PAPAGO PARK: MASTER PLAN REDEVELOPMENT

by

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A REPORT

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Abstract

Papago Park is an extraordinary urban space that has a rich history in the development of the Phoenix metropolitan area. The park was settled by pre-historic civilizations and has since been a significant recreation space for more recent generations. Although the park has been treasured among locals for ages, the development of large tourist attractions and other program elements have not been part of a cohesive park design. The park lacks a sense of unity and a strong local identity.

Papago is unique in the fact that it is the only major urban park that showcases the native Sonoran Desert ecosystem. Conservation of these limited areas of native landscape is important. There is great potential for Papago to better respond to the environmental, educational, and recreational needs of the public.

With this master plan, development of Papago Park is guided in order to unify park elements and strengthen its identity. It is intended that a cohesive park design which focuses on conservation of native landscape with an integrated social program will help Papago Park gain proper recognition on a regional and national scale.

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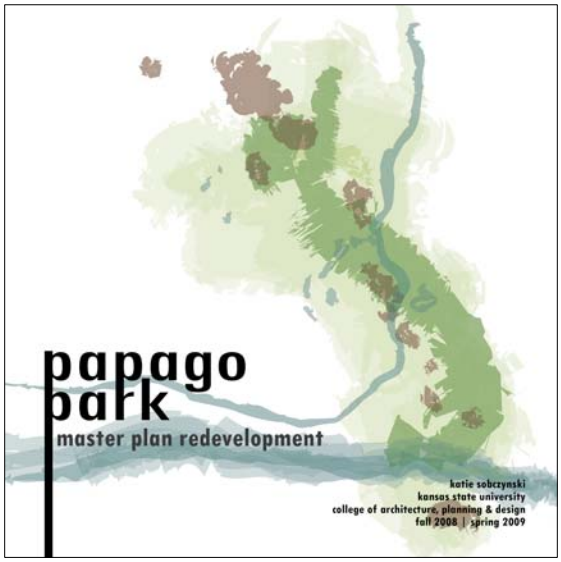

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Most of all, I would like to thank my family for their continuous emotional and financial support. The encouragement that you have provided has guided me to my every accomplishment. Just knowing that I have your support through every endeavor that life may bring, is most important to me.

project abstract.

Papago Park is an extraordinary urban space that has a rich history in the development of the Phoenix metropolitan area. The park was settled by pre-historic civilizations and has since been a significant recreation space for more recent generations. Although the park has been treasured among locals for ages, the development of large tourist attractions and other program elements have not been part of a cohesive park design. The park lacks a sense of unity and a strong local identity.

Papago is unique in the fact that it is the only major urban park that showcases the native Sonoran Desert ecosystem. Conservation of these limited areas of native landscape is important. There is great potential for Papago to better respond to the environmental, educational, and recreational needs of the public.

With this master plan, development of Papago Park is guided in order to unify park elements and strengthen its identity. It is intended that a cohesive park design which focuses on conservation of native landscape with an integrated social program will help Papago Park gain proper recognition on a regional and national scale.

papago park

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Introduction

Analysis

papago park

introduction

project selection.

Papago Park is an extraordinary urban park, that offers a wide variety of recreational opportunities to the residents of the Phoenix Valley. After living in Phoenix for just a short time, it is easy to recognize that Papago Park is a special place that deserves greater recognition. There is great potential for Papago to better address the needs of the environment and the public. Papago presented itself as an opportunity to explore a large public planning project with the benefit of having a positive influence on future planning efforts.

Figure 1.01. Papago Park.
Photo by Katie Sobczynski, 2009.

dilemma.

Papago Park is a 1500 acre green space that connects the cities of Phoenix, Tempe, and Scottsdale. It is home to several of the metropolitan area's major tourist attractions, including the Desert Botanical Garden and the Phoenix Zoo, and numerous historical ties to native civilizations including Salt River Pima Maricopa Indian Community.

Construction of Galvin Parkway has bisected the park as it provides a major vehicular connection between Tempe and Scottsdale, and the existing transportation network is less than adequate.

The multiple stakeholder influences and layout conflicts have left the park lacking a sense of unity and identity.

thesis.

A cohesive park design which focuses on conservation of native landscape with an integrated social program will assist Papago Park to better respond to the environmental, educational, and recreational needs of the region.

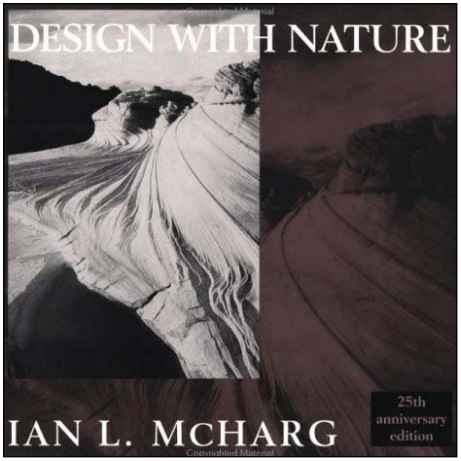


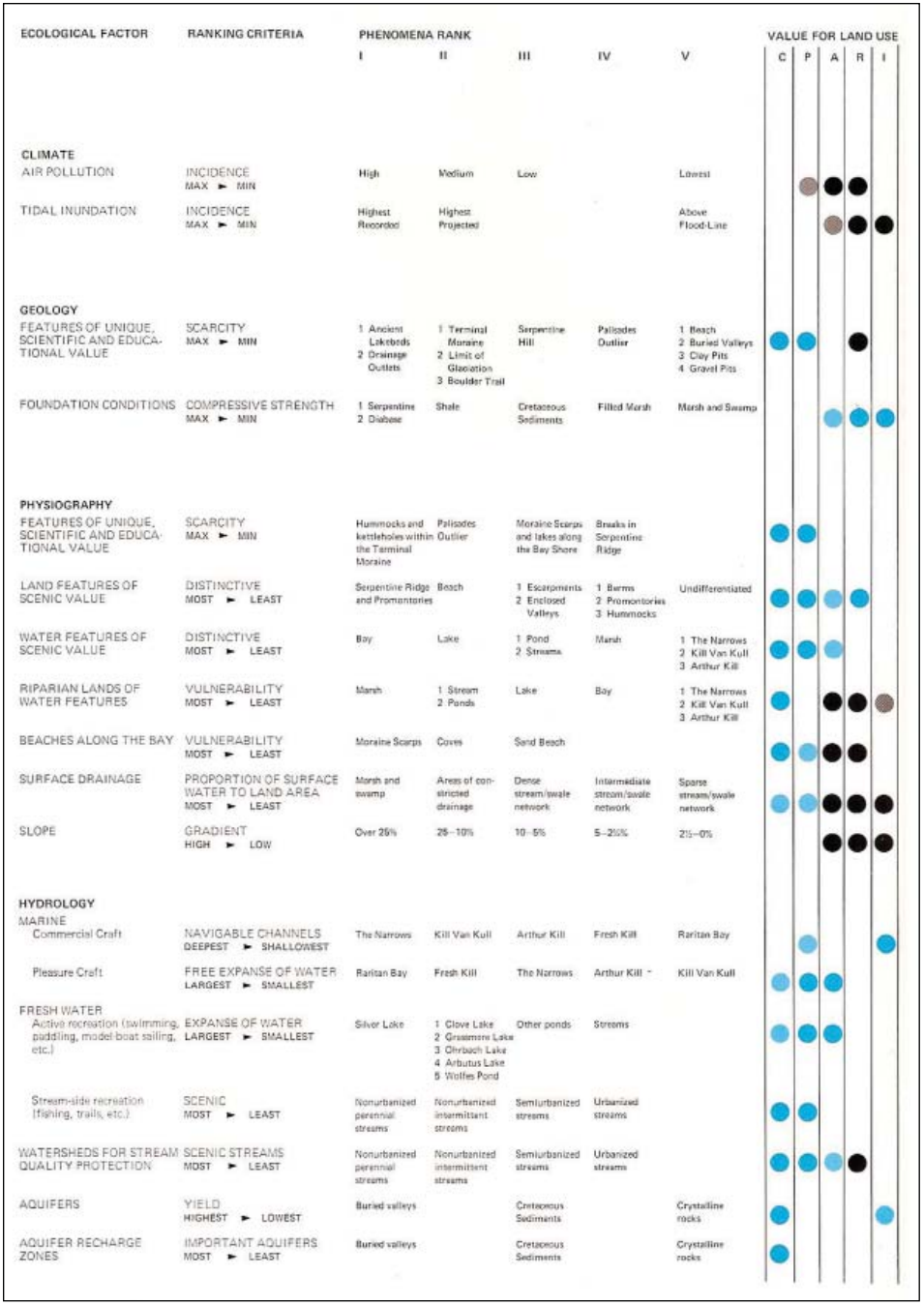
Figure 1.02. Design with Nature.
Cover image of Design with Nature. 25th Anniversary Edition. (McHarg,1992)

theory.

Ian McHarg is widely known as the father of ecological planning and has written one of the most influential books on environmentally based design. *Design with Nature* offers an ecological approach to designing the built environment in order to foster a healthy relationship with the ecological systems that surround it. See Figure 1.02. Design with Nature.

In the section of Design with Nature that describes Processes as Values (pg.103), McHarg evaluates a wide range of ecological factors based on their individual properties as they influence value for land use. The ecological factors include climate, geology, physiography, hydrology, pedology, vegetation, and wildlife. Each factor is ranked based on its individual criteria on a scale of five values. The land uses for which McHarg analyzed the project site's ecological factors are conservation, passive recreation, active recreation, residential development, and commercial and industrial development. The relevance of the factors as they relate to each land use is indicated by dots of a range of tonal intensities. Factors of highest importance are shown with full black dots, lower values decrease in tonal intensity. See Table 1.03: McHarg Analysis Matrix.

McHarg's process of analysis is relevant to this project based on the ecological focus of the project goals. The land uses that will be considered for Papago Park will include conservation, passive recreation, and active recreation. Residential, commercial and industrial developments lie on the periphery of Papago Park, but will not be included in this study. (McHarg, 1992)



ECOLOGICAL FACTOR	RANKING CRITERIA	PHENOMENA RANK I	II	III	IV	V	VALUE FOR LAND USE C	P	A	R	I
CLIMATE											
AIR POLLUTION	INCIDENCE MAX ► MIN	High	Medium	Low		Lowest		●	●	●	
TIDAL INUNDATION	INCIDENCE MAX ► MIN	Highest Recorded	Highest Projected			Above Flood-Line			●	●	●
GEOLOGY											
FEATURES OF UNIQUE, SCIENTIFIC AND EDUCATIONAL VALUE	SCARCITY MAX ► MIN	1 Ancient Lakebeds 2 Drainage Outlets	1 Terminal Moraine 2 Limit of Glaciation 3 Boulder Trail	Serpentine Hill	Palisades Outlier	1 Beach 2 Buried Valleys 3 Clay Pits 4 Gravel Pits	●	●		●	
FOUNDATION CONDITIONS	COMPRESSIVE STRENGTH MAX ► MIN	1 Serpentine 2 Diabase	Shale	Cretaceous Sediments	Filled Marsh	Marsh and Swamp			●	●	●
PHYSIOGRAPHY											
FEATURES OF UNIQUE, SCIENTIFIC AND EDUCATIONAL VALUE	SCARCITY MAX ► MIN	Hummocks and kettleholes within the Terminal Moraine	Palisades Outlier	Moraine Scarps and lakes along the Bay Shore	Breaks in Serpentine Ridge		●	●			
LAND FEATURES OF SCENIC VALUE	DISTINCTIVE MOST ► LEAST	Serpentine Ridge and Promontories	Beach	1 Escarpments 2 Enclosed Valleys	1 Berms 2 Promontories 3 Hummocks	Undifferentiated	●	●	●	●	
WATER FEATURES OF SCENIC VALUE	DISTINCTIVE MOST ► LEAST	Bay	Lake	1 Pond 2 Streams	Marsh	1 The Narrows 2 Kill Van Kull 3 Arthur Kill	●	●	●		
RIPARIAN LANDS OF WATER FEATURES	VULNERABILITY MOST ► LEAST	Marsh	1 Stream 2 Ponds	Lake	Bay	1 The Narrows 2 Kill Van Kull 3 Arthur Kill	●		●	●	●
BEACHES ALONG THE BAY	VULNERABILITY MOST ► LEAST	Moraine Scarps	Coves	Sand Beach			●	●	●	●	
SURFACE DRAINAGE	PROPORTION OF SURFACE WATER TO LAND AREA MOST ► LEAST	Marsh and swamp	Areas of constricted drainage	Dense stream/swale network	Intermediate stream/swale network	Sparse stream/swale network	●	●	●	●	●
SLOPE	GRADIENT HIGH ► LOW	Over 25%	25–10%	10–5%	5–2½%	2½–0%			●	●	●
HYDROLOGY											
MARINE											
Commercial Craft	NAVIGABLE CHANNELS DEEPEST ► SHALLOWEST	The Narrows	Kill Van Kull	Arthur Kill	Fresh Kill	Raritan Bay		●			●
Pleasure Craft	FREE EXPANSE OF WATER LARGEST ► SMALLEST	Raritan Bay	Fresh Kill	The Narrows	Arthur Kill	Kill Van Kull	●	●	●		
FRESH WATER											
Active recreation (swimming, paddling, model boat sailing, etc.)	EXPANSE OF WATER LARGEST ► SMALLEST	Silver Lake	1 Clove Lake 2 Grassmere Lake 3 Ohrbach Lake 4 Arbutus Lake 5 Wolfes Pond	Other ponds	Streams		●	●	●		
Stream-side recreation (fishing, trails, etc.)	SCENIC MOST ► LEAST	Nonurbanized perennial streams	Nonurbanized intermittent streams	Semiurbanized streams	Urbanized streams		●	●			
WATERSHEDS FOR STREAM QUALITY PROTECTION	SCENIC STREAMS MOST ► LEAST	Nonurbanized perennial streams	Nonurbanized intermittent streams	Semiurbanized streams	Urbanized streams		●	●	●	●	
AQUIFERS	YIELD HIGHEST ► LOWEST	Buried valleys		Cretaceous Sediments		Crystalline rocks	●				●
AQUIFER RECHARGE ZONES	IMPORTANT AQUIFERS MOST ► LEAST	Buried valleys		Cretaceous Sediments		Crystalline rocks	●				

Table 1.03. McHarg Analysis Matrix.

(McHarg, 1992)

personal goals.

To draw local, regional, and national attention to Papago Park as a distinctive and successful urban park.

To instill a focus on conservation and restoration into future planning efforts for Papago Park.

To educate park planners about the importance of conservation and restoration of native areas.

To expand my knowledge of the Phoenix metropolitan area.

To gain experience in large, urban, public park design.

To create and end product that will be a dramatic addition to my portfolio.

To continue a growing relationship with Olsson Associates.

papago park

project development

site description.

Location

Sonoran Desert Ecoregion

The Sonoran Desert is an arid ecoregion covering 100,000 square miles in southwestern Arizona and southeastern California, as well as most of Baja California and the western half of the state of Sonora, Mexico. Canals and irrigation have made it possible for humans to inhabit the area. The Phoenix metropolitan area is located in the Lower Colorado River Valley subdivision of the ecoregion.

Although it records the hottest annual temperatures of the North American deserts, a bimodal rainfall pattern produces a distinctive lush biological diversity in comparison to most other deserts. Two visually dominant life forms of plants distinguish the Sonoran Desert from other North American deserts: legume trees and columnar cacti. The saguaro cactus, an icon of the desert southwest region of the United States, has evolved to this ecoregion and exists naturally no where else on the planet. Papago Park offers an exceptional opportunity by bringing a piece of this incomparable environment into the urban fabric of Phoenix. See Figure 2.01: Sonoran Desert Ecoregion. (www.desertmuseum.org)

Phoenix metropolitan area, Arizona

Incorporated in 1881, Phoenix is one of the fastest-growing cities in the nation. Covering more than 517 square miles and with a population of over 1.5 million, it ranks as the fifth largest city in the country and the largest state capital in terms of population. With an average age of 34, greater Phoenix is also the fifth youngest metro region in the country. This large, growing, diverse population has a heavy impact on Papago Park, and justifies the need for an updated park master plan. See Figure 2.02: Phoenix, Arizona. (www.phoenix.gov)

Figure 2.01. Sonoran Desert Ecoregion.

Surrounded by the highlands to the east and desert to the west, the Sonoran Desert Ecoregion is a distinct lush desert that is home to extraordinary plant and animal species. Adapted from The Nature Conservancy, 2009.

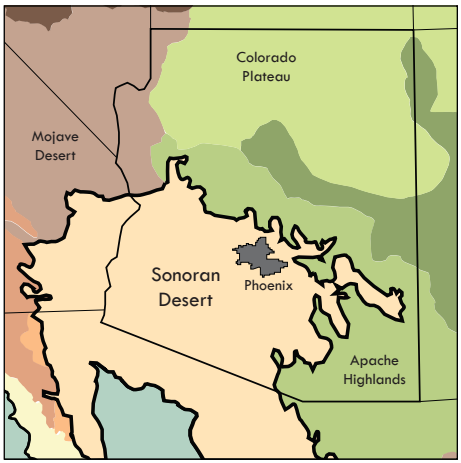
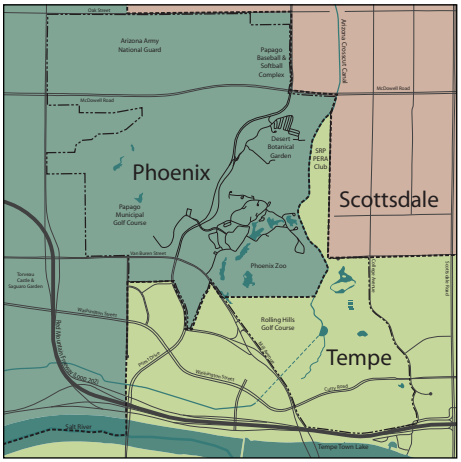


Figure 2.02. Phoenix, Arizona.

Adapted from Google Maps, 2009.

Figure 2.03. Urban Context: City Limits.

Papago Park lies at the intersection of the cities of Phoenix, Tempe, and Scottsdale. Less than 10 miles from downtown Phoenix, it is near the core of the metropolitan area.



625 North Galvin Parkway

Less than 10 miles from downtown Phoenix, Papago Park is located at the intersection of the cities of Phoenix, Tempe, and Scottsdale. Arizona State University is on the opposite side of Tempe Town Lake, to the south of the park. See Figure 2.03: Urban Context: City Limits.

Elevation

Papago Park rests at the bottom of the Salt River Valley, adjacent to Tempe Town Lake, an urban lake along the Salt River corridor. The mean elevation of the park is 1117 feet above sea level.

Size

One of the largest urban parks in the United States, Papago Park totals 1500 acres, spread across the cities of Phoenix and Tempe. (www.phoenix.gov)

Surrounding Land Uses

The surrounding land uses have a strong influence on the park. On the west, the city of Phoenix has shown signs of economic decline of its commercial areas and would likely benefit from an increased interest in Papago Park. Tempe has shown fairly rapid development along the park's south edge; the construction of Tempe Town Lake has sparked development of high-density residential units and linear lake front park systems. Along the northeast boundary of the park, Scottsdale has maintained healthy residential neighborhoods and small commercial centers. See Figure 2.04: Urban Context: Land Use.

Access

Park visitation exceeds two million annually. Phoenicians have developed a dependency on their personal vehicles and in response to that need vehicular access to the park is available from all directions. Downtown Phoenix cis connected to the park from McDowell Road, Washington Street, Van Buren Street, 52nd Street, and the Red Mountain Freeway (202 Loop). Tempe's business center is less than a mile to the south of the park, and has direct access via Mill Avenue. Tempe residents can also use a combination of Rural Avenue (Scottsdale Road), Curry Avenue, or the Red Mountain Freeway (202 Loop). Scottsdale residents' primary access is via McDowell Road and Scottsdale Road.

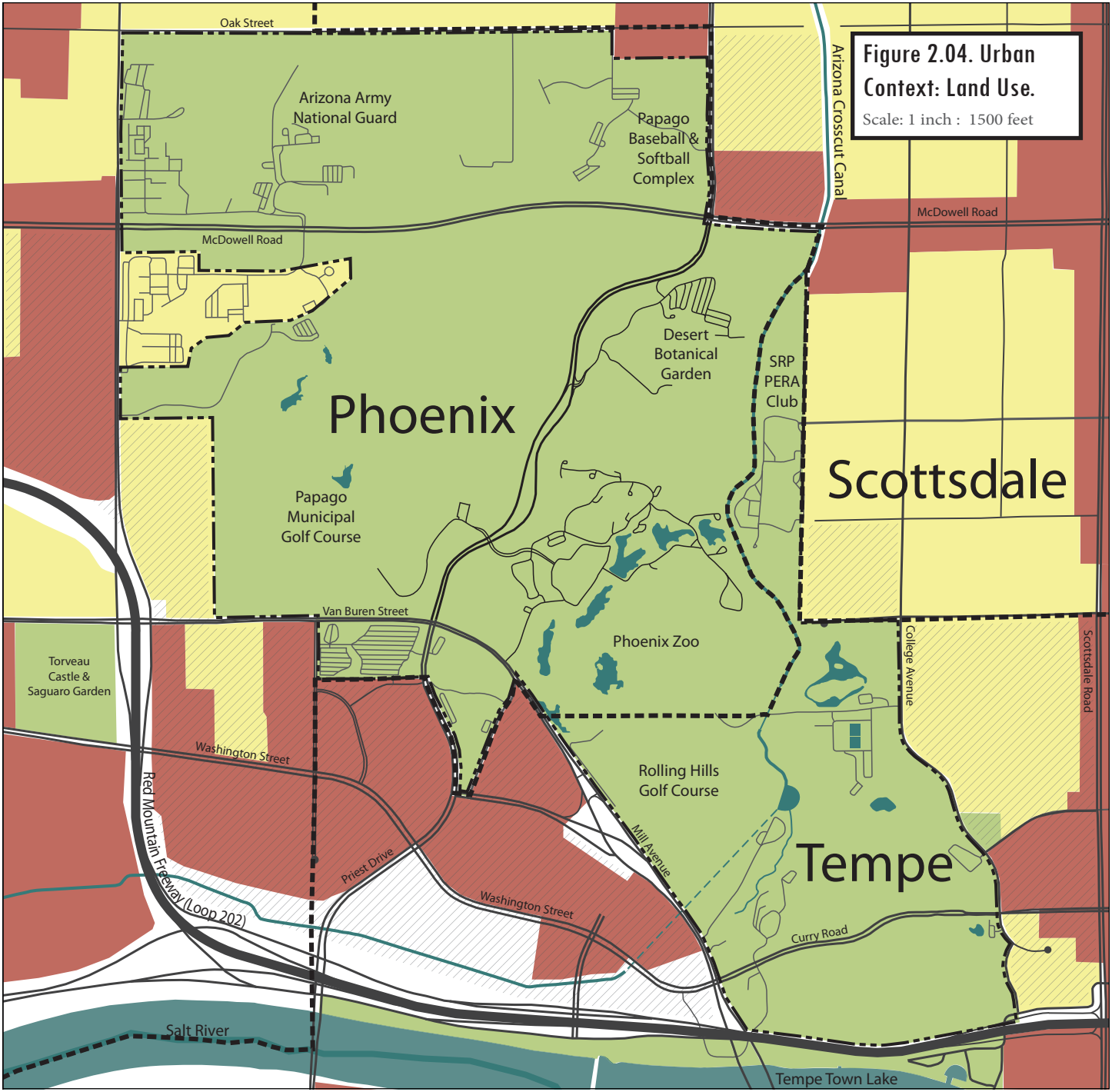


Figure 2.04. Urban Context: Land Use.
Scale: 1 inch : 1500 feet
Oak Street
Arizona Army National Guard
Papago Baseball & Softball Complex
Arizona Crosscut Canal
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
Phoenix
Scottsdale
Papago Municipal Golf Course
Van Buren Street
Phoenix Zoo
College Avenue
Scottsdale Road
Torveau Castle & Saguaro Garden
Washington Street
Red Mountain Freeway (Loop 202)
Rolling Hills Golf Course
Mill Avenue
Tempe
Priest Drive
Washington Street
Curry Road
Salt River
Tempe Town Lake

Visual Presence

Papago Park has a strong visual presence throughout the metropolitan area. The large red rock formations can be seen from most anywhere on the Valley floor.

Land values of the area around the park are often higher because of the abundant recreational opportunities and astounding views. Apartment complexes nearby charge higher premiums for those units that provide balcony views of the buttes. Likewise, surrounding offices that face the park are often allocated to employees in more prestigious positions. The overlaid hatch pattern on Figure 2.04: Urban Context: Land Use indicates areas of increased land value. See Figures 2.05: McDowell Road, 2.06: Papago Park, and 2.07: Papago Buttes.

Figure 2.05. McDowell Road.
The Papago Buttes are easily identifiable from miles around, and are often used as a landmark for Valley residents. Photo by Katie Sobczynski, 2009.

Figure 2.06. Papago Park.

A local landmark, Papago Park can be identified by its extraordinary rock formations from all over the Phoenix metropolitan area. As seen from Hayden Butte Preserve near downtown Tempe and Arizona State University, the buttes rise in front of Camelback Mountain and the Phoenix Mountain Preserve. Photo by Katie Sobczynski, 2009.

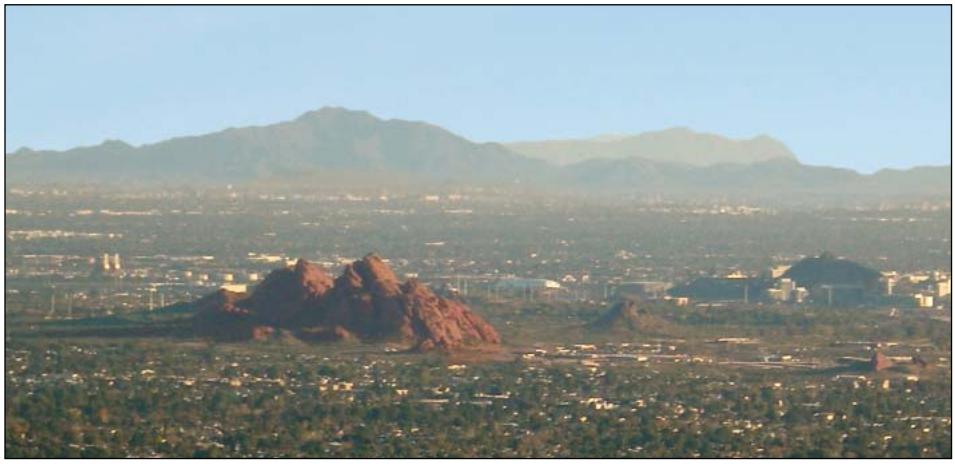


Figure 2.07. Papago Buttes.

Piestewa Peak (commonly known as Squaw Peak) provides views of the urban development surrounding the Phoenix Mountain Preserve. The Papago Buttes are easily identifiable to the southeast. Photo by Katie Sobczynski, 2009.

goals and objectives.

1. Protect the unique natural resources including the native vegetation, wildlife habitats, and geology of this piece of the Sonoran Desert

- limit recreation opportunities in conservation areas
- maintain recreation facilities in order to reduce unnecessary human disturbance
- update trail system with consistent signage, edging, and paving materials to encourage hikers to remain on the designated trails

2. Reclaim areas for conservation and ecological restoration where unnecessary human disturbance has caused degradation and fragmentation; to provide a more accurate representation of the Sonoran Desert ecosystem

- remove unnecessary lengths of pavement
- reclaim degraded areas of the Salt River Project's (SRP) Project Employees Recreation Association (PERA) Club, and the Arizona National Guard lands as well as other parts of the park
- remove or repair under-utilized or damaged site elements

3. Unite park conservation areas, recreation, surrounding neighborhoods, and other attractions in order to create a defined social core, while avoiding areas of vulnerability

- remove a length of Galvin Parkway in order to reconnect the east and west fragments of the park
- connect the Phoenix and Tempe trail systems
- improve pedestrian connections between existing program elements
- provide better neighborhood connections with trails, monuments, rest areas, and signage

4. Strengthen park identity, focusing on the character of the local environment, culture and history

- design a standard for signage, building materials, and park facilities that reflects local character, culture, and history
- increase monuments that identify park boundaries

5. Educate park visitors about the natural resources that have been preserved and are intended to be restored within the park; to instill a sense of pride that encourages the public to adhere to park rules and participate in conservation efforts

- establish themed educational trails within trail system: history, water, conservation, health
- provide educational signage that follows the standard signage design
- increase educational opportunities through the cities of Phoenix and Tempe Parks and Recreation Departments
- promote the current educational opportunities established by organizations that reside within the park

proposed program elements.

The proposed program elements are directly related to the goals of the project. To determine the feasibility of each program element, a comprehensive site inventory and analysis was completed across the entire park property. Combination of the project goals and conclusions of the site analysis led to the proposal of the following program elements.

- Corridor of open space that unites the park to the three surrounding cities, as well as Tempe Town Lake and Arizona State University
- Conservation and restoration plans
- Cohesive multi-use path and trail network including overpasses and underpasses in order to unite park fragments
- Restriction of vehicular circulation to the exterior edges of the park
- Entry monuments and a standardized signage system including directional, informational, and educational signs that adhere to park identity and promote unity of park attractions

design process.

There are four major phases in the design process as it has been outlined in Figure 2.08: program development, site inventory and analysis, design development, and graphic communication. Although each phase is outlined as having its own set of tasks and products, it should be understood that this process is organic, one that evolves as it proceeds. Knowledge of a later phase influences the conduct of an earlier phase, and earlier decisions will be reworked. For instance, the program development cannot be completed without a basic site inventory, and a complete inventory cannot be gathered without a firm understanding of the project design goals that are decided during program development. It was essential to establish a clear process in order to efficiently manage the phases of design and understand their connections to one another.

The program development phase includes the project abstract, project goals, precedent studies, literature reviews, and the proposed program elements. Project goals are listed according to order of importance with an ecological focus; the most important goal is listed first. The project goals have been refined based on the site inventory and analysis. Precedents have been studied in order to better understand successful methods of urban park design and conservation. A literature review of the history of the park and desert ecosystem restoration methods provided a base of knowledge for the development of the proposed program elements. The proposed program has acted as a guide for the rest of the project.

Site inventory and analysis work was guided by the goals and proposed program elements outlined in the program development phase. Each goal requires a particular set of inventory of existing site conditions to determine related pieces of analysis. First, it was vital to determine the areas of high vulnerability - those that should be protected for their natural and cultural resources. Second, areas suitable for the implementation of proposed program elements were determined. Synthesis of the site analysis guided design in close conjunction with the project goals.

Design development began with a storyboard which organized the information gathered, conclusions gleaned, and proposed design solutions

into a sequence for presentation. Three conceptual design alternatives were developed to a level of detail appropriate for feedback from project reviewers. These concepts were compared to the site analysis to ensure that they continue to respond to the important site conditions. The project goals were also continuously reviewed to ensure that the project intent was maintained throughout the project. After sufficient development and comparison, the best combination of conceptual design ideas was developed into a single design solution. Once the program development, site analysis and inventory, and design development phases were completed, the development of the design graphics and final documentation concluded the project with this final product.

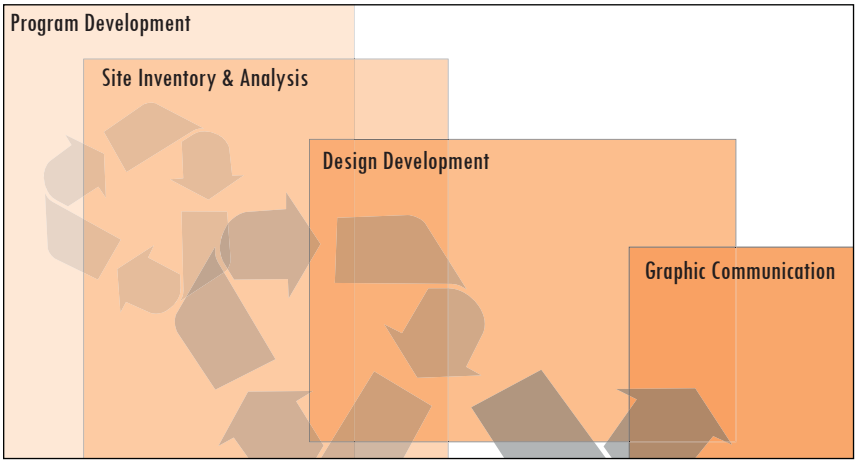


Figure 2.08. Project Development Process.
As the phases of design increase in tonal value, they also increase in complexity. This process is very cyclical; decisions made in any one phase will influence revision of previous decisions and future decisions to be made.

papago park

precedents & literature

selection of precedents and literature.

Park designs used as precedents for this planning effort include Central Park in Manhattan, New York and the Tonto National Forest, in the eastern Sonoran Desert of Arizona. Central Park was selected because it is often recognized as one of the most iconic urban parks within the United States. Designed by Frederick Law Olmsted, often called the father of landscape architecture, Central Park employs several significant design features that are required for any successful urban park.

The Tonto National Forest was selected for its similar Sonoran Desert ecosystem, its close proximity to the Phoenix metropolitan area, and its conservation and management practices.

Two sources of information that were especially influential in the design development of this updated Master Plan are:
A Guide for Desert and Dryland Restoration by Bainbridge, David, 2007.
Signage and Wayfinding Design by Calori, Chris, 2007.

David Bainbridge's book on desert restoration is a clear and concise source for those interested in restoring ecosystem functions in an arid landscape. His research incorporates the knowledge of the indigenous people and current scientific methods. These methods are practical and easily implemented.

Signage and Wayfinding Design, by Chris Calori, was valuable in the development of a park identity. Understanding the hierarchy of signage and appropriate signage layouts greatly increases the success of any signage design.

central park, manhattan, new york.

There are several program elements in Central Park that are successful examples of similar program elements proposed for the re-development of the Master Plan for Papago Park. Central Park has a strong identity and sense of unity between program elements. Park boundaries have a strong definition marked with fences, gates, sculptures, and monuments. At the center of the park is the social core of both passive and active recreation. But most importantly, each element compliments the other with well organized pedestrian connections separated from vehicular traffic. (Miller, 2003)

Central Park is an icon for the City of New York, American urban park design, and the profession of Landscape Architecture. It is recognized across the world as one of the most successful public urban outdoor recreation spaces. It was originally intended to be the "pathway to the American Dream" for all visitors. The gateways and statues at most every park entrance were designed to educate the public while they provide park definition and character. Statues and monuments are dedicated to important figures of all cultures and professions. See Figure 3.01: Central Park: Merchants' Gate. (Miller, 2003)

Figure 3.01. Central Park: Merchants' Gate.

The walls that wrap the park boundary and the prominent gates at major intersections enforce a strong sense of place to park visitors. Photo courtesy Rich Gersh on www.flickr.com.

Centered in the south half of the park is the "heart of the park," the Bethesda Terrace. This plaza marks the end of the Mall and overlooks the lake and the Ramble. It is a symbol of the social and spiritual core of the park. The Mall, the only straight length of pavement in the park, provides a place for people of all levels of society to socialize together on one level. The Ramble, on axis with the Mall and on the opposite side of the Bethesda Terrace and the lake, is a densely wooded area intended to evoke a sense of religion through nature. Just west of the Mall is the Sheep Meadow, used today as one of several meadows for picnicking, passive recreation, and cultural events. See Figure 3.02: Central Park Map. (Miller, 2003)

One of the most important design features of Central Park, which can be attributed to its renowned success, is the separation between pedestrian and vehicular circulation. The four traverse roads that connect the city on the east and west sides of the park, have been sunken where they cross major pedestrian pathways. This innovative solution to a dangerous and serious problem has eliminated potentially disruptive traffic intersections within the park. See Figure 3.03: Central Park: Bridge. (Miller, 2003)

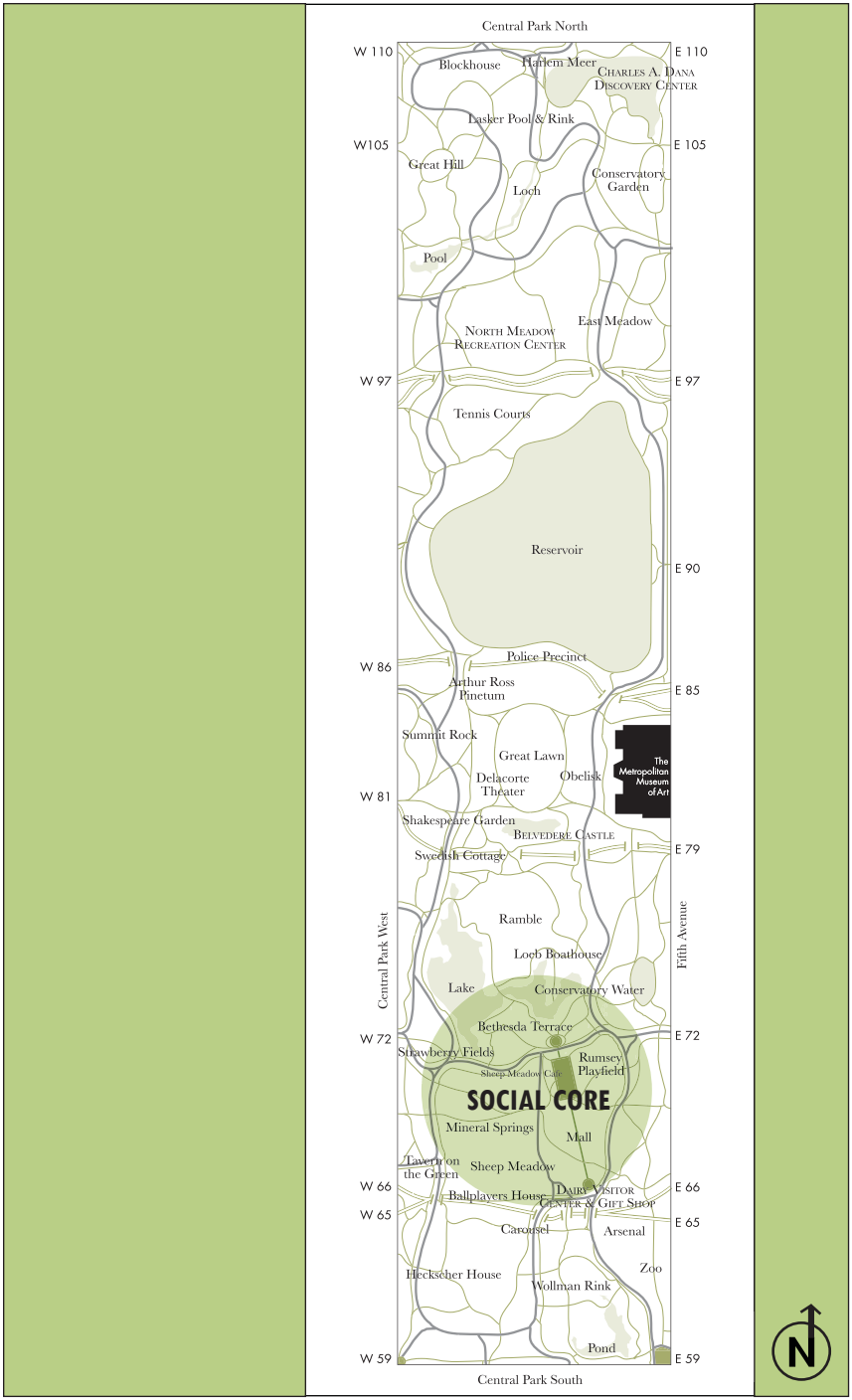


Figure 3.02. Central Park Map.

Several of the most popular destinations of the park are located in close proximity to one another including the Bethesda Terrace, the Mall, and Sheep Meadow. Together these destinations create a strong social core for all levels of society. Adapted from Central Park Conservancy, 2007.

Figure 3.03. Central Park: Bridge.

Separation of vehicular and pedestrian networks was key to the success of the park in an urban context. Photo courtesy of www.centralpark.com.

Figure 3.04. Tonto National Forest Map.

The fifth largest national forest and containing seven designated wilderness areas, the Tonto National Forest protects almost three million acres of the Sonoran Desert and Apache Highland ecoregions. Map courtesy of the USDA, Forest Service, 2007.

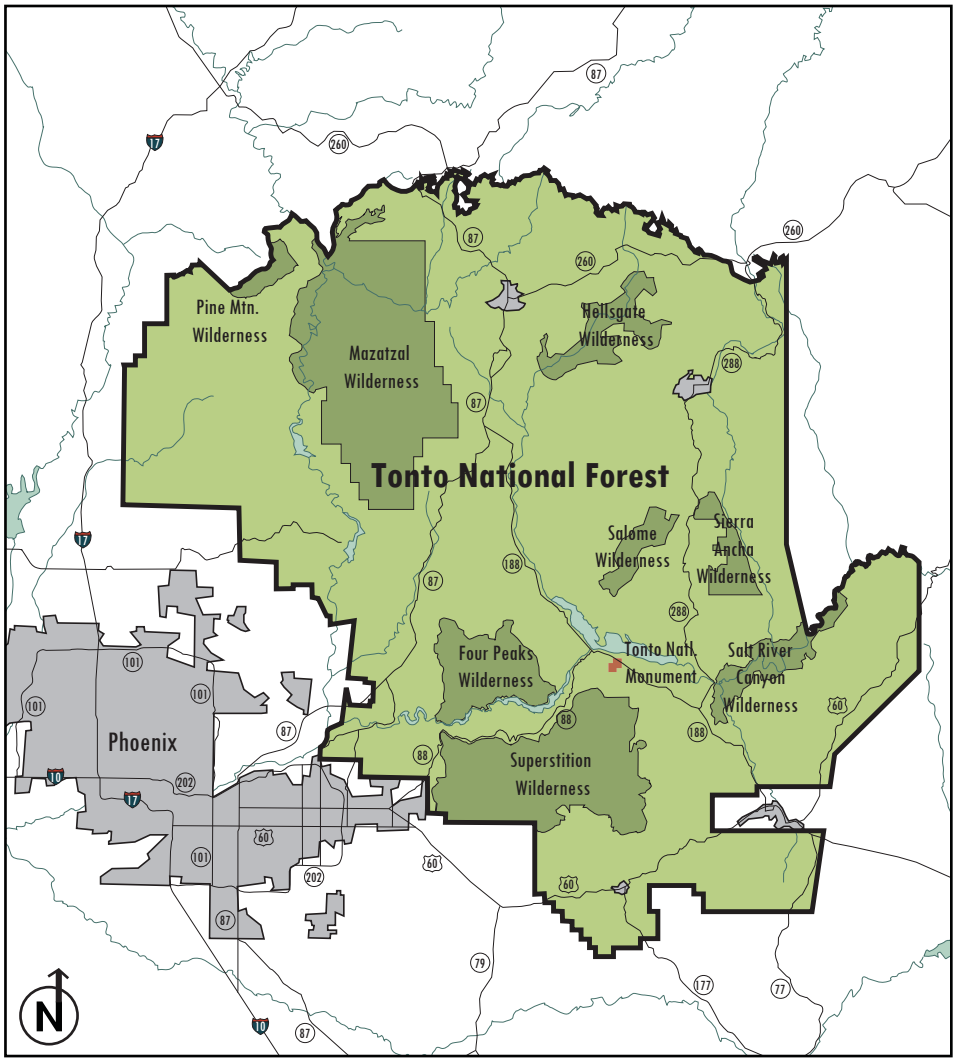


Figure 3.05. Tonto: Four Peaks, Access Road.

Saguaros, although not an endangered species, are protected by the Native Plant Protection Act for their distinguishing characteristics. Maintaining diverse vegetation communities and quality wildlife habitat are primary management considerations of the Forest Service. Photo by Katie Sobczynski, 2009.

tonto national forest, arizona.

Visitors to the Tonto National Forest will quickly discover a lush desert environment that is generally not expected when a person imagines desert landscape. A large preservation area, this is the Sonoran Desert in its most natural state with healthy systems and ecological functions. See Figure 3.04: Tonto National Forest Map and Figure 3.05: Four Peaks, Access Road.

"The mission of the Tonto National Forest is to meet recurring stewardship responsibilities for National Forest lands and resources by: Providing a continuing supply of quality water for National Forest and downstream needs; providing a quality mix of year-round outdoor recreation experience opportunities for personal enjoyment ranging from developed recreation sites to wilderness experiences; archaeological investigation and interpretation; promoting quality wildlife and fish habitat, including preserving habitat for known Threatened and Endangered species; providing for grazing of domestic livestock; providing for the utilization of timber, minerals, and special land uses in a manner that is compatible with other resource production and use, while assuring wise management of cultural and visual resources; expanding public understanding of the environment and resource programs; and coordinating activities with interested City, County, State, and other Federal agencies as well as with individuals and groups." (USDA, 1985)

In order to accomplish this difficult mission, the Forest's plan addresses the issues of recreational opportunities, wilderness opportunities, fuelwood availability, forage production and use, water quality and quantity, transportation systems, wildlife habitat, riparian habitat, off-road vehicle use, timber management, unauthorized use, soil productivity and stability, mineral development, fire management, land ownership, special areas and other opportunities. See Figure 3.06: Tortilla Flat. (USDA, 1985)

Although Papago Park is considerably smaller and requires special attention for its urban surroundings and heavy recreational use, the mission, goals, and management strategies in the Tonto National Forest Plan are an excellent precedent to the management required for any desert recreational area.

Figure 3.06. Tonto: Tortilla Flat.
During the summer monsoon season the desert vegetation undergoes a period of growth and the landscape turns to a lush green. Photo by Katie Sobczynski, 2008.

desert ecosystem restoration.

a literature review of *A Guide for Desert and Dryland Restoration* by David A. Bainbridge, 2007.

Over 25 years, Bainbridge has gathered information on the basics of desert ecosystem function, causes of desertification, and ecological restoration methods. His research is valuable to the redevelopment of the Papago Park master plan, as the park has seen years of poor management strategies and heavy recreational use, and requires restoration in order to provide a more accurate representation of a healthy Sonoran Desert ecosystem.

Poor management decisions that cause desertification as explained by Bainbridge include over-grazing, timber harvesting, mining, farming, dam construction, water diversion, groundwater extraction, off-road vehicle use, urbanization, pollution, invasion of non-native species, and the destruction of native cultures. Many of these have occurred within the park at one time or another. The most destructive effects to desert vegetation is soil compaction which reduces water infiltration, restricts root growth and reduces soil organisms.

Figure 3.07. Propagation Bed.
Seed propagation and transplantation is a key phase of the revegetation process according to Bainbridge, author of *A Guide for Desert and Dryland Restoration*. Photo by Katie Sobczynski, 2009.

It is important to first restore ecosystem function, which will increase the recovery rate and long-term success of the overall restoration efforts. Bainbridge has outlined an extensive process for optimal success. In short, this process includes restricting access; identifying financial contributors, collaborators, and volunteers; seed collection and plant propagation; remediation of soil compaction; and restoring proper water infiltration. See Figure 3.07. Propagation Bed.

It is necessary to monitor restoration efforts in order to better understand the best methods for desert restoration. It is important to learn how to improve high-value ecosystem functions including water retention, flood control, water purification, oxygen production, and dust control. In the case of Papago Park, Arizona State University and other surrounding universities would likely be valuable institutions with which to collaborate for research experience. (Bainbridge, 2007) (www.desertrestore.org)

signage and wayfinding.

a literature review of *Signage and Wayfinding Design* by Chris Calori, 2007.

Creating a sense of place is vital for any site design. Placemaking can be accomplished through many different site features. Signage is one of the easiest features to manipulate in order to create a distinctive identity.

It is first important to understand the psychological functions of a person in a space. Once a person identifies a common amenity, such as a trash receptacle or a drinking fountain, they correlate that item with the place which they have visited. If they then notice that the form, material, color, or texture of that amenity has changed from which they had previously identified, it is often assumed that they have moved into a new place. Implementing a standard for signage, lighting, and amenities to be adhered throughout a space enforces a unified identity of place.

Signage of a place should reflect its individual character. A hierarchy should be applied to signage as the visitor progresses from the social core of the place out to less significant destinations. The social core should feature large, eye catching, informative signage. As the visitor moves away from this major destination along a path, the signage should reduce in size, and provide only the most relevant information. Smaller signage should not draw attention away from the path experience, but should enhance the experience with direction and information.

The signage and amenities design for Papago Park should adhere to a park wide standard across the property of both the cities of Phoenix and Tempe. As illustrated in Figure 3.08: Evelyn Hallman Park, a unified signage design is not employed across the park. These strategies of placemaking would certainly strengthen a unified identity for the updated master plan proposal.

Figure 3.08. Evelyn Hallman Park, Signage.
Signage throughout Papago Park does not follow a cohesive park-wide standard, as illustrated by this photo of multiple signage formats. Photo courtesy of Randal Kopff, Olsson Associates, 2008.

papago park

inventory

site improvements.

Papago Park offers numerous park attractions and endless opportunities for active and passive recreation. See Figure 4.04: Existing Park Improvements.

Desert Botanical Garden

A living museum of desert vegetation, this exceptional garden showcases 50 acres of beautiful outdoor exhibits. Accredited by the American Association of Museums, the garden is one of the nation's only centers dedicated to the Sonoran Desert, including desert vegetation, ecology and conservation. Visitors can experience more than 20,000 individual plants representing over 4,000 different species of cacti, succulents, trees and flowers. It is home to 139 rare, threatened and endangered plant species from around the world. The garden also presents Music in the Garden every winter season, and features several outdoor art and vegetation exhibits. Educational programs help to increase public knowledge to the more than 300,000 visitors each year. See Figure 4.01: Desert Botanical Garden. (www.dbg.com) (Gart, 1996)

Figure 4.01. Desert Botanical Garden.
November 2008 through May 2009, the Desert Botanical Garden hosted the first outdoor desert Chihuly glass exhibit by Dale Chihuly. Photo by Katie Sobczynski, 2009.

Phoenix Zoo

Opened in 1962 and developing into one of America's premier desert attractions, this 125 acre zoo features 1,300 animals from some of the most fragile ecosystems. Themed trails offer a glimpse into the habitat of animals from around the world. The Arizona Trail features plants and animals of the Southwest United States that thrive naturally in the Sonoran Desert climate.

To help meet the challenge of the changing environment, the Phoenix Zoo has rededicated itself to functioning as an advocate for the natural world, educating people about animals, plants, humanity, and the needs we share. The Zoo participates in multiple local and international efforts on behalf of endangered species, including the Mexican wolf, thick-billed parrot, black-footed ferret, Bornean orangutan, Sumatran tiger, Asian elephant, and many more. See Figure 4.02: Phoenix Zoo. (www.phoenixzoo.org) (Gart, 1996)

Figure 4.02. Phoenix Zoo.
The Africa Trail is one of the largest within the Phoenix Zoo, and offers an exquisite savanna exhibit including gazelle, giraffes, vultures, and watusi. Photo courtesy of Michaela Oltmans, Olsson Associates., 2008

Papago Park Municipal Golf Course

Papago Golf Course is an 18 hole course designed and built in 1963 by architect William F. Bell. It has long been considered one of the finest municipal golf courses in the United States. This is a popular course among Valley residents because of its reasonable green fees, quality fairways, and stunning natural scenery. With native vegetation between the fairways, this course reduces its impact on the surrounding natural systems.

The entire course underwent a major restoration in April 2008 through December 2008. Renovations included the irrigation system, greens, bunkers, lakes, driving range, restrooms, Pro-shop and restaurant. The renovation was such a success that it hosted the Women's Professional Golf Association (WPGA) tournament in March 2009. (www.papagogolfcourse.net) (Huffman, 2008) (Van Sickle, 2008)

Papago Ponds and Picnic Areas

Papago Park includes a 70 acre picnic area, operated and maintained by the Phoenix Parks and Recreation Department, that can accommodate nearly 1,000 people. Seven of the 17 ramadas are available for reservations for a variety of group sizes. The Park Ranger Office is centrally located among the ramadas, and can assist with reservations. There are also fourteen uncovered picnic tables that are available for public use without a reservation. Most of the ramadas and picnic tables are spread around the Papago Ponds and Hole-in-the-Rock, located immediately north of the Phoenix Zoo on Galvin Parkway.

Three of the Papago Ponds are available to the public for use as fishing lagoons. These three lagoons total roughly 8 acres, and contain channel catfish, rainbow trout (in season), largemouth bass, bluegill, redear sunfish, hybrid sunfish, crappie, tilapia, carp and white amur. Review of the City of Phoenix regulations for fish catch and release is required before fishing. Four additional ponds are located within the property of the Phoenix Zoo which completes the chain of the Papago Ponds. See figure 4.03: Papago Ponds and Picnic Ramada. (www.papagosalado.org) (Gart, 1996)

Figure 4.03. Papago Ponds and Picnic Ramada.

The Civilian Conservation Corporation (CCC) completed several projects throughout the park including ramadas that provide shade and protection from inclement weather. Photo courtesy of Randall Kopff, Olsson Associates, 2008.


Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Continental Drive
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Washington Street
Washington Street
Priest Drive
Mill Avenue
Red Mountain Freeway (Loop 202)
Sky Harbor Boulevard
Curry Road
Arizona Army National Guard
Archery Range
Orienteering Course
Papago Baseball & Softball Complex
Amphitheater
Martino Sculpture
Phoenix Parks & Rec Office
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Papago Municipal Golf Course
Phoenix Zoo
Phoenix Municipal Stadium
Oakland A's Training Facility
Hall of Flame
Torveau Castle & Saguaro Garden
Rolling Hills Golf Course
Canal Park
Water Treatment
SRP Water Control Center
Eisendrath House and Gardens
Historical Society Museum
Green Line
Tempe Sports Facilities
Sandra Day O'Connor Center
ASU Community Services
Moeur Park
Tempe Dog Park
Loma del Rio
LoPiano Bosque
Salt River
Tempe Town Lake
N
Figure 4.04. Existing Site Improvements.
Scale: 1 inch : 1500 feet

Figure 4.05. Amphitheater.

This aerial view illustrates the impressive integration of the seating with the slope of Papago Butte and the close proximity of McDowell Road. Photo courtesy of Michaela Oltmans, Olsson Associates, 2008.

Figure 4.06. Evelyn Hallman Park.

First known as Canal Park, the park was renamed Evelyn Hallman Park after an extensive restoration. The lake is now one of the best urban fishing lakes in the Valley. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

Amphitheater

The historic open-air rock amphitheater was constructed by the Civilian Conservation Corporation (CCC) and dedicated on April 1, 1934. Most of the construction was completed by hand without assistance of mechanical tools. The hillside was leveled and terraced with twenty rows of rock masonry and concrete seats. Some of the original events at the amphitheater included Sunday church services. See Figure 4.05: Amphitheater. (Gart, 1996)

The amphitheater is no longer functional due to the construction of McDowell Road and the lack of adequate parking. McDowell Road now cuts behind the north end of stage area. Facing a major urban thoroughfare creates an extremely noisy, distracting, and dangerous backdrop rendering the facility useless. Currently, there is not a parking facility that is of appropriate proximity to the amphitheater to accommodate regular use. (www.papagosalado.org) (Gart, 1996)

It is important to retain this historical piece of Papago Park. Major renovations for ADA accessibility and adaptations between McDowell Road and the performing area are required for the amphitheater to be returned to the functionality that it once offered Valley residents. Small educational presentations, cultural performances, and musical concerts could all be reintroduced to this once thriving amphitheater.

Rolling Hills Golf Course

Rolling Hills is one of the most popular 18 hole, par 62, championship golf courses in the metropolitan Phoenix area. Its located on Mill Avenue just north of the Salt River and south of the Phoenix Zoo. The first 9 holes of the golf course were built in 1960, and in 1987 the second 9 holes and a new clubhouse were added. Views to the Phoenix Zoo and the Papago Buttes makes this course unique among the many courses in the Valley. Close proximity to downtown Tempe and the Arizona State University campus provides recreation to a wide variety of local residents. See Figure 4.07: Rolling Hills Golf Course. (www.tempegolf.net/rollingHills) (Gart, 1996)

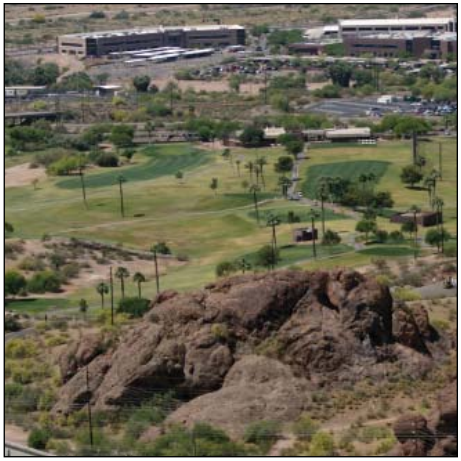


Figure 4.07. Rolling Hills Golf Course.
Located just north of downtown Tempe and Arizona State University, Rolling Hills Golf Course provides a valuable recreation opportunity for a wide variety of residents. Photo courtesy of Michaela Oltmans, Olsson Associates, 2008.

Evelyn Hallman Park (formerly Canal Park)

Canal Park was developed in 1973 in North Tempe neighborhood. In 2006, the park was renamed for Evelyn Hallman. Joined by members of her neighborhood association, she worked tirelessly to renovate and enhance the park and the fishing lagoon. During the renovation of this 40 acre oasis, the lake was drained and the shoreline was reinforced. In addition, fish habitats were installed making this one of the best urban fishing locations in the Valley. A multi-use trail that surrounds the lake is shared by walkers and runners and provides access to an accessible fishing area. Walkers and runners can also access the nearby Papago Trail paralleling the Arizona CrossCut Canal. (www.tempe.gov/Parks/parks/EvelynHallman)

Loma del Rio

From 500 A.D. to 1450 A.D., Hohokam Indians farmed along the Salt River Valley and lived in homes on both sides of the Salt River. An example of these dwellings may be found at the archeological site Loma del Rio, south of Curry Road in the west half of Papago Park. Loma del Rio, translated to "small hill by the river," is a Hohokam ruin approximately 650 years old. Partially stabilized and enhanced with a ramada and wheelchair-accessible path, visitors may explore the ruin at no cost. See Figure 4.08: Loma del Rio. (www.tempe.gov)

Figure 4.08. Loma del Rio.

Now reduced to a pile of rubble, Loma del Rio is the site of a historical structure constructed by the Hohokam Native American tribe. Its name translates into "little hill by the river". Photo courtesy of Randall Kopff, Olsson Associates, 2008..

Carl Hayden Campus for Sustainability

The Carl Hayden Campus for Sustainability borders the east boundary of Papago Park. It includes the Green Line riparian area, the Arizona Historical Society Museum, the O'Connor House and Center for Civil Discourse, LoPiano Mesquite Bosque, Loma del Rio, Evelyn Hallman Park, and the historic Eisendrath House and Center for Water Conservation. Each of these organizations and destinations have united for a common mission to educate the public about water conservation and ecological design in desert climates. (www.tempe.gov)

networks.

trails.

The cities of Phoenix and Tempe have individually developed networks of multi-use trails for pedestrians, bicyclists, and horseback riders. Over-use of the park has caused the development of unplanned footpaths through areas of native vegetation. These unintentional trails are commonly referred to as "spider trails." As seen by aerial photo, these spider trails have spread beyond current management practices. It is vital to the vegetation and wildlife conservation efforts that the spread of unintentional human disturbance is limited. See Figure 4.09: Hole-in-the-Rock Trail, Figure 4.10: Unplanned Footpaths, and Figure 4.11: Existing Trails Map.

Figure 4.09. Hole-in-the-Rock Trail.
Although it is beginning to show signs of erosion and extreme use, the trail to Hole-in-the-Rock is one of the better defined trails within the Phoenix park property. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

Phoenix

Phoenix has established nine trails of varying length, difficulty, and use. Pedestrians, leashed dogs, bicyclists, and horseback riders can all use most of the trails provided. Unless otherwise noted, these trails are all compacted earth and have little to no edge definition. All nine trails are described below.

1. Hole-in-the-Rock Trail. 825 feet. Medium difficulty. This is the only trail that does not accommodate horseback riding or mountain biking, as it scales the smooth and sometimes slippery slopes of the Hole-in-the-Rock Butte. See Figure 4.09: Hole-in-the-Rock Trail.
2. Eliot Ramada Loop. 2.7 miles. Low difficulty. This trail begins at the Papago Park west trailhead – on Galvin Parkway just north of Van Buren Street. An asphalt surface is provided for the first 1.2 miles, which is wheelchair accessible. The remainder of the trail is a natural compacted earth path that loops the Papago Municipal Golf Course.
3. Big Butte Loop. 0.8 miles. Medium-high difficulty. This is one of the more difficult trails as it loops the rocky slopes of the Papago Buttes. Resting areas are provided at the historical amphitheater and the Elliot Ramada.
4. Little Butte Loop. 0.5 miles. Medium difficulty. Accessed from trail 5 and encompassing Contact Butte, spectacular views of the majority of the park can be seen from this gravel trail.
5. Double Butte Loop. 2.3 miles. Medium-high difficulty. Beginning at the West Papago Park trailhead, encircling the Papago Buttes, the trail passes

the Eliot Ramada and historic amphitheater, and then returns along the west side of Contact Butte.

6. Galvin Bikeway. 1.4 miles. Low-medium difficulty. Paved for the use of bicycles and pedestrians, this path parallels Galvin Parkway from Van Buren Street to McDowell Road. This provides access to the Phoenix Zoo, Papago Ponds, and the Desert Botanical Gardens; it also connects the cities of Tempe and Scottsdale.
7. Ranger Office Loop. 0.6 miles. Low difficulty. This trail is an additional lane that is attached to the paved vehicular loop through the Ramada and Papago Ponds area. Slow speed limits, speed bumps and the one-lane one-way traffic lane are current traffic calming measures in place to reduce danger to pedestrians and bicyclists.
8. Crosscut. 1.4 miles. Low difficulty. This paved path parallels the Arizona Crosscut Canal.
9. Nature Trail. 0.25 miles. Low difficulty. This easy trail begins at the Ranger Office and features interpretive signs that educate visitors about Sonoran Desert vegetation and wildlife. (www.phoenix.gov)

It seems that trail 3 (Big Butte Loop) surrounding Papago Butte, is repetitive of portions of trail 5 (Double Butte Loop). The east portion of trail 2 (Eliot Ramada Loop) and the east portion of trail 5 (Double Butte Loop) are also fairly repetitive. The combination of these trials should be considered in order to eliminate unnecessary human disturbances.

From a park visitor's perspective, it is extremely difficult to discern the intended direction of the trails that lie within the undeveloped, passive recreation areas. It is clear that spider trails have spread out of the control of the current park management system.

Figure 4.10. Unplanned Footpaths.
Unplanned footpaths have spread across the landscape like a web, earning the name 'spider trails'. When these trails are not properly managed, they can have a large negative impact on vegetation and wildlife populations. Photo by Katie Sobczynski, 2009.

Tempe

The majority of the designated and mapped trail system in Tempe is restricted to the south side of Curry Road in Moeur Park and the LoPiano Mesquite Bosque. These compacted earth trails are intended to be multi-use for hikers, mountain bikers, and horseback riders. Evelyn Hallman Park also has two loop trails that circle the pond and the inner island. These two systems are connected through various trails that are unmapped by the city of Tempe. See Figure 4.11: Existing Trails Map and Figure 4.10: Unplanned Footpaths. (www.tempe.gov)

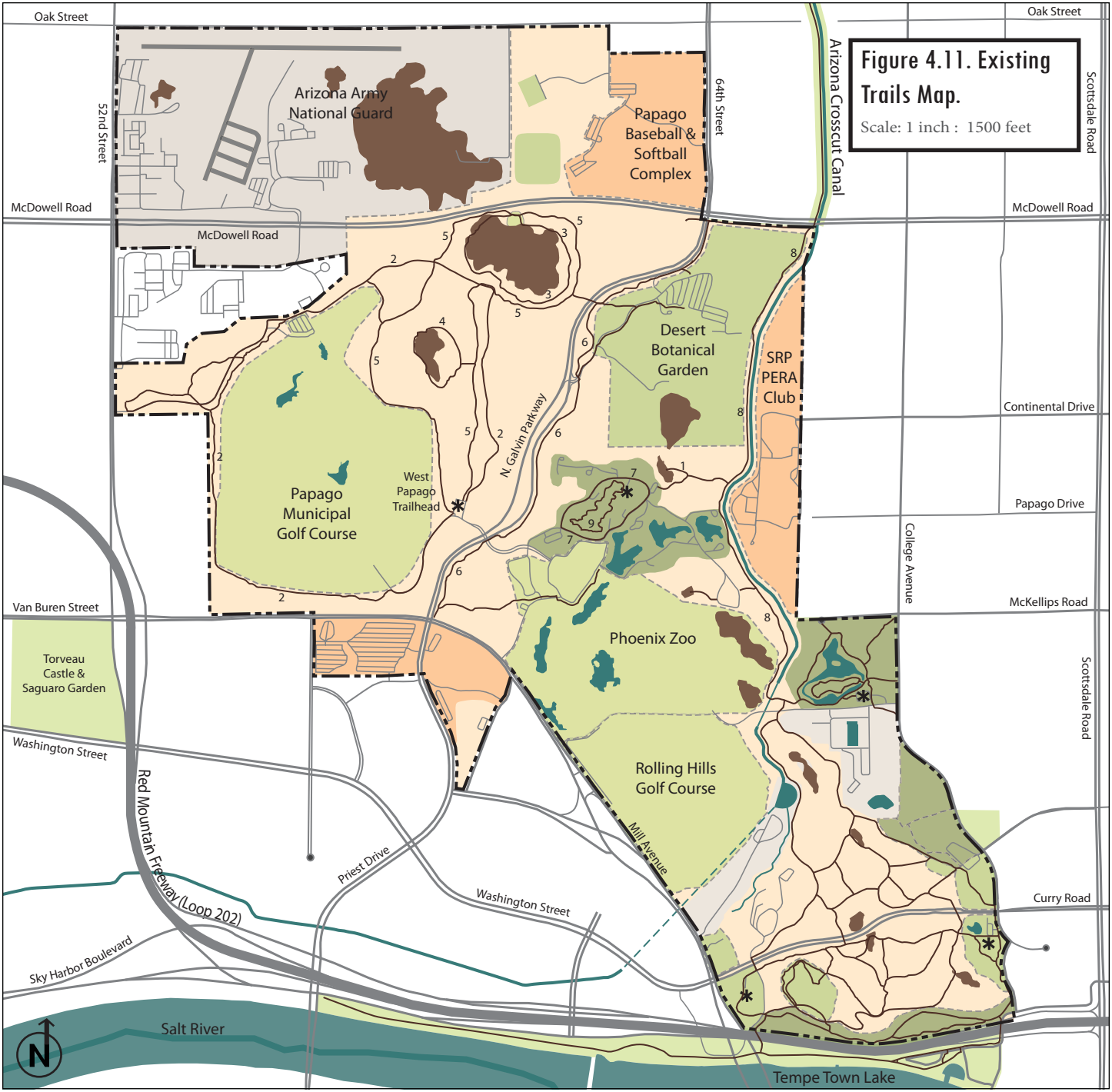


Figure 4.11. Existing Trails Map.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Arizona Army National Guard
Papago Baseball & Softball Complex
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Papago Municipal Golf Course
West Papago Trailhead
N. Galvin Parkway
Phoenix Zoo
Rolling Hills Golf Course
Mill Avenue
Torveau Castle & Saguaro Garden
Washington Street
Red Mountain Freeway (Loop 202)
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

transportation network.

McDowell Road, Galvin Parkway, Curry Road, and Mill Avenue carry the heaviest loads of traffic that influence Papago Park. Although these roads provide the transportation infrastructure to support the general public's reliance on personal transportation, they also cause fragmentation, dividing the 1500 acres of park into five smaller fragments. See Figure 4.14: Existing Road Map and Figure 4.12: Park Fragments.

Galvin Parkway creates a major division in the flow of pedestrians and wildlife between the largest east and west portions of the park. The curvilinear road layout and urban speeds reduce the motorist's visibility of pedestrian crossings. Conversely pedestrians cannot detect oncoming traffic, and therefore pedestrian crossings are limited to three places along Galvin Parkway: Galvin Parkway and McDowell Road, Galvin Parkway and the Phoenix Zoo entrance, and Galvin Parkway and Mill Avenue. Although this may sound sufficient, it restricts pedestrian crossings for approximately three-quarters of the length of Galvin Parkway. See Figure 4.13. Galvin Parkway.

McDowell Road isolates the Arizona National Guard property and the sports facilities at the north end of the park. It also causes the amphitheater on the north slope of Papago Butte to be dis-functional. Meanwhile, Curry Road to the south separates the LoPiano Mesquite Bosque and Moeur Park from the entire north portion of the park. The Arizona CrossCut Canal also completely isolates the SRP PERA Club.

The largest of barriers is the Red Mountain Freeway (Loop 202) which restricts both physical and visual access from the park to Tempe Town Lake and downtown Tempe.

This habitat fragmentation has been a major contributor to the degradation of wildlife densities and species richness within the park, specifically affecting the mammal populations according to Ommeron and Helmstetter, 2004.

It is also important to understand the traffic volume levels on the roads that cut through and surround the park. Although it is designed to carry a volume of traffic similar to McDowell Road and Curry Road, Galvin Parkway carries approximately one-third fewer cars per day than McDowell Road, and almost double the traffic of Curry Road. See Figure 4.15. Traffic Volumes. (www.phoenix.gov) (www.tempe.gov)

Figure 4.12. Park Fragmentation.

Divided by roads and the Arizona CrossCut Canal, the park consists of five major fragments. Visual and physical connections between the fragments is essential to the success of the park.

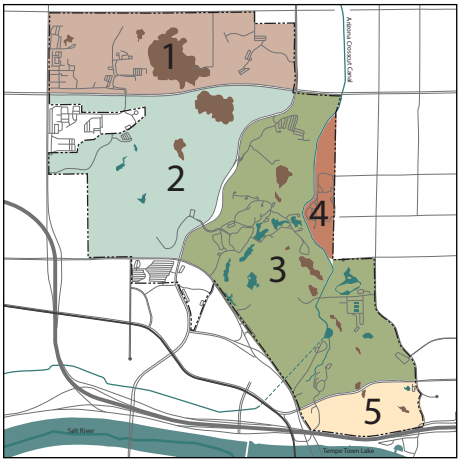


Figure 4.13. Galvin Parkway.

Galvin Parkway separates the two largest and most centralized fragments of the park. Limited pedestrian crossings, the winding street layout, and high traffic speeds create a dangerous pedestrian environment. Photo by Katie Sobczynski, 2009.


Figure 4.14. Existing Road Map.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Arizona Army National Guard
Papago Baseball & Softball Complex
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

METRO transit system.

The newly constructed METRO light rail system, opened in December 2008, runs along Washington Street near the southwest edge of the park. The Washington Street and Priest Drive station provides the nearest light rail access to the park, a short 0.3 miles from the Phoenix Municipal Stadium and 0.5 miles from Galvin Parkway and Van Buren Street.
METRO public bus routes provide ample connections between the light rail and the surrounding cities. The following list includes the six bus routes that are most convenient for the visitors of Papago Park. See Figure 4.16: Existing METRO Transit Map. (www.valleymetro.org)

1 Washington Street. Connection between the bus system and the light rail system. Provides access to the Phoenix Municipal Stadium, Hall of Flame Museum, ending at the Phoenix Zoo. Connects Papago Park to downtown Phoenix.

3 Van Buren Street. Provides direct access to the Phoenix Zoo and the Papago fishing lagoons and picnic ramadas. Connects Papago Park to downtown Phoenix.

17 McDowell Road. Provides access to the north portion of the park, with less than adequate access to the Desert Botanical Garden, Softball Complex, and Arizona National Guard. Connects Papago Park with Scottsdale and Phoenix.

29 Thomas Road. Runs primarily along Thomas Road (2 streets north of McDowell Road), but it also makes a loop south along 52nd Street providing access to the Phoenix Parks & Recreation office and the Arizona National Guard. Connects Papago Park with Scottsdale and Phoenix.

56 Priest Drive. Provides access to the light rail system and to the Phoenix Municipal Stadium. Connects Papago Park to Tempe and Arizona State University.

66 Mill Avenue/Kyrene Road. Provides access to Moeur Park, the LoPiano Bosque, Canal Park, the Tempe Dog Park, and the SRP PERA Club. Connects Papago Park to downtown Tempe, Arizona State University, and downtown Scottsdale. (www.valleymetro.org)

Figure 4.15. Traffic Volumes.

Traffic volumes are displayed in thousands. Red: 30-40, Yellow: 20-30, Light Green: 10-20, Light Green: Less than 10, Gray: no data available.

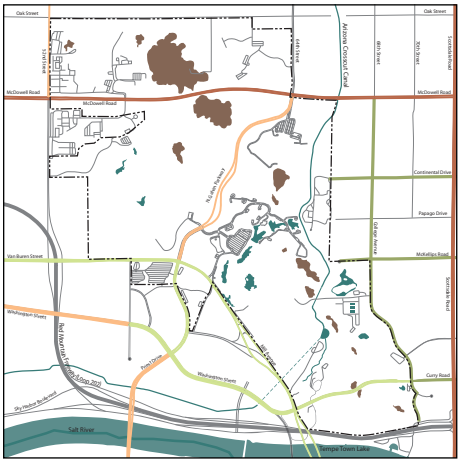



Figure 4.16. Existing METRO Transit Map.
Scale: 1 inch : 1500 feet
Oak Street
29
52nd Street
Arizona Army National Guard
Papago Baseball & Softball Complex
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
17
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Papago Municipal Golf Course
Continental Drive
66
Papago Drive
College Avenue
Van Buren Street
3
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Washington Street
LR
1
Rolling Hills Golf Course
Mill Avenue
Red Mountain Freeway (Loop 202)
Priest Drive
56
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

ecological systems.

In order to design the best solution for the site, it is critical to understand how the ecological systems interact with one another in order to maintain a healthy environment. Designing site features in order to create the least possible disturbance is the overall mission of the redevelopment of the Papago Park master plan.

As noted, Ian McHarg lists the following ecological factors as the most important to include in the site inventory and analysis: climate, geology, pedology, hydrology, vegetation, and wildlife. Each of these factors is a closely related piece of a healthy ecosystem. The underlying geology, climatic weather patterns, and organic matter compose the soil texture and capacity to support vegetation. Soil, hydrology, and climate dictate the vegetation that can be supported. Vegetation is a food source and habitat for native wildlife. And in return the wildlife is a major contributor to seed dispersal and species diversity among vegetation communities. (McHarg, 1992)

It is clear that once any piece of this system is disturbed, the entire system will be effected. Managing these systems correctly and reducing human impact will provide the most accurate representation of a functional Sonoran Desert ecosystem for park visitors. See Figure 4.17: Park Vegetation.

Figure 4.17. Park Vegetation.
Park vegetation is a major piece of the ecological system. Vegetation diversity and reproduction has fallen due to unmanaged human recreation. The saguaro cacti population is no longer naturally reproducing. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

geology.

Papago Park is most easily recognized by the distinguishing red sandstone geological formations that were formed between 6 million and 15 million years ago. A major social landmark, Hole-in-the-Rock, is exceptional due to tafoni, the openings eroded in the rock over time by wind and weather.

The geology of Papago Park is not only important to the understanding of its physical evolution and present form, the granite and sedimentary butte formations were of noted significant to the Native American cultures that first established a territory in the park. The buttes are a large factor in the identity of the park as they can be seen from all around the Phoenix metropolitan area. Geologic symbol definitions are provided in the following annotated legend. See Figure 4.18: Barnes Butte and Figure 4.19: Geology Map. (McHarg, 1992) (USGS, 2000)

Annotated Legend:

Q Surficial deposits (Holocene to middle Pleistocene) - Alluvium in present-day valleys and piedmonts, eolian deposits, and local glacial deposits; approximately 10% of the site

Qy Young alluvium (Holocene to latest Pleistocene) Deposits in present-day river and stream channels, flood plains, and playas; approximately 60% of the site

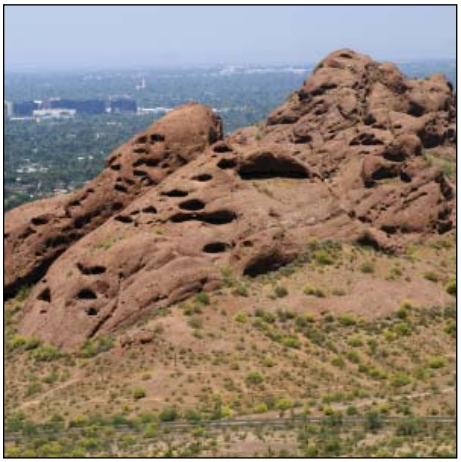
Tsm Sedimentary rocks (middle Miocene to Oligocene; 15 to 38 Ma) - Deposited during mid-Tertiary orogenic activity in the Basin and Range Province and southwestern Transition Zone; approximately 10% of the site

Tsv Volcanic and sedimentary rocks (middle Miocene to Oligocene) ; approximately 5% of the site

Xg Granitoid rocks (Early Proterozoic; 1650 to 1750 Ma) - Granite; approximately 15% of the site

Commonly referenced buttes include Barnes Butte, Papago Butte, Contact Butte, Garden Butte, Hole-in-the-Rock, and Bighorn Butte, which are collectively known as the Papago Buttes. See Figure 4.19: Geology Map.

Figure 4.18. Barnes Butte.
The large rock formations that rise out of the park landscape are composed of a sedimentary rock, red sandstone. Photo courtesy of Michaela Oltmans, Olsson Associates, 2008.



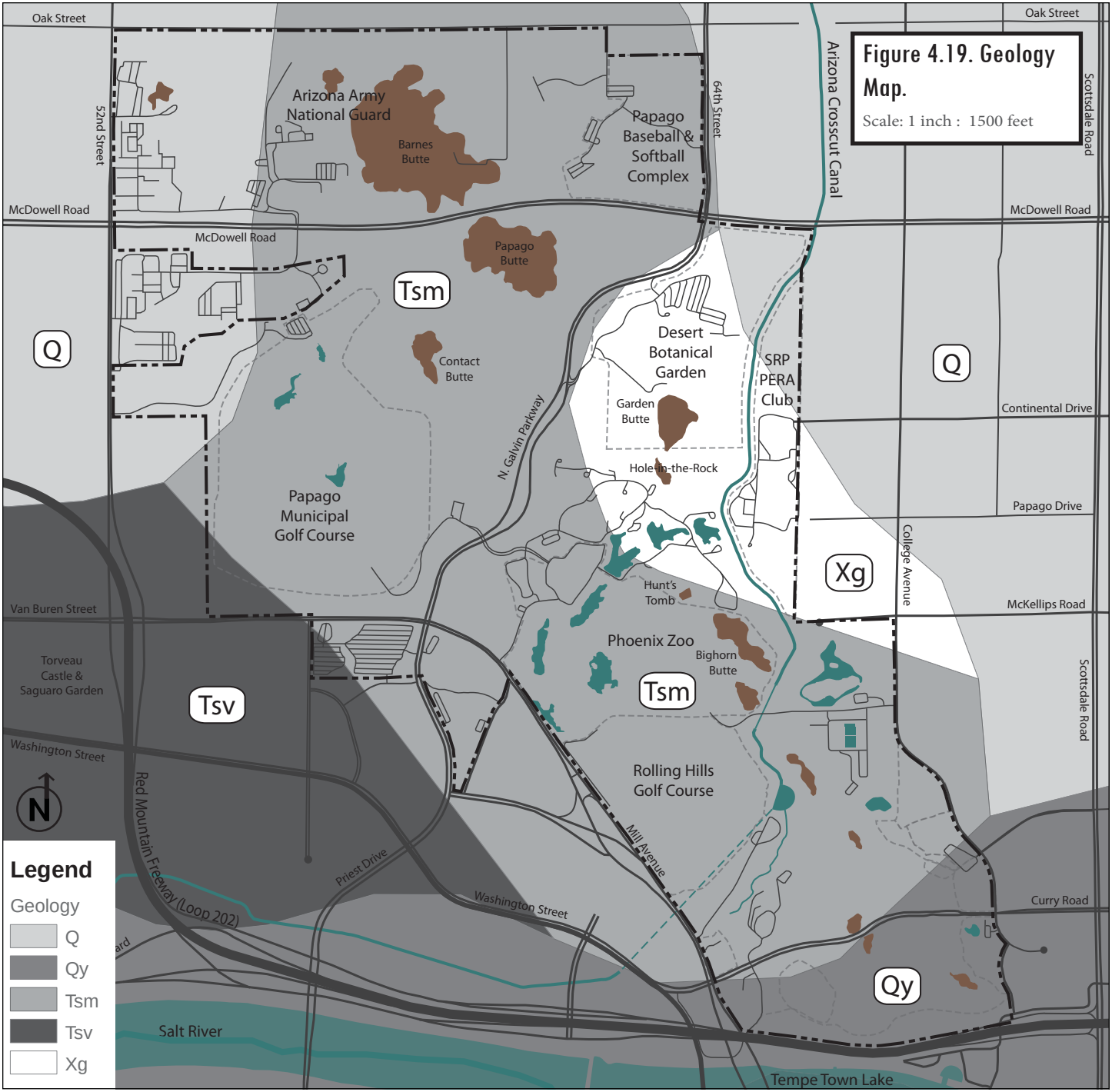


Figure 4.19. Geology Map.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Arizona Army National Guard
Barnes Butte
Papago Baseball & Softball Complex
Papago Butte
Tsm
Q
Contact Butte
Desert Botanical Garden
Garden Butte
Hole-in-the-Rock
SRP PERA Club
Q
Continental Drive
N. Galvin Parkway
Papago Municipal Golf Course
Papago Drive
College Avenue
Xg
Hunt's Tomb
McKellips Road
Van Buren Street
Phoenix Zoo
Bighorn Butte
Tsm
Torveau Castle & Saguaro Garden
Tsv
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Qy
Salt River
Tempe Town Lake
N
Legend
Geology
Q
Qy
Tsm
Tsv
Xg

topography.

Papago Park is generally flat with a scattering of large rock formations rising from the valley floor. The floor area of the park generally does not have larger than a 5% slope, which does not limit most park visitors from hiking the majority of the park. Steep faces of the rock formations provide rock climbing opportunities and astounding views to the floor of the park and the surrounding urban development.

Solar aspect of the valley floor is predominantly southern facing. While, the buttes consist of an even distribution of slopes facing all cardinal directions, as they are generally conical in shape. Southern facing slopes collect more direct solar radiation, creating a considerably warmer environment. See Figure 4.20: Topography Map. (USGS, 2000)

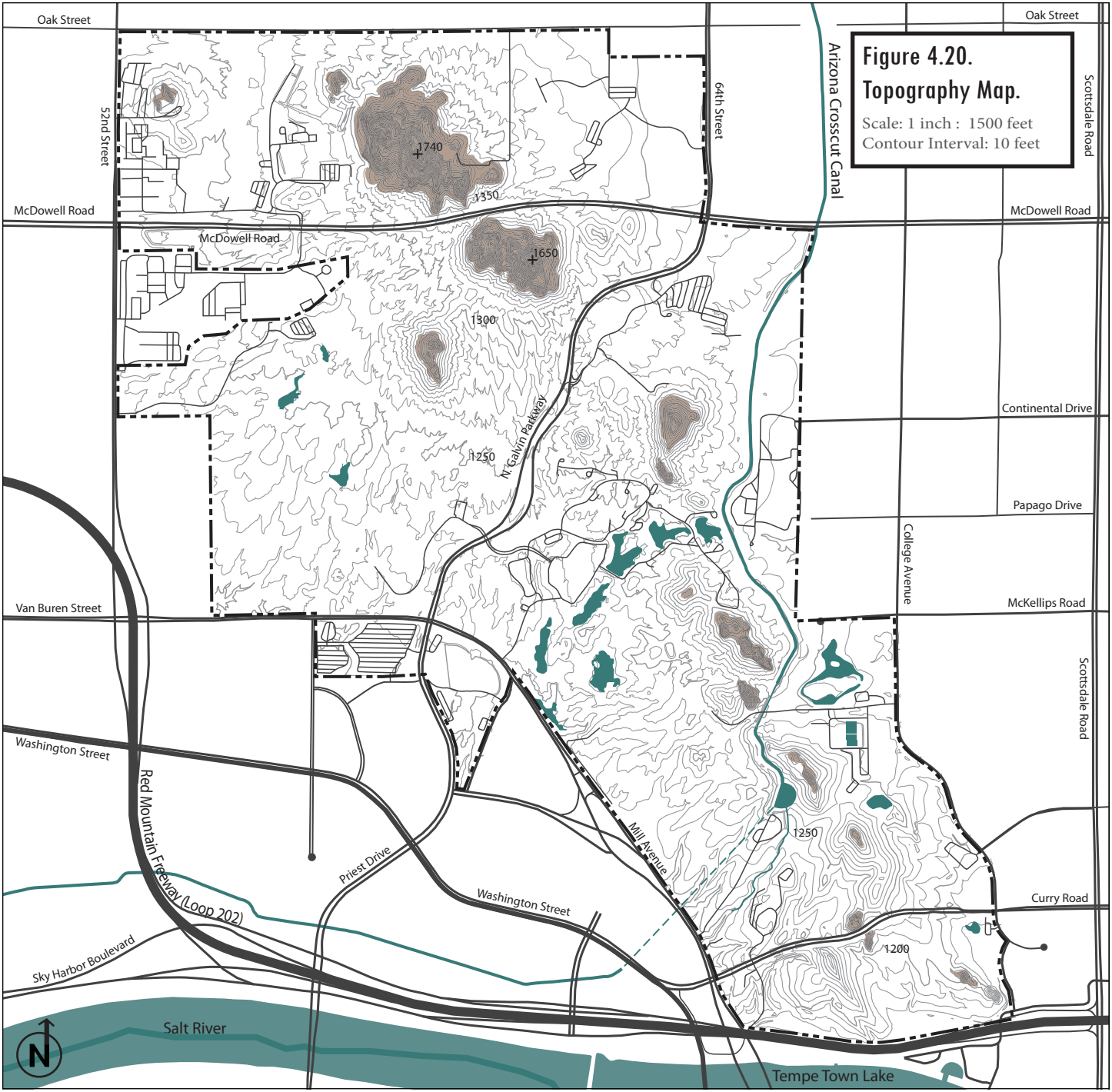


Figure 4.20.
Topography Map.
Scale: 1 inch : 1500 feet
Contour Interval: 10 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
1740
1650
1350
1300
1250
N. Galvin Parkway
Continental Drive
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Scottsdale Road
Washington Street
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Washington Street
1250
Curry Road
1200
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

hydrology.

Generally speaking, water flows from the north end of the park towards Tempe Town Lake and Salt River corridor near the south end of the park. Stormwater west of the ridge line between the Papago Buttes and the Barnes Butte flows into the retention pond within the Phoenix Municipal Golf Course.

The Papago Ponds near Hole-in-the-Rock and within the Phoenix Zoo collect water from the east side of the ridge line between Papago Buttes and Barnes Butte. They are also fed by the Arizona CrossCut Canal.

The Arizona CrossCut Canal is a public water supply that connects the Arizona Canal to the north and the Grand Canal to the southwest. All of the canals are property of the Salt River Project (SRP). South of the Arizona CrossCut Canal, stormwater flows south under Curry Road and into the LoPiano Mesquite Bosque. Any stormwater overflow from the LoPiano Mesquite Bosque runs under the Red Mountain Freeway (Loop 202) into the Tempe Town Lake, and eventually into the Salt River. See Figure 4.22: Hydrology Map and Figure 4.21: LoPiano Mesquite Bosque.

Overflow from the SRP water treatment facility has created the Green Line riparian habitat as it flows west of the Arizona Historical Society Museum. This area has been protected and enhanced as a valuable educational opportunity. (AZHS, 2009)

Figure 4.21. LoPiano Mesquite Bosque.
The bosque collects the majority of the water from the southern end of the park before it runs into Tempe Town Lake and eventually into the Salt River corridor. Photo courtesy of Randall Kopff, Olsson Associates.

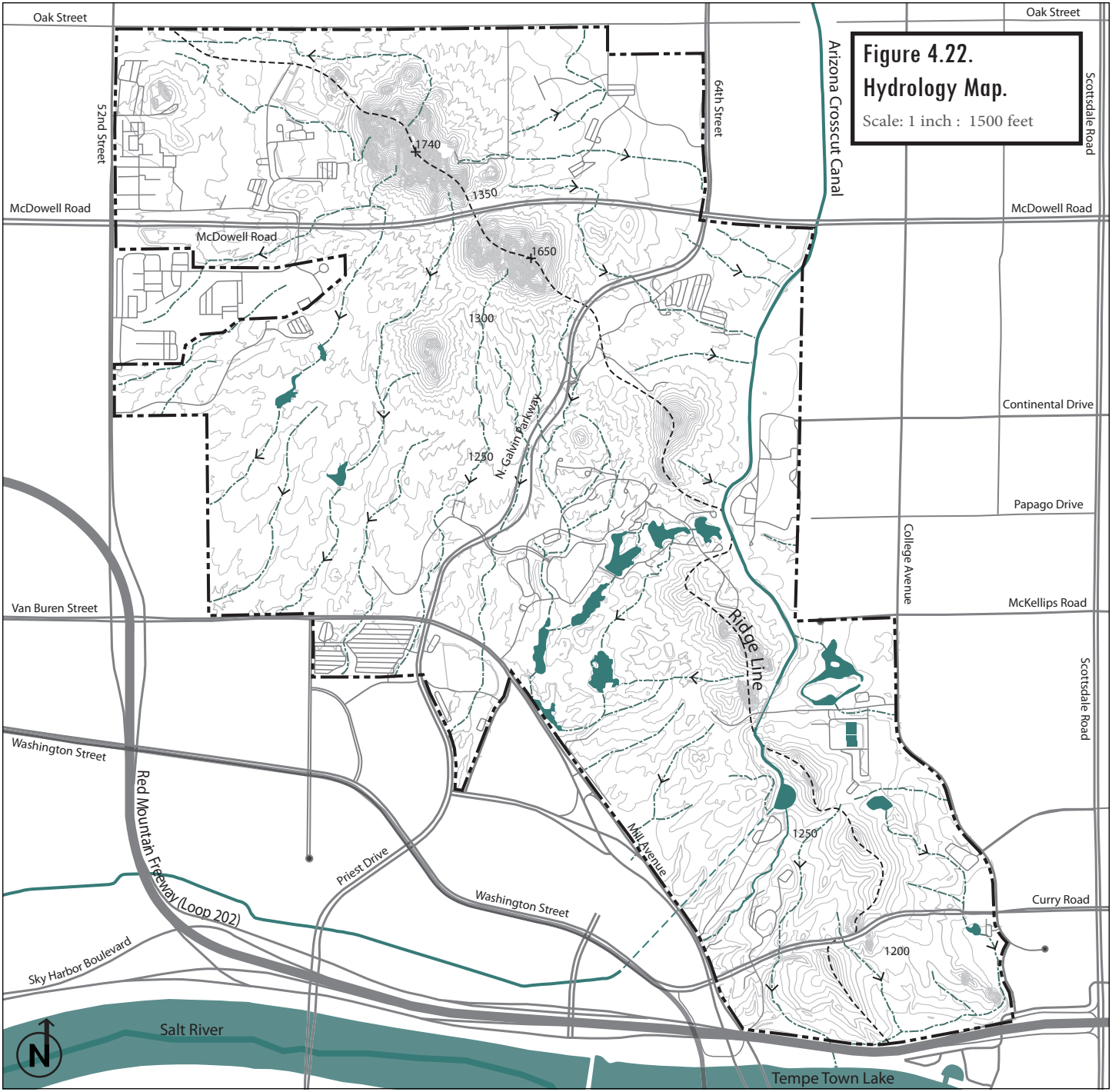


Figure 4.22.
Hydrology Map.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
1740
1350
1650
1300
1250
N. Galvin Parkway
Continental Drive
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Ridge Line
Scottsdale Road
Washington Street
Red Mountain Freeway (Loop 202)
Priest Drive
Washington Street
Mill Avenue
1250
Curry Road
1200
Sky Harbor Boulevard
Salt River
N
Tempe Town Lake

climate.

Phoenix records temperatures of 100°F or higher for an average of 90 days per year, earning it the reputation of the hottest city in the United States. The arid climate produces hot summers and temperate winters.

July is the hottest month of the year with an average high of 104°F and low of 81°F. January is the coolest month of the year with an average high of 65°F and low of 43°F. On average, Phoenix typically has only five days in which the temperature drops below freezing. See Figure 4.23: Temperature Graph.

Sunshine is persistent throughout the year with an average of 85% of possible sunshine. The months with the highest percentage of sunshine per daylight hours are May and June. Figure 4.24: Sunshine Graph.

Precipitation is limited in the Valley, relative to the rest of the nation, with a yearly average of 8.5 inches. The driest month in Phoenix is June with 0.09 inches of precipitation, while 1.07 inches makes March the wettest month. July and August also bring close to an inch of rain during the summer monsoon season. Traditionally, the spring monsoon season brings gentle rains, and the summer monsoon season consists of several violent storms. Monsoonal storms raise humidity levels and produce scattered heavy rainfall which can result in localized flooding. Figure 4.25: Precipitation Graph.

Winds are predominantly from the east year round.
(National Weather Service, 2009)

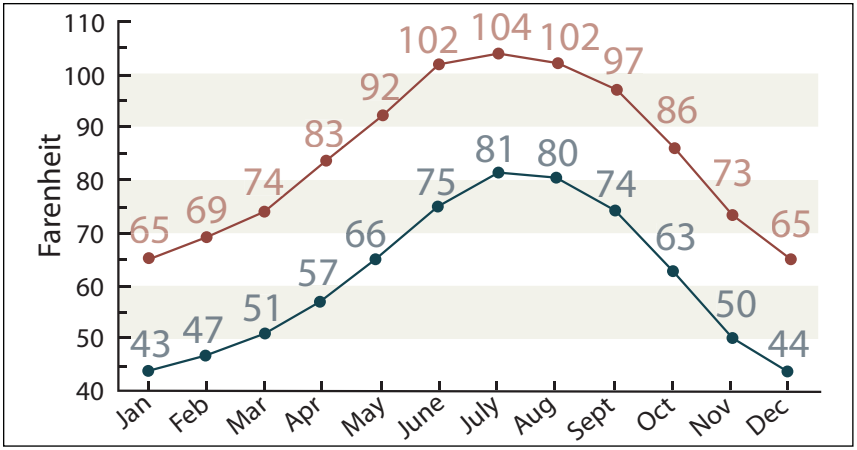


Figure 4.23. Temperature Graph.
Red represents the average high temperatures per month, while blue represents the average cool temperatures. Adapted from the National Weather Service, 2007.

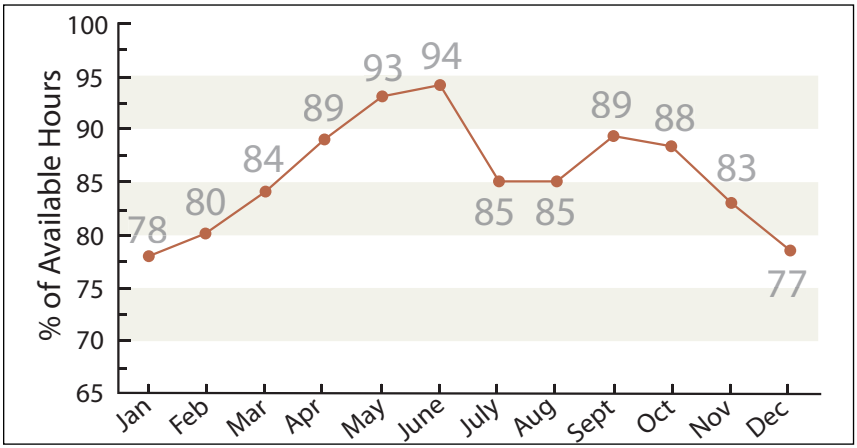


Figure 4.24. Sunshine Graph.
This graph represents the average percent of sunshine per available daylight hours. Adapted from the National Weather Service, 2007.

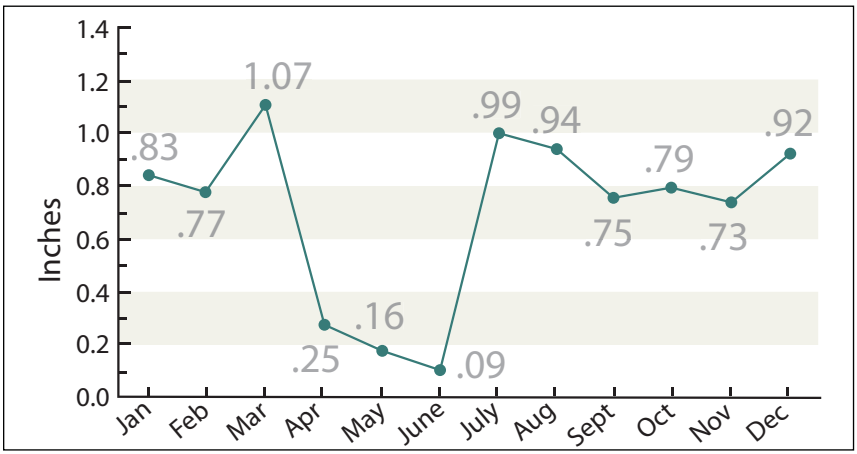


Figure 4.25. Precipitation Graph.
This graph clearly marks the spring and summer monsoon seasons in March and July-August, illustrating the average amount of rainfall per month. Adapted from the National Weather Service, 2007.

soils.

Understanding the geology, climate, and hydrology, it is possible to understand patterns of soil characteristics and composition. Soils are formed by a combination of organic matter and finely decomposed rocks and minerals. Soil composition varies across the site based on the underlying geology. Soil types are defined in the following annotated legend. See Figure 4.26: Soils Map. (USGS, 2000)

Annotated Legend

CeC Cavelt gravelly loam - 1 to 5 percent slopes, Not prime farmland, High-Medium erodible land

Gf Gilman fine sandy loam - Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season, High-Medium erodible land

Gm Gilman loam - Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season, High-Medium erodible land

RiA Rillito gravelly loam - 0 to 1 percent slopes, Prime farmland if irrigated, High-Medium erodible land

RiB Rillito gravelly loam - 1 to 3 percent slopes, Prime farmland if irrigated, High-Medium erodible land

Ro Rock land - Not prime farmland, Not highly erodible land

Ru Rough broken land - Not prime farmland, High-Medium erodible land

W Water

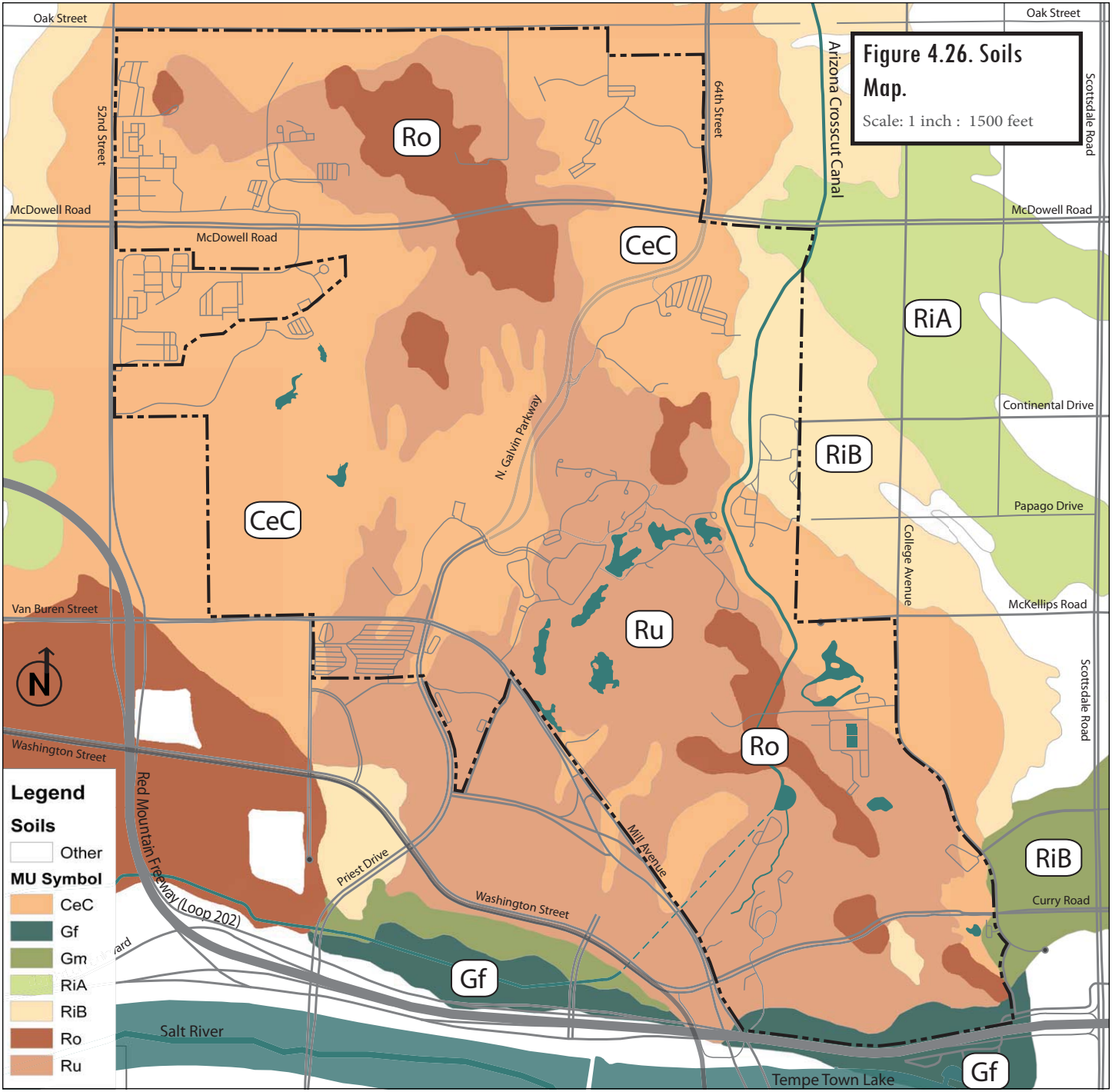


Figure 4.26. Soils Map.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Continental Drive
Papago Drive
College Avenue
McKellips Road
Scottsdale Road
Van Buren Street
N. Galvin Parkway
Mill Avenue
Priest Drive
Washington Street
Washington Street
Red Mountain Freeway (Loop 202)
Curry Road
Salt River
Tempe Town Lake
Ro
CeC
RiA
RiB
Ru
Gf
Legend
Soils
Other
MU Symbol
CeC
Gf
Gm
RiA
RiB
Ro
Ru

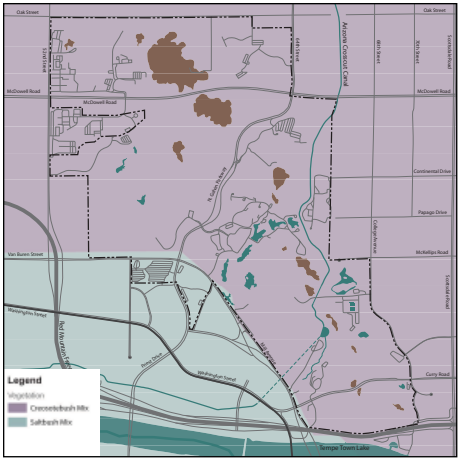


Figure 4.27. Vegetation Map.
Violet represents the variety of Creosotebush communities, approximately 98% of the park. Blue represents the variety of Saltbush communities, approximately 2% of the park.

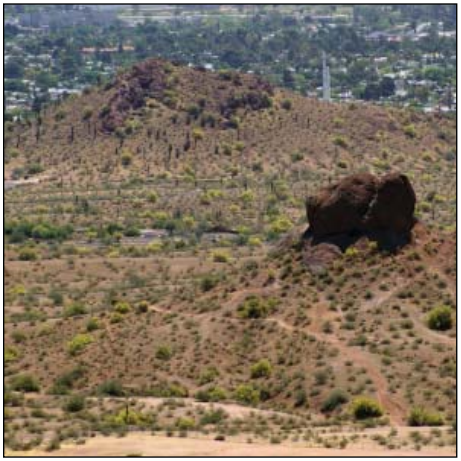


Figure 4.28. Contact Butte and Garden Butte.
The vegetation on Contact Butte, is less than thriving and showing signs of heavy degradation. Garden Butte, in the background, has one of the most healthy stands of saguaros in the park due to the constant maintenance from the Desert Botanical Gardens. Photo courtesy of Michaela Oltmans, Olsson Associates, 2008.

vegetation.

In the Sonoran Desert, ecosystem processes are closely related to the precipitation patterns. Most vegetation growth occurs in the spring following the typically gentle winter rains. Less significant growth occurs during the violent summer monsoon season. This biannual precipitation pattern allows for the Sonoran desert to maintain a far more lush vegetation cover than neighboring deserts. (Ewan, 2003)

Ron van Ommeron and Andrea Helmstetter completed an inventory in 2004 of the floral and vertebrate faunal communities in Papago Park; the inventory delineated seven vegetation associations, estimated relative abundance of wildlife in each vegetation association, and inferred changes of the ecological conditions in the Park over time. (Ommeron, 2004)

In general, plant communities within Papago Park have been described as transitional between Lower Colorado River (Saltbush) and Arizona Upland Sonoran Desertscrub (Creosote-Bursage). These vegetation communities have been divided further based on the seven vegetation associations determined in the 2004 study by Ommeron and Helmstetter. Unfortunately the seven more specific vegetation associations have not been delineated in plan, but the two plant communities that have been illustrated reflect the percentages outlined below. See Figure 4.27: Vegetation Map and Figure 4.28: Contact Butte and Garden Butte. (USGS, 2000)

Vegetation Associations:

CBP Creosotebush-Bursage-Palo Verde – 70% of the site

CBPS Creosotebush-Bursage-Palo Verde-Saguaro – 20% of the site

CB Creosotebush-Bursage – 8% of the site

Totaling approximately: 98%

PCW Palm-Cottonwood-Willow – <2% of the site

MPI Mesquite-Palo Verde-Ironwood – <1% of the site

SC-mix Salt Cedar-Mixed Deciduous Shrub – <1% of the site

SC Salt Cedar – <1% of the site

Totaling approximately: 2%

See Figure 4.27: Vegetation Map

wildlife.

According to the 2004 park inventory by Ommeron and Helmstetter, high densities of native birds were located in the MPI and SC-mix vegetation types, and lowest densities were found in CBP and CB. Although CBP had one of the lowest species densities, it had the highest species richness. This is because 70% of the site is composed of CBP. If MPI and CBPS had similar areas as CBP, they would likely have significantly higher species richness than CBP.

Mammal densities did not reveal strong correlations with the seven vegetation types; mammals were located more frequently around rock outcrops. This is likely credited to the high densities of vegetation and shelter opportunities.

Reptile densities were highest in the MPI vegetation type, a xeroriparian habitat. The reptile population consisted primarily of the western whiptail. See Figure: 4.29: Western Whiptail. (Ommeron, 2004)

The densities of native birds and reptiles were both highest in the MPI vegetation type, which is likely related to the LoPiano Mesquite Bosque and Papago Ponds. See Figure 4.30: Picnic Intruders.

Several positive correlations were concluded with this data:

- total vegetation volume and total wildlife density
- native vegetation volume and native bird density
- native plant species richness and total wildlife species richness
- native plant species richness and bird species richness

Figure 4.29. Western Whiptail.
This reptile is one of the most commonly found within Papago Park, according to Ommeron and Helmstetter, 2004. Photo courtesy of 'downclimb' at www.flickr.com.

Figure 4.30. Picnic Intruders.
Although they contribute to the wildlife statistics, these geese are less than wild. They can often be found around the Papago Ponds, pestering picnickers for scraps of food, which is certainly not part of their natural diet. Photo by Katie Sobczynski, 2008.

local character.

The Native American civilizations that are still present in the Valley have pre-historic ties to Papago Park, for which the park has earned it name. The Tohono O'odham, commonly known as the Papago, are a group of aboriginal Americans who reside primarily in the Sonoran Desert of the southwest United States and northwest Mexico. The Papago tribe is a descendant of a larger tribe called the Hohokam. Having once resided along the Salt River, they have left evidence of their inhabitation within the park.

White, Hispanic, and Native American populations have created a diverse urban culture that is unique to the Phoenix Valley. Typical color palettes of this cultural mix consist of red, orange, and purple earthtones. Architecture in the Valley employs historic and modern methods of construction including adobe, brick, stone, and tile. See Figure 4.31: Eisendrath House. (www.phoenix.gov) (www.tempe.gov)

Figure 4.31. Eisendrath House.
This historic adobe house is in the process of being restored as an office for the Carl Hayden Campus for Sustainability. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

park history.

In 1879, Papago Park was designated a reservation for the local Maricopa and Pima tribes of aboriginal Americans. Evidence has been gathered that the Hohokam civilization, an aboriginal tribe that once lived in the Phoenix area, used openings in Hole-in-the-Rock to track the solar patterns by the changes in sunlight and shadow patterns cast on the surrounding landscape. See Figure 4.32: Papago Butte and Figure 4.33: Hole-in-the-Rock.

The Native American reservation was relocated to the east and the land became the Papago Saguaro National Monument in 1914, but this status was abolished by Congress in 1930 due to the local-extinction of the saguaro cacti. Some local myths about the disappearance of the saguaros state that they were secretly harvested and relocated to the nearby Tovrea Castle and Carraro Cacti Gardens constructed from 1928 to 1930. No matter the story, the Papago Saguaro National Monument is the only National Monument to ever be abolished.

After the abolishment of the National Monument status, the property was divided amongst the State of Arizona, City of Tempe, Arizona National Guard, and the Salt River Project. During WWII, the northern portions of the park housed a Prisoner of War (POW) camp, and after the war it served as a government hospital. Today the Army Reserve facility is used by the Arizona National Guard. The state owned portion of the park was sold to the city of Phoenix on February 25, 1959. A parcel of the Tempe owned park property was conveyed to the Salt River Project in 1955 for water resource management.

The park has seen many site improvements throughout the years from several different organizations. The Works Projects Administration (WPA) completed multiple construction projects in the 1930s including raised planters, stairs, planter borders, stone benches, stone tables, an automobile bridge, retaining walls, and irrigation boxes. The historic open-air rock amphitheater was constructed by the Civilian Conservation Corporation (CCC) and dedicated on April 1, 1934. Other large attractions include the Desert Botanical Garden, the Phoenix Zoo, two public golf courses, and multiple athletic facilities. See Figure 4.34: Eliot Ramada. (Gart, 1996) (www.papagosalado.org)

Figure 4.32. Papago Butte.
The rock formations that decorate the park landscape first attracted the Hohokam people to this area, and have since marked this area as a place of incredible importance. Photo courtesy of Michaela Oltmans, Olsson Associates, 2008.

Figure 4.33. Hole-in-the-Rock.

Once used to track solar patterns, Hole-in-the-Rock has become an icon and a major landmark for Papago Park. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

Figure 4.34. Eliot Ramada.

Dedicated in 1964, Eliot Ramada is one of the few picnic shelters on the west portion of the park, and offers elevated views of the surrounding landscape and nearby buttes. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

cultural resources.

Archeological sites of pre-historic Native American civilizations are present within the park. The LoPiano Bosque, once part of the Salt River floodplain, may have been used by the Hohokam Native American tribe for gathering plants for baskets or other household uses. Prehistoric homes once lined the canal in this area in the 1930s through 1960s. Many of these homes flooded during seasonal monsoons and were eventually lost to the destructive forces of the elements. In 1992, the Salt River was channelized, protecting this land from future floods, and left the previously described prehistoric structure, Loma del Rio, in its current state of ruin. See Figure 4.35: Loma del Rio.

The exact locations of most archeological sites are not made available to the public for historical preservation reasons, and will be marked as "Cultural Resource Areas." These areas are generalized in red on Figure 4.36: Cultural Resource Areas and may include archeological sites, vegetation and wildlife habitat conservation. Public recreation should be limited and any further development should be prohibited in these areas to prevent disturbance or loss of cultural artifacts. (Gart, 1996)

Figure 4.35. Loma del Rio.
Currently, to the untrained eye, it is difficult to identify this pile of rocks as a culturally significant area. Once consisting of a structure built by the Papago tribe, this area has been protected as a cultural resource and provides valuable educational information to the public. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

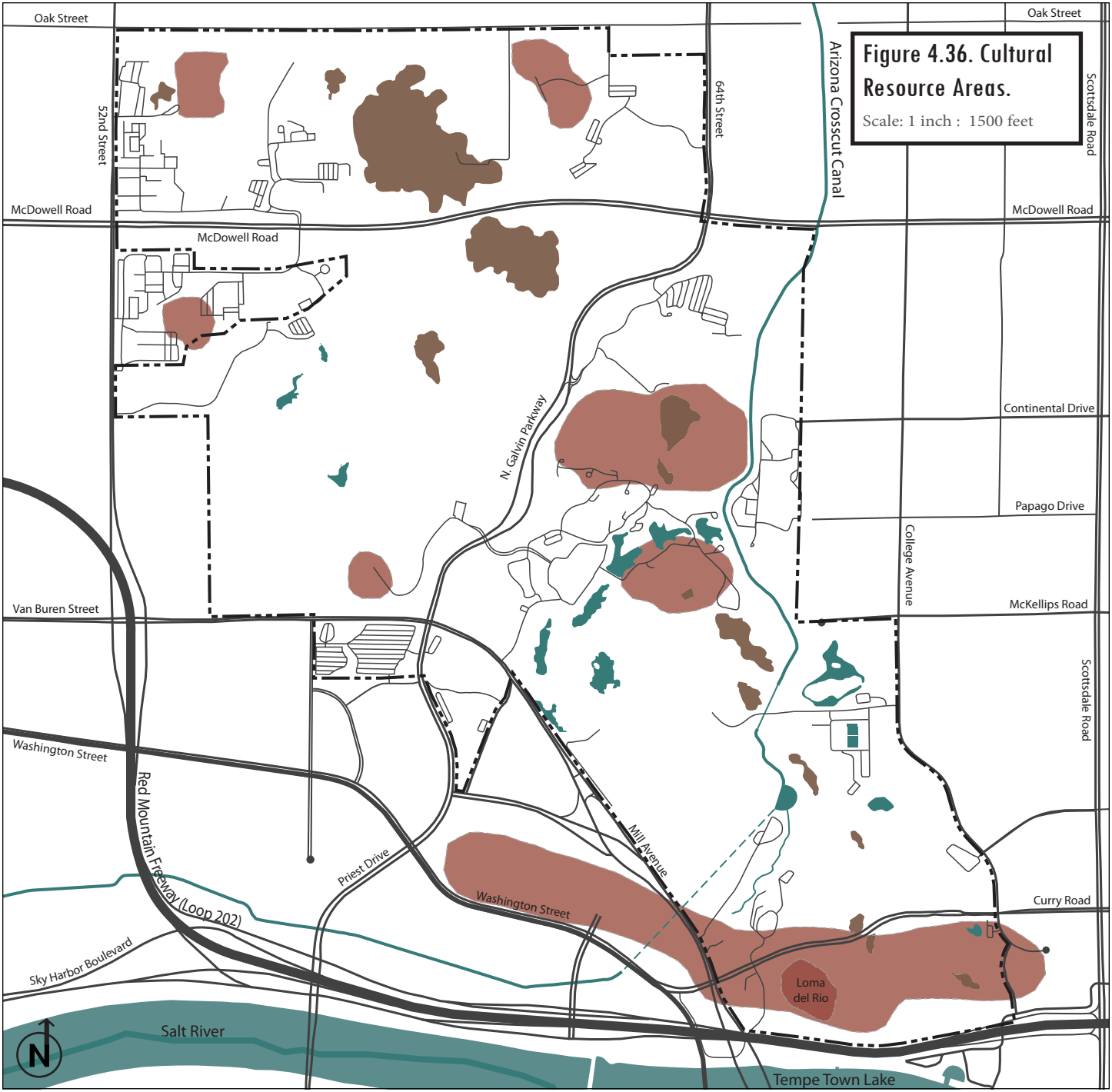


Figure 4.36. Cultural Resource Areas.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
N. Galvin Parkway
Continental Drive
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Scottsdale Road
Washington Street
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Washington Street
Curry Road
Sky Harbor Boulevard
Loma del Rio
Salt River
Tempe Town Lake
N

demographics.

Population

According to the 2000 census, Phoenix is the fifth largest city in the United States in terms of population. It is the most populated state capital in the United States and is the only state capital with a population of more than a million people. Population density was 2782 people per square mile.
The metropolitan area reported over 3.2 million residents in the 2000 census. For every 100 females there were 103.5 males. See Figure 4.37: Population Distribution & Density Map. (USGS, 2000)

Age Distribution

Age statistics as of the 2000 census concluded that 28.9% of the population was under the age of 18 years, 10.9% from 18 to 24 years, 33.2% from 25 to 44 years, 18.8% from 45 to 64 years, and 8.1% was 65+ years. The median age was 31 years, while the mean age was 34 years. These numbers do not account for the large "snow bird" population of retired people that live in the Valley for only the winter season, but do not consider Phoenix their permanent place of residence. See Figure 4.38: Age Distribution & Density Map. (USGS, 2000)

Race/Ethnicity Distribution

According to the 2000 census, Phoenix is composed of 71.1% White non-Hispanic, 34.1% Hispanic, 5.1% African American, 2.0% Native American, 2.0% Asian, 0.13% Pacific Islander, 16.4% from other races, and 3.3% from two or more races. Since the 2000 census, the non-Hispanic White population in Phoenix dropped below 50%, according to William Frey, a demographer with the Brookings Institution. See Figure 4.39: Ethnicity Distribution & Density Map. (USGS, 2000)

Crime Statistics

According to the Phoenix Police Department website, over 7% of all crimes committed in the Central City Precinct were located within the 533rd Beat, which encompasses Papago Park and the surrounding neighborhood. When compared to the city of Phoenix as a whole, the 533rd Beat is consistently labeled between Moderately Low to Very Low for the occurrence of crime. (http://phoenix.gov/POLICE/crista1.html)

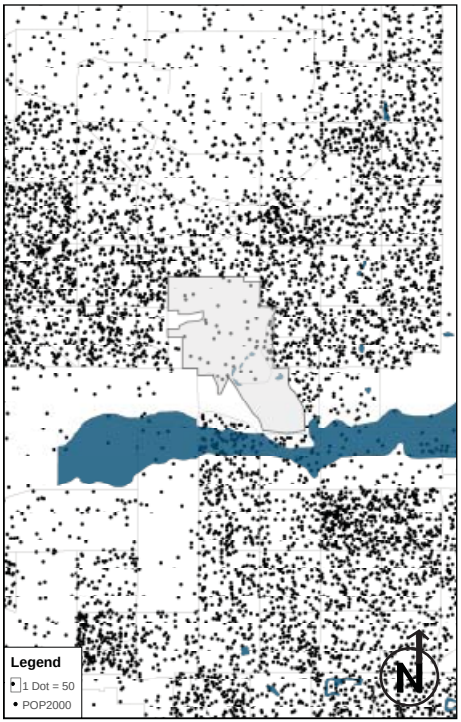


Figure 4.37. Population Distribution & Density Map.

Voids in the population density can be easily identified to the southwest where the Salt River corridor, Phoenix Sky Harbor Airport and South Mountain Preserve are located. There is also a reduced population to the north representing Camelback Mountain. To the southeast an increased density represents Arizona State University. (US Census Bureau, 2000)

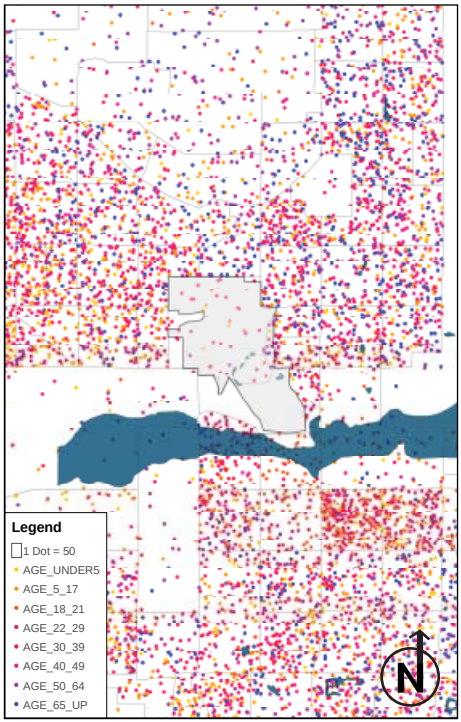


Figure 4.38. Age Distribution & Density Map.

Arizona State University can be clearly identified as having an age demographic of approximately 18-29. There is a slightly older population northeast along the Scottsdale side of Camelback Mountain. Otherwise, age distribution appears to fairly even spread. (US Census Bureau, 2000)

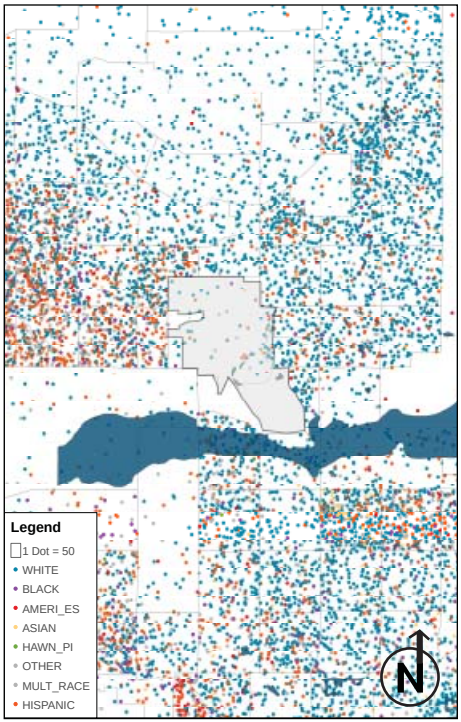


Figure 4.39. Race/Ethnicity Distribution & Density Map.

Directly east of Papago Park, toward downtown Phoenix, there is a strong Hispanic population. Arizona State University consists of an ethnically diverse population. The overwhelming majority across the cities of Scottsdale and Tempe is White. (US Census Bureau, 2000)

Figure 4.40. Saguaro Fruit Harvesting
Learning the traditional Hohokam methods for harvesting the fruit of the saguaro is just one of many classes offered by the Desert Botanical Garden. Photo courtesy of David Bygott at www.flickr.com.

educational programs.

A wide variety of park attractions allows for a wide range of educational opportunities.

The Desert Botanical Garden offers several educational opportunities for both children and adults related to desert gardening, vegetation conservation, cultural traditions, water conservation, and photography among many more topics. The Phoenix Zoo provides several programs for children, teens, and families. These educational programs include summer camps, zoo tours, and wildlife health and management. See Figure 4.40: Saguaro Fruit Harvesting. (www.dbg.org) (www.phoenixzoo.org)

Papago Park is rich in variety of active and passive recreational opportunities. The athletic facilities include the Phoenix Municipal Golf Course, Rolling Hills Golf Course, the Tempe Sports facility, the Papago Baseball and Softball complex, archery, and orienteering.

Although neither of the golf courses currently offer lessons, the Phoenix Municipal Papago Golf Course has plans to address the need for educational programs. In addition to a driving range and practice putting greens, plans are under consideration for a Learning Center that is intended to provide an environment for golfers of all levels to perfect their golfing skills.

Athletic facilities accommodate both youth and adult softball and baseball teams. This is an important recreation opportunity that promotes a healthy and active lifestyle among Valley residents of all ages. A fitness trail that loops the Phoenix Municipal Golf Course also promotes outdoor exercise activities in combination with hiking or biking in the park. (www.papagosalado.org)

papago park

analysis

process of analysis.

Site analysis is guided by the design goals of the project. Each project goal requires a particular set of site and regional inventory which, when analyzed in terms of the proposed program elements, will reveal important considerations for the resulting design solution. Proposed program elements will become more refined based on the analysis results.

It was vital to first determine the areas of high vulnerability, those that should be protected for their natural and cultural resources. Second, the areas suitable for implementation of proposed program elements that were established in the program development phase were determined. The synthesis of the findings from the site analysis will guide the design in close conjunction with the project goals. See Figure 5.01: Analysis Process.

Preliminary analysis was completed in a matrix form, adapted from the process Ian McHarg developed in Design with Nature, 1992. The matrix evaluates ecological factors based on their individual properties as they influence value for land use. The ecological factors include climate, geology, physiography, hydrology, pedology, vegetation, and wildlife. Each factor is ranked based on its individual criteria on a scale of five values. The land uses for which Papago Park is analyzed are conservation, passive recreation, and active recreation. The appropriate application of each land use according to value 1 of each ecological factor is indicated by a range of gray tonal intensities. Factors of greatest influence for each land use are shown with full black blocks; lower values decrease in tonal intensity. See Table 5.01: McHarg Analysis: Papago Park.

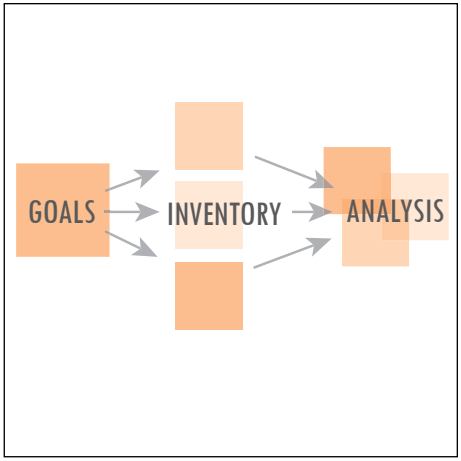


Figure 5.01. Analysis Process.
This diagram illustrates the linear relationship between each project goal, relevant site inventory and analysis conclusions.

Table 5.01. McHarg Analysis: Papago Park.

Ecological Factor	Ranking Criteria	Phenomena Rank					Value For Land Use		
		I	II	III	IV	V	Conservation	Passive Recreation	Active Recreation
Climate									
Air pollution	Incidence max > min	Extreme	High	Medium	Low	Lowest			
Heat island temperatures	Incidence max > min	Extreme	High	Medium	Low	Lowest			
Geology									
Features of unique, scientific, and educational value	Scarcity max > min	Hole-in-the-Rock	Barnes Butte & Papago Butte	Garden Butte	Contact Butte & Bighorn Butte	other rock formations			
Physiography									
Features of unique, scientific, and educational value	Scarcity max > min	Papago Buttes	LoPiano Mesquite Bosque, Green Line	Conservation Areas & Loma del Rio	Desert Botanical Gardens & Phoenix Zoo	Golf Courses & Athletic Facilities			
Land features of scenic value	Distinctive most > least	Papago Buttes	——	Sonoran Desert Landscape	LoPiano Mesquite Bosque	——			
Water features of scenic value	Distinctive most > least	Papago Ponds & Evelyn Hallman Pond	Tempe Town Lake	Golf Course Ponds	Green Line & LoPiano Mesquite Bosque	CrossCut Canal & Grand Canal			
Riparian lands of water features	Vulnerability most > least	LoPiano Mesquite Bosque & Green Line	Papago Ponds	Tempe Town Lake	Cross Cut Canal	Grand Canal			
Surface drainage	Proportion of Surface Water to Land Area most > least	Tempe Town Lake	Papago Ponds	Evelyn Hallman Pond & Golf Course Ponds	Grand Canal, Cross Cut Canal	Washes			
Slope	Gradient high > low	Over 25%	25-10%	10-5%	5-2.5%	2.5-0%			
Hydrology									
Stream-side recreation (fishing, hiking)	Scenic most > least	Papago Ponds & Evelyn Hallman Pond	LoPiano Mesquite Bosque, Green Line	Cross Cut Canal, Grand Canal	Major washes	Minor washes			
Watershed Quality Protection	Streams most > least	Non-urbanized streams/washes	——	Semi-urbanized streams/washes	——	Urbanized streams/washes			

Ecological Factor	Ranking Criteria	Phenomena Rank					Value For Land Use		
		I	II	III	IV	V	Conservation	Passive Recreation	Active Recreation
Pedology									
Soil drainage	Permeability as indicated by soil type most > least	Excellent	Good-Fair	Fair-Poor	Poor	Nil			
Erosion	Susceptibility most > least	Slopes over 5%	Sandy Soils	Slopes 5-2.5%	Slopes 2.5-0%	Flat			
Vegetation									
Existing native Sonoran Desert	Quality best > poorest	pristine	good	poor	disturbed	none			
Desert type	Scarcity most > least	Conservation Areas	Hiking Areas	_____	_____	Heavy Recreation			
Land Use	vegetation conservation best > poorest	Conservation Areas	LoPiano Mesquite Bosque, Green Line	Desert Botanical Garden	Phoenix Zoo & Museums	Golf Course & Athletic Facilities			
Wildlife									
Existing habitats	Scarcity most > least	Conservation Areas	LoPiano Mesquite Bosque, Green Line	Desert Botanical Garden	Phoenix Zoo	Golf Courses & Athletic Facilities			
Land Use									
Features of unique, educational, and historic value	Importance most > least	Conservation Areas including buttes	LoPiano Mesquite Bosque & Green Line	Desert Botanical Garden	Phoenix Zoo	Museums			
Features of scenic value	Distinctive most > least	Papago Buttes & Conservation Areas	Papago Ponds	Tempe Town Lake	Desert Botanical Garden	Phoenix Zoo			
Recreational resources	Availability most > least	Golf Courses & Athletic Facilities	Hiking & Biking Trails	Papago Ponds	Horseback Riding	Archery & Orienteering			

Adapted from McHarg, 1992.

analysis by goal.

1. The first goal, and most desirable to satisfy, is to *protect the unique natural resources including the native vegetation, wildlife habitats, and geology of this piece of the Sonoran Desert*. In order to best protect these areas, they must be identified as areas of high vulnerability. The inventory phase provided the following information and figures that are critical to consider:

- Inventory of the floral and vertebrate faunal communities in Papago Park by Ommeron and Helmstetter, 2004.
- Figure 4.04: Existing Site Improvements
- Figure 4.11: Existing Trails Map
- Figure 4.36: Cultural Resource Areas
- Table 5.01: McHarg Analysis: Papago Park

Review of the geology and soils reveals the growth patterns of the native vegetation. Wildlife habitats are largely plant-related because wildlife tends to live nearest its food source. Therefore areas that have the least disturbance to native vegetation density and species richness are considered important and highly vulnerable because these areas also provide the best habitats for wildlife populations. Without more specific delineations of the vegetation associations, the best method for determining areas with least disturbance to vegetation densities is to consider the undeveloped areas on Figure 4.04: Existing Site Improvements. These areas are delineated in gray in Figure 5.02: Resource Analysis, and are most vulnerable to degradation from human activity and development.

Cultural Resource Areas include historic and pre-historic archeological sites, vegetation and wildlife habitats. These areas, as shown on Figure 4.37: Cultural Resource Areas, are also considered highly vulnerable to human disturbance. In Figure 5.02: Resource Analysis, these areas are delineated in red.

It is apparent that the least disturbed areas are furthest from the human interaction. It is necessary that this division of human recreation and conservation areas be maintained. Elimination or combination of trails that are close in proximity to conservation areas should be considered, and the unintended expansion of 'spider trails' needs to be restricted first and foremost.

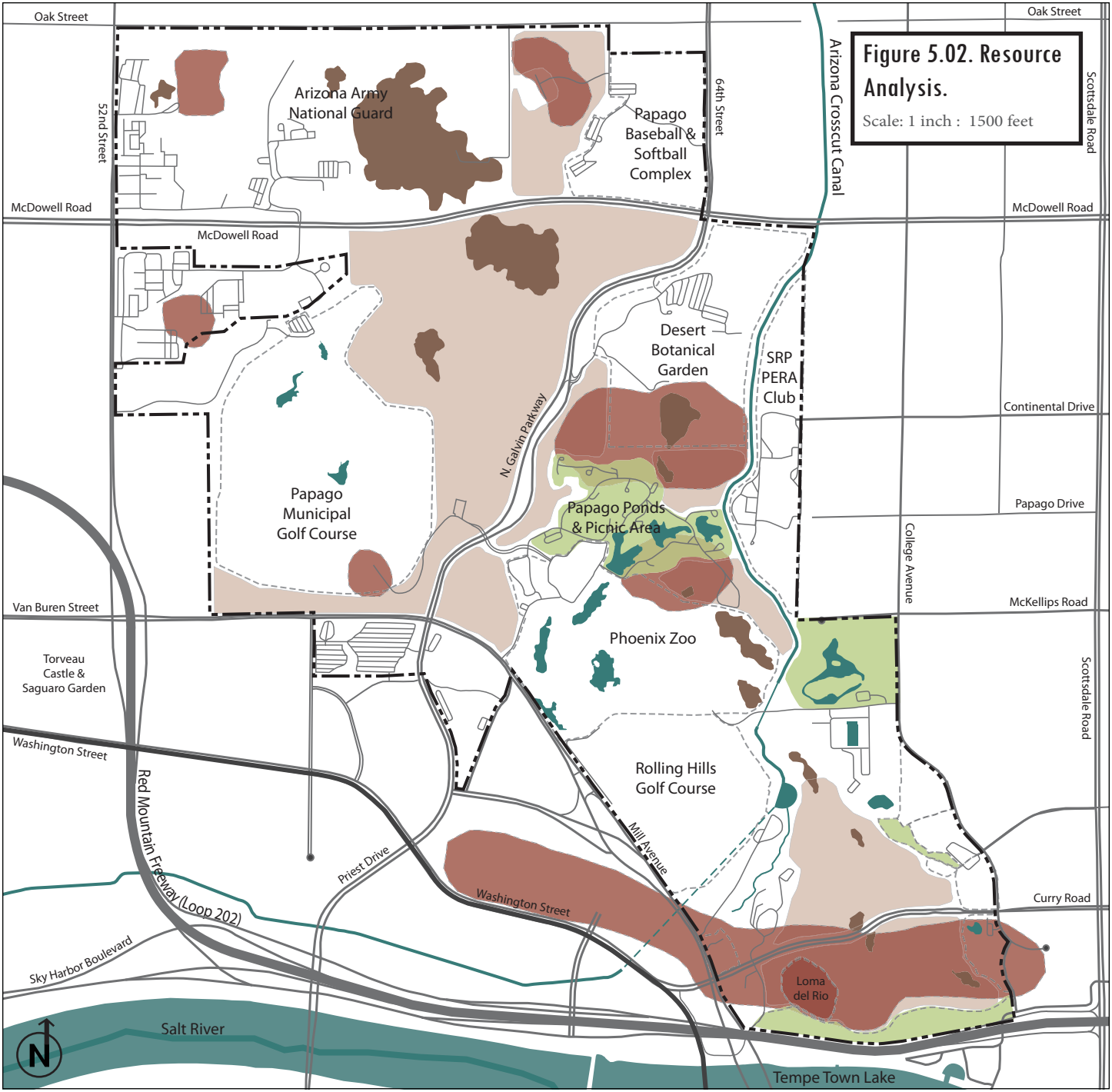


Figure 5.02. Resource Analysis.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
Arizona Army National Guard
Papago Baseball & Softball Complex
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Continental Drive
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Loma del Rio
Salt River
Tempe Town Lake
N

2. The second goal is closely related to the first, it intends to *reclaim areas for conservation and ecological restoration where unnecessary human disturbance has caused degradation and fragmentation; to provide a more accurate representation of the Sonoran Desert ecosystem*. The areas most suitable for the re-establishment of native vegetation and wildlife habitat will be determined based on the following pieces of inventory:

- Inventory of the floral and vertebrate faunal communities in Papago Park by Ommeron and Helmstetter, 2004.
- Figure 4.04: Exiting Site Improvements
- Figure 4.11: Existing Trails Map
- Figure 4.27: Vegetation Map
- Table 5.01: McHarg Analysis: Papago Park

Existing program elements that are under-utilized or have fallen into dis-repair should be considered suitable for the restoration of native vegetation. Areas that are currently designated as conservation and low-impact recreation are evaluated based on the amount of recreation and resulting human disturbance that has taken place. Likewise, areas where unintended human disturbance has become unmanageable are highly suitable for the restoration of native vegetation and increased stringent recreation management. Closed 'spider trails' should be considered areas of high priority for ecological restoration. See Figure 5.03: Conservation Analysis – Native Revegetation.

Several of the areas delineated in Figure 5.03: Conservation Analysis carry a set of opportunities and constraints listed as follows.

1. Arizona National Guard: requires participation or land donation, educational opportunity
2. Archery Range
3. Phoenix Parks & Recreation Office: educational exhibit opportunity
4. Papago Butte
5. Galvin Parkway: requires road closure and removal
6. SRP PERA Club (north): requires participation, educational opportunity
7. Desert Botanical Garden: requires participation
8. Phoenix Municipal Stadium parking: requires pavement modifications
9. SRP PERA Club (south): requires participation, educational opportunity
10. Phoenix Zoo & Hunt's Tomb: requires participation, educational opportunity
11. Tempe: educational exhibit opportunity
12. Moeur Park: disc golf course interference

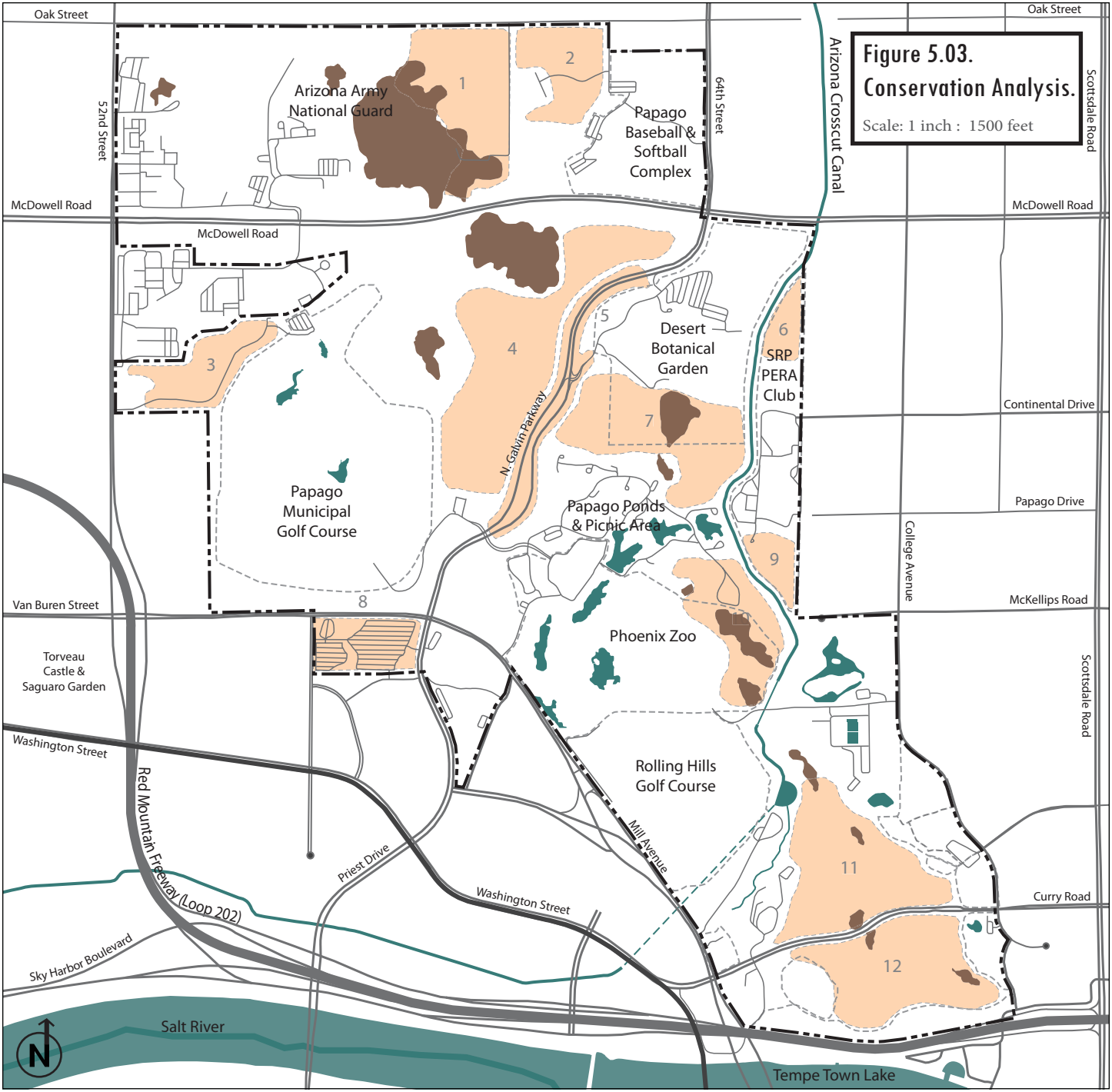


Figure 5.03.
Conservation Analysis.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Arizona Army National Guard
Papago Baseball & Softball Complex
1
2
3
4
5
6
7
8
9
11
12
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Continental Drive
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Phoenix Zoo
Torveau Castle & Saguaro Garden
Washington Street
Red Mountain Freeway (Loop 202)
Rolling Hills Golf Course
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

3. The third goal, to *unite park conservation areas, recreation, surrounding neighborhoods, and other attractions in order to create a defined social core,* is vital for long-term maintenance of plant and wildlife species richness and diversity and for social utility. Larger and more cohesive areas of native vegetation will contribute to the success of the conservation efforts in the park. This can be accomplished through a variety of methods, but it is first important to understand where it is most necessary or appropriate to create such connections between conservation areas.

Unity is also important for social and recreational purposes. Currently, there are few pedestrian connections across major traffic thoroughfares, and existing program elements lack physical and visual connections to one another. Creating these connections would improve the circulation and functionality of the park, and would strengthen the social core.

Determining where vehicular circulation should be modified is of utmost importance. Traffic-calming strategies and road closings are options to be considered. Each of these options requires dramatically different levels of modification and construction, and each would provide different levels of accomplishment of the proposed goal. The following inventory is necessary to understanding the potential of such possibilities.

- Figure 4.04: Existing Site Improvements
- Figure 4.11: Existing Trails Map
- Figure 4.12: Park Fragmentation
- Figure 4.13: Galvin Parkway
- Figure 4.14: Existing Road Map

As described in the inventory of the transportation network, the three major roads that cross through the park property and the Arizona CrossCut Canal have divided the park into five smaller habitat fragments. It seems possible to close (except for emergency use only) or to completely remove Galvin Parkway between the Phoenix Zoo and the northern most exit of the Desert Botanical Gardens. If Galvin Parkway were to be closed or removed, there would be greater challenges in providing physical connections between the Phoenix Zoo and the Desert Botanical Garden, and the northern exit of the gardens would have to be restructured to accommodate two-way traffic.

It is important to note that the Arizona National Guard has fenced the majority of its native areas and these will remain as such for security purposes; participation in restoration efforts would be beneficial for unity of wildlife habitats.

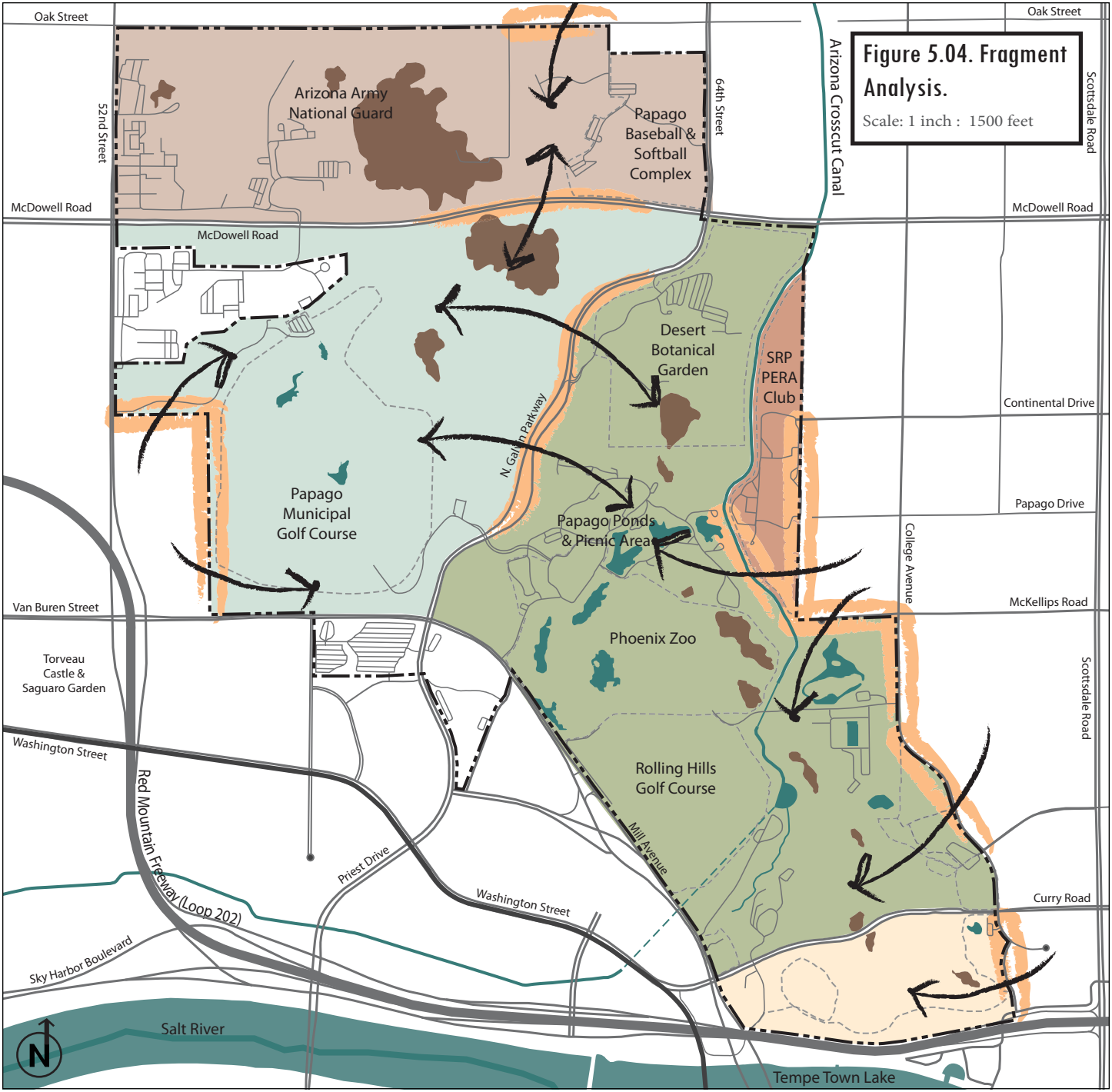


Figure 5.04. Fragment Analysis.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Arizona Army National Guard
Papago Baseball & Softball Complex
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Continental Drive
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
N
Tempe Town Lake

The Trails Map and the Transportation Map reveal conflicts for the pedestrian and bicyclist movement between the five park sections. There are limited pedestrian crossings along all of the major thoroughfares, which restricts the flow of hikers and bicyclists just as it restricts the flow of wildlife. Pedestrian overpasses and underpasses at major roadways need to be provided to accommodate regular park usage in an urban environment.

4. To *strengthen park identity, focusing on the local environment, culture and history* is vital to increase public awareness and national recognition. Relevant inventory is as follows:

- Figure 4.04: Existing Site Improvements
- Figure 4.14: Existing Road Map
- Figure 4.31: Eisendrath House
- Figure 4.33: Hole-in-the-Rock
- Figure 3.08: Evelyn Hallman Park, Signage

Inventory of park facilities revealed that disconnected development through time has caused a variety of signage and facilities to be installed without a cohesive design standard. As noted in the literature review, humans are creatures of habit. Simply establishing a standard for park facilities and amenities on a park-wide scale will maintain public associations from one program element to another, promoting park unity.

Monuments and signage should be located at all major property boundaries and near major transportation intersections in order to announce to the public that they have entered a place of importance. These structures should adhere to local character and native building materials.

Areas that would benefit from strengthened definition and increased signage are delineated in Figure 5.05: Identity Analysis where red boxes indicate places where increase signage and monuments are important; green indicates neighborhood connections that should be strengthened; and yellow indicates park edges that would benefit from increased park definition of a combination of hardscape and landscape design.

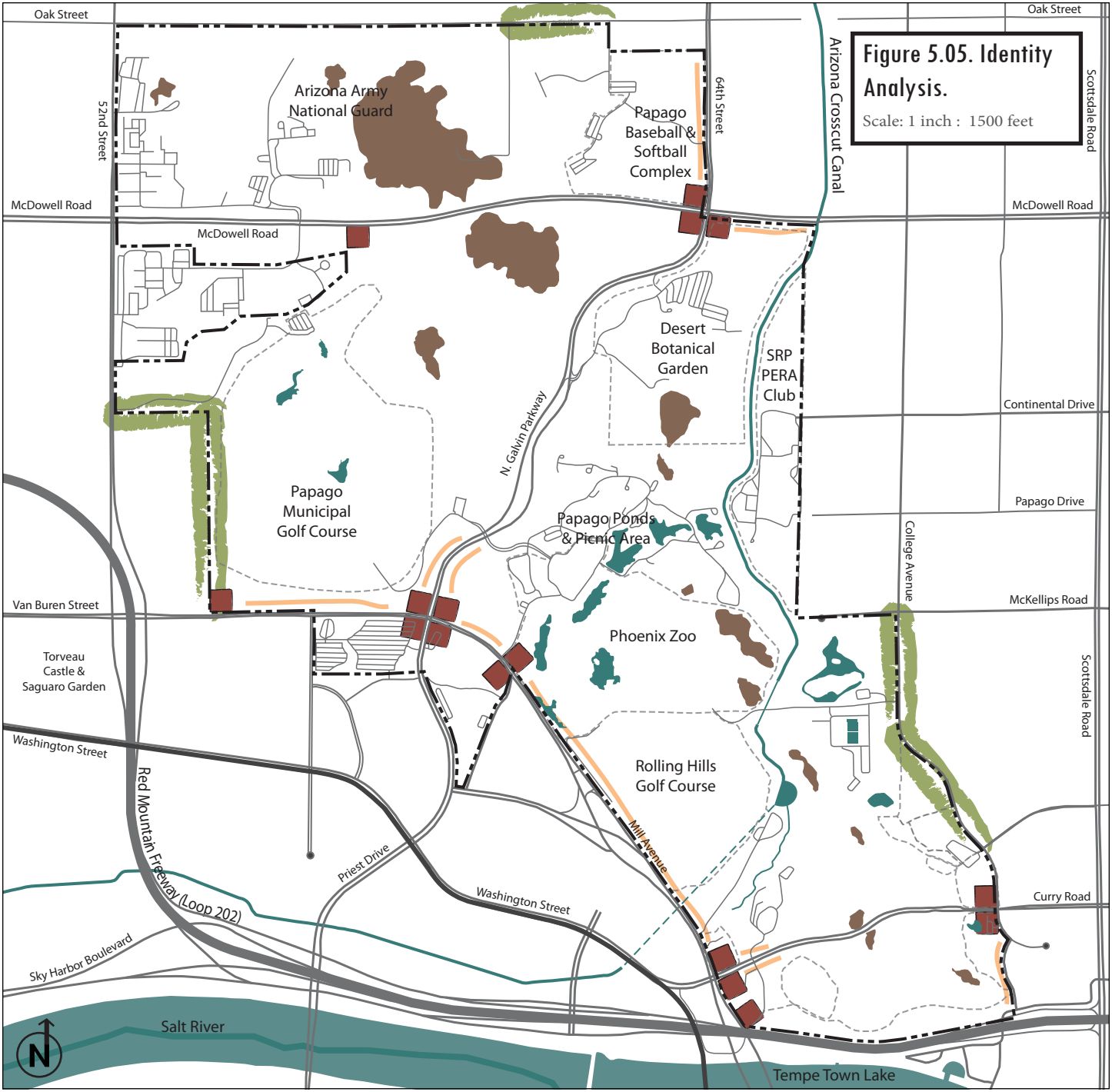


Figure 5.05. Identity Analysis.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
Arizona Army National Guard
64th Street
Papago Baseball & Softball Complex
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
N. Galvin Parkway
Continental Drive
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
N
Tempe Town Lake

5. The final project goal, to *educate park visitors about the natural resources that have been preserved and are intended to be restored within the park; to instill a sense of pride that encourages the public to adhere to park rules and participate in conservation efforts*, required the following inventory.

- Figure 4.04: Existing Site Improvements
- Figure 4.11: Existing Trails Map
- Figure 4.33: Hole-in-the-Rock
- Figure 4.36: Cultural Resources Map
- Educational programs

Inventory of the individual existing organizations was successful in gathering information about each of the educational programs offered to the public. The Desert Botanical Garden targets both children and adults in their desire to educate people about conservation efforts.

The Nature Trial located behind the Ranger Office near Hole-in-the-Rock features educational signage that is intended to prepare visitors for exploration onto the longer and more difficult trails in the park. This signage should be expanded to all trailheads and along the trails in order to best educate trail users about the importance of remaining on the trail so as to not disturb native vegetation and wildlife habitats.

Opportunities for expanded educational programs and facilities are delineated in green in Figure 5.06: Educational Opportunity Analysis. In the same figure, yellow indicates existing educational opportunities as they were described in the park inventory.

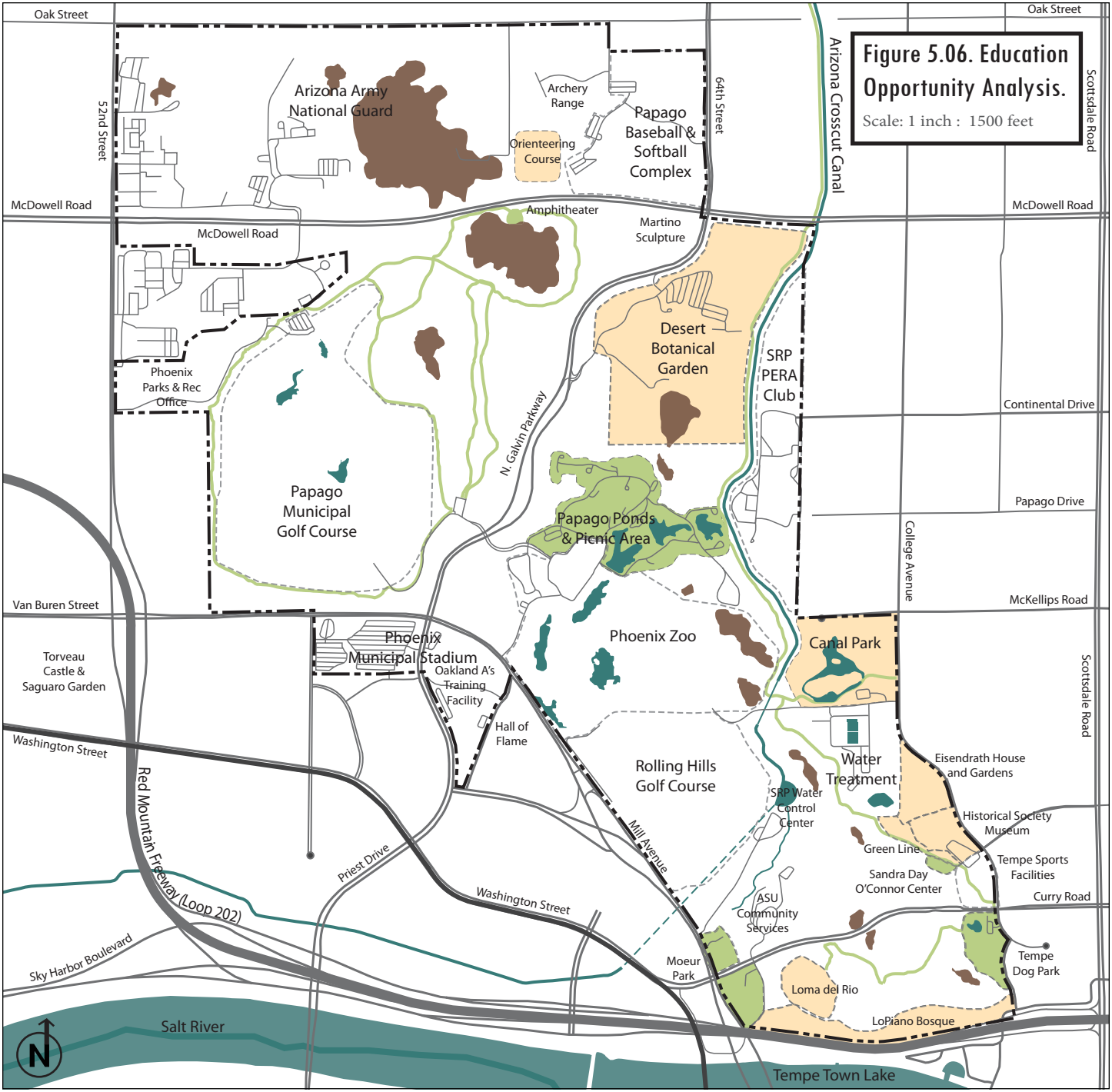


Figure 5.06. Education Opportunity Analysis.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
Arizona Army National Guard
Archery Range
Orienteering Course
Papago Baseball & Softball Complex
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
Amphitheater
Martino Sculpture
McDowell Road
Phoenix Parks & Rec Office
Desert Botanical Garden
SRP PERA Club
Continental Drive
N. Galvin Parkway
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Municipal Stadium
Phoenix Zoo
Canal Park
Torveau Castle & Saguaro Garden
Oakland A's Training Facility
Hall of Flame
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Water Treatment
Eisendrath House and Gardens
SRP Water Control Center
Historical Society Museum
Green Line
Tempe Sports Facilities
Sandra Day O'Connor Center
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Curry Road
Washington Street
ASU Community Services
Sky Harbor Boulevard
Moeur Park
Tempe Dog Park
Loma del Rio
LoPiano Bosque
Salt River
N
Tempe Town Lake

papago park

design

introduction.

As Papago Park has developed through time, several spatial conflicts have developed which has resulted in a lack of identity and restricted pedestrian movement. The mission of this master plan is to unite the park as a green corridor of open space in order to create a strong park identity and provide ample recreation for Valley residents.

program elements.

1. Corridor of open space that unites the three surrounding cities and Arizona State University
2. Conservation and ecological restoration plan
    - Mitigation strategies for unplanned footpaths and other unnecessary human disturbance
    - Short- and long-term management strategies
3. Cohesive multi-use path and trail network including overpasses and underpasses in order to unite park fragments
4. Restricted vehicular circulation to the exterior edges of the park
    - Traffic calming measures along Mill Avenue, Van Buren Road, Curry Road and McDowell Rd.
    - Removal of Galvin Parkway between Phoenix Zoo and Desert Botanical Garden
    - Provided public transportation within the existing METRO bus system: introduce a loop specific to Papago Park, with buses that adhere to park identity and promote unity of park attractions
5. Entry monuments and a standard signage system including directional, informational, and educational signs that adhere to park identity and promote unity of park attractions

green corridor.

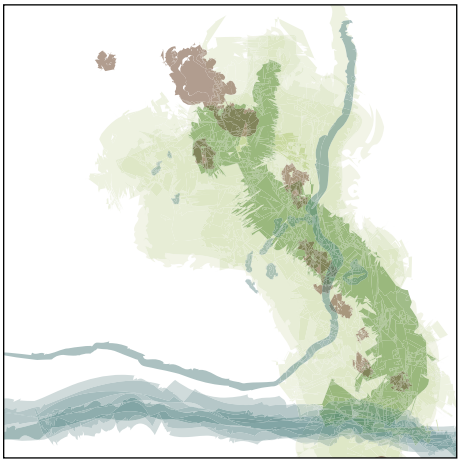
Papago Park creates a strong link of green open space between the Tempe Town Lake, Hayden Butte Preserve, and Arizona State University to the Papago Buttes and the Papago Trail. The Papago Trail parallels the CrossCut Canal and completes the link to the Camelback Mountain Preserve area, north of the park. See Figure 6.01: Concept.

At the intersection of the three cities of Phoenix, Tempe, and Scottsdale, Papago Park provides a common open space with unique recreational opportunities and attractions. Conservation of the open space for ecological restoration and regulated passive recreation will ensure that the park will remain for future generations. Designating the undeveloped areas of the park as "preservation land" will allow park staff to use stronger enforcement including fines to discourage park visitors from violating park rules and regulations. Regulations prohibit visitors from littering, traveling off the designated trails, using off-road vehicles, removing vegetation, or otherwise damaging park property.

Restoration of the native desert vegetation will provide a more accurate representation of a 'natural' area for park visitors. This is important for the health of the vegetation community, wildlife populations, and public education.

Several opportunities for alternative transportation enforces the concept of respecting the natural environment. The improved trail plan provides ample pedestrian, bicycle, and horse trail access. Public transportation in the form of a shuttle bus and the nearby light rail reduces the need for personal vehicle access and parking. See Figure 6.02: Green Corridor.

Figure 6.01. Concept.
A corridor of green open space with a variety of trails and passive recreation offers Valley residents a place to travel from Tempe Town Lake to the Papago Buttes. This concept is reinforced through a corresponding transportation system, trail system, and restoration plan.



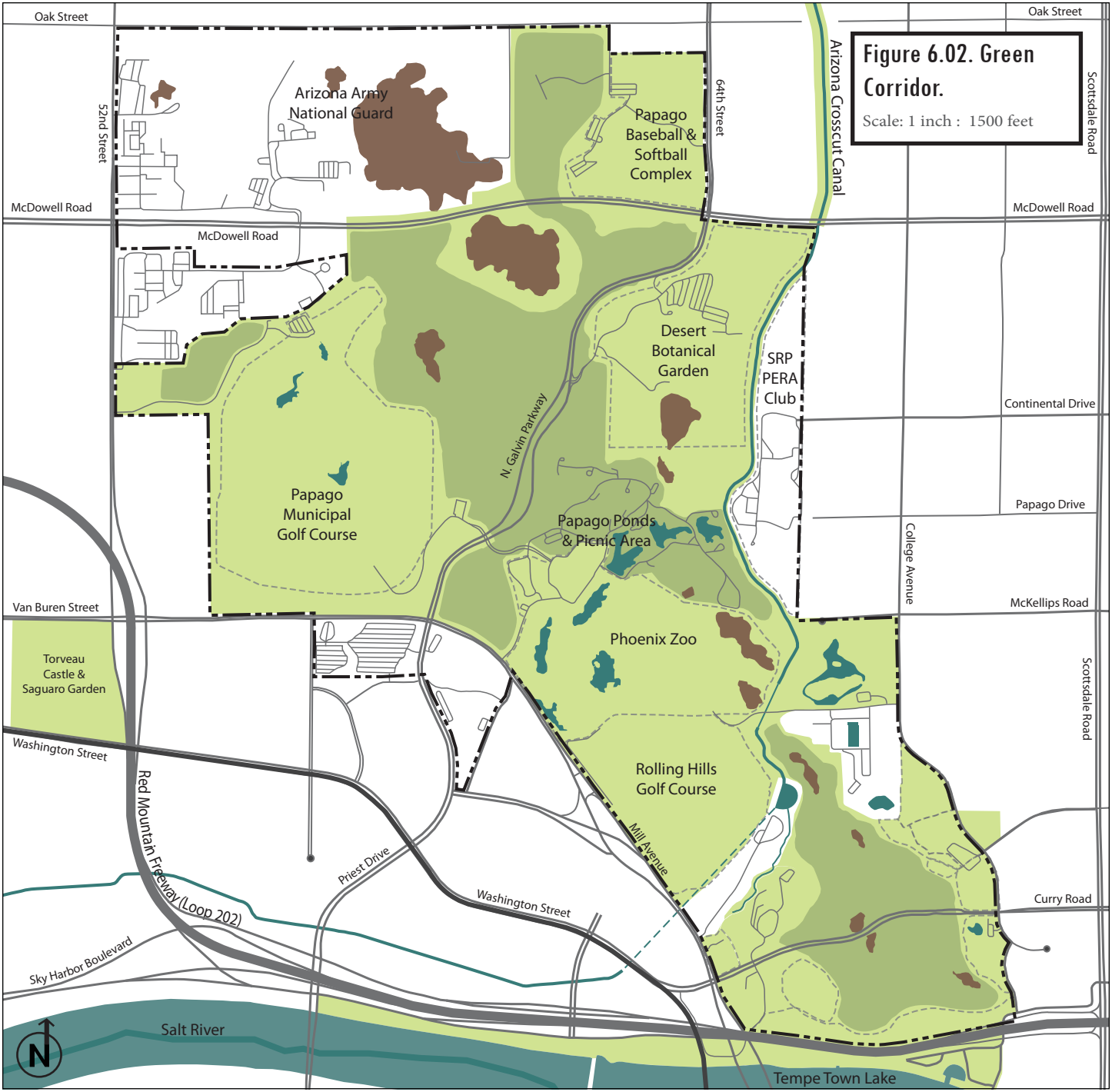


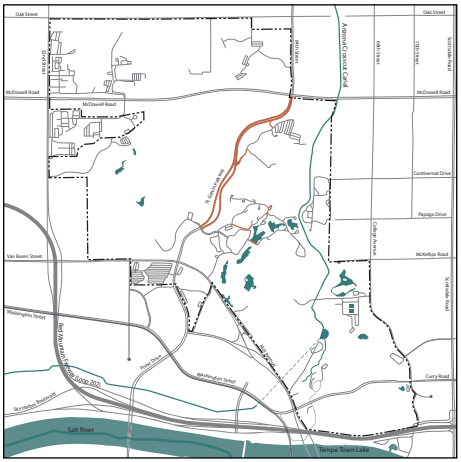
Figure 6.02. Green Corridor.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
Arizona Army National Guard
Papago Baseball & Softball Complex
64th Street
Arizona Crosscut Canal
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
Continental Drive
N. Galvin Parkway
Papago Municipal Golf Course
Papago Ponds & Picnic Area
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

Figure 6.03. South Galvin Parkway, Park Entry.

The roundabout provides a smooth transition between South Galvin Parkway, the Phoenix Zoo, and the west trailhead parking lot. A monument in the center of the roundabout will announce the park as the primary destination and signage will direct traffic to park attractions.

Figure 6.04. Removed Roads.

Approximately one mile of roadway is to be removed from Galvin Parkway between the Phoenix Zoo and Desert Botanical Garden.



proposed road system.

Due to street layout, park fragmentation, and traffic volumes, this master plan proposes to keep the majority of the vehicular traffic along the outer edges of the park. Reducing vehicular impact and increasing pedestrian movement reinforces the concept of the green corridor as the unifying element of the three surrounding cities.

In this proposal approximately one mile of Galvin Parkway is to be removed between the Desert Botanical Garden and the Phoenix Zoo. The Desert Botanical Garden's main entry will be relocated; traffic will enter directly from the intersection of McDowell Road and Galvin Parkway. From Van Buren Street, Galvin Parkway will continue north and end at a roundabout that provides access to the Phoenix Zoo, the Papago Ponds, picnic ramadas, and the Papago west trailhead. See Figure 6.04: Removed Roads and Figure 6.05: Proposed Road System Plan.

Traffic from the commercial office development south of Papago Park can be re-routed from Galvin Parkway, to Curry Road, 52nd Street, or the Red Mountain Freeway (Loop 202). According to traffic volumes discussed in the site inventory, Curry Road can accommodate the increase in traffic volumes caused by the removal of Galvin Parkway.

The Phoenix Zoo entry will remain as it exists, while access to the Papago Ponds and picnic ramadas are enhanced to a divided parkway lined with bicycle lanes and pedestrian sidewalks. Reduced speed limits, speed humps, and frequent stop signs at intersections are intended to keep traffic calm to ensure cyclist and pedestrian safety. Native plantings along the parkway will provide shade while reducing the visual impact to the natural park setting. On-street, angled parking will reduce the amount of pavement required to accommodate the necessary parking. See Figure 6.03: South Galvin Parkway, Park Entry.

Vehicular signage will be introduced in order to inform drivers of park attractions and to guide park visitors to their destination without confusion. Speed limits should be reduced to 30 mph along McDowell Road, Van Buren Street, Mill Avenue, and Curry Road as they pass Papago Park to improve pedestrian safety, reduce noise pollution and to reinforce the concept of the park as a green corridor of undeveloped open space.

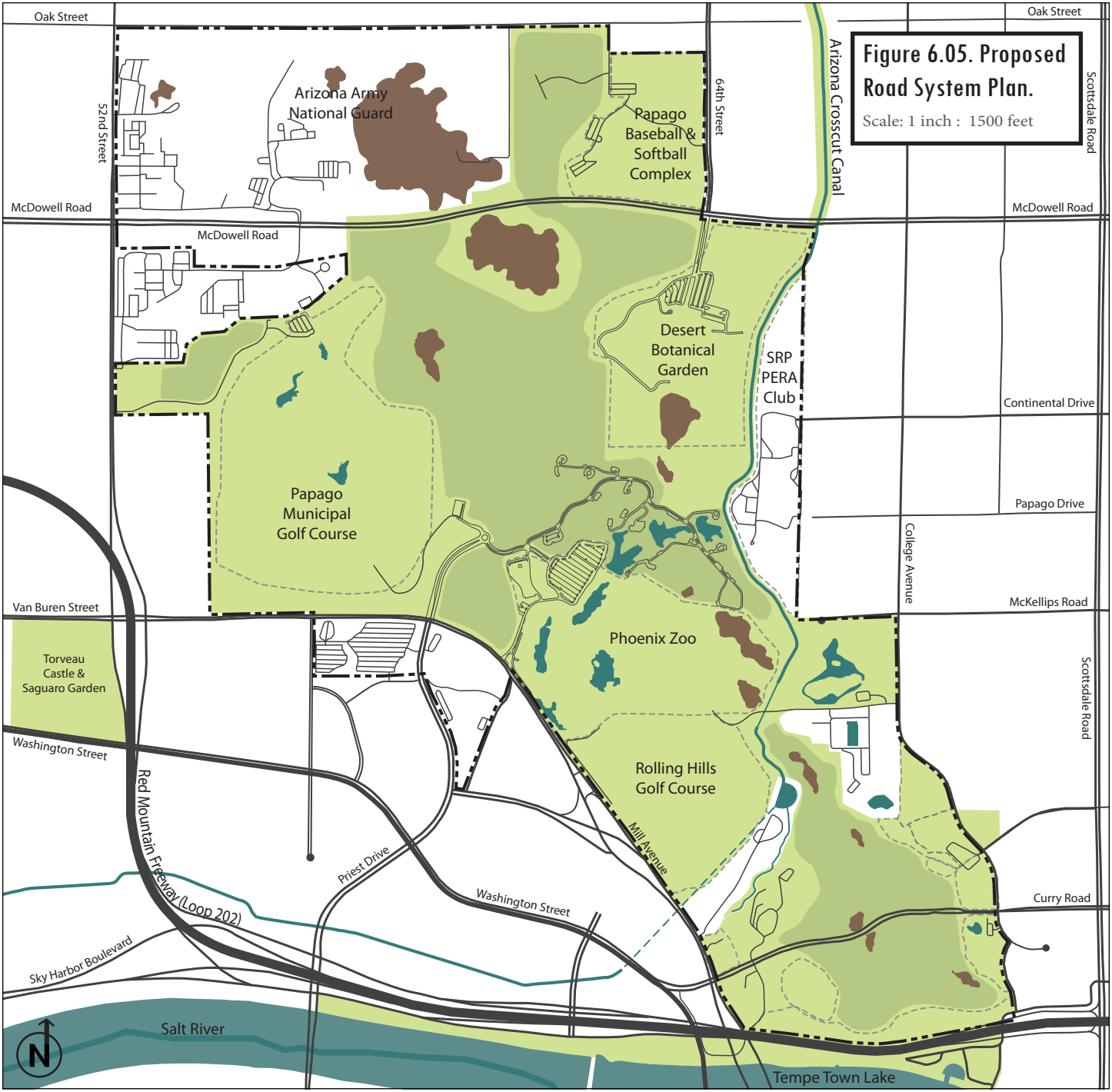


Figure 6.05. Proposed Road System Plan.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Arizona Army National Guard
Papago Baseball & Softball Complex
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

Figure 6.06. Removed Trails.

Red represents the lengths of trails that are removed in order to decrease human impact on the vegetation communities and revegetation efforts.

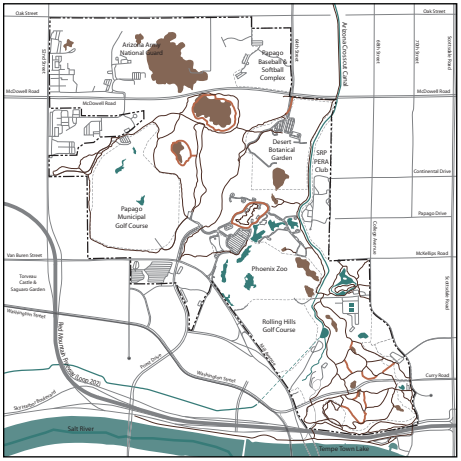


Figure 6.07. Standard Trail.

Establishing a standard trail material is critical in order to indicate to park visitors that the trail system is cohesive across the cities of Phoenix and Tempe. It will also encourage visitors to remain on the trail so as to not disturb vegetation and wildlife. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

proposed trails.

An enhanced trail system is necessary in order to create a cohesive corridor between the Tempe Town Lake and the Papago Buttes. The Phoenix trail system and the Tempe trail system have not been connected in a standard format. A park-wide trail system is vital to unite the park across the two cities.

Approximately 1.8 miles of new trails have been proposed in an effort to unite the Phoenix and Tempe portions of the park and to increase access to the surrounding neighborhoods. In order to reduce the human impact and provide much needed revegetation opportunities, 0.5 miles of trails have been removed. Four new pedestrian tunnels and three new bridges will provide pedestrian access across the Red Mountain Freeway (Loop 202), Curry Road, McDowell Road, and the CrossCut Canal. See Figure 6.08: Proposed Trail Plan and Figure 6.06: Removed Trails.

As identified in the site inventory, poor trail definition and signage has led to over-use and extreme degradation of vegetation communities and wildlife habitat. Standard trail material, edging and signage will guide pedestrians and encourage them to remain on the designated trails. See Figure 6.07: Standard Trail.

Separation of trail users is proposed in an effort to reduce conflict between users. Pedestrians and hikers, bicyclists, and horseback riders have designated trails. Although multi-use trails can accommodate a combination of users where necessary, horse-back riders and bicyclists do not cross paths with one another in an effort to reduce startling the horses. In order to allow for greater success rates of the revegetation efforts, it is also critical that the horse trails be restricted to the south portion of the park and the outer edges of the park. Horseback riders are responsible for keeping the impact of their animal on the park's vegetation to a minimum and are expected to remain on designated trails. See Figure 6.09: Trail System: User Designations.

In an effort to increase public education, four of the pedestrian trails have been assigned themes: ecological function and sustainability; buttes and history; water in the desert; and health and fitness. Each educational trail will have nodes featuring educational signage. See Figure 6.10: Proposed Trails: Educational Themes.

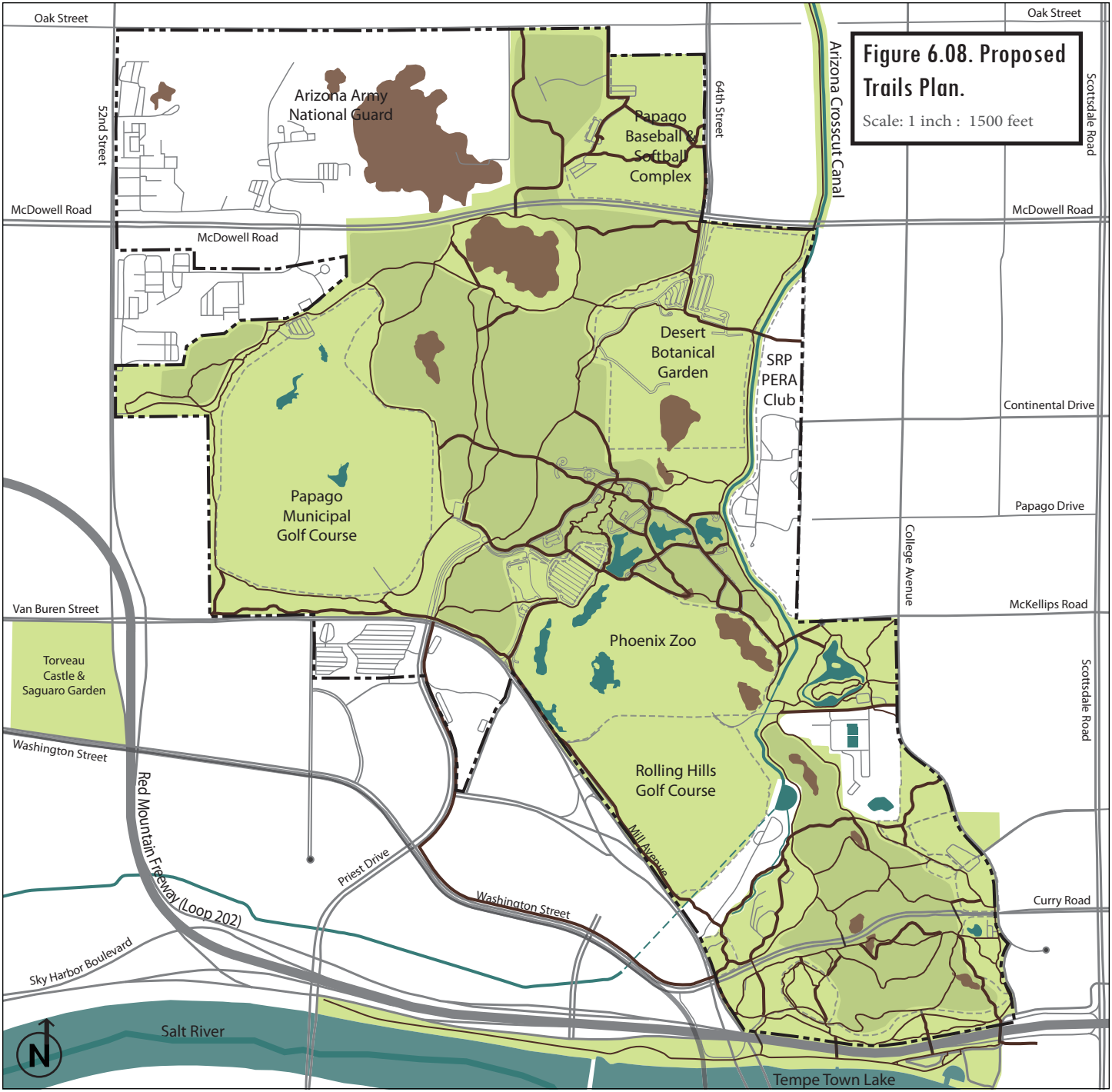


Figure 6.08. Proposed Trails Plan.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Scottsdale Road
McDowell Road
McDowell Road
McDowell Road
Arizona Army National Guard
Papago Baseball & Softball Complex
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Washington Street
Red Mountain Freeway (Loop 202)
Rolling Hills Golf Course
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N


Figure 6.09. Trails: User Designations.
Scale: 1 inch : 1500 feet
Oak Street
McDowell Road
Arizona Army National Guard
Papago Baseball & Softball Complex
64th Street
Arizona Crosscut Canal
68th Street
70th Street
Scottsdale Road
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Torveau Castle & Saguaro Garden
Phoenix Zoo
Rolling Hills Golf Course
Washington Street
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Curry Road
Salt River
Tempe Town Lake
Legend
Horse Trail
Bicycle Trail
Pedestrian Trail
Multi-Use Trail

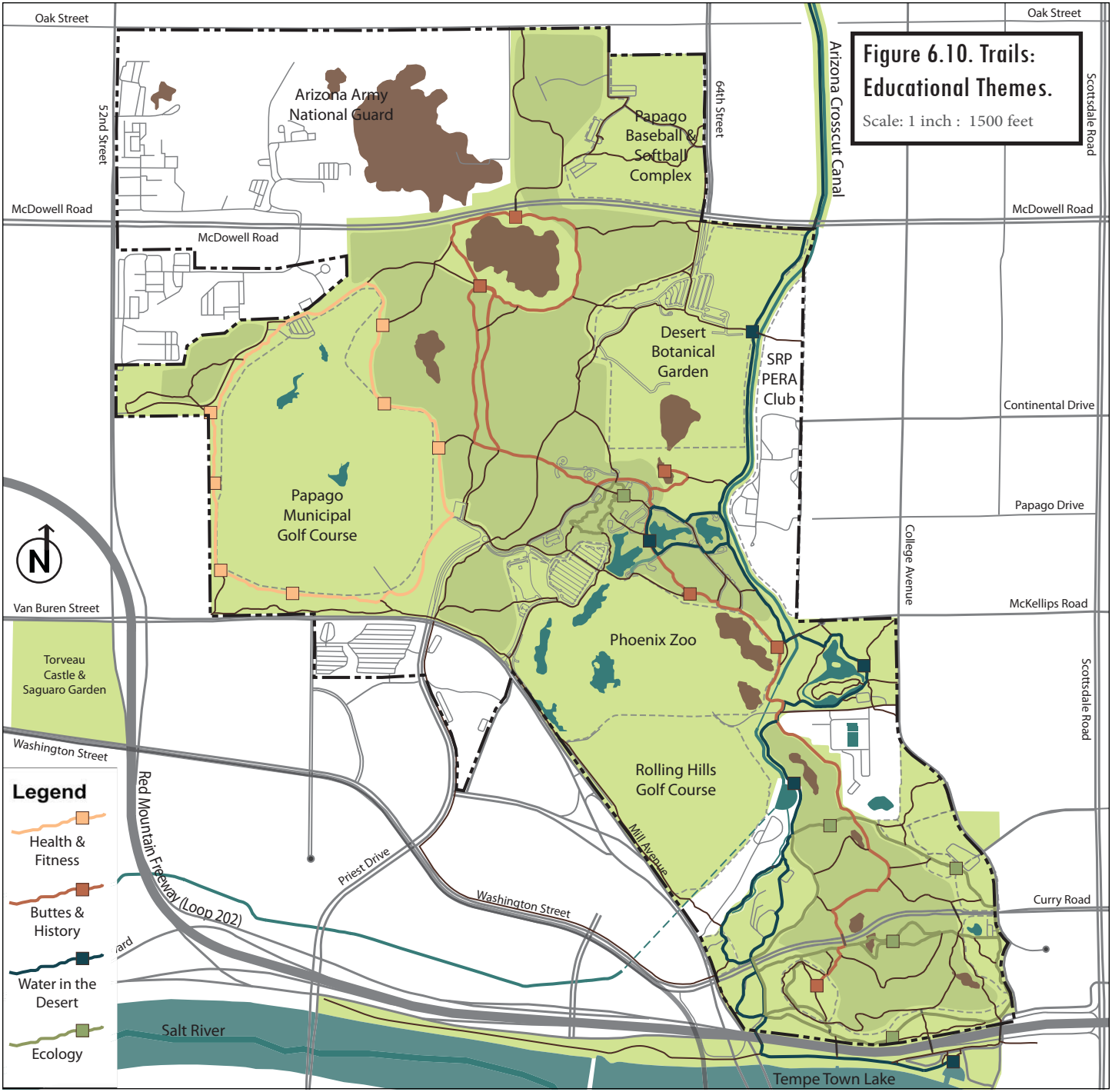


Figure 6.10. Trails: Educational Themes.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Arizona Army National Guard
Papago Baseball & Softball Complex
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
McKellips Road
Van Buren Street
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Priest Drive
Mill Avenue
Washington Street
Curry Road
Salt River
Tempe Town Lake
Legend
Health & Fitness
Buttes & History
Water in the Desert
Ecology

ecological restoration.

In order to provide the best representation of a healthy Sonoran Desert ecosystem, an extensive revegetation plan has been proposed. The city of Phoenix has begun some revegetation projects within the park which have been included in this updated proposal and are used as precedents and public educational opportunities. See Figure 6.12: Revegetation Plan. The following process is adapted for Papago Park from Bainbridge, author of *A Guide for Desert and Dryland Restoration*. (Bainbridge, 2007) (Phoenix, 2007)

1. Remove unplanned footpaths, and establish revegetation signage.
2. Re-zone park property as "preservation land" in order to increase regulation enforcement opportunities for park staff.
3. Remediate soils where compaction has degraded vegetation growth.
4. Collect seeds from healthy, local, native plant species.
5. Propagate plants to be transplanted into revegetation areas. See Figure 6.11: Propagation Bed.
6. Restrict public access to revegetation areas through fencing.
7. Cage newly transplanted propagated plants where visitor access is not restricted.
8. Spread a previously gathered seed mix to increase vegetation diversity.
9. Maintain a consistent watering schedule for the first 2 years.
10. Provide educational signage for public education of the benefits of revegetation and improved wildlife habitat.

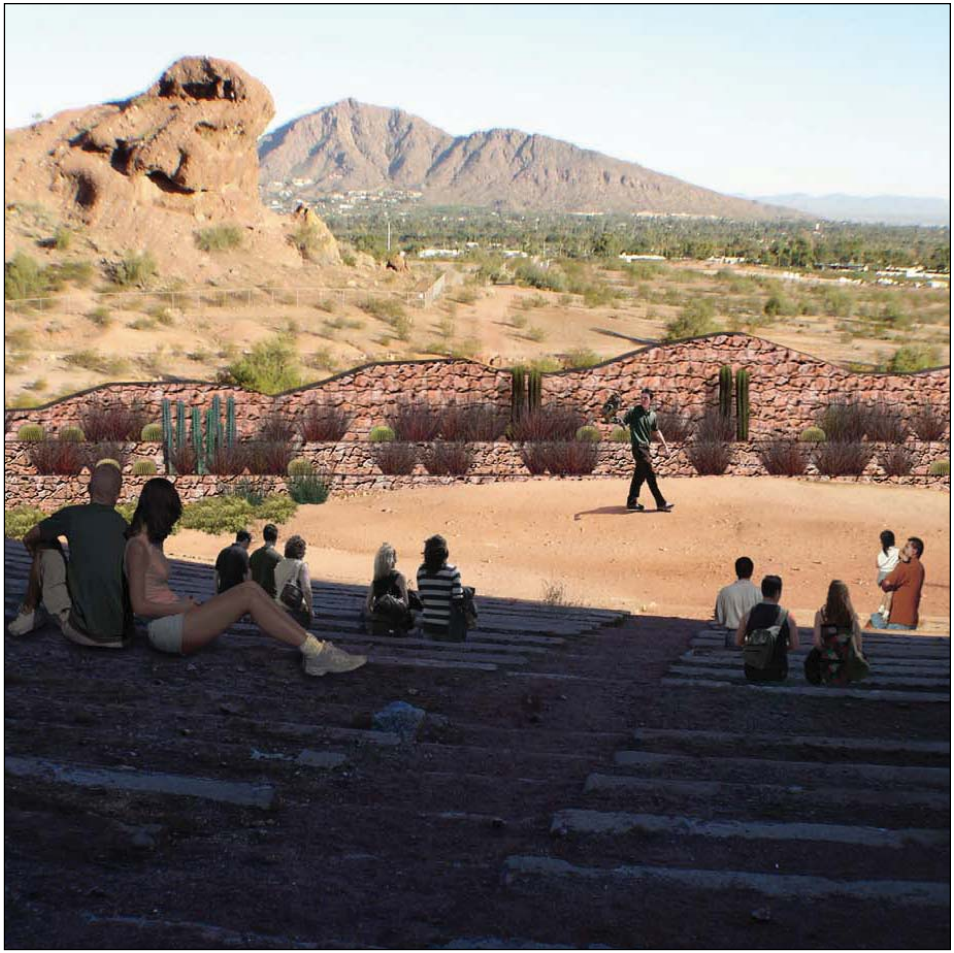
This revegetation plan includes areas that are privately managed by park attractions and organizations and requires their participation for optimal restoration of a cohesive vegetation community. The Arizona National Guard is asked to participate in the restoration efforts by implementing revegetation projects within undeveloped areas for the benefit of the vegetation community. They might also consider donating infrequently used land adjacent to the park boundary, for the city of Phoenix to manage in its revegetation and recreation efforts. The Desert Botanical Garden is asked to provide their expertise on plant propagation and transplantation techniques and processes. The two north and south corners of the SRP PERA Club offer exceptional educational and volunteer opportunities for club member participation in the revegetation process. This would not only be a positive media opportunity for SRP, but it would also improve connections to the adjacent neighborhoods.

Figure 6.11. Propagation Bed.
Seed propagation is a key step in any successful desert ecosystem restoration process. Once these young specimens reach the proper level of maturity, they will be relocated to their permanent place within the designated revegetation area. Photo by Katie Sobczynski, 2009.


Figure 6.12.
Revegetation Plan.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Arizona Army National Guard
Papago Baseball & Softball Complex
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
Tempe Town Lake
N

Figure 6.13. Educational Destination.

The terraced and planted wall provides both a noise barrier and a visual barrier from McDowell Road, without hindering the views to the surrounding landscape.



amphitheater.

Constructed in the 1930s by the Civilian Conservation Corporation, the 75 year-old stone amphitheater is a valuable piece of park history. Since the construction of McDowell Road the amphitheater cannot accommodate public performances, yet it is valuable to retain and enhance this historical piece of the social utility of Papago Park. (www.papagosalado.org) (Gart, 1996)

Repairing the eroded soil and gravel from the stone seating is the most necessary repair to return basic functionality to the amphitheater. See Figure 6.14: Amphitheater Erosion. Although there is minimal room between the performance area and McDowell Road, a terraced planted wall is proposed to reduce noise pollution within the amphitheater. The wall mimics the silhouettes of the mountainous topography in the distance and will be composed of stacked red stone, similar in color to the surrounding butte formations.

Manufacturers of noise-barrier walls have developed wall material that absorbs the majority of traffic noise, and noise that is not absorbed is reflected away from the amphitheater. Terraces will increase the mass of the wall in order to absorb and reflect traffic noise. Plantings within the terraces will be native and could also be used as propagation beds for the park-wide revegetation efforts. (www.acoustax.com)

Small educational presentations, cultural performances, and musical concerts could all be reintroduced to this once thriving amphitheater. As a destination on the "park history" themed pedestrian trail, educational signage will be a minimal, yet important improvement. Pedestrian access through a pedestrian tunnel under McDowell Road will connect the northern portion of the park and adjacent neighborhoods to the largest area and major attractions of the park. See Figure 6.13: Educational Destination.

Figure 6.14. Amphitheater Erosion.
The stone seating is most important to be repaired and restored after years of erosion. Photo courtesy of Randall Kopff, Olsson Associates, 2008.

Figure 6.15. Extruded Signage Diagram.

A modular system can be adjusted for a variety of uses throughout the park and allows for the signage to be changed as the park evolves through time. Bolts along the iron frame can be easily removed in order to release individual sign pieces for maintenance or replacement.

Figure 6.16. Vehicular Signage.

Motorists require adequate signage to direct them to park destinations. Signs should display both directional and distance information.

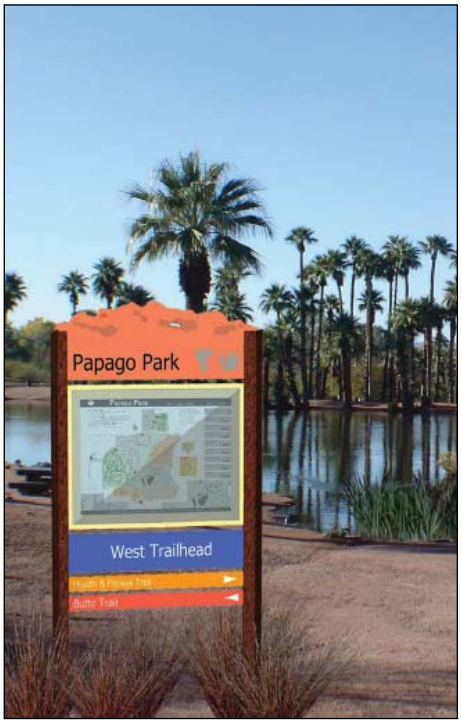


Figure 6.17. Informational Signage.

Park maps, trail locations, regulations, fines, hours of operation, and amenities should be on the large pedestrian informational signs.

signage design.

Creating a strong identity for Papago Park is one of the most difficult tasks of a master plan. The park is distinctive in the fact that it showcases the Sonoran Desert submerged in a highly developed urban setting. Although it features remarkable geologic formations and a rich history, the park is often overlooked compared to its high profile attractions including the Phoenix Zoo and Desert Botanical Garden. (Calori, 2007)

Implementing a standard signage design across all features of the park would dramatically increase the profile of the park among the other attractions. Phoenix has made use of a modular signage system, using an abstracted silhouette of Hole-in-the-Rock as the park icon. This design could be easily extended on a park-wide system. The modular system allows the signage to be easily updated as the park changes through time. See Figure 6.15: Extruded Signage Diagram.

There are three major signage types that need to be installed: vehicular signage, informational and educational signage, and pedestrian signage. Vehicular signage will provide traffic with distances and directions to park attractions, in order to entice and guide visitors into the park and to park attractions. See Figure 6.16: Vehicular Signage.

Once at a destination, informational signage will include park hours, rules and regulations, applicable fines, park maps, and directional signage. See Figure 6.17: Informational Signage. As the visitor travels away from the destination, pedestrian scaled signage will guide hikers, bicyclists, and horseback riders along appropriate trails. Educational signage will be included along the designated themed trails, but will be located and designed so as to educate without detracting from the natural environment. See Figure 6.18: Pedestrian Signage.

Figure 6.18. Pedestrian Signage.
Reduced in size in order to cause minimal distraction from the surrounding environment, pedestrian signage will be applied for a variety of uses including destination information, direction along the trail system, and for educational information.

public transportation: papago shuttle.

The METRO public bus system provides several connections from the light rail and the surrounding cities to Papago Park. There is a combination of six bus lines that surround Papago Park, and unfortunately no combination of those six routes provides adequate public transportation access to all of the major park attractions. (www.valleymetro.org)

In order to reduce personal vehicle dependency, a Papago Shuttle is introduced into the existing METRO bus system. The Papago Shuttle will loop the park and provide access to the Desert Botanical Garden, Papago Trail, SRP PERA Club, Evelyn Hallman Park, Eisendrath House, Arizona Historical Society Museum, Tempe Papago Park, Tempe Town Lake, Moeur Park, the light rail, Phoenix Municipal Stadium, West Papago trailhead, Phoenix Zoo, Papago Ponds, Hunt's Tomb, Phoenix Parks and Recreation Office, Military Museum, and the Papago Baseball & Softball Complex. Due to the large number of shuttle stops the Papago Loop requires multiple buses to be running during peak visitor hours. The shuttle schedule should also be staggered to accommodate the more frequently visited destinations. See Figure 6.20: METRO: Papago Shuttle Loop Plan.

The buses to be used should be those that are already in the METRO bus fleet. Bus decals will be unique for the Papago Loop and will reflect the character and identity of the park. Advertisements on the outer decals and bus interior will advertise park attractions and upcoming park events, and should not adhere to the city wide standard or display random advertisements. Intercom systems inside the buses should inform riders about park destinations and promote park identity, history, and attractions. See Figure 6.19: Proposed Shuttle Stop. (www.valleymetro.org, 2009)

Figure 6.19. Proposed Shuttle Stop.
Structural elements should provide shade and protection from inclement weather for bus riders. The Papago Shuttle matches the city-wide METRO bus fleet, but is in accordance with the park in color scheme and advertisement decals.


Figure 6.20. METRO: Papago Shuttle Loop.
Scale: 1 inch : 1500 feet
Oak Street
Oak Street
52nd Street
64th Street
Arizona Crosscut Canal
Scottsdale Road
Arizona Army National Guard
Papago Baseball & Softball Complex
McDowell Road
McDowell Road
McDowell Road
Desert Botanical Garden
SRP PERA Club
Continental Drive
Papago Municipal Golf Course
Papago Drive
College Avenue
Van Buren Street
McKellips Road
Phoenix Zoo
Torveau Castle & Saguaro Garden
Scottsdale Road
Washington Street
Rolling Hills Golf Course
Red Mountain Freeway (Loop 202)
Mill Avenue
Priest Drive
Washington Street
Curry Road
Sky Harbor Boulevard
Salt River
N
Tempe Town Lake

educational programs.

In an effort to create a sense of pride among the public, every opportunity to incorporate educational information has been explored. Trends show that when people have a basic understanding of the environment around them, they are more likely to respect it.

The educational themed trails discussed previously, are intended to educate the public on all of the opportunities and benefits of Papago Park: ecological processes, history, water, and recreation. Educational signage that will adhere to the modular park-wide signage system, will inform pedestrians about the each of these topics. See Figure 6.21: History Trail Node.

Park attractions including the Desert Botanical Garden, Phoenix Zoo, and Arizona Historical Society are encouraged to continue their educational programs, and to consider incorporating an ecological focus into those programs. Recreational facilities including the Phoenix Municipal Stadium, Papago Baseball & Softball Complex, Papago Municipal Golf Course, Rolling Hills Golf Course, and Tempe Sports Facility are encouraged to offer increased organized recreational opportunities such as team sports and lessons to promote a healthy and active lifestyle for all ages. (www.dbg.org) (www.phoenixzoo.org)

Both the cities of Phoenix and Tempe Parks and Recreation Departments should work together to provide educational opportunities in a passive recreation format. These could include educational hikes such as bird-watching, vegetation identification, or protection of wildlife habitats. Leave No Trace is a national organization that should be contacted in order to provide supplemental educational programs that focus on recreation strategies in which park visitors "leave no trace." (www.lnt.org)

Figure 6.21. History Trail Node.
Loma del Rio is the most southerly destination on the history themed trail. Educational information about this site is included on nearby signage for the benefit of the public.

papago park

conclusion

accomplishment of goals.

In order to determine whether the design solution is successful the proposed design features are compared to the project goals.

1. Protect the unique natural resources including the native vegetation, wildlife habitats, and geology of this piece of the Sonoran Desert

- removed unplanned footpaths ('spider-trails')
- established a standard trail system to mandate public interaction with conservation areas

2. Reclaim areas for conservation and ecological restoration where unnecessary human disturbance has caused degradation and fragmentation; to provide a more accurate representation of the Sonoran Desert ecosystem

- revegetation plan for degraded areas: approximately 800 acres
- 0.8 miles of road pavement removed and revegetated
- 0.5 miles of trail removed and revegetated

3. Unite park conservation areas, recreation, surrounding neighborhoods, and other attractions in order to create a defined social core, while avoiding areas of vulnerability

- cohesive trail system, introduced 1.8 miles of new trails to connect the park attractions and surrounding neighborhoods
- public transportation, Papago shuttle loop: approximately 11 miles
- consistent park wide signage and park boundary monuments
- ecological restoration and revegetation plan

4. Strengthen park identity, focusing on the character of the local environment, culture and history

- proposed park identity focuses on urban open space and butte formations
- signage and monuments announce the park as the major destination

5. Educate park visitors about the natural resources that have been preserved and intend to be restored within the park; to instill a sense of pride that will encourage the public to adhere to park rules and participate in conservation efforts

- established educational opportunities for park visitors using signage, trails, and Parks & Recreation programs

management strategies.

1. "Preservation" zoning classification of open space would allow park officials to better enforce park rules and regulations with fines. Park visitors should be fined for tampering with, damaging, or removing any vegetation within the park. Visitors should be fined for diverting from the established trail system.

2. Park rangers and officials should manage park-wide, across city boundaries. Funding should be provided proportionally to property ownership by the cities

3. Roads should be managed by the corresponding city according to the appropriate codes and ordinances

4. Trails should be managed to a park-wide standard by park officials, across city boundaries. Funding should be provided proportionally to property ownership by the cities. Trail signage should be updated as trails are introduced, removed, or changed.

5. Revegetation efforts should follow the phased plan. Once established, vegetation should be properly maintained through any periods of uncharacteristic, extreme drought. Continued annual seeding should occur to maintain species diversity. (Bainbridge, 2007)

phased implementation.

The proposed master plan is intended to be implemented in a series of phases. Strategic phasing allows for successful implementation with the distribution of construction costs over an extended period of time.

The first phase should be completed before 2012 in preparation for the state centennial. Phase One includes:

- Trails that create the strongest connections from Tempe Town Lake to the Papago Buttes and the surrounding neighborhoods
- Existing trails to be upgraded to the design standard
- Revegetation areas nearest the high profile trails and destinations, to enforce the green corridor concept and provide educational demonstrations about healthy vegetation communities
- Signage according to the design standard at all major vehicular intersections, destinations, and trail systems
- Public transportation: Papago Shuttle Loop
- Preservation classification of the park land, to increase rules and regulations enforced by fines when applicable

Later phases will be developed as Phase One is completed to best respond to current issues at that time. Proposed program elements that are not implemented in Phase One should be included in later phases. All phases are intended to be completed over the course of the next 20 years, at which time the Master Plan should again be revised and updated.

intended impact on metropolitan area.

1. Bring attention to the relationship between over-use and false representation of the Sonoran Desert ecosystem
2. Unite park attractions and amenities to one another as one destination within the metropolitan area
3. Improve urban open space, recreational opportunities, management strategies
4. Create a regionally and nationally recognized landmark
5. Educate the public about ecosystem function, conservation of native areas, and sustainable design

lessons learned.

1. When selecting a project for educational purposes, collect base information several months before the semester in which you will be required to develop the project. Determine the quality, accuracy , and age of the data.
2. Do not rely on a firm, government office, or any other organization to provide the information at a later date. They will not put your schedule above their own.
3. Make contacts early. (firms, designers, city offices, educational institutions, stakeholders, organizations, property owners, etc.)
4. Be specific about the format of the information that you are requesting. (digital vs. printed, PDF, .dwg, Illustrator, SketchUp, Photoshop, etc.)
5. Utilize local educational institutions. They will be more likely to assist you in a timely manner.
6. Gather contacts that your professors are willing to share.
7. Do not format a layout until writing, diagramming, mapping, and rendering is complete to ensure that all subject matter is considered.
8. Write and diagram congruently to ensure that they are related as closely as possible.

papago park

glossary

glossary.

A

adapted (introduced) plants: plants that reliably grow well in a given habitat with minimal attention from humans in the form of winter protection, pest protection, water irrigation, or fertilization once root systems are established in the soil. Adapted plants are considered to be low maintenance but not invasive. (USGBC, 2009)

aquatic systems: ecologically designed treatment systems that utilize a diverse community of biological organisms (e.g., bacteria, plants and fish) to treat wastewater to advanced levels. (USGBC, 2009)

aquifer: an underground water-bearing rock formation or group of formations, which supplies groundwater, wells or springs. (USGBC, 2009)

B

BMP: Best Management Practice; refers to the practice considered most effective to achieve a specific desired result for protection of water, air and land and to control the release of toxins. (Smart Growth)

biodiversity: The variety of life in all forms, levels and combinations, including ecosystem diversity, species diversity, and genetic diversity. (USGBC, 2009)

biomass: plant material such as trees, grasses and crops that can be converted to heat energy to produce electricity. (USGBC, 2009)

bioremediation: involves the use of microorganisms and vegetation to remove contaminants from water and soils. Bioremediation is generally a form of in-situ remediation, and can be a viable alternative to landfilling or incineration. (USGBC, 2009)

bosque: a small wooded area. (Merriam-Webster Online, 2009)

butte: an isolated hill or mountain with steep or precipitous sides usually having a smaller summit area than a mesa
(Reichert 2001, 50-56)

C

climate: the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity, and precipitation. (Merriam-Webster Online, 2009)

conservation areas: environmentally sensitive and valuable lands protected from any activity that would significantly alter their ecological integrity, balance, or character, except in cases of overriding public interest. (Smart Growth)

conservation easements: conservation easements are voluntary, legally binding agreements for landowners that limit parcels of land or pieces of property to certain uses. Land under conservation easements remains privately owned, and most easements are permanent. (Smart Growth)

conservation landscape: a spatial zoning plan(s) for a priority area that meets fundamental conservation objectives while addressing other socio-economic needs. (World Wildlife Foundation)

D

degradation: decline to a low, destitute, or demoralized state. (Merriam-Webster Online, 2009)

detention ponds: (Extended Detention Basins) An area surrounded by an embarkment, or an excavated pit, designed to temporarily hold stormwater long enough to allow settling of solids and reduce local and downstream flooding. (Smart Growth)

E

EPA (Environmental Protection Agency): The federal body charged with responsibility for natural resource protection and oversight of the release of toxins and other threats to the environment. (Smart Growth)

ecology: the study of the interactions of organisms and environment which includes other organisms. (McHarg, 1992)

ecosystem: a basic unit of nature that includes a community of organisms and their non-living environment linked by biological, chemical and physical process. (USGBC, 2009)

endangered: species that are in danger of extinction. It also is a category that denotes protection under federal law (Endangered Species Act). (Smart Growth)

F

flood plain: the land adjacent to a water body: stream, river, lake or ocean - that experiences occasional flooding. (Smart Growth)

flora: a treatise on or list of the plants of an area or period. (Merriam-Webster Online, 2009)

fauna: the animals characteristic of a region, period, or special environment. (Merriam-Webster Online, 2009)

G

geology: a science that deals with the history of the earth and its life especially as recorded in rocks. (Merriam-Webster Online, 2009)

H

habitat: living environment of a species, that provides whatever that species needs for its survival, such as nutrients, water and living space. (Smart Growth)

habitat fragmentation: division of large tracts of natural habitat into smaller, disjunct parcels. (Smart Growth)

heat island effect: occurs when warmer temperatures are experienced in urban landscapes compared to adjacent rural areas as a result of solar energy retention on constructed surfaces. Principal surfaces that contribute to the heat island effect include streets, sidewalks, parking lots and buildings. (USGBC, 2009)

historic area: an area or building in which historic events occurred, or one which has special value due to architectural or cultural features relating to the heritage of the community. Elements in historic areas have significance that necessitates preservation or conservation. (Smart Growth)

hydrology: a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere. (Merriam-Webster Online, 2009)

I

infrastructure: water and sewer lines, roads, urban transit lines, schools and other public facilities needed to support developed areas. (Smart Growth)

J

K

L

lagoon: a shallow sound, channel, or pond near or communicating with a larger body of water; 2: a shallow artificial pool or pond. (Merriam-Webster Online, 2009)

landscape: a picture representing a view of natural inland scenery ; the art of depicting such scenery; 2: the landforms of a region in the aggregate ; a portion of territory that can be viewed ;at one time from one place ; a particular area of activity. (Merriam-Webster Online, 2009)

landscape architect: a person who develops land for human use and enjoyment through effective placement of structures, vehicular and pedestrian ways, and plantings. (Merriam-Webster Online, 2009)

M

mass transit: Includes transportation facilities designed to transport large groups of persons in a single vehicle such as buses or trains. (USGBC, 2009)

master plan: A statement, through text, maps, illustrations or other forms of communication, that is designed to provide a basis for decision making regarding the long term physical development of the municipality. (Smart Growth)

monsoon: the season that is characterized by above average rainfall when compared to the rest of the year. (Merriam-Webster Online, 2009)
- typically in late July through August in Maricopa County, Arizona.

N

native (indigenous) plants: Plants that have adapted to a given area during a defined time period and are not invasive. In America, the term often refers to plants growing in a region prior to the time of settlement by people of European descent. (USGBC, 2009)

O

P

pedestrian access: implies that pedestrians can walk to the services without being blocked by walls, freeways or other barriers. (USGBC, 2009)

pedology: a science of soil. (Merriam-Webster Online, 2009)

physiography (physical geography): geography that deals with the exterior physical features and changes of the earth. (Merriam-Webster Online, 2009)

public transportation: bus, rail or other transportation service for the general public, operating on a regular, continual basis that is publicly or privately owned. (USGBC, 2009)

Q

R

ramada: a roofed shelter with usually open sides. (Merriam-Webster Online, 2009)

reclamation: the act or process of reclaiming; as restoration. (Merriam-Webster Online, 2009)

recreation: refreshment of strength and spirits after work. (Merriam-Webster Online, 2009)

renegade trails: paths that have developed due to high pedestrian traffic; not intended to be part of the trail system; spider trails. (Reichert 2001, 50-56)

revegetation: to provide (barren or denuded land) with a new vegetative cover (Merriam-Webster Online 2008); 2: to reintroduce native vegetation where it has been degraded. (Reichert 2001, 50-56)

riparian area: vegetated ecosystems along a waterbody through which energy, materials, and water pass. Riparian areas characteristically have a high water table and are subject to periodic flooding. (Smart Growth)

runoff: the water that flows off the surface of the land, ultimately into our streams and water bodies, without being absorbed into the soil. (Smart Growth)

S

saguaro: a tall columnar usually sparsely-branched cactus (Carnegiea gigantea) of dry areas of the southwestern United States and Mexico that bears white flowers and a scaly reddish edible fruit and that may attain a height of up to 50 feet -called also giant cactus. (Merriam-Webster Online, 2009)

Salt River Project (SRP): part public utility and part government entity, was established during the administration of President Theodore Roosevelt to function as the manager of the watershed for the federal government and to provide the most substantial water delivery system in the state; it stores [water] behind massive dams, then distributes it in a series of canals; it provides irrigation, urban water, and electricity. (Dollin, 2000)

Salt River Pima Maricopa Indian Community (SRPMIC): Indian community that has deeply rooted history in Papago Park and currently has partial rights to the property; a major stakeholder to be included in any planning and development.(Dollin, 2000)

sanitorium: an establishment that provides therapy combined with a regimen for treatment or rehabilitation. (Merriam-Webster Online, 2009)

snow bird: one who travels to warm climes for the winter. (Merriam-Webster Online, 2009)

Sonoran Desert landscape: landscapes that rely exclusively on native plants and indigenous conditions. (Dollin, 2000)

T

tafoni: openings eroded in the rock over time by water breaking up the minerals in the rock. (www.phoenix.gov)

threatened species: an animal or plant species that is likely to become endangered within the foreseeable future. (USGBC, 2009)

U

urban sprawl: the spreading of urban developments (as houses and shopping centers) on undeveloped land near a city. (Merriam-Webster Online, 2009)

V

The Valley: refers to the Valley of the Sun, the metropolitan area of Phoenix, Arizona

vertebrate: any of a subphylum (Vertebrata) of chordates possessing a spinal column that includes the mammals, birds, reptiles, amphibians, and fishes. (Merriam-Webster Online, 2009)

W

wash: a shallow creek; the dry bed of a stream -called also dry wash. (Merriam-Webster Online, 2009)

watershed: the geographic area which drains into a specific body of water. A watershed may contain several sub-watersheds. (Smart Growth)

wetland: land or areas (as marshes or swamps) that are covered often intermittently with shallow water or have soil saturated with moisture. (Merriam-Webster Online, 2009)

X

xeriscape: a water-conservation strategy that uses zoned planting and irrigation and concentrates the most intense water use in locations where people are likely to congregate as pedestrians - such as building entries - transitioning to dryer, less irrigates landscapes at site perimeters; it relies heavily on drought-tolerant plants both native an nonnative, with prudent use of exotics. (Dollin, 2000)

xeroriparian: relating to or living or located on the bank of a dried natural watercourse. (Merriam-Webster Online, 2009)

Y

Z

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references

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appendix

literature review

The following review of literature regarding the history of Papago Park, and urban park design standards is intended to compliment the development of the proposed program and design solution. This literature review covers the most important sources of information and does not include all of the reference materials used in this project; the reference list in the previous section is comprehensive of all reference material used in the research and development of this project.

Three cities united in effort to create Master Plan for Papago Park. 2007. US Fed News Service Including US State News.
This is the news release from the city of Tempe announcing that there is to be a regional effort to create a Master Plan for Papago Park as of April 2007. Enthusiasm is expressed among the Mayor of Tempe, Phoenix Councilmen, and Scottsdale Committee Members. As best stated by Betty Drake, Scottsdale City Council member, "Through cooperative planning, we can create, where three cities come together, a fresh vision - a common ground that honors Papago Park's unique history, natural beauty and traditional attractions."

This article is the base for this entire thesis project. Without expressed interest by all of the stakeholders involved, this project would be far less effective at accomplishing any of the project goals.

Gart, Jason H. Papago Park: A History of Hole-in-the-Rock from 1848 to 1995. Phoenix: City of Phoenix, 1996.
Based on archival papers, newspapers, topographic surveys, photographic archives, oral accounts, and governmental publications, this study has compiled the history of Papago Park from the middle of the 19th Century to the present. Emphasis lies on the interaction and interrelationship between federal, state, and local entities in the acquisition, preservation, development, and maintenance of the recreational area. This study has proven to be very helpful in the inventory of historical information regarding the development of existing program elements.

Golany, Gideon S. Urban Planning for Arid Zones. New York: John Wiley & Sons, 1978.

Golany not only provides planning guidelines for arid regions, but he has also included historical information on the development of the Phoenix metropolitan area as a case study for his guidelines. The historical information was helpful in the understanding of the regional climate and physiography. This book has a strong focus on the location, conservation, and responsible use of water in the desert climate. The planning considerations outlined was certainly useful for the design development phase of this project.

Hoyle,Cynthia. Traffic Calming. American Planning Association, 1995.

As a brief guide to the principles, techniques, and benefits of the implementation of traffic calming measures, this provides an excellent knowledge base for purposes of this project. There are six traffic calming techniques that are outlined by this guide: speed reduction, psychological change, incentives for public transit, discourage private vehicles, encourage efficient trip planning, and plan well-organized communities.

Speed reduction can be accomplished through two different methods: active physical controls and passive controls. Active controls include speed bumps, speed tables, rumble strips, traffic circles, medians, interrupted sight lines, and changes in direction. Passive traffic controls are primarily traffic signage, but may also include traffic signals and pavement markings. The passive measures are most effective only when compliance can be expected by motorists and law enforcement is possible.

Psychological changes can communicate different driving environments to motorists. Wide lanes and straight road alignments lead the motorist to believe that the road is primarily for vehicular use. Vegetated medians, sidewalks, curved road alignments, and narrowed lanes will communicate the fact that the street is often a shared space with pedestrians and bicyclists.

Provide incentives for those who use public transit. Conversely, discourage the use of private vehicles by implementing parking restrictions, parking fees, or by banning personal vehicles from designated urban areas all together.

park attractions and amenities

The following descriptions of park attractions and amenities includes only those that have not been previously explained in the Inventory section beginning on page 37.

Phoenix

Desert Botanical Garden
1201 N. Galvin Parkway, Phoenix, AZ
(www.dbg.com) (Gart, 1996)

Phoenix Zoo
455 North Galvin Parkway, Phoenix, AZ
(www.phoenixzoo.org) (Gart, 1996)

Papago Park Municipal Golf Course
5595 East Moreland, Phoenix, AZ
(papagogolfcourse.net)

Phoenix Municipal Stadium
5999 E. Van Buren Street, Phoenix, AZ
The 57 acre complex was built in 1966 and holds 8,775 people. It is the spring training home of the Oakland Athletics, and hosts several concert events throughout the year. Although it has recently been completely renovated and modernized, the Phoenix Municipal Stadium has a traditional feel and exudes the raw charm of baseball. The framed views of Papago Park over the left field fence are breathtaking. (www.papagosalado.org)

Hall of Flame, Firefighters Museum
6101 East Van Buren Street, Phoenix, AZ
The Hall of Flame Fire Museum and the National Firefighting Hall of Heroes, located near the Phoenix Municipal Stadium, has almost an acre of fire history exhibits, with over 90 fully restored pieces of fire apparatus on display, dating from 1725 to 1969. The Hall of Flame sponsors the National Firefighting Hall of Heroes, which honors firefighters who have died in the line of duty or who have been decorated for heroism. The Hall also includes a gallery dedicated to the history of wildland firefighting in the United States. The museum creates little disturbance to the park as a whole. It is located on the outer southwest edge near other urban development, and it will not likely be changed. (www.hallofflame.org)

Softball & Baseball Complexes
1802 N. 64th Street, Phoenix, AZ
6201 E. Oak Street, Phoenix, AZ
Located in Papago Park, Papago Softball facility features four championship softball diamonds which are lighted at night. These provide well located recreational opportunities nearest the highest density of residential neighborhoods along the Scottsdale boundary of the park. (www.papagosalado.org)

Archery Range
6201 East Oak Street, Phoenix, AZ
The archery range once consisted of a trail leading over terrain which the bowman followed, and at various points along the route targets would appear resembling game. Today the range is only open on Saturdays for the public. Instructional courses are offered for the first hour of opening every week. 52" foam targets are used on Saturdays, while hay bales on metal stands are set-up for daily use by the City of Phoenix Parks and Recreation Department. (www.papagoarchery.com)

Papago Ponds and Picnic Ramadas
Van Buren Street & Galvin Parkway, Phoenix, AZ
(www.papagosalado.org) (www.phoenix.gov)

Hunt's Tomb
Van Buren Street & Galvin Parkway, Phoenix, AZ
The tomb, erected in 1928 is a white pyramid that is visible from most of Papago Park. Entombed here is Governor George Wiley Paul Hunt, who set a national record by being elected to seven terms as Arizona's governor. Lying with him is his wife, Helen, her parents, the J. W. Ellisons, and her sister, Lena Ellison.

Unfortunately, the faces of the tomb have fallen into disrepair through the destructive processes of the elements and vandalism. Many of the 4-by-4-inch white tiles that cover the façade are discolored or damaged. Plans currently exist to raise money for refurbishment of the tomb to take place in recent future. These plans for should be included in the re-development of the Master Plan, and should be expanded to include the small resting area around the tomb, the trails providing access to the tomb, and the parking facilities. (www.papagosalado.org) (Clancy, 2008)

Amphitheater
McDowell Road & Galvin Parkway, Phoenix, AZ
(www.papagosalado.org) (Gart, 1996)

Arizona National Guard Military Reserve and Arizona Military Museum
5636 East McDowell Road, Phoenix, AZ
Sponsored by the Arizona National Guard Historical Society, this remodeled arsenal features memorabilia relating to the military history of Arizona and its residents. The facility is housed in a historical adobe building, which was built in 1936 and used for German prisoners during WWII. Displayed are vehicles, uniforms, artillery, weapons, photographs, mementos, and archival material items spanning time periods from the Spanish conquistadors to the more current Desert Storm. Included are the Korean conflict, Vietnam and the Spanish-American Wars. Interesting exhibits include a diorama depicting an underground escape by German prisoners of war, and an Army helicopter used during the Vietnam War.

It is hard to know exactly the conditions of this area because it is restricted from the public for security purposes. This area should be considered for vegetation and wildlife habitat conservation efforts especially because it is already restricted from the general public and the destruction that is associated with such users. The area surrounding Barnes Butte which is restricted from public use, appears to have been left undeveloped for a significant amount of time. Vegetation densities would likely benefit from ecological restoration efforts. The design solution and management plans should be presented to the Arizona National Guard for their consideration and educational purposes. (www.az.ngb.army.mil) (www.papagosalado.org)

Papago Park City Boundary Project, Sculpture Monument
McDowell Road & Galvin Parkway, Phoenix, AZ
Designed by Steve Martino, the sculpture embraced the site that had been damaged by over-use and development. The sculpture is based on the requirements of the natural environment in which it has been placed. It is a large tree-like structure of raised rock walls that create seven organic shaped water-harvesting pools. During a rain storm, water flows down the 'trunk' and is dispersed among the 'branches' where it pools and is eventually absorbed into the desert soil. Native vegetation was salvaged and replanted, and has since shown positive signs of recovery. This is an excellent example of a design that employs conservation techniques while responding to local culture, environment, and social needs. (Martino, 2009) (Phillips, 1993)

Phoenix Parks and Recreation Office
Located at 52nd Street and Moreland Street, the Phoenix Parks and Recreation facility is on the far west edge of the park. Specific services provided from this building are unknown. (www. phoenix.gov/parks/)

Tempe

Rolling Hills Golf Course
1415 N. Mill Avenue, Tempe, AZ
(www.tempegolf.net/rollingHills) (Gart, 1996)

Moeur Park
North Mill Avenue & Curry Road, Tempe, AZ
Moeur Park is significant for its Works Projects Administration (WPA) construction projects. The park began as an automobile rest stop established by the Arizona Highway Department. The stone and concrete bridge over the Salt River Project drainage easement includes a stamp reading "W.P.A. Project 652, 1936". Field stone and concrete materials were used to construct a variety of features throughout the park including raised planters, stairs, planter borders, stone benches, stone tables, an automobile bridge, retaining walls, and irrigation boxes.

In 1949, the park was dedicated in memory of Mrs. Honor Anderson Moeur, wife of Governor Benjamin Baker Moeur (Tempe's first governor). She is recognized for her tireless work for roadside beautification and this park in particular. Moeur Park now features one of the best disc golf courses in the Valley. (www.tempe.gov/parks/parks/moeur) (Gart, 1996) (www.papagosalado.org)

Evelyn Hallman Park (formerly Canal Park)
College Avenue & McKellips Road, Tempe, AZ
(www.tempe.gov/Parks/parks/EvelynHallman) (www.papagosalado.org)

Eisendrath House and Center for Water Conservation
College Avenue & McKellips Road, Tempe, AZ
The Eisendrath House, constructed in 1930, is a significant work of noted Arizona architect Robert T. Evans. The construction of the Eisendrath House helped inspire a revival of adobe architecture in the Salt River Valley from the mid-twenties to the start of World War II. The two-story structure represents a masterwork of traditional building materials executed in high style.

While maintaining the inherent environmental appropriateness of adobe, this elegant Pueblo Revival home uses traditional materials in a refined design constructed with a degree of skill and sophistication noticeably above the simplicity that is normally encountered in traditional adobe architecture.

The site provides a significant visual and historic framework for the Eisendrath House, including two distinct landscape typologies. The "natural landscape" constitutes the majority of the nine-plus acre site, and includes a native Sonoran vegetation characteristic of Papago Park. The "cultivated landscape" areas are intended to enhance the aesthetic quality and to provide shade immediately around the house. With a microclimate tempered by landscaping, the patios, balconies and courtyards strengthened the connection of the Eisendrath House to the site and enhanced comfort and livability. A historic fruit tree orchard had been planted on site, but is no longer in operation.

The City of Tempe is restoring the property for use as a water conservation center. This will allow the house and property to serve the public as a reminder of the region's past and as a touchstone for its future as a sustainable, diverse community. A variety of interior and exterior spaces will provide opportunities for new and expanded programs in an unparalleled setting. (www.tempe.gov/historicpres/EisendrathHouse) (www.papagosalado.org)

Tempe Park – Dog Park
College Avenue & Curry Road, Tempe, AZ
Papago Park offers drinking fountains for both humans and dogs, tables, benches, poop bags and trash receptacles, shade trees, and lights. Dogs should be trained to respond appropriately under voice control and the owner must be within the enclosure at all times. Aggressive or disobedient dogs should not be unleashed while at the park. In Tempe it's the law for dog owners clean up their pet's feces and place it in the designated trash receptacle. Dog handlers must repair damage from digging and must remove/dispose of hair from grooming.

The dog park is within walking distance to the neighborhoods east of Papago Park and adds diversity to the recreational opportunities offered to Valley residents. (www.tempe.gov/parks/) (www.papagosalado.org)

LoPiano Mesquite Bosque
Curry Road & Mill Avenue, Tempe, AZ
This area was once part of the Salt River floodplain. Plants that grew here were often washed out whenever the river overflowed its banks. There is evidence that the Hohokam Native American tribe may have inhabited this area and would have made use of the rich alluvial soils and nearby water sources for food harvesting. Since the channelization of the Salt River and the construction of the Red Mountain Freeway (Loop 202), this parcel has become an isolated area that is reserved by the City of Tempe for habitat restoration.

The 13 acre LoPiano Bosque habitat stretches along the north side of Loop 202 between College and Mill Avenues just south of the Indian Bend Pump Ditch and Papago Park. It is named for former Tempe Mayor Dr. William LoPiano, who was on the first council that determined to pursue the dream of Rio Salado. Volunteers from 26 schools constructed this habitat in 1993. This exceptional environment provides a calm, shady walk along the canal. Birds and other wildlife are prevalent here. (www.tempe.gov) (www.papagosalado.org)

Arizona Historical Society Museum
1300 North College Avenue, Tempe, AZ
The Arizona Historical Society (AHS) utilizes exhibits, programs, publications, and public outreach to inform and inspire people of all ages with the rich history of countless individuals, past and present, who have made Arizona their home. AHS collections not only provide premier resources for recounting Arizona's past, but are invaluable tools for promoting public understanding of contemporary issues such as water conservation, immigration, free trade, mining, ranching and agribusiness, the defense industry, cultural diversity, and urban development and revitalization.

The Arizona Historical Society Museum at Papago Park collects, preserves, and interprets central Arizona's history with special emphasis on the 20th century. This is one of four museums of the statewide Arizona Historical Society. Exhibits at the Tempe location include the impact of water in the desert, the development of agriculture, and transportation, and the Home Front during World War II. (www.arizonahistoricalsociety.org) (www.papagosalado.org)

Sandra Day O'Connor House and Center for Civil Discourse
College Avenue & Webber, Tempe, AZ
The Sandra Day O'Connor Center for Civic Discourse is a community-based effort to relocate the original adobe bricks and the spirit of the home of former U.S. Supreme Court Justice Sandra Day O'Connor and husband John O'Connor. It will open to the public as a gathering place where groups can move beyond their differences and focus on the hard work of finding solutions to challenges.

The adobe bricks used to build this home in 1957 were made of mud from the Salt River in Tempe. This home reflects a love of desert materials and landscapes. The house is carefully being moved, with each adobe block being hand numbered. The process of rebuilding this home in Tempe is a more than $2 million endeavor. This act will not only preserve this historic building, it will also provide meeting space for the public and a tribute to Justice O'Connor and her family. (www.tempe.gov)

Loma del Rio
Mill Avenue & Curry Road, Tempe, AZ
(www.tempe.gov) (www.papagosalado.org)

Carl Hayden Campus for Sustainability
College Avenue & Curry Road, Tempe, AZ
(www.tempe.gov)

Water Treatment Facilities
College Avenue & Marigold Lane, Tempe, AZ
The Johnny G. Martinez Treatment Plant receives surface water originating from the Arizona CrossCut Canal, which receives water from SRP's Arizona Canal. The majority of water received at the treatment plants throughout the year is a mixture of the Salt and Verde rivers.

The City of Tempe does not provide any further information on the use of the land surrounding water treatment facilities to the public for security purposes. It can be assumed that the primary goal of the facility is to provide adequate

drinking water to Valley residents and that native vegetation and wildlife conservation is not a top priority. Since the facility covers a sizable piece of acreage in Papago Park, it could only benefit the goals of this project to propose at least minimal conservation efforts wherever applicable within the facility's boundaries. (www.tempe.gov/waterquality/wqsum)

SRP PERA Club
1 E Continental Drive, Tempe, AZ
The Project Employees Recreation Association (PERA) Club is a private club for employees and families of the Salt River Project (SRP), the major water and power utility provider to Valley residents. This 83 acre club includes a social center, employee store, fitness center, swimming pool, game courts, and fields. It also offers children's programs, fitness classes, business meetings, sports leagues, and employee gatherings and celebrations.

The undeveloped area at the north and south ends of the SRP PERA Club property appear to show signs of unmanaged off-road vehicle use. Vegetation densities are unhealthy levels, and these areas should be considered prime locations for conservation efforts at the site scale. The design solution and management plans should be presented to the SRP for consideration and educational purposes. (www.papagosalado.org)

ASU Community Services Building
200 East Curry Road, Tempe, AZ
Originally the Arizona State Tuberculosis Sanitorium, the ASU Community Services Building has a rich history in Papago Park. Sanatoriums were popular in Phoenix in the early 1900s for treating patients with tuberculosis. Tuberculosis causes the sores to develop in the lungs of the affected; when these sores break, the patient often coughs up blood. Treatment was minimal and more often then not those who were infected with the disease did not survive. It was thought that the hot, dry air of the desert climate would assist in curing the symptoms of the disease and lengthen the infected person's life expectancy. The sanatorium had since been converted to a hospital for crippled children, and today it is the ASU Community Services Building.

The Community Services Building (Curry Road Facility) is about one mile north of the ASU Tempe campus. As part of the School of Human Evolution and Social Change, it is the primary location for the Office of Cultural Resource Management and provides additional faculty and student laboratories and curation space for a portion of the archaeological collections. This is particularly appropriate because of Papago Park's rich history with the Hohokam aboriginal tribe that once settled within the park and the archeological artifacts that have not yet been preserves and archived.. (Gart, 1996) (www.asu.edu)