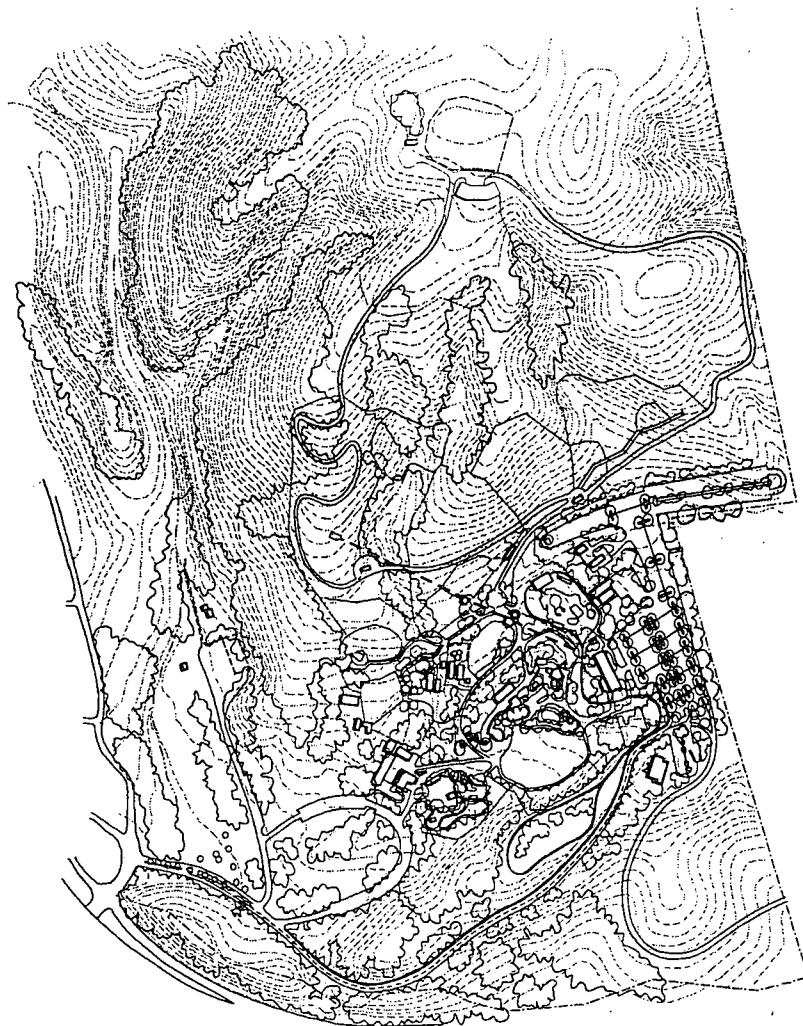


# The Oakland Zoo

in Knowland Park

## Master Plan

for the  
East Bay Zoological Society



Amphion Environmental Inc.  
October 1996



## Purpose of the 1996 Master Plan

The Oakland Zoo has been improving so dramatically and at such a rapid pace over the last few years that it is time to refine the 1990 Oakland Zoo in Knowland Park Master Plan. The 1996 Master Plan will need to achieve many goals:

### ❖ *Communicate a vision for the future.* ❖

The 1996 Master Plan for the Oakland Zoo must clearly identify the vision for the facility. It needs to be able to convince the staff, supporting societies, City Council members, potential funding sources and other investors that the plan represents a viable, exciting future. It needs to communicate the "game plan" for the next 20 years -- the animal collection, habitat types, educational programs, improved visitor services and most importantly the underlying conservation philosophy. Two guiding visions have been identified:

- ✓ *Make optimum use of the unique combination of historic and native Californian landscapes in Knowland Park.*
- ✓ *Balance fiscal prudence and bold new ideas, building an achievable vision of the future for The Oakland Zoo in Knowland Park.*

### ❖ *Incorporate projects under development* ❖

The dream of the future of the zoo needs to clearly identify what is new and what is already existing or is currently under construction. While information regarding ongoing projects exists in a number of reports and separate drawings, the 1996 Master Plan incorporates these projects in a single document. Enough detail also is included in the plan to establish the design quality and identify the size, quantity and general types of materials of the proposed new features. This information supports the environmental review process required by the California Environmental Quality Act, as well as provide substance for the vision of the future zoo. Hard questions which the plan addresses include -- What does it look like? What will it cost? How will we pay for it? What changes and what remains the same? What do we do first? The 1996 plan provides a blueprint that addresses environmental issues and project implementation.

### ❖ *Provide sufficient detail for CEQA review* ❖

The California Environmental Quality Act (CEQA) of 1969 requires that all state and local agencies consider the environmental consequences of their actions. It is important that the 1996 Master Plan be detailed enough for a comprehensive environmental review. Certification of an environmental document will permit the Zoo to implement the plan in smaller steps without outside agencies continually reviewing each project in a piecemeal fashion.

... needs to be sensitive to environmental issues, and should try to avoid potential impacts where possible. If the impacts can not be avoided, the plan will need to be inventive and incorporate mitigation measures that reduce any potential impacts to a level of insignificance. Additional documents in the form of technical reports need to incorporate supporting data.

❖ *Develop a document that is approachable and easy to update* ❖

The document needs to be more than just a plan on a shelf -- it should share the exciting vision of the Zoo's future. The Master Plan should be approachable on several levels: easy to read, fun to look at, a logical strategy for development, and with clear ideas for implementation. All good planning documents should address a range of audience -- Master Plans need to reach the widest range. The plan must achieve support from decision makers, excite citizens, elicit confidence from environmental review agencies, provide a solid image for potential funding sources, and help the Zoo staff set priorities and direct their energies. The plan must also recognize that things change and that it will be necessary to accommodate future refinement and updates.

### Update Process

This 1996 Master Plan for The Oakland Zoo in Knowland Park gathers in one document the results of many years of planning and special studies.

Beginning in 1990, a Master Plan Summary was developed using a process that included input from neighborhood groups through several public meetings. As a result of the commitment of the Zoo to be a "good neighbor" the 1990 Master Plan incorporated concerns and minimized impacts upon the adjacent neighborhoods.

In the Spring of 1990, the planning efforts culminated in a series of interactive planning workshops. Members of the planning committee, zoo staff and The Portico Group participated intensively in these sessions. These sessions led to the development of the Master Plan Summary in September 1990.

Following the acceptance of the Plan, the Oakland Zoo actively pursued funding and has begun to implement the master plan. As new projects have developed, the plan has continued to be refined. To better understand the potential impacts of the Master Plan on the environment and surrounding neighborhoods, the East Bay Zoological Society (EBZS) has undertaken several technical studies. These studies have addressed such issues as:

- Initial Study for CEQA Compliance
- Biotic Resources Survey
- Attendance and Staffing Projections

In the Spring of 1996, Amphion was retained to undertake a comprehensive update of the Master Plan. Working closely with members of the planning committee and zoo staff, the 1996 plan incorporates the many projects under construction, the findings of the special studies, as well as reinforcing the vision set forth in the 1990 Master Plan. Upon completion of the 1996 Master Plan, the document will undergo the state required CEQA review. The 1996 Master Plan update process has been developed to incorporate environmental concerns. By identifying potential issues early in the process, the proposed improvements have avoided significant impacts. A number of enhancements and project restrictions have been incorporated into the plan to ensure that the plan minimizes adverse impacts to the environment.

### Organization of the Master Plan

The Master Plan has been divided into 5 sections that address the goals of the update.

*The Introduction establishes updated goals, and provides background on the process and procedures used to adopt the plan.*

Section 2 - *Guiding Principles for Development* establishes the vision for the future of the facility. It sets out the zoo's mission, defines the unique environments and captures the spirit of dedication to conservation. The vision statement quantifies the future in terms of desired changes and protection of valuable resources.

Section 3 - *The Oakland Zoo in Knowland Park Master Plan* details the physical attributes of the future zoo. In this section the existing zoo is described and the various elements are identified that will be changed or retained. The three unique landscape elements that make up the zoo are discussed in detail and shown in graphics.

Section 4 - *Environmental Considerations* uses the topics identified by the CEQA checklist to identify the opportunities and constraints. The section details how the proposed improvements to the zoo maximize opportunities and reduce potential impacts to the environment.

Section 5 - *Plan Implementation* discusses the steps needed to develop the vision. The market area and attendance are discussed in terms of revenue sources and potential development strategies. Capital improvements are identified as well as operations funding. The on-going requirements for management, operations, staffing and maintenance are also discussed to ensure the implementation is sustainable. Finally project priorities and phasing are discussed to provide a blueprint into the future.

## Guiding Principles for Development

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The Oakland Zoo in Knowland Park is a unique regional environmental resource within the greater Alameda/ Contra Costa County region. It combines three unique landscape environments within a single visitor experience: the Historic Park Landscape and Arboretum, the Zoological Park and California 1820.

- ❖ The *Historical Park Landscape and Arboretum* provides a pastoral setting for picnics and quiet recreation.
- ❖ The *Zoological Park* touches the senses and stimulates an understanding of the world's wild places. The experience promotes stewardship and conservation of the earth's wild animals, plants and habitats.
- ❖ *California 1820* teaches visitors about California's rich, natural heritage and preserves hundreds of acres of chaparral, grasslands, and riparian habitats. Experience of this landscape motivates visitors to understand and conserve the wild habitats of California.

The presence of three very different but complementary landscape components in Knowland Park offers us the opportunity to educate visitors to the values of stewardship of wild habitats. Traditional family recreation in the Historic Park Landscape will complement the experience of exotic habitats and animals and provide a setting for enjoyment and exploration by Knowland Park's visitors.

### **The East Bay Zoological Society (EBZS)**

The East Bay Zoological Society (EBZS) has full responsibility under contract from the City of Oakland for the operation, maintenance and development of the 37 acre Oakland Zoo and the 443 acres of Knowland Park which surround the zoo. In September 1984, the EBZS's missions and goals:

"The Society's Mission is to provide an opportunity for the public to see and be able to study animals from around the world which are displayed in humane, naturalistic exhibits to provide a quality outdoor experience in the large parkland. In planning and development of a well managed, quality facility, education opportunities for all ages are paramount factors."

When the mission statement was developed, EBZS also adopted a series of specific goals and objectives for the zoo:

- ❖ Emphasize education, conservation of animals and cooperation with other agencies in appropriate research projects.
- ❖ Make the comfort of all zoo animals a high priority and enrich existing mammal, bird and reptile environments with natural habitats according to behavioral needs.



- ❖ Maintain high standards of animal health which included: sanitation, nutrition, parasite control, preventive medicine, necropsy procedures, and maintain records under direction of a full-time veterinarian.
- ❖ In planning and the development of new facilities emphasize natural settings and mixed species exhibits.
- ❖ Give priority to present habitat improvement, replacement and enlargement of outdated exhibits.
- ❖ Use the Animal Selection Plan to guide future acquisitions and exchanges of species with other zoos.

The General Goals are to:

- ❖ Cooperate with schools, colleges and other educational agencies to provide educational and research programs.
- ❖ Provide in-service training and educational opportunities for zoo staff.
- ❖ Place emphasis on the public's and staff's safety.
- ❖ Expand membership and community support.
- ❖ Use a coordinated approach with the zoo and surrounding parklands.
- ❖ Have a full public relations program for community awareness.

Approximately 31,000 school children visit The Oakland Zoo each year from over 40 cities in Alameda/ Contra- Costa County and throughout the Bay Area. The zoo provides quality educational programs for 6,400 of these students and reaches another 7,000 through Zoomobile outreach programs and 1,000 through summer Zoo Camp Programs. To help meet these goals the EBZS established the Oakland Zoo Education Department whose mission is:

"To provide young people with the tools for making sense of the world around them. and

To foster and focus the natural affinity human beings have for wild things and places."

The zoo offers five programs for teachers and their classes, preschool through sixth grade. Three of these programs take place at the zoo, the other two occur off-site at local schools.

1. **Docent Tours** by trained docents interpret the Main Zoo to children ages 5 years and older. The docents also have a program for the blind called "Sensory Safari."
2. **Classroom Programs** include day-long programs for single classes (maximum 35 students) at the zoo. Each grade level features a different topic related to the State Science Framework. The zoo also offers a special four day program called "Animal Behavior" just for the G.A.T.E. students in grades 5 and 6.



3. The zoo also provides **Discovery Packs** for teachers of grades K through 3 who wish to lead their own field trips. After attending a training workshop, teachers may check out a bag of biofacts, pictures and brief tests to assist their tour. Teacher training classes are offered twice during the year.
4. The **Conservation Zoomobile** is designed for single classes grades 4 through 6 with portable materials set up as a series of stations in a school's library, multi-purpose room or classroom. The scheduled class spends about two hours moving through the staff and docent led stations at 15 minute intervals.
5. The **Primary Zoomobile** for single classes preschool through first grade with three to five small animals, pictures and animal artifacts. All of the children who wish to may touch most of the animals presented.

The department also offers a Zoo Camp during the summer for ages 4 - 12 and two one-week full day programs for teens during the summer: The Zoo Camp Teen Assistant Program and the Zoo Teen Program. In addition the Department develops a public lectures series, provides a rest home/ hospital program and organizes other special events.

The Oakland Zoo has come to take an increasingly active role in conservation efforts both locally and globally. The Zoo supports the City of Oakland on creek clean-up days, recycling projects and education outreach programs, as well as undertaking their own creek restoration project and state-of-the-art manure recycling as proposed in this plan. Support for the Zoo translates into a wider conservation effort beyond the 443 acre boundary of Knowland Park. The Zoo has chosen three projects that enrich local programs, incorporate the Zoo's vision environmentally and work toward a greater good for our global community. These include:

**African Wildlife Foundation. Cynthia Moss.** Since 1972, Cynthia Moss has been carrying out a scientific study of the elephant population in Amboseli National Park in Kenya. The Oakland Zoo provides financial support for this field research program. The Oakland Zoo's captive husbandry program for African elephants, one of a handful in the nation, can enrich and be enriched by this research.

**The Jane Goodall Institute. Jane Goodall.** For 35 years Jane Goodall has studied the chimpanzees of the Gombe Stream Reserve. Through this long term study the Zoo has come to understand much more about this species and the rain forest exhibit at the Oakland Zoo. The Oakland Zoo provides support to The Jane Goodall Institute.

**Association of Zoos and Aquariums Bear Taxon Advisory Group.** Established in 1990 by the Association of Zoos and Aquarium (AZA), Taxon Advisory Groups (TAGS) examine the conservation needs of entire taxa or groups of

related species. The Zoo's sun bears are a part of this advisor group. With their recently constructed exhibit, the curatorial staff will be key participants in these national and international discussions regarding important conservation efforts for bears around the world.

The Zoo is constantly balancing its education mission with the need to provide a wholesome and entertaining environment for the visitor. The EBZS also actively reaches beyond the park boundaries to bring the Zoo to the Oakland community. The Zoo works cooperatively with other businesses to spread the word. The zoo is proud to be the largest youth employer in the East Bay and represented on the Steering Committee of The New Ways Workers and the Mayor's Youth Employment Center. Training new employees to better serve zoo visitors remains a top priority, but the Zoo also prepares the youth of Oakland for other job opportunities. The EBZS also maintains an active volunteer program. In the past year the Zoo benefited from over 10,000 hours of service from 66 volunteers who assist keepers in animal management, answer phones in the main office or help out at special events. The zoo also has support of local groups and companies that volunteer labor for special projects. Volunteers who successfully complete the Docent Training Program join the approximately 180 member Docent Council to teach classes, staff "educational stations" within the Zoo, provide public lectures and participate in other programs.

The Oakland Zoo in Knowland Park is composed of three unique landscape environments: The Historical Park Landscape and Arboretum, The Zoological Park and Upper Knowland Park. The rich combination of local historic and native California landscapes play off the global themes of the zoological park and provide a visitor experience found nowhere else in the world. These three environments enrich each other with their contrasting physical characteristics -- stately historic palms, the exotic gibbons in their treetops and dense chaparral. The proposed enhancements and program components reinforce how each interrelates to form a comprehensible whole -- The Oakland Zoo in Knowland Park!

The Oakland Zoo in Knowland Park totals 443 acres of which 350 acres are in the undeveloped Upper Knowland Park, 56 acres are within the Historical Park Landscape and 37 acres are in the Zoological Park. The 1996 Master Plan is designed to minimize disturbance to undeveloped lands by clustering new development and efficiently using existing developed areas. The Master Plan preserves approximately 80% (350 acres) of the site as open space. The remaining 20% (118 acres) of the site represents existing and planned development for zoological and recreational use. The Master Plan proposes new development affecting 62 acres. Of this, approximately 25 of undeveloped lands located in Upper Knowland Park would be developed and the remaining 37 acres would consist of new projects within the developed 37 acre Zoological Park. New development is planned to be in compliance with the standards set forth in the Americans with Disabilities Act (ADA). The plan also proposes habitat enhancement and revegetation with native plants throughout Knowland Park as the proposed new development is implemented. The natural oak woodland, native grasslands, coastal scrub and riparian woodland communities will be augmented by plantings of appropriate oaks, redwoods, bay trees, bunch grasses, shrub species and others, as eucalyptus, French broom and other exotic plants are removed.

### Historical Park Landscape and Arboretum

Visitors enter The Oakland Zoo in Knowland Park through the picturesque landscape of the Historical Park and Arboretum. The stately trees throughout this area are the remnants of the Frederick Talbot estate, an early Bay Area lumber and shipping magnate.

A row of mature Canary Island Date Palms mark the park entry. Stately Mexican Fan Palms, Chilean Palms and exotic Bunya Bunya trees from Australia dot the formal meadows of the existing picnic grounds. These arboretum specimens were planted at the turn of the century as a part of the Talbot Estate grounds. The Arboretum's international collection of trees includes eight species of palms, native and exotic oaks, redwoods and many other specimens from areas such as Australia, North Africa, the Himalayas, Chile and the Canary islands. The importance of Frederick Talbot's private arboretum is

reflected in the earlier names of Knowland Park -- formerly Alameda County Zoological Gardens and Arboretum (1936) and later Joseph Knowland State Park and Arboretum (1950).

While there is little visible evidence of former occupations, it is likely this enclosed stream valley was visited by the Costanoan Indians. During the 1770s, a Spanish Land grant made it part of the southern most end of Rancho San Antonio.

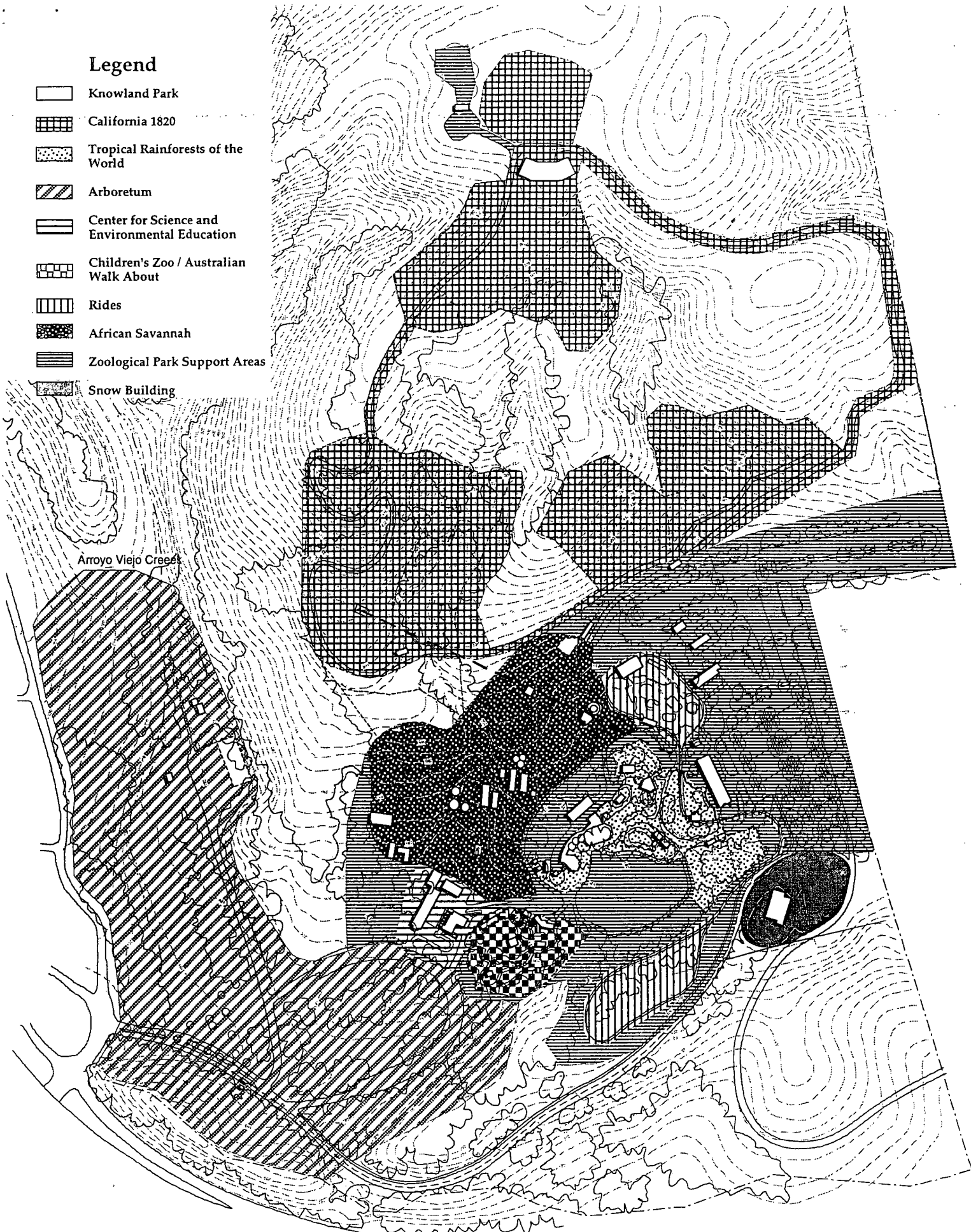
The Master Plan will improve the existing entry and picnic functions, while preserving the valuable historic resources. The formal serenity of the historic landscape is enhanced with entry, roadway and parking improvements. The existing entrance kiosk was recently constructed to improve the stacking distance for cars waiting to enter the park and the flow of traffic into the Park. The two lanes provide 800 feet of stacking space for approximately 45 cars. The City of Oakland has plans to add a signal light across from the Zoo entry at the "Y" intersection at Mountain Boulevard and Golf Links Road in fiscal year 1996/97. New signage and planting will be added to help identify the Zoo entry's turning lane and further improve traffic flow.

Group and individual picnic sites provide opportunities for casual recreation in a quiet green oasis -- echoing the former role of the arboretum as a pleasure garden. Three new picnic shelters will be located in the meadow and on the picnic knoll. Visually, these shelters will evoke the architectural richness of Oakland's many turn of the century Victorian structures, while being in scale with the historic landscape -- fitting for the estate of a former lumber magnate who made his fortune during the heyday of wood construction. As the arboretum ages, new plantings will continue to augment the present collection of semi-tropical and temperate trees. The meadow currently extends to the east, taking advantage of the narrow valley bound on the north by the ephemeral stream. Here exotic plant materials intermingle with the native oaks and naturalized Australian blue gum eucalyptus trees. To protect the riparian values of the stream, a 100 foot wide buffer from the top of the bank will be established and no structures or other improvements will encroach on this buffer. The existing bathrooms will be removed from the riparian corridor. The new restroom facility will be located adjacent to the meadow and parking area, providing easy access for visitors and maintenance. A new pedestrian hiking trail following the general alignment of Arroyo Viejo Creek will connect the meadow picnic area with the hiking trails near the proposed California Interpretive Center and throughout the rest of Upper Knowland Park. The Arroyo Viejo trail will provide opportunities for creekside interpretive overlooks to inform visitors about the native environment, urban creek restoration activities and the importance of riparian habitats.

Immediately south of the entrance kiosk, the existing one-way loop road continues to provide access to parking that serves not only the picnic areas, but also the lower zoo entrance that is open in the summer and for special events. The close proximity of the Environmental Education Center (currently under construction) allows for 152 convenient parking spaces (with 6 meeting ADA guidelines) for evening events in the center's meeting rooms and small auditorium. The three

# Legend

-  Knowland Park
-  California 1820
-  Tropical Rainforests of the World
-  Arboretum
-  Center for Science and Environmental Education
-  Children's Zoo / Australian Walk About
-  Rides
-  African Savannah
-  Zoological Park Support Areas
-  Snow Building



Arroyo Viejo Creek

**Master Plan Components**  
The Oakland Zoo in Knowland Park

small structures that create the environmental education center house the administrative offices, classrooms and an auditorium. These buildings are grouped around an entry courtyard, defined by planters and trellis, to provide pleasant, indoor and outdoor public spaces. Other improvements include a seasonally operated ticket booth, and provision for handicap parking adjacent to the entry. The service areas for the Environmental Education Center are located below the buildings and accessed from the existing service road into the Children's Zoo. The main service entry is located to the north of the environmental education center providing access to the service area for the Zoological gardens, which is screened by plantings and fencing.

The existing parking spaces throughout the site (565 spaces in the upper lots and 335 spaces in the lower lots) will be retained in 4 parking areas. An overflow parking lot is provided east of the main meadow and can accommodate 183 vehicles (6 spaces meeting ADA guidelines) serving both the picnic areas and zoo. The entrance drive currently narrows near the main parking area. This will be widened to 30 feet to allow for two way traffic, with a paved shoulder for pedestrians. The proposed two-way road will improve the internal zoo and park circulation and reduce traffic in the neighborhood adjacent to the 106th Street on-ramp to I-580. The entrance road winds uphill for approximately one-half mile. A left hand turn at the top of the hill delivers visitors into the existing main parking lot for the Zoological Park. The main parking lot provides space for 268 cars (12 spaces meeting ADA guidelines), with graded overflow parking lots at the far eastern end for an additional 292 cars. These overflow parking areas will be paved in the future to accommodate attendance increases. A right-hand turn provides access to the existing one way exit drive that proceeds to the exit gate at 106th Avenue. From here there is easy access to the west bound entrance of the I-580 Freeway.

The Snow Building and its gardens, located at the southern edge of the Historic Park Landscape, overlooks the lights of the Bay Area. This facility will be improved and continue to be available for larger parties and receptions which require indoor space for up to 250 people. The high vaulted ceiling of the current structure and kitchen facilities make it ideal for catering formal lunches or dinners. A smaller room at the west end of the building forms an ideal dressing room for weddings and other events. The main glassed-in gathering room opens onto the garden that wraps around the north and west sides providing spectacular views of Oakland, the San Francisco Bay and Knowland Park. A small parking lot serves this facility with spaces for 26 cars (2 spaces meeting ADA guidelines). Additional parking is provided in the western portions of the main zoo parking lot.

### The Zoological Park

The zoological park offers visitors a world class experience of exotic animals in natural habitats. It provides the opportunity for the public to see and study animals from around the world displayed in humane, naturalistic exhibits providing a quality outdoor experience in the large parkland. The Park's relatively gentle topography and intimate scale provides a setting for easy

exploration by adults and children alike. The emphasis of education, conservation of animals and cooperation with other agencies in appropriate research projects expands the visitors experience beyond the park boundaries.

Over the next ten years, the animals will progressively be arranged to highlight three major environmental themes: the African Savanna, Tropical Rainforests of the World and California 1820. The Children's Zoo also will be expanded to include not only the current domestic animals, but also to accommodate the current collection of Australian animals in an adjacent area that will become known as the Australian Walk-about.

All of the animals in the major trail areas will be in naturalistic settings with social groupings appropriate for each species. The remaining outdated cages, such as the Gelada baboon and spider monkey, will be addressed first as the zoo continues to renovate, upgrade and incorporate the current animals into the new themes. The new exhibits will offer an enriched variety of visitor-animal interaction such as the possibility to view the underwater world of the river otters, experience the misty world of the rainforest and look over the African Savanna.

### **The African Savanna**

The story of African wildlife, their ecology and conservation will never lose relevance or appeal. The existing animals in the African Veldt, featuring giraffe, eland and gazelle, the two acre African lion exhibit, and the elephant exhibit are among the best of their kind in the nation. Continued development of the African Savanna in the northeast portion of the Zoological Park will feature a trail returning from the existing elephant exhibit to the center of the zoo. Along the trail numerous additions will include warthog, green monkeys and hyena. The trail will provide opportunities for overlooks at the lions, impala, greater kudu, and baboon exhibits, and for close-up experiences for smaller mammals such as the playful meerkats or rock hyrax. The Savanna monitor exhibit will house reptiles to highlight the diversity of life of the African plains.

At the heart of the Savanna, a small African village will provide visitor services including a restroom, food service, and cultural hut adjacent to the existing elephant exhibit. The village's shady rest areas will provide not only an opportunity to refresh, but will include educational graphics describing the ecology, culture and challenges facing Africa today.

### **Tropical Rainforests of the World**

Threats to the Tropical Rainforests are now among the major concerns of conservationists worldwide. Destruction of the rainforests will not just affect the complex ecology itself; but because of their diversity, destruction will ultimately affect us all. The Tropical Rainforests of the World will build upon existing exhibits to provide zoo visitors with insight into the tremendous diversity of life found in these unique environments. The gibbon island, chimpanzee, tiger, ocelot, siamang island, wreathed hornbill and sun bear canyon provide the core of this environment. Additional dense plantings along the rainforest trails will create the tropical environment for animals and visitors alike. Siamangs and white-handed gibbons are heard throughout the Zoo as they call from their island

environments. The newly completed sun bear canyon is the largest Asian bear exhibit in the United States. The Zoo's curatorial staff will be key participants in national and international discussions regarding important conservation efforts for bears around the world. Graphics, state of the art enrichment tools and interactive displays will explain the intricate web of life that makes up the rainforest environment and the importance of this ecology, vital to us all.

### **Children's Zoo and Australian Walk About**

The new Australian Walk About will provide visitors with an enlightening experience with the Zoo's Australian animals. The existing wallabies, wallaroos, and large flightless emus will have a new home in an area of tall eucalyptus trees adjacent to the Children's Zoo and existing tortoise exhibit. The visitor pathway will wind through the exhibit, with low railings providing the barrier for safety of both animals and people. New lorikeets, budgerigar and cockatoos will be free in a walk-through tropical flight cage -- adding colorful chatter to the forest setting.

The Children's Zoo will continue to provide children and adults with the opportunity to touch and feed a few of the world's many varieties of domestic animals. This has always been one of the Oakland Zoo's main attractions and will continue to be so. There is no substitute for the sensory experience of touch in engendering excitement for learning and understanding.

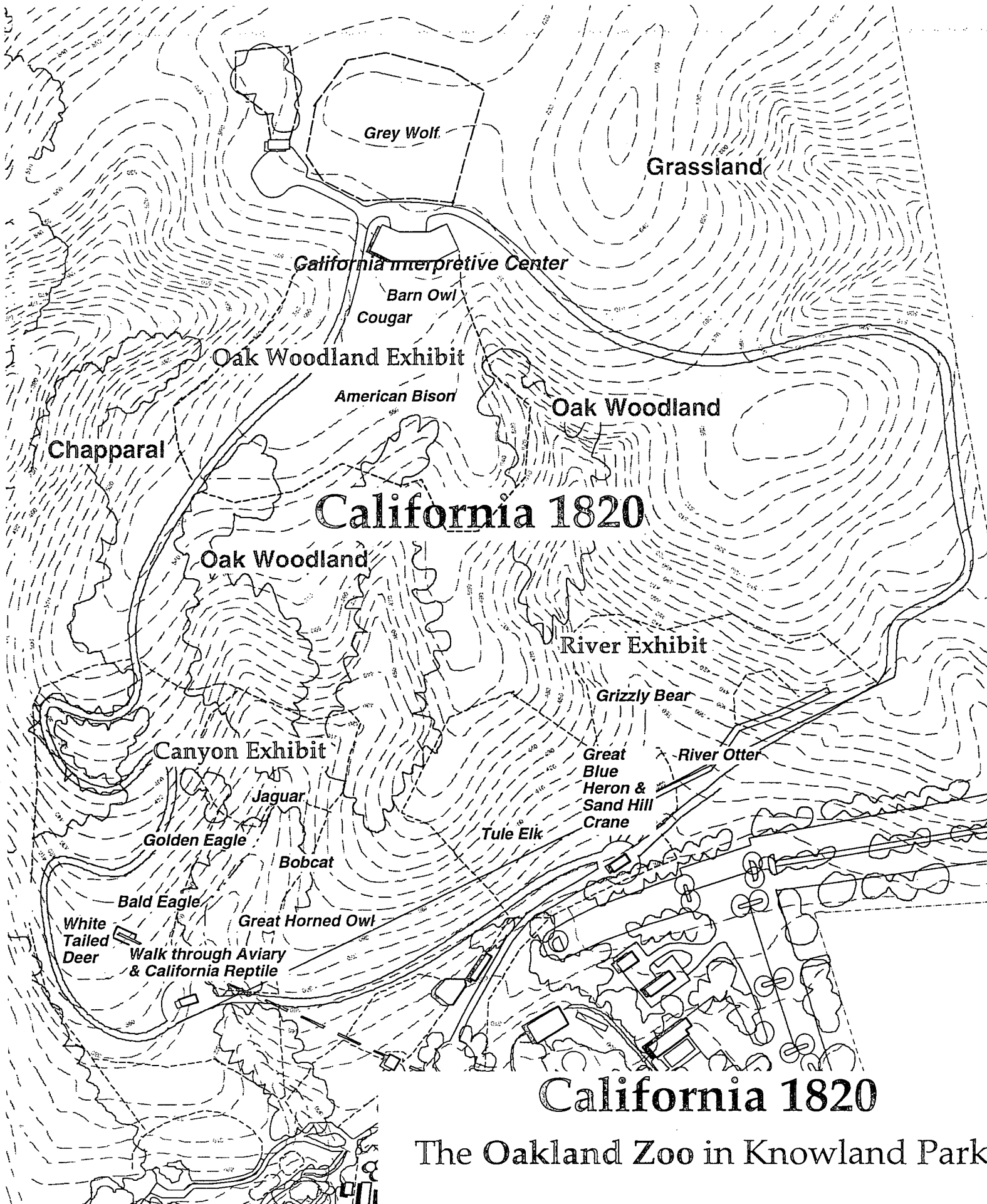
### **California 1820**

Located in both the Zoological Park and the adjacent landscape environment called Upper Knowland Park is a series of unique exhibits that comprise California 1820. Recognizing that California today faces tremendous environmental challenges at an accelerating rate, the central theme focuses on regional extinction, featuring native California species which occurred prior to the Gold Rush. The primary message is about California's own natural heritage; what we have lost, why we lost it and how we can preserve what is left.

Five native California ecological units are highlighted by the exhibits: grassland, chaparral, oak woodland, riparian and canyon. These exhibits are set in the broad hillside where the existing bison and tule elk currently live. The exhibits are surrounded by the 350 hundred acres of Knowland Park that will remain in its native state in the California habitat preserve known as Upper Knowland Park. The time is 1820, prior to the Gold Rush and the rapid influx of people that would change California's natural environments forever. A mobile, open air shuttle will depart the shuttle station and transport visitors along a loop trail that ascends through the five ecological areas. Two natural ravines and the top crest of the hillside serve as the three shuttle stops that allow visitors opportunities to walk among the exhibits. The exhibit areas will be restricted to areas that are currently utilized by Zoo activities, in order to protect the adjacent native riparian vegetation.

The first stop will focus on an experience of California's large open rivers and highlights the grizzly bear, a magnificent animal which once numbered over 10,000 animals throughout the state, but is now seen only on the California state flag. The existing river otters, great blue heron and Sandhill crane currently





# California 1820

# California 1820

The Oakland Zoo in Knowland Park

housed in the Zoo will be relocated to the new river site. A new exhibit for the Zoo's river otters will provide the opportunity for underwater viewing in a natural setting. Glass panels will split the stream's surface, providing glimpses of the otter's aquatic adaptations. Visitors will leave the shuttle stop and traverse along boardwalks to visit the river associated displays.

Visitors will re-board the shuttle to pass through grasslands, current home to the zoo's own tule elk. The second stop is at a walk-through aviary and the California reptile exhibit. The gentle enclosure of the surrounding canyon will provide the setting for a more intimate look at such animals as bald eagle, great horned owl, golden eagle, and the bobcat currently housed at the children's zoo. The canyon exhibits will culminate with the jaguar enclosure. Jaguars are a native California species and were known to have extended as far north as the Monterey area, with the last recorded kill in 1865 outside of Palm Springs.

The shuttle continues up across the grassland inhabited by the Zoo's herds of white tail deer and American bison to make its final stop at the new California Interpretive Center. Nearby exhibits such as the cougar, barn owl and grey wolf will allow for a closer look. Situated just below the dramatic crest of Knowland Park hills, the Interpretive Center provides an overview of the ecological environment and human development of San Francisco Bay. With graphics presenting the Bay Area as it was in 1820, this is where the visitor will appreciate what we have lost, and learn about what we must do to preserve and enhance what remains. The Center also forms a trail-head for self guided nature walks into the surrounding chaparral, grasslands and oak woodlands that make up the Upper Knowland Park.

### *Visitor Services and Amenities*

Visitor entrances will be improved to better serve not only individuals and families, but also larger groups such as school children. The existing main entry at the southern end of the Zoological Park will be enhanced with landscaping, new ticket booth, trellis, improved signage and banners to be more visible from the parking lot and entrance road. The northern entrance will be primarily for group access through the new Center for Science and Environmental Education. This small complex of buildings will include a ticket booth staffed during the summer for family access. School buses will drop off children at this entrance. Buses will then be directed to park in the picnic area parking lot located to the north of the Education Center. This improved north entrance will result in decreased congestion at the main Zoo entrance and improve overall zoo visitor circulation. Visitors will be able to exit by either the north or south gateways.

The existing entrance building will be retained at the main entrance to the zoo. The Safari Restaurant and adjoining patio will continue to be the main food service location. The side dining patio will be enclosed and the kitchen expanded to provide a full service restaurant. The existing gift shop will expand into the existing education room site. First aid station, staff/ security office, telephone and restrooms will continue to make this entrance area one of the primary visitor service points. A new visitor services core (including restrooms, and food service)

will be provided in the African Village in the heart of the African Savanna. The existing restrooms and drinking fountain in the Children's Zoo provide the third visitor service area within the zoological park. Visitor services such as restrooms and drinking fountains will also be incorporated into the new buildings at the Education Center (at the northern entry) and at the California Interpretation Center.

Two new facilities will be developed for important educational contact and interpretive opportunities. At the northern entry, the Education Center will occupy a new complex of buildings. These will include four administrative offices, class room building with space for 120 children, and a 120-seat auditorium/ multi-use room. The buildings form outdoor seating areas that are further defined with trellises and plantings. Located beneath the Auditorium is a parking area for the zoo mobiles and an associated animal handling room.

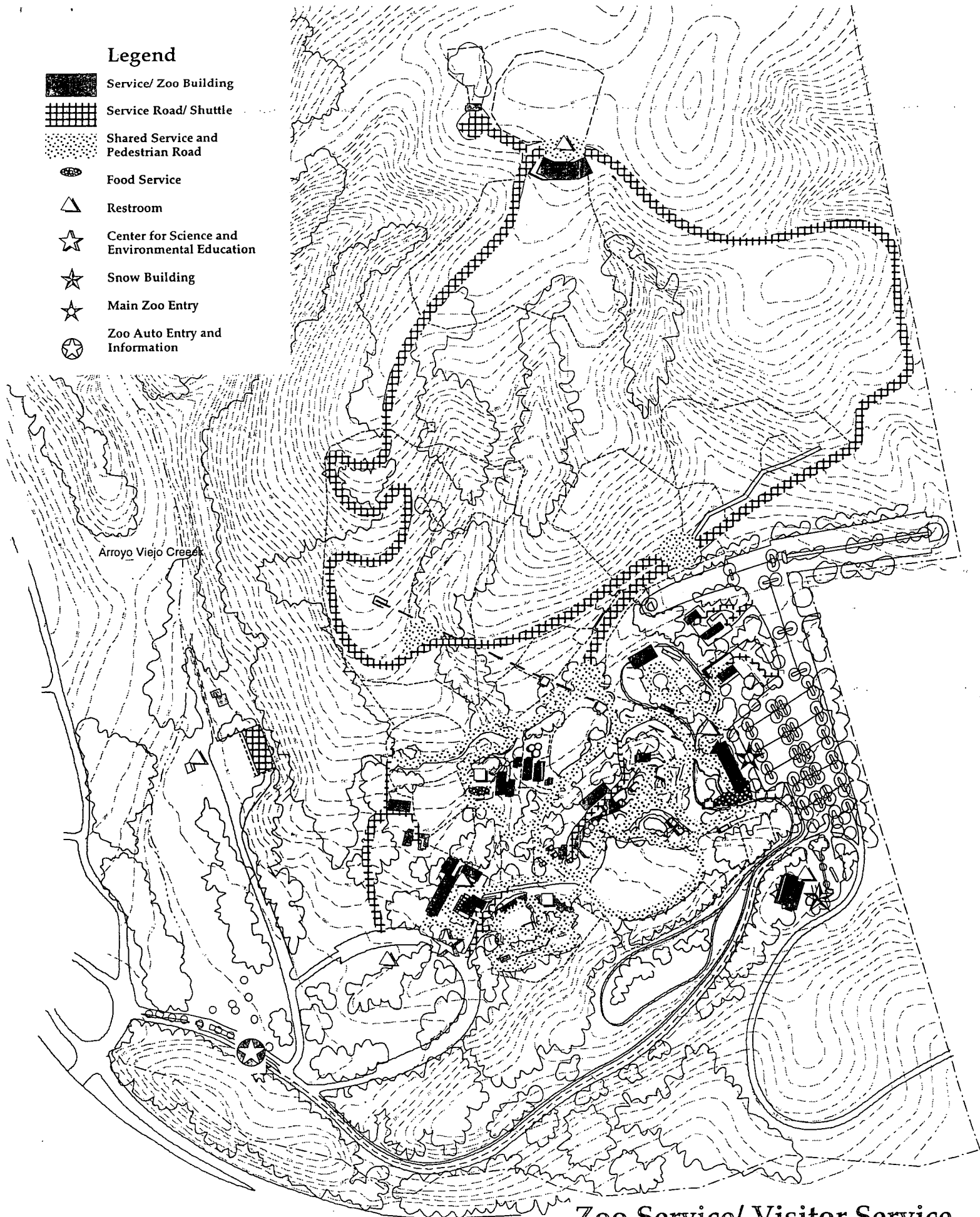
The second interpretive facility will be located at the eastern edge of the Zoo grounds. The California Interpretive Center will provide the visitor with a focus on California's natural heritage. The proposed 7,500 square foot building will incorporate reptiles and small mammals with the botanical and geological components that complete their unique California habitats. The building will be located in a natural saddle set back from the crest of the hill and sheltered by surrounding vegetation. It will be a low profile, wood framed structure, with expanses of glass and decks to connect the visitor to the surrounding environment. The final design will take into account not only the visitor experience, but also incorporate the following environmental sensitivities and design guidelines:

- ✓ The building footprint will minimize grading and preserve native vegetation.
- ✓ The structure will maintain a low profile, reducing its visibility from adjacent neighborhoods and the I-580 freeway. Security and night lighting will be specifically designed to reduce spillage and glare on adjoining areas. Building materials will be predominantly matte finish to reduce the potential for glare.
- ✓ Construction materials will acknowledge that the surrounding California landscape is subject to wildfire. The building will incorporate such features as fire safe roofing, siding, detailing of overhangs and decks. These features offer the opportunity to educate visitors about the role of fire in the natural ecosystem, as well as how humans can live in a more fire safe manner.

A memorable part of a day at the Zoo for many Bay Area children is the traditional rides area located east of the Zoo entrance. This area will be improved with new landscaping, arbor entry patio, handicap access, relocated food service, new benches, drinking fountain and incorporated with the existing restrooms. The existing Zoo train will continue to loop along the western perimeter, providing visitors with an overview of the zoo and a special view of the sika deer and sunbears. The existing sky ride will continue to soar above the zoological park, offering a unique birds-eye perspective of the habitats of the camels, African

# Legend

-  Service/ Zoo Building
-  Service Road/ Shuttle
-  Shared Service and Pedestrian Road
-  Food Service
-  Restroom
-  Center for Science and Environmental Education
-  Snow Building
-  Main Zoo Entry
-  Zoo Auto Entry and Information



**Zoo Service/ Visitor Service**  
The Oakland Zoo in Knowland Park

Veldt residents, lions and California 1820 exhibits. Existing rides such as the Red Baron, Ferris Wheel, and Tubs-of-Fun will be augmented by new rides within the existing area, such as the Dragon Wagon, Umbrella Cars and Buggy Ride scaled down for the smaller visitors. Adjacent to the rides area the existing picnic area will continue to be used for birthday parties, school groups and group picnics.

### *Zoo Support Facilities & Infrastructure*

The Zoo will continue to disperse its operations support facilities. Currently primary deliveries, food storage and staff services are grouped in a small service yard located south of the rides area. The existing administrative functions housed here in a temporary building will be relocated into a new building east of the service area. The existing maintenance and shop yard (adjacent the rides area) will be relocated to the existing materials yard area adjacent to the existing overflow parking at the north edge of the zoo. Core veterinary facilities and kitchens will continue to operate from the service area located at the center of the zoo -- screened from the visitor by exhibits, the natural topography and vegetation. The two remnant houses from the historic Talbot estate provide Zoo caretaker's residences for night security. Additional 10-foot fencing will be incorporated into the zoo improvements to complete perimeter fencing for security and safety.

The existing service road at the north end of the Zoo will be improved to provide access to such facilities as the holding pens, hay barn and elephant barn. Service access also will continue from the northern edge of the Children's Zoo, and on the south-eastern edge near the new exhibit for the Grants zebra exhibit. Satellite service areas will be associated with each of the exhibit areas, providing off exhibit night-houses, holding pens and other facilities required for animal health and treatment. These service areas will be secured and screened from visitor view. Emergency vehicle access will be enhanced to all areas of the zoo for both visitor safety and animal care.

Manure processing is an important support activity for the zoo. Operation personnel will continue to test improved techniques that minimize impacts on surrounding environment, reducing erosion, improving water quality and eliminating objectionable odors or pests. The primary compost area will be relocated from the existing site (location of the future California 1820 river exhibit) to an area adjacent to the overflow parking. The composting technique contains the materials within long, air and water tight bags that speed decomposition and eliminate odor and potential water pollution. This technique is more environmentally safe than windrow composting since all decomposition takes place within an enclosed container. Processed compost soil will be utilized throughout the zoo to enrich planting areas or be sold to regional outlets. This program to recycle and reuse the composted materials is an on-going part of the Zoo's recycling effort and environmental commitment.

A new Off-exhibit Breeding Center will be hidden from view east of the California Interpretive Center. The 35,000 square foot site will be located in a natural level area screened by surrounding topography from neighboring residences and zoo visitors riding the shuttle or hiking nearby trails.

- ✓ The development area will minimize grading and preserve native vegetation.
- ✓ The office building will maintain a low, one story profile. Security and night lighting will be specifically designed to reduce spillage and glare on adjoining areas.
- ✓ The taller breeding aviaries will be enclosed with black coated fencing that will visually blend with the surrounding landscape. Aviary fencing will follow existing topography and avoid impacting existing vegetation.
- ✓ Paved access roads and parking areas will be minimized, utilizing the same routes as the shuttle and existing fire roads, and providing parking for a maximum of 5 cars.

A shuttle system will be developed to provide visitor access to the proposed California 1820 exhibit areas. A propane vehicle is proposed to pull a train of cars with capacity for 30 visitors. A 15-foot wide paved one-way loop road will be developed interconnecting the three exhibit areas and taking visitors through several of California's ecosystems. In developing the final road alignment several guidelines will be followed:

- ✓ The final alignment will minimize grading and preserve native vegetation. The road will follow existing dirt road alignments to the greatest extent feasible. The maximum slope will be 15%.
- ✓ Drainage run-off from the road will be controlled and dispersed to reduce erosion.
- ✓ Vehicle maintenance, refueling etc. will occur only in the designated service areas of the maintenance yard to reduce potential for hazardous material spills.
- ✓ A staff training program will emphasize special caution during daily operation for protection of native species in the California 1820 exhibit areas, such as braking the shuttle to allow Alameda whipsnakes to cross the road.

Infrastructure improvements will continually be required for The Oakland Zoo in Knowland Park. Some of the existing systems have been developed over the life of the zoo and are reaching capacity or have components that are near the end of their useful life. The historical park and zoological park are currently connected to municipal sewage, storm water and water lines, with service provided by the East Bay Municipal Utilities District. Electrical service and gas are provided by Pacific Gas and Electric Company. The zoological park currently has back up support systems such as emergency generators, water storage tanks or delivery systems should these services be interrupted by power outages, earthquakes or fires. The condition of existing asphalt pavement surfaces vary throughout the site, and are continually being upgraded. Maintenance and replacement of infrastructure components will be a continuing part of the operations and capital improvement budgets.

### CEQA Compliance

In 1969 the State of California enacted the California Environmental Quality Act (CEQA) that requires environmental review and assessment be undertaken for all projects in order to assess potential impacts and protect the environment. Compliance with this law can take several forms depending upon the type of project. In early 1994, a draft Initial Study of The Oakland Zoo in Knowland Park was prepared based on the 1990 Master Plan concepts. This Initial Study identified potentially significant effects in the areas of visual quality, transportation, noise, air quality, biology, geology/topography and water. These potential effects led to a number of changes in the master plan to avoid impacts or reduce the effects to less than significant.

In conjunction with adoption of this 1996 Master Plan, the 1994 draft Initial Study will be revised to re-evaluate the potential impact of the updated Master Plan. One of the significant changes in the 1996 Master Plan is the revised projection figures for future attendance to more accurately reflect anticipated increases in the number of annual visitors. Recent trends have shown little increase in the AZA accredited zoos throughout the western United States -- approximately 1.5% per year over the last eleven years. Actual zoo attendance figures are available from Fall 1994 and represent a range of increase of 12% in 1994 (308,656 visitors) to less than 0.5% increase in 1995 (309,651 visitors). (Prior to July 1994 attendance figures were estimated.) Attendance varies throughout the year depending upon weather, competing regional events and zoo programs or special events such as animal births. The international milestone birth of the African Elephant Kijana in November 1995 has contributed to a large attendance increase of 42% to date over 1994-1995 attendance figures. However, this type of increase is unlikely to be sustained. Based on the visitation for the first quarter of 1996, even with a 3% growth for the rest of the year, it is unlikely that the 1996 annual visitation will reach the figure of 316,874 visitors that was projected for 1995 in the Attendance and Staffing Projection Annual Report, even with the birth of the baby elephant. On the basis of these data, an annual increase of 3% is determined to represent a conservative projection of Zoo attendance increases to the year 2010.

A projection figure of 3% increase per year based on the 1994 attendance baseline anticipates an future visitation of 493,680 visitors by the year 2010. A figure of 627,550 visitors per year (an increase of 5% per year) was used in the 1994 Initial Study to look at potential traffic impacts. An even higher figure of 1,000,000 visitors per year was used to assess noise and air quality impacts. Thus potential impacts identified in the 1994 Initial Study do not accurately reflect attendance figures and potential impacts would be less than identified in the Initial Study.

It is the intent of the 1996 Master Plan to incorporate the results of the technical studies regarding attendance, parking and traffic, geology, seismic, and biotic resources and to avoid adverse impacts to the environment. By avoiding or mitigating any potentially significant impacts, the 1996 Master Plan could be a good candidate for utilizing a document known as a Negative Declaration to

comply with CEQA requirements. A revised Initial Study will determine if a Negative Declaration or Environmental Impact Report (EIR) will be prepared. If a Negative Declaration or Mitigated Negative Declaration cannot be adopted, a focused EIR or a full scale EIR would be undertaken and the 1996 Master Plan could possibly be further modified to comply with CEQA.

### **Potential Environmental Effects**

In order to evaluate potential environmental effects, the following sections discuss fourteen issues identified by the CEQA environmental evaluation checklist. For each issue, the potential effects of the proposed 1996 Master Plan improvements are identified. This discussion focuses on the way the improvements avoid, minimize or mitigate potentially significant impacts in order to develop an environmentally superior plan for future development.

### **Compatibility with Existing Zoning and Plans**

The Oakland Zoo in Knowland Park is located within the City of Oakland and subject to its General Plan and zoning code. The proposed improvement sites (project sites) are located within the "park, recreation or natural area" designation in the City of Oakland Illustrative Future Land Use Map. Since all of the improvements are designed to enhance the Zoo and Knowland Park, all of the components are consistent with the existing General Plan land use designation and policies.

Over the past several years, the City has been updating its Open Space Conservation, and Recreation (OSCAR) Element of the Oakland General Plan. The OSCAR recognizes The Oakland Zoo and Knowland Park as open space and recreation resources. The adopted OSCAR establishes many Goals, Objectives and Policies that the 1996 Master Plan directly supports. These include goals, objectives, policies and actions addressing creek conservation and management, public access to creeks through the development of trails, development of master plans as a tool for a rational system of park planning and management, park design with compatible uses, environmentally sensitive designs, and protection of historic features.

The City of Oakland has a Tree Preservation Ordinance that promotes tree preservation throughout the City. *Chapter 7 Article 6 - Trees* requires a tree removal permit for removal of any protected tree. Protected trees include any *Quercus agrifolia* measuring 4" dbh or larger and any other trees measuring 9" dbh or larger except *Eucalyptus* (Monterey Pines are partially protected as amended 1993). To comply with this ordinance, a tree survey has been completed for the proposed areas including the California 1820 exhibits. As each project is undertaken the permitting procedures set forth in the tree preservation ordinance will be followed, and all conditions of approval and other protection measures enacted as part of the construction.

The project area is also located within the Fire Prevention and Suppression Assessment District (FPSAD) created in December 1992. This special assessment district funds services and programs for fire suppression, prevention and preparedness within designated areas of Oakland. The Oakland Zoo in Knowland



Park contains several areas of wildland vegetation types that have been identified as high hazard areas by a regional fuel management plan. The zoo management will continue to work in conjunction with the City of Oakland Parks and Recreation Department to identify and manage these high fire hazard areas. Fuel management will include the progressive removal of eucalyptus, French broom and other highly flammable, non-native vegetation types. The zoo annually blades firebreaks around the zoo perimeter to reduce the spread of grass fires. They also coordinate with the Parks and Recreation Department to facilitate other vegetation management activities funded by the FPSAD.

#### Land Use Consistency

The 1996 Master Plan includes developing a small amount of the existing open space within the Knowland Park area. This would include the 7,500 square foot California Interpretive Center, the 37,500 square foot Off-exhibit Breeding Center, access roads and observation areas proposed for development in currently undeveloped recreation land. Approximately 60% of new development is located in areas already developed for other Zoo related uses. Only approximately 25 acres of open space will be developed from the existing 443 acre Knowland Park. Although these projects would convert open space for development, the projects are considered recreational uses since they are Zoo related. Therefore, no change in land use would occur, and the overall character of the area would not be affected.

The proposed improvements in the Historic Park and Zoological Park areas would not result in any substantial land use changes. The proposed Center for Science and Environmental Education, picnic shelters, parking areas and California 1820 exhibits are located within developed portions of the park. The design intent of California 1820 is to restore the natural setting within this area to California habitats as they appeared prior to 1820. This includes long term management for removal of non-native vegetation within the exhibit areas. Circulation changes will improve the existing pedestrian and vehicle circulation as well as emergency access and egress. The proposed improvements would expand and enhance recreational opportunities for the public. Additionally, new development will be compatible with adjacent land uses and is specifically designed to have no impact on the surrounding neighborhood community due to set backs and other screening methods.

#### Visual Quality

The California Interpretive Center and the Off-Exhibit Breeding Center have been carefully sited to minimize their visibility from nearby residential areas and to not disrupt the views of the hills from within the zoo. Design guidelines to minimize the height and mass of these structures, and to make them blend with the surrounding hillsides are discussed in Section 3. Additional trees and screening vegetation compatible with the surrounding oak woodland will be planted around the Off Exhibit Breeding Center to reduce its visibility from trails.

Other facilities proposed within the zoo will be built within the existing developed areas. Most of this construction will be visible only from within the Zoological Park and will blend in with the existing character of the vicinity. Approximately

60% of the proposed improvements are renovation of existing exhibits or previously developed sites. In most cases, the proposed projects will have a beneficial impact on the zoo character, replacing outdated enclosures with habitat appropriate to discussion of animals and their natural environments. The proposed improvements to parking areas are located within the existing parking lot areas. Improvements will include landscaping around the perimeter to minimize visibility and tree plantings within the parking lot to reduce the impact of large areas of pavement and direct visitors toward the main zoo entry. The final selection of parking lot lighting fixtures and lamp types will incorporate measures to control light and reduce glare and spill impacts on adjacent neighbors. The facility will continue to operate primarily in daylight hours. The proposed lighting will be for security and safety.

### Transportation

Detailed analysis of potential environmental effects related to the existing traffic load and capacity of the street system are provided in the *Preliminary Circulation and Parking Analysis* prepared by ESA (September 1, 1995). As reported in the *Oak Knoll Naval Hospital Reuse Study* recently prepared for the City of Oakland, existing peak hour levels of service (LOS) at the Golf Links Road and I-580 intersections are currently unacceptable (LOS F conditions). This intersection is scheduled to have traffic signals installed in Fiscal Year 1996/97, which will improve the level of service to an acceptable level. To evaluate the potential effect of the proposed Master Plan improvements, preliminary trip generation projections were made for average and peak conditions for years 2000 and 2010 using attendance projections and traffic generation data collected during field surveys. The maximum attendance and traffic projection scenario (a growth rate of 5% per year) was chosen to provide a conservative analysis. Following detailed analysis, the projected level of increases in arriving and departing traffic in 2000 and 2010 (up to a net increase of +196 vehicles) are expected to be accommodated at acceptable levels of service on the roadway network used by arriving and departing vehicles in the Park/Zoo vicinity. The basis for that expectation are:

- 1) the high weekend Zoo generated traffic would mix with background traffic that is lower than on weekdays. The weekday traffic peak generated by the zoo occurs between 10 AM and 3 PM when background traffic is at its daily minimum.
- 2) the freeway ramp intersections on Golf Links Road will be signalized by the City prior to 2000;
- 3) inbound traffic to the zoo will consist primarily of right turns from Golf Links Road.

However, even at the higher projected attendance increase of 5% per year, Zoo generated traffic increases would result in the maintenance of nearby intersections at acceptable levels of service.

At the public meeting on October 3, 1996 several residents of the adjacent neighborhood expressed speeding and safety issues along Malcolm Ave. A subsequent meeting with the City Traffic Engineering and Parking Division confirmed their awareness of the neighborhood concerns. All way stop signs

could be installed at the intersection of ... disadvantage of the stop signs is that traffic noise would increase due to start and stop of vehicles and safety conditions could deteriorate resulting from persons running the stop sign. The Zoo is committed to supporting neighborhood associations efforts to request traffic safety programs in their neighborhoods. The Oakland Police Department has two programs to discourage speeding:

- 1) Photo Radar Program - after the Department has conducted a traffic speed survey, photo radar devices are installed to photograph the license plate of the cars exceeding the posted speed limit and violators are cited and sent a ticket in the mail.
- 2) Radar Display Trailer which displays speed of vehicles passing the trailer.

The Master Plan will incorporate feasible traffic mitigation measures recommended by the Environmental Impact Report.

The potential impacts of traffic increases on internal circulation roads were also evaluated. The Master Plan proposes improving the existing 1/2 mile of the Zoo Drive by converting from one-way to two way flow. This will have the following overall benefits:

- 1) accommodate both existing and projected inbound traffic volumes,
- 2) reduce the volume of traffic exiting the Zoo onto Sheldon/ 106th Street, thereby lessening potential effects on residents in that area. The proposed exit onto Golf Links is adjacent to local service businesses and does not affect residences.
- 3) improve internal circulation and permit Zoo patrons to make use of the Historic Park area without being forced to exit the park, drive north on I-580 and reenter the park from Golf Links Road.

An unavoidable effect of this proposal is the required widening of approximately 300 linear feet of the Zoo Drive near the Snow Building to provide adequate width for the two-lane two way traffic. These effects are further discussed under Geology/ Topography.

The Zoo is served by one bus route operated by Alameda-Contra Costa Transit (AC Transit) that stops along Golf Links Road at the Zoo entrance drive. This bus route originates at the Fruitvale BART (Bay Area Rapid Transit) station where it connects with other AC Transit routes and the BART train system to provide regional transit access to the Zoo. The increase in visitors at the Zoo could also result in increased ridership on the AC Transit bus route serving the Zoo. Currently few visitors utilize public transit to access the zoo. However, the addition during peak season of an internal shuttle by the Zoo from the park entrance to the southern zoo entrance is planned and will improve access from public transportation to the zoo entry.

Based on the *Preliminary Circulation and Parking Analysis* the existing 900 parking spaces are anticipated to accommodate peak parking needs through the year 2000. As stated in the technical background material, parking demand analysis is directly tied to attendance projections. The *Preliminary Circulation*

*and Parking Analysis* considered a range of attendance projections to calculate parking demand including annual growth rates of 1%, 3% and 5%. Assuming a maximum annual growth rate of 5%, an extremely conservative analysis, the projected parking demand would result in a shortage of 40 parking spaces in the year 2010. As previously discussed, it is expected that an annual growth rate of 3% would be the upper range for attendance projections. If attendance increases at a rate of 3% per year to 2010, the parking demand in 2010 would be 735 spaces instead of the projected 940 spaces, and existing parking areas will meet the demand.

In order to continue to accommodate parking demand, attendance trends and parking demand levels will be monitored in future years. However, should the projections exceed the 3% increase and parking demand approaches capacity, the Oakland Zoo management will explore the following two options to accommodate the demand:

- 1) increase the on-site parking supply to accommodate future needs, or
- 2) establish a program of strategies to reduce/ manage parking demand (e.g. preferential parking spaces for vehicles with three or more occupants, use of lower parking lots for zoo parking with entrance at north group entry or a shuttle to the main south entry).

### Noise

Construction activities required to build the proposed projects will involve ground clearing, excavation and foundation preparation. Typically noise levels of these activities and the equipment range from 65 decibels (dBA) to 90 dBA at 50 feet. Noise from construction activities would be a short term, temporary impact on the zoo and unlikely to be heard at the distance to adjacent residential areas. As a mitigation these construction activities would be limited to between 7:00 AM and 6:00 PM as required by the City of Oakland Noise Ordinance.

Traffic associated with any increase in zoo attendance could raise long-term ambient noise levels in the adjacent neighborhood. An increase in traffic would also increase noise along the existing one-way exit road. The proposed widening of the present one-way entrance drive from Golf Links Road to handle two way traffic, will offset some future traffic demands on the existing one-way exit road. To further reduce the amount of noise from traffic in the residential area to the south of the zoo, buses bringing school children and other groups to the Zoo will be directed to the northern Zoo entrance and buses will be parked at adjacent parking lots. This will reduce traffic noise levels in the adjacent neighborhood because buses will no longer drop-off passengers at the main Zoo entrance, park in the southern parking lot or leave by the southern exit. During the October 1996 public meeting the adjacent neighbors expressed concern over noise in the parking lot, especially after the zoo has closed for the evening. To mitigate these concerns a sound wall will be installed along the southern boundary adjacent to the parking lot and residential properties.

Traffic on I-580, aircraft and natural sources of noise determine the ambient noise level at most locations in the developed portions of the zoo and upland

canyon portions of Knowland Park. Short-term noise measurements taken during peak-hour traffic were 67 dBA, Lav (average noise level) in the zoo parking lot, 65 dBA, Lav in the lower canyon, 64 dBA, Lav in Knowland Park and 66 dBA, Lav at the location of the proposed California Interpretive Center. These noise levels are within the "Normally Acceptable" land use category, and would not have an impact on Zoo visitors at locations within the Zoo or Park boundaries .

#### Air Quality Climate

The San Francisco Bay Area Air Basin is currently designated a non-attainment area with respect to the state and federal ozone (O<sub>3</sub>) standard and the state particulate matter (PM<sub>10</sub>) standard. The Bay Area Air Quality Management District (BAAQMD) has applied for O<sub>3</sub> attainment status. Given this information, a project generated violation of the O<sub>3</sub> and/or PM<sub>10</sub> standard at nearby air monitoring stations would be considered a significant effect.

Construction of the proposed Master Plan projects would generate dust particles (PM<sub>10</sub>) by earth moving and vehicle travel over unpaved surfaces. Construction activities would also result in emissions of criteria air pollutants (carbon monoxide (CO), oxides of nitrogen and sulfur (NO<sub>x</sub> and SO<sub>x</sub>) PM<sub>10</sub> and O<sub>3</sub> precursors) through combustion of fuel to run mobile construction equipment and through generation of construction worker motor vehicle trips. The number of miles traveled by construction workers and machine-hours of equipment operation would not be substantial and would not contribute substantially to an existing or projected air quality violation.

During operation, the Zoo would have stationary (e.g. boilers for heating, combustion activities) and mobile (vehicle trips to and from the zoo) sources of air pollutants. Most stationary sources would be permitted by the BAAQMD and would not be considered a significant source of air pollution.

Motor vehicle trips associated with an increase in zoo attendance will be the main source of operational emissions of criteria air pollutants. Mobile source emissions were calculated using EMFAC7F emission factors for year 2005, an average trip length of 17 miles and a threefold increase (1,000,000 visitors) in Zoo attendance. (Note: Projected attendance increases have been revised and would represent a maximum increase of 3% per year or 426,000 visitors by 2005.) The analysis showed that the difference between the project and existing conditions would be 53 pounds/day of NO<sub>x</sub>, 7 pounds/day of reactive organic gasses (ROGs), 6 pounds/day of SO<sub>x</sub>, 122 pounds/day of PM<sub>10</sub> and 59 pounds/day of CO. These pollutant levels are all below BAAQMD criteria for significance. Mobile source emissions would be regional in nature, as trips to the Zoo would be attracted from many East Bay locations. In addition, the Zoo proposes to use a propane shuttle for the California 1820 exhibit. Therefore, the Zoo's total air quality impact would not be significant and would be unlikely to have an impact on existing and projected air quality violations.

The nearest sensitive receptors are residents of the neighborhood adjacent to the southern zoo boundary. The largest exposure to pollutants would occur during construction. Construction activities north of the neighborhood would generate

dust. Although prevailing winds are westerly, it is possible that a north wind could blow dust into the adjacent neighborhood. Heavy watering of exposed soil would mitigate this impact and reduce the potential for exposure to substantial pollutant concentrations.

Compost piles to process Zoo manure are currently located in the lower canyon area and are an existing source of moderate odors. The compost operation is proposed to be relocated and new methods undertaken to enclose the manure/hay, speed-up the composting process and minimize odors. The new location will be located at least 100 feet from any perennial stream or wetland area, and at least 300 feet from neighboring residences. The current compost piles are less than four feet in height, covered with straw and occasionally aerated. The 1996 Master Plan proposes increasing the number of Zoo animals, which would result in an increase of compost activity. The impact of the odors will not be significant due to the proposed proper handling of the composting techniques and proposed location distant from the southern perimeter. Overall odors will be reduced using the new system by enclosing the composting materials and accelerating the composting process.

No buildings or activities required by the Master Plan would be capable of altering wind, moisture or temperature in public areas. The relatively small scale of the projects are not capable of changing the micro and/or regional climate.

#### Utilities and Public Services

The proposed Master Plan improvements will not extend a sewer trunkline, violate solid waste standards or require major utility expansion of power, water or communications facilities. Because the current capacity of each service will accommodate any proposed increase in demand, there are no significant impacts associated with utilities or public services. The proposed facilities will not increase demand for schools, recreation or other public facilities, and are by their very nature a beneficial addition to Oakland's recreation and education facilities.

Two transmission water mains are located in an East Bay Municipal Utility District (EBMUD) right of way that runs approximately north to south across the zoo from Stella Street toward Golf Links Road. During design and construction of future facilities in this area mitigation measures will be incorporated to prevent impacts to the pipe. These mitigation may include provision of adequate pipeline cover for construction wheel loads or relocation of the water mains. To help mitigate the impact of future water demand, water conservation measures as recommended by EBMUD for both internal and external use will be incorporated in the design and construction of facilities identified in the Master Plan. This may include use of equipment, devices, methodologies that furthers water conservation, as well as the use of drought resistant plants, inert materials and minimal use of irrigated turf areas.

#### Biology

A Biotic Resources Survey was drafted in October 1995 and updated in May 1996 to assist in developing the 1996 Master Plan. This survey included an analysis of opportunities and constraints and helped define the elements of the proposed

master plan to avoid significant impacts to biotic resources. The survey included mapping and describing the natural communities at the project site, field surveys for sensitive plant species, field tree surveys, field surveys for sensitive wildlife, a search for vernal pools, an assessment of aquatic habitats for their potential qualifications as US Army Corps of Engineers jurisdictional wetlands, as well as literature review and consultation with knowledgeable persons.

Seven natural communities as described by Holland (1986) were found in the study area: Needlegrass Grassland, Northern Coyote Brush Scrub, Diablan Sage Scrub, Chamise Chaparral, Coast Live Oak Woodland, Seep and Spring, and Central coast Live Oak Riparian Forest. In addition there are three types of vegetation units not described by Holland: Non native Grassland, French Broom Scrub, and Ornamental Plantings, as well as areas that were considered Barren/ Disturbed/ Developed. Of these natural communities, three are considered rare from a local or statewide perspective: needlegrass grassland, seep and riparian forest. In addition, Oak woodlands are protected by city ordinance and California Department of Fish and Game (CDFG) and Diablan sage scrub is important because it provides habitat for the endangered Alameda whipsnake.

During the survey of sensitive plants, botanists observed two colonies of rare plants and several plants listed as "unusual" by the East Bay Chapter of California Native Plant Society, comprising an outstanding example of relatively natural vegetation assemblages in the East Bay Hills. The tree survey recorded a total of 514 trees meeting the criteria in the Oakland tree ordinance; with 80% of these being coast live oak.

The purpose of the initial wildlife survey was to assay the potential for occurrence of those special status wildlife species whose geographic range includes the project site. Although no special status animal species were observed either directly or indirectly on the project site, good quality habitat does exist for the threatened Alameda whipsnake. The position of the proposed exhibit areas and the Off-exhibit Breeding Center and the Arroyo Viejo Creek trail have been relocated to avoid sensitive habitats or minimize impacts. Opportunities exist to enhance the previously degraded habitat at the western terminus of the two central ravine sites, the proposed Center for Science and Environmental Education areas and the Arroyo Viejo Creek area.

The biotic survey included a number of opportunities and constraints that have been incorporated in the proposed Master Plan improvements. Initially primary concerns about botanical resources include many issues that have been addressed in the Master Plan. These included:

- 1) *concern over loss of acreage of natural lands within the California 1820 exhibit area.* The plan was designed to focus on improvement of already developed lands and to reduce the amount of natural lands impacted.
- 2) *concern over the increased risk of rapid spread of weedy species through the undeveloped portions of Knowland Park due to development.* The plan includes a commitment to remove and reduce the spread of non-native

weedy species such as French broom and Eucalyptus as a part of their enhancement of the California 1820 exhibit.

- 3) *concern over the potential for the exhibits containing large herbivore animals to significantly alter the environment within their enclosures, resulting in a complete or near complete alteration of habitat.* These enclosures have been sited in areas that have already been impacted by development.
- 4) *concern over the ways in which the public is invited to enjoy the natural resources while maintaining the quality of the site. Some of the issues that may arise might include increased fire hazard; increased access by wheeled vehicles to other undeveloped parts of Knowland Park and erosion and tramping from treading.*

However, the opportunities for increased environmental education opportunities and enhanced management of remaining resources could well offset potential impacts due to the commitment to incorporate mitigation measures that are built into the proposed Master Plan. The following measures have been included in the plan for each area of proposed development:

- ❖ Arroyo Viejo Creek and the associated Riparian Community include a hiking trail from the proposed Interpretive Center to the existing parking lot in the Historic Park. The alignment of this trail is proposed to traverse the chamise chaparral covered slopes, into the oak woodlands and connect to the existing dirt road near the Zoo night security residence. The trail will be located outside of a 100-foot buffer created from each bank of the Arroyo Viejo to avoid impacting the creek. It is located on the outer edges of the riparian vegetation where this vegetation is wider than the established buffer. The trail is proposed to include several viewing decks with interpretive displays to provide opportunities to look down into and across this good example of coast range riparian woodland. As the trail traverses up the dense chamise covered hillside, there are opportunities to partially open up the mature closed canopy stand for a number of vertebrate species, including the Alameda whipsnake, as well as by cutting back (not removing) a four to six foot swath along each side of the trail to stimulate new growth that would provide browse for several types of herbivores.
- ❖ The proposed Center for Science and Environmental Education site is in a highly disturbed area with few natural resources and offers the opportunity for enhancement planting around the proposed structure.
- ❖ New bison enclosure areas will be located to completely avoid prime Alameda whipsnake habitat and be restricted to the existing areas already impacted by grazers and browsers.
- ❖ The proposed Off-exhibit Breeding Center site is proposed to be located near the proposed Interpretive Center in an area currently used for dog training and other activities. This area represents a less sensitive site, avoiding good quality needlegrass grassland and potential Alameda whipsnake habitat.



- ❖ The proposed Interpretive Center Site is located adjacent to the existing cellular telephone transmission facility. The final design of the Center will avoid impacting the potential prime Alameda whipsnake habitat and will include a grassland buffer zone greater than 100 feet, where feasible. The recently burned chaparral area with *Monardella villosa* var. *globosa* and *Helenium scoparium* will also be avoided.
- ❖ The area around the proposed California 1820 Exhibit sites have been previously used for composting and as a part of the bison exhibit at the western ends of these two ravines. These areas have been previously degraded and will be utilized for exhibit development. The upper parts of the ravines contain natural coastal scrub and oak woodland communities. The upper south facing walls of each ravine support high quality Alameda whipsnake habitat and will not be impacted. The exhibits will be sited at the western ends of both ravines where intensive ungulate grazing and manure composting has already altered the natural habitats. The exhibits offer an opportunity for meaningful reclamation and enhancement of the site, with relocation of the manure composting site and revegetation with native California species.
- ❖ A comprehensive enhancement and management plan will be developed to ensure that the Alameda whipsnake habitat and native vegetation are protected. In coordination with the California Department of Fish and Game, the Zoo will prepare a management plan that will remove eucalyptus and French broom (non-native species); protect and enhance Alameda whipsnake habitat; reforest the Zoo and Knowland Park with native plant species including wildflowers, grasses, redwood and oak trees; and restore riparian habitat along Arroyo Viejo Creek.
- ❖ The proposed asphalt paved 15-foot wide shuttle route follows an existing dirt fire road on the eastern side of Knowland Park through the existing bison exhibit then up a grassy hillside past a gully, crossing more gentle topography toward the proposed Interpretive Center. Moving south then east the proposed route follows the existing dirt road rising through the annual grassland to the oak woodland at the top of the knoll, then beginning a descent through chamise chaparral to return to the starting point near the zebra exhibit. The road will require regrading to reduce run-off and associated erosion in some of the steeper portions of the existing alignment. The proposed paving, grading and culvert system will improve the existing annual erosion problems associated with the current fire trails and seasonal access road network. The grading will avoid, where possible, loss of needlegrass grassland and oaks. It also will avoid areas that exhibit prime habitat features of the Alameda whipsnake. The shuttle will be operated by Zoo personnel and a training program will establish low speed limits and drivers instructed to watch out and "break for snakes."
- ❖ The plan also proposes habitat enhancement and revegetation with native plants throughout Knowland Park as the proposed new development is

implemented. The natural oak woodland, native grasslands, coastal scrub and riparian woodland communities will be augmented by plantings of appropriate oaks, redwoods, bay trees, bunch grasses, shrub species and others, as eucalyptus, French broom and other exotic plants are removed.

### Geology/ Topography

A preliminary geology study technical report prepared Harza Consulting Engineers and Scientists in September 1995 reviewed the existing geology and seismic data and identified the potential impacts of development. The study identified visitor services components of the Master Plan that are located within the Alquist Priolo Earthquake Hazard Zone along the Hayward Fault, which runs north to south through the western portion of the Zoo. The proposed Center for Science and Environmental Education, and the African Village are located within the Alquist-Priolo zone. The use of the site for the Zoo is consistent with City of Oakland Seismic Safety Policy number 2 to use high seismic risk areas in open space and parks -- compared to other potential land uses, the proposed Master Plan is considered a low intensity land use.

Prior to the development of visitor facilities located within the Alquist Priolo zone, project-specific seismic investigations will be completed as required by law to dictate the final design and siting requirements. In Spring 1996, the required detailed trenching and investigations were completed for the both the Center for Science and Environmental Education and the African Savanna exhibit and no evidence of the Hayward fault were identified. All proposed construction will meet current construction requirements for the Uniform Building Code with California Amendments, and incorporate specific foundation recommendations from the geotechnical reports and other seismic studies. All state design requirements will be applied to buildings with potentially high occupancy. Additional mitigation will include onsite storage of emergency response supplies. An Emergency Preparedness and Response Plan and animal capture plan have been prepared for the Zoo and will continue to be updated as the Master Plan improvements are implemented.

The geotechnical report and reconnaissance observations indicate that unstable slopes are present on the site that could expose visitors to life threatening slope failure hazards or could significantly damage facilities. The impact is potentially significant; however, mitigation measures relating to landslides, slope instability and grading will reduce this to less than significant impact. Specific measures will include the use of retaining walls with appropriate footings, creation of keyed and benched slopes, appropriate compaction of fill, appropriate gradients for all altered slopes, removal of expansive soils that could impose large lateral earth pressures, and development of drainage facilities to reduce the hazard to an acceptable level of risk. Mitigation measures will also be utilized as necessary, including the removal of expansive soils, clearing of organic rich soils that are compressible and use of appropriate fill materials and engineering them to established standards of compaction, moisture content, etc. to mitigate high shrink-swell behavior and/ or potential settlement impacts. The report standards also address mitigation to prevent slips of fill material using well established engineering measures.

Erosion hazards are present on the steep slopes and on all sites disturbed by construction. Compliance with the Alameda County Urban Clean Water Runoff Program requirements, as part of the municipal National Pollutant Discharge Elimination System (NPDES) Stormwater Runoff Permit, will be one of the best management practices incorporated for erosion control. Other mitigation measures incorporated will include the control of runoff so it is not directed over unprotected slopes, mitigation methods to prevent short term erosion associated with construction and other measures to reduce silt deposition in water courses that could degrade their water quality and impair their channel capacities. Mitigation will be through both "at source" controls as well as direct clean-up of stream channels (such as the relocation of the existing manure handling site).

### Water

The proposed Master Plan improvements are located within areas of the Arroyo Viejo watershed currently impacted by Zoo operations. While new construction may alter existing impacted drainage patterns, water will be channelized through the storm drainage system approved by the State Fish and Game as well as the City of Oakland. The relocation of manure handling out of the existing perennial stream and drainage swale will improve overall water quality. The overall increase in impervious surfaces will be proportionally small, including the Center for Science and Environmental Education, Interpretive Center, Off-Exhibit Breeding Center, the 15-foot wide shuttle roadway, visitor pathways and small portions of the exhibits used for animal management. The mitigation measures outlined above in the discussion of Geology and Topography will not only mitigate erosion and siltation, but also reduce the potential impact to nearby watercourses during construction. A 100-foot wide setback has been established from the top of bank of Arroyo Viejo Creek to any proposed improvements. This setback protects the riparian corridor from erosion, flooding or siltation from construction and the use of proposed trail improvements and picnic facilities.

The manure handling site will be relocated out of the existing drainage swale and a new system of composting implemented. The composting systems contains the materials within air & water tight low density polyethylene bags that will prevent leaching of wastes into the surrounding soils or water table.

### Energy/ Natural Resources

Energy consumption related to the proposed improvements at the Oakland Zoo in Knowland Park results from operation of construction equipment during the construction phases, and from lighting and operation of heating, ventilation and air conditioning equipment in new Zoo facilities. Construction energy consumption would be temporary and would not represent an on-going drain on a finite supply of natural resources. Operation energy consumption is approximately 1 megawatt hour for each 135 square feet of new buildings at the Zoo. Use of this energy to maintain Zoo operations is not considered to be substantial. Each of the buildings will also undergo the state required Title 24 energy review to ensure energy efficient building materials and techniques are utilized.

### Hazards

No potential public health hazards are associated with the veterinary hospital which uses compressed oxygen gas, x-ray film and developer, an autoclave sterilizer and pharmaceuticals. The oxygen gas tank is handled and refilled by an off-site vendor using safe practices. The x-ray film and developer is removed and disposed of by Diagnostic X-ray. The sterilizer uses heat only, no ethylene oxide is required. Pharmaceuticals are dispensed by a veterinarian and no radio active materials (e.g. x-ray tracers) are used in the veterinary hospital.

The proposed Master Plan increases the number of animals that potentially could need treatment in the hospital, thereby increasing the potential for exposure to hazardous materials in the Zoo; however, it would not create a potential health hazard that currently does not exist. The current use, handling and disposal of hazardous materials would continue to be properly conducted in accordance with applicable state and federal regulations.

Increases in Zoo attendance would not have a substantial effect on emergency response time, operating level of service or serve as a barrier to regional evacuation. Oakland Fire Department Station 26, located less than one mile from the Zoo on 98th Avenue, provides a response time of approximately 5 minutes to the area. The improved circulation system will facilitate timely emergency response or evacuation in the event of an emergency. Access to the California 1820 and Interpretive Center from lower areas will be sufficient using the Shuttle Road and will be an improvement over existing conditions. Existing fire roads provide secondary access to this area from Golf Links Road.

The Oakland Zoo in Knowland Park is located within the Oakland Fire Prevention and Suppression Assessment District (FPSAD) that was established after the 1991 Oakland-Berkeley Hills Fire to address risks associated with wildland fires in Oakland. The May 1995 Fire Hazard Mitigation Program and Fuel Management Plan (developed by a regional group of cities and agencies called the East Bay Hills Vegetation Management Consortium) identifies several areas within the Zoo as having the potential for extreme fire behavior. These areas include the mature eucalyptus groves near the entry at Golf Links Road, the grasslands on the south and west borders and areas of aged dry north coastal scrub along the northern ridge lines where the shuttle route is proposed. Mitigation of these hazards is part of an on-going program funded by the FPSAD and managed by City of Oakland Parks and Recreation. Management techniques have included goats that graze the grassland and scrubland areas to reduce fuel build up. There also has been some selective removal of eucalyptus and its understory to reduce the potential for fire getting into the tops of these trees, creating fire brands that get carried by winds and igniting fires within adjacent neighborhoods. Eucalyptus tree removal is part of an ongoing program at the park and zoo. The Zoo and City of Oakland also manages on an annual basis the fire roads and disked firebreaks along the perimeter of the property to prevent accidental ignitions related to such sources as hot catalytic converters on cars or discarded cigarettes. All proposed new buildings will incorporate fire sprinkler systems and new fire hydrants as a part of their construction.

## Cultural

Knowland Park was included in the Spanish land grant of the Rancho San Antonio in the 1880s and later became the site of the Frederick Talbot mansion. The Talbot family, which was involved in the early Bay Area lumber and shipping trades, planted and maintained the exotic tree specimens still present in the Historic Landscape Park and Arboretum section of the Park. The 1996 Master Plan would protect these existing mature tree specimens and does not propose any new parking areas or major structures in this area. The proposed facilities include picnic shelters, a small restroom adjacent to the existing parking lot and continued use of the white, wood frame caretaker house, which is the only remaining structure from the Talbot era. The site has been identified as a local historic landmark.

In June 1996, Holman & Associates Archaeological Consultants completed a literature review and field inspection. The maps and records on file at the California Archaeological Inventory located at Sonoma State University indicate that there are no recorded prehistoric or historic sites at the Zoo, and that there had been no previous archaeological surveys for a radius of at least a mile from the project area. In general, prehistoric cultural resources at the same general elevation as the project area have been limited to small camp sites and evidence of the utilization of exposed bedrock; the slopes facing the bay were utilized for acorn and seed gathering in season, as well as probably for hunting, which as some locations led to the establishment of annually utilized camp sites. However, the archival and field inspection did not find any evidence of aboriginal use and/or occupation of the proposed Zoo development area or general vicinity. A single probable quarry area as discovered along a fire road to the south of the Offsite Breeding Center. However, inspection of the ground adjacent to the outcrop itself revealed no associated cultural deposit (midden) or surface indicators of quarrying activity, although the form of removal of the chert from the exposed veins strongly suggest that this was done by aboriginal peoples seeking stone for artifact manufacture. In conclusion, earth moving activities associated with future development of the hillside will have no effect on prehistoric cultural resources.

## Plan Implementation

### **Market Area**

There are three primary population groups that are potential visitors to The Oakland Zoo in Knowland Park. These three market areas include: the local residents of Alameda and Contra Costa Counties, the residents of the Greater Bay Area, and the growing numbers of tourists who travel California's principal freeways and airways.

**Local Residents:** Presently, four-fifths of The Oakland Zoo's visitors arrive from locations in Alameda and Contra Costa Counties. The combined population of these two counties has exceeded two million. This strong local support is expected to continue to grow. The Historical Park and Arboretum provide a unique recreational experience and the Zoological Park and California 1820 provide the opportunity to explore the natural world in a comfortable setting very close to home.

**Residents of the Greater Bay Area:** The park's location adjacent to I-580 provides excellent access from the Greater Bay Area. The residents of Alameda, Contra Costa, Marin, San Francisco, San Mateo, San Joaquin and Santa Clara counties are all within a one hour drive of The Oakland Zoo in Knowland Park. The combined population of this area exceeds six million.

Once fully implemented, the Oakland Zoo in Knowland Park's unique combination of three very distinct landscapes, in concert with the attraction of Upper Knowland Park, should increase total visitation from these neighboring counties. The percentage of the Park's visitors from these counties is currently approximately 20% of the total number of visitors. The Oakland Zoo competes with many other Bay Area attractions. Within a 30 mile radius are the San Francisco Zoo and Marine World Africa USA in Vallejo, both of which focus on zoological experiences.. Families also can choose from wide range of commercial amusement sites such as Great America and Falling Waters in Santa Clara County; National and regional recreation areas and parks; and a number of historic sites including National Historic Sites, Regional Parks and Sites of State or local historic significance. There are also several other facilities that interpret California or local ecology such as the San Francisco Bay National Wildlife Refuge, Coyote Hills Regional Park, and Coyote Park Environmental Education Center.

**Tourists:** Each year, more than six million visitors arrive to visit the Bay Area from out of state. Many of these visitors will stay with friends and relatives, stimulating visits to local attractions. These visitors will form an important source of visitation to The Oakland Zoo and Knowland Park. In the case of out-of-the-region tourists, the Zoo competes with an even larger range of activities including regional scenic locations, sporting events, museums, art galleries, and recreational parks. The

California 1820 exhibit will offer a unique experience that can serve to attract these visitors to visit the Zoo.

### Projected Attendance

The present attendance at The Oakland Zoo is approximately 309,700 visitors annually, based on visitor data from January through December 1995. In July 1995 an Attendance and Staffing Projection Technical Report was prepared to provide data to enable the Zoo to realistically evaluate the potential growth of zoo activities. These projections are critical and integrally related to the 1996 Master Plan. For example, the size and number of required facilities such as parking spaces, restrooms, animal exhibits and concession areas are directly related to the number of persons visiting or working at the zoo. It is recognized that attendance at a recreational and educational facility such as the Oakland Zoo is subject to the success of marketing and advertising campaigns undertaken by the facility. Since it is not possible to predict future success of such campaigns, it was assumed during the projections that they would have an average degree of success and not sustain cumulatively more than 3% increase per year in the annual attendance.

Annual Attendance Projection 3% Per Year Increase	
Year	Projected Number of Visitors
Baseline - 1994	307,645
1995	316,874
1996	326,381
1997	336,172
1998	346,257
1999	356,645
2001	378,365
2002	389,715
2003	401,407
2004	413,449
2005	425,853
2006	438,628
2007	451,787
2008	465,341
2009	469,301
2010	493,680

Using the 1994 attendance figure of 307,645 as a baseline (compounded annually at a 3% increase through 2010) a maximum of 493,680 visitors is projected. Beginning in 1993, attendance counts have been kept and the Zoo has seen an irregular pattern of attendance. Attendance figures since 1993 show some months with an increase in attendance over the previous year's, followed by months with great decreases. The 3% increase projection was chosen to provide a conservative maximum visitation figure to evaluate potential impacts. It is interesting to note that this projection was not met in 1995 when visitation only increased by less than 0.5% (from 308,656 to 309,651). Based on the visitation for the first quarter of 1996, even with a 3% growth for the rest of the year, it is unlikely the visitation will reach the projected 1995 level of 316,874 in spite of the birth of Kijana, the baby elephant.

Acknowledging the necessity of phasing the proposed development the 1996 Master Plan addresses parking, circulation and other key elements at annual attendance levels of both 370,000 (year 2000 projected attendance) and 490,000 visitors.

### Revenue Sources

Implementation of the Master Plan for the Oakland Zoo in Knowland Park will be a long-term project and will necessitate funding from a variety of sources.

Operating funds are currently derived from public tax support and revenue from entrance fees, educational activities, the amusement rides, food concessions, gift shop, facility rentals, memberships and donations.

Maintaining a stable tax base for support of Zoo operations is necessary for the continued health and growth of the institution. The Zoo presently receives public support from the City of Oakland and the East Bay Regional Park District. With the implementation of the improvements anticipated in the Master Plan, attendance is also anticipated to increase. With an increase in attendance, it will be possible for the Zoo to document through surveys and questionnaires its importance to the city and region. This documentation will substantiate the need for the maintenance of public funding allocations. Public support is the essential source to insure financial stability, accessibility and affordability to all economic levels of the community.

Further capital improvement funding to implement the Master Plan may be obtained through capital improvement levies, revenue bonds, or general obligation bonding sources. Private and corporate donations are also a potential source of capital improvement funding. Over the past several years, the East Bay Zoological Society has been able to steadily capture funds for capital projects from both individual and corporate donors.

Local bond issues specifically for zoos have generally been very successful throughout the United States when other municipal bond issues have failed. The City of New Orleans recently passed a \$40 million bond issue for an aquarium shortly after bond issues for increasing police and fire protection and schools were defeated. El Paso, Detroit and Seattle have also recently passed bond issues for their zoos. In 1988 voters in the East Bay Regional Park District approved measure AA for \$225 million dedicated to park development and open space. Of that \$5 million dollars were designated for the Zoo. In 1990, City of Oakland voters passed Measure K, a general obligation bond that raises \$60 million for City parks and open space. Ten million dollars of these bond funds have been made available to the Zoo for capital projects. In 1996, another bond is being proposed for the City of Oakland Rehabilitation of City facilities. The Oakland Zoo is included for an amount of \$2 million.

Both program and capital fund raising projects must coordinate with the Zoo's development priorities. Capital improvement funds will be allocated proportionally to maintain an equitable balance among animal exhibits, educational facilities, visitor service facilities and operational/ maintenance facilities. Gifts and bequests will only be accepted by the Zoo when they are consistent with the needs and goals of this Master Plan adopted by the Zoo.

As the East Bay Zoological Society, the Zoo's non-profit support organization, has grown in membership, marketing and revenue development has increased the Society's ability to capture capital funds to assist in the implementation of the Master Plan.



Fund raising activities will be planned to provide appealing capital project opportunities to potential donors. These will also provide positive public relations and media attention for public tax and bond funding. The Master Plan's thematic exhibit organization allows for portions of the work to be marketed, funded and built in individual segments over time as funds become available. The Zoo will continue to seek benefits from public/ private partnerships as it implements the 1996 Master Plan.

### **Capital Improvements and Operations Funding**

At present (FY 1996-97) the Oakland Zoo has an operating budget of approximately \$3.4 million, which includes revenue from admissions, concessions, education and subsidies from the City of Oakland and the East Bay Regional Park District. As with all municipal zoos in the United States, the Oakland Zoo requires public subsidies in excess of the income generated through Zoo operations. This insures that admission prices remain affordable and there are outreach programs to serve all economic levels within the local community. The Oakland Zoo has the potential to continue to increase its annual per capita revenues from visitors. Increasing the number and quality of food and gift concessions, in addition to an increase in admission fees is an immediate way to move toward increased revenues. To enable this strategy to work, the Oakland Zoo must increase visitor perceptions of value received. The key rests in two areas:

1. Continue to increase the perceived quality and enjoyment of the exhibit/ educational experience.
2. Increase the perceived quality and convenience of the visitor services: food service, restrooms, gift shop and other public spaces.

**Staffing Projections.** The staffing at the Oakland Zoo is anticipated to increase to provide sufficient staff for the proposed Master Plan. The projected number of staff would range from 55 (assuming the zoo is closed) to 145 at peak season. This projected number represents an increase of approximately 25% over 1996 staffing levels and see an similar increase in supporting Docents and other volunteers.

**Capital Improvement Budget.** A detailed budget estimate was prepared for the improvements proposed in the Master Plan. These improvements are summarized below. The budgets below reflect the Zoo's balance of fiscal prudence and bold new ideas.

The proposed capital improvements incorporate existing facilities and utilize the existing utility system whenever feasible. The Master Plan works with, not against, the rugged topography of the landscape, minimizing site grading, expensive utility improvements and steep pedestrian access routes to fully comply with the Federal Americans with Disabilities Act (ADA) and reinforce the Zoos commitment to accessibility to all members of the community. The Zoo is dedicated to upgrading facilities to comply fully with ADA requirements and will incorporate such things

as the shuttle between the bus stops and the north and south entries, as well as the shuttle within the California 1820 exhibit to improve access.

Oakland's climate has guided selection of both exotic and native animals for each exhibit so that individual animals can acclimate effectively to the East Bay weather. Exhibits have been selected to minimize the use of water. All water which is used in the moats surrounding exhibits will be filtered and recycled.

*Historic Park & Arboretum*

Picnic Area Improvements & Nature Trail \$150,000

*Zoological Park*

Main Entry, Parking Lot & Rides Area Improvements \$1,200,000

West Entry and Center for Science & Environmental Education \$2,200,000

Exhibit Improvements, & Children's Zoo \$2,800,000

*California 1820*

Exhibits, Interpretive Center,  
Shuttles, Trails & Roadway Improvements \$14,000,000

*Off Exhibit Breeding Center*

Holding Building, Aviaries and Access Road \$1,200,000

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Total for all Proposed Capital Improvements: \$21,5050,000<sup>1</sup>

The total budget for all proposed capital improvements is approximately \$21.6 million. The highest priority is the development of the Center for Science and Environmental Education, followed by the African Savanna, improvements of the elephant exhibit, gift shop remodeling, upgrade of the rides area and enhancements to the main zoo entrance/ parking lot. After those improvements will be the development of the California 1820 exhibits, the Children's Zoo renovation and Australian Walk About. Finally will be the completion of the renovation of the Tropical Rainforest, the development of the Off Site Breeding Center and expansion of the Safari Cafe into a restaurant.

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<sup>1</sup> 1996 Dollars.