

Voyage to Sustainability

The Greening of the Presidio:

A First Step



National Park Service and the U.S. Department of Energy, Federal Energy Management Program

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Foreword

A new day is dawning for the Presidio of San Francisco, a former military base in California that is now a unit of the Golden Gate National Recreation Area. This priceless treasure encompasses more than 550 historic structures on 1,487 acres overlooking San Francisco Bay at the southern end of the Golden Gate Bridge. Today, the one-time army post is pioneering a new mission as a working model of a sustainable community. By becoming a prototype of sustainability, the Presidio is breathing energy into an abstract concept.

A number of plans, projects, and documents served as initial guides to the Presidio's transformation. One is this report of work done by more than 100 professionals in various fields who spent three intensive days in 1995 at a charrette addressing the question of how to make the concept of sustainability a reality at the Presidio.

To apply the concept, everyone involved in shaping the transformation needed a shared understanding of the term. A definition popularized in 1987 by the Brundtland Commission on Sustainability was adapted to read: "A sustainable community is one that values and measures its resources (environmental, economic, and human) to improve the quality of life in the present without compromising the ability of future generations to meet their own needs."

The members of the charrette adopted this as their working definition while recognizing that the achievement of sustainability is a dynamic process, not a fixed goal. At any given time, progress achieved at the Presidio will represent a turning point along the road.

Reaching each of these milestones will take time, and obstacles and constraints may be encountered and slow progress. Occasional tradeoffs will be necessary; yet the fundamental direction—the determination to achieve a sustainable community—will remain clear.

To transform the abstract concept into reality, our approach was to define it through specific examples and applications. This document describes a few of the first steps we are taking. Recognizing that these initial actions are just a beginning, we welcome your participation in achieving the next steps.

The purpose of the first "greening" charrette was to identify specific actions that can lead to tangible results such as improvements in energy efficiency, waste reduction, transportation, and community redevelopment. Since the meeting in 1995, much progress has been made toward realizing some of these actions. At the same time, additional challenges and opportunities have become evident, such as the incorporation of social equity and cultural diversity into the dual goals of economic self-sufficiency and ecological restoration.

The first light of the Presidio's new day is already dawning. At the park's northwestern corner, signs point to native plants sowed to heal the Presidio's fragile soils. Across the park at the Thoreau Center for Sustainability, a unique partnership has transformed an historic building into a real-life model of sustainability. The main 75,000-square-foot structure in Phase 1, formerly a hospital, houses the Tides Foundation and organizations committed to sustainability, such as the Energy Foundation, Materials for the Future, and the

The Presidio will be a beacon to the future guiding this region and the nation to sustainability.



— **John Reynolds**

*Deputy Director,
National Park Service*



Institute for Global Communications. Renovations of the Presidio's residential homes have begun as well. In addition, Phase 2 of the Thoreau Center has been completed, incorporating an additional 85,000 square feet with tenants such as San Francisco Baykeeper and Lighthawk. These rehabilitations of historic buildings drive home the message that every home and office can conserve energy while remaining affordable.

Conversion of the Presidio offers an unparalleled opportunity to establish a model to inspire communities near and far. Military bases, national parks, and municipalities in transition can look to the Presidio for real-life ideas for rekindling vital communities. The new park is joining cities such as Seattle and Chattanooga that are guiding America toward the future. The Presidio is facing and meeting the same challenges the nation itself will face and meet in the twenty-first century. The Presidio's transformation is a microcosm of the nation's journey as we improve our lives while insuring that the "footprints" left by our actions do not detract from the needs of present and future generations.

The Presidio represents a special opportunity because of the U.S. National Park Service's educational mission. Rangers at national parks often serve as interpreters informing the public about natural and cultural environments. The Presidio, as a unit of the Golden Gate National Recreation Area (GGNRA) and therefore the National Park System, is uniquely suited to supplement that educational mission by furthering understanding of sustainability. Each year, more than 20 million people visit the Golden Gate National Recreation Area. Of these, eight million will include the Presidio as a highlight of their sojourn in the region. Visitors who tour the Presidio will see sustain-

able principles in action. The message they take home may affect the destiny of their own communities.

The future belongs to the young. Children accompanying their parents on visits to the park will absorb its message. Moreover, through groups like AmeriCorps' Presidio Leadership Center and the San Francisco Conservation Corps, young people are becoming integral to the process of creating a working model of sustainability.

Adults and children who live at the Presidio, work here, visit the park, or reside in the neighborhood are embarking on a great voyage of discovery together. They are the explorers who will scout the way to a better future.

We hope that, in reading this, you will be encouraged to participate in the transformation of this special place and to work with the U.S. National Park Service and the Presidio Trust in realizing the Presidio's unique role as a gateway to tomorrow.

A Glimpse of the Future

Visitors arriving at the Presidio—perhaps by electric shuttle or water taxi—disembark at one of the park’s strategically located transit hubs. Information kiosks provide facts about available energy-efficient modes of transportation, such as electric bicycles. Some who rent an electric bike to tour the park stop for lunch at a sustainably designed picnic grounds. Awaiting them is a delightful adventure as they find out how they can experience the outdoors while producing “zero waste.” Employees of companies and organizations headquartered at the Presidio work in buildings constructed of environmentally sound materials that preserve the Presidio’s history while maximizing the use of natural energy and light. Visitors and residents alike are offered opportunities to learn about sustainability through public events such as the Bioneers Conference, an annual meeting of “biological pioneers using nature to heal nature,” and public exhibits such as the Living and Building Center, which will provide information on practices individuals can apply in their daily lives.

Some of this vision is already a reality at the Presidio. Now it is time to take the next steps.



Recent Presidio History

In 1988, the federal Base Realignment and Closure Commission (BRAC) announced that the Presidio of San Francisco was to be closed as a military installation. After two centuries of military rule spanning the era of Spanish sovereignty and the years of Mexican dominion and finally American jurisdiction, the Presidio was to become part of the National Park System as a unit of the Golden Gate National Recreation Area.¹

General Management Plan

The U.S. National Park Service developed a General Management Plan (GMP) for the Presidio, as it does for all new additions to the National Park System. The process took four years from 1990 to 1994. Thousands of people participated in public meetings, workshops, and an environmental review process that led to the final plan, *Creating a Park for the 21st Century—From Military Post to National Park*. In September 1994, the Presidio was officially incorporated into the National Park System and embarked on its new mission.

Presidio Today

Motivated by concerns about the long-term viability of \$25 million in annual appropriations to operate the Presidio, Congress established in 1996 a unique management structure for this park unit. Management of

1988	1990	1993	August 1994
Base Realignment and Closure Commission (BRAC) announcement—Presidio slated for closure	Park planning and transition process initiated	Draft General Management Plan for Presidio released	Record of Decision on Final GMP



the majority of the land (referred to as “Area B” on the map found in the appendix) was assigned to a federal, wholly-owned government corporation called the Presidio Trust. Authorized to facilitate redevelopment of the Presidio, the Presidio Trust is structured to focus primarily on leasing, property management, financing, and day-to-day operations.

As of July 1, 1998, the Trust will assume stewardship and management responsibility for Area B from the U.S. National Park Service. The NPS retains its charge to preserve the natural systems, interpret the site’s unique natural and cultural legacy, and manage the coastal areas (designated “Area A” on the map). Congress mandated that the Trust, in its new partnership role with the U.S. National Park Service, become financially self sufficient within 15 years and “manage [the Presidio] . . . in accordance with the general objectives of the General Management Plan.”

Vision for the Presidio

The Presidio General Management Plan is based on a unified vision with three key elements. The first envisions the Presidio as a Center for Research and Learning, “a dynamic setting for institutions dedicated to research, training, education, policy formulation, and demonstration activities addressing the world’s most critical environmental, social, and cultural issues.”

Second, as a Great Urban Park, “the Presidio’s distinctive historic buildings, diverse natural resources, and abundant recreational features will be preserved to perpetuate its value as a world-class landmark.”

The Presidio’s third function is to serve as a Working Model of Sustainability, a place where the public will be able to experience the abstract concept coming to life. “Opportunities to showcase sustainability at the Presidio will abound—in the programs offered on site; through an environmentally responsible transportation strategy; in rehabilitation and operation of its buildings and infrastructure, and restoration of its natural system; and in the actions of its tenants, residents, and visitors.”

The public’s expectation is that the Presidio will become “a global center dedicated to addressing the world’s most critical environmental, social, and cultural challenges.” Global environmental challenges such as the depletion of natural resources can lead to population migrations and regional conflicts, undermining international stability and indirectly threatening our nation’s security. There is a growing recognition that nation states can no longer base their security solely on military and political strength, but rather on stewardship of the planet’s natural and human resources. Achieving this broader stewardship ethic is increasingly becoming a necessary condition for sustained global peace.



<i>October 1994</i>	<i>June 1995</i>	<i>October 1995</i>	<i>March 1996</i>
Presidio becomes part of the U.S. National Park Service	U.S. Sixth Army departs from Presidio	Greening of Presidio Charrette held	Presidio Alliance for Sustainability emerges

The plan’s vision for the Presidio thus builds on its past as a military post and key component in our nation’s global defense strategy. Through promoting local understanding of sustainable decisions, principles, and practices, the new Presidio has the opportunity to serve as a cornerstone of the effort to turn “swords into plowshares.” The impact will be magnified since the Presidio stands at the doorstep of San Francisco and the Golden Gate, among the most visited destinations in the nation.

“Security is no longer based solely on political and military strength, but on stewardship of the world’s human and physical resources through global cooperation.”

*Citizens Summary
Final General Management Plan Amendment
Presidio of San Francisco
Golden Gate National Recreation Area*

Greening Charrette

In autumn 1995, the U.S. National Park Service convened a charrette to discuss ways to bring to life the concept of the Presidio as a Working Model of Sustainability. The goals were to formulate hands-on projects that would exemplify the opportunities for sustainable practices and to incorporate education on sustainability into all aspects of the experience of a

park resident, tenant, or visitor. The Greening of the Presidio Charrette, chaired by the U.S. National Park Service’s then-Deputy Director John Reynolds, brought together 100 leading architects, designers, energy experts, environmental consultants, transportation specialists, engineers, educators, exhibit designers, Presidio tenants, members of the neighboring community, students, and representatives of the U.S. National Park Service and U.S. Department of Energy.

The charrette’s teams explored six focus areas: transportation, waste minimization, rehabilitation of historic residential and nonresidential buildings, preservation and restoration of natural habitats, and community redevelopment. The teams developed visions for each category and then looked at specific projects. Their aim was to create a path for the Presidio to take, in the words of Mahatma Gandhi, “a small step in the right direction.”

The projects identified by the charrette teams, presented in the following pages, offer a map of possible routes for the park as it embarks on its historic voyage. Further implementation of the ideas lies in the hands of the Presidio community and the readers of this document. Join us in envisioning the potential of the Presidio of San Francisco as a pathfinder to the future.



Like the old story of stone soup, we emerged from our offices at the Presidio dragging a giant pot of water into the town center (the charrette) where the team members arrived with veggies and spices—their expertise and experience—to flavor the broth. Everyone took turns stirring and a community was united around a pot of hope for a sustainably evolving Presidio.



— *Aimee Vincent*
Park Volunteer,
Waste Prevention

November 1996	April 1997	July 1997	July 1998
Presidio Trust legislation enacted	Presidio Alliance enters into cooperative agreement with NPS	Presidio Trust board officially sworn in	Presidio Trust assumes principal management from the NPS



The Greening of the Presidio:

Steps in the Right Direction

Transportation

The Vision: A Clean Transportation Zone

Imagine the year is 2010. By now 2,000 residents live on the Presidio grounds. They reside in safe, quiet neighborhoods where they raise their families, run errands by electric tram, and walk or bicycle to and from work. On weekdays, 4,800 commuters arrive to work at the park's on-site companies and civic organizations. They take Bay Area Rapid Transit (BART) to the downtown Civic Center and then an electric trolley to the Presidio.

Weekdays and weekends, more than 23,000 visitors arrive daily to enjoy the park's many activities. Before embarking for the Presidio, they learn about it by accessing an electronic information service on their home computers or at their hotels. They read about the new transportation technologies demonstrated at the park, then travel to the park via ferries powered by compressed natural gas or electric trolleys from Fisherman's Wharf.

When they arrive at the Presidio and disembark at one of the central transportation hubs, they are greeted with various transportation options for touring or reaching a particular destination. They can board an electric tram or alternatively fueled shuttle, use an electric bike to assist with the Presidio's steep grades, hire a horse-drawn carriage to enhance the historical experience, or simply take an old-fashioned walk in the park. Each of these alternatives is part of a sustainable transportation infrastructure that is environmentally clean, energy efficient, safe, convenient, accessible, and affordable. Getting to the Presidio and traveling around the park is educational and, above all, fun!

Most cities are designed for cars, not people. The Presidio can begin to turn that around through a people-friendly, energy-efficient transportation system.



— **Robert Jarcho**
*Transportation
Coordinator,
Department of the Interior
Team Leader,*



Let's follow a day visitor, who arrives via the Bay Area transportation system and proceeds to the hub's electronic kiosk to find out where the visitors center and interactive technology demonstrations are located. She then hops on the electric open-air tram and arrives at the visitors center within minutes. After viewing the exhibits, she takes a pleasant walk to one of the many renovated historic structures in the park and enjoys a cappuccino or afternoon tea after an interpretive tour.

Or we can tag along as a participant at a conference on sustainable development reaches the Presidio by catching the alternatively fueled airport shuttle. Disembarking at the Presidio's conference center, he tunes into the park's information system and discovers that a concert is being held at the old parade grounds that evening. He catches the electric shuttle for an easy and quiet ride to the concert, or rents one of the bicycles provided at the conference center and secures it at a bike rack at the event site.

After a week of attending the conference and seeing many of San Francisco's attractions without the need of a rental car or the expense of numerous taxi rides, the conference participant may return home wondering if the family really needs a second car. If his community were to build a bicycle route with safe crossings over major roadways, the family members could bike to work and school.

One more: It is 8 a.m. and commuter travel is in full swing. As the driver for a commuter carpool crosses the Golden Gate Bridge, she looks at her watch and thinks back to 1995 and the traffic jams that were a daily event. As the car reaches the bridge's access ramp, the passengers in the car look down at the Presidio and are reminded of the changes that have taken place, thanks to planning that included the needs

of the community as well as the park. Meanwhile, the driver decides that maybe she will bring the kids to the Presidio this weekend for some rollerblading.

Transportation at the Presidio Today

Unlike most national parks, the Presidio is located in an urban setting and is already popular with joggers, bicyclists, and recreational walkers who live nearby. Others travel the Presidio's roads to reach a variety of destinations: windsurfers, kayakers, golfers, neighbors, school groups, conference participants, delivery truck drivers, people who attend special events, and commuters who use two main arteries that bisect the park.

A resolution signed by the federal agencies—Transportation, Energy, Interior, Army, and the General Services Administration—declared the Presidio a "Clean Transportation Zone." The resolution recognized that the park offers a significant opportunity for educating a broad cross-section of the public about clean transportation technologies.

In addition to serving a variety of users, transportation at the Presidio presents a number of challenges. Many of the park's roadways have two traffic lanes and are relatively narrow. Their historical significance imposes unique constraints on improvements. Because of the steep terrain, some roads intersect at odd angles that result in poor sight distances. Ensuring public safety and meeting the needs of neighbors and through-traffic are recognized as fundamental objectives of the U.S. National Park Service's transportation management plan. Refining the plan and implementing a self-funding transportation system will require a collaborative effort involving state and local transportation authorities, park neighbors, residents, and other park users.

The Transportation Plan

In a sustainable community, most daily transportation needs should be met by foot, bicycle, or public transportation. Public and private vehicles are powered by clean, renewable fuels.

Internal transportation needs within the Presidio involve a complex set of linkages to the rest of the park's infrastructure. Likewise, external transportation modes that provide access to and from the Presidio constitute a system with multiple linkages to the surrounding city and region. Although simple measures such as bicycle racks and bike routes can be developed, a holistic approach developed by an interdisciplinary regional team of stakeholders is needed to achieve a fully integrated transportation solution.

A sustainable system is one that integrates a number of alternative modes of transportation and includes a program of public information and education. This integrated system is achievable through a phased approach over several years. Reaching the milestones in each phase will require leadership in fostering partnerships with industry, state and local governments, utilities, the local community, and federal agencies. The phases described below are intended to be an outline of initial steps that could be taken to design and implement alternative transportation ideas that were discussed during the charrette. These ideas could bring the Presidio closer to becoming a "Clean Transportation Zone."

Phase 1 – Transportation Hubs

A key to achieving the vision is the establishment of transportation linkages, central transportation hubs, and a land use plan that clusters park facilities so that travel destinations are consolidated. For the initial

phase, the U.S. National Park Service already has been working with Presidio users and neighbors to identify potential locations for transportation hubs, facilities required at each hub such as bike lockers and rentals, transportation modes to and from each hub, and a well-defined circulation plan.

The goal of such a plan is "seamless transfers"—transitions that are convenient, smooth, easy, and fast—from the Bay Area's public transportation modes, other sites in the Golden Gate National Recreation Area, and major visitor destinations within the Presidio. Necessary first steps include analysis of traffic flows, planning for commuter traffic, consolidation of parking areas convenient to the transportation hubs, and perhaps the restriction of certain roadways to transportation modes such as bicycles and alternatively fueled vehicles. The hubs will be designed to minimize vehicular interaction with pedestrians and bicycles.

The hubs also will serve as centers for visitor information on sustainable transportation technologies. The visitors center will house an educational exhibit, including an information kiosk with printed materials. An initial step is to develop a prototype transportation hub and electric tram system. The tram would take visitors from the hub to various park exhibits and events as well as serve as an educational tool via signs in the vehicles and taped commentaries. Another early step is installation of an electric vehicle charging system for use by non-gasoline-powered vehicles in the park fleet.

Phase 2 – Refueling Station

During the second phase, a fast-fill refueling station will be established for vehicles powered by com-



pressed natural gas (CNG), as park fleets and those of park partners are converted. At this time, transportation hubs will become operational. Plans for an airport shuttle employing an alternatively fueled vehicle will begin. Consideration will be given to other important transportation linkages, such as van pools, and incentive programs to encourage people to leave personal automobiles at home. Recruitment of park transportation concessions that employ alternatively fueled vehicles is an important step, and a transportation management association will be created to link the interests of employees with those of visitors and operational providers.

A transportation event could be held at the Presidio to showcase state-of-the-art alternative vehicles of various kinds. The inaugural transportation exhibition held during the Presidio transition ceremony could become an annual event and include ongoing operational demonstrations throughout the year.

During the second phase, an electronic information kiosk would supplement or replace the visitor center display planned for the first phase. The electronic kiosk will provide access to information on shuttle schedules, location of park exhibits and service facilities, and a schedule of park events.

The establishment of walkways and bike paths within the Presidio to separate pedestrian and vehicular traffic is important during this phase. A parking permit system will discourage the use of automobiles on park grounds, and a transportation council will finalize a master transportation plan.

Phase 3 – Alternatively Fueled Vehicles

In the third phase, a fully integrated sustainable transportation system will emerge. The Presidio will

become a stop for several modes of public transportation, including a Bay Area ferry system. A fleet of alternatively fueled vehicles could transport visitors to and around the Presidio. Other attractions in the Golden Gate National Recreation Area, such as Muir Woods and East Fort Baker, would be included in a land- and water-based shuttle system to points of interest in local Bay Area communities.

Commuter traffic needs will be satisfied along with those of recreational users. The electronic traveler information systems will emerge at key GGNRA destinations and at local hotels. New types of signs will facilitate the movement of visitors from one location to another within the Presidio, to other parts of the GGNRA, and to parts of the city. The master transportation plan will be a road map for implementing and maintaining a system that serves the needs of the Presidio's many users, while enhancing preservation of the park's natural beauty and historical significance. The Presidio will become a model community that other parks and communities can emulate by drawing ideas for their own transportation systems.

Getting From Here to There

Accomplishments To Date

1. The development of a well-defined circulation plan based on analysis of traffic flows, commuter traffic, and parking areas is underway.
2. Bicycle routes have been designated with the cooperation of the Bicycle Transportation Group.
3. Road-testing and an energy analysis have been conducted to determine the benefit of electric shuttles within the park. A pilot electric tram program has been initiated and will become a regular week-

end feature for interpretive tours from the Main Post to Fort Point.

4. A consortium of partners and funders have enabled the park to install a quick-fill compressed natural gas fueling station at the Presidio. U.S. National Park Service vehicles are being converted to compressed natural gas.
5. The U.S. National Park Service and U.S. Department of Energy have set up a demonstration solar-powered charging station for electric vehicles near the Thoreau Center for Sustainability.
6. The Bay Area Air Quality Management District has awarded an initial funding grant for development of a “Greenlink” electric/hybrid shuttle between BART and the Presidio.
7. To improve public transportation access to the Presidio, the Thoreau Center Partners has developed a framework for a transportation management association in cooperation with the U.S. National Park Service, Fort Mason Foundation, and Metro Dynamics.

Next Steps

1. Formally establish a transportation management association as a 501(c)(3) project to work actively with the Presidio Trust and the U.S. National Park Service to improve transportation options and to realize an effective commuter link between BART and the Presidio.
2. Make more bicycle racks and lockers, bike maps, and signage of routes available throughout the park.
3. Institute a parking permit system and initiate removal of paved parking areas in accordance with the GMP, as efficient public transit links are provided.
4. Expand public transportation options to the Presidio to include alternatively fueled buses and improved tram, rail, and bike access along the Bay coastline; determine the feasibility of access by water shuttle.
5. Establish electronic traveler information systems internally and externally linked to TRAVNET, BART, the airports, hotels, and park partners; improve other internal circulation signage within the Presidio.
6. Create an interactive educational program on the impact of personal travel choices and the options available for access to the park.
7. Support ongoing demonstrations of alternative transportation technologies through park partner and special events programs.



Waste Minimization

The Vision: A Zero-Waste Park

A new employee arrives at the Presidio to work at an organization housed in a restored building. The first thing she notices as she enters the park is an information kiosk with a sign, “Welcome to the Presidio: A Zero-Waste Park.” Intrigued by this description of her new workplace, she reads on:

“Those of us who pass briefly or stay for a lifetime in this special place have a vision of the Presidio as a Zero-Waste Park. In nature there is no such thing as waste. Everything is food for something else. The ideal for the Presidio is to be a closed-loop system where little or nothing comes in, and little or nothing goes out. Below is a list of basic guidelines for waste prevention at the Presidio, and a map that highlights the Reuse and Recycling Depot, The Compost Demonstration Site, and a Sustainable Demolition Project in Progress with visiting hours and a number to call for tours.”

The guidelines are followed by a calendar of upcoming classes and events including a demonstration in Worm Composting and a Recycled Jewelry Fair.

The new employee begins to suspect that she is working at an unusual kind of place. Arriving at her office, she is even more convinced. To start, her assistant provides a lesson in operating the double-side copier. He brings out fact sheets about recycling procedures and no-waste purchasing guidelines, and tells her about a free computer software course that she can attend at the nearby training center to obtain more information. A co-worker presents a ceramic coffee mug engraved with her name and leads her to a vending machine with a sign that reads, “Zero-Waste Machine—Supply Your Own Cup.” All vending items have minimal packaging.

At lunchtime, her new supervisor takes her past a row of shops and points out the office supply store where her organization buys recycled paper and other environmentally friendly goods. They pass a repair shop and an artists cooperative on their way to the no-waste picnic supplies shop where they pick up a basket with a healthful lunch and durable dishes, thermos bottles, and utensils to be returned after they are used. They ride an electric tram to a scenic area overlooking the sea.

Near their picnic table, the new employee sees a sign that reads, “Be A Zero-Waste Visitor.” The sign supplies facts and information about waste prevention, as well as a map indicating where to find recycling and composting containers, a dishwashing station, and a composting toilet. The picnic tables and benches are engraved with the message, “Made with lumber fabricated from 100 percent recycled plastic soda bottles.”

As they eat, her new boss mentions that the wood chips mulching a nearby garden of native plants were made from a tree that fell in a forest near the picnic area. The new employee is interested, so her supervi-

sor adds that a local youth group built the border around the garden from salvaged lumber. Veterans are being trained in landscaping and gardening techniques while maintaining gardens throughout the park.

As the two leave, the new worker notes the closing message on the kiosk, “Leave nothing behind when you depart.” She decides to come back on the weekend to show her family this wondrous place.

Plans for a Zero-Waste Park

Americans represent only 5 percent of the world’s population but generate more than 30 percent of the world’s waste. Californians alone create about 46 million tons of trash every year, enough to fill two freeway lanes 100 feet deep from Oregon to Mexico. As San Francisco marches toward the state’s goal of 50 percent diversion of materials from landfills by the year 2000, cooperating with the local community to minimize waste is becoming increasingly important.

The creation of a zero-waste park by establishing a reuse, recycling, and composting infrastructure will result in opportunities for a variety of groups to participate. Sustainable materials will be sought for use in park furnishings and building rehabilitations.

Qualified park partners may be identified who can provide environmentally sound products and services in bulk to all tenants. Experienced educators and community advocates will be needed to spread the message of commitment to a zero-waste park and to help reach out to disadvantaged communities. Striving toward a zero-waste park may create new job opportunities for youth-at-risk, veterans, and persons with disabilities. The Presidio has a once-in-a-lifetime oppor-

tunity to showcase zero-waste practices while proving that waste prevention goes hand-in-hand with human, economic, and community development.

The time is now! In the early course of its redevelopment, the Presidio has the opportunity to design a waste management infrastructure proactively. The projects described below are actions that could solve important local problems while serving as a global example.

The Reuse and Recycling Depot

At a central park location, a Reuse and Recycling Depot will serve as a consolidation point for materials and as a gathering place for community members and visitors. Picture the Depot: Reusable materials are salvaged from building demolition and rehabilitation projects and brought to the depot to have their life and usefulness renewed. Recyclable materials are collected from public containers, offices, and concessions around the park. Visitors are invited to participate in workshops and programs at the depot and see recycling and reuse in action. Recycling-based manufacturers, retailers of “green-friendly” products, reuse artisans, and others are encouraged to participate in creating a zero-waste park.

Close-the-Loop-Room

This section of the depot is devoted to the handling of recyclables. From the Close-the Loop-Room, visitors look through a glass wall into the recycling area where glass, paper, metals, and plastics are sorted and prepared for markets. Displays explain the further processing needed to make the material into new products. Other exhibits depict the life-cycle of materials. One panel, for example, shows the many possible





ways a bottle can be reused. It can be returned for reuse, washed, sterilized, and used again; or it can be melted down and made into a new bottle; or ground up and used in a road base.

Visitors are invited to sit on furniture made from recycled plastic milk bottles, to walk across a floor of tiles made from old tires, to touch walls painted with reconstituted paint, and to feel an array of fabrics and carpet made from recycled materials. Products like shoes, dishware, and planter boxes made from recycled materials are on display, and lists of manufacturers and local suppliers of these items are available. In the Close-the-Loop-Room, children are urged to try hands-on activities such as making a piece of recycled paper.

Training Center

One section of the depot is a Training Center that is designed to reach park staff, Presidio tenants, and visitors with messages about conservation of materials and recycling. The Training Center is a place to orient the Presidio community and to challenge visitors to consider the true value of resources and the needlessness of “waste.” A brief introduction to the park’s recycling and composting programs is provided, as well as information about “buy recycled” programs and the Materials Exchange Program. Green Management guidelines are available describing the zero-waste concept and sustainable business practices for the Presidio. Park policies and federal legislation are described in layperson’s language, and lists of local resources and contacts are available. Computer courses provide training in conducting solid waste assessments and developing reports containing tangible measures of economic and environmental successes.

Master Materials Managers

After completing the computer courses noted above, those who wish can become volunteer Master Materials Managers, a program modeled after the highly successful extension program for gardeners. Park staff from every department and at least one representative from every tenant group will be urged to enroll in this free workshop. Participants in this tiered-teaching program become experts in waste prevention. They teach co-workers, customers, and park visitors about the zero-waste initiative. Master Materials Managers can visit schools, businesses, and community groups to further spread the word and to train additional Master Materials Managers.

In addition, the Training Center will be the site for technical training in the area of sustainable construction and demolition, design, removal of hazardous materials, alternative energy use, and much more. Demolition professionals might enroll in refresher courses about advanced salvaging techniques and building dismantlement for the preservation of valuable materials. The goal is for the Presidio, in partnership with trade associations and qualified instructors, to become a national center for research and training in cutting-edge technologies in the sustainable building, rehabilitation, and demolition fields. Techniques used in Presidio pilot projects and demonstrations will serve as a model for base closures and community revitalization around the nation.

The Reuse Warehouse

This section of the depot would house salvaged materials from the removal and renovation of buildings at the Presidio and other items available for repair or reuse. A virtual “Home Depot” of reusable materials,

the Reuse Warehouse would be a paradise for contractors and do-it-yourself home renovators looking for low-cost materials. A materials database would list available items such as appliances, roofing tiles, doors, fixtures, etc. The Reuse Warehouse would attract teachers, artists, and others in search of interesting materials for craft projects, theater props, or other creative endeavors. A video program would show how the park is “adding value” to salvaged materials. For example, old beams from demolition projects will be re-milled at an on-site building and made into flooring. Demonstrations would inspire visitors to find creative reuses for items in their homes. A parkwide materials exchange program could facilitate reuse within the park, matching available resources with on-site needs.

Green Business Opportunities

The Reuse Warehouse will be complemented by the start-up of nearby cottage industries to reuse and recycle materials. The zero-waste park initiative could attract many innovative business enterprises, such as:

- Salvagers to extract valuable materials from buildings for reuse.
- Repair shops to renew appliances and damaged goods.
- A milling operator to re-work wood from demolition and tree-removal projects.
- Craftspeople and artists-in-residence to make art from recycled materials for sale to visitors.

The workshops and craft shops would host openings and shows, and offer classes for the public. Market development for recycled and reused products would be fostered. Entrepreneurs would benefit from being part of a Recycled Market Development Zone.

Other green business opportunities include:

- A rental store for durable party goods and picnic supplies.
- An office supply store specializing in recycled and eco-friendly products.
- A zero-waste healthful food service (featuring organic food grown on-site or locally).
- A low-waste, low-toxic custodial service.
- A myriad of green retailers, educators, and consultants.

Organic Materials at the Presidio

According to the California Department of Conservation, yard waste makes up about 20 percent of California’s garbage. Given this statistic, the Presidio needs a comprehensive waste management plan to divert organic materials from landfills, capture their inherent value in the form of wood products, and make use of the nutrients they contain to create healthy soils.

Best practices for waste management can be loosely sorted into priorities for achieving a comprehensive management plan for organic materials at the Presidio:

1. Waste prevention and minimization

Plant low-maintenance native plants and shrubs in place of high-maintenance lawns and non-native trees.

2. On-site use at generation point

- Employ mulching mowers instead of collecting grass.
- Use in-place stump grinders instead of removing stumps of downed trees.





3. In-park reuse
 - Use wood chips for trails and as a mulch for gardens.
 - Employ compost as a top dressing and soil amendment.
 - Mill lumber from downed trees for on-site uses (such as park benches and tables).
4. Off-site reuse
 - Donate or sell wood chips.
 - Donate or sell firewood.
 - Sell crafts or other items made from fallen trees.
5. Recycling of food scraps from on-site concessions and events as compost.
6. Composting of manure from horse stables in the park.

Composting

A central compost facility would receive organic debris from the park's landscaping, tree pruning, and trail maintenance operations. One approach is to employ low-tech composting techniques such as windrowing, which requires mechanical mixing, moistening, and piling of debris to encourage managed decomposition. Another option is a more high-tech, in-vessel system with controlled air flow and a mechanism to capture gases from the decomposition process. A state-of-the-art facility could attract U.S. and foreign professionals from communities, national parks, and businesses interested in establishing similar programs. Either operation could serve as an excellent training ground for local youth.

The facility will include a demonstration site to display options for backyard and home composting.

Visitors touring the compost facility will learn about the composting process and participate in workshops to take the composting message and techniques back to their homes, schools, and businesses.

Presidio residents, tenants, and park staff could be trained to compost garden debris and fruit and vegetable scraps to produce compost for use at community garden sites within the park. Grounds crews and the visiting public will be encouraged to attend demonstrations about planting low-maintenance native plants, avoiding chemical pesticide use, and employing gardening techniques that help conserve water.

With education, coordination, and the cooperation of the U.S. National Park Service, the Presidio Trust, stakeholders, tenants, visitors, and the community, the Presidio can become a model for waste prevention.

Getting From Here to There

Accomplishments To Date

1. The U.S. National Park Service hired a full-time employee to develop and coordinate a waste reduction and materials conservation program.
2. Shortly after the charrette, the U.S. National Park Service selected Building 1243 to be rehabilitated as the Recycling Depot. A park partner was identified to facilitate the program, and a cooperative agreement was drafted.
3. A pilot deconstruction project salvaged more than 100,000 board feet of valuable lumber from two buildings at Crissy Field.
4. New specifications for deconstruction and salvage were drafted.

5. Five small-scale worm composting systems were developed, and mid-sized systems are used at community gardens.
6. Internships in the waste reduction program are offered.
7. The U.S. National Park Service is developing policy and guidelines for “green management.”
8. Recycling services are available to Presidio offices and residences.
9. An artist-in-residence created totem carvings and figures from recycled logs and trees in conjunction with a Pacific Islanders Cultural Event.
8. Form an artisans and artists cooperative that makes use of recycled and reused materials.
9. Engage eco-friendly businesses and concessions as park partners to offer the necessary goods and services at the park.
10. Support the development of cottage industries that use recycled or reused materials to close the loop by creating new products from discards at the Presidio.
11. Establish an educational program at area schools on reducing, recycling, and reusing.

Next Steps

1. Develop policies, leasing and contractual language, and guidelines for waste prevention at the Presidio.
2. Create an electronic bulletin board for distribution of a “Greening” newsletter to all park partners.
3. Develop a demonstration compost site and centralized facility.
4. Create a zero-waste campground and picnic areas in the park.
5. Make recycling containers available in high -visitation areas.
6. Coordinate with park partners to provide training in waste reduction, resource conservation, and building salvaging techniques.
7. Establish a job skills training program in materials conservation and waste reduction.

The Team’s Commitment

The charrette team consisted of waste management experts from the public and private sectors. At the conclusion of the meeting, the entire team signed on as an advisory body offering their expertise to help establish the infrastructure needed for a zero-waste park. Immediately following the charrette, the team members began offering technical assistance and a wealth of resources to help further the projects discussed during the meeting.





Residential Buildings

The Vision: Reading a House

Listen in as a park ranger at the main post of the Presidio addresses a tour group assembled in front of the visitor center. “Today, on this walk we’ll look at residential structures—homes that are probably much like your own. We’ll talk about how these houses were adapted for a changing world at various times during the past 150 years. And we’ll learn how these homes are now being prepared for the next century and a half. In the process, we’ll take a close-up look at how to renovate a house—rehabilitate it for resource conservation and energy efficiency. And we’ll learn how to read your home like a book.”

The ranger goes on to tell stories of the “Layers of Time” of important residential homes on the Presidio.

The ranger teaches about history and also about how a building rehabilitation can embrace the concepts of sustainability while at the same time preserving historical integrity.

Funston Avenue Home: An Example to Be Replicated

Carpenters working at one of the Presidio’s houses discovered that the foundation was constructed over adobe rubble remaining from the original Spanish *presidio* (fort). When the workers replaced the planking that covered the foundation of the Funston Avenue house, they provided several access doors to accommodate archaeologists. The deeper prehistoric layers are a rich archaeological resource that has been partially documented.

The rangers leading walking tours will be able to open one of these doors so the public can obtain a glimpse of this building’s historical significance. The ranger will enrich the visitors’ experience by talking about prehistoric findings before continuing the Spanish story, which explains that in the late 1770s the Spanish built a *comandancia* or commandant’s headquarters. The *comandancia* was circled by an adobe wall that formed a large square.

Archaeologists have uncovered remnants of that wall in the backyard of another of the Funston Avenue houses. The adobe rubble behind this second house is just beneath the surface of the soil and contains pieces of pottery and tile. The layers of history for this particular house predate its construction in 1862 by nearly a century.

The story of this house unfolded over the years as the needs of its inhabitants changed. Sheds, dormers, and a bay window were added. Then in the 1930s the

house was divided into a duplex, with two entrances opening off the front porch. By the 1950s the house was being used as an office.

The ranger will point out that the U.S. National Park Service's guidelines for historic districts primarily affect the renovation of exterior surfaces. At that point, many a visitor looking at the ordinary clapboards that cover this home's exterior may well exclaim, "This house reminds me of mine." But underneath the clapboards is a unique kind of wood frame construction that reveals building techniques of a bygone era. The wall underneath the clapboards is constructed of fir planks and then, on the interior of the house, another layer of planks is covered with a thin board. Over the years, the board has worn away. The layers of history embodied in the walls are literally visible to the eye.

"Greening" Houses

As historic structures, most Presidio buildings need some form of restoration before they can be occupied. The restoration process presents many opportunities for incorporating environmentally sound practices into a building renovation; it also presents many challenges to preserving the historic fabric. At the charrette, the residential team used the Funston Avenue house as a case study for establishing "greening" guidelines for rehabilitation of historical residences. The technical specifications developed by the team are refinements of working guidelines already being applied on Funston Avenue. Further refinements are anticipated as the rehabilitation process is extended and, over the years, as industry develops improved building materials. Following is a sample of the general guidelines for building exteriors, energy efficiency, and waste and economic considerations.

The Building Envelope

- Install insulation when walls are opened to upgrade wiring or plumbing.
- Give preference to recycled materials such as fiberglass with recycled paper backing.
- Use blown-in insulation in applications whenever appropriate.
- Use low-emitting sealant to caulk windows and plumbing penetrations.
- Add weather-stripping around doors, and use rubber gaskets to seal electrical outlets.
- Install non-permeable membranes to prevent air and moisture penetration.
- Apply two layers of gypsum wallboard over the membranes to add thermal mass to stabilize building temperatures. The wallboard also will serve to encapsulate lead paint.
- Bolt houses to their foundations to improve seismic structural integrity.

Energy Efficiency

- When replacement radiators are needed, use high-efficiency fin radiators.
- Select high-efficiency natural gas appliances, including hot water tanks.
- Use T-8 compact fluorescent lighting with pin-based fixtures.
- Use occupancy sensors with solid state ballasts.
- Increase the use of natural daylighting.
- Follow the local building code, which requires low-volume flush toilets.





- Install rainwater and gray water recovery systems to increase water conservation.
- Use native and drought-resistant plants and low-flow irrigation.
- Monitor present energy efficiency prior to all rehabilitations in order to establish a performance benchmark.

Waste and Economic Considerations

- Recycle all household recyclables, and compost in backyards or at designated composting sites. Waste reduction and resource conservation should factor into all decisions on rehabilitation projects.
- Examine building materials to be salvaged for reuse.
- Select new materials based on full life-cycle costs, including energy needed for manufacture and transportation of products.
- Factor durability, air quality impacts, health impacts, and recycling potential into life-cycle costs.
- Offer affordable housing to members of diverse socio-economic strata.
- Provide residents with training and information on how to employ sound, environmentally appropriate maintenance and operations practices.
- Quantify before-and-after measurements to evaluate success during the first phase of rehabilitation. Assess techniques and materials selected for replication during subsequent phases, and disseminate the results to the public.
- Exhibit in displays infrared photographs taken to test air infiltration and leakage.

“Greening” Minds

Buildings can be used for education and dissemination or information about green principles used in building rehabilitation. One way to do this is to develop demonstration buildings open to the public. For example, a house might be renovated as a period house of the 1880s. Visitors entering the sitting room would see a decorative cast iron cover over the fireplace and next to it a “decision tree” exhibit. Visitors would learn about the choices made in the rehabilitation process and would engage interactively as a “rehab decisionmaker.”

Decision Process Simulation

The exhibit might explain that the fireplaces in the Funston Avenue houses were damaged by the 1989 earthquake. The first option the visiting decisionmaker faces—having the flues and chimneys fixed—turns out to be costly. Even after repairs, fireplaces still represent a fire hazard in wood frame houses. The visiting decisionmaker might think of gas logs as another option, but fireplaces leak cold air whether they use wood or gas. Installing high-efficiency wood stoves with catalytic converters is the next possibility. But the U.S. National Park Service has banned wood stoves in other parks, such as the Grand Canyon, because catalytic converters that malfunction contribute to air pollution. In addition, in an area like San Francisco where there are few trees, wood supplies might have to be trucked from a distance, an added energy cost.

On the other hand, the decisionmaker thinks, bed-and-breakfasts often have fireplaces. They are a particular comfort in a foggy area like San Francisco. Weighing the pros and cons, the visiting decisionmak-

er might come to the conclusion that metal covers are the optimum solution.

Undertaking this decision process would help visitors understand how to sort through rehabilitation decisions for their own homes. They might learn additional lessons from schematic displays that document examples of give-and-take decisions in which environmental considerations may conflict with factors such as comfort, affordability, life safety, aesthetics, historic values, future adaptability, and accessibility for persons with disabilities.

Displays and Education

Another display might showcase the development of an energy-saving product such as compact fluorescent bulbs. A timeline would illustrate how a combination of legislation and the marketplace influenced change. Still another exhibit could portray economically viable rehab strategies that illustrate the message that small steps multiplied nationwide can make a big difference.



Dioramas could provide a sense of change in lifestyles from 1862 to today and the relationship between levels of comfort and evolving construction techniques. Vivid physical comparisons can help viewers visualize these changes: “The wood needed to heat a Funston Avenue house in 1862 would stretch from the Presidio to Alcatraz Island . . .”

Children will be invited to special programs where a grandparent talks about what it was like to grow up in the house of yesterday, or a local artisan demonstrates old-time building techniques and compares them with today’s sustainable construction practices.

Literature will be available on the U.S. National Park Service’s recycling program for building materials. Visitors will be reminded to visit the bookstore in the display house and pick up an energy coupon on their way out. “The coupon can be used for a discount on the purchase of a compact fluorescent bulb,” the ranger points out. “You won’t have to change the bulb until your child is ready for college!” The aim of the demonstration renovations at the Presidio is to show what Americans can do in their own homes, using available technology and commonsense approaches. The display house and the walking tour will be successful if visitors react by saying, “I didn’t know that,” and then add, “I can do that at home.”

Some houses around the world have survived for hundreds of years because they fit the environment.



— **Michael Willis**
*Michael Willis &
Associates
Team Leader,
Residential Rehabilitations*



Getting From Here to There

Accomplishments To Date

1. Educational walking tours are being expanded to include historic home rehabilitations.
2. Rehabilitation of Funston Avenue houses is ongoing.
3. Rehabilitation and opening of residences to employees of organizations housed at the Presidio has begun.

Next Steps

1. Apply sustainable building standards for all residential rehabilitation.
2. Compile a bibliography of existing materials used in sustainable rehabilitation.
3. Initiate programs for monitoring energy efficiency prior to rehabilitations, and document decision-making.
4. Initiate post-rehabilitation energy efficiency monitoring.
5. Renovate a demonstration house and develop interpretive displays, including oral history demonstrations, energy coupons, reading materials, and a rehabilitation bookstore.
6. Offer overnight accommodations in an eco-efficient, quality historic residence.

Nonresidential Buildings

The Vision: A Building Is Alive

On another day, our visitors will take a walking tour of historic nonresidential structures. On the tour, they'll see buildings that have not yet been renovated, others that are in various stages of rehabilitation, and still others that are fully restored. At one of the sites, they'll visit the Rehab Rover, and they'll hear about the Adopt a Building program. They'll tour the public spaces of the Thoreau Center for Sustainability, and finally they'll visit the Presidio Building Center. There they will learn that a building is alive. Read on . . .

Renovating Historic Buildings

When historic residential and nonresidential structures are renovated, a variety of building code regulations impose diverse constraints in addition to the usual balance between desired elements and cost. Sustainability also requires finding balances among historic, social, economic, and environmental factors to result in a cost-effective, energy-efficient, and people-friendly environment. Solutions sought and found at the Presidio will help other regions find ways to preserve their historic legacy while moving toward sustainability.

Of the Presidio's 870 buildings, approximately two-thirds contribute to the park's significance as a national historic landmark district. The buildings originally functioned as officers' quarters, barracks, and mess halls. The U.S. National Park Service has completed extensive analyses of these existing structures, guidelines for rehabilitating historic buildings, and preliminary working specifications for incorporating

sustainable design practices.

The structural materials employed at the Presidio—wood frame, brick, and concrete—are representative of the main building types in use throughout the United States. What is learned at the Presidio will be replicable in the vast majority of the nation’s buildings. Adaptation for local climate and specific sites are the main variables.

Reusing buildings rather than constructing anew results in a net reduction in consumption of building materials. Equally important, sustainable construction practices can represent a sound financial investment. Energy-efficient systems, natural lighting, natural ventilation with operable windows, and shared services can result in substantial reductions in a building’s annual operating costs. And the costs of rehabilitations will prove more and more competitive as projects at the Presidio showcase sustainable building materials and increase demand for those products.

Rehab Rover

Imagine a rehabilitation rover, a van powered by an alternative energy source, parked in front of a rehabilitation project and moved to another when that building is finished. The Rehab Rover houses educational exhibits about the renovation in progress. The evolution of the building is explained through graphics that illustrate the original floor plan, the reasons why walls were moved over time, and the environmental benefits of the new floor plan. Other graphics might compare the “sustainability quotient” of the construction materials and energy systems used at various periods of the building’s history. Visitors on walking tours will be able to stop and take a look at the exhibits.

Since the Rehab Rover is mobile, it leaves the

Presidio periodically and visits universities, schools, and businesses in the Bay Area. In addition, the exhibits developed for the Rehab Rover receive wide distribution through a website, stimulating interest in environmental technologies locally, nationwide, and globally.

Adopt a Building

The Rehab Rover could visit schools where an individual class has expressed interest in “adopting” a building. A class whose interest is further stimulated by the Rehab Rover would then visit the Presidio and adopt an actual building scheduled for rehabilitation. The class would study the building’s history, energy needs, and the life-cycle costs of its construction materials. The students would follow the progress of the rehabilitation, and in subsequent years those who are interested might monitor the building’s operating costs. Years later, as adults, some of these early friends of the Presidio will return to visit “their” building.

Community groups and businesses will also be able to participate in the Adopt-a-Building program. These groups will visit the Presidio to find ideas for projects to improve their own sustainability quotient at work and at home.

History in the Making: Thoreau Center for Sustainability

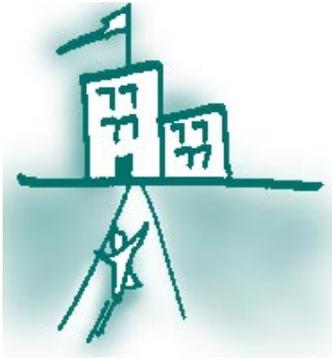
The nonresidential buildings team focused on the rehabilitation and reuse of offices, conference facilities, and commercial space. The first restoration of a nonresidential structure, the Thoreau Center for Sustainability, began in autumn 1995. The center consists of a complex of four main buildings connected to

Buildings have a life cycle. They are born, mature, and age, evolving over time in response to changes in our culture and technologies. Extending their life conserves existing resources and America’s history for future generations.



— *Marsha Maytum*

*Partner, Tanner Leddy Maytum Stacy Architects
Team Leader,
Nonresidential
Rehabilitations*



three former ward buildings with a recent addition of five row houses. The earliest structure was constructed just after the end of the Spanish American War. The complex, which originally served as hospital wards and an administrative headquarters, is linked by a light-filled corridor that was constructed wide enough to handle gurneys and stretchers.

The anchor tenants—the Tides Foundation, Energy Foundation, Institute for Global Communications, Materials for the Future, Wilderness Society, and the Social Venture Network—and more than 20 other occupants will use the glass-enclosed hall, now named the Thoreau Gallery, for exhibits on sustainability and historic displays. The gallery will function as a public gathering place with corridors often sparking the spontaneous combustion of ideas among its inhabitants. It will be the center’s “main street.”

The original spatial configuration and circulation patterns have been preserved. Modifications are limited to those needed to meet the needs of modern office tenants, including a mix of open floor plans, meeting rooms, and private offices. Architectural features including wainscoting and a stamped tin ceiling have been preserved.

The complex housing the Thoreau Center for Sustainability was originally the Army’s first general hospital. Subsequent to World War I, it was a center for research on tropical diseases and artificial limbs. Now the facility serves national security in a new way as a showcase of sustainability.

Discovery Windows

The Thoreau Center symbolizes the Presidio in its new role, part of which is to educate visitors. Another building, the Presidio Visitor’s Center, could do the

same by housing interpretive displays such as a continually changing map that tracks the progress of on-site building rehabilitations. The U.S. National Park Service already conducts educational walking tours, and a next step will be to expand that activity to include information on sustainable building and rehabilitation. Visitors and potential residents will be able to sign up for a sustainable building tour led by a ranger or a volunteer docent. Or take a self-guided tour, following a path with signs that are moved as projects are completed.

The first stop on a guided or self-guided tour could be a building that has not yet undergone a rehab. The guide or the signs would provide information on the building’s history, the goals of the rehabilitation, its economic and environmental benefits, and challenges specific to that building. Next, the tour would be routed past several structures in various stages of rehabilitation, concluding with a finished project. Inside that last building, the tour participants would find a “discovery window” that provides a glimpse of the original lath and plaster, wiring from the turn of the century, and hidden architectural details covered over by previous remodels. Another peep hole will reveal the new electrical wiring, computer cabling, and various kinds of insulation materials.

Presidio Building Center

In the long term, visitors could tour a Presidio Building Center. Displays in the center’s main exhibit space would convey the message that buildings are living machines, not static entities. They are like organisms, changing over time and adapting in order to survive. They have bones (a framework or structure) and skin (external siding). They require

“food”—water, air, heat, raw materials, human energy, and financing—and they produce waste. Like a human body, they must be kept healthy through maintenance.

Additional exhibits might explain the life cycle of a building, including a number of decision points when the structure must be adapted to changing circumstances. In the main exhibit space of the Presidio Building Center, visitors could play the “Living Building Game,” or “Sim Presidio,” in which they put themselves in the shoes of building renovators who are challenged with difficult choices. At each decision point, the game will reinforce messages such as: “Buildings are alive and must change and evolve over time. They are important resources that should be conserved and used wisely and efficiently. And all of us can help make that happen.”

The use of interactive touch screens or multimedia computers could enable individual buildings to “tell” their own stories. Visitors would be invited to “listen to the place,” that is, learn about the site, its topography, and weather: They could hear about the evolution of the Presidio’s natural environment from sand dunes to forests planted by the Army.

Each building might “talk” about the various functions it has served over the years, why it has changed, and the limitations and hidden opportunities it offers. Carrying on the living organism theme, the building would explain its structure, frame, materials, and systems. It could describe the various energy systems it has used over the years—from wood and coal fireplaces to radiators, gas-fired furnaces, and today’s energy-efficient heating systems.

The Systems Room

As visitors leave the main exhibit space, they could

enter the Systems Room and view the Presidio Building Center’s own mechanical systems and a matrix of its present, past, and future energy technologies. Exhibits of alternative energy sources such as photovoltaics and wind systems would be displayed. These and other exhibits would explain how technologies, along with building uses, change over time and represent a nation’s cultural history.

Materials Room

Next, the visitors will go to a hands-on Materials Room where they will have a chance to handle innovative and recycled building materials, such as low-toxic carpeting or tile made from automobile windshields. In the Materials Room, they will learn that using local materials reduces transportation costs and thus is more efficient economically and environmentally. They will listen to stories told by traditional materials, such as the bricks used to construct some of the Presidio’s buildings. They will learn about the life-cycle costs of other materials, such as copper downspouts and gutters, which are more expensive initially but less costly in the long run because of their durability and recyclability. This project potentially overlaps with the programs envisioned for the Reuse and Recycling Depot and could perhaps be housed in the same building.

Museum Store

A museum store will carry children’s books on the history of buildings and environmental topics. Technical monographs will be stocked so that the Presidio Building Center can serve audiences with many levels of expertise. As visitors leave the building, they will view demonstration sites for recycling gray water and stormwater runoff. Everyone visiting





the Presidio Building Center—from school groups to retired people, history buffs, architecture enthusiasts, tour groups, local joggers, and visitors from other nations—will have an opportunity to learn about stewardship of the urban built environment. They will come away with the message that individuals can plant the seeds of change.

Professional Training

The vision for this center encompasses classroom space where training workshops will be conducted for professionals in the building industry. Architects, developers, and contractors will learn sustainable construction practices, hear about new technologies and building materials, and become versed in the U.S. National Park Service's rehabilitation specifications. They will look at the energy savings that result from reducing general lighting, maximizing daylighting, and using task lights. They will learn ways to minimize the disturbance of toxic materials in rehabilitated buildings. They will study methods for ensuring seismic safety and creating safe and healthy work environments. The curriculum will include methods for ensuring access for persons with disabilities while conforming with guidelines for historic preservation. Participants will be taught to plan for future changes and ensure building adaptability. They will learn to keep modifications simple and respect the past.

Other classes target Presidio tenants, rangers, residents, and volunteers. Participants would learn skills in the sustainable operation and maintenance of buildings. A user manual developed for these classes might receive distribution through the Presidio's Internet home page. An awards program administered by the Presidio tenants council could monitor performance

and provide recognition for outstanding achievement. Those who visit the Presidio Building Center will learn that the Presidio offers real-life models to help guide the nation's transformation to sustainability. With the Presidio, the aim is that visitors return again and again to learn more as the park continues to develop as a living laboratory for the future.

Getting From Here to There

Accomplishments To Date

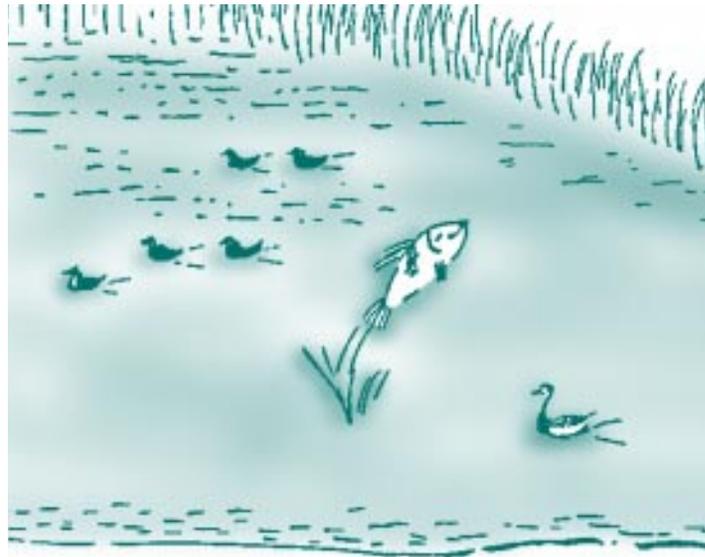
1. The Thoreau Center for Sustainability, the Presidio's first demonstration of "green" rehabilitation and adaptive reuse held its initial open house in June 1996, and a second phase open house in December 1997.
2. The Thoreau Center maximizes daylighting, natural ventilation, and energy-efficient lighting.
3. Green building materials such as sustainably harvested wood, recycled glass tiles, recycled aluminum, natural linoleum, nontoxic paint, and recycled carpet were featured in rehabilitation projects in the Thoreau Center, as well as by other new tenants such as Urban Habitat and the Presidio Alliance.
4. The Presidio Cavalry Stables were rehabilitated using recycled plastic lumber.
5. Low-flow plumbing is required in building rehabilitations.
6. The YMCA installed a co-generation plant to maximize energy efficiency at its facility.
7. The shut down of an inefficient steam plant and construction of a boiler system at the Letterman

Army Institute of Research is saving 888,861 therms annually.

8. Energy efficiency guidelines have been developed for tenants on the Presidio.
9. Low water use landscaping using drought-tolerant plants and low-flow irrigation has begun replacing historic lawns at the Main Post of the Presidio.
10. An educational Adopt-A-Building program has begun.

Next Steps

1. Identify an organization, foundation, or corporation to establish the Presidio Building Center and assume responsibility for coordinating training for professionals in the building industry.
2. Require all new tenants to incorporate sustainable design and construction in rehabilitation work.
3. Ensure that Presidio tenants understand and employ models of sustainable building and rehabilitation practices to reduce their energy bills by 30 percent.



Natural Habitats

The Vision: Healing Mountain Lake

Visitors who spend any amount of time at Mountain Lake cannot help but realize that it is a special place. Mountain Lake is precious to San Franciscans because it is one of the few freshwater bodies in the city. In fact, it is the only natural lake in the Golden Gate National Recreation Area. Parents with infants in strollers, school children playing along the lake's sandy beach, grandparents tossing bread to the swans and ducks—Mountain Lake is a constantly changing kaleidoscope of people.

Imagine the same place with no lake. Replaced by a marsh, it would remain pretty and teeming with wildlife, but few people would come to visit. Unless present trends are altered, this is Mountain Lake's future. The lake is significantly degraded ecologically;



it is becoming a marsh due to the natural process of *eutrophication*, which is occurring at an unnaturally rapid rate. Human activities have drastically accelerated the death of Mountain Lake. As the lake dies, fish kills—already a problem—will become more frequent. Smelly algal blooms caused by the water’s already high levels of nitrogen and phosphorus will affect its ecology dramatically and become an increasing nuisance for nearby residential neighborhoods.

In order to avoid this likely scenario, a comprehensive habitat restoration project is needed for Mountain Lake. Healing natural habitats in urban environments presents a number of challenges. Various individuals and groups in the community have divergent interests in the habitat’s future. The ecological and social considerations involved in this lake’s restoration offer a microcosm of the thorny issues our nation faces in the search for environmental revitalization and social well-being.

Existing Conditions

Mountain Lake is the centerpiece of an adjacent city park and is bisected by a boundary between San Francisco and the Golden Gate National Recreation Area. This joint ownership means that collaborative planning is essential.

Three wells drilled into the aquifer that supplies Mountain Lake were used at one time to supply irrigation water to the Presidio golf course. The fairway is adjacent to the lake but screened from it by a tree-covered hillside. This vegetative buffer filters rainwater runoff from the golf course. The only exception is rain that flows from the third tee through a storm drain and into the lake. At one time, Mountain Lake was probably polluted by DDT used on the fairway, but runoff

from that source is no longer a significant problem.

The lake’s remaining shores are wooded except for one section where noisy high-speed traffic on U.S. 1 is only partially screened by trees. Unlike the waters from the golf course, stormwaters running off the highway flow directly into the lake with little or no filtration. The lake water has not been tested for pollutants such as heavy metals washing off the road, but other water quality tests have revealed nitrogen and phosphorus pollution.

Sediment from erosion and fill dumped when the highway was under construction have reduced the lake’s depth from 20 or 30 feet to approximately 10 feet. The danger zone for the growth of marshy aquatic vegetation is about 9 feet. Historic photographs and aerial maps show that the lake’s perimeter also has decreased by almost half since the 1980s. Reduction in depth and size are indicators of eutrophication, a process that normally takes thousands of years.

The water once contained native fish, perhaps species such as threespine stickleback. Alien species present today include carp, bluegills, mosquito fish, and catfish. Children and adults who come to fish often contribute to the lake’s organic pollution by throwing unused bait into the water. Large fish die-offs occur regularly. In addition, the lake was once home to the rare red-legged frog, but today is inhabited only by its predator, non-native bull frogs.

On shore, alien invasive plants such as German ivy have crowded out native plant communities. Eucalyptus trees were planted in the 1880s to landscape the Presidio, but they are also an exotic species and have invaded natural areas along the shores of the lake. Although the eucalyptus trees on the lake’s hillsides belong to the historic planted forest, they do pro-

vide forage for invertebrates and perches for red-shouldered hawks.

Birdwatchers who come to see the hawks often spot great blue herons fishing in the lake, double-crested cormorants on the willows that remain along one shore, and mew gulls and American coots in the water. The lake's popularity with birdwatchers and nearby residents is contributing to the sedimentation problem. Heavy foot traffic has caused visible erosion gullies in the beach. A defined footpath is needed to stop erosion and provide access for people with disabilities.

Community-Based Restoration

Given its uniqueness, Mountain Lake offers a singular opportunity for educational programs on watershed ecosystems, pond ecology, native plants, riparian areas, hydrology, the human dimensions of ecological change, and history. The lakeshore was likely the first campsite of an expedition led by Spanish explorer Juan Bautista de Anza. The Presidio's management plan envisions the shore as the trailhead for a national historic trail commemorating the Spanish exploration.

The charrette's Mountain Lake team examined various options for the lake's future. First is the "no-project alternative," which would allow present trends to continue so that the lake would become a marsh. Another alternative is active management to slow eutrophication through the application of herbicides and use of mechanical means for culling aquatic weeds. This would involve intensive management and require continuing, long-term maintenance and expenditures.

A third approach involves removing the fill that washed in from the highway project to return the lake

to its original depth and then reintroducing natural species, such as western pond turtles. Although this alternative would involve significant up-front expense and short-term disruption of the lake, those impacts may be balanced by reduction of long-term costs and the establishment of a healthy ecosystem requiring little or no active management. Planning would need to ensure suitable timing so that the project would avoid disturbance of breeding birds.

Plan of Action

The charrette team proposed a preliminary plan of action that is aimed at involving the public in selecting an alternative. The idea is that a community that actively participates in collaborative planning and environmental stewardship will find common ground in seeking a sustainable future for Mountain Lake.

Phase One

Regardless of the long-term action chosen, it is necessary to determine the types and quantity of pollutants in the lake. During the initial phase, samples of the bottom sediments will be tested for toxins, and coordination with the Army's toxic remediation group will be initiated. Tests of surface runoff and the lake's water quality will be conducted with the cooperation of the golf course, the city's transportation department, and, it is hoped, research programs in state universities. Park consultants will determine whether the existing wells can be used for monitoring the aquifer's water level and quality or whether they should be removed.

Alternative locations for an interpretive center and aquatic laboratory will be identified during this phase. Development of a school curriculum focused on Mountain Lake also will be initiated. The park already

How can we ensure that future generations enjoy what we are enjoying today at Mountain Lake? Our job is to make this precious resource healthy.



— Terri Thomas

Chief, Natural Resources Branch
Golden Gate National Recreation Area



has a waiting list of schools that want to become involved in ecological restoration activities.

Phase Two

During the second phase, consideration will be given to planning a public access trail. This trail could be constructed from durable materials that demonstrate sustainability in action. Recycled plastic, wood, or another sustainable building material could be used if a rustic boardwalk and observation deck are selected. Salvaged materials such as crushed porcelain or recycled concrete could be employed for a path.

Exploration of funding sources for youth internships will begin during this phase. Service learning can help the human community even as the natural habitat is restored. At the same time, a range of possible ways to mitigate highway runoff also will be explored. For example, establishing tie-ins to a sewer line would reduce runoff from small storms. Construction of a settling pond and a wetlands or low berms could provide a buffer for overflow from heavy storms.

Phase Three

The cornerstone of the third phase will be the formalization of a final planning document for the lake's future. Regulatory compliance will be sought if necessary. During this long-term phase, issues such as replanting coast live oaks to improve visual screening of the highway traffic will be appraised. Plans for an interpretive center will be established, including the development of a docent program. In the meantime, it is anticipated that best management practices for reducing runoff will be applied at the golf course. Ultimately, reclaimed water from the Presidio will be

employed for irrigating the grass on the fairway, tees, and putting greens.

A Dynamic Interpretive Center

Imagine visitors touring the main room of an interpretive center viewing exhibits that capture the dynamic, community-based planning process that healed Mountain Lake. They will see displays that depict the various alternatives that the community explored. Accompanying audio will bring the participants and process to life, and video clips from the community forum will capture the challenges of communicating science to the public.

Before, during, and after displays will show the actual process of restoration. Similar projects from other regions will depict the complexity of restoring natural systems. Such displays could serve as a draw for experts from abroad who are interested in seeing state-of-the-art restoration techniques.

College-level language classes could participate by helping with multi-language interpretive signs. The primary messages will be that nature in an urban environment can be healed and that stewardship can foster healthy human communities by building links between people.

Another room will be devoted to historic dioramas, beginning with Native American use of the lake and continuing through the Spanish and American periods. A natural history room will have displays that capture the ecological and aesthetic values of open water bodies, as well as the difficulties of reversing eutrophication and changing a marsh back into an open lake. Other themes might depict the process of monitoring water quality and showcase university-level research on the reintroduction of native species. After touring

the interpretive center, visitors will be able to experience Mountain Lake firsthand and see the living benefits that result when a community bands together to heal a lake.

Getting From Here to There

Accomplishments To Date

1. Testing of lake water and sediments for toxins was begun shortly after the charrette and is ongoing.
2. Data and information were gathered over a period of six months.
3. A public forum was held in August 1996.
4. An intern produced an educational flyer about the lake's ecological health and developed a slideshow and public presentation about Mountain Lake.
5. A memorandum of understanding with the City of San Francisco was signed for cooperative management of the lake and the development of an accessible trail.
6. Restoration of native plant communities is ongoing.
7. The development of a school curriculum was initiated.
8. Initial funding was identified for project planning and implementation.

Next Steps

1. Construct a public access trail with trailside information.
2. Develop strategies for leveraging and dispersing funds for project planning and implementation.
3. Find a solution for reducing highway runoff.
4. Site and establish an interpretive information display.
5. Formalize a final planning document for the lake and achieve regulatory compliance.
6. Plant a vegetative screen for highway traffic.

The Team's Commitment

Members of the charrette team are committed to forming the nucleus of a steering committee that will jumpstart the public information process by making joint presentations to key groups, such as the park staff and GGNRA Citizen's Advisory Commission, San Francisco Board of Supervisors, the mayor, congressional staff, planning association, and the city's unified school district. Immediate actions will include developing a memorandum of understanding between the city and the park. The agreement will emphasize cooperative management for revegetation, maintenance, educational projects, and construction of an access trail. A public forum and a brochure will provide information on the lake's ecological health.

The group identified the need for a project manager to coordinate a variety of activities associated with the overall project. One important responsibility would be to coordinate the activities of volunteers for selective thinning of young eucalyptus and restoring native plant communities. Volunteers are currently growing 50,000 native plants a year in the Presidio's nursery.





Community Redevelopment

The Vision: A Thriving, Vibrant Village

Imagine a community where residents, tenants, neighbors, and visitors are all committed to the Presidio as a model of sustainability and affirm their values through everyday actions. The act of joining the Presidio community implies the acceptance of a pledge to service as a genuine participant in building the park's future. The Presidio is more than just a place to work, live, or visit; it is a beehive of activity where participants share what they learn and thus help it evolve.

A Culture of Peace

The U.S. National Park Service's management plan for the Presidio represents the broader community's hope and expectation that the Presidio will become "a global center dedicated to addressing the world's most critical environmental, social, and cultural challenges" while striving to accommodate the economic realities of the base conversion. The role of turning "swords to plowshares" outlines a new mission for the Presidio's

stewards. Just as global defense served as a unifying force for the military mission and its families, this new mission and vision can serve to unite all those who are helping shape the Presidio's future and revitalize its community.

The Challenges

Drawing from the spirit of the Presidio vision, the charrette's community redevelopment team focused on the challenge of learning to work together toward a common purpose. Members of the team included all park partners, concessions, the local utility company, the City of San Francisco, neighbors, and residents as well as regional and national experts on community-building. Through the charrette process, the team recognized that the synergy from diverse organizations cooperating as a community can accomplish more than any one group working separately. Still, the team needed a common focal point for its energy, efforts, and enthusiasm.

One of the first tasks was to find this common ground for diverse organizations to function as an integrated community. A framework for this partnership was drawn up and later formalized into a 501(c)(3) nonprofit called the Presidio Alliance.

Another action identified by the charrette team was the establishment of a Presidio tenants group, whether through a separate formal governance structure such as a tenants council or through a committee of the Presidio Alliance. While the Alliance was conceived as the nexus and infrastructure for rebuilding the community, the tenants council emerged as an independent entity for addressing practical needs and issues such as improving mail service, transportation, and recycling services.

Energizing the Vision: The Presidio Alliance

To maintain an ongoing forum for dialogue, education, and action, the Presidio Alliance became an umbrella organization of park partners, community members, and regional stakeholder organizations. The Alliance is evolving in order to integrate the activities of those who live and work in the community, those who reside in adjacent neighborhoods, and those who are interested in contributing to the park's development.

During the two years since the charrette, the Presidio Alliance has hosted community meetings, roundtables, and educational talks to facilitate development of the park as a sustainable community. While the Alliance convenes regular meetings to build community involvement, its members are encouraged to sponsor innovative initiatives that further community revitalization. Quarterly membership meetings update the community on new developments, and a regular schedule of educational events are held for the public.

The Presidio Alliance provides opportunities for members of the six charrette teams and all others interested in shaping the park's future to further their vision in practical ways by engaging them in projects and activities. It also introduces new Presidio partners and participants to the concept of building a sustainable community. One project is the research, development, and monitoring of indicators of a sustainable community. These benchmarks will measure the community's environmental, economic, and social impacts, along with quality-of-life indicators such as the number of people using public transportation or percentages of wastes recycled.

The Presidio Alliance now resides in Building 563, which is becoming a meeting place for those interested in learning how they can help a sustainable community evolve. Members of the Alliance share information about on-site activities as well as initiatives to build sustainable communities throughout the region, the nation, and the world. They participate in volunteer-led teams that involve community members in specific tasks.

To realize the vision of a sustainable community, the Presidio Alliance works to:

- Promote new initiatives and existing programs that bring to the Presidio a critical mass of energy, effort, and enthusiasm focused on integrating environmental, economic, and social perspectives.
- Facilitate and champion community input into the Presidio's management and governance structure.
- Provide a physical gathering place and environment for discussing, developing, and implementing the principles, practices, and programs of a sustainable community.

Four operational goals drive the Presidio Alliance's efforts:

- To offer and support educational programs and workshops on sustainability.
- To facilitate public forums and dialogue on sustainability and public stewardship.
- To foster principles and practices that result in a more sustainable Presidio community.
- To establish and operate a collaborative community center.

Each of us is responsible for defining the future by the activities we undertake. In the words of Arthur





Ashe, we must start where we can, use what we have, and do what we can . . . to make a difference. New members continually augment the Presidio Alliance's energy and capabilities. Any individual or organization with an interest in working toward a sustainable Presidio community is welcome to join the Presidio Alliance and become part of the solution!

Getting From Here to There

Accomplishments To Date

1. A leadership council with by-laws was formed.
2. The Presidio Alliance gained 501(c)(3) status by becoming a project of the Tides Center.
3. A cooperative agreement was signed with the U.S. National Park Service for the use of Building 563.
4. Start-up support was obtained from the San Francisco Foundation.
5. Three lecture series on sustainability were held.
6. Two roundtables on sustainable building restoration were convened.
7. An executive director was hired.
8. At least four program-related meetings are held each month.
9. A directory of Presidio organizations was published and is updated semi-annually.
10. An Alliance newsletter was established and is published quarterly.
11. An initial rehab to make Building 563 accessible was completed.
12. A tenants council was established as a separate structure with monthly meetings.

Next Steps

- Implement top three educational program priorities for 1998.
- Establish a sustainability indicators project for the Presidio in 1998.
- Launch Youth Action Program of the Alliance (YAPA).
- Increase financial support from foundations and corporations.
- Expand social network and community activities to integrate tenants & residents.
- Increase sustaining memberships and participation from the business sector.
- Improve energy efficiency in lighting and heating systems in Building 563 community center.
- Integrate efforts at the Presidio with a regional sustainable community network.



A Story to Carry Us to the Future

Stewardship and service are the Presidio's missions. Education is the vehicle, and the essence of education is storytelling. From time immemorial, humans have learned by gathering around a fire and listening as a wise person tells a story that has multiple layers of meaning. At the conclusion of the charrette, participant and co-coordinator Anne Sprunt Crawley told such a tale. Originally related by anthropologist Gregory Bateson, it goes as follows:

At New College in Oxford, England, the roof of a main hall built in the early 1600s was supported by huge oak beams. Eventually the beams developed dry rot. When the college's administrators were unable to find any English oaks large enough to replace the beams, a faculty member suggested that they ask the college forester.

"I wondered when you were going to ask," replied the forester. "The architects who built the hall 350 years ago specified that a grove of trees be planted and maintained so that new beams would be available once the originals developed dry rot."

Seeds of Tomorrow

This story highlights the kind of action that takes the concept of sustainability from abstraction to reality. Much like the English architects, those involved with sustainability at the Presidio today are planting seeds for the world four centuries from now.

As the Presidio develops into a community, the park will take on a life of its own. The hope is that the Presidio vision will continue to guide the community and become an ethic that all can embrace. The realization of that vision now falls to those who are involved actively with the Presidio, whether as tenants, users, residents, friends, or visitors. They will be responsible for making sustainability a reality through the activities they undertake.

Since sustainability is a process that will be refined continuously over years and even decades, it is important to recognize that the process is still in its infancy. The charrette was the fire that sparked energy, momentum, and excitement about what could be; the Presidio Alliance is carrying on the task of bringing the community together to transform opportunities into realities. As additional people become involved, the momentum will create a culture of sustainability that will become stronger with each new person who joins in to become a steward of the Presidio of San Francisco.

I've been a resident of the area for 50 years. The Presidio is my backyard, and I'm going to make sure it comes out okay.



— **Redman Kernan**

*Golden Gate National
Recreation Area Advisory
Committee*

Team Member, Total Site

Appendices

Participants

Transportation

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Jerry Edelbrock, *Marin Conservation League (logistics coordinator)*

Barbara Riddick, *U.S. National Park Service (administrative support)*

David Sibbet, *The Grove Consultants (lead facilitator)*

Resources

Publications

- American Council for an Energy-Efficient Economy. 1996. Guide to Energy-Efficient Office Equipment. Rev. 1. Palo Alto, California: Electric Power Research Institute.

The energy consumption characteristics of personal computers, computer monitors, computer printers, copiers, facsimile machines, combination equipment, and retrofit power management devices manufactured through 1995 are described in this document.

- Architectural Resources Group. 1995. Guidelines for Rehabilitating Buildings at the Presidio of San Francisco. Denver, Colorado: U.S. National Park Service, U.S. Department of the Interior.

This comprehensive set of guidelines is the original and most authoritative treatment of rehabilitation topics, including energy and environmental concerns, for the Presidio.

- Brown, K., D. Sartor, D. Kinsey, T. Voong, D. Chamberlain, T. Riley, S. Wentworth, B. Hines, S. Greenberg, D. Lockhart, J. Waltz, and F. Mayhew. 1997. Guidelines for Sustainable Building Design: Recommendations from the Presidio of San Francisco Energy Efficiency Design Charrette. LBL-38868. Berkeley, California: Lawrence Berkeley National Laboratory.

Local experts on energy efficiency in buildings examined the Presidio and compiled their findings and recommendations in this comprehensive report.

- Eley, C., T.M. Tolen, J.R. Benya, F. Rubinstein, and R. Verderber. 1993. Advanced Lighting Guidelines: 1993. DOE/EE-0008. Washington, D.C.: Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy.

Architects and engineers will find these guidelines invaluable in the specification of all types of interior and exterior lighting fixtures and system controls for energy efficiency.

- U.S. National Park Service. 1993. Guiding Principles of Sustainable Design. Denver, Colorado: U.S. National Park Service, U.S. Department of the Interior.

This publication is a detailed compilation of recommended practices for all aspects of sustainable development: site design, building design, energy management, water usage, waste prevention, and environmental impacts.

Programs

- U.S. Environmental Protection Agency and U.S. Department of Energy. ENERGY STAR® Program. Telephone hotline: (888) 782-7937.

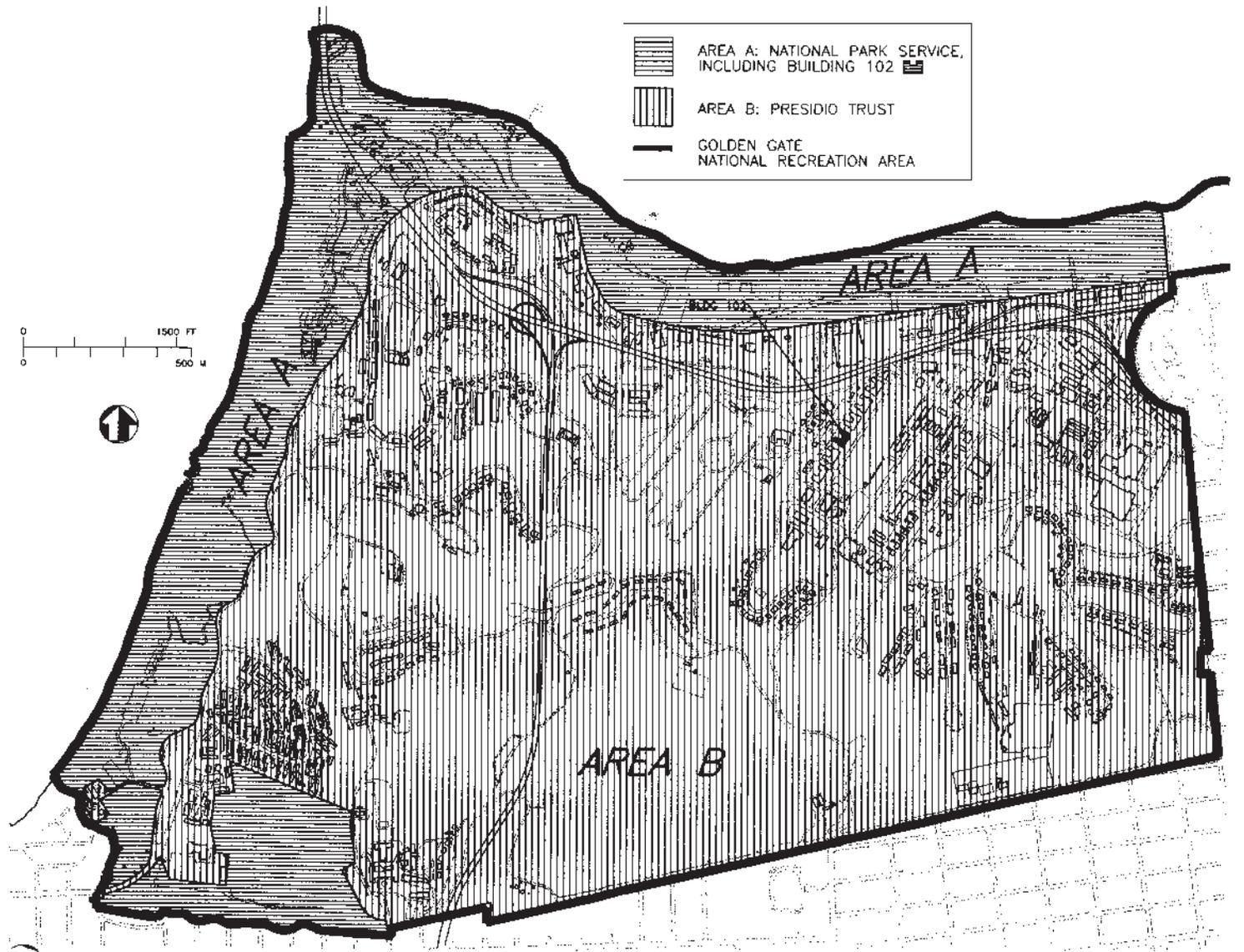
Under this program, government agencies label office equipment and appliances that meet or exceed specific energy efficiency standards, allowing consumers of these products to shop wisely.

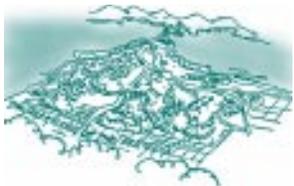
Websites

Numerous websites provide information on energy efficiency and sustainable design. A sample:

- Lawrence Berkeley National Laboratory, Center for Building Science:
<http://eetd.lbl.gov/CBS/eXroads/EnergyXroads.html>
- U.S. Department of Energy's Energy Efficiency and Renewable Energy Clearinghouse (EREC):
<http://www.eren.doe.gov/erec/factsheets/erec.html>
- U.S. Department of Energy, Federal Energy Management Program (FEMP): <http://webdevvh.nrel.gov/femp>
- U.S. National Park Service: <http://www.nps.gov>
- U.S. Department of Energy, Center of Excellence for Sustainable Development:
<http://www.sustainable.doe.gov>
- U.S. Environmental Protection Agency and U.S. Department of Energy, ENERGY STAR® Program:
<http://www.epa.gov/energystar.html>
- GreenClips Environmental Journal: <http://solstice.crest.org/environment/greenclips>
- The Presidio Alliance has a website at: <http://www.presidio.org>

Presidio Map





***A Voyage to Sustainability* - THE PRESIDIO OF SAN FRANCISCO**

National Park Service and the U.S. Department of Energy, Federal Energy Management Program



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