, there inevitably will be an environmental collapse. Consider these sobering facts:

- **Hawaii is the endangered species capital of the world and the extinction capital of the US.** Of the 2,400 native plant species that remain in Hawaii, nearly half are endangered.¹
- Carbon emissions, largely from fossil fuel combustion, are propagating well documented indicators of global warming. If current trends continue, **sea levels in Hawaii are expected to rise as much as 25 inches**, and major changes in rainfall, heat indexes and agricultural production are expected. Forty-seven percent of the greenhouse gases emitted in Hawaii are from electricity production. \$1.4 billion leaves the Hawaiian economy annually to pay for oil.²
- Oahu alone generates **1.5 million tons of waste each year**, all of which is trucked to rapidly filling landfills. This quantity of garbage is equivalent to two lanes of the entire 134-mile-long Kamehameha Highway covered in trash to a depth of 17 feet. A large percentage of this waste is recyclable; it is estimated that 85% of office-generated waste could be diverted from the landfill and used to make new products.³



1. www.oahunaturetours.com
2. www.giss.nasa.gov
3. www.opala.org

This is an issue beyond political bias or personal belief – it is an issue of ethics at the deepest level. We must ask ourselves if human beings have the right to continue exploiting the planet and undermining delicately balanced ecosystems. Sustainable development means acting on the best elements of human intelligence in order to grow and prosper while remaining in harmony with the natural world upon which we rely. It is a concept that ultimately will determine the success or failure of the human species. With this in mind, the University of Hawai`i can and must embrace a forward-moving path of sustainability.

Responsibility: The University as a model for island sustainability

“There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction.”

- John F. Kennedy

A collective awareness of the planet’s environmental destruction has been developing for several decades. The result of this increasing knowledge has led to the creation of powerful environmental organizations such as the Sierra Club and the World Watch Institute, led by people who are dedicated to protecting the health of the Earth that supports humanity. Simultaneously, however, this same environmental awareness has been met by the majority with passivity. Faced with problems of global proportions, our society at large has chosen so far to hold onto the *status quo*. By clinging to the security of “business as usual” while ecological destruction is mounting, we are passing on a degraded and abused world to the next generation.

As a major institution dedicated to educating the leaders of the next generation, the University of Hawai`i publicly has acknowledged its role of responsibility in the protection of the environment. As an integral part of Hawaiian society, the University recognizes that by making sustainable choices in policy, operations and education, a critical step will be made toward the health and integrity of the islands and the greater world. While it is accepted that change is more difficult than following well established procedures, it is strongly believed that the benefits will far outweigh the costs. It is this pioneering spirit that defines how the University of Hawai`i will evolve to meet a dynamic future. As Alan Kay of Apple Computers once said, “The best way to predict the future is to invent it.” By

enacting positive changes one step at a time, the University welcomes a new age of increased prosperity that functions in balance with the natural world.

A major step in the right direction already has been taken with the establishment of the University of Hawai'i Office of Sustainability. In conjunction with faculty, staff, students and community members, the Office of Sustainability has produced this Charter to define a new path forward. By addressing critical campus functions, defining priority outcomes and recommending action steps, this Charter provides the blueprint for the University to begin operating as a sustainable institution. Sustainability is not about reverting to old ways and giving up modern conveniences, but rather utilizing the best knowledge and technology available to allow prosperity without destroying the natural world upon which we depend. It is about providing the members of the University with a place they are proud of and that inspires them to live their lives in balance with the Earth. It is about closing resource gaps so that we make the most of the materials we have and minimize the waste that we create. Overall, sustainability is the pursuit of an improved quality of life now that can be maintained into the future.



Looking Forward: Moving the University of Hawai`i onto a sustainable track

The Origin of the Charter of Sustainability

The concept for the University of Hawai`i Charter of Sustainability originated out of two innovative strategic planning processes conducted by the University of Hawaii President's Office and the University of Hawaii at Manoa Chancellor's Office in early 2002. In these comprehensive, day-long brainstorming sessions, well over 1,000 faculty members, administrators and students, along with individuals from the community, business, governmental and educational sectors, shared their hopes and examined the challenges in implementing their vision of the best possible future for the University of Hawaii. The assembled participants developed the major areas of focus for the Charter and adopted the following mission statement:

“The University of Hawai`i will apply the principles of sustainable design and environmental stewardship to all of its activities. It will become a leader in Hawai`i and the Pacific region in education, research, extension, and community collaboration related to sustainability.”

With this statement as a guiding principle, 12 committees were formed (see the list of members beginning on page 2) to address specific problems and solutions on the Manoa campus. Their task was to develop a set of principles and policies that would direct the University of Hawaii at Manoa on its path toward a sustainable future. This Charter of Sustainability is the product of their dedication and hard work.

Why action now on a Sustainability Charter?



President Dobbelle has given each of us a challenge to think boldly, and to ask for actions that will lead to change. He has brought new vigor and vision to this university, and has illuminated new possibilities and directions. Propelled by this reaffirmed spirit, many on our university campuses are revitalized, and eager to move forward with implementing a vibrant vision of this university's key role in shaping the future of Hawaii, and contributing positively to the growth of the larger Pacific/Asia community. Whether we move forward to realize this potential is dependent upon the actions of everyone at this institution.

With the state seeking ways to restructure our economy, and indeed our very society, the University stands on the threshold of tremendous opportunity. We feel that the time is long overdue for us to reclaim moral authority as the intellectual epicenter of this state, and in so doing guide these islands toward a future of social and cultural equity, responsible economic development and environmental restoration. We believe that through renewed purpose and vigor, this university can lead, by its example, and be a model for other universities worldwide. It is time for this university to step boldly forward to sustain and support our unique culture, to ensure social equality and justice, to support diversified and sustainable economic development, to preserve and restore our unique and delicate ecosystems, and to re-build our campuses properly. This is not business as usual, but rather business as it needs to be.

Therefore, as an integral part of the University Strategic Planning process now underway, it is essential for the University to demonstrate that we have the collective will and institutional support to enact the action recommendations described in the Charter of Sustainability. Guided by this Charter, the University can exemplify through its decisions and behavior that it is ready to better serve the underserved here at home; that through our instructional agenda, our facilities, our administrative and management practices, our personal work habits, and our internal community organization, the values we hope to instill throughout the rest of our society will be nurtured and demonstrated throughout all levels of this university system. Specifically, the University can lead efforts to develop advanced energy technologies that can position Hawai'i as a world leader in this field, and can help the state become an international model for sustainable development. That, in turn, will perpetuate the quality of life that others will want to emulate, stimulating a robust economy in the process.

With these goals in mind, we can confidently and decisively make the following statement:

“From this day forward, the University of Hawai'i, acting through its statewide campus network, is committed to the conservation, sustainable use, and enhancement of the local, regional and global environment for the present and for the future. We will meet our commitment through leadership by example in education, research and environmentally responsible operations. We will engage in equitable and participatory partnerships with the community to enhance our unique culture. We will ensure social and environmental equity and justice while supporting a diversified and sustainable path of economic development. Ultimately, we will design, build and administer our campuses sustainably, in order to preserve and restore our unique and delicate ecosystems.”

It is encouraging to note that success already has been achieved in various parts of the University. The University of Hawai'i Office of Sustainability has been located in the Hawai'i Energy House, a building designed to be efficient and carry a low environmental impact. This facility is in the process of becoming a model for sustainable living and will provide a valuable resource for people to see a working example of sustainability in action. Another notable success story is the agreement just signed between the University and the Honolulu Board of Water Supply to install at no cost low-flow toilets, sinks and showerheads throughout the Manoa campus. Examples such as these show that with the right energy and commitment, we can produce impactful, lasting results. Without a doubt we have a long road ahead of us, but this Charter provides the guidance necessary to begin the journey toward a brighter, more sustainable future.



The Charter of Sustainability:

Nine essential strategic goals

The University of Hawaii has tremendous potential to minimize its impact on the natural world while maximizing its economic, educational and social prosperity. By enacting progressive measures and extending its influence to the surrounding community, both locally and globally, it can become a leading force for positive change in the world. The following list identifies nine Essential Strategic Goals that will establish the University as a sustainable institution.

Essential Strategic Goals:

Strategic Goal 1 – Use Energy Wisely

Strategic Goal 2 – Practice Sustainable Water Use

Strategic Goal 3 – Minimize Negative Impact on the Land

Strategic Goal 4 – Create Sustainable Buildings

Strategic Goal 5 – Promote Alternative Transportation

Strategic Goal 6 – Minimize Material Waste

Strategic Goal 7 – Adopt Green Purchasing Policies

Strategic Goal 8 – Enhance the Quality of the Campus Experience

Strategic Goal 9 - Teach the Principles of Sustainability

For each Essential Strategic Goal, this Charter identifies a Vision for Sustainability, the Issues involved, the Opportunities present, and Priority Outcomes and Action Recommendations.



Strategic Goal 1: Use Energy Wisely

Vision for Sustainability

The University of Hawai'i at Manoa will develop and implement a comprehensive energy plan that will reduce energy use through conservation and improved efficiency, and emphasize the development of renewable energy sources.

What are the issues?

From lighting and air conditioning to cooking and computing, our society requires a tremendous amount of energy, which we currently produce primarily through the burning of oil. Just 20 years ago, few people questioned the merits of an oil-based economy. Today, however, the environmental, social and economic costs associated with the oil industry are increasingly well known. The causal relationship of human activities to global warming has been recognized by the International Panel on Climate Change, which attributes much of the source of this critical planetary problem to the combustion of fossil fuels. The international politics of oil supply has led to social unrest, gross economic inequity and warfare. For better or for worse, though, our unhealthy use of oil appears to be short-lived; even conservative estimates predict that soon we will reach the peak of oil production capabilities, with the inevitable decline in oil reserves leading to soaring energy prices, economically unfeasible crop production and jeopardized food distribution.

On a local level, the bustling economy and society that developed in Hawaii during the last century has become highly dependent on oil- and coal-generated energy. On O`ahu, which accounts for 72% of the state's total usage, 96% of the electricity is produced from fossil fuels.¹ Island residents pay the highest rates in the nation for electricity, about double the national average cost.¹ And the University of Hawai'i at Manoa is one of the state's largest consumers, spending more than \$11,000,000 every year on electricity.² It is in the best economic and environmental interests of our campus and our state to take a critical look at the global energy situation and Hawaii's role in it, then take the steps necessary toward reducing our consumption and developing renewable sources.

What are the opportunities?

Within this global and local context, the University of Hawai'i has both the ability and the responsibility to minimize its reliance on oil-based energy. By making simple changes, millions of dollars can be saved while reducing pollution and greenhouse gas production. A successful and sustainable energy plan can be developed to facilitate change in three primary ways:

- 1) Establish conservation efforts through an education and outreach program directed at increasing energy awareness and minimizing wasted energy
- 2) Improve efficiency in all sectors of the campus by adopting new technologies that minimize energy consumption
- 3) Focus on renewable energy generation in the University's energy plan

Priority Outcomes and Action Recommendations

1. Conserve Energy

A) Priority Outcome: Educate members of the University about the importance of careful energy use

The most basic element of sustainable operation is the elimination of waste. When we leave on lights, computers and copiers needlessly, we are wasting money and precious natural resources. By educating our campus about the importance of energy use and the simple actions that can be taken to manage it, a decrease in wasteful behavior will result that will yield measurable savings.

- Action Recommendations
 - Create an informational pamphlet addressing energy issues and simple conservation efforts to distribute to all incoming students
 - Discuss conservation issues in faculty meetings
 - Post stickers with conservation messages on light switches, copiers, computers and other intermittently used equipment

B) Priority Outcome: Use current technology to make conservation easier

Despite education efforts, people often still forget to conserve energy. Technology can be a great aid in facilitating conservation efforts. The up-front cost of purchasing and installing sensors that detect human activity typically is paid back in the short term by reduced energy costs.

- Action Recommendations
 - Fully equip buildings on campus with activity sensors and assess energy reductions.

C) Priority Outcome: Develop an incentives program to encourage campus-wide conservation

Faculty, staff and students should be acknowledged and rewarded for proactive beneficial behavior. This system creates a positive feedback loop, as campus conservation efforts save energy and money, which the University then can reinvest in incentives and other projects.

- Action Recommendations
 - Establish building-specific energy competitions (for example, the dormitory that uses the least energy per capita would be rewarded with funds, recreational equipment or another appropriate incentive)
 - Offices that make a commitment to using energy-conserving features will receive added funds or other appropriate compensation

D) Priority Outcome: Engage campus personnel in promoting sustainability goals

Campus conservation efforts would benefit greatly from faculty, staff or student support and oversight. By utilizing the abilities of dedicated University members, it is expected that energy conservation will improve and more money will be saved.

- Action Recommendations
 - Set up a student work-study program to target conservation goals
 - Hire an Energy and Resources Manager to work with administration and facilities staff to identify and coordinate important conservation efforts

2. Use Energy Efficiently

A) Priority Outcome: Reduce energy use in existing buildings

The buildings on our campus require considerable energy input, demanding extensive oil consumption and costing the University millions of dollars. By adopting progressive efficiency measures, significant amounts of money can be saved while minimizing our negative environmental impact.

- Action Recommendations
 - Within existing buildings, reduce source energy by 20% by 2007
 - Within new buildings, reduce source energy relative to 2000 levels by 40%
 - Reduce campus per capita energy usage by 15% by 2007
 - Improve existing chiller plant system efficiencies by 15% relative to current usage by 2007
 - Require new chiller plant system efficiencies to exceed Model Energy Code (MEC) by 15%, to be implemented immediately
 - Require unit A/C efficiencies to exceed MEC by 15% or meet CEE Tier II efficiencies by 2007
 - Reduce indoor lighting density to average of 1.0 W/ft² by 2007
 - Upgrade outdoor lighting efficiency to current MEC levels by 2007
 - Reduce indoor lighting operating hours by 15% in kWh/ft² relative to 2000 usage
 - Provide annually updated indicators of progress being made

3. Generate Renewable Energy

A) Priority Outcome: Use renewable resources to offset fossil-fuel dependence

Despite any improvements in conservation and efficiency, the University still will be reliant primarily on burning oil for its energy consumption. It is recognized that this dependency is inherently unstable, and supportive of an industry that adversely is altering the global climate and greater environment. Therefore, it is the University's responsibility to support renewable energy development to the greatest degree possible.

- Action Recommendations:
 - Generate 5% of campus electricity from on-campus renewable energy sources
 - Retrofit the Hawai'i Energy House to generate 100% of its own electricity
 - Install solar water-heating features for one building on campus

1. "Requesting a Preliminary Assessment of Energy Sustainability in Hawaii," Center for a Sustainable Future
2. UHM Fiscal Report 2001-2002 www.opala.org

Strategic Goal 2: Practice Sustainable Water Use

Vision for Sustainability

The University of Hawai'i at Manoa will ensure that our water is used as efficiently as possible, that gray water and rainwater are reused on campus, and that our contributions to water pollution are minimized to the fullest extent possible.

What are the issues?

The expression “E malama I ka wai” (Cherish the Water) was a core principle of the ancient Hawaiians, as they fully recognized the precious nature of fresh water on an isolated island. However, the last century of economic development on the Hawaiian Islands has progressed with little regard to the integrity of the water that has allowed our society to prosper. Wasteful and



excessive use has been common practice for many years, but we are quickly discovering that the world of tomorrow cannot function with the rules of yesterday. With O'ahu's population nearing one million, it is no small task to meet today's surging water demand. Groundwater supplies the majority of the freshwater used on the island, and it is often being removed at a rate faster than it is being replenished: this is the most basic idea of *unsustainable* practice. In addition, pollution from sources such as motor oil, pesticides, and cleaning chemicals filter into our water and create closed beaches, dead wildlife, and poisoned drinking water. If we continue this pattern of negligent use, it is only a matter of time before O'ahu will lack the water resources necessary to facilitate our society and our University.

What are the opportunities?

The University of Hawai'i at Manoa currently consumes one million gallons of water each day, a total that bears an annual cost of \$1,023,553 (FY2001-2002) for acquisition and sewer system removal.¹ This

is a figure that can be cut substantially, and it is not difficult to think of more productive uses for this money. Perhaps the greatest opportunity to reduce our water consumption is to work in partnership with the Honolulu Board of Water Supply and utilize their knowledge and expertise in addressing these issues. There are many strategies to reduce our water consumption, such as installing low-flow appliances and designing water-efficient landscaping projects. We can effectively reduce our water bill by taking advantage of the water resources that we already have on campus by incorporating projects such as rain water catchment or gray water reuse for irrigation. Finally, we can ensure the protection of our watershed by identifying and eliminating sources of water pollution.

Priority Outcomes and Action Recommendations

1. Conserve Water Used in Buildings

The Manoa campus currently spends \$454,175 (FY2001-2002) annually to acquire water, much of which is wasted or used inefficiently and then drained into our sewer system to be pumped into the ocean.² By incorporating progressive water efficiency measures it is expected that the University will save large sums of money while reflecting a commitment towards preserving O`ahu's water resources.

A) Priority Outcome: Complete Partnership with Honolulu Board of Water Supply

The University is currently working with the Honolulu Board of Water Supply (HBWS) to address indoor water use issues. It is recognized that the Manoa campus adds a significant demand to the island's water resource base, and HBWS has established an action plan that will save them money, save UHM money, and ultimately help to save our groundwater supplies. The following is a summary of the HBWS action plan to reduce indoor water usage:

- Audit building water fixtures
- Meter water use within buildings
- Repair leaks
- Retrofit all sinks, toilets, and showers with efficient models

B) Priority Outcome: Educate University Members about Water Conservation

While the HBWS partnership will achieve significant water savings, there are other ways for UHM to save water that is used indoors. Water is often used wastefully, such as running the sink needlessly or

flushing small waste items in the toilet. Through simple educational efforts we can help to ensure that water on campus is used wisely.

- Action Recommendations:
 - Organize annual Water Day to bring awareness to water issues and promote conservation
 - Educate faculty, students and staff about water conservation issues
 - Establish service learning project for students to work on water use issues

2. Conserve Water Used for Outdoor Applications

A significant portion of the University's water consumption is used outdoors, primarily for irrigation of the plants on campus. The following steps provide attainable solutions that will minimize the amount of water we use for these purposes.

A) Priority Outcome: Form Partnership with HBWS to minimize water used outdoors.

After the indoor water use projects are completed with HBWS, a similar project on outdoor water use should be established. Again, this is an issue that is in the best interest of both parties involved and it is expected that we can cut outdoor water use significantly.

- Action Recommendations:
 - Install meters for and collect data from all outdoor sources of water use
 - Identify and repair leaking pipes
 - Research watering schedules for maximum efficiency
 - Design and retrofit landscaping projects to use drip irrigation
 - Install a prominent example of xeriscopic landscaping
 - Discourage the use of hoses for cleaning purposes

3. Maximize Use of On-Campus Water

While we are paying large sums of money to import and export our water, there are several opportunities to use the water that we already have and consequently lower our bills.

A) Priority Outcome: Reuse water from buildings for outdoor applications

The University pays \$2.49 for every thousand gallons of water that leaves the campus through the sewer system, adding up to an annual total of \$569,378 (FY2001-2002).³ The reality is that much of this sewage is gray water that could be diverted for reuse in applications such as irrigation or fountains, and consequently offset our input and output costs of water.

- Action Recommendations:
 - Install gray water fountain feature at Kuykendall Courtyard
 - Set up building-integrated gray water reuse systems for irrigation around the building
 - Install Eco-Engine at the Lyon Arboretum (see proposal)

B) Priority Outcome: Use new sources of water for outdoor applications

The University currently acquires its water from the Board of Water Supply. In order to offset the large sums of money that we pay for this water, we can utilize water resources that are present on campus, such as our pond and stream. Another simple method of accomplishing this goal is to catch rainwater for irrigation. The University receives 40 inches of rainfall every year, most of which runs off into storm drains and is added to our sewer system. By using the roofs of our buildings as rain collection systems, the University can generate a significant portion of its own water while saving money. Using only 10,000 square feet of roof area (100 feet by 100 feet) to offset purchased irrigation water, the University could generate 3,000,000 gallons per year and save over \$3000 dollars.⁴

- Action Recommendations:
 - Retrofit the Energy House to have a fully functioning rain catchment system.
 - Install rain catchment system at Kuykendall Courtyard.
 - Use excess water from the quarry pond to irrigate a new landscaping feature in the surrounding area

4. Protect the Watershed

The boundaries of the Manoa ahupua`a are determined by the valley's geology, not the property lines. Anything that we do to the water on our campus will be carried to the downstream community. It is our responsibility to ensure that we do not compromise the quality of the water flowing off of our campus.

A) Priority Outcome: Minimize water pollution on campus

Pollution often originates in localized areas, such as parking lots or specific landscaped areas that are controlled with pesticides. These pollutants are often carried away by runoff into streams and storm sewers that flow to the Ala Wai and ocean. The University has the responsibility to protect the water that leaves the campus, to put the principle of “E malama I ka wai” into action.

- Action Recommendations:
 - Have students conduct pollution source study of the UHM campus
 - Only use pest control chemicals that are non toxic and break down rapidly
 - Provide covered parking for vehicles to reduce parking lot runoff
 - Cover all garbage containers
 - Research and update the Hazardous Materials removal process
 - Create constructed wetlands that naturally clean runoff water

B) Priority Outcome: Minimize Wasteful Runoff

With expansive areas of paved surfaces, the footprint of the University alters the natural flow of water from the Manoa valley.

- Action Recommendations:
 - Change back the drainage system alongside the Biomedical Building
 - Utilize permeable surfaces in all new pavement applications

C) Priority Outcome: Work with the ahupua`a community

The University has a responsibility to ensure that its operations are conducive to the health of this valley’s watershed, and can better accomplish this goal by working with our community.

- Action Recommendations:
 - Form partnerships with organizations that are connected to UHM property, such as Malama O Manoa, which focuses on managing the resources of the Manoa ahupua`a
 - Develop a community Manoa Stream enhancement project
 - Develop a watershed health monitoring program for the UHM campus

1. UHM Fiscal Report 2001-2002
2. UHM Fiscal Report 2001-2002

Strategic Goal 3: Minimize Negative Impact on the Land

Vision for Sustainability

What are the issues?

What are the opportunities?

Priority Outcomes and Action Recommendations

Strategic Goal 4: Create Sustainable Buildings

Vision for Sustainability

The University of Hawai'i at Manoa will be committed to creating buildings that reflect an awareness of environmental and human health issues. By designing and retrofitting our buildings to be exemplary models of functional efficiency, wise resource use, and conducive to human well-being, we are establishing ourselves as a University that is committed to environmental, economic and social prosperity.

What are the issues?

The building industry has a tremendous impact on our planet: 40% of the raw materials used globally are for construction projects, and 60% of U.S. electricity is consumed within buildings.¹ These realities have caused widespread ecological problems, from species extinctions to carbon-sink reductions and petroleum burning that contribute to global warming. On the other end of the spectrum, the waste generated from construction and demolition projects accounts for a full third of the garbage in America, a fact that is demanding new expansive landfills to cover and pollute our land. Beyond these issues, the EPA and the Occupational Safety and Health Administration consider Sick Building Syndrome, caused from interior toxins, to be one of the most serious environmental threats to people in America. In addition, the building environment can dramatically affect productivity and performance.

What are the opportunities?

The University continually creates new buildings and undertakes retrofitting projects in order to maintain its role as a cutting-edge institution of education and research. If we choose to engage in construction projects that ignore environmental and human health, we are choosing an unsustainable path that will waste money, resources, time and energy. If instead, however, we decide to take a progressive approach and require that our buildings function efficiently and healthily, we can take a great step towards a sustainable future. Through simple design choices, multifaceted benefits can arise. For instance, designing buildings to use daylighting saves money on electricity and often reduces construction costs. In addition, numerous studies have shown that day-lit buildings are conducive to significantly higher productivity amongst workers and improved test scores among students. In order to

promote sustainable building projects, the United States Green Building Council (USGBC) has developed the LEED program, which provides the blueprint for Leadership in Energy & Environmental Design. This is a multi-tiered system that addresses the critical elements of designing sustainable buildings. These are: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, and the Innovation & Design Process. By enacting the specific actions established in the program, a building can become LEED qualified, and depending on the number of actions taken it is designated as Certified, Silver, Gold, or Platinum. A Certified building takes basic steps towards sustainability, while a Platinum building incorporates sustainability to the greatest degree possible. The LEED program provides a great opportunity for the University to make a strong commitment to environmental health and human well being. This can be accomplished most successfully by adapting a program that requires either some or all of our new construction and retrofit projects to meet LEED requirements.

Priority Outcomes and Action Recommendations

1. Design New Buildings to be Sustainable

A) Priority Outcome: Require new buildings to meet LEED certification standards.

With our current understanding of the environmental and human health problems created by standard building practices, it is irresponsible to continue erecting new structures that do not reflect an awareness or concern for these issues. Each new building is a blank slate that should be designed for maximum efficiency and minimum detrimental impact. By implementing “green” design features we can minimize our negative impact on the environment, save great deals of money in the long run, and ensure that all building occupants will not suffer from Sick Building Syndrome.

- Action Recommendations
 - Require the next new building project to meet LEED silver requirements.
 - Analyze costs and benefits of LEED project
 - Based on success, require all new buildings to meet LEED silver requirements.

2. Retrofit Existing Buildings to be Sustainable

A) Priority Outcome: Require all major renovation projects to create LEED certified buildings.

The University continually updates its buildings to meet new needs, and each renovation is a chance to make a building that incorporates sustainable elements. While upfront costs may be higher, there are

numerous places where money can be saved in the short term and especially in the long term. For example, by preserving and donating removed building materials to programs such as Habitat for Humanity, significant tax write-offs can be gained while minimizing land-fill waste and providing shelter for those in need. By adopting a commitment to sustainable renovation, the University will be on its way to having a campus full of “green” buildings.

- Action Recommendations

- Require the next renovation project to meet LEED silver requirements.
- Analyze costs and benefits of LEED project
- Based on success, require all new buildings to meet LEED silver requirements.



(photo by Craig T. Kojima)

Strategic Goal 5: Promote Alternative Transportation

Vision for Sustainability

The use of petroleum powered vehicles will be minimized as cleaner transportation options are promoted. The campus will have networked bicycle paths, mass transit will be encouraged, carpooling will be convenient, and campus vehicles will be run with alternative fuels.

What are the issues?

Modern day transportation has allowed urban and suburban areas to grow and prosper in the last century. The freedom of mobility has fundamentally changed how we interact with the world, and the personal automobile has become a staple of our culture. However, automobiles have brought about their fair share of problems. Eight million barrels of oil are burned each day in America, accounting for a full quarter of our greenhouse gas emissions. Pollution from cars has clogged the air and brought about skyrocketing numbers of cases of asthma, emphysema, heart disease and bronchial infections. Seven billion pounds of unrecycled scrap and waste are produced annually from cars. On a local note, just about everyone on Oahu has been stuck in the clogged road system during the ever-lengthening rush hour period and has reluctantly filled their vehicles time and again with increasingly expensive gasoline. The University of Hawai'i at Manoa is largely a commuter campus, adding an average of approximately 10,000 vehicles to the roads each day.¹

What are the opportunities?

When dealing with an entity as large and ubiquitous as the automobile industry, success can only be achieved by taking small but significant steps. While engineers and designers work on creating the next generation of efficient, alternatively fueled vehicles, there are tangible actions that we can take on a local level to start facilitating a more sustainable method of transportation. We can encourage bike riding for shorter distance commutes by creating attractive and user friendly bike paths. We can start purchasing campus vehicles that are the most efficient available. We can power diesel vehicles with fuel made locally from organic materials rather than imported, expensive, and dirty diesel. Ultimately, we can start by making the University an institution that welcomes the changing nature of transportation.

Priority Outcomes and Action Recommendations

1. Increase Use of Public Transportation and Mass Transit

Public transportation and mass transit provide increasingly attractive means of getting to and from the Manoa Campus. Between TheBus and the Rainbow Shuttle, we have the infrastructure necessary to provide convenient and reliable transportation options that can effectively minimize the number of personal vehicles and consequently reduce the transportation impacts on the surrounding community.

A) Priority Outcome: Research Mass Transit

In order to maximize the potential of our mass transit options, it is essential that we fully research the issues involved.

- Action Recommendations:
 - Conduct research on public transportation use at UHM and research on how to promote mass transit use
 - Do a survey to monitor bus and shuttle ridership

B) Priority Outcome: Increase use of TheBus

As residents of O`ahu, we are lucky to have access to TheBus, which was named America's Best Transit System for 2000-2001. While a number of University members do utilize TheBus services, there is great potential to increase bus ridership.

- Action Recommendations:
 - Convert UH ID cards to work as "smart card" bus passes
 - Provide annual student bus passes that are financed during registration
 - Make monthly and annual bus passes more desirable or less expensive for employees by offering incentives and purchasing through pre-tax payroll deductions

C) Priority Outcome: Increase use of the Rainbow Shuttle

The UHM's Rainbow Shuttle has the potential to minimize a great deal of on-campus driving, though it is acknowledged that there is room for improvement.

- Action Recommendations:

- Increase advertising for the shuttle
- Post a map of the routes and round-trip times of the campus shuttles on signs around campus
- Apply to the City and DTS for funding to supplement UH expenditures for campus shuttles

2. Encourage Car Pooling

Car pooling is an easy way to dramatically reduce the number of vehicles on the road and consequently make large reductions in petroleum use and pollution. If every person that drove to the campus found just one other driver to share the ride with, thousands of cars would be removed from the roads, thousands of gallons of gasoline would be saved each day, and countless hours of wasted commuting time can be eliminated.

A) Priority Outcome: Make Car Pooling Easy and Attractive

While many people are aware of the potential benefits of carpooling, it is not extensively practiced. The University currently offers 300 half-price car pool parking passes per year, and they are rarely all purchased. However, we can make simple changes to promote the common use of ride sharing.

- Action Recommendations:
 - Conduct research on methods of ride-sharing promotion
 - Establish ride-share matching service on the UHM website that allows people to identify University members who live near them and are willing to share rides
 - Raise non-car-pooling parking rates and lower car pool parking rates
 - Establish priority parking spaces for people who car pool
 - Publicize Van Pool and Cool Pool programs

3. Use Alternative Fuel Vehicles

It is recognized that petroleum fuels are damaging our environment and are expected to become increasingly expensive in the near future. Currently, federal law requires that 75% of newly acquired fleet vehicles of the University use alternative fuels, an encouraging commitment that we can improve upon.

A) Priority Outcome: Generate Fuel on Campus

On-site fuel generation has the potential to save large sums of money while protecting the environment through pollution prevention and waste reduction.

- Action Recommendations:
 - Use dining services waste oil to create bio-diesel, with a target of 20% bio-diesel use for diesel fueled campus vehicles by 2004.
 - Produce methanol from organic materials
 - Install solar powered charging station for electric vehicles on campus

4. Promote Bicycle Use and Walking

While progress with mass transit, car pooling, and alternative fuel vehicles are important elements of sustainable transportation, human-powered transport is the most conducive to environmental and human health.

A) Priority Outcome: Make bicycle transportation and walking easy and attractive

Many people are discouraged from biking due to simple inconveniences that can be easily remedied.

- Action Recommendations:
 - Create and maintain wide, shaded bicycle and pedestrian paths that form an interconnected network on the campus and connect to mass-transit stops
 - Work with city to make bike friendly lanes on the surrounding roads
 - Eliminate parking on one side of East West Road and Maile Way to create bike lanes
 - Build bicycle hubs with parking, servicing, showering and locker facilities at two strategic points on campus
 - Apply to the city, DTS, DOT and FHWA for funding to supplement UH expenditures on bicycle and walking projects

5. Reduce Need for Transportation to and from Campus

With appropriate technology and wise planning, we can minimize the need for transportation to and from the UHM campus.

A) Priority Outcome: Encourage faculty and students to work and learn close to home

- Action Recommendations:
 - Allow faculty to work from home, or offer 4-day work week options
 - Convert classes to distance-learning system
 - Set up satellite learning centers and offer UHM classes at community colleges

- Use internet web-casts or cable television to replace large lecture classes, particularly those before 10 a.m. when traffic is at its worst

6. Improve Parking Options for the UHM Campus

The current parking plan at UHM demands extensive use of valuable campus space and often impacts the surrounding community. By creating convenient parking areas that are located off campus, we can create a more attractive environment and minimize our impact on the community.

A) Priority Outcome: Establish off-campus parking areas

- Action Recommendations:
 - Encourage parking in off-campus lots that are serviced by shuttles and offer incentives for using these spaces (e.g., monthly passes at discounted rates, or car pooling discounts)
 - Negotiate parking terms and rates for off-campus community parking stalls with homeowners and businesses, and post the information on the UHM website
 - Identify large parking areas (such as Aloha Stadium) that are off campus, and provide service to campus via mass transit
 - Identify off-campus parking areas in partnership with the private sector (e.g., Safeway Manoa) for both students and shoppers

Strategic Goal 6: Minimize Material Waste

Vision for Sustainability

The University of Hawai'i at Manoa will close the resource gap by minimizing the amount of waste that is sent to landfills. The campus will be a working example of waste recycling, reuse and reduction in action.

What are the issues?

If you ask anybody on Oahu what the tallest man-made structure on the island is, chances are that they will name a building in downtown Honolulu. The truth, however, is that the structure is not even a building, but rather a pile of garbage. The Waimanalo Gulch landfill has been approved to grow as high as 430 feet, or 30 feet taller than building codes allow skyscrapers to stand on the island. We live in a consumptive culture, and under our current operations, this consumption produces an astonishing amount of trash – 1.5 million tons per year.¹ This is a figure that is much easier to comprehend when put in physical terms. Picture the Kamehameha highway, stretched for approximately 134 miles around Oahu, covered over both lanes to a depth of 17 feet. That is what 1.5 million tons of garbage looks like, and that is what we as residents of this beautiful island are piling up each and every year.² This sobering reality is not indicative of the principles of E Malama Pono, but rather revealing of a society that cares more about cheap and disposable consumption than the preservation of our small piece of paradise.

What are the opportunities?

From paper and worn out appliances to organic cuttings and food scraps, the University adds a huge amount of trash to this island. A significant portion of this “garbage” could easily be diverted towards recycling or reuse. This is a simple concept that is rich with benefits: landfill growth and pollution can be slowed, raw natural resources can be conserved, jobs can be created in the recycling sector, and

renewable fuel can be created from what would otherwise be dumped as toxic waste. Just as the University can mitigate the input of materials through green purchasing principles, we can commit to dealing with our output responsibly and sustainably. There are three primary strategies to accomplish this task. First, we can reduce the amount of garbage that we create to begin with. Second, we can reuse as much so-called garbage as possible. Finally, we can recycle the waste that remains. These simple methods can drastically reduce the amount of detritus that the University adds to places such as the Waimanalo Gulch.

Priority Outcomes and Action Recommendations

A) Priority Outcome: Reduce, reuse and recycle aluminum, glass, plastic, paper and cardboard

The University pays \$82 for each ton of trash dumped at the landfill, while recycling basic materials can actually generate income.

- Action Recommendations
 - Perform Disposal Analysis (free service from most garbage companies)
 - Form partnership with local recycling company (e.g. Island Recycling) to establish recycling program
 - Allocate space on campus for recycling operation (use parking lot space as parking is moved off campus)
 - Install cardboard baler on campus (easiest way to reduce trash)
 - Investigate biodegradable silverware and dishes for dining services

B) Priority Outcome: Process Wet Waste into Compost

It currently costs \$30 to dispose of each 50 gallon container of waste generated on campus, totaling \$700 each week. By composting wet waste, we can save money and generate a useful product.

- Action Recommendations
 - Investigate composting technologies
 - Install Earth Tub® recycling container
 - Conduct on-campus seminar about wet waste and composting
 - Use shredded documents in compost

C) Priority Outcome: Maximize the re-use of landscaping waste (biomass)

D) Priority Outcome: Reuse and recycle building materials from construction, renovation and demolition projects

E) Priority Outcome: Minimize the amount of furniture, appliances and other equipment sent to landfill

F) Priority Outcome: Manage the treatment and disposal of hazardous waste

1. www.opala.gov
2. calculations based on garbage density

Strategic Goal 7: Adopt Green Purchasing Policies

Vision for Sustainability

The University of Hawai'i at Manoa will reflect its commitment to environmental health in all purchases of goods and services. In addition, we will invest in environmentally responsible businesses.

What are the issues?

It is well known that Americans buy more goods than the people of any other nation. From automobiles to televisions, we live in a culture of consumption. Material goods correspond with a high quality of life, and few people would argue that we don't need our modern products. Here at the University of Hawai'i, we require a massive amount of material input to keep our fine institution running. From computers to printer paper, air conditioners to food vending services, the University plays a significant role in the market economy of Hawai'i and the greater world. Basic economics describes how supply and demand naturally seek a balance in order to keep producers and consumers happy. By requiring certain material goods for operation, the University creates a market demand that is then matched by the supply of these goods. In this day and age, however, we need to look beyond basic economics and impose qualitative decisions onto our market activity. If the University orders 1000 reams of virgin printer paper, this demand is matched by a supply that requires the logging of a forest. When the University buys non-organic food products, a demand is created that results in toxic chemicals infiltrating the soil and water and being digested by the consumers. Anytime the University buys a good that has to be shipped in from the mainland, the resulting supply consumes enormous amounts of energy and emits greenhouse gases into our fragile atmosphere. Ultimately, our consumption choices have extensive consequences that are not always obvious and rarely questioned.

What are the opportunities?

We are by no means advocating the establishment of an ascetic University. Instead, we propose that we should purchase our products consciously and responsibly. Perhaps the most important votes that we can cast come from our checkbook, and by demanding environmentally responsible goods we can make great strides towards the realization of sustainability. It is a simple matter of being a conscientious consumer and putting our money where our mouth is. The University needs a large supply of paper to operate. However, we don't need it to be made of virgin wood, and by purchasing post-consumer recycled paper we can make a dent in the destruction of the world's forests. If we establish a preference for locally produced goods, we can bolster our local economy while eliminating a demand for energy intensive shipping. By investing in successful companies that are practicing environmentally responsible business, we can support the innovators who are working to create a better world while we receive a return on our investment.

Priority Outcomes and Action Recommendations

A) Priority Outcome: Buy Recycled and Recyclable Products

- Action Recommendations

B) Priority Outcome: Purchase Resource Efficient Goods

- Action Recommendations
 - Purchase only Energy Star certified electronics

C) Priority Outcome: Purchase Non-Toxic Goods

- Action Recommendations

Strategic Goal 8: Enhance the Quality of the Campus Experience

Vision for Sustainability

We will create a beautiful and people-friendly campus environment that reflects a Hawaiian sense of place, demonstrates sustainable practice, and encourages lively conversation and campus/community networking.

What are the Issues?

The original UHM campus was designed and built at a time when Manoa was a gracious neighborhood located in a green and productive agricultural valley. Known for its good soil, abundant pure water and lush tropical vegetation, Manoa represented a place where people lived in harmony with each other and consistent with the Hawaiian value of aloha aina. As the pace of development accelerated after statehood, Manoa was rapidly transformed into a suburban community, and the University became an urban commuter campus that lost its sense of community and connection to the land. Today, many people feel that the campus is basically uninviting, with shabby infrastructure, poor choices of food, and few places to gather. Few UHM employees remain on campus after hours, and except for special athletic or cultural events, the community does not feel welcome on campus.

What are the opportunities?

Throughout the University of Hawai'i strategic planning meetings and in our discussions concerning the development of the Sustainability Charter, we have repeatedly encountered several recurring themes related to the quality of the campus experience. There is a consistent desire for a better-maintained and

more beautiful campus, together with an enhanced sense of place that reflects Hawaii's unique cultural and ecological traditions and values. People would like to see more trees and shrubs in the many barren areas, as well as more attractive plantings that are cared for and nurtured. There has also been a consistent desire for interesting open-air and roofed gathering places that would attract faculty, staff, students and community members to a setting where lively conversation, good food, and quiet reflection are supported and encouraged. Many individuals desired a wider selection of tasty and nutritious food choices, and a greater diversity of beverages in café-type settings. Most importantly, people who work on, learn at, and visit UHM want a campus that is alive, vibrant, and has a sense of positive and progressive movement forward. They want a campus that is a role model of the best ideas and traditions that our society has to offer, a place where art and culture are present, and where people are engaged in free and spirited cross-cultural communication.

Priority Outcomes and Action Recommendations

A) Priority Outcome: Create Gathering Places

The campus of UHM could benefit greatly from added places of congregation for the discourse that is so crucial to an educational institution. By developing new meeting areas to incorporate sustainable design options, people will take away an understanding of the University's environmental commitment and will hopefully apply this awareness to their daily lives.



- Action Recommendations:

- Establish an attractive and welcoming gathering place at Kuykendall Courtyard.

B) Priority Outcome: Provide Organic Food Options

There are numerous food vending services available on the Manoa campus, though none of them offer an extensive selection of organic or locally grown food items. There is a growing demand for these healthy and responsible foods, as there is a burgeoning awareness about the detriments of chemical-based farming.

- Action Recommendations:

- Establish a food vending service at Kuykendall Courtyard that has organic and locally grown options.

C) Priority Outcome: Allow student, faculty, and staff access to gardening land space.

D) Priority Outcome: Educate people outside of the classroom.

Strategic Goal 9: Teach the Principles of Sustainability

Vision for Sustainability

The University of Hawaii at Manoa will place sustainability concepts at the core of all education, research and outreach efforts.

What are the issues?

Much of the current debate about educational standards and reforms is driven by the belief that we must prepare the young only to compete effectively in the global economy. That done, all will be well, or so it is assumed. But there are better reasons to reform education, which have to do with the rapid decline in the habitability of the earth. The kind of discipline-centric education that enabled us to industrialize the earth will not necessarily help us heal the damage caused by industrialization. It will take “nothing less than the re-education of humankind.”⁴ Today’s students will live in a world that is as different from that of today as today is from the world of our grandparents. For this, they will need the tools to build economies that are resilient and sustainable and environmentally sound.

What are the opportunities?

The University of Hawaii has a responsibility for educating the next generation of responsible citizens, leaders and scientists to recognize and understand that the Earth we inhabit is finite, that humankind is having a perceptible and damaging impact on its environment, and that we must begin now to reverse this process and establish principles and practices to guide our daily lives and future decision-making, in order to sustain the world as we know it for future generations. To achieve this goal will require a new

educational paradigm involving cooperation across disciplines, creating opportunities for students to learn and experience new ways of viewing the world in which they live. It also will require an unprecedented level of leadership and commitment from the university community aimed at creating change by:

- 1) Instituting programs and new courses that will offer participants the chance to suspend their status as disciplinary specialists and be exposed to new concepts and ideas in an interdisciplinary learning environment
- 2) Engaging young people and faculty working together with the community in efforts to address and solve real world problems
- 3) Developing a scientifically, socially and politically literate citizenry of business, educational, government and community leaders who understand the nature of the crisis we face and are prepared to act responsibly in exercising stewardship over our precious natural resources

Priority Outcomes and Action Recommendations

1. Incorporate Sustainability into Existing and New Curriculum and Research

The university curriculum is at the heart of the educational process. It is the formal basis around which all learning is structured and takes place; it is the core where fundamental values are developed and nurtured. Despite growing public concern over the environment and loss of habitat and biological diversity, universities continue to graduate a large percentage of students who have no idea how their personal and professional actions are intertwined with and affect the vital signs of the Earth. Infusing the UHM curriculum with the concepts of sustainability is a daunting challenge, but if successful, it holds the promise of producing an educated and informed citizenry for the future that is far more committed and equipped to deal with the world in which it lives, and to provide for the generations to come.

A) Priority Outcome: Develop an undergraduate and graduate curriculum that emphasizes sustainability and prepares students to be environmentally responsible citizens in a society in which environmental protection and economic development are complementary rather than antagonistic objectives

- Action Recommendations
 - Develop an upper-division 400-level course offering for undergraduates and graduate students focused on contemporary case studies in sustainability
 - Establish, as part of the general education requirements, a requirement that all students should know how the earth works as a physical system and what it takes to build ecologically resilient communities and economies
 - Expand and enrich the Global Environmental Sciences undergraduate degree program
 - Support the development of the Coastal Resources graduate degree program and build connections to relevant undergraduate degree programs
 - Strengthen connections to the University certificate program in Environmental Studies with relevant degree programs
 - Provide help and assistance to UHM faculty in building relevant sustainability concepts, ideas and issues into the curricula and course offerings of all departments, schools and colleges of the University

B) Priority Outcome: Encourage graduate research in topics and areas relating to sustainability

- Action Recommendations
 - Provide financial incentives for research and campus projects that promote campus, community and state sustainability
 - Encourage interdisciplinary research projects that integrate a physical science focus with social science, architecture, law and other disciplines
 - Encourage graduate students to undertake mission-directed research that supports and encourages sustainable economic and environmental development for the state and region
 - Publish an annual University report detailing the contribution of research and campus sustainability projects of the University to the realization of economic and environmental sustainability within the state and region

2. Link with the Community through an Education and Outreach Program

Hawaii faces a broad range of critical environmental and ecological problems. Population growth, development pressures, pollution, over-exploitation of resources including water, energy and fisheries, and loss of our rich biological diversity are impinging on our future quality of life and, importantly, our prospective economic viability. The University represents a tremendous resource that can identify and

disseminate solutions to head off these impending crises. By supporting our faculty and students in working together with the community, we can build the capability to correct detrimental trends and create a stronger social and economic base for the state. A community-based education and outreach program provides a means for uniting the University and the community in a mutually beneficial bond, allowing for the transfer of accumulated knowledge and research results to facilitate informed decision-making and the development of balanced environmental and economic development strategies. These activities in turn serve as part of the educational process as well, enriching it in ways that transcend traditional classroom approaches.

A) Priority Outcome: Establish a community-based sustainability education program

- Action Recommendations
 - Develop and offer to the community a series of continuing education credit courses addressing local sustainability issues
 - Make available courses and other related educational material through distance learning via public television programs and video-streaming
 - Develop on-line interactive educational material and information to be offered through the institution of a sustainable Hawai`i website

B) Priority Outcome: Develop community-based sustainability outreach projects

Project activities provide real-world opportunities to address and solve current and emerging problems. They benefit the community and provide relevant challenges to University researchers.

- Action Recommendations
 - Establish a University-sponsored lecture series in contemporary issues of sustainability facing the community, state and nation
 - Commit the University to developing and publishing annually indicators characterizing the current status of the state in terms of environmental and economic sustainability
 - Create a multidisciplinary “Virtual Center” that focuses University studies and research on issues related to sustainability and the future use and development of the natural resources of the state
 - Establish a University/community committee to identify and prioritize projects and activities that support campus, neighborhood, city and state sustainability
 - Utilize faculty to link University sustainability efforts to the community

3. Create Environmentally Literate Leaders

Educating future leaders is what a university is all about. However, there are vital environmental issues confronting us now that must be addressed immediately by our current executives and administrators. It is imperative that the University develop a scientifically, socially and politically literate citizenry of business, educational, government and community leaders who understand the nature of the crises we face and are prepared to act responsibly in exercising stewardship over our precious natural resources.

A) Priority Outcome: Transfer the knowledge sourced at the University to business, educational, government and community leaders

- Action Recommendations:
 - Better link the resources of the University to enhance the capacity of city, state and federal governments to achieve economic and environmental sustainability
 - Create incentives for faculty to direct their service activities toward working with government, business and community leaders in addressing issues of sustainability
 - Develop a university-government-business roundtable to address issues in sustainability facing the state

ⁱ Orr, David W., Earth in Mind: On Education, Environment, and the Human Prospect, Island Press, Washington, D.C., 1994; and Kennedy, Paul, Preparing for the Twenty-First Century, Random House, New York, 1993.