San Antonio Parks & Recreation System Strategic Plan (2006 -2016)

May 18, 2006

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I. INTRODUCTION

The Mission of the San Antonio Parks and Recreation Department is to develop and maintain a balanced, safe, and easily accessible system of exceptional parks, recreational facilities and programs, as well as promote and maintain world-class facilities to further the City's prominence as a major City and visitor destination.

A. PURPOSE

This 2005 update of the San Antonio Parks and Recreation System Strategic Plan is intended to provide guidance on future decisions concerning operations, capital improvement needs, and programs. As with any function of local government, the ability to plan for the short and long term is critical to meeting community needs. At no time in the City's history has the need for organized, citizen-involved planning been so vital. The public continues to be concerned about its quality of life and expects efficient utilization of funds. These are issues that are constantly being influenced by urban growth pressures, changing demographics, dwindling natural resources, and competing financial demands.

The City of San Antonio adopted the most recent predecessor to this document in 1981. (There was also a master plan document adopted in 1964.) That document was limited to parks acquisition and development needs. It did not provide a comprehensive view of the many factors that impact the parks and recreation system including community demographics, integration of recreation programming, security, and public/private partnerships. More importantly, the plan had not been updated on an ongoing basis and had never been consistently utilized as a public planning document.

The Parks and Recreation System Plan, adopted in 1999, articulated a five year comprehensive view in a document that was used repeatedly for capital improvement program project identification and program prioritization. Since 1999, the Department has adhered to the commitment that the Plan be utilized and updated regularly, and thus continues to serve as a guide to future planning decisions for facilities, operations, and programming.

The Parks and Recreation System Strategic Plan 2005-2015 will continue to fully support the goals and objectives stated in the City of San Antonio's Master Plan Policies adopted in 1997, especially related to Neighborhoods and Urban Design sections. Recommendations stated in the Plan reflect not only the intent of the Master Plan Policies, but other ordinances and processes adopted by the City of San Antonio, including the annual operating budget. These include the Neighborhood Planning Process, the Unified Development Code (UDC), the Open Space Plan, the Drainage Regulations Ordinance and the Tree Preservation Ordinance.

On a state-wide planning level, as part of the Texas Parks and Wildlife Department's local parks grant program, a process was initiated in 1994 that directs local governmental agencies to complete parks system plans in order to recieve State grants. This has led to the completion of such plans by many Texas municipalities. The State of Texas also commissioned a study in 1998 to evaluate the overall parks system in Texas, including municipal, county, state and federal facilities. The San Antonio Parks and Recreation System Strategic Plan, while tailored to our specific community needs, will support this and other statewide efforts to improve the integrated parks system in the region and throughout Texas.

The City of San Antonio is recognized as one of the most unique and fastest growing communities in the nation, ranking as the eighth largest city in the nation in 2005. Among Texas municipalities, San Antonio ranks second in population with an estimated 1,282,800 (2005 estimate) residents, and second in land area with 512 square miles. New businesses and residents are attracted by San Antonio's central location, proximity to the Texas Hill Country and Mexico, climate, cultural diversity, and economic development opportunities. As a result, since the Parks and Recreation System Plan was adopted in 1999, the city has grown by 15%, an increase of over 167,200 residents in five years.

I. INTRODUCTION

Not only has the population increased, but its composition has changed. Today, based on ongoing public input, the needs and expectations of residents regarding San Antonio's parks and recreation facilities and programs are definitely different than in 1981, and even different than in 1999. The City faces an increasingly complex challenge to assure that these varied expectations and needs are met.

San Antonio possesses a nationally recognized array of unique facilities that distinguishes its parks and recreation system from others in the country. Residents and visitors alike can enjoy world famous tourist attractions such as the RiverWalk, La Villita, Hemisfair Park/Tower of Americas, and Market Square; historic properties such as San Pedro Springs Park, Brackenridge Park, the Spanish Governor's Palace, and the Historic Eastside Cemeteries; and special and unique facilities such as the Botanical Gardens and Friedrich Nature Park, to name only a few. Golfers can play six fine courses, among them historic Brackenridge and nationally-recognized Cedar Creek. The After School Challenge, Kidquest, and Roving Leader programs are distinguished both state-wide and nationally as unique solutions to community needs.

In spite of its many and diverse park and recreation assets, the City must look to the future and assess how it will meet future needs. The Parks and Recreation System Strategic Plan is a document to address the needs of users in this era of accelerating growth, changing demographics, and diverse citizen needs. The plan inventories existing parks and recreation system facilities and programs, assesses community needs, and summarizes priorities for the coming ten years. As a functional companion to the City of San Antonio's Master Plan Policies, the San Antonio Parks and Recreation System Strategic Plan will guide staff, City leaders, and citizens as they make decisions on future development of facilities and programs. The plan will also assist the Parks and Recreation Department in competing for public and private funding to realize the goals, objectives, and recommendations of the plan.

The purpose of the San Antonio Parks and Recreation System Strategic Plan is to:

1. Update the 1999 Parks and Recreation System Plan by evaluating the Goals and Objectives, Recommendations, and Accomplishments.
2. Continue to develop a coordinated, achievable plan to guide decisions impacting San Antonio's Parks and Recreation System
3. Integrate pertinent City Master Plan policies and adopted ordinances into ongoing parks and recreation system planning (i.e. Neighborhood Planning Process, Drainage Regulations Ordinance, Tree Preservation Ordinance, Open Space Plan; and the Unified Development Code)
4. Integrate information and recommendations from other Departmental studies and reports including the Park Police Performance Review, the National Golf Foundation Report, and the After School and Summer Program Monitoring Standards.
5. Ensure adoption by the Texas Parks & Wildlife Department to support statewide efforts to improve Texas' parks and provide a plan as required for both public and private grants.
6. Integrate the three volumes of the Parks and Recreation System Plan which include this updated Parks and Recreation System Plan (2005), the Planning and Design Guidelines for Creek Based Greenway Parks (2001), and the Land Use Management Planning Guidelines for Natural Areas (2003).

B. SAN ANTONIO PARKS AND RECREATION SYSTEM: 1932 TO 1981

Formal planning of San Antonio's parks and recreation system began in 1932 with the adoption of the City's first Master Plan. Between 1932 and 1981, park planning was addressed in various documents including San Antonio's 1951 Master Plan, the 1964 Master Plan of Parks, the 1980 City Master Plan, the 1980 Urban Park and Recreation Recovery (UPARR) Action Plan, and the Department of Parks and Recreation's 1981 Parks Master Plan.

The 1964 Master Plan for Parks established that San Antonio had 2,931 acres of park land to serve approximately 600,000 residents. This provided a paltry ratio of 4.89 acres per 1,000 residents. As a

result, an ambitious parks development program was recommended to address the tremendous shortfall in parks and open space.

This development program was relatively successful, and 17 years later, the 1981 Parks and Recreation Master Plan reported that park holdings had nearly doubled to 5,988 acres, or 7.6 acres per 1,000 residents. Because other publicly owned park and recreation facilities such as those of the County, State, and other municipalities, were not included in the study, the plan concluded that "the overall deficiency in total public park acres is minimal at this time and is primarily in the neighborhood and community park types."

C. SAN ANTONIO PARKS AND RECREATION SYSTEM: 1981 TO 1999

From the time the 1981 Parks Master Plan was completed until a new plan was adopted in 1999, San Antonio's population grew from 785,400 to 1,115,600. A comparison of the 1980 and 1990 Federal Census indicated that the population's composition changed in the following ways:

- median age increased from 27.1 years to 29.8 years
- racial minorities increased from 62% to 64% of the population
  - -persons of Hispanic origin increased from 53.7% to 55.6%
  - -persons of Anglo origin decreased from 38.2% to 35.9%
  - -persons of African American origin decreased from 7.3% to 7.0%.
  - -persons of "other non-Anglo" origin, including Asians, increased from.9% to 1.5%
- median household income rose from $13,775 to $26,885
- San Antonio families remaining below the poverty level increased from 16.9% to 18.7%.

Analysis of 1990 census figures and 1997 population estimates showed that San Antonio's growth trend was to continue. The City was physically growing to the north, northeast, and northwest, and all sectors of the city had experienced population increases. These projections raised concerns related to urban sprawl.

To address the population increase in all areas of town, particularly the rapid growth in the northern sector of the city, an ambitious park bond program was adopted by the voters in 1994. The program set aside $42 million for over sixty park improvement projects. Bond funds were used to rehabilitate overused and neglected inner city parks and to acquire land and develop parks in the faster growing sectors of the city to try to keep pace with growth. This acquisition and development program was extremely successful.

By 1999, the city's park land holdings totaled 7,575 acres, an increase of over 1,500 acres, or 27%, since the 1981 plan was adopted. The increased park acreage resulted from purchases using park bond funds, Federal and State grants, as well as gifts of both Federal surplus and private property. Though significant, these acquisitions did not keep pace with the city's rapid growth and the park acreage ratio per 1,000 residents decreased from the previous planning period to 6.69 acres.

D. SAN ANTONIO PARKS AND RECREATION SYSTEM: 1999 TO 2005

Since the 1999 Parks and Recreation System Plan was completed, San Antonio's population has continued to grow. During these years the population has increased from an estimated 1,115,600 in 1999 to an estimated 1,282,800 at the end of 2004, or an increase of 15%. Between 1999 and 2004, the population's composition changed in the following ways:

- median age increased from 29.8 years to 32.4 years
- makeup of race and ethnicity
  - o persons of Hispanic origin increased from 55.6% to 58.7%
  - o persons of Anglo origin decreased from 35.9% to 31.8%
  - o persons of African American origin decreased from 7.0% to 6.8%
  - o persons of "other non-Anglo" origin, including persons of Asian origin increased from 1.5% to 2.7%

- median household income rose from $26,885 to $36,214

Analysis and assumption of the census data and estimated population figures for 2010 and 2015 show that San Antonio's growth trend will continue, and that the City will continue to grow again to the north, northeast, and the northwest. An influx of rapid growth to the far west and the south of the City is also projected. While most sectors of the City have experienced population increases, the percentage of growth inside Loop 410 increased only slightly, and in at least one instance, decreased slightly. The City park acreage ratio per 1,000 residents increased to 12.35 acres during this time period.

Several ambitious programs were implemented to provide more park land, improve existing parks, and develop new parks since the 1999 Parks and Recreation System Plan was adopted.

1. The 1999 Park Bond Program was approved by the voters in May 1999. The program set aside $24.2 million for 63 projects for park improvements. Included was the development of many parcels of property bought from the 1994 bond program; continued rehabilitation of existing facilities; and purchase of property in the faster growing sectors of the City. Most of the projects were identified from recommendations in the 1999 Parks and Recreation System Plan.

2. The 2000 (Proposition 3) Sales Tax for Park Land Acquisition Program was approved by voters in May 2000. It provided for a sales tax increase (1/8th of a cent) for $65 million for the purchase and development of property over the Edwards Aquifer Recharge Zone and in the Salado Creek and Leon Creek watersheds. The City closed on the first acquisition in December 2000. Commercial paper (a debt instrument) was used to accelerate land purchases. For the Edward's aquifer and for the creekways program, $65 million in tax revenue was collected between October 2000 and July 2004 - $45 million was for the Edward's program and $20 million for the creekways program. As of late 2004, the funds for land in the Edward's program are all expensed due to the purchase of over 6,400 acres of land for aquifer protection and land conservation. The creekways program will address purchase of properties in selected contiguous areas of Salado Creek and Leon Creek by 2006. By February 2005, over 200 acres had been purchased and another 2,000 acres are proposed for acquisition to complete this program. Due to funding limitations, all acreage will not be purchased, but a number of sections will be acquired to greatly enhance recreational opportunities along the Leon and Salado Creeks.

3. On June 4, 2001, the Park Dedication Requirement of the newly adopted Unified Development Code (UDC) became effective. For the first time, developers were required to provide either a private or public park, or pay fees-in-lieu of land to the city. In 2004, staff also began the process to amend the UDC as directed by City Council. The process, the ratio of acres per units, and other significant improvements were made to the Park Dedication Requirement making it easier to follow. The changes to the ordinance were adopted on December 9, 2004 and May 12, 2005.

4. 2003 Park Bond Program was approved by the voters in November of 2003. This bond program set aside an additional $27.2 million for 54 projects that again focused on development, acquisition, and rehabilitation. Again, the 1999 Parks and Recreation System Plan was used as a guide to identify most of the bond projects.

5. The 2005 Proposition 1 Sales Tax for Edward's Aquifer Protection and Proposition 2 Sales Tax for Creekways Parks Development and Expansion was approved by voters in May 2005. This program will provide for a sales tax increase (1/8th of a cent) up to $135 million ($90 million for Proposition 1 and $45 million for Proposition 2). Proposition 1 will provide funds to acquire land located over the Edwards Aquifer to protect and preserve the primary source of water for the fast growing San Antonio are. Proposition 2 will provide funds to acquire and develop linear parks along the Leon and Salado Creeks as well as to make improvements to projects on the Medina River and the San Antonio River. The tax collection will start in October 2005 with the first funds available in December 2005. This program will complete the work started from Proposition 3 above in the acquisition and development of properties into useable recreational space and to protect life and property near flood-prone areas.

6. The HUD 108 Program application was submitted by the City to the Federal Housing and Urban Development Department in June 2005. This program, allotting a larger amount of CDBG funds at once, allows larger eligible projects to be completed, thus making a more dramatic impact to the community. The Parks and Recreation HUD108 Capital Improvement Projects received a total of $6,661,000 at 15 separate project sites.

With the help of these voter and/or City Council approved programs, the City's current park land holdings totaled over 16,100 acres, an increase of over 8,500 acres since 1999, largely due to the Sales Tax Initiatives land acquisition efforts. This more than doubled the park system holdings in five years. In spite of these impressive additions to the system and the large investment of funds to develop, maintain, and program parks, new useable park acres and facilities will continue to be a challenge to keep pace with the city's rapid growth.

E. SAN ANTONIO PARKS AND RECREATION SYSTEM: THE FUTURE OF THE SYSTEM 2005 - 2015

Population estimates (based on census tract data and growth projections as provided by the Planning Department) project continued growth for San Antonio in the next several years.

2000 (est.)	2005 (est.)	2010 (est.)	2015 (est.)
1,173,400	1,282,800	1,370,400	1,454,100

The population increased by 9.3% between 2000 and 2005 and is expected to increase by another 6.8% over the next five years and another 6.1% by 2015. The City's physical growth will most likely be accompanied by annexation of additional land that will extend the city limits. The City currently occupies 41% (512 square miles) of the land in Bexar County (1,246 square miles), making San Antonio the second largest City in area in Texas with no major barriers to decelerate land expansion.

Recognizing San Antonio's continued growth, the Parks and Recreation System Strategic Plan lists park inventories, currently funded projects, and proposed projects that will increase and improve park and recreation facilities and programs.

F. CONCLUSION

It is clear that thoughtful but aggressive planning and promotion of parks and recreational facilities and programs is needed to keep pace with the growth, changing demographics, aging infrastructure, and social needs faced by San Antonio and the surrounding region in the early 21st century. Though the City of San Antonio will assume a leadership role in this effort, adequate and successful planning can only be accomplished through close coordination and cooperation with other public agencies, private organizations, and land development efforts. The San Antonio Parks and Recreation System Strategic Plan recognizes the challenges presented by city growth and complex social needs, and hereby presents the following recommendations to assure that public park and recreation facilities and programs keep pace with the needs of city residents for the coming years.

II. PLANNING AND ASSESSMENT

The following chapter deals with the process of updating this document, surveying citizens about concerns and ideas, and development of the community needs assessment regarding parks and recreation in the city. The chapter is broken out into three main sections.

A. **Plan Development Process** discusses the development of this document.
B. **Community Input** discusses how information was gathered from the community and stakeholders in order to help identify community needs.
C. **Needs Assessment** discusses priorities of the community in a general and city-wide sense.

A. PLAN DEVELOPMENT PROCESS

Development of the updated San Antonio's Parks and Recreation System Strategic Plan (2005 – 2015) began in Spring 2004. The process was led by staff members of various divisions of the Parks and Recreation Department and involved numerous meetings of the Parks and Recreation Board as well as citizens at public meetings and other venues.

1. The Parks and Recreation Facilities and Programs Inventory

A critical element in determining system-wide needs is an up-to-date and complete inventory of all public park and recreation facilities in Bexar County. Inventories from the 1999 Plan were updated, including properties of the City of San Antonio, 22 other incorporated cities, Bexar County, San Antonio River Authority, the Texas Parks and Wildlife Department, National Park Service, and City Public Service. Existing inventories of parks and specific facilities within parks were updated using site visits, especially for those parks where capital projects were completed since 1999. The compiled inventory data may be found in both Chapter IV and the individual Subarea sections in Chapter VII.

Because the Parks and Recreation System Strategic Plan is a comprehensive document addressing both facilities and programs, an update of the city's current recreation programs was also completed. In this way, the plan goes beyond Texas Parks and Wildlife Department planning process requirements which generally focus only on facilities and land. This approach is essential for San Antonio's parks and recreation system in order to present a balanced plan that addresses the complex local relationship of facilities and programs. The inventory of recreation programs currently offered by the City of San Antonio is found in Chapter IV.

2. Establishing Strategic Initiatives

To establish Strategic Initiatives, the goals and objectives of the 1999 Parks and Recreation System Plan were examined to determine which still remained valid. These goals and objectives were then combined with current issues and initiatives identified by departmental staff to produce draft Strategic Initiatives. Following a series of public meetings held to gather citizen input about the future of the parks and recreation system, the draft Strategic Initiatives were revised. As presented in this plan in Chapter V, the Strategic Initiatives address facilities, operations, and programs. They acknowledge the scope and complexity of the City of San Antonio's parks and recreation system, the need to expand and adapt the system to meet expanding community needs, and the importance of achieving these goals in partnership with other public and private entities. The Strategic Initiatives have been reformatted to match the goals and objectives stated for the Department in the annual budget documents.

3. Classifying Park Facilities and Recreation Programs

To assist in studying San Antonio's parks and recreation system, each park and facility type and recreation program is assigned a classification type consistent with the 1999 System Plan. Park classifications are generally based on size, use, and type of facilities within that park. Nine categories of park land are defined. Information on the classification of facilities and programs is discussed in Chapter III.

4. Identifying Needs

Because cities are so diverse in size and characteristics, it is difficult to define a standard to judge the exact extent to which a parks and recreation system meets the needs of its users. In the past, a commonly used park standard was defined by the number of acres per 1,000 residents. In 1999 the goal ratio as established and recommended by The National Recreation and Parks Association was 10 acres per 1,000 residents. The NRPA has since dropped this recommendation and at this time does not issue a recommended standard ratio.

In order to place some sort of ratio or measurement to our Parks system, some benchmark had to be used for this updated plan. There is a need to determine if our parks meet a national average of other cities of the same size or even other cities in general. The Department has opted to use a document published by The Trust for Public Land called "The Excellent Park System". This document presents research and survey results of cities across the country. Cities were grouped according to population density with an average of acres per 1,000 residents. The City of San Antonio falls within the "Medium-Low Population Density" grouping, who's average of those cities is 19.1 acres per 1,000 residents. The total for all cities in the national survey is 16.2 acres per 1,000 residents. For the purposes of this document, the department will use the 16 (rounded) acres per 1,000 residents as a baseline measurement of our system. This plan references the 16:1,000 standard for the city as a whole and each planning subarea, and makes recommendations for the acreage acquisition roughly based on this ratio.

It must be understood that the 16:1,000 acreage ratio accumulates all park acreage and does not differentiate between a neighborhood park, sports facility, or open space acreage. It also does not take into account which entity owns or operates the property nor does it include any privately owned parks. Though this comparative measure can be instructive and serve as a guide, it is important to judge the unique needs of San Antonio as a whole, as well as each of its 10 planning subareas, when planning for future park and recreation facilities and programs. Using the park facilities inventory and city and subarea population estimates for 2005, 2010, and 2015, a ratio of park land per 1,000 residents was calculated for each of those three years.

While the acreage ratio comparison has been used in the past on parkland, current national planning standards are now deviating from such a uniform measurement. Distance from a park facility, time (walking) to a park facility, access to non-governmental facilities, and expenditure per resident on parks and programs are a few of the benchmarks being evaluated in certain circumstances. Additional means of measuring service to San Antonio residents may be more appropriate in future updates of this document.

Complicating the assessment of how well San Antonio meets its residents' needs is the lack of generally accepted benchmarks used to judge recreational facilities and programming. The Texas Outdoor Recreation Plan (TORP), issued by the Texas Parks and Wildlife Department in 1990, attempted to measure recreational facilities and programming throughout 24 statewide planning areas. The TORP judged facilities, the existence of a park land dedication ordinance, and level of funding. The performance of cities was ranked based on statewide averages for these measures. When compared with other Texas cities at the time, San Antonio ranked low in number of recreational acres and facilities, and the plan recommended that the City adopt a voluntary park dedication program for developers and enter into partnerships with private organizations to acquire additional land. Because the TORP has not been updated recently, current comparative data is not available.

While the measures used in the TORP are quantitative, it is also important to weigh other factors when developing recreational facilities and programs. In order to plan wisely for future parks and recreation facilities and programs, it is important to understand the demographics and social profile of the community to be served. The 2002 Park Police Performance Review, the National Golf Foundation Report, and the After School and Summer Program Monitoring Standards all provide comprehensive recommendations to address needs in the community and the organization. By identifying specific factors, the Parks and Recreation Department, through its facilities and programs and in partnership with other departments and agencies, can establish a more integrated approach to serving community needs.

5. Recommendations

Development of future park and recreation facilities and programs is based on indicators of need. Recommendations address the unique needs of each part of the city (subarea), taking into account current service levels and facilities, demographics, social statistics, natural resource assets, and needs expressed by subarea residents.

6. Plan Implementation

General guidelines to prioritize recommendations for future development of facilities and programs were established based on public input, the extent and condition of current facilities, and demographics. The recommendations were then prioritized by year through 2015 and this information is presented in a later chapter entitled Plan Implementation (Chapter VIII).

B. COMMUNITY INPUT

Two processes were used to solicit information from citizens about their interest and participation in San Antonio's parks and recreation facilities and programs. A formal survey of recreation activities was conducted by an outside consultant in 1996, and results of this survey appear to remain valid in many regards. In addition, ten public meetings were held in April and May of 2004, one in each of the ten planning subareas defined for the System Plan. These meetings provided residents the opportunity to share information and provide input about their specific planning subareas. Ten additional meetings were held in March of 2005.

The 1996 study of the City's recreation functions was designed to assist the Department in formulating goals and policies for its recreation programs. Adults and high school students were surveyed using questions about use of discretionary time, existing and future recreation facilities and programs, public outreach, and ways to improve service. The highest level of interest was expressed in lighted sports fields, hike/bike trails, and equipped playgrounds. Preferences were also expressed for new aquatic facilities and multi-purpose centers for indoor recreational activities. Respondents also indicated the need for better marketing of department activities, safety and security at department facilities, modern equipment, better maintenance of facilities, and equitable recreation opportunities. It appears from current surveys and discussions that these interests and concerns are still very valid today.

The twenty public input meetings held in 2004 and 2005 provided staff members from various Divisions (Park Projects, Park Maintenance, Recreation, and Park Police) the opportunity to personally visit with citizens. Participants were asked to provide information about their facility and program preferences using a paper survey. Additional verbal and written comments were also solicited, and participants were urged to ask other interested individuals to submit their comments to the Parks and Recreation Department. At each of the public meetings the paper surveys were handed out and they were also placed at the city community centers. The survey was also available on the department's website.

Though not scientific, responses indicated that the public's number one interest was hike and bike trails, especially in natural settings (natural areas and greenways). Public meeting participants also expressed a strong interest in individual and informal group pursuits as opposed to more organized, formal recreation activities. Participants strongly supported a wide variety of youth sports facilities and programs. Results of the 2004 survey included alternative and nontraditional types of facilities and programs not mentioned in the 1999 planning process. Examples of facilities include skate parks, bmx bike facilities, dog parks, climbing walls, and disc golf courses. The survey indicated that upgrades of existing facilities were important in certain areas of town inside Loop 410, while acquisition of park land was important in rapidly growing sectors of the city outside Loop 410 and Loop 1604. These variations between 1999 and 2004 survey results underscore the need to update the Strategic Plan every two years to measure ongoing changes in community desires, priorities, and needs.

Responses received to the paper and website survey and public meeting input have all been considered in assessing city-wide and subarea needs and in formulating recommendations. The ten public input meetings, one in each subarea, held in March 2005 were to review the proposals and to verify with the community, the specific recommendations.

C. NEEDS ASSESSMENT

Every city's need for park land and recreational facilities and programs is unique and the means of meeting those needs vary widely. San Antonio, like most metropolitan areas, has several public entities that provide facilities and programs. Each metropolitan area, however, is unique in the level of facilities and programs offered by its various providers. This factor complicates comparisons with other park systems in Texas and the United States.

Because San Antonio residents comprise over 83% of Bexar County's population, it is not surprising that the City is looked to as the primary provider of park and recreation facilities and programs in this area. However, because of the extensive, more populous metropolitan area surrounding San Antonio, other governmental and private sector entities also play an important role in meeting the citizen's park and recreation needs. As the population continues to grow, cooperation with non-City providers will become increasingly important.

1. Need for Facilities

One means of addressing need is to use the aforementioned Trust for Public Land's "The Excellent City Park System" national average of 16 acres of park land per 1,000 residents. For this plan, calculations of City of San Antonio park land per 1,000 residents have been made based on the City's estimated 2005, 2010, and 2015 populations and June 2005 park acreage total. Another set of calculations takes into consideration other public park lands, and a third calculation includes three metropolitan-based parks (Braunig Lake, Calaveras Lake, and Government Canyon State Natural Area) as well as city natural areas that are currently inaccessible to the public. The ratios are stated to demonstrate the growth in acreage-based need as the population increases. The same calculations were made for each planning subarea and are included in subsequent subarea chapters.

	June 2005 Inventory	Current Service Ratio	2005 est. pop 1,282,800		2010 est. pop 1,370,400		2015 est. pop 1,454,100	
			Need	*Exc./Def.**	*Need*	*Exc./Def.**	*Need*	*Exc./Def.**
City of S.A. acres	16,100	12.55:1,000	20,525	-4,425	21,926	-5,826	23,266	-7,166
All public recreation acres except lakes, Govt. Canyon SNA, and Undeveloped Natural Areas	11,420	8.90:1,000	20,525	-9,105	21,926	-10,506	23,266	-11,846
All public park acres including lakes, and Govt. Canyon SNA, and Undeveloped Natural Areas	23,178	18.07:1,000	20,525	+2,653	21,926	+1,252	23,266	-88

* denotes excess or deficit of acres as compared with service goal of 16 acres per 1,000 residents.

While facilities such as Braunig and Calaveras Lakes, Government Canyon State Natural Area, and the city's undeveloped natural areas provide city residents with a large surplus of park land, they are inaccessible for many residents and serve very specialized needs or purposes such as boating, fishing, hiking, and horseback riding, or in the case of the natural areas, protecting sensitive environments. Careful attention must therefore be paid to serving the majority of residents by providing quality neighborhood and community parks, sports complexes, greenways, and recreation programs that address more urgent urban needs.

It is important that the City of San Antonio continue to assure that other large recreation facilities in the metropolitan area like those mentioned above be made available and accessible to the public. Though the City of San Antonio will develop facilities (in the future) to serve both local, urban, and more general metropolitan needs, it will increasingly need to rely on cooperation with other public and private interests. The need for collaboration with other entities is dictated by shared needs and limited financial and physical resources of all area agencies.

One clear example of the need and opportunity for collaboration is the identification, evaluation, and preservation of parkland resources in the city and the region. For example, floodplains such as Leon and Salado Creeks and the San Antonio River have tremendous potential to be developed as multi-purpose linear greenways reaching into every sector of the community. They can be used not only to improve drainage and protect health, safety, and welfare, but to provide additional parks, hike and bike trails, and increased recreational opportunities, as well as to protect natural plant communities and wildlife habitat. In this way, floodplains can improve overall community aesthetics, link neighborhoods and public facilities, provide for multiple public uses, and assist with the cleaning of our air and water. The integration of drainage with parkland development will continue to require close cooperation between city departments, other public agencies, and private organizations and land owners. If successful, San Antonio will be a safer, more attractive, and livable community because of it.

When assessing the current ability of San Antonio's parks and recreation system to serve the community's needs, it is useful, though not fully conclusive, to compare the City's existing park acres per 1,000 residents to similar ratios for other major cities. It is important to remember that while other cities may have more park acres area-wide, it is the type of park land (i.e. neighborhood parks, greenways, etc.) and geographic distribution that helps determine if a community is adequately served. It is important to note that many cities calculate large tracts of inaccessible conservation land and large lakes and reservoirs in their park land inventory. Therefore, comparisons between cities must take this into account.

The chart below compares San Antonio with six other Texas cities and twenty-one municipalities throughout the nation in the number of park acres owned and/or managed. Included is other parkland owned by county, metropolitan, State, and Federal agencies within the boundary of the specific city. In some cases, city government is not the primary provider of local park lands. The data is the most recently available from the Trust for Public Land (2003).

Texas Cities

City	Population	Park Acres	Park Acres/1,000 Residents
El Paso	564,000	26,372	46.80
Austin	707,604	16,814	23.76
Ft. Worth	535,000	10,554	19.70
Dallas	1,189,000	21,670	18.20
San Antonio	***1,145,000***	***16,503***	***14.40***
Arlington	333,000	4,151	12.50
Houston	1,954,000	21,252	10.90

Selected United States Cities Outside Texas

City	Population	Park Acres	Park Acres/1,000 Residents
San Diego, CA	1,223,000	38,993	31.90
Kansas City, MO	442,000	13,782	31.20
Oklahoma City, OK	506,000	14,684	29.00
Phoenix, AZ	1,321,000	36,944	28.00
Virginia Beach, VA	425,000	11,258	26.50
Portland, OR	529,000	12,959	24.50
Cincinnati, OH	331,000	7,000	21.10
Honolulu, HI	876,000	17,538	20.00
Memphis, TN	650,000	10,490	16.10
Minneapolis, MN	383,000	5,694	14.90
San Antonio	***1,145,000***	***16,503***	***14.40***
Las Vegas, NV	478,000	5,416	11.30
New Orleans, LA	485,000	5,228	10.80
Seattle, WA	563,000	6,024	10.70
Sacramento, CA	407,000	3,694	9.10
Atlanta, GA	416,000	3,235	7.80
Philadelphia, PA	1,518,000	10,621	7.00
Tucson, AZ	487,000	3,175	6.50
Detroit, MI	951,000	5,890	6.20
Long Beach, CA	462,000	2,792	6.00
Fresno, CA	428,000	1,323	3.10

* Source: The Trust for Public Land, "The Excellent City Park System", Peter Harnick, 2003.

2. Need For Programs

While the comparison of population and park acreage serves as a guide to determining need for facilities, the need for programming is complicated by many factors. It is here that the profile of community residents including age, income, and ethnicity plays a significant role. When these population statistics are combined with social statistics such as educational level, juvenile arrests, and births to young and/or single mothers, a profile emerges of needs that should be addressed as much as practicable through city programs. Using this profile, existing and proposed facilities and programs can be studied to assure that they meet these community needs.

It is important to note that typical park system plans in this country have been centered solely on physical needs based on numerical standards. This has been true in San Antonio's previous park system plans as well. The Parks and Recreation System Strategic Plan, however, is based on the premise that physical improvements, including park acquisition and facilities' development, can only be planned and recommended if the programmatic needs of the community are identified first.

Physical improvements are primarily funded through capital campaigns and general bond issues, whereas maintenance of those physical improvements, policing, and program development are primarily funded through annual operating budgets. This interrelationship of funding is critical to the viability and sustainability of all facilities and their related programs.

Additionally, all programs offered, or to be offered, by the City of San Antonio do not require a typical community center or recreation facility to be successful. Programs such as the Roving Leader program are "mobile" and can be offered at a variety of sites including city parks, private neighborhood centers, schools, and churches. The dependence on a fixed facility and its related operation and maintenance costs can be lessened using this approach.

II. PLANNING AND ASSESSMENT

The City is currently expanding the availability of facilities and programs historically perceived as "inaccessible", such as golf courses and tennis centers. Creating sustainable activities for low income and non-traditional users of such facilities, especially youth who live near the facilities, will remain a high priority. Access to other traditionally non-urban activities such as hiking, boating, and fishing must also be pursued. These activities should also be made available through existing facilities, such as golf course parking areas for trail heads, public pools for snorkeling and scuba diving training, etc...

III. CLASSIFICATIONS

A. INTRODUCTION

San Antonio's parks are all unique in their location, size, and type of facilities and amenities. Likewise, the City's recreation programs vary widely by content, audience, and the place and time they are offered. When San Antonio's parks and recreation system was evolving in the late 19th and early 20th centuries, little thought was given to planning.

San Antonio's parks are found where 18th century Spanish colonists established them; where real estate developers sought to create green space for their subdivisions regardless of adjoining areas; where individuals were able to donate and/or sell unwanted land to the City; and where parks were located for political expediency. Historically few of San Antonio's early existing parks were located based purely on the needs of its citizens. Only recently was more effort made to acquire and develop parks in areas of fastest growth.

Today, however, it is important to continually analyze San Antonio's existing or proposed park and recreation facilities and programs to determine how they do (or can) address specific community needs. The nature of each facility and program must be studied to determine if it is achieving its potential. Are facilities suited to the community's needs and are they receiving maximum use? Are programs designed to meet specific community needs and are they reaching the maximum target audience?

B. PARK CLASSIFICATIONS

To assist with this analysis, a list of park classifications has been developed that describes the key features of each type of park facility. Each existing park is assigned to one classification according to its predominant characteristics. It is recognized, however, that a park may have characteristics of, and be assigned to, one or more classifications. The classification of existing parks is found in the city-wide park inventory in the next Chapter, as well as in each park planning subarea inventory.

An estimated cost range for developing traditional park types has been established (in 2005 dollar figures). This cost will vary depending on the types of facilities included in the park-- decisions that are based on site constraints, budget, and community input. These cost ranges are stated in the following section and detailed cost breakdowns are found in Appendix C. It is important to note that all facilities, whether rehabilitated or new, require compliance with all local, state, and federal codes, most notably the Americans with Disabilities Act (ADA), and safety codes dealing with playgrounds. This compliance can have a dramatic impact on the cost of a particular facility.

1. NEIGHBORHOOD PARK (NP)

a. Definition

Neighborhood parks are the basic unit of a park system, and are recreational and social centers for those living in the nearby service area. Neighborhood parks are not intended to be used for programmed activities that attract city-wide users and that could result in overuse, noise, parking problems, and congestion. It is important for these parks to be easily accessible from throughout the neighborhood area, and for particular attention to be paid to non-vehicular access. Trails or sidewalks and low-volume streets may all be used to provide access. Playgrounds are usually a high priority. Restroom facilities for users are not normally included because of access to home by users. Off-street parking should be minimal. Park lighting should be primarily for safety and security.

b. Recommended Size

- Optimum size is from 3 acres to 10 acres.

c. Recommended Uses
- Neighborhood parks should balance active and passive uses as appropriate.
- Active use facilities include play structures, sport courts, and informal play fields.
- Passive use facilities include trails, picnic areas, small shelters, and vegetative conservation/ornamentation areas.

d. Basic Facilities Menu

The cost of developing a typical neighborhood park may range from $125,000 to $400,000. Costs are dependent on existing site conditions and the level of development as determined with community input. A typical neighborhood park may include one or more, but rarely all, of the following amenities.
- Playground
- Basketball/Multi-use court
- Skate plaza
- Park toilet
- Informal play fields/open space
- Walking trails
- Utilities
- Security lighting
- Parking/access control
- Park furnishings
- Landscaping

2. COMMUNITY PARK (CP)

a. Definition

A community park meets the recreational needs of several neighborhoods and may also preserve unique landscapes and open spaces. These parks accommodate group activities and recreational facilities that are not provided in neighborhood parks. Community park sites should be accessible by arterial and collector streets. Restroom facilities and off-street parking for facility users should be considered. Park lighting should be for security and safety as well as facility use.

b. Recommended Size
- While the optimal size for a community park is between 10 and 50 acres, acreage should be based on the land area needed to accommodate desired uses. Size may also vary with the demographic profile, population density, resource availability, and recreation demand within the service area.

c. Recommended Uses
- Community parks should provide for both active and passive uses. Recreation centers, gymnasiums, and cultural activity facilities may be appropriate.
- Active use recreation facilities may include large play structures, sport courts, formal ball fields, and swimming pools.
- Passive use recreation facilities may include trails, individual and group picnic areas, open recreation areas, and unique landscape features.

d. Basic Facilities Menu

The cost of developing a typical community park may range from $600,000 to $4,900,000. Costs are dependent on existing site conditions and the level of development as determined with community input. A typical community park may include one or more, but rarely all, of the following amenities.

- Large playground
- Basketball/Multi-use court with lighting
- Concrete skate park
- Park toilet(s)
- Restroom structure
- Tennis court
- Volleyball court
- Youth athletic fields
- Swimming pool with bathhouse
- Trail
- Individual picnic facilities
- Group picnic facility
- Recreation center
- Utilities
- Security lighting
- Parking/access control
- Park furnishings
- Landscaping

3. LARGE URBAN PARK (LUP)

a. Definition

Large urban parks supplement neighborhood and community parks, serving broader community-based recreation needs in addition to those addressed by neighborhood and community parks. These parks may include large areas of undeveloped land with natural vegetation and/or water features. Park location is determined by the size, quality, and suitability of available sites. Restroom facilities and off-street parking should be provided for facility users. Park lighting should be for security and safety as well as facility use.

b. Recommended Size

- While the optimal size for a large urban park is over 50 acres, each park is unique. Park size should be based on acreage needed to accommodate desired uses as well as the demographic profile, population density, available resources, natural conditions, and recreation demand in the service area.

c. Recommended Uses

- In large urban parks, land is distributed between active and passive uses on a site-by-site basis.
- Active use recreation facilities may include trails, individual and group picnic areas, open recreation areas, unique landscape features, and cultural events facilities.
- Passive use recreation facilities may include trails, individual and group picnic areas, open recreation areas, unique landscape features, and cultural events facilities.

d. Basic Facilities Menu

The cost of developing a typical large urban park may range from $1,250,000 to $6.000,000. Costs are dependent on existing site conditions and the level of development as determined with community input. A typical large urban park may include one or more, but rarely all, of the following amenities.

- Large playground
- Basketball/Multi-use court
- Concrete skate park
- Dog park

- Tennis court
- Volleyball court
- Sports fields
- Swimming pool with bathhouse
- Water spray playground
- Trail
- Trail lighting
- Disc golf course
- Individual picnic facilities
- Group picnic facility
- Restrooms
- Park toilets
- Allowance for unique landscape feature development
- Recreation center
- Utilities
- Security lighting
- Roads, parking/access control
- Accessible walks
- Park furnishings
- Landscaping

4. SPORTS COMPLEX (SC)

a. Definition

Sports complexes consolidate programmed athletic fields and associated facilities at large sites which are to be strategically located throughout the community. Sports complexes, unlike neighborhood and community parks, are meant for city-wide use. These complexes should be located within reasonable driving distances of target populations, and adjacent to non-residential land uses. They relieve the negative impacts on smaller parks such as over-use, noise, traffic congestion, and parking issues. Adequate spectator seating and parking should be provided. Lighting should be for security, safety, and facility use.

b. Recommended Size

- The size of a sports complex is determined by projected need and programs and activities.

c. Recommended Uses

- Facilities at sports complexes are determined by demographic profiles, age group populations, and participation rates, as well as program offerings and projected demands of user groups and athletic associations.
- Sports complex facilities may include ball fields, soccer and football fields, game courts, play structures, swimming pools, gymnasium, aquatic facilities, sports stadiums, golf courses, disc golf courses, tennis centers, multipurpose buildings, and appropriate support facilities.

d. Basic Facilities Menu

The cost of developing a typical sports complex varies depending on facilities. Costs are dependent on existing site conditions and the level of development as determined with community input. A sports complex typically includes one of the following amenities.

- Softball complex
- Soccer complex
- Tennis complex

- Athletic center building
- Natatorium
- Golf course
- Disc golf course
- Large concrete skate park

5. NATURAL AREA (NA)

a. Definition

Natural Areas are park sites established for the protection and stewardship of outstanding natural attributes of local, regional, and statewide significance. Natural Areas are intended to be used in a sustainable manner for scientific research, education, aesthetic enjoyment, and appropriate public use not detrimental to the primary purpose. Minimal infrastructure may include access, parking, signage and security lighting as appropriate. For additional information on the development and management of Natural Areas refer to this documents companion, *"Volume 3: Land Use and Management Planning Guidelines for Natural Areas"* (January 2003), included herein.

b. Recommended Size

- The size and location of natural areas are determined by significance, availability, and opportunity to conserve the resource.

c. Recommended Uses

- These areas are resource rather than user-based, but some passive recreation opportunities such as nature study, hiking, biking, and picnicking may be provided.
- Preservation of the resource integrity must guide development.

d. Basic Facilities Menu

The cost of developing a typical natural area may range from $100,000 to $250,000. Costs are dependent on existing site conditions and the level of development as determined with community input. A typical natural area may include one or more of the following amenities.

- Parking/access control
- Trailhead facility
- Multi-purpose trails (hiking, biking, and/or equestrian)
- Park toilets
- Park furnishings
- Utilities

6. GREENWAY (GW)

a. Definition

Greenways are linear features that emphasize harmony with the natural environment. Their purpose is to allow safe, uninterrupted pedestrian movement along both natural and/or man-made corridors. They will often follow suitable natural features such as rivers and creeks, but may also follow man-made corridors including revitalized waterways, drainage ways, utility easements, and abandoned railroad beds. Greenways may connect neighborhoods and/or natural landscape features and provide non-motorized transportation routes as well as recreation opportunities. Minimal infrastructure may include access, parking, signage, and security lighting as appropriate. For additional information on the development of Greenways refer to this documents companion, *"Volume 2: Planning and Design Guidelines for Creek Based Greenway Parks"* (May 2001), included herein.

b. Recommended Size
- Greenway width typically is a minimum of 200 feet. Location is determined by resource availability, linkage need, and opportunity of utilizing the resource.

c. Recommended Uses
- Greenways can accommodate various modes of travel, notably hiking, walking, jogging, and bicycling.
- Greenways can provide passive recreation opportunities such as nature study, hiking, and picnicking.

d. Basic Facilities Menu
The cost of developing a typical greenway may range from $100,000 to $650,000. Costs are dependent on existing site conditions and the level of development as determined with community input. A typical greenway may include one or more of the following amenities.
- Multi-purpose trails (hiking, biking, equestrian)
- Trailhead facility
- Parking/access control
- Park toilets
- Park furnishings
- Utilities

7. HISTORIC RESOURCE (HR)

a. Definition
Historic resources are sites, structures, buildings, and individual park items or features set aside to preserve and enhance their historic, cultural, and archaeological significance.

b. Recommended Size
- The size and location of historic facilities are determined by resource availability and significance and opportunity of utilizing the resource.

c. Recommended Uses
- The use of historic facilities is determined by the unique nature of each resource.
- Preservation of the resource must guide development.

d. Facilities Cost Estimate
Cost varies with site and use.

8. SPECIAL USE FACILITY (SUF)

a. Definition
Special use facilities have a broad range of single-purpose uses. The service area for these facilities is community-wide. Each facility is unique, and should be developed as determined with community input.

b. Recommended Size
- The size and location of special use facilities are determined by community interests, type of facility, and land availability.

c. Recommended Uses
- Special use facilities may be sites such as downtown plazas, botanical gardens, amphitheaters, and cemeteries.

d. Facilities Cost Estimate
Cost varies with site and use.

9. URBAN SPACE (US)

a. Definition
Urban space includes a broad range of remnant landscapes related to metropolitan area development including parkways, ornamental areas, medians, traffic islands, and minor drainage ways.

b. Recommended Size
- The size and location of urban spaces are primarily determined by resource availability and opportunity of utilizing the resource.

c. Recommended Uses
- Urban spaces are primarily ornamental or utilitarian, with site visibility as a criterion.

d. Facilities Cost Estimate
Cost varies with site and use.

C. PROGRAM CLASSIFICATIONS

Like park types, recreation programs may also be classified according to their particular attributes. Program classifications and types are generally based on the age of participants, the type of activity, the time of day or time of year the program is offered, as well as the location of where the program is offered. All programs offered by the Parks and Recreation Department are inventoried in the next Chapter.

1. AFTER SCHOOL CHALLENGE PROGRAM

The After School Challenge Program (ASCP) is implemented during both the traditional and year-round school year. The program works with eight area school districts and is currently running programs in 138 schools. Programming is provided Monday through Friday, for a maximum of three hours per day. The Program focuses on the elementary, middle school, and high school youth who may not be involved in extracurricular activities or whose only alternative is to go home after school.

2. AQUATICS

Aquatics programming occurs at any of the City's twenty-three outdoor community pools and two natatoriums. Learn-to-Swim classes, competitive swimming programs, and water aerobics classes are offered at several of the pools. Lifeguard training is also offered at the San Antonio Natatorium for those seeking employment with SAPARD as a lifeguard. The Natatorium also offers swim lessons, water aerobics classes, lap swimming, and year round open swim periods. During the summer months when outdoor pools are open (9 – 13 weeks a year), admission to the pools are free of charge.

3. ATHLETICS

Athletics programming is offered through organized sports for both youth and adults. Youth activities include amateur boxing, tennis, summer track and field meets, and girls fast pitch leagues and tournaments. Adult activities include men's and women's softball, basketball leagues, and league teams.

4. CULTURAL PROGRAM

Cultural programming provides art training to all people ages 5 and older. Various classes are offered including modern dance, hip hop, flamenco, folklorico, Afro-Brazilian, jazz, tap, fine arts, tumbling, fitness, guitar, percussion, voice classes, pageants, and talent shows. These all help to build self-esteem and confidence. Exposure to art education also helps to develop self-expression, critical thinking skills, and cooperation and appreciation of the work of others.

5. GOLF

The City operates seven municipal golf courses. PGA professionals are available to provide instruction and golfing tips. A junior golf program for area children ages 6 to 18 is offered throughout the year and includes instructional clinics, 9 and 18 hole tournaments, and other golf events.

6. OUTDOOR EDUCATION

a. Natural Area parks, including Friedrich Park, Eisenhower Park, Walker Ranch Historical Landmark Park, and Medina River Park offer educational opportunities for all ages. Participants can learn bird watching, native plant use and identification, geology, archaeology, stargazing, and much more. These parks are open seven days a week, but some are closed on Christmas and New Years days. Each park has trails accessible to people with disabilities.

b. The San Antonio Botanical Gardens offers classes in a variety of subjects and study areas including landscaping, herb gardening, plants that attract butterflies, and decorating with natural plant material. Additional programs are offered for children's gardening.

7. RECREATION (Year Round, Community Centers, and Summer Programs)

The City's 26 Community Centers provide recreational and educational programs throughout the year. The programs are designed to serve both youth and adults and supervised by recreational professionals. Additionally, programs include Kid Quest Summer Program at approximately 40 school sites, Play Zone Summer Program, Teen Connection, and Summer Food Service Program, providing free lunches during the summer, holiday camps, camping programs, teen clubs, Bike Expo, Camping Adventure, arts and crafts, organized games and tournaments.

8. THERAPEUTIC RECREATION

The Therapeutic Recreation Program provides recreational programs for both youth and adults with special needs. The program provides and outlet for participants to be involved in constructive recreational pursuits. Activities include an Adult Day Program where participants develop recreational, social and life skills in a structured setting. The Blaze Sports Program offers wheelchair sports activities in tennis, track & field, fencing, basketball, rugby and various wheelchair sport tournaments. Special events include dances, parades, flea markets, bowling and other events. The TR program also offers participation in Special Olympic events. Youth programs also include a Summer Day Program and an Outreach Program to the schools.

9. VOLUNTEER PROGRAM

The Volunteer Services Division provides concerned individuals and groups opportunities to assist in the clean-up and beautification of City parks. The City matches workers with selected sites (workers may also choose their own site), designs the project, and provides the tools and supplies needed for the project. All age groups are invited and encouraged to participate. Tasks

include painting, trash pick up, and digging grass from playground "fall zone" areas. In FY 2003-2004, there were 4,840 volunteers who helped keep city parks clean and safe.

10. YOUTH ATHLETICS

Youth Athletics provides programming for young people ages 6 to 19. All activities are designed to help participants develop self-confidence, self-esteem, and an understanding of the value of team play. Activities include flag football, volleyball, soccer, Spurs Drug Free Basketball, fishing contest, Elks Soccer Shoot Out, Punt, Pass and Kick, NBA Two Ball Competition, Inner City Games, and the Alamo City Shoot Out Basketball Tournament. These activities take place in community centers and other city

IV. INVENTORY

An inventory of all facilities owned and/or operated by the City of San Antonio, Bexar County, San Antonio River Authority, Texas Parks and Wildlife Department, National Park Service, City Public Service, and 22 other incorporated cities was compiled for this document. All programs offered by Parks and Recreation Department were also inventoried, either at its own facilities or sites used through partnerships.

These inventories will assist in understanding the extent to which San Antonio's parks and recreation system meets the adopted strategic initiatives and objectives. In addition, the inventories will help determine what action must be taken to assure that the City continues to meet these goals and objectives in the coming 10 years and beyond. By taking an inventory of the facilities of other public agencies, the role of San Antonio's parks and recreation system can be understood in a community-wide context. City facilities and programs are mapped within each planning subarea in Chapter VII.

A. INVENTORY OF FACILITIES

On June 1, 2005, the City of San Antonio provided 202 park facilities totaling 16,100 acres to serve 1,282,800 residents. San Antonio residents also have access to 33 facilities encompassing 7,184 acres of park land owned and operated by public entities including 9 other incorporated cities (out of 22 incorporated cities in the county), Bexar County, San Antonio River Authority, City Public Service, the Texas Parks and Wildlife Department, and the National Park Service. Not included in these facilities are Braunig and Calaveras Lakes which contributes 5,050 acres of open water. The diagram at the end of this Chapter demonstrates the distribution of parks and recreation facilities managed by the City. These include swimming facilities, golf courses, and community centers.

B. INVENTORY OF PROGRAMS

All programs offered by the Parks and Recreation Department, either at its own facilities or sites used through partnerships, were inventoried for the System Plan. Programs were inventoried according to their content, age of audience (youth or adult), frequency (year around or seasonal), and location. Participation figures for Fiscal Year 2004 were also compiled. This information was used to define ten program classifications, and within those, numerous program types and over seventy different programs that are offered by the Parks and Recreation Department. These programs are offered at both City-owned and non-City owned facilities throughout the community.

PARK INVENTORY OF CITY-OWNED AND/OR OPERATED PROPERTIES AS OF MAY 5, 2006

	GENERAL						RECREATION FACILITIES																						
																Play Fields					Courts								
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquisition	Restroom	Pavillion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr/Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
ACEQUIA** 8500 Mission Pky	78223	LUP	73.100	22.50	3	S	1965	P/DO	1			30													H,S			R	Fishing, Canoeing
ACME 534 S. Acme Rd.	78237	NP	2.800	2.80	6	W	1963	DE	1	1 P	1	9					1				2(L)			1 V,B	H	0.17	C		Open Play Area
ADAM'S HILL 2003 Hunt Lane S	78245	NP	1.641		4	FW	2000	P																					
ALAMO PLAZA 300 Alamo Plaza	78205	HR	1.100	1.10	1	C	1950	SLG		1G					810														Cenotaph
ALDERETE, CLARISSA 300 Aurora	78228	NP	9.600	9.60	5	W	1952/53	DO	1	1P	1	13					1(L)	2(L)		2	1(L)			1 V,B	H		C		
AMISTAD 1600 Tampico	78207	NP	16.250	16.25	5	W	1971	DO				20					1	1											
APACHE CREEK 2901El Paso St	78207	GW	80.800	74.80	5	W	1971	P				19									1				H			C/S	
ARNOLD, HENDRICH 1011 Gillette Road	78224	CP	24.600	24.60	4	S	1972	P	1	1S	1(L)	12		1	11,897		1(L)			2 (L) FB, R, SC	1(L)		2		H	0.62	A		Ramirez Community Center
BAMBERGER 12401 Babcock Rd	78249	NA	70.910	6.20	8	NW	1997	DO																	H	2.45	C,D, O		
BELLAIRE 733 Ansley Road	78221	NP	6.500	6.50	3	S	1950	DE	1	1P	2	4									1				H	0.15	C,D	C/S	Skate Plaza
BELMEADE *** 119 W. Hathaway	78209	NP	4.400		9	N	1945	DE																	H				
BENAVIDES, FATHER ALBERT 1500 Saltillo	78207	NP	8.000	8.00	5	W	1973	DE	2	1P		10			1,290		1(L)				2(L)	2(L)							Open Play Field, Plaza
BLOSSOM, VIRGIL T. ** 15015 Heimer Road	78232	CP	17.600	17.60	9	NE	1972	P		1P	1	10				1				1 BB,SB, FB,SC	2	2							
BRACKENRIDGE 3700 N. St. Mary's	78209	LUP/ HR	349.642	349.64	9&1	N	1899/1908/ 15/16/17 /08	SLG/ DO/P	5	3P	2(L)	195		1			1 2L								H, S	0.44		R	Train, Japanese Tea Gardens, Polo Field, Driving Range, Lions Field Adult Cntr. Sunken Garden Theatre, Tuesday Music Club, Shuffle Board
BRACKENRIDGE GOLF COURSE 2315 Avenue B	78215	SC	113.600	113.60	1	N	1899	DO	2					1	4,300													R	18-Holes, Clubhouse, 2 Putting Greens
BROOKS *** 3605 Goliad Road	78235	SC	21.400	21.40	3	S	1975	O										1		3 FB, SC, R									
BROWN 9601 Villemain Road	78214	SUF	26.500		3	S	1977	P																				P/L	Fishing, Canoeing, Open Play Area
BUCKEYE 1600 W Wildwood	78201	NP	0.500	0.50	1	N	1945	P			1	4									1(L)								Open Play Area
CALAVERAS 10441 New Sulphur Springs Road	78101	LUP	146.700	0.00	0	E	1990	Do																				P/L	
CALDERON BOYS' & GIRLS'S CLUB *** 600 S.W. 19th Street	78207	SUF	2.500	2.50	5	W	N/A	N/A			1		ISR	1							1								
CAMARGO, MATEO 5738 Castroville	78227	SUF	45.000	15.00	4	SW	1927/ 35/41	P	1	3P	1(L)	32																	
CANYON RANCH/MABE	78023	NA	421.005		6	FW	2005	P																					
CASSIANO 1728 Potosi	78207	CP	5.200	5.20	5	W	1898	P	1	1P	1(L)	10	ISR								1(L)								Bathhouse

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CATALINA 1400 Fresno	78201	US	0.800	0.80	1	W	1942	P																					FAA Antenna and Shed
CATHEDRAL ROCK 8400 Old Grissom	78251	CP	56.863		6	FW	2000/01	P																					
CEDAR CREEK 9680 Menchaca	78255	NA	239.300		8	NW																							
CEDAR CREEK GOLF COURSE 8250 Vista Colina	78255	SC	172.720	172.72	8	NW	1991	DE	2																				Clubhouse, 1 Putting Green, 18-Hole Course, Driving Range
CHESTNUT SPRINGS PARK INGRAM RD		NP	3.550		6	FW	2006	DO																					
CHRIS HILL	78254	NA	710.000		6	FW	2003																						
COLISEUM OAKS 101 Ambrosia	78220	NP	3.840	3.84	2	E	1999	DO/P			1														H	0.38			Open Play Area
COLLINS GARDENS 1525 Nogalitos	78404	NP	8.400	8.40	5	W	1917	DO	1	1S	1	7									2	2		2L, B,V	S	0.79 (L)	D		Open Play Area
COLUMBUS 500 Columbus	78207	NP/ SUF	2.100	2.10	1	C	1885	SLG	1	3S											1(L)			3					3 Boccie Courts, Statue, Fountain
COMANCHE LOOKOUT 15551 Nacogdoches	78247	LUP/ HR	99.731	52.00	10	NE	1994	P				5													NH	2.2	A/C/O		Historic Stone Tower
COMMANDER'S HOUSE 645 S. Main	78204	HR	2.300	2.30	1	S	1972	DE	4					2															Senior Citizen/Adult Center; Gardens
CONCEPCION 500 E. Theo	78210	CP	21.400	21.40	3	S	1925	P	1		1(L)	34	1SR								1(L)								Bathhouse
COPERNICUS, NICHOLAS 5003 Lord Road	78220	CP	21.000	21.00	2	E	1972	P		1P	1	8		1	11,368		1(L)	2 SC	1	1 FB, SC	1(L)	2(L)		1	H	0.5 (L)	A		Open Play Area
CROCKETT 1300 N. Main	78212	NP/ SUF	5.300	5.30	1	N	1875	O		1G	1	9													H				Open Play Area, Statue
CROWNRIDGE 7222 Luskey Blvd	78256	NA	207.790		8	NW	2001	3																					
CUELLAR, PATROLMAN RICHARD 5626 San Fernando	78237	CP	27.000	27.00	6	W	1972	P	2		1	6	1SR	1	18,354	1	1		1	1BB, SB,FB,SC	1(L)	2(L)	1	1 B,T	H	0.5	A		Open Play Area, Bathhouse, Concession Building
CULEBRA CREEK 11225 FM 471 W	78254	CP	145.300		6	FW	2000	DO																					
DAFOSTE 210 Dafoste	78220	NP	15.100	11.00	2	E	1977	P	1		1(L)	4									2(L)	2(L)							
DAWSON, ROBERT B. 2500 E. Commerce	78203	CP	4.200	4.20	2	E	1890	DE			1			1	10,824		1				2(L)	1		1 B,V					Open Play Field
DELLCREST 1701 Diane	78220	NP	6.000	6.00	2	E	1958	DE			1						2												
DELLVIEW 507 Basswood	78213	CP	5.500	5.50	1	N	1953	DE	2	1P	1	12	1SR						1	1(L) SB, SC				1 B,V					Bathhouse
DENVER HEIGHTS 300 Porter	78210	CP	4.200	4.20	2	E	1891	DE						1	11,948					1 BB, SC	1(L)	2							
DIGNOWITY 701 Nolan	78202	NP	3.200	3.20	2	E	1951	P		1P		9									1								Plaza Area, Tables and Benches
EISENHOWER, DWIGHT D. 19399 NW Military Hwy.	78257	LUP/ NA	323.000	50.00	8	FN	1973	DO	2	3P	1	94													H,S, NH	1.8/ 4.55	A/O	C/S	Nature Trails, Camping, Caretaker's House

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ELMENDORF LAKE 3700 W Commerce	78237	CP	29.600	29.60	5	W	1917	DO	2	1	1(L)	26	1SR			1(L)												P/L	Bathhouse, Caretaker House
ESCOBAR FIELD 1400 S. Zarzamora	78207	SC	6.000	6.00	5	W	N/A	N/A													2(L)	2(L)	1(L)	3					Two Lighted Handball Courts
ESPADA* 1750 S E. Military	78214	GW	10.800	10.80	3	S	1978	L	1			8													H				Fishing
FAIRCHILD, EURETTA 1214 E. Crockett	78202	CP	6.800	4.00	2	E	1923 - 1979	P	2		1(L)	6	1SR									14(L)							Bathhouse, Tennis Center, Clubhouse
FARIAS, MARIO* 1012 Leal St	78207	NP	2.100	2.10	1	W	1975	P	1	1P	1(L)	5									1(L)								
FLORES, JIMMY 803 Southcross	78211	CP	8.360	8.36	4	SW	1955	DE	1		1(L)	20	1SR	1***			1(L)	2	1	BB, SC, FB, R	1		2		H,S	0.66	C,D		Bathhouse; Y.M.C.A. Lease
FORGE, AL 1900 W. Pyron	78211	NP	3.100	3.10	4	SW	1976	P	1		1	4					1				1	1							
FALCONE, NANI 7625 Mystic Park	78254	CP	65.510	5.00	7	FW	1996 /2001	P	1	2	5									1								C/S	
FOX PARK 6518 Hausman Road	78249	CP	34.804		8	NW	2005	P																					
FRIEDRICH, EMILE AND ALBERT 21395 Milsa	78256	NA	279.730	40.00	8	NW	1973 /2001	DO/P	2			6													H,S, NH	75/ 3.67	A/O	P/L C/S	Nature Trails, Signage for Impaired,Outdoor Education Facility
FRIESENHAHN 15701 O'Connor Road	78247	NP	11.800	11.80	10	NE	1979	DE		1P		4													H,S, NH			P/L	
GARCIA 1200 N Frio	78207	NP	6.000	6.00	5	W	1925/35/36	P				4													H				
GARZA, GILBERT 1450 Mira Vista	78228	CP	21.500	21.50	7	W	1972	P	1		1		1SR	1	14,592	1	1	2		2 B, SC FB	1(L)	2(L)	1(L)	2 B,T	H				Bathhouse; Gilbert Garza Community Center
GATEWAY TERRACE 5605 Stony Brook	78242	NP	5.300		4	SW	2004																						
GOLDEN COMMUNITY 7801 Somerset Road	78211	CP	15.990	6.00	4	SW	1994	P		1S	1										2(L)					0.25	D		Open Play Area
GRANADOS 500 Freiling	78213	CP	5.000		1	N																							
HAMPTON 12725 HWY 211	78254	NA	50.000		8	FW	2003	P																					
HARLANDALE 301 Sussex	78221	CP	11.100	11.10	3	S	1950 & 1977	P	2		1(L)	14		1	7,800		1(L)			1 SB, FB	1(L)								
HASKIN 200 Haskin	78209	NP	0.900	0.90	10	N	1955	DE			1(L)														S	0.25	D		
HAUSMAN ROAD PARK 7038 Hausman Road	78249	CP	24.055		8	NW	2005	P																					Open Play Area
HEALY MURPHY 210 Nolan	78205	NP	1.000	1.00	2	E	1978	P			1(L)										1								Open Play Area; Dullnig House
HEMISFAIR 600 Hemisfair Park	78205	SUF	150.000	150.00	1	C	1975	DE	3	1P	1														H			WP	Tower of Americas, Historic Structures
HERITAGE-DUCK POND 900 Ellison Dr. S.	78245	NP	6.734	6.73	4	FW	2001	DO	2	1P	2	9									1(L)				C/D	0.53		WP	
HERRERA, FERNANDO Q 130 "I" Street	78210	NP	4.500	4.50	2	E	1919 & 1980	P	1		1(L)	4					1(L)				1(L)								

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HIGHLAND 901 Rigsby	78210	CP	4.900	4.90	3	E	1926	P			1			1	2,257							6(L)		1 V,B					James A. Bode Recreation Center, Open Play Area
HIGHLAND HIGH SCHOOL TENNIS COMPLEX* 3119 Elgin	78210	SC	0.800	0.80	3	E	Leased	L														4(L)							
HISTORIC CITY CEMETERIES 2015 E. Commerce	78202	SUF	46.730	46.73	2	E	1894-1898	SLG/DO																					Office Building
HUEBNER CREEK 6300 Whitby Road	78240	NP	11.140		7	NW	2001	P																					
INGRAM HILLS 3803 Majestic Dr	78228	NP	3.280		7	W	2001	P																					
IRON HORSE CANYON 12751 FM 1560 N	78023	NA	594.578		6	FW	2001	3																					
"J" STREET 3500 "J" Street	78220	NP	11.800	11.80	2	E	1970	P	1	1P	1	10					1(L)				2(L)	1(L)			H,NH			C/S	Play Field with Backstop, Fishing
JAMES, JOHN 1300 Rittiman Road	78234	LUP	89.600	40.00	2	N	1973	DO			1	5				2		1SR							H,S, NH	0.5	D	C/S	
JOHNSON, LADY BIRD 10700 Nacodoches	78217	LUP/ SC	77.800	77.80	10	NE	1972	L	2		1	2\7		1, 1***	11,166		4(L)	4JR, 1SR	1		1	1						C/S	Community Center, Alva Jo Fisher Complex, Comcessions, Skate Park
JOHNSON FOUNTAIN, LADY BIRD 300 E. Crockett	78205	US	0.100	0.10	1	C	1974	O																				F	
KALLISON, MORRISON 9500 Moroga	78217	NP	15.200	7.60	10	NE	1972	P				5					1												Open Play Area
KALLISON RANCH*** 13651 Kallison Ln	78254	NA	1163.810		6	FW	2002	P																					
KARDON, LOU 6161 Gibbs Sprawl Rd	78218	CP	23.390	10.00	2	N	1998	P	2		1	3					2								NB	0.51	O		Open Play Area
KELLY AREA 949 W. Thompson Place	78226	NP	3.500	3.50	5	SW	1998	P				1													S	0.25	A		
KENNEDY, JOHN F. 3101 Rose Lawn	78226	SC	39.400	39.40	5	SW	1979	P	2	1P	1L	10	1SR			2	4(L)			2 SB, FB, SC	2	9(L)		1	H	0.5	A		Concessions, Bath House
KENWOOD 305 Dora	78212	CP	6.470	6.47	1	N	1976	DE			2	11		1	8,369		1(L)				1(L)				H				
KING, MARTIN LUTHER 3503 M.L. King Drive	78220	LUP	177.234	60.00	2	E	1972/2004	P	2	2P	1	42	1SR	1	36,400		1(L)				2 1(L)	2			H	0.33	A	C/S	Fishing, Eastside Boys' & Girls Club Lease
KING, MARTIN LUTHER PLAZA 2202 E. Houston Street	78202	SUF	0.300	0.30	2	E	N/A	O																					Statue
KING WILLIAM 131 King William	78204	NP	0.700	0.70	1	S	1901	P/DO	1G						378														
KINGSBOROUGH 350 Felps	78221	CP	12.900	4.00	3	S	1979	DE	1			4	1SR								1								Bathhouse
LA VILLITA 418 Villita Street	78205	HR	3.600	3.60	1	C	1939/40/43/67	P	10																			R	28 Building Complex of Shops, Plazas, and River Theatre
LACKLAND TERRACE 7902 Westshire	78227	CP	7.200	7.20	4	W	1972	P			1	2		1	2,200	2(L) 1		1							S	0.25	D		Baseball Buildings, Community Center

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LAKESIDE 5640 Lakefront Dr	78222	CP	30.420	3.50	2	E	1998	P				3													H,NB	0.64		P/L	
LAREDO CULEBRA		NA	55.477				2009	DO																					
LAS PALMAS 503 Castroville Road	78237	CP	5.500	5.50	5	W	1974	P		1S	2(L)	4		1***	6,000		1(L)			IFB,SC	1	2			S		D		Olga H. Madrid Y.W.C.A. Lease
LEE'S CREEK 1215 E. Sunshine	78228	NP	7.800	5.00	7	W	1986	DO																	S	0.15	D	C/S	Open Play Area
LEON CREEK GREENWAY - NORTHERN SEGMENT 12160 Babcock Road	78249	GW	135.585		8	NW	1997/98/00 01/05/06	DO/P																	S, NB			C/S	
LEON CREEK GREENWAY - CENTRAL SEGMENT	78251	GW	14.890		6	FW	2005	P																					
LEON CREEK GREENWAY - SOUTHERN SEGMENT		GW	7.066				2005	P																					
LEON VISTA 8561 Rochelle Rd	78240	CP	6.100	2.00	7	NW	1999	P						1	5205														
LEVI STRAUSS 6100 Old Hwy. 90 West	78227	CP/ GW	19.800	9.00	6	W	1981	DO		1S		7						4			1(L)			1(L) B,V				F	Open Play Area
LINCOLN 2915 E. Commerce	78202	CP	32.700	32.70	2	E	1927 - 1970	P	1	1S	1	3	3SR	1	10,614	1(L)	1(L) 2				2(L)								Multi-Service Center, Open Play Area, Bath House, Community Gardens
LOCKWOOD 801 N. Olive	78202	CP	3.800	3.80	2	E	1926	DO		1S	1(L)	4		1	8,718					BB, SB, FB 1(L)	1(L)								Open Play Area
LORENCE CREEK 14800 Henderson Pass	78232	GW	49.462		9	NE	1997/00 /06	P																	NH			C/S	
LOS ANGELES HEIGHTS 1700 W. Hermosa	78201	NP	0.690	0.69	1	W	1945	P													1								Covered Basketball Court
MADISON SQUARE 400 Lexington	78215	NP/ SUF	5.100	5.10	1	C	1858	DE				5													S	0.2	D		Ornamental Plantings, Benches, Plaza
MAHNCKE 3400 Broadway	78209	NP	10.000	10.00	9	N	1906	DO																	S	0.46	D		Statue and Fountain
MARKET SQUARE 514 West Commerce	78207	SUF	4.100	4.10	1	C	1894	SLG	6																			F	Mexican Market, Shops, Plazas
MARTINEZ, PATROLMAN GUADALUPE 201 Merida	78207	NP	9.800	9.80	5	W	1975	P	1	1P		6					1	1		I R,SC PB	2(L)	4(L)							
MAVERICK 1000 Broadway	78215	NP	3.000	3.00	1	C	1881	D		1P		2																	
MAYBERRY 12725 HWY 121	78254	NA	345.110		6	FW	2002	p																					
MCALLISTER, W.W. 13102 Jones-Maltsberger	78247	LUP/ NA	995.7947	450.00	9	NE	1963-1979 /2001	P,DO	5	4P	1	156				8(L)		11SR							H,S, NB	3	A	C/S	Bike Trails, Camp Sites
MCCLAIN 15700 O'Connor	78247	NP	97.497	0.25	10	NE	2001	P		1P		3																	
MEADOWCLIFF* 1260 Pinn Road	78227	CP	0.500	0.50	6	W	1976	DO						1	11,464														Meadowcliff Community Center
MEDALLION White Fawn Dr	78255	NA	145.500		8	NW	2002	p																					
MEDINA BASE ROAD 6303 Medina Base Rd	78227	CP	44.534		4	SW	2000	P	1	1G	2	9													H,S	0.25	C,D	C/S	

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Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquisition	Restroom	Pavilion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr.Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
MEDINA RIVER 15890 HWY 16 S	78264	NA	382.316	0.00	4	S		DO/O	2	1															H/NH	2.62			
MILAM 501 W. Commerce	78207	SUF	3.500	3.50	1	C	1733	SLG		1G	1	5													S/H	0.25	D		Plaza, Statue, Fountains
MILLER, DORIE 2802 Martin Luther King	78220	CP	1.040	1.04	2	E	1991	O	2		1			1							1								Covered Basketball Court, WIC CLinic, Gardens
MILLER'S POND 6175 Pearsall Road	78242	CP	42.200	10.00	4	SW	1976	P	1	1P	1(L)	12		1	8,113					2 BB, SB,FB	1(L)				H	0.25	A	P/L	Fishing
MISSION DEL LAGO GOLF COURSE 1250 Mission Grande	78221	SC	182.700	182.70	3	S	1988	DO/O	2																				Driving Range, 18 Holes, Club House
MISSION PARKWAY 3600 Mission Pkwy	78214	GW/ SUF	72.400	72.40	3	S	1968	P/DO				10													H	7.2	A	R	Fishing, Wood Bridges
MONTERREY 5909 W. Commerce	78237	CP	51.000	48.00	5&7	W	1962	P	1		1(L)	11	1SR	1	4,118		2(L)	4JR/ 1SR			1	4				0.4	D	C/S	Bath House; Melendrez Community Center
MONTICELLO 400 Club Dr.	78201	NP	0.500	0.500	7	W	N/A	N/A																	S	0.18	D		Historic Neighborhood
MORRILL 238 E. Hart	78214	NP	1.400	1.40	5	S	1944	DE			1	4									2(L)								
MUD CREEK 16675 Jones Maltsberger	78232	NA	67.370		10	NE	2001	DO/O																					
NAVARRO, JOSE ANTONIO 500 N W. 24th Street	78207	NP	3.000	3.00	5&7	W	1917/53/71/ 73	DE/P			1(L)	3					1				1								
NEW TERRITORIES 9023 Bowen	78250	CP	11.090	11.09	6	FW	1996 & 1999	P	1		1(L)	6	1	1							2(L)	2(L)			NB	0.45	D		Bath House
NORMOYLE 700 Culberson	78211	CP	30.200	30.20	5	SW	1960	P	3	1P	1(L)	10	1SR	1	11,698	1(L)	2(L)	1SR			1(L)	5							Bath House; Normoyle Community Center; 2 Shuffle Boards (L), Skate Plaza
NORTHAMPTON 8989 FM 78	78109	CP	20.607		2	N	2000	DO/O																					
NORTHRIDGE 821 Chevy Chase	78209	NP	4.600	4.60	10	N	1952	DE	1	1P	1	4					1												Concessions
NORTHSIDE TENNIS CENTER* 7001 Culebra	78238	SC	5.000	5.00	6	W	Leased	L	8				1SR	1		1(L)	1(L)	2(L)	1(L)	2 SC	1	10(L)	1						Pro Shop, Activity Bldg
OAKHAVEN 16400 Parkstone	78232	NP	9.500	9.50	9	NE	1972	DE				3					1				1	1			H, NH	0.47			
OAK HILLS 200 Edgeville	78229	NP	8.100		7	NW	N/A	N/A																					Open Space
OJEDA, WILLIE 1100 N. Trinity	78207	NP	2.300	2.30	1	W	1975	P			1	2									1								

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OLMOS BASIN 651 Devine	78216	LUP/ NA	1010.000	450.00	1&9	N	1925	SLG	2	1P	4	24		1	1,500	2(L)		5 2(L)	1					S, NH			C/S	Group Picnic Area, Gun Club, Party House, Driving Range, NEISD Leased Playing Fields
OLMOS BASIN GOLF COURSE 7022 N. McCullough	78212	SC	167.000	167.00	1&9	N	1963	SLG	1	1S																	C/S	Club House, 18 Holes, 2 Practice Greens
OLYMPIA 2101 Basse	78213	NP	2.100	2.10	1	N	1950	DE	1	1		3					1				1(L)							
PALM HEIGHTS 1201 W. Malone	78225	CP	2.000	2.00	5	SW	1910/29	DO			1(L)	1		1	16,357		1			1	1(L)	2(L)						
PALO ALTO 1625 Palo Alto Rd	78211	NP	12.000	12.00	4	S	1965	P		1P	1(L)	10					1			1	1(L)	2			H	0.4	A		Open Play Area
PALO ALTO TERRACE 9700 Celeste Dr	78211	NP	7.200	7.20	4	S	1974	P	1	1P	1(L)	6					1(L)				1(L)	1(L)							Open Play Area
PANTHER SPRINGS**** 21456 Blanco Road	78258	NA	281.190	42.32	9	FN	1991/ 2001	DO																					Leased to Y.M.C.A.
PEARSALL 4700 Pearsall	78242	LUP	231.709	15.00	4	SW	1966/ 1999	P	1																H				Enclosed Dog Park, Landfill Property to be converted to Park Land
PEREZ MEMORIAL, OSCAR 8601 Timber Path	78250	CP	17.017	0.00	6	FW	2001	P																					
PERSHING 500 Sandmeyer	78208	NP	1.900	1.90	2	N	1931	DO/P			1	3					1	1			1								Open Play Area
PICKWELL 6911 Pickwell	78223	NP	11.000	11.00	3	E	1957	DE	1		1(L)						1				2(L)	1			H,S	0.35	C,D		Open Play Area
PITTMAN-SULLIVAN 1101 Iowa	78203	CP	25.400	25.40	2	E	1933	SLG	2	1P	2	10		1***		1(L)	1(L)			1 BB, SB	3	2							Alamo Branch YMCA Lease, Open Play Field, Concessions
PLAZA DE ARMAS 100 Plaza De Armas	78205	SUF	1.200	1.20	1	C	1876	SLG	1																				City Hall, Statues; Historic Markers
PLAZA DE LAS ISLAS 100 E. Commerce	78205	SUF	0.900	0.90	1	C	1733	SLG																				F	Fountain
PORTAL SAN FERNANDO 100 Main Plaza	78205	SUF	0.2394	0.2394	1	C	1994	P																				F	
PRICE MEMORIAL, CAMILLE 100 Dalewood	78209	NP	5.300		10	N	1955	DE																					Open Play Area
PYTEL 6220 S. New Braunfels	78223	CP	34.400	34.40	3	S	1993	DO	1		1	15													H, NH	0.53	A		
RAINBOW HILLS 528 Rasa Drive	78227	NP	10.410	10.41	4	FW	1994/2002	DO	2	1P		8		1			1	1		1 FB, SC	1(L)				H	1	A		Exercise Course
RANCHO DIANA 9680 Menchaca	78255	NA	1392.69	10.00	8	NW	2001/2002	P																					
RIDGE CHASE PARK		CP	24.81		8	NW	2006	D																					
RIVERSIDE GOLF COURSE 203 MacDonald	78210	SC	175.80	175.80	3	S	1936	P	2																				18 Holes, 9 Holes, Par 3, Concessions, Club House
RIVERWALK S. Alamo to Lexington	78205	HF	15.400	15.40	1	C	1936	SLG	1																H	2.3	O	R	Shops, Restaurants, Barges, Outdoor Theater

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ROMANA PLAZA 100 Camden	78205	US	0.200	0.20	1	C	1920	P																					
ROOSEVELT 331 Roosevelt	78210	CP	12.900	12.90	5	S	1916	DO/P	1	1P	2	22	1SR								1(L)				H		C	R	Bath House
ROSEDALE 303 Dartmouth	78237	LUP	61.800	50.00	5	W	1945	DE/P	2	2P	2	35	1SR	1***	49,235	2(L)	1(L) 1	1(L)		1 FB, R, SC	1(L)	3(L)	1(L)	1	H	0.5	A/C	C/S	Westside Y.M.C.A. Lease, Mass Picnic Facility with Kitchen
ROYALGATE* 5801 Windy Hill	78242	NP	8.200	8.20	4	SW	1974	L			1	4								1 BB, SB, FB	1(L)	1(L)							
SALADO CREEK GREENWAY - NORTHERN SEGMENT	78231/78216	GW	77.721		9	FN	2003	P,D																					
SALADO CREEK GREENWAY - SOUTHERN SEGMENT		GW	190.790		2,3	E	2004, 2005	P,D																					
SAN ANTONIO BOTANICAL CENTER 555 Funston	78209	SUF	36.580	33.60	9	N	1905	P	3	7															H NH			P/L	Lake, Conservatory, Japanese Gardens, Observation Pavilion, Childrens Garden, Garden for the Blind, Gift Shop
SAN ANTONIO NATATORIUM 1430 W. Durango	78207	SC	2.900	2.90	5	W	1979	DO	4				1	1	33,280														
SAN FERNANDO GYMNASIUM 319 W. Travis	78205	SC	0.900	0.90	1	C	1974	P	4					1	22,000														
SAN JOSE BURIAL PARK 8235 Mission Road	78214	SUF	83.800	83.80	3	S	1895	N/A																					Cemetery
SAN JUAN-BRADY 2307 S. Calaveras	78207	CP	4.800	4.80	5	W	1977	DO			1(L)			1	13,330					1 SC FB,R	1(L) 1	2(L)							
SAN PEDRO SPRINGS 1315 San Pedro	78212	LUP/HF	46.000	46.00	1	N	1933	SLG	4	1G	1	15	1				2(L)					22(L)		1	H			C/S, P/	McFarlin Tennis Center, Theater, Gazebo, Bath House, Library, Springs, Concessions
SAN PEDRO DRIVING RANGE & PAR 3 6102 San Pedro	78216	SC	31.000	31.00	1	N	1976	N/A	1																				Driving Range, Clubhouse
SCATES 434 N Meadow Ln	78209	NP	0.700	0.70	10	N	N/A	N/A			1	5																	
SCHNABEL, "O.P." **** 9606 Bandera	78240	LUP	202.000	55.00	8	NW	1964	P	1	1	1	19		1	6,000	4					2				S NH	4.5	C/O	C/S	Y.M.C.A. Lease
SCHUCHARDT 12940 SH 211	78254	NA	87.000		8	FW	2003	P																					
SECOND BAPTIST* 3330 East Commerce	78220	NP	1.700	1.70	2	E	Leased	L			1	2									1(L)	1(L)							
SEELING 105 Placid Drive	78228	NP	1.500	1.50	7	W	1939	DE																					Open Play Area
SKYLINE 800 Green Valley	78219	NP	1.200	1.20	2	E	1955	DE			1					1	1				1(L)								Open Play Area
SLICK, TOM 7400 HWY 151	78227	CP	62.772	35.00	6	W	1999/2000	P	1							1		1		1					H,NH	0.5		P/L	
SMITH 1301 Buena Vista	78207	US	0.300	0.30	5	W	1916	DO			1	2																	
SOUTH SAN 2031 Quintana Road	78211	CP	1.300	1.30	5	SW	1948	P	1					1	13,875						1								
SOUTHSIDE LIONS 3100 Hiawatha	78210	LUP	600.100	275.00	3	E	1944/64	P/DO	5	4P	2	35	1SR	1	10,944	4(L)	3(L) 1				1	6(L)			H NH			P/L	Open Play Area, Fishing

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SPANISH GOVERNOR'S PALACE 105 Plaza de Armas	78205	HF	0.400	0.40	1	C	1929	P	1						4,850													F	Wishing Well, Museum, Gardens
SPICEWOOD 3139 Fidelia	78224	CP	31.800	3.50	4	S	1989	DO				2									1(L)				H	0.2	C,D		
SPRING TIME 6571 Spring Time	78249	NP	2.756	2.76	8	NW	2002	P	2		1	2	1																Skatepark
STABLEWOOD FARMS 3903 Crooked Trail	78227	NP	7.145	7.14	4	SW	2006	DO																			D	P/L	
STINSON 900 March	78214	CP	75.000	25.00	3	S	1895	P								5(L)				2 FB, SC									Concession Building
STONE OAK 20395 Stone Oak Parkway	78258	NA	245.300		9	FN	2000	P/DO																					
SUNRISE 6525Binz-Engleman Rd.	78244	NP	5.500	2.00	2	N	2000	P																	H	0.25	O		
SUNSET HILLS 500 Inspiration	78228	CP	1.900	1.90	7	W	1977	P	1		1(L)	4	1								1								Bath House
TEJEDA, FRANK 541 Division	78214	NP	8.900	8.90	5	S	1977	P	1		1(L)	12					1				2(L)	3(L)							
TOBIN, JOHN 1900 W. Martin	78207	CP	1.100	1.10	1	W	1944	DO						1	16,614						1								
TOBIN, ROBERT L. B. 100 Ira Lee	78218	NA/ GW	60.590		10	N	2003																						
TRAVIS 301 E. Travis	78205	SUF	2.600	2.60	1	C	1870	DE																					Old Cannon, Statue, Plaza
VAN DE WALLE, GREGORY 1925 Herbert	78227	NP	0.700	0.70	6	W	1979	DO			1(L)	2									2(L)								
VICTORIA* 800 E. Durango	78210	NP	0.900	0.90	1	S	1985	DO																					Open Play Area
VIDAURRI, JUAN 1201 Merida	78207	NP	7.700	7.70	5	W	1952	P			1(L)	11					1			FB, SC, R	1(L)								
VILLA CORONADO 11031 Renova	78214	CP	14.800	10.80	3	S	1979	P	1	1P	1(L)	5		1	7845		1	1	1		1	2(L)							
WALKER RANCH 12603 West Ave.	78216	HR/ SUF	90.000	14.05	9	FN	1993/97/98/ 99/05	DO/P	1	1P	1(L)	12													H	0.5	A	C/S	Historic/Archaeologicial Sites, Outdoor classroom
WARD, JOE 435 E. Sunshine	78228	CP	4.200	4.20	7	W	1978	P	1		1(L)	3	1J 1SR	1	13,550			1SR		2 FB, SC	2								Bath House
WEST END 1401 N. Hamilton	78207	CP	5.200	5.20	1	W	1931	P		1P	2(L)			1			1(L)			FB, SC 1(L)	2(L)	1(L)	1(L)						Multi-Service Center, Open Play Area
WESTWOOD VILLAGE*** 7627 S.W. Military Dr.	78227	CP	2.700	2.70	6	W	1976	P	1	1P	1	1	1SR																Bath House
WHITE,JACK 3803 Old Sequin Rd.	78219	GW	59.600		2	N	2004	P																					Park Police Substation
WILLOW SPRINGS GOLF COURSE 202 Coliseum	78219	SC	188.600	188.60	2	E	1945	P	1																				18 Hole Course, Club House, Snack Bar
WILSHIRE TERRACE 1301 Rittiman Rd	78218	US	11.200	1.20	2	N	1952	DO																					Open Play Area

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WINDGATE RANCH 12940 SH 211	78254	NA	1123.944		6	FW	2000	P																					
WINDSOR 2300 Ingleside	78213	NP	2.500	2.50	1	N	1958	DE			1(L)	4								1 sc		1							
WOODARD, RUTH 1011 Locke	78208	CP	3.900	3.90	2	E	1973	P	1		1	5		1	13,134		1(L)				1(L)		1(L)						
WOODLAND HILLS 21395 Milsa Rd	78256	NA	312.900		8	NW	2003	P																					
WOODLAWN LAKE 1103 Cincinnati	78201	LUP	62.000	62.00	1&7	W	1918	P	2	1P	1(L) 1	20	1SR	3	15,000	1	1				1	3(L)			H	1.25	A	P/L	Fishing, Boating, Casting Pool, Lighthouse, Bath House, Open Play Area,Berta Almaguer Dance Studio
TOTAL ACREAGE			16781.769	4672.331							69.000															40.960			

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2005

PARKS AND RECREATION DEPARTMENT PROGRAM INVENTORY AS OF DECEMBER 2004

Name of Program	Description/Duration	Classification*	Annual Participation #'s		Location(s)**
			Est.#	Youth, Adult, Both	
AFTER SCHOOL CHALLENGE PROGRAM					
After School Challenge	M-F from 3-6 @ 138 sites working with children in homework assistance, arts-crafts, and recreational activities in 8 school districts during the school year.	AS	16,000 +	Y	ES, MS, HS
AQUATICS					
Swimming (Outdoor)	Recreational Swimming (S)	R	250000	B	PF
Natatorium Swimming	Recreational Swimming (YA)	R		B	PF, N
ATHLETICS					
Softball Leagues	Recreation/Competitive (S)	ATH		B	
Softball Tourneys	Competitive (S)	ATH		B	
Basketball Leagues	Competitive (S)	ATH		B	
Basketball Tourneys	Competitive (S)	ATH		B	
Boxing	Competitive (S)	ATH		B	
Tennis	Recreation/Competitive	ATH		B	
CULTURAL PROGRAM					
Arts & Crafts	Classes (YA)	C	666	Y	CC & SF
Christmas Card Design Contest "Christmas in San Antonio"	Christmas Card Contest	C	1082	Y	SF
Fiesta Contest	Fiesta Contest (S)	C	902	Y	SF
Dance	Classes (YA)	C	1325	Y	SF
Fandango	Folklorico & Spanish Troupe (YA)	C	24	Y	SF
Finale Show	Summer Classes Show (YA)	C	680	Y	SF
Holiday River Float	Holiday River Parade/CC Barge	C	34 riders	B	SF
Santa's Barge	Holiday River Parade	C	4 riders	B	SF

PROGRAM CLASSIFICATIONS*

AS-After School
ATH-Athletics
AQ-Aquatics
C-Cultural
G-Golf
OE-Outdoor Ed.
R-Recreation
TR-Therapeutic Recreation
V-Volunteer Program
YA-Youth Athletics

LOCATION CATEGORY**

CC-Community Center
GC-Golf Course
L-Library
ES-Elementary School
MS-Middle School
HS-High School
N-Natatorium
SC-Complex
PF-Park Facility
SF - Special Facility
HF-Historical Facility

PARKS AND RECREATION DEPARTMENT PROGRAM INVENTORY AS OF DECEMBER 2004

Name of Program	Description/Duration	Classification*	Annual Participation #'s		Location(s)**
			Est.#	Youth, Adult, Both	
CULTURAL PROGRAM (CONT'D)					
"Come Out & Play Day"	Play day in Park Entertainment & Booth	C	3100	Y	SF
Christmas Tree Lighting	Alamo Plaza (S)	C	150000	B	SF
District & Mayor's Talent Show	Talent Shows (S)	C	3270	B	SF
Miss Recreation Pageant & Rehearsal	All Community Center Queen Competition	C & R	350	Y	SF
Talent Shows/Rehearsals & Talent Show Finals			community centers		
Entertainment	Support Civic Events (S)	C	280 performers	B	SF
GOLF					
Junior Golf	Clinics, Par 3, 9, & 18 Hole Tourneys (YA)	G	1500	Y	GC, SF
Volunteer Program	Starters, Marshalls, Carts, etc. (YA)	G	200	B	GC, SF
Reciprocal Play	School Golf Teams & Individuals (YA)	G	3000	Y	GC, SF
OUTDOOR EDUCATION					
Natural Areas 1st Saturday Hike	Natural History Guided Hikes (YA)	OE	98	B	PF
Natural Areas 2nd Saturday Program	Various Nature Programs (YA)	OE	588	B	PF
Natural Areas General Education	Field Tours, Special Events, Training (YA)	OE	3858	B	PF, ES, CC, O
Natural Area Volunteers	Field Guide, Science and Research, Trail Maintenance, Habitat Restoratio, Special Event Interpretation (YA)	OE & VP	872	B	PF
RECREATION					
Center Registration	Recreational Activities	R	266751	B	CC
Play Zone	Recreational Activities	R	4872	Y	CC
Holiday Camps	Recreational Activities	R	868	Y	CC
Bike Expo, Camping	Recreational Activities	OE	135	Y	SF
Teen Club Camping Trip	Recreational Activities	OE	135	Y	SF

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PARKS AND RECREATION DEPARTMENT PROGRAM INVENTORY AS OF DECEMBER 2004

Name of Program	Description/Duration	Classification*	Annual Participation #'s		Location(s)**
			Est.#	Youth, Adult, Both	
RECREATION (CONT'D)					
Kid Quest	Recreational Activities	R	172478	Y	ES, MS
Summer Food Service Program	Recreational Activities	R	291964	Y	ES, MS
Teen Connection	Recreational Activities	R	583	Y	HS
THERAPEUTIC RECREATION					
Adult Day Program		TR	34	A	CC
Special Olympics		TR	166	A	SF
Blaze Sports					
Wheelchair Tennis		TR	40	B	T
Wheelchair Fencing		TR	18	B	CC
Wheelchair Track		TR	16	B	CC
Wheelchair Basketball		TR	11	B	CC
Wheelchair Rugby		TR	25	A	CC
Wheelchair Tournaments		TR	188	A	CC
Blaze Sports Special Events		TR	58	B	CC
Special Events		TR	1402	B	CC
Outreach to Schools		TR	82	Y	EC
Summer Program		TR	53	Y	CC
VOLUNTEER PROGRAM					
Community Service	Park Maintenance (YA)	VP	69	A	PF
Volunteer Program	Individual and Group Volunteer Projects (YA)	VP	7669	B	PF, SC
Restitution Program	Restitution assigned by court (YA)	O	31067	B	CC, GC, SC, PF

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PARKS AND RECREATION DEPARTMENT PROGRAM INVENTORY AS OF DECEMBER 2004

Name of Program	Description/Duration	Classification*	Annual Participation #'s		Location(s)**
			Est.#	Youth, Adult, Both	
YOUTH ATHLETICS					
Flag Football		ATH	953	Y	CC
Volleyball		ATH	684	Y	CC
Soccer		ATH	523	Y	CC
Spurs Drug Free Basketball		ATH	3030	Y	CC
Punt, Pass, Kick		ATH	285	Y	CC
Elks Soccer Shoot Out		ATH	246	Y	CC
Elks Hoop Shoot		ATH	375	Y	CC
Fishing Contest		ATH	628	Y	PF
Hershey Track & Field		ATH	163	Y	SF
Inner City Games		ATH	888	Y	SF
Alamo City Shoot Out Tournament		ATH	480	Y	CC
Holiday Basketball Trounament		ATH	328	Y	CC
Summer Night Hoops		ATH	250	Y	CC

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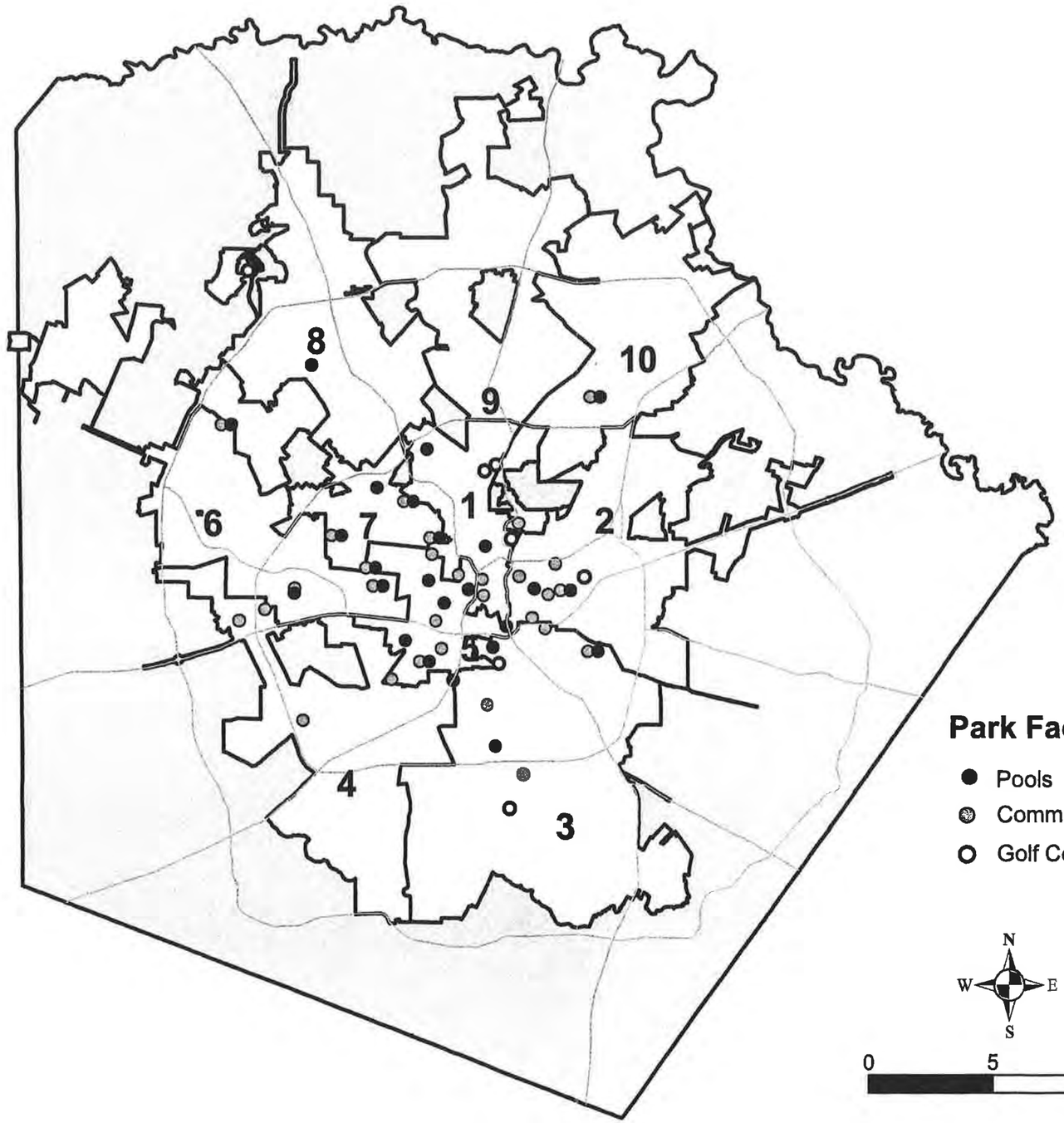
San Antonio Parks and Recreation Facilities by City Council Districts



Park Facilities

- Pools
- Community, Activity, Senior Centers and Gyms
- Golf Courses / Driving Range

N
W E
S

0 5 10 20 Miles

Parks and Recreation Department
Map Date: July 6, 2005
Map Location: K\Subareas\System Plan maps\Park_Facilities.mxd
PDF Filename: K\PDF\System Plan Maps\June05\Park_Facilities.pdf

V. STRATEGIC INITIATIVES

A. INTRODUCTION

Strategic Initiatives outline necessary and appropriate actions and goals to meet San Antonio's needs for facilities and programs in order to create a great Parks and Recreation System. In order to develop Strategic Initiatives that reflect community priorities, input was solicited from members of the Parks and Recreation Advisory Board at several Board meetings over a one year period. In addition, 20 public meetings were held in April and May 2004, and March 2005 to receive community comments. The resulting Strategic Initiatives summarize the vision and hopes of citizens and staff for the parks and recreation system in the coming ten years. These are consistent with the Department's budget priorities adopted by Council. Each Strategic Initiative section is divided into two components. First, the Strategic Initiative is clearly stated, followed by general Objectives. All parks and recreation operations and programs are addressed to include park maintenance, recreation services, park police/security, golf, special facilities, and capital improvements.

B. STRATEGIC INITIATIVE 1

Plan, develop and sustain a diversified, balanced, and well-conditioned citywide system of public parks and recreation facilities.

1. Continue implementation of the Parks and Recreation Strategic System Plan through the public input process.

2. Renovate, acquire, and develop park and recreation facilities through bond programs, CDBG, donations, grants, sales tax initiatives, and parkland dedications, especially in underserved areas.

3. Coordinate with other public and private entities in the acquisition, development and shared use of existing and/or new park and recreation facilities when in the public's best interest. Continue enhancement of partnerships with school districts for joint school/park facilities and programs. Maximize multi-purpose use of floodplains for Stormwater and park/open space applications. Accomplish capital improvement projects and program partnerships with the Alamo Community College District, San Antonio River Authority, San Antonio Water System, Texas Parks and Wildlife, Parks Foundation, etc.

4. Complete the 1999 and 2003 Parks Improvement Bond Program to include coordination and partnerships with other City departments, i.e., Library, Public Works.

5. Coordinate completion of the Sales Tax and Park Bond initiatives to acquire land along the Salado and Leon Creeks, Medina River, and other creek based linear parks and appropriately develop, maintain, and secure these sites. This will create a unique interconnected linear park system encircling the entire city, with the San Antonio River as it's central core.

6. Develop urban, neighborhood, and cultural parks adjacent to and connecting with the San Antonio River Improvement Project and developed Creekways, as a means for citizens to easily access the San Antonio River, Creekways, and individual neighborhood centers.

7. Coordinate completion of the Sales Tax initiative to acquire land over the Edwards Aquifer Recharge Zone, and appropriately develop, maintain, and secure these sites to protect our water supply and create open park space. Link sites such as Government Canyon State Natural Area, Windgate Ranch, Rancho Diana, Friedrich Park, and any future properties into an urban open space system.

8. Effectively utilize and monitor the Unified Development Code Parkland Dedication Ordinance to ensure the availability of neighborhood parks where new development is occurring.

9. Enhance automated systems in order to quantify and qualify job tasks and specific job costs in coordination with Enterprise Resource Management (ERM) systems.

10. Improve the efficiency and level of park maintenance through internal improvement, competition and community partnerships with individuals, corporations and government agencies.

11. Improve the appearance of urban areas with the increased usage of public art, reforestation, and enhanced landscape planting and maintenance.

C. STRATEGIC INITIATIVE 2

Ensure equitable access and maximize usage of parks and recreation facilities.

1. Assure a city-wide park system that is accessible to everyone regardless of location, physical ability, or income level, specifically addressing underserved areas.

2. Maximize appropriate usage of existing properties and develop multiple use facilities in order to increase efficiency and usage. (Natural areas, golf courses, quarries, creekways, undeveloped parks, etc...)

3. Rehabilitate and upgrade existing facilities that are not in compliance with current Americans with Disabilities Act (ADA) standards to ensure accessibility to all citizens.

4. Enhance recreation programs for special populations.

5. Enhance marketing efforts by providing easily accessible information to the public regarding the facilities and programs offered and provide convenient citizen access to the facility reservation system, to include utilization of the City's Community Link Centers.

6. Maximize the on-line reservation system and golf reservations system to facilitate customer access and maximize facility usage.

7. Develop an annual customer survey for parks and recreational facilities and programs to determine community needs.

D. STRATEGIC INITIATIVE 3

Provide quality recreation and cultural program opportunities for all users.

1. Cooperate with public and private agencies to encourage shared use of recreational facilities owned by the City, school districts, institutions and other public agencies to reduce duplication and maximize resources.

2. Provide increased opportunities for youth and adults to participate in our athletic, aquatic, golf cultural and other recreational programs, especially in regards to improving youth physical fitness.

3. Modify or establish programs to meet particular community/neighborhood needs by utilizing demographic, crime, and health data, surveys, and program evaluations.

4. Implement quality enhancements to the after school challenge program and the summer recreation programs in regard to Texas Department of Protective and Regulatory Services (TDPRS) standards.

5. Expand the Therapeutic Recreation Program to offer activities for youth with disabilities and implement a more diverse program to include tennis, aquatics, golf, and wheel chair sports.

E. STRATEGIC INITIATIVE 4

Ensure that municipal parks and recreation facilities are safe for all users.

1. Provide the level of Park Police presence needed to enforce existing ordinances such as Park Curfew, Park Alcohol Restrictions and ensure safety in City parks.
2. Increase Park Police skills by providing increased training.
3. Increase the number of Park Police Officers and enhance methods to adequately patrol newly acquired park acreage and facilities.
4. Address crime at parks and recreation facilities through coordinated security measures with other local law enforcement entities and citizen awareness and partnership programs.
5. Abate graffiti from department facilities and public and private property in the immediate vicinity of targeted areas.
6. Determine deterrent strategies such as lighting, signage, landscaping, design, etc. at facilities in order to reduce graffiti and vandalism.

F. STRATEGIC INITIATIVE 5

Maximize financial efficiencies and ensure contractual compliance.

1. Prepare Requests for Proposals (RFP's), contracts, and intergovernmental agreements to maximize service delivery and financial return to the City.
2. Through organizational enhancements, improve monitoring of financial and performance milestones as stipulated in these contractual and permit obligations.
3. Coordinate the negotiation and re-negotiation of essential department contracts with the City Attorney's Office and the Contract Services Department.

G. STRATEGIC INITIATIVE 6

Enhance the City's prominence as a major visitor destination.

1. Continue to manage and maintain the River Walk as a world-class attraction, taking into account any improvements, linkages and expansions. Coordinate with the Convention and Visitors Bureau, Paseo del Rio Association, Centro San Antonio, contractors, businesses, and property owners.
2. Develop the San Antonio River Improvement Project from Brackenridge Park to Mission Espada to create the most unique urban linear park in the country. This project will spur private economic development along the entire length of the River.

3. Coordinate operations of the San Antonio River Improvement Project as those improvements are made during the next several years, to include maintenance, river operations, security, utilities, contracts, etc.

4. Promote and improve departmental tourist/cultural facilities, i.e., La Villita, HemisFair Park, Spanish Governor's Palace and Market Square, through program, interpretive and concession enhancements.

5. Working with the Botanical Society, develop a comprehensive plan for future development, expansion, programming and increased attendance for the Botanical Gardens.

6. Develop and promote eco-tourism opportunities at natural areas, creek and river corridors, in conjunction with other agencies, i.e., Audubon Society, Texas Parks and Wildlife Department, San Antonio River Authority, Convention and Visitors Bureau, etc...

7. Continue improvement in the promotion, maintenance, and financial condition of municipal golf operations.

VI. CITY-WIDE RECOMMENDATIONS

While the Strategic Initiatives presented in the previous Chapter outline the objectives of the plan, the further defining of priorities is needed in order to eventually identify specific projects. The Plan establishes both Citywide and geographic Subarea priority recommendations. The intent of the Citywide recommendations is to list the priorities that are accurate needs all across the community. Public, staff, and City Council input has been used to identify these recommendations, which are presented in no particular order. The related Strategic Initiative is stated at the end of each of the priorities below.

- Enhance the development, renovation, and maintenance of facilities through field operation efficiency, reforestation, public art, etc., especially in neighborhood parks. (Strategic Initiative 1)
- Incorporate trends in capital improvement projects and program planning, for example, skate parks, dog parks, intergenerational programs, etc. (Strategic Initiative 1)
- Recruit/Train/Retain a knowledgeable and effective workforce. (Strategic Initiatives 1, 3, and 4)
- Expand the Volunteer Services Program to assist in maintenance and enhancement of park facilities. (Strategic Initiative 1)
- Complete the 1999 and 2003 Park Improvement Bond Programs by December 2007 to include coordination and partnerships with other city departments. (Strategic Initiative 1)
- Coordinate completion of the Sales Tax initiatives to acquire land over the Edwards Aquifer Recharge Zone and along Leon and Salado Creeds, and the San Antonio River and Medina River by 2015 to include coordination and partnerships with other city departments and outside agencies. (Strategic Initiative 1)
- Conserve and protect floodplains as linear greenways/creekways and promote their development into a citywide system of linear greenways that will connect neighborhoods and provide alternative transportation routes and recreation opportunities as appropriate. (Strategic Initiative 1)
- Effectively utilize and monitor the Unified Development Code Parkland Dedication Ordinance to ensure the availability of neighborhood parks where development is occurring. (Strategic Initiative 1)
- Rehabilitation, maintenance, and operation plans for facilities including, but not limited to, Hemisfair Park, La Villita, Market Square, Community Centers, Golf Courses, Spanish Governor's Palace, etc. (Strategic Initiative 1, 6)
- Identify and document archeological, cultural, historical, and artistic resources in San Antonio's parks by the use of volunteers, interns, or other available means. (Strategic Initiative 1)
- Ensure the rehabilitation of park and recreation facilities to assure safety, security, accessibility & quality programming for users through the capital budget process, CDBG and park bond programs. (Strategic Initiative 1, 4)
- Improve response times on public and internal work requests for repair and replacement of park facilities. (Strategic Initiative 1, 4)
- Prepare and implement funding requests based on master development plans for existing and new City parks, providing for varying intensities of development and phasing as appropriate. (Strategic Initiative 1)
- Establish San Antonio River and Creekways projects as major parks, accessible by every citizen. (Strategic Initiatives 1, 2, and 6)

- Provide facilities and programs in underserved and unserved areas. (Strategic Initiative 2)
- Develop a marketing campaign utilizing online reservations systems, customer surveys, internet, all media, and other means to promote and support the use of parks and recreation services, programs, and facilities. (Strategic Initiative 2)
- Expand and publicize all programs available at recreation centers and in park settings in the summer and fall guides, with press releases, brochures, through the Park Bench show, and by other means available. (Strategic Initiative 2)
- Assure a citywide park system that is accessible to everyone regardless of location, physical ability, or income level. (Strategic Initiative 2)
- Encourage multi-model forms of transportation (pedestrian, bicycle, vehicular, mass transit, etc.) to parks and recreation facilities working with the Public Works Department, VIA, etc.. (Strategic Initiative 2)

- Rehabilitate and upgrade existing facilities to meet current ADA standards to ensure that facilities are accessible to all residents. (Strategic Initiative 2)
- Incorporate life long fitness programs and well being as a priority focus for recreation programs to help coordinate the efforts to prevent obesity, diabetes, and other chronic illnesses for residents of all ages. (Strategic Initiative 2)
- Provide community centers with computers, appropriate software, and other technological resources for staff and citizen use and for programming activities. (Strategic Initiatives 2 and 3)

- Expand activities, facilities, and programs that promote physical activity for all ages, especially our youth. (Strategic Initiative 3)
- Continue addressing monitoring standards for Afterschool and Summer youth programs. (Strategic Initiative 3)
- Expand existing and develop new volunteer opportunities including docent programs to encourage use and support recreation programs. (Strategic Initiative 3)
- Increase Therapeutic Recreation programs for youth, adults, and for seniors. (Strategic Initiative 3)
- Develop citywide intergenerational programs that enable residents to bridge with people of different backgrounds and cultures. (Strategic Initiative 3)
- Create an ad hoc sub-committee of the Parks and Recreation Advisory Board to specifically to assist staff in the assessment and development of new recreation programs. (Strategic Initiative 3)
- Elevate and promote the value of visual, fine arts, and cultural arts through programs and services and through active promotion of art in the community centers and park facilities. (Strategic Initiative 3)
- Increase the number of learn-to-swim and water aerobics class locations and provide new programs and activities to encourage participation. (Strategic Initiative 3)

- Incorporate the 2002 Park Police Performance Review recommendations and address current and future security needs based on specific demands (creekways/trails, neighborhood and large urban parks, special events, motorized vehicles, etc.) (Strategic Initiative 4)
- Implement appropriate security measures, coordination with other local agencies and law enforcement entities, rapid repair response, and citizen awareness and partnership programs (i.e. "adopt a park"). (Strategic Initiative 4)
- Develop deterrent strategies such as lighting, signage, landscaping, design, etc., at facilities in order to reduce graffiti and vandalism. (Strategic Initiative 4)

- Continue partnerships, consolidations, outsourcing, and multi-purpose utilization of facilities that improve efficiency, service delivery, and funding especially in coordination with school districts. (Strategic Initiative 5)
- Develop a plan that analyzes and makes recommendations on various issues relating to fundraising, grants, evaluation of participation fees, review of resident vs. non-resident fees, sponsorships, partnerships, and other sources for parks and recreation improvements and programs, to include consideration of a grants management position. (Strategic Initiative 5)
- Modernize the revenue collection system for all Divisions and in concert with the Cash Handling Procedures and other City requirements. (Strategic Initiative 5)
- Support the efforts of the San Antonio Parks Foundation to benefit parks and recreation fundraising. (Strategic Initiative 5)
- Coordinate the negotiation and re-negotiation of essential department contracts with the City Attorney's Office and the Contract Services Department. (Strategic Initiative 5)
- Continue to implement and enhance the use of Enterprise Resource Management (ERM) in order to quantify and qualify job tasks, costs, data collection, etc.. (Strategic Initiative 5)

- Expand cultural, natural, and historical programs offered at community centers and develop new programs at locations not presently offering related activities, to promote the education and appreciation of these resources. (Strategic Initiative 6)
- Expand the programs offered at the Natural Areas, and develop new programs as the Natural Areas inventory grows, to promote interpretive, educational and appropriate recreational activities. (Strategic Initiative 6)

VII. A. SUBAREA INTRODUCTION

To provide a manageable framework in which to identify and address parks and recreation facility and program needs, ten planning subareas were defined during the development of the 1999 System Plan. These areas were delineated using census tract boundaries, major highways and thoroughfares (which act as barriers between neighborhoods), and city limits as the various boundaries. Though roughly equal in area (except for the Central subarea), the subareas vary in population, existing park facilities and programs, natural resource assets, demographics, and social statistics. (These characteristics differentiate the ten planning subareas from the ten City Council districts.) Each planning subarea is summarized in subsequent sections. For this document it has been determined that the ten existing Subareas are still valid due to limited changes in the characteristics; however, it is realized that with growth from the southeast to the southwest part of the City, additional subareas may need to be defined in future updates of this document.

It is important to clarify that City Council districts may overlap more than one planning subarea. A detailed list of City park and recreation facilities has been compiled for each City Council District (see Appendix D).

Population figures for the ten planning subareas in 2005 and projections for the year 2010 and 2015 are important in assessing not only the current parks and recreation system inventory, but in making future recommendations for the system as well. These figures are summarized in each subarea section. It is important to recognize that the boundaries of census tracts comprising each subarea extend beyond the current City Limits in various places. The total subarea population therefore exceeds the estimated City population. The overall populations by Subarea over the next ten years are as follows:

Subarea	2000	2005	% change	2010	% change	2015	% change
Central	3,692	4,064	+10.10%	4,436	+9.20%	4,810	+8.4%
East	113,795	115,414	+1.40%	117,035	+1.40%	118,656	+1.4%
South	126,585	130,598	+3.20%	135,600	+3.80%	140,285	+3.5%
Southwest	93,240	94,995	+1.90%	96,763	+1.90%	97,530	+0.8%
West	214,440	211,824	-1.20%	210,396	-0.70%	210,970	+0.3%
North	151,673	155,961	+2.80%	160,250	+2.80%	164,538	+2.7%
Far West	127,495	155,026	+21.60%	180,184	+16.20%	200,530	+11.3%
Northwest	97,450	113,759	+16.70%	128,634	+13.10%	142,662	+10.9%
Far North	108,910	137,847	+26.60%	155,628	+12.90%	176,600	+13.5%
Northeast	136,120	163,312	+20.00%	181,474	+11.10%	197,519	+8.8%
CityWide	**1,173,400**	**1,282,800**	**+9.30%**	**1,370,400**	**+6.80%**	**1,454,100**	**+6.1%**

***This information is based on projections made by the City Planning Department using past trend analysis (1970 – 2000) and current 2005 city limit boundaries.

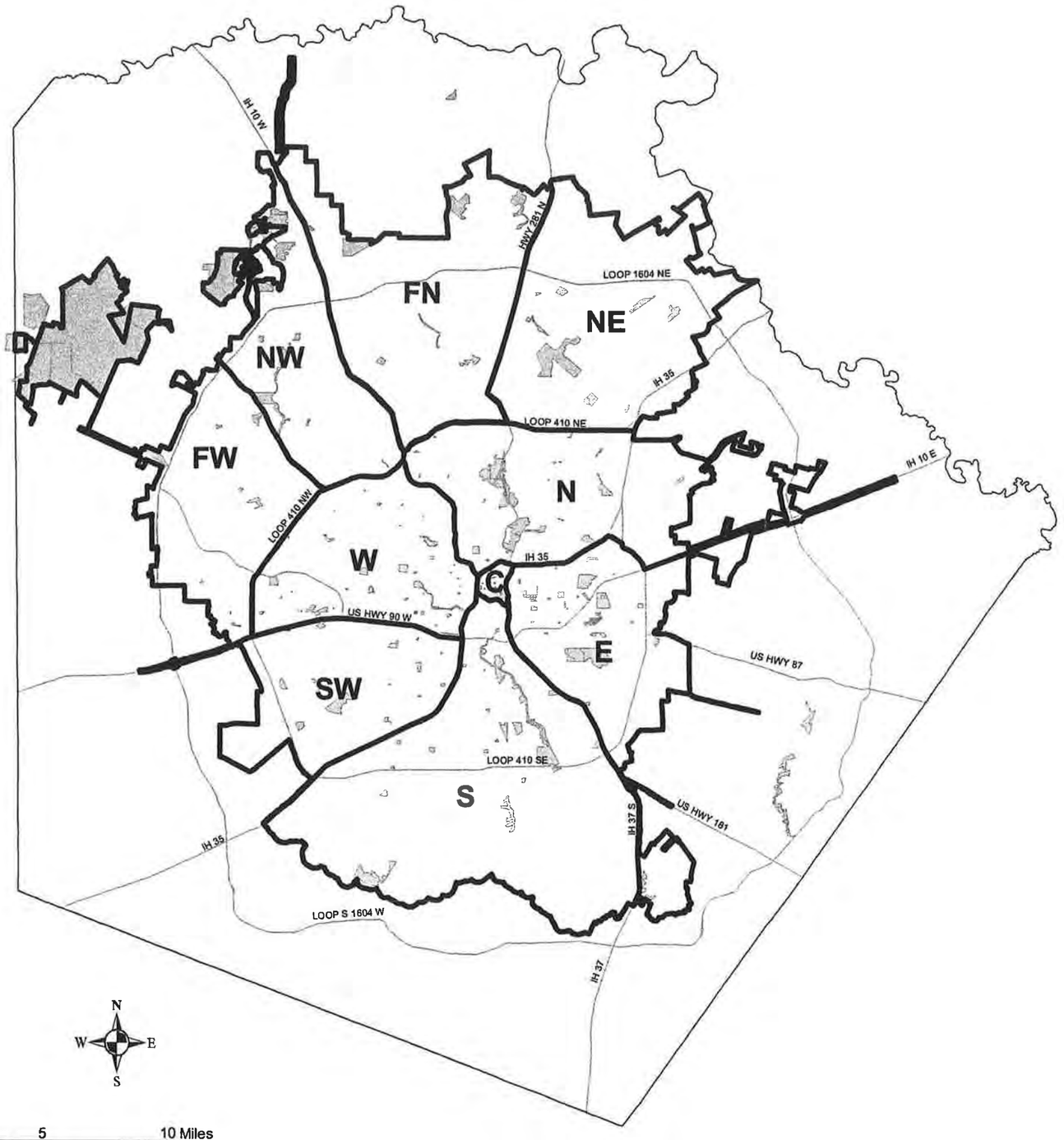
In the following sections of this chapter, each subarea is summarized with reference to:

- **General characteristics** including an overall description of the area.
- **Population figures** for 2000, 2005, with five year (2010 and 2015) projections. This information is based on projections made by the City Planning Department using past trend analysis (1970 – 2000) and current 2005 city limit boundaries.
- **Demographics** including race, gender, age, and median income of the area.
- **Prominent landmarks and natural resource assets** that give the subarea its unique identity and may be critical when analyzing future acquisition and/or development opportunities.
- **List of all City of San Antonio park facilities** including classification type and acreage.
- **List of other public park facilities** including those of the County, State, and Federal governments, and other incorporated cities within Bexar County, and acreage.
- **Needs assessment summary** including present and projected acreage goals (i.e. 16 acres per 1,000 residents), and results of verbal discussions and written surveys conducted at 10 public meetings held in the summer of 2004 and Spring of 2005.

VII. A. SUBAREA INTRODUCTION

- **Listing of Past Accomplishments** in the areas of Capital Improvement Projects completed and/or currently funded (physical projects and land acquisitions).
- **Recommendations** for park and recreation facilities based on the subareas current and projected demographics and existing facilities. These recommendations are listed as general priorities for the subarea.
- **Proposed/Unfunded Projects** for specific parks and facilities within the subarea with scope of work, cost estimate for land acquisition, design, and construction, source of funding, and proposed year of funding.
- **Maps** of each subarea that identify existing park and recreation facilities and existing programs (after school programs, summer sites, community center programs, aquatics programs).

Overall Subarea Map



C	Central
E	East
S	South
SW	Southwest
W	West
N	North
FW	Far West
NW	Northwest
FN	Far North
NE	Northeast

Map Prepared by San Antonio Parks and Recreation Dept
Date: June 2005

VII. B. CENTRAL SUBAREA

The **Central Subarea** is bounded by IH 10, IH 35, and IH 37. It is characterized by heavy urban development including governmental and private offices, restaurants, retail facilities, and tourism-related facilities such as attractions, large hotels, and the Convention Center. In recent years, older and historic buildings have been converted to mixed use developments including a mix of commercial, retail, and multi-family housing. This trend appears to be continuing, and will mean an influx of additional residents to the downtown area. The area is small in both size and population, and is dramatically different from the other nine Subareas in its commercial and residential character. This Subarea includes portions of Council Districts 1 and 2.

1. CENSUS TRACTS

1101, 1109

2. POPULATION (estimated)* % of change

2000	3,692	--
2005	4,064	+10.10%
2010	4,436	+9.20%
2015	4,436	+8.40%

*Based on past trend analysis (1970 – 2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS

Hispanic	61.40%
Anglo	27.60%
African American	8.10%
Other	2.90%
Male	57.00%
Female	43.00%

Age

<5	3.60%
5-17	6.90%
18-24	13.70%
25-44	23.10%
45-64	23.10%
65+	15.00%

Median Household Income $16,103

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- the Alamo
- the San Antonio River Walk
- Hemisfair Park and the Tower of the Americas
- Main Plaza (Plaza de las Islas) and Military Plaza (Plaza de Armas)
- City Hall and related offices
- Bexar County Courthouse and Justice Center
- Henry B. Gonzalez Convention Center
- San Antonio Central Library

5. NATURAL RESOURCE ASSETS

- undeveloped portions of the San Antonio River Walk north of the downtown area.
- vacant and underdeveloped properties along the outer boundaries of the subarea.

VII. B. CENTRAL SUBAREA

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage			
Columbus	NP/SUF	2.10			
Madison Square	NP/SUF	5.10			
Maverick	NP	3.00			
Subtotal Neighborhood Parks			**10.20 acres**		
San Fernando Gymnasium	SC	.90			
Subtotal Sports Complexes			**.90 acres**		
Alamo Plaza	HR	1.10			
La Villita	HR	3.60			
River Walk	HR	15.40			
Spanish Governor's Palace	HR	.40			
Subtotal Historic Resources			**20.50 acres**		
Hemisfair	SUF	15.00			
Market Square	SUF	4.10			
Milam	SUF	3.50			
Military Plaza	SUF	1.20			
Main Plaza	SUF	.90			
Portal San Fernando	SUF	.24			
Travis	SUF	2.60			
Subtotal Special Use Facility			**27.54 acres**		
Lady Bird Johnson Fountain	US	.10			
Romana Plaza	US	.20			
Subtotal Urban Spaces			**.30 acres**		
TOTAL CITY PARK ACREAGE				**59.44**	
TOTAL NON-CITY PARK ACREAGE				**0.00**	
GRAND TOTAL CENTRAL SUBAREA PARK ACREAGE					**59.44**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1000 residents, the following chart summarizes the park land needs of the Central Subarea (based on June 2005 park acreage).

CENTRAL SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 4,064 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 4,436 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 4,810 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	59.44	14.63/1,000	65	-5.56	71	-11.56	77	-17.56

Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	59.44	14.63/1,000	65	-5.56				

* Based on June 2005 Park Acreage

In June 2005, the City owned 59.44 acres of park land, or 14.63 acres per 1,000 residents in the Central Subarea. Based on the national average of 16 acres per 1,000 residents, a deficit of 5.56 acres exists. This deficit should not be alarming due to the unique nature of the Subarea; its low population, and high number of parks, plazas, and historic sites that characterize the area. Based on increasing population and existing facilities, there will be a need to provide for an influx of residents to multifamily housing projects and to maintain and enhance the present inventory of parks.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project**	Funding	Source	Completion
Columbus Park Landscape Improvements	$50,000	Park Bonds	April 1999
La Villita ADA Modifications Phase 2***	$182,424	CDBG	May 1999
Riverwalk ADA Modifications Phase 2***	$585,300	General Fund	July 2000
Riverwalk Sidewalk Repairs***	$36,500	General Fund	July 2000
San Fernando Gym Lighting Improvements***	$110,000	Park Bonds	September 2000
San Fernando Gym Floor Replacement***	$90,000	Park Bonds	December 2000
Arneson River Theater Improvements***	$100,000	Donation	February 2001
Little Church of La Villita ADA Improvements	$65,000	CDBG	April 2001
Milam Park Fountains	$0	Donation	April 2001
Madison Square Park Improvements***	$100,000	General Fund	December 2001
La Villita Cos House Paving Repairs***	$60,000	General Fund	January 2003
Riverwalk Extension ADA Improvements***	$160,000	General Fund	June 2003
San Fernando Gym ADA Improvements***	$368,000	CDBG	June 2003
Tower of the Americas Parking Garage	$31,900	General Fund	October 2003
Farmer's Market Interior Renovations	$193,379	Market Fund	March 2004
Market Square Design Guidelines	$89,248	Market Fund	May 2004
Alamo Plaza Bandstand Renovations***	$0	Donation	November 2004
San Fernando Gym Sewer Connection	$110,000	CDBG	January 2005

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 18 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $2,331,751. Out of the projects completed 61% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

In addition to the above, a comprehensive Master Plan was completed for Hemisfair Park (2004), providing guidelines for land use, public/private ventures, partnerships, and events.

B. Park Land Acquired
- Portal San Fernando Park – (2002) - .2394 acres

There were .2394 acres of park land added in the past five years with a total of 59.44 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Bolivar Hall Electric Upgrades***	$100,000	C of O
El Mercado Building Rehabilitation	$274,144	Market Fund
Farmer's Market Building Rehabilitation	$419,000	Park Bonds
Market Square Rehabilitation Phase 1***	$1,000,000	Park Bonds and C of O
Riverwalk Electrical and Lighting Analysis***	$200,000	River Fund
Riverwalk Rehabilitation Phase 1***	$500,000	River Fund
San Fernando Gym Facility HVAC***	$377,000	CDBG
Tower of the Americas Improvements***	$2,154,700	Park Bonds and C of O

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 8 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $5,024,844. Out of these projects, 75% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

At public meetings held during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities in the Central Subarea.
- Park Police presence at parks not regularly visited by tourists, so that residents feel safe using typical park facilities (Columbus Park, Madison Square Park, and Maverick Park for example).
- Useable park facilities for downtown residents, not just for tourists.

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Central Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- implement all aspects of the Hemisfair Park Master Plan.

- redevelop Main Plaza (Plaza de las Islas), (from the San Antonio River to the San Fernando Cathedral and from the Bexar County Courthouse to the north side of Commerce Street) into a traditional styled plaza that is more pedestrian oriented and less impacted by vehicular traffic. This project will serve as a major phase of the Historic Civic Center Master Plan and westward connection to Market Square.
- rehabilitate park and recreation facilities to assure safety, security, accessibility and quality programming for users.
- Improve and program outdoor plazas and open areas for downtown residents, workers, and visitors.
- develop with other public agencies and private organizations and individuals the of property along the north channel of the San Antonio River to Brackenridge Park as a major park initiative.
- develop an appropriate rehabilitation and maintenance plan for historic structures including those in Hemisfair Park, La Villita, and the Spanish Governor's Palace.
- Coordinate with various Departments on addressing downtown infrastructure needs to include public restrooms, parking, wayfinding, and accessibility.
- Increase number of park police and river operations staff to effectively patrol and maintain the expansions of the Riverwalk to the north and the south.
- Maintain Park Police presence in the downtown area and the Riverwalk and maintain patrol methods by boat and other means.
- Improve the marketing of downtown special use facilities such as the Spanish Governor's Palace, La Villita, and Market Square.
- Improve the coordination with other agencies and Departments and make improvements to the downtown infrastructure to better support downtown special events and festivals at parks and plazas.

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Main Plaza (Plaza de las Islas)—design and construct rehabilitation to electrical systems, lighting, irrigation, drainage, landscape, site furnishings, paving, fountains, and ADA modifications (excluding traffic improvements). (Council District 1)			
Design	$1,040,000	all but CDBG	2006
Construction	$4,499,456	all but CDBG	2007
Outdoor Priority 1			
HemisFair Park-- design and construct improvements to the park based on approved conceptual master plan to compliment private investment. (Council District 1)			
Design	$625,000	all but CDBG	2007
Construction	$2,704,000	all but CDBG	2008

Outdoor Priority 3

Riverwalk—design and construct rehabilitation to the historic river bend including ADA improvements, reconstruction of retaining walls, walkways, retaining walls, lighting, utilities, and amenities. (Council District 1)

Design	$780,000	all but CDBG	2007
Construction	$3,244,800	all but CDBG	2008

Outdoor Priority 4

Market Square-- design and construct second phase of rehabilitation based on the approved design guidelines and master plan to include ADA modifications, infrastructure, perimeter sidewalks, paving, signage, lighting, tour bus parking, restrooms, new elevator, and San Saba Street closure. (Council District 1)

Design	$577,200	all but CDBG	2007
Construction	$2,401,152	all but CDBG	2008

Outdoor Priority 5

Alamo Plaza-- design and construct improvements to lighting, paving, landscape, interpretive features, and ADA modifications. (Council District 1)

Design	$270,400	all but CDBG	2008
Construction	$1,124,864	all but CDBG	2009

Indoor Priority 1

Market Square El Mercado Building-- design and construct rehabilitation to the building to include roof replacement, restrooms, windows, interior upgrades, exterior repairs, and ADA modifications. (Council District 1)

Design	$154,648	all but CDBG	2007
Construction	$643,552	all but CDBG	2008

Indoor Priority 2

Spanish Governor's Palace-- design and construction of improvements based on ISES study to include HVAC, utility upgrades, and ADA modifications. (Council District 1)

Design	$151,424	all but CDBG	2008
Construction	$629,924	all but CDBG	2009

Other Subarea Project Needs

Columbus Park-- design and construct rehabilitation to security lighting, plaza paving, sport courts, restrooms, and ADA modifications. (Council District 1)

Design	$164,455	all	2009
Construction	$684,367	all	2010

Downtown parks and plazas—design and construct rehabilitation to electrical systems, lighting, irrigation, landscape, site furnishings, and ADA modifications. (Council District 1)

Design	$247,000	all but CDBG	2007
Construction	$1,027,520	all but CDBG	2008

La Villita-- design and construct rehabilitation to plazas and buildings electrical systems; lighting; restrooms; landscape, park furnishings, and ADA modifications. (Council District 1)

Design	$343,587	all but CDBG	2010
Construction	$1,429,567	all but CDBG	2011

Madison Square Park-- design and construct rehabilitation of lighting, trails, picnic facilities, benches; landscape, irrigation, park furnishings and ADA modifications. (Council District 1)

Design	$110,083	all but CDBG	2012
Construction	$460,576	all but CDBG	2013

VII. B. CENTRAL SUBAREA

Maverick Park-- design and construct rehabilitation of lighting, walks, picnic facilities, benches; landscape, irrigation, park furnishings, and ADA modifications. (Council District 1)

Design	$152,082	all but CDBG	2011
Construction	$632,660	all but CDBG	2012

Milam Park-- design and construct replacement of playground and playground surfacing. (Council District 1)

Design	$102,643	all but CDBG	2014
Construction	$426,994	all but CDBG	2015

Riverwalk—design and construct a "safe harbor" facility on the north channel of the Riverwalk extension near the Pearl Brewery development. (Council District 1)

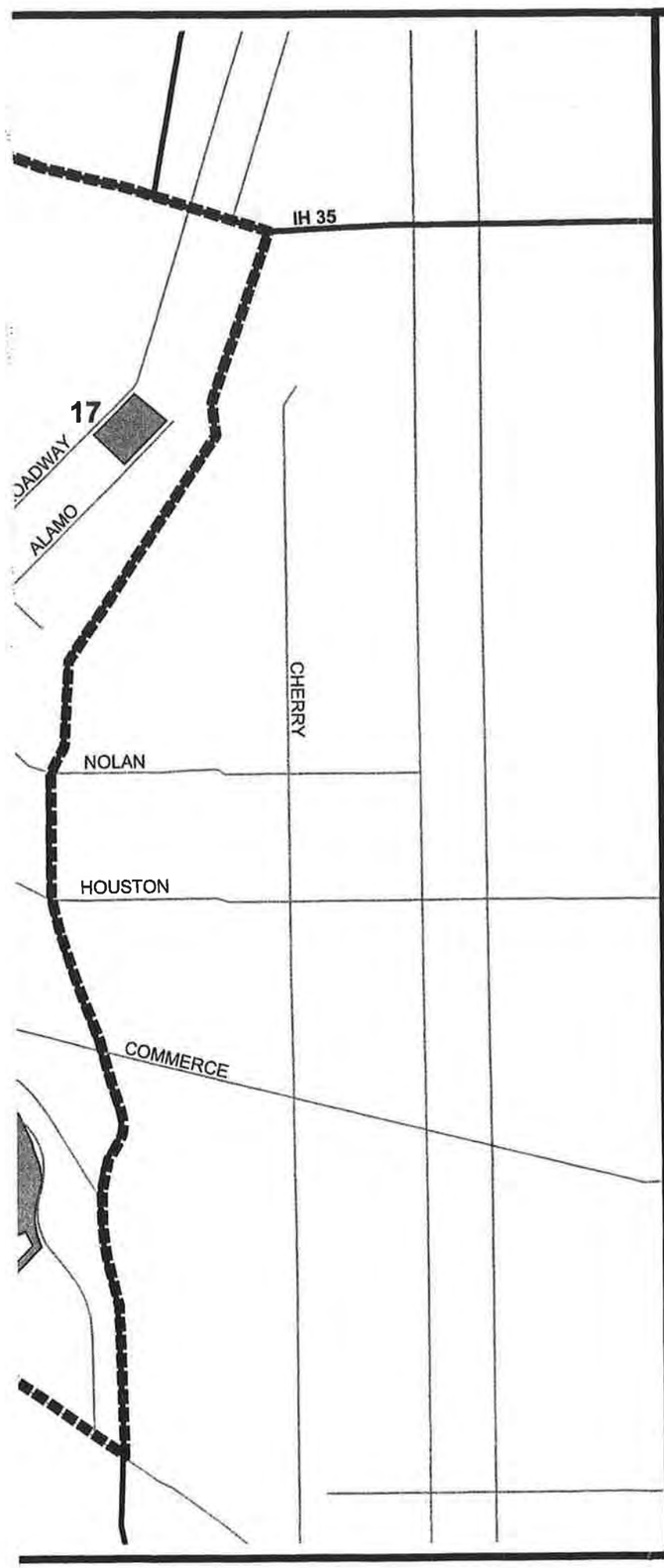
Design	$250,000	all but CDBG	2006
Construction	$1,040,000	all but CDBG	2007

TOTAL PROPOSED PROJECTS **$25,918,954**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. **CENTRAL SUBAREA FACILITIES MAP (Following Attachment)**

13. **CENTRAL SUBAREA PROGRAMS MAP (Following Attachment)**



Central Subarea Facilities Map

Location Map

Park	Pool	Community Center
1 Madison Square		
2 Romana Plaza		
3 Colombus		
4 SanFernando Gynmasium		Y
5 Milam		
6 Market Square		
7 Plaza de Armas		
8 Spanish Governor's Palace		
9 Plaza de las Islas		
10 Portal San Fernando		
11 HemisFair		
12 La Villita		
13 River Walk		
14 Alamo Plaza		
15 Lady Bird Johnson Fountain		
16 Travis Park		
17 Maverick		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Central Subarea Programs Map

Location Map

- ● Community Centers
- ★ Arneson River Theater

Community Centers	
Map Number	Community Center
1	San Fernando Gymnasium

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. C. EAST SUBAREA

The **East Subarea** is characterized by single family residential housing, retail/ commercial development, and heavy industrial usage. Retail/commercial development is particularly concentrated along IH 10, IH 37, IH 35, and major thoroughfares such as Walzem and W.W. White Roads. The area encompasses two City Historic Districts as well as new residential subdivisions. The East Subarea is ethnically and economically diverse. Geographically, the area is generally flat to gently sloping with wooded areas consisting of oak, pecan, mesquite, and cedar elm. The majority of available open land consists of agricultural fields that have reverted to open grasslands. This Subarea includes portions of Council Districts 2 and 3.

1. CENSUS TRACTS

1102, 1103, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1318, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1417

2. POPULATION* (estimated) % of change

2000	113,795	--
2005	115,414	+1.40%
2010	117,035	+1.40%
2015	118,656	+1.40%

* Based on past trend analysis (1970 – 2000) and current 2005 city limits boundaries.

3. DEMOGRAPHICS

Hispanic	55.80%
Anglo	18.60%
African American	23.20%
Other	2.40%
Male	47.40%
Female	52.60%

Age

<5	8.00%
5-17	22.80%
18-24	9.50%
25-44	27.30%
45-64	19.60%
65+	12.80%

Median Household Income $28,865

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- St Paul's Square and the Alamodome
- SBC Center and Freeman Coliseum
- St. Philip's College
- The Carver Community Cultural Center
- Historic Eastside City Cemeteries

5. NATURAL RESOURCE ASSETS

- Salado, Rosillo, and Martinez Creeks
- Calaveras Lake
- Braunig Lake

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage	
Coliseum Oaks	NP	3.84	
Dafoste	NP	15.10	
Dellcrest	NP	6.00	
Dignowity	NP	3.20	
Healy-Murphy	NP	1.00	
Herrera	NP	4.50	
"J" Street	NP	11.80	
Pickwell	NP	11.00	
Second Baptist	NP	1.70	
Skyline	NP	1.20	
Subtotal Neighborhood Parks			**59.34 acres**
Copernicus	CP	21.00	
Dawson	CP	4.20	
Denver Heights	CP	4.20	
Fairchild	CP	6.80	
Highland	CP	4.90	
Lakeside	CP	30.42	
Lincoln	CP	32.70	
Lockwood	CP	3.80	
Miller, Dorie	CP	1.04	
Pittman-Sullivan	CP	25.40	
White, Jack	CP	59.27	
Woodard	CP	3.90	
Subtotal Community Parks			**197.63 acres**
Calaveras	LUP	146.70	
M.L. King	LUP	168.97	
Southside Lions	LUP	600.10	
Subtotal Large Urban Parks			**915.77 acres**
Highland H.S. Tennis Center	SC	.80	
Willow Springs Golf	SC	188.60	
Subtotal Sports Complexes			**189.40 acres**
Salado Creek Greenway S.	GW	48.12	
Subtotal Greenways			**48.12 acres**
Historic City Cemeteries	SUF	46.73	
M.L. King Plaza	SUF	.30	
Subtotal Special Use Facilities			**47.03 acres**
TOTAL CITY PARK ACREAGE			**1,457.29**

B. Bexar County Facilities

NAME	ACREAGE	
Comanche Park	60.00	
Covington Park	19.29	
Pletz Park	24.30	
Subtotal		**103.59 acres**

C. City Public Service (CPS) Facilities

NAME	ACREAGE	
Calaveras Lake & Park*	3,650.00	
Braunig Lake & Park**	1,400.00	
Subtotal		**5,050.00 acres**

D. City of Converse Facilities

NAME	ACREAGE	
North Park	41.91	
South Park	37.98	
Subtotal		**79.89 acres**

TOTAL NON-CITY PARK ACREAGE **5,233.48**

GRAND TOTAL EAST SUBAREA PARK ACREAGE **6,690.77**

* Calaveras Lake includes 3,450 surface acres available for boating & fishing.
** Braunig Lake includes 1,300 surface acres available for boating & fishing.

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1000 residents, the following chart summarizes the park land needs of the East Subarea (based on June 2005 park acreage figures).

EAST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 115,414 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 117,035 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 118,656 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	1,457.29	12.63/1,000	1,847	-390	1,873	-416	1,898	-441
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	6,690.77	57.97/1,000	1847	+4,844				

* Based on June 2005 Park Acreage.
** Includes 3,450 surface acres at Calaveras Lake and 1,300 surface acres at Braunig Lake.

In June 2005, the City owned 1,457.29 acres of park land or 12.63 acres per 1,000 residents in the East Subarea. Based on the national average of 16 acres per 1,000 residents, a deficit of 390 acres exists. When park acres of other public entities are added, notably City Public Service with its Calaveras and Braunig Lake facilities, which include surface acreage of the lake water, a positive ratio exists to 57.97 acres per 1,000 residents. Based solely on city population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 416 acres by the year 2010.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project	Funding	Source	Completion
M.L. King Park Pavilions Roof Replacement***	$12,000	Park Bonds	April 1999
Davis Scott YMCA ADA Improvements	$20,000	General Fund	August 1999
S.S. Lions Park Lake Spillway Repairs	$140,000	General Fund	August 1999
Copernicus Park Trail Lighting***	$87,000	Park Bonds	November 1999
Lockwood Park Playground Replacement	$0	Donation	January 2000
S.S. Lions Park Ballfield Parking Improvements	$87,000	CDBG	May 2000
Highland H.S. Track Lighting Improvements	$70,000	General Fund	June 2000
Pittman Sullivan Park Basketball Court***	$0	Donation	June 2000
Denver Hts. Park Community Center Addition***	$306,000	Park Bonds	November 2000
Lincoln Park Community Center Addition	$240,000	Park Bonds	November 2000
Pickwell Park Improvements***	$235,000	Park Bonds	March 2001
Highland Park Tennis Court Improvements***	$25,000	CDBG	April 2001
S.S. Lions Lake Park Improvements***	$150,000	Park Bonds	July 2001
Coliseum Oaks Park Fence	$23,624	CDBG	August 2001
Dawson Park Community Center Structural***	$419,475	CDBG	August 2001
J Street Park Improvements***	$100,000	Park Bonds	October 2001
Dawson Park Improvements***	$100,000	Park Bonds	October 2001
M.L. King Park Improvements***	$200,000	Park Bonds	October 2001
Bode Community Center Addition	$790,134	Park Bonds	December 2001
Coliseum Oaks Park Drinking Fountain	$7,904	CDBG	December 2001
Lakeside Park Improvements	$400,000	Park Bonds	February 2001
Lockwood Park Community Ctr. Renovations***	$105,000	General Fund	February 2002
S.S. Lions Park Community Center Addition***	$681,404	CDBG	April 2003
Pittman Sullivan Park Backstop Renovations	$4,600	CDBG	May 2003
Skyline/Highlands Ballfield Improvements***	$274,500	Park Bonds	August 2003
Highland Park Walking Trail***	$100,000	Park Bonds	September 2003
Pickwell Park Improvements Phase 2***	$195,200	Park Bonds	August 2004
Lincoln Park Pool and Playground Repairs ***	$802,883	Grant	November 2004

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 28 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $5,576,724. Out of all the projects completed, 61% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Oddfellows Cemetery (Eastside Cemeteries) – (1999) – 5.73 acres
- Coliseum Oaks Park – (2000) – 3.84 acres
- Jack White Park – (2005) – 59.27 acres
- Salado Creek Greenway South – (2005) – 48.12

There were 116.95 acres of park land added in the past five years with a total of 1,457.29 acres of City park land currently in the subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Coliseum Oaks Park Playground	$323,548	HUD 108
Copernicus Park Youth Sports Fields***	$400,000	Park Bonds
Davis Scott YMCA Roof Replacement	$555,320	HUD 108
Dawson Park Parking Lot Expansion	$234,323	HUD 108
Historic City Cemeteries Fencing***	$50,000	Park Bonds
Lakeside Park Playground and Improvements	$400,000	Park Bonds
Lincoln Park Community Center Roof Replacement	$267,818	HUD 108
S.S. Lions Park Dam/Spillway Repairs***	$1,547,636	Park Bonds, HUD 108
S.S. Lions Park Drainage Improvements	$173,000	CDBG
S.S. Lions Park Playground and Skatepark***	$239,696	CDBG
S.S. Lions Park Pool Drainline Relocation	$133,000	CDBG
Salado Creek Greenway Development***	$7,966,000	Sales Tax, TEA-21
Skyline Park Improvements	$126,000	HUD 108
Skyline/Highlands Ballfield Improvements***	$253,796	CDBG

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 14 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $12,670,137. Out of these projects, 43% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities in the East Subarea.

- retired persons activity areas
- skate facilities
- rehabilitation of existing facilities
- development of Lincoln Park
- development of Skyline Park
- develop meeting facilities at Pickwell Park
- develop and enhance facilities for bikers at South Side Lion's Park

VII. C. EAST SUBAREA

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the East Subarea and the inventory of current facilities and programs, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals in relation to neighborhood parks.
- rehabilitate park and recreation facilities to assure safety, security, accessibility, and quality programming for users.
- design and construct lighted park pedestrian trails.
- update and implement priorities addressing the Historic East Side Cemeteries Master Plan that reinforce the area's neighborhood revitalization efforts.
- implement priorities from the M. L. King Park and Wheatley Heights area Master Plan.
- expand recreational programs that introduce urban youth to non-traditional activities and expand senior programs.
- work with other public agencies, private organizations, and individuals to secure land and further develop the Salado Creek corridor, and other natural creekways, into greenways.
- design and construct the first phase of the master planned concrete skate park at S.S. Lion's Lake Park in the location of the existing tennis court complex and of the master planned lake area of the park.
- implement first phase of improvements from the Lincoln Park Master Plan.
- Develop, in coordination with other agencies, organizations, and businesses, the Willow Springs Golf Course area based on the area Master Plan.

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
M.L. King Park Area-- design and construct rehabilitation to sewer lift station, parking lots, roadways, restrooms, lighting, tennis courts, trails, ADA modifications, and new improvements in the area in accordance with the Master Plan for the park area. (Council District 2)			
Design	$750,000	all	2006
Construction	$3,244,800	all	2008
Outdoor Priority 2			
South Side Lions Park (West)—design and construct a concrete skate facility at the site of the old tennis courts along Pecan Valley Drive as per the site Master Plan, ADA modifications, lighting, and parking improvements. (Council District 3)			

Design	$229,840	all	2008
Construction	$956,134	all	2009

Outdoor Priority 3
Lincoln Park-- design and construct rehabilitation to outdoor restrooms, parking lot, lighting, basketball court, sport field lighting, tennis courts, repaint interior/exterior of center, and replace roof on community center. (Council District 2)

Design	$309,338	all	2009
Construction	$1,286,844	all	2010

Outdoor Priority 4
South Side Lions Park (East)-- design and construct rehabilitation to infrastructure, sewer system, playgrounds, restrooms, parking lots, roadways, trails, pavilions, ADA modifications, lighting, picnic facilities, and access to the west along Hiawatha Street. (Council District 3)

Design	$438,697	all	2010
Construction Phase	$1,824,979	all	2011

Outdoor Priority 5
East Side Historic Cemeteries-- design and construction of improvements to include basic infrastructure, entrances, restoration of public monuments and structures, lighting, roadways, landscape, and irrigation in accordance with the Master Plan for the facility. (Council District 2)

Design	$228,122	all	2011
Construction	$948,989	all	2012

Indoor Priority 1
Lockwood Park Gymnasium--design and construct replacement of the existing gymnasium building. (Council District 2)

Design	$312,000	all	2007
Construction	$1,297,920	all	2008

Indoor Priority 2
Copernicus Park Community Center--design and construct rehabilitation to the HVAC system, repaint interior and exterior of center, and general rehabilitation of the structure and its components. (Council District 2)

Design	$148,720	all	2008
Construction	$618,675	all	2009

Indoor Priority 3
Woodard Park and Community Center--design and construct rehabilitation to overhead doors, HVAC system, exterior doors, playground, basketball court, parking area, repaint interior/exterior of center, and ADA modifications. (Council District 2)

Design	$154,669	all	2009
Construction	$643,422	all	2010

Indoor Priority 4
Denver Heights Park and Community Center--design and construct rehabilitation to the gym lighting, security lighting, resurface basketball & tennis courts, repaint interior/exterior of center, and ADA modifications. (Council District 2)

Design	$160,856	all	2010
Construction	$694,880	all	2011

Indoor Priority 5
Dorie Miller Community Center—acquisition of additional park property and development of a 3000 s.f. multi-use facility. (Council District 2)

Land Acquisition	$162,240	all	2008
Design	$608,326	all	2011
Construction	$2,530,638	all	2012

Other Subarea Project Needs

Copernicus Park --design and construct rehabilitation to the playground, trails, pavilion, basketball courts, security and basketball tennis courts lighting, pavilion electrical service, parking lot and lighting, convert tennis courts to basketball court, irrigation systems, and ADA modifications. (Council District 2)

Design	$108,160	all	2011
Construction	$449,946	all	2012

DaFoste Park-- design and construct rehabilitation to basketball and tennis courts, fencing, ADA modifications, and park furnishings. (Council District 2)

Design	$85,536	all	2014
Construction	$355,828	all	2015

Dawson Park—design and construct roof replacement of the older portion of the Community Center. (Council District 2)

Design	$65,000	all	2007
Construction	$270,400	all	2008

Dellcrest Park-- design and construct rehabilitation to existing park facilities including a new playground and ADA modifications. (Council District 2)

Design	$82,246	all	2013
Construction	$342,142	all	2014

Dignowity Park-- design and construct rehabilitation to lighting, landscape, irrigation, plazas, and ADA modifications. (Council District 2)

Design	$94,899	all	2012
Construction	$394,780	all	2013

Fairchild Park-- design and construct rehabilitation to tennis court lights, HVAC system, windscreens, ADA modifications, restrooms, parking lots, tennis court walls, repaint interior/exterior of clubhouse, and playground. (Council District 2)

Design	$204,726	all	2010
Construction	$851,657	all	2011

Fairchild Park Pool Facility-- design and construct rehabilitation to include bath house, shade covers, lighting, filtration system, ADA modifications, and roofing. (Council District 2)

Design	$104,000	all	2007
Construction	$432,640	all	2008

Herrera Park-- design and construct rehabilitation to ADA, playground, restrooms, picnic area; landscape, parking lot, security lighting, and basketball/softball field lighting. (Council District 2)

Design	$104,050	all	2009
Construction	$432,848	all	2010

J Street Park-- design and construct rehabilitation to entrance, parking lot, trail, basketball courts, gazebo, lighting, picnic facilities, erosion control, landscape, park furnishings, and ADA modifications. (Council District 2)

Design	$272,287	all	2011
Construction	$1,132,461	all	2012

Park Land Acquisition—acquire land for neighborhood and community type parks. (Council Districts 2 and 3)

Acquire 5-10 acres	$260,000	all but CDBG	2007
Acquire 5-10 acres	$281,216	all but CDBG	2009
Acquire 5-10 acres	$304,163	all but CDBG	2011
Acquire 10-20 acres	$657,966	all but CDBG	2013
Acquire 10-20 acres	$711,656	all but CDBG	2015

Pedestrian Wellness Trails @ Dawson, Denver Heights, Lincoln, Lockwood, Pittmann-Sullivan, & Woodard Parks--design & construct pedestrian wellness trails in 6 parks, ½ mile trail each. (Council District 2)

Design	$409,451	all	2010
Construction	$1,703,314	all	2011

Pittman Sullivan Park-- design and construct rehabilitation to parking lots, lighting, outdoor and ball field restrooms, basketball and tennis court lighting, playground, pavilion, park furnishings, and ADA modifications. (Council District 2)

Design	$126,532	all	2012
Construction	$526,373	all	2013

Second Baptist Church Park-- design and construct rehabilitation to basketball court, tennis courts, general park lighting, ADA modifications, and playground. (Council District 2)

Design	$119,750	all	2014
Construction	$498,159	all	2015

Skyline Park-- design and construct rehabilitation to basketball court and ADA modifications. (Council District 2)

Design	$67,600	all	2008
Construction	$281,216	all	2009

South Side Lions Park Pool (West)-- design and construct rehabilitation to include bath house, shade covers, lighting, filtration system, ADA modifications, and roofing. (Council District 3)

Design	$104,000	all	2007
Construction	$432,640	all	2008

Jack White Property—design and construct renovations to building for park police substation and park maintenance facility, public parking, trailhead feature, trails, access, and park furnishings. (Council District 2)

Design	$207,256	all	2013
Construction	$862,199	all	2014

Willow Springs Golf Course—design and construct renovations to buildings, grounds, and other general rehabilitation. (Council District 2)

Design	$546,875	all	2014
Construction	$2,187,500	all	2015

TOTAL PROPOSED PROJECTS **$33,621,561**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. EAST SUBAREA FACILITIES MAP (Following Attachment)

13. EAST SUBAREA PROGRAMS MAP (Following Attachment)

East Subarea Facilities Map

Location Map

	City Park	Pool	Community Center
1	Healy Murphy		
2	Lockwood		Y
3	Dignowity		
4	Ruth Woodard		Y
5	Willow Springs Golf Course		
6	Skyline		
7	Nicholas Copernicus		Y
8	Martin Luther King		
9	Dafoste		
10	Second Baptist		
11	Lincoln	Y	Y
12	Coliseum Oaks		
13	Dorie Miller		Y
14	Robert B. Dawson		Y
15	Historic City Cemetery		
16	Euretta Fairchild	Y	Y
17	Pittman Sullivan		
18	Denver Heights		Y
19	Highland		Y
20	Fernando Herrera		
21	J Street		
22	Dellcrest		
23	Lakeside		
24	Southside Lions Park East		
25	Southside Lions Park West	Y	Y
26	Highlands H.S. Tennis Court		
27	Pickwell		
28	Calaveras		
29	Martin Luther King Plaza		
30	Saldo Creek Greenway South		

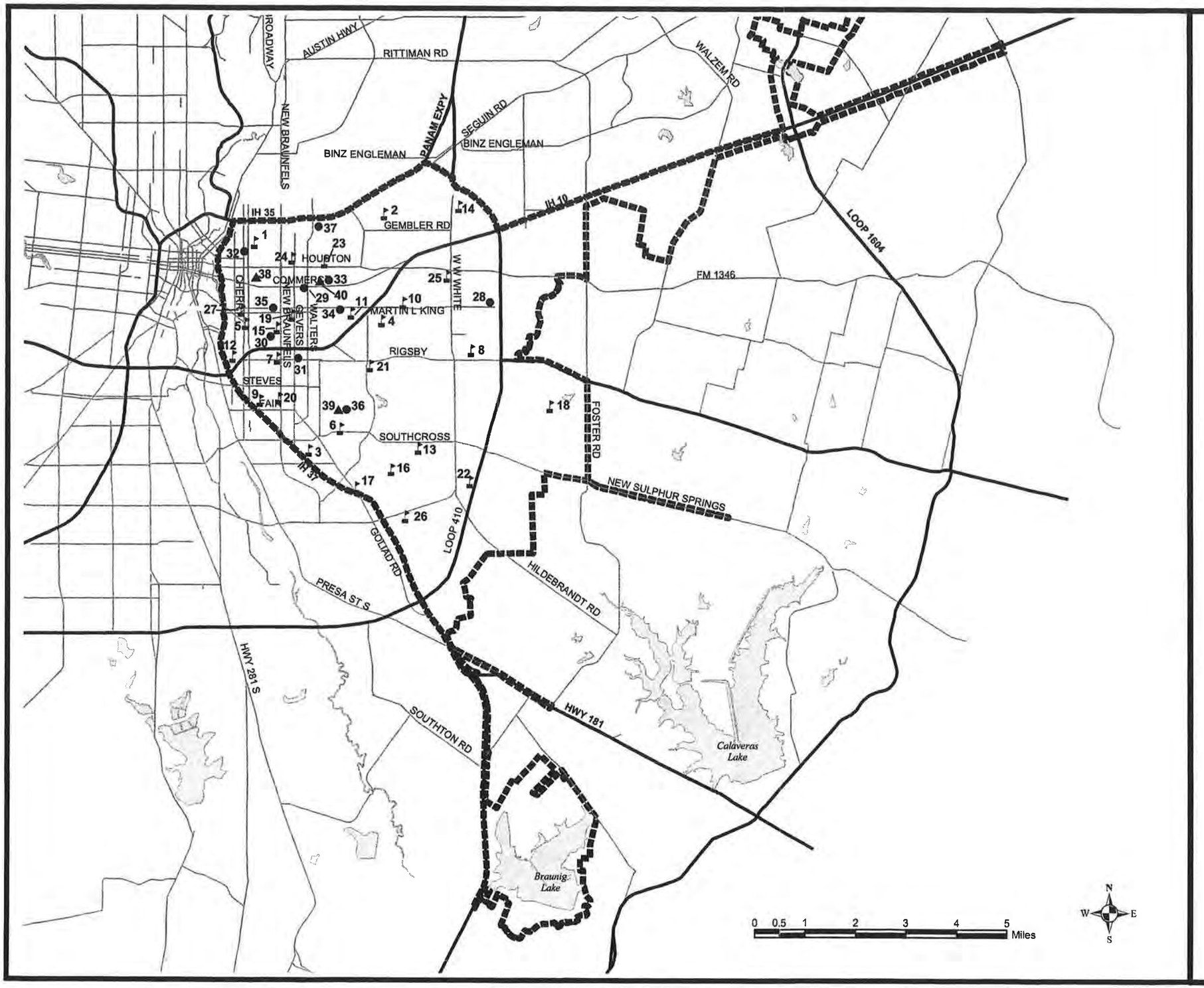
Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

0 0.5 1 2 3 4 5 Miles

N W E S

East Subarea Programs Map

Location Map



- Afterschool Challange Programs
- Community Centers
- Swimming Pools

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Afterschool Challenge Programs			Community Centers	
Map Number	School Name		Map Number	Community Center
1	Bowden		28	Copernicus, Nicholas
2	Cameron		29	Dawson, Robert B.
3	Forbes		30	Denver Heights
4	Gates		31	Highland
5	Herff		32	Lockwood
6	Highland Hills		33	Lincoln
7	Highland Park		34	Miller, Dorie
8	Hirsch		35	Pittman-Sullivan
9	Japhet		36	Southside Lions
10	King, Martin L		37	Woodard, Ruth
11	Miller		**Swimming Pools**	
12	Page		**Map Number**	**Name**
13	Pecan Valley		38	Fairchild, Euretta
14	Pfeiffer		39	Southside Lions
15	Poe		40	Lincoln
16	Rogers			
17	Schenck			
18	Sinclair			
19	Smith			
20	Steele			
21	Stewart			
22	Salado Intermediate			
23	Tynan			
24	Washington			
25	White			
26	Highland Forest			
27	Douglass Academy			

East Subarea Programs Legend

Location Map

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. D. FAR NORTH SUBAREA

The **Far North Subarea** is characterized by single and multi-family housing and retail and commercial development. The neighborhoods are largely new subdivisions where generally middle and upper income families live. The retail/commercial development includes large strip centers and mega-store development. It is concentrated along Highway 281, Loop 410, IH 10, and major roadways including Blanco, Huebner, De Zavala and Bitters Roads and NW Military Drive. The terrain ranges from gently sloping near Loop 410 at the southern end of the subarea to extremely hilly and rocky at the northern end near Loop 1604. A variety of terrain and ecosystems exist, but are dominated by oak, cedar elm, and cedar. Undeveloped land is limited, and exists along the northern boundary of the subarea. The northern half of the subarea is located in the Edwards Aquifer Recharge Zone where there are limitations on development. This Subarea includes portions of Council Districts 8 and 9.

1. CENSUS TRACTS

1810, 1811, 1812, 1813, 1818, 1911, 1912, 1913, 1914, 1915, 1917, 1918

2. POPULATION (estimated)* % of change

2000	108,910	--
2005	137,847	+26.60%
2010	155,628	+12.90%
2015	176,000	+13.50%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	28.40%
Anglo	64.40%
African American	2.80%
Other	4.40%
Male	48.10%
Female	51.90%

Age

<5	6.80%
5-17	17.50%
18-24	9.00%
25-44	32.40%
45-64	24.20%
65+	10.10%

Median Household Income $60,931

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Leon Springs Military Reservation (Camp Bullis)

5. NATURAL RESOURCE ASSETS

- existing rock quarries
- Edwards Aquifer Recharge Zone
- Salado, Olmos, and Panther Springs Creeks
- undeveloped, sensitive ecosystems north and south of Loop 1604

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage		
Panther Springs	CP/NA	281.19		
Subtotal Community Parks			**281.19 acres**	
Eisenhower	LUP/NA	323.36		
Subtotal Large Urban Parks			**323.36 acres**	
Walker Ranch	HR/NA	90.00		
Subtotal Historic Resources			**90.00 acres**	
Stone Oak Park	NA	245.30		
Subtotal Natural Areas			**245.30 acres**	
Upper Salado Creek	GW	60.94		
Subtotal Greenways			**60.94 acres**	
TOTAL CITY PARK ACREAGE				**1,000.79**

B. Bexar County Facilities

Name	Acreage	
Bullis Park	46.91	
Orsinger Park	15.11	
Raymond Russell Park	23.17	
Subtotal		**85.19 acres**

C. City of Hollywood Park Facilities

Name	Acreage	
Voight Park	4.10	
Un-named Pocket Park	.50	
Subtotal		**4.60 acres**
TOTAL NON-CITY PARK ACREAGE		**89.79**

GRAND TOTAL FAR NORTH SUBAREA PARK ACREAGE **1,090.58**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1000 residents, the following chart summarizes the park land needs of the Far North Subarea (based on June 2005 park acreage figures).

FAR NORTH SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 137,847 (Acres/Goal) (Excess/Def.)	2010 Estimated Population 155,628 (Acres/Goal) (Excess/Def.)	2015 Estimated Population 176,600 (Acres/Goal) (Excess/Def.)

Total City-Owned Park Acres	1,000.79	7.26/1,000	2,206	-1,205	2,490	-1,489	2,826	-1,825
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	1,090.58	7.91/1,000	2,206	-1,116				

* Based on June 2005 Park Acreage

In June 2005, the City owned 1,000.79 acres of park land, or 7.26 acres per 1,000 residents in the Far North Subarea. Based on the national average of 16 acres per 1,000 residents, a deficiency of 1,205 acres exists. Park acres of other public entities impact this total only minimally. Based solely on City population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 1,489 acres by the year 2010.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Walker Ranch Park Improvements***	$400,000	Park Bonds	September 1999
Walker Ranch Park Outdoor Education Facility***	$100,000	Donation	August 2000
Eisenhower Park Playground***	$112,937	Park Bonds	August 2003
Walker Ranch Park Trail Lighting***	$108,245	Park Bonds	May 2004

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 4 Park Capital Improvement Projects completed in the past five years with the total budgets and investments in the community of $721,182. Out of all the projects completed, 100% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Walker Ranch Park Addition – (2000) – 45.00 acres
- Stone Oak Park – (2000) – 245.30 acres
- Panther Springs Park Addition – (2001) – 239.69 acres
- Upper Salado Creek Greenway – (2003) – 75.44 acres

There were 605.43 acres of park land added in the past five years with a total of 1,000.79 acres of City park land currently in the subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Dist. 9 Neighborhood/Sports Field Acquisition***	$500,000	Park Bonds
Edwards Aquifer Protection Land Acquisition***	$22,500,000*	Sales Tax
Eisenhower Park Water Service Connection***	$515,500	Park Bonds

Neighborhood Park Land Acquisition***	$48,338	UDC Fees
Quarry Area Park Land Acquisition	$365,470	Park Bonds
Salado Creek Greenway Development***	$6,105,984	Sales Tax
Stone Oak Park Improvements	$437,500	Park Bonds, Grant
Stone Oak Park Improvements	$795,225	Park Bonds, UDC Fee
Walker Ranch Park Improvements Phase 2***	$110,000	Park Bonds
Walker Ranch Park Improvements Phase 3***	$820,000	Park Bonds

* Estimated
*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 10 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $32,198,017. Out of all these projects, 70% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need has been expressed for the following activities and facilities.

- walking, jogging, and bicycle multi-use trails
- playgrounds
- skate parks
- dog park
- swimming pools
- multi-purpose community centers with gymnasiums
- accessible natural areas
- development of park facilities in the Stone Oak area.
- allow biking at Eisenhower Park

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Far North Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals, especially in regards to neighborhood and community parks and a large urban park, by Park Dedication or by other means.
- rehabilitate parks and recreation facilities to assure safety, security, accessibility, and quality programming for users.
- work with other public agencies and private organizations and individuals to secure land and further develop the Salado Creek corridor as a greenway.

- address major deficit of city youth and adult programs.
- secure natural area acreage over the Edwards Aquifer Recharge Zone and develop into accessible nature parks.
- develop a master plan for Panther Springs Park and fund first phase of construction.
- construct a multi-purpose community center with gymnasium and pool.
- Develop cooperative efforts with NISD/NEISD for park development and programs

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Neighborhood Park Development--design and construct new neighborhood park with walking trails, playgrounds, sport courts, and other appropriate development. (Council Districts 8 and 9)			
Design	$104,000	all but CDBG	2007
Construction	$432,640	all but CDBG	2008
Outdoor Priority 2			
Natural Area Development-- design and construction of an existing natural area property to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council Districts 8 and 9)			
Design	$189,280	all but CDBG	2008
Construction	$787,405	all but CDBG	2009
Outdoor Priority 3			
Eisenhower Park-- design and construction of improvements & rehabilitation to post and cable barrier, special use complex, picnic facilities, Moltke House restoration, trails, pavilions, and ADA improvements. (Council District 8)			
Design Phase	$562,432	all but CDBG	2009
Construction Phase	$2,339,717	all but CDBG	2010
Outdoor Priority 4			
Panther Springs Park-- design and construct development of the nature park to include parking, trail, picnic facilities, amenities, restrooms, trail head, wayfinding, and park furnishings. Also acquisition of additional property to connect park to Wilderness Oak Drive. (Council District 9)			
Land Acquisition	$208,000	all but CDBG	2007
Master Plan	$27,040	all but CDBG	2008
Design	$438,697	all but CDBG	2010
Construction	$1,824,979	all but CDBG	2011
Outdoor Priority 5			
Neighborhood Park Development--design and construct new neighborhood park with walking trails, playgrounds, sport courts, and other appropriate development. (Council Districts 8 and 9)			
Design	$116,986	all but CDBG	2010
Construction	$486,661	all but CDBG	2011

Indoor Priority 1

Community Center-- design & construct a community center with a gymnasium and pool. (Council Districts 8 and 9)

Land Acquisition	$1,622,400	all but CDBG	2008
Design Phase	$703,040	all but CDBG	2009
Construction Phase	$2,924,646	all but CDBG	2010

Other Subarea Project Needs

Land Acquisition—acquire land for neighborhood and community type parks. (Council Districts 8 and 9)

Acquire 5-10 acres	$260,000	all but CDBG	2007
Acquire 5-10 acres	$281,216	all but CDBG	2009
Acquire 5-10 acres	$304,163	all but CDBG	2011
Acquire 10-20 acres	$657,966	all but CDBG	2013
Acquire 10-20 acres	$711,656	all but CDBG	2015

Neighborhood Park Development—design and construct new neighborhood parks with walking trails, playgrounds, sport courts, and other appropriate development (5 parks). (Council Districts 8 and 9)

Design	$112,456	all but CDBG	2009
Construction	$467,943	all but CDBG	2010
Design	$116,986	all but CDBG	2010
Construction	$486,661	all but CDBG	2011
Design	$121,665	all but CDBG	2011
Construction	$506,128	all but CDBG	2012
Design	$126,532	all but CDBG	2012
Construction	$526,373	all but CDBG	2013
Design	$131,593	all but CDBG	2013
Construction	$547,428	all but CDBG	2014

Quarry Park Land Acquisition—acquisition, design, and construction of park development within an existing limestone quarry. (Council District 8)

Acquisition Phase	$1,081,600	all but CDBG	2008
Design Phase	$608,326	all but CDBG	2011
Construction Phase	$2,530,638	all but CDBG	2012

Stone Oak Park-- design and construction of improvements to include additional trail development, nature overlook, interpretive features, and park amenities. (Council District 9)

Design Phase	$342,142	all but CDBG	2014
Construction Phase	$1,423,312	all but CDBG	2015

TOTAL PROPOSED PROJECTS **$23,878,707**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. FAR NORTH SUBAREA FACILITIES MAP (Following Attachment)

13. FAR NORTH SUBAREA PROGRAMS MAP (Following Attachment)

Northwest Subarea Facilities Map

Location Map

Park	Pool	Community Center
1 Friedrich		
2 Crownridge Canyon		
3 Cedar Creek Golf Course		
4 Cedar Creek		
5 Rancho Diana		
6 Medallion		
7 Hausman		
8 Bamberger		
9 Spring Time	Y	
10 O.P. Schnabel		
11 Leon Creek Greenway		
12 Leon Vista		
13 Huebner Creek		
14 Oak Hills		
15 Fox		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Camp Stanley
Camp Bullis
BOERNE STAGE RD
BABCOCK RD
SCENIC LOOP RD
IH 10 W
BLANCO
STONE OAK PKWY
SAN PEDRO AV
LOOP 1604
UTSA BV
HAUSMAN
FM 1560
DE ZAVALA
BANDERA
PRUE
BABCOCK
HUEBNER
FREDERICKSBURG RD
BRAUN
GUILBEAU
ECKHERT
TEZEL
CALLAGHAN
JACKSON KELLER
WURZBACH
Raymond Rimcus Park
LOOP 410 NW
FREDERICKSBURG
FRESNO
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0 0.5 1 2 3 4 Miles
N
W
E
S

Northwest Subarea Programs Map

Location Map

▲ Swimming Pools

Swimming Pools

Map Number	Name
1	Spring time

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

BOERNE STAGE RD
BABCOCK RD
SCENIC LOOP RD
IH 10 W
LOOP 1604
BLANCO
STONE OAK PKWY
SAN PEDRO AV
UTSA BV
HAUSMAN
FM 1560
DE ZAVALA
1
BANDERA
PRUE
BABCOCK
HUEBNER
FREDERICKSBURG RD
CALLAGHAN
JACKSON KELLER
BRAUN
GUILBEAU
ECKHERT
TEZEL
WURZBACH
LOOP 410 NW
FREDERICKSBURG
FRESNO
0 0.5 1 2 3 4 Miles
N
W E
S

Far North Subarea Facilities Map

Location Map

Park	Pool	Community Center
1 Stone Oak		
2 Panther Springs		
3 Eisenhower		
4 Upper Salado Creek Greenway		
5 Walker Ranch		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Camp Stanley
Camp Bullis
Bullis Park
BORGFELD
IH 10
BOERNE STAGE RD
BLANCO
HWY 281
EVANS
STONE OAK PKWY
REDLAND RD
LOOP 1604
Raymond Russell Park
Voight Park
Un-Named Pocket Park
BITTERS
SAN PEDRO
DE ZAVALA
MILITARY DR
Orsinger Park
WEST
JONES MALTSBERGER
THOUSAND OAKS
PRUE
WURZBACH
HUEBNER RD
FREDERICKSBURG
BRAUN RD
BANDERA RD
GUILBEAU RD
CALLAGHAN
JACKSON KELLER
SAN PEDRO AV
MC CULLOUGH AV
LOOP 410
WETMORE
BROADWAY
NACOGDOCHES
PERRIN BEITEL
0 0.5 1 2 3 4 Miles
N W E S

Far North Subarea Programs Map

Location Map

After School Challenge Programs

After School Challenge Programs

Map Number	School Name
1	Colonial Hills
2	Jackson
3	Larkspur

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

IH 10
BOERNE STAGE RD
BORGFELD
BLANCO
HWY 281
EVANS
STONE OAK PKWY
REDLAND RD
LOOP 1604
BITTERS
BLANCO
SAN PEDRO
DE ZAVALA
MILITARY DR
WEST
BITTERS
JONES MALTSBERGER
THOUSAND OAKS
PRUE
WURZBACH
BLANCO
HUEBNER RD
FREDERICKSBURG
BRAUN RD
BANDERA RD
GUILBEAU RD
CALLAGHAN
MILITARY DR
BLANCO
LOOP 410
WETMORE
BROADWAY
BITTERS
NACOGDOCHES
PERRIN BEITEL
LOOP 410
JACKSON KELLER
SAN PEDRO AV
MC CULLOUGH AV
1
2
3
0 0.5 1 2 3 4 Miles
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S

VII. E. FAR WEST SUBAREA

The **Far West Subarea** is characterized by single and multi-family housing and retail and commercial development. The neighborhoods are generally new subdivisions that are ethnically and economically diverse. Retail and commercial areas include strip centers and mega-store developments that are largely located along Loop 410 and major thoroughfares including Bandera, Culebra, Grissom, Marbach, and Guilbeau Roads. The terrain varies from flat in the Subareas southern portion to gently sloping or hilly in the northern portion. The area is dominated by oak, cedar elm, cedar, and mesquite. The majority of undeveloped land is in the central part of the subarea and is hilly to flat agricultural land. This Subarea includes portions of Council Districts 4, 6, 7, and 8.

1. CENSUS TRACTS

1719, 1720, 1817, 1821

2. POPULATION (estimated)* % of change

2000	127,495	--
2005	155,026	+21.60%
2010	180,184	+16.20%
2015	200,530	+11.30%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	48.30%
Anglo	38.40%
African American	8.10%
Other	5.20%
Male	48.30%
Female	51.70%

Age

<5	8.80%
5-17	23.00%
18-24	9.10%
25-44	36.10%
45-64	18.80%
65+	4.20%

Median Household Income $50,568

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Sea World of Texas
- Texas Research Park
- Northwest Vista College

5. NATURAL RESOURCE ASSETS

- Leon Creek and its tributaries including Culebra, Helotes, French, and Huebner Creeks
- undeveloped land along and near Loop 1604 and State Highway 151

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage	
Adam's Hill	NP	1.64	
Heritage Duck Pond	NP	6.73	
Subtotal Neighborhood Parks			**8.37 acres**
Cathedral Rock	CP	50.79	
Falcone, Nani	CP	65.51	
New Territories	CP	11.09	
Perez, Oscar	CP	17.02	
Rainbow Hills	CP	7.50	
Subtotal Community Parks			**151.91 acres**
Culebra Creek	LUP	145.30	
Subtotal Large Urban Parks			**145.30 acres**
Gallagher Ranch	NA	710.17	
Hampton	NA	50.00	
Iron Horse Canyon	NA	593.74	
Kallison Ranch	NA	1,163.81	
Mayberry	NA	345.11	
Windgate Ranch	NA	1,033.24	
Mabe/Canyon Ranch	NA	421.00	
Subtotal Natural Areas			**4,317.07 acres**

TOTAL CITY PARK ACREAGE **4,622.65***

*Although the Far West Subarea comprises such a large amount of acreage, the majority of this land is currently in natural areas that are not developed and open for public use.

B. City of Leon Valley Facilities

Name	Acreage	
Raymond Rimcus Park	22.25	
Subtotal		**22.25 acres**

C. State of Texas Facilities

Name	Acreage	
Government Canyon S.N.A.	5,839.00	
Subtotal		**5,839.00 acres***

*Although the Government Canyon State Natural Area comprises 5,839 acres, limited recreational activities will be allowed on only 683 acres.

TOTAL NON-CITY PARK ACREAGE **5,861.25**

GRAND TOTAL FAR WEST SUBAREA PARK ACREAGE **10,483.90**

7. NEEDS ASSESSMENT

Based on statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the Far West Subarea (based on June 2005 park acreage figures).

VII. E. FAR WEST SUBAREA

FAR WEST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 155,026 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 180,184 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 200,530 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	4,622.65	29.82/1,000	2,480	+2,143	2,883	+1,740	3,208	+1,415
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	10,483.90	67.63/1,000	2,480	+8,004				

* Based on June 2005 Park Acreage

In June 2005, the City owned 4,622.65 acres of park land or 29.82 acres per 1,000 residents in the Far West Subarea. Based on the national average of 16 acres per 1,000 residents, a substantial excess of 2,143 acres exists. The park service ratio is offset by the large amount of natural areas and the Government Canyon S.N.A. which account for more than half the park acreage in this Subarea. There still, with this excess, is a shortage of basic neighborhood and community parks.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Heritage Duck Pond Park Development	$614,200	Park Bonds	November 2002
New Territories Park Improvements***	$220,839	Park Bonds	June 2003
Rainbow Hills Park Community Center	$917,549	Park Bonds	January 2004
Falcone Park Development Phase 1***	$291,454	Park Bonds	November 2004

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 4 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $2,044,042. Out of the projects completed, 50% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- New Territories Park Addition – (1999) - 9.07 acres
- Cathedral Rock Park – (2000) - 50.79 acres
- Heritage Duck Pond Park – (2001) - 6.73 acres
- Adam's Hill Park – (2001) - 1.64 acres
- Falcone, Nani Park Addition – (2001) - 65.51 acres
- Culebra Creek Park – (2001) - 145.30 acres
- Windgate Ranch Tract – (2001) - 1,033.24 acres
- Perez, Oscar Memorial Park – (2001) - 17.02 acres
- Iron Horse Canyon Tract – (2001) - 593.74 acres
- Rainbow Hills Park Addition – (2002) – 2.91 acres
- Kallison Ranch Tract – (2002) – 1,163.81 acres
- Hampton Tract – (2003) – 50.00 acres
- Mayberry Tract – (2003) - 345.11 acres

- Gallagher Ranch Tract – (2004) – 710.17 acres
- Mabe/Canyon Ranch Tract – (2005) – 421.00 acres

There were 4,616.04 acres of park land added in the past five years with a total of 4,622.65 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Cathedral Rock Nature Park Improvements	$449,067	Park Bonds, Grant
Edwards Aquifer Protection Land Acquisition***	$22,500,000*	Sales Tax
Falcone Comm. Park Improvements Phase 2***	$750,000	Park Bonds
Heritage Duck Pond Park Basketball Court	$185,000	Park Bonds
Leon Creek Greenway Development***	$8,886,995	Sales Tax
Neighborhood Park Land Acquisition***	$31,298	UDC Fees
Oscar Perez Park Development	$690,306	Park Bonds, UDC Fees
Rainbow Hills Park Basketball Court Cover	$143,112	Park Bonds, UDC Fees

* Estimated
*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 8 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $33,635,778. Out of these projects, 50% of the projects were identified as priority needs from the 1999 Parks and Recreations System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and in discussions with citizens, need was expressed for the following activities and facilities.

- lighted walking, jogging and bicycle trails
- retired persons activity areas
- multi-purpose community center with gymnasiums and arts and crafts rooms
- playgrounds
- basketball courts
- lighted sports fields and softball fields
- picnic areas
- greenways connecting to Leon Creek

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Far West Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

VII. E. FAR WEST SUBAREA

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals, especially in regards to neighborhood, pocket, and community parks, utilizing Park Dedication and other means.
- rehabilitate parks and recreation facilities to assure safety, security, accessibility, and quality programming for users.
- develop recently acquired properties into neighborhood and community parks.
- acquire and develop a large urban park between Loop 410 and Loop 1604.
- acquire property and further develop the Leon Creek Greenway.
- develop a greenway plan incorporating the other existing creeks in the Far West subarea.
- develop recently purchased Natural Areas into useable park facilities

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Neighborhood Park Development--design and construct new neighborhood park with walking trails, playgrounds, sport courts, and other appropriate development. (Council Districts 4, 6, and 7)			
Design	$104,000	all but CDBG	2007
Construction	$432,640	all but CDBG	2008
Outdoor Priority 2			
Culebra Creek Park-- design and construction of second phase improvements to include access, parking, playgrounds, picnic facilities, trails, restrooms, dog park, and other park amenities. (Council District 6)			
Design	$671,824	all but CDBG	2008
Construction	$2,687,296	all but CDBG	2009
Outdoor Priority 3			
Nani Falcone Park-- design and construction of a concrete skate facility and additional parking as per the park Master Plan. (Council District 7)			
Design	$140,608	all but CDBG	2009
Construction	$584,929	all but CDBG	2010
Outdoor Priority 4			
Natural Area Development-- design and construction of an existing natural area property to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council District 6)			
Design	$263,218	all but CDBG	2010
Construction	$1,094,988	all but CDBG	2011
Outdoor Priority 5			
Rainbow Hills Park-- design and construct rehabilitation to trail, ADA modifications; playground, parking lot, lighting, landscape, and park furnishings. (Council District 4)			
Design	$152,082	all	2011

Construction	$632,660	all	2012

Indoor Priority 1

Rainbow Hills Park Gymnasium-- design and construction of gymnasium addition to the community center and additional parking. (Council District 4)

Design	$405,600	all	2008
Construction	$1,687,296	all	2009

Indoor Priority 2

New Territories Recreation Complex--design and construct rehabilitation of the HVAC, exterior and interior painting, ADA modifications, and other general building improvements. (Council District 6)

Design	$84,365	all	2009
Construction	$350,958	all	2010

Indoor Priority 3

Community Center-- design & construct a community center with a gymnasium and pool. (Council Districts 4, 6, and 7)

Design Phase	$760,408	all but CDBG	2011
Construction Phase	$3,163,298	all but CDBG	2012

Other Subarea Project Needs

Cathedral Rock Park-- design and construction of second phase improvements to include additional trails, lighting, parking, playground expansion, interpretive features, pavilion, picnic facilities. (Council District 6)

Design	$182,790	all but CDBG	2009
Construction	$760,408	all but CDBG	2010

Land Acquisition—acquire land for neighborhood, pocket, and community type parks. (Council District 4, 6, and 7)

Acquire 5-10 acres	$260,000	all but CDBG	2007
Acquire 5-10 acres	$281,216	all but CDBG	2009
Acquire 5-10 acres	$304,163	all but CDBG	2011
Acquire 10-20 acres	$657,966	all but CDBG	2013
Acquire 10-20 acres	$711,656	all but CDBG	2015

Large Urban Park—acquisition, design and construction of a large urban park to include roadways, parking picnic facilities, playgrounds, sports fields, dog park, trails, sport courts, and other park improvements. (Council Districts 4, 6, and 7)

Acquire 50 to 80 acres	$1,892,800	all but CDBG	2008
Design	$703,040	all but CDBG	2009
Construction	$3,041,632	all but CDBG	2011

Natural Area Development-- design and construction of an existing natural area property to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council District 6)

Design	$263,218	all but CDBG	2014
Construction	$1,094,988	all but CDBG	2015

Neighborhood Park Development--design and construct new neighborhood and pocket parks with walking trails, playgrounds, sport courts, and other appropriate development. (5 Parks) (Council Districts 4, 6, and 7)

Design	$112,486	all but CDBG	2009
Construction	$467,943	all but CDBG	2010
Design	$116,986	all but CDBG	2010
Construction	$486,661	all but CDBG	2011

Design	$121,665	all but CDBG	2011
Construction	$506,128	all but CDBG	2012
Design	$126,532	all but CDBG	2012
Construction	$526,373	all but CDBG	2013
Design	$131,593	all but CDBG	2013
Construction	$547,428	all but CDBG	2014
TOTAL PROPOSED PROJECTS	**$26,513,842**		

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. FAR WEST SUBAREA FACILITIES MAP (Following Attachment)

13. FAR WEST SUBAREA PROGRAMS MAP (Following Attachment)

Far West Subarea Facilities Map

Location Map

Park	Pool	Community Center
1 Iron Horse		
2 Mayberry		
3 Hampton		
4 Schuchart (Gallagher)		
5 Windgate		
6 Kallison		
7 Culebra Creek		
8 Nani Falcone		
9 New Territories	Y	Y
10 Oscar Perez Memorial		
11 Cathedral Rock		
12 Heritage Duck Pond		
13 Adams Hill		
14 Rainbow Hills		Y
15 Mabe/ Canyon Ranch		
16 Gallagher Ranch		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Government Canyon State Park

Camp Bullis

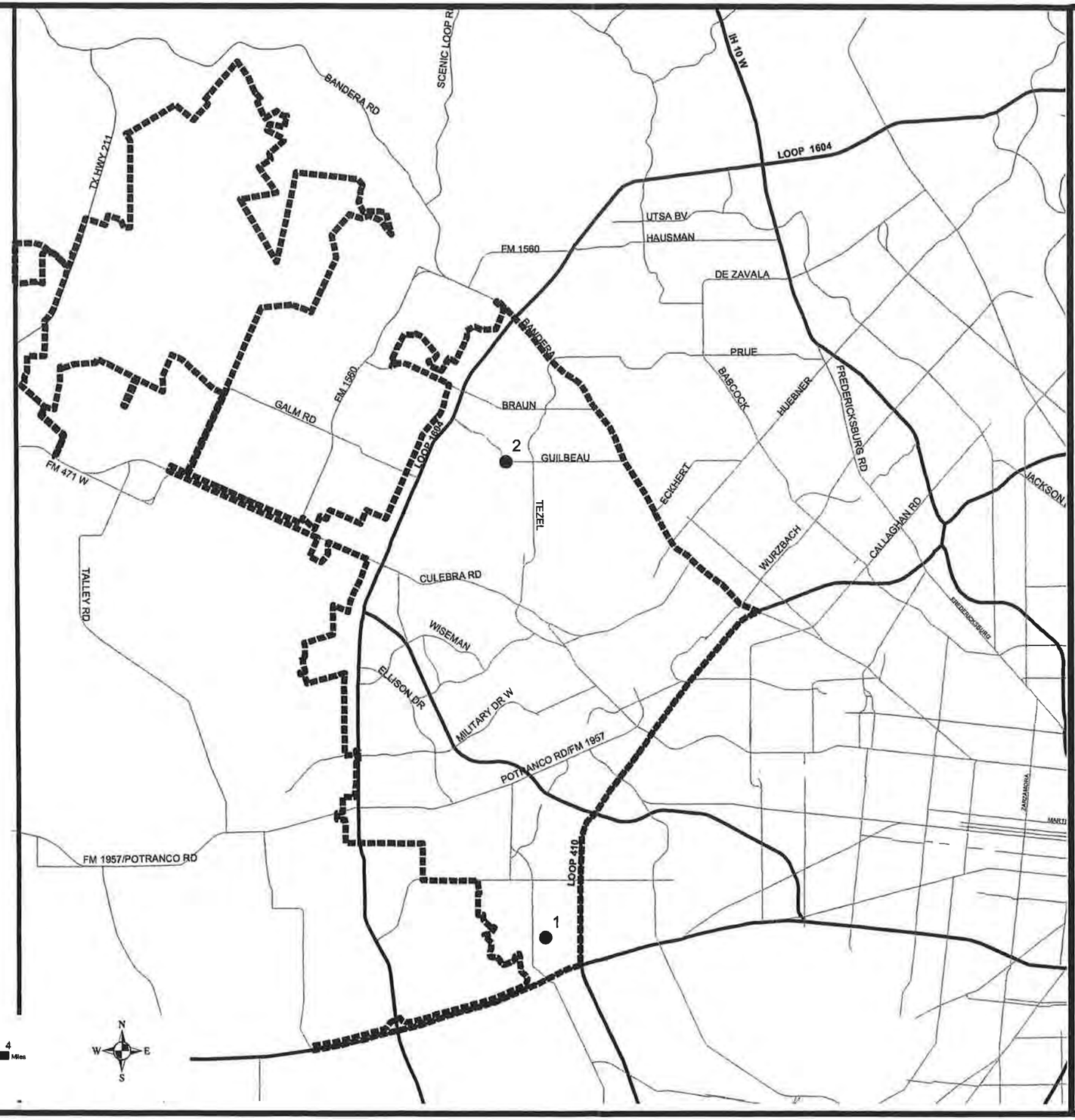
Lackland AFB

Lackland AFB Annex

BANDERA RD
SCENIC LOOP
H 16W
LOOP 1604
UTSA BV
HAUSMAN
FM 1560
DE ZAVALA
PRUE
BABCOCK
HUEBNER
FREDERICKSBURG RD
BRAUN
GALM RD
GUILBEAU
ECKHERT
TEZEL
WURZBACH
CALLAGHAN RD
CULEBRA RD
WISEMAN
ELLISON DR
MILITARY DR W
POTRANCO RD/FM 1957
FM 471 W
TALLEY RD
LOOP 410
FM 1957/POTRANCO RD
0 0.5 1 2 3 4 Miles

Far West Subarea Programs Map

Location Map



● Community Centers

Community Centers

Map Number	Name
1	Rainbow Hills
2	New Territories

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. F. NORTH SUBAREA

The **North Subarea** is characterized by single and multi-family housing. The older neighborhoods close to downtown include historic districts while those near Loop 410 are newer subdivisions. The subarea is diverse economically and ethnically. Five incorporated cities occupy much of the land included in the North Subarea. Retail/commercial development includes large strip centers and mega-store developments that are located on Loop 410 and major roadways including Blanco Road, San Pedro Avenue, Broadway, and Austin Highway. The terrain is generally flat to gently sloping with wooded areas consisting of oak, cedar elm, and pecan. There is little undeveloped land remaining in the subarea; however, the subarea includes two of the largest parks in the park system. This Subarea includes portions of Council Districts 1, 2, 9, and 10.

1. CENSUS TRACTS

1107, 1108, 1109, 1110, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1307, 1308, 1315, 1316, 1809, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910

2. POPULATION (estimated)* % of change

2000	151,673	
2005	155,961	+2.80%
2010	160,250	+2.80%
2015	164,538	+2.70%

*Based on past trend analysis (1970-2000) and current 2005 City limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS

Hispanic	53.40%
Anglo	37.10%
African American	6.10%
Other	3.40%
Male	47.50%
Female	52.50%

Age

<5	7.10%
5-17	17.40%
18-24	11.60%
25-44	31.10%
45-64	18.50%
65+	14.30%

Median Household Income $33,778

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Fort Sam Houston Army Post
- Trinity University
- University of the Incarnate Word
- San Antonio College

5. NATURAL RESOURCE ASSETS

- Salado and Olmos Creeks
- San Antonio River

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

NAME	TYPE	ACREAGE		
Belmeade	NP	4.40		
Buckeye	NP	.50		
Crockett	NP/SUF	5.30		
Haskin	NP	.90		
Mahncke	NP	10.00		
Northridge	NP	4.60		
Olympia	NP	2.10		
Pershing	NP	1.90		
Price, Camille	NP	5.30		
Scates	NP	.70		
Sunrise	NP	5.50		
Wilshire Terrace	NP	11.20		
Windsor	NP	2.50		
Subtotal Neighborhood Parks			**54.90 acres**	
Dellview	CP	5.50		
Granados	CP	4.25		
Kardon, Lou	CP	23.39		
Kenwood	CP	6.47		
Northampton	CP	20.61		
Subtotal Community Parks			**60.22 acres**	
Brackenridge	LUP/HR	343.70		
James, John	LUP	89.60		
Olmos Basin	LUP/NA	1,010.00		
San Pedro Springs	LUP/HR	46.00		
Subtotal Large Urban Parks			**1,489.30 acres**	
Brackenridge Golf Course	SC/HR	113.60		
Olmos Basin Golf Course	SC	167.00		
San Pedro Driving Range	SC	31.00		
Subtotal Sports Complexes			**311.60 acres**	
Tobin, Robert (Salado)	GW	60.59		
White, Jack (Salado)	GW	53.89		
Subtotal Greenways			**114.48 acres**	
San Antonio Botanical Garden	SUF	36.77		
Subtotal Special Use Facilities			**36.77 acres**	
TOTAL CITY PARK ACREAGE				**2,067.27**

B. City of Kirby Facilities

NAME	ACREAGE	
Friendship Park	80.00	
Hugo Lentz Park	2.00	
Autumn Park	.17	
John Sterling Park	1.00	
Subtotal		**83.17 acres**

VII. F. NORTH SUBAREA

TOTAL NON-CITY PARK ACREAGE **83.17**

GRAND TOTAL NORTH SUBAREA PARK ACREAGE **2,150.44**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the North Subarea (based on June 2005 park acreage figures).

NORTH SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 155,961 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 160,250 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 164,538 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	2,067.27	13.25/1,000	2,495	-428	2,564	-497	2,638	-566
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	2,150.44	13.79/1,000	2,495	-345				

* Based on June 2005 Park Acreage

In June 2005, the City owned 2,067.27 acres of park land, or 13.25 acres per 1,000 residents in the North Subarea. Based on the national average of 16 acres per 1,000 residents, a deficit of 428 acres exists. Park acres of other public entities impact this total only minimally. Based solely on City population projections and park acreage figures (assuming no further acquisition), a deficiency of 497 acres will exist by the year 2010, most notably on the eastern portion of the Subarea.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Haskin Park Improvements	$18,000	Park Bonds	January 1999
Northridge Park Improvements***	$30,000	Park Bonds	January 1999
Northwood Park Improvements***	$187,000	Park Bonds	January 1999
Pioneer Hall Electrical & ADA Improvements	$260,000	Park Bonds	August 1999
Lou Kardon Park Improvements	$30,000	Park Bonds	October 1999
Pershing Park Improvements***	$19,000	CDBG	December 1999
San Antonio Garden Center ADA Ramp	$17,000	General Fund	March 2000
San Pedro Springs Park Rehabilitation***	$4,500,000	Park Bonds	May 2000
Japanese Tea Gardens ADA Improvements***	$10,000	General Fund	June 2000
Crockett Park Improvements Phase 2***	$63,000	CDBG	August 2000
Olympia Park RR Fencing	$8,000	Park Bonds	October 2000
San Pedro Springs Park Pool Fence***	$200,000	Park Bonds	November 2000

John James Park Improvements***	$500,000	Park Bonds	January 2001
Crockett Park Gazebo***	$0	Donation	February 2001
Lou Kardon Park Improvements	$138,615	Park Bonds	October 2001
Buckeye Park Improvements	$113,000	Park Bonds	December 2001
Olmos Basin Park Improvements (Devine Rd.)***	$200,000	Park Bonds	April 2002
Dellview Park Pool ADA Modifications***	$130,800	CDBG	July 2002
San Antonio Botanical Gardens Improvements***	$367,500	Park Bonds	September 2002
San Pedro Springs Park Playground & Irrigation***	$408,420	Park Bonds	September 2002
San Pedro Springs Park Buildings Restoration***	$245,000	Park Bonds	February 2003
Camille Price Memorial Park Improvements	$25,000	Park Bonds	April 2003
Sunrise Park Improvements	$36,100	General Fund	April 2003
Mahncke Park Improvements***	$210,000	Park Bonds	May 2003
Olmos Basin Park parking Improvements***	$200,000	Park Bonds	July 2003
Brackenridge Park Rehabilitation Phase A***	$3,685,000	Park Bonds	August 2003
Northridge Park Improvements***	$75,000	Park Bonds	May 2005

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 27 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $11,676,435. Out of the projects completed 67% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Sunrise Park – (2000) – 5.50 acres
- Northampton Park – (2001) – 20.607 acres
- Robert L.B. Tobin Park – (2003) – 60.50 acres

There were 86.607 acres of park land added in the past five years with a total of 2,067.27 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Botanical Gardens ADA Improvements Phase 2***	$950,000	Park Bonds
Brackenridge Park Rehabilitation Phase B***	$2,540,164	Park Bonds
Buckeye Park Toilet Enclosure	$15,000	CDBG
Crockett Park Improvements Phase 3***	$125,000	CDBG
Granados Park Senior Center	$1,056,346	HUD 108
Japanese Tea Gardens Rehabilitation***	$750,000	Park Bonds
Northampton Park Development	$235,000	Park Bonds
Olmos Basin Park Party House Repairs***	$100,000	Park Bonds
Olmos Basin Park Rehabilitation & Trail System***	$1,558,727	Park Bonds

Olmos Basin Park Youth Sports Fields***	$200,000	Park Bonds
Salado Creek Greenway Development***	$5,373,014	Sales Tax
Sunken Gardens Theater ADA Modifications***	$300,000	C of O

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 12 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $13,203,251. Out of these projects, 75% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities in the North Subarea.

- walking trails
- swimming facility
- community center for youth

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the North Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals.
- rehabilitate park and recreation facilities to assure safety, security, accessibility, and quality programming for users.
- address major deficits of City recreation facilities and programs
- renovate and develop the Granados Park facility into a senior center with appropriate park development
- develop with other public agencies and private organizations and individuals the development of property along the north channel of the San Antonio River to Brackenridge Park as a major park initiative.
- work with other public agencies and private organizations and individuals to secure land and further develop the Salado Creek and Olmos Creek corridors as a greenways.
- construct a community center with gymnasium possibly to be located at the Lion's Field area in Brackenridge Park, as a compliment and enhancement to the senior center.
- complete implementation of the San Pedro Springs Park Master Plan.

- complete implementation of the Brackenridge Park Master Plan, in coordination with the San Antonio River Improvements Project, so that it becomes a great large urban park as well as a northernmost anchor for the San Antonio River Improvements Project.
- complete implementation of the Olmos Park Master Plan
- enhance partnerships for the renovation and utilization of the Sunken Gardens Theater and the Japanese Tea Gardens in Brackenridge Park
- complete transition of the Botanical Gardens to a lease arrangement with the Botanical Gardens Society

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Olmos Basin Park -- design and construct improvements and rehabilitation to parking lots, roadways, picnic facilities, area lighting, electrical modifications, playgrounds, sports fields, landscape, erosion control, park furnishing, and ADA improvements, and construct a dog park. (Council District 1)			
Design	$468,000	all but CDBG	2007
Construction	$1,946,800	all but CDBG	2008
Outdoor Priority 2			
Brackenridge Park -- design and construct rehabilitation of lighting, river wall repair, ADA modifications, road improvements, walkways, trails, amenities and other areas along the St. Mary's Street corridor in an effort to create a major park initiative connecting the San Antonio River Improvements Project with the northern stretches of Brackenridge Park. (Council District 9)			
Design	$1,562,432	all but CDBG	2009
Construction	$5,339,717	all but CDBG	2010
Outdoor Priority 3			
San Pedro Springs Park -- design and construct rehabilitation to lighting, open space development, signage, picnic area, and irrigation in the southwest portion of the park, and restoration and installation of the cast iron fountain, the grotto, and the masonry star features. (Council District 1)			
Design	$436,697	all but CDBG	2010
Construction	$1,824,979	all but CDBG	2011
Outdoor Priority 4			
Japanese Tea Gardens -- design and construct rehabilitation to structural repairs to bridges, walk, and walls; trails; lighting; landscape; irrigation, and park furnishings. (Council District 9)			
Design	$511,813	all but CDBG	2010
Construction	$2,129,143	all but CDBG	2011
Outdoor Priority 5			
Sunken Gardens Theater -- design and construct rehabilitation to theater renovations, seating, paving, ADA modifications, concession stands, electrical upgrade, lighting, utilities, landscape, and park furnishings. (Council District 9)			
Design	$608,326	all but CDBG	2011
Construction	$2,530,638	all but CDBG	2012

VII. F. NORTH SUBAREA

Indoor Priority 1

San Antonio Garden Center -- design and construct rehabilitation and structural repairs to the building. (Council District 9)

Design	$67,600	all but CDBG	2008
Construction	$281,600	all but CDBG	2009

Indoor Priority 2

Community Center and Gym -- design and construct a 5,000 s.f. center to include multi-purpose rooms, offices, storage, and a gymnasium. (Council District 1, 2, 9, and 10)

Design	$590,554	all but CDBG	2009
Construction	$2,456,703	all but CDBG	2010

Other Subarea Project Needs

Brackenridge Park Golf Course-- design and construct improvements to the golf course buildings and grounds, including ADA improvements. (Council District 1)

Design	$484,375	all but CDBG	2012
Construction	$1,453,125	all but CDBG	2013

Brackenridge Park Golf Course Borglum Studio-- design and construct rehabilitation to the historic structure including stabilization and ADA modifications. (Council District 1)

Design	$156,250	all but CDBG	2012
Construction	$468,750	all but CDBG	2013

Brackenridge Park Golf Course Entrance-- design and construct a park entrance along Millrace from Broadway to Avenue B. (Council District 1)

Design	$239,500	all but CDBG	2014
Construction	$996,318	all but CDBG	2015

Brackenridge Park Rehabilitation-- design and construction of improvements to the Urrutia Estate property to include a pedestrian bridge, walkways, lighting, irrigation, park amenities, and a walkway connecting to the Witte Museum. (Council District 9)

Design	$390,000	all but CDBG	2007
Construction	$1,687,296	all but CDBG	2009

Brackenridge Park Sports Facilities-- design and construct rehabilitation of the Tony Martinez and Lambert Beach ball fields to include scorer's booth, screens, fencing, bleachers, and ADA modifications. (Council District 9)

Design	$162,240	all but CDBG	2008
Construction	$674,918	all but CDBG	2009

Crockett Park -- design and construct improvements to the existing playground. (Council District 1)

Design	$54,080	all	2008
Construction	$224,973	all	2009

Dellview Park -- design and construct rehabilitation to playground, lighting, pavilion, parking lot, and ADA modifications. (Council District 1)

Design	$113,879	all but CDBG	2012
Construction	$473,735	all but CDBG	2013

Granados Park -- design and construct improvements to the existing park to include a walking trail, parking lot, walkways, landscape, sport court, and other amenities. (Council District 1)

Design	$253,094	all	2009
Construction	$1,052,973	all	2010

John James Park -- design and construct rehabilitation to ADA modifications, trail, picnic facilities, drinking fountains, park furnishings, landscaping, and sports fields. (Council District 2)

Design	$131,593	all but CDBG	2013
Construction	$547,428	all but CDBG	2014

Kenwood Park -- design and construct rehabilitation to ADA modifications, ballfields, basketball court, picnic lighting, outdoor restrooms, landscaping, and park furnishings. (Council District 1)

Design	$116,986	all	2010
Construction	$511,077	all	2011

Northridge Park -- design and construct rehabilitation to playground, pavilion, sports fields, grading, roadways, and park furnishing. (Council District 10)

Design	$81,200	all	2008
Construction	$337,459	all	2009

Olmos Park Golf Course-- design and construct improvements to the golf course buildings and grounds, including ADA improvements. (Council District 1)

Design	$462,500	all but CDBG	2014
Construction	$1,850,000	all but CDBG	2015

Olympia Park -- design and construct rehabilitation to playground, parking lot, restrooms, security lighting, sports field, landscape, park furnishings, and ADA improvements. (Council District 1)

Design	$78,000	all but CDBG	2007
Construction	$324,480	all but CDBG	2008

Park Land Acquisition – acquisition of neighborhood park property. (Council Districts 1, 2, 9, and 10)

Acquire 5-10 acres	$312,000	all	2007
Acquire 5-10 acres	$281,216	all	2009
Acquire 5-10 acres	$364,996	all	2011
Acquire 5-10 acres	$328,983	all	2013
Acquire 5-10 acres	$426,994	all	2015

San Antonio Botanical Gardens -- design and construct improvements and rehabilitation to flagstone walkways, benches, sidewalks, courtyard decorative pool; signage; lighting, perimeter fencing, replacement of Conservatory windows, and ADA modifications. (Council District 9)

Design	$409,451	all but CDBG	2010
Construction	$1,771,447	all but CDBG	2011

San Pedro Driving Range-- design and construct improvements to the facilities buildings and grounds, including ADA improvements. (Council District 1)

Design	$425,000	all but CDBG	2014
Construction	$1,700,000	all but CDBG	2015

Sunrise Park -- design and construct improvements to include playground, picnic facilities, basketball court, and other park improvements. (Council District 2)

Design	$112,486	all but CDBG	2009
Construction	$467,943	all but CDBG	2010

Wilshire Terrace Park -- design and construct improvements to include a walking trail, landscape, and park furnishings. (Council District 2)

Design	$68,428	all but CDBG	2014
Construction	$284,662	all but CDBG	2015

Windsor Park -- design and construct rehabilitation to ADA modifications, playground, and tennis courts. (Council District 1)

Design	$54,080	all but CDBG	2008
Construction	$224,973	all but CDBG	2009
TOTAL PROPOSED PROJECTS	**$41,313,890**		

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. NORTH SUBAREA FACILITIES MAP (Following Attachment)

13. NORTH SUBAREA PROGRAMS MAP (Following Attachment)

North Subarea Facilities Map

Location Map

	Parks	Pool	Community Center
1	Windsor		
2	Dellview	Y	
3	Granados		Y
4	Olympia		
5	Olmo's Basin Golf Course San Pedro Driving Range		
6	and Par Three		
7	Kenwood		
8	Olmos Basin		
9	Camille Price Memorial		
10	Robert Tobin		
11	Northridge		
12	Haskin		
13	Scates		
14	Wilshire Terrace		
15	John James		
16	Northampton		
17	Lou Kardon		
18	Sunrise		
19	Belmeade		
20	Botanical Gardens		
21	Mahncke		
22	Brackenridge		Y
23	Brackenridge Golf Course		
24	Pershing		
25	San Pedro Springs	Y	
26	Crockett		
27	Buckeye		
28	Jack White		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

North Subarea Programs Map

Location Map

- After School Challenge Programs
- Community Centers
- Swimming Pools

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

0 0.35 0.7 1.4 2.1 2.8 3.5 Miles

N W E S

North Subarea Programs Legend

After School Challenge Programs			Community Centers	
Map Number	**School Name**		**Map Number**	**Community Center**
1	Arnold		21	Brackenridge (Lion's Field)
2	Austin		**Swimming Pools**	
3	Beacon Hill		**Map Number**	**Name**
4	Cotton		22	Dellview
5	Garner		23	San Pedro Springs
6	Krueger			
7	Lamar			
8	Neal			
9	Nimitz			
10	Pershing			
11	Ridgeview			
12	Rogers			
13	Salado Intermediate			
14	Travis			
15	Twain			
16	Walzem			
17	White, Ed			
18	Wilson			
19	Roy P. Benevides			
20	West Avenue			

Location Map

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. G. NORTHEAST SUBAREA

The **Northeast Subarea** is characterized by single and multi-family housing and retail and commercial development. The neighborhoods are generally new subdivisions where middle and upper income families reside. The retail/commercial development includes large strip centers and mega-store developments located on Loop 410, Highway 281, and Nacogdoches, Thousand Oaks, Perrin Beitel and Judson Roads. The terrain ranges from gently sloping near Loop 410 at the southern end of the subarea to extremely hilly and rocky at the northern end of the subarea near Loop 1604. A variety of terrains and ecosystems exists along the northern boundary of the subarea. The northwest corner of the subarea is located in the Edwards Aquifer Recharge Zone where there are limitations on development. This Subarea includes portions of Council Districts 9 and 10.

1. CENSUS TRACTS

1209, 1210, 1211, 1212, 1213, 1215, 1218, 1219, 1913

2. POPULATION (estimated)* % of change

2000	136,120	--
2005	163,312	+20.00%
2010	181,474	+17.10%
2015	197,519	+8.80%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	28.40%
Anglo	61.50%
African American	5.50%
Other	4.60%
Male	48.20%
Female	51.80%

Age	
<5	7.50%
5-17	19.40%
18-24	8.10%
25-44	34.30%
45-64	22.40%
65+	8.30%

Median Household Income $53,796

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- San Antonio International Airport
- Rolling Oaks Mall

5. NATURAL RESOURCE ASSETS

- existing rock quarries
- Edwards Aquifer Recharge Zone
- Salado, Mud, Lorence, Elm, Long, and Perrin Beitel Creeks
- undeveloped, sensitive ecosystems north and south of Loop 1604

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage	
Friesenhahn	NP	11.80	
Kallison	NP	15.20	
Oakhaven	NP	9.50	
Subtotal Neighborhood Parks			**36.50 Acres**
Blossom	CP	17.60	
McClain	CP	97.50	
Subtotal Community Parks			**115.10 Acres**
Comanche Lookout	LUP/HR	99.73	
Johnson, Lady Bird	LUP/SC	77.80	
McAllister	LUP/NA	995.79	
Subtotal Large Urban Parks			**1,173.32 Acres**
Mud Creek	NA	67.37	
Subtotal Natural Areas			**67.37 Acres**
Lorence Creek	GW	37.39	
Subtotal Greenways			**37.39 Acres**
TOTAL CITY PARK ACREAGE			**1,429.68 Acres**

B. Bexar County Facilities

Name	Acreage	
MacArthur Park	12.25	
Subtotal		**12.25 Acres**

C. City of Live Oak Facilities

Name	Acreage	
Blaha Park	5.00	
Live Oak Park	75.00	
Montanio Park	5.00	
Xeriscape Gardens	.25	
Subtotal		**85.25 Acres**

D. City of Selma Facilities

Name	Acreage	
Davenport Park	2.00	
Subtotal		**2.00 Acres**

E. City of Windcrest Facilities

Name	Acreage	
Takas Park	10.20	
Subtotal		**10.20 Acres**
TOTAL NON-CITY PARK ACREAGE		**109.70 Acres**

GRAND TOTAL FAR WEST SUBAREA PARK ACREAGE **1,539.38**

VII. G. NORTHEAST SUBAREA

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1000 residents, the following chart summarizes the park land needs of the Northeast Subarea (based on June 2005 park acreage figures).

NORTHEAST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 163,312 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 181,475 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 197,519 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	1,429.68	8.75/1,000	2,613	-1,183	2,904	-1,474	3,160	-1,730
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	1,539.38	9.43/1,000	2,613	-1,074				

* Based on June 2005 Park Acreage

In June 2005, the City owned 1,429.68 acres of park land, or 8.75 acres per 1,000 residents in the Northeast Subarea. Based on the national average of 16 acres per 1,000 residents, a deficiency of 1,183 acres exists. Park acres of other public entities impact this ratio slightly, raising the total to 9.43 acres per 1,000 residents. Based solely on City population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 1,474 acres by the year 2010.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Lou Hamilton Community Center Addition	$400,000	Park Bonds	May 2000
Blossom Park Improvements***	$200,000	Park Bonds	June 2000
Friesenhahn Park Improvements***	$57,780	Park Bonds	August 2000
Comanche Lookout Park Development***	$400,000	Park Bonds	April 2001
Alva Jo Fisher Softball Complex Repairs***	$78,643	General Fund	January 2002
McAllister Park Improvements Phase 1***	$1,000,000	Park Bonds	February 2002
McClain Park Development	$97,260	General Fund	February 2002
Kallison Park Improvements***	$50,000	Park Bonds	May 2003
Oakhaven Park Improvements	$50,000	Park Bonds	May 2003
Lady Bird Johnson Park Skate/Aquatic Facility***	$781,716	Park Bonds	January 2004
Comanche Lookout Park Improvements Ph. 2***	$862,298	Park Bonds	June 2005

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 11 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $3,977,697. Out of all the projects completed, 72% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Mud Creek Park – (2001) – 67.37 acres
- Comanche Lookout Park Addition – (2002) – 3.731 acres
- McAllister Park Addition – (2002) – 139.4947 acres
- McClain Park – (2002) – 97.497 acres
- Lorence Creek Park Addition – (2003) – 12.076 acres
- Lorence Creek Park Addition – (2005) – 5.576 acres

There were 325.75 acres of park land added in the past five years with a total of 1,429.68 acres of City park land currently in the subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Edwards Aquifer Protection Land Acquisition***	$22,500,000*	Sales Tax
Friesenhahn Park Improvements Phase 2***	$238,900	Park Bonds
Lorence Creek Park Improvements***	$200,000	Park Bonds
McAllister Park Improvements Phase 2***	$2,643,974	Park Bonds
McClain Park Improvements	$100,000	Park Bonds
Mud Creek Park Development	$100,000	Park Bonds
Neighborhood Park Land Acquisition***	$155,860	UDC Fees
Northeast YMCA Building Improvements	$55,000	CDBG
Salado Creek Greenway Development***	$5,881,479	Sales Tax

* Estimated
*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 9 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $31,875,213. Out of all these projects, 67% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need has been expressed for the following activities and facilities.

- developed parks
- community center
- swimming facility

VII. G. NORTHEAST SUBAREA

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Northeast Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals, especially in regards to neighborhood and community parks, by Park Dedication or by other means.
- rehabilitate existing parks and recreation facilities to assure safety, security, accessibility, and quality programming for users.
- work with other public agencies and private organizations and individuals to secure land and further develop the Salado Creek corridor as a greenway.
- address major deficit in youth and adult city programs.
- Emphasize nature and outdoor programs at Comanche Lookout Park and Semmes Library.
- continue implementation of the McAllister Park Master Plan.
- secure natural area acreage over the Edwards Aquifer Recharge Zone and develop into accessible nature parks.
- construct a multi-purpose community center with gymnasium and pool.
- develop cooperative efforts with NEISD for park development and programs

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Neighborhood Park Development--design and construct new neighborhood park with walking trails, playgrounds, sport courts, and other appropriate development. (Council Districts 9 and 10)			
Design	$104,000	all but CDBG	2007
Construction	$432,640	all but CDBG	2008
Outdoor Priority 2			
Natural Area Development-- design and construction of an existing natural area property to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council Districts 9 and 10)			
Design	$243,360	all but CDBG	2008
Construction	$1,012,378	all but CDBG	2009
Outdoor Priority 3			
McAllister Park--design and construct rehabilitation to include trails, wayfinding, ADA modifications, playgrounds, picnic facilities, restrooms, parking, and roadways. (Council District 9)			
Design	$703,040	all but CDBG	2009
Construction	$2,924,646	all but CDBG	2010

Outdoor Priority 4

Lady Bird Johnson Park-- design and construct rehabilitation to include entrance, roadways, parking, ADA, park furnishings, addition of snake run to concrete skate park. (Council District 10)

Design	$478,123	all but CDBG	2010
Construction	$1,912,490	all but CDBG	2011

Outdoor Priority 5

Oakhaven Park--design and construct rehabilitation to include trail and ADA modifications. (Council District 9)

Design	$29,246	all but CDBG	2010
Construction	$243,331	all but CDBG	2011

Indoor Priority 1

Community Center—design & construct a community center with a gymnasium and a pool. (Council Districts 9 and 10)

Land Acquisition	$1,622,400	all but CDBG	2008
Design	$703,040	all but CDBG	2009
Construction	$2,924,646	all but CDBG	2010

Other Subarea Project Needs

Comanche Lookout Park--design and construct rehabilitation to include trails and erosion control. (Council District 10)

Design	$158,165	all but CDBG	2012
Construction	$657,966	all but CDBG	2013

Lady Bird Johnson Park/Fisher Softball Complex--design and construct rehabilitation to include connect sewer system with lift station from Y.M.C.A. & softball complex to main server, construct water diversion wall behind fields #2 & #3, heighten fences #1 & #4 to 12 feet, #2 & #3 to 10 feet, ADA improvements, and a playground. (Council District 10)

Design	$167,648	all but CDBG	2008
Construction	$1,124,864	all but CDBG	2009

Land Acquisition—acquire land for neighborhood and community type parks. (Council Districts 9 and 10)

Acquire 5-10 acres	$260,000	all but CDBG	2007
Acquire 5-10 acres	$281,216	all but CDBG	2009
Acquire 5-10 acres	$304,163	all but CDBG	2011
Acquire 10-20 acres	$657,966	all but CDBG	2013
Acquire 10-20 acres	$711,656	all but CDBG	2015

Large Urban Park—acquire 75 to 100 acres north of Loop 1604 and east of Highway 281, for a large urban park, and develop property appropriately. (Council District 10)

Acquisition	$3,640,000	all but CDBG	2007
Design	$811,200	all but CDBG	2008
Construction	$3,374,592	all but CDBG	2009

McClain Park--design and construct trails, interpretive features, and park amenities. (Council District 10)

Design	$187,500	all but CDBG	2008
Construction	$750,000	all but CDBG	2009

Mud Creek Natural Area-- design and construction of improvements to include access, parking, ADA trails, wayfinding, restroom, trail head, interpretive features, and park furnishings. (Council District 10)

Design	$312,500	all but CDBG	2009
Construction	$1,250,000	all but CDBG	2010

Natural Area Development-- design and construction of an existing natural area property outside of Loop 1604 to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council District 10)

Design	$1,000,000	all but CDBG	2010
Construction	$4,000,000	all but CDBG	2011

Neighborhood Park Development--design and construct new neighborhood parks with walking trails, playgrounds, sport courts, and other appropriate development. (5 Parks) (Council Districts 9 and 10)

Design	$112,486	all but CDBG	2009
Construction	$467,943	all but CDBG	2010
Design	$116,986	all but CDBG	2010
Construction	$486,661	all but CDBG	2011
Design	$121,665	all but CDBG	2011
Construction	$506,128	all but CDBG	2012
Design	$126,532	all but CDBG	2012
Construction	$526,373	all but CDBG	2013
Design	$131,593	all but CDBG	2013
Construction	$547,428	all but CDBG	2014

TOTAL PROPOSED PROJECTS **$36,126,571**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. NORTHEAST SUBAREA FACILITIES MAP (Following Attachment)

13. NORTHEAST SUBAREA PROGRAMS MAP (Following Attachment)

Northeast Subarea Facilities Map

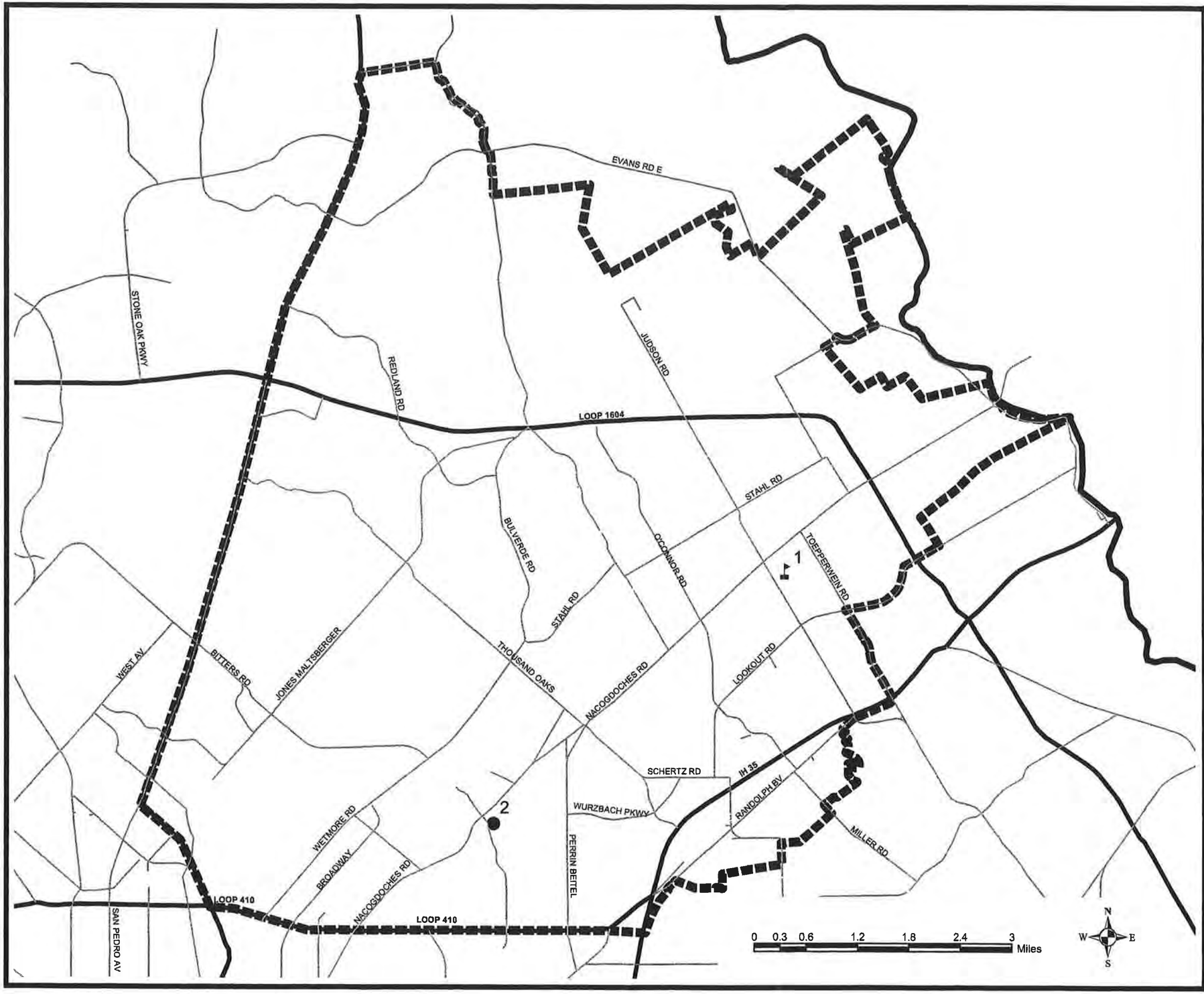
Location Map

	Parks	Pool	Community Center
1	Oakhaven		
2	Mud Creek		
3	McClain		
4	Friesenhahn		
5	Comanche Lookout		
6	Virgil T. Blossom		
7	Lorence Creek		
8	McAllister		
9	Lady Bird Johnson	Y	Y
10	Morrison Kallison		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Northeast Subarea Programs Map

Location Map



After School Challenge Programs

Community Centers

Afterschool Challenge Programs

Map Number	School Name
1	Wood

Community Centers

Map Number	Community Center
2	Johnson, Lady Bird

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. H. NORTHWEST SUBAREA

The **Northwest Subarea** is characterized by single and multi-family housing, and retail and commercial development, including many office complexes. The neighborhoods are largely new subdivisions where generally middle and upper income families live. The retail/commercial development includes large strip centers, mega-store developments, restaurants, hotels, and movie theater complexes. These predominate along IH 10, Loop 410, Loop 1604 and other major roadways including Bandera, Babcock, Fredericksburg, Huebner and Wurzbach Roads. The terrain of the Northwest Subarea ranges from gently sloping near Loop 410 to extremely hilly at the northern edge near Loop 1604. A variety of terrains and ecosystems exist, but are dominated by oak, cedar elm, cedar, and mesquite. Undeveloped land is very limited, and is found along the northwestern boundary of the subarea near Loop 1604. The northern portion of the subarea is located over the Edwards Aquifer Recharge Zone where there are limitations on development. This Subarea includes portions of Council Districts 7 and 8.

1. CENSUS TRACTS

1807, 1810, 1813, 1814, 1815, 1818, 1819, 1820, 1821

2. POPULATION (estimated)* % of change

2000	97,450	--
2005	113,759	+16.70%
2010	128,634	+13.10%
2015	142,662	+10.90%

*Based on past trend analysis (1970-2000) and current city limits boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	42.10%
Anglo	46.10%
African American	5.30%
Other	6.50%
Male	48.30%
Female	51.70%

Age

<5	7.40%
5-17	15.60%
18-24	15.70%
25-44	36.70%
45-64	16.70%
65+	7.90%

Median Household Income $41,492

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- South Texas Medical Center
- University of Texas at San Antonio
- Six Flags Fiesta Texas

5. NATURAL RESOURCE ASSETS

- Edwards Aquifer Recharge Zone
- Leon, Huebner, and French Creeks
- Undeveloped, sensitive ecosystems near Loop 1604

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage	
Huebner Creek	NP	11.14	
Leon Vista	NP	6.10	
Oak Hills	NP	8.10	
Spring Time	NP	2.76	
Subtotal Neighborhood Parks			**28.10 acres**
Fox	CP	34.80	
Hausman Road	CP	24.06	
Subtotal Community Parks			**58.86 acres**
O.P. Schnabel	LUP	202.00	
Subtotal Large Urban Parks			**202.00 acres**
Cedar Creek Golf Course	SC	172.72	
Subtotal Sports Complexes			**172.72 acres**
Bamberger	NA	70.91	
Crownridge Canyon	NA	207.79	
Friedrich	NA	606.64	
Medallion	NA	145.83	
Rancho Diana	NA	1,827.12	
Subtotal Natural Areas			**2,858.29 acres**
Leon Creek Greenway	GW	103.42	
Subtotal Greenways			**103.42 acres**

TOTAL CITY PARK ACREAGE **3,423.39**

TOTAL NON-CITY PARK ACREAGE **0.00**

GRAND TOTAL NORTHWEST SUBAREA PARK ACREAGE **3,423.39**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the Northwest Subarea (based on June 2005 park acreage figures).

NORTHWEST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 113,754 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 128,634 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 142,662 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	3,423.39	30.09/1,000	1,820.00	+1,603	2,058.00	+1,365	2,283	+1,140

Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	3,423.39	30.09/1,000	1,820.00	+1,603				

* Based on June 2005 Park Acreage

In June 2005, the City owned 3,423.39 acres of park land, or 30.09 acres per 1,000 residents in the Northwest Subarea. Based on the national average of 16 acres per 1,000 residents, an excess of 1,603 acres exists. Currently, there are no additional public park acres in the subarea. Based solely on City population projections and park acreage figures (assuming no further acquisition), there will continue to be an excess of 1,365 acres in 2010. It should be noted that the majority of the park acreage listed is in the classification of natural areas, and these properties are not yet developed and open to the public. There continues to be a shortage of neighborhood and community parks in this Subarea.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
O.P. Schnabel Playground & Improvements***	$1,000,000	Park Bonds	February 2000
Friedrich Park Trail Signage	$13,250	CDBG	October 2001
Huebner Creek Park Improvements	$13,700	Park Bonds	September 2002
Bamberger Nature Park Development***	$125,000	Grant	March 2003
Leon Creek Greenway Development Phase 1***	$110,000	Grant	March 2003
Leon Vista Park Development***	$80,000	Sales Tax	July 2003
Spring Time Park Playground	$190,650	General Fund	November 2004

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 7 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $1,532,600. Out of the projects completed 57% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Leon Vista Park – (1999) – 6.10 acres
- Bamberger Nature Park – (1999) – 70.91 acres
- Crownridge Canyon – (2001) – 207.79 acres
- Rancho Diana – (2001) – 1,827.12 acres
- Leon Creek Greenway Addition – (2002) – 82.49 acres
- Medallion Tract – (2003) – 145.83 acres
- Friedrich Park Addition – (2004) – 335.91 acres
- Hausman Road Park – (2005) – 24.055 acres
- Fox Park – (2005) – 34.804 acres

There were 2,735.01 acres of park land added in the past five years with a total of 3,423.39 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Crownridge Canyon Nature Area Improvements	$1,137,484	Park Bonds, Sales Tax
District 7 Leon Creek Greenway Acquisition***	$500,000	Park Bonds
District 8 Leon Creek Greenway Acquisition***	$264,923	Park Bonds
Edwards Aquifer Protection Land Acquisition***	$22,500,000*	Sales Tax
Friedrich Park Building Improvements	$364,386	Park Bonds
Friedrich Park Water Service Connection***	$25,000	Park Bonds
Hausman Rd. Park Acquisition & Development	$800,000	Park Bonds
Leon Creek Greenway Development***	$9,151,599	Sales Tax
Neighborhood Park Acquisition***	$171,695	UDC Fees
O.P. Schnabel Park Entrance Improvements***	$250,000	Park Bonds
Spring Time Park Swimming Facility Rehab.	$350,000	Park Bonds

* Estimated
*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 11 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $35,515,087. Out of these projects, 64% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities.

- walking and bicycle trails
- playgrounds
- new basketball courts
- picnic areas
- skate parks
- dog park
- water sports facilities (water playgrounds and swimming pools)
- multi-purpose community centers
- natural areas
- offer recreational programs and activities in the Subarea

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Northwest Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

VII. H. NORTHWEST SUBAREA

GENERAL PRIORITIES

- acquire and develop additional neighborhood park acreage to meet service goals, by Park Dedication and other means.
- address major deficit of City recreation youth and adult programs
- rehabilitate parks and recreation facilities to assure safety, security, accessibility and quality programming for users.
- acquire additional community park acreage to meet service goals.
- acquire additional large urban park acreage to meet service goals.
- Develop cooperative efforts with NISD for park development and recreation programs.
- acquire property along the Leon Creek Greenway and develop into accessible greenway trail systems.
- secure natural area acreage over the Edwards Aquifer Recharge Zone and develop acreage into accessible nature parks.
- construct a multi-purpose community center with gymnasium and swimming pool on the Fox Park property.
- Develop the Hausman Road Park and Library with multi-purpose facilities and programs.
- expand and appropriately develop the Friedrich/Crownridge/Cedar Creek/Rancho Diana contiguous park properties into a natural area destination.

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Neighborhood Park Development--design and construct new neighborhood park with walking trails, playgrounds, sport courts, and other appropriate development. (Council Districts 7 and 8)			
Design	$104,000	all but CDBG	2007
Construction	$432,640	all but CDBG	2008
Outdoor Priority 2			
Friedrich Park -- design and construct improvements to connect to entry parking area, new maintenance building/garage, storage, stone ruins to outdoor recreational facility, and other amenities. (Council District 8)			
Design	$236,654	all but CDBG	2008
Construction	$984,256	all but CDBG	2009
Outdoor Priority 3			
Natural Area Development-- design and construction of an existing natural area property to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council District 8)			
Design	$253,094	all but CDBG	2009
Construction	$1,052,893	all but CDBG	2010

Outdoor Priority 4

Rancho Diana—design and construct a Natural Areas Visitors Center, with rehabilitation to the existing structures, parking, access, interpretive features, trails, trailhead features, and other amenities following a master plan for the historic park. (Council District 8)

Master Plan	$40,945	all but CDBG	2010
Design	$912,490	all but CDBG	2011
Construction	$3,795,957	all but CDBG	2012

Outdoor Priority 5

Leon Vista Park – Design and construct renovations to building for park police substation and park maintenance facility, parking, trailhead feature, trail, access, and park furnishings. (Council District 7)

Design	$318,543	all but CDBG	2011
Construction	$1,274,175	all but CDBG	2012

Indoor Priority 1

Fox Park Community Center—design & construct community center with a gymnasium and a pool. (Council District 8)

Design	$650,000	all but CDBG	2007
Construction	$2,704,000	all but CDBG	2008

Other Subarea Project Needs

Bamberger Nature Park—design and construct additional trails, parking, drinking fountain, park toilets, security lighting, and park furnishings. (Council District 8)

Design	$119,750	all but CDBG	2014
Construction	$498,159	all but CDBG	2015

Cedar Creek Golf Course—design and construct improvements to the facilities buildings, grounds, and including ADA improvements. (Council District 8)

Design	$125,000	all but CDBG	2014
Construction	$500,000	all but CDBG	2015

Fox Park—design and construct trails, playground, sport courts, parking, walkways, picnic facilities, lighting, and other park improvements. (Council District 8)

Design	$243,360	all but CDBG	2009
Construction	$1,012,338	all but CDBG	2010

Hausman Road Park—design and construct trails, sports fields, playgrounds, picnic facilities, pavilion, and park furnishings. (Council District 8)

Design	$204,725	all but CDBG	2010
Construction	$851,657	all but CDBG	2011

Huebner Creek Park—design and construct trails, playground, drinking fountain, security lighting, and park furnishings. (Council District 7)

Design	$98,695	all but CDBG	2013
Construction	$410,571	all but CDBG	2014

Land Acquisition—acquire land for neighborhood, pocket, and community type parks. (Council Districts 7 and 8)

Acquire 5-10 acres	$260,000	all but CDBG	2007
Acquire 5-10 acres	$281,216	all but CDBG	2009
Acquire 5-10 acres	$304,163	all but CDBG	2011
Acquire 10-20 acres	$657,966	all but CDBG	2013
Acquire 10-20 acres	$711,656	all but CDBG	2015

Neighborhood Park Development--design and construct new neighborhood and pocket parks with walking trails, playgrounds, sport courts, and other appropriate development. (5 Parks) (Council Districts 7 and 8)

Design	$108,160	all but CDBG	2008
Construction	$449,946	all but CDBG	2009
Design	$112,486	all but CDBG	2009
Construction	$467,943	all but CDBG	2010
Design	$116,986	all but CDBG	2010
Construction	$486,661	all but CDBG	2011
Design	$121,665	all but CDBG	2011
Construction	$506,128	all but CDBG	2012
Design	$126,532	all but CDBG	2012
Construction	$526,373	all but CDBG	2013

Oxbow Neighborhood Area Park—design and construct trailhead feature, trails, pavilion, and neighborhood park facilities. (Council District 8)

Design	$73,116	all but CDBG	2010
Construction	$304,163	all but CDBG	2011

Spring Time Park— acquisition, design and construct neighborhood park improvements. (Council District 8)

Acquisition	$312,000	all but CDBG	2007
Design	$67,600	all but CDBG	2008
Construction	$281,216	all but CDBG	2009

TOTAL PROPOSED PROJECTS **$23,299,878**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. NORTHWEST SUBAREA FACILITIES MAP (Following Attachment)

13. NORTHWEST SUBAREA PROGRAMS MAP (Following Attachment)

VII. I. SOUTH SUBAREA

The **South Subarea** is characterized by residential, retail/commercial, and light industrial uses. The neighborhoods are ethnically diverse and include historic districts near downtown and newer subdivisions in the outer areas near Loop 410. Retail/commercial development is concentrated along major thoroughfares such as S.W. Military Drive. The terrain is generally flat with wooded areas composed of mesquite and hackberry. Abandoned agricultural fields that are now open grassland comprise the majority of undeveloped land in the Subarea. The Toyota manufacturing plant and support facilities will produce a major influx of development in this Subarea, and may change the makeup of the Subarea drastically over the next five years. This Subarea includes portions of Council Districts 1, 3, 4, and 5.

1. CENSUS TRACTS

1103, 1104, 1105, 1401, 1402, 1408, 1410, 1411, 1415, 1416, 1501, 1502, 1503, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1522, 1610, 1612

2. POPULATION (estimated)* % of change

2000	126,585	--
2005	130,598	+3.20%
2010	135,600	+3.80%
2015	140,285	+3.50%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS

Hispanic	84.10%
Anglo	13.40%
African American	1.40%
Other	1.10%
Male	48.90%
Female	51.10%

Age

<5	8.70%
5-17	22.90%
18-24	10.80%
25-44	28.60%
45-64	18.80%
65+	10.20%

Median Household Income $27,695

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Brooks City Base
- Stinson Municipal Airfield
- San Antonio Missions National Historical Park
- San Antonio River
- Palo Alto College

5. NATURAL RESOURCE ASSETS

- Undeveloped portions of the San Antonio River
- Historically significant sites
- Leon and Comanche Creeks
- Mitchell and Canvasback Lakes
- Medina River
- An abundance of flat, undeveloped property in the southern half of the Subarea

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

NAME	TYPE	ACREAGE	
Bellaire	NP	6.50	
King William	NP	.70	
Morrill	NP	1.40	
Palo Alto	NP	12.00	
Palo Alto Terrace	NP	7.20	
Tejeda, Frank	NP	8.90	
Victoria	NP	.90	
Subtotal Neighborhood Parks			**37.60 acres**
Arnold	CP	24.60	
Concepcion	CP	21.40	
Harlandale	CP	11.10	
Kingsborough	CP	12.90	
Pytel	CP	34.40	
Roosevelt	CP	12.90	
Spicewood	CP	31.80	
Stinson	CP	75.00	
Villa Coronado	CP	14.80	
Subtotal Community Parks			**238.90 acres**
Acequia	LUP	73.10	
Espada	LUP	10.80	
Subtotal Large Urban Parks			**83.90 acres**
Brooks	SC	21.40	
Mission del Lago Golf	SC	182.70	
Riverside Golf	SC	175.80	
Subtotal Sports Complexes			**379.90 acres**
Brown	NA	26.50	
Medina River	NA/LUP	362.32	
Subtotal Natural Areas			**388.82 acres**
Mission Parkway	GW/SUF	72.40	
Subtotal Greenways			**72.40 acres**
Commander's House	HR	2.30	
Subtotal Historic Resources			**2.30 acres**
San Jose Burial Park	SUF	83.80	
Subtotal Special Use Facilities			**83.80 acres**
TOTAL CITY PARK ACREAGE			**1,287.62**

BEXAR COUNTY FACILITIES

NAME	ACREAGE	
Harlandale Civic Center	1.08	
Mission County Park	64.09	
Subtotal		**65.17 acres**

CITY OF SOMERSET FACILITIES

NAME	ACREAGE	
Vernon G. Schimmel Park	16.00	
Subtotal		**16.00 acres**

NATIONAL PARK SERVICE FACILITIES

NAME	ACREAGE	
San Antonio Missions N.H.P.	736.00	
Subtotal		**736.00 acres**

TOTAL NON-CITY PARK ACREAGE **817.17**

GRAND TOTAL SOUTH SUBAREA PARK ACREAGE **2,104.89**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the South Subarea (based on June 2005 park acreage figures).

SOUTH SUBAREA LAND ACQUISTION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 130,598 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 135,600 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 1140,285 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	1,287.62	9.86/1,000	2,089	-801	2,170	-882	2,245	-957
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	2,104.89	16.12/1,000	2,089	+16				

* Based on June 2005 Park Acreage

In June 2005, the City owned 1287.62 acres of park land, or 9.86 acres per 1,000 residents in the South Subarea. Based on the national average of 16 acres per 1,000 residents, a deficiency of 801 acres exists. However, when park acres of County, State, Federal and other incorporated cities are added to this total, the ratio increases to 16.12 per 1,000 residents, near the national average. This is due to the large size of the San Antonio Missions National Historical Park. Based solely on City population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 882 acres in the year 2010. Acquisitions along the Medina River corridor and possible parks dedicated for new subdivisions will help in shortening this deficit.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Palo Alto Park Improvements***	$140,000	Park Bonds	May 1999
Arnold Park Walking Trail	$100,000	Park Bonds	September 1999

Spicewood Park Improvements***	$175,000	Park Bonds	March 2000
Harlandale Park Improvements***	$270,000	Park Bonds	July 2000
Harlandale Park Community Center HVAC	$130,000	Park Bonds	August 2000
Arnold Park Sand Volleyball Court	$5,241	Park Bonds	July 2001
Stinson Park Improvements***	$225,000	Park Bonds	July 2001
Roosevelt Park Improvements***	$250,000	Park Bonds	October 2001
Commander's House Exterior Improvements***	$192,000	General Fund	September 2002
Brooks Park Improvements***	$150,000	Park Bonds	September 2002
Stinson Park Lighting Improvements***	$150,000	Park Bonds	September 2002
Roman Community Center Improvements	$50,000	General Fund	June 2003
Kingsborough Park Improvements***	$50,000	CDBG	December 2003
Bellaire Park Development***	$153,018	CDBG	April 2004
Pearsall Park Dog Park and Improvements	$312,906	C of O	June 2004
Medina River Park Development***	$931,107	Grant	November 2004
Roosevelt Park Improvements Phase 2***	$228,193	Park Bonds	December 2004
Spicewood Park Improvements Phase 2***	$105,435	Park Bonds	December 2004
Morrill Park Basketball Court***	$55,000	CDBG	January 2005
Arnold Park Improvements***	$400,000	Park Bonds	June 2005

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 20 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $4,072,900. Out of the projects completed 75% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Padre Park (delete from City inventory…transferred to County inventory) – (1999) - -31.19 acres
- Medina River Park – (2002) – 362.316 acres

There were 362.316 acres of park land added in the past five years with a total of 1288.42 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Brooks Park Regional Youth Sports Facility	$1,000,000	Park Bonds
Kingsborough Park Playground***	$100,000	CDBG
Medina River Hike and Bike Trail (Mitchell Lake/Land Heritage Institute)***	$6,450,000	Park Bonds, Sales Tax
Palo Alto College Soccer Field Development	$150,000	Park Bonds
Palo Alto Park Improvements Phase 2***	$150,000	Park Bonds
Palo Alto Terrace Park Improvements	$250,000	HUD 108

Pytel Park Picnic Facilities	$4,000	UDC Fees
Ramirez Community Center Roof Replacement	$100,000	CDBG
Roosevelt Park Community Facility	$1,000,000	Park Bonds

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 9 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $9,204,000. Out of these projects, 33% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities in the South Subarea.

- lighted walking and jogging trails
- playgrounds
- skate parks

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the South Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals especially in regards to neighborhood parks by Park Dedication and other means.
- rehabilitate parks and recreation facilities to assure safety, security, accessibility and quality programming for users.
- design and construct lighted park pedestrian trails.
- support the completion of the Mission Trails project and the San Antonio River project, to include security and operational plans with multiple entities.
- further develop the Brooks City Base soccer complex master plan.
- seek funding for the architectural and structural repairs of the interior of the historic Commander's House.
- support and develop a hike and bike trail in a major greenway preserving the Medina River corridor and connecting the Medina River Park, Land Heritage Institute, Mitchell Lake and other properties to the San Antonio River.
- modify existing policies to allow for canoeing and kayaking on the San Antonio and Medina Rivers.
- implement cooperative efforts within City South (Texas A&M University, Southside ISD, Toyota, Audubon Society, Mission del Lago, etc...).

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Brooks Park – design and construct further improvements to include walking trail, expansion of youth athletic fields, parking, walkways, lighting, restrooms, and other park improvements. (Council District 3)			
Design	$500,000	all	2006
Construction	$2,163,200	all	2008
Outdoor Priority 2			
Arnold Park -- design and construct rehabilitation to the walking trail, lighting, sports field irrigation, trail markers, covered basketball court, parking expansion, and ADA modifications. (Council District 4)			
Design	$171,600	all	2007
Construction	$713,856	all	2008
Outdoor Priority 3			
Swimming Facilities -- Roosevelt Pool, Kingsborough Pool, and Concepcion Pool – design and construct rehabilitation to ADA modifications; deck replacement, filter system/piping replacement, and utility upgrades. (Council District 3 and 5)			
Design)	$246,064	all	2008
Construction	$1,023,626	all	2009
Outdoor Priority 4			
Pedestrian Wellness Trails -- Concepcion, Kingsborough, Villa Coronado Parks --design and construct pedestrian wellness trails (3 parks, ½ mile trail each) (Council District 3)			
Design	$196,851	all	2009
Construction	$818,901	all	2010
Outdoor Priority 5			
Mission Trail Parkway Parks -- design and construct rehabilitation to parking areas, roadways, trails, bridges, picnic facilities;, security lighting, and ADA modifications. (Council District 3)			
Design	$554,163	all but CDBG	2010
Construction	$2,216,653	all but CDBG	2011
Indoor Priority 1			
Commander's House – design and construct interior renovations and rehabilitate the main house and ADA modifications. (Council District 1)			
Design	$260,000	all	2007
Construction	$1,081,600	all	2008
Indoor Priority 2			
Harlandale Park Community Center -- design and construct outdoor pavilion new 5,000 s.f. addition to gymnasium structure to include multi-purpose rooms, office, storage, new restrooms, and ADA modifications. (Council District 3)			
Design	$324,480	all	2008
Construction	$1,349,837	all	2009
Other Subarea Project Needs			
Acequia Park -- design and construct rehabilitation to picnic facilities, roadway, restrooms, lighting, and ADA modifications. (Council District 3)			
Design	$95,405	all	2013
Construction	$396,885	all	2014

VII. I. SOUTH SUBAREA

Concepcion Park -- design and construct rehabilitation to roadways, parking, restrooms, playground, lighting, ballfields, post and cable barrier, picnic facilities, landscape, park furnishings, and ADA modifications. (Council District 3)

Design	$179,978	all	2009
Construction	$748,709	all	2010

Espada Park -- design and construct rehabilitation to restrooms, parking lot, lighting, and ADA modifications. (Council District 3)

Design	$132,341	all	2014
Construction	$550,822	all	2015

Kingsborough Park -- design and construct improvements park toilets, picnic facilities, picnic pavilion, park furnishings, landscape, and ADA modifications. (Council District 3)

Design	$136,873	all	2011
Construction	$569,394	all	2012

King William Park -- design and construct rehabilitation to gazebo, irrigation, landscape, and general park improvements. (Council District 1)

Design	$70,304	all	2009
Construction	$292,465	all	2010

Land Acquisition – acquire land for neighborhood and community type parks. (Council Districts 3 and 4)

Acquire 15-20 acres	$312,000	all	2007
Acquire 10-15 acres	$224,973	all	2009
Acquire 15-20 acres	$350,958	all	2011
Acquire 10-15 acres	$263,186	all	2013
Acquire 15-20 acres	$410,571	all	2014
Acquire 10-15 acres	$284,662	all	2015

Medina River Park – design and construct further improvements to include parking, access, pavilions, park amenities, and sports fields along Watson Road. (Council District 4)

Design	$567,840	all	2008
Construction	$2,362,214	all	2009

Mission del Lago Golf Course -- design and construct rehabilitation to facilities buildings and grounds, and ADA modifications. (Council District 3)

Design	$187,500	all	2014
Construction	$750,000	all	2015

Morrill Park -- design and construct rehabilitation to basketball court, playground, fencing, lighting, and ADA modifications. (Council District 5)

Design	$74,414	all	2008
Construction	$309,338	all	2009

Natural Area Development-- design and construction of a natural area property in the Southeast part of the County to include access, parking, ADA trails, wayfinding, bridges, restroom, trail head, interpretive features, and park furnishings. (Council District 3)

Acquisition	$2,500,000	all but CDBG	2008
Design	$253,094	all but CDBG	2009
Construction	$1,052,893	all but CDBG	2010

Neighborhood Park Development -- design and construct new neighborhood parks with walking trails, playgrounds, sport courts, and other appropriate development (5 parks). (Council Districts 3 and 4)

Design	$112,486	all	2009
Construction	$467,943	all	2010
Design	$116,986	all	2010
Construction	$486,661	all	2011
Design	$121,665	all	2011
Construction	$506,128	all	2012
Design	$126,532	all	2012
Construction	$526,373	all	2013
Design	$131,593	all	2013
Construction	$547,428	all	2014

Palo Alto Terrace Park -- design and construct rehabilitation to playground, lighting, and ADA modifications. (Council District 4)

Design	$67,600	all	2008
Construction	$281,216	all	2009

Pytel Park -- design and construct rehabilitation to the park facilities and park furnishings. (Council District 3)

Design	$125,000	all	2011
Construction	$500,000	all	2012

Riverside Golf Course -- design and construct rehabilitation to facilities buildings and grounds, and ADA modifications. (Council District 3)

Design	$359,375	all	2013
Construction	$1,437,500	all	2014

San Jose Burial Park -- design and construct rehabilitation to fencing, irrigation, roadways, landscape, lighting, park furnishings, and ADA modifications. (Council District 3)

Design	$444,785	all but CDBG	2014
Construction	$1,850,305	all but CDBG	2015

Skate Parks -- design and construct skate plazas and parks as a conversion of underused tennis courts. (Council Districts 3, 4, and 5)

Design	$135,200	all	2008
Construction	$562,432	all	2009

Spicewood Park -- design and construct a playground. (Council District 4)

Design	$62,500	all	2006
Construction	$260,000	all	2007

Stinson Park -- design and construct rehabilitation, general park improvements, and ADA modifications. (Council District 3)

Design	$115,144	all	2013
Construction	$478,999	all	2014

Tejeda Park -- design and construct rehabilitation to playground, restrooms, parking, basketball and tennis courts, irrigation, landscape, and park furnishings. (Council District 5)

Design	$167,290	all	2011
Construction	$695,925	all	2012

Villa Coronado Park and Father Ramon Center -- design and construct rehabilitation to pavilion, restroom, basketball court, tennis courts, parking lot, and ADA modifications. (Council District 3)

Design	$168,109	all	2010
Construction	$699,575	all	2011

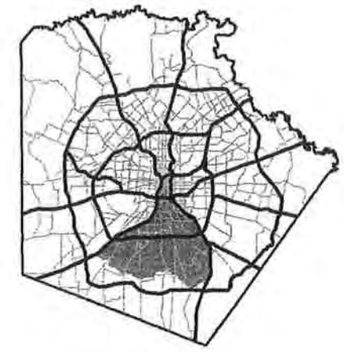
TOTAL PROPOSED PROJECTS	**$36,252,400**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. SOUTH SUBAREA FACILITIES MAP (Following Attachment)

13. SOUTH SUBAREA PROGRAMS MAP (Following Attachment)

South Subarea Facilities Map

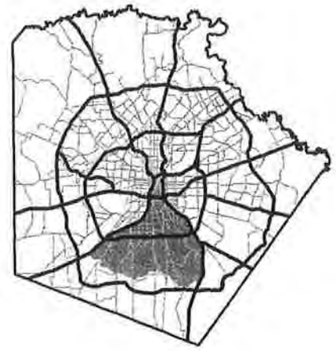


Location Map

	Park	Pool	Community Center
1	Commander's House		Y
2	King William		
3	Victoria		
4	Roosevelt	Y	
5	San Antonio River		
6	Concepcion	Y	
7	Riverside Golf Course		
8	Frank Tejeda		
9	Morrill		
10	Mission Parkway		
11	Pytel		
12	Harlandale		Y
13	San Jose Burial		
14	Acequia		
15	Stinson		
16	Bellaire		
17	Kingsborough	Y	
18	Brooks		
19	Brown		
20	Villa Coronado		Y
21	Arnold Hendrich		Y
22	Palo Alto		
23	Palo Alto Terrace		
24	Spicewood		
25	Mission del Lago Golf Course		
26	Medina River		
27	Espada		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

South Subarea Programs Map



Location Map

- After School Challenge Programs
- Community Centers
- Swimming Pools

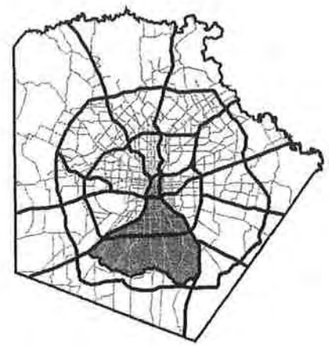
Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

0 1 2 4 Miles

N W E S

South Subarea Programs Legend

After School Challenge Programs			Community Centers	
Map Number	**School Name**		**Map Number**	**Community Center**
1	Adams		28	Arnold, Hendrich
2	Ball		29	Commander's House
3	Bellaire		30	Harlandale
4	Hope, Bob		31	Villa Coronado
5	Bonham		**Swimming Pools**	
6	Bell, Carrol		**Map Number**	**Name**
7	Connell		32	Concepcion
8	Douglass		33	Kingsborough
9	Gilbert		34	Roosevelt
10	Gillette			
11	Green			
12	Harlandale			
13	Hillcrest			
14	Hutchins			
15	Kazen, Abraham			
16	Kingsborough			
17	Knox			
18	Morrill			
19	Palo Alto			
20	Raybum			
21	Scheh			
22	Terrell Wells			
23	Vestal			
24	Wright			
25	Briscoe			
26	Schulze			
27	Roy P. Benevides			



Location Map

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. J. SOUTHWEST SUBAREA

The **Southwest Subarea** is characterized by light residential, retail/commercial and industrial uses, as well as military installations. Neighborhoods are ethnically diverse, and range from low to middle income. Retail and commercial development is concentrated along major thoroughfares such as Southwest Military Drive. The terrain is generally flat to slightly sloping with wooded areas comprised of mesquite, hackberry, and persimmon. The majority of undeveloped land was once used for agriculture and is now open grassland. This Subarea includes portions of Council Districts 4 and 5.

1. CENSUS TRACTS

1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618

2. POPULATION (estimated)* % of change

2000	93,240	
2005	94,995	+1.90%
2010	96,763	+1.90%
2015	97,530	+0.80%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	85.70%
Anglo	10.20%
African American	2.40%
Other	1.70%
Male	48.40%
Female	51.60%

Age

<5	9.30%
5-17	24.50%
18-24	11.50%
25-44	27.90%
45-64	16.70%
65+	10.10%

Median Household Income $27,171

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Lackland Air Force Base
- KellyUSA

5. NATURAL RESOURCE ASSETS

- Undeveloped, flat property in the southwestern half of the subarea.
- Leon and Medio Creeks

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage
Forge	NP	3.10
Gateway Terrace	NP	5.30
Kelly Area	NP	3.50
Royal Gate	NP	8.20

Subtotal Neighborhood Parks			**20.10 acres**	
Flores, Jimmy	CP	10.87		
Golden	CP	15.99		
Kennedy	CP/SC	39.40		
Medina Base Road	CP	44.53		
Miller's Pond	CP	44.17		
Normoyle	CP	30.20		
Palm Heights	CP	2.00		
South San	CP	1.30		
Subtotal Community Parks			**188.46 acres**	
Pearsall	LUP	231.08		
Subtotal Large Urban Parks			**231.08 acres**	
Camargo, Mateo	SUF	45.00		
Subtotal Special Use Facilities			**45.00 acres**	
TOTAL CITY PARK ACREAGE				**484.64**

B. Bexar County Facilities

NAME	ACREAGE		
South San Civic Center	.328		
Subtotal		**.328 acres**	
TOTAL NON-CITY PARK ACREAGE			**.328**

GRAND TOTAL SOUTHWEST SUBAREA PARK ACREAGE **484.97**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent City Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the Southwest Subarea (based on June 2005) park acreage figures).

SOUTHWEST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 94,995 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 96,763 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 97,530 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	484.64	5.10/1,000	1,520	-1,035	1,548	-1,063	1,560	-1,075
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	484.97	5.10/1,000	1,520	-1,035				

* Based on June 2005 Park Acreage

In June 2005, the City owned 484.64 acres of park land, or 5.10 acres per 1,000 residents in the Southwest Subarea. Based on the national average of 16 acres per 1,000 residents, a deficiency of 1,520 acres exists. Park acres of other public entities do not impact this total. Based solely on City

population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 1,063 acres by the year 2010.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project	Funding	Source	Completion
Miller's Pond Park Tree Planting	$50,800	General Fund	May 1999
Normoyle Community Center Addition	$313,000	Park Bonds	June 1999
Royalgate Park Basketball Court	$15,000	CDBG	July 1999
Kelly Area Park Development	$170,000	CDBG	October 1999
Golden Community Park Improvements Ph 3***	$50,000	General Fund	January 2000
Camargo Park Rehabilitation***	$860,000	Park Bonds	June 2000
Palm Heights Community Center Repairs	$80,000	General Fund	May 2001
Flores Park Improvements***	$200,000	Park Bonds	February 2002
Golden Community Park Improvements Ph 4	$200,000	Park Bonds	March 2002
Normoyle Park Improvements	$315,000	Park Bonds	June 2002
Miller's Pond Park Road Realignment	$62,163	CDBG	March 2003
Medina Base Road Park Development	$434,674	Park Bonds	October 2003

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 12 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $2,750,637. Out of the projects completed 25% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Kelly Area Park – (1999) – 3.50 acres
- Pearsall Park Addition – (2000) – 4.71 acres
- Medina Base Road Park – (2001) – 44.534 acres
- Gateway Terrace Park – (2004) – 5.30 acres
- Flores Park addition – (2004) - .87 acres
- Miller's Pond Park addition – (2004) – 1.97 acres

There were 60.884 acres of park land added in the past five years with a total of 484.64 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project	Funding	Source
Flores Park Improvements Phase 2***	$645,000	Park Bonds, CDBG
Forge Park Improvements***	$150,000	Park Bonds

Gateway Terrace Park Development	$250,000	Park Bonds
Golden Community Park Phase 5***	$150,000	Park Bonds
Hillside Acres Garden Development	$100,000	Park Bonds
Leon Creek Greenway Development***	$1,200,000	Sales Tax
Medina Base Road Park Skate Facility	$150,000	Park Bonds
Miller's Pond Park Improvements Phase 2***	$200,000	Park Bonds
Neighborhood Park Acquisition***	$32,000	UDC Fees
Normoyle Park Community Center Repairs	$50,000	CDBG
Palm Heights Park Improvements***	$157,431	HUD 108
Pearsall Park Disc Golf Course***	$80,000	Park Bonds
Pearsall Park Youth Sports Facility***	$1,000,000	Park Bonds
Royalgate Park Playground Replacement***	$150,000	CDBG
South San Playground Development	$110,000	Park Bonds
Valley Hi/Sky Harbor RR Spur Hike & Bike Trails	$420,000	Park Bonds

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 16 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $4,844,431. Out of these projects, 63% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed during the planning process for this document and on discussions with citizens, need was expressed for the following activities and facilities in the Southwest Subarea.

- development of Gateway Terrace Park
- further development of Pearsall Park
- rehabilitation of facilities at Kennedy Park

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the Southwest Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals, especially in regards to neighborhood and community parks.
- rehabilitate parks and recreation facilities to assure safety, security, accessibility and quality programming for users, especially in regards to neighborhood and community parks.

- acquire park acreage and further develop the Leon Creek Greenway with links to Pearsall Park, Lackland Air Force Base, and KellyUSA.
- continue implementation of master plan for Pearsall Park.
- complete implementation of master plan for Golden Community Park.
- complete implementation of master plan for Miller's Pond Park.
- expand non-traditional recreation programs at existing community centers and park facilities.
- develop a youth activity center near Loop 410.
- renovate existing sports fields to develop competitive girls softball at Normoyle Park.

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Pearsall Park (North) -- design and construct development of the north end of the park including parking, access trails, trailhead facility, picnic facilities, and park amenities based on the master plan for the park. (Council District 4)			
Design	$437,500	all	2006
Construction	$1,820,000	all	2007
Outdoor Priority 2			
Kennedy Park -- design and construct rehabilitation to restrooms, parking lots, trail, drainage, irrigation, landscape, park furnishings, ADA modifications, and sports fields. (Council District 5)			
Design	$221,000	all	2007
Construction	$919,360	all	2008
Outdoor Priority 3			
Swimming Facility Rehabilitation @ Normoyle Pool, Flores Pool, and Kennedy Pool – design and construct rehabilitation to ADA modifications, shade structures, deck replacement, and filter system/piping replacement. (Council Districts 4 and 5)			
Design	$263,694	all	2008
Construction	$1,096,742	all	2009
Outdoor Priority 4			
Miller's Pond Park -- design and construct development of formal ball fields, softball, soccer & football fields, amenities, restrooms, skate park, and parking. (Council District 4)			
Design	$251,775	all	2009
Construction	$1,047,023	all	2010
Outdoor Priority 5			
Normoyle Park Sports Fields – design and construct rehabilitation to sports facilities to include irrigation, utility upgrades, scorer's booths, shade canopies, and ADA modifications. (Council District 5)			
Design	$160,000	all	2010
Construction	$669,159	all	2011

Indoor Priority 1

South San Community Center-- design and construct rehabilitation to the building to include overhead doors, parking lot, HVAC rehabilitation, interior and exterior painting, and ADA modifications. (Council District 5)

Design	$143,312	all	2008
Construction	$596,178	all	2009

Indoor Priority 2

Youth Activity Community Center-- design and construct a 13,000 s.f. facility near Highway 90 and Loop 410, possibly in an existing park, to include a gymnasium, multi-purpose rooms, storage, restrooms, and park improvements to include ball fields, playgrounds, skate park, and basketball courts. (Council Districts 4, and 5)

Land Acquisition (15 to 20 acres)	$520,000	all	2007
Design	$646,797	all	2009
Construction	$2,690,675	all	2010

Indoor Priority 3

Community Center—design & construct community center with a gymnasium in the Thompson neighborhood area . (Council District 5)

Design	$760,408	all but CDBG	2011
Construction	$3,163,298	all but CDBG	2012

Other Subarea Project Needs

Acquisition -- of neighborhood and community park land. (Council Districts 4 and 5)

Acquire 15-20 acres	$312,000	all	2007
Acquire 45 acres	$1,012,378	all	2009
Acquire 15-20 acres	$364,996	all	2011
Acquire 45 acres	$1,184,339	all	2013
Acquire 15-20 acres	$426,974	all	2015

Forge Park -- design and construct rehabilitation to playground, restrooms, security lighting, ADA modifications, landscape, and park furnishings. (Council District 4)

Design	$98,426	all	2009
Construction	$409,451	all	2010

Gateway Terrace Park -- design and construct playground, walking trail, security lighting, parking, and park furnishings. (Council District 4)

Design	$167,290	all	2011
Construction	$695,925	all	2012

Golden Park -- design and construct development to include volleyball court, pavilion, picnic units, parking addition, ball field, and park furnishings. (Council District 4)

Design	$133,634	all	2009
Construction	$555,683	all	2010

Kelly Area Park -- design and construct lighting for the walking trail. (Council District 5)

Design	$56,243	all	2009
Construction	$233,972	all	2010

Kennedy Park Sports Facility –design and construct rehabilitation to sports facility to include irrigation, utility upgrades, scorer's booths, shade canopies, and ADA modifications. (Council District 5)

Design	$297,440	all	2008
Construction	$1,237,350	all	2009

Neighborhood Park Development -- design and construct new neighborhood parks with walking trails, playgrounds, sport courts, and other appropriate development (5 parks). (Council Districts 4 and 5)

Design	$112,486	all	2009
Construction	$467,943	all	2010
Design	$116,986	all	2010
Construction	$486,661	all	2011
Design	$121,665	all	2011
Construction	$506,128	all	2012
Design	$126,532	all	2012
Construction	$526,373	all	2013
Design	$131,593	all	2013
Construction	$547,428	all	2014

Palm Heights Park -- design and construct rehabilitation to lighting and tennis courts. (Council District 5)

Design	$122,200	all	2007
Construction	$508,352	all	2008

Pearsall Park (South) -- design and construct development of the south end of the park including a bmx and mountain bike facility, trails, birding overlook, and park amenities based on the master plan for the park. (Council District 4)

Design	$365,581	all	2010
Construction	$1,250,000	all	2011

Royalgate Park -- design and construct rehabilitation to picnic facilities, lighting, park furnishings, landscape, and ADA modifications. (Council District 4)

Design	$71,237	all	2012
Construction	$296,085	all	2013

Skate Parks -- design and construct skate plazas and parks as a conversion of underused tennis courts. (Council Districts 4 and 5)

Design	$135,200	all	2008
Construction	$562,432	all	2009

Stablewood Farms Park -- design and construct rehabilitation and further development of this neighborhood park to include picnic facilities, lighting, and ADA modifications. (Council District 4)

Design	$116,975	all	2012
Construction	$467,899	all	2013

TOTAL PROPOSED PROJECTS **$29,632,778**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. SOUTHWEST SUBAREA FACILITIES MAP (Following Attachment)

13. SOUTHWEST SUBAREA PROGRAMS MAP (Following Attachment)

Southwest Subarea Facilities Map

Location Map

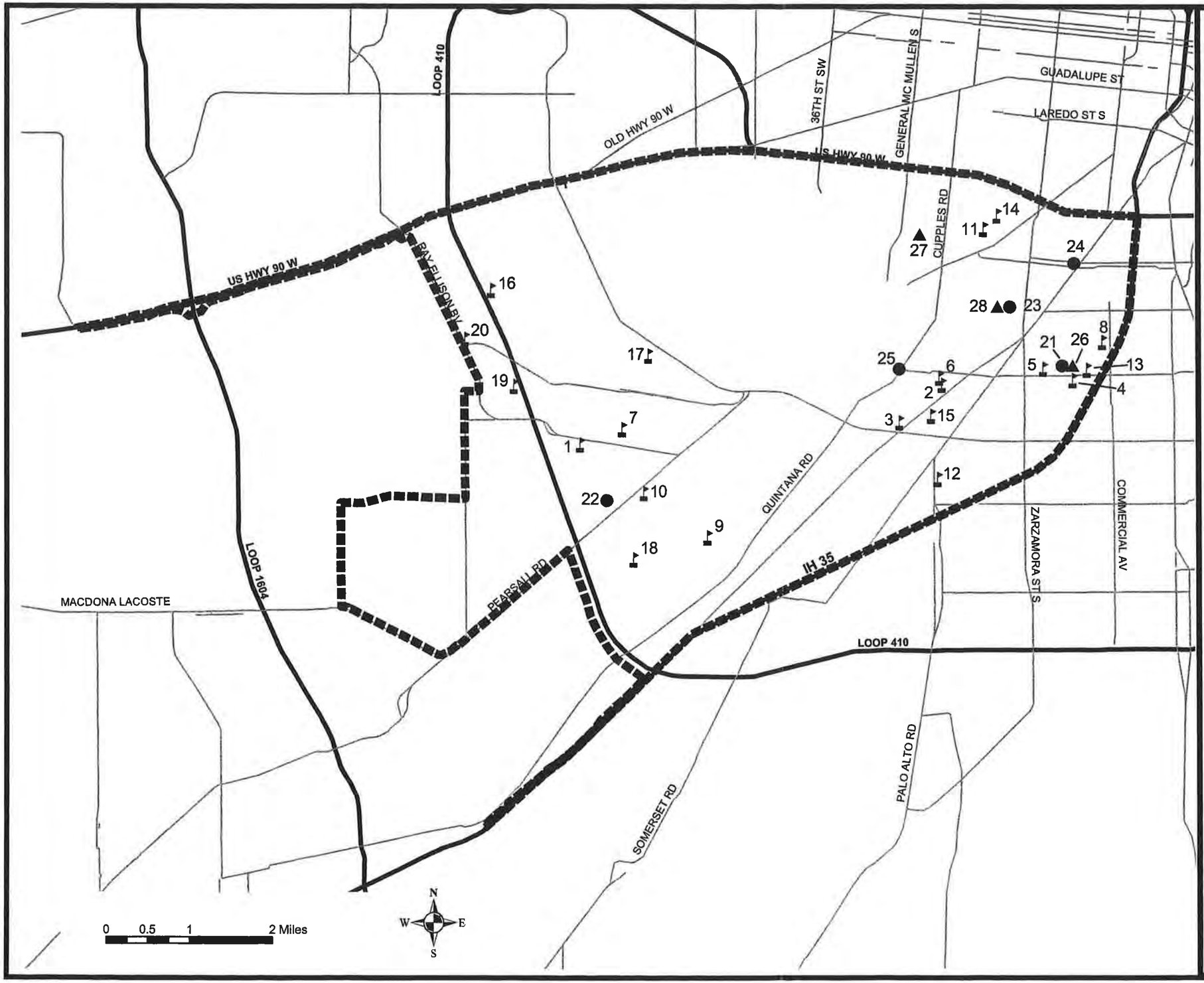
Parks	Pool	Community Center
1 Mateo Camargo		
2 Kelly Area		
3 John F. Kennedy	Y	
4 Palm Heights		Y
5 Normoyle	Y	Y
6 Jimmy Flores	Y	
7 South San		Y
8 Al Forge		
9 Golden Community		
10 Pearsall Park		
11 Royalgate		
12 Medina Base Road		
13 Miller's Pond		Y
14 Gateway Terrace		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

LOOP 410
OLD HWY 90 W
US HWY 90 W
36TH ST SW
GENERAL MC MULLEN S
GUADALUPE ST
LAREDO ST S
CUPPLES RD
BAY ELLISON BL
Lackland AFB
Lackland AFB Annex
QUINTANA RD
ZARZAMORA ST S
COMMERCIAL AV
LOOP 1604
PEARSALL RD
IH 35
MACDONA LACOSTE
LOOP 410
PALO ALTO RD
SOMERSET RD
0 0.5 1 2 Miles
N
W
E
S

Southwest Subarea Programs Map

Location Map



- After School Challenge Programs
- Community Centers
- Swimming Pools

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

Southwest Subarea Programs Legend

After School Challenge Programs

Map Number	School Name
1	Armstrong, Neil
2	Athens
4	Collier
5	Columbia Heights
6	Dwight
7	Five Palms
8	Flanders
9	Hidden Cove
10	Indian Creek
11	Kelly
12	Kindred
13	Leal
14	Lowell
3	Carrillo, Miguel
15	Price
16	Rayburn, Sam
17	Royalgate
18	Sky Harbour
19	Sun Valley
20	Valley Hi

Community Centers

Map Number	Community Center
21	Flores, Jimmy
22	Miller's Pond
23	Normoyle
24	Palm Heights
25	South San

Swimming Pools

Map Number	Name
26	Flores, Jimmy
27	Kennedy, John F.
28	Normoyle

Location Map

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VII. K. WEST SUBAREA

The **West Subarea** is characterized by dense residential development and retail/commercial use. The neighborhoods include historic districts in the inner city area and newer subdivisions in outer areas near Loop 410. The subarea is ethnically and economically diverse. Retail and commercial developments include strip centers and mega-stores that are concentrated along major thoroughfares such as Loop 410, Bandera, Fredericksburg and Culebra Roads and West Commerce Street. The terrain is generally flat to gently sloping, with some wooded areas of mesquite, persimmon and oak. Most of the undeveloped land was once used for agriculture, and is now open grassland. This Subarea includes portions of Council Districts 1, 4, 5, 6, and 7.

1. CENSUS TRACTS

1105, 1106, 1601, 1602, 1605, 1606, 1607, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1801, 1802, 1803, 1804, 1805, 1806, 1816, 1900, 1905

2. POPULATION (estimated)* % of change

2000	214,440	--
2005	211,824	-1.20%
2010	210,396	-0.70%
2015	210,970	+0.30%

*Based on past trend analysis (1970-2000) and current 2005 city limit boundaries as provided by the City of San Antonio Planning Department, January 2005.

3. DEMOGRAPHICS*

Hispanic	85.50%
Anglo	10.30%
African American	3.10%
Other	1.10%
Male	48.60%
Female	51.40%

Age	
<5	8.60%
5-17	21.90%
18-24	11.60%
25-44	28.10%
45-64	17.80%
65+	12.00%

Median Household Income $27,500

*Based on census population and housing statistics as provided by the City of San Antonio Planning Department, January 2005.

4. PROMINENT LANDMARKS AND FACILITIES

- Southwest Research Institute
- St. Mary's University
- Our Lady of the Lake University
- University of Texas at San Antonio (downtown campus)
- Wolff Stadium
- Levi Strauss Parks and Recreation Department Operations Headquarters and Community Center

5. NATURAL RESOURCE ASSETS

- Apache, Alazan, and Leon Creeks
- Undeveloped land near Loop 410 and along State Highway 151

6. PARK FACILITIES LISTING

A. City of San Antonio Facilities

Name	Type	Acreage	
Acme	NP	2.80	
Alderete	NP	9.60	
Amistad	NP	16.25	
Benavides, Father	NP	8.00	
Collins Gardens	NP	8.40	
Farias	NP	2.10	
Garcia	NP	6.00	
Ingram Hills	NP	3.28	
Lee's Creek	NP	7.80	
Los Angeles Heights	NP	.69	
Martinez	NP	9.80	
Monticello	NP	.50	
Navarro	NP	3.00	
Ojeda	NP	2.30	
Seeling	NP	1.50	
Van de Walle	NP	.70	
Vidaurri	NP	7.70	
Subtotal Neighborhood Parks			**90.42 acres**
Cassiano	CP	5.20	
Cuellar	CP	27.00	
Elmendorf	CP	29.60	
Garza	CP	21.50	
Lackland Terrace	CP	7.20	
Las Palmas	CP	5.50	
Levi Strauss	CP/GW	19.80	
Meadowcliff	CP	.50	
Monterrey	CP	51.00	
San Juan-Brady	CP	4.80	
Slick Creek	CP	62.77	
Sunset Hills	CP	1.90	
Tobin	CP	1.10	
Ward, Joe	CP	4.20	
West End	CP	5.20	
Westwood Village	CP	2.70	
Subtotal Community Parks			**249.97 acres**
Rosedale	LUP	61.80	
Woodlawn	LUP	62.00	
Subtotal Large Urban Parks			**123.80 acres**
Calderon	SC	2.50	
Escobar Field	SC	6.00	
Northside Tennis Center	SC	5.00	
San Antonio Natatorium	SC	2.90	
Subtotal Sports Complexes			**16.40 acres**
Apache Creek	GW	80.80	
Leon Creek Greenway South	GW	3.81	
Subtotal Greenways			**84.61 acres**

Levi Strauss Park Hdqtrs.	SUF	35.96		
Subtotal Special Use Facility			**35.96 acres**	
Catalina	US	.80		
Smith	US	.30		
Subtotal Urban Spaces			**1.10 acres**	
TOTAL CITY PARK ACREAGE				**602.26**

B. Bexar County Facilities

NAME	ACREAGE		
Rodriguez Park	37.60		
Subtotal		**37.60 acres**	

C. City of Balcones Heights Facilities

NAME	ACREAGE		
Rogiers	1.38		
Novack Park	.61		
Subtotal		**1.99 acres**	
TOTAL NON-CITY PARK ACREAGE			**39.59**
GRAND TOTAL SOUTHWEST SUBAREA PARK ACREAGE			**641.85**

7. NEEDS ASSESSMENT

Based on the statistics in the report entitled "The Excellent Park System" published by The Trust for Public Land, the national average of 16 acres of park land per 1,000 residents, the following chart summarizes the park land needs of the West Subarea (based on June 2005 park acreage figures).

WEST SUBAREA LAND ACQUISITION NEEDS IDENTIFICATION*

	2004 Inventory (Acres)	Current Service Ratio (Acres/Pop.)	2005 Estimated Population 211,824 (Acres/Goal)	(Excess/Def.)	2010 Estimated Population 210,396 (Acres/Goal)	(Excess/Def.)	2015 Estimated Population 210,970 (Acres/Goal)	(Excess/Def.)
Total City-Owned Park Acres	602.26	2.84/1,000	3,389	-2,787	3,366	-2,764	3,376	-2,774
Total Public Park Acres** including City, County, State, Federal and Incorporated Cities park land	641.85	3.03/1,000	3,389	-2,747				

* Based on June 2005 Park Acreage

In June 2005, the City owned 602.26 acres of park land, or 2.84 acres per 1,000 residents in the West Subarea. Based on the national average of 16 acres per 1,000 residents, a deficiency of 2,787 acres exists. Park acres of other public entities impact this total only minimally. Based solely on City population projections and park acreage figures (assuming no further acquisition), there will be a deficit of 2,764 acres by the year 2010.

8. PAST ACCOMPLISHMENTS (1999-2004)

A. Capital Improvement Projects Completed

Project***	Funding	Source	Completion
Alderete Park Improvements***	$22,000	Park Bonds	January 1999
Farias Park Basketball Court Cover	$80,000	CDBG	January 1999
Natatorium Toddler Pool & ADA Improvements***	$370,112	Park Bonds	August 1999
Alderete Park Basketball Court Rehabilitation***	$16,805	Park Bonds	October 1999
Tobin Community Center Addition	$200,000	Park Bonds	November 1999
Elmendorf Park Improvements***	$600,000	Park Bonds	January 2000
Monterrey Park Improvements***	$450,000	Park Bonds	January 2000
Apache Creek Parks Improvements***	$350,000	Park Bonds	May 2000
Collin's Gardens Park Improvements***	$150,000	Park Bonds	May 2000
Cuellar Park Ballfield Irrigation	$25,000	CDBG	May 2000
Rosedale Park Playground Development	$0	Donation	May 2000
Acme Park Toilet Enclosure	$8,000	CDBG	June 2000
Lee's Creek Park Improvements***	$85,000	Park Bonds	August 2000
Lackland Terrace Park Improvements***	$195,000	General Fund	September 2000
Meadowcliff Community Center Addition	$545,000	Park Bonds	September 2000
Cuellar Park Community Center Addition	$465,000	Park Bonds	December 2000
Garza Park Community Center Addition	$525,000	Park Bonds	December 2000
Garza Park Community Center Roof Repairs	$40,357	Park Bonds	December 2000
Ward Community Center Addition	$338,000	Park Bonds	December 2000
Woodlawn Lake Park Improvements Phase 1***	$2,100,000	Park Bonds	February 2001
Lackland Terrace Community Center Addition***	$212,000	Park Bonds	April 2001
San Antonio Natatorium Roof Replacement***	$266,000	CDBG	April 2001
Cuellar Park Playground Replacement	$75,000	CDBG	August 2001
San Antonio Natatorium Flat Roof Replacement***	$200,870	Park Bonds	September 2001
Martinez Park Improvements***	$150,000	Park Bonds	October 2001
Vidaurri Park Improvements***	$50,000	Park Bonds	October 2001
Monticello Park Area Park Improvements***	$110,000	Park Bonds	January 2002
Lackland Terrace Park Security Lighting***	$80,000	General Fund	February 2002
Tom Slick Creek Park Improvements	$500,000	General Fund	September 2002
Cuellar Park Security Lighting***	$111,000	General Fund	November 2002
Calderon Boys & Girls Club ADA Improv.***	$100,000	Park Bonds	May 2003
Frank Garrett Center ADA Improvements	$292,000	Park Bonds	May 2003
Cuellar Park Community Center Roof Repairs	$17,600	General Fund	May 2003
Farias Park Improvements	$25,000	CDBG	May 2003

Ingram Hills Park Improvements	$41,331	Park Bonds	June 2003
Collin's Gardens Park Fencing	$11,000	CDBG	September 2003
Tom Slick Creek Park Site Amenities	$18,000	General Fund	November 2003
Seeling Park Development***	$90,000	Park Bonds	January 2004
Woodlawn Lake Park Landscape Irrigation***	$64,728	Park Bonds	March 2004
Alderete Park Improvements***	$109,779	Park Bonds	August 2004
Las Palmas Park Walking Trail***	$40,962	Park Bonds	September 2004
Father Benavides Park Restroom Rehabilitation***	$45,000	CDBG	January 2005
Calderon Boys and Girls Club Court Lighting	$40,000	CDBG	January 2005
Las Palmas Park Improvements***	$200,000	Park Bonds	January 2005
Collin's Gardens Park Lighting***	$190,615	Park Bonds	March 2005
Cuellar Park Pool Rehabilitation***	$300,000	C of O	May 2005
Monterrey Park Pool Rehabilitation***	$300,000	C of O	May 2005
Elmendorf Park Pool Rehabilitation***	$433,000	C of O	June 2005
Westside YMCA Roof Replacement	$169,500	Park Bonds	June 2005

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There were 49 Park Capital Improvement Projects completed in the past five years with total budgets and investments in the community of $10,808,659. Out of the projects completed 59% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

B. Park Land Acquired

- Tom Slick Creek Community – (2002) – 62.722 acres
- Ingram Hills Park – (2002) – .68 acres
- Ingram Hills Park Addition – (2003) – 2.6 acres
- Levi Strauss Parks Headquarters – (2004) – 35.958 acres
- Leon Creek Greenway South – (2005) – 3.8117 acres

There were 105.7717 acres of park land added in the past five years with a total of 602.26 acres of City park land currently in the Subarea.

C. Funded Projects (currently under design or construction)

Project***	Funding	Source
Acme Park Basketball Court Cover	$147,150	CDBG, UDC Fees
Alderete Park Walking Trail***	$200,000	Park Bonds
Arroyo Vista Linear Park	$260,000	CDBG
Cuellar Park Basketball Court Cover	$140,000	CDBG
Cuellar Park Community Ctr. Roof Replacement	$236,000	Park Bonds
Father Benavides Park Improvements***	$100,000	Park Bonds
Garrett Community Center Gym Floor	$265,000	Park Bonds

Garza Park Pedestrian Bridge***	$332,108	Park Bonds, HUD 108
Ingram Hills Park Improvements	$144,753	Park Bonds, UDC Fees
Lackland Terrace Park Improvements***	$329,366	Park Bonds
Lee's Creek Park Improvements Phase 2***	$50,000	Park Bonds
Leon Creek Greenway Development***	$6,261,000	Sales Tax
Levi Strauss Park Repairs	$10,000	UDC Fees
Levi Strauss Parks Facility Headquarters	$3,510,000	C of O
Levi Struass Park Community Center***	$1,065,367	HUD 108
Los Angeles Heights Park Basketball Court	$150,000	Park Bonds
Monterrey Park Youth Sports Field Improv.***	$300,000	Park Bonds
Monticello Park Gazebo	$119,000	Park Bonds, UDC Fees
Rosedale Park Improvements***	$276,156	Park Bonds, UDC Fees
San Antonio Natatorium Bleachers***	$65,176	HUD 108
Tom Slick Creek Park Playground	$239,125	Park Bonds
Vidaurri Park Drainage Improvements	$50,890	HUD 108
Westside YMCA Structural Repairs	$455,978	HUD 108
Westwood Terrace Park Pool Rehabilitation***	$265,000	Park Bonds

*** Denotes project identified in the 1999 Parks and Recreation System Plan.

There are currently 24 Park Capital Improvement Projects funded and underway with total budgets and investments in the community of $14,972,069. Out of these projects, 46% of the projects were identified as priority needs from the 1999 Parks and Recreation System Plan.

9. COMMUNITY SURVEY

Based on surveys completed by citizens during the planning process for this document and on discussions with citizens, the need was expressed for the following activities and facilities in the West Subarea.

- lighted walking and jogging trails
- lighted sports fields
- retired person activity areas
- multipurpose community center
- dog parks
- skate parks
- playgrounds
- picnic areas
- multipurpose courts

10. RECOMMENDATIONS

After study of the demographic profile (both current and projected) of the West Subarea, inventory of current facilities and programs, and expressed needs of citizens, the following recommendations are being made to guide development of parks and recreation facilities and programs in the next ten years. Included are both general and specific recommendations.

VII. K. WEST SUBAREA

GENERAL PRIORITIES

- acquire additional park acreage to meet service goals especially in regards to expansion of accessible neighborhood, pocket, and community parks.
- rehabilitate parks and recreation facilities to assure safety, security, accessibility and quality programming for users.
- acquire property and further develop the Leon Creek Greenway.
- further develop Alazan/Apache Creeks and Martinez Creeks as greenways and connectors to existing public park properties.
- develop a skate park and a dog park in an existing large urban park.
- in consultation with neighborhood residents, design and construct lighted walking and jogging trails.
- further develop the community center located at the Levi Strauss facility and youth sports facilities, tree growing operation, and with a Leon Creek Greenway connection.
- continue to partner with agencies such as the Edgewood ISD and the YMCA for development of joint-use sports facilities.
- expand non-traditional recreation programs and senior programs at existing facilities such as Bertha Almaguer Dance Studio and Garrett Community Center

11. PROPOSED/UNFUNDED CAPITAL IMPROVEMENT PROJECTS

Recommendation	Estimate*	Source	Year
Outdoor Priority 1			
Woodlawn Lake Park -- design and construct rehabilitation and improvements to include exterior and interior painting of structures, landscape work, irrigation, park furnishings, skate park, dog park, and a pedestrian bridge. (Council District 7)			
Design	$520,000	all but CDBG	2007
Construction	$2,163,200	all but CDBG	2008
Outdoor Priority 2			
Elmendorf Park -- design and construct rehabilitation to Rodriguez stage and walls concrete art, landscape, park furnishings, and ADA modifications. (Council District 5)			
Design	$200,096	all	2008
Construction	$769,600	all	2009
Outdoor Priority 3			
Swimming Facility Rehabilitation -- design and construct rehabilitation and renovations at Sunset Pool, Garza Pool, Ward Pool, and Cassiano Pool to include ADA modifications, deck replacement, filter system/piping replacement, and general renovations. (Council Districts 5 and 7)			
Design	$309,338	all	2009
Construction	$1,286,844	all	2010

Outdoor Priority 4

Vidaurri Park -- design and construct rehabilitation to parking lot, security lighting, pavilion, sidewalk, and ADA modifications. (Council District 5)

Design	$116,986	all	2010
Construction	$486,661	all	2011

Outdoor Priority 5

Sunset Hills Park -- design and construct rehabilitation to playground, basketball and tennis courts, parking lot, security lighting, and ADA modifications. (Council District 7)

Design	$91,249	all	2011
Construction	$379,596	all	2012

Indoor Priority 1

San Juan Brady Park Community Center – design and construct rehabilitation to HVAC, roof, security lighting, doors and windows, interior and exterior painting, and ADA modifications. (Council District 5)

Design	$137,904	all	2008
Construction	$573,681	all	2009

Indoor Priority 2

Community Center -- design and construct in existing city park a 5,000 s.f. community center to include multi-purpose rooms, storage, gymnasium offices, and restrooms for use as a Senior Center. (Council Districts 1, 5, 6, and 7)

Design	$646,797	all	2009
Construction	$2,798,302	all	2011

Indoor Priority 3

San Antonio Natatorium -- design and construct rehabilitation to include deck surfacing replacement, and general building rehabilitation. (Council District 5)

Design	$153,602	all	2010
Construction	$638,743	all	2011

Indoor Priority 4

Woodlawn Lake Park Bertha Almaguer Dance Studio-- design and construct an addition to the facility and provide general rehabilitation to the existing facility. (Council District 1)

Design	$182,498	all but CDBG	2011
Construction	$759,191	all but CDBG	2012

Indoor Priority 5

Joe Ward Community Center -- design and construct an addition to the community center, rehabilitation of the aquatics facility, and parking improvements. (Council District 7)

Design	$246,737	all	2013
Construction	$1,026,427	all	2014

Other Subarea Project Needs

Acme Park -- design and construct rehabilitation to parking, walkways, lighting, and ADA modifications. (Council District 6)

Design	$131,250	all	2013
Construction	$525,000	all	2014

Acquisition – of park land for community, neighborhood, and pocket parks, notably in the vicinity of Loop 410, Loma Vista neighborhood area, and the Mirasol Homes neighborhood area. (Council Districts 5, 6, and 7)

Acquire 15-20 acres	$390,000	all but CDBG	2007
Acquire 15-20 acres	$421,824	all but CDBG	2009
Acquire 45 acres	$1,094,988	all but CDBG	2011

Acquire 35-40 acres	$921,152	all but CDBG	2013
Acquire 35-40 acres	$996,318	all but CDBG	2015

Alazan/Apache Creek -- design and construct rehabilitation to lighting, trails, signage, park furnishings and ADA modifications. (Council District 5)

Design	$657,966	all	2013
Construction	$2,737,138	all	2014

Amistad Park -- design and construct rehabilitation to sports fields to include irrigation, bleachers, lighting, park furnishings, and ADA modifications. (Council District 5)

Design	$87,739	all	2010
Construction	$364,996	all	2011

Cassiano Park-- design and construct rehabilitation to security lighting, pavilion, parking lots, post and cable barrier, and ADA modifications. (Council District 5)

Design	$128,496	all	2008
Construction	$534,310	all	2009

Cenizo Park (Rosedale Park Area)-- design and construct rehabilitation to existing school buildings, gymnasium, parking, walkways, ADA modifications, and other general building and site improvements. (Council District 5)

Design	$125,000	all	2007
Construction	$500,000	all	2008

Collins Gardens Park -- design and construct rehabilitation to restrooms, lighting, tennis and basketball courts, playground, walking trail, landscape, park furnishings, irrigation, ADA modifications, shade structure, and a skate plaza. (Council District 5)

Design	$251,545	all	2012
Construction	$1,046,166	all	2013

Cuellar Park -- design and construct a covered skate park and associated amenities. (Council District 6)

Design	$118,620	all	2007
Construction	$474,480	all	2008

Father Benavides Park -- design and construct rehabilitation to lighting, tennis and basketball courts, restrooms, parking lot, electrical, and ADA modifications. (Council District 5)

Design	$136,873	all	2011
Construction	$569,394	all	2012

Garcia Park -- design and construct rehabilitation to trails, lighting, art work, picnic facilities, irrigation, landscape, and ADA modifications. (Council District 5)

Design	$112,486	all	2009
Construction	$467,943	all	2010

Garza Park -- design and construct rehabilitation to building to include original multi-purpose room and HVAC, and park improvements to include renovations of the tennis courts, trails, landscape, park bridge to pool complex, and ADA modifications. (Council District 7)

Design	$125,479	all	2010
Construction	$729,992	all	2011

Levi Strauss Park-- design and construct rehabilitation to security lights, water service, parking lots, landscape, park furnishings, picnic pavilion, and ADA modifications. (Council District 6)

Design	$129,359	all	2009
Construction	$538,135	all	2010

Martinez Creek Greenway-- design and construct trail system to include walkways, lighting, trailhead, parking areas, and park furnishings. (Council Districts 1 and 5)

Design	$513,213	all	2014
Construction	$2,134,968	all	2015

Martinez Park-- design and construct rehabilitation to security lighting, irrigation, tennis courts, lighting, walking trail, park furnishings, landscape, and ADA modifications. (Council District 5)

Design	$161,328	all	2012
Construction	$671,125	all	2013

Monterey Park-- design and construct rehabilitation to the existing tennis courts into a skate and bmx park. (Council District 7)

Design	$196,232	all	2010
Construction	$608,326	all	2011

Monticello Park-- design and construct improvements from the park master plan including landscape and irrigation improvements. (Council District 7)

Design	$44,460	all	2011
Construction	$177,840	all	2012

Navarro Park -- design and construct rehabilitation, new park playground, parking, fencing, bleachers, landscape, irrigation, benches, bar-b-que pits, and ADA modifications. (Council District 5)

Design	$122,221	all	2008
Construction	$506,189	all	2009

Ojeda Park -- design and construct rehabilitation to basketball court, lighting, and ADA modifications. (Council District 1)

Design	$64,480	all	2007
Construction	$270,400	all	2008

Rosedale Park -- design and construct improvements and rehabilitation to roadways, parking, picnic facilities, walking trail, ADA modifications, restrooms, irrigation, tennis and basketball courts, electrical, lighting, landscape, and park furnishings. (Council District 5)

Design	$272,780	all	2009
Construction	$1,134,761	all	2010

San Juan Brady Park -- design and construct rehabilitation to basketball and tennis court surfacing, parking, area lighting, landscape, park furnishings, and ADA modifications. (Council District 5)

Design	$115,144	all	2013
Construction	$478,999	all	2014

Seeling Park -- design and construct lighting and landscape improvements. (Council District 7)

Design	$40,019	all	2008
Construction	$168,730	all	2009

Skate Parks -- design and construct skate plazas and parks as a conversion of underused tennis courts. (Council Districts 1, 5, 6, and 7)

Design	$140,608	all	2009
Construction	$584,929	all	2010

Slick Creek Park -- design and construct trails, trailhead, pavilion, lake overlook, lighting, landscape tree planting, irrigation, and park furnishings. (Council District 6)

Design	$425,760	all	2007
Construction	$1,703,040	all	2008

Van de Walle Park -- design and construct rehabilitation to playground, ADA modifications, and basketball court. (Council District 6)

Design	$45,624	all	2011
Construction	$189,798	all	2012

West End Park -- design and construct rehabilitation to playground, security lighting, sports field lighting, basketball and tennis courts, trail, picnic facilities, park furnishings, landscape, and ADA modifications. (Council District 1)

Design	$175,479	all	2010
Construction	$729,992	all	2011

TOTAL PROPOSED PROJECTS **$39,480,546**

*Costs adjusted for annual inflation of 4% per year beginning in 2006.

12. WEST SUBAREA FACILITIES MAP (Following Attachment)

13. WEST SUBAREA PROGRAMS MAP (Following Attachment)

West Subarea Facilities Map

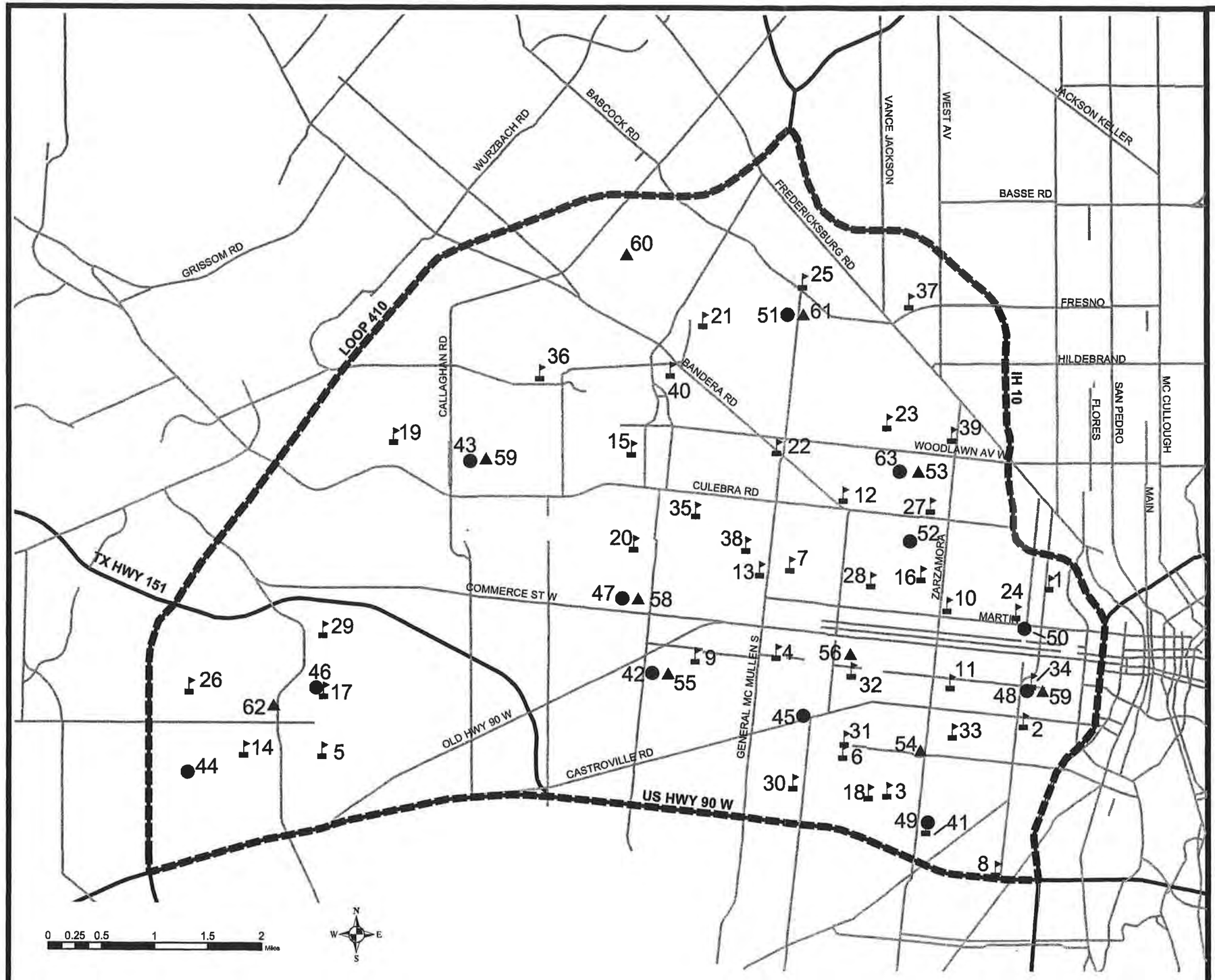
Location Map

Park	Pool	Community Center
1 Sunset Hills	Y	
2 Los Angeles Heights		
3 Catalina		
4 Joe Ward	Y	Y
5 Lee's Creek		
6 Monticello		
7 Ingram Hills		
8 Seeling		
9 Woodlawn Lake	Y	Y
10 West End		Y
11 Rosedale		
12 Clarissa Alderete		
13 Gilbert Garza	Y	Y
14 Northside Tennis Center		
15 Slick Creek		
16 Meadowcliff		Y
17 Westwood Village	Y	
18 Lackland Terrace		Y
19 Levi Strauss		
20 Van de Walle		
21 Acme		
22 Monterrey	Y	Y
23 Patrolman Richard Cuellar	Y	Y
24 Las Palmas		
25 Elmendorf	Y	
26 John Vidaurri		
27 Father Albert Benevides		
28 San Juan Brady		Y
29 Collins Gardens		
30 Calderon Boy's and Girl's Club		
31 Apache Creek		
32 Cassiano	Y	
33 Escobar Field		
34 Amistad		
35 Patrolman Guadalupe Martinez		
36 San Antonio Natatorium	Y	
37 Smith		
38 Jose Antonio Navarro		
39 Mario Farias		
40 Willie Ojeda		
41 Eduardo S. Garcia		
42 John Tobin		Y
43 Park Facility Headquarters		
44 Leon Creek Greenway South		

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

West Subarea Programs Map

Location Map

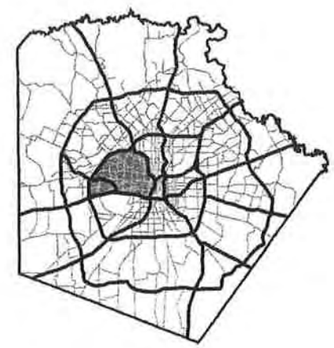


- After School Challenge Programs
- Community Centers
- Swimming Pools

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

After School Challenge Programs			Community Centers	
Map Number	School Name		Map Number	Community Center
1	Bowie		42	Cuellar, Patrolman Richard
2	Brackenridge, J T		43	Garza, Gilbert
3	Brewer		44	Lackland Terrace
4	Burleson		45	Las Palmas
5	Cable		46	Meadowcliff
6	Carvajal		47	Monterrey
7	Cenizo Park		48	San Antonio Natatorium
8	Collins Garden		49	San Juan Brady
9	Coronado Escobar		50	Tobin, John
10	Crockett		51	Ward, Joe
11	De Zavala		52	West End
12	Fenwick		53	Woodlawn Lake
13	Garcia, Gus		**Swimming Pools**	
14	Hull, Mary		Map Number	Name
15	Huppertz		54	Cassiano
16	Irving		55	Cuellar, Patrolman Richard
17	Jones, Anson		56	Elmendorf Lake
18	King, Sarah		57	Garza, Gilbert
19	Linton		58	Monterrey
20	Loma Park		59	San Antonio Natatorium
21	Longfellow		60	Sunset Hills
22	Madison		61	Ward, Joe
23	Mann		62	Westwood Village
24	Margil		63	Woodlawn Lake
25	Maverick			
26	Meadow Village			
27	Nelson			
28	Ogden			
29	Passmore			
30	Perales			
31	Rhodes			
32	Rodriguez			
33	Ruiz			
34	Tafolla			
35	Truman			
36	Villareal			
37	Whittier			
38	Williams, H K			
39	Woodlawn			
40	Woodlawn Hills			
41	Storm			

West Subarea Programs Legend



Location Map

Map Prepared by San Antonio Parks and Recreation Dept.
Date: June 2005

VIII. FUNDING/PLAN IMPLEMENTATION

A. INTRODUCTION

It is obvious from the previous chapters that for the Parks and Recreation Department to be successful, public revenue is needed to acquire land and make improvements. However, revenue for maintenance, policing, programs (operating budget), and a steady and consistent input of capital funds for small and large rehabilitation and development construction projects and for repairs to facilities is also needed. In 2003, the Trust for Public Land, in the document "The Excellent City Park System" surveyed the "adjusted park budget" of the largest 55 cities in the United States (fiscal year 2000). The adjusted park budget was defined as the amount spent by each city on park operations and capital, minus everything spent on big expense items such as zoos, museums, and planetariums. The national average is $80 per resident. As shown below, San Antonio at the time ranked below this average at $54 per resident; however, meets the average of those Texas cities surveyed.

Texas Cities

City	Adjusted Spending	Dollars/Resident
Austin	$51,773,000	$79
Ft. Worth	$35,833,000	$67
San Antonio	***$61,925,000***	***$54***
Dallas	$53,680,000	$45
Arlington	$14,779,000	$44
Houston	$64,634,000	$33
El Paso	Not available	Not available

Selected United States Cities Outside Texas

City	Adjusted Spending	Dollars/Resident
Seattle, WA	$120,749,000	$214
Minneapolis, MN	$62,879,000	$164
Cincinnati, OH	$43,737,000	$132
Chicago, IL	$380,000,000	$131
Kansas City, MO	$54,118,000	$122
Las Vegas, NV	$58,140,000	$122
Virginia Beach, VA	$51,447,000	$121
Phoenix, AZ	$158,980,000	$120
Sacramento, CA	$44,360,000	$109
Honolulu, HI	$93,805,000	$107
Long Beach, CA	$47,802,000	$103
Portland, OR	$52,203,000	$99
Atlanta, GA	$36,719,000	$88
San Diego, CA	$101,775,000	$83
Tucson, AZ	$36,580,000	$75
Boston, MA	$34,066,000	$58
New York City, NY	$431,930,000	$54
San Antonio	***$61,925,000***	***$54***
Nashville, TN	$29,828,000	$52
Philadelphia, PA	$76,443,000	$50
Oklahoma City, OK	$24,261,000	$48
Fresno, CA	$20,008,000	$47
New Orleans, LA	$20,670,000	$43
Memphis, TN	$27,229,000	$42

Baltimore, MD	$27,411,000	$42
Los Angeles, CA	$136,897,000	$37

Summary of Average of Dollars per Resident

Texas	$54
Texas & U.S. Cities	$80
San Antonio	$54

* Source: The Trust for Public Land, "The Excellent City Park System", Peter Harnick, 2003.

The Parks and Recreation Department's largest area of concern over the past five years, since the 1999 Plan was completed, has been a steady increase in the number of park lands and facilities to patrol and maintain. In spite of this increase, budgets and staffing have stayed level or decreased in comparison to the amount of acreage in the system. A commitment to the sufficient stewardship of park lands, whether developed or not, is important in the eyes of the residents and visitors alike. Effective stewardship involves an adequate budget for qualified staff at all levels to oversee the management, development, policing, maintenance, and programming of the parks system. It is necessary to make the public aware of the need for stewardship in order to encourage volunteerism among citizens. Volunteers can help bridge the gap between tight budgets and system needs.

Given the state of municipal budgets over the past five to ten years, it becomes increasingly important to seek other forms of revenue, especially from the private sector. In 2000, San Antonio received approximately $.52 per capita in private donations. This is well below other large cities in the country and efforts need to be increased to infuse more private dollars to the Parks and Recreation Department through the San Antonio Parks Foundation. There are also numerous grants that are available to Parks and Recreation Departments for programming and improvements. A steady and consistent search of grant opportunities and an aggressive grant application program is important to capitalize on these programs.

The following is a detailed listing of possible revenue streams, other than the General Fund, that the Parks and Recreation Department could utilize to build appropriate budgets in all categories of the system.

Municipal Programs

- Certificates of Obligation
- General Obligation Bonds – bonded indebtedness issued with the approval of the citizens for capital improvements
- Dedication/Development Fees – fees are assessed for the development of residential and/or commercial properties with the proceeds to be used for parks and recreation purposes, such as open space acquisition and community or neighborhood park development
- User Fees – user fees established by local ordinance for constructing and maintaining recreation facilities or for underwriting program costs
- Revenue Bonds – bonds used for capital projects that will generate revenue for debt service where fees can be set aside to support repayment of the bond
- Private Concessionaires – contract with a private business to provide and operate desirable recreational activities financed, constructed, and operated by the private sector with additional compensation paid to the City
- Naming Rights – many cities and counties have turned to selling the naming rights for new buildings or renovation of existing buildings and parks for the development cost associated with the improvement
- Private Developer's Leases – developers lease space from City-owned land through a subordinate lease that pays out a set dollar amount plus a percentage of gross dollars for recreation enhancements
- Special Improvement District – taxing districts established to provide funds for certain types of improvements that benefit a specific group of affected properties

- Designated License Plate for Parks – can be used to finance improvements or programs in the state or city
- Park Authority – facilitate creative business approaches to leisure services that some governmental entities cannot provide
- Bond Referendum – massive capital needs, renovation and construction or new facilities
- Fees/Charges – should be market driven; most public parks and recreation agencies only generate an average of 35% to 50% of operating expenditures
- Cost Avoidance – decide whether or not to provide certain facilities or programs. Can't be everything to everyone; must be market-driven and stay within department's core businesses
- Cell Towers – cell towers attached to existing light poles in game field complexes are another source of revenue
- Sales Tax - use of local sales tax revenue available
- Licensing Rights – Department of City licenses its name on all resale items that private or public vendors use when they sell clothing or other items with the City's name on it
- Advertising sales – selling tasteful and appropriate advertising on parks and recreation related items such as in the City's recreation program guide, scoreboards, etc.
- Parking fee in parks – at selected destination facilities

Public Agency Grants

- Federal Grants –
  - Highway and Transportation Enhancement Grants
  - Land and Water Conservation Fund
  - Community Development Block Grants (CDBG)
  - Urban Parks and Recreation Recovery Grant (UPARR)
- State Grants –
  - Texas Parks and Wildlife Regional Park Grant
  - Texas Parks and Wildlife Recreational Trails Grant

Private Agency Grants

- Park Foundation (501c3 status for accepting tax-deductible contributions) – dollars are raised from tax-exempt, non-profit organizations established with private donations to promote specific causes
- Corporate sponsorships – allows corporations to invest in the development of enhancement of new or existing facilities. Sponsorships are also highly recommended for programs and events

Public and Private Partnerships

- Partnerships with other organizations – are a joint development funding source between two separate agencies, such as two government entities, a non-profit and a City department. The two partners jointly develop revenue-producing park and recreation facilities and share operational costs, risk, responsibilities and asset management
- Intergovernmental Agreements (with County and surrounding cities) – contractual relationships entered into between two or more local units of government for the joint usage/development of sports fields, regional parks, or other facilities
- Land Trusts – help secure and fund the cost for acquiring land that needs to be preserved and protected

B. IMPLEMENTATION STRATEGY

The Parks and Recreation System Strategic Plan should be implemented in the coming years according to objective criteria developed to evaluate needs and set priorities for acquisition and improvement of public park facilities, to offer recreation programming meeting contemporary needs, to evaluate needs and set priorities for maintenance of the varied public park facilities, and to provide for effective and comprehensive policing activities to protect the City investment and to provide safety of park users. Generally, the plan implementation should be based on the following hierarchy of concerns:

1) safety and security of park users.
2) custodianship of existing park structures and facilities.
3) stewardship of natural resources in City parks.
4) development of underdeveloped parks.
5) acquisition of parks and/or facilities in underserved areas.
6) development of newly acquired parks as appropriate to each classification.
7) provision of recreational programs as determined by ongoing public input.

C. FUNDING STRATEGY

State and Federal matching grants will be pursued as local share resources exist, and the value of donated land will be used as a match whenever possible or when a monetary match is not available. In addition, the Department will continue its leadership role in fostering short and long term partnerships with all levels of the public and private sector to maximize the potential of applying shared resources and energy to the realization of projects and programs. This includes working with the San Antonio Parks Foundation whose mission is to support the Parks and Recreation Department and its projects.

The Department will seek funding to implement recommendations included in the Parks and Recreation System Strategic Plan utilizing a flexible strategy fitting needs to opportunities when seeking funding for both capital projects and programs. On a project-by-project basis, the complex and wide array of public and private funding sources will be studied to maximize financing opportunities.

Though it is difficult to predict available funding on an annual basis, it is assumed that, except for General Obligation Bonds, some funds will be available in each fiscal year. General Obligation Bonds are dependent on a successful election and issuance of bonds.

All of the projects listed in the subarea sections in Chapter VII have been prioritized according to the criteria above, and spread out over the ten year period of this plan (the listing for FY2005/2006 are currently funded projects). Land acquisition, design, and construction funding rarely fall in the same year, but rather are staggered to follow the natural progression of a project. The projects are also broken down by Council District, and secondarily by Subarea on the following pages. Where a project falls into one or more Council Districts, the projects are grouped accordingly. Finally totals for each Council District, and grouped Council Districts are shown, with grand totals for that fiscal year. A listing of all projects by Council District may be found in Appendix IX.E.

D. 2005/2006 CURRENTLY FUNDED PROJECTS

PROJECT	CD#	SUBAREA	AMOUNT
Boliver Hall Electrical Upgrades	1	Central	$100,000
Buckeye Park Toilet Enclosure	1	North	$15,000
Crockett Park Improvements	1	North	$125,000
El Mercado Building Renovations	1	Central	$274,144
Farmers Market Building Renovations	1	Central	$419,000
Garrett Community Center Gymnasium Floor Replacement	1	West	$265,000
Granados Park Senior Center	1	North	$1,056,346
Los Angeles Heights Park Basketball Court	1	West	$150,000
Market Square Rehabilitation Phase 1	1	Central	$1,000,000
Riverwalk Electrical and Lighting Analysis	1	Central	$200,000
Riverwalk Rehabilitation Phase 1	1	Central	$500,000
San Fernando Gymnasium HVAC	1	Central	$377,000
Tower of the Americas Improvements	1	Central	$1,864,000
TOTAL			**$6,345,490**
Coliseum Oaks Park Playground	2	East	$323,548
Copernicus Park Youth Sports Fields	2	East	$400,000
Davis-Scott YMCA Roof Replacement	2	East	$555,320
Dawson Park Parking Lot Expansion	2	East	$234,323
Historic City Cemeteries Fencing	2	East	$50,000
Lakeside Park Playground and Improvements	2	East	$400,000
Lincoln Park Community Center Roof Replacement	2	East	$267,818
Northampton Park Development	2	North	$235,000
Skyline Park Improvements	2	East	$126,000
TOTAL			**$2,592,009**
Salado Creek Greenway Development	2/3	East	$7,966,000
TOTAL			**$7,966,000**
Salado Creek Greenway Development	2/10	North	$5,373,014
TOTAL			**$5,373,014**
Brooks Park Regional Youth Sports Facility	3	South	$1,000,000
Kingsborough Park Playground	3	South	$100,000
Pytel Park Amenities	3	South	$4,000
Skyline/Highlands Ball Field Improvements	3	East	$253,796
S.S. Lions Park Dam/Spillway Repairs	3	East	$1,547,636
S.S. Lions Park Playground and Skatepark	3	East	$239,696
S.S. Lions Park Pool Drainline Relocation	3	East	$133,000
S.S. Lions Park Drainage Improvements	3	East	$173,000
TOTAL			**$3,451,128**
Medina River Hike and Bike Trail	3/4	South	$6,450,000
TOTAL			**$6,450,000**
Arnold Park Improvements	4	South	$400,000
Flores Park Improvements	4	Southwest	$645,000
Forge Park Improvements	4	Southwest	$150,000
Gateway Terrace Park Development	4	Southwest	$250,000
Golden Community Park Improvements	4	Southwest	$150,000
Heritage Duck Pond Park Basketball Court	4	Far West	$185,000
Hillside Acres Gardens Development	4	Southwest	$100,000
Lackland Terrace Park Improvements	4	West	$329,366
Leon Creek Greenway Development	4	Southwest	$1,200,000

Medina Base Road Park Skate Facility	4	Southwest	$150,000
Miller's Pond Park Improvements	4	Southwest	$200,000
Neighborhood Park Acquisition	4	Southwest	$32,000
Palo Alto College Soccer Field Development	4	South	$150,000
Palo Alto Park Improvements Phase 2	4	South	$150,000
Palo Alto Terrace Park Improvements	4	South	$250,000
Pearsall Park Youth Sports Facility	4	Southwest	$1,000,000
Pearsall Park Disc Golf Course	4	Southwest	$80,000
Rainbow Hills Park Basketball Court Cover	4	Far West	$143,112
Ramirez Community Center Roof Replacement	4	South	$100,000
Royalgate Park Playground Replacement	4	Southwest	$150,000
Valley Hi/Sky Harbor RR Spur Hike and Bike Trail	4	Southwest	$420,000
TOTAL			**$6,234,478**
Alderete Park Walking Trail	5	West	$200,000
Father Benavides Park Improvements	5	West	$100,000
Las Palmas Park Improvements	5	West	$200,000
Normoyle Park Community Center Repairs	5	Southwest	$50,000
Palm Heights Park Improvements	5	Southwest	$157,431
Roosevelt Park Community Building	5	South	$1,000,000
Rosedale Park Improvements	5	West	$276,156
San Antonio Natatorium Bleachers	5	West	$65,176
South San Playground Development	5	Southwest	$110,000
Vidaurri Park Drainage Improvements	5	West	$50,890
Westside YMCA Structural Repairs	5	West	$455,978
TOTAL			**$2,665,631**
Monterrey Park Youth Sports Field Improvements	5/7	West	$300,000
TOTAL			**$300,000**
Acme Park Basketball Court Cover	6	West	$147,150
Arroyo Vista Linear Park	6	West	$260,000
Cathedral Rock Park Development	6	Far West	$449,067
Cuellar Park Basketball Court Cover	6	West	$140,000
Cuellar Park Community Center Roof Replacement	6	West	$169,500
Edwards Aquifer Protection Land Acquisition	6	Far West	$22,500,000
Leon Creek Greenway Development	6	West	$6,261,000
Oscar Perez Park Development	6	Far West	$690,306
Tom Slick Creek Park Playground	6	West	$239,125
Levi Strauss Park Facility Headquarters & Community Center	6	West	$4,565,367
Levi Strauss Park Repairs	6	West	$10,000
Westwood Village Park Pool Rehabilitation	6	West	$265,000
TOTAL			**$35,696,515**
Leon Creek Greenway Development	6/7	Far West	$8,886,995
Neighborhood Park Land Acquisition	6/7	Far West	$31,298
TOTAL			**$8,918,293**
Nani Falcone Park Improvements Phase 2	7	Far West	$750,000
Garza Park Pedestrian Bridge	7	West	$63,459
Ingram Hills Park Improvements	7	West	$144,753
Lee's Creek Park Improvements Phase 2	7	West	$50,000
Leon Creek Greenway Acquisition and Development	7	Northwest	$500,000
Monticello Park Gazebo	7	West	$119,000
TOTAL			**$1,627,212**
Leon Creek Greenway Development	7/8	Northwest	$9,151,599
Neighborhood Park Land Acquisition	7/8	Northwest	$171,695

TOTAL			**$9,323,294**
Crownridge Canyon Nature Area Development	8	Northwest	$1,137,484
Edwards Aquifer Protection Land Acquisition	8	Northwest	$22,500,000
Eisenhower Park Water Service Connection	8	Far North	$515,500
Friedrich Park Building Improvements	8	Northwest	$364,386
Friedrich Park Water Service Connection	8	Northwest	$25,000
Hausman Road Park Development	8	Northwest	$800,000
Leon Creek Greenway Acquisition and Development	8	Northwest	$264,923
Quarry Area Park Land Acquisition	8	Far North	$365,470
O.P. Schnabel Park Entrance Improvements	8	Northwest	$250,000
Spring Time Park Swimming Facility Rehabilitation	8	Northwest	$350,000
TOTAL			**$26,572,763**
Edwards Aquifer Protection Land Acquisition	8/9	Far North	$22,500,000
Neighborhood Park Land Acquisition	8/9	Far North	$48,338
Salado Creek Greenway Development	8/9	Far North	$6,105,984
TOTAL			**$28,654,322**
Botanical Gardens ADA Improvements Phase 2	9	North	$950,000
Brackenridge Park Japanese Tea Gardens Rehabilitation	9	North	$750,000
Brackenridge Park Sunken Gardens Theater ADA Modifications	9	North	$300,000
Brackenridge Park Rehabilitation Package B	9	North	$2,540,164
Lorence Creek Park Improvements	9	Northeast	$200,000
McAllister Park Improvements Phase 2 & Youth Sports Fields	9	Northeast	$2,643,974
Olmos Basin Park Party House Repairs	9	North	$100,000
Olmos Basin Park Rehabilitation and Trail System	9	North	$1,558,727
Olmos Basin Park Youth Sports Field Improvements	9	North	$200,000
Neighborhood and Sports Field Park Land Acquisition	9	Far North	$500,000
Stone Oak Park Improvements Phase 1	9	Far North	$437,500
Stone Oak Park Improvements Phase 2	9	Far North	$795,225
Walker Ranch Park Improvements Phase 2	9	Far North	$110,000
Walker Ranch Park Land Acquisition & Improvements Phase 3	9	Far North	$820,000
TOTAL			**$11,905,590**
Edwards Aquifer Protection Land Acquisition	9/10	Northeast	$22,500,000
Salado Creek Greenway Development	9/10	Northeast	$5,881,479
TOTAL			**$28,381,479**
Friesenhahn Park Improvements Phase 2	10	Northeast	$238,900
McClain Park Development	10	Northeast	$100,000
Mud Creek Park Development	10	Northeast	$100,000
Neighborhood Park Land Acquisition	10	Northeast	$155,860
Northeast YMCA Building Improvements	10	Northeast	$55,000
TOTAL			**$649,760**
GRAND TOTAL			**$193,106,978**

E. 2006 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Hemisfair Park Improvements Design	1	Central	$625,000
Riverwalk North Extension Safe Harbor	1	Central	$250,000
TOTAL			**$875,000**
M.L. King Park Area Development Design	2	East	$750,000
TOTAL			**$750,000**
Brooks Park Youth Athletic Complex Development Design	3	South	$500,000
TOTAL			**$500,000**
Spicewood Park Playground Design	4	South	$62,500
Pearsall Park North Development Design	4	Southwest	$437,500
TOTAL			**$500,000**
GRAND TOTAL			**$2,625,000**

F. 2007 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Market Square Rehabilitation Design	1	Central	$577,200
Market Square El Mercado Building Rehabilitation Design	1	Central	$154,648
Downtown Parks and Plazas Rehabilitation Design	1	Central	$247,000
Main Plaza Redevelopment Design	1	Central	$1,040,000
Riverwalk Historic Bend Rehabilitation Design	1	Central	$780,000
Riverwalk North Extension Safe Harbor Construction	1	Central	$1,040,000
Olmos Basin Park Rehabilitation and Development Design	1	North	$468,000
Olympia Park Rehabilitation Design	1	North	$78,000
Commander's House Interior Renovations Design	1	South	$260,000
Ojeda Park Rehabilitation Design	1	West	$64,480
TOTAL			**$4,709,328**
Park Land Acquisition	1,2,9,10	North	$312,000
TOTAL			**$312,000**
Lockwood Park Gymnasium Reconstruction Design	2	East	$312,000
Dawson Park Roof Replacement Design	2	East	$65,000
Fairchild Park Pool Facility Rehabilitation Design	2	East	$104,000
TOTAL			**$481,000**
Park Land Acquisition	2,3	East	$260,000
TOTAL			**$260,000**
South Side Lions Park Pool Rehabilitation Design	3	East	$104,000
TOTAL			**$104,000**
Land Acquisition	3,4	South	$312,000
TOTAL			**$312,000**
Arnold Park Rehabilitation Design	4	South	$171,600
Spicewood Park Playground Construction	4	South	$260,000
Pearsall Park North Development Construciton	4	Southwest	$1,820,000
TOTAL			**$2,251,600**
Youth Activity Community Center Land Acquisition	4,5	Southwest	$520,000
Land Acquisition	4,5	Southwest	$312,000
TOTAL			**$832,000**
Neighborhood Park Development Design	4,6,7,8	Far West	$104,000
Park Land Acquisition	4,6,7,8	Far West	$260,000
TOTAL			**$364,000**
Kennedy Park Rehabilitation Design	5	Southwest	$221,000
Palm Heights Park Rehabilitation Design	5	Southwest	$122,200
Cenizo Park (Rosedale Park Area) Rehabilitation Design	5	West	$125,000
TOTAL			**$468,200**
Land Acquisition	5,6,7	West	$390,000
TOTAL			**$390,000**
Cuellar Park Skate Facility Design	6	West	$118,620

Slick Creek Park Development Design	6	West	$425,760
TOTAL			**$585,000**
Woodlawn Lake Park Rehabilitation Design	7	West	$520,000
TOTAL			**$520,000**
Neighborhood Park Development Design	7,8	Northwest	$104,000
Land Acquisition	7,8	Northwest	$260,000
TOTAL			**$364,000**
Fox Park Community Center Design	8	Northwest	$650,000
Spring Time Park Land Acquisition	8	Northwest	$312,000
TOTAL			**$962000**
Neighborhood Park Development Design	8,9	Far North	$104,000
Park Land Acquisition	8,9	Far North	$260,000
TOTAL			**$364000**
Panther Springs Park Expansion Land Acquisition	9	Far North	$208,000
Brackenridge Park Rehabilitation Design	9	North	$390,000
TOTAL			**$598000**
Neighborhood Park Development Design	9,10	Northeast	$104,000
Land Acquisition	9,10	Northeast	$260,000
TOTAL			**$364000**
Large Urban Park Land Acquistion	10	Northeast	$3,640,000
TOTAL			**$3,640,000**
GRAND TOTAL			**$17,840,508**

G. 2008 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Hemisfair Park Rehabilitation Construction	1	Central	$2,704,000
Market Square Rehabilitation Construction	1	Central	$2,401,152
Alamo Plaza Rehabilitation Design	1	Central	$270,400
Market Square El Mercado Building Rehabilitation Construction	1	Central	$643,552
Spanish Governor's Palace Rehabilitation Design	1	Central	$151,424
Downtown Parks and Plazas Rehabilitation Construction	1	Central	$1,027,520
Riverwalk Historic Bend Rehabilitation	1	Central	$3,244,800
Olmos Basin Park Rehabilitation & Development Construction	1	North	$1,946,800
Crockett Park Playground Replacement Design	1	North	$54,080
Olympia Park Rehabilitation Construction	1	North	$324,480
Windsor Park Rehabilitation Design	1	North	$54,080
Commander's House Interior Restoration Construction	1	South	$1,081,600
Ojeda Park Rehabilitation Construction	1	West	$270,400
TOTAL			**$14,173,888**
M.L. King Park Area Development Construction	2	East	$3,244,800
Lockwood Park Gymnasium Reconstruction Construction	2	East	$1,297,920
Copernicus Park Community Center Rehabilitation Design	2	East	$148,720
Dorie Miller Park Expansion Land Acquisition	2	East	$162,240
Dawson Park Roof Replacement Construction	2	East	$270,400
Fairchild Park Pool Rehabilitation Construction	2	East	$432,640
Skyline Park Improvements Design	2	East	$67,600
TOTAL			**$5,424,620**
South Side Lions Park West Skate Complex Design	3	East	$229,840
South Side Lions Park Pool Rehabilitation Construction	3	East	$432,640
Brooks Park Youth Sports Development Construction	3	South	$2,163,200
Harlandale Park Community Center Rehabilitation Design	3	South	$324,480
Natural Area Land Acquisition	3	South	$2,500,000
TOTAL			**$5,650,160**
Skate Facilities Design	3,4,5	South	$135,200
TOTAL			**$135,200**
Swimming Facilities (3 Pools) Rehabilitation Design	3,5	South	$246,064
TOTAL			**$246,064**
Rainbow Hills Park Gymnasium Design	4	Far West	$405,600
Arnold Park Rehabilitation Construction	4	South	$713,856
Medina River Park Development Design	4	South	$567,840
Palo Alto Terrace Park Rehabilitation Design	4	South	$67,600
TOTAL			**$1,754,896**
Swimming Facility Rehabilitation (Three Pools) Design	4,5	Southwest	$263,694
Skate Facilities Development Design	4,5	Southwest	$135,200
TOTAL			**$398,894**
Neighborhood Park Development Construction	4,6,7	Far West	$432,640
Large Urban Park Land Acquisition	4,6,7	Far West	$1,892,800
TOTAL			**$2,325,440**

Morrill Park Rehabilitation Design	5	South	$74,414
Kennedy Park Rehabilitation Construction	5	Southwest	$919,360
South San Community Center Rehabilitation Design	5	Southwest	$143,312
Kennedy Park Sports Facility Rehabilitation Design	5	Southwest	$297,440
Palm Heights Park Rehabilitation Construction	5	Southwest	$508,352
Elmendorf Park Rehabilitation Design	5	West	$200,096
San Juan Brady Park Community Center Rehabilitation Design	5	West	$137,904
Cassiano Park Rehabilitation Design	5	West	$128,496
Cenizo Park (Rosedale Park Area) Rehabilitation Construction	5	West	$500,000
Navarro Park Rehabilitation Design	5	West	$122,221
TOTAL			**$3,031,595**
Culebra Creek Park Development Design	6	Far West	$671,824
Cuellar Park Skate Facility Construction	6	West	$474,480
Slick Creek Park Development Construction	6	West	$1,703,040
TOTAL			**$3,254,944**
Woodlawn Lake Rehabilitation Construction	7	West	$2,163,200
Seeling Park Lighting Design	7	West	$40,019
TOTAL			**$2,203,219**
Neighborhood Park Development Construction	7,8	Northwest	$432,640
Neighborhood Park Development Design	7,8	Northwest	$108,160
TOTAL			**$540,800**
Natural Area Development Design	8	Far North	$189,280
Quarry Park Land Acquisition	8	Far North	$1,081,600
Friedrich Park Development Design	8	Northwest	$236,654
Fox Park Community Center Construction	8	Northwest	$2,704,000
Spring Time Park Development Design	8	Northwest	$67,600
TOTAL			**$4,279,134**
Neighborhood Park Development Construction	8,9	Far North	$432,640
Community Center Land Acquisition	8,9	Far North	$1,622,400
TOTAL			**$2,055,040**
Panther Springs Park Master Plan	9	Far North	$27,040
San Antonio Garden Center Structural Repairs Design	9	North	$67,600
Brackenridge Park Sports Facilities Rehabilitation Design	9	North	$162,240
TOTAL			**$256,880**
Neighborhood Park Development Construction	9,10	Northeast	$432,640
Natural Area Development Design	9,10	Northeast	$243,360
Community Center Land Acquisition	9,10	Northeast	$1,622,400
TOTAL			**$2,298,400**
Northridge Park Rehabilitation Design	10	North	$81,200
Lady Bird Johnson Park/Fisher Softball Complex Rehabilitation Design	10	Northeast	$167,648
Large Urban Park Development Design	10	Northeast	$811,200
McClain Park Development Design	10	Northeast	$187,500
TOTAL			**$1,141,168**
GRAND TOTAL			**$49,276,722**

VIII. PLAN IMPLEMENTATION

H. 2009 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Alamo Plaza Rehabilitation Construction	1	Central	$1,124,864
Columbus Park Rehabilitation Design	1	Central	$164,455
Spanish Governor's Palace Rehabilitation Construction	1	Central	$629,924
Main Plaza Rehabilitation Construction	1	Central	$4,499,456
Crockett Park Playground Replacement Construction	1	North	$224,973
Granados Park Development Design	1	North	$253,094
Windsor Park Rehabilitation Construction	1	North	$224,973
King William Park Rehabilitation Design	1	South	$70,304
TOTAL			**$7,192,043**
Community Center Complex Design	1,2,9,10	North	$590,554
Land Acquisition	1,2,9,10	North	$281,216
TOTAL			**$871,770**
Skate Facilities Design	1,4,5,6,7	West	$140,608
TOTAL			**$140,608**
Community Center Design	1,5,6,7	West	$646,797
TOTAL			**$646,797**
Lincoln Park Rehabilitation Design	2	East	$309,338
Copernicus Park Community Center Rehabilitation Construction	2	East	$618,675
Woodard Park & Community Center Rehabilitation Design	2	East	$154,669
Herrera Park Rehabilitation Design	2	East	$104,050
Skyline Park Rehabilitation Construction	2	East	$281,216
Sunrise Park Development Design	2	North	$112,486
TOTAL			**$1,580,434**
Park Land Acquisition	2,3	East	$281,216
TOTAL			**$281,216**
South Side Lions Park West Skate Facility Construction	3	East	$956,134
Pedestrian Wellness Trails Design (Three Parks)	3	South	$196,851
Harlandale Park Community Center Rehabilitation Construction	3	South	$1,349,837
Concepcion Park Rehabilitation Design	3	South	$179,978
Natural Area Development Design	3	South	$253,094
TOTAL			**$2,935,894**
Land Acquistion	3,4	South	$224,973
Neighborhood Park Development Design	3,4	South	$112,486
TOTAL			**$337,459**
Skate Facilities Construction	3,4,5	South	$562,432
TOTAL			**$562,432**
Swimming Facility Rehabilitation (Three Pools)	3,5	South	$1,023,626
TOTAL			**$1,023,626**
Rainbow Hills Park Gymnasium Construction	4	Far West	$1,687,296
Medina River Park Development Construction	4	South	$2,362,214

Palo Alto Terrace Park Rehabilitation Construction	4	South	$281,216
Miller's Pond Park Rehabilitation Design	4	Southwest	$251,775
Forge Park Rehabilitation Design	4	Southwest	$98,426
Golden Community Park Development Design	4	Southwest	$133,634
TOTAL			**$4,814,561**
Swimming Facility Rehabilitation (Three Pools) Construction	4,5	Southwest	$1,096,742
Youth Activity Community Center Design	4,5	Southwest	$646,797
Land Acquisition	4,5	Southwest	$1,012,378
Neighborhood Park Development Design	4,5	Southwest	$112,486
Skate Facilities Construction	4,5	Southwest	$562,432
TOTAL			**$3,430,835**
Land Acquisition	4,6,7,8	Far West	$281,216
Large Urban Park Development Design	4,6,7,8	Far West	$703,040
Neighborhood Park Development Design	4,6,7,8	Far West	$112,486
TOTAL			**$1,096,742**
Morrill Park Rehabilitation Construction	5	South	$309,338
South San Community Center Rehabilitation Construction	5	Southwest	$596,178
Kelly Area Park Lighting Design	5	Southwest	$56,243
Kennedy Park Sports Facility Rehabilitation Construction	5	Southwest	$1,237,350
Elmendorf Park Rehabilitation Construction	5	West	$796,600
San Juan Brady Park Community Center Rehabilitation Construction	5	West	$573,681
Cassiano Park Rehabilitaion Construction	5	West	$534,310
Garcia Park Rehabilitation Design	5	West	$112,486
Navarro Park Rehabilitation Construction	5	West	$506,189
Rosedale Park Rehabilitation Design	5	West	$272,780
TOTAL			**$4,995,155**
Land Acquisition	5,6,7	West	$421,824
TOTAL			**$421,824**
Swimming Facility Rehabilitation Design (4 Pools)	5,7	West	$309,338
TOTAL			**$309,338**
Culebra Creek Park Development Construction	6	Far West	$2,687,296
New Territories Park Recreation Complex Rehabilitation Design	6	Far West	$84,365
Cathedral Rock Park Development Design	6	Far West	$182,790
Levi Strauss Park Rehabilitation Design	6	West	$129,359
TOTAL			**$3,083,812**
Nani Falcone Park Skate Facility Design	7	Far West	$140,608
Seeling Park Lighting Construction	7	West	$168,730
TOTAL			**$309,338**
Land Acquisition	7,8	Northwest	$281,216
Neighborhood Park Development Construction	7,8	Northwest	$449,946
Neighborhood Park Development Design	7,8	Northwest	$112,486
TOTAL			**$843,648**
Natural Area Development Construction	8	Far North	$787,405
Eisenhower Park Rehabilitation Design	8	Far North	$562,432
Friedrich Park Improvements Construction	8	Northwest	$984,256
Natural Area Development Design	8	Northwest	$253,094

Fox Park Development Design	8	Northwest	$243,360
Spring Time Park Development Construction	8	Northwest	$281,216
TOTAL			**$3,111,763**
Community Center Design	8,9	Far North	$703,040
Land Acquisition	8,9	Far North	$281,216
Neighborhood Park Development Design	8,9	Far North	$112,456
TOTAL			**$1,096,712**
Brackenridge Park Rehabilitation Design	9	North	$1,562,432
San Antonio Garden Center Structural Repairs Construction	9	North	$281,600
Brackenridge Park Sports Facilities Rehabilitation Construction	9	North	$674,918
Brackenridge Park Urrutia Estate Rehabilitation	9	North	$1,687,296
McAllister Park Rehabilitation Design	9	Northeast	$703,040
TOTAL			**$3,909,286**
Natural Area Development Construction	9,10	Northeast	$1,012,378
Community Center Design	9,10	Northeast	$703,040
Land Acquisition	9,10	Northeast	$281,216
Neighborhood Park Development Design	9,10	Northeast	$112,486
TOTAL			**$2,109,120**
Northridge Park Rehabilitation Construction	10	North	$337,459
Lady Bird Johnson Park/Fisher Softball Complex Rehabilitation Construction	10	Northeast	$1,124,864
Large Urban Park Development Construction	10	Northeast	$3,374,592
McClain Park Development Construction	10	Northeast	$750,000
Mud Creek Natural Area Design	10	Northeast	$312,500
TOTAL			**$5,899,415**
GRAND TOTAL			**$52,043,826**

VIII. PLAN IMPLEMENTATION

I. 2010 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Columbus Park Rehabilitation Construction	1	Central	$684,367
La Villita Rehabilitation Design	1	Central	$343,587
San Pedro Springs Park Rehabilitation Design	1	North	$436,697
Granados Park Development Construction	1	North	$1,052,973
Kenwood Park Rehabilitation Design	1	North	$116,986
King William Park Rehabilitation Construction	1	South	$292,465
West End Park Rehabilitation Design	1	West	$175,479
TOTAL			**$3,102,554**
Community Center Construction	1,2,9,10	North	$2,456,703
TOTAL			**$2,456,703**
Skate Facilities Construction	1,4,5,6,7	West	$584,929
TOTAL			**$584,929**
Lincoln Park Rehabilitation Construction	2	East	$1,286,844
Woodard Park & Community Center Rehabilitation Construction	2	East	$643,422
Denver Heights Park & Community Center Rehabilitation Design	2	East	$160,856
Fairchild Park Rehabilitation Design	2	East	$204,726
Herrera Park Rehabilitation Construction	2	East	$432,848
Pedestrian Wellness Trails (Six Parks) Design	2	East	$409,451
Sunrise Park Development Construction	2	North	$467,943
TOTAL			**$3,606,090**
South Side Lions Park East Rehabilitation Design	3	East	$438,697
Pedestrian Wellness Trails Construction (Three Parks)	3	South	$818,901
Mission Trail Parkway Parks Rehabilitation Design	3	South	$554,163
Concepcion Park Rehabilitation Construction	3	South	$748,709
Villa Coronado Park and Father Ramon Community Center Rehabilitation Design	3	South	$168,109
Natural Area Development Construction	3	South	$1,052,893
TOTAL			**$3,781,472**
Neighborhood Park Development Construction	3,4	South	$467,943
Neighborhood Park Development Design	3,4	South	$116,986
TOTAL			**$584,929**
Miller's Pond Park Rehabilitation Construction	4	Southwest	$1,047,023
Forge Park Rehabilitation Construction	4	Southwest	$409,451
Golden Community Park Development Construction	4	Southwest	$555,683
Pearsall Park South Development Design	4	Southwest	$365,581
TOTAL			**$2,377,738**
Youth Activity Community Center Construction	4,5	Southwest	$2,690,675
Neighborhood Park Development Construction	4,5	Southwest	$467,943
Neighborhood Park Development Design	4,5	Southwest	$116,986
TOTAL			**$3,275,604**
Neighborhood Park Development Construction	4,6,7,8	Far West	$467,943
Neighborhood Park Development Design	4,6,7,8	Far West	$116,986
TOTAL			**$584,929**

Normoyle Park Sports Fields Rehabilitation Design	5	Southwest	$160,000
Kelly Area Park Lighting Construction	5	Southwest	$233,972
Vidaurri Park Rehabilitation Design	5	West	$116,986
San Antonio Natatorium Improvements Design	5	West	$153,602
Amistad Park Rehabilitation Design	5	West	$87,739
Garcia Park Rehabilitation Construction	5	West	$467,943
Rosedale Park Rehabilitation Construction	5	West	$1,134,761
TOTAL			**$2,355,003**
Swimming Facility Rehabilitation Construction (Four Pools)	5,7	West	$1,286,844
Monterrey Park Rehabilitation Design	5,7	West	$196,232
TOTAL			**$1,483,076**
Natural Area Development Design	6	Far West	$263,218
New Territories Recreation Complex Rehabilitation Construction	6	Far West	$350,958
Cathedral Rock Park Development Construction	6	Far West	$760,408
Levi Strauss Park Rehabilitation Construction	6	West	$538,135
TOTAL			**$1,912,719**
Nani Falcone Park Skate Facility Construction	7	Far West	$584,929
Garza Park Rehabilitation Design	7	West	$125,479
TOTAL			**$710,408**
Neighborhood Park Development Construction	7,8	Northwest	$467,943
Neighborhod Park Development Design	7,8	Northwest	$116,986
TOTAL			**$584,929**
Eisenhower Park Rehabilitation Construction	8	Far North	$2,339,717
Natural Area Development Construction	8	Northwest	$1,052,893
Rancho Diana Natural Area Master Plan	8	Northwest	$40,945
Fox Park Development Construction	8	Northwest	$1,012,338
Hausman Road Park Developoment Design	8	Northwest	$204,725
Oxbow Neighborhood Park Development Design	8	Northwest	$73,116
TOTAL			**$4,723,734**
Neighborhood Park Development Design	8,9	Far North	$116,986
Community Center Construction	8,9	Far North	$2,924,646
Neighborhood Park Development Construction	8,9	Far North	$467,943
Neighborhood Park Development Design	8,9	Far North	$116,986
TOTAL			**$3,626,561**
Panther Springs Park Development Design	9	Far North	$438,697
Brackenridge Park Rehabilitation Construction	9	North	$5,339,717
Japanese Tea Gardens Rehabilitation Design	9	North	$511,813
San Antonio Botanical Gardens Rehabilitation Design	9	North	$409,451
McAllister Park Rehabilitation Construction	9	Northeast	$2,924,646
TOTAL			**$6,624,324**
Community Center Construction	9,10	Northeast	$2,924,646
Neighborhood Park Development Construction	9,10	Northeast	$467,943
Neighborhood Park Development Design	9,10	Northeast	$116,986
TOTAL			**$3,509,575**

Lady Bird Johnson Park Rehabilitation Design	10	Northeast	$478,123
Oakhaven Park Rehabilitation Design	10	Northeast	$29,246
Mud Creek Natural Area Development Construction	10	Northeast	$1,250,000
Natural Area Development Design	10	Northeast	$1,000,000
TOTAL			**$2,757,369**

GRAND TOTAL **$51,642,646**

J. 2011 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
La Villita Rehabilitation Construction	1	Central	$1,429,567
Maverick Park Rehabilitation Design	1	Central	$152,082
San Pedro Springs Park Rehabilitation Construction	1	North	$1,824,979
Kenwood Park Rehabilitation Construction	1	North	$511,077
Bertha Almaguer Dance Studio (Woodlawn Lake Park) Rehabilitation Design	1	West	$182,498
West End Park Rehabilitation Construction	1	West	$729,992
TOTAL			**$4,830,195**
Land Acquisition	1,2,9,10	North	$364,996
TOTAL			**$364,996**
Community Center Construction	1,5,6,7	West	$2,798,302
TOTAL			**$2,798,302**
Eastside Historic Cemeteries Improvements Design	2	East	$228,122
Denver Heights Park & Community Center Rehabilitation Constrcution	2	East	$694,880
Dorie Miller Park Development Design	2	East	$608,326
Copernicus Park Rehabilitation Design	2	East	$108,160
Fairchild Park Rehabilitation Construction	2	East	$851,657
J Street Park Rehabilitation Design	2	East	$272,287
Pedestrian Wellness Trails (Six Parks) Construction	2	East	$1,703,314
TOTAL			**$4,466,746**
Land Acquisition	2,3	East	$304,163
TOTAL			**$304,163**
South Side Lions Park East Rehabilitation Construction	3	East	$1,824,979
Mission Trails Parkway Parks Rehabilitation Construction	3	South	$2,216,653
Kingsborough Park Development Design	3	South	$136,873
Villa Coronado Park and Father Ramon Community Center Rehabilitation Construction	3	South	$699,575
Pytel Park Rehabilitation Design	3	South	$125,000
TOTAL			**$5,003,080**
Land Acquisition	3,4	South	$350,958
Neighborhood Park Development Construction	3,4	South	$486,661
Neighborhood Park Development Design	3,4	South	$121,665
TOTAL			**$959,284**
Rainbow Hills Park Rehabilitation Design	4	Far West	$152,082
Gateway Terrace Park Development Design	4	Southwest	$167,290
Pearsall Park South Development Construction	4	Southwest	$1,250,000
TOTAL			**$1,569,372**
Land Acquisition	4,5	Southwest	$364,996
Neighborhood Park Development Construction	4,5	Southwest	$486,661
Neighborhood Park Development Design	4,5	Southwest	$121,665
TOTAL			**$973,322**

Community Center Design	4,6,7,8	Far West	$760,408
Land Acquistion	4,6,7,8	Far West	$304,163
Large Urban Park Development Construction	4,6,7,8	Far West	$3,041,632
Neighborhood Park Development Construction	4,6,7,8	Far West	$486,661
Neighborhood Park Development Design	4,6,7,8	Far West	$121,665
TOTAL			**$4,714,529**
Tejeda Park Rehabilitation Design	5	South	$167,290
Normoyle Park Sports Fields Rehabilitation Construction	5	Southwest	$669,159
Community Center Design	5	Southwest	$760,408
Vidaurri Park Rehabilitation Construction	5	Southwest	$486,661
San Antonio Natatorium Renovation Construction	5	West	$638,743
Amistad Park Rehabilitation Construction	5	West	$364,996
Father Benavides Park Rehabilitation Design	5	West	$136,873
TOTAL			**$3,224,130**
Land Acquisition	5,6,7	West	$1,094,988
TOTAL			**$1,094,988**
Monterrey Park Rehabilitation Construction	5,7	West	$608,326
TOTAL			**$608,326**
Natural Area Development Construction	6	Far West	$1,094,988
Van de Walle Park Rehabilitation Design	6	West	$45,624
TOTAL			**$1,140,162**
Leon Vista Park Development Design	7	Northwest	$318,543
Sunset Hills Park Rehabilitation Design	7	Northwest	$91,249
Garza Park Rehabilitation Construction	7	West	$729,992
Monticello Park Development Design	7	West	$44,460
TOTAL			**$1,184,224**
Land Acquisition	7,8	Northwest	$304,163
Neighborhood Park Development Construction	7,8	Northwest	$486,661
Neighborhood Park Development Design	7,8	Northwest	$121,665
TOTAL			**$912,489**
Quarry Park Development Design	8	Far North	$608,326
Rancho Diana Natural Area Development Design	8	Northwest	$912,490
Hausman Road Park Development Construction	8	Northwest	$851,657
Oxbow Neighborhood Park Development Construction	8	Northwest	$304,163
TOTAL			**$2,676,636**
Neighborhood Park Development Construction	8,9	Far North	$486,661
Land Acquisition	8,9	Far North	$304,163
Neighborhood Park Development Construction	8,9	Far North	$486,661
Neighborhood Park Development Design	8,9	Far North	$121,665
TOTAL			**$1,399,150**
Panther Springs Park Development Constructon	9	Far North	$1,824,979
Japanese Tea Gardens Rehabilitation Construction	9	North	$2,129,143
Sunken Gardens Theater Rehabilitation Design	9	North	$608,326
San Antonio Botanical Gardens Rehabilitation Construction	9	North	$1,771,447
Oakhaven Park Rehabilitation Construction	9	Northeast	$243,331
TOTAL			**$6,577,226**

Land Acquisition	9,10	Northeast	$304,163
Neighborhood Park Development Construction	9,10	Northeast	$486,661
Neighborhood Park Development Design	9,10	Northeast	$121,665
TOTAL			**$912,489**
Lady Bird Johnson Park Rehabilitation Construction	10	Northeast	$1,912,490
Natural Area Development Construction	10	Northeast	$4,000,000
TOTAL			**$5,912,490**
GRAND TOTAL			**$51,626,769**

K. 2012 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Madison Square Park Rehabilitation Design	1	Central	$110,083
Maverick Park Rehabilitaion Construction	1	Central	$632,660
Brackenridge Golf Course Rehabilitation Design	1	North	$484,375
Brackenridge Golf Course Borglum Studio Rehabilitation Design	1	North	$156,250
Dellview Park Rehabilitaion Design	1	North	$113,879
Bertha Almaguer Dance Studio (Woodlawn Lake Park) Rehabilitation Construction	1	West	$759,191
TOTAL			**$2,256,438**
Eastside Historic Cemeteries Rehabilitation Construction	2	East	$948,989
Dorie Miller Park Development Construction	2	East	$2,530,638
Dignowity Park Rehabilitation Design	2	East	$94,899
J Street Park Rehabilitation Constructuion	2	East	$1,132,461
Pittman-Sullivan Park Rehabilitation Design	2	East	$126,532
Copernicus Park Rehabilitation Construction	2	East	$449,946
TOTAL			**$5,283,465**
Kingsborough Park Development Construction	3	South	$569,394
Pytel Park Development Construction	3	South	$500,000
TOTAL			**$1,069,394**
Neighborhood Park Development Construction	3,4	South	$506,128
Neighborhood Park Development Design	3,4	South	$126,532
TOTAL			**$632,660**
Rainbow Hills Park Rehabilitation Construction	4	Far West	$632,660
Gateway Terrace Park Development Construction	4	Southwest	$695,925
Royalgate Park Rehabilitation Design	4	Southwest	$71,237
Stablewood Farms Park Development Design	4	Southwest	$116,975
TOTAL			**$1,516,797**
Neighborhood Park Development Construction	4,5	Southwest	$506,128
Neighborhood Park Development Design	4,5	Southwest	$126,532
TOTAL			**$632,660**
Community Center Construction	4,6,7,8	Far West	$3,163,298
Neighborhood Park Development Construction	4,6,7,8	Far West	$506,128
Neighborhood Park Development Design	4,6,7,8	Far West	$126,532
TOTAL			**$3,795,958**
Tejeda Park Rehabilitation Construction	5	South	$695,925
Community Center Construction	5	Southwest	$3,163,298
Collin's Gardens Park Rehabilitation Design	5	West	$251,545
Father Benavides Park Rehabiliation Construction	5	West	$569,394
Martinez Park Rehabilitation Design	5	West	$161,328
TOTAL			**$4,841,490**
Van De Walle Park Rehabilitation Construction	6	West	$189,798
TOTAL			**$189,798**

Leon Vista Park Development Construction	7	Northwest	$1,274,175
Sunset Hills Park Rehabilitation Construction	7	West	$379,596
Monticello Park Development Construction	7	West	$177,840
TOTAL			**$1,831,611**
Neighborhood Park Development Construction	7,8	Northwest	$506,128
Neighborhood Park Development Design	7,8	Northwest	$126,532
TOTAL			**$632,660**
Quarry Park Development Construction	8	Far North	$2,530,638
Rancho Diana Natural Area Development Construction	8	Northwest	$3,795,957
TOTAL			**$6,326,595**
Neighborhood Park Development Construction	8,9	Far North	$506,128
Neighborhood Park Development Design	8,9	Far North	$126,532
TOTAL			**$632,660**
Sunken Gardens Theater Rehabilitation Construction	9	North	$2,530,638
TOTAL			**$2,530,638**
Neighborhood Park Development Construction	9,10	Northeast	$506,128
Neighborhood Park Development Design	9,10	Northeast	$126,532
TOTAL			**$632,660**
Comanche Lookout Park Rehabilitation Design	10	Northeast	$158,165
TOTAL			**$158,165**
GRAND TOTAL			**$32,963,649**

L. 2013 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Madison Square Park Rehabilitation Construction	1	Central	$460,576
Dellview Park Rehabilitation Construction	1	North	$473,735
Brackenridge Park Golf Course Rehabilitation Construction	1	North	$1,453,125
Brackenridge Park Golf Course Borglum Studio Rehabilitation Construction	1	North	$468,750
TOTAL			**$2,856,186**
Land Acquisition	1,2,9,10	North	$328,983
TOTAL			**$328,983**
Dellcrest Park Rehabilitation Design	2	East	$82,246
Dignowity Park Rehabilitation Construction	2	East	$394,780
Pittman-Sullivan Park Rehabilitation Construction	2	East	$526,373
Jack White Property Development Design	2	East	$207,255
John James Park Rehabilitation Design	2	North	$131,593
TOTAL			**$1,342,247**
Land Acquisition	2,3	East	$657,966
TOTAL			**$657,966**
Acequia Park Rehabilitation Design	3	South	$95,405
Stinson Park Rehabilitation Design	3	South	$115,144
Riverside Golf Course Rehabilitation Design	3	South	$359,375
TOTAL			**$569,924**
Land Acquistion	3,4	South	$263,186
Neighborhood Park Development Construction	3,4	South	$526,373
Neighborhood Park Development Design	3,4	South	$131,593
TOTAL			**$921,152**
Royalgate Park Rehabilitation Construction	4	Southwest	$296,085
Stablewood Farms Park Development Construction	4	Southwest	$467,899
TOTAL			**$763,984**
Land Acquisition	4,5	Southwest	$1,184,339
Neighborhood Park Development Construction	4,5	Southwest	$526,373
Neighborhod Park Development Design	4,5	Southwest	$131,593
TOTAL			**$1,842,305**
Land Acquisition	4,6,7,8	Far West	$657,966
Neighborhood Park Development Construction	4,6,7,8	Far West	$526,373
Neighborhood Park Development Design	4,6,7,8	Far West	$131,593
TOTAL			**$1,315,932**
Alazan and Apache Creeks Development Design	5	West	$657,966
Collin's Gardens Park Rehabilitation Construction	5	West	$1,046,166
Martinez Park Rehabilitation Construction	5	West	$671,125
San Juan Brady Park Rehabilitation Design	5	West	$115,144
TOTAL			**$2,490,401**
Land Acquisition	5,6,7	West	$921,152
TOTAL			**$921,152**

Acme Park Rehabilitation Design	6	West	$131,250
TOTAL			**$131,250**
Huebner Creek Park Development Design	7	Northwest	$98,695
Joe Ward Park and Community Center Rehabilitation Design	7	West	$246,737
TOTAL			**$345,433**
Land Acquisition	7,8	Northwest	$657,966
Neighborhood Park Development Construction	7,8	Northwest	$526,373
TOTAL			**$1,184,339**
Land Acquisition	8,9	Far North	$657,966
Neighborhood Park Development Construction	8,9	Far North	$526,373
Neighborhood Park Development Design	8,9	Far North	$131,593
TOTAL			**$1,315,932**
Land Acquisition	9,10	Northeast	$657,966
Neighborhood Park Development Construction	9,10	Northeast	$526,373
Neighborhood Park Development Design	9,10	Northeast	$131,593
TOTAL			**$1,315,932**
Comanche Lookout Park Rehabilitation Construction	10	Northeast	$657,966
TOTAL			**$657,966**
GRAND TOTAL			**$18,961,084**

M. 2014 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Milam Park Playground Design	1	Central	$102,643
Brackenridge Park Golf Course Entrance Design	1	North	$239,500
Olmos Basin Golf Course Rehabilitation Design	1	North	$462,500
San Pedro Driving Range Rehabilitation Design	1	North	$425,000
TOTAL			**$1,230,643**
Martinez Creek Greenway Development Design	1,5	West	$513,213
TOTAL			**$513,213**
DaFoste Park Rehabilitation Design	2	East	$85,536
Dellcrest Park Rehabilitation Construction	2	East	$342,142
Second Baptist Church Park Rehabilitation Design	2	East	$119,750
Jack White Property Development Constructino	2	East	$862,199
Willow Springs Golf Course Rehabilitation Design	2	East	$546,875
John James Park Rehabilitation Construction	2	North	$547,428
Wilshire Terrace Park Development Design	2	North	$68,428
TOTAL			**$2,572,358**
Acequia Park Rehabilitation Construction	3	South	$396,885
Espada Park Rehabilitation Design	3	South	$132,341
San Jose Burial Park Rehabilitation Design	3	South	$444,785
Stinson Park Rehabilitation Construction	3	South	$478,999
Mission del Lago Golf Course Rehabilitation Design	3	South	$187,500
Riverside Golf Course Rehabilitation Construction	3	South	1,437,500
TOTAL			**$3,078,010**
Land Acquisition	3,4	South	$410,571
Neighborhood Park Development Construction	3,4	South	$547,428
TOTAL			**$957,999**
Neighborhood Park Development Construction	4,5	Southwest	$547,428
TOTAL			**$547,428**
Neighborhood Park Development Construction	4,6,7,8	Far West	$547,428
TOTAL			**$547,428**
Alazan and Apache Creeks Development Construction	5	West	$2,737,138
San Juan Brady Park Rehabilitation Construction	5	West	$478,999
TOTAL			**$3,216,127**
Natural Area Development Design	6	Far West	$263,218
Acme Park Rehabilitation Construction	6	West	$525,000
TOTAL			**$788,218**
Huebner Creek Park Development Construction	7	Northwest	$410,571
Joe Ward Park and Community Center Rehabiliation Construction	7	West	$1,026,427
TOTAL			**$1,436,998**
Bamberger Nature Park Development Design	8	Northwest	$119,750
Cedar Creek Golf Course Rehabilitation Design	8	Northwest	$125,000
TOTAL			**$244,750**

Neighborhood Park Development Construction	8,9	Far North	$547,428
TOTAL			**$547,428**
Stone Oak Park Development Design	9	Far North	$342,142
TOTAL			**$342,142**
Neighborhood Park Development Construction	9,10	Northeast	$547,428
TOTAL			**$547,428**
GRAND TOTAL			**$16,021,742**

N. 2015 PROPOSED & UNFUNDED PROJECTS

PROJECT	CC#	SUBAREA	AMOUNT
Milam Park Rehabilitation Construction	1	Central	$426,994
Brackenridge Park Golf Course Entrance Construction	1	North	$996,318
Olmos Basin Golf Course Rehabilitation Construction	1	North	$1,850,000
San Pedro Driving Range Rehabilitation Construction	1	North	$1,700,000
TOTAL			**$4,973,312**
Land Acquistion	1,2,9,10	North	$426,994
TOTAL			**$426,994**
Martinez Creek Greenway Development	1,5	West	$2,134,968
TOTAL			**$2,134,968**
DaFoste Park Rehabilitaion Construction	2	East	$355,828
Second Baptist Church Park Rehabilitation Construction	2	East	$498,159
Willow Springs Golf Course Rehabilitation Construction	2	East	$2,187,500
Wilshire Terrace Park Development Construction	2	North	$284,662
TOTAL			**$3,324,149**
Land Acquisition	2,3	East	$711,656
TOTAL			**$711,656**
Espada Park Rehabilitation Construction	3	South	$550,822
San Jose Burial Park Rehabilitation Construction	3	South	$1,850,305
Mission del Lago Rehabilitation Construction	3	South	$750,000
TOTAL			**$3,151,127**
Land Acquisition	3,4	South	$284,662
TOTAL			**$284,662**
Land Acquisition	4,5	Southwest	$426,974
TOTAL			**$426,974**
Land Acquisition	4,6,7,8	Far West	$711,656
TOTAL			**$711,656**
Land Acquisition	5,6,7	West	$996,318
TOTAL			**$996,318**
Natural Area Development Construction	6	Far West	$1,094,988
TOTAL			**$1,094,988**
Land Acquisition	7,8	Northwest	$711,656
TOTAL			**$711,656**
Bamberger Nature Park Development Construction	8	Northwest	$498,159
Cedar Creek Golf Course Rehabilitation Construction	8	Northwest	$500,000
TOTAL			**$998,159**
Land Acquistiion	8,9	Far North	$711,656
TOTAL			**$711,656**
Stone Oak Park Development Construction	9	Far North	$1,423,312
TOTAL			**$1,423,312**

Land Acquisition	9,10	Northeast	$711,656
TOTAL			**$711,656**
GRAND TOTAL			**$22,793,243**

IX. A. ACKNOWLEDGMENTS

The following were instrumental in the completion of this document:

City Council

Phil Hardberger, Mayor
Roger O. Flores, District 1
Sheila D. McNeil, District 2
Roland Gutierrez, District 3
Richard Perez, District 4
Patti Radle, District 5
Delicia Herrera, District 6
Elena K. Guajardo, District 7
Art A. Hall, District 8
Kevin A. Wolff, District 9
Chip Haass, District 10

City Manager's Office

Sheryl Sculley, City Manager
Frances Gonzalez, Assistant City Manager

Parks and Recreation Advisory Board

(At time the Board approved the document.)
Doug McMurry, Chairman
Barbara Witte-Howell
Lillie Harris
Charles Bartlett
Frederick McGee
Roy R. Botello
Eugene M. Gloria
Jody Ray Sherrill
Jasper D. Cozort
Dr. Jan Van den Hende
Mark Trevino

Planning Commission

(At time the Commission approved the document.)
Susan Wright
James Darryl Bird
Murray H. Van Eman
Cecilia Garcia
Robert Hanley
Amelia Hartman
Mitch Meyer
Jose R. Limon
Dr. Francine S. Romero

Parks and Recreation Department

Malcolm Matthews, Director
Ronald Smudy, Assistant Director- Operations
Mike Gonzaba, Assistant Director- Programs

Scott E. Stover, ASLA, Park Projects Manager
Kelly Irvin, Public Relations Manager
Janet Martin, Recreation Manager
Richard Hurd, Park Operations Manager
Steven Baum, Chief of Park Police
Rae Riojas, Fiscal Manager

Park Project Services Division

Rodney Dziuk, Park Design Superintendent
Rocky Duque de Estrada, Sr. Planner
Leslie Anthony
Veronica Arguello
Bill Pennell
Dianne Hart
Carlos Mendez
Jamaal Moreno
Paul K. Johnson
Alma Nunez
Eric Reyna
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Monica Urdiales
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Chris Yanez
Jamaal Moreno
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IX. A. ACKNOWLEDGMENTS

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Planning Department
Emil R. Moncivais, Director
Stephen Pease

Other Public Agencies
Texas Parks and Wildlife Department
Bexar County Parks Department
National Park Service
San Antonio River Authority

Incorporated Cities

Alamo Heights
Balcones Heights
Castle Hills
Converse
Elmendorf
Fair Oaks
Grey Forrest
Helotes
Hill Country Village
Hollywood Park
Kirby
Leon Valley
Live Oak
Lytle
Olmos Park
Schertz
Selma
Shavano Park
Somerset
Terrell Hills
Universal City
Windcrest

TEXAS PARKS & WILDLIFE

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LEE M. BASS
CHAIRMAN-EMERITUS
FORT WORTH

ROBERT L. COOK
EXECUTIVE DIRECTOR

May 31, 2006

Mr. Scott E. Stover, ASLA
Park Projects Manager
P. O. Box 839966
San Antonio, Texas 78283

RE: Master Plan Review—City of San Antonio

Dear Mr. Stover:

Our review of your parks and recreation master plan has been completed. The plan meets the standard requirements identified in the "Park, Recreation, and Open Space Master Plan Guidelines."

You will now qualify for priority points under item 2 of the "TRPA Outdoor Recreation Grant Project Priority Scoring System," beginning with the July 31, 2006 review.

Please contact me at 512/912-7119 if you have any questions. The Department commends you and your organization for your planning efforts.

Sincerely,

Joel S. Seffel, CPRP
Program Administrator
Recreation Grants Branch

JSS:jss

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To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

SW/mgc
05/18/06
Item No. 18

AN ORDINANCE 2006-05-18-0605

APPROVING THE PARKS AND RECREATION SYSTEM STRATEGIC PLAN FOR 2006-2016.

* * * * *

WHEREAS, the Parks and Recreation System Strategic Plan for 2006 - 2016 will be used to guide decisions impacting San Antonio's system of parks, facilities, and recreation programs; and

WHEREAS, the plan will also be used to ensure future funding eligibility for various Texas Parks and Wildlife Department (TPWD) grant programs, federal grant programs, and other potential funding sources; and

WHEREAS, the City of San Antonio previously adopted a five year Parks and Recreation System Plan, approved on January 28, 1999 through Ordinance 89162; and

WHEREAS, an update is also needed at this time to reflect the following two amendments to the previous plan made after 1999: Amendment 1 : Guidelines for Greenway Parks, 2001 (Ordinance 93920) Amendment 2: Guidelines for Natural Areas, 2003 (Ordinance 97052); **NOW THEREFORE:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SAN ANTONIO:

Section 1. The Parks and Recreation System Strategic Plan for 2006 – 2016 on file with the City Clerk is hereby approved and adopted.

Section 2. This ordinance shall be effective on and after May 28, 2006.

PASSED AND APPROVED this 18th day of May, 2006.

M A Y O R

PHIL HARDBERGER

ATTEST: Leticia M. Vacek
City Clerk

APPROVED AS TO FORM: Hollis Young
for City Attorney

SAN ANTONIO PLANNING COMMISSION

RESOLUTION NO. 05-04-03

RECOMMENDING THE ADOPTION AND APPROVAL OF THE PARKS AND RECREATION SYSTEM STRATEGIC PLAN (2005 – 2015).

WHEREAS, there exists a need to update the 1999 Parks and Recreation System Plan; and

WHEREAS, extensive public input was gathered during the twenty public meetings held in April 2004 and March 2005; and

WHEREAS, efforts have been made to relate the proposed plan to the existing 1997 San Antonio Master Plan, Unified Development Code requirements, Guidelines for Greenway Parks, Guidelines for Natural Areas, Park Police Performance Review, After School Standards Report, National Golf Foundation Report, existing Neighborhood Plans, and other City approved planning documents; and

WHEREAS, the updated plan will guide decisions impacting park projects, programs, facilities, and services over the next ten years; and

WHEREAS, an updated plan is needed to apply for grants from the State and Federal government for programs and capital improvement projects; and

WHEREAS, the plan has been endorsed and approved by the Parks and Recreation Advisory Board and has been reviewed by the City Council Quality of Life Committee; **NOW THEREFORE**

BE IT RESOLVED BY THE PLANNING COMMISSION OF THE CITY OF SAN ANTONIO:

1. That the Parks and Recreation System Strategic Plan (2005 – 2015) attached here to and incorporated herein is recommended to the City Council for adoption.

2. That the City Council is urged to consider adoption of the Plan.

PASSED AND APPROVED THIS 27th **DAY OF THE MONTH OF** April, **2005.**

Susan Wright
Chairperson

ATTEST: Robin A. Sen
Executive Secretary

IX. C. CLASSIFICATION COSTS

A. NEIGHBORHOOD PARK (NP)

The cost of developing a typical neighborhood park may range from $125,000 to $400,000. Costs are dependent on existing site conditions and level of development as determined with community input. A typical neighborhood park may include one or more, but rarely all, of the following amenities.

FACILITIES		COST***
Playground	$	120,000
Basketball/multi-use court (unlighted)	$	50,000
Skate plaza	$	65,000
Park toilet (single unit)	$	15,000
Informal playfields/open space	$	15,000
Trail (8' decomposed granite with borders; 1/4 mile, signage)	$	60,000
Individual picnic facilities (8' table with trash receptacle)	$	2,000
Utilities (water, electric)	$	15,000
Parking/access control (20 cars, post & cable, access gate)	$	50,000
Park furnishings (benches, drinking fountains, trash receptacles, walks, signage)	$	25,000
Security lighting	$	25,000
Landscaping (trees, seed/sod, water distribution)	$	20,000
RANGE	**$**	**125,000 to $400,000**

***estimated costs, 2005

B. COMMUNITY PARK (CP)

The cost of developing a typical community park may range from $600,000 to $4,900,000. Costs are dependent on existing site conditions and level of development as determined with community input. A typical community park may include one or more, but rarely all, of the following amenities.

FACILITIES		COST***
Large playground	$	160,000
Basketball/multi-use court (lighted)	$	80,000
Concrete skate park	$	325,000
Dog park	$	250,000
Park toilet (multiple units)	$	20,000
Restroom	$	200,000
Tennis court (lighted)	$	65,000
Volleyball court (sand)	$	15,000
Softball (irrigated, bleachers on pads, backstop & dugout and drinking fountain)	$	200,000
Soccer/football (irrigated, bleachers on pads, goals)	$	170,000
Swimming pool with bathhouse	$	1,400,000
Trail (8' decomposed granite with border; 1/2 mile, signage)	$	120,000
Individual Picnic Facilities (8' table with BBQ grill, trash receptacle)	$	3,000
Group picnic facility (4- 8' tables w/ lighted pavilion cover & large grill)	$	150,000
Recreation center (with gym, multi-use rooms, office, restrooms)	$	2,000,000
Utilities (water, electric)	$	40,000
Parking /access control (75 cars, post & cable, access gates)	$	160,000
Park furnishings (lighting, benches, drinking fountains, trash receptacles, water, signage)	$	75,000

Security lighting	$	25,000
Landscaping (trees, seeding/sod, water distribution)	$	40,000
RANGE	**$**	**600,000 to $4,900,000**

***estimated costs, 2005

C. LARGE URBAN PARK (LUP)

The cost of developing a typical large urban park may range from $1,250,000 to $6,000,000. Costs are dependent on existing site conditions and level of development as determined with community input. A typical large urban park may include one or more, but rarely all, of the following amenities.

FACILITIES		**COST*** **
Large playground	$	160,000
Basketball/multi-use court (lighted)	$	80,000
Concrete skate park	$	500,000
Dog park	$	250,000
Tennis courts (lighted)	$	65,000
Volleyball court (sand)	$	10,000
Sports Fields		
Softball- irrigated, bleachers on pads, backstop & dugout, drinking fountain	$	180,000
Soccer/football- lighted, irrigated, bleachers on pads, goals	$	150,000
Swimming pool with bathhouse	$	1,400,000
Trail (8' wide, decomposed granite with border; 1 mile, signage)	$	170,000
Trail lighting (1 mile)	$	200,000
Individual picnic facilities (8' table with BBQ grill, trash receptacle)	$	5,000
Group picnic facility (4-8' picnic tables with lighted pavilion cover and large grill)	$	150,000
Restrooms	$	200,000
Park toilet	$	15,000
Allowance for unique landscape feature development	$	100,000
Recreation center (gym, multi-use rooms, office, restroom)	$	2,000,000
Utilities (water, electric)	$	50,000
Roads, parking/access control (1200 cars, post & cable, access gates)	$	500,000
Accessible walks	$	100,000
Park furnishings (benches, drinking fountains, trash receptacles, signage)	$	200,000
Security lighting	$	250,000
Landscaping (trees, water distribution)	$	40,000
RANGE	**$**	**1,000,000 to $6,000,000**

***estimated costs, 2005

D. SPORTS COMPLEX (SC)

The cost of developing a typical sports complex varies depending on facilities. Costs are dependent on existing site conditions and level of development as determined with community input. A sports complex typically includes one of the following amenities.

FACILITIES		**COST*** **
Softball complex, 4 fields (irrigation, lighting, fencing, parking, concession/restroom/scorekeepers building, amenities, utilities, shaded bleachers)	$	1,800,000 to $3,000,000

Soccer complex, 10 fields (irrigation, lighting, fencing, parking, concession/restroom building, amenities, utilities)	$	1,700,000 to $3,000,000
Tennis complex, 20 courts (fencing, lighting, parking, utilities, concession/pro shop building)	$	2,500,000 to $4,800,000
Athletic center building (indoor collegiate-size gym, 5 racquetball courts, weight room, showers, sauna, whirlpool, classroom, offices, concession area, pro shops)	$	6,000,000 to $9,000,000
Natatorium	$	2,500,000 to 4,500,000
Golf course, 18 holes (parking, pro shop, concession, driving range, maintenance/cart barn)	$	6,500,000 to $9,000,000
Disc golf course, 18 holes	$	100,000 to $250,000
Skate park (skateboard/rollerblade court, seating area, restrooms, drinking fountain, fencing, lighting, parking)	$	125,000 to $600,000

***estimated costs, 2005

E. NATURAL AREA (NA)

The cost of developing a typical natural area may range from $100,000 to $250,000. Costs are dependent on existing site conditions and level of development as determined with community input. A typical natural area may include one or more of the following amenities.

FACILITIES		COST***
Utilities (water, electric)	$	35,000
Parking/Access Control (20 cars, post & cable, access gate)	$	50,000
Trailhead w/ security lighting	$	20,000
Trail (1/4 mile)	$	50,000
Park toilet (composting toilet)	$	70,000
Park furnishings (benches, drinking fountain, trash receptacles, signage)	$	25,000
RANGE	**$**	**100,000 to 250,000**

***estimated cost, 2005

F. GREENWAY (GW)

The cost of developing a typical greenway may range from $100,000 to $650,000 per half mile. Costs are dependent on existing site conditions and level of development as determined with community input. A typical greenway may include one or more of the following amenities.

FACILITIES		COST***
Utilities (water, electric)	$	35,000
Trails (1/2 mile – no lighting)	$	500,000
Trailhead w/ security lighting	$	25,000
Parking /access control (10 cars, security lighting)	$	40,000
Park toilet (at appropriate intervals and locations along trail route)	$	15,000
Park furnishings (benches, drinking fountain, trash receptacles, signage)	$	30,000
RANGE	**$**	**100,000 to $650,000**

***estimated costs, 2005

G. HISTORIC RESOURCE (HR)

Cost varies with site and use.

H. SPECIAL USE FACILITY (SUF)

Cost varies with site and use.

I. URBAN SPACE (US)

Cost varies with site and use.

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																Play Fields					Courts								
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquisition	Restroom	Pavillion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr;Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
ALAMO PLAZA 300 Alamo Plaza	78205	HR	1.100	1.10	1	C	1950	SLG		1G					810														Cenotaph
BRACKENRIDGE 3700 N. St. Mary's	78209	LUP/ HR	343.700	343.70	9&1	N	1899/1908/ 15/16/17	SLG/ DO/P	5	3P	2(L)	195		1			1 2L								H, S	0.44		R	Train, Japanese Tea Gardens, Polo Field, Driving Range, Lions Field Adult Cntr. Sunken Garden Theatre, Tueday Music Club, Shuffle Board
BRACKENRIDGE GOLF COURSE 2315 Avenue B	78215	SC	113.600	113.60	1	N	1899	DO	2					1	4,300													R	18-Holes, Clubhouse, 2 Putting Greens
BUCKEYE 1600 W Wildwood	78201	NP	0.500	0.50	1	N	1945	P			1	4									1(L)								Open Play Area
CATALINA 1400 Fresno	78201	US	0.800	0.80	1	W	1942	P																					FAA Antenna and Shed
COLUMBUS 500 Columbus	78207	NP/ SUF	2.100	2.10	1	C	1885	SLG	1	3S											1(L)			3					3 Boccie Courts, Statue, Fountain
COMMANDER'S HOUSE 645 S. Main	78204	HR	2.300	2.30	1	S	1972	DE	4					2															Senior Citizen/Adult Center; Gardens
CROCKETT 1300 N. Main	78212	NP/ SUF	5.300	5.30	1	N	1875	O		1G	1	9													H				Open Play Area, Statue
DELLVIEW 507 Basswood	78213	CP	5.500	5.50	1	N	1953	DE	2	1P	1	12	1SR						1	1(L), SB, SC				1 B,V					Bathhouse
FARIAS, MARIO* 1012 Leal St	78207	NP	2.100	2.10	1	W	1975	P	1	1P	1(L)	5									1(L)								
GRANADOS 500 Freiling	78213	CP	5.000		1	N																							
HEMISFAIR 600 Hemisfair Park	78205	SUF	150.000	150.00	1	C	1975	DE	3	1P	1														H			WP	Tower of Americas, Historic Structures
JOHNSON FOUNTAIN, LADY BIRD 300 E. Crockett	78205	US	0.100	0.10	1	C	1974	O																				F	
KENWOOD 305 Dora	78212	CP	6.470	6.47	1	N	1976	DE			2	11		1			1(L)				1(L)				H				
KING WILLIAM 131 King William	78204	NP	0.700	0.70	1	S	1901	P/DO	1G						378														
LA VILLITA 418 Villita Street	78205	HR	3.600	3.60	1	C	1939/40/43/ 67	P	10																			R	28 Building Complex of Shops, Plazas, and River Theatre
LOS ANGELES HEIGHTS 1700 W. Hermosa	78201	NP	0.690	0.69	1	W	1945	P													1								
MADISON SQUARE 400 Lexington	78215	NP/ SUF	5.100	5.10	1	C	1858	DE				5													S	0.2	D		Ornamental Plantings, Benches, Plaza
MARKET SQUARE 514 West Commerce	78207	SUF	4.100	4.10	1	C	1894	SLG	6																			F	Mexican Market, Shops, Plazas
MAVERICK 1000 Broadway	78215	NP	3.000	3.00	1	C	1881	D		1P		2																	
MILAM 501 W. Commerce	78207	SUF	3.500	3.50	1	C	1733	SLG		1G	1	5													S/H	0.25	D		Plaza, Statue, Fountains

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L-Lighted

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H-Hard Surface (Hike/Bike)
S-Soft Surface (Jogging)
NH-Nature (Hike)
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																Play Fields					Courts										
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquisition	Restroom	Pavilion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr;Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
OJEDA, WILLIE 1100 N. Trinity	78207	NP	2.300	2.30	1	W	1975	P			1	2									1								
OLMOS BASIN 651 Devine	78216	LUP/ NA	1010.000	450.00	1&9	N	1925	SLG	3	1P	4	24		1	1,500	2(L)		5 2(L)	1						S, NH			C/S	Group Picnic Area, Gun Club, Party House, Driving Range, NEISD Leased Playing Fields
OLMOS BASIN GOLF COURSE 7022 N. McCullough	78212	SC	167.000	167.00	1&9	N	1963	SLG	1	1S																		C/S	Club House, 18 Holes, 2 Practice Greens
OLYMPIA 2101 Basse	78213	NP	2.100	2.10	1	N	1950	DE	1	1		3					1				1(L)							
PLAZA DE ARMAS 100 Plaza De Armas	78205	SUF	1.200	1.20	1	C	1876	SLG	1																				City Hall, Statues; Historic Markers
PLAZA DE LAS ISLAS 100 E. Commerce	78205	SUF	0.900	0.90	1	C	1733	SLG																				F	Fountain
PORTAL SAN FERNANDO 100 Main Plaza	78205	SUF	0.2394	0.2394	1	C	1994	P																				F	
RIVERWALK S. Alamo to Lexington	78205	HF	15.400	15.40	1	C	1936	SLG	1																H	2.3	O	R	Shops, Restaurants, Barges, Outdoor Theater
ROMANA PLAZA 100 Camden	78205	US	0.200	0.20	1	C	1920	P																					
SAN FERNANDO GYMNASIUM 319 W. Travis	78205	SC	0.900	0.90	1	C	1974	P	4					1	22,000														
SAN PEDRO SPRINGS 1315 San Pedro	78212	LUP/ HF	46.000	46.00	1	N	1733	SLG	4	1G	1	15	1				2(L)					22(L)		1	H			C/S, P/	McFarlin Tennis Center, Theater, Gazebo, Bath House, Library, Springs, Concessions
SAN PEDRO DRIVING RANGE & PAR 3 6102 San Pedro	78216	SC	31.000	31.00	1	N	N/A	N/A	1																				Driving Range, Clubhouse
SPANISH GOVERNOR'S PALACE 105 Plaza de Armas	78205	HF	0.400	0.40	1	C	1929	P	1						4,850													F	Wishing Well, Museum, Gardens
TOBIN, JOHN 1900 W. Martin	78207	CP	1.100	1.10	1	W	1944	DO						1	16,614						1								
TRAVIS 301 E. Travis	78205	SUF	2.600	2.60	1	C	1870	DE																					Old Cannon, Statue, Plaza
VICTORIA* 800 E. Durango	78210	NP	0.900	0.90	1	S	1985	DO																					Open Play Area
WEST END 1401 N. Hamilton	78207	CP	5.200	5.20	1	W	1931	P		1P	2(L)			1			1(L)			FB, SC 1(L)	2(L)	1(L)	1(L)						Multi-Service Center, Open Play Area
WINDSOR 2300 Ingleside	78213	NP	2.500	2.50	1	N	1958	DE			1(L)	4								1 SC		1							
WOODLAWN LAKE 1103 Cincinnati	78201	LUP	62.000	62.00	1&7	W	1918	P	2	1P	1(L) 1	20	1SR	3	15,000	1	1				1	3(L)			H	1.25	A	P/L	Fishing, Boating, Casting Pool, Lighthouse, Bath House, Open Play Area,Berta Almaguer Dance Studio
TOTAL ACREAGE			2011.199	1446.199							13.000															4.440			

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COLISEUM OAKS 101 Ambrosia	78220	NP	3.840	3.84	2	E	1999	DO/P			1														H	0.38			Open Play Area
COPERNICUS, NICHOLAS 5003 Lord Road	78220	CP	21.000	21.00	2	E	1972	P	1	1P	1	8		1	11,368		1(L)	2 SC	1	1 FB, SC	1(L)	2(L)		1	H	0 5 (L)	A		Open Play Area
DAFOSTE 210 Dafoste	78220	NP	15.100	11.00	2	E	1977	P		1S	1(L)	4									2(L)	2(L)							
DAWSON, ROBERT B. 2500 E. Commerce	78203	CP	4.200	4.20	2	E	1890	DE			1			1	10,624		1				2(L)	1		1 B,V					Open Play Field
DELLCREST 1701 Diane	78220	NP	6.000	6.00	2	E	1958	DE			1						2												
DENVER HEIGHTS 300 Porter	78210	CP	4.200	4.20	2	E	1891	DE						1	11,948					1 BB, SC	1(L)	2							
DIGNOWITY 701 Nolan	78202	NP	3.200	3.20	2	E	1951	P		1P		9									1								Plaza Area, Tables and Benches
HEALY MURPHY 210 Nolan	78205	NP	1.000	1.00	2	E	1978	P			1(L)										1								Open Play Area; Dullnig House
HERRERA, FERNANDO Q. 130 "I" Street	78210	NP	4.500	4.50	2	E	1919 & 1980	P	1		1(L)	4					1(L)				1(L)								
HISTORIC CITY CEMETERIES 2015 E. Commerce	78202	SUF	46.730	46.73	2	E	1894-1998	SLG/D O																					Office Building
"J" STREET 3500 "J" Street	78220	NP	11.800	11.80	2	E	1970	P	1	1P	1	10					1(L)				2(L)	1(L)			H,NH			C/S	Play Field with Backstop, Fishing
JAMES, JOHN 1300 Rittiman Road	78234	LUP	89.600	40.00	2	N	1973	DO			1	5				2		1SR							H,S, NH	0.5	D	C/S	
KARDON, LOU 6161 Gibbs Sprawl Rd	78218	CP	23.390	10.00	2	N	1998	P	2		1	3					2								NB	0.51	O		Open Play Area
KING, MARTIN LUTHER 3503 M L. King Drive	78220	LUP	168.970	60.00	2	E	1972	P	2	3P	1	42	1SR	1	36,400		1(L)				2 1(L)	2			H	0.33	A	C/S	Fishing, Eastside Boys' & Girls Club Lease
KING, MARTIN LUTHER PLAZA 2202 E. Houston Street	78202	SUF	0.300	0.30	2	E	N/A	O																					Statue
LAKESIDE 5640 Lakefront Dr	78222	CP	30.420	3.50	2	E	1998	P				3													H,NB	0.64		P/L	
LINCOLN 2915 E. Commerce	78202	CP	32.700	32.70	2	E	1927 - 1970	P	1	1S	1	3	3SR	1	10,614	1(L)	1(L) 2				2(L)								Multi-Service Center, Open Play Area, Bath House, Community Gardens
LOCKWOOD 801 N. Olive	78202	CP	3.800	3.80	2	E	1928	DO		1S	1(L)	4		1	8,718					BB, SB, FB 1(L)	1(L)								Open Play Area
MILLER, DORIE 2802 Martin Luther King	78220	CP	1.040	1.04	2	E	1991	O	2		1			1							1								Covered Basketball Court, WIC CLinic, Gardens
NORTHAMPTON 8989 FM 78	78109	CP	20.607		2	N	2000	DO/O																					
PERSHING 500 Sandmeyer	78208	NP	1.900	1.90	2	N	1931	DO/P			1	3					1	1			1								Open Play Area
PITTMAN-SULLIVAN 1101 Iowa	78203	CP	25.400	25.40	2	E	1733	SLG	2	1P	2	10		1***		1(L)	1(L)			1 BB, SB	3	2							Alamo Branch YMCA Lease, Open Play Field, Concessions

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SALADO CREEK GREENWAY		GW	53.824		2	E																							
SECOND BAPTIST* 3330 East Commerce	78220	NP	1.700	1.70	2	E	Leased	L			1	2									1(L)	1(L)							
SKYLINE 800 Green Valley	78219	NP	1.200	1.20	2	E	1955	DE			1					1	1				1(L)								Open Play Area
SUNRISE 6525Binz-Engleman Rd.	78244	NP	5.500	2.00	2	N	2000	P																	H	0.25	O		
WHITE,JACK 3803 Old Sequin Rd.	78219	GW	59.600		2	N	2004	P																					Park Police Substation
WILLOW SPRINGS GOLF COURSE 202 Coliseum	78219	SC	188.600	188.60	2	E	1945	P	1	1S																			18 Hole Course, Club House, Snack Bar
WILSHIRE TERRACE 1301 Rittiman Rd	78218	US	11.200	1.20	2	N	1952	DO																					Open Play Area
WOODARD, RUTH 1011 Locke	78208	CP	3.900	3.90	2	E	1973	P	1		1	5		1	13,134		1(L)				1(L)		1(L)						
TOTAL ACREAGE			845.221	494.710							16.000															2.610			

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ACEQUIA** 8500 Mission Pky	78223	LUP	73.100	22.50	3	S	1965	P/DO	1			30													H,S			R	Fishing, Canoeing
BELLAIRE 733 Ansley Road	78221	NP	6.500	6.50	3	S	1956	DE	1	1P	2	4									1				H	0.15	C,D	C/S	Skate Plaza
BROOKS *** 3605 Goliad Road	78235	SC	21.400	21.40	3	S	1975	O										1		3 FB, SC, R									
BROWN 9601 Villemain Road	78214	SUF	26.500		3	S	1977	P																				P/L	Fishing, Canoeing, Open Play Area
CONCEPCION 500 E. Theo	78210	CP	21.400	21.40	3	S	1925	P	1		1(L)	34	1SR								1(L)								Bathhouse
ESPADA* 1750 S.E. Military	78214	GW	10.800	10.80	3	S	1978	L	1			8													H				Fishing
HIGHLAND 901 Rigsby	78210	CP	4.900	4.90	3	E	1926	P			1			1	2,257							6(L)		1 V,B					James A. Bode Recreation Center, Open Play Area
HIGHLAND HIGH SCHOOL TENNIS COMPLEX* 3119 Elgin	78210	SC	0.800	0.80	3	E	Leased	L														4(L)							
KINGSBOROUGH 350 Felps	78221	CP	12.900	4.00	3	S	1979	DE	1			4	1SR							1									Bathhouse
MISSION DEL LAGO GOLF COURSE 1250 Mission Grande	78221	SC	182.700	182.70	3	S	1988	DO/O	2																				Driving Range, 18 Holes, Club House
MISSION PARKWAY 3600 Mission Pkwy	78214	GW/ SUF	72.400	72.40	3	S	1968	P/DO				10													H	7.2	A	R	Fishing, Wood Bridges
PICKWELL 6911 Pickwell	78223	NP	11.000	11.00	3	E	1957	DE	1		1(L)						1				2(L)	1			H,S	0.35	C,D		Open Play Area
PYTEL 6220 S. New Braunfels	78223	CP	34.400	34.40	3	S	1993	DO	1		1	15													H, NH	0.53	A		
RIVERSIDE GOLF COURSE 203 MacDonald	78210	SC	175.80	175.80	3	S	1936	P	1																				18 Holes, 9 Holes, Par 3, Concessions, Club House
SAN JOSE BURIAL PARK 8235 Mission Road	78214	SUF	83.800	83.80	3	S	1895	N/A																					Cemetery
SOUTHSIDE LIONS 3100 Hiawatha	78210	LUP	600.100	275.00	3	E	1944/64	P/DO	5	4P	2	35	1SR	1	10,944	4(L)	3(L) 1				1	6(L)			H NH			P/L	Open Play Area, Fishing
STINSON 900 March	78214	CP	75.000	25.00	3	S	1895	P								5(L)				2 FB, SC									Concession Building
VILLA CORONADO 11031 Renova	78214	CP	14.800	10.80	3	S	1979	P	1	1P	1(L)	5		1	7845		1	1	1		1	2(L)							
TOTAL ACREAGE			1428.300	963.200							6.000															8.230			

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	GENERAL						RECREATION FACILITIES																						
																Play Fields					Courts								
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan Subarea	Year Acquired	Method of Acquisition	Restroom	Pavillion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr.Gym& Acivity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
ADAM'S HILL 2003 Hunt Lane S	78245	NP	1.641		4	FW	2000	P																					
ARNOLD, HENDRICH 1011 Gillette Road	78224	CP	24.600	24.60	4	S	1972	P	1	1S	1(L)	12		1	11,897		1(L)			2 (L) FB, R, SC	1(L)		2		H	0.62	A		Ramirez Community Center
CAMARGO, MATEO 5738 Castroville	78227	SUF	45.000	15.00	4	SW	1927/ 35/41	P	1	4P	1(L)	32																	Bandstand, Mass Picnic Facility
FLORES, JIMMY 803 Southcross	78211	CP	8.360	8.36	4	SW	1955	DE	1		1(L)	20	1SR	1***			1(L)	2	1	BB, SC, FB, R	1		2		H,S	0.66	C,D		Bathhouse; Y.M.C.A. Lease
FORGE, AL 1900 W. Pyron	78211	NP	3.100	3.10	4	SW	1976	P	1		1	4					1				1	1							
GATEWAY TERRACE 5605 Stony Brook	78242	NP	5.300		4	SW	2004																						
GOLDEN COMMUNITY 7801 Somerset Road	78211	CP	15.990	6.00	4	SW	1994	P		1S	1										2(L)					0.25	D		Open Play Area
HERITAGE-DUCK POND 900 Ellison Dr S	78245	NP	6.734	6.73	4	FW	2001	DO	2	1P	2	9									1(L)				C/D	0.53		WP	
LACKLAND TERRACE 7902 Westshire	78227	CP	7.200	7.20	4	W	1972	P			1	2		1	2,200	2(L) 1			1						S	0.25	D		Baseball Buildings, Community Center
MEDINA BASE ROAD 6303 Medina Base Rd	78227	CP	44.534		4	SW	2000	P	1	1G	2	9													H,S	0.25	C,D	C/S	
MEDINA RIVER 15890 HWY 16 S	78264	NA	362.316	0.00	4	S		DO/O	2	1															H/NH	2.62			
MILLER'S POND 6175 Pearsall Road	78242	CP	42.200	10.00	4	SW	1976	P	1	1P	1(L)	12		1	8,113					2 BB, SB,FB	1(L)				H	0.25	A	P/L	Fishing
PALO ALTO 1625 Palo Alto Rd	78211	NP	12.000	12.00	4	S	1965	P		1P	1(L)	10					1			1	1(L)	2			H	0.4	A		Open Play Area
PALO ALTO TERRACE 9700 Celeste Dr	78211	NP	7.200	7.20	4	S	1974	P	1	1P	1(L)	6					1(L)				1(L)	1(L)							Open Play Area
PEARSALL 4700 Pearsall	78242	LUP	231.709	15.00	4	SW	1966/ 1999	P	1																H				Enclosed Dog Park, Landfill Property to be converted to Park Land
RAINBOW HILLS 528 Rasa Drive	78227	NP	10.410	10.41	4	FW	1994/2002	DO	2	1P		8		1			1	1		1 FB, SC	1(L)				H	1	A		Exercise Course
ROYALGATE* 5801 Windy Hill	78242	NP	8.200	8.20	4	SW	1974	L			1	4								1 BB, SB, FB	1(L)	1(L)							
SPICEWOOD 3139 Fidelia	78224	CP	31.800	3.50	4	S	1969	DO				2									1(L)				H	0.2	C,D		
TOTAL ACREAGE			868.294	137.304							8.000															7.030			

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ALDERETE, CLARISSA 300 Aurora	78228	NP	9.600	9.60	5	W	1952/53	DO	1	1S	1	13					1(L)	2(L)		2	1(L)			1 V,B	H		C		
AMISTAD 1600 Tampico	78207	NP	16.250	16.25	5	W	1971	DO				20					1	1											
APACHE CREEK 2901El Paso St.	78207	GW	80.800	74.80	5	W	1971	P				19									1				H			C/S	
BENAVIDES, FATHER ALBERT 1500 Saltillo	78207	NP	8.000	8.00	5	W	1973	DE	1	1P		10			1,290		1(L)				2(L)	2(L)							Open Play Field, Plaza
CALDERON BOYS' & GIRLS'S CLUB *** 600 S.W. 19th Street	78207	SUF	2.500	2.50	5	W	N/A	N/A			1		1SR	1							1								
CASSIANO 1726 Potosi	78207	CP	5.200	5.20	5	W	1898	P	1	1P	1(L)	10	1SR								1(L)								Bathhouse
ELMENDORF LAKE 3700 W Commerce	78237	CP	29.600	29.60	5	W	1917	DO	2		1(L)	26	1SR			1(L)										1.22	D	P/L	Bathhouse, Caretaker House
ESCOBAR FIELD 1400 S. Zarzamora	78207	SC	6.000	6.00	5	W	N/A	N/A													2(L)	2(L)	1(L)	3					Two Lighted Handball Courts
GARCIA 1200 N Frio	78207	NP	6.000	6.00	5	W	1925/35/36	P				4													H				
KELLY AREA 949 W. Thompson Place	78226	NP	3.500	3.50	5	SW	1998	P				1													S	0.25	A		
KENNEDY, JOHN F. 3101 Rose Lawn	78226	SC	39.400	39.40	5	SW	1979	P	2	1S	1L	10	1SR			2	4(L)			2 SB, FB, SC	2	9(L)		1	H	0.5	A		Concessions
LAS PALMAS 503 Castroville Road	78237	CP	5.500	5.50	5	W	1974	P		1S	2(L)	4		1***	6,000		1(L)			1FB,SC	1	2			S		D		Olga H. Madrid Y.W.C.A. Lease
MARTINEZ, PATROLMAN GUADALUPE 201 Merida	78207	NP	9.800	9.80	5	W	1975	P	1			6					1	1		1 R, SC FB	2(L)	4(L)							
MONTERREY 5909 W. Commerce	78237	CP	51.000	48.00	5&7	W	1962	P	1		1(L)	11	1SR	1	4,118		2(L)	4JR/ 1SR			1	4				0.4	D	C/S	Bath House, Melendrez Community Center
MORRILL 238 E. Hart	78214	NP	1.400	1.40	5	S	1944	DE			1	4									2(L)								
NAVARRO, JOSE ANTONIO 500 N.W. 24th Street	78207	NP	3.000	3.00	5&7	W	1917/53/71/ 73	DE/P			1(L)	3					1				1								
NORMOYLE 700 Culberson	78211	CP	30.200	30.20	5	SW	1960	P	3	1P	1(L)	10	1SR	1	11,698	1(L)	2(L)	1SR			1(L)	5							Bath House; Normoyle Community Center; 2 Shuffle Boards (L), Skate Plaza
PALM HEIGHTS 1201 W. Malone	78225	CP	2.000	2.00	5	SW	1910/29	DO			1(L)	1		1	16,357		1			1	1(L)	2(L)							
ROOSEVELT 331 Roosevelt	78210	CP	12.900	12.90	5	S	1916	DO/P	1	P, 1S	2	22	1SR								1(L)				H		C	R	Bath House
ROSEDALE 303 Dartmouth	78237	LUP	61.800	50.00	5	W	1945	DE/P	3	2P	2	35	1SR	1***	49,235	2(L)	1(L) 1	1(L)		1 FB, R, SC	1(L)	3(L)	1(L)	1	H	0.5	A/C	C/S	Westside Y.M.C.A. Lease, Mass Picnic Facility with Kitchen
SAN ANTONIO NATATORIUM 1430 W. Durango	78207	SC	2.900	2.90	5	W	1979	DO	4				1	1	33,260														
SAN JUAN-BRADY 2307 S. Calaveras	78207	CP	4.800	4.80	5	W	1977	DO			1(L)			1	13,330					1 SC, FB, R	1(L) 1	2(L)							

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SMITH 1301 Buena Vista	78207	US	0.300	0.30	5	W	1916	DO			1	2																	
SOUTH SAN 2031 Quintana Road	78211	CP	1.300	1.30	5	SW	1948	P	1					1	13,875						1								
TEJEDA, FRANK 541 Division	78214	NP	8.900	8.90	5	S	1977	P	1		1(L)	12					1				2(L)	3(L)							
VIDAURRI, JUAN 1201 Merida	78207	NP	7.700	7.70	5	W	1952	P	1	1P	1(L)	11					1			FB, SC, R	1(L)								
TOTAL ACREAGE			410.350	389.550							8.000															2.670			

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ACME 534 S. Acme Rd.	78237	NP	2.800	2.80	6	W	1963	DE	1	2P	1	9					1				2(L)			1 V,B	H	0.17	C		Open Play Area
CANYON RANCH/MABE	78023	NA	421.005		6	FW	2005	P																					
CATHEDRAL ROCK 8400 Old Grissom	78251	CP	56.863		6	FW	2000/01	P																					
CHRIS HILL	78254	NA	710.000		6	FW	2003																						
CUELLAR, PATROLMAN RICHARD 5626 San Fernando	78237	CP	27.000	27.00	6	W	1972	P	2		1	6	1SR	1	18,354	1	1			1 BB, SB,FB,SC	1(L)	2(L)	1	1 B,T	H	0.5	A		Open Play Area, Bathhouse, Concession Building
CULEBRA CREEK 11225 FM 471 W	78254	CP	145.300		6	FW	2000	DO																					
HAMPTON 12725 HWY 211	78254	NA	50.000		6	FW	2003	P																					
IRON HORSE CANYON 12751 FM 1560 N	78023	NA	594.578		6	FW	2001	3																					
KALLISON RANCH*** 13651 Kallison Ln	78254	NA	1163.810		6	FW	2002	P																					
LEVI STRAUSS 6100 Old Hwy. 90 West	78227	CP/ GW	19.800	9.00	6	W	1981	DO		2S		7						4			1(L)			1(L) B,V				F	Open Play Area
MAYBERRY 12725 HWY 121	78254	NA	345.110		6	FW	2002	P																					
MEADOWCLIFF* 1260 Pinn Road	78227	CP	0.500	0.50	6	W	1976	DO						1	11,464														Meadowcliff Community Center
NEW TERRITORIES 9023 Bowen	78250	CP	11.090	11.09	6	FW	1996 & 1999	P	1		1(L)	6	1	1							2(L)	2(L)			NB	0.45	D		
NORTHSIDE TENNIS CENTER* 7001 Culebra	78238	SC	5.000	5.00	6	W	Leased	L	8				1SR	1		1(L)	1(L)	2(L)	1(L)	2 SC	1	10(L)	1						Pro Shop, Activity Bldg.
PEREZ MEMORIAL, OSCAR 8601 Timber Path	78250	CP	17.017	0.00	6	FW	2001	P																					
SCHUCHARDT 12940 SH 211	78254	NA	87.000		6	FW	2003	P																					
SLICK, TOM 7400 HWY 151	78227	CP	62.772	35.00	6	W	1999/2000	P	1							1		1		1					H,NH	0.5		P/L	
VAN DE WALLE, GREGORY 1925 Herbert	78227	NP	0.700	0.70	6	W	1979	DO			1(L)	2									2(L)								
WESTWOOD VILLAGE*** 7627 S.W. Military Dr.	78227	CP	2.700	2.70	6	W	1976	P	1	1P	1	1	1S																Bath House
WINDGATE RANCH 12940 SH 211	78254	NA	1123.944		6	FW	2000	P																					
TOTAL ACREAGE			4846.989	93.790							3.000															1.620			

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FALCONE, NANI 7625 Mystic Park	78254	CP	65.510	5.00	7	FW	1996 /2001	P	1	2	5									1								C/S	
GARZA, GILBERT 1450 Mira Vista	78228	CP	21.500	21.50	7	W	1972	P	1		1		1SR	1	14,592	1	1	2		2 B, SC,FB	1(L)	2(L)	1(L)	2 B,T	H				Bathhouse; Gilbert Garza Community Center
HUEBNER CREEK 6300 Whitby Road	78240	NP	11.140		7	NW	2001	P																					
INGRAM HILLS 3803 Majestic Dr	78228	NP	3.280		7	W	2001	P																					
LEE'S CREEK 1215 E. Sunshine	78228	NP	7.800	5.00	7	W	1986	DO																	S	0.15	D	C/S	Open Play Area
LEON VISTA 8561 Rochelle Rd.	78240	CP	6.100	2.00	7	NW	1999	P						1	5205														
MONTERREY 5909 W. Commerce	78237	CP	51.000	48.00	5&7	W	1962	P	1		1(L)	11	1SR	1	4,118		2(L)	4JR/ 1SR			1	4				0.4	D	C/S	Bath House; Melendrez Community Center
MONTICELLO 400 Club Dr.	78201	NP	0.500	0.500	7	W	N/A	N/A																	S	0.18	D		Historic Neighborhood
NAVARRO, JOSE ANTONIO 500 N.W. 24th Street	78207	NP	3.000	3.00	5&7	W	1917/53/71/ 73	DE/P			1(L)	3					1				1								
OAK HILLS 200 Edgeville	78229	NP	8.100		7	NW	N/A	N/A																					Open Space
SEELING 105 Placid Drive	78228	NP	1.500	1.50	7	W	1939	DE																					Open Play Area
SUNSET HILLS 500 Inspiration	78228	CP	1.900	1.90	7	W	1977	P			1(L)	4	1								1								Bath House
WARD, JOE 435 E. Sunshine	78228	CP	4.200	4.20	7	W	1978	P	1		1(L)	3	1J 1SR	1	13,550			1SR		2 FB, SC	2								Bath House
WOODLAWN LAKE 1103 Cincinnati	78201	LUP	62.000	62.00	1&7	W	1918	P	2	1P	1(L) 1	20	1SR	3	15,000	1	1				1	3(L)			H	1.25	A	P/L	Fishing, Boating, Casting Pool, Lighthouse, Bath House, Open Play Area,Berta Almaguer Dance Studio
TOTAL ACREAGE			247.530	154.600							6.000															1.980			

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DE-Dedicated
SLG-Spanish Land Grant
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O-Other

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S-Shelter

L-Lighted

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H-Hard Surface (H&B)
S-Soft Surface (Jogging)
NH-Nature (Hike)
NB-Nature(Bike/Hike)
A-Asphalt
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D-Decomposed Granite
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PARK INVENTORY OF CITY-OWNED AND/OR OPERATED PROPERTIES AS OF JUNE 20, 2005

	GENERAL						RECREATION FACILITIES																								
																Play Fields					Courts										
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquisition	Restroom	Pavilion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr.Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
BAMBERGER 12401 Babcock Rd	78249	NA	70.910	6.20	8	NW	1997	DO																	H	2.45	C,D, O		
CEDAR CREEK 9680 Menchaca	78255	NA	239.300		8	NW																							
CEDAR CREEK GOLF COURSE 8250 Vista Colina	78255	SC	172.720	172.72	8	NW	1991	DE	2																				Clubhouse, 1 Putting Green, 18-Hole Course, Driving Range
CROWNRIDGE 7222 Luskey Blvd	78256	NA	207.790		8	NW	2001	3																					
EISENHOWER, DWIGHT D. 19399 NW Military Hwy.	78257	LUP/ NA	323.000	50.00	8	FN	1973	DO	2	3P	1	94													H,S, NH	1.8/ 4.55	A/O	C/S	Nature Trails, Camping, Caretaker's House
FOX PARK 6518 Hausman Road	78249	CP	34.804		8	NW	2005	P																					
FRIEDRICH, EMILE AND ALBERT 21395 Milsa	78256	NA	279.730	40.00	8	NW	1973 /2001	DO/P	2			6													H,S, NH	.75/ 3.67	A/O	P/L, C/S	Nature Trails, Signage for Impaired,Outdoor Education Facility
HAUSMAN ROAD PARK 7038 Hausman Road	78249	CP	24.055		8	NW	2005	P																					
LEON CREEK GREENWAY 12160 Babcock Road	78249	GW	103.418		8	NW	1997/98/00/ 01	DO/P																	S, NB			C/S	
SCHNABEL, "O.P." **** 9606 Bandera	78240	LUP	202.000	55.00	8	NW	1964	P	1	1	1	19		1	6,000	4					2				S NH	4.5	C/O	C/S	Y.M.C.A. Lease
SPRING TIME 6571 Spring Time	78249	NP	2.756	2.76	8	NW	2002	P	2		1	2	1																Skatepark
WOODLAND HILLS 21395 Milsa Rd	78256	NA	312.900		8	NW	2003	P																					
TOTAL ACREAGE			1973.383	326.676							3.000															6.950				

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FB-Football
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B-Basketball

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NH-Nature (Hike)
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	GENERAL						RECREATION FACILITIES																						
																Play Fields					Courts								
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan. Subarea	Year Acquired	Method of Acquitision	Restroom	Pavilion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr;Gym& Activity Bldg.	Bldg. S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
BELMEADE *** 119 W. Hathaway	78209	NP	4.400		9	N	1945	DE																	H				
BLOSSOM, VIRGIL T. ** 15015 Heimer Road	78232	CP	17.600	17.60	9	NE	1972	P		1P	1	10				1				1 BB,SB, FB,SC	2	2							
BRACKENRIDGE 3700 N. St. Mary's	78209	LUP/ HR	343.700	343.70	9&1	N	1899/1908/ 15/16/17	SLG/ DO/P	5	3P	2(L)	195		1			1 2L								H, S	0.44		R	Train, Japanese Tea Gardens, Polo Field, Driving Range, Lions Field Adult Cntr. Sunken Garden Theatre, Tueday Music Club, Shuffle Board
LORENCE CREEK 14800 Henderson Pass	78232	GW	43.886		9	NE	1997	P																	NH			C/S	
MAHNCKE 3400 Broadway	78209	NP	10.000	10.00	9	N	1906	DO																	S	0.46	D		Statue and Fountain
MCALLISTER, W.W. 13102 Jones-Maltsberger	78247	LUP/ NA	995.7947	450.00	9	NE	1963-1979 /2001	P,DO	5	4P	1	156				8(L)		11SR							H,S, NB	3	A	C/S	Bike Trails, Camp Sites
OAKHAVEN 16400 Parkstone	78232	NP	9.500	9.50	9	NE	1972	DE				3					1				1	1			H, NH	0.47			
OLMOS BASIN 651 Devine	78216	LUP/ NA	1010.000	450.00	1&9	N	1925	SLG	3	1P	4	24		1	1,500	2(L)		5 2(L)	1						S, NH			C/S	Group Picnic Area, Gun Club, Party House, Driving Range, NEISD Leased Playing Fields
OLMOS BASIN GOLF COURSE 7022 N. McCullough	78212	SC	167.000	167.00	1&9	N	1963	SLG	1	1S																		C/S	Club House, 18 Holes, 2 Practice Greens
PANTHER SPRINGS**** 21456 Blanco Road	78258	NA	281.190	42.32	9	FN	1991/ 2001	DO																					Leased to Y.M.C.A.
SAN ANTONIO BOTANICAL CENTER 555 Funston	78209	SUF	36.580	33.60	9	N	1905	P	3	7															H NH			P/L	Lake, Conservatory, Japanese Gardens, Observation Pavillion, Childrens Garden, Garden for the Blind, Gift Shop
STONE OAK 20395 Stone Oak Parkway	78258	NA	245.300		9	FN	2000	P/DO																					
UPPER SALADO CREEK GREENWAY 15300 Huebner Rd	78231/ 78216	GW	75.440		9	FN	2003	P,D																					
WALKER RANCH 12603 West Ave.	78216	HR/ SUF	90.000	10.00	9	FN	1993/97/98/ 99	DO/P	1	1P	1(L)	12													H	0.5	A	C/S	Historic/Archaeologicial Sites, Outdoor classroom
TOTAL ACREAGE			3330.391	1533.718							6.000															4.870			

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	GENERAL						RECREATION FACILITIES																							
																Play Fields					Courts									
Name of Park / Address of Park	Zip Code	Park Type	Total Acres	Developed Acres	Council District	Plan Subarea	Year Acquired	Method of Acquisition	Restroom	Pavilion/ Shelter	Playground	Picnic Tables/ Picnic Units	Swimming Pool	Community Cntr,Gym& Activity Bldg.	Bldg S.F.	Baseball	Softball	Soccer/ Rugby	Football	Multi-Purpose	Basketball	Tennis	Volleyball	Multi-Purpose	Trails	Trail Length (mi.)	Trail Construction	Water Feature	Other
COMANCHE LOOKOUT 15551 Nacogdoches	78247	LUP/ HR	99.731	52.00	10	NE	1994	P				5													NH	2.2	A/C/O		Historic Stone Tower
FRIESENHAHN 15701 O'Connor Road	78247	NP	11.800	11.80	10	NE	1979	DE		1P		4													H,S, NH			P/L	
HASKIN 200 Haskin	78209	NP	0.900	0.90	10	N	1955	DE			1(L)																		Open Play Area
JOHNSON, LADY BIRD 10700 Nachodoches	78217	LUP/ SC	77.800	77.80	10	NE	1972	L	2		1	2\7		1, 1***	11,168		4(L)	4JR, 1SR	1		1	1						C/S	Community Center, Alva Jo Fisher Complex, Comcessions, Skate Park
KALLISON, MORRISON 9500 Moroga	78217	NP	15.200	7.60	10	NE	1972	P				5					1												Open Play Area
MCCLAIN 15700 O'Connor	78247	NP	97.497	0.25	10	NE	2001	P		1P		3																	
MUD CREEK 16675 Jones Maltsberger	78232	NA	67.370		10	NE	2001	DO/O																					
NORTHRIDGE 821 Chevy Chase	78209	NP	4.600	4.60	10	N	1952	DE	1	1P	1	4					1												Kitchen; Concessions
PRICE MEMORIAL, CAMILLE 100 Dalewood	78209	NP	5.300		10	N	1955	DE																					Open Play Area
SCATES 434 N Meadow Ln	78209	NP	0.700	0.70	10	N	N/A	N/A			1	5																	
TOBIN, ROBERT L. B. 100 Ira Lee	78218	NA/ GW	60.590		10	N	2003																						
TOTAL ACREAGE			441.488	155.650							3.000															2.200			

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IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

A. Council District 1 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Alamo Plaza Improvements	1	Central	$1,395,264
Bertha Almaguer Dance Studio Rehabilitation (Woodlawn Lake Park)	1	West	$941,689
Borglum Studio Rehabilitation	1	North	$625,000
Brackenridge Golf Course Improvements	1	North	$1,937,500
Brackenridge Park Golf Course Entrance Improvements	1	North	$1,235,818
Columbus Park Improvements	1	Central	$848,822
Commander's House Improvements	1	South	$1,341,600
Community Center Development	1,2,9,10	North	$3,047,257
Community Center Development	1,5,6,7	West	$3,445,099
Crockett Park Playground	1	North	$279,053
Dellview Park Improvements	1	North	$587,614
Downtown Parks and Plazas Rehabilitation	1	Central	$1,274,520
Granados Park Development	1	North	$1,306,067
Hemisfair Park Rehabilitation	1	Central	$3,329,000
Kenwood Park Improvements	1	North	$628,063
King William Park Improvements	1	South	$362,769
La Villita Improvements	1	Central	$1,773,154
Land Acquisition	1,2,9,10	North	$1,714,189
Madison Square Park Improvements	1	Central	$570,659
Main Plaza Rehabilitation	1	Central	$5,539,456
Market Square El Mercado Building Improvements	1	Central	$798,200
Market Square Rehabilitation	1	Central	$2,978,352
Martinez Creek Greenway	1,5	West	$2,648,181
Maverick Park Rehabilitation	1	Central	$784,742
Milam Park Playground	1	Central	$529,637
Ojeda Park Improvements	1	West	$334,880
Olmos Basin Golf Course Improvements	1	North	$2,312,500
Olmos Basin Park Rehabilitation	1	North	$2,414,800
Olympia Park Improvements	1	North	$402,480
Riverwalk Historic Loop Rehabilitation	1	Central	$4,024,800
Riverwalk Safe Harbor Facility	1	Central	$1,290,000
San Pedro Driving Range Improvements	1	North	$2,125,000
San Pedro Springs Park Rehabilitation	1	North	$2,261,676
Skate Parks	1,5,6,7	West	$725,537
Spanish Governor's Palace Improvements	1	Central	$781,348
West End Park Improvements	1	West	$905,471
Windsor Park Improvements	1	North	$279,053
TOTAL COUNCIL DISTRICT 1			**$57,779,250**

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

B. Council District 2 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Community Center Development	1/2/9/10	North	$3,047,257
Copernicus Park Community Center Improvements	2	East	$767,395
Copernicus Park Improvements	2	East	$558,106
DaFoste Park Improvements	2	East	$441,364
Dawson Park Community Center Roof Replacement	2	East	$335,400
Dellcrest Park Improvements	2	East	$424,388
Denver Heights Park & Community Center Rehabilitation	2	East	$855,736
Dignowity Park Improvements	2	East	$489,679
Dorie Miller Parkland Acquisition and Development	2	East	$3,301,204
Fairchild Park Improvements	2	East	$1,056,383
Fairchild Park Pool Facility Rehabilitation	2	East	$536,640
Herrera Park Improvements	2	East	$536,898
Historic City Cemeteries Improvements	2	East	$1,177,111
J Street Park Improvements	2	East	$1,404,748
Jack White Property Park Development	2	East	$1,069,455
John James Park Improvements	2	North	$679,021
Land Acquisition	2/3	East	$2,215,001
Land Acquisition	1/2/9/10	North	$1,714,189
Lincoln Park Improvements	2	East	$1,596,182
Lockwood Park Gymnasium Replacement	2	East	1,609,920
M.L. King Park Area Improvements	2	East	$3,994,800
Pedestrian Wellness Trails (6 Parks – Dawson, Denver Heights, Lincoln, Lockwood, Pittman-Sullivan, Woodard)	2	East	$2,112,765
Pittman-Sullivan Park Improvements	2	East	$652,905
Second Baptist Church Park Improvements	2	East	$617,909
Skyline Park Improvements	2	East	$348,816
Sunrise Park Improvements	2	North	$580,429
Willow Springs Golf Course Improvements	2	East	$2,734,375
Wilshire Terrace Park Improvements	2	North	$353,090
Woodard Park and Community Center Improvements	2	East	$798,091
TOTAL COUNCIL DISTRICT 2			**$36,009,253**

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

C. Council District 3 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Acequia Park Improvements	3	South	$492,290
Brooks Park Improvements	3	South	$2,663,200
Concepcion Park Improvements	3	South	$928,687
Espada Park Improvements	3	South	$683,163
Harlandale Park Community Center	3	South	$1,674,317
Kingsborough Park Improvements	3	South	$706,267
Land Acquisition	3/4	South	$1,846,350
Land Acquisition	2/3	East	$2,215,001
Mission del Lago Golf Course Improvements	3	South	$937,500
Mission Trail Parkway Parks Rehabilitation	3	South	$2,770,816
Natural Area Development	3	South	$3,805,987
Neighborhood Park Development	3/4	South	$3,143,795
Pedestrian Wellness Trails (Three Parks)	3	South	$1,015,752
Pytel Park Improvements	3	South	$625,000
Riverside Golf Course Improvements	3	South	$1,796,875
S.S. Lions Park (East) Improvements	3	East	$2,263,676
S.S. Lions Park (West) Skate Park Facility	3	East	$1,185,974
S.S. Lions Park Pool Facility Rehabilitation	3	East	$536,640
San Jose Burial Park Improvements	3	South	$2,295,090
Skate Parks	3/4/5	South	$697,632
Stinson Park Improvements	3	South	$594,143
Swimming Facility Rehabilitation (Three Pools)	3/5	South	$1,269,690
Villa Coronado Park Improvements	3	South	$867,684
TOTAL COUNCIL DISTRICT 3			**$35,015,529**

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

D. Council District 4 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Arnold Park Rehabilitation	4	South	$885,456
Community Center	4/6/7	Far West	$3,923,706
Forge Park Improvements	4	Southwest	$507,877
Gateway Terrace Park Development	4	Southwest	$863,215
Golden Community Park Development	4	Southwest	$689,317
Land Acquisition	3/4	South	$1,846,350
Land Acquisition	4/5	Southwest	$3,300,687
Land Acquisition	4/6/7	Far West	$2,215,001
Large Urban Park Development	4/6/7	Far West	$5,637,472
Medina River Park Development	4	South	$2,930,054
Miller's Pond Park Improvements	4	Southwest	$1,298,798
Neighborhood Park Development	3/4	South	$3,143,795
Neighborhood Park Development	4/6/7	Far West	$3,680,435
Neighborhood Park Development	4/5	Southwest	$3,143,795
Palo Alto Terrace Park Improvements	4	South	$348,816
Pearsall Park (North) Development	4	Southwest	$2,257,500
Pearsall Park (South) Development	4	Southwest	$1,615,581
Rainbow Hills Park Gymnasium	4	Far West	$2,092,896
Rainbow Hills Park Improvements	4	Far West	$784,742
Royalgate Park Improvements	4	Southwest	$367,322
Skate Parks	3/4/5	South	$697,632
Skate Parks	4/5	Southwest	$697,632
Spicewood Park Playground	4	South	$322,500
Stablewood Farms Park Development	4	Southwest	$584,874
Swimming Facility Rehabilitation (3 Pools)	4/5	Southwest	$1,360,436
Youth Activity Center	4/5	Southwest	$3,857,472
TOTAL COUNCIL DISTRICT 4			**$49,053,361**

IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

E. Council District 5 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Alazan/Apache Creek Park Improvements	5	West	$3,395,104
Amistad Park Improvements	5	West	$452,735
Cassiano Park Improvements	5	West	$662,806
Cenizo Park (Rosedale Park Area) Rehabilitation	5	West	$625,000
Collin's Garden Park Improvements	5	West	$1,297,711
Community Center	5	Southwest	$3,923,706
Community Center	1,5,6,7	West	$3,445,099
Elmendorf Park Improvements	5	West	$969,696
Father Benavides Park Improvements	5	West	$706,267
Garcia Park Improvements	5	West	$580,429
Kelly Area Park Lighting	5	Southwest	$290,215
Kennedy Park Improvements	5	Southwest	$1,140,360
Kennedy Park Sports Field Improvements	5	Southwest	$1,534,790
Land Acquisition	5/6/7	West	$3,824,282
Martinez Creek Greenway	1/5	West	$2,648,181
Martinez Park Improvements	5	West	$832,453
Morill Park Improvements	5	South	$383,752
Navarro Park Improvements Design	5	West	$628,410
Neighborhood Park Development	4/5	Southwest	$3,143,795
Normoyle Park Sports Fields Improvements	5	Southwest	$829,159
Palm Heights Park Improvements	5	Southwest	$630,552
Park Land Acquisition	4/5	Southwest	$3,300,687
Rosedale Park Improvements	5	West	$1,407,541
San Antonio Natatorium Rehabilitation	5	West	$792,345
San Juan Brady Park Community Center Improvements	5	West	$711,585
San Juan Brady Park Improvements	5	West	$594,143
Skate Parks	1,5,6,7	West	$725,537
Skate Parks	3/4/5	South	$697,632
Skate Parks	4/5	Southwest	$697,632
South San Community Center Rehabilitation	5	Southwest	$739,490
Swimming Facility Rehabilitation (3 Pools)	3/5	South	$1,269,690
Swimming Facility Rehabilitation (3 Pools)	4/5	Southwest	$1,360,436
Swimming Facility Rehabilitation (4 Pools)	5/7	West	$2,683,200
Tejeda Park Improvements	5	South	$863,215
Vidaurri Park Improvements	5	West	$603,647
Youth Activity Center	4/5	Southwest	$3,857,472
TOTAL COUNCIL DISTRICT 5			**$51,618,754**

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

F. Council District 6 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Acme Park Improvements	6	West	$656,250
Cathedral Rock Park Development	6	Far West	$943,198
Community Center Development	1,5,6,7	West	$3,445,099
Community Center Development	4,6,7	Far West	$3,923,706
Cuellar Park Skate Park	6	West	$593,100
Culebra Creek Park Development	6	Far West	$3,359,120
Land Acquisition	5,6,7	West	$3,824,282
Land Acquisition	4,6,7	Far West	$2,215,001
Large Urban Park Development	4,6,7	Far West	$5,637,472
Levi Strauss Park Improvements Design	6	West	$667,494
Natural Area Park Development (2 Sites)	6	Far West	$2,716,412
Neighborhood Park Development	4,6,7	Far West	$3,680,435
New Territories Recreation Complex Improvements	6	Far West	$435,323
Skate Parks	1,5,6,7	West	$725,537
Slick Creek Park Improvements	6	West	$2,128,800
Van De Walle Park Improvements	6	West	$235,422
TOTAL COUNCIL DISTRICT 6			**$35,186,651**

IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

G. Council District 7 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Community Center Development	4,6,7	Far West	$3,923,706
Garza Park Improvements	7	West	$855,471
Huebner Creek Park Development	7	Northwest	$509,266
Joe Ward Park Community Center Addition and Bath House Improvements	7	West	$1,273,164
Land Acquisition	4,6,7	Far West	$2,215,001
Land Acquisition	7,8	Northwest	$2,215,001
Land Acquisition	5,6,7	West	$3,824,282
Large Urban Park	4,6,7	Far West	$5,637,472
Leon Vista Park Development	7	Northwest	$1,592,718
Monterrey Park Skate Facility Improvements	7	West	$804,558
Monticello Park Landscape Improvements	7	West	$125,000
Nani Falcone Park Skate Facility and Park Improvements	7	Far West	$725,537
Neighborhood Park Development	4,6,7	Far West	$3,680,435
Neighborhood Park Development	7,8	Northwest	$3,559,520
Seeling Park Lighting Improvements	7	West	$208,749
Skate Parks	1,5,6,7	West	$725,537
Sunset Hills Park and Pool Facility Improvements	7	West	$470,845
Swimming Facility Rehabilitation (4 Pools)	5,7	West	$1,596,182
Woodlawn Lake Park Improvements	7	West	$2,683,200
TOTAL COUNCIL DISTRICT 7			**$36,625,644**

IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

H. Council District 8 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Bamberger Nature Park Improvements	8	Northwest	$617,909
Cedar Creek Golf Course Improvements	8	Northwest	$625,000
Community Center Development	8,9	Far North	$5,250,086
Crownridge Park Improvements	8	Northwest	$750,000
Eisenhower Park Improvements	8	Far North	$2,902,149
Fox Park Community Center	8	Northwest	$3,354,000
Fox Park Development	8	Northwest	$1,255,698
Friedrich Park Improvements	8	Northwest	$1,220,910
Hausman Road Park Development	8	Northwest	$1,056,382
Land Acquisition	7,8	Northwest	$2,215,001
Land Acquisition	8,9	Far North	$2,215,001
Natural Area Park Development	8	Northwest	$1,305,987
Natural Area Park Development	8,9	Far North	$976,685
Neighborhood Park Development	7,8	Northwest	$3,559,520
Neighborhood Park Development	8,9	Far North	$4,284,052
Oxbow Neighborhood Park Development	8	Northwest	$377,279
Quarry Park Land Development	8	Far North	$4,220,564
Rancho Diana Natural Area Development	8	Northwest	$4,749,392
Springtime Park Land Acquisition and Development	8	Northwest	$660,816
TOTAL COUNCIL DISTRICT 8			**$41,596,431**

IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

I. Council District 9 System Plan Proposed Projects

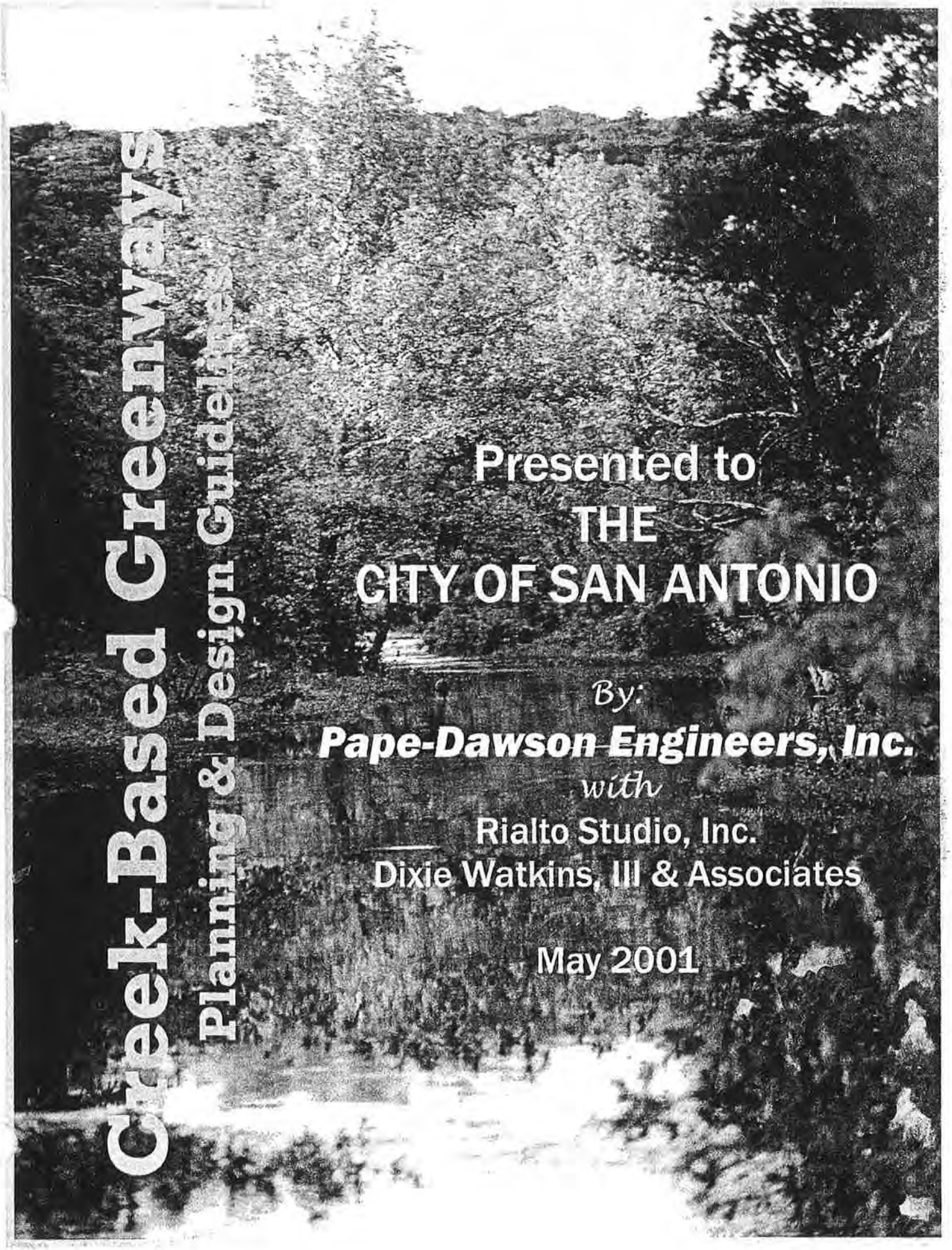
PROJECT	CC#	SUBAREA	AMOUNT
Brackenridge Park Japanese Tea Gardens Rehabilitation	9	North	$2,640,956
Brackenridge Park Rehabilitation	9	North	$6,902,149
Brackenridge Park Sports Facility Improvements	9	North	$837,158
Brackenridge Park Sunken Gardens Theater Improvements	9	North	$3,138,964
Brackenridge Park Urrutia Property Rehabilitation	9	North	$2,077,296
Community Center Development	1,2,9,10	North	$3,047,257
Community Center Development	8,9	Far North	$5,250,086
Community Center Development	9,10	Northeast	$5,250,086
Land Acquisition	8,9	Far North	$2,215,001
Land Acquisition	9,10	Northeast	$2,215,001
Land Acquisition	1,2,9,10	North	$1,714,189
McAllister Park Improvements	9	Northeast	$3,627,686
Natural Area Park Development	8,9	Far North	$976,685
Natural Area Park Development	9,10	Northeast	$1,255,738
Neighborhood Park Development	8,9	Far North	$4,284,052
Neighborhood Park Development	9,10	Northeast	$3,680,435
Panther Springs Park Land Acquisition and Development	9	Far North	$2,498,716
San Antonio Botanical Gardens Improvements	9	North	$2,180,898
San Antonio Garden Center Structural Repairs	9	North	$349,200
Stone Oak Park Improvements	9	Far North	$1,765,454
TOTAL COUNCIL DISTRICT 9			**$55,907,007**

IX.E. PROPOSED PROJECTS 2006-2016

Note: The following list of projects is collated from each Subarea list of projects. The costs listed include design fees, construction costs, due diligence, land acquisition, environmental, archaeological, and other necessary and required costs.

J. Council District 10 System Plan Proposed Projects

PROJECT	CC#	SUBAREA	AMOUNT
Comanche Lookout Park Improvements	10	Northeast	$816,131
Community Center Development	9,10	Northeast	$5,250,086
Community Center Development	1,2,9,10	North	$3,047,257
Lady Bird Johnson Park Alva Jo Fisher Softball Complex Rehabilitation	10	Northeast	$1,292,512
Lady Bird Johnson Park Improvements	10	Northeast	$2,390,613
Land Acquisition	9,10	Northeast	$2,215,001
Land Acquisition	1,2,9,10	North	$1,714,189
Large Urban Park Development	10	Northeast	$7,825,792
McClain Park Development	10	Northeast	$937,500
Mud Creek Park Development	10	Northeast	$1,562,500
Natural Area Park Development	9	Northeast	$5,000,000
Natural Area Park Development	9,10	Northeast	$1,255,738
Neighborhood Park Development	9,10	Northeast	$3,680,435
Northridge Park Improvements	10	North	$418,659
Oakhaven Park Trail Improvements	10	Northeast	$272,577
TOTAL COUNCIL DISTRICT 10			**$37,678,990**


Creek-Based Greenways
Planning & Design Guidelines
Presented to
THE
CITY OF SAN ANTONIO
By:
Pape-Dawson Engineers, Inc.
with
Rialto Studio, Inc.
Dixie Watkins, III & Associates
May 2001

PLANNING AND DESIGN GUIDELINES FOR CREEK-BASED GREENWAYS

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Major Watersheds of Bexar County
Potential Creek-based Greenways

I. EXECUTIVE SUMMARY

PLANNING AND DESIGN GUIDELINES FOR CREEK-BASED GREENWAYS

I. EXECUTIVE SUMMARY

A creek-based greenway is defined as a linear open space established along a natural or manmade creek, or other drainage way, that is put to appropriate recreational use. A strategic goal of the City of San Antonio Parks and Recreation Department is to construct a network of creek-based greenways throughout Bexar County. By utilizing a combination of creek-based greenways and as many other open space opportunities as possible, linkages between communities, parks, and other various facilities will be created. A greenway network will provide a fundamental framework for improving and enhancing the quality of life for everyone in the region. Recognizing that storm water management is the primary function of the creeks and drainage ways in San Antonio, it is the intent of this project that greenway design and implementation complement regional and local storm water management, to their mutual benefit.

In order to provide a common strategy and to promote consistency in the development of creek-based greenways, planning and design guidelines are required. In developing the guidelines, the Design Team identified a set of goals for the project:

- Complement regional and local storm water management
- Promote a multi-objective approach to project design and implementation
- Provide a baseline for design and development of all creek-based greenways
- Enhance the appearance and function of San Antonio's greenways
- Conserve and respect natural processes and resources

An integral part of the project is its multi-objective focus, so that – ultimately - greenway development pairs the wisest use of resources with benefits to the most people. The major components of the multi-objective approach are:

- Facilitating better storm water management
- Providing new and varied recreational opportunities
- Maintaining and enhancing water quality
- Protecting aquifer recharge and sensitive karst components
- Facilitating neighborhood revitalization and inner-city development
- Conserving and interpreting cultural resources
- Protecting natural resources and habitat
- Restoring and rejuvenating existing drainage channels
- Providing opportunities for outdoor education
- Providing alternative transportation corridors
- Developing stronger community pride
- Lowering crime rates in greenway corridors
- Providing economic development opportunities

The project document is comprised of two main sections. The first section guides understanding of creek-based greenways and provides a planning approach and methodology. The second is a guide for design, including criteria for physical development of greenways.

Implementation of creek-based greenways will require active participation from the community and close coordination and cooperation between the City's Parks and Recreation Department, Public Works Department, Planning Department, and other key players. This document is an official component of the San Antonio Parks and Recreation System Plan (1999).

II. PLANNING

II. PLANNING

Planning for a creek-based greenway involves an evaluation of the characteristics and assets of the creek and the enhancements that can be made and are desired by the community. Storm water management is the primary function of creeks and drainage ways in San Antonio. Every other use of these facilities, including greenways, is secondary to the primary function of storm water management. Consequently, the planning process must also consider safety of users as it relates to flash flooding along trail segments. Assets of a particular stretch of creek or a network of creeks and drainages may be existing ones, past assets that have been lost through development or environmental impact, or potential assets that have not yet been realized. All pertinent components that may affect the planning and design - positively or negatively - need to be considered early in the process.

Along with the primary physical analysis, each greenway segment must also be evaluated with respect to applicable local plans and policies. There are numerous planning efforts that have taken place in San Antonio that may impact planning of a creek-based greenway. Major guidance can be found in:

- Adopted Neighborhood Plans of San Antonio
- San Antonio Master Plan Policies
- San Antonio Parks and Recreation System Plan
- Open Space Plan
- Water Quality Ordinance
- Regional Storm Water Master Plans
- Unified Development Code

In addition, there are other regional, state, and national policies, laws and requirements that may apply. For instance, the planning level might involve habitat analysis for compliance with the Endangered Species Act. The design will require compliance with the Americans with Disabilities Act. In addition, any work planned within the 100-year floodplain must receive a floodplain permit from Storm Water Utility and submit documentation as required by the EPA in accordance with the Storm Water Compliance for Construction Activity Ordinance. Design must be in compliance with floodplain management policies and consider hydraulic and hydrological impacts. The consultant should reference the City's floodplain ordinances for guidance. This section attempts to present the major requirements for planning a creek-based greenway. Of course, each project may have its own additional unique characteristics to be considered.

A. REGIONAL CONTEXT AND CHARACTERISTICS

Understanding Creek Systems

Each creek-based greenway to be evaluated can be generally described as belonging to one or more of three natural regions that make up Bexar County. For many of the region's creeks, that description can vary even within a particular segment. In greenway planning these described segments are defined between both natural and man-made nodes.

Creek systems are generalized as beginning at their headwater origins. These can be a single spring in the head of a box canyon, or where the intermittent stream designation is first shown on a U.S.G.S. map. The second node, heading downstream, is simply to the next tributary's confluence point. In terms of both watershed and greenway planning, it is convenient to identify these segments. But, in an urban and developing watershed, man-made features and in-channel impacts can also be used as nodes. These can be road crossings, dams, lakes or the beginning of improved channels. The first step in the planning process is to identify a segment or segments of creek that define the project.

In addition to the longitudinal dynamics, the width of the creek system is also important. The most critical foundation for creek-based greenway planning is a working knowledge of stream channel and floodplain dynamics. Whether in conservation or restoration projects, understanding the various ecological niches, landform, and adjacent terrain, is fundamental in defining the boundaries for a creek-based greenway. Even within relatively short creek segments there may be several types of erosional and depositional zones, vegetation, and unique geologic features.

Perhaps the most important definitions to know in understanding creek systems are the floodplain and channel.

- *The floodplain is the total area inundated (covered) by water for a given size storm.*
- *The channel is the area which carries the majority of the water during the same storm.*

Source: Dixie Watkins, III & Associates

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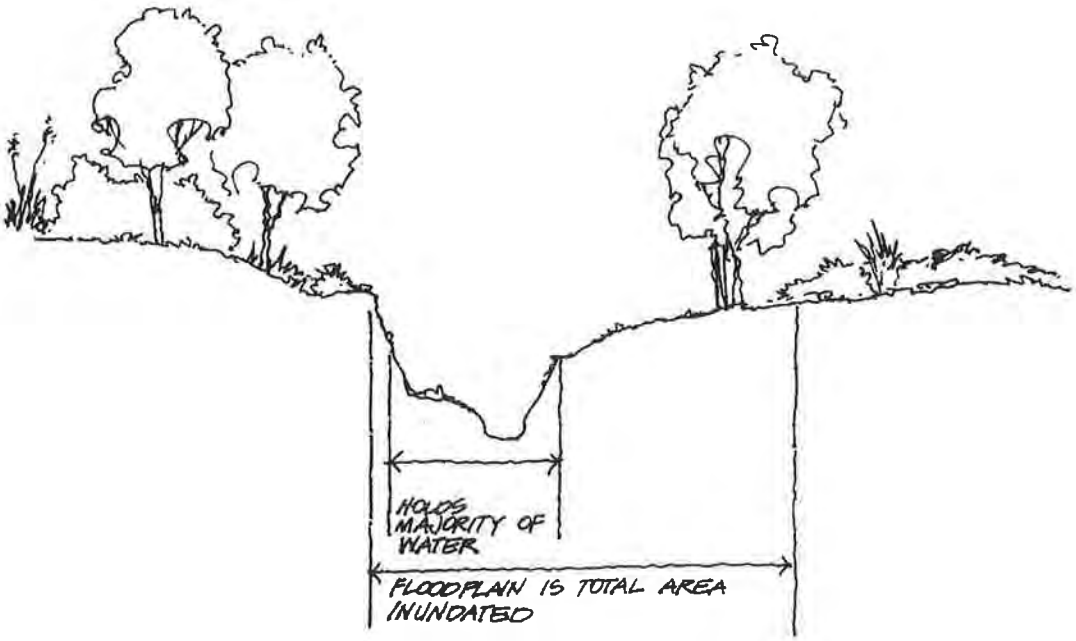
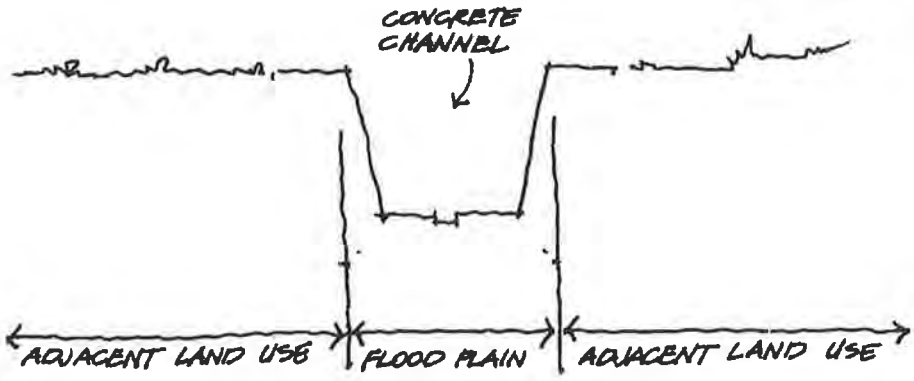




Figures 1 and 2: Channel and Floodplain Areas
Source: Pape-Dawson Engineers, Inc.

The Creek Channel

- Unvegetated Streambed
- Man-made Concrete or Earthen Channel
- Eroded Lower Banks
- Adjacent Vegetated Banks
- Adjacent Bluffs, Ledges and Cliffs
- Hardened Unvegetative Bottom
- Well-established Vegetative Channel Bottom
- Highest Velocities of Flood Waters

- Will include all of floodplain in urban engineered channel
- May contain only the channel or less in a natural system
- Contains most small frequency rain events

The Creekside Zone

- Just outside the channel
- Riparian and/or Vegetated Edges
- Vegetated Terraces
- Adjacent Landforms (Erosional and Depositional)
- Adjacent Public or Private Development, Streets, Utility Corridors, etc.
- Slower Velocities of Flood Waters due to Irregular Topography and Vegetation
- Storm Drainage Structures and Outlets from Tributaries

Middle Zone

- 100-year Floodplain
- Adjacent Landforms and Development
- Contiguous Wetlands
- Contiguous Storm Water Detention Areas (both natural and man-made)
- Significant Habitat
- Adjacent Public or Private Development, Streets, Utility Corridors, etc.
- Slowest Velocities of Flood Waters

Outer Zone-Buffers

More natural creeks also have outer-zone buffer areas. There are significant benefits provided by even minimal buffers, including:

- An average buffer width of 100 feet protects up to 5% of watershed area from future development.
- Reduce small drainage problems and complaints. When properties are located too close to a stream, residents are likely to experience and complain about backyard flooding, standing water, and bank erosion. A buffer greatly reduces complaints.
- Stream "right-of-way" allows for lateral movement of the stream. Most stream channels naturally shift or widen over time; a buffer protects both the stream and nearby properties.
- Effective flood control. Other, expensive flood controls may not be necessary if the buffer includes the 100-year floodplain.
- Protection from streambank erosion. Tree roots consolidate the soils of floodplain and stream banks, reducing the potential for severe bank erosion. Buffer zones with significant trees will reduce streambank erosion.
- Increase property values. Homebuyers perceive buffers as attractive amenities to the community.

- Increase pollutant removal. Buffers can provide effective filtering of storm water runoff from development located adjacent to the buffer boundary.
- Provide food and habitat for wildlife. Leaf litter is the base food source for many stream ecosystems; forests also provide woody debris that creates cover and habitat structure for aquatic insects and fish.
- Mitigate stream warming. Shading by the tree canopy in a buffer prevents further stream warming in urban watersheds.
- Protect associated wetlands. A wide stream buffer can include wetlands that are frequently found along the stream corridor.
- Preserve important habitat. Riparian corridors are important transition zones, rich in species. A mile of stream buffer can provide 25-40 acres of habitat area.
- Provide corridors for habitat conservation. Unbroken stream buffers provide corridors for migration of plant and animal populations.
- Provide essential habitat for amphibians. Amphibians require both aquatic and terrestrial habitats and are dependent on riparian environments to complete their life cycle.
- Discourage excessive storm drain enclosures/channel hardening. Can protect headwater streams from extensive modification.
- Provide space for storm water ponds. When properly placed, structural best management practices within the buffer can be an ideal location for Best Management Practices that remove pollutants and control flows from urban areas.
- Allowance for future restoration. Even a modest buffer provides space and access for future stream restoration, bank stabilization, or reforestation.

Natural-Physiographic Context

Bexar County may generally be divided into three geologic regions.

Edwards Plateau – Balcones Canyonlands
Creeks and floodplains of the north and northwestern portions of Bexar County are characterized as mostly perennial streams, which flow only after rainfall events or from springs and seeps. The exposed limestone bed and banks are as critical to the Trinity and Glen Rose aquifers as to the more sensitive Edwards aquifer. Dominant streamside vegetation is composed mostly of juniper-oak-cedar elm savannah, with riparian components of sycamore, willow, rough-leafed dogwood, and mulberry. Special endemic species, which vary with slope and orientation, include black cherry, black walnut, redbud, and ash, among others.

From fairly broad gravel channels between hills, to modest canyons characterized by alternating low cliffs, this "hill country" section contains many characteristics that should be considered assets and that may affect greenway prioritization:

- Microclimates where steep facing slopes harbor unique dells of plant and animal communities.
- Caves and karst features
- Significant recharge features
- Prehistoric rock shelter sites
- Endangered species habitat

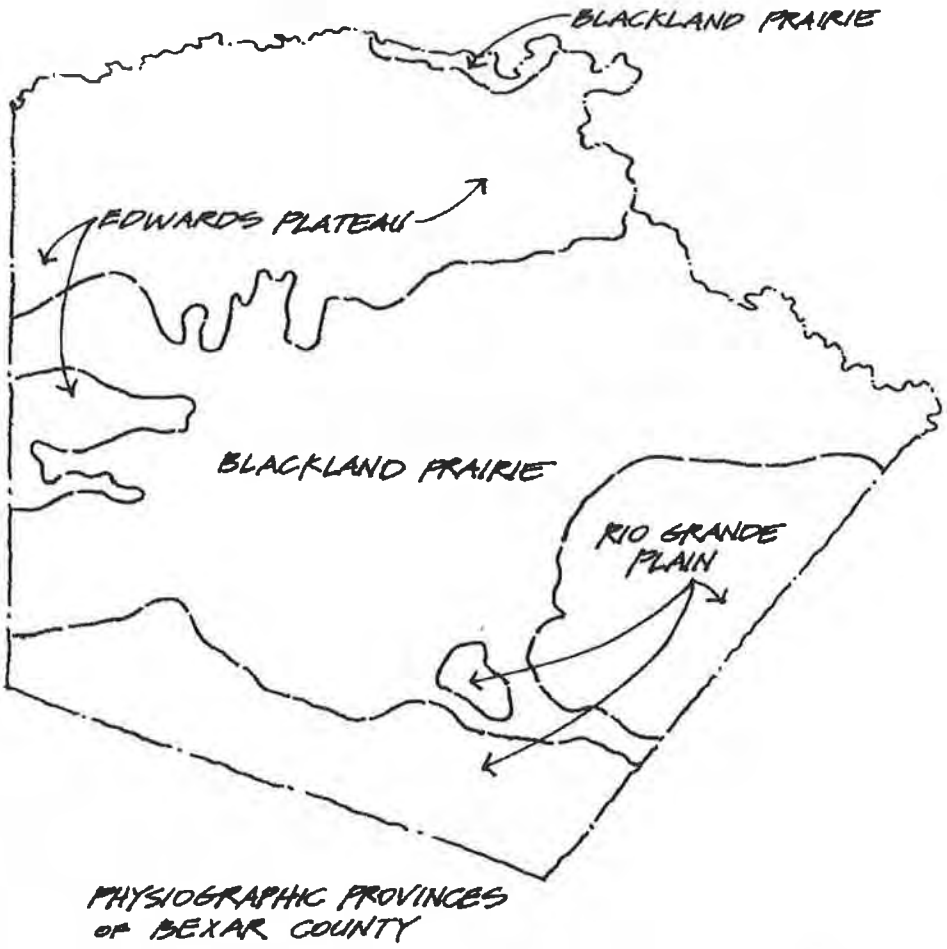


Figure 3: Physiographic Regions of Bexar County
Source: Dixie Watkins, III

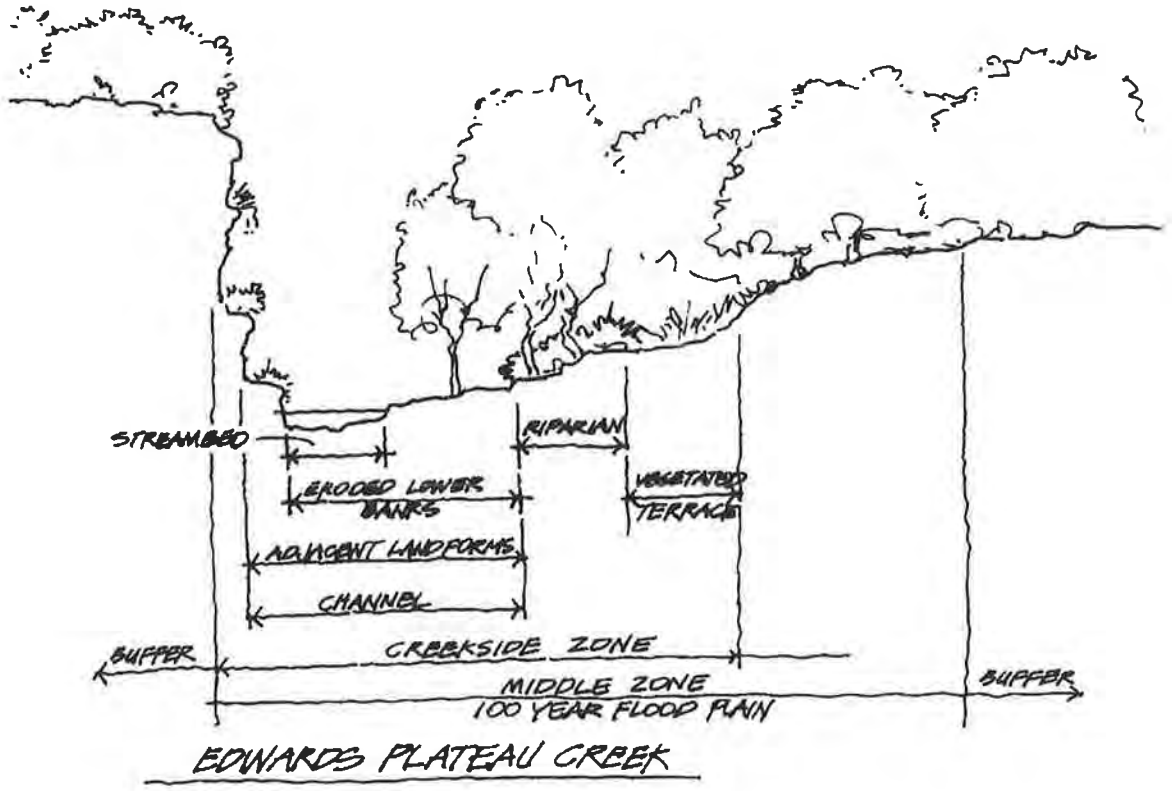


Figure 4: Edwards Plateau-Balcones Canyonlands: Typical Section
Source: Dixie Watkins, III

Blackland Prairie – Transitional

The deep, rolling topography of this area is from the thick older deposits of what was eroded out of the canyonlands and hill country. As such, the creeks of this section vary from being similar to those of the plateau, to deeply cut beds with highly erodable banks, numerous in-channel deposits, and broader floodplains. The clay and gravelly clay soils give rise to increasingly different dominant species proceeding downstream. Hill country species can still be found in these segments, but pecan, boxelder, hackberry, willow, cottonwood and cedar elm become more dominant. Flanking these corridors are remnant prairie grasslands.

The primary assets of this region are:

- Historic trails and roads
- Battlefields
- Culturally significant sites
- Endemic and unique plant communities

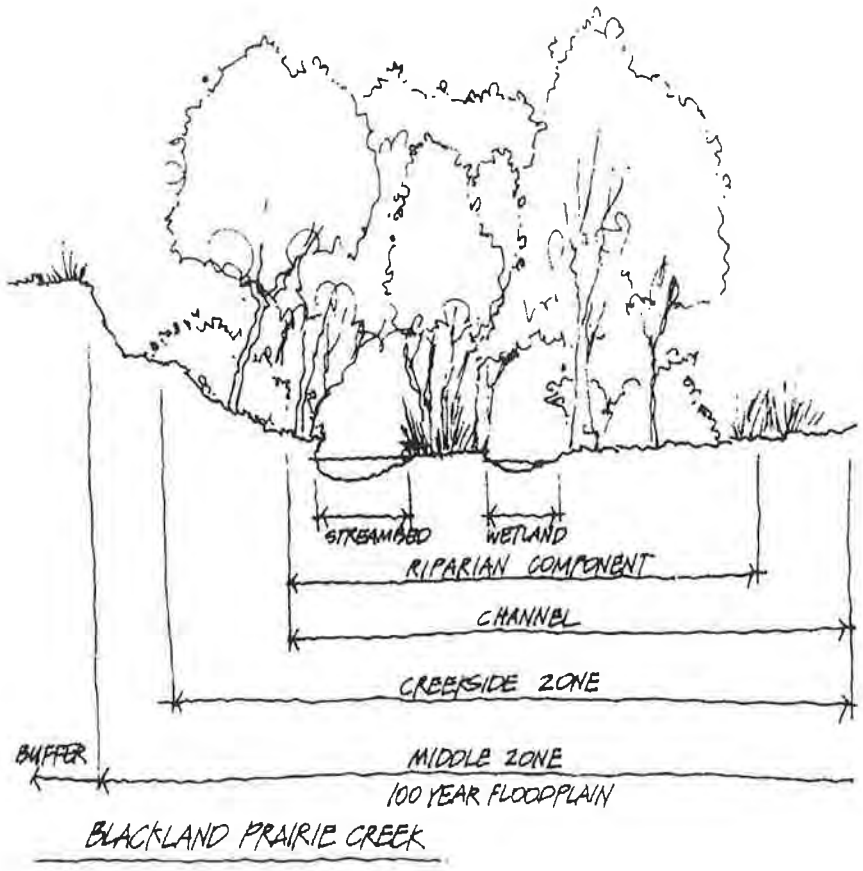


Figure 5: Blackland Prairie-Transitional: Typical Section
Source: Dixie Watkins, III

Rio Grande – Coastal Plain

The southwestern and southern parts of Bexar County contain a mix of sandy and mixed clay soils that vary significantly and are derived from younger geologic deposits. The riparian components in these segments contain most of what is common in the Blackland Prairie province along with more mulberry and willow species and some bald cypress. Adjacent regimes vary significantly, from South Texas scrub, to Post Oak-Hickory belts, to Live Oak motts with remnant short grasses. The primary assets of this region are generally the same as those of the Blackland Prairie.

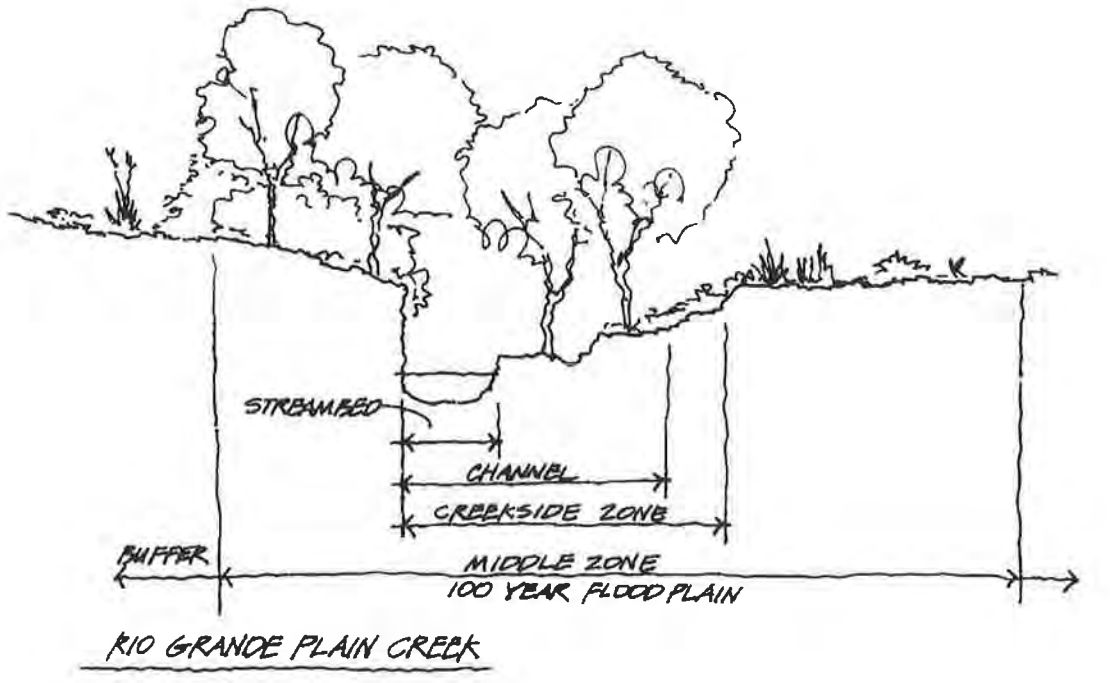


Figure 6: Rio Grande Coastal Plain: Typical Section
Source: Dixie Watkins, III

Development Context

Stream channel and floodplain dynamics vary significantly, in both the natural context and the degree of development in the project area. The type of land use, intensity of development, amount of impervious surfaces, and adjacent topography within each catchment area and subwatershed greatly affect the energies and impacts on each segment. Planning a creek-based greenway requires that the development context of the creek in the project area be identified. More than one context may apply.

The degree of ecological impact on streams in San Antonio worsens generally from the northwest portion of Bexar County towards the developing edges into the urban core. However, many of the creeks, by virtue of their broad floodplains and vegetated banks, show a marked healing as they pass on further to the south and east. In broad terms of both planning and ecological variables, these generalized creek settings, and their level of management plans, are shown in Table 1.

Development Context	Channel	Floodplain Character	Greenway Management Goal
Urban	Concrete & man-made earthen channels	Highly impacted to denuded	Enhancement/ Reconstruction
Suburban	Man-made earthen channels, concrete channels & natural streams	Patchwork to highly-impacted	Restoration/ Reconstruction/ Conservation
Rural	Semi-natural streams	Moderately impacted	Conservation/ Preservation
Undeveloped	Natural	Natural	Preservation

Table 1: Development Context
Source: Dixie Watkins, III

Urban

The existing urban context should not preclude the development and continuation of creek-based greenways. The goal of planning and design in these areas will be to restore natural and cultural resources which have been diminished through development. The greatest challenge will be to incorporate existing streets and drainage structures and the built environment into the greenway design. In a highly urbanized setting where the creek is channelized and fronted on both sides by development, the creek-based greenway trail system will have to leave the creek alignment and follow local streets, utility easements, abandoned railroad right-of-way, and other open spaces, in order to provide continuity.

Park development should build upon and not have a negative impact on the existing drainage system, which in an urban setting will likely be engineered. The urbanization of waterways results in two primary physical characteristics: increased impervious cover and channelization of natural streams. Impervious surfaces such as rooftops, and pavements accelerate the runoff of rain water which increases velocities and causes erosion and sediment transport to the receiving streams. Paved surfaces and rooftops also absorb more heat than landscape and natural areas and can therefore raise the temperature of storm water runoff. Increased temperatures in the receiving streams will affect the biota in the stream. If possible, greenway projects should include returning some impervious areas back into landscaped natural ground. For example, a large parking lot adjacent to a drainageway could be retrofitted with a landscape buffer.

Whereas natural streams have varying widths, depths, and textures, engineered channels are uniformly dimensioned and smooth. This results in a constant and generally faster velocity of storm water in the channel which precludes pockets of aquatic plants and

animals. The tradeoff between man-made and natural streams is that while man-made streams do not support plants and wildlife, they convey floodwaters through an area without impacting the areas outside the channel. Natural streams will spread floodwaters out over a larger area. This allows for storage of the flood, slows the velocities of the floodwaters but impacts sometimes large areas. When planning a greenway project in an urban setting, one must weigh the impacts (pros and cons) of natural and man-made streams in the project area.

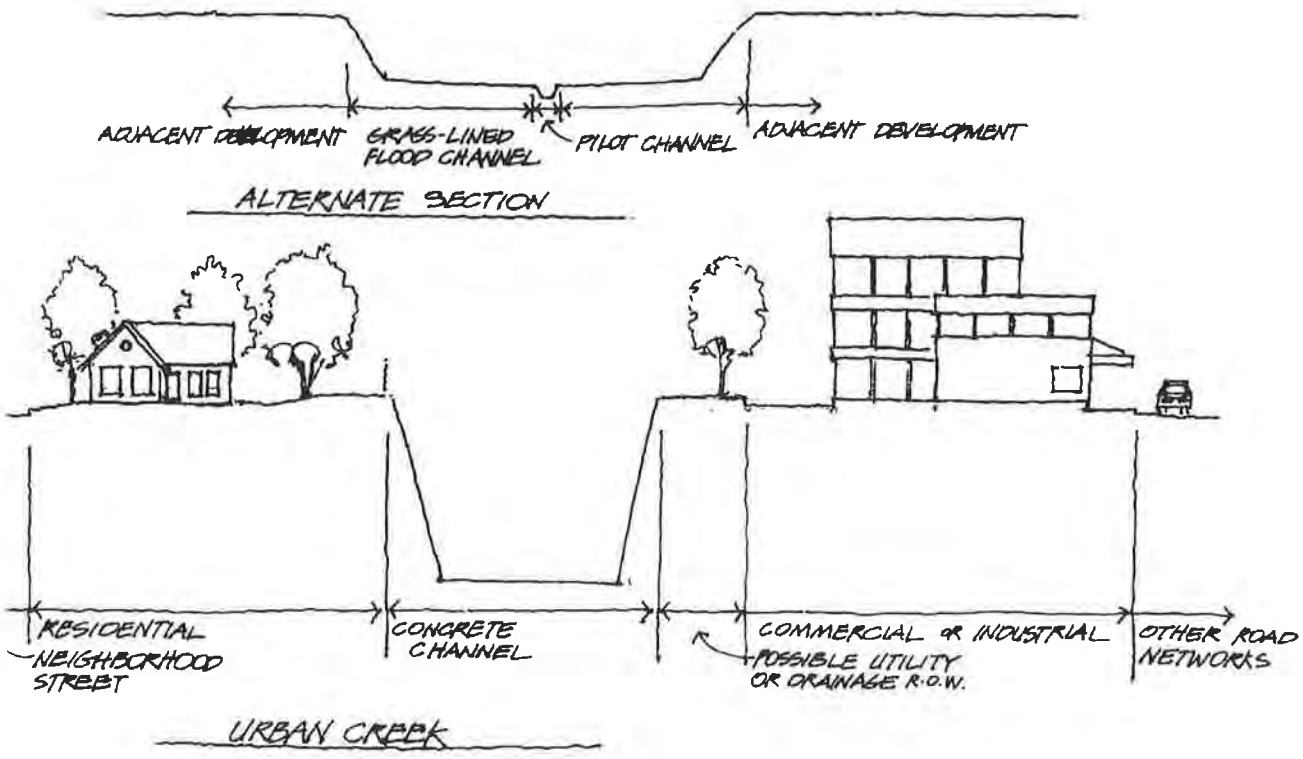


Figure 7: Urban Creeks
Source: Pape-Dawson Engineers, Inc.

The urban setting may pose the following planning and design challenges:

- Dense development adjacent to existing and channelized drainage ways.
- Lack of existing vegetation to screen and enhance a greenway and lack of space to re-establish such vegetation.
- Small and large drainage structures crossing the greenway must be incorporated.
- Greenways may need to incorporate regional storm water detention. However, the space available for regional storm water detention will be smaller in existing urban developments.
- Existing utility corridors may already occupy some of the space being planned for a greenway.

- Utility corridors may be used for trail alignments in developed urban areas.
- Scenic drives may be created with existing less-utilized streets along the edge of the floodplain.
- Lack of right-of-way.
- Existing undersized drainage facilities.

Creek Context
Source: Dixie Watkins, III & Associates

Creek Context
Source: Dixie Watkins, III & Associates

Suburban

The suburban setting is a mixture of developed and undeveloped areas. In general, the density of existing development in suburban areas is less than that of urban areas. More open space is likely available for greenways and trails in suburban areas. The goal of planning and design in these areas will focus on the preservation and enhancement of remaining natural and cultural resources. Figures 3, 4, and 5 demonstrate cross-sections of the natural setting of the three major natural creek types in San Antonio. The following considerations should be incorporated into planning and design:

- Where possible, limits of greenway right-of-way should equal the 100-year floodplain.
- Vegetation will be present, and may have to be carefully reduced to allow trail development while retaining habitat and vegetative cover.
- Preserving and maintaining wide natural floodplains and meanders in creeks will be the priority. This will reduce maintenance of engineered structures and minimize flood impacts downstream.

- Transitions between natural and man-made drainages will be important from both an aesthetic and a hydraulic design perspective.
- The opportunity for coordinating tie-ins with private developments such as residential subdivisions and golf courses will be present in the suburban setting. The public-private partnership is important in developing greenways and trails that serve future development.
- Greenways in suburban settings may come before other development and may spur opportunities for adjacent more intensive parks (i.e. ball fields.)

Creek Context
Source: Dixie Watkins, III & Associates

Rural/Undeveloped

Rural and undeveloped areas require similar planning and design objectives. In these areas, creeks are natural with some possible man-made changes due to irrigation practices for farming or water uses for ranching. The goal of planning and designing in these areas is conservation of lands which are threatened by encroaching suburban development and preservation of land which is yet unaffected by any development. Planning greenways in rural and undeveloped areas may require the following considerations:

- These projects may require special considerations for placing a narrow public park across larger tracts of private land. Right-of-way established for greenways should equal the 100-year floodplain, where feasible. Design should incorporate latest fluvial geomorphogical practices. Design should consider ultimate upstream development for adequate drainage.

- Rather than working to get as much available remaining creek areas included in the project, planning may involve limiting the project to what area is truly significant.
- Animal habitat may be significant and should be preserved. Connections to larger habitat areas should be considered.
- Trail should be segregated from farming and ranching uses.

B. PHYSICAL ORGANIZATION FOR GREENWAY PLANNING

Defining a Greenway Corridor

To begin planning a creek-based greenway, a project corridor should be defined. The definition should allow flexibility during the project development. Most communities who have embraced creek-based greenways have targeted the 100-year floodplain as their principal building block. However, in many cases in San Antonio, the floodplain is either too broad or too restrictive for defining the breadth of a greenway. Again, depending on each segment of a corridor, flexibility is the key. Overall project goals should be defined to keep the project focused. For example, a project goal could be to reduce sediment and trash that are washed into a local drainageway and render it physically unappealing. Another goal may be to link a local school to adjacent neighborhoods. Define a beginning and an end for the greenway. These points will likely serve as trailheads. Define a realistic corridor to ensure that the project can be executed successfully.

Watersheds form the key for the spatial organization and prioritization of creek-based greenways. Within the San Antonio River Basin, inside Bexar County, are twelve principal watersheds (some of which have been "split" into an "Upper" and "Lower" designation). The four primary watersheds incorporating the bulk of the developed and developing areas are Culebra Creek, Leon Creek, San Antonio River and Salado Creek. Supporting these are Cibolo Creek, Martinez Creek, Calaveras Creek, Atascosa River, Elm Creek, Medina River, Medio Creek and San Geronimo Creek. Each of these can be further broken down into smaller subwatersheds by "namesake" creeks. Lastly, detailed catchment areas, or individual drainage areas, are usually less than 50 acres in size and are usually not included at this level of planning.

Table 2 lists the principal creeks. The preparation of individual Greenway Corridor Plans should ideally be organized by subwatershed. However, convenient natural and/or man-made nodes may be more efficient and practical to divide up creek systems within the larger subwatersheds. For instance, the Panther Springs Corridor – from Camp Bullis' eastern boundary to West Avenue, above the Salado Creek Confluence in the Upper Salado Creek subwatershed – would be a logical segment for planning.

Table 2: Watersheds and Their Major Creeks in Bexar County

Watershed	Creek Corridor	USGS 7.5' Map
Calavaras Creek	Chupaderas Creek Hondo Creek Parita Creek	Elmendorf Elmendorf Elmendorf
Cibolo Creek	Clear Fork Indian Creek Meusebach Creek West Fork Cibolo Creek	Bulverde Bulverde Bulverde Bulverde
Culebra Creek	Culebra Creek Helotes Creek Huesta Creek Lee Creek Ranch Creek Reyes Creek, Los Chimenea Creek	Culebra Hill Culebra Hill Helotes Helotes Helotes Helotes Helotes
Elm Creek	Black Hill Branch Elm Creek Live Oak Creek Post Oak Creek	Macdona Terrell Wells Macdona Macdona
Lower Leon Creek	Comanche Creek Huebner Creek Indian Creek	Terrell Wells Culebra Hill Terrell Wells
Lower Salado Creek	Ackerman Creek Beitel Creek Pershing Creek Rittiman Creek Rosillo Creek Walzem Creek	Martinez Longhorn San Antonio East San Antonio East Southton San Antonio East
Lower San Antonio River	Losoya Creek Medina Creek Minita Creek Palo Blanco Creek	Losoya Losoya Southton Losoya
Martinez Creek	Woman Hollering Creek Escondido Creek Salitrillo Creek	Saint Hedwig Martinez Saint Hedwig
Medina River	East Branch Big Sous Creek Live Oak Slough Lucas Creek Polecat Creek Potranco Creek	La Coste Macdona Macdona Macdona Macdona
Medio Creek	Caracol Creek Medio Creek	Culebra Hill Terrell Wells
Upper & Lower Leon Creek	Leon Creek	Southton

Watershed	Creek Corridor	USGS 7.5' Map
Upper & Lower Salado Creek	Salado Creek	Southton
Upper Leon Creek	French Creek Pecan Creek	Culebra Hill Van Raub
Upper Salado Creek	East Elm Creek Elm Creek Elm Waterhole Creek Lewis Creek Lorence Creek Mud Creek Mustang Creek Panther Springs Creek West Elm Creek	Longhorn Longhorn Longhorn Camp Bullis Longhorn Longhorn Bulverde Longhorn Longhorn
Upper San Antonio River	Alazan Creek Apache Creek Harlandale Creek Martinez Creek Olmos Creek San Pedro Creek Six Mile Creek Zarzamora Creek	San Antonio West San Antonio West Southton San Antonio West San Antonio East San Antonio East Southton San Antonio West

Table 2: Watersheds and Their Major Creeks in Bexar County
Source: Dixie Watkins III

Multi-Objective Planning

Greenways should be evaluated from as many corollary perspectives as possible. The ability to analyze and evaluate sometimes disparate factors is critical to making balanced planning, design and management decisions. For instance, habitat conservation may be in conflict with certain recreational uses, and active storm water management techniques might conflict with habitat conservation. Yet, given the breadth and diversity of floodplains, adjacent buffers, and open spaces, these issues can usually be accommodated. It will be essential, for a greenway system design to be truly viable, that the variety of major stakeholders be equally represented as early in the planning process as possible.

Awareness and identification of concurrent development issues can aid greenway development and may assist in assigning development priorities. Greenway projects could be "tacked on" to other improvement projects. For example, a sewer outfall line is being extended up along a potential greenway concurrent with development. Since that requires an easement, which also necessitates the removal of vegetation for installation, why not take advantage of part of this alignment for a pathway? Or perhaps community development money is available for an inner-city redevelopment-drainage project; why not stipulate streamside vegetative restoration in concert with channel improvements? By

creatively and comprehensively addressing not only the "standard" greenway issues but also the broader view, many open space connections, neighborhood improvements, recreational, and interpretive opportunities can be realized concurrently. This approach can also save money by adding sometimes small greenway construction scopes of work to larger infrastructure projects. The greenway planner may refer to Parks & Recreation Department's "Creek-Based" Linear Park System Priority Map" to evaluate potential concurrent planning opportunities.

GATHERING DATA

Once the general limits of the greenway are defined, it is time to start gathering information and creating a base map. By gathering and mapping this basic data, the critical components and opportunities within the greenway project can be identified. An overlay mapping technique that puts each basic category on its own layer and then superimposes the layers can define areas where many unique resources and opportunities co-exist.

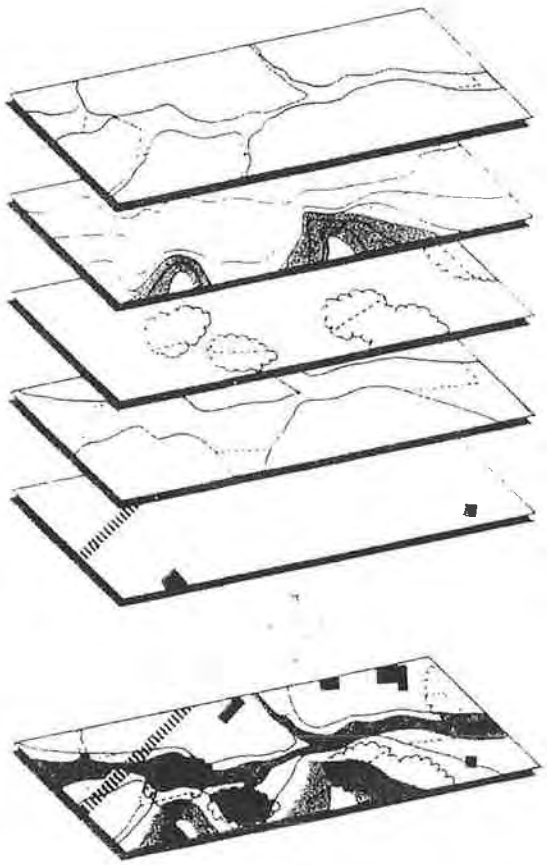


Figure 8: Overlay Mapping Technique
Source: Flink and Searns, Greenways A Guide to Planning, Design and Development, 1993.

Topography

An excellent overview of the project area can be created using topographical data. Topography is generally the slope of the land. This data can be found on U.S. Geologic Survey (USGS) quadrangle maps. Topography is very important for planning the feasibility and design for trails, storm water structures and other management devices, connections to other open spaces and urban areas, and so on.

Storm Water Management

Determine how storm water being managed (by natural or engineered means) in the project area. Perform a walk-through of the project and identify major creek features such as the width and character of the main channel, significant tributaries, problem areas where erosion or sedimentation is occurring, etc. A walk-through after a rain event could be particularly informative. Identify the channel and floodplain. Contact the City of San Antonio to discuss the project area and identify any ongoing or future drainage projects in the area.

Land Use

Identify the general land uses in the project area. The Bexar County Appraisal District maintains records and maps of each parcel of land in San Antonio. It will be critical to the project's success to identify any land acquisition or easements that will be required and to consult the landowners as soon as possible. Landowners should not find out about their properties being part of a greenway project after the project has been planned or designed. They should be made part of the process. Highlight public and institutional lands on your base map for future consideration of trail connections.

Transportation

Since one goal of creek-based greenways is to provide alternative transportation routes within the community, it is important to plot street/highway and other transportation information on the base map. San Antonio has a developing street-based bicycle network which should be related to creek-based greenway trails whenever the two are in the same area. Contact the City of San Antonio for bike lane information. It is also important to make greenway trailheads easily accessible for visitors who have to drive the trail. Finally, where greenway trails cross streets and intersections, safety measures will have to be designed into these parts of the trail. Contact the Metropolitan Planning Organization to learn about future transportation projects and modifications that could impact the greenway.

Historic and Cultural Resources

San Antonio was originally settled along its creeks, which makes these corridors rich in history and culture. Gather general information on possible historic and cultural resources which may exist and could be preserved or restored. Contact the City Historic Preservation Office, library and local universities in San Antonio for this information.

Environmental Hazards

Identify potential past or present environmental hazards that could impact the greenway. In general terms, environmental law is written such that if one encounters contaminated soil during construction of any type, that same party is responsible for properly identifying and disposing of the contamination. This can be a costly and time-consuming process. By researching the project through the City's Environmental Management Office and the local office of the Texas Natural Resource Conservation Commission (TNRCC), a great deal of environmental history can be gathered so that the greenway project can be designed to avoid potentially contaminated areas.

Vegetation and Habitat

It is important useful to plot general areas of vegetation on the project base map as well. Significant stands of trees or potential landscape buffer areas are important. Perhaps there are small pools or wetland areas that would provide scenic picnic areas or vistas while preserving fish and animal habitat. What is the general height and width of the vegetation? Are there any views that should be protected? Will there be sufficient landscape screening of the greenway facilities during winter months. At this stage of the planning process, overall areas and character of the vegetation are sufficient; a more detailed analysis should occur during design.

Community Impacts

Part of the initial data gathering should include identifying key neighborhood and community leaders and groups who will either support or oppose the greenway project. What are the current attitudes regarding greenways and open space preservation in the community? Identify benefits to the community and possible economic development opportunities.

C. CORRIDOR ANALYSIS AND EVALUATION

In order to plan a creek-based greenway, the following five major aspects of the proposed project should be investigated in detail. Below is a checklist for each item. It will be useful to develop a feasibility study that answers the questions below.

Although a particular creek section may rank high on a composite list of candidates for greenway development, the ability to focus on a different segment because of development pressure, water quality issues, or unique linkages to other open spaces should always be considered. Similarly, while prioritizing creeks and floodplains, in their natural state as much as possible, if funding mechanisms become available, highly-impacted, inner-city drainageways which could facilitate neighborhood revitalization should be included.

Storm Water Management

Regional storm water management is important and any specific project must be coordinated with the Storm Water Utility Division to ensure that storm water system needs are met. Greenways improvements can be built to accomplish the following storm water best management practices:

- Preserve floodplain areas along creeks. Wide, natural channels and banks help keep storm water velocities under control. Natural creeks fit best within the natural park setting. Clean and well-maintained engineered channels can accomplish this as well.
- Improve conveyance of storm water by selective clearing of underbrush and cleaning of debris to open the natural floodplain while maintaining its aesthetic and ecological value. Coordinate this activity with habitat preservation.
- Minimize erosion and sedimentation in creeks through the use of vegetation to hold soil in place and to filter sediments out of storm water.
- Detain storm water in low areas developed as park space along linear creek-based greenways.
- What are the channel dynamics? – both hydraulic and hydrological
- What is the impact of greenway development on the watershed?
- Is this project consistent with the Master Drainage Plan for the watershed?
- Is this creek subject to flash flooding in the creek?
- Is the planned development in compliance with the Storm Water Ordinances? What permits will be required?
- What creeks are included in the project? Are they always wet or are they intermittent creeks?
- Where is the creek in relation to the potential trail?
- What type of creek section(s) is (are) present?
- Does the City have available calculations for the 5-, 10-, 25-, and 100-year storm?
- What are the creek velocities? Can the trail practically be outside of the 100-year floodplain? Can it be outside the normal channel? Is this creek subject to flash flooding? What user safety concerns should be addressed?
- Are there existing or planned crossings that can be used for the trail such as low water crossings or bridges?
- Identify perpendicular crossings of local drainage (i.e. tributaries to the main creek). What type of designed storm water outlets connect to the creek?
- Contact Public Works for a list of drainage projects in the planning area.

- Is there a natural low area that is open space and could be used for storm water detention? Contact the City Drainage Department to discuss such opportunities.
- Is the creek routinely maintained? How can a trail be designed to accommodate maintenance?
- Does the pathway also need to serve vehicles doing creek maintenance or just pathway maintenance?
- Is this greenway in the floodplain?
- What drainage calculations will be required by Storm Water Utility Department?
- Is the floodplain contained within an easement?
- Are there any improvements located in the floodplain?

Natural Resources

- Vegetation and Habitat – What are the predominant plant and animal species within and adjacent to the creek, and how intact is the habitat?
- Topography – What are the slope characteristics of the creek's streambed and adjacent landforms and floodplain?
- Geology and Soils – What is the dominant geologic setting and what types of soils are there?
- Hydrology – Is this a "live" creek section, and does it have a significant aquatic and/or groundwater component?
- Geomorphology – What are the physical characteristics of the channel, creekside zone, floodplain area, and potential buffers?

Riparian Vegetation
Source: Dixie Watkins, III & Associates

Cultural Resources

- Archaeological Sites – Are there any known sites previously studied, and if not, what cultural material can be documented?
- Historic Structures – What types, ages, and quality of historically significant structures are present?
- Historic Sites – Are there any significant sites (battles, treaties, famous people...) related to the creek?
- Cultural Landmarks (Heritage Connections) – Are there any significant "connections" to history? (Camino Reales, Indian, scouting and/or cattle trails...)?
- Is/was there any historically significant ranching or farming in the project area?

Prehistoric Rock Shelter
Source: Dixie Watkins, III & Associates

Open Space-Recreational Opportunities

- Existing Parks and Recreational Facilities – Are any of these located on or near the creek, floodplain, or connecting drainageway?

- Public and Quasi-Public Land – Do any other open spaces which may have public use exist nearby?
- Educational Facilities – Are any public or private schools nearby?
- Nature Preserves – Is there a restricted access preserve adjacent to the corridor?
- Linkage Potential (Off-corridor Proximity) – Does this particular greenway segment have either an existing or proposed connection to other public facilities or greenways? (For example: bikeways, street-based pedestrian connections, private recreational sites, public transportation routes, etc.)
- Utility Easements and Rights of Way – Are utility runs or maintenance easements an option:
- Scenic-visual Opportunities – Are there significant views, vistas, panoramas, or unique settings worthy of incorporation?
- Abandoned and Potentially Abandoned Rail and Roadways – Are there existing or unused rights-of-way which could be used?
- What precautions need to be considered to ensure safety of users?

Land Use and Development "Environment"

- Ownership – Who owns the parcels that comprise this section?
- Zoning – What is the zoning, if within the city limits?
- Density, Proximity, and Setback (Adequate Buffer?) – How many dwelling units per acre back up to the greenway, and how close are they to any part of the creek zone?
- Storm Water Interface
- Pedestrian Access – Are there any existing trail connections?
- Vehicular Crossings (Existing and Proposed) – How many, what kind, and where are all road crossings?
- HOA or POA's (Neighborhood Plans) – Are there any approved neighborhood plans available, and how do they relate to the creek?

Example of Creek Context with Land Uses
Source: Dixie Watkins, III & Associates

Greenway Component	Creek Zone			
	Channel Only	Creekside Above Channel	Middle Abutting Creekside	Buffer Outside of Middle
Stormwater Management				
- Detention Basins	U	L	M	OK
- Recharge Protection	U	L	OK	M
- Vegetative Filters	U	M	M	L
Recreation				
- Athletic Fields and Courts	U	L	OK	M
- Trails	L	L	OK	M
- Playgrounds	L	U	OK	M
- Restrooms	U	U	OK	M
- Trash Receptacles	U	U	OK	M
- Picnic Facilities	U	L	OK	M
- Nature Study	M	M	M	M
- Educational Signage	U	L	M	M
Cultural Resources				
- Archaeological Interpretation	OK	OK	M	M
- Historic Site Interpretation	L	L	OK	M
- Community Gardens	U	L	OK	M
- Neighborhood Centers	U	U	L	M
Natural Resources				
- Vegetation Restoration	OK	OK	M	M
- Habitat Preservation	M	M	M	M
- Habitat Restoration	OK	M	M	M
- Aquatic Integrity	M	M	OK	L
- Wetland Preservation	M	M	M	M

M= Most Suitable OK=Suitable L= Least Suitable U= Unsuitable

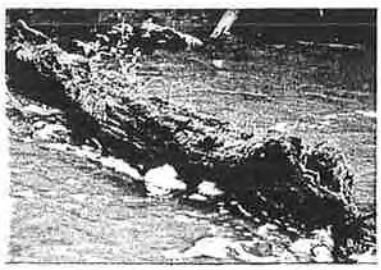
"For purposes of this Table, Channel is the area carrying most of the water; Creekside is the area adjacent to and above the channel; Middle is the area beyond the Creekside and is equivalent to the 100-year floodplain; and Buffer is the area beyond the Middle. Any improvement in the Middle or floodplain would be required to comply with Public Works Drainage requirements. Floodproofing of elements would be required in the Middle Zone."

Table 3: Matrix of Appropriate Development
Source: Dixie Watkins III and Pape-Dawson Engineers, Inc.

D. CORRIDOR RANKING AND SIGNIFICANCE

Biodiversity and Sustainability

San Antonio has long suffered from treating storm water, and therefore our creeks, as liabilities. The design criteria of getting water off of a site and into all creeks or channels as rapidly and efficiently as possible are contradictory to an ecologically sound greenway program. Even as new drainage policies and sensitivities begin to be assembled, much more still needs to be done. The impact on



Source: Dixie Watkins, III & Associates

floodplains in their natural state from development practices is significant. From the subtle, but cumulative, effect of litter and debris, to conspicuous eroded banks, stripped vegetation, and silt-clogged streams, these are neither healthy nor attractive greenways.

The further drainage policies and practices go towards emulating natural processes and conditions, the greater the net improvement of the greenway system's ecology. The conservation of vegetation and natural landforms, both within the primary channels as well as in the floodplain and its buffers, will do the most in terms of furthering biodiversity and sustainability. The further up the drainageways and watersheds the most fundamental of all best management practices is extended, the greater the overall health of each creek.

Connectivity, Node to Node

Using both natural and designed connections of integral landscapes will also greatly offset development losses to wildlife habitat and water quality. These connections can be made along both biologically and spatially-feasible swaths. And, it has been proven across the country that these can sometimes be relatively strategic in width and length. They may be as little as a wildlife-friendly culvert under a roadway, along a ridge for an arbitrary distance, or as big as a regional nature preserve, or park. In any case, wherever connections can be forged between greenways, both the environment and the recreational potential therein is tremendously enhanced.

Connectivity
Source: Dixie Watkins, III & Associates

The full exercise of this integration is not enabled by either the public or the private sector but both. And, conversely, it is also not just the task of a parks entity, but of all city, county and state agencies working in concert. To make these desirable connections will require a broad vision. This vision is far larger than the scope of a single governmental entity. At a minimum, having requirements that allow the primary greenways to be unified from one node to the next is fundamental. The priority should be first to whole, natural floodplain components, for segments that are defined naturally (headwater to tributary, tributary to confluence, etc.). But, practicality mandates that political boundaries, urban edges, road crossings, community facilities, and so on are just as logical for making these connections.

Allowable Impacts

The extent of any recreational use of any greenway segment will always have to balance the potential benefit of the use against its potential environmental impact. Offsetting variables should therefore be planned for. For example, in a creek system which will be highly impacted by storm water increases and adjacent development densities, greater freeboard for both storm water and human use can offset the degree of impact. By providing more room in the improved greenway for storm water and recreation, through breadth, depth and buffer, both downstream and lateral impacts are lessened.

Also, in the areas of high composite values such as recharge features in the floodplain, adjacent caves, archaeological sites, or endangered species, habitat, provide the basis for planning alternative alignments for recreational uses such as pathways and related activities.

E. POTENTIAL CREEK-BASED GREENWAY CORRIDORS

Included with this document is an overall plan that delineates potential corridors for creek-based greenways in San Antonio and Bexar County. This plan shows locations of major streets and primary creeks in addition to flood zones and existing park facilities. Any potential greenway project should relate to the overall greenway system so that the system is ultimately inter-connected, continuous, and regional.

F. FUNDING GREENWAYS

Along with the basic planning and concept development and preparation of preliminary maps and drawings, funding sources are an integral component of the planning process. Often, applications for funding will require a defined scope and general mapping of the proposed project. Appendix E is a list of federal funding sources for greenway projects. Some local sources of funding include the following:

- Local bond issues
- Federal Emergency Management Agency (FEMA) floodplain property acquisition
- Community Development Block Grants
- Property owner and homeowner associations
- City Council funding
- Transportation Equity Act of the 21st Century (Texas Department of Transportation)
- Local grants and foundation funding

III. DESIGN OF CREEK-BASED GREENWAYS

III. DESIGN OF CREEK-BASED GREENWAYS

A. RECREATION OPPORTUNITY IN CREEK-BASED GREENWAYS

Creek-based greenways offer twin opportunities for park development. One, they provide valuable open space, and two, they offer the opportunity for recreational development that takes people from place to place. The feature common to this type of use is a trail. Trails may allow more active and intensive recreation than site-specific parks, and a variety of circulation-based recreation opportunities is possible. Creek-based greenways can also be used for non-recreational purposes, by people who are traveling to work or school, for example. Because most greenway trails can accommodate a mix of user types and activities, careful design and attention to potential conflicts is necessary.

Source: Dixie Watkins, III & Associates

Walking, Jogging/Running, and Wheelchair Rolling

Trail Example
Source: Dixie Watkins, III & Associates

These activities can be recreational or functional and require little support equipment. These activities are appropriate in every instance of trails in greenways. The basic design criterion is the pedestrian scale. Primary considerations for providing for these activities include: pathway surface; pathway gradient; pathway width; sight lines; and amenities. Other considerations include variety of sensory stimuli and environmental ambience.

Street Bicycles

Sometimes referred to as "touring" bicycles, they are restricted by their design to use on improved surfaces. A greenway trail must provide a relatively smooth and continuous hard surface to accommodate these types of bicycles. They are appropriate only in greenways that offer improved trails; neighborhood streets may also be a part of a greenway network in urban areas. Primary design considerations include: pathway width, surface and construction; bicycle speed; sight and stopping distances; curve radii; intersection designs; and safety from hazards.

Mountain and Hybrid Bicycles.

These bicycles allow the rider more flexibility in choice of route. Both may be operated on a variety of surfaces, although only the mountain bike is a true all-terrain vehicle. They share primary design considerations with touring bicycles, although accommodation of these types of bikes in a greenway is a bigger challenge because their use is not restricted to the trail proper.

Skates, In-Line Skates, Skateboards.

As with the touring bicycle, these activities are appropriate only in greenways that feature hard pavements, and share design considerations with both pedestrian and bicycle requirements.

Horseback Riding

Equestrian use is an appropriate activity in a greenway, and special design criteria would apply. Special support facilities, such as stables, trailer parking, corrals, and staging areas, need to be provided. Trail surface material must be compatible with horse traffic, concrete for example is inappropriate. Waste control and disposal is a special maintenance consideration. The dimensional control of a horse trail, especially in the vertical dimension, is critical. Overhead clearance required for a horseback rider is greater than for a pedestrian or bicycle rider.

Horse Trail
Source: Dixie Watkins, III & Associates

Combining horseback riding with other uses on a shared use bicycle trail is not recommended due to the potential for animal/bicycle conflict. Other uses may also pose conflicts and this should be carefully studied, and adequate space for all uses should be considered. As site conditions allow, providing multiple trails in order to segregate horseback riding in the same greenway is encouraged. Such multiple alternate trail alignments should be designed to be physically separated and clearly signed.

Other

Where trails intersect or terminate at nodes or destinations, there is potential for mutually-supportive facilities or activities. Sharing facilities helps extend the impact of available resources and serves a wider audience of users. Locating restrooms or drinking fountains at nodes can alleviate concerns and costs associated with placing such facilities in more remote areas along trails. Elements that require regular maintenance or that may invite vandalism are better placed where access and security may be more readily available.

Discussion of other movement-based recreation activities would have to include consideration of personal motorized vehicles. Due to concerns for safety and environmental degradation, such activities are generally not wise additions to creek-based greenways. Provision for such activities – such as dirt bikes – may be accommodated at other sites that allow for application of specific design criteria.

B. SHARED USE TRAILS

It is unreasonable to assume that any greenway trail could be restricted to a single use or user type. Moreover, combining activities and user types yields a facility that is more flexible, more cost-efficient, and a wiser use of resources. Although amenities will vary with sites and budgets, trails will be the primary design feature of any creek-based greenway, and most will share activities and user types.

Shared Use Trails
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999

A shared use trail is one that is distinct and physically separated from motorized vehicular traffic roadways. It may occur within a roadway right-of-way, a park or greenway, or within an independent right-of-way, such as a utility or railroad easement. It should be signed and marked to announce the uses that it accommodates, as well as those it does not. Shared use trails may be used by walkers, runners, bicyclists, skaters, wheelchair users, and others. Another option for providing shared use trails is to provide multiple trails in the same general location that might share common trailheads or nodes, but whose routes are physically separated. For example, this could include providing wet/dry trails, i.e. if one trail is impassable due to high water, another may be above it. Another reason might be to separate potentially conflicting uses; signage will be critical to inform users about which trail to use.

Creek Crossing
Source: Dixie Watkins, III & Associates

The trail should be designed to be closed to public operation of motorized vehicles but should accommodate maintenance and emergency vehicles. Curbing alone will not prevent unauthorized vehicular access. Barriers should be designed to protect the trail from unauthorized use by motor vehicles, yet be complementary to the overall design of the area of the trailhead. Careful coordination between types of vehicles and types of trail surfaces is important. Where some trails may be capable of supporting truck and other traffic, others – by virtue of their design – may be capable only of accommodating small cart-type vehicles. Therefore, consideration must be given to selection of trail materials and surfaces, as well as understanding the maintenance requirements so that the trail is properly accessible by the appropriate mix of users and vehicles.

Trail Example
Source: Rialto Studio, Inc.

Types of Users

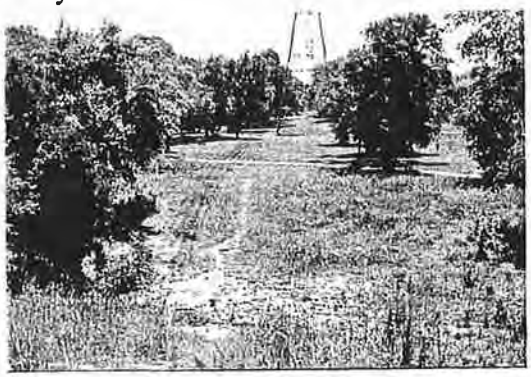
Depending upon the trail's surface and other design features, any non-motorized user may use a shared trail. In general, users are of two types: recreational and functional. A recreational user – whether a walker, runner or a bicyclist – will use the trail for recreation and pleasure. A functional user will use it as an alternative form of circulation and travel. Although user types share many design criteria in common, each also requires certain specialized attention, discussed more thoroughly below.

Route Selection

By its definition herein, the trail will be contained within the boundaries of existing creeks and other drainageways and park land; in that sense, its route is fixed. However, there is great latitude in how the trail may be configured to fit its site and how it interacts with its surroundings. The selection of trailheads, trail routes, and nodes will be guided by combinations of several criteria: pedestrian and bicycle traffic generators; scenic and recreational amenities; continuity; terrain; adequate space; and constraints.

Also of importance is design consideration where trails have to be routed onto streets. Existing constraints can include such situations as dense surrounding development or the creek being characterized solely by a narrow concrete channel. Such conditions will force the designer to seek alternate routes. Where trails have to be routed onto adjacent streets, attention must be paid to delineation of the trail route from the traffic travel zone, and provision of adequate signage and signalization at trail/traffic crossings.

Connectivity is a key criterion for route selection and trail continuity. If a trail must leave the creek-based greenway due to physical constraints, routing it onto adjacent streets is one option. The designer should analyze other options available, especially the possibility of utilizing existing utility corridors, to provide a continuous trail route. The area is laced with such corridors; due to their size, corridors of widths 75 feet and greater offer the most flexibility for shared use operations, maintenance, and security. The design and installation of a shared use trail in a utility easement should not interfere with the function or maintenance of the utility. Where creeks cross utility easements, and the trail does not have to leave the creek, it would be desirable to design trails that utilize the easement, providing multiple routes and connections.



Connectivity via Utility Easement
Source: Dixie Watkins, III & Associates

Examples of traffic generators, especially for bicycle traffic, are residential concentrations; schools; parks and recreational facilities and other community centers; employment concentrations; and commercial centers. Because bicycle trips in urban areas average 3 – 6 miles in length, generators of these types coupled with a proximal greenway system, afford the user opportunity for combining recreational and functional

uses. Linking physically distinct generators together by trails increases the likelihood of trail use.

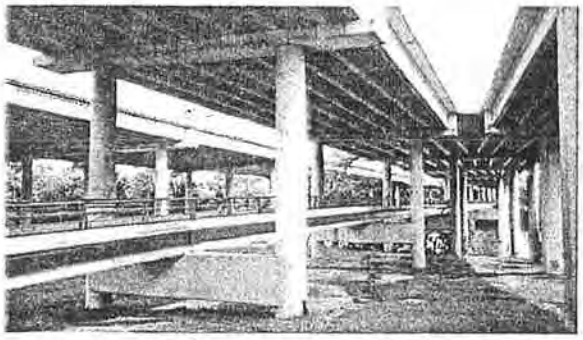
Amenities not only embellish the attractiveness of the trail, but could provide the reason for choosing to use it. It is reasonable to assume that a scenic and well-maintained trail will be utilized more often than its unattractive and unkempt counterpart.

A trail offering the user an uninterrupted journey from one destination to the next increases the likelihood of its use. A discontinuous pattern of trails is less likely to be used with frequency. For the sake of continuity, interruptions should be minimized by finding alternate routes around them. Unavoidable interruptions, like street crossings, should be designed to allow the user safe harbor and signed, safe crossing areas. Trail design should seek out and maximize the amount of trail that is physically distinct from interruptions; there is safety in fewer crossings. Trails should be continuous and avoid interruptions; however, they should also provide links and access to major roads, nodes and destinations.

Trail Examples
Source: Rialto Studio, Inc.

Terrain and site-specific conditions will help dictate the number of users and relative difficulty of travel on a trail. Too many steep grades will deter repeated use of a trail by any but the more hardy of users. Grades should be kept to 5% or less as much as possible, and application of accessibility criteria is mandatory. Circumstances dictating steeper grades should be the exception, not the rule. Route selection and mapping should ensure that grades stay within acceptable gradient/distance ratios. Similarly, trail widths should be selected and mapped so that there is adequate room for the trail and its appurtenant parts, like signage.

Design of a trail system should also consider the impact of constraints that may affect trail layout and even user safety. Physical influences may include elevated roadways, freeways and interchanges, busy streets, and other potential impediments to safe, continuous trail travel. Trails should be designed to eliminate potential negative factors like dead-ends, blind corners, or unlighted or dark areas.



Trail Coordination with Elevated Roadway
Source: Rialto Studio, Inc.

Trailheads

Trailheads will usually occur at intersections with roadways, bridges, or at confluences with other types of developments. Trailhead design should accommodate the largest number of users and will have to comply with requirements for accessibility. Where possible, trailheads should be located at logical points of intersection with vehicular roadways, combining the trailhead feature with a crossing pattern.

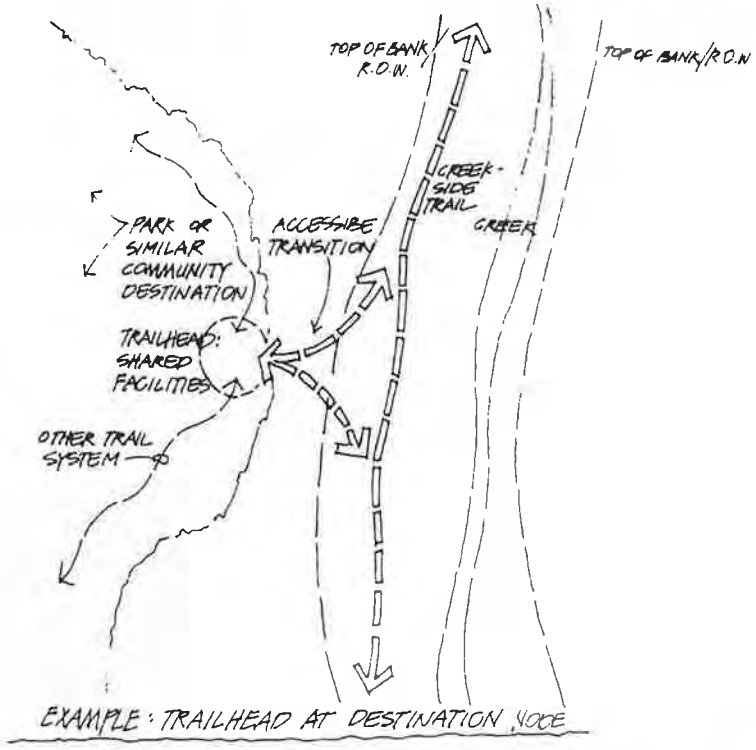


Figure 9: Example Trailhead at Destination Node
Source: Rialto Studio, Inc.

Terrain/Relation to Floodplain

In addition to terrain mapping to ensure that the trail is compatible with its site and surroundings, its relationship to water level, channel, and floodplain extents is important to consider. Where the trail is located within the creek's cross-section will determine its susceptibility to flooding and scouring by erosion. The cross-sectional shape of the channel itself may guide the placement of the trail on one side or another of the channel.

Neighborhood Proximity

Among the connections and generators a creek-based trail system can accommodate, maybe none are more important than residential centers. The trail's potential and availability as an alternative route for recreational and functional travel make it a positive improvement in residential areas. Also, neighborhoods can provide "eyes and ears" for added park and trail security.

However, consideration should be given to trail-to-neighborhood proximity issues so that residents feel secure. Select routes that do not compromise residential privacy. Where trails abut residential areas and where feasible, increased buffer areas, fences or walls, or moving of the trail to an opposite bank of a creek are options for dealing with privacy and security issues. Every effort should be made to provide a buffer between the trail and residential property.

Vegetative Buffer
Source: Rialto Studio, Inc

Where trails are adjacent to neighborhoods, design should include providing access by park rangers and emergency personnel and vehicles for added security. The trail design process shall include a public process for input from adjacent neighbors.

Connections

The following are some of the important destinations for trail users and will require consideration of trailhead design to complement the specific use. They are also themselves generators of trail traffic. Of particular importance is the potential for shared facilities, like restrooms or drinking fountains, so that the trail itself does not have to provide all such amenities.

- Parks
- Schools
- Neighborhood and Community Centers
- Commercial Development
- Public Gathering Places
- Open Spaces
- Other Trails (i.e. Street Bicycle Corridors)

Trailhead
Source: Dixie Watkins, III & Associates

Horizontal Alignment

The horizontal alignment of a trail will rely primarily on the criteria for wheeled travel, as there are specific requirements for design of pavements to accommodate bicycles. The safety of other users can be accommodated by the criteria established for bicycle use. Because bicycles must lean into turns, the relationship between angle of lean and horizontal curve radius is important. For casual or recreational use, the maximum angle of lean is generally 15 – 20 degrees. Through a series of calculations, the angle of lean is translated into curve data. The tables below offer recommended radii based upon lean angles and design speed of the trail. Because the trail also must meet accessibility requirements, a maximum of 2% superelevation is recommended on banked horizontal curves.

Design Speed (V)		Minimum Radius (R)	
km/h	(mph)	M	(ft)
20	(12)	12	(36)
30	(20)	27	(100)
40	(25)	47	(156)
50	(30)	74	(225)

Table 4: Desirable Minimum Radii for Shared Use Paths Based on 15° Lean Angle for Bicycles
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Design Speed (V)		Friction Factor (f) (paved surface)	Minimum Radius (R)	
Km/h	(mph)		m	(ft)
20	(12)	0.31	10	(30)
30	(20)	0.28	24	(90)
40	(25)	0.25	47	(155)
50	(30)	0.21	86	(260)

Table 5: Minimum Radii for Paved Shared Use Paths Based on 2% Superelevation Rates and 20° Lean Angle for Bicycles
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Where site conditions dictate smaller radii than recommended by the tables, signage and pavement markings should be installed to convey warnings about tight curves ahead. Another consideration is to widen the pavement in the curve as much as possible. Where bicycles use a two-directional shared use trail, lateral clearances should be designed based on the sum of the sight stopping distances for each bicyclist traveling in opposite directions around a curve.

Vertical Alignment and Grading

Grades on trails should be designed to allow maximum user potential and enjoyment, yet provide interest and some degree of physical challenge. For compliance with the requirements of the Americans with Disabilities Act (ADA), no trail should exceed a grade of 1:12 (vertical:horizontal). Where a grade of 1:12 is designed, level resting areas are required at regular intervals not exceeding 30 feet apart for ADA-compliant trails. For trails that are more challenging (or not ADA-compliant) the longitudinal slopes may exceed 1:12 and the distances between resting areas may be greater than 30 feet.

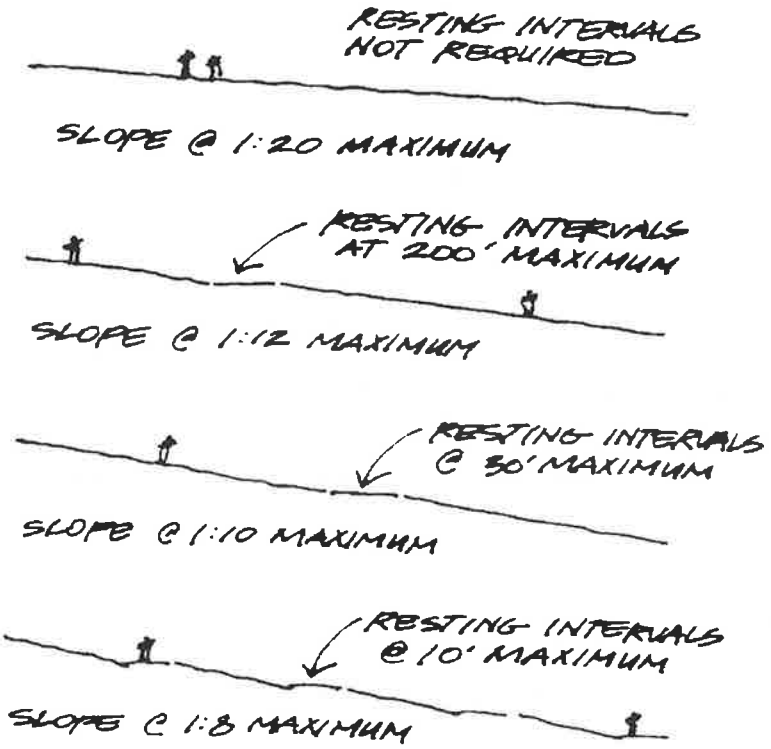


Figure 10: Typical Trail Longitudinal Sections for Non-ADA Compliant Pedestrian Trails
Source: Adapted from American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Although site-specific terrain might dictate special solutions, generally grades should be held to no more than 5%. This will accommodate accessibility requirements as well as provide safe tolerances for bicycle users (in fact, grades in excess of 5% can be an impediment to many recreational bicyclists.) If grades must exceed 5% in certain instances, Table 5 is a guide for implementation; it is based on bicycle requirements.

Grade Restrictions	Grade Lengths
5-6%	For up to 240 m (800 ft)
7%	For up to 120 m (400 ft)
8%	For up to 90 m (300 ft)
9%	For up to 60 m (200 ft)
10%	For up to 30 m (100 ft)
11+%	For up to 15 m (50 ft)

Table 5: Grade Restrictions and Grade Lengths for Bicycle Trails
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

If grades in excess of 5% are necessary, options for mitigating this condition include additional width of trail to allow safe dismount from a bike; signage and pavement markings to announce the steep grade; longer stopping sight distances; longer horizontal clearances and recovery areas; and consideration of trail switchback design to control descent speed. Design of run-off areas at the bottoms of steep grades may improve a trail's safety.

Dimensional Criteria

A shared use path primarily will accommodate both foot traffic and bicycle traffic. For shared use trails with exclusive rights-of-way, the following dimensions are encouraged. Recommended minimum width for a two-directional shared use trail is 10 feet. (If site-specific conditions dictate, 8 feet is the absolute minimum.) If a normal-to-high use is expected, it is recommended that the trail width should be 12 feet.

Minimum width of a one-directional trail is 6 feet. Caution is urged in considering this type of trail, one-directional trails will often be used regardless as two-directional trails. Careful design, attention to signage and trail markings, and enforcement of one-directional travel are some ways to direct proper use of a one-directional trail.

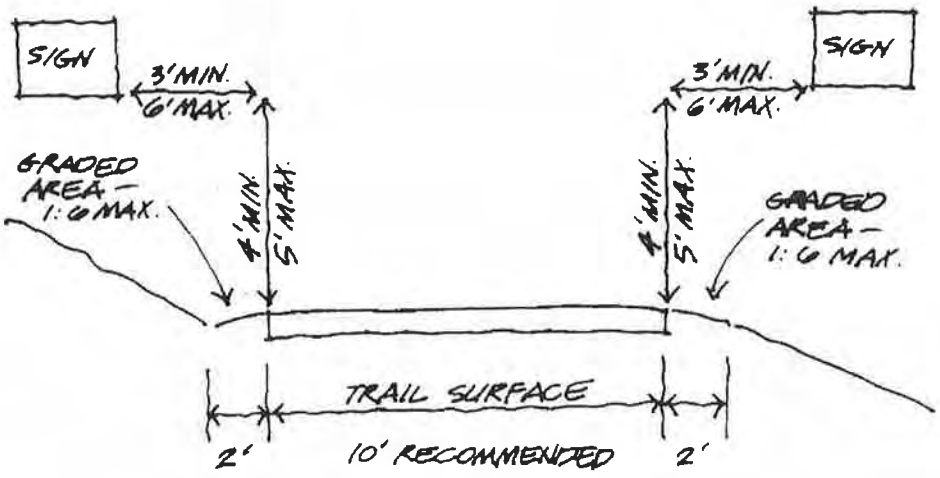


Figure 11: Cross-Section of Two-Way Shared Use Path on Separated Right-of-Way
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

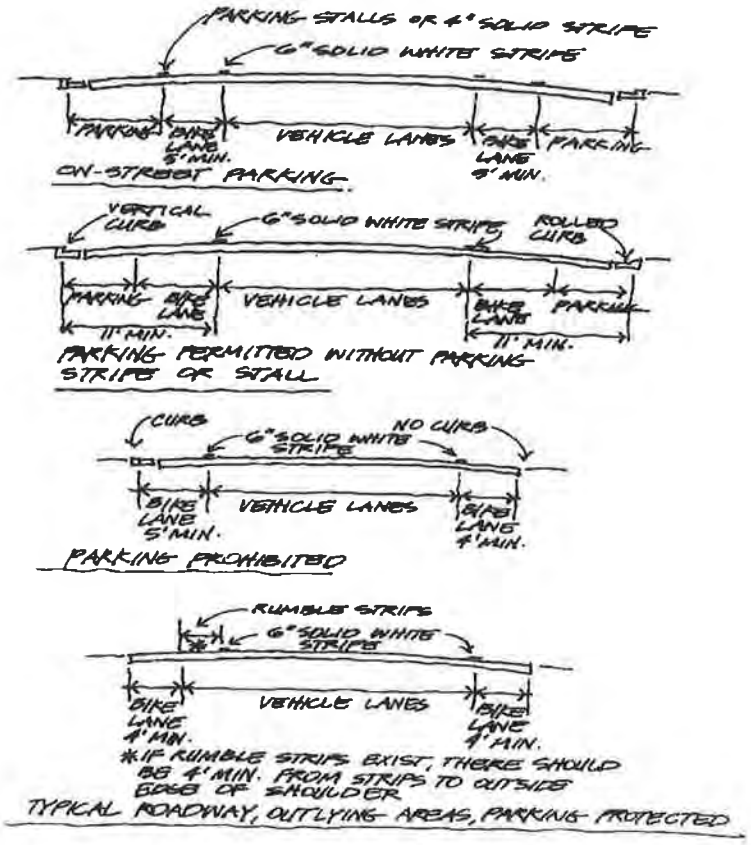
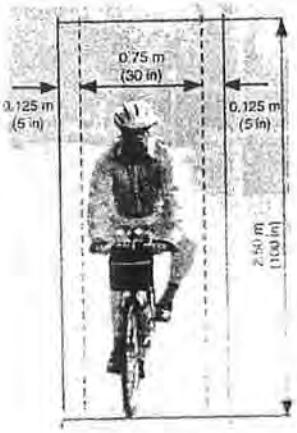


Figure 12: Typical Bike Lane Cross-Sections
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Where a trail shares a right-of-way with a road or is adjacent to a roadway, it should be clearly distinguished from the roadway, whether this is achieved by width, signage, markings, barriers, or a combination. Where this is not possible, and the roadway and trail are less than 5 feet apart, it is recommended that a barrier be placed to provide protection for trail users. The barrier should be 42 inches high, but should not be designed in such a way that it would obstruct sight distances, especially at intersections.

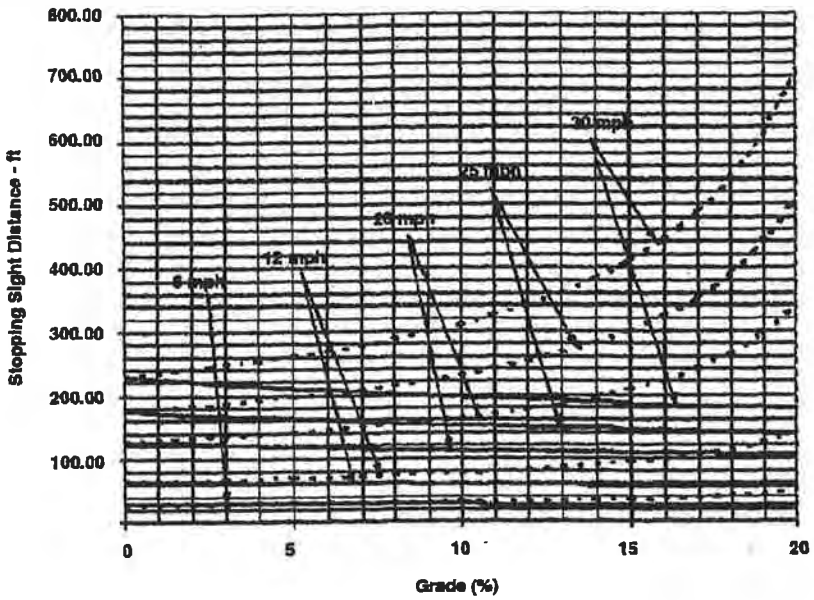
On each side of the trail, a minimum clear shoulder of 2 feet is recommended, with a maximum slope 0f 6:1. If site conditions allow, the shoulder width should be 3 feet or more to provide clearance from obstacles such as utility poles, fences, signs, and the like. If the trail is adjacent to a steep slope or waterway, a wider shoulder should be considered. In extreme instances, a barrier may be considered to provide protection, however a barrier placed within the channel must meet criteria as set out in the Unified Development Code. It must also not impede storm flows.

Vertical clearances are also important. There should be a continuous minimum clear vertical dimension over the trail of 8 feet for pedestrian and bicycle users. If service or emergency vehicular access is anticipated, this vertical clearance should be increased to accommodate the vehicle. Emergency vehicle clearance should be a minimum of 14 feet. If equestrian use of the trail is anticipated, the vertical clearance should be designed to a minimum of 12 feet to allow for horse and rider to traverse the trail comfortably and safely. Where trails cross into tunnels or undercrossings, the vertical dimension should be calculated to provide safe clearance, but in no case should it be less than 8 feet (14 feet if emergency vehicles are anticipated.)



Dimensional Criteria
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999

A shared use path should be designed using recommended criteria for stopping sight distances for bicycle users. This will allow for safe approaches to intersections or other stopping points, as well as allowing reasonable reaction time for emergency stops for situations that can be seen ahead.



Descend ------
Ascend ——

$$S = \frac{V^2}{30\,(f \pm G)} + 3.67V$$

Where: S = stopping sight distance (ft)
V = velocity (mph)
f = coefficient of friction (use 0.25)
G = grade (ft/ft) (rise/run)

Table 6: Minimum Stopping Sight Distance vs. Grades for Various Design Speeds
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

S = Stopping Sight Distance (ft)														
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300
											30	70	110	150
							20	60	100	140	180	220	260	300
					15	55	95	135	175	215	256	300	348	400
				20	60	100	140	180	222	269	320	376	436	500
			10	50	90	130	171	216	267	323	384	451	523	600
			31	71	111	152	199	252	311	376	448	526	610	700
		8	48	88	128	174	228	288	356	430	512	601	697	800
		20	60	100	141	196	256	324	400	484	576	676	784	900
		30	70	111	160	218	284	360	444	538	640	751	871	1000
		38	78	122	176	240	313	396	489	592	704	826	958	1100
	5	45	85	133	192	261	341	432	533	645	768	901	1045	1200
	11	51	92	144	208	283	320	468	578	699	832	976	1132	1300
	16	56	100	156	224	305	398	504	622	753	896	1052	1220	1400
	20	60	107	167	240	327	427	540	667	807	960	1127	1307	1500
	24	64	114	178	256	348	455	576	711	860	1024	1202	1394	1600
	27	68	121	189	272	370	484	612	756	914	1088	1277	1481	1700
	30	72	128	200	288	392	512	648	800	968	1152	1352	1568	1800
	33	76	135	211	304	414	540	684	844	1022	1216	1427	1655	1900
	35	80	142	222	320	436	569	720	889	1076	1280	1502	1742	2000
	37	84	149	233	336	457	597	756	933	1129	1344	1577	1829	2100
	39	88	156	244	352	479	626	792	978	1183	1408	1652	1916	2200
	41	92	164	256	368	501	654	828	1022	1237	1472	1728	2004	2300
3	43	96	171	267	384	523	683	864	1067	1291	1536	1803	2091	2400
4	44	100	177	278	400	544	711	900	1111	1344	1600	1878	2178	2500

Shaded area represents S = L
L = Minimum Length of Vertical Curve (ft)
A = Algebraic Grade Difference (%)
S = Stopping Sight Distance (ft)
Minimum Length of Vertical Curve = 3 ft.

Table 7: Minimum Length of Crest Vertical Curve Based on Stopping Sight Distance for Bicycles
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

R (ft)	S = Stopping Sight Distance (ft)														
	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300
25	2.0	7.6	15.9												
50	1.0	3.9	8.7	15.2	23.0	31.9	41.5								
75	0.7	2.7	5.9	10.4	16.1	22.8	30.4	38.8	47.8	57.4	67.2				
95	0.5	2.1	4.7	8.3	12.9	18.3	24.7	31.8	39.5	48.0	56.9	66.3	75.9	85.8	
125	0.4	1.6	3.6	6.3	9.9	14.1	19.1	24.7	31.0	37.9	45.4	53.3	61.7	70.6	79.7
155	0.3	1.3	2.9	5.1	8.0	11.5	15.5	20.2	25.4	31.2	37.4	44.2	51.4	59.1	67.1
175	0.3	1.1	2.6	4.6	7.1	10.2	13.8	18.0	22.6	27.8	33.5	39.6	46.1	53.1	60.5
200	0.3	1.0	2.2	4.0	6.2	8.9	12.1	15.8	19.9	24.5	29.5	34.9	40.8	47.0	53.7
225	0.2	0.9	2.0	3.5	5.5	8.0	10.8	14.1	17.8	21.9	26.4	31.3	36.5	42.2	48.2
250	0.2	0.8	1.8	3.2	5.0	7.2	9.7	12.7	16.0	19.7	23.8	28.3	33.1	38.2	43.7
275	0.2	0.7	1.6	2.9	4.5	6.5	8.9	11.6	14.6	18.0	21.7	25.8	30.2	34.9	39.9
300	0.2	0.7	1.5	2.7	4.2	6.0	8.1	10.6	13.4	16.5	19.9	23.7	27.7	32.1	36.7
350	0.1	0.6	1.3	2.3	3.6	5.1	7.0	9.1	11.5	14.2	17.1	20.4	23.9	27.6	31.7
390	0.1	0.5	1.2	2.1	3.2	4.6	6.3	8.2	10.3	12.8	15.4	18.3	21.5	24.9	28.5
500	0.1	0.4	0.9	1.6	2.5	3.6	4.9	6.4	8.1	10.0	12.1	14.3	16.8	19.5	22.3
565		0.4	0.8	1.4	2.2	3.2	4.3	5.7	7.2	8.8	10.7	12.7	14.9	17.3	19.8
600		0.3	0.8	1.3	2.1	3.0	4.1	5.3	6.7	8.3	10.1	12.0	14.0	16.3	18.7
700		0.3	0.6	1.1	1.8	2.6	3.5	4.6	5.8	7.1	8.6	10.3	12.0	14.0	16.0
800		0.3	0.6	1.0	1.6	2.2	3.1	4.0	5.1	6.2	7.6	9.0	10.5	12.2	14.0
900		0.2	0.5	0.9	1.4	2.0	2.7	3.6	4.5	5.6	6.7	8.0	9.4	10.9	12.5
1000		0.2	0.5	0.8	1.3	1.8	2.4	3.2	4.0	5.0	6.0	7.2	8.4	9.8	11.2

Table 8: Minimum Lateral Clearance for Horizontal Curves for Bicycles
Source: American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Trail Construction Materials

A variety of materials is available for the finished surface of the greenway's trail. Durable, easily maintained pavements which offer accessibility are the best all-around selection. Site-specific selection of material, however, will depend upon several factors. Type and anticipated numbers of users may dictate the material. Maintenance, and the frequency of it, will inform the choice, and the ease and cost of replacement of trail material should be factored into any decision based on maintenance. If the trail is in the channel and is susceptible to periodic flooding, the material should be selected based in part on the velocity of the flood water. Making the design of the trail, especially at trailheads, compatible with adjacent properties should be considered.

Trail Example
Source: Dixie Watkins, III & Associates

Concrete

The most permanent and durable material is concrete. It is equally suitable for foot or wheeled traffic. It also is a good surface for trails where accessibility is required. It is the most popular material, behind asphalt, for bike trail construction. It is the most expensive of trail materials and the costs of its use should be weighed against the benefits. It will probably require the least maintenance as far as replacement but may necessitate constant maintenance to keep clean of debris. Paths close to channel should be wide enough to accommodate a small sweeper to keep pathway clean of mud and debris. The surface of the concrete should be textured to provide traction and grip, especially on slopes and in wet conditions. Numerous options are available for coloring and finishing concrete for aesthetic and practical purposes (compatibility with adjacent features or glare reduction, for example) Refer to City of San Antonio Standard Specifications for Public Works Construction, current version, for City requirements that might apply to construction of concrete trails. It is recommended that concrete trails be provided in areas with velocities in excess of 6 ft/sec.

Asphalt

The most popular material for bike trails, there are certain considerations that go into its selection. Aggregate selection is important to the degree of surface texture and resistance to stripping. Local standards and practices should inform the selection of the appropriate grade of asphalt cement and aggregates that have proven to be suitable for the area. It is recommended that the designer utilize geotechnical data in support of the pavement design. Asphalt offers the designer a more natural-looking trail that is still very durable. It may require more maintenance in areas prone to heavy flooding. Paths close to channel should be wide enough to accommodate a small sweeper to keep pathway clean of mud and debris. Refer to City of San Antonio Standard Specifications for Public Works Construction, current version, for City requirements.

Cement Stabilized Base

For a trail with more durability than gravel or earth, but without the cost of concrete or asphalt, limestone base material may be placed, depth depending on the site-specific terrain and the intended use. Materials for its installation are limestone base material (refer to Item 200, Flexible Base in City of San Antonio Standard Specifications for Public Works Construction, current version), Portland cement ASTM Type 1 Normal, and potable water. After the base is placed, the cement dust is applied and watered in for a fairly durable finished surface. This material affords a still more natural look, with more frequent but fairly easy and inexpensive maintenance.

Compacted Gravel

Although in certain forms, it is accessible by bicycles, this surface is better suited to recreational foot traffic. Use only where grades are moderate (less than 5%) and where little or no vehicular activity is expected. It will require replenishment periodically, depending on the frequency of its use and the severity of its exposure to erosion-causing conditions. Different materials that support this installation include limestone base and

granite gravel. Compacted gravel material is typically composed of sharp, angular pieces of aggregate, well-graded from fine to coarse. Angular pieces are capable of being compacted together for a more cohesive surface. Round gravels will not compact and will not yield a desirable finished grade.

Stabilized Earth or Natural Ground

The most primitive of trail surfaces, it is also the least expensive application. It is more appropriate for use out of the floodplain and in generally rocky areas, suitable primarily for the Edwards Plateau region. It has a more limited application in areas with more plastic soils, such as the Blackland Prairie and Rio Grande Plains regions. Wherever it is utilized, stabilized earth should be designed to avoid steep slopes. It may need bracing with rocks or other materials to prevent washing out.

Natural ground and normally dry exposed bedrock are appropriate trail surfaces in creek areas that are normally dry, and where unimproved surfaces are dictated by location or budget.

Material	Initial Cost	Maintenance Cost	ADA	Durability	Aesthetic Quality
Lime Stabilized Compacted Dirt	Low	High	No	1-2 Years	Poor
Compacted Granite Gravel	Moderate	Moderate	Yes	3-5 Years	Good
Soil Stabilizer and Granite Gravel	High	Low	Yes	5-7 Years	Good
Asphalt	High	Low	Yes	5-7 Years	Fair
Concrete	Very High	Very Low	Yes	10-15 Years	Fair

Table 9: Paving Materials Matrix
Source: Rialto Studio, Inc.

Area	Recommended Minimum Level of Paving
Paths within 10-year Flood Area	Concrete
Paths above 10-year Flood Area	Soil Stabilizer and Granite Gravel
Bridges and Erosion Controlled Areas	Concrete
Paths to Neighborhood Links	Compacted Granite Gravel
Parking Areas at Trailheads	Asphalt

Table 10: Matrix of Paving Materials
Source: Rialto Studio, Inc.

Creek velocities should be a consideration in selecting paving materials to avoid possible vegetative impacts downstream. Velocities in excess of 6 ft/sec will require a concrete trail.

Accessibility

The design of trails must accommodate the greatest possible number of users and should be guided by adherence to standards for universal design. The requirements of the Americans with Disabilities Act (ADA) will be a necessary part of any trail design. The trail design will also have to comply with requirements of the State of Texas Accessibility Standards. Refer to the table below for a general summary of disabilities and design provisions.

	Mobility Impaired	Visually Impaired	Manually Impaired	Agility/ Stamina Impaired	Learning Impaired
Site Organization	Continuous site access network.	Consistent tactile information. Tactile maps and signs.		Proximity of facilities.	Clarity of site organization
Information	Accessibility symbols. Level of accessibility information.	Raised character signs, pictographs. Verbal information.			Pictographs and clear information systems, visual orientation
Vehicle Parking Area	Reserved space size access to paths. Surface type.	Readability of signs.		Distance to facilities.	
Pathways/Trails	5% longitudinal and 2% cross slopes. Width of trail. Surface type. ramp railings.	Path edges delineated with tactile warning strips. Curbs		Rest areas and seating.	Clarity of orientation.
Fishing	Level surface type curbs, rails, shelves, shade & shelter.	Curbs, casting aids, casting space.	Special fishing equipment.	Seating, shade, shelter.	
Boating	Access to boats. Safety of access.	Safety at water's edge.	Access to boats. Operation of boats.		
Restrooms	Accessible to all persons.	Accessible to all persons.	Fixture controls.	Proximity to other facilities.	
Camping & Picnic Areas	Adjacent parking. Type of surface materials. Convenience of utilities.	Tactile warning strips around grills.		Distance to restrooms and water.	

Table 11: Physical Needs of Persons with Disabilities
Source: Flink and Searns, Greenways: A Guide to Planning, Design, and Development, 1993

For a shared use trail to meet the requirements for an accessible route, it must be paved with a hard, durable surface and its longitudinal gradient should not exceed 1:20 (vertical:horizontal) or 5%. (Refer elsewhere in this document for recommended gradients and level resting areas where slopes are required.) The trail should be of sufficient width – 10 feet wide is recommended - to allow comfortable travel and passing by wheelchair and other disabled users. It should have safe access from trailheads and, where feasible, the trailhead should be located proximate to accessible parking. An accessible route must be signed accordingly.

Accessible Share Use Trail
Source: Greenways: A Guide to Planning, Design, and Development / Loring LaB. Scwarz, editor: Charles A. Flink, Robert M. Stearns, authors, 1993.

While a goal of the design of shared use trails should be to make them completely accessible, it should also be recognized that there may be site-specific instances where achieving a fully accessible route is not possible. Examples of this might include insufficient right-of-way to construct proper length of ramp, or trails that are constructed of material other than a hard finished surface, like compacted gravel or stabilized earth. Only in rare, site constraint-driven instances might the requirements for full accessibility be waived. Trails or trail segments that are not fully accessible must be signed accordingly.

Creek/Drainage Crossings

Drainage design criteria must meet the criteria outlined in the Unified Development Code and the Floodplain Ordinance. Exceptions to these criteria should be discussed with the Storm Water Utility Division prior to commencement of the project. Exceptions to the design criteria may be allowed as follows: Criteria for creek crossings and safety may be based on the location of the trail relative to the floodplain. General crossing criteria may be used. Crossings must not adversely impact flood elevations. Crossings will be designed to prevent creek erosion and crossing washout.

Types of Crossings

Creek-based greenways are, by definition, aligned along the flow line of area creeks and drainages. Where trails are constructed, they will interface with these drainages in two basic ways. The trail may have to cross the major creek to get from one side of the creek to the other, perhaps to make a park or neighborhood link or to be in a better alignment. These will be more major crossings. There will also be crossings of the trail over smaller tributaries to the main creek that run perpendicular to the trail.

- **Creeks**
  Creek crossings will vary in size and complexity depending on the size of the creek and the geometry of the floodplain. Crossings over smaller creeks where the 100-year floodplain is fairly confined to the channel may be done with bridges. Bridges should be simple and have as much open space as possible to allow the free passage of water in the event of a major flood. This will also make them safer as open bridges will allow good visibility. Bridges shall also be designed to minimize opportunity for graffiti.

  Creek crossings over larger creeks where the floodplain is fairly wide will have to be designed to provide minimum obstruction to floodwaters. The basic design objective is to minimize the profile of the structure to create the smallest possible obstruction to flood waters. This can be done with low water crossings or bridges which would cross the channel but still be submerged within the floodplain. Bridges above the floodplain would be too long and would likely reach outside the limits of the greenway. Low water crossings should be designed to pass the base flow plus one foot of freeboard or 10 percent of the flow depth (whichever is greater) below the trail. Low water crossings for the trail may also be designed to allow emergency vehicles access in some cases. Bridges can be designed with extra width to eliminate the need for handrails and thereby reduce obstructions to debris carried downstream during a flood. Where there is no base flow in the creek, minimum 24" diameter concrete pipes may be used along the creek flowline to pass low flows under the crossing. Low water crossings in the main creek will be permitted with provisions for safety. These provisions may include warning signs, flood gauges, etc.

  Where practical, and if it does not cause significant interruption to the trail, existing street crossings of creeks should be used for trail crossings. Additional crossings are not desired if existing ones can be used.

- **Drainage Perpendicular to Trail**
  Most tributary crossings will be small local drainages and will, therefore, be confined to a small swale or channel. These tributaries can be crossed with a small bridge or culvert crossing. Crossings must not adversely impact flood elevations. Crossings should be designed to prevent creek erosion and crossing washouts. A 10-year ultimate development flood frequency will be used to analyze tributaries crossing the trail if the crossing is likely to cause backup of local drainage that would impact flooding outside of the 100-year floodplain. Structures crossing tributaries will be modeled with a simple backwater calculation, no flood models will be generated. A 2-year ultimate development flood frequency will be used to analyze tributaries crossing the trail down in the 100-year floodplain. This will be the vast majority of the structures analyzed.

Intersection with Streets, and Other Roadways

Inevitably, trails will have to cross vehicular roadways. These interruptions should be kept to a minimum and route mapping should be carefully designed to allow trail continuity even if a portion of the trail must cross a street; trail intersections with low-profile bridges is an example of this condition. Sight distances, especially for bicyclists, will have to be calculated to enable trail users to approach the intersection safely and allow enough distance to come to a stop. Intersections should be signed and the trail marked, so that there is no confusion about right-of-way priorities. Where possible, the trail should intersect with a roadway at a right angle. The trail should be widened at an intersection, if possible, to allow for multiple users to congregate safely. If the street is a lightly-traveled one, and the design demands it, an at-grade crossing may be made in mid-block. The trail should cross at right angles, and trail should be marked to stop trail user traffic and give vehicular traffic the right-of-way. Refer to AASHTO publications for more specific recommendations for the relationship of trails to roadways.

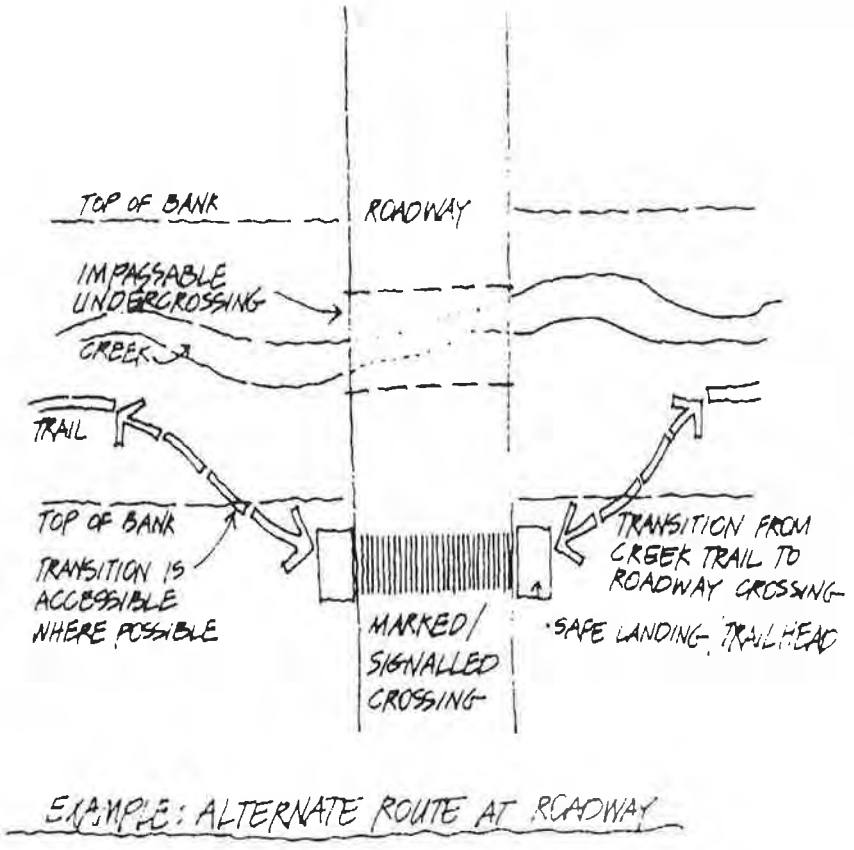


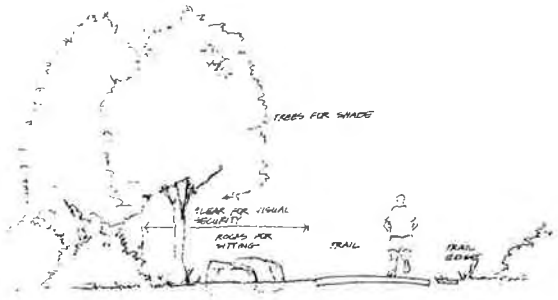
Figure 13: Example Alternate Route at Roadway
Source: Rialto Studio, Inc.

C. SITE FURNISHINGS

Creek-based shared use trails will be primarily functional for foot and wheeled traffic, that is, the provision of site furnishings will be considered an amenity and will occur at special selected locations. Within the 100-year floodplain, man-made site furnishings should be located out of the main channel and appropriately secured to the ground.

Seating

Seating is the most common site furnishing for trail systems. Periodic placement of seating will allow trail users rest and respite from physical activity and places to pause and enjoy peripheral aspects of the trail system. For the most part, seating may be provided by placing large boulders or logs, or leaving tree stumps in strategic locations; the initial cost is effectively low and the seat requires little or no maintenance. Low vulnerability to vandalism is also a feature. At more visible areas, like trailheads adjacent to schools or community centers, seating may be more elaborate and fixed. The provision of seating and other site furnishings in such locations will demand that they complement the overall visual character of their surroundings.



Trailside Seating
Source: Rialto Studio, Inc.

Trash Receptacles

Placement of receptacles in the channel is prohibited. Due to the difficulty in providing trash collection along the entire extent of a creek-based trail system, these elements should be congregated at selected destinations or transition nodes. Sharing the facility, they should complement the overall visual character of their surroundings. Of particular concern to the designer is selection of an appropriate element. It should be securely fastened in place and be of a material and strength that is vandal-resistant. It should have a securely fitted cover that stays routinely closed, to provide protection against both animal behavior and inclement weather.

Drinking Fountains

Similarly, these elements should be provided where they will be used by the most people, most likely at a shared use facility, like a trailhead, park, or other destination. The trail routing should be designed so that one can encounter a drinking fountain at regular intervals while using a trail. The fixture should be compliant with the requirements of ADA and should be of a material and strength to resist vandalism. To reduce the expense of installation, it should be convenient to a water supply.

Bicycle Racks

These should be located as close to destinations as possible without causing a conflict with pedestrians or other users of the destination facility. Failure to provide bicycle racks conveniently close to a destination invites bikes being chained to trees, light poles, or other objects without regard to the functioning of the destination space. A variety of bicycle racks is available commercially, affording the designer a range of options considering cost, aesthetics, and maintenance.

Other

Exercise Stations

Provision of these elements along a trail system increases the likelihood of use of the trail system by increasing the attractiveness of it as a recreational destination. These should be sited in locations where maintenance, if required, is not difficult. It is recommended that they be located in shared facilities, like parks or schoolyards, where they can serve more users than just trail users. A variety of products is available commercially, affording the designer a range of options considering cost, aesthetics, and maintenance.

Exercise Trail Example
Source: Dixie Watkins, III & Associates

Picnic Tables

Like other elements above, these should be congregated at trail destinations where they may be utilized by the maximum amount of people. Random placement of these along trails is possible, where they might serve also as rest areas, but access for maintenance must be considered. If fire pits are provided in conjunction with picnic tables, it is recommended that they occur only in a shared destination facility, like a park, where they may be monitored. As with other site furnishings, they must be compliant with ADA requirements for full accessibility.

Self-Contained Toilets

Where restrooms are not readily available in a shared-use facility, consideration should be given to placing self-contained toilet structures at selected locations along the trail system. In their simplest form, they would require a concrete pad, an enclosure for privacy, and a self-contained unit. This unit would require infrequent service and should be designed to resist vandalism. Where nighttime trail use is anticipated, lighting is of the unit and general area is essential. As with other site furnishings, they must be compliant with ADA requirements for full accessibility. As appropriate, the unit should be flood-proofed and anchored securely to prevent floating downstream.

D. BARRIERS AND SEPARATIONS

Trails that occupy roadways or that are immediately adjacent to one should be clearly marked for safety. Similarly, shared use paths should clearly delineate intended patterns of use. There are several material options for denoting an edge or a barrier. Barriers must comply with requirements outlined in the Unified Development Code concerning floodplains.

Walls

Use walls where the terrain demands grade changes, to distinguish between public and private property, where objectionable views must be screened, or to direct the intended uses as emphatically as possible. Surface materials and textures should be selected on the basis of strength, permanence, graffiti-resistance, and cost. Modular materials should be securely installed so that they may not be taken apart.

Fences

Fencing should not crowd the trail and should be set back, for both safety reasons and visual relief. A variety of fence materials is available, but they should share the characteristic of being semi-opaque or transparent, so that vision flows through while physical boundaries are marked. Plantings can supplement the fence to make an attractive trail-side experience or to diminish the visual impact of the fence.

It is not the intent of these guidelines to promote fencing throughout greenways. Fences provide a viable option where a physical separation between public and private property is required, but should be used as a last option.

Planting

Planting can provide an effective barrier, depending on the species selected and allowing time for the planting to mature. Larger plants at time of installation can provide a more immediately effective visual barrier, but generally a physical barrier will take some time to develop. A planting barrier requires more space than a fence, so the trail's edges should be monitored for adequate dimension. Infrequent clearing and cutting is expected, the plants' ultimate growth must be anticipated so that a maintenance problem is not created that obligates regular pruning and cutting.

Pavement Markings

Pavement marking reinforce the messages provided by other types of signage and are especially useful in bicycle trail applications. White is the preferred color for striping and messages; other colors are not as easily perceived. Stenciled messages such as STOP, YIELD, BIKE LANE, etc. may be used to supplement edge-of-trail signage. Refer to AASHTO publications for more a complete discourse on types, sizes, and requirements of trail signage.

Pavement markings also must adhere to the requirements of ADA for tactile differences and color contrast. Another concern for the designer is that painted surfaces provide less friction and traction than unpainted surfaces, so care should be taken to in the placement of pavement markings to prevent exposing a pedestrian or bicyclist to slipping and falling.

E. VEGETATION

In greenways, plantings can provide wildlife habitat; afford passive recreation opportunities; filter and improve water quality; reduce erosion; reduce flood danger; reduce non-point source pollution; create environmental ambience; and function to buffer and direct views. Trail design mapping and construction should seek to preserve as much existing vegetation as possible in the greenway. It should be supplemented with new plantings where appropriate to serve a design or functional role. Different uses of a shared use trails may also be delineated by planting. Plants should be carefully placed and maintained so that sight distances are not obscured or vertical clearance criteria are not violated. Revegetation of constructed edges is crucial to the continued viability of the greenway and its trail system.

Preservation of Existing Vegetation

During the construction process and thereafter, existing vegetation should be maintained and preserved intact in order not to exacerbate the effects of construction activities, increased use of the greenway, and the changes to the flow characteristics of the creek channel. Habitat protection is another reason to carefully plan improvements in creek channels where existing vegetation is established.

Erosion Control

Plants are an effective means of erosion control. Plants can control run-off sediment and trash before it finds its way into the water. Where existing eroded or slumped bank conditions occur, bank stabilization will be a requirement of designing a shared use trail into a creek-based greenway. There are installation options for stabilizing banks that have eroded, subsided, or been damaged by construction activities.

In many cases, vegetation alone will suffice to provide long-term erosion control on banks. Even dead plant material, by virtue of its root systems, left in place is a deterrent to erosion. Establishing the vegetative cover may be achieved by several different methods. These may require temporary (biodegradable) materials placed to control the surface of the bank while the permanent vegetation establishes itself. Permanent structures include non-degradable material that ultimately becomes part of the plant's root mass, or engineered barrier systems. Each material or system has its own technical requirements and limits of application. The designer is encouraged to consider initial cost, severity of existing conditions, desired finished product vs. intended use, and maintenance when choosing erosion control solutions.

Plant Types

Existing vegetation should be monitored and inventoried to establish the identities of associations and to anticipate plant succession. New plantings should be of native or adapted species that are compatible with the existing patterns and specimens.

There are abundant sources for information about type, appropriateness, and availability of native or indigenous plant species. The designer should consult any of the sources such as City of San Antonio Landscape and Tree Protection officers; Master Gardeners program; SAWS; Bexar County Agricultural Extension Service; San Antonio Botanical Garden; and City of San Antonio Parks and Recreation Department. The San Antonio River Authority has developed a list of recommended plants. There are also numerous books and other literature available.

F. LIGHTING

In general, it is anticipated that the trail systems will be used during daylight hours. Where exceptions, functions, or level of user demand dictate otherwise, lighting of trails, or trail segments, is essential. Certainly, trailheads and other nodes of activity that function at nighttime and are accessible by trails might demand attention to providing lighting for safety and security. Visibility and user safety are improved by lighting along trails and at intersections. Functionality of the trail is also enhanced, as users can more easily see path alignment, surface conditions, and potential obstacles to travel. Beyond nodes and destinations, where nighttime use of a shared use trail is anticipated, lighting is essential.

Depending on site-specific conditions, it is recommended that an average maintained horizontal illumination level of 0.5 footcandle (5 lux) to 2 footcandles (22 lux) be the goal for trail lighting. Special areas might require higher levels. Care should be exercised in design of trail lighting so that light is thrown only where it is needed and no spill-over onto adjacent properties occurs. The pattern of light on the trail will depend on the alignment and width of the trail, as well as configuration of the shoulder and any barrier conditions.

Footcandle is a U.S. measurement of incident light; 1 footcandle = 1 lumen per square foot. Lux is an International Standard (SI) measure of incident light; 1 lux = 1 lumen per square meter. For purposes of conversion: 1 lux times .0929 = footcandles, and 1 footcandle times 10.76 = lux.

Lighting Concepts

Safety/Security

The majority of trails in a creek-based greenway system will be used during daylight hours and therefore will be unlighted; the character of these trails will be essentially natural and minimally developed. Where trails intersect with roadways, nodes,

trailheads, or other destinations, or where they are built in a more urban context where nighttime use may be anticipated, lighting is essential for safety and security of trail users. A sense of security is increased when potential hiding places and dark shadow pockets are eliminated. Use downlights exclusively. Lights mounted lower than higher will reduce the possibility of foliage shadows being created.

What Gets Lighted

Intersections, underpasses, nodes, trailheads, and trails that anticipate nighttime use are primary lighting candidates. The remainder of the trail system should be designed basically for daytime use.

Where Can Light Standards Be Located

Lights should be located on trail shoulders, with proper dimensions – referenced elsewhere in this report - from the trail edge so as not to form a hazard to travel. Lights should be placed out of the areas of normal water flow to reduce the danger of electrocution or damage from debris. Channels in creek channels will have to be calculated if lights are proposed for use along trails that run in creek channels, so that high water will not pose a danger to the stability of the poles.

Undersides of bridges, underpasses, and railroad trestles should accommodate placement of lights for security in those locations. This will decrease the numbers of poles that might otherwise need to be erected.

At intersections with trailheads, community centers, parks, shopping centers, and similar highly-developed destinations, the trail lighting should be compatible with the overall visual character and light quality of the development. At intersections with roadways, trail lighting should be placed only if the roadway lighting at the intersection is insufficient to provide safety and security for the trail user.

Lighting, especially as it is coordinated with nodes and trailheads, may utilize existing available public service and be powered from sources existing at trailheads, intersections, or constructed elements, like bridges.

Serious consideration should be given to alternative sources, such as solar-powered lights. This is a good alternative in areas that require lighting but that are difficult to access for routine maintenance, and where provision of conventional power is limited. Use of solar-powered lights should anticipate existing and designed foliage patterns so that solar access is not blocked.

Light Fixtures

Spacing, height, and arrangement of lighting should create a uniform distribution of light and avoid casting shadows from foliage or other trail appurtenances onto the trail surface. Luminaries should be selected that will cast light in a pattern parallel with the long axis of the trail and provide cut-off shields so light does not spill over onto adjacent property.

Light distribution is a consideration in both the horizontal and vertical dimensions. Lights that illuminate upward should be avoided. A "dark sky" concept is desirable, wherein the light is concentrated downward onto the trail and not lighting uselessly upward. Horizontally, a uniform pattern is desirable, and lighting should be designed to achieve average footcandle recommendations tabulated elsewhere.

Fixture Materials and Finishes

The selection of appropriate light fixtures is the prerogative of the designer, given certain guidelines and standards are met. Selections should also be made from the viewpoints of durability, low maintenance, lamp life, and vandal-resistance.

Lamp Types

While many different lamp types are available, it is recommended that the trails be lighted with metal halide for true rendering of colors. This is important from safety and security standpoints. It is also a maintenance issue, as it relates to lamp life.

Lamp	Wattage Range, M (ft)	Efficacy, lumen/watt*	Average Life, hrs	Apparent Color	Color Rendering	Initial Cost of Equipment
Incandescent	3-300 (10-1000)	10-25	750-2000	Warm white	Best overall	Low
Fluorescent	4.5-64.5 (15-215)	40-80	7500-15,000	Warm to cool white	Good	Medium
Induction	16.5-25.5 (55-85)	63-70	100,000	White	Very Good	High
Mercury Vapor (Deluxe White)	12-300 (40-1000)	25-60	24,000	Cool white	Good	Medium
Metal Halide	52.5-450 (175-1500)	65-105	7500-20,000	Cool white	Very Good	Med to High
High-pressure Sodium (STP)	10.5-300 (35-1000)	60-120	–	Orange-yellow	Poor	High
White High-pressure Sodium	45-75 (150-250)	75-80	–	Warm white	Very Good	High
Low-pressure Sodium	5.4-54 (18-180)	70-150	–	Intense yellow	Very Poor	High

**Includes ballast losses*

Table 12: Summary of Lamp Characteristics
Source: Charles W. Harris and Nicholas T. Dines, Time-Saver Standards for Landscape Architecture, second edition, 1998.

Light Levels

Recommended Levels of Illumination are summarized in the Table, utilizing information from the Illuminating Engineering Society (IES).

Using 16' tall light poles...

For average of one foot candle, space poles approximately 40' apart.
For average of ½ foot candle, space poles approximately 60' apart.
For minimum of 0.2 foot candle, space poles approximately 100' apart.

Activity	Horizontal Footcandles		Uniformity (Max. to Min.)
	Minimum	Average	
Parking & Pedestrian Areas	0.6		4.0
Jogging Trails			
General	0.2	1.0	4.0
Bridges & Tunnels	1.0	2.0	4.0
Traffic Areas	1.0	2.0	4.0
Bicycle Paths	0.2	1.0	4.0
Nature Trails	0.2	0.5	6.0

Table 13: Recommended Levels of Illumination

Source: Charles W. Harris and Nicholas T. Dines, Time-Saver Standards for Landscape Architecture, second edition, 1998.

G. INFORMATION SYSTEMS (SIGNAGE)

Signs will be of three types: regulatory, warning, and guide. Regulatory signs communicate laws and regulations, primarily concerning traffic in the case of shared use trails proper. Warning signs are used to alert the user to possible dangerous conditions ahead. Guide signage conveys information and assistance to aid the trail user. Fixed signs will be supplemented with pavement markings for a total package of information and assistance.

Fixed signs should be placed along the trails so that they will not be obscured by foliage or man-made elements. Warning signs should be located ahead of potential hazards to allow time for reading the sign and making an appropriate response (design speeds and sight stopping distances are also critical here.) Signs should be placed so that a safe horizontal distance between the edge of the trail and the nearest portion of the sign is at least 3 feet.

The beginnings of trails should be signed to communicate the nature and level of the trails accessibility. Inclusion of information about the trail ahead such as typical slopes, steepest slope, cross slope, trail width, trail surface, and obstacles will aid the user, particularly those with disabilities, to understand and evaluate the trail before entering.

Considerations for placement of signs along trails include size, scale, and proportion of letters, and contrast of letters with background. The size of the letters must make the sign – especially warning signs - legible so that the trail user can anticipate the message and

act accordingly. Therefore, careful consideration to the layout and dimensioning of sign locations is important. The table below recommends minimum letter sizes for legibility at various distances.

Signs should be designed of materials that are strong, durable, and cost-effective. They should have vandal-resistant qualities and should be securely mounted in place. Where nighttime trail use is an issue, signs should be either easily readable in the dark, or receive illumination from adjacent light sources. Signage should be designed to reduce long-term maintenance; for example, avoid repeated and frequent painting.

Signage types may include:

- Location Identification (i.e. Park, Trailhead, etc.). These will identify major components of a trail system, usually nodes, and destinations. Examples include park name, trailhead address, community center, boundary markers, etc.
- Trailhead Maps would provide graphic overview of route and territory directly ahead to orient the first-time trail user to conditions ahead. To address trails accessibility, the sign should include, at a minimum: average and maximum trail longitudinal slope; average and maximum trail cross slope; average and minimum trail width; type of surface; and notable obstacles. Levels of accessibility should be noted (an example of this is the trail signage of O.P. Schnabel Park
- Directional Signs would provide information about one's location along a trail in relation to nodes, trailheads, and other landmarks.
- Interpretative Signs would provide an opportunity to educate the trail user about points of interest encountered along the trail.
- Hazard / Warning Signs would alert the trail user to possible conditions ahead that require caution. Signage should also be developed that alerts the trail user to the possibility of flood conditions.
- Distance Markers would provide information about one's progress along the trail system.

Minimum signage information shall include:

- Trailheads
  - Trail Name
  - Trailheads Upstream & Downstream
  - Mileage (from Trailhead to Trailhead)
  - Trail Map
  - Accessibility Rating
  - Flood Hazards
- Trail-side Signs
  - Trail Name
  - Milepost
  - Facilities Ahead
- Safety Signage
  - Flood Hazards and Warnings
  - Nearest Exit

Examples of signage from various communities appear below.

Examples of Trail Signs

Source: Greenways: A Guide to Planning, Design, and Development 'Loring LaB Schwarz, editor: Charles A Flink, Robert M. Stearns, authors, 1993; Charles W Harris and Nicholas T. Dines, *Time-Saver Standards for Landscape Architecture*, second edition, 1998; and Catalog

H. PUBLIC SAFETY INFORMATION SYSTEMS (SIGNAGE)

The welfare of the trail user is of paramount importance and the designer should always acknowledge such when providing facilities and amenities for use by the general public. Certain public safety elements are available to the designer and deserve consideration when implementing a trail system.

- Emergency Telephones should be a feature of trail destinations where they may be utilized by the maximum amount of people, it is also important that public safety guide the locations of these elements at places along the trail proper. Units that are solar-powered are suitable for more remote applications; random placement of these along trails is possible, where they might be coupled with rest areas. Overhead obstructions must be cleared to allow solar access to unit. Use the City of San Antonio-specified unit.
- Well-signed and signaled crossings are important when a trail must leave the confines of a protected right-of-way and cross vehicular traffic. Signs arranged to alert the trail user to upcoming intersections or crossings and that alert oncoming traffic that a crossing exists ahead must be provided as part of the total trail design. Supplementing this signage should be pedestrian signalization – synchronized with traffic signals – where vehicular traffic volumes might dictate additional consideration for safety.
- Park Ranger personnel will play a primary role in providing safety and security for trail users.
- Flash Flood Early Warning Devices

I. SUMMARY

The issues, elements, and implementation of the concepts embodied herein are intended to support the Goals and Objectives of the San Antonio Parks and Recreation System Plan, adopted in January 1999. The individual designer should work within the framework of not only the information contained here, but in recognition of and response to the San Antonio Parks and Recreation System Plan: Facility and Program Classification, and a process allowing public input, when providing a public amenity such as a creek-based greenway trail system.

IV. ACKNOWLEDGEMENTS

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CITY OF SAN ANTONIO:

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Malcolm Matthews, *Parks & Recreation Department Director*
Thomas Wendorf, *Public Works Department Director*

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APPENDICES

APPENDIX A

Operations and Maintenance

From an operational viewpoint, while public vehicular access must be strictly controlled, the shared use trails should be designed to allow official access of trails. Provision for emergency vehicle access must be considered, and the variety of maintenance vehicles must be accommodated, although perhaps not all vehicles may access all trails. Levels of maintenance should be anticipated. Trails at nodes and other destinations may require more types and frequency of maintenance vehicle access. Trails in more remote reaches may require only the smallest maintenance effort. The design of the shared use trails should consider that regular, routine maintenance will be difficult and that trails and amenities should be low-maintenance-requiring designs. The maintenance of the trails can be a contribution of volunteer and other support agencies.

Maintenance activities in the greenway should be balanced against protection of the resource. Preservation of vegetative cover helps mitigate the effects of erosion and provides valuable habitat for wildlife. It should be recognized that some clearing will have to be accomplished to construct trails in creek-based greenways, but careful routing and attention to demolition and construction details can minimize this impact. The use of silt fences and other erosion management practices during construction is essential to protecting water quality. Maintenance for flood control should be done with precision and care, so that vegetative cover can contribute to the mitigation of erosion, among other benefits. Overclearing of vegetative cover can lead to remediation and restoration efforts to re-establish it; good conservation practices can minimize this drain on available resources. Observation of best management practices during construction and maintenance is key to protection and enhancement of the greenways as a valuable resource.

Trail use rules and regulations must be clearly posted and enforced. City of San Antonio codes, ordinances, and policies, as they apply to the trail system, should be clearly posted and enforced. While Park Ranger staff will have primary responsibility for enforcement of regulations and trail security, self-policing of the trails by users is encouraged. Trail design and public safety should always be the prime considerations of the designer.

APPENDIX B

Implementation

The adoption of this plan by any and all of the appropriate boards and commissions (Parks and Recreation Advisory Board, Open Space Advisory Board, Planning Commission and etc.) and even with Council adoption will only do a little to achieving the physical vision. Concurrent with the political empowerment of this document needs to be an extensive public education program geared as much to individuals as developers and public policy makers. To truly effect change, the Public Works employee reviewing a drainage plan for a development needs to be just as enlightened as the homeowner putting chemicals on his lawn, or the zoning commissioner approving a land use change. To this end, implementation begins with educational initiatives that target changing the very way that day-to-day practices and procedures are executed by all relevante staff members. And, as importantly, that sea-change will need to be shepherded by the Parks & Recreation Department as an ombudsman, whose full-time responsibility is to effectively manage the planning, design and management of this future regional greenway system. The power of this oversight needs to be articulated well enough for all to follow. At a minimum, the following entities should all be involved:

- City Departments
  - Parks and Recreation (as primary oversight)
  - Public Works
  - Planning

- Municipal Entities
  - San Antonio Water System
  - Bexar Metropolitan Water
  - City Public Service
  - Texas Department of Transportation
  - San Antonio River Authority

- Regional Governmental Entities
  - Bexar County Public Works
  - Bexar County Parks Department
  - Texas Parks and Wildlife
  - US Fish and Wildlife Service
  - US Geological Survey
  - Edwards Aquifer Authority
  - AACOG
  - Texas Natural Resource Conservation Commission
  - National Park Service

Once these liaisons are firmly established and the operational mechanics for cooperation are in place, the next step in implementation is **area-wide policy change**. Much of this can only be accomplished by the mutual consent between these organizations as they begin to better chart their individual impacts on greenways. And, how much they overlap or gap with each other or issues will also determine how better that they can act in concert to further the conservation and restoration of greenways.

Another key ingredient of implementation is how the development or redevelopment process might trigger the advancement and establishment of greenways. At the very least, greenway corridor segments should be flagged for conservation at the earliest possible stages of the development process. Both informal master plans and Preliminary Overall Area Development Plans should designate the component parts of any potential greenway. And, then throughout the development and construction phase the designation and protection of greenways, their buffers, connections and recreational potential should be established.

Conversely, in areas which have already been developed, corridor designations, restoration plans and recreation linkages must be forged by a variety of techniques. The City should take the lead in identifying these corridors and the specific segments which should receive priority of action. Some of the different approaches to this level of greenway infrastructure is thinking at a very broad and multi-objective level. And some of it is very basic and detailed single-focus projects. On the broader spectrum, things that should be considered include:

- Greenway Overlay Districts – Create an overlay zoning district for all major namesake creeks and their floodplains and associated recreational and/or ecological lands. This could be job one in mapping greenways, and not have to change any underlying zoning designations, ownerships, etc.
- Greenway Brownfield Identification – As much of the historically legal and illegal landfills, "hot spots" and scarred landscapes have been in or adjacent to floodplains, the proper inventory, analysis and remediation-restoration of these sites will greatly enhance our inner-city greenways.
- Partnership Linkages – Where outside the purview of the City of San Antonio, the significant greenway corridors that course through private, military, and other incorporated communities should benefit from alliances through inter-governmental agreements and memorandums of understanding for like-minded stewardship.

Some of the smaller-scale or limited scope approaches should include:

- Utility relocation/improvement projects
- Drainage projects
- Community Development Block Grant programs
- Tax-Increment-Financing districts
- Neighborhood revitalization programs
- ISD-based outdoor education facilities

As with any program that delimits types of uses and allowable impacts, incentives should also be given to the private sector. Landowners, homeowners, developers, and businesses should be encouraged through tax-deferment, waived fees, low-interest loans, credits and whatever else might be available for helping to further greenway development and conservation work.

There is already some funding in place for greenway programs. According to the Parks & Recreation Department, as of May 2001, the following sources, amounts, and allocations are available to begin the implementation of greenways. Importantly, the funds derive from a variety of sources, bespeaking the potential for full and continued support for this important initiative.

General Obligation Bond Elections

1994	$0.47M	Leon Creek
1999	$3.29M	Leon Creek
1999	$5.22M	Salado Creek

Sales Tax Revenues

2001 – 2004	$8.20M	Leon Creek
2001 – 2004	$11.80M	Salado Creek

State and Federal Matching Grants

TPWD	$0.10M	Leon Creek
TXDOT	$2.00M	Salado Creek
TPWD	$0.75M	Medina River

Totals

Leon Creek (North Loop 1604 to Somerset Road)	$12.06M
Salado Creek (Huebner Road to SE Military Road)	$19.02M
Medina River	$ 0.75M
Grand Total	$32.83M

Note: Figures do not include value of land donations, and do not include $10.0M in FEMA funding for flood plain buy-out program in certain segments of Leon and Salado Creeks.

Strategically, the next step for any of these particular greenways is to prepare specific corridor plans for established segments. To build on what is already established and needs help should be the priority plans. The Salado, Leon and Olmos should be focused on and dealt with in strategic segments. And, then as these plans sequence into reality, second-priority greenway corridor plans should be started. By this incremental, phased approach, the vision of a network of continuous greenways may be achieved.

APPENDIX C

Acquisition and Stewardship

Public access and management of these greenways is a challenging part of the implementation process. But, protection of the resource is job one. Afterwards, a variety of techniques and partnerships can greatly facilitate completing greenway corridors. This includes:

- Fee Title
- Conservation Easements
- Access/Egress Agreements
- Hold Harmless/Liability Releases
- Contributions in lieu of Dedication
- Phased Dedication
- Below-market (Tax Credit) Sales
- Third Party Agreements with Texas Nature Conservancy, Trust for Public Land, and Bexar Land Trust.

Management and stewardship will be enhanced by working with Texas Parks and Wildlife Urban Biologists, Master Naturalists, and others to provide effective conservation and even restoration plans.

Multi-agency coordination is critical to the successful protection and carefully planned and executed use of the greenway resource. Cooperation between agencies with overlapping jurisdictions (e.g. City, CPS, SAWS, etc.) will provide a greater good than individual agency action. Finally, greenways offer a resource base for programmatic partnership opportunities between various educational institutions, civic organizations, and public agencies.

APPENDIX D

Adoption

1. San Antonio Planning Commission Resolution No. 01-04-04, 25, April 2001, attached.
2. City of San Antonio Ordinance No. 93920, 10 May 2001, attached.

SAN ANTONIO PLANNING COMMISSION

RESOLUTION NO. 01-04-04

RECOMMENDING THE ADOPTION OF THE PLANNING AND DESIGN GUIDELINES FOR CREEK-BASED GREENWAYS AND AUTHORIZING THEIR AMENDMENT TO THE PARKS AND RECREATION SYSTEM PLAN.

WHEREAS, public input was gathered in November 2000 and March 2001; and

WHEREAS, efforts were made to relate the proposed guidelines to the 1997 San Antonio Master Plan Policies and the 1999 Parks and Recreation System Plan; and

WHEREAS, the process and direction of the proposed guidelines have been endorsed by the Parks and Recreation Advisory Board; and

WHEREAS, it is necessary to amend the 1999 Parks and Recreation System Plan due to changing parks and recreation facility and programming needs; **NOW THEREFORE**:

BE IT RESOLVED BY THE PLANNING COMMISSION OF THE CITY OF SAN ANTONIO.

Section 1. That the Planning and Design Guidelines for Creek-based Greenways attached here to and incorporated herein is recommended to the City Council for adoption.

Section 2. That the 1999 Parks and Recreation System Plan is hereby amended to include these Guidelines.

PASSED AND APPROVED THIS 25TH Day of April, 2001.

APPROVED:

Robert J. Wandrisco
Chairperson

ATTEST:

Executive Secretary

SW: jmr
05/10/01
Item No. 23

AN ORDINANCE

AMENDING THE CITY OF SAN ANTONIO'S PARKS AND RECREATION SYSTEM PLAN, ADOPTED BY ORDINANCE NO. 89162, PASSED AND APPROVED ON JANUARY 28, 1999, TO ADD CREEK BASED GREENWAYS PLANNING AND DESIGN GUIDELINES.

* * * * * *

WHEREAS, Ordinance No. 89162, passed and approved on January 28, 1999, adopted the City of San Antonio's Parks and Recreation System Plan as an instrument to guide decisions impacting the City's system of parks, park facilities, recreation and leisure programs; and

WHEREAS, the City has retained the services of a design team, comprised of Pape Dawson Engineers, Inc., Rialto Studio, Inc. and Dixie Watkins II & Associates, to develop Creek-Based Greenways Planning and Design Guidelines for use in developing creek based greenways in San Antonio; and

WHEREAS, said design team has completed the guidelines and it is in the best interest of the City to amend the Parks and Recreation System Plan to include these new planning and design guidelines; **NOW THEREFORE:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SAN ANTONIO:

Section 1. The City of San Antonio's Parks and Recreation System Plan, adopted as an instrument to guide decisions impacting the City's system of parks, park facilities, recreation and leisure programs, by Ordinance No. 89162, passed and approved on January 28, 1999, is hereby amended to include Creek-Based Greenways Planning and Design Guidelines for use in developing creek based greenways in San Antonio. A copy of said Creek-Based Greenways Planning and Design Guidelines is affixed hereto and incorporated herein for all purposes as Attachment I.

Section 2. This will become effective on the tenth (10th) day after passage hereof.

PASSED AND APPROVED this 10th day of May, 2001.

M A Y O R

ATTEST: _____
City Clerk

APPROVED AS TO FORM: _____
City Attorney

ORD. NO. 93920

MAY 10 2001

CITY CLERK

APPENDIX E

Bibliographies - Planning Handbooks

1. City of San Antonio Parks and Recreation System, January 1999.

2. Rapid Watershed Planning Handbook – A Resource Guide for Urban Subwatershed Management, October 1998, The Center for Watershed Protection, Ellicot City, Maryland.

3. Trinity Trails Management Guide – A guide for Agencies, Interest Groups, and Individuals, September 1997, Trinity Trails Working Group, Dallas/Ft. Worth area.

4. Land and People Annual Report 2000, The Trust for Public Land, Fall 2000, Los Angeles, CA.

5. Integrated Storm water Management, 1993, Lewis Publishers, Boca Raton, FL. (editors - Richard Field, Marie O'Shea, Kee Chin)

6. Johnson Creek Corridor Plan, July 1997, The Johnson Creek Consortium, Arlington, Texas.

7. Thinking Green – A guide to the Benefits and Costs of Greenways and Trails, February 1998, Florida Department of Environmental Protection, Tallahassee, FL.

8. S.A. River Flood Control Channel Modifications Preliminary Engineering Analysis Report for S.A. River Authority and Bexar County, September,1997, Freese and Nichols, Inc.

9. Greenways for America, 1990, Johns Hopkins University Press, Baltimore, Maryland.

10. Floodplain Management Guidelines for Implementing E.O. 11988, 2/10/78, U.S. Water Resources Council, Washington, D.C.

11. Ecology of Greenways – Design and Function of Linear Conservation Areas, 1993, University of Minnesota Press, Minneapolis, MN (Daniel Smith & Paul Hellmund, editors)

12. Watershed Protection Techniques, January 2000, Center for Watershed Protection, Ellicott City, MD

13. Nutrient Loading from Conventional and Innovative Site Development for Chesapeake Research Consortium, July 1998, Center for Watershed Protection, Ellicott City, MD.

14. Landscape Restoration Handbook, 1993, Donald Harker and Sherri Evans, Lewis Publishers, Boca Raton, FL

15. Greenways – A Guide to Planning, Design and Development, 1993, The Conservation Fund, Island Press, Washington, D.C.

16. Open Space Policy – Final Report and Recommendations of the Open Space Development Policy Work Group, February, 1989.

17. Open Space Plan – City of San Antonio, May 1991, City of SA Dept. of Planning

18. Open Space – An Element of the Boulder County Comprehensive Plan, November 1977.

19. 1994 Park, Recreation and Open Space Plan – Willimalane Park and Recreation District, Springfield, OR

20. Natural Open Space Plan – City of Dallas

21. Facility Plan for Arroyos – Multiple Use of Albuquerque's Arroyos and Their Floodplains

22. An Open Space Plan for Collin County, Texas

APPENDIX F

Greenway Contact Organizations

American Farmland Trust
1920 N. Street NW, Suite 400
Washington, D.C. 20036
202-659-5170

The American Greenways Program
The Conservation Fund
1800 N. Kent St., Suite 1120
Arlington, VA 22209
7003-525-6300

American Hiking Society
PO Box 20160
Washington, DC 20041-2160
703-385-3252

American Planning Association
1776 Massachusetts Ave., N.W.
Washington, DC 20036
202-872-0611
and
1313 E. 60th St.
Chicago, IL 60637
312-955-9100

American Rivers
801 Pennsylvania Ave, SE
Washington, DC 20003
202-547-6900

American Society of Landscape Architects (ASLA)
4401 Connecticut Ave., NW, 5th floor
Washington, DC 20008
202-6886-ASLA

American Trails
1400 16th St., N.W.
Washington, DC 20036
202-483-5611

The Appalachian Mountain Club
5 Joy St.
Boston, MA 02108
617-523-0636

Greenways Inc.
121 Edinburgh South
Suite 107, MacGregor Park
Cary, NC 27511
919-380-0127

Izaak Walton League of America
1401 Wilson Blvd., Level B
Arlington, VA 22209
703-528-1818

Land Trust Alliance
900 17th St., NW, Suite 410
Washington, DC 20006
202-785-1410

National Park Service
Rivers and Trail Conservation Assistance Program
PO Box 37127
Washington, DC 20013
202-343-3780

National Recreation and Parks Association (NRPA)
2773 S. Quincy St., Suite 300
Arlington, VA 22206
703-820-4940

National Trust for Historic Preservation
1785 Massachusetts Ave., N.W.
Washington, DC 20036
202-673-4000

The Nature Conservancy
1815 N Lynn St.
Arlington, VA 22209
703-841-5300

Rails to Trails Conservancy
1400 16th St. NW
Washington, DC 20036
202-797-5400

Scenic America
21 Dupont Circle, NW
Washington, DC 20036
202-833-4300

Trout Unlimited
501 Church St. NE
Vienna, VA 22180
703-281-1100

Trust for Public Land
116 New Montgomery St., 4th Floor
San Francisco, CA 94105
415-495-4014

Urban Edges
1401 Blake St., Suite 301
Denver, CO 80202
303-623-8107

The Waterfront Center
1536 44th St.
Washington, DC 20007
202-337-0356

APPENDIX G

History of Planning Efforts and Current Initiatives in Greenways in San Antonio

1933 "First" San Antonio Master Plan
(addressed basics of a parks system and advocated "scenic byways")

1954 Master Plan
(basically an urban renewal "justification")

1964 Master Plan for Parks
(first specialized inventory and analysis of the park system)

1973 The San Antonio River Corridor Feasibility Study
(addressed urban design issues from the headwaters to below downtown)

1978 San Antonio River Programming Design Phase(s)
(first aesthetic-environmental integration of channel improvements since 1954)

1980 Proposed San Antonio Comprehensive Master Plan
(advanced an 'Environmental Conservation' component and overlay districts)

1980 Urban Parks and Recreation Recovery Action Plan (UPARR)
(million dollar grant for greenway on Salado Creek makes it only as far as D.C.)

1981 Parks Master Plan
(comprehensive system-wide update)

1988 Open Space Policy Work Group Report and Recommendations
(advocates conservation of floodplains, scenic, natural, & cultural resources)

1991 Open Space Plan
(details and formalizes policy and process)

1997 City of San Antonio Master Plan Policies
(addresses quality of life issues at both a neighborhood and regional level)

1999 City of San Antonio Parks and Recreation System Plan

APPENDIX H

Local Initiatives and Advocates of Creek-based Greenways

Leon Creek Greenway Initiative

Leon Creek Greenbelt Coalition

Salado Creek Foundation

Salado Creek Hike and Bike Trail

Cibolo Conservancy

Friends of the Medina River

Helotes Creek Association

SA AIA Environmental Design Charettes

Proposition 3, Parks, Aquifer Protection, and Open Space Programs

City-wide passive flood control measures (from 1998 bond issue)

FEMA, Bexar County, and City of San Antonio floodplain buy-out programs

APPENDIX I

Federal Funding Sources

Agricultural Conservation Program
Dept. of Agriculture
Agriculture Stabilization and Conservation Service

Conservation Reserve Program
Department of Agriculture
Agriculture Stabilization and Conservation Service

Water Bank Program
Department of Agriculture
Agriculture Stabilization and Conservation Service

River Basin Surveys and Investigations
Department of Agriculture
Soil Conservation Service

Resource Conservation and Development
Department of Agriculture
Soil Conservation Service

Watershed Protection and Flood Prevention
Department of Agriculture
Soil Conservation Service

Public Works and Development Facilities
Department of Commerce
Economic Development Administration

Aquatic Plant Control
US Army Corps of Engineers

Floodplain Management Services
US Army Corps of Engineers

Planning Assistance to States
US Army Corps of Engineers

Small Flood Control Projects
US Army Corps of Engineers

Community Development Block Grants – Entitlement Program
Department of Housing and Urban Development
Community Planning and Development

Community Development Block Grant – Small Cities Program
Department of Housing and Urban Development
Community Planning and Development

Small Reclamation Projects
Department of Interior
Bureau of Reclamation

Anadromous Fish Conservation
Department of the Interior
US Fish and Wildlife Service

Fish and Wildlife Management Assistance
Department of the Interior
US Fish and Wildlife Service

Sport Fish Restoration
Department of the Interior
US Fish and Wildlife Service

Wildlife Restoration (Pittman-Robertson Program)
Department of the Interior
US Fish and Wildlife Service

Land and Water Conservation Fund
Department of the Interior
National Park Service

Rivers, Trails, and Conservation Assistance Program
Department of the Interior
National Park Service

Urban Park and Recreation Recovery Program
Department of the Interior
National Park Service

Senior Community Service Employment Program
Department of Labor
Employment and Training Administration

Nonpoint Source Implementation
Environmental Protection Agency

State Wetlands Protection Development Grant Program
Environmental Protection Agency

Acquisition of Flood-Damaged Structures
Federal Emergency Management Agency

Highway Planning and Construction
(Federal Aid Highway Program)
Federal Highway Administration

Disposal of Federal Surplus Real Property
General Services Administration

APPENDIX J

References for Design

American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 1999.

Greenways: A Guide to Planning, Design, and Development, Loring LaB. Schwarz, editor, and Charles A. Flink and Robert M. Stearns, authors, 1993.

Charles W. Harris and Nicholas T. Dines, Time-Saver Standards for Landscape Architecture, second edition, 1998.

APPENDIX K

The Four Stages of Greenway Design

Stage 1: Understanding Regional Context

1.1 Are there significant unprotected biological, water, recreational, or other features in the region that could be maintained or enhanced by a greenway or network of greenways?
1.1a. What are the characteristics of greenways that successfully maintain or enhance natural features and processes?
1.1b. Are there significant opportunities for maintaining or enhancing biological diversity in the region? What are the constraints?
1.1c. Are there significant opportunities for maintaining or enhancing water resources in the region? What are the constraints?
1.1d. Are there significant opportunities for maintaining or enhancing outdoor recreation in the region? What are the constraints?
1.1e. Are there other significant opportunities for greenway development in the region? Are there any other constraints?
1.2. With the knowledge gained from the contextual study, should the greenway project go forward?

Stage 2: Selecting Project Goals and a Study Swath

2.1. What are the goals of the project?
2.1a. Which ecological or recreational issues of the region discovered in Stage 1 should be addressed by the goals of a greenway?
2.1b. What are workable objectives for each of the goals? What are the key uses of the greenway?
2.2a. What will be the most important uses of the greenway?
2.2b What are the ecological conditions needed to maintain and enhance each use?
2.2c Where is the most promising study swath?
2.3a. Which areas within the region have the qualities needed to serve as nodes for a greenway?
2.3b. Which areas are already managed for biological diversity, water resource protection or recreation?
2.3c. Where are there linear landscape elements, such as abandoned rail lines or hedgerows, that might form the spine of a greenway (even though they may not connect significant nodes?)
2.3d. What areas can easily be eliminated from consideration because they present significant constraints and no opportunities for a greenway with the given goals?
2.3e. What general areas are suitable for some form of development (housing, agriculture, etc.) that might compete for land with greenways?
2.3. With the knowledge gained to this point should the project go forward?

Stage 3: Defining Greenway Boundaries

3.1. Where within the swath is the best general alignment for the greenway?
3.1a. What are the disturbance characteristics of the swath that might affect either greenway alignment or width setting?
3.1b. Where are the best alignments for the key biological uses?
3.1c. Where are the best alignments for the key water resource uses?
3.1d. Where are the best alignments for the key recreational uses?
3.1e. How are the best alignments to be combined into a single unified greenway system?
3.2. Where should the boundaries for the greenway be set?
3.2a. How can width be set locally along the greenway alignment in response to the needs of key uses?
3.2b. What is the priority for acquiring and implementing each segment of the greenway?
3.3. With the knowledge gained to this point should the project go forward?

Stage 4: Creating and Implementing Site Designs and Management Schemes

4.1. What is the design program for the greenway?
4.2. Where should facilities (such as trails, wildlife underpasses, bridges, etc.) be sited and how should they be implemented?
4.3. How should ecological restoration be accomplished where it is needed?
4.4. How should the greenway be managed?

APPENDIX L

Regional, State, and National Policy, Law, and Requirements

1. Bexar County/MPO Bicycle Mobility Plan
2. SARA Storm water Detention/Management Plans
3. NPDES
4. National Historic Preservation and Antiquities Act
5. TNRCC
6. Endangered Species Act

LAND USE AND MANAGEMENT PLANNING GUIDELINES FOR NATURAL AREAS

Prepared for
Parks and Recreation Department
City of San Antonio, Texas

By
Adams Environmental, Inc.
Turner Collie & Braden, Inc.
Environmental Survey Consulting
Fernandez, Frazer, White & Associates
The UTSA Center for Archaeological Research
Sprinkle Robey Architects
Dixie Watkins III
McCall & Associates

February 18, 2003

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EXECUTIVE SUMMARY

Over the past several years, the City of San Antonio (CSA) has acquired properties that have been designated for use as Natural Areas. The Parks and Recreation Department recognized that the current Master Plan for parklands in San Antonio did not address land use and management of Natural Areas. Bearing this in mind, a team of consultants led by Adams Environmental, Inc. was selected to perform a comprehensive study to develop a general land use and management plan that would aid CSA staff in determining appropriate land uses and management practices for existing and future Natural Areas acquired by the City. The resulting plan includes a reference document entitled "Land Use and Management Planning Guidelines for Natural Areas" and a supplementary GIS model that outlines the basic process to be completed for preparing an individual land use and management plan for each individual tract.

According to the *San Antonio Parks and Recreation System Plan,* Natural Areas are:

> "Areas established for the protection and stewardship of outstanding natural attributes of local, regional, and statewide significance, which may be used in a sustainable manner for scientific research, education, aesthetic enjoyment, and appropriate public use not detrimental to the primary purpose."

This guideline document has been created for Natural Areas as opposed to recreational areas. Natural Areas are resource-based with a primary goal of protecting natural resources. These areas are primarily used for passive recreational activities such as hiking and nature observation. In contrast, recreational areas are user-based with the primary goal of offering active recreational uses such as playgrounds, sports, and other similar activities.

The Land Use and Management Planning Guidelines document has been developed to provide a process to evaluate properties acquired and designated as Natural Areas. The document provides guidance and tools to create a strategy for the use and protection of each City-managed Natural Area.

The guidelines document is organized very simply. The majority of the document describes the process by which land use and management plans will be prepared for each tract. Another section of the document suggests methods of involving the public in the improvement and use of Natural Areas. Last, the document provides general recommendations for proper use and management of Natural Areas.

The process used to prepare Land Use and Management Plans for individual tracts includes the following steps:

- Upon acquisition of an individual tract, the Natural Area will be classified using a general GIS model. The model uses information on natural resources in northern Bexar County to classify general land areas according to the level of sensitivity of natural resources found in that area. Natural Area classifications range from Class 1, which denotes the presence of highly sensitive natural

resources, to Class 5, which are impacted areas that probably are not sensitive or susceptible to human impacts.

- Following classification of the Natural Area based on the General GIS model, each Natural Area will be placed under interim management until a final Land Use and Management Plan for each site is in place. During interim management, boundaries of the property are identified and secured and overall property security is ensured. In addition, the Natural Area Manager will monitor and study sensitive resources found on the property and manage the property to maintain those resources and any other valuable features. The level and type of management during this interim period is determined by the classification of the property. Class 1 properties require more careful management and study than Class 5 properties.
- During the interim period and following initiation of property improvement, the site is evaluated for site-specific characteristics by either City staff or outside consultants. Investigations will concentrate on sensitive natural resources including cultural resources, wildlife and habitat, groundwater and surface water, and species of concern.
- Once site-specific data has been collected and mapped, the Natural Area Manager will use management tools provided in the guideline document to determine the appropriate uses for the Natural Areas. Selection of appropriate uses will be based on the goals and objectives of Proposition 3, which include protection of the aquifer, protection of unique natural resources, and development of interpretive, educational, or recreational opportunities. To develop the Land Use and Management Plan, eight natural resources are mapped and scored on a 2-meter grid in a GIS model. The natural resources that are mapped and scored include the following:
    - Geologic features
    - Soil
    - Surface water
    - Species of concern
    - Wildlife
    - Vegetation
    - Cultural resources
    - Slope
- Following mapping and scoring of natural resources, appropriate land uses are identified using a GIS matrix. Within this matrix, each possible appropriate land use is assigned a recommended maximum resource score for each natural resource. For any given 2x2 grid, if a resource is scored higher than the maximum resource score, the land use is not recommended for that particular grid. If all resources are scored lower than the maximum resource score for an appropriate land use, the land use is recommended for that grid. This document includes a site-specific GIS model that electronically produces maps based on this matrix and also includes an issue scoring matrix that can be used to manually determine appropriate uses.
- Once appropriate areas for uses and activities are identified, the Natural Area Manager may now prepare the final Land Use and Management Plan. This plan includes documentation and mapping of areas appropriate for different uses and activities. It also provides a conceptual design for the location of improvements, trails, and other features within the Natural Area. The plan designates a budget to meet the maintenance, operations, construction, and staffing requirements for

the Natural Area. Last, the plan will provide a schedule for initiation of improvements and opening of the Natural Area to the public.

- Finally, the Land Use and Management Plan will be implemented for each Natural Area. This will include obtaining required approvals and permits for the operation and maintenance of the Natural Area. Plan implementation will follow the guidelines provided in this document.

The Natural Area Manager is encouraged to continually monitor and re-evaluate individual Land Use and Management Plans for each Natural Area as well as the overall process provided in this document. This document may require some updating as the environmental and political climates change over time.

The public is encouraged to participate and provide input into future improvements for each individual Natural Area. Citizens of San Antonio are stakeholders in these Natural Areas and are encouraged to be part of the preservation of our natural heritage through Natural Areas. Volunteer programs are recommended for each Natural Area as well as the overall Natural Area management program. These can include stewardship and resource management programs, educational programs, and development of "Friends Groups" for individual Natural Areas or the Natural Areas at large.

VISION STATEMENT

The Land Use and Management Plan for Natural Areas envisions a system in which sensitive recharge features, native plant and animal life, natural resources, and historically and culturally significant features are managed and preserved to sustain their existence for the enjoyment of present and future generations.

The Plan has been prepared to meet the following goals:

- Protecting aquifer recharge/contributing areas and sensitive features from land use or development that could negatively impact these key features by destroying their structural integrity, obstructing flow of water through them, or polluted water to enter them;
- Protecting natural resources and habitat;
- Preserving and managing habitat for species of concern to continue to support viable populations of these species;
- Conserving, protecting, researching, and interpreting cultural and historic resources;
- Providing opportunities for environmental education, appropriate recreation, and aesthetic enjoyment;
- Developing stronger community pride and fostering an awareness of our identity as a culture and how we are connected to our natural heritage.

INTRODUCTION

Purpose of the Plan

The purpose of this document is to provide comprehensive land use guidelines and management practices for environmentally sensitive properties or Natural Areas acquired and managed by the City of San Antonio (CSA). Guidelines provided by this document are intended to serve as a basis for the formulation of management practices, capital improvement plans, and maintenance programs for these Natural Areas. This document provides the information required to identify critical considerations for the development of a land use and management plan for each Natural Area. Using this general information, the Plan provides a step-by-step procedure for managing individual tracts in a sustainable manner for research, education, and enjoyment that is not detrimental to the Natural Area. This Plan is an addition to the *San Antonio Parks and Recreation System Plan*, with an emphasis on managing Natural Areas rather than recreation areas.

Natural Areas and Recreation Areas

Natural Areas differ from recreation areas in several conspicuous ways, both in their management and appropriate use. The *San Antonio Parks and Recreation System Plan* Provides the following definition for Natural Areas:

> *"Natural areas are areas established for the protection and stewardship of outstanding natural attributes of local, regional, and statewide significance, which may be used in a sustainable manner for scientific research, education, aesthetic enjoyment, and appropriate public use not detrimental to the primary purpose. Minimal infrastructure may include access, parking, signage and security lighting as appropriate."*
>
> *"Recommended Uses:*
> - *These areas are resource rather than user-based, but some passive recreation opportunities such as nature study, hiking, and picnicking may be provided.*
> - *Preservation of the resource integrity must guide development."*

Natural Areas contain invaluable characteristics and opportunities that will be lost without judicious planning and comprehensive management guidelines. San Antonio's Natural Areas are just as significant, culturally and historically, as our most revered local symbols such as the Alamo, the San Antonio Missions National Historic Park, and the San Antonio Riverwalk. It is critical that governmental entities and the public understand the priceless nature of these areas. With the explosion of development occurring over the aquifer, it is essential that guidelines be put into place to ensure that appropriate land use occurs. Active public education and involvement will be a key tool in building support for preserving these areas in the manner intended by Proposition 3, park bond issues, and other acquisition and improvement funding sources.

By their very nature, Natural Areas are resource-based rather than user-based. The "Step 3: Planning and Design Options" section found in Part I of this document explains in greater detail activities that are appropriate in different types of environmental settings.

Brief History and Background of Proposition 3

As the primary water source for the City of San Antonio, the Edwards Aquifer System is a vitally important natural resource. In an effort to protect this resource, the City of San Antonio (CSA) proposed Proposition 3 which was an aggressive program to purchase and protect environmentally sensitive areas overlying the aquifer. This proposition was approved by voters in May of 2000. The proposition created an ordinance which authorized a sales tax of 1/8 cent, with a not-to-exceed amount of $45 million, for the purpose of purchasing and protecting sensitive land over the Edwards Aquifer recharge zone and surrounding areas.

Under the direction of the San Antonio City Council and the Conservation Advisory Board (CAB), a Scientific Evaluation Team (SET) was established to identify science-based priorities for purchasing properties. Additionally, a plan was envisioned to assist CSA in determining appropriate uses and management strategies for properties already acquired and those yet to be purchased.

The Land Use and Management Plan for City of San Antonio Natural Areas

To create a land use and management plan, a team of consultants led by Adams Environmental, Inc. of San Antonio was selected to perform a comprehensive study of the issues pertaining to the land overlying the Edwards Aquifer and surrounding areas. The next task was to develop a general land use and management plan that would aid CSA staff in determining appropriate land uses and management practices for existing and future Natural Areas acquired by the City. The resulting plan, consisting of this reference document and a supplementary GIS model, outlines the basic process to be completed for each individual tract.

Document Organization

This document is divided into the following four parts:

Part I: The Process

Part I of this document describes the four-step process used to create a land use and management plan for each Natural Area. The process is described in a flow chart format in Figure 1. The four steps in the process include:

- ***Step 1:*** Become Familiar with Issues Encountered on the Project Area
- ***Step 2:*** Evaluate the Individual Site
- ***Step 3:*** Select Planning and Design Options
- ***Step 4:*** Develop a Land Use and Management Plan for the Individual Tract

Part II: Public Involvement

Part II of this document briefly discusses potential opportunities and methods to educate and inform San Antonio and surrounding communities about the purpose of the establishment of Natural Areas acquired by the City of San Antonio. This section also describes methods to create and implement a public relations and marketing campaign potentially enticing further eco-tourism to the San Antonio area.

Part III: Recommendations

Part III contains general recommendations for the proper management and design of Natural Areas. Also included are suggested rules for Natural Area use and protection.

Part IV: References

This portion of the document lists sources of information used in the document as well as sources of information available for use by the land manager.

The land manager should follow Part I – Part IV in consecutive order when developing a land use and management plan for a Natural Area. Once familiar with the document and the overall project area, most land managers will be able to begin with ***Step 2*** and continue through ***Step 4*** to develop a complete management plan for each Natural Area.

Table 1 lists terms and abbreviations that are commonly used in this Plan along with an explanation of each.

Table 1. List of terms and abbreviations used in this Plan.

TERM/ABBREVIATION	EXPLANATION
BCV	Black-capped vireo
BMP	Best Management Practice
CSA	City of San Antonio
EAA	Edwards Aquifer Authority
GCW	Golden-cheeked warbler
GIS	Geographic Information System
GPS	Global Positioning System
Issue	This term is used to describe both on and offsite physical, biological, and governmental features that must be measured and evaluated for proper preparation of a land use and management plan
Land Manager/Natural Area Manager	The specific person who will use this document to prepare a land use and management plan for a specific tract of land to be used as a Natural Area.
LAC	Limits of acceptable change
NRCS	Natural Resource Conservation Service
Project Area	The area for which this document was prepared. In general, this includes the Edwards Aquifer recharge zone, transition zone, contributing zone, and other Natural Areas owned and managed by the City of San Antonio.

TERM/ABBREVIATION	EXPLANATION
SOC	Species of concern: Federal or State listed endangered, threatened plant and animal species. For the purposes of this document, this term also includes rare, listed, proposed, and candidate species.
TCEQ	Texas Commission for Environmental Quality (formerly TNRCC)
THC	Texas Historical Commission
TPWD	Texas Parks and Wildlife Department
Tract	A piece of land comprised of a parcel or several parcels that constitutes a specific piece of property to be used as a Natural Area. Used interchangeably with "Property."
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WPAP	Water Pollution Abatement Plan

PART I: THE PROCESS

The process of evaluating a Natural Area to determine optimal land use, design appropriate improvements and recreational opportunities, and identify best management practices for the Natural Area requires four steps:

Step 1: Gain a familiarity with natural, cultural, and socioeconomic issues encountered across the entire project area.

Step 2: Evaluate the individual Natural Area and identify potential site-specific issues that might impact the Natural Area's land use and management.

Step 3: Select appropriate planning and design options tailored to protect and enhance the Natural Area.

Step 4: Develop a land use and management plan for the Natural Area.

Immediately following acquisition and purchase of a Natural Area, ***Step 1*** of the process is initiated. During this step, the land manager performs a desktop and cursory field study to become familiar with natural, cultural, and socioeconomic issues encountered both onsite and potentially influenced by offsite activities. A GIS model has been developed to assist the land manager in developing a general, interim classification for the Natural Area. These classifications allow the land manager to incorporate general guidelines for land use and management of the property prior to more specific development, which may occur several years in the future when funding for Natural Area planning and improvement is available. Prior to that time, the area must be properly managed to meet the goals of its general classification. The general GIS model and a cursory site survey also allow the land manager to identify potential issues that may impact future use of the property.

Initiation of ***Step 2*** in this process will occur when CSA has approved a budget for the preparation of a land use and management plan for the specific Natural Area. At that point, funds will be available for staff or consultants to conduct site-specific surveys focusing on issues identified in ***Step 1***. Collection of site-specific data is a critical point in the development of the land use and management plan ***(Step 2)***. It is very important to clearly define the data requirements for development of the plan to avoid the common pitfall of overzealous collection of data that may be "interesting and academic" but is essentially "overkill" for meeting the objectives of development of a land use and management plan. More definitive, in-depth studies may be appropriate once the Natural Area has been established and education and grant programs can be pursued.

Site-specific data should be carefully analyzed and summarized for use in the land use and management plan. Portions of the data must be manually interpreted and scored to characterize the level of sensitivity of each of the features identified on the site. Features and issues will be mapped and labeled according to their scores. This information will be incorporated into a Site-Specific GIS model or manually interpreted to determine which areas should be restricted from public use as well as optimal areas for specific improvements, appropriate activities, and management strategies for the Natural Area.

Using the information developed by the Site-Specific GIS model and manual interpretation of data, the management and design options or requirements will be

determined ***(Step 3: Planning and Design Options)***. These management and design options must be focused toward the original goals and objectives for the Natural Area.

Once the design options and requirements have been developed and delineated, a formal management plan and conceptual design for the Natural Area will be prepared. ***(Step 4: Developing a Land Use and Management Plan for an Individual Tract)***. Conceptual design will provide a map showing the general locations of trails, infrastructure, interpretive areas, and other improvements and activities appropriate for the Natural Area. In addition, the plan will determine budgets, staff requirements, and outside consultation requirements for implementation of the plan.

Implementation will include preparation of detailed designs for specific improvements on the site as well as their actual construction, if any. In addition, implementation encompasses management and protection of natural resources on the site.

Although the temptation may exist to rush through the process to achieve results, it is important that the land manager complete each step thoroughly and accurately in order to determine the best land use and management strategies for each Natural Area. However, it is also of critical importance that the land manager is allowed to begin managing resources immediately upon acquisition of a property so that these resources may be managed, protected, and preserved until a formal land use and management plan can be prepared.

The Process to Develop a Land Use and Management Plan

Figure 1. Process Flow Chart

STEP 1: GENERAL EVALUATION AND CLASSIFICATION OF THE SITE

Survey of Information

In evaluating an individual site and the surrounding areas, two types of surveys will be used:

- Desktop survey
- Onsite survey

Desktop Survey

For the desktop survey, general attributes of the tract and its surrounding areas are analyzed using a general GIS model described below and studying other maps and information that may be available for the site. The general GIS model can be used to determine the overall environmental sensitivity of the tract with respect to natural resources present on and about the site. Also included in the general GIS model are various map layers that can be used to identify potential issues within and outside of the boundaries of the tract. The desktop survey should also include careful analysis of the governmental and socioeconomic landscape in and around the tract. These environmental, social, and governmental drivers must be carefully weighed to determine how to fit the use of the Natural Area within the natural and man-made context of the environment.

Checklist of Issues and Features

The onsite survey involves a preliminary pedestrian review of the site and adjacent properties. During this review, potential issues are identified using a checklist provided in Appendix A of this document. At this point in the process, issues and features of the site are identified only; they are not analyzed or quantified until later in the process.

Development of Goals, Objectives and Proposals

Data collected from the desktop survey and onsite survey should be carefully analyzed and summarized to establish objectives and goals for conservation and management of the Natural Area. Once these goals and objectives are established, the land manager will have sufficient information to develop a scope of work that will include a proposal and budget delineating efficient use of in-house staff and outside professionals (if any) needed to collect onsite data. Site-specific data can be collected during the interim management period if staff or funds are available. However, most site-specific studies will be initiated after the scope of work and proposal have been approved. Site-specific evaluation procedures are discussed in detail in ***Step 2.***

Using the GIS General Model

A GIS model was developed to assist the land manager in locating general areas of environmental sensitivity on parcels that are acquired. The model also provides several map layers that will assist the land manager in making decisions concerning onsite and offsite environmental considerations. Map layers provided in the GIS model include the following:

- USGS ortho quad aerial photographs
- USGS topographic 7.5 minute quad maps
- Master plans for northern Bexar County
- City limits
- Public schools
- Private schools
- Parks
- ETJs for the City of San Antonio and other incoporated cities
- Streets
- Parcels
- 100-year floodplains
- Land use
- Edwards Aquifer recharge zone, transition zone, and contributing zone
- Major thoroughfares
- Geologic faults
- Geologic formations
- Potential habitat for endangered species
- General topography
- Potential for archaeological issues
- Soil mapping units

These layers can be used to assist the land manager in the initial determination of potential issues for the newly acquired property. A layer for parcels is included to allow the land manager to locate the new property and place it properly on the map. The information provided by the general GIS model is to be used to make interim land management decisions for the new Natural Area prior to preparation of a final land use and management plan using site-specific data.

The model prepared for this general map depicts areas of environmental sensitivity and human impact based on several factors. These factors include the following:

- Major thoroughfares
- Faults
- Geologic outcrops
- Endangered species
- Topography
- Archaeology
- Floodplains
- Soils

These attributes were considered to be the most important in determining sensitivity of a specific Natural Area to environmental stresses. This sensitivity could in turn equate to the type of management and use that would be appropriate for that site. Table 2 below shows the general scores used in developing this model. Scores were assigned to each attribute based on the level of sensitivity to impacts by man. Thus, a high score would indicate an attribute or feature that is very sensitive to human activities. Conversely, a low score would indicate an attribute or feature that is relatively resistant to human activities. The model was created by converting areas or polygons scored for a specific attribute into a grid layer containing 50 m x 50 m grid cells, each cell containing a score for the specific attribute. Thus, a grid layer was created for each of the attributes listed above. These grid layers were then added together mathematically to produce the map shown in Figure 2. Areas highly sensitive to environmental stress are shown in red, while areas that are not sensitive to environmental stress are shown in pink. The areas were then classified into five different land management classes based on the level sensitivity to human activities. These classifications are to be used to set interim guidelines for the management of each property between the time acquisition is completed and the approval of a final land use and management plan for the Natural Area.

The land manager should be cautioned not to use this data for site-specific purposes. The data was derived from large maps with very low resolution and using general assumptions. Thus, this tool should be used only for a general categorization of the Natural Area based on features within and around the Natural Area that may be sensitive or should be protected.

Table 2. Map layers and feature scores used for the development of the GIS general model for the land use and management plan.

Description of Map Layer	Score
Endangered Species	
Documented endangered species habitat	15
High potential for habitat	12
Good potential for habitat	10.5
Fair potential for habitat	9
Low potential for habitat	6
Very low potential for habitat	3
No potential for habitat	0
Topography (Slope)	
Slopes >10%	15
Slopes 5-10%	10
Slopes 1-5%	5
Slopes <1%	0
Archaeology	
Very high sensitivity	15
High sensitivity	13.5
Moderate sensitivity	12
Sensitive	9
Low sensitivity	6
No sensitivity	0

Geologic Outcrops	
High sensitivity	15
Moderate sensitivity	10.5
Low sensitivity	7.5
No sensitivity	3
Geologic Faults	
Present	5
Absent	0
Soils	
Very high sensitivity	7
High sensitivity	6
Moderate sensitivity	5
Fair sensitivity	4
Low sensitivity	3
Little or no sensitivity	2
Major Thoroughfares	
Thoroughfare present	-5
Thoroughfare not present	0

Natural Area Sensitivity Classifications

It is recommended that all Natural Areas acquired by the CSA be initially classified into one of five categories based on interpretation of sensitive features by the general GIS model. Any one property may contain areas that meet the scores for different classes. Because of this, it is left to the land manager's discretion to determine the classification of the majority of the site. In cases where the majority of the site is divided between two classifications, the more sensitive classification should be used for initial site classification. The following five classifications of properties will be used for initial site management and planning:

- Class 1: Very highly sensitive; score >70
- Class 2: Highly sensitive; score 55-70
- Class 3: Moderately sensitive; score 40-55
- Class 4: Low sensitivity; score 30-40
- Class 5: Very low sensitivity; score <30

The determination of the classification of each site should be made immediately upon site acquisition. Within one month of acquisition, a cursory field survey should be conducted using the Checklist provided in Appendix A. This checklist is used to identify sensitive features and other issues that may impact the management and use of the Natural Area. During this survey, the results of the general GIS model can be confirmed. During the cursory survey, the land manager may determine that the project site could be divided into two or more distinct areas that may be classified separately. This should only be done at the discretion of the land manager and subsequently approved by the Parks and Recreation Department. It is important to note that these classifications are preliminary, but remain in force and effect until site-specific evaluations are conducted and a final land use and management plan is prepared for the Natural Area.

In the paragraphs that follow, the general classifications for Natural Areas are discussed in more detail. These discussions describe the general attributes of each classification and the limitations on use of Natural Areas placed under that classification. This list of classifications is a modification of the original classification system prepared by the Parks and Recreation staff.

Class 1

Class 1 Natural Areas are very highly sensitive areas that would be significantly impacted by most park development improvements and activities. These areas would be dedicated for the primary purpose of preservation and restoration of sensitive biological, geological, hydrological, or archaeological resources. These resources would be considered highly susceptible to damage or degradation by public access and Natural Area improvement. Therefore, these areas should restrict public access and development until site-specific studies have been performed that may identify less sensitive areas within the property that would be appropriate for public access. Land areas designated under this classification should only be surveyed and used by Natural Area personnel or groups accompanied or authorized by Natural Area personnel. Until site-specific studies have been conducted, improvement of these areas should be restricted to preservation of the designated resources. In addition, the sites should be monitored to ensure that degradation of the sensitive features does not occur, or is at least minimized.

During the interim period between classification of the site and site-specific land management plan development, the site will require oversight to ensure that these features are not impacted by public (human) activities in and around the area and by the encroachment of exotic or invasive species, both plant and animal.

Class 2

Class 2 Natural Areas are those areas that are considered highly sensitive and somewhat susceptible to impacts. These areas contain habitat or physical features that may have been modified or impacted in the past by human activities and are now recovering. These areas would be expected to contain endangered species, but the habitat would not be of the same high quality found in Class 1. These areas also contain potential archaeological features and geological features that may not be as sensitive to impacts as those in Class 1.

Class 2 areas should essentially be managed the same as Class 1. However, the potential for significant impacts to this classification is somewhat less than that of Class 1 because the sites are probably recovering from past impacts. These areas could probably be used to a limited extent for scientific research, education, aesthetic enjoyment, and some passive recreational public uses if these are not detrimental to protection of the sensitive features. These sites should be restricted for public use until a formal land use and management plan has been prepared for the site.

Class 3

Class 3 Natural Areas are moderately sensitive Natural Areas that are somewhat sensitive to impacts by man's activities. Most of these sites have been significantly impacted by man's activities in the past. These activities could include limited development, clearing for easements, overgrazing by livestock, and clearing of rangeland. Class 3 areas contain natural resources or features that probably could not be significantly further impacted by appropriate use and activities. In most cases, the vegetation on these areas is at an earlier level of succession and is recovering from past activities.

Limited public access to these sites under the supervision of a Natural Area employee could occur on these sites prior to preparation of a land use and management plan. However, unsupervised public access should not be allowed until the land use and management plan has been developed and implemented.

Class 4

Class 4 Natural Areas would be those that were significantly impacted by human activities in the past and probably contain natural resources or features that are not especially sensitive to further impacts from appropriate use and activities. Location over the Edwards Aquifer Recharge Zone is the only identified sensitive feature of these Natural Areas. However, these sites do contain sufficient vegetation and geologic features to give them potential for restoration and enhancement as part of the land use and management program.

Class 5

Class 5 Natural Areas are areas that have been significantly modified by development and clearing activities. Class 5 properties may be open to alternative parkland classifications other than "Natural Areas" due to their highly impacted and modified condition. These areas may not support populations of perennial or woody vegetation. Typical areas that fall into this category would be areas cleared for development prior to acquisition, areas recently clear-cut for rangeland, cultivated fields, quarries, and other similar sites. Class 5 sites are not likely to be threatened by further appropriate human activity because of existing high levels of impact.

Managing Properties in the Interim Between Acquisition and Preparation of a Land Use and Management Plan

It is important to note that the classification system used for this part of the management of Natural Areas is restricted to the interim period between acquisition of the land and development and implementation of the land use and management plan prepared specifically for the tract. Regardless of whether the land is classified as 1, 2, 3, 4, or 5, it should be restricted from unsupervised public access until the formal land use and management plan has been prepared and implemented. Although these areas have the preliminary classification, it is only to be used for interim management of the site and to assist the land manager in the development of the formal land use and management plan. Many of the properties acquired by the CSA may remain undeveloped as Natural Areas for many years until funds are available for their improvement. These classifications will ensure that highly sensitive areas are properly protected during this

interim period and proper management techniques are used. If during the cursory survey certain sensitive features are identified, management options and rules provided in the site-specific portion of this document should be used until further formal studies are conducted.

A common misconception, especially during this interim period, is that the Natural Areas require no management or minimal management during this period. Although these areas are not open to access by the public, they should be monitored and managed carefully. Some of the management activities that should be performed during this interim period include the following:

- Fences should be checked and repaired as necessary.
- Natural Area staff should carefully mark boundaries and fences with signs every 200 to 500 feet around the periphery of the site designating it as a Natural Area. If fences are not present, markers could be placed on trees or wooden posts.
- Access roads and trails should be maintained for use by Natural Area personnel for site management and monitoring during the interim period.
- A fire plan should be developed to ensure protection of the site from offsite fires and to prevent onsite fires that could spread to offsite properties. Fire plans should be prepared in coordination with the local fire department. Access roads and other trails should be maintained to allow for access by firefighting personnel to a limited extent. Potential areas for fire breaks and fire lanes should be determined in advance to minimize destruction by fires in the future.
- The boundary of the property should be walked and monitored twice per year for security purposes. If possible, current staffing resources should be increased to allow for more frequent monitoring of boundaries.
- Cursory pedestrian surveys of the site should be conducted monthly to monitor sensitive areas and habitat to ensure that they have not been impacted by invasive species or trespassers. This is especially critical for caves, geological features, and endangered species habitat.
- The Natural Area personnel should remain cognizant of any missing persons reported within or near Natural Areas. If this has occurred, Parks and Recreation personnel should cooperate with local law enforcement officials to search the Natural Area for the missing person. Ideally, plans should be coordinated with local law enforcement agencies to develop a plan for searching the site in case a missing person or escaped fugitive issue occurs within the proximity of the Natural Area. Search procedures should be prepared that minimize impacts to sensitive features and wildlife habitat.

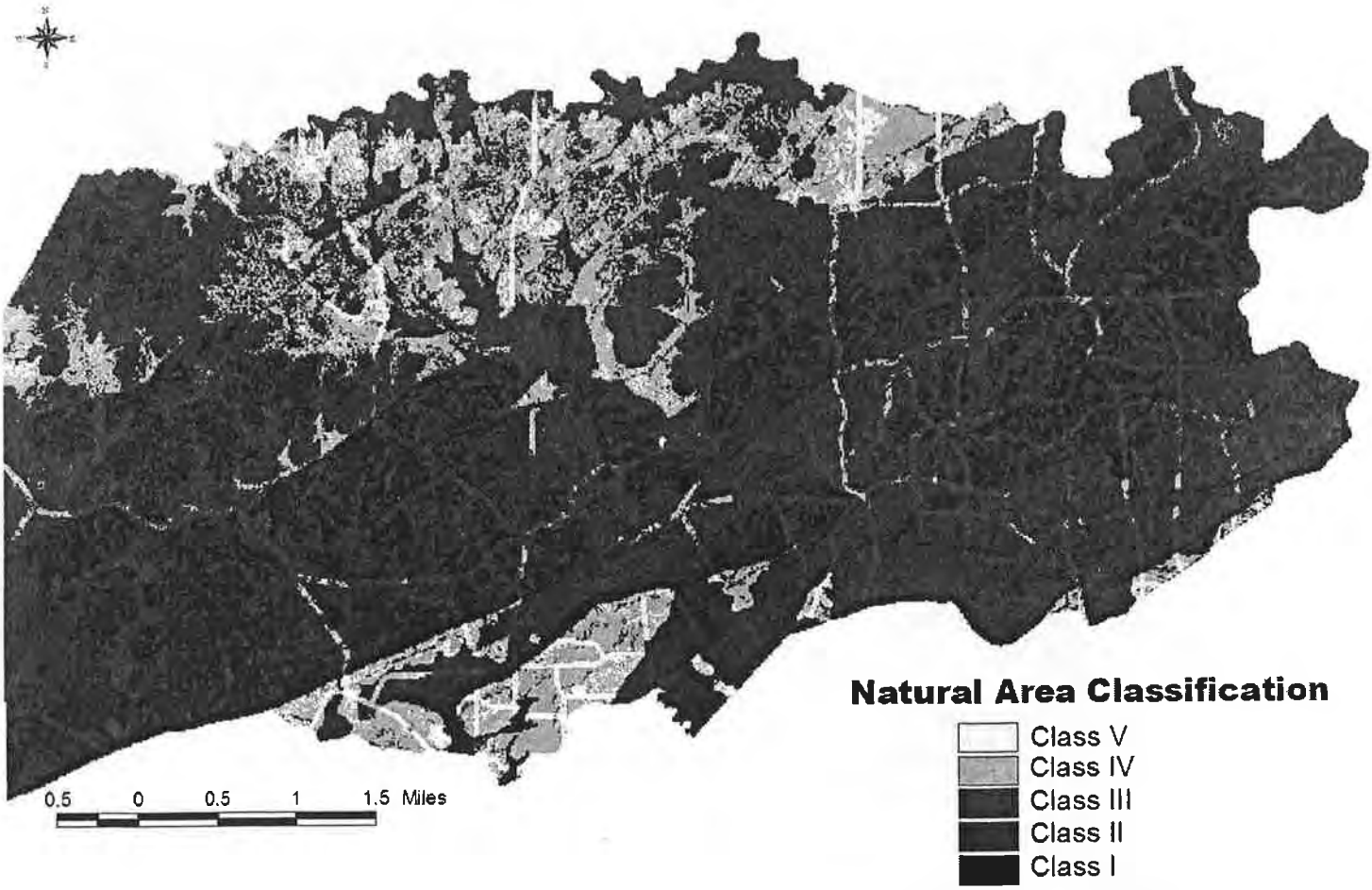
Prior to development of the land use and management plan, all acquired land for Natural Areas should be subject to the following restrictions:

- Public access should be restricted to scheduled visitation by groups and other persons under direct supervision of Parks and Recreation or Natural Area personnel.
- In general, site improvement activities should not be conducted prior to the preparation of a site-specific land use and management plan. The only development activities that should be allowed on the site would be those required to ensure preservation of sensitive features on the site.

- Invasive or exotic species may be removed from the site but only under supervision of the Natural Area manager.
- Maintenance of currently established trails and roads will be allowed, but only for access by Natural Area personnel and/or emergency vehicles in case of fire or other emergencies.
- Maintenance of buildings and historic structures as necessary to prevent any further degradation by trespassers or forces of nature.

It is extremely important that these newly-acquired lands be properly managed during the interim period between acquisition and the preparation of a formal land use and management plan. These areas are highly susceptible to damage by trespassers, fire, exotic and invasive species, and other potential problems. In spite of the fact that they have not been improved and are not in public use, these newly acquired properties still require personnel and management specifically assigned for their preservation and maintenance.

Figure 2. General GIS Model Showing Natural Area Classification



STEP 2: SITE-SPECIFIC EVALUATION

As mentioned previously, data will first be collected and analyzed from the desktop and onsite survey. Once these goals and objectives for land use and management are established for the Natural Area, the land manager should prepare a scope of work that will include a proposal and budget delineating efficient use of in-house staff and outside professionals (if any) to collect the required onsite data. Once the scope of work has been approved, site-specific data will be collected. Site-specific evaluation procedures are discussed in detail in this section, ***Step 2.***

Table 3 lists the natural, cultural, and interpretive/educational issues that may be encountered on the site and must be considered in developing a land use and management plan.

Table 3. Natural and cultural issues potentially impacting land use and management

Natural Resources
Physical Features
Geology
Soils
Surface Water
Biological Features
Species of Concern
Wildlife
Vegetation
Cultural Resources
Archaeological and Historical Resources
Socioeconomics and Land Use
Urban Considerations
Easements

In the sections that follow, each of these issues is described in detail. Each issue section begins with a general description of the feature, methods for collecting data, and methods for scoring data for incorporation into the Site-Specific GIS model or manual decision-making matrix. Appropriate land use and management strategies for the Natural Area are discussed in ***Step 3*** of this section.

NATURAL RESOURCES

Page Number

Physical Features

Geology 25

Soils 39

Surface Water 46

Biological Features

Species of Concern 57

Wildlife 69

Vegetation 74

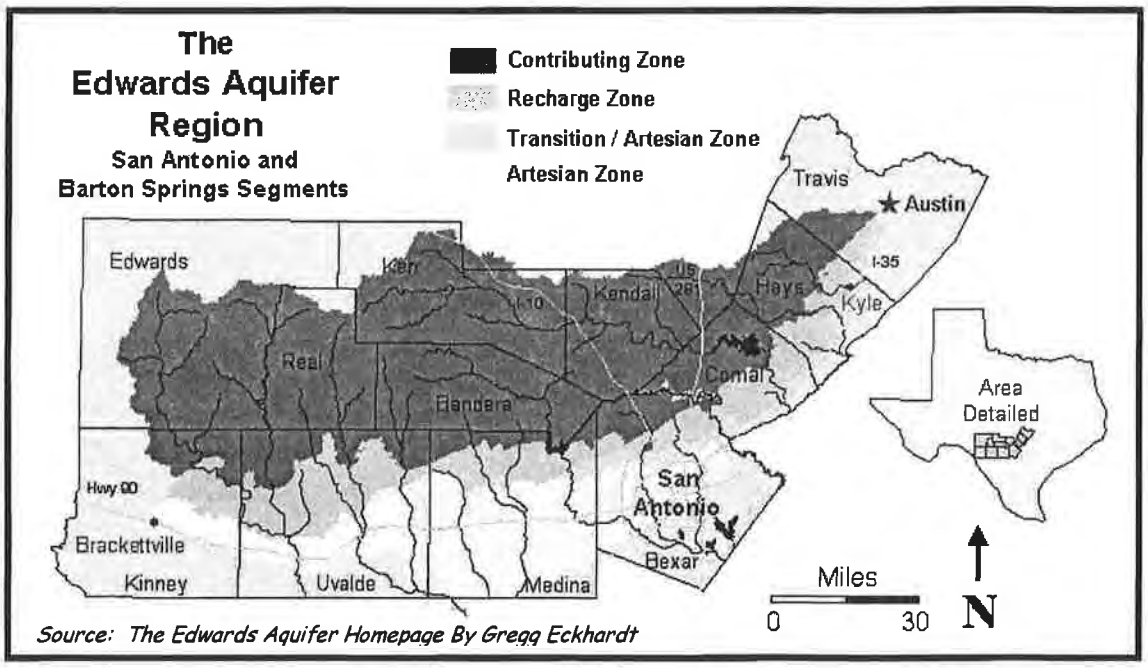
GEOLOGY

General Description

THE EDWARDS AQUIFER

Most of the project area lies over the contributing and recharge zones of the Edwards Aquifer. Presented below is a description of the aquifer identifying sensitive geologic features that provide conduits for water to flow or seep into the aquifer.

The Edwards Aquifer is an underground layer of porous, honeycombed, water-bearing rock that is between 300-700 feet thick. It includes the Edwards Group and other limestone that is in contact with the Edwards. The San Antonio segment of the aquifer is between 5 and 40 miles wide at the surface and the entire system extends in a 160-mile arch-shaped curve from Brackettville in the west to near Kyle in the northeast. At these two locations, groundwater divides separate the San Antonio segment of the aquifer from other Edwards limestones, such that their waters do not mix. The Barton Springs segment extends from Kyle to south Austin. The San Antonio segment contains many of the major natural springs and underlies some of the most heavily populated areas in the region.



Zones of the Edwards Aquifer

The Edwards Aquifer and the surface areas that contribute water to the aquifer are divided into five main zones: the recharge zone, the transition zone, the contributing zone, the artesian zone, and the saline zone.

The Recharge Zone

The recharge zone is a 1,500 square mile area where highly faulted and fractured Edwards limestone outcrops at the land surface, allowing large quantities of water to flow directly into the aquifer. About 75 to 80% of recharge occurs when streams and rivers cross this permeable formation and flow underground. A small percentage occurs when precipitation falls directly on the outcrop. Medina Lake, which is a surface water reservoir built partly on the recharge zone, contributes large amounts of water to the aquifer. Some recent models suggest that as much as 10% of the annual total of recharge enters the Edwards from the Trinity Aquifer. Most of the annual average recharge of about 680,000 acre feet (for the period 1934-2000) occurs in the western counties of Medina and Uvalde. Because rainfall is highly variable, recharge amounts can vary widely from year to year. In the recharge zone, no other rock formations overlie the Edwards; instead, it is exposed at the surface and the aquifer is "unconfined" with a water table that rises and falls in response to rainfall.

The Transition Zone

The transition zone is defined as that area where geologic formations outcrop south and southeast of the recharge zone. This zone is in close proximity to the recharge zone and contains faults, fractures, and other geologic features that provide a possible conduit for surface water to enter the Edwards Aquifer. This zone is characterized by many large faults that are close to the areas where most public water supply wells are located. Water can move through the ground and into the aquifer along these faults.

The Contributing Zone

The contributing zone occurs upstream from the recharge zone and includes all the watersheds that feed runoff into rivers and streams that flow over the recharge zone. This zone comprises about 4,400 square miles of the Texas Hill Country with elevations ranging between 1,000 and 2,300 feet above sea level. The rugged, rolling topography is often covered with thick woodlands of oak and juniper. The contributing zone is also called the drainage area or the catchment area. Here the land surface "catches" water from rainfall that averages about 28 to 30 inches per year in the Bexar County area. Water flows into streams or infiltrates into the water table aquifer of the Edwards Plateau. Runoff from the land surface and water table springs feed streams that flow over relatively impermeable limestones until they reach the recharge zone. (In part adapted from *Introduction to the Edwards Aquifer*, from The Edwards Aquifer Homepage, Gregg A. Eckhardt, used with permission, and *Complying with the Edwards Aquifer Rules, Administrative Guidance,* Texas Commission on Environmental Quality [TCEQ] publication RG-349, 1999.)

The Artesian Zone

The artesian zone is the largest part of the Edwards Aquifer and the area from which most of the water is produced. The water in the aquifer is confined and stored under pressure and will rise above the top of the aquifer when penetrated by a well.

The Saline Zone

The saline zone refers to the southernmost section of the Edwards Aquifer. Pressure separates drinking water from water that is too saline to be potable. This separate area is referred to as the "Bad Water Line". "Bad Water" is water consisting of more than 1,000 milligrams per liter (mg/L) of dissolved solids and is often characterized by a foul odor, higher temperature, and low dissolved oxygen.

Sensitive Geologic Features

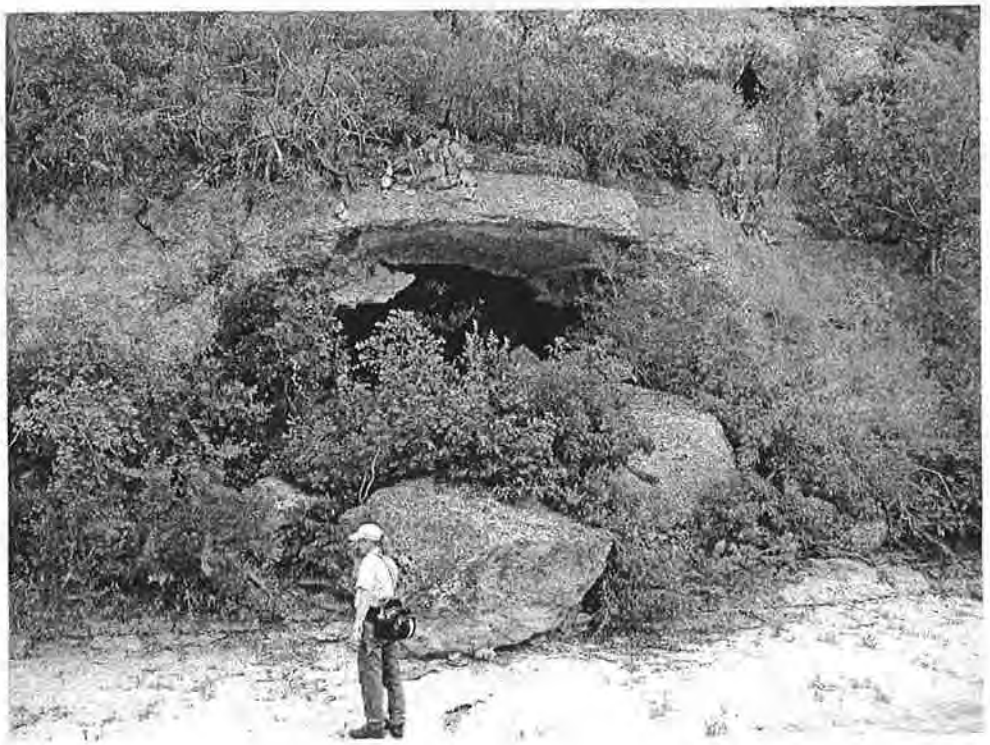
Sensitive geologic features are surface features that allow or enhance flow of water from the surface into the subsurface part of the Edwards Aquifer. Sensitive geologic features include caves, sinkholes, faults, wells, surface streams, potentially permeable fractures, and solution zones. Part of the goal for acquiring Natural Areas is to preserve and protect sensitive geologic features. These features must be identified so that they can be preserved and protected and so that improvements to Natural Areas will not have significant negative impacts to the aquifer.

General GIS Model Geology Layer used for scoring areas according to potential sensitivity of geologic features. This map should not be used for site-specific mapping and scoring, but gives the land manager a general guideline for the level of sensitivity to be expected at each specific Natural Area.

Sensitive geologic features are identified and described in the following section. (Adapted from the TCEQ and other sources.)

Caves. Caves are important both as recharge features and as potential threatened and endangered species habitat. Veni and Associates (1992) defined a cave as "a naturally occurring, humanly enterable cavity in the earth, at least 5 meters in length and/or depth, and where no dimension of the entrance exceeds the length or depth of the cavity." (per the definition of the Texas Speleological Survey). The TCEQ defines a cave as…

> *"…a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Note that caves are commonly partly filled by collapse, loose rocks, debris, or soil; assessment requires sufficient investigation to define the dimensions of the feature defined by in-place bedrock…"*
>
> *"The subsurface extent of the cave must be shown on a map. If a cave map is not available, you must conservatively estimate the amount of passage on the basis of geophysical or other measurements or on the dimensions of typical cave footprints of typical caves in the Edwards recharge zone. The cave footprint is not the same as a buffer zone around the cave entrance."*



This cave located adjacent to San Geronimo Creek is a sensitive geologic feature. Since it is near the creek, water enters the cave during flood events.

Solution Cavities. A solution cavity is a natural cavity or depression formed as a result of dissolution of limestone. This category is designed to capture features that are not

large enough for a normal-sized person to enter but appear to be part of a system of interconnected voids that connect the surface with the subsurface (including features like vertical solution pipes). The size and geometry of the feature are defined by in-place bedrock. Fill must be probed or excavated to determine the size of the feature. If the cavity size appears to increase at depth, this observation should be used to classify the feature as a solution cavity or cave, depending on the size. Features that the geologist interprets as limited to the surface and soil zone (karren, weathering textures, and features formed on loose blocks) are not reported as solution cavities.

Solution-Enlarged Fractures. Only fractures that show evidence of being locally enlarged by dissolution of limestone need to be considered. Solution enlargement can be recognized by measurable (larger than hairline) openings and mismatched fracture surface shapes. Fractured slabs or blocks in the weathering profile are not listed as features unless the geologist interprets them as evidence of relationships between the surface and the subsurface.

This solution cavity in an Edwards Limestone cliff face next to San Geronimo Creek is an example of a sensitive geologic feature.

Faults. A fault is defined as a fracture along which there has been displacement of one side of the fracture relative to the other side. Faults are potentially sensitive recharge features where they indicate the presence of conduits for stormwater, runoff water, or stream flow into the Edwards Aquifer. Faults should be identified in surveys of individual tracts. Major faults are mapped in USGS publications including:

- *Vulnerability of Ground Water to Contamination, Edwards Aquifer Recharge Zone, Bexar County, Texas, 1998,* Water-Resources Investigations Report 0-4149.
- *Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Bexar County, Texas*, Water-Resources Investigations Report 95-4030.

The general GIS model includes a layer showing major faults in Bexar County and also geologic outcrops.

Zones of fractures and faulted Edwards Limestone rocks along drainages are potentially significant recharge features. This example is from the Mayberry property.

Other Natural Bedrock Features. Vuggy rock and reef deposits may contain large holes or vugs. These features are listed in the Edwards Aquifer rules, and their significance as recharge features should be evaluated on a case-by-case basis. Surficial weathering textures (karren) should not be reported as features.

Manmade Features in Bedrock. Water wells, sanitary sewer lines, storm sewer lines, trenches, quarries, and other cultural features that intersect bedrock can potentially increase the rate of recharge to the subsurface. Wells are potential conduits to the Edwards Aquifer from the surface. A listing of wells that have been registered with the State of Texas is available through the TCEQ. Wells that have not been registered will need to be identified during surveys of the individual tracts.

Swallets or Shallow Holes. A swallet is a focused recharge feature located in an intermittent drainage or stream in a karst terrain. Some shallow holes have a surface

expression, for example, a cave opening or formation of a whirlpool in the stream at high flow. The general case is that fine soils and sediment as well as gravel are deposited over the bedrock feature during falling stages of flow, thereby intermittently or frequently obscuring the feature. During the geologic assessment, care must be taken to investigate the possibility that these highly sensitive features may be present in drainage ways. The best method is to field test for infiltration or gauge the stream when it is flowing. Observation of rapid infiltration of pooled water at rates higher than background can help identify buried swallets. Indicators of the presence of karst features (e.g., dipping or fractured bedrock indicating collapse) can help to identify these sensitive features when they are obscured by gravel and sediments.

Sinkholes. Sinkholes are potentially sensitive recharge features that indicate the presence of conduits for stormwater, runoff water, or stream flow into the Edwards Aquifer. Sinkholes should be identified in surveys of the individual tracts. Sinkholes are shallow, broad topographic depressions formed in response to karst processes. Sinkholes are pragmatically defined as features greater than six feet in diameter with more than six inches of topographic relief. Sinkholes are usually circular in map view. In cross section they may be subtle swales or funnel-shaped pits and some have exposed rimrock surrounding the perimeter. It is common for sinkholes to have other karst openings on the floor. The presence of a sinkhole implies that processes including collapse, subsidence, and soil sapping over geologic time have caused the land surface to sink below the surrounding area. Fracture patterns and dipping beds in exposed bedrock can help identify sinkholes. Sinkholes can have subtle topographic expressions, so awareness of soil and vegetation characteristics can help the geologist locate them.

Example of a sinkhole.

Non-Karst Closed Depressions. A non-karst closed depression is a natural or non-natural topographic depression that is not formed by karst processes and does not have a bedrock floor. Features larger than six feet in at least one direction and with six inches or more of topographic relief should be identified. Examples of non-karst closed depressions include scoured pools in drainages, animal wallows, large animal burrows, large pits created by clearing tree stumps, dammed tanks, or other agricultural constructions that are soil floored and do not modify the topography on top of bedrock. Care must be taken to determine that the feature was not a karst feature that has been modified by human or animal activities or a scour that overlies a swallet. The reasons for determination that the feature is non-karst should be noted in the narrative description of the site geology.

Surface Streams. Streams are mapped on U.S. Geological Survey maps, and recharge areas are shown in the publications mentioned above. For a more complete discussion of streams, please refer to the "Surface Water" subsection.

Potentially Permeable Fractures and Solution Zones. These features will need to be identified in surveys of the individual tracts. An area in which any type of karst feature occurs along a trend or in a cluster can be described as a zone. Clustered or aligned features are more likely to be an indicator of an integrated flow system at depth greater than isolated features. Alignment is expected in areas where conduit flow is strongly influenced by structurally controlled features. Fracture control favors connection between the surface and the subsurface and integrates subsurface flowpaths to provide rapid flowpaths to the aquifer and to discharge points. Fracture zones are well developed adjacent to faults and may be more permeable than the fault plane itself. Zones of aligned features can be indicated by subtle evidence such as vegetation, changes in soil properties, and subtle topographic changes.

In addition, the USGS has identified the members of the Edwards limestone formation that are most permeable and that are the primary conduits for stormwater and runoff infiltration into the Edwards Aquifer. Recharge-sensitive members of the Edwards limestone will need to be recognized to minimize activities that may disrupt recharge flow or quality.

Each individual tract should be surveyed for the presence of the features listed above. If these features are observed, they need to be mapped and categorized according to sensitivity and importance.

Data Collection Methods

THE GEOLOGIC ASSESSMENT

The general procedure for preparation of a geologic assessment for a tract includes:

- A review of available geologic maps and publications for the area prior to initiating the field study;
- A field survey of the ground surface for the presence of geologic and manmade features;
- A description of the karst geologic and manmade features identified using the provided Geologic Assessment Data Sheet (Table 2).

If the initial geologic assessment indicates that karst features are present, then the potential for impact to the karst features or caves should be evaluated. Unless these features are identified in a remote area that is unlikely to be visited or impacted by activities in the Natural Area, a karst survey should be performed for the tract. Instructions for performing a karst survey are provided in *Karst Feature Survey Protocols* provided by the USFWS.

If improvements to the Natural Area or proposed activities will impact geologic features by removing vegetation or altering and disturbing the soil surface, a formal geologic assessment may be required under current regulations of the Edwards Aquifer Authority (EAA) and the TCEQ. These types of impacts require preparation of a water pollution abatement plan (WPAP). Such a plan requires a formal geologic assessment performed by a qualified geologist. In addition, the WPAP must be signed and stamped by a professional engineer. Methods used for a formal geologic assessment are much more intensive than those required for a general survey of the tract. Instructions for completing geologic assessments have been prepared by the TCEQ in a document entitled *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones.* This type of assessment comes into play during the design and construction phase of the Natural Area improvements and thus would be part of the plan implementation. For the purposes of this document, formal geologic assessments are not discussed in detail. Only assessment of geologic features on the property for use in preparing the land use and management plan are considered.

Procedure For Conducting A Geologic Assessment

The procedure for conducting a geologic assessment includes the following two steps:

1. Research information
2. Perform a field survey

Researching Information

Published reports and maps of area geology should be studied prior to performing the field survey. A literature or database search should be conducted for the presence of documented caves or other karst features on the property or in proximity to the property boundary. Information may be found about known caves such as mapped extent, depth or elevation, or orientation on the subject tract or on adjacent properties. Some commonly used data sources for geologic maps and cave location and interpretation are included in the Part IV, References. In addition, general geologic maps are provided in the general GIS model.

Further information should be acquired from evaluating former land use practices and modifications. It is helpful to interview persons knowledgeable about historical activities such as well drilling, irrigation or water control ditches or trenches, pit or structure construction, episodes of brush clearing and tree pulling, and cave filling or excavation. Manmade features can be degraded, overgrown and mistaken for natural features on ranches that have been occupied for a long-time. Human activities also may obscure indicators of natural processes that otherwise could be used to determine the sensitivity of a feature.

Historic as well as contemporary aerial photos may be examined for the presence of structural features that should be identified during field surveys and plotted on the map.

Performing a Field Survey

A pedestrian survey should be conducted on the entire subject site to identify of geologic and manmade features. It is recommended that the site be walked systematically in transects, paying close attention to streambeds and structural features observed on aerial photographs. The transect configuration should be modified to ensure that the geologist can observe most geologic features. Configurations will often vary with topography and vegetation on the site. All streambeds should be carefully studied because they provide a major portion of aquifer recharge. Features in streambeds are important to delineate because they are likely to receive large volumes of recharge. These features may be obscured by transported soil or gravel (i.e., swallets or shallow holes). Structural features such as faults and fracture zones have influenced karst processes in the Edwards recharge zone and should be mapped and characterized. Any features identified should be accurately located, preferably using a GPS. The location of the feature should be accurately plotted on a site map and descriptive data recorded. The intensity of investigations should be modified by the land manager to meet the specific requirements of the property. Each mapped feature should be scored according to Table 2 and entered as a map layer into the site-specific GIS model.

Once the geologic assessment has been completed, areas of the tract targeted for improvements should be identified. Depending on the level of impacts imparted to the soil and vegetation, these areas may require additional assessment following the protocols provided under the USFWS for Karst Surveys and under EAA/TCEQ for WPAPs.

Table 2. Geologic Assessment Data Sheet (Modified from TCEQ/EAA protocol)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME:																
LOCATION		FEATURE CHARACTERISTICS												EVALUATION	PHYSICAL SETTING				
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						Length	Width	Height		10						<40	>40	<1.6	>1.6	

* DATUM:_____

Abbrev.	TYPE
C	Cave
SC	Solution cavity
SF	Solution-enlarged fracture(s)
F	Fault
O	Other natural bedrock features
MB	Manmade feature in bedrock
SW	Swallow hole
SH	Sinkhole
CD	Non-karst closed depression
Z	Zone, clustered or aligned features

Abbrev,.	INFILLING
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

Scoring Methods

Sensitive features identified during the geologic assessment will be scored according to Table 3 below. Effort should be focused in order to (1) efficiently and correctly separate sensitive features from features that are not sensitive and (2) provide adequate information about the sensitive features so that appropriate decisions can be made regarding the feature. In some sites, it is likely that a return visit to collect additional information about certain features will be needed to accomplish these goals.

Table 3. Sensitive Geologic Features	Issue Score
Cave	10
Solution cavity	6
Solution-enlarged fracture(s)	6
Fault	6
Other natural bedrock features	2
Manmade feature in bedrock	10
Swallow hole	6
Sinkhole	6
Non-karst closed depression	2
Zone, clustered or aligned features	10

Management Strategies

Management Guidelines

The Edwards Aquifer rules regulate construction-related activities that might contaminate the aquifer or the streams that feed into it. Any activity that involves disturbing the soil or removing vegetation might be regulated by the rules. Depending on the potential impacts of an activity on water quality in the Edwards Aquifer, these rules may (a) prohibit that activity, (b) allow the activity but regulate it, or (c) exempt the activity from certain regulations. Activities that pose little or no risk to water quality in the aquifer are not regulated by the TCEQ. Examples of regulated activities include:

- The construction of buildings, utility stations, utility lines, roads, highways, or railroads.
- Clearing, excavation, or any other activity that alters or disturbs the topographic, geologic, or existing recharge characteristics of a site.
- The installation of underground or aboveground storage tanks on either the recharge or transition zones.

A plan must be developed for protecting water quality during and after construction unless the project or other activity is not regulated. The plan must show how water quality will be protected before, during, and after construction. Additional information on preparing the plan is included in the references listed at the end of this document.

The TCEQ has developed extensive guidelines for minimizing the movement of sediments from construction sites to offsite locations via stormwater. Most of these procedures are called best management practices (BMPs) and are well documented by

the TCEQ in several different guideline documents for the preparation of WPAPs, stormwater pollution prevention plans, and Section 401 certifications. The type of BMPs used can range from silt fences, hay bales, and other devices for controlling sediment movement on smaller sites versus construction of stormwater retention and filtration basins for collection of sediments originating from larger construction and developed sites.

The application of a BMP for water quality control is dependent upon the nature of the site itself. Such factors as slope, soil type and depth, and availability of a constant supply of water, determine which BMPs may be appropriate. Additional information on BMPs can be found in the publications listed in the reference section of this document.

In areas where permanent structural BMPs are not required, non-structural BMPs may be used. Non-structural BMPs should be identified and integrated into the land use and management plan. Examples of non-structural BMPs that may be employed include:

- Education of Natural Area staff on standard pollution prevention/good housekeeping methodology and the detection and elimination of potential pollution sources both onsite and offsite.
- Public education and outreach on stormwater pollution prevention, especially for neighboring properties.
- Public involvement and participation in assisting with the placement of erosion control devices along trails and improvements, removal of litter and other pollution sources, and control of offsite pollution impacts.

Many of the varied non-structural management practices and source controls available are good examples of common sense and a stewardship ethic. Nearly any technique that reduces the potential adverse impacts of our daily activities on a watershed's natural resources can be considered a non-structural control.

MANAGEMENT LIMITATIONS

After the geologic assessment is completed, the data will be evaluated. High scoring features and areas should avoid higher-impact developments including parking areas, buildings and other constructed improvements. More specific options for sensitive features follow.

Caves and Sinkholes: Disturbance to caves should be avoided. In general, trails and improvements should be located so that caves are not impacted. Caves that are in remote areas should be identified in the geologic assessment and evaluated to determine whether or not they may be disturbed. If the probability of future disturbance is low, then the cave would probably not require a karst survey per USFWS protocols. If caves are in areas where the potential for human impacts is high, then a USFWS karst survey should be performed. Following the survey, appropriately designed gates or fences should be installed to allow for water infiltration while preventing impacts from humans.

Faults: Significant impacts to faults should be avoided where feasible. Permeable pavements should be used to allow infiltration of water into faults. Trails that cross faults

generally do not cause significant disturbances to faults, especially when the trail is configured perpendicular to the fault and does not follow the fault. Trails should not be constructed parallel to faults due to potential impedance to water infiltration and increased erosion.

Wells: Wells that are no longer in use should be properly plugged and abandoned according to TCEQ requirements. Wells that are in use should be inspected and the production monitored to ensure that the wells are operating properly.

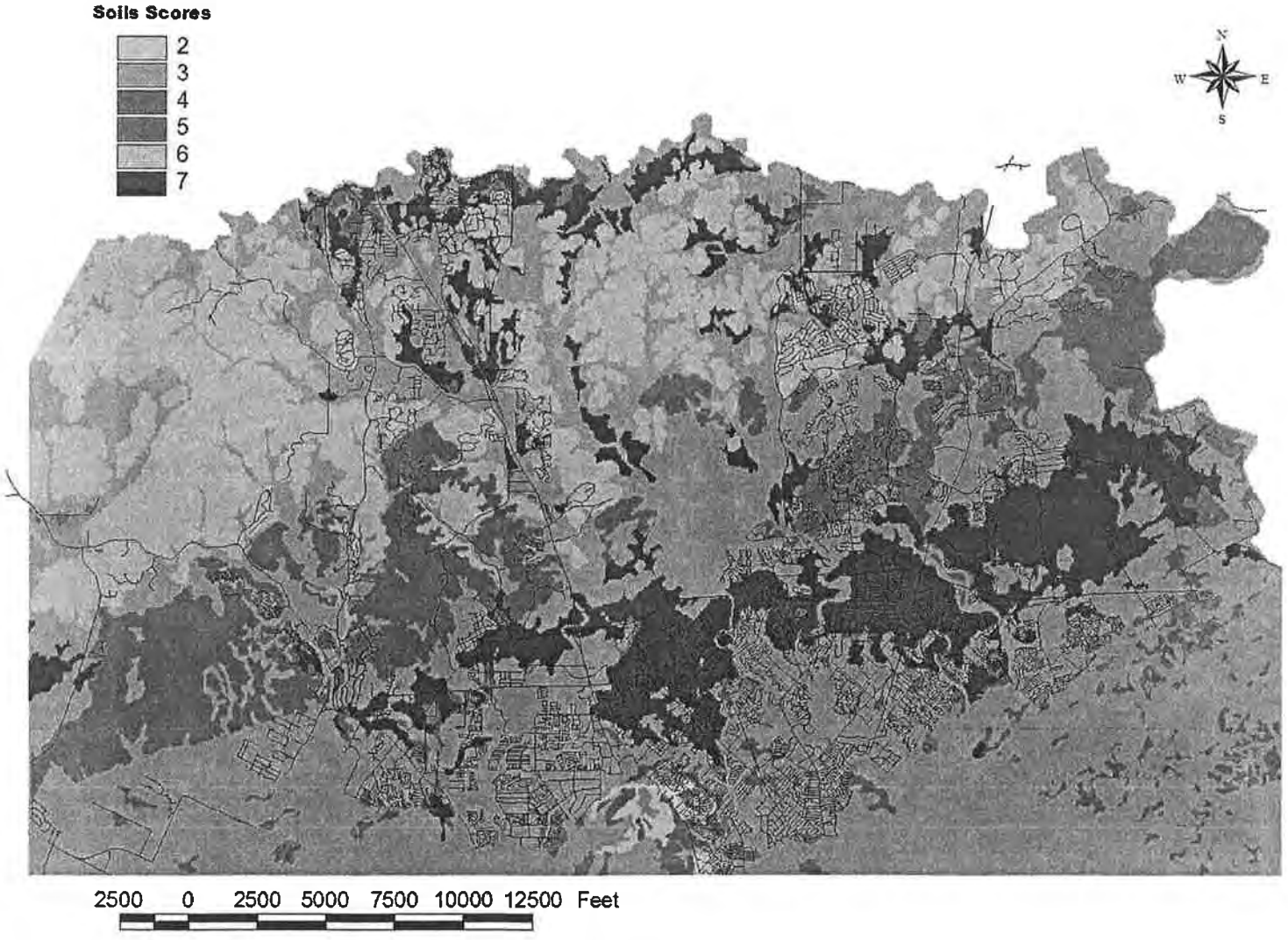
Surface Streams: Streambeds are sensitive recharge features that provide habitat for aquatic and terrestrial wildlife species. Disturbance to streams should be avoided.

Potentially Permeable Fractures and Solution Zones: Disturbance of potentially permeable fractures and solution zones should be avoided where feasible. Permeable pavements should be used whenever possible to allow for infiltration of water.

SOILS

General Description

Soils have far-reaching effects on the use and management of Natural Areas. The type of soil determines the vegetation community that can develop in a Natural Area as well as vegetation that could potentially be planted or managed for the site. In addition, soils often limit the types of improvements that can be constructed on a site, including buildings and trails. Soils also provide valuable information on the potential for erosion, both by wind and water. The General GIS Model includes a mapping layer showing the soil mapping units for northern Bexar County. This in compbination with the Bexar County soil survey are excellent tools for preparation of a land use and management plan for a Natural Area.



General GIS Model Map showing the scores associated with potential sensitivity of soil features in northern Bexar County.

SOIL TYPES

According to the Soil Survey of Bexar County, the project area overlies three different soil associations:

- The Tarrant-Brackett association which includes shallow and very shallow soils lying over limestone;
- The Crawford-Bexar association which includes moderately deep, stony soils lying over limestone;
- The Lewisville-Houston Black, terrace, association which are deep clay soils lying over calcareous clay and marl.

The majority of the project area lies over the Tarrant-Brackett association and the Crawford-Bexar association. Only the northern portion of the project area that extends over the Cibolo Creek corridor contains the Lewisville-Houston Black, terrace, association. In the sections that follow, each of these associations will be described in general. In addition, potential issues or considerations for each of the soils found in these associations will be discussed.

Tarrant-Brackett Association

The Tarrant-Brackett soil association is found mostly in the western and northern portions of the project area. These soils developed predominantly over limestone. Topography associated with these soils ranges from generally sloping to very steep. The soils tend to be shallow or very shallow and are moderately permeable. Usually they are underlain by either the Glen Rose limestone formation or the Edwards limestone formation. The most common soils found within this association include Tarrant soils and Brackett soils.

Tarrant soils are very dark, clayey soils that usually are calcareous and range from a few inches to about 10" in thickness. These soils are often mixed with stones, flagstones, cobblestones, channery fragments, and gravel. In most cases, these soils overlie hard fractured limestone.

Brackett soils are lighter in color than Tarrant soils but also have a highly calcareous surface layer. They tend to be 4" to 16" thick and lie over either soft marl or limestone which is embedded with hard limestone. Like the Tarrant soils, Brackett soils are mixed with stones, gravel, channery fragments, and cobblestones. Very often these soils contain outcropping slabs of limestone that give the landscape a stair-step appearance.

Considerations for Tarrant-Brackett Soils

In general, the Tarrant-Brackett soil association is not suited for crops and has been used as rangeland in the past. A great deal of San Antonio is now expanding into this area for development of suburban home sites. Undeveloped portions of this association have been also used for wildlife preserves and shooting leases. The ruggedness of topography makes these areas difficult for use of machinery for maintenance.

Major considerations for development over these soils include the following:

- Brackett Soils
  - Relatively active erosion, even where vegetation is present.
  - Low fertility.
  - Best suited for pasture or range, but their alkaline condition often results in poor forage quality.
  - Fairly well suited for path and hiking trail development as well as riding trails where topography is flat.
  - Depending on topography, fairly well suited for picnic grounds.
  - In general, these soils are not very well suited for cottages and utility buildings except in level areas. Base material would be required for construction of buildings and roads.
  - Not suitable for development of ponds or other bodies of water.
  - In general, excellent for wildlife.

- Tarrant Soils
  - Best suited for rangeland or wildlife habitat.
  - Water erosion is a major limitation.
  - Lack of soil moisture is a major limitation.
  - Well suited for paths and trails.
  - Fairly well suited for riding trails where topography is flat.
  - Well suited for picnic grounds in areas where topography is flat.
  - Suitable for small buildings only in areas where slopes are less than 5%.
  - Poorly suited for construction of ponds.
  - Very suitable for wildlife management.

Crawford-Bexar Association

A major portion of the project area that overlies the Edwards recharge zone is comprised of soils from the Crawford-Bexar Association. Crawford soils are moderately deep and are typified by a brown or reddish-brown color. Crawford soils are usually clays that are 12" to 16" thick and overlie broken limestone. The soils are often mixed with large fragments of chert and limestone. In some cases, the soil is free of these fragments and can be used for growing crops. These soils are naturally well drained and crack when the soil is dry. They are often high in natural fertility and can be quite productive for forages. Erosion can be a real problem on this soil if vegetation is not present.

Bexar soils are also moderately deep and have the same color and thickness as Crawford soils. Bexar soils overlie soft, weathered limestone and hard, crystalline limestone. These soils tend to be very stony and are not suitable for cultivation. Most of the areas containing these soils are used for rangeland. Soil fertility is relatively good and will provide high-quality forages for wildlife.

Considerations for Tarrant-Brackett Soils

Issues associated with the soils in this association include the following:

- Crawford and Bexar Soils
  - Well suited for paths and hiking trails.
  - Moderately suitable for riding trails where topography is flat.
  - Moderately suitable for picnic grounds where topography is flat.

- Not suitable for construction of buildings.
- Not suitable for construction of ponds.
- Suitable for wildlife management.

Lewisville-Houston Black, Terrace Association

This association occupies only a small portion of the project area on the eastern end of the Cibolo Creek basin. This association is characterized by deposits of calcareous alluvium found along the banks and terraces of Cibolo Creek. Most of the soils in this association are deep clays or silty clays formed by alluvium. On the project area, the majority of these soils are Lewisville silty clays. Lewisville soils are deep, silty clays that usually overlie clays. These soils are relatively easy to identify on the project area because most of them are currently used for cropland production.

Considerations for Lewisville-Black, Terrace Association

These soils have excellent natural fertility and can produce high-quality forage if allowed to go back to natural conditions. Issues associated with Lewisville soils include the following:

- Susceptibility to water erosion is very serious on sloping areas but slight in nearly level areas.
- Moderately suitable for paths and hiking trails.
- Suitable for riding trails where topography is flat.
- Moderately suitable for picnic grounds.
- Moderately suitable for building construction.
- Somewhat suitable for pond construction.
- Suitable for wildlife management.

RANGE SITES

As previously discussed, soils have a definite impact on the type of vegetation that will grow in an area depending on moisture regimes and other factors. Each of the soils listed above is characterized by certain range sites that have been described by the NRCS. The condition of the range can be determined by the types of plants present. This allows for determination of the level of impacts that have been experienced by a specific area. In addition, it allows for prediction of the potential vegetation community expected to develop on a site as well as the approximate time for the site to recover from impacts.

An in-depth discussion of range sites and vegetation is provided in the "Vegetation" subsection. Range sites that are associated with soils found within the project area are listed below:

- Crawford series: Redland range site
- Bexar stony soils: Redland range site
- Brackett soils: Steep Adobe range site, Adobe range site, Low Stony Hill range site

- Tarrant soils: Low Stony Hill range site, Steep Rocky range site, Rocky Upland range site
- Lewisville soils: Clay Loam range site

Data Collection Methods

The most important tool to be used for data collection of soils is the Bexar County Soil Survey provided by the NRCS. Within the soil survey are aerial photographs showing specific soil mapping units. Boundaries of the Natural Area should be located on the aerial maps. The types of soils found within the boundaries can then be observed on the soil survey aerials. The mapping units shown on the aerials show only the dominant soil in the area and may contain inclusions (other soils that may be found in a mapping unit, but to a lesser degree). Therefore, the land manager should map and identify soil mapping units in the field, if at all possible, to obtain more accurate, site-specific data. Soils could be mapped and identified when the geology or vegetation surveys are being conducted. For use in the GIS model, these specific mapping units should be transferred to electronic format and designated scores according to the scoring scheme described in the next section. In general, usage of Natural Areas as influenced by soils will be especially impacted by topography or slope. Most of the soils are well suited for trails and low-impact development but, depending on topography, more intensive uses may be appropriate.

Scoring Methods

As previously discussed, the actual use of soils on a site is impacted not only by the soil type but also by topography and slope. Therefore, in scoring the potential uses of soil types, both of these factors must be considered. The scores shown in Table 4 are based on soil mapping units as listed in the Bexar County Soil Survey.

Table 4. Soil Mapping Units	**Issue Score**
Brackett clay loam, 1-5% slopes	2
Brackett soils, 5-12% slopes	3
Brackett soils, 12-30% slopes	6
Brackett-Austin complex, 1-5% slopes	5
Brackett-Tarrant association, hilly	6
Crawford clays	5
Crawford and Bexar stony soils	7
Lewisville silty clay, 0-1% slopes	3
Lewisville silty clay, 1-3% slopes	3
Lewisville clay, 3-5% slopes	3
Tarrant association, gently undulating	3
Tarrant soils, chalk substrate, undulating	4
Tarrant association, rolling	3
Tarrant association, hilly	5

Note: Scores are based on a range of 1 to 10, with 1 being low sensitivity and 10 being extremely sensitive.

Management Strategies

MANAGEMENT GUIDELINES

In general, soils found within the project area are ideal for Natural Areas. These soils are especially suited for development of wildlife management areas and preserves. All of the soils are fairly well suited for low-impact activities when they are located in areas that are flat or have no more slope than approximately 3%. These areas could be used for construction of parking lots, picnic areas, and facilities including restrooms, interpretation/educational facilities, offices, and maintenance areas. Base material will probably be required, especially in areas where soils are thin or extremely clayey. However, many of the low, flat areas contain thicker soils that are less susceptible to erosion and more suitable for infrastructure development. Please note that decisions for improvement of the Natural Area should be made based on all features and not just soils.

As the slope increases on all of these soils, the suitability for higher intensive use decreases significantly. In general, we recommend that any areas greater than 10% slope should be used only for low impact trail development and wildlife habitat. Ideally, structures should not be constructed in any areas where slopes are greater than 5% unless modifications are made in the design to accommodate slopes and erosion issues. In areas where slopes are extremely steep, trails should be configured in a manner to decrease potential for erosion.

Nearly all of the land located in the Cibolo Creek basin on the east side of the project area is typified by cultivated croplands and Lewisville soils. These areas are well suited for nearly all forms of recreation. If the site is designated as a Natural Area, it should be allowed to grow back to native vegetation to conserve and preserve the natural heritage of the site. Some of these sites may be appropriate as recreational areas and could be used as such if authorized by the Parks and Recreation Department. Because these areas are supported by alluvial soils, care should be taken to ensure that improvements are not placed in floodplains or wetlands. In areas where crops have been cultivated, the NRCS should be consulted to determine if prior converted wetlands (wetlands that had been drained and used as croplands in the past) are present. If the use of the land is changed from agricultural or natural conditions to any other land usage, a Section 404 permit may be required. Those areas that fit this description should be allowed to convert back to wetlands as they were in their original state.

Opportunities for development of the various types of soils found on the project area are listed below according to the group of soils and/or topography.

- Tarrant, Brackett, Crawford, and Bexar soils: 0-5% slopes
    - Hiking trails
    - Riding trails
    - Biking trails
    - Picnic areas
    - Parking lots
    - Restrooms
    - Interpretation/educational facilities

- Maintenance facilities
- Other small structures
- Outdoor amphitheaters
- High-quality wildlife habitat

- Tarrant, Brackett, Crawford, and Bexar soils: 5-15% slopes
  - Hiking trails
  - Riding trails
  - Biking trails
  - Wildlife observation benches or shelters
  - Fitness trails

- Tarrant, Brackett, Crawford, and Bexar soils: >15% slopes
  - Trails (erosion control structures definitely required)
  - Limited wildlife observation areas such as benches

- Lewisville soils
  - Hiking trails
  - Riding trails
  - Biking trails
  - Picnic areas
  - Parking lots
  - Restrooms
  - Interpretation/educational facilities
  - Maintenance facilities
  - Other small structures
  - Outdoor amphitheaters
  - High-quality wildlife habitat

MANAGEMENT LIMITATIONS

The major limitations for Natural Area management associated with soils are closely related to topography. As the slopes increase, the sensitivity of the soil to improvement options increases. As previously discussed, most of the areas with less than 3% slope can be used for many improvement options. However, as slopes increase, uses are definitely limited by susceptibility of soils to erosion and other hazards. Extremely steep areas would be very difficult to develop. These areas should be restricted to use as trails or wildlife preserves. If trails are placed in these areas, they should be configured in a manner to decrease susceptibility to erosion. Depending upon the level of slope, different erosion control structures will be required.

SURFACE WATER

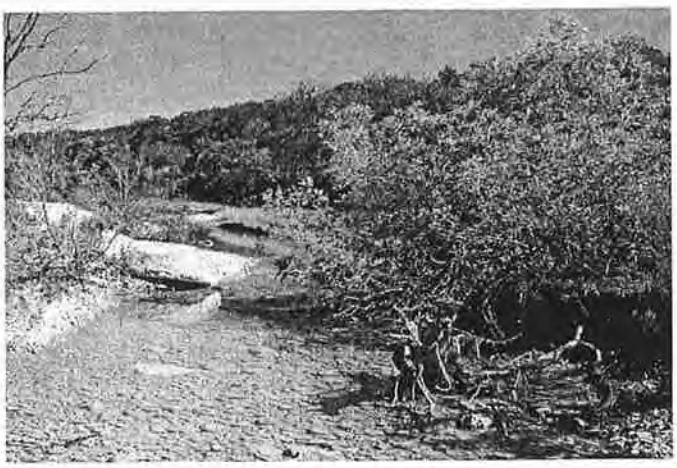
General Description

Within the general project area, some issues unique to surface water will be encountered. Surface waters include streams, rivers, lakes, ponds, wetlands, seeps, and springs. Recently, federal jurisdiction of surface waters has been extended for streams. Now, the U.S. Army Corps of Engineers (USACE) requires permits when any stream is filled. This includes ephemeral streams, which, in most cases appear to be dry streambeds. The USACE takes jurisdiction over these streams as long as there is a defined channel or an ordinary high-water mark. Interestingly, the USACE's jurisdiction over wetlands has decreased. Currently, the USACE only controls filling of wetlands, and only those wetlands that are connected to other waters of the U.S. by stream channels, floodplains, hydric soils, or groundwater. Isolated wetlands such as abandoned stock ponds that are not connected to a nearby stream are no longer under the jurisdiction of the USACE. On City of San Antonio Natural Areas, many stock tanks would be considered isolated or would be exempt from filling if they have been used by cattle within the last 5 years. For the purposes of this plan, surface waters will be divided into the categories that follow.

Streams

Perennial Streams. Perennial streams are streams that flow continually throughout the year and receive most of their water from groundwater sources. Perennial streams in the project area are relatively rare because most of the water collecting in streams percolates into the Edwards Aquifer. Because of the rareness of perennial streams in this area, these would be considered sensitive features of Natural Areas. Perennial streams tend to attract people for recreational activities and also tend to be the most impacted by human activities. Perennial streams serve a very important function in ecosystems, providing aquatic habitat as well as transitional habitat between wet areas and terrestrial areas. Most of the perennial streams in the project area support a rich diversity of vegetation along the riparian corridors.

Intermittent Streams. Intermittent streams are those that flow periodically during the year but may dry up during periods when precipitation is low. Intermittent streams gain at least 10% of their flow from groundwater sources. Intermittent streams are more common in the project area than perennial streams and provide a very important role in the establishment of riparian corridors and habitat conducive to many of the species of concern found in the area. The photo



shows San Geronimo Creek on the Mayberry Tract where it is an intermittent stream that only flows when water tables are high or after significant precipitation has occurred.

Ephemeral Streams. Ephemeral streams derive all of their flow from surface water. The only time that these streams flow is following storm events. Jurisdiction of the USACE extends up to the point where ephemeral streams no longer exhibit a definable channel or an ordinary high-water mark. The vast majority of streams on the project area are ephemeral. Ephemeral streams play an important role in that they provide a semi-moist environment for the establishment of vegetation and wildlife. In addition, they provide channels for the collection of surface water running from the upper limits of watersheds.

Watersheds

For the purposes of this plan, watersheds are restricted to those areas potentially contributing stormwater to any streambed. All surface areas found in a Natural Area are part of a watershed. Watersheds can be defined by the stream into which they flow and are typically defined by ridgelines, which determine the direction of flow of surface waters. The size of the watershed is arbitrarily set by the land manager and is usually based on the objectives and goals of surface water quality management for the Natural Area. Water originating in watersheds enters streams by sheet flow or through poorly

defined channels. The photograph in this section shows a part of a typical watershed in Northern Bexar County. Watersheds are extremely important because they are the original source of surface water that eventually flows into the Edwards Aquifer. A properly functioning watershed will filter and clarify water before it actually enters streams and eventually resides in the Edwards Aquifer. Much of the watershed in the project area has been degraded due to overgrazing, urban development, and vegetation

removal. All of these activities result in decreasing the filtration and clarification functions of the watershed, causing sediment-laden water to enter the recharge zone. It is vitally important that we protect and nurture watersheds in these Natural Areas. In addition, watersheds from urban developed areas flowing into Natural Areas should be carefully examined and methods of improving the water flowing through or into the Natural Area should be addressed.

Lakes and Ponds

Lakes and ponds usually hold water throughout the year except during extreme drought conditions. In most cases, lakes and ponds derive their water from surface water

sources, although some derive a portion of their water from groundwater sources. Lakes and ponds provide aquatic habitat and water for terrestrial species. In addition, they provide aquatic species for predation by terrestrial species and of course an aquatic ecosystem, which is a rare occurrence in the project area.

Wetlands

Wetlands are areas that are inundated or saturated for a sufficient period of time to support aquatic plant species specifically adapted to anaerobic (lacking oxygen) conditions associated with this environment. Wetlands are under the jurisdiction of the USACE if they are connected to other waters of the U.S. Wetlands are not a common occurrence in the project area.

They tend to occur along the banks of streams and lakes. They are a common occurrence in abandoned stock ponds and areas where water collects and may stand for long periods of time, such as borrow pits and swales. In addition, wetlands are often found in areas where springs saturate soils or produce shallow water environments that are lush in vegetation. The photograph included in this section is a small vernal wetland that contains water only during the wet part of the growing season, but holds the water for sufficient time to support a wetland environment. Like lakes and ponds, wetlands serve a very important function in nature, specifically by adding a more diverse environment and providing water for use by terrestrial and aquatic wildlife.

Seeps

Seeps are locations where groundwater flows at a very slow rate, exiting geologic formations into areas of saturated soils or very slow flowing water. In most cases, seeps support a microenvironment comprised of saturated soils and small, shallow pools of

water. Seeps are commonly associated with a confining geologic layer which intercepts shallow groundwater often originating from precipitation. The water moves through a more permeable geologic formation and intercepts the confining layer, causing it to flow across the surface of that layer. The water then exits the geologic formation, usually at a cut or along a fault line or streambed. Many of the Natural Areas contain seeps that are located along the bases of cliffs, streams, and faults. These are very important ecological features in that they provide small microenvironments and ecological niches that support small, isolated, and often unique plant communities. These plant communities in turn support unique vertebrate and invertebrate wildlife populations. Many of the rare ferns and orchids are found around seeps. Because of this fact, these areas should be considered extremely sensitive and the land manager should take precautions to preserve and protect these areas.

Springs

Springs are similar to seeps but are often located in the headwaters of streams. On the Edwards Aquifer recharge zone, these streams may only flow a short distance due to the fact that the streambeds often contain recharge structures and the water is returned back to the Edwards Aquifer. Both springs and seeps may not flow all year depending

on the level of the water table. Springs differ from seeps in that they support a flowing body of water or feed into a larger pool or pond. Springs are also very important in Natural Areas, especially in northern Bexar County. Springs are somewhat rare and,

like seeps, support unique populations of plants, invertebrates, and vertebrates. They also provide a source of water for terrestrial wildlife, both common and endangered species. Both seeps and springs are very important sources of water for the GCW and BCV. The stream shown in the photograph in this section is fed by a spring.

Upland Ditches

Upland ditches are ditches that were excavated by man to either drain upland areas or to provide for an accumulation of stormwater for runoff into other bodies of water. Many upland ditches support unique populations of plants due to the fact that they accumulate and hold water for long periods of time. This is especially common in upland ditches that are relatively level and contain uneven areas that tend to block flow and accumulate water. Upland ditches are not jurisdictional under the USACE except where they connect to jurisdictional bodies of water and the water from those bodies of water flows through the ditch. In other cases, an upland ditch can flow into a jurisdictional body of water and is jurisdictional only where the ordinary high-water mark of the jurisdictional body of water lies within the ditch. In most cases, upland ditches are not jurisdictional and can be managed in any manner without intervention of the USACE. On the Natural Areas owned by CSA, upland ditches should be protected if they support aquatic wildlife or aquatic habitat. In addition, they should be protected if they are supporting wetlands or other similar plant communities.

Summary

Because most of the project area lies in the recharge zone or contributing zone, wetlands and surface waters are relatively uncommon. This is due to the fact that the area is located on an outcrop of the Edwards limestone that is characteristically permeable. However, some of the stream valleys and alluvial plains in the area contain relatively thick deposits of clay and alluvium and may actually hold water, providing an environment conducive to wetlands or other aquatic habitat. Wetlands and surface

waters are very important to Natural Areas because of their somewhat uncom mon occurrence. Wildlife require water for their existence, so these sources of water must be protected. Wetlands also develop unique plant communities that provide edge habitat and add diversity to the Natural Area environment.

Data Collection Methods

Once a piece of property has been acquired, USFWS wetland inventory maps should be reviewed to determine if any potential jurisdictional wetlands occur on the site. It is important to note that wetland inventory maps only denote potential jurisdictional wetlands and do not necessarily confirm that areas are wetlands. In addition, aerial photographs and soil surveys should be reviewed to determine potential sites for wetlands. Once these sites have been determined, the property should be physically surveyed to identify and map all potential jurisdictional wetlands. Boundaries and sizes of wetlands should be determined by a qualified biologist/wetland scientist. The ultimate purpose for determining the wetland boundaries will dictate whether they should be surveyed rather than simply approximated.

Vernal pools and ephemeral wetlands are the more common wetlands found on the project area and are critically important features in canyonlands. At the time of field inspections, these wetlands may appear as only small depressions containing relatively dense populations of sunflower, giant ragweed, seacoast sumpweed, and other invasive annual weeds. Sometimes these areas contain a monoculture of bermudagrass or no vegetation at all. During wet seasons, these depressions hold water for sufficient time to produce anaerobic conditions and support wetland vegetation at that time. During wet periods these small pools often support populations of tadpole shrimp, insect larvae, amphibians, and other aquatic species. During dry periods, the wetland vegetation disappears and is replaced by annual plants such as those listed above.

Streams located on the site should also be delineated to where the ordinary high-water mark or a defined channel is no longer present. It is recommended that high-quality aerial photographs be prepared for the site. These should then be converted into topographic maps with 1 to 2 foot contours. Maps and aerials are excellent tools for mapping and identifying surface waters on each site. In addition, this information can be incorporated into GIS to provide detailed information on watersheds on the site. Once information for all wetlands and other surface waters of the U.S. has been collected, they should be mapped and inventoried for management purposes.

After surface bodies of water have been identified and mapped, the watersheds contributing to each of these bodies of water should be delineated. Watershed delineation is best accomplished by carefully identifying ridge lines and determining the direction of water flow from topographic maps for the tract. Again, the importance of having high-quality topographic maps and aerials cannot be overemphasized, especially for watershed delineation. Several hydraulic models, such as those found in ArcView™ are excellent tools for delineating watersheds. Once the watersheds are identified, field studies should be conducted to determine the quality of the watershed. The most important factor for a high-quality watershed is the presence of relatively dense vegetation to provide filtration of water as it runs over the surface of the watershed. Sod grasses, bunch grasses, and dense stands of herbaceous vegetation are indicative of a high-quality watershed. Woody vegetation is also important in watersheds but often

does not always provide adequate filtration of stormwater and decreases the quality of water originating from the area due to a high concentration of suspended solids. This is due to the fact that the soil surface under woody vegetation tends to be sparsely populated with herbaceous vegetation. However, leaf litter and interception of rainwater by tree foliage decreases the impact of rain on the soil surface, allowing for some woodland areas to be relatively good watersheds. Examples of degraded watersheds would include overgrazed areas, areas completely devoid of vegetation, areas where vegetation has been removed for urban development, and areas covered with impermeable surfaces including rooftops, parking lots, roads, and high-impact trails. These areas should be delineated and scored accordingly. Areas having poor watershed characteristics should be mitigated by various techniques including invasive plant removal, planting of native species, and allowing areas to grow back by preventing further negative impacts. These areas should be set aside and not used for any activities until they have recovered from their previous disturbances.

Once onsite watersheds have been delineated, watersheds that flow into the Natural Area should be delineated and characterized. Watersheds potentially contributing contaminated water into the Natural Area should be identified, and methods to minimize impacts from these watersheds should be considered. Ideally, owners of the watersheds offsite could be encouraged to improve the runoff water quality of that area by using best management practices for control of stormwater runoff. Because much of the project area is located on the Edwards Aquifer recharge zone, most offsite areas are under jurisdiction of the TCEQ and must meet certain standards for the filtration of stormwaters. If degraded sources of water are identified offsite, this information could be brought to the attention of the TCEQ.

Scoring Methods

In general, it is recommended that any surface water or wetland encountered on a site be protected. These are valuable assets for Natural Areas and provide extremely important water sources for wildlife in the area. Table 5 provides a list of potential surface waters with an associated sensitivity score.

Table 5. Surface Water	**Issue Score**
Streams	
Perennial stream	10
Intermittent stream	8
Ephemeral stream	6
Watersheds	
Greater than 90% herbaceous vegetation cover	8
Greater than 80-90% herbaceous vegetation cover	6
100% tree canopy with >50% herbaceous vegetation cover	6
90-100% tree canopy with <50% herbaceous vegetation cover	4
70-80% herbaceous vegetation cover	4
50-70% herbaceous vegetation cover	2
25-50% herbaceous vegetation cover	1
<25% herbaceous vegetation cover	0

Table 5. Surface Water	Issue Score
Ponds and Lakes	
Abandoned stock pond	7
Active stock pond	5
Lake or pond	8
Wetlands	
Connected wetland	10
Isolated wetland	8
Ephemeral wetland or vernal pool	8
Other Water Sources	
Seeps	10
Springs	10
Upland ditch—dry	3
Upland ditch—supporting wetland or aquatic habitat	7

Notes:

1. If woody vegetation is less than 90% cover, evaluate herbaceous cover both under and between woody plants.
2. Shrubs (woody plants <6 ft. tall) should be treated as herbaceous cover adjusted by a factor of 75%. For example, 100% shrub cover would be equivalent to 75% herbaceous cover.

Management Strategies

Management Guidelines

A common problem in streams on the project area is the presence of trash in floodwaters. Trash from offsite can collect in floodwaters and flow through a Natural Area leaving plastic bags, cans, and various items along the riverbanks or stream banks. An effort should be made by the Natural Area staff to encourage managers or owners of offsite areas to practice good environmental stewardship by encouraging their patrons to dispose of litter and trash properly.

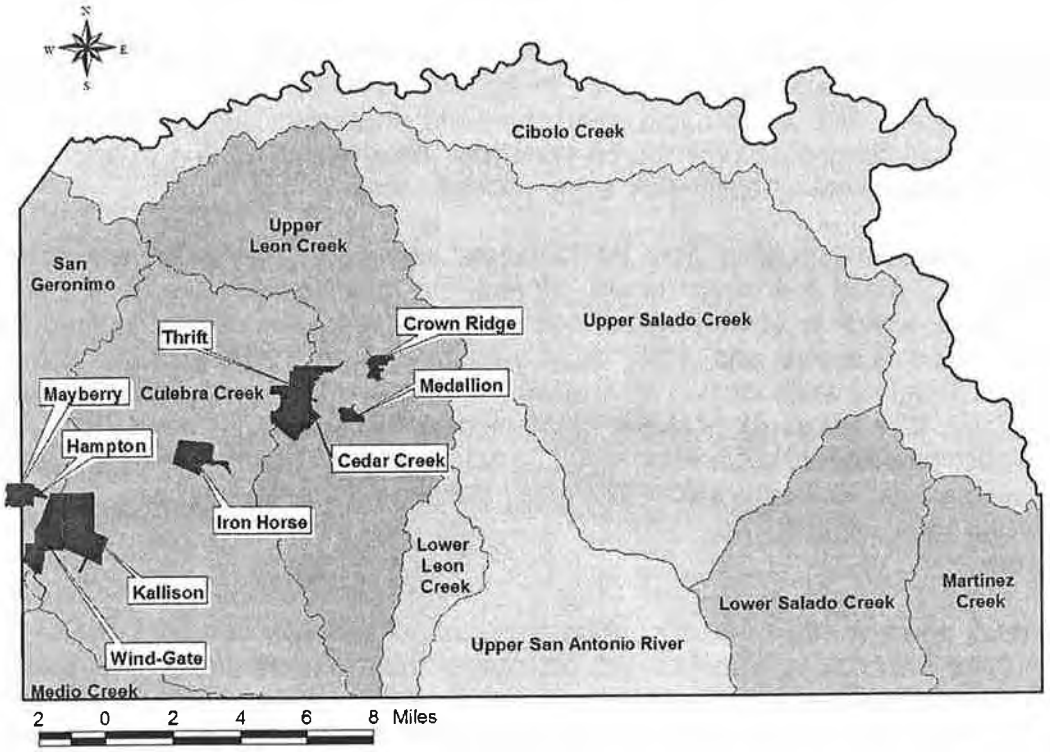
Watersheds

We must be cognizant of the fact that watersheds are the ultimate source of water in the Edwards Aquifer. CSA currently has guidelines for streams and greenways. Management of watersheds should enhance greenways downstream of the watershed. Greenways upstream and downstream of the Natural Area should be expanded if possible and if they are under the jurisdiction of CSA. To protect water quality, it is critical that watersheds be properly managed. The management techniques provided in this document focus on maintaining high-quality watersheds. Therefore, it is assumed that if the guidelines provided in this plan are followed, watershed quality will ultimately be improved.

CSA and other governmental agencies are currently developing watershed management rules and policies for the major watersheds in Bexar County. Guidelines and policies will probably be used to ensure protection of water quantity and quality in watersheds in

this area. These new policies may directly impact management of some of the properties acquired as Natural Areas. However, the guidelines in this document have been prepared especially for protection of watersheds and should be compatible with any future policies or regulations involving watershed management.

As a tool for the Natural Area manager, we are including the map below which shows Natural Areas that have been acquired as of January 20, 2003 and their location with respect to watersheds.



One of the key functions of Natural Areas is to improve and protect watersheds, so management practices should focus on minimizing the potential of degradation to watersheds. As previously discussed, degradation of watersheds is mostly a result of vegetation removal by various means such as overgrazing, development, mowing, and landscaping. These types of activities should be minimized, if not completely excluded, from Natural Areas. These areas should be used for grazing only by wildlife and not by domesticated animals. Nuisance species such as feral hogs can cause extreme damage to watersheds, resulting in their filtration function being impaired. These species should be removed form the sites if possible. Overgrazing by dense deer populations can also result in watershed degradation. Deer populations will probably require management, which usually entails controlling the size and density of deer populations.

Wetlands

Again, wetlands are a unique feature in the project area. Thus, management options should be restricted to preserving or enhancing the current condition of the wetland. Another option would be to enhance the wetland by improving hydrology or by removing invasive species such as cattails, common reed, and bermudagrass. These species must be replaced by native sedges, grasses, and rushes immediately after removal to prevent erosion. Some wetland areas can also be expanded to a certain degree by a small amount of excavation or dredging. Dredging activities do not require a Section 404 permit as long as the dredged material is placed on an upland area.

Wetlands can be used as educational sites for the general public. Wetland integrity can be preserved and the wetland still used for educational purposes, or as a site near a trail. Structures such as bridges and boardwalks that allow for observation of the wetland without direct contact would be preferred. Boardwalks leading to bird-watching stations are also excellent options for some wetland areas.

Another management option may be to create wetlands in areas where soils and hydrology to support the wetlands are present. In locating such areas, soil surveys should be reviewed to identify hydric soils. These soils are usually located where wetlands once occurred and often, with a change in drainage patterns and other hydrologic features, wetlands can be created. The sites and properties located over the Cibolo Creek area have high potential for development into wetlands due to the fact that they contain soils capable of holding water. Areas near the streams could be excavated or terraced to hold floodwaters from streams or drainage from nearby areas.

Streams

In general, any type of stream should be protected. Especially sensitive are perennial streams and intermittent streams which probably support aquatic life. These areas can be used for educational purposes similar to wetlands if proper precautions are taken to minimize impacts of humans on the water. Again, boardwalks, bridges, and piers should be used in lieu of paths along streams. If paths are placed along a perennial stream, they should either be placed on a boardwalk or bridge or should be located above the ordinary high water mark. The practice of damming streams is not successful on the recharge zone and should be avoided if at all possible. Further, a USACE Section 404 permit would be required to dam streams.

Other Surface Waters

Most of the remainder of the surface waters found on the project area will be ponds and stock tanks. Once cattle have been removed from the property, these areas should be carefully investigated to determine if the ponds can be re-contoured to provide shallow water habitat conducive to wetland plant development. In addition, artificial islands could be produced in the lakes to provide habitat for waterfowl. More activity options are feasible for stock tanks and ponds may allow for more human impacts than other areas. These areas could provide excellent places for education concerning aquatic wildlife or for picnicking or bird observation. However, these same areas could be carefully managed and allowed to turn into excellent wildlife habitat after several years.

MANAGEMENT LIMITATIONS

One of the major limitations for use of surface waters in a Natural Area is the fact that these surface waters are mostly under the jurisdiction of the USACE. If any fill material is placed in a jurisdictional wetland or a perennial, intermittent, or ephemeral stream, consultation with the USACE must be initiated. Depending on the area to be filled, permitting may or may not be required. Again, these areas should not be filled or impacted, but should be protected.

Listed below are the different types of surface waters and the potential uses. If a use is not listed, it should be eliminated from consideration.

Type of Surface Water	Appropriate Uses
Wetlands	Boardwalks, bridges, interpretation/education
Ephemeral wetlands	Boardwalks, bridges, interpretation/education
Ponds and stock tanks	Boardwalks, piers, bridges, interpretation/education
Perennial and intermittent streams	Boardwalks, bridges, piers. Trails may be placed along perennial streams but should be above the 100-year floodplain. If in the 100-year floodplain, trails should be replaced with boardwalks or bridges, if possible.
Ephemeral streams	Trails can be placed above the ordinary high-water mark of ephemeral streams. However, erosion may occur during significant precipitation. Measures may be required to prevent significant erosion of these trails.
Seeps and springs	Seeps and springs should be protected from any human interference. Direct contact with these areas should be limited to Natural Area personnel and researchers. Guided tours could be taken near these areas to allow observation, but not direct contact. In addition, trails with rails or boardwalks with rails could be used near these areas in some instances. The rails could be used to prevent direct contact with the seeps or plant communities associated with the seeps.

SPECIES OF CONCERN

General Description

ENDANGERED SPECIES

Federally Listed Animal Species

Bexar County is home to several federal and state endangered species, protected under the Endangered Species Act of 1973 (with amendments) or the Texas Parks and Wildlife Code. Two federal endangered songbirds breed in Bexar County, the black-capped vireo (*Vireo atricapillus*) and golden-cheeked warbler (*Dendroica chrysoparia*). Nine karst invertebrates occurring in Bexar County are federal endangered species: Braken Bat Cave meshweaver (*Cicurina venii*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon Bat Cave meshweaver (*Cicurina vespera*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), Helotes mold beetle (*Batrisodes venyivi*), Madla's Cave meshweaver (*Cicurina madla*), Robber Baron Cave meshweaver (*Cicurina baronia*), and two species of ground beetle (no common name) (*Rhadine exilis* and *Rhadine infernalis*). Any proposed activities which would modify endangered species habitat or otherwise impact endangered species require coordination with the USFWS and possibly a permit under the Endangered Species Act.

Black-capped Vireo. The black-capped vireo (BCV) is a small, insect-eating songbird. Mature males are olive green above and white below, with faint greenish-yellow flanks. The crown and upper half of the head is black, with a partial white eye-ring. The iris is brownish-red and the bill black. The female's plumage is duller than the males and females have a dark slate gray head (Campbell 1995).

The BCV typically nests in mid-successional brush areas. The current breeding range includes portions of western Oklahoma, central Texas, and Coahuila, Mexico (Grzybowski 1995). The BCV's range in Texas extends west to Brewster County, north to Jones and Dallas counties, and east to Bell County. Habitat is usually found on rocky limestone soils of the Edwards Plateau, the Lampasas Cut Plain, the eastern Trans-Pecos, and, to a limited extent, on igneous soils in the Chisos Mountains. Texas BCV habitat includes: blackjack oak (*Quercus marilandica*), shin oak (*Quercus sinuata* var. *breviloba*), plateau live oak (*Q. fusiformis*), Spanish oak (*Q. texana*), Vasey oak (*Q. pungens* var. *vaseyana*), sumac (*Rhus* spp.), Texas persimmon (*Dyosporis texana*), roughleaf dogwood (*Cornus drummondi*), and redbud (*Cercis canadensis*) (Grzybowski 1995).

BCVs arrive in Texas from mid-March to mid-April, with adult males often arriving before females and first-year males (Campbell 1995). Territory sizes range from 1 to 16 acres. BCVs are habitat specialists, requiring sites exhibiting a 30 to 60 percent or greater vegetative cover, with vegetation in thick mottes and leaf cover extending from the ground to about six feet in height. Without some type of disturbance (i.e. fire or

mechanical vegetation manipulation) to maintain habitat in a mid-successional growth stage, the plant community will eventually mature to a higher level of succession where habitat is no longer suitable for the vireo.

Of the properties currently owned by the City of San Antonio, only the Thrift Tract is known to contain significant quantities of habitat suitable for the black-capped vireo. Surveys conducted in 2000 indicated 32 BCV territories were established on the property (G. Kegley, pers. comm.).

Golden-cheeked Warbler. The golden-cheeked warbler (GCW) is a small, migratory songbird, 4.5 to 5 inches long, with a wingspan of about 8 inches. The male has a black back, throat, and cap; and yellow cheeks with a black stripe through the eye. Females are similar, but less colorful. The lower breast and belly of both sexes are white with black streaks on the flanks (Campbell 1995).

The GCW nests exclusively in central Texas, from about March to September. Nesting habitat is comprised of dense forests and woodlands containing Ashe juniper and a variety of other, mostly deciduous species, including plateau live oak, Texas oak (*Q. buckleyi*), scaly bark or shin oak, Lacey oak (*Q. glaucoides*), post oak (*Q. stellata*), blackjack oak, American elm (*Ulmus americana*), cedar elm (*U. crassifolia*), hackberry (*Celtis reticulata*), sugarberry (*C. laevigata*), little walnut (*Juglans microcarpa*), Arizona walnut (*J. major*), sycamore (*Platanus occidentalis*), Texas ash (*Fraxinus texana*), Mexican or Texas persimmon (*Diospyros texana*), coma (*Bumelia lanuginosa*), redbud, evergreen sumac (*Rhus virens*), soapberry (*Sapindus drummondii*), deciduous holly (*Ilex decidua*), escarpment black cherry (*Prunus serotina*), Mexican buckeye (*Ungnadia speciosa*), red mulberry (*Morus rubra*), big-tooth maple (*Acer grandidentatum*), and Texas mountain laurel (*Sophora secundiflora*) (USFWS 1992). Preferred tree stands are those composed of mature Ashe juniper, over 10 feet in height, with scattered oaks (at least 10 percent total canopy cover), where the total canopy cover of trees exceeds 35 percent. The range of the GCW stretches from Kinney County north to Stephens County, and east to McLennan County. Between July and October, the bird migrates south, and spends the rest of the year in the highlands of southern Mexico and Central America (USFWS 1992).

Karst Invertebrates. The USFWS recently listed as endangered nine obligate cave-dwelling invertebrate species in Bexar County caves. Threats to these species and their habitat include destruction of habitat by development construction, filling of caves and karst features, loss of permeable cover, contamination from septic effluent, sewer leaks, runoff, and pesticides, predation and competition from non-native fire ants, and vandalism to cave and karst features.

Little is known of the life habits of these nine species, but they likely prey on the eggs, larvae, or adults of other cave invertebrates (Federal Register [FR] 63: 71855-71867).

The following species information was current as of its publication in the Federal Register December 30, 1998:

The Robber Baron Cave harvestman (*Texella cokendolpheri)*, is known only from Robber Baron cave in the Alamo Heights karst fauna region on private property.

Batrisodes venyivi, the Helotes mold beetle, is known from only three caves northwest of San Antonio, in the vicinity of Helotes. Two of these caves are located in the Helotes karst fauna region on private property. Access to one of these caves has been denied access in recent years, so *Batrisodes venyivi*'s status there is unknown. However, fire ants (*Solenopsis invicta*) have heavily infested the cave in the past (Reddell 1993). Fire ants are also present in the second locality. The third cave's location has not been disclosed by the collector of the specimen from this cave, but it may be located in the UTSA karst fauna region.

Rhadine exilis (no common name) is known from 33 caves in north and northwest Bexar County. Nineteen are located on Department of Defense (DOD) land, with the remainder being distributed among the Helotes, UTSA, Stone Oak, and Government Canyon karst fauna regions.

Rhadine exilis. Photo: Jean Krejca, USFWS

Rhadine infernalis (no common name) is known from 25 caves in five of the six karst fauna regions—Helotes, UTSA, Stone Oak, Culebra Anticline, and Government Canyon.

Cicurina venii (no common name) is known from only one cave located on private property in the Culebra Anticline karst fauna region. The construction of a home in 1990 resulted in the filling of the cave entrance. Any effects this may have had on the species is difficult to determine without excavation; however, some nutrient input may still enter the cave through a reported small side passage.

Robber Baron Cave, in the Alamo Heights karst fauna region, is the only known location for *Cicurina baronia*, the Robber Baron cave spider. The cave's entrance is protected through ownership and operation by the Texas Cave Management Association, however its location in a heavily urbanized area threatens the cave's fauna.

One cave within the Government Canyon karst fauna region in Government Canyon State Natural Area is inhabited by *Cicurina madla*, the Madla's cave spider. Three other caves with this species are located in the Helotes karst fauna region on private property, and one is located on private property in the UTSA karst fauna region.

Circurina madla. Photo: Jean Krejca, USFWS

Cicurina vespera, the vesper cave spider, is known from only two caves. One is Government Canyon Bat Cave in the Government Canyon State Natural Area, and the other is a cave 5 miles northeast of Helotes, the location and name of which has not been made available to the USFWS.

Neoleptoneta microps (Government Canyon cave spider) is known only from the Government Canyon karst fauna area from two caves at Government Canyon State Natural Area.

The USFWS has proposed designation of critical habitat for the nine Bexar County karst invertebrates in the Federal Register dated Tuesday, August 27, 2002 (Part II Department of the Interior, Fish and Wildlife Service: 50 CFR Part 17). This proposed rule includes more in depth discussion of each of the species as well as maps showing the location of critical habitat units. The objective of designation of critical habitat is the identification of areas essential to the conservation of a listed species and that may require special management considerations of protection. The proposed critical habitat consists of 25 units encompassing 9,516 acres in Bexar County. Each unit includes one or more caves or other karst features known to contain one or more of the listed species. Four of these units include portions of the project area.

Section 7 of the Endangered Species Act requires Federal agencies to ensure that actions they fund, authorize, or conduct do not destroy or adversely modify critical habitat. Therefore, if CSA were to plan any activities requiring a Federal permit or use any Federal funds, the permitting or funding agency would be required to consult with the USFWS to ensure the proposed activity would not destroy or adversely modify the critical habitat. If Federal permit or funding is not involved, the designation of critical habitat would have no effect on the CSA's activities. However, in view of the goal of these Natural Areas, we recommend that CSA promote the concept of good environmental stewardship and include the USFWS in determining proper management and use of areas containing endangered species habitat, even if not required by federal law.

State-Listed Animal Species

State threatened and endangered species of potential occurrence on the project area are the Texas horned lizard (*Phrynosoma cornutum*), Comal blind salamander (*Eurycea tridentifera*), Texas indigo snake (*Drymarchon corais*), Texas tortoise (*Gopherus berlandieri*), toothless blindcat (*Trogloglanis pattersoni*), and widemouth blindcat (*Satan eurystomus*).

Texas Horned Lizard. The Texas horned lizard (THL) is distinguished by its two elongated central spines at the rear of the skull (giving the appearance of two horns), two rows of fringe scales on its sides, dark brown to sooty-colored dorsal spots edged with lighter colors, and a light-colored stripe down the center of the back (Stebbins 1954, Henke and Fair 1998). The THL ranges in length from 3 to 5 inches (excluding the tail) (Ballinger 1974) and has a somewhat flattened body.

Texas horned lizards usually inhabit open, flat terrain with minimal vegetation cover, although they may be found in areas with thicker cover and partial sunlight (TPWD no date, W. Hodges personal communication). THL may be found in habitats ranging from desert to grasslands and shrublands, from sea level to nearly 6,000 feet in elevation, and on soil types ranging from pure sands and sandy loams to coarse gravels,

conglomerates, and desert pavements (Price 1990). THL are active from March to October and require warm temperatures to stimulate their appetite (75°F or greater) (Henke and Fair 1998, TPWD no date).

The current distribution of the THL is the southeastern tip of Arizona and Colorado, southern and eastern New Mexico, most of Kansas and Texas, and all of Oklahoma. The species is apparently doing well throughout most of its range except in Texas. The current Texas range appears to be decreasing; the species no longer occurs in Texas east of an imaginary line from Forth Worth to Corpus Christi (Donaldson et al. 1994), with the exception of small, isolated populations. Reasons for decline may include: red imported fire ant (*Solenopsis invicta*) competition with harvester ants (*Pogonomyrmex barbatus*), the chief prey species of THL; widespread use of broadcast insecticides; over-collection by humans; and possibly habitat loss from urbanization, suburban sprawl, and conversion of native rangeland to agricultural cropland (Price 1990, Donaldson et al. 1994).

Comal Blind Salamander. This strictly aquatic salamander is found only in the underground waters of limestone caves. It has white or yellowish translucent skin, a slender body with a large head with sloping forehead and flattened snout, reduced eyes under the skin surface, and bright red external gills. Little is known of its reproduction, other than seven to eighteen eggs are laid. Behavior is unknown. This species is found only in Bexar and Comal Counties.

Indigo Snake. The Texas indigo snake is Texas' largest snake, with adults reaching between 60 and 84 inches in length. The overall appearance of this snake is shiny, translucent black or blue-black smooth scales with a blue-gray belly and reddish or orange-brown chin and sides of the head. Occasionally dark striping on the face and body may be present.

Photo: Utah's Hogle Zoo

The habitat preferences of the Texas indigo are thornbush-chaparral woodlands of south Texas, particularly dense riparian corridors or along the margins of stock ponds, resacas, and streams, but it may also be found in grassy plains or on coastal sandhills. This species actively forages during the day for anything small enough to swallow, including lizards, frogs, birds, small mammals and other snakes. Although non-venomous, it can still bite vigorously when threatened.

Texas Tortoise. Occurring throughout South Texas, the Texas tortoise is a resident of open scrub woods, arid brush, lomas, and grass-cactus associations. The preferred habitat is open brush with a grass understory on sandy, well-drained soils. Diet consists mainly of cacti, grasses, and forbs, and sometimes includes insects, land snails, and tortoise and rabbit feces (Ernst and Barbour 1972). Texas tortoises are diurnal, being most active in the morning and late afternoon during summer, in contrast to activity during midday in spring and fall (Ernst and Barbour 1972). During cold weather they remain inactive in shallow depressions dug at the base of a bush or cactus or in underground burrows.

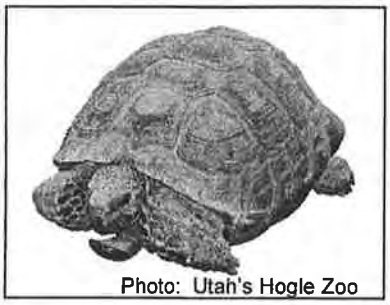
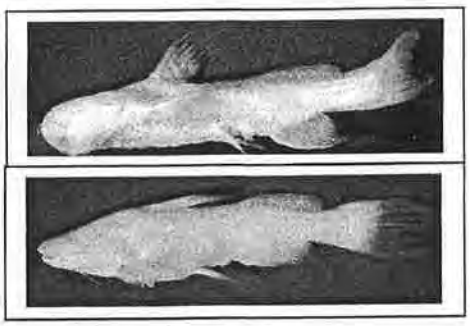


Photo: Utah's Hogle Zoo

Threats to the Texas tortoise include habitat alterations associated with agriculture or grazing "improvements" (introduction of buffel grass [*Cenchrus ciliaris*]). Dense vegetation may force tortoises to use open roadway rights-of-way, possibly resulting in increased exposure to vehicular mortality (Judd and Rose 2000, Bury and Smith 1986). Other threats include Upper Respiratory Tract Disease, collecting for personal pets and the pet trade, release of sick pets into the wild, and predation on tortoise and eggs by exotic animals and by native animals whose populations have increased due to human activity (e.g. raccoons and opossums) (Judd and Rose 2000).

Toothless Blindcat and Widemouth Blindcat. Both species are troglobitic, blind catfishes endemic to the San Antonio Pool of the Edwards Aquifer in Bexar County, occurring in the deep portions of the aquifer (over 300 meters below the surface). Threats to these species may include increased groundwater withdrawals and groundwater contamination. (Photos by Dean Hendrickson: Top—Toothless blindcat; bottom—Widemouth blindcat)



Rare Vascular Plants

Big Red Sage (*Salvia penstemonoides).* This is a rare plant that is endemic to the state of Texas and found in Bexar County. The plant prefers moist to seasonally wet clay or silt soils found in creek beds and also along seepage slopes of limestone canyons. The plant has irregular crimson-colored flowers characteristic of many sage species. The flowering period for this species usually occurs between June and October.

Bracted Twistflower *(Streptanthus bracteatus).* This is another plant endemic to Texas. The plant has rather showy, purple flowers and grows in shallow clay soils over limestone, mostly on rocky slopes and in openings in juniper-oak woodlands. The plant commonly flowers between April and May.

Correll's False Dragon-head *(Physostegia correllii).* This plant has a lavender-pink flower that is spotted or streaked with purple. The plant flowers in June to July and is commonly found in wet soils along roadside ditches, streams, and irrigation channels.

All three of these species are listed as rare plant species but have no regulatory listing status. If these species are observed or identified on a Natural Area, they should be carefully protected

from any potential impacts. In addition, information should be collected on the species and sent to the TPWD for their records.

Data Collection Methods

A variety of data collection methods are available to the land manager. Published and unpublished reports, public presentations, and interviews with species experts are all sources of information for the stewardship of these lands, in addition to field collection of original site-specific data. The bulleted items below are suggested sources for additional information.

- Review Texas Parks and Wildlife records – Biological Conservation Data System (BCD), Government Canyon State Natural Area reports and planning documents
- Review U.S. Fish and Wildlife maps/reports – endangered species permit reports
- Review Veni's karst zone maps – Veni (1994) conducted a status survey of the nine karst species in which he delineated karst zones based upon geology, distribution of known caves, distribution of cave fauna, and primary factors that determine the presence, size, shape, and extent of caves with respect to cave development. Part of the project area lies in Zones 1&2, areas either known to contain one or more of the nine invertebrates, or having a high probability of suitable habitat for the invertebrates. These maps are provided in the general GIS model.
- Aerial photography/topographic maps. These maps are also provided in the general GIS model.
- Review published/unpublished literature – papers/reports relating to BCV, GCW, karst invertebrates, endangered species management, etc.
- Interview biologists with species expertise
- Attend conferences
    - Annual conferences
        - Society for Conservation Biology
        - Natural Areas Association
        - Ecological Society of America
        - Society for Ecological Restoration
        - Southwestern Area Naturalists
        - Texas Academy of Science
        - Partners In Flight
    - Special topic conferences

Using current aerial photography and other pertinent data, areas of threatened and endangered species habitat should be preliminarily identified and mapped. Further refinement of habitat maps will be accomplished through field verification. The USFWS has written specific presence/absence survey protocols for the black-capped vireo, golden-cheeked warbler, and karst invertebrates. Endangered species surveys must be conducted by a USFWS-permitted biologist of under supervision and permission of the

USFWS. It is recommended that at least one member of the Natural Area staff be certified for GCW and BCV even if contract biologists are used.

The site-specific endangered species assessment of a tract should include characterization and mapping of various plant communities found onsite. Areas identified as potential threatened or endangered species habitat should be scored according to the criteria and scoring system presented in the Scoring Methods section below (Table 6). During the survey, the presence of any rare plants should be noted and their location mapped. Areas potentially supporting rare plants should also be mapped.

Presence/absence surveys for endangered species would be warranted for any potential habitat areas for which land use changes are planned (e.g. development of hiking trails, construction of parking areas, etc.). Such surveys are required by the USFWS for any proposed activities that could impact federal endangered species. Additionally, these surveys must be conducted by a USFWS-permitted biologist and follow USFWS survey protocols. Non-USFWS-permitted Natural Area staff experienced with bird identification may conduct breeding bird surveys, during which GCWs or BCVs may be observed, but for any proposed activities that could potentially impact the endangered birds or their habitat, the USFWS should be contacted and USFWS survey protocol followed.

Endangered karst invertebrate species are known to occur in northwestern Bexar County, and could potentially inhabit caves and other recharge features found on many Natural Areas. If during the geologic study any karst features are identified, further investigation of such features may be warranted to determine if they are inhabited by any of the protected species. As with all endangered species investigations, such a study must be conducted by a USFWS-permitted biologist. The USFWS should be contacted regarding any proposed activities in the vicinity of a karst feature that could potentially impact that feature. Unlike some other endangered species issues that may be approached in a standard fashion, all potential karst-impacting projects are reviewed by the USFWS on a case-by-case basis. Probably the most effective means of protecting karst invertebrate species is the avoidance of any impacts to karst features potentially supporting these species. If the karst features can be avoided to the extent that the proposed activity would not impact the feature, subsurface investigations and surveys would not be necessary.

Scoring Methods

Factors considered in assigning scoring values for endangered species assessment include the following:

- Which species are present
- Habitat quality
- Habitat size / degree of fragmentation
- Surrounding land use (type and nearness)

In general, high-quality habitat areas can support more individuals of a particular species than low-quality habitat areas. Determination of habitat quality is somewhat subjective, but knowledge of each species' habitat needs is critical in assessing whether a certain area can adequately support a viable population of that species.

Habitat specialists like the golden-cheeked warbler require fairly well-defined habitat components, whereas a habitat generalist like the northern cardinal can thrive in a wide variety of habitat types. What constitutes high-quality habitat for one species may not even support another species, due to contrasting habitat requirements. For example, the GCW thrives in mature, closed-canopy juniper-oak woodlands, whereas the BCV prefers mid-successional, patchy shrubland. Although these habitat types are mutually exclusive, individual birds of either species may on occasion use portions of adjacent habitat types within their respective territories.

In assigning a score for habitat quality, the natural resource manager must consider for which species or group of species the habitat quality is being assessed, and what criteria are to be met for each scoring level. If habitat exists for any of the endangered species discussed above, the highest appropriate score should be applied. For example, if a given site has high-quality habitat for the endangered karst invertebrates, but only poor-quality habitat or no habitat for any of the other species, that area would still be assigned a high-quality habitat score.

Presented below is an example of the criteria used to determine habitat quality for the GCW:

High Quality: continuous canopy woodland (50-100% canopy closure) of Ashe juniper, Texas oak, live oak, cedar elm, cherry, and other deciduous trees at least 15 feet in height, generally along slopes, canyons, and associated creek bottoms

Moderate Quality: continuous canopy woodland (50-100% canopy closure) of live oak, shin oak, cedar elm, hackberry, Vasey oak, Ashe juniper and other hardwoods at least 15 feet in height, on flat or rolling uplands with shallow, rocky soils of variable depth

Poor Quality: patchy woods (35-50% canopy closure) interspersed with mottes of mature live oak, Ashe juniper and other trees at least 15 feet in height. Usually occurring on uplands with a mix of mature juniper, live oak, Texas oak, and shin oak.

Not Habitat: 1) stands of small Ashe juniper less than 10 feet in height (considered regrowth juniper); such sites are often dry, relatively flat, and lacking in oaks and other broad-leaved trees and shrubs; 2) pure stands of 10-ft and taller Ashe juniper with few or no oaks or other hardwoods; 3) open park-like woodlands or savannahs with tree canopy less than 35%; such sites are often scattered with live oaks and other tree species

Similar criteria for other threatened and endangered species should be used in assessing the habitat value score.

Habitat size dictates to some extent the size of a species population that a particular site can support. Generally, the larger the habitat size, the larger the potential species population at that site, however habitat quality plays a significant role in this determination. For instance, BCV territories generally range in size between 2 and 4 acres, although extremes range between 1 and 16 acres. This size disparity is related to habitat quality and inter-specific competition, among other factors. High-quality habitat provides sufficient food, nesting sites, and cover. Poor-quality habitat still provides these things but generally in smaller proportions, forcing the individual animals to travel farther to meet their needs. As a result, larger areas are required to support similar numbers of

individuals that a smaller, high-quality habitat area could support. Larger habitat size also provides a greater habitat to edge ratio, providing a buffer against negative outside influences such as fire ant invasion, brood parasitism, and other nuisance species invasion.

A number of landscape features can cause habitat fragmentation, including utility corridors, roadways, and associated residential and commercial urbanization. Small habitat size in most cases is attributable to fragmentation. For example, for a given area of 500 acres containing a total of 100 acres of habitat, high levels of fragmentation of that 100 acres can be just as damaging as outright destruction of habitat. Large, intact areas of habitat are also preferable from a management perspective. Perimeter patrol for safety and security is more easily managed for unfragmented habitat.

The types of land use surrounding a habitat area can enhance or hinder the ecological management of a property, as well as the management of people using the property. Management issues related to habitat areas adjacent to high density residential areas include trespass, illegal dumping, vandalism, poaching, introduction of invasive species, and harassment of wildlife. Conversely, such a setting presents an opportunity for community outreach and development of public support for stewardship, educational, and Natural Area experiences and appreciation. From the perspective of ecological management and public use management, the highest scores in this evaluation category are assigned to adjacent areas of comparable habitat, similarly managed specifically for natural resource conservation. In contrast, an adjacent area densely populated or highly developed is much less desirable for ecological management and usually poses major challenges for people management.

Scores to be assigned for each category are shown in Table 6, with a value of 10 assigned to the most sensitive features. Less sensitive features are scored accordingly with descending values.

Table 6. Species of Concern	Issue Score
Species Present	
Federal endangered species present (karst inverts, GCW, BCV)	10
Habitat present for Federal or State listed species; no individuals confirmed	8
State listed species present (no Federal listed species); rare plants present	5

No Federal or State listed species present, or their habitat	0
Habitat Quality	
Excellent	10
Moderate/Marginal	6
Poor	2
None	0
Habitat Size/Fragmentation	
Excellent: >150 acres of contiguous bird habitat; Contiguous with habitat on adjacent properties; sufficient buffer around endangered species karst features.	10
Moderate: 60-150 acres of contiguous bird habitat; Discontinuous habitat patches, but within 1000 ft. of each other; Minimal buffer around karst features.	5
Poor: 20 – 59 acres of bird habitat; Isolated patch bisected by roads, easements, etc.; Inadequate karst feature buffer.	1
Surrounding Land Use	
Conservation/Natural Area w/ similar habitat (land use restrictions in place – conservation easement, private conservation entity, government-owned land dedicated as preserve, conservation area)	10
Private land of similar high quality habitat to that above	8
Agricultural/pasture land; Public park land; Undeveloped military land	6
Residential subdivision; Major public roadway/freeway; shopping mall; etc.	1

Management Strategies

MANAGEMENT GUIDELINES

Designating the appropriate uses for Natural Areas requires careful consideration to avoid activities and improvements that may cause degradation of endangered species habitat. For example, constructing trails through endangered species habitat could impact the very species for which the property is managed through disturbance by hikers, erosion of trails from excessive use, and loss of habitat through excessive clearing of overhead canopy for trail construction. On the other hand, sensitive trail design can incorporate scenic views of endangered species habitat without significant impacts to the life cycle of the species. Closing trails to public use during the breeding season is a means of avoiding disturbance of rare species and simultaneously affording the public the opportunity to hike through scenic Hill Country habitat.

A variety of techniques are available to achieve the management goals of the CSA's Natural Areas. Active land management techniques may include vegetation manipulation, restrictions on types of public use, prohibition of pets, closure of trails during species breeding seasons or wet weather, and fencing to protect sensitive areas, and signage to identify sensitive habitat. Monitoring of target species is important in determining appropriate courses of action. Post-manipulation monitoring of vegetation and wildlife is essential in determining effectiveness of a chosen management technique. Periodic monitoring of brown-headed cowbird, fire ant, blue jay, and mammalian predator populations is important for determining if and when certain management actions may be needed to protect endangered species populations. The flexibility provided through regular monitoring will enable the Natural Area staff to respond to needed changes in their management strategy in a timely fashion.

If any rare plants are identified on a Natural Area, provisions should be made to protect those plant populations. Public access to areas supporting rare plants should be limited to Natural Area personnel and researchers, or small groups accompanied by Natural Area personnel. Trails and other Natural Area improvements should be avoided around areas supporting rare plants. The land manager should prioritize the removal of any invasive or exotic plants found in or near rare plant populations.

If plant communities or microenvironments are identified that could potentially support rare plants, these should also be protected to some degree. These areas should be monitored to determine the presence of any rare plants that may become established. In addition, these sites could be used for transplanting rare plants from other areas impacted by human activities offsite or impacted by changes in the environment onsite. Again, access to these areas should be limited to Natural Area personnel or groups and individuals supervised by Natural Area personnel.

MANAGEMENT LIMITATIONS

Development of this Land Use and Management Planning Guidelines for Natural Areas should include acknowledgement of known limitations to Natural Areas management. Up-front identification of these limitations may help resource managers avoid public opposition to proposed management plans, regulatory compliance problems, or other issues that could negatively impact planned management activities. Early identification of potential impediments to achievement of management goals can help resource managers avoid project delays, negative budgetary impacts, and political and public resistance to management objectives.

Specific legal, social, and political concerns resource managers should be aware of include the Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act, Texas Parks and Wildlife Code, and the Edwards Aquifer Rules. In addition to these legal drivers, social and political drivers deserve consideration in Natural Area management decision-making. A few of these sociopolitical drivers are public opposition to trail closures and limited access trails, prohibited uses of the Natural Areas properties, and lethal control of problem animals (i.e. deer overpopulation).

WILDLIFE

General Description

Wildlife issues discussed in this section are in addition to the species of concern issues discussed previously. Some overlap of management needs is unavoidable and, in fact, desirable. However, other issues must be addressed that are specific to certain general categories of wildlife.

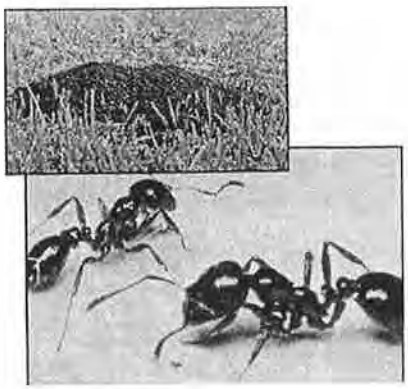
The primary objective of this section is to assist the land manager in decision-making regarding management strategies employed to ascertain the current status of sensitive or ecologically important wildlife species of direct management interest, or those serving as indicators of overall ecosystem health of the Natural Areas. Some of the wildlife topics to be addressed are white-tailed deer, songbird, and predator management, and introduced species management.

White-tailed Deer. Because their natural predators have essentially been eliminated from most of the state, white-tailed deer populations have increased to the point of becoming a nuisance species from a habitat management perspective. Deer overpopulation leads to heavy browse pressure on native plants, which in turn negatively impacts other native wildlife populations. In many areas throughout the range of the GCW, lack of oak regeneration due to heavy deer browse is a significant concern.

Songbirds. A large number of neotropical migrant songbirds have experienced significant population declines over the past few decades, while interest in birding has increased. Managing for songbird diversity not only benefits wildlife, but can benefit the general public by providing recreational venues for birding and environmental education. Providing the citizens of San Antonio and surrounding areas with birding and other nature oriented opportunities is a means of developing public support for natural resource management programs.

Predators. Predators are certainly an integral component of a healthy ecosystem. Some human activities can alter species compositions and/or population sizes leading to an ecological imbalance of predator and prey species. When managing for rare, threatened, or endangered species land managers must consider whether native and/or introduced predators pose a significant threat to those species being managed for. As is the case with both the endangered BCV and GCW, the brown-headed cowbird (a nest parasite or predator) is a documented threat to the reproductive success of these two species. Other nest predators include snakes, rodents, blue jays, skunks, raccoons, opossums, and fire ants.

Introduced Species. Non-native or introduced wildlife species can pose significant threats to native wildlife populations through competition and predation. The red imported fire ant (*Solenopsis invicta*) has steadily increased its range in the United States since being introduced from South America in the 1930s. This species preys upon other ground-inhabiting invertebrates, mice, and rabbits and often preys upon bird eggs and nestlings both on the ground and in trees. Fire ants indirectly impact other wildlife species by reducing their available food source. Fire ants have also been documented as a significant threat to endangered cave fauna.



Feral hogs can be extremely destructive to habitat through uprooting and trampling of vegetation and predation on small wildlife species. Currently feral hogs have imposed significant impacts on lands acquired by CSA. Likewise, feral dogs and cats, as well as unrestrained pets, pose a threat to native wildlife. Packs of feral dogs often harass native wildlife such as deer and small mammals, and feral cats can devastate populations of ground nesting birds, reptiles, amphibians, and many small rodents.

Other Topics to be Identified. Selecting specific species to monitor as indicators of overall ecosystem health is a reasonable means of maximizing limited management funds. Natural resource managers are encouraged to select representative species from several major biological categories as the focus of monitoring programs. Examples of biological monitoring categories include targeted endangered species and breeding bird surveys, as well as baseline surveys for reptiles and amphibians, small and medium mammals, large mammals, and aquatic, terrestrial, and arboreal insect communities.

Invasive or Exotic Plants. Several species of plants could potentially invade Natural Areas, often destroying endemic populations and altering the integrity of the ecosystem. Common invasive or exotic species include the following:

- King Ranch Bluestem
- Giant Cane *(Arunda donax)*
- Cattail
- Bermudagrass
- Johnsongrass
- Chinaberry
- Chinese tallow tree
- Multifloral rose
- Ligustrum
- Willow Baccharis or Dryland Willow

Data Collection Methods

Many of the same data sources used to gather endangered species information are useful for general wildlife information as well. Data sources more specific to wildlife management are presented below.

- Review Texas Parks and Wildlife records – Countywide deer census data, Government Canyon State Natural Area reports and planning documents
- Review other wildlife management documents pertaining to similar habitat types
- Contact regional wildlife managers (government and private)
- Aerial photography/topographic maps
- Site evaluation of habitat
    - Vegetation community characterization
    - Identification of food sources/availability
    - Identification of water sources/availability
    - Availability and quality of cover, feeding areas, nesting/denning areas, etc.
- Baseline surveys for vertebrate and invertebrate classes of wildlife (i.e. birds, mammals, insects, reptiles)

Examples of specific survey techniques include deer spotlight census, breeding bird surveys along predetermined survey routes, and small mammal live-trapping on predetermined transects. Compilation of a taxonomic species list should be an ongoing project. Suggested organizational categories for such a list include season of observation, relative abundance (e.g. common or uncommon), or native versus non-native species.

Scoring Methods

Factors to be considered in assigning a scoring value to specific wildlife management categories include the following:

- Habitat quality
- Habitat size / degree of habitat fragmentation
- Surrounding land use (type and nearness)
- Introduced species (plant and animal)

Scores to be assigned for each category are shown in Table 7, based on a score from 1 to 10 with 10 being the most sensitive.

Table 7. Wildlife	Issue Score
Habitat Quality	
Excellent (diverse vegetation community supporting diverse wildlife community)	10
Moderate	5
Poor	1
Habitat Size/Fragmentation	
>200 acres; Contiguous with similar habitat on adjacent properties	10
150-199 acres; Discontinuous habitat patches, but within 1000 ft. of adjacent patches	7
60-149 acres; Isolated patch	4
<60 acres; Isolated patch bisected by roads, easements, etc.	1
Surrounding Land Use	
Dedicated preserve land	10
Private land of high quality wildlife habitat	8
Undeveloped military land/public park land; Range land (grazing or hay meadow)	5
Residential subdivision	2
Heavy development (freeway, shopping mall, etc.)	1
Nuisance Wildlife and Plants	
No nuisance species	10
Low infestation (present, but not posing a problem)	8
Moderate infestation of 1 nuisance species	6
Moderate infestation of >1 nuisance species	5
Heavy infestation of 1 nuisance species	3
Heavy infestation of >1 nuisance species	1

Management Strategies

Management Guidelines

Implementation of management strategies discussed in the Species of Concern and Vegetation sections would benefit other wildlife species on the Natural Areas properties. Periodic wildlife monitoring studies allow Natural Area managers to determine management needs and priorities. Such monitoring studies should be scheduled to coincide with periods of greatest wildlife visibility. For example, breeding bird surveys should be conducted during the height of the breeding season, deer census surveys during fall when antlered bucks are easily distinguishable from does, or small mammal trapping at night when those species are active.

Control techniques for management of nuisance species range from non-toxic, yet lethal control of fire ants by treating mounds with boiling water, to hunting of deer to control overpopulation and excessive browsing. Non-lethal control techniques include habitat modification to discourage invasive species, trap-and-relocation programs to remove nuisance species from Natural Areas, and contraception to reduce reproductive rates.

Regardless of which management techniques are implemented, Natural Area managers must be aware that certain activities may be prohibited by environmental regulations. Those regulations of most direct concern are the Migratory Bird Treaty Act, the Clean Water Act, the Endangered Species Act, the Texas Parks and Wildlife Code, the Edwards Aquifer Rules, and City ordinances pertaining to use of firearms (i.e. deer

hunting). Managers must also be sensitive to public opposition to lethal control methods.

VEGETATION

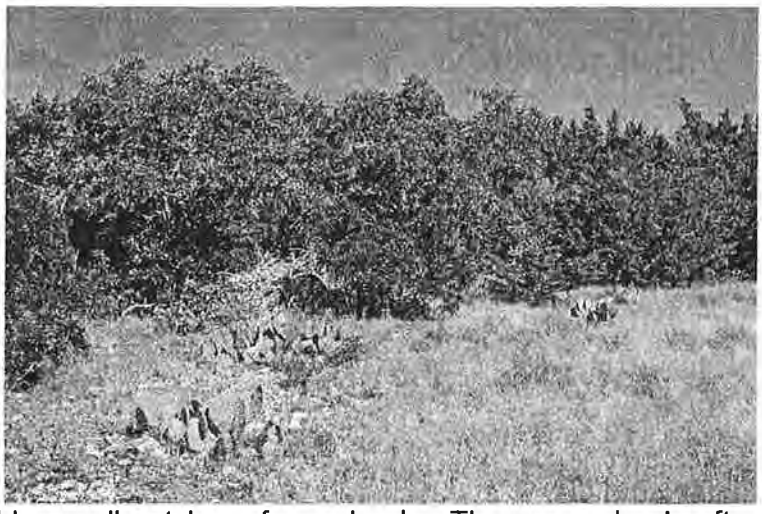
General Description

Many of the CSA's Natural Area properties are located along the Balcones Escarpment within the Edwards Aquifer recharge zone, contributing zone, and transitional zone. Most of these properties lie over either the Edwards limestone outcrop or the Upper and Lower Glen Rose outcrop. Plant communities found on these areas are mostly adapted to alkaline clays and silty clays, which are relatively shallow and overlay limestone parent material. These species are especially adapted to droughty conditions due to the fact that the soils tend to readily percolate and do not hold water for long periods of time. One exception to this general characteristic is the plant communities located along Cibolo Creek in the northeastern portion of Bexar County. These areas are comprised of relatively deep alluvial soils and are presently under cultivation for crops such as wheat, sorghum, and cotton. The vegetation found within the project area often contains the elements of several vegetation zones including the Edwards Plateau, South Texas Plains, and Blackland Prairies. As tracts are acquired by CSA, they can be easily divided into detailed vegetation communities based on visual observations and site investigations. These vegetation communities can then be used to determine the overall condition of the tract and its plant communities.

Grasslands and woodlands, which were formerly widespread and the dominant plant communities in the Edwards Plateau, have been diminished substantially through urban development, agriculture, and ranching practices that have resulted in overgrazing and erosion. In addition, control of the coyote and removal of predators in this area has resulted in an explosion of deer populations that has ravaged the browse and herbaceous vegetation in many areas. Suppression of fire has resulted in the encroachment of Ashe juniper, live oak, and other woody species across upland areas far beyond naturally occurring population levels. Recovery from all of these different stresses is a very slow process now due to the fact that this is a semi-arid area and past erosion, agriculture, and ranching stresses have been present for over a century. This has resulted in a loss of soils, plant diversity and much of the seedbank that would provide species common in the past.

Generally, most of the properties located within the project area are not supporting undisturbed or climax plant communities. Within that area, a majority will be under high levels of stress or recovering from high levels of stress. The situation is exacerbated by the fact that many of the woody invasive species have become established and are maintaining the site at low levels of succession with respect to past plant communities. In the past, the majority of the area supported open grasslands with small motts of woody plants such as live oak and Texas oak. However, with the advent of heavy

grazing and fire suppression, woody plants have encroached into the area and become the dominant species. Plant communities commonly found in the Natural Areas will probably not revert back to native grasslands unless management practices such as prescribed burning and brush removal are used.



Currently, plant populations are often oriented spatially within a project area. Upland areas and rolling areas tend to support relatively dense populations of woody plants including live oak, Ashe juniper, Texas oak, and Lacey oak. Ashe juniper commonly dominates large portions of the area but may be in populations comprising as little one percent of the plant community. These upland areas are frequently dissected by small patches of grasslands. These grasslands often form concentric circles along ledges and areas of shallow, alkaline soils that will not support woody plants. These small patches of open areas are usually dominated by shortgrass species such as curly mesquite and buffalograss with scattered populations of bunchgrasses including little bluestem, indiangrass, and silver bluestem. The stage of the range condition or level of succession can usually be determined by the dominant grasses present on these sites.

Steep slopes located in the project area are dominated by scattered populations of large woody plants such as live oak and Ashe juniper. However, these areas are often dominated by shorter, brush species such as evergreen sumac, flameleaf sumac, Texas persimmon, various species of sage, pricklypear, tasajillo, Texas kidneywood, and others. These steep slopes support a mixture of deciduous hardwoods and Ashe juniper that provide important habitat structure and function for golden-cheeked warbler populations.

Plant communities found in riparian corridors on the more level areas are usually dominated by deciduous hardwoods and evergreen hardwoods including live oak, Texas oak, cedar elm, sugarberry, and red mulberry. Perennial streams support more mesic plant populations dominated by riverbank willow, black willow, buttonbush, eastern cottonwood, and red mulberry.

Methods of assessing the plant communities on a tract will be discussed in later sections. However, it is important to note that these areas should be carefully mapped and described to allow for proper management. The current level of succession must be determined. Use of range indices for the range sites listed above can be incorporated into such a plan. When plant communities are identified, dominant grasses can be used to determine the level of range condition by comparing the plant communities found onsite to those that are listed above in the range site descriptions. This information can allow for a determination of the current condition of the site and possible methods to improve that condition.

For the purposes of this management plan, the use of range sites and range site indices as described in the Bexar County Soil Survey is recommended. Because most of the project area overlies limestone parent material, only a few range sites are present. The diversity in range sites mostly is a result of differences in topography such as slopes, upland areas, and riparian corridors. In the paragraphs that follow, each range site is discussed as well as the common dominant plants that would be expected under different levels of disturbance and/or grazing.

Range Sites over the Project Area

Redland Range Site

The Redland Range Site is characteristic of those plant communities that occur on Crawford or Bexar stony soils. Under excellent conditions, this site is dominated by little bluestem, indiangrass, plains lovegrass, Canada wildrye, and big bluestem. Only 10% of the site would be covered by a canopy of post oak and blackjack oak. Very little of the project area is currently in this condition due to many of the stresses in the past.

Under moderate stress conditions, the site becomes encroached with sideoats grama, Texas wintergrass, hairy dropseed, silver bluestem, and cane bluestem. The overall cover of post oak and blackjack oak tends to increase on this site. Currently, this range site may also contain large, dense populations of live oak.

As range conditions decline, the site is often invaded by curly mesquite, three-awn, and many of the common brush species including mesquite, huisache, and pricklypear. Ashe juniper has encroached into this area and, in many cases, has become the dominant species. In general, most of the project area supports plant populations that are either dominated by invasive species or recovering from overgrazing.

Steep Adobe Range Site. The Steep Adobe Range Site is often found on hilly or steep areas of the project area. This range site is supported by Brackett soils. Under excellent conditions, this range site supports little bluestem, plains lovegrass, sideoats grama, and hairy dropseed. Additionally, small populations of indiangrass, Lindheimer

muhly, big bluestem, and switchgrass may be found. Under light stresses or under recovery from heavy grazing, the more common species include tall grama, seep muhly, slim tridens, fall witchgrass, and orange zexmenia. Live oak, Texas oak, and evergreen sumac often increase under these conditions. On the project area, this is a common plant community that would be found on areas after approximately 20 years of recovery from overgrazing.

As range condition continues to decline, common invasive species include hairy tridens, red grama, Texas grama, three-awn, queensdelight, Ashe juniper, and annual grasses. Much of the project area has been encroached by Ashe juniper and contains many of these species, especially where the site was overgrazed in the past.

Adobe Range Site. The Adobe Range Site is also found on Brackett soils. This site is more undulating and rolling, unlike the steep slopes found in the Steep Adobe Range Site. Climax vegetation on this site is comprised of little bluestem, which may make up as much as 50% to 80% of the vegetation. Other species include plains lovegrass, tall dropseed, hairy dropseed, and sideoats grama. Scattered populations of indiangrass and Lindheimer muhly may also be found in deeper soils.

Under moderate grazing pressure or following recovery from heavy grazing and other disturbances, areas may be encroached by seep muhly, Texas wintergrass, tall grama, feather bluestem, Wright three-awn, and fall witchgrass. Broadleaf plants may also be common and include orange zexmenia, pitchers sage, and bush sunflower. Texas oak may also move into these areas.

Under high grazing pressure and other recent disturbances, areas become invaded by various three-awns, queensdelight, Ashe juniper, agarito, and Texas persimmon.

Low Stony Hill Range Site. The Low Stony Hill Range Site is found in areas supported by Tarrant soils which are very shallow and relatively level. Under excellent conditions, the dominant species on this site are little bluestem, indiangrass, sideoats grama, green sprangletop, plains lovegrass, and Texas cupgrass.

Under moderate grazing pressure and/or recovery from past disturbances, dominant species include hairy dropseed, buffalograss, Texas wintergrass, feather bluestem, Wright three-awn, and various perennial legumes. Scrubby live oak and shin oak are common on this site in these conditions. Broadleaf plants include bush sunflower, orange zexmenia, and sagewort.

Under conditions of high stress, the site is often invaded by purple three-awn, hairy tridens, Texas grama, red grama, queensdelight, annual grasses and forbs, Ashe juniper, Texas persimmon, and Texas oak.

Steep Rocky Range Site. The Steep Rocky Range Site is comprised of plant communities supported by very shallow Tarrant soils. These soils are usually located on extremely hilly surfaces. Under good conditions, this site is supported by little bluestem, sideoats grama, tall dropseed, and green sprangletop. Scattered populations of indiangrass and big bluestem may be found in pockets of deeper soil, and Canada wildrye may be found in clumps of shin oak on ridges.

Sites that have been impacted by moderate grazing or are recovering from high levels of stress may be dominated by species such as slim tridens, Wright three-awn, fall witchgrass, and Texas wintergrass. Other plants include skunkbush sumac, evergreen sumac, Lindheimer silktassel, and kidneywood. Woody plants often are found in this area and are dominated by Texas oak, Lacey oak, and live oak.

Under very poor range conditions following various levels of stress, the site is invaded by three-awn, Texas grama, red grama, mat sandbur, and annual weeds and grasses. Ashe juniper and Texas persimmon are usually the most common woody plant invaders.

Rocky Upland Range Site. The Rocky Upland Range Site also occurs on Tarrant soils found on gently undulating upland areas. Under good range conditions, the dominant species are little bluestem, sideoats grama, plains lovegrass, Canada wildrye, and green sprangletop.

Under moderate stress or recovery from heavy stress, plant communities are dominated by hairy grama, buffalograss, curly mesquite, slim tridens, Texas wintergrass, and fall witchgrass. Live oak and shin oak establish relatively dense populations under these conditions.

As range conditions continue to degrade, the site is dominated by hairy tridens, red grama, tumblegrass, pricklypear, buffalo-bur, mealycup sage, and three-awn. Ashe juniper is usually the common woody plant invader.

Clay Loam Range Site. The Clay Loam Range Site is most commonly found in the portions of the project area located along the riparian corridor of Cibolo Creek. These areas are supported by relatively deep alluvial soils and Lewisville soils. Under good range conditions, the dominant species include cane bluestem, silver bluestem, fourflower trichloris, sideoats grama, plains lovegrass, Texas cupgrass, and Arizona cottontop.

Under levels of moderate stress, the plant community is usually dominated by spike bristlegrass, Texas wintergrass, pink pappusgrass, buffalograss, curly mesquite, and fall witchgrass.

As range conditions decline or high levels of stress have occurred, the site tends to be invaded by Halls panicum, Texas grama, hooded windmillgrass, sand dropseed, red grama, purple three-awn, and hairy tridens. Common woody invaders include mesquite, condalia, whitebrush, spiny hackberry, blackbrush, acacia, agrito, persimmon, pricklypear, and tasajillo.

Data Collection Methods

Conducting a vegetation survey and analysis of each tract is essential to making decisions regarding vegetation management, public access decisions, and interpretive/educational options. High-quality aerial photographs and topographic maps should be used to assist in mapping plant communities. Wherever possible, GPS equipment should be used to assist in the demarcation of unique plant populations and plant community boundaries. All data should be associated with geographic locations on the tracts. Detailed vegetation surveys should include the following:

1. Identification and characterization of plant communities based on dominant plant species.
2. Delineation/mapping of plant communities

Other areas requiring mapping include the following:

- Significant populations of invasive or exotic plant species
- Overgrazed areas
- Areas with erosion problems
- High-quality plant population remnants requiring specific management techniques such as burning or cedar removal
- Areas with seed harvest potential for planting disturbed areas
- Areas with potential for research on vegetation control and management issues
- Fragile areas that should be restricted from public access
- Locations of example vegetation types that could be incorporated into an interpretive trail system

Mapping Vegetation Units

Field notes taken during vegetation surveys should include mapping the boundaries of existing vegetation units based on the vegetative character and descriptive notes including the following:

1. Description of dominant species in each strata of the plant community. Horizontal strata include:

    - Trees (greater than 20 ft. tall)
    - Shrubs/Brush (less than 10 ft. tall)
    - Herbaceous plants

    Notes on the plants can include a description of height, form and character of the vegetation. In most cases, dominance of plant species can be determined by visually estimating the percent of the ground covered by the canopy or foliage of the species.

2. Description of the successional level of the existing plant community. Describing the successional level of a plant community is often a difficult, speculative and incomplete venture. Even so, these descriptions and understandings will be central to the development of restoration models and management strategies. The successional level of a plant community is a result primarily of (a) passage of time, (b) plant dispersal and growth rates, (c) synergistic effects of plants, animals, and the environment, (d) interruptions by discrete natural events such as fires, wind storms or floods, and (e) impact of human activities such as clearing, burning, farming and grazing.

    Successional levels of plant communities in the project area can best be determined by using the range site descriptions in the previous section. The dominant grass species usually provides a good index as to the level of disturbance on the site. This information coupled with observation of woody plant age, age distribution, and any

evidence of physical disturbances can provide a relatively accurate determination of the level of succession. Additionally, it is recommended that historic aerials be used to detail the activities and changes in plant cover/composition over time. In Bexar County, most areas have aerial photographs available as early as 1938.

3. Locations of special biological features such as rare plant species or unusually large specimens.

4. Description of browse and grazing impacts. This will be a description of components of the plant community that reflects a decrease in diversity as a result of past management practices related to browsing and grazing.

5. Description of soil and moisture characteristics as they relate to existing vegetation.

6. Location and extent of colonies of introduced invasive species. This should include notation regarding any illegal wetland species. Refer to the Texas Parks and Wildlife Department for a list of state prohibited plant species.

7. Location of highly disturbed and stressed areas.

Compiling a Species List

An ongoing list of plant species found on each tract during all seasons should be compiled. The list can be used in the field to make annotated notes for planning purposes. The list should have columns for the following topics:

1. Native
2. Exotic
3. Ranking of Common to Uncommon
4. Potential for Seed Harvest
5. Column for Comments, such as
   - Uncommon native species deserving special considerations in site planning or salvage
   - Abundant species which will help in defining existing vegetation units
   - In disturbed areas, remnant native species likely to have been significant in the former vegetation structure
   - Species likely to be utilized in restoration or landscaping

Where possible, an existing species list from a similar area should be used as a checklist. Caution should be used in making assumptions about the similarity of two different sites.

Scoring Methods

Vegetation data collected should be compiled onto four separate mapping layers:

1. Community type
2. Browse and grazing impact
3. Exotics and invasive species

4. Location of disturbance (such as roads, oil spills, etc.)

Information on each mapping layer will be scored separately based on a range of 1 – 10, with 1 being of the lowest natural value and 10 being of the highest natural value.

Table 8. Vegetation	Issue Score
Community Type	
High quality, highly sensitive to impact	10
High quality, diverse example of a vegetation unit	9
Recovering from past impacts; moderate disturbance	5
Low level of plant succession; highly disturbed	1
Browse and Grazing Impact	
Little evidence of browsing or grazing	10
Moderate browsing and grazing	5
Most edible browsing and grazing species virtually gone	1
Exotics and Invasive Species	
Up to 2% cover of exotic species	10
Up to 10% cover of exotic species	7
Up to 20% cover of exotic species	5
>20% cover of exotic species	1
Disturbance	
No evidence of disturbance	10
Medium evidence	5
Complete alteration of vegetation, soil and structure/shape	1

Management Strategies

MANAGEMENT GUIDELINES

The overall goal of vegetation management for Natural Areas is to create stable eco-systems that contain a high diversity of appropriate plant species.

When developing a plan for managing vegetation, a statement of objectives must be created for each Natural Area. Plans should include schedules, budgets, performance standards, and strategies for long-term monitoring and maintenance of the managed areas. There will be a number of different management concerns regarding various vegetation issues and more than one management strategy option.

Managing Exotic Species

Exotic and invasive plants are the second greatest threat to species conservation, second only to land development. Noxious weeds crowd native plants, resulting in decreased plant diversity and available forage for animals. The land manager should develop a prioritized list of target species and update the list regularly.

In managing Natural Areas, one goal is to improve the biological health of the habitat as much as possible. This will involve reducing or eliminating exotic and invasive species, though it is important to be realistic when trying to control exotic species. There are, however, some exotic species that are not very harmful. In developing a management plan, it is important to determine which exotic species pose the greatest threats, based on biological and economic realities. When managing against exotic species, methods that cause the least possible disturbance to native vegetation and soils should be used. Once exotic and invasive species have been removed, there is a danger that re-invasion can occur. The land manager should use habitat restoration techniques described in the section on managing low-diversity areas after removal of exotic species is complete.

Methods for controlling invasive and exotic species include the following management techniques:

Mechanical removal. Use of mowers or weed eaters with attached bags to remove all cut material. This method is best for removing annual species before they set and drop seed.

Hand removal. Removing species by hand is time consuming but effective in areas where colonies of exotic species are relatively small. It is important to remove the entire root system to eliminate the possibility of regrowth.

Prescribed Fire. Prescribed fire can be used in grassland areas to retard the growth of invasive species while restoring the burned area with native species.

Herbicides. In areas where invasive species are too numerous to control with other methods, limited use of herbicides such as Round-Up is sometimes the only solution to a difficult problem. Careful consideration should be made before deciding to use herbicides. If used according to the instructions on the label, herbicides can be a safe and effective method of invasive plant control.

Brush hog or hydro-axe. Use of brush hogs or hydro-axes can be detrimental to Natural Areas due to the depth of mulch often left on the ground. This equipment is used to cut and mulch brush species with stem diameters as great as 4 inches. When mulch is greater than two to three inches thick, it will inhibit growth and germination of many seeds. This tool is especially useful for removal of young Ashe juniper because it will not regrow from cut stems, thus creating population of more desirable species such as live oak and deciduous woody plants that regrow well following cutting.

The mulch of Ashe Juniper, which is allelopathic, inhibits the growth of many species of grasses, forbs, and woody species. If the brush hog or hydro-axe is used, the cut and mulched material should be removed from the site for use in areas where plant control is desired (trails, etc.). The same equipment may also be used to cut live oak, shin oak, evergreen sumac, and other species conducive to BCV habitat. These species re-grow relatively rapidly following mechanical removal. Thus, areas that may not currently be supporting habitat conducive to the BCV may be enhanced by removal of current populations and allowing these to re-grow in more dense populations.

Bulldozing. Bulldozing is a common practice used in the Hill Country for removal of vegetation. The method is not very effective for most deciduous species of plants, but may provide some control of Ashe juniper. Because bulldozing often significantly

disturbs the soil surface and may remove herbaceous vegetation, its use in Natural Areas is not recommended except for areas where no other alternative for plant management is available and in areas where soils and topography are not sensitive. The land manager should carefully consider the destructive quality of this plant control method. In addition, consultation with the TCEQ is usually required, since the site is located on areas falling under regulations for the Edwards Aquifer recharge zone. Erosion control measures are usually required following use of bulldozing as a management tool.

Stripping/Chaining. Stripping or chaining is another method commonly used for brush control, especially in South Texas. It usually involves dragging a cable or anchor chain between two bulldozers to knock over and remove vegetation. This method is not recommended for Natural Areas due to its indiscriminate removal of all vegetation and potential impacts to plant communities caused by increased erosion. However, some forms of stripping can be used prior to prescribed burns to increase the fuel load close to the ground surface.

Ashe Juniper, Live Oak, and Brush Removal

Under certain circumstances, it may be desirable to remove young Ashe juniper, live oak, and other brush species. This can be accomplished by many of the methods listed above. On a Natural Area, the ideal method of removal is individual plant cuttings. Ashe juniper does not require any further control due to the fact that it generally will not re-grow from cut plants. However, live oak and brush species may require further control following cutting. One of the better methods of controlling woody plants following cutting is to paint the stumps with a Roundup solution (according to label directions) or diesel fuel. If either of these methods is used, impacts to the environment are probably minimized and relatively high levels of control of the species are obtained. Control of invasive woody plant species may require application of herbicides in emergency situations. If herbicides are used for controlling brush and woody plants, the land manager should carefully research the spectrum of plants controlled by the herbicide to ensure that non-target plants will not be impacted by herbicide application. This can be accomplished by proper selection of herbicides and proper selection of application methodology. It is recommended that the land manager consult with the Texas Agricultural Extension Service for recommendations concerning brush control on Natural Areas.

Managing Low-Diversity Areas

Some areas that require management are those that have been impacted by heavy browsing or grazing. Some of these areas might not contain invasive or exotic species, but may be simply low in bio-diversity. Habitat restoration techniques can be used to manage these areas. The land manager can seek out nearby remnant areas that have the missing species and harvest seeds for use in the area to be managed. Seed harvesting should be done in late spring or early summer and again in late fall in order to collect the widest variety of species. Seeds from annual and perennial grasses and wildflowers should be collected.

In addition to seeding, re-introducing woody vegetation through planting is another management technique to increase diversity. If irrigation is not possible in areas to be

planted, woody species should be planted during the dormant season between mid-November and mid-March. Plants should be grouped in naturalistic colonies appropriate to the soils and rock types. To increase survival rates, natural drainage patterns should be considered when placing the plant material to be installed.

Managing Damaged Areas

Areas that have been severely damaged will need full-scale habitat restoration. If there is a need to reshape the soil, it is important to ensure that the created drainage patterns mimic the natural patterns. If berming is needed for erosion control, native materials such as rocks or locally cut brush should be used. The techniques described in the section on managing low-diversity areas may also be used.

CULTURAL RESOURCES

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ARCHAEOLOGICAL AND HISTORICAL RESOURCES

General Description

The people of San Antonio live within a rich matrix of cultures, representing a long history of human occupation in what is now the project area. The history of the city is embodied not just in historic records, but in the material remains left behind in historic and prehistoric sites by former inhabitants of the area.

The importance of any such site on city-owned land is enormously enhanced by the fact that so many historic and especially prehistoric sites have already been destroyed. This destruction is largely the result of three major factors: 1) urban development such as housing construction, road building, parking lot construction, etc., that is a natural outcome of the increasing population of the city; 2) looting of archaeological sites by "collectors" seeking to enhance their personal collection of "relics," or to sell artifacts on the antiquities market; and 3) natural forces such as erosion. The cultural resources of the project area have been seriously impacted by these destructive forces, and this destruction is continuing.

The City of San Antonio has long recognized its obligation to preserve cultural resources on city property. The draft of the City of San Antonio Unified Development Code (UDC) currently in force states, "...archaeological sites shall be treated as any other exceptional or significant resource" (City of San Antonio 2001). Because the archaeological record is so much at risk, the city's role as steward of the cultural resources on city-owned Natural Areas becomes vitally important. The need to protect the Edwards Aquifer Recharge Zone recognized in Proposition 3 has provided the city with an opportunity and an obligation to preserve the cultural resources contained within the properties purchased.

In addition, the city's plans for Natural Areas will also provide an opportunity to increase public awareness of the cultural resources of the city and the need to protect them, encouraging that idea of resource stewardship in the citizens of San Antonio and surrounding areas.

The exact nature of cultural resources on city-owned properties remains to be determined, however a general overview of the cultural history of the region will provide a background from which a more detailed estimation of the nature of the cultural resources on these properties can be built.

CULTURAL HISTORY

The cultural history of the project area spans at least 11,000 years (Howard et al. 2000:11-12). This long time frame has traditionally been divided into four major periods, the Paleoindian, the Archaic, the Late Prehistoric, and the Historic. Each of these major groups is, in turn, divided into subgroups, which will be discussed in brief below. While there is a general agreement on the nature of these subdivisions, the dates of beginning and ending of each is more or less arbitrary and subject to minor disagreements in the

literature (Black 1989; Collins 1995; Hester 1995; Johnson and Goode 1994). This document will use the time-line defined by Johnson and Goode (1994).

The Paleoindian Period (9500 BC-6800 BC)

The terminal Pleistocene period (12,000-10,000 BC) is characterized by cool-moist conditions (Bousman 1997). During this period mega-fauna still inhabit the region, but they become extinct by approximately 10,000 BC, and human occupation first occurs.

The earliest identified occupation of Bexar County is associated with Clovis projectile points found in a number of locations across the county. For example, at the Pavo Real Site (41BX52), located within the Edwards Aquifer recharge zone, both Clovis and Folsom point types were identified (Henderson and Goode 1991). However, most of the Paleoindian occupation of the region appears to have been located in the central and southern part of the county (Howard et al. 2000:12; Orchard and Campbell 1954).

Subsistence during the Paleoindian period is traditionally described as centered on the hunting of large herbivores most of which are now extinct, however, exploitation of many smaller animals and plants was also an important part of the lifeway (Howard 2000:11). In the latter part of the Paleoindian period, projectile point types become somewhat more diversified and localized (Collins 1995:382), probably in response to the extinction of the larger herbivores and the adaptation to increasing seasonality in the early Holocene. Late Paleoindian sites are more widespread. The most common point types from this period in Bexar County are the Plainview and Golondrina.

Bousman (1997) used modern pollen rain and current arboreal canopy cover patterns to estimate the changes in past canopy cover with the Weakly and Boriack bogs data. These data suggest that significant changes in tree cover occurred over the last 17,000 years, and these patterns can be used to suggest a number of climatic intervals for a portion of Texas that includes the Central Coastal Plains. Given that no pollen samples derive from the Rio Grande Plains proper, we can only assume that the climatic regimes there broadly paralleled those immediately to the northeast on the Central Coastal Plains.

The Archaic Period (6800 BC-600 AD)

The lengthy Archaic Period subsumes the Middle Holocene, and much of the Late Holocene geologic epochs. Significant climatological changes occurred during the Middle and Late Holocene. The Early Holocene (8,000-6,000 BC; 10,000-8,000 years BP) is characterized by warmer and moist conditions with a brief cool-dry interval between 7,500-7,000 BC. The Middle Holocene (6,000-4,000 BC) can be identified by a dramatic shift to dry conditions and perhaps warm to hot temperatures. A significant shift to more moist conditions, marked by an increase in arboreal pollen occurs around 4,000 BC. The Late Holocene (2,000 BC-present) represents modern climatic patterns that reflect a return to more moist conditions. These changes in climatic conditions significantly altered the distribution and density of edible resources and dramatically impacted the intensity of utilization of different parts of the state and the land use strategies employed by prehistoric peoples.

The 7,000-year span of the Archaic in Texas is variously divided (Black 1985; Collins 1995; Johnson and Goode 1994; Prewitt 1981, 1985). This report will use the

suggestion of Johnson and Goode (1994), which divides the Archaic into Early (6800-3600 BC), Middle (3600-2300 BC), Late I (2300 –600 BC), and Late II (600 BC-600 AD).

Early Archaic (6800-3600 BC). Early Archaic sites along the Balcones Escarpment are generally small and widely dispersed. Angostura, Gower, Martindale, Uvalde, and Early Corner-notched projectile points are often seen at these locations (see Potter et al. 1995). There are, however, examples of sites dating to the Early Archaic period that were clearly revisited with considerable intensity. Based on a small excavated sample, Tennis (1996; see also Tennis and Hard 1995) estimated 4000 hearth features associated with Early Archaic deposits across site 41BX47, on the upper Leon Creek, not far from the Paleoindian site at 41BX52.

The distribution of sites across South Texas and the southern edge of the Balcones Escarpment suggests that as a response to increasingly drier conditions much of the drier southern portion of South Texas is relatively sparsely populated during the first half of the Middle Holocene. On the other hand, the more riverine and spring-laden Balcones Escarpment region sees an increase in occupation intensity as peoples aggregate near more predictable and stable water sources fed by springs issuing from the deeper Edwards Aquifer (see also Collins 1995:383).

The very early portion of the Middle Holocene may have witnessed the presence of bison within the region. However, as climatic conditions begin to deteriorate and become drier, hunter-gatherer subsistence strategies tend to place greater emphasis on plant resources and the hunting of medium-sized ungulates such as deer and antelope. It is during this period that the first of the features known in Texas as "burned rock middens" begin to appear. These accumulations of fire-fractured limestone are believed to be the remains of earth ovens, in which the bulbs of such plants as sotol and yucca were cooked. They tend to be smaller and less prevalent in the Early Archaic than in later periods (Collins 1995: 383).

Middle Archaic (3600-2300 BC). The Middle Archaic period appears to be a time of increased population, based on the large number of sites reported from Central and South Texas (see Black 1989b; Story 1985). There is evidence of a brief more mesic (i.e. wetter) period during this time and bison were apparently present during at least the first part of the period (Dillehay 1974). Toward the end of the period, as the climate began to dry once more (Johnson and Goode 1994:26), the use of burned rock middens, first recognized in the Early Archaic, become increasingly common (Collins 1995:383; Creel 1986). A variety of point types have been recovered from Middle Archaic sites, including Bell, Nolan, Langtry, Early Triangular, and Travis dart points.

Late Archaic I (2300 –600 BC). Johnson and Goode (1994:26) believe that the Late Archaic I period saw an increase in the drying trend that began in the last part of the Middle Archaic. On the other hand, based on arboreal and grass pollen frequencies, Bousman (1997) suggests that moister conditions prevail at least during the period. Bison populations increase throughout Central Texas and subsistence practices again seem to favor the hunting of large-body-size species. The beginning date is somewhat earlier than most other dating schemes suggest (see Collins 1995:384) and includes the largest growth of burned rock middens. Large, thin-bladed points such as Bulverde, Montel, Castroville and Pedernales are most common from this period.

Late Archaic II (600 BC-600 AD). This is a transitional period and a brief drying trend appears to be present near the very end of the period. Bison populations shrink once more (Dillehay 1974) and while the hunting of deer and antelope continues, the utilization of burned rock middens seems to begin to increase and flourishes into the early part of the Late Prehistoric. The projectile points range from the large, thin Marcos to the much smaller Frio and Ensor points. It is believed that the accumulation of burned rock middens slowed in this period.

A proliferation of human cemeteries seems to take place, especially in south and south-central Texas (e.g., Givens 1968; Lukowski 1988; Taylor and Highley 1995), leading some to argue that populations were becoming more territorial with reduced mobility (Story 1985: 44-45). This idea is given more weight by the increase in evidence of violence in the first part of the Late Prehistoric.

The Late Prehistoric Period (600-ca.1500 AD)

At about 600 AD there was a major shift in projectile technology from darts (thrown) and spears (thrusting weapons) to the bow and arrow. The period between the adoption of the bow to the contact with Europeans is generally referred to as the Late Prehistoric (Collins 1995:385), although it has also been called the Neo-Archaic (Prewitt 1981), and the Post-Archaic (Johnson and Goode 1994). The Late Prehistoric is divided into two intervals. The Austin (600 AD-1200 AD) is characterized by Scallorn and Edwards arrow points. The Toyah (1200-ca. 1500 AD) saw the adoption of pottery and a new tool kit consisting of Perdiz arrow points, large, thin bifaces and prismatic blades. It was at this time that the bison returned to South-Central Texas (Dillehay 1974) and it is believed that the new tool kit is associated with hunting them (Collins 1995:385).

In the roughly 110 years between the arrival of the Spanish in the New World and the first serious explorations of south central by Spanish and French explorers beginning in 1609, there is a serious disruption of the Toyah lifestyle in South-Central Texas. This Proto-Historic period is very poorly understood. Groups of displaced peoples fleeing northeast from the Spanish and others fleeing southeast ahead of the Apache expansion flooded into the region, so that the cultures that are later chronicled (somewhat sporadically) by the Spanish are not the same as those who had so successfully adapted to life along the edge of the Edwards Plateau for thousands of years (Campbell and Campbell 1985:1; Collins 1995:387; John 1975).

The Historic Period (1609 AD-Present)

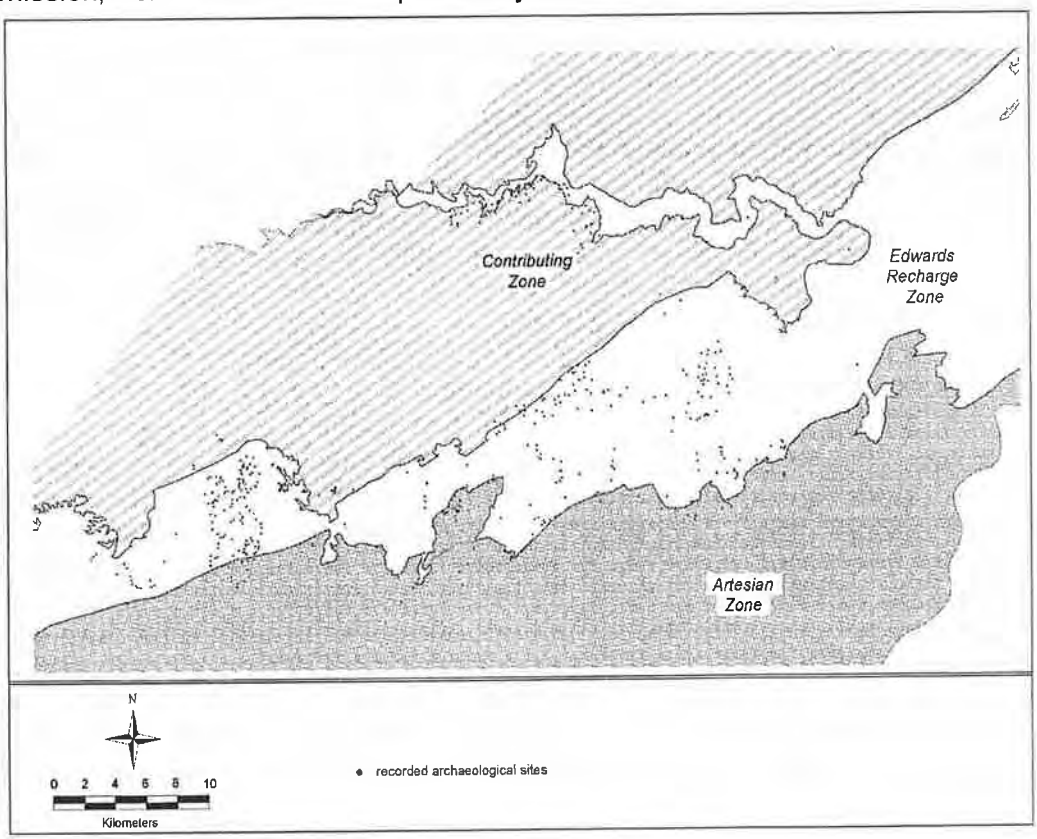
Beginning with the Spanish *entrada* of 1609 and continuing to this day, we have at least some documentary evidence of the uses to which the Balcones Escarpment has been put. This has been largely limited to cattle ranching, since the area in question is for the most part extremely rugged, with very thin or no soils. The area was principally an area of large cattle ranches and smaller homesteads (Scott et al. 1998:10). Previous surveys have shown that there are various types of historic structures over the Edwards Aquifer recharge zone, some of which have been assessed as potentially eligible for inclusion in the National Register of Historic Places (NRHP), and State Archeological Landmark (SAL). There is a possibility of discovering more such sites in the Natural Areas purchased by the city.

ESTIMATING CULTURAL RESOURCES ON THE PROJECT AREA

The process used to estimate the cultural resource potential in properties acquired by CSA included the following steps:

1) Search archives and create database of previously identified sites on and near the Edwards Aquifer recharge zone in Bexar County.
2) Use GIS techniques to examine relationship of landscape to prehistoric and historic land use.
3) Create maps showing areas of high, moderate, and low probability for archaeological sites in the Edwards Aquifer recharge zone. These maps will allow fairly accurate estimates of the potential for cultural resources in the properties purchased by the City of San Antonio.

The first step in the assessment process was to gather information on previously identified sites in a study area defined as "areas inside and immediately adjacent to the Edwards Aquifer recharge zone, as well as sites located in and near a small area of the eastern edge of Medina County donated to the City of San Antonio." A search on the Texas Archeological Sites Atlas, an online database administered by the Texas Historic Commission, for information on previously identified sites in the study area was



Distribution of archaeological sites within the contributing zone, artesian zone, and recharge zone of the Edwards Aquifer.

performed. In addition, data was retrieved from a number of surveys and site reports on projects in the study area. A review draft of a recent survey of Government Canyon

State Natural Area (Greaves and Mauldin 2002) was also consulted. Data collected included site trinomial; UTM Easting and Northing for site center; site type; estimate of site size (m^2); temporal intervals (e.g., Late Paleoindian, Early Archaic, Middle Archaic, Late Archaic I, Late Archaic II, Late Prehistoric, Historic) for which there is evidence; and nearest named watercourse. This information was then used to add data based on GIS maps: the soil type, and the distance (m) to the nearest water from the site center.

The Database

Data was compiled from a total of 450 archaeological sites found within the project area and its immediate vicinity. Although the majority of the sites come from within the recharge zone proper, a small number of sites that were considered to be representative of the immediate vicinity of the recharge zone (i.e., artisian-wells and contributing zone) were also included in the sample These sites come from a band no more than 2.5 kilometers outside of the recharge zone proper.

Of the 450 sites, 337 (75 percent) archaeological sites are found within the Edwards Aquifer recharge zone, 58 (13 percent) are from the contributing zone immediately north of the recharge zone and 55 (12 percent) are from the artesian-wells zone lying on the south side of the recharge zone. Only 16 (4 percent) of the sites are from the Medina County portion of the aquifer; the remaining 434 (96 percent) are from the Bexar County portion.

The list of sites includes all sites that have been professionally recorded and had at least partial information on one or more of the characteristics included in the database used for this document. Other sites are known to exist in the project area, but since no State of Texas Survey Forms have been completed for them, little else is known other than their location. Therefore, none of these sites are included in our database. No doubt, the actual number of sites present within the project area is substantially larger. However, we feel that the sites occupy sufficiently diverse locations that they are representative of the general distribution of sites and the general characteristics of sites found within the project area.

Archaeological Components and Site Types

Each discrete, clearly identifiable occupation of a location (i.e., of a site) is called a component. Normally components are identified as distinct occupations of a site that occurred at different times. For instance, the database contains information on 450 previously identified sites in the study area. Of these, 418 contained only prehistoric remains and 28 contained only signs of historic occupations. An additional six sites contained signs of both prehistoric and historic occupations. This breakdown indicates that there was little overlap between areas used by prehistoric peoples and historic peoples within the project areas. That is, there is little overlap in the locations preferred by prehistoric and historic occupants of the region. However, through urban growth and development, the degree of overlap between areas used by prehistoric peoples and contemporary populations increases.

A site type is a descriptive short hand that describes or characterizes the nature of the occupation of the site. The following site types were identified in the study area:

Prehistoric Open Camps. These sites are open-air locations where there is evidence of prehistoric residential occupation, such a remains of cooking, food consumption, tool manufacture and repair, etc.

Prehistoric Burials. Most of these found in the study area are in sinkholes or caves, but they may be found anywhere.

Burned Rock Middens. These are accumulations of fire-cracked limestone, the remains of earth ovens in which bulbs of plants were roasted. In general, the oven itself is simply one feature (i.e., a cooking facility) on a campsite utilized for the performance of a number of different tasks.

Lithic Procurement Areas. These are areas where chert nodules are eroding out of the limestone bedrock and there is evidence of testing and trimming of the nodules by prehistoric peoples.

Historic Ranch/homesteads. These sites often have a series of outbuildings and other structures in association.

Historic Cemeteries. These are usually, but not always, marked with tombstones and/or other indicators.

Historic Military Sites. These are unlikely to be in the project area unless land previously used for military training is acquired by the city.

Historic Trash Dumps. These might range in age from Colonial to early twentieth century.

Miscellaneous Historic Structures. Any historic structure not listed above. An example would be the various water acquisition and storage features located along Cibolo Creek.

Because a particular spot on the landscape may have been occupied for a number of different reasons (i.e., the co-occurrence of water, stone material for tools, etc), or a number of different times throughout prehistory and history, it may exhibit a combination of "site types" such as an open camp used for lithic procurement, an open camp containing human burials, or a prehistoric open camp reoccupied during historic times and used as part of a ranch.

Of the 450 sites, 392 are identified as Prehistoric Open Camps. The cultural material on these sites consists of a combination of the remains of prehistoric tool making and repair, such as broken and exhausted tools, and the remains of hearths used for cooking, such as small concentrations and/or scatters of burned, sometimes reddened angular rocks. Of the 392 open campsites, four have evidence of human burials. The presence of burials increases the archaeological significance of these sites and the need for their protection. In the case of at least 40 of these Prehistoric Open Camps, however, large rock ovens were constructed for the bulk processing of certain kinds of foods. These ovens could have been reused repeatedly over a number of years leading to large accumulations of what during modern times would be recognized as fire cracked angular rocks. In a pristine (un-looted) state, these piles may retain a central pit features

and the burned rock midden itself can contain invaluable botanical evidence of the food remains, diet, and manner of food preparation employed by prehistoric peoples.

An additional 47 Prehistoric Open Camps also contained ample evidence of the procurement and manufacture of large quantities of stone tools. This is of course not to say, that the occupants of the other 345 open camps did not procure raw materials and manufacture tools at those sites. The only distinction the notation of lithic raw material procurement may be identifying is the relative bulk of raw material that was being procured and processed at these types of camps compared to the other open camps where lithic procurement is not directly identified.

Finally, of the 392 sites, only one is identified as containing both a burned rock oven and the signs of the procurement of large quantities of raw material.

As mentioned before, 28 sites retained evidence of having been occupied only during historic times and six others were occupied during both prehistoric and historic times. Of the 34 historic components, 13 are identified on the site forms as historic ranches, eight are identified only as the remains of structures, and five others are historic kilns. These sites may have significant research potential due to their unique interpretive potential. Importantly, two historic sites are identified as cemeteries. These and any other cemeteries and family plots located within the project area are highly sensitive properties that require special protection and management care. Three components consist of nothing more than dumps of historic debris, while the remaining three are simply segments of rock walls such as property markers. These later six historic sites have little in terms of research potential.

The distribution of the three major prehistoric site categories (i.e., open camps with middens, open camps with lithic procurement, and open camps) by topographic zone indicates that the majority (n=33, 69%) of the lithic procurement sites are located in the uplands and on intermediate clay soils on moderate slopes (n=11, 23%). Only four sites (8%) with strong lithic procurement aspect are found on floodplain/terrace settings. The majority (n=260, 66%) of the prehistoric open campsites also are found in upland settings, although nearly double the lithic procurement sites are found on floodplain/terrace settings (n=59, 15%). Interestingly, nearly one third (n=11, 27.5%) of the prehistoric campsites with burned rock middens are found on floodplain/terrace deposits.

	Uplands	Intermediate Clays	Floodplain/Terrace	Total
Lithic Procurement	33	11	4	48
Burned Rock Middens	24	5	11	40
Open Camp	260	73	59	393

This pattern suggests that access to water was a relatively important aspect for locating rock oven sites. This is even more clearly evident when we consider the mean distance to water of the three site categories.

	Mean Distance to Water	Standard Deviation	Minimum	Maximum
Lithic Procurement	207.8	142.7	2.6	570
Burned Rock Middens	140.3	147.3	1.3	528
Open Camp	174.8	149.6	1.1	836

Prehistoric open camps with burned rock middens are on the average within 140 meters of a stream while open camps with strong evidence of lithic procurement are on the average more than 200 meters from streams. Prehistoric open camps without either of these aspects are located at an intermediate distance between the two previous types. This pattern indicates that the likelihood of finding burned rock midden sites and open campsites is relatively high on land parcels with flowing water. Lithic procurement sites, on the other hand, would be more common on land parcels containing large patches of upland settings.

Temporal Evidence

Of the 450 sites, 304 (68%) have no known chronological affiliation, that is, the age of their archaeological materials cannot or has not been determined. On the remaining 146 sites, between 1-6 archaeological components -- archaeological materials of distinct ages -- have been recognized. Of the sites with known archaeological components, 89 (61%) have a single component, 35 (24%) have two components, 12 sites (8%) have three components, five (3%) sites have four components, four (3%) sites have five components, and a single (1%) site has six recognized components. In the large majority of the cases, however, the recognition of the number of components is based on the presence of surface artifacts alone without subsurface investigations at the site. This means that it is possible that the total number of sites with multiple components is no doubt larger than what is estimated based purely on surface artifact recovery. In addition, since many of these sites may have been surface collected for many years, it is likely that the number of temporally diagnostic artifacts may have also decreased over the years resulting in lower potential estimates of numbers of archaeological components per site.

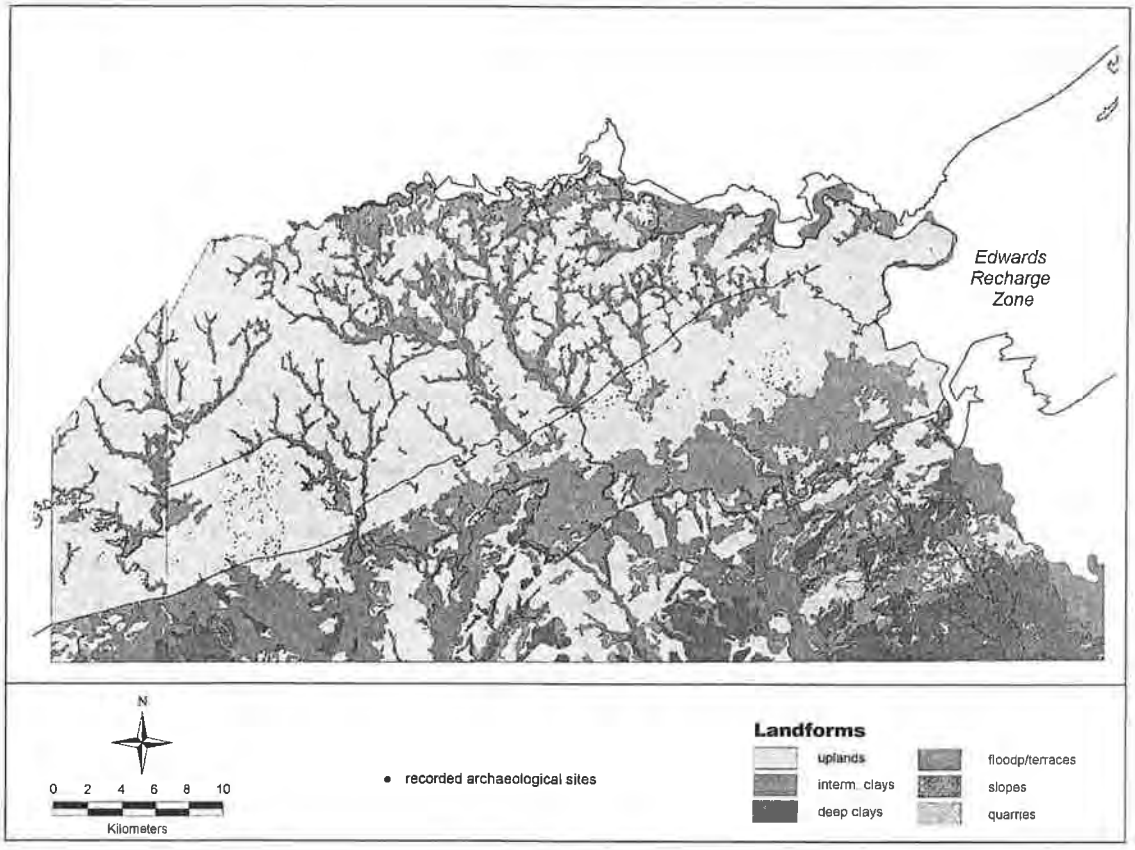
All together, the 146 sites with archaeological components with known temporal affiliation contain a total of 237 components. Among these, Late Prehistoric components are the most common (n=44, 19%), followed by Early Archaic (n=42, 18%), Late Achaic I (n=42, 18%), and Late Archaic II (n=42, 18%) components. Middle Archaic (n=30, 13%) and Historic (n=32, 13.5%) components occur less frequently, while Late Paleoindian components, the oldest in the region, are present only at 10 (4%) sites.

The relative abundance of Late Prehistoric components is not very surprising given that it is the most recent prehistoric manifestation and therefore would have had a shorter time to become buried. In addition, given that Late Prehistoric components would probably be identified based on arrow points, and arrow points are more difficult to spot by collectors and/or on professional surveys, it is likely that the number of Late

Prehistoric components is even greater than indicated by this survey. Given the length of the Early Archaic period (3,200 years) it is somewhat surprising that only 42 components dating to this time period have been identified in the region.

The Distribution of Sites

The 17 soil types present within the project area were combined into six zones (uplands, intermediate clays, steep slopes, deep clays, floodplain/terrace soils, and quarry locations) that roughly represent similar soil types and topographic settings. The location of Archeological sites with respect to these landforms are shown in the figure below.



Location of known archeological sites with respect to landforms.

Uplands constitute the largest area followed by intermediate clays, and floodplain/terrace deposits. Deep clays cover a smaller area, while the two other zones represent isolated pockets across the project area.

	Uplands	Intermediate Clays	Steep Slopes	Deep Clays	Floodplain/ Terrace	Quarry	Total
Area (acres)	116,811	39,309	48	2,588	31,931	447	
No. Sites	290	84		1	74		449

Because of the breakdown of the acreage within the project area, it is not surprising that the largest number of sites is in the uplands followed by the intermediate clays and the floodplain/terrace clays. It is also likely, however, that this distribution is also heavily influenced by the surface visibility of the archaeological remains. That is, because upland settings tend to be settings characterized by erosion rather than deposition, it is likely that sites would have little chance of being buried. On the other hand, sites located in the deep clays of the floodplains and terraces are usually in buried contexts and have been identified through subsurface probing rather than surface manifestations. Given this circumstance, it is likely that numerous buried and hitherto unidentified sites may be present in floodplain/terrace settings. Because these sites would often not be visible on surface, their discovery depends on the systematic use of shovel testing and backhoe trenching. In most instances, upland sites can be discovered using simple surface surveys although the identification of site boundaries may require subsurface shovel testing.

Typical Upland Site

Typical Terrace Site

Site Sizes

In addition to the distribution of sites by landform and in terms of distance to water, an additional important archaeological aspect of the size of the sites that may be potentially encountered within the project area. In general, prehistoric campsites where lithic procurement activities have played a prominent role have the largest mean size (n=44; 97,036 m^2). Prehistoric campsites with burned rock middens have the second largest mean size (n=40; 60,630 m^2), while prehistoric open camps without either of these elements have the smallest mean size (n=394, 40,680 m^2).

	Mean Site Size	Standard Deviation	Minimum	Maximum
Lithic Procurement	97,036	151.836	100	755,558
Burned Rock Middens	60,630	114,299	160	600,000
Open Camp	40,680	82,717	21.8	37,500

Summary of Site Distributional Data

Although a large number of archaeological sites are already known from the project area, it is likely that this number is only a small fraction of all the sites actually present. In general, prehistoric sites greatly outnumber historic sites within the project area. The spatial distribution of prehistoric sites is quite different from those of prehistoric sites due to the different resources that were of significance to the respective inhabitants of the project area. Historic archaeological sites should be expected in the immediate vicinity of streams and on flat floodplains and terraces. The majority will consist of ranching related occupations and the presence of standing structures should be expected. Historic cemetery sites should also be expected and a comprehensive historic and archival research project should be carried out to identify all cemetery locations with the project area. In addition, family cemetery plots may also be encountered on isolated ranch sites.

A large number of prehistoric archaeological sites are present throughout the project area. The occupations on these sites may range from 12,000 years before the present to as little as 400 years ago. Existing archaeological evidence indicates that Early Archaic, Late Prehistoric, and Late Archaic I and II period sites may be the most common across the project area. The oldest sites dating to the Paleoindian period may be relatively scarce and Middle Archaic sites also may be relatively under-represented.

The majority of the sites may be classified as prehistoric open campsites, and will be characterized by large quantities of debris from stone tool making and repair, food preparation and cooking activities. They are archaeologically highly visible due to the quantity of materials present on site. This means that both archaeologists, the general public, and potential looters can easily recognize and impact them. Open campsites with burned rock middens, commonly representing ovens, should be even more visible due to the large quantity and concentration of angular fire-cracked rock associated with such features. These sites are commonly very easy to spot and a large proportion of them found on public lands are heavily looted or destroyed. Open campsites with the remains of lithic procurement activities present on them are characterized by large quantities of chipping debris from the manufacture of large numbers of stone tools. Individuals trained in recognizing chipping debris can easily spot such sites and large numbers of stone tools are traditionally collected from their surfaces when the general public has access to them.

The fact that open camps with lithic procurement debris tend to be large and located in upland settings where they are not buried, makes such sites highly visible and subject to various adverse impacts. The fact that regular access to water seems to have been an important aspect of the utilization of rock ovens results in open campsites with burned rock middens being located in the general vicinity of streams either on the floodplain or on a nearby terrace. Such contexts may also contribute to some of these sites having a higher chance of burial that may in turn reduce the changes of vandalism. Open campsites without these highly visible features (i.e., middens or large quantities of lithic debris) are widely distributed throughout the project area and range from very small sites to extremely large sites littered with areas of high artifact density scattered among a background of sparse low density materials.

HISTORIC SITES AND STRUCTURES

Most of the properties and tracts located on the project area could potentially contain historic buildings or structures. In most cases, these buildings and structures are related to past ranching operations and other enterprises that may have occurred in the area. Remnants of old wells, stone fences, wagon roads, bridges, and stagecoach stops may be present on these properties. Historic sites may also be found on these properties and may be no more than the location of a significant event or activity. This type of site may only include the location of an event and may not actually contain any visible buildings or structures. However, such sites are very important culturally and should be protected just as any obvious historical structure would be protected.

Under the Historic Preservation Act, all structures or remnants of structures greater than 50 years old could potentially be protected by federal regulations. If these structures or sites are observed on one of the Natural Areas, the historic value of such property should be evaluated by a qualified historian and its potential for listing in the National Registry should be determined.

In developing a land use and management plan, the historic landscape of the area should be evaluated. This includes the geographic area, both historic and natural features, associated with an event, person, activity, or design style that is significant in American history. This often includes a combination of the historic designed landscapes, vernacular landscapes, and historic sites. The land manager should consider the historic landscape of a Natural Area in the development of the land use and management plan.

Data Collection Methods

In order to properly manage the cultural resources located in the Natural Areas, it is necessary to know what those resources are.

For the initial assessment of the tract in developing the land use and management plan, the following should be performed by a qualified professional archaeologist or archaeological consultant as defined by the Texas Historic Commission (THC):

- Review previously recorded sites on Texas Historic Commission Database and in the literature.
- Perform a 100% pedestrian survey of lands acquired with Proposition 3 funds, using at least the minimum survey standard defined by the Texas Historical Commission.

- Map all sites using GPS equipment, allowing detailed digital mapping of site boundaries. Structures in historic sites should also be mapped and described in detail.

Once sites have been found and mapped, further studies and research may be desired. This work is required if the sites will be impacted by public use. Intensive studies could be scheduled as required, but sites must be protected until documentation according to THC rules has been complete. These studies would be an important aspect of the land use and management plan and should include the following:

- Make a photographic record of each site. For prehistoric sites, this can be limited to one or two frames each, if no features of interest are visible, but a careful photographic record of historic sites should be made.

- Revisit and reevaluate previously recorded sites and evaluate newly discovered sites for eligibility for inclusion in the Nation Register of Historic Places (NRHP) and/or as State Archeological Landmarks (SAL)
    - For some sites, this will involve shovel testing and/or excavation of test units in order to collect enough data for site evaluation.
    - Geomorphological evaluation may be necessary on some sites, in order to understand site formation processes.

- For historic sites, research history of site, including public documents (e. g., deed chains) and other literature, oral histories, etc.

- Assess degree to which collecting/looting/vandalism, previous construction activities, previous land use, and natural impacts such as erosion have already affected site, and the potential for future damage to site from each type of impact. Score each site using standards in the next section.

- Create written report on results of survey. Access to detailed site location information must be severely restricted. Generally, this information is published in a map supplement not available to the public.

- Create digital maps showing location of sites, indicating scoring as described in next section. Actual site boundaries should be enlarged with a 300-foot buffer around each site. Access to these maps should be restricted.

Scoring Methods

Any time previously inaccessible properties are open to public access or undeveloped parcels of land are subject to development, there is a great deal of danger that cultural resources may become adversely impacted. The impact to cultural resources, however, will likely depend on a combination of factors including but perhaps not limited to: 1) the type of agents impacting the property; 2) the type of archaeological property being impacted; and 3) the location of the property.

In general, the types of agents that can impact archaeological sites can be categorized into two broad groups: 1) natural, and 2) cultural. Some of the most common natural agents include:

- burning;
- gully erosion;
- sheet erosion;
- burrowing animals;
- roof fall.

A host of cultural agents can impact prehistoric and historic archaeological sites including:

- land clearing
- vegetation cutting and pushing
- plowing
- cultivation
- earth moving
- borrow pits
- grazing
- historic habitation
- structure deterioration
- pipeline/powerline construction
- road and railroad construction
- wheeled vehicle traffic
- pedestrian traffic
- vandalism

ARCHAEOLOGICAL SENSITIVITY TO DAMAGE

Both groups of agents can significantly impact archaeological sites and their deposits. For instance, forest and grassland fires can significantly impact surface archaeological manifestation by introducing recent charcoal that can lead to erroneous dates on archaeological materials. In addition, burning can severely damage flaked stone artifacts by shattering them if and when temperatures reach sufficient levels and/or burning is persistent and localized. Of course, man-made fires for field clearance can have equally dramatic impacts on surface archaeological resources. Archaeological sites that may have already been impacted by fire may be found within the uplands and in the intermediate clay zones of the project area. Many of the sites located there are surface sites due to the lower probability of burial (i.e., non-aggrading settings).

Gully and sheet erosion also can have dramatic impacts on archaeological deposits including the wholesale removal and translocation of archaeological assemblages, the exposure of buried assemblages, and even their reburial in secondary contexts. Examples of these types of impacts are particularly common on sloping upland surfaces with little vegetation. Much of the project area is located within the Balcones Escarpment, a region characterized by rapid changes in elevation and deeply incised canyons and narrow stream channels. The approximately 30-34 inches of annual rainfall create ideal conditions for the gully and sheet erosion, and indeed the extensive survey efforts carried out by the Center for Archaeological Research (CAR) at the Government Canyon State Natural Area have documented several instances of heavily impacted site surfaces.

Burrowing animals can also impact archaeological deposits whether they are domesticated and/or wild species. Javelinas and hogs both have equally destructive impacts on shallowly buried archaeological deposits and can themselves, contribute to gully initiation. Of significance is the fact that while the other natural agents impact most directly materials that are exposed and on surface, burrowing animals are even more destructive because they can impact shallowly buried deposits that could potentially escape damage from other agents such as fires and sheet erosion. Once the materials are brought to the surface by burrowing animals, they become subject of the destructive agents described above.

The final natural agent that may have a negative impact on archaeological deposits is roof fall. The collapse of rock shelter and cave roofs can significantly damage underlying archaeological deposits due to the weight of the overlying materials. Interesting, however, is the fact that in some instances thick layers of roof fall have actually also served as impenetrable caps to looters and even archaeologists and the discovery of some of the more important and earliest archaeological deposits was delayed because archaeologists assumed that cultural material was likely not present below a thick layer of roof fall. A total of 14 caves and or sinkholes were present among the 450 archaeological sites reviewed within our database. Given the nature of the geomorphology of the Balcones Escarpment, it would not be unexpected that other, hitherto undiscovered rock shelters are common within the project area. It is these caves, rock shelters, and sinkholes that would be subject to disturbance resulting from roof fall. These sites would be located at the margins of limestone ledges that are very common along the escarpment.

Among the various man-made impacts that can severely impact archaeological deposits are land clearing and vegetation cutting and pushing. Whether it is done by chaining, bulldozing, or other mechanical means, land clearing activities impact archaeological remains dramatically. The removal of trees and woody vegetation disturbs the top soil and with it any shallowly buried archaeological sites. Chaining to remove mesquite and other common South Texas invaders has destroyed many archaeological sites and it is likely that sites located in cleared meadows and or on cleared parcels in the lowlands and floodplain terraces would have seen dramatic impacts.

Mechanized agriculture including plowing, disking, and other related activities also result in significant damage to both archaeological sites and individual artifacts. Plow damage is a well-recognized breakage pattern on stone artifacts and many studies have been written to document and account for the vertical and horizontal displacement of artifacts in flowed agricultural fields. Shallowly buried archaeological sites located in intermediate clay soils or in deep clay soils on the floodplains and terraces may have been impacted by such activities if and when the plots were originally cleared and cultivated.

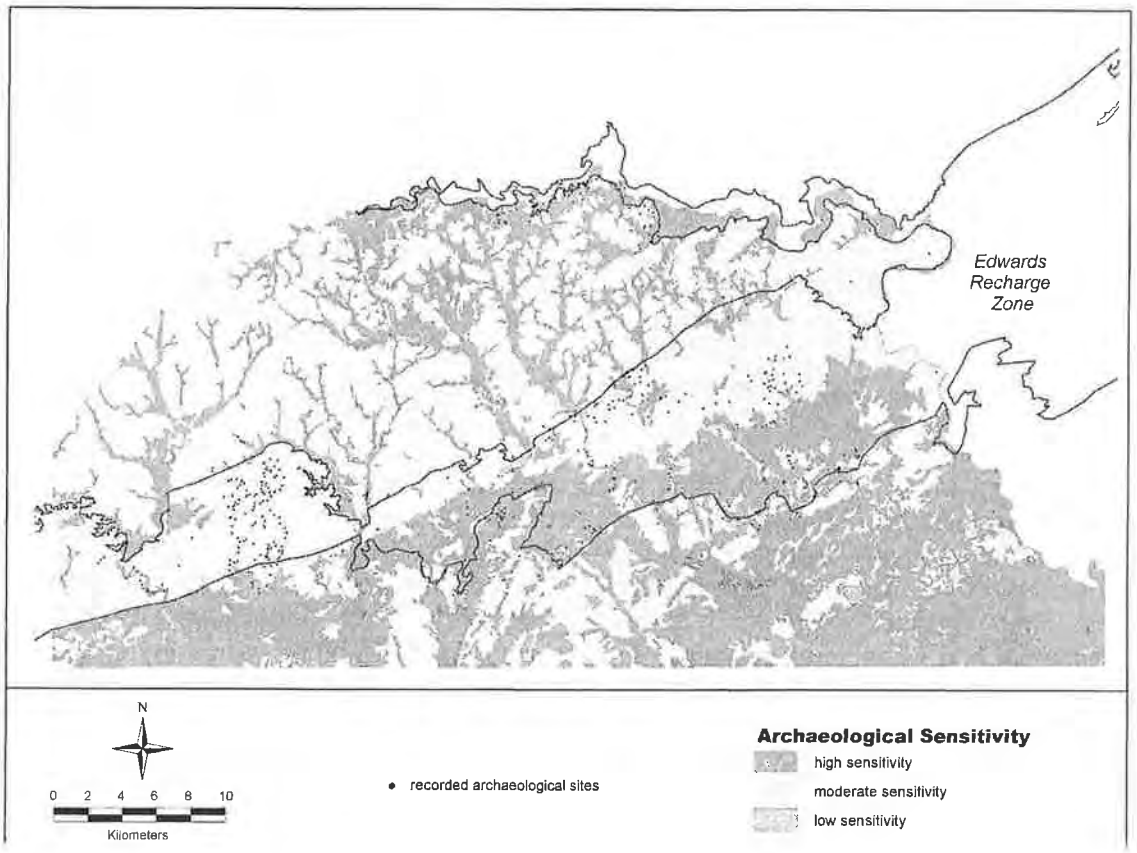
Earth moving and the use of borrow pits associated with large-scale construction also can be responsible for severe impacts to archaeological sites. Unfortunately, while plowing and most land clearing activities only impact the upper few inches of topsoil, significant scales of earth moving and burrow pit use impact deeply buried deposits. Such activities associated with quarrying for instance have uncovered and destroyed some very significant archaeological deposits dating to the very first occupants of the New World. Therefore, when present, such impacts, unless discovered early on, destroy virtually the entire integrity of archaeological deposits.

It is not only agricultural work but also the use of areas as pastures and as parts of historic and modern ranches can impact archaeological deposits when these are shallowly buried or sitting on surface. Artifact breakage and horizontal and vertical displacements are the common impacts. The most severely impacted archaeological sites in our project area should be in the floodplain/terrace zone and possible upland meadow settings. Surface sites that are very common in the uplands would be most likely to have suffered impact as a result of this agent. Facilities associated with ranching, such as structures, barns, pens, would deteriorate over time leaving only features and facilities made of stone available for archaeological study. It will be necessary to map the distribution of historic ranches across the project area to identify the location of former habitations and compounds and monitor the state of their deterioration. Such historic sites and impacts would most likely be expected in lowland settings on floodplains and terraces.

Pipeline, powerline, road and railroad construction also can cause severe impact to archaeological sites. Many of the archaeological sites and indeed the project area itself are within a relatively well-developed area criss-crossed by numerous roads. The key aspect of these types of disturbances is associated with their surface as well as subsurface impacts. The land clearance associated with right-of-way clearance is substantial and impacts all surface manifestations. On the other hand, any excavation, grade alterations, etc. associated with trenching, ROW leveling etc. will impact most shallowly and even some deeply buried archaeological sites. Any areas of the project area that are slated for extensive development, either to provide access to areas or for development of facilities will result in dramatic impacts to all archaeological sites within the proposed ROWs.

Finally, pedestrian access to previously closed areas within the project area will encouraged the collection of surface artifacts and the looting of high visibility sites (i.e., burned rock middens) across the project area. Sites that are visible on surface, such as many of the large sites in upland settings, as well as burned rock midden sites, located close to streams will be subject to such impacts. Looting and surface collection of artifacts will have dramatic impacts and will skew the artifacts remaining for study and will destroy the integrity of archaeological sites and reduce their eligibility for listing to the National Register of Historic Places and as State Archaeological Landmarks.

Given these natural and man-made agents of site destruction, and combining their probability of occurrence with the types of archaeological resources known to be present within the project area, three levels of "archaeological sensitivity" to damage have been developed.



Map showing sensitive areas due to a potential for archeological features.

Areas of high sensitivity, those where the likelihood of site destruction is high, are identified as those located in floodplain and terrace settings, in intermittent clays, and in deep clays. Sites located in such settings have a great deal of research potential but these areas also may be the ones that are most vulnerable to modern impact due to cultural agents of destruction. Portions of the project area that include uplands are defined as having moderate sensitivity because they contain primarily open camps with surface manifestation but these areas may be less likely to be heavily developed compared to the low-lying areas. However, when impacted, sites located in such zones will suffer significant damage. Finally, areas located on steep slopes and in active, modern, or historic quarries have low sensitivity because the archaeological research potential of any sites has already been destroyed.

Table 9. Archeological and Historical Resources	**Issue Score**
Topographic Location	
Floodplains and terraces	8
Upland open camps/work areas	5
Steep slopes	3
Identified Archaeological Sites	
Well preserved, minimal impacts	10
Moderately impacted	9
Significant impacts	7
Scant remnants of past use	5

Historic Structures	
Excellent condition, potential eligibility in Historic Register	10
Minor damage, potential eligibility in Historic Register	9
Significant damage, potential eligibility in Historic Register	7
Not eligible for Historic Register	3

Management Strategies

Management Guidelines

Prehistoric sites should be protected from potential damage by collectors/looters by placing developed areas away from sites, and by routing trails away from sites as much as possible. For historic sites, the land manager should consider:

- Should the public be encouraged to visit?
- Should structure(s) be stabilized or allowed to deteriorate naturally?
- Should structure(s) be renovated or restored for use? If so what use? (Educational outreach, maintenance structures, etc.)

Consider modifications to slow disturbance by natural impact. For example, planting native grasses or other native ground covers on sites where erosion is serious.

In cases where important sites are likely to be visited (due to ease of access and/or obviousness, i.e. rockshelters and sinkholes), and cannot be protected otherwise, fencing of the area and allowing access only to qualified researchers may be considered.

Management Limitations

Legal and social/political drivers to be considered by the land manager include the following:

Legal Drivers:

- State and city regulations concerning historic properties.
- State regulations concerning marked graves.
- State and city regulations regarding archaeological sites on public lands.

Social/Political Drivers:

- Public outcry (especially from Native American groups) if burials are disturbed, either through management action, or through failure to protect site.
- Public outcry if sites are damaged or destroyed, either through management action, or through failure to protect site.
- Public opposition to limited access areas or trails.
- Pressure by collectors for permission to "surface collect" on prehistoric sites.
- Pressure by metal detector groups to allow survey and collection of "relics" on historic sites.

SOCIOECONOMIC ISSUES

Land Use of Adjacent Properties

GENERAL DESCRIPTION

To maximize the protective mission of this Plan, properties adjacent to the Natural Areas must be evaluated from a land use perspective. Evaluation should include a blend of both the physical and governmental features of those properties. Degrees in density of existing or proposed development significantly impact the degree of buffering and/or management required. Conversely, undeveloped portions of properties adjacent to Natural Areas may be candidates for acquisition, donation, conservation easements, or joint stewardship agreements. In what may seem like worst-case scenarios, quarries might even become candidates for adaptive reuse as landscape restoration projects or even uninhabited buffers.

The types of land use on properties adjacent to Natural Areas can have significant impacts on the management of Natural Areas and on the potential use of those Natural Areas. The magnitude of impacts on a specific parcel's management is often dictated by the size or configuration of the parcel. In general, parcels less than 200 acres or having a linear configuration are more susceptible to adjacent property influences as compared to larger parcels or parcels that are square or rectangular with significant distance between the central portions of the parcel and adjacent properties.

Impacts from Commercial and Industrial Development

Commercial and industrial development on adjacent properties will definitely impact the Natural Areas. In most cases, direct influences will be felt as far as 300 ft. into the Natural Area. Potential significant impacts caused by industrial or commercial development on adjacent properties include the following:

Noise. High levels of noise can potentially disrupt wildlife behavior and decrease visitor enjoyment.

Air pollution, including dust. Air pollution can influence the composition of plant and animal life in buffering areas or even further into the Natural Area.

Light pollution. Use of artificial lighting on adjacent properties can have significant impacts on wildlife and plant populations. Activities of many wildlife species are controlled by photoperiods that are significantly impacted by artificial lighting. These activities can include feeding behaviors as well as nesting and breeding habits. If offsite or adjacent properties are using lights that significantly impact the Natural Area, the land manager should contact the adjacent property owner to negotiate possible methods of mitigating these impacts. Mitigation could be as simple as redirecting the light away from the Natural Area.

Lighting may also impact plants. The flowering and seed production of many plants is controlled by photoperiod. Obviously, artificial lighting can impact photoperiods, which may in turn cause plants to flower or produce seed during the wrong time of the year. In

addition, it may cause plants to not produce seeds or to flower. Research has also indicated that germination of some seeds is controlled by photoperiod and could be impacted by artificial lighting offsite.

Human activities. Commercial or industrial enterprises that stockpile trash could impact neighboring Natural Areas by migration of windblown trash or illegal trespass dumping of trash or hazardous materials, which could result in loss of wildlife and some types of vegetation. This is especially a problem for land acquisitions in the interim stage of management prior to improvement when public use, staff and security may be less intensive, providing opportunities for trespassing and illegal dumping along the periphery of the area.

Stormwater runoff. Many industrial and commercial areas contain relatively large areas of impermeable surfaces. These surfaces may be used to store materials potentially hazardous to plant and animal life. If slopes are toward the Natural Area, stormwater may contain fugitive hazardous materials that could be detrimental to the development of wildlife habitat in buffer areas around the Natural Area. In addition, waters may flow into streams that traverse the Natural Area and could impact aquatic life in pools and other areas. Last, runoff from these impermeable surfaces may be in greater magnitude compared to natural surfaces, resulting in significant increases in flood levels for streams. This could impact riparian corridors by destruction of vegetation, increased erosion, and deposition of trash and other materials along the banks of streams. Polluted stormwater may also run off adjacent properties into karst features, which could potentially result in contamination of the Edwards Aquifer. If potential sources of pollution are observed offsite, the land manager should first contact the adjacent property owner to discuss methods to remove pollution sources or control pollution movement into the aquifer. If the adjacent property owner refuses to cooperate, the land manager should contact the TCEQ for further consultation.

Impacts from Residential Development

Residential development may also significantly impact the management and use of Natural Areas. Residential developments having lots greater than one acre in size will impact Natural Areas less than those with smaller lots. In general, in the Hill Country, larger lots are not landscaped to a significant degree and would impose less of an artificial environment adjacent to the Natural Area. In addition, the density of populations adjacent to the Natural Area would be less; thus, impacts caused by human disturbance would be less.

High-density residential developments may have strong influences on the Natural Area. These influences can include the following:

Deposition of trash and debris on the backside of lots. Owners of property adjacent to Natural Areas will often deposit trash, grass clippings, brush piles and other debris along the edge of the Natural Area. In some cases, the property owners may even clear land inside the park for a distance as much as 50 to 100 feet. These activities can be

decreased by education of the adjacent landowners and use of fences and other barriers.

Stormwater runoff from developed areas. Runoff from residential areas may be contaminated by fertilizers, pesticides, herbicides, fungicides, and oils or lubricants and fuels. In addition, the sediment load may be relatively high, especially during construction. These surface waters can potentially flow through a Natural Area, impacting both aquatic habitat and riparian corridors. As with industrial and commercial sites, these waters may also contain trash and other debris that may be deposited along the banks and in vegetation of riparian corridors. Runoff from developed areas can also flow into karst features that may be providing habitat for many of the endangered invertebrate species. These contaminated waters could result in significant impact to these species as well as impacts to the Edwards Aquifer.

Noise pollution. The sounds of everyday life in residential areas can have an impact on wildlife. This noise tends to cause the more sensitive species of wildlife to migrate into the Natural Area to avoid the bordering areas.

Pets. Domestic pets can also have a strong influence on the Natural Area. This is especially true for pets that are not confined to yards, or kept on leashes or in cages. Free-roaming cats can be especially damaging to small wildlife populations (birds, lizards, rodents).

Wildlife. Wildlife residing in the Natural Area may impact adjacent properties by foraging in yards and trash. In addition, wildlife may attack domestic species such as cats and dogs. Adjacent property owners may demand control of specific wildlife species if they are not educated as to their function in the wildlife environment. Snakes and other reptiles may also venture into adjacent residential areas. Most homeowners do not consider snakes a welcome sight in their backyard. Finally, adjacent properties that house bird feeders, human food scraps, dog and cat food, gardens, and exotic plants can have significant impacts on the wildlife in Natural Areas.

Rangeland and Cropland

Often, adjacent properties may be large properties used for agriculture or rangeland. Areas cultivated for crops will probably have a much greater influence on the Natural Area than those used for rangeland and pasture. Stormwater originating from cultivated lands can be heavily laden with sediments, pesticides, and fertilizers. All of these materials could have far-reaching effects on the aquatic environment and karst species of the Natural Area. In addition, cultivated areas may also pollute air with dust particles, pesticides, and other materials. Rangeland areas may or may not influence the Natural Area. If overgrazed, rangeland areas can significantly increase the sediment load in stormwater runoff potentially flowing in streams on the Natural Area. Trespass livestock may cause damage by grazing, vegetation trampling, and other activities.

Other Impacts

Other impacts that may be associated with adjacent properties include the following:

Individual or community wells and septic systems. If constructed properly, these systems may not impact the Natural Area. However, poorly constructed septic systems can result in runoff containing high levels of organic matter and nitrogen. In addition, a large concentration of wells in an area may lower the water table, resulting in the failure of springs and other underground sources.

Municipal or community water and sewer. With respect to protecting the environment, these systems are probably better than septic systems. Local utilities may request or require an easement through the Natural Area which could create management problems. Sewage package plants may discharge treated water into streams that flow through the Natural Area. These waters will be higher in organic matter and phosphates, which may have direct influence on the aquatic environment on the Natural Area.

Sewage lines commonly follow riparian corridors to allow for gravitational flow of materials in the line. Often, these sewage lines leak or break, resulting in pollution of streams with municipal sewage. This can have a significant impact on sensitive aquatic habitat located along riparian corridors. The land manager for a Natural Area should periodically inspect sewage lines running through the Natural Area to ensure that leaks do not occur. In addition, any work accomplished around sewer lines should be conducted carefully to prevent damage to the line. The land manager should be aware of the proper notification procedures for releases from sewer lines and the proper methods to contain those releases.

Homeowners associations—restrictive covenants. Some homeowners associations may have restrictions that could influence Natural Areas. These covenants often involve control of wildlife and natural plant species that may encroach into residential areas. In some cases, however, the covenants may actually further protect wildlife and native plant species. These covenants should be reviewed to determine if there might be any problems or enhancements from homeowners associations. Meetings with those organizations should be held to inform the members of the needs and requirements of the Natural Area.

Off-road vehicles. Off-road vehicles can cause significant damage to Natural Areas. Often, trespassers will break through fences and drive off-road vehicles across Natural Areas. These vehicles can cause devastating damage to riparian corridors and sensitive vegetation/habitat. The damage is especially accentuated in wet weather, which is a time when many users of off-road vehicles prefer to conduct their activities. Off-road vehicles should be prohibited from Natural Areas, and any violators or trespassers using off-road vehicles within Natural Areas should be fined for infractions of that rule. Fines should be established by city ordinance and set at a level that would be considered a deterrent for trespassing on the Natural Areas.

Recreational areas. Depending on the type of recreation, these areas can have strong influences on adjacent Natural Areas. Recreational areas tend to concentrate large numbers of people in small areas, which in itself will have strong influences on the

Natural Area. Users of the recreational facilities will tend to venture into the Natural Area and may cause damage along the boundaries.

Factors to Consider

Other general factors should be considered when the influence of adjacent properties is being evaluated. Such general factors include the following:

- Scenic views from the Natural Area may be compromised by development along adjacent ridgelines and hilltops. Viewsheds currently providing natural panoramic views may be destroyed by housing construction, buildings, roads, utility lines, maintained easements, cellular and radio towers, water towers, and other structures.

- As previously mentioned, sheet flow and stream runoff from adjacent developed areas or even undeveloped areas can degrade the natural environment and affect water quality and quantity over time.

- Endangered species habitat located in a Natural Area may be impaired due to encroaching development on adjacent properties. If at all possible, buffer areas should be negotiated with adjacent developments to protect endangered species habitat near the edge of a Natural Area.

- Current landscape installation and maintenance trends for many of the developments can introduce unnecessary levels of fertilizers, insecticides, pesticides, and invasive plant species that may encroach onto the Natural Areas and compromise the integrity of natural systems.

- Introduction of nuisance plant species may result in significant changes in plant composition on the Natural Area and could threaten wildlife diversity. Boundaries of the wildlife areas should be patrolled to identify encroachment of non-native, invasive species.

- Natural Areas may become islands within well-developed areas. These islands will no longer be connected to other Natural Areas via wildlife corridors. This can result in a decrease in diversity of wildlife species.

- Proximity to quarries or quarry leasehold boundaries will cause dust pollution, and blasting may pose problems for endangered species habitat. Quarries can grow by spreading or may be a series of small quarries that provide a variety of materials.

- Outside city limits there is no jurisdiction to enforce zoning and code compliance. Lack of zoning can lead to establishment of small private salvage yards or enable existing ones to remain in operation or other light industrial operations that may be detrimental to a Natural Area.

DATA COLLECTION METHODS

The periphery of the Natural Area should be surveyed for potential impacts from adjacent properties. If issues of concern are identified, adjacent landowners should be contacted to determine if agreements can be negotiated to allow for protection of the Natural Area. Each adjacent parcel should be mapped and scored according to its potential impact to the Natural Area.

In addition to site visits, the land manager should also review the following documents to determine potential and current use of adjacent properties:

- Land use plans for the City of San Antonio
- Major Thoroughfare Plan for the City of San Antonio
- Unified Development Code for the City of San Antonio
- Open Space Plan for the City of San Antonio
- Land development requirements and available Public Works data from any municipalities adjacent to the Natural Area
- County development requirements
- Drainage regulations and state regulations for development over the recharge zone
- San Antonio Parks and Recreation System Plan

SCORING METHODS

Activities and uses on adjacent properties should only be mapped and not scored for preparation of the land use and management plan. The use and potential use of each parcel adjacent to the Natural Area should be designated on the map. Using the information provided in the previous section, the potential impacts of the adjacent properties around the Natural Area should be measured, evaluated, and the resulting information eventually used in making management and land use decisions.

MANAGEMENT STRATEGIES

Management Guidelines

In general, influences of adjacent properties on the Natural Area are a factor of both activities and uses of the adjacent property in combination with the status and use of the portion of the Natural Area adjoining the property. In most cases, the use of adjacent properties cannot be controlled by the land manager. The only option available for the land manager is to protect the Natural Area from adjacent property impacts.

Listed below are some of the methods by which Natural Areas can be partially or completely protected from offsite or adjacent property impacts:

Fencing. Various types of fences can be used to protect the Natural Area from invasion of the property boundaries by both humans and animals. In most cases, fencing is limited more by cost than by other factors. Fences should be marked every 100 to 300 feet with a sign identifying the property as a protected Natural Area. A standard barbed-wire fence can be used to deter human encroachment on the Natural Area but does little to prevent movement of domestic animals, with the exception of livestock and larger

mammals. Barbed wire can be reinforced by hog wire, Elwood wire, or other similar mesh fencing. This increases the cost of the fence considerably, but will prevent encroachment of smaller domestic species such as sheep, goats, dogs, hogs, and other similar sized animals. These fences are also more difficult for humans to trespass. Other higher cost fencing could be used but may be cost prohibitive. This includes deer-proof fences, chain link fences, and other similar types of structures. In most cases, this type of fencing is not economically feasible for a Natural Area. It is important to note that the intent is not to prevent use of the Natural Area by humans, but rather to attempt to control access to the Natural Area by deterring encroachment from areas outside of the entrance. If human activity is focused to the entrance of the Natural Area, control of those activities is much more manageable.

Noise Abatement. It is very difficult to control noise originating from offsite areas. In many cases, the only available control measure is buffer distances. If endangered species are being impacted by the noise, federal regulations may be used to force some action by the adjacent property owners. Although sound barriers can be constructed along the periphery of a Natural Area, these are usually extremely expensive and not cost-effective. However, federal funding may be available for construction of these barriers if they are located along highways and roads funded by federal monies. Because the Natural Areas are city-owned, they fall under the City Noise Ordinance and would be subject to those rules. Adjacent properties would be subject to the noise ordinance only if they are located in the city limits of San Antonio.

Air Pollution Abatement. Beyond forcing compliance of adjacent property owners with the regulations under the Clean Air Act, very little can be done to decrease air pollution on the Natural Area. The land manager must spend some time observing sources of pollution and determining if violations to the Clean Air Act are causing this pollution, and whether this can be used as a tool to force the adjacent landowner to incorporate more stringent air pollution controls into his business or activity.

Stormwater Pollution Abatement. Because many of the City-owned properties are located on the Edwards Aquifer recharge zone, current regulations require that commercial and industrial properties provide proper control of stormwater runoff from their properties. If it is determined that stormwater runoff from adjacent properties is polluted or may have detrimental impacts on the Natural Area, the TCEQ and EAA should be consulted to determine if the adjacent property owner is in violation of current regulations. The adjacent property owners would then be forced to comply with those rules. This would provide some measure of protection from stormwaters. However, floodwaters may contain trash, invasive weed species, and other debris that cannot be controlled under current stormwater rules. If these materials flow from adjacent watersheds into the Natural Area, very little can be done to decrease their impacts. The land manager may want to consider construction of sedimentation basins or filtration basins where significant impacts are imminent. However, the most cost-effective method of protection for the Natural Area would be periodic inspections of riparian corridors to remove trash, debris, and other items as well as control of any invasive species that may have encroached on the site.

Perhaps the most cost-effective and preferred method of working with adjacent property owners is via direct negotiation and education. Landowners of adjacent properties should be directly contacted by the land manager and provided with information as to the objectives and use of the Natural Area. In many cases, these landowners will be very

receptive to assisting the Natural Area in achieving its goals. The land manager should encourage adjacent landowners to be stakeholders for the Natural Area and be committed to share in the responsibility of maintaining the integrity of the resources and features in the Natural Area.

In addition to direct negotiations, extensive public relations programs could be used to enlighten the public as to the goals and objectives of the Natural Area. Public relations could include a wide variety of activities including volunteer days, mailers and brochures providing information for adjacent landowners, public meetings, and other activities.

Management Limitations

Legal and social/political considerations the land manager should consider include:

Legal Drivers

- Edwards Aquifer Rules
- City of San Antonio Unified Development Code (within the ETJ of San Antonio)
- City of San Antonio Zoning (within the city limits)
- National Pollutant Discharge Elimination System
- County Development Regulations
- Major thoroughfare Plan City of San Antonio
- Easement Requirements for Purveyors
- Other city development regulations
- Open Space Master Plan
- Creek-Based Greenways
- SAWS Water Quality Ordinance

Easements

GENERAL DESCRIPTION

Nearly all properties currently or potentially acquired for the development of Natural Areas could contain various types of easements. These easements could include the following:

Access Easements

Access easements are easements usually provided in the deed record of the property allowing for access of an adjacent property to a utility or transportation corridor. In other words, if the property lies between an adjacent property and an important utility or transportation corridor, an access easement is usually present. These easements cannot be removed from the deed unless allowed by the adjacent property owner. Impacts imparted by access easements can be significant due to the fact that it could allow for the clearing of the area for construction of a road or utility corridor. Property deeds acquired for Natural Areas should be carefully reviewed to determine the location of access easements and their potential impact on the development of the Natural Area. If the easements could have significant impacts on the Natural Area, the owner of the adjacent property could be contacted and potential options for access could be negotiated.

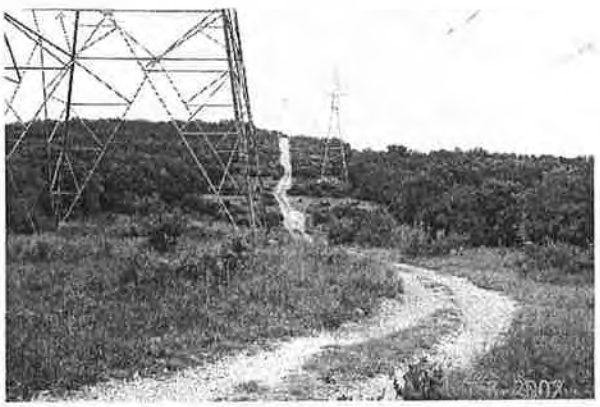
Conservation Easements

Conservation easements are easements for all or parts of properties that protect the property according to specific standards stated in the easement terms. The easements are usually monitored by a sponsoring agency such as the Nature Conservancy, Trust for Public Land, or Bexar Land Trust. Conservation easements that are under the Texas Parks and Wildlife program or similar programs are in perpetuity and cannot be changed. If a property contains a conservation easement, the sponsor and the controlling agency should be contacted. All management decisions within the area of the conservation easement must be passed by the sponsoring agency. In general, the presence of a conservation easement will probably not impact the ultimate goal of these Natural Areas, which is to protect the Edwards Aquifer recharge zone. However, it may limit the types of improvements allowed within the easement.

Transportation Rights-of-Way (ROW) and Easements

Although transportation easements usually do not appear on the deed of a property, ROWs do. These easements are usually donated to or purchased by the city, state, county, or federal agency for the construction of roads and other modes of transportation, such as rail. The transportation master plan for Bexar County should be investigated when any property has been purchased to determine if a road or other transportation corridor has been planned to run through that property. These potential corridors are still in the negotiable stage but may be difficult to change because of the need to connect with other transportation corridors. If a transportation corridor appears to run through a Natural Area, methods to provide buffer and possibly use the corridor to the advantage of the Natural Area should be addressed.

Utility Corridors



Utility corridors include linear easements or rights-of-way for telephone, electricity, water, sewer, and other pipelines provided for conveyance of liquid materials. Much of the land found in the project area is dissected by an intricate network of these corridors. Each of these corridors range from 8-feet wide low maintenance corridors to 300-foot wide highly maintained corridors. Because of recent rules passed by the Department of Transportation, oil and gas pipelines must now be maintained for access and security issues. Most of the major telephone and electric utilities are located in corridors maintained by mowing and/or herbicide application. These areas tend to be dominated by grasses, shrubs, and other short vegetation. Other corridors or rights-of-way for utilities such as sewer lines and water lines may not be maintenanced and may have already become revegetated. Although these areas are not maintained, they may potentially be accessed for repairs or leaks.

Drainage Easements

Some areas have been platted to include easements to provide drainage of adjacent properties. These areas must be managed in a manner to allow for the development of ditches and other drainage structures if necessary.

Data Collection Methods

In general, easements running through or near the Natural Area can easily be found by reviewing the property title and survey for the tract. In most cases, these easements will be listed as part of the property title or part of the survey. Future transportation corridors and utility easements are provided as part of the GIS model. In addition, these corridors and easements are usually listed in updated master plans for City Public Service, SAWS, and City of San Antonio. All of this information should be collected and compiled to determine the type of easements found on the property and their location. This information should be included in the map that will be used in the site-specific GIS model for determining the land use and management plan for the site.

Scoring Methods

In most cases, corridors are going to represent negative scoring with respect to sensitivity to Natural Area development. Thus, the following scores are recommended for easements.

Table 10. Types of Easements	Issue Score
Access easements	-8
Un-maintained utility easements	-7
Maintained utility easements	-10
Transportation corridors	-10
Conservation easements	+10
Drainage easements	-5

MANAGEMENT GUIDELINES

Conservation Easements

In general, conservation easements should pose no management problems for Natural Area use. Most conservation easement objectives and goals are quite similar to those of a Natural Area. However, placement of improvements, trails, and other infrastructure may be restricted by these easements. This should be carefully considered before decisions are made. The land manager should meet with the sponsor of the conservation easement and together they should develop a management strategy for those portions of the property lying within the easement. Most conservation easements have been put in place to preserve wildlife and wildlife habitat, and, to a lesser extent, cultural resources. Therefore, it would be expected that these areas would probably be treated as highly sensitive areas. Most improvements to be placed in these easements would probably be considered low-impact improvements and low-impact activities.

Access Easements

Access easements create interesting management problems for the land manager. In a Natural Area, the goal is to conserve and/or preserve natural resources. In many cases, access easements will never be used and can remain unimpacted by development activities. However, these areas should be set aside as areas that could be potentially used as transportation corridors or utility corridors and have high impacts on wildlife, wildlife habitat, and other natural resources. It may be appropriate to place trails, emergency access, and other higher-impact improvements along access easements if they are compatible with the future use of the easement. Otherwise, these easements should not be committed to any long-term use by the Natural Area unless the use is compatible with the terms of the easement. It is especially important to not place any permanent structures in access easements where they may require removal when the easement is placed in use.

Un-maintained Easements and Rights-of-Way (ROWs)

Un-maintained easements and ROWs should not be used as sites for structures or other improvements. Trails may traverse these ROWs and easements but in general should not follow them for very long distances. This can create safety problems and the trails could be destroyed if an emergency repair or other action must be conducted on an easement. Most un-maintained easements involve pipelines and underground cables or utilities. There is always a potential for these lines to require repairs that would result in impacts to the easement and surrounding areas. Equipment used for the repair must

access the easement and may also cause damage to the environment via access routes. In developing a management plan for a Natural Area, access routes to these un-maintained ROWs and easements should be identified. These access routes could be maintained or not maintained, but could be located in areas that could handle high impacts and recover from those impacts relatively quickly. These easements should be marked to allow for easy identification and to warn Natural Area users of their presence. Often these easements may contain high-pressure gases, oils, petroleum products, high-voltage lines, and other hazards that could be dangerous in a Natural Area because of exposure to the environment or releases and leaks. The land manager should make a practice of walking these easements to determine if there are any problems. The telephone numbers of the users of the easement should be kept close at hand in case of any emergencies.

Maintained Easements and Rights-of-Way (ROWs)

Easements for pipelines, high-voltage lines, and other similar linear utilities are often present in Natural Areas. These utilities are critical to provide power and other supplies to cities around the Natural Area. In general, these easements will be maintained by either mowing or application of herbicides. From an environmental standpoint, herbicide application would probably be preferable to mowing in that it allows for growth of vegetation that could be used by wildlife. Mowing tends to be more destructive in many cases and often decreases the productivity of areas. Judicious use of herbicides can be safe and will not impact the environment or Natural Area users.

From a land use standpoint, maintained ROWs can have positive values to a Natural Area under many conditions. The land manager should meet with the owners of the utilities for the ROWs to discuss potential uses. In some cases, utility companies will be somewhat apprehensive about any use of those ROWs due to safety concerns and liabilities. However, activities for the use of these ROWs may be negotiable.

Some potential uses of maintained easements and ROWs include paths and trails for horses, bikes and mountain bikes, and some of the more intensive trail uses that are not generally compatible to Natural Areas. Large ROWs could be configured in a way to allow for curved paths running in a serpentine manner across the straight corridor.

In the Hill Country, maintained easements often provide a grassland wildlife habitat and openings for wildlife from thicker brush areas outside of the ROW. These easements often provide excellent areas for browsing of animals such as deer and other ungulates. In addition, the edge environment that is created along the boundaries of the easement can produce excellent habitat for black-capped vireo and other species of animals that are attracted to "edge environments." The land manager should work with the owners of the easement to assist in the proper maintenance procedures to enhance the growth of native grasses such as bluestems, indiangrass, and others. In addition, judicious use of herbicides could allow for an excellent grassland habitat that would attract different wildlife species and improve diversity for the Natural Area.

Fire could be used as a control measure in certain sections of easements, however, the land manager should be careful not to damage utilities and other structures. This can easily be handled by clearing the brush around the utility structures. This would not be a problem for pipelines except for potential destruction of signs. The signs could be removed during burning periods and later replaced. In addition, rotation of prescribed

burns on different sections of an easement could be planned to allow for development of edge habitat and different levels of succession in different sections of the ROW at different times. Again, this encourages diversity of wildlife.

As mentioned previously, most utility companies will be somewhat apprehensive to allow use of these maintained easements by the public. However, if these uses can be negotiated the easements could be used as connections between different Natural Areas. Bike paths, jogging trails, and horse trails could be placed in these easements and used to provide transportation from one Natural Area to another.

Transportation Corridors

Transportation corridors provide unique opportunities for connecting Natural Areas. Roads running between two Natural Areas could be designed to be ecologically friendly using native species, xeriscape, and low-maintenance landscaping. Along the ROW could be bike paths, hiking trails, jogging trails, and horse trails. Many of the ROWs used for roads in San Antonio are sufficiently wide to provide at least an adjacent bike trail. Natural landscaping could be designed using current topography as much as possible to enhance the natural appearance of the site. If at all possible, roads and trails should be designed in a curved configuration versus straight lines.

Stops and scenic overlooks along transportation corridors should be considered. These areas could include park benches, small picnic areas, and other improvements. Another potential use could be an exercise trail equipped with exercise equipment and jogging trails. All of these improvements could be made eco-friendly with the bottom-line objective to provide recreation and education for the public.

Areas along transportation corridors could be marked with interpretive and educational signage and infrastructure to encourage observation of wildlife, geologic features, vegetation, and endangered species. Transportation corridors provide a unique opportunity for interpretive centers. These interpretive centers could be as simple as signage placed along paths or roads. Explanations for areas of ecological interest and where scenic overlooks may be located are also possible. Signs explaining different types of environments and natural resource features could be placed in any areas where people would tend to stop such as benches, picnic areas, scenic overlooks, and exercise trail stops. The land managers for Natural Areas should make use of these corridors and consider them a potential opportunity for public education and public relations. Proper use and maintenance of these corridors can ensure that the public will truly respect nature and Natural Areas in a manner conducive to the goals of those areas.

Open Space and Greenway Connections

With the adoption of the Open Space Master Plan and the Creek-Based Greenways Planning and Design Guidelines, connections between Natural Areas via open space and greenways is now possible. Greenways are especially good routes for connections between Natural Areas. Creeks and streams located between Natural Areas could be designed and improved according to guidelines and ultimately used to provide hiking trail, bike trail, and other connections between the Natural Areas. These connections would provide excellent opportunities for interpretive/educational signage to promote natural resource conservation and enhance public understanding of Natural Areas.

CONCLUSION

In conclusion, easements may provide management challenges for Natural Areas. However, as with any challenge, these can be made into opportunities. The land manager consider limitations of each easement and conceptualize a management plan that encompasses the needs of the easement while at the same time enhancing the wildlife area. Proper communication with the users of the easement is mandatory in making this a successful endeavor. The land manager and the users should form a team to develop a plan compatible with the goals and needs of both parties. With proper planning and teamwork, these easements can become excellent interpretive components for the use of Natural Areas.

Jurisdictional Considerations

Proper land use and management of Natural Areas requires the manager to be cognizant of the governmental "landscape" of the Natural Area and its surrounding regions. In addition, the actual jurisdictional status of the Natural Area and adjacent properties must be addressed. Both of these "environments" can have as much influence on the management and use of the Natural Area as the physical and biological environment. This section of the document discusses these issues and how they may impact management of a Natural Area.

One of the most important steps in addressing the management of both existing and proposed Natural Areas is to accurately depict the governmental landscape of the area. In other words, management and use of the Natural Area may be strongly influenced by decisions and regulations previously promulgated by federal, state, and local governments. In other sections, this plan discusses many of the regulatory and permitting requirements that may pertain to Natural Areas on the Edwards recharge zone. However, in this case, we are more interested in a real estate perspective, which may actually restrict many of the options, alternatives, and future scenarios of the areas surrounding the Natural Area. In Texas, counties currently do not have the power of zoning and have very limited land use controls. Under these circumstances, city limits and their relative extra-territorial jurisdictions (ETJs) become critical. With the notable exceptions of applicable state and federal laws, most development and conservation processes stem from local municipalities. Thus, in developing a land use and management plan for a Natural Area, jurisdiction of local governments must be addressed. These local municipalities and governmental bodies must be consulted about their concerns with the Natural Area. These concerns should be seriously considered throughout the development of the land use and management plan.

It is also important to be aware of proposed changes in jurisdictional boundaries. Annexation of new property into a city's limits almost always changes the ETJ. Very often, for growing areas in north Bexar County, ETJs are increasingly becoming "negotiated settlements" between San Antonio and the communities in its urban interface. These negotiated settlements may have strong impacts on the management and use of Natural Areas. Many of the smaller towns in Bexar County are very sensitive to the growing ETJ of San Antonio. This can lead to "disgruntled" neighbors adjacent to or near the Natural Area. These smaller municipalities should be included in the planning process to foster a cooperative environment for the development of the Natural Areas.

Depending on the areas of jurisdiction for both the Natural Area and contiguous parcels, there will be a variety of legal settings. Often, there may be a mixture of these various settings that may cross, overlap, gap, and create a tricky "patchwork" of mismatched political agendas. In its broadest perspective, property is either undeveloped, developing, or developed. Undeveloped property does not mean that it is protected or that it is poised for development. It may be vacant, with or without improvements, or in some form of agricultural production, either as pastures, rangeland, or cropland. The current and proposed state or use of the property, whether or not it is zoned, should be considered in developing its management plan.

In the northern portions of Bexar County, a substantial number of properties stand poised for development. Physically, sewer systems may have been expanded to these property boundaries, making them "ripe" for development. From a governmental standpoint, vested rights, master plans, plats, water and/or electric services, and transportation corridors may already exist that will alter how these properties are either valued or slated for development. This being the case, adjacent properties should be carefully researched to determine their potential use in the future. This may have far-reaching effects on the overall management of the Natural Area. As previously discussed, the uses of adjacent properties can have significant impacts on the use and management of the Natural Area.

Master development plans for the city, county, and other governmental agencies should be carefully researched to determine if any of the planned development in the vicinity of the Natural Area could impact management and use plans. Master plans currently used by the City of San Antonio and Bexar County include the following:

- Major Thoroughfare Plan (City of San Antonio)
- City of San Antonio Strategic Plan for Enhanced Economic Development
- San Antonio Water System Sewer and Water Master Plan
- City Public Service Electrical and Gas Substation and Right-of-Way Master Plan
- Creek-Based Greenways Planning and Design Guidelines (City of San Antonio)
- City of San Antonio Parks and Recreation System Plan
- Master Plans of Individual School Districts in Northern Bexar County

Established plats for the property and adjacent properties should also be researched. Platting may include easements that could potentially impact the management of a Natural Area. Easements may allow for construction of roads and installation of pipelines and utility corridors through the Natural Area.

If the property lies within a municipality, zoning with respect to that property should be determined. In addition, future planned components within the area or in the adjacent areas should be researched. This could include plans for open space and greenways. Development of the Natural Area could be enhanced by connections through things such as previously planned open space and stream corridors.

Without question, governmental entities will have a strong influence on the use and development of these Natural Areas. These groups should be consulted to determine if any plans for the area will impact the Natural Area. In an effort to counter some of the problems that may be caused by governmental agencies, a citizen's group for all Natural Areas could be formed. This group could provide interaction with government entities for support and protection of these Natural Areas.

STEP 3: PLANNING AND DESIGN OPTIONS

In this step, the land manager will select planning and design options for the Natural Area.

This section of document offers the land manager a variety of options for planning appropriate recreational activities, improvements, interpretive/educational opportunities, and public involvement for the Natural Area.

To aid in this planning process, this section includes a decision-making matrix for determining the optimal locations within a Natural Area for specific improvements or activities. This matrix is to be used in combination with data collection and scoring that has been previously discussed. The matrix can be used manually, however, a site-specific GIS program allows for the expeditious location of these areas using mathematical/spatial models. This GIS site-specific model is provided as a separate tool for use with this management plan.

PLANNING AND DESIGN OPTIONS

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RECREATIONAL ACTIVITIES

The Natural Area may offer public access and limited recreational opportunities where appropriate and manageable. Public access may be allowed where and when such access does not threaten the welfare of targeted species of concern, nor cause the degradation of soil, vegetation, archaeological, geological, or water resources.

The key to allowing public access which is non-threatening and non-damaging to Natural Area lands is implementation of effective management strategies to control such access and use. These management strategies must be specified in the individual land management plans and implemented by the Natural Area managers in association with Department Director. Long-term demonstration of effectively implemented management strategies on a Natural Area may justify increased public access opportunities. Demonstrated ineffectiveness or habitat degradation caused by an activity may justify less public access for a particular Natural Area.

Effective management strategies can be any combination of, but are not limited to:

- Fencing
- Signage
- Seasonally restricted access
- Selected access to non-habitat areas of a Natural Area only or prohibited access to selected sensitive areas of a Natural Area.
- Careful trail and improvements location, design and relocation
- Ranger patrols and enforcement

The Natural Area manager is encouraged to consider creative plans that could increase public education and recreational opportunities while ensuring the welfare of the species of concern and preservation of all resources.

Access to specific sites during specific seasons should be regulated in order to conserve species and their associated communities. The land manager should be cognizant of that access to areas during specific seasons may impart negative alterations to wildlife habitat impacting wildlife use during the season when the habitat is protected. The creation of new roadways, trails, and cleared rights-of-way that open the canopies of woodland and shrubland communities, create additional impervious cover, or facilitate public use of preserve interiors or high quality sites occupied by target species should be discouraged. Access routes for Natural Area operation and maintenance can be rerouted to avoid sensitive areas during specific seasons can be addressed in the approved land management plan.

BASIC ACCESS CONTROL FOR NATURAL AREAS

Provisions for adequate fencing and signage on all Natural Area components should be undertaken by the land manager. As Natural Areas are acquired, fencing along the perimeter boundaries should be upgraded and repaired as soon as possible to achieve human access control. Signage identifying the property as a Natural Area to discourage unauthorized use and trespassing should be posted along the fences every 200 – 300 ft. as soon as possible. These signs also should be placed on gates and other access

points, and along trails and roads. Interior fencing, if appropriate, should be established as a lower priority.

Individual or Group Use

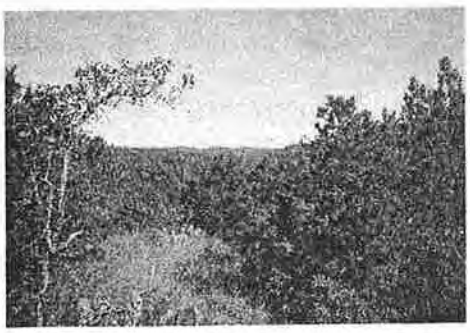
It is necessary to avoid, detect, control, and reduce the types of localized detrimental impacts associated with human activity on the Natural Areas. The following types of outdoor activities may be allowed if they do not have a negative impact on resource conservation as described in the individual Natural Area management plans.

Types of Recreational Activities

The two major types of appropriate recreation include passive recreation and active recreation. It is important to note that Natural Areas in general lend themselves to more passive forms of recreation. However, under some circumstances, active recreation may be an option. Before instituting any form of active recreation in a Natural Area, the land manager must carefully consider impacts to the natural resources being protected.

Appropriate Recreational Activities

Nature Viewing and Contemplation. Some examples of acceptable nature viewing opportunities include designated viewing areas with blinds, trails with descriptive trail brochures, or guided tours. Educational tours should be encouraged, but procedures for reviewing tour group activities should be established in individual land management plans.



Source: Fernandez Frazer White & Assoc.

Trails. Unsupervised group access should not be allowed within 100 meters of occupied endangered or threatened bird habitat during the breeding season, unless such access can be documented to show no apparent degradation to the welfare of the species of concern. Creation of new trails should be addressed in Natural Area land management plans and should leave woodland canopies intact. New trails should not degrade habitat for species of concern.

- Bicycling
- Horseback Riding
- Mountain biking

Inappropriate Recreational Activities

Many activities are appropriate for recreational areas but not Natural Areas due to the level of impact to sensitive natural features. The following should be routinely prohibited on Natural Areas because they are not compatible with Natural Area management objectives and goals. These same activities would probably be appropriate in areas designated as recreational areas by the CSA Parks and Recreation Department.

- Jogging and racing

- Cross-country racing
- Group sports, ball fields; open play fields, multi-use courts, playgrounds, skate parks
- Cooking and open fires
- Pets, restrained or unrestrained
- Picnicking other than in designated areas

Group Activities

Activities involving organized groups can negatively impact Natural Areas, particularly those that produce a large amount of noise and those that involve extraction of natural resources. Group activities that should be routinely prohibited from taking place in Natural Areas include the following:

- Music Events and Concerts
  Music events and concerts should be prohibited as a recreational activity in Natural Areas.

- Receptions
  Receptions should be prohibited, except for selected sites designated as appropriate, with proper monitoring for effects on the Natural Area and with enforcement of all applicable rules. These activities could also be prohibited during peak nesting periods for endangered birds.

- Bird Watching When Audiotapes are Used
  Bird watching using audiotapes should be prohibited unless specifically allowed by Natural Area management for research or wildlife survey purposes.

- Electronic Noise
  Radios and "boom boxes" should be prohibited. Headphones may be used as long as no noise is emitted.

Recreational Activities that Involve Removal of Resources

In general, any activities that involve resource extraction should be prohibited in Natural Areas. Exceptions to this rule could include curation and inventory or archeological artifacts by permitted researchers and other research or educational activities approved by the Natural Area manager. Prohibited resource extraction activities include, but are not limited to the following:

- Fishing
  Fishing may be allowed where there is existing access to lake or tank frontage that is not inhabited by sensitive species. If allowed, fishing areas will be designated, and fishing will not be allowed outside designated areas. Fishing in environmentally sensitive springs and deeper spring runs, especially where rare salamander species are present, should be prohibited. Construction of new roads, access points and other support facilities for fishing must be approved in the preserve land management plans. Stocking

of native or exotic species is prohibited unless specified in an approved land management plan.

- Hunting

  Hunting should be prohibited as a recreational activity because it is not compatible with Natural Areas management objectives and goal. Furthermore, appropriate barriers and enforcement penalties should be established to minimize trespassing and illegal hunting in the Natural Area. Hunting may be used by Natural Area staff as a population control measure if wildlife populations become too dense.

- Collection or Harvesting of Plants or Plant Parts and Animal or Animal Parts

  Except for approved research projects or approved use in natural history museums or herbariums, collection of plants and animals should be prohibited in Natural Areas.

- Collection or Removal of Minerals or Fossils

  Except for approved research projects, harvesting of minerals and fossils should be prohibited. Furthermore, appropriate barriers and enforcement penalties should be established to minimize trespass into preserve properties and prevent subsequent damage by vandals.

Miscellaneous Recreational Activities

Other miscellaneous activities are not appropriate for Natural Areas. These activities include, but are not limited to the following:

- Rock Climbing / Rappelling

  Rock climbing and related activities should be prohibited, except for selected sites such as borrow pits and quarries, with appropriate supervision and safety measures. These areas should be designated as recreational areas and not Natural Areas.

- Camping

  Camping should be prohibited because it results in extensive impacts to the natural environment. Areas that appear to be desirable for campling should be designated and managed as recreational areas, not Natural Areas.

- Spelunking

  Access to caves should be restricted to persons specifically approved for cave studies by the Natural Area manager based on an appropriate program which should be outlined in the land management plan for the preservation of the caves' ecosystem.

- Film Making

  Film production projects may be allowed subject to approval of the Department Director. The film production process must not negatively impact the preserve environment and must be held responsible for repairing any damage resulting from filming activities.

IMPROVEMENTS

UTILITIES

Certain utility connections may be necessary to support various activities at Natural Area properties. All utility connections should be designed and constructed underground. Locations for these utility easements should be identified during the site planning process, should be underground, and should be constructed in a manner and location that minimizes impacts to the environment. The easements should be restricted to the perimeter of the property where the majority of facilities should be sited. There are many factors that should be considered during the design process that will minimize the impact caused by utilities installation. These easements or corridors, once established, should not be increased, and all other additional utilities should be restricted to this corridor.

Water. Water used from a municipal source or a well should be conserved by installing plumbing fixtures and appliances that conserve water. Wherever possible, rainwater should be collected for irrigation and other uses. Wastewater should be used for irrigation and other uses if it meets specifications of the EAA and SAWS. When using a municipal source for water, determine the location of easements or corridors during the planning process.

Waste Water Disposal. Regulations exist for determining methods for wastewater treatment at the state (TCEQ) and county (Bexar County Public Works) levels. The most current methods for sustainable wastewater disposal should be considered, such as composting toilets or aerobic treatment units with surface irrigation.

Solid Waste Disposal. Recycling solid waste should be accomplished by establishing a recycling center and providing a composting system. Construction debris and waste should be minimized during construction by designing with standard sized materials and by estimating quantities accurately. Construction and demolition waste should be recycled.

Electrical Power. In addition to standard sources of underground electrical power, other sources that are sustainable such as solar energy should be considered. This will provide a low impact and economical source of energy for general use and is especially suited for remote sites should the need arise. As stated previously, sustainability and energy conservation technologies should be incorporated in all aspects of development. There are many methods, from passive to technology-based methods, explored in the section labeled ***Structures and Features/Improvements***. These methods will help to conserve energy. **All electrical connections will be underground.**

Gas. Gas connections to municipal gas supplies may not be possible at a more remote Natural Area property. However, compressed gases can be used in remote areas if desired. Although gas should be considered for heating water and buildings, a more efficient method for both tasks can be accomplished with one appliance called a hydronic heating gas furnace. **All gas connections will be underground.**

Telephone & Cable. Telephone and cable lines can share a common underground trench with electrical lines. In addition, solar powered telephones can be placed at

remote sites for emergency use. Cable may be considered for an educational resource. **All telephone connections will be underground.**

DRAINAGE

Stormwater Management. Stormwater management for the improvement of Natural Areas involving the construction of structures, features, and amenities will be in accordance with the City of San Antonio Unified Development Code regulations governing such development and/or other applicable city, county, and state agency design criteria. Additionally, stormwater is subject to pollution abatement rules under the TCEQ for areas on the Edwards recharge zone.

Floodplains. Floodplains of natural drainageways must and will be preserved to maintain the Natural Area setting. Floodplains, natural drainageways, and stream channels should not be used for sewer or other utility pipelines or conduits. In Natural Areas, cut, fill and clearing activities should be prohibited in floodplains.

Roads. In general, public access to the Natural Area via roads should be limited to the perimeter of the Natural Area to minimize impacts to sensitive features. Where feasible, roadways should be located completely out of floodplains. Where creek crossings are necessary, engineered structures should be designed to minimize increases to local flooding and to reduce impact on the aesthetic and ecological value of the creek and overbank areas. Roads and crossings should also be designed to not significantly alter natural drainage patterns in the Natural Area. Selection of materials that harmonize with the environment and with other park facilities is encouraged. Crossings and any impacts to perennial, intermittent, and ephemeral streams will usually require permitting under the USACE.

Roadways located over the Edwards Aquifer recharge zone and its contributing zone will require permanent abatement BMPs in accordance with applicable state and local regulations. This BMP may be vegetative filter strips or grassed swales.

Parking Facilities. Parking areas shall be located on the immediate perimeter nearest the public access point. Parking areas should always be located outside of the floodplain. Parking facilities should be designed to reduce the impact upon creek flooding and attempt to minimize the impact to the aesthetic and ecological value of the surrounding overbank area. Parking facilities should be designed to accommodate the carrying capacity of the Natural Area and not designed to necessarily accommodate the public demand for use of the Natural Area. This is an excellent method to control the level of use of the Natural Area by the public.

Parking facilities located over the Edwards Aquifer recharge zone and its contributing zone shall require a permanent abatement BMP in accordance with applicable state and local regulations. This BMP may be an earthen sand filter basin or other filtration basins. Parking facilities shall require detention of stormwater runoff to attenuate flows to predevelopment discharge rates.

Buildings. Habitable buildings non-inhabitable buildings and other structures should be located on the immediate perimeter of the Natural Area nearest to the public access point and outside of any floodplain area. Both habitable and non-habitable buildings and structures located over the Edwards Aquifer recharge zone and its contributing zone

may require a permanent abatement BMP in accordance with applicable state and local regulations.

Features and Improvements. Features and improvements may be placed within the floodplain where circumstances dictate such placement. For medium- and high-impact improvements, consideration should be given to the need for alternate surface material to reduce the potential for erosion and to reduce maintenance requirements. Features and improvements should be kept at ground level and should conform to the contouring of the ground so as to further minimize the potential for erosion, to not alter existing drainage patterns, and to minimize the impact on the depth of flooding.

Trails. Trails may be placed within the floodplain where circumstances dictate such placement. Trails should be kept at ground level and should conform to the contouring of the ground so as to minimize the potential for erosion and the impact on the depth of flooding. Trails should not be located within the active channel or ordinary high water mark of any perennial, intermittent, or ephemeral streams. Trails should also be designed and constructed in a manner to not alter existing drainage patterns.

Where trails cross creek beds, placement of the trail on a fill section may be required to comply with ADA accessibility standards. Such placement may also be necessary if the trail is also to be used by emergency vehicles. Such creek crossings should be engineered structures and should not increase local flooding and should minimize impacts to the aesthetic and ecological value of the creek and overbank areas. Selection of materials that harmonize with the environment and with other park facilities is encouraged.

Trails located over the Edwards Aquifer recharge zone and its contributing zone that are constructed of a hard surface, such as asphalt or concrete, may require a permanent abatement BMP in accordance with applicable state and local regulations.

Edwards Aquifer Recharge Zone Permanent Abatement BMP. Structures constructed to meet the requirements of permanent abatement BMP under TCEQ regulations should be located outside of the floodplain. The structures should be designed in a manner to minimize the impact on the aesthetic and ecological value of the Natural Area. Selection of materials that harmonize with the environment and with other park facilities is encouraged.

City of San Antonio Stormwater Detention Facilities. In most cases, if the Natural Area is properly designed, stormwater detention structures should not be required. However, if required, structures constructed to meet stormwater detention requirements are most effective and most efficient when located outside of the floodplain. Design should minimize the impact on the aesthetic and ecological value of the Natural Area. Selection of materials that harmonize with the environment and with other park facilities is encouraged. When structures are placed in drainageways, they should be designed in accordance with all applicable local, state, and federal regulations governing such facilities.

STRUCTURES AND FEATURES / IMPROVEMENTS

This section discusses the possible structures that may be considered for the operation of a Natural Area. Some sites may warrant nothing more than a secured gate, some staff

parking, and a bus turnaround. Other sites might require developing some or most of these facilities. Careful consideration must be given to determine levels of improvement for each individual site by following the process as developed by this plan. In addition, there are other types of uses for which buildings may be recommended. These uses must be considered on a case-by-case basis to ascertain whether they are appropriate for a Natural Area. The key is to consider whether or not that use will impact the natural or cultural resources of the Natural Area. This plan provides the process by which to determine appropriate levels of improvement.

Developing a detailed land use and management plan will reveal, among other important factors, ideal building sites that minimize impacts to the land and maximize sustainability. Sites acceptable for facilities should be identified early in the process using the criteria provided in this document. Any future consideration for facilities expansion should be restricted to these sites. Ideally, most facilities should be located on or near the perimeter of the Natural Area at the point of public access. Properly sited buildings can benefit by capturing prevailing summer breezes and by using the existing landscape to aid in climate control when providing shade and buffering winter winds.

Structures

When considering preservation of historic structures, they may be preserved for their interpretive value or they may be adapted or modified for another purpose. There may be parts of an historically significant old structure left standing such as walls or a chimney stack, and very little may be done other than stabilizing the ruins so as not to create a hazard or allowed to decay gracefully.

Source: Sprinkle Robey Architects

These existing structures, along with other local historic architecture of the area, can be reflected in the design of the new structures. A regional vernacular promotes sustainability through the use of regional materials and would encourage certain architectural elements historically used for climate control such as porches, deep overhangs, dog trots for ventilation, thick stone walls, and reflective standing seam metal roofs high ceilings and roof vents similar to that shown in the photograph to the right.

Newly constructed buildings should also be designed and built in a manner that promotes energy efficiency and green sustainable architecture. There are new energy efficient measures that are available, including:

- Roof ventilators or thermal siphons (natural ways to ventilate buildings), or solar operated attic fans.
- Water-based cooling tower (to promote energy efficiency of air conditioning system, although a smart climatically and site-based design can eliminate the need for mechanical air conditioning.)
- Hydronic heating (gas furnace that heats water and air)
- Hot water solar heater collector

Insulation alternatives for energy savings and climate control include aluminum radiant barriers, recycled cellulose, rammed earth, and straw bale, to name a few. Other methods that have been used in this region for decades should be utilized as a natural way to cool and heat, thereby cutting energy costs. Some of these methods include:

- Louvered windows
- Screen doors
- Screened-in porches
- Deep overhangs that make use of sun angles for shade in summer and sun in winter

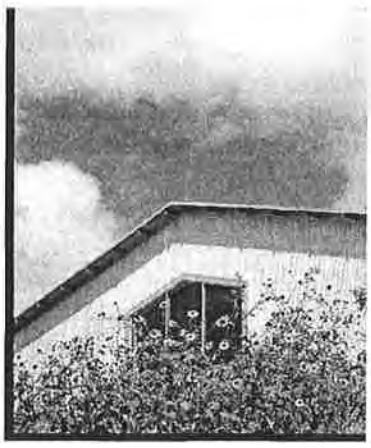
Locally available building materials such as limestone, wood and metal, if used properly, can cut energy costs. Light colors and reflective metal finishes will repel heat. Other technologies and materials that should be used are energy conserving lighting equipment and design, passive solar lighting, and solar energy.

Material choices should include resource conserving engineered products, least toxic materials, recycled content materials, regionally sourced materials, earth materials, and agricultural by-products such as straw.

Given the importance of water conservation, which is one of the primary motivating factors for acquisition of these Natural Areas, every step that can be taken to conserve water is critical and will further sustainability efforts. Consideration should be given to incorporating water conserving fixtures and appliances. Rainwater harvesting should be used as well as composting toilets and onsite wastewater systems that permit improved irrigation benefits and higher quality effluent.

All facilities must be compliant with ADA requirements for accessibility.

Administrative Building. The structure used for administrative staff of all Natural Areas at the time this document was prepared is small and probably will not meet future staffing requirements. As the program grows a new facility will be required. This facility should be centrally located, providing easy access to the majority of the Natural Areas. It should be located in an area that is acceptable according to the appropriate use criteria provided in this document.



Source: Sprinkle Robey Architects

Maintenance Facility. The maintenance facility and yard use for all Natural Areas at the time this document was prepared is inadequate for the needs and requirements of currently acquired properties, much less those that may be acquired in the future. As the program grows a new facility and yard will be required. This facility may be centrally located, providing easy access to the majority of the sites. It should be located in non-sensitive areas and should be screened from site. Ideally, these facilities could occupy an existing barn or large shed and livestock pen. Keeping the maintenance operations centralized, with work crews being dispatched daily with required equipment, will

eliminate incidences of theft and vandalism of maintenance related facilities at the other sites.

Restrooms. As stated previously, site planning is critical when minimizing impact to the land, promoting sustainability, and attempting to provide a readily available public convenience. In sensitive Natural Areas, buildings and restrooms should be prohibited. The restrooms should be in close proximity to utilities connections, the public entry, and the trailhead. Restrooms may also be part of a shared use facility.

All restrooms should be equipped with plumbing fixtures and appliances that conserve water. Composting toilets should be used where appropriate.

Indoor Classroom. A space that can function as an indoor classroom may be required for some class activities or when inclement weather dictates cover. This space can be a covered porch, a pavilion, or some other room that can serve multiple uses. One central indoor classroom for all Natural Areas may also be more desirable than having classrooms at each Natural Area. Field classrooms are usually more suitable for teaching in individual Natural Areas and for the most part impart fewer impacts to the environment.

Pavilion. A pavilion, if chosen, should be located close to parking areas and can serve several functions, such as:

- A staging area prior to beginning a tour
- Educational activities that require tables and shade
- A temporary shelter from rain
- A place for meals.

However, a pavilion may not be necessary for most or even all of the Natural Area sites. There will most likely be plenty of shade provided by vegetation for lunch to be enjoyed by the occasional organized tour group. There may also be nearby parks whose function, among other activities, is to provide picnicking.

A pavilion, if chosen, should also be sited close to parking and other facilities concentrated in one area to minimize impacts. Other shared use facilities may provide some of the functions mentioned above.

Caretaker's House. Security of the Natural Areas may be adequately handled by various methods, without resorting to providing living quarters for after-hours security. However, if this should be deemed necessary, a site should be selected and the house should be constructed to minimize impact to the land and maximize sustainability through green building principles.

Paved Surfaces

Public or Private Entry Road. The selection of a private or public entry road alignment should be determined after a detailed land use and management plan has been developed in order to minimize impacts. Factors that should be taken into consideration when developing an entry road are as follows:

- Where on the perimeter will the road create the least impact?
- Is it an existing ranch road?
- If existing, what is its proximity to future or existing major thoroughfares?
- What is its proximity to future utility hookups if required?
- Is it situated on sites of low-level sensitivity?
- Does it adversely impact sensitive areas?
- Would a new alignment be warranted?
- Is it on a steep or relatively gentle slope?
- Is there an erosion problem associated with its current location?
- How far into the Natural Area does it need to penetrate?
- Can the entry roaad be kept close to the perimeter of the Natural Area?
- What is the subgrade condition?
- Will it require lime-stabilized subgrade treatment if it is paved?
- If needed, can this entry road be buffered from view, both from the visitors' view and from that of adjacent neighbors?

Materials Recommended: Private Entry Road. If used by staff only, limestone base material surfaces are preferred and will provide a low-impact permeable surface. They may require more maintenance in terms of replacement compared to a concrete or asphalt road will but will yield a more environmentally sensitive solution. The road should not significantly alter natural drainage patterns.

Materials Recommended: Public Entry Road. If used as public entry road, limestone base material surfaces will compact over time and will become impervious. Another alternative to limestone base is a concrete grid paver system with gravel limestone gravel filling the voids. This paving system may require more maintenance in terms of replacement than a concrete or asphalt road will but will yield a more environmentally sensitive solution. The road should not significantly alter natural drainage patterns.

Parking Areas. If warranted, the selection of a parking lot site should be determined using the criteria provided in these guidelines in order to minimize impacts. The parking area should be placed at the perimeter, in close proximity to the nearest public entrance. Factors that should be taken into consideration are as follows:

Permeable Parking Lot

- Where on the perimeter will the road create the least impact?
- Can it be located near the perimeter of the Natural Area?
- How many parking spaces should be accommodated?
- What is its proximity to utility for future connections if required?
- Are there sites of low-level sensitivity available?
- If site adjacent to existing entry road is over a sensitive area, is there an alternative site for parking and entry?
- Will it be sited on a steep or relatively gentle slope?
- Are there possible erosion problems that might arise?
- What is the subgrade condition?

- Will it require lime-stabilized subgrade treatment?
- If needed, can this entry road be buffered from interior view sheds and from adjacent neighbors' views?
- Is there existing vegetation to shade parking lot?

Materials Recommended. In addition to those materials listed for entrance roads polymer stabilized soil and crushed granite may also be used for a more permeable surface. A variety of permeable parking lot surfaces and designs are available and may be suitable for Natural Areas (See photograph above). The parking facility should not significantly alter natural drainage patterns.

Other Improvements

Outdoor Classroom. Traditionally, outdoor classrooms have taken the form of small amphitheaters or areas that provide tables in an outdoor setting, and in some instances this may be an appropriate setting. However, when presented with an entire Natural Area as an outdoor classroom resource, the traditional form seems inadequate. The trail system can provide access to key points of interest to the students. These points should be determined early on with Natural Areas staff, key resource people, and consultants. These areas will occur primarily along the trail. These key points can be accommodated informally by providing a wider point in the trail for a short distance that might comfortably allow shared use. Seating or benches may be provided in conjunction with these areas if deemed necessary.

Picnic Units. Picnic units are not generally recommended for Natural areas, but may be app[roved on a case by case basis. If approved, these picnic units should be located close to other related facilities such as restrooms, water fountains and other improvements that will have been sited according to the criteria in this document. These units may also serve as rest areas or as work surfaces for educational activities. Barbeque pits should not be provided and trash receptacles should be available at each unit. The picnic unit must be compliant with ADA requirements for accessibility.

Site Furniture

Benches. Seating may be used along trail systems, trailheads, and improved areas containing facilities. Periodic placement of seating may occur along ADA trails. These benches can be strategically placed along the trails to provide rest, shade, quietude, or enjoyment of a particular vista or point of interest. Seating may be as simple as incorporating a large existing boulder at a strategic point along the trail, thereby minimizing maintenance and vandalism. In improved areas, seating may be more traditional and secured. The seating selected for these Natural Areas should be site appropriate and compliant with ADA requirements for accessibility if in an ADA-accessible area. The state recommends that benches be placed periodically along ADA accessible trails.

Source: Fernandez, Frazier, White and Assoc.

Trash Receptacles. Placement of trash receptacles should occur at specific destination points such as at restrooms, parking, and at the trailhead. The selection of an appropriate trash receptacle should both fit in with the design theme and be vandal resistant, securely fastened in place and equipped with a top containing a hinged flap that will discourage wildlife from accessing trash. It must be compliant with ADA requirements for accessibility.

Drinking Fountains. These elements should be provided in improved areas such as a administrative facility, restrooms, at a trailhead and/or staging area. To reduce the expense of installation or maintenance, it should be convenient to a water supply.

In Natural Areas, a different mindset exists concerning the providing of drinking fountains. It is very costly to provide water beyond the entry if multiple water sources do not already exist. Further, the majority of hikers carry their own water. For hikers who are unfamiliar with this practice, signage or literature should be present at the Natural Area to warn hikers to carry water, thereby avoiding dehydration and heat exhaustion. If drinking fountains are provided, they should be made very visible by selecting a contrasting color and the fixture should be vandal resistant. It must be compliant with ADA requirements for accessibility.

Bicycle Racks. Bicycle racks may be required as a convenience for users that travel to the area via bicycles for bicycle storage while using the Natural Area. These should be provided at trailheads and adjacent to parking areas without causing a conflict with pedestrians or other users of the Natural Area. Failure to provide conveniently located bicycle racks invites bikes being chained to trees, light poles, or other objects without regard to pedestrian circulation. A variety of bicycle racks are available commercially, affording the designer a range of options considering cost, aesthetics, and maintenance.

Bridges

Pedestrian bridges may be required to cross creeks and ravines and should be in keeping with the character of the Natural Area. They should be constructed of materials that will minimize maintenance and withstand flood conditions.

Trails

Source: Environmental Survey Consulting

Development of any type of trail system on Natural Areas should be decided after compiling and analyzing natural resource scores using the site specific GIS matrix. If the matrix indicates that trails are not appropriate on a particular property, then no further analysis for trail design needs to continue.

To evaluate a property for trail options, a determination needs to be made whether it is possible to design and construct any type of trail on a particular property. The decisions made as

to which type of trail should be installed on a Natural Area will have effects on their development and management. There are a number of different types of trails that can be constructed to offer a variety of experiences to visitors. The planning and construction of each trail type, as well as their impact upon the land, vary widely, from high impact to low impact. A discussion of the different trails that could be used on Natural Areas follows.

Hiking Trails. Hiking trails have the least impact of all the trail types, and they are the least expensive to construct. There are a variety of design techniques for hiking trails that will minimize erosion including sidebars, steps and angle of trail. Cost of constructing hiking trails is less than for other types of trails, although cost can vary depending upon the intensity of steps preferred.

Source: Environmental Survey Consulting

Carefully designed and constructed hiking trails will have a minimal impact on a Natural Area. There are a variety of techniques for designing hiking trails that will minimize erosion including sidebars, waterbars, steps, and control of cross slope and trail grade. Cost of constructing trails can vary depending on the level of difficulty and amenities or upgrades preferred. Hiking trails require periodic management and monitoring. Full time on-site staffing is not necessary unless the trails are fee-based or security and resource protection is an issue. Staffing is required for periodic maintenance and control of trails. Minimal parking is required at the trail head and should be sized according to the pre-determined carrying capacity for the trail.

Trails will be designed to accommodate different levels of difficulty. Listed below are the four levels of difficulty for trails to be used in the Natural Areas (Adapted from Government Canyon Natural Area Master Plan, Texas Parks and Wildlife Department, 1998).

- **Level I (Easiest):** This level of trail difficulty is considered ADA compliant and is most often used for interpretive trails. The trail is designed to have gentle slopes and to provide access to the widest spectrum of users. The trail is designed to meet or exceed all ADA standards. These trails are usually approximately 60 inches wide with a maximum allowable grade of 8.33% with a maximum sustained running grade of 5%. No more than 20% of the total trail length should exceed the maximum sustained running grade. The cross slope on the trail will not exceed 2%. The trail surface should be constructed using various permanent hard materials such as asphalt and concrete. Hand rails will be provided on these trails where required to assist disabled visitors.
- **Level II (More Difficult):** This trail level provides opportunity for active persons with disabilities to experience the Natural Area in a more primitive environment with more challenges compared to Level I. These trails meet most of ADA criteria, but are not ADA compliant. These trails can have a grade as high as 8.33% and a maximum sustained running grade 5%. No more than 20% of the total trail length should exceed the maximum sustained running grade. Level II trails are somewhat narrower than Level I with a width of no more than 48 inches. The cross slope on these trails can be as high as 3%. Hand rails are not provided for these trails. The surface of these trails is

stable and firm, usually comprised of asphalt, concrete, or base materials that are somewhat permeable.

- **Level III (More Challenging):** Level III trails are constructed for use by the general public to access most of the major features of the Natural Area. These trails are no more than 36 inches wide with a maximum grade of 20% and maximum sustained grade of 12%. No more than 20% of the total trail length should exceed the maximum sustained running grade. The cross slope on these trails can be as high as 8%. These trails are often required to access more remote parts of the Natural Area and are sufficiently difficult to present a challenge to the majority of the public users. For those in wheelchairs, these trails would require exceptional upper body strength. The surface of these trails is usually stable and firm, but comprised of *in situ* materials that have been compacted or modified to minimize erosion or instability. Base material should only be used on these trails for areas where erosion or degradation of the trail cannot be prevented using materials on site.
- **Level IV (Most Challenging):** Level IV trails are defined as primitive trails. These trails may have grades greater than 20% in places. The trail surface is comprised only of *in situ* materials. In many cases, these trails may be developed from pre-existing trails used by wildlife or humans in the past. These trails are not designed for use by wheelchairs. The trails may have steep rock ledges or other obstructions that may be dangerous. The width of the trail is less than 24 inches with minimal vegetation removal and alteration of the ground surface required for their construction. The major modifications to these trails would be placement of erosion controls. These trails are used to access remote areas of the Natural Area and their use would often be seasonal protect sensitive features along the trail or weather dependent to protect the trail from erosion.

ADA Trails. A determination should be made where ADA trails are required to fulfill legal obligations. ADA trails are somewhat costly to construct, although the actual usage by visitors is not high impact. These trails require periodic management to replace surface material.

Bike Trails. Bike trails can have a large impact on sites. There are a variety of design techniques for bike trails that will minimize impacts to erosion and vegetation. Trails must be designed, located and constructed appropriately to have as little impact as possible to the Natural Area Site. Staffing will be necessary for maintenance and monitoring of rogue trail development. Minimal parking is required at the trail head and should be sized according to the pre-determined carrying capacity of the trail. It is highly anticipated that many bike trail uses will travel to the site by bike either at street level, or by an interconnecting series of greenway trails.

MANAGEMENT GUIDELINES

There are differing management options and concerns for each of the trail types.

Source: Environmental Survey Consulting

ADA Trails. ADA trails must be constructed to comply with ADA rules and regulations. ADA trails must be placed in locations that are basically level. During construction, access for construction vehicles and materials is required and may impose temporary, but significant impacts to the Natural Area. No steps or sidebars can be part of an ADA trail system. Once the trail is constructed, there is relatively little impact of wheels on the trail. Periodic maintenance is required to replace any surface material that might have eroded away during wet weather. ADA trails require regular trimming of vegetation for blind users. Seating, rest areas, or benches must be placed in regular intervals along the trail. Benches must meet ADA standards and should be located in shady areas, if possible. Grade along the trail should be sufficiently shallow (<10%) to avoid handrails on Level 2 trails. In Level 1 trails where handrails are required, they should be designed and installed to meet ADA standards. Level 1 ADA trails should be wide enough to accommodate wheel chairs and electric scooter (not less than 60" wide). ADA trails must have access to a parking area and should be surfaced with hard materials such as asphalt or concrete. There are no additional staffing needs to monitor an ADA trail.

Hiking Trails. Hiking trails will have the least impact on any property if properly designed. Care must be taken in design and construction to minimize any erosion potential. Sidebars, waterbars, and steps can be used to deflect water off the trail. Placement of the trail can maximize deflection of water. There are no additional staffing needs to monitor a hiking trail. Periodic maintenance is required to clear hiking trails of any fallen debris or vegetation growth on the trails.

Bike Trails. There exists concerns with bike trails and the impact they have on the park site. With proper placement, design techniques, and construction materials, the impact to park sites is lessened. The more serious impact is rogue bike trail users, who make their own paths through natural area properties. Sufficient signage and monitoring by staff will be necessary. Periodic maintenance is required to clear biking trails of any fallen debris or vegetation growth onto the trails.

All Trails. Some concerns affect all types of trails. Design techniques can help minimize future maintenance needs. All trails should be kept out of extreme flood prone areas, although hiking trails can handle a certain amount of flooding. Hiking trails can be combined with ADA trails, but ADA trails cannot be combined with rougher hiking trails. Sunny areas along trails will require periodic trimming vegetation that may spread across the trail. Shady areas will often require periodic trimming of woody plants and branches.

MANAGEMENT LIMITATIONS

No legal limitations to trail systems exist, with the exception of those that apply to ADA trails. Some social and political concerns might affect management of trails. The Natural Area manager should be aware of the fact that the public may oppose trail closures and limited access to trails during inclement weather or endangered species breeding seasons. Public demand for access to properties, and pressure by single

interest groups for access to hiking trails may also be an issue. Educational or interpretive signage can be strategically placed in and outside of the Natural Area to explain why trail use may be limited or trails are periodically closed.

Re-Vegetation Planting

When planting is required in Natural Areas, only forbs, shrubs and trees found in that bioregion should be selected. Re-vegetation planting may be carried out for the following reasons:

- Restoration of habitat
- Reestablishing endangered species habitat
- Areas disturbed by construction
- Preventing erosion
- Construction of new wetlands or surface waters
- Replacement of controlled or removed exotic vegetation
- Restoring vegetation over abandoned ranch roads, trails, fallow fields, and new utility easements as well as buffering stormwater runoff, creeks and swales that have been damaged by flooding
- Reclaiming creeks that have been channelized or damaged by erosion
- Covering demolished building sites and abandoned quarries.

Existing Vegetation

During the construction process and thereafter, existing vegetation should be maintained and preserved intact in order not to exacerbate the effects of construction activities, increased use of the Natural Area, and the changes to the environment. Habitat protection should be a prime objective to carefully plan improvements in Natural Areas where existing vegetation is established.

Restoration

Restoration will require re-vegetation of all disturbed areas using native grasses, forbs, shrubs and trees that dominate the plant community on-site to ensure compatibility with the vegetation community and to foster plant diversity. Vegetation with the potential to compete with on-site native plants and plant communities should not be used.

Erosion Control

Plants are an effective means of erosion control. Plants can control and filter runoff sediment and trash before it flows into surface waters or recharge features. Bank stabilization and re-vegetation will be required in areas where existing eroded or slumped bank conditions are present, where areas have been disturbed by construction, and where existing roads and trails are no longer used. Installation options are available

for stabilizing banks that have been eroded, subsided, or damaged by construction activities, and for exposed areas that require re-vegetation.

In many cases, vegetation alone will suffice to provide long-term erosion control in areas that have been disturbed. Dead plant material left in place, by virtue of its root systems and stabilized organic material, is a deterrent to erosion. Establishing vegetative cover may be achieved by several different methods. These methods may require temporary (biodegradable) materials to be placed to stabilize and control erosion of the soil surface while the permanent vegetation becomes established. Permanent structures may also be used and include non-degradable material that ultimately becomes part of the plant's root mass, or engineered barrier systems. Each material or system has its own technical requirements and limits of application. The designer is encouraged to consider initial cost, severity of existing conditions, desired finished product vs. intended use, and maintenance requirements when selecting erosion control solutions.

Plant Types

Existing vegetation should be monitored and inventoried to establish the composition of plant communities and to anticipate plant succession. Preferably, new plantings should use grasses, forbs, shrubs and trees that are native and are dominant species in the Natural Area. This ensures that the plantings will probably be successful and the new vegetation will not compete with native plant communities in the Natural Area.

Lighting

Natural Areas will be used primarily during daylight hours. Where exceptions will occur, minimal area lighting will be required. Certain entry points, parking areas, trailheads, buildings, and other nodes of activity that function at night will require lighting for visibility, safety and security. Visibility and user safety are improved by lighting at these key points. Functionality of these areas is also enhanced as users can more easily see path alignment, surface conditions, and potential obstacles to travel.

Lighting Concepts

As previously discussed, the greater majority of Natural Areas is used primarily during daylight hours and should not offer lighting. Lighting will negatively impact wildlife habitat and will detract from the night sky. All light fixtures should be equipped with a photocell and timer and when possible should be solar-powered to further sustainability. Lighting is essential for visibility and security at entry points, buildings, parking lots, the intersection of trails with roadways, nodes, trailheads, and the points at which trails begin or conclude. Light pole mounted luminaries with down light vertically mounted lamps with a 45° cutoff should be used exclusively. The remainder of the trail system should be for daytime use.

Light Fixtures

Spacing, height, and arrangement of lighting should create a uniform distribution of light and avoid casting shadows from foliage or other trail appurtenances onto the trail surface. Luminaries should be selected that will cast light in a pattern parallel with the

long axis of the trail and provide cut-off shields so light does not spill over onto adjacent property. Light distribution is a consideration in both the horizontal and vertical dimensions. Lights that illuminate upward should be avoided. A "dark sky" concept is desirable, wherein the light is concentrated downward onto the trail and not lighting uselessly upward. Horizontally, a uniform pattern is desirable, and lighting should be designed to achieve uniform foot candle recommendations listed below.

Lamp Fixture Materials and Finishes

While many different lamp types are available, it is recommended that entry points, parking lots, and other structures be lighted with metal halide for true color rendering. This is important from a safety and security standpoint. The average life of the lamp is 24,000 hours and its cost is in the medium range when compared with other alternatives.

The selection of appropriate light fixtures is the prerogative of the designer, given certain guidelines and standards are met. Selections should also be made from the viewpoints of durability, low maintenance, lamp life, and vandal-resistance.

Light Levels

Recommended levels of Illumination are summarized in Table 11, utilizing information from the Illuminating Engineering Society (IES).

Table 11. Foot Candle Recommendations	
Using 25' tall light poles for trails and pedestrian spaces between buildings as needed	
For average of 1 foot candle	Space poles approximately 40 feet apart
For average of 1/2 foot candle	Space poles approximately 60 feet apart
For minimum of 0.2 foot candle	Space poles approximately 100' feet apart
Using 30' tall light poles and 250 watt for parking areas	
For average of ½ foot candle	Space poles approximately 80 feet apart

Entry Gate and Fencing

Entry

The entrance should be secured obviously and should be visible with adequate directional signage. Signs should be placed along major roads approaching the Natural Area at sufficient intervals such that the entry can be easily found and accessed. Low key, but easily discernable signage should mark the entrance. A large landmark element that may be visible from a distance could be incorporated into the entry. Such landmarks could be windmills or a gate

Source: Fernandez Frazer White & Assoc.

with an element that spans the entrance, possibly reminiscent of a historic ranch entry gate. These entries may be excellent opportunities to incorporate artwork as well.

Public or Private Entry Road

The selection of a private or public entry road alignment should be determined after a detailed land use and management plan has been developed in order to minimize impacts. Factors that should be taken into consideration when designing an entry road are described in the section that follows.

Fencing for Boundary Demarcation, Storage, and Wildlife Management

Provisions for adequate fencing and signage on all preserve components should be undertaken by Natural Area staff. As preserve lands are acquired, upgrading of fencing along the perimeter boundaries should be accomplished as soon as practical to achieve human access control. Problems arising from neighboring properties include dumping and unauthorized access, resulting in a spider web of trails forming. By clearly delineating the property line with fencing and signage, laws prohibiting trespassing can be enforced with impunity. The fence for boundary demarcation can be as simple and cost effective as cedar posts and hogwire, or fencing can involve more elaborate alternatives, as budget allows.

Source: Fernandez Frazer White & Assoc.

There may be a need for small fenced-off areas to protect habitat or to provide temporary barriers to protect new plantings from browsing. For a discussion of endangered species habitat, see the endangered species guidelines found in ***Step 2, Site-Specific Evaluation***.

Maintenance yards require more substantial fencing, such as a 6-foot chain link security fence, which should be buffered from sight.

Information Systems Signage

Signs should be of four types: regulatory, warning, educational and directional. Regulatory signs communicate laws and regulations. Warning signs are used to alert the user to possible dangerous conditions ahead. Educational signs are made to enhance the knowledge of the Natural Area user about various features found in the Natural Area. Directional signage conveys information and assistance to aid the trail user. Fixed signs should be supplemented with pavement markings for a total package of information and assistance.

Warning signs should be located ahead of potential hazards to allow time for reading the sign and making an appropriate response (design speeds and sight stopping distances are also critical here). Signs should be placed so that a safe horizontal distance between the edge of the trail and the nearest portion of the sign is at least 3 feet.

The beginnings of trails should be marked with signage to communicate the nature and difficulty level of the trail. The sign should also include information about the trail, such as typical slopes, steepest slope, cross slope, trail width, trail surface, and obstacles will aid the user, particularly those with disabilities, to understand and evaluate the trail before entering. This information could also be provided in a trail map or brochure that could be placed in a weatherproof container at the trailhead.

Considerations for placement of signs along trails include size, scale, and proportion of letters, and contrast of letters with background. The size of the letters must make the sign – especially warning signs – legible so that the trail user can anticipate the message and act accordingly. Educational and interpretive signage could be designed to blend with the surrounding environment. However, warning signs should be placed in obvious areas and designed with bright colors that contrast with the surrounding environment to ensure that they are easily seen by Natural Area users. Selection of the color of warning signs should consider seasonal changes in the color of vegetation. For example, a red warning sign located in a site having a background of flameleaf sumac may be easily seen in the spring and summer when the plants are green, but may be camouflaged in the fall when the plants are red.

Signs should be designed of materials that are strong, durable, and cost-effective. They should have vandal-resistant qualities and should be securely mounted in place. Where nighttime trail use is an issue, signs should be either easily readable in the dark, or receive illumination from adjacent light sources. Signage should be designed to reduce long-term maintenance; for example, avoiding repeated and frequent painting.

Signage types may include:

- ***Location Identification Signs*** (i.e. Natural Area, trailhead, etc.) identify major components of a trail system, usually nodes and destinations. Examples include Natural Area name, trailhead address, boundary markers, etc.
- ***Natural Area Maps*** provide a graphic overview of the Natural Area including trails and the entire property to orient the first-time trail user to site conditions. To address trails accessibility, the sign should include, at a minimum:
    - Average and maximum trail changes in elevation;
    - Average and maximum trail cross slope;
    - Average and minimum trail width;
    - Type of surface;
    - Notable obstacles.
- ***Directional Signs*** provide information about one's location along a trail in relation to nodes, trailheads, and other landmarks.
- ***Educational/Interpretative Signs*** provide an opportunity to educate the trail user about points of interest encountered along the trail.
- ***Hazard/Warning Signs*** alert the trail user to possible conditions ahead that require caution. Signage should also be developed that alerts the trail user to the possibility of flood conditions.

- ***Distance Markers*** provide information about progress along the trail.

Minimum signage information should include:

- Trailheads
  - Trail Name
  - Mileage of trail loop
  - Mileage (from Trailhead to Trailhead)
  - Trail Map
  - Accessibility Rating
  - Hazards
- Trail-Side Signs
  - Trail Name
  - Mileposts
  - Safety Signage
  - Hazards and Warnings
- Interpretive/Educational Signage
  - Natural
  - Cultural
  - Sustainability/Energy Conservation Development

Examples of signage that may be used are shown below and on the next page.

Recreational / Interpretive Signs

Restrooms

Drinking Water

Wildlife Viewing Area

Prohibitive Signs

Reflective Trail Signs

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USING THE GIS MODEL AND SCORING MATRIX TO SELECT ACTIVITIES AND IMPROVEMENTS

A site-specific GIS model has been developed to assist the land manager in determining those areas within the Natural Area that are most suited for specific activities and improvements. Prior to using the model, data must be collected on all of the natural resources that could be potentially impacted by management and use of the Natural Area. Collection of this data is described in detail earlier in ***Step 2, Site-Specific Evaluation.*** Once data has been collected in the field on the specific natural resources, this data is mapped onto seven different layers for use in the model. These layers include the following:

- Geologic features
- Soil
- Surface water
- Species of concern
- Wildlife
- Vegetation
- Cultural resources
- Slope

Each of the map layers for each of the natural resources will be comprised of polygons scored according to the scoring methods listed in ***Step 2.*** The level of the score is a direct indication of the level of sensitivity of each of the natural resource features. For the purposes of the Site-Specific GIS model, all areas within the property boundaries must be scored for each natural resource. Where these natural resources are not present, "0" will be used as a score.

Table 12 shows the scoring matrix used for natural resources to determine those areas that are optimal for specific activities or improvements within the Natural Area. For example, areas that can be used for low-impact trails must meet the following scoring criteria:

- Geologic features <8
- Soil <7
- Surface water <10
- Species of concern <30
- Wildlife <35
- Vegetation <38
- Cultural resources <27
- Slope <70%

These map layers are then incorporated into the Site-Specific GIS model by converting them into grids that can be mathematically added and manipulated to show those areas that meet the criteria. Thus, as with the previous example on trails, those areas where low-impact trails may be considered would be highlighted in red or some other color on

the map. Table 12 shows the various criteria and scoring levels used for each of the different types of activities and improvements for the Natural Area. Once the final map has been prepared using the Site-Specific GIS model, the manager may then confirm results in the field and develop a more site-specific conceptual design for land use and management for the Natural Area. It is important to note that the Site-Specific GIS model only shows the general areas where specific activities and improvements may be conducted or constructed. Exact locations can then be determined using more site-specific data, which is also provided as separate maps within the Site-Specific GIS model.

The Site-Specific GIS model and the scoring matrix are intended to provide guidance information for use of the Natural Area. The maps will serve to set the final restrictions as to the land use and management of the Natural Area. This information would eventually be incorporated into the final land use and management plan for each specific Natural Area, which would be approved by the San Antonio Parks and Recreation Department and ultimately the City Council.

Table 12. Issue Scoring Matrix

Activity/Improvement	Geologic Features	Soil	Surface Water	Species of Concern	Wildlife	Vegetation	Cultural Resources	Slope
TRAILS								
Low Impact Trails (Level IV)	<8	<7	<10	<30	<35	<38	<27	<70
Low impact, all-weather hiking trails 2-3' wide with erosion control prevention structures including high quality waterbars, sidebars, and steps constructed of existing soils and local native materials.								
Interpretive trail with signage, constructed the same as the low impact hiking trail.								
Restricted seasonal hiking trails (during endangered species restricted times, only under staff supervision)								
Restricted weather hiking trails (only for water crossing and flood-prone areas)								
Moderate Impact Trails (Level II to III)	<7	<6	<7	<20	<35	<37	<24	<20
Hiking trail, up to 4' wide, with permeable surface material (granite/caliche/mulch)								
Flat or sloped (< 3%) ADA Trails up to 4' wide, with permeable surface (granite)								
High Impact Trails (Level I)	<6	<6	<6	<15	<30	<30	<15	<20
Access road: All season 10 ft wide, no surface material								
Hard surfaced ADA trails								
Very High Impact Trails	<1	<3	<5	<10	<20	<16	<10	<10
Parking areas for hiking trails								
Access road: All season 10 ft wide, with surface material								
RECREATIONAL ACTIVITIES								
Low Impact Activities	<8	<7	<10	<30	<35	<38	<27	<70
Nature viewing								
Walking/Hiking								
Guided educational/interpretive tours								
Observational research								
Research involving impacts to areas less than 0.1 acre with permit								
Research involving limited speciman collection with permit								
Moderate Impact Activities	<5	<5	<5	<15	<30	<16	<15	<20
Jogging								
Fishing								
Research involving impacts to areas greater than 0.1 acre by permit								
INFRASTRUCTURE								
High Impact	<1	<3	<4	<10	<20	<16	<10	<20
Rainwater catchments								
Composting Restroom								
New or old well--wind, solar, or manually driven pump								
Wetland wastewater treatment system								
Solar powered amenities								
Sky lights								
Windmill								
Cellular phone								
New or old well--electric pump								
Septic system								
Butane/propane tank gas system								
Municipal water source								
Wastewater treatment package plant								
City Sewage System								
Municipal Electric Systems								
Municipal gas system								
Conventional Telephone								

Table 12. Issue Scoring Matrix (Continued)

Activity/Improvement	Geologic Features	Soil	Surface Water	Species of Concern	Wildlife	Vegetation	Cultural Resources	Slope
DRAINAGE								
Moderate Impact	<7	<6	<7	<20	<30	<25	<24	<20
Grass filtration systems								
Wetland treatment systems								
Vegetative filters (native plants)								
High Impact	<5	<5	<5	<15	<20	<16	<15	<10
Sedimentation basins								
Filtration basins								
Stormwater retention basins								
Pedestrian bridges								
Erosion control devices--earthen dikes/check dams								
Very High Impact	<1	<3	<4	<10	<11	<16	<10	<10
Vehicle bridge								
Concrete drainage structures								
STRUCTURES/BUILDINGS								
Moderate Impact	<7	<7	<5	<26	<35	<38	<15	<20
Existing building adapted for sustainable re-use								
Natural area/trail outdoor classroom								
Grid pavement/sod road								
Site furniture (This could be put into ADA trails.)								
Fencing--barbed wire or natural/5 ft cleared ROW								
High Impact	<5	<4	<3	<15	<20	<20	<15	<10
New sustainable building								
Amphitheater classroom								
Covered classroom								
Gravel road								
Grid pavement/gravel								
Grid pavement parking areas								
Directed lighting								
Deer proof fence--10 ft ROW (to protect good areas?)								
Very High Impact	<1	<3	<1	<8	<10	<10	<10	<10
New non-sustainable building								
Classroom/educational building								
Asphalt/concrete road								
Asphalt/concrete/gravel parking areas								
Picnic areas								
Undirected lighting								
Hurricane or privacy fence--10 ft ROW								

STEP 4: DEVELOPING A LAND USE AND MANAGEMENT PLAN FOR A NATURAL AREA

In developing a land use and management plan for a Natural Area, the land manager must first determine the objectives for the natural area. As previously discussed, this information can be obtained by using the General GIS model in combination with the Site-Specific GIS model. The General GIS model can provide information as to the overall sensitivity of the Natural Area. Highly sensitive Natural Areas may lend themselves more towards resource protection while those Natural Areas that are categorized as lower in sensitivity may lend themselves more to educational and interpretive opportunities. Once the general objectives for the Natural Area have been determined, management strategies for meeting those objectives should be selected. The management strategies include methods used for the maintenance of the Natural Area as well as activities and improvements to be included as part of the Natural Area. All of these will be a function of the objectives. Management strategies can be obtained by use of the Site-Specific GIS model, which will assist the land manager in determining the location and potential use of various activities and improvements on the tract.

Suggested Outline for Land Use and Management Plan

Listed below is a general outline that depicts the content of a land use and management plan for a specific Natural Area.

I. Introduction
   A. General description of the tract and method by which it was acquired
   B. Purpose and objectives for the Natural Area
   C. General schedule for the development and design of the Natural Area

II. Existing Conditions
   A. Current access points to the Natural Area
   B. Cultural and natural landscape of the environment
      1. Governmental considerations
      2. Adjacent property use
      3. Historic landscape of the Natural Area and surrounding environment
      4. Ecological connectivity
   C. Natural features
      1. Geology
      2. Soils
      3. Hydrology
      4. Vegetation
      5. Wildlife
      6. Endangered Species
      7. Topography
   D. Cultural and historic features
      1. Archeological sites
      2. Historic sites

3. Historic structures

E. Currently developed features
   1. Roads
   2. Trails
   3. Structures
   4. Other manmade features (Stock tanks, windmills, water wells)
   5. Fencing
   6. Easements

F. Maps used for planning purposes
   1. General GIS model sensitivity map
   2. Site-Specific GIS maps

III. Management Options

A. Conceptual design

B. Management strategies
   1. Protection of natural resources
   2. Removal of invasive exotic species
   3. Management of wildlife populations
   4. Major limits and constraints placed on natural area development and use
   5. Accessibility to the public
   6. Natural area security and protection
   7. Other maintenance strategies

C. Improvements
   1. Trails
   2. Structures
   3. Day use areas
   4. Educational facilities
   5. Maintenance roads
   6. Access road and parking areas
   7. Utilities
   8. Drainage
   9. Signage
   10. Site furniture
   11. Lighting
   12. Miscellaneous components

D. Activities
   1. Appropriate recreational activities
   2. Interpretive opportunities
   3. Educational opportunities
   4. Science and research opportunities

IV. Natural Area Administration

A. General schedule for implementation and completion of the plan

B. Proposed budget for design and construction

C. Proposed budget for maintenance and operation

D. Funding sources

E. Staffing requirements

F. Security requirements

Determining Natural Area Carrying Capacity

Creating a plan for the development of a Natural Area for public use is an ongoing process that will need constant monitoring and adjustment. Any construction, whether minimal or intense, will affect the natural and cultural resources in some way. The challenge is to try to anticipate the impact, incorporate these anticipations into the planning stage, monitor the results after construction, and be ready to modify any development if it becomes unacceptable.

Step One: Gather Information

The first step is to follow the guidelines outlined in ***Step 2*** of ***Part I, The Process***, to determine (1) environmentally sensitive and interesting areas, (2) general terrain and soil conditions, and (3) natural and cultural features.

Step Two: Determine Development Potential

After all pertinent information has been gathered, the key features that affect trail and improvements potential can be determined. This will be an analysis of which areas should be protected completely, which areas can handle moderate usage, and which areas can handle more intense development.

Step Three: Determine Carrying Capacity

In conjunction with determining how a property could possibly handle development, there needs to be an effort to estimate each site's carrying capacity. The process of determining carrying capacity of Natural Area users is a young science and has too many complexities to be able to provide conclusive answers. However, the technique called the limits of acceptable change (L.A.C.) is a technique often applied in Natural Area planning to minimize adverse impacts on the environment and on the experience of the visitors.

Basically, the planner needs to make a best-guess estimate regarding carrying capacity, then follow up with an extensive monitoring and management program. Estimating carrying capacity should take into consideration four distinct types of carrying capacity.

- Ecological (e.g. vegetation, wildlife, soils)
- Social (e.g. the perception of crowding)
- Spatial or physical (e.g. ability of certain terrain to absorb the number of users)
- Facility (design capacity, e.g. parking lot)

The L.A.C. approach assumes that change to an area will occur. The goal is to manage the rate and type of change within acceptable levels. L.A.C. includes the following:

- Keep the rate and type of change to an acceptable level
- Develop management objectives regarding different types of visitor experiences
- Identify the sensitive issues for each site and select indicators to measure any change
- Set acceptable change standards that will determine whether management objectives are being met

- Allow for management responses to changes
- Encourage public participation by visitors to keep decisions open and accountable

Developing Management Zones

The carrying capacity estimates and L.A.C. goals will lead to establishing management zones that will determine the type of development and visitor experiences for each property.

Wilderness Zones
This zone will have few or no trails and retain mostly undisturbed resources. The visitors will experience solitude and few encounters. The management emphasis in this zone is on sustaining ecosystems.

Natural Environment Zone
This zone will be a mostly unmodified natural environment. Some vegetation might be lost at specific locations, such as trail junctions or interpretive stops where large groups congregate, but natural processes are only minimally affected. Encounters between visitors are infrequent in this zone. Trails are maintained for light use. Structures are provided if required, but not for visitor convenience.

Intensive Recreation Zone
This zone will have a natural appearing environment. Modifications to the environment are not apparent to most people and are mostly for user facilities. Visitors will have more contact with each other. This is mostly a day use zone. Management will emphasize sustaining the natural environment and preventing conflicts between visitors. Structures are for visitor convenience and trails are maintained for heavy use.

Indicators Affecting Carrying Capacity

Since determining carrying capacity is an on-going process involving monitoring and management, there should be a system for determining when an area has reached limits of change that are unacceptable. If indicators show that the Natural Area is over its carrying capacity, decisions will have to be made regarding lowering visitor numbers.

The land manager should select indicators that will help measure changes over time. These indicators must be easy to measure and helpful with the most important issues. Examples of indicators include the following. This list can be expanded as events within each property require.

Social

- Incidents of vandalism
- Number of visitor conflicts
- Number of unofficial trails created by visitors
- Number of visitor-caused fires

Trails

- Depth of tread below ground surface
- Braided trails
- Standing water

Vegetation

- Diversity of species maintained
- Percent of vegetation cover
- Increase in non-native species

Water

- Coliform counts

Fish and Wildlife

- Change in wildlife distribution
- Population trend changes
- Increase in non-native species

Management

- Number of incidents of wildlife harassment

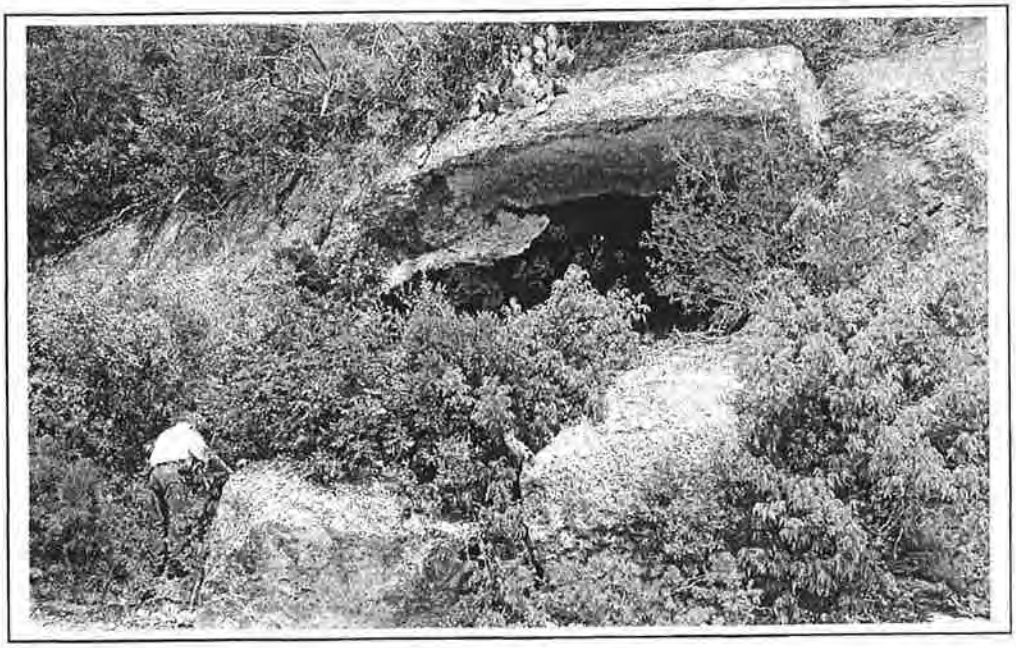
Management Actions

Standards should be set for each management zone. Standards should describe what is minimally acceptable, not what is desired. A standard is a contract between the manager and the public. Standards should be achievable and set in consultation with user groups. The standard does not change, and action should be taken when standards are over-reached.

Alternative zones should be mapped to match as many of the management zones as possible. These alternatives can be used when over-used trails need to be off-limits while being restored. Consult with user groups to explain alternative zones. Write a description of the Natural Area management goals, which includes use of alternative zones. For example, there might be signage stating "return to natural condition as soon as possible."

Management actions should be assessed in terms of their desirable outcomes and undesirable side effects. Consider which groups will be affected. Which values are promoted and which are diminished? How feasible will it be to manage the trail as prescribed? What are the costs? When implementing management actions, develop a schedule for completion, a monitoring plan and evaluation process to determine the success of the management actions.

PART II: INTERPRETIVE AND EDUCATIONAL OPPORTUNITIES



Natural Areas provide unique opportunities for interpretive and educational activities. Although one of the major objectives of Natural Areas is protection of natural resources, a secondary objective is to provide an example of undisturbed natural resources for observation and education of the public. Thus, every opportunity must be made to educate the public about the natural resources that are being protected on the Natural Area.

In determining the interpretive/educational potential for a Natural Area, two steps must be followed. The first step involves determining the educational opportunities potentially provided by each tract. The second step involves an analysis of the demographics and a needs assessment of potential visitors.

Educational opportunities for each Natural Area are a function of several factors described below.

Proximity

The proximity of the tract to targeted populations, such as schools and other public interest groups, plays an important role in determining the potential for educational opportunities. If the Natural Area is close to a targeted population, its use as an educational opportunity may be a higher priority compared to tracts that are remote from targeted populations. However, it is important to note that most of the properties in the project area are somewhat remote from targeted populations. Therefore, educational opportunities may be focused on widespread, distant groups versus close groups. Educational opportunities may focus on all school districts in San Antonio, Bexar County, and surrounding communities, allowing Natural Areas to be visited on a scheduled and controlled basis. For example, the Northeast Independent School District currently has a program where fifth grade students spend three days and two nights at a camp near New Braunfels learning respect for natural resources. This allows for an excellent educational opportunity for students in a controlled, scheduled environment. The proximity of the students to the area is not an issue because they are transported various distances by buses and other forms of transportation.

Vehicle Access

If the Natural Area is to be used for educational purposes, some form of parking must be available for buses and cars. If no parking is available, educational opportunities will be considerably diminished.

Variety of Educational Experiences

Ideally, educational opportunities are much better for Natural Areas that can provide a variety of floral, faunal, geologic, and cultural experiences for the students. In addition, these experiences must be accessible and their use should not impact the integrity of the natural resources. Natural area containing one or two major natural resources do not provide as good an educational opportunity as those that provide a multitude of experiences.

Natural Area Access

If access to the Natural Area is limited either seasonally or geographically to protect natural resources or endangered species, interpretive opportunities are somewhat limited. For instance, a site that contains golden-cheeked warbler or black-capped vireo habitat may have to be closed seasonally to prevent impacts to the birds during the breeding or nesting season. Such a circumstance definitely limits the opportunities for educational and interpretive use of the Natural Area.

Proximity to Other Natural Areas and Parks with Interpretive Opportunities

If the Natural Area is in close proximity to other protected lands with interpretive opportunities, the potential for use as an educational facility is increased considerably. In such a situation, groups could visit two or more Natural Areas in one day. This would provide a method to overcome the fact that one or more of the Natural Areas do not provide a variety of interpretive experiences.

Potential for Educational Staff On-Site

Many of the properties potentially acquired by the City of San Antonio do not have sites available for construction of educational buildings and offices for staff. Sites that can provide for these types of buildings as well as classrooms, camps, and other facilities can provide excellent educational opportunities for the public. Natural Areas having sites that can support these facilities should be used for educational purposes.

In general, if a property has sensitive environmental issues, there may be only a need for interpretive signage for hiking trails that are open seasonally. Conversely, if a property is close to other properties with interpretive opportunities, it could be linked to those properties into a potential eco-tourism guided tour program. Properties close to targeted school populations might be visited more frequently due to potential logistical and financial constraints imposed on classes and students by schools.

In order to make conclusions regarding demographic and need assessment, research needs to be completed on the following topics for each property.

- Number and age level of schools within easy access
- Miles from public transportation
- Miles from nearest populated area
- Miles from downtown San Antonio

The following topics need to be researched for all of the properties in general.

- Survey of teachers regarding field trip interest
- Survey of general public at other parks to determine interest in Natural Areas
- Survey of general public through newspapers to determine interest in Natural Areas
- Survey of general public through neighborhood newsletters to determine interest in Natural Areas

Management Guidelines for Interpretive / Educational Programs

Educational goals for Natural Areas should include helping the general public develop a sense of stewardship and awareness regarding Natural Area issues. Developing concern and awareness for Natural Area issues will help create a base of support within the community, which could be instrumental when challenges arise pertaining to current and future Natural Areas. Making Natural Areas available for research by universities and environmental groups will help create a sophisticated population of citizens who are involved and committed. Connecting interpretive programs to local schools will help develop future adult supporters. Designing programs that offer access to the general public will help create concerned and supportive citizens.

Care must be taken to develop interpretive programs that take into consideration the sensitive issues of each property. Understanding these variables, limitations and opportunities can be part of the interpretive program.

There are potential eco-tourism and fee-based opportunities that could possibly help to sustain various interpretive programs. Public relations through newspapers, radios and television will help develop awareness in a wider audience.

Before developing a final interpretive program for any of the properties, the maximum usage at any one time should be determined. This determination should be based upon sensitivity of the property and size of parking options for buses and cars.

Types of interpretation can vary from non-staffed signage to staffed hands-on programs. All interpretive options will depend upon funding for program development and staffing.

Signage and Exhibits

Self-guided signage and simple exhibits could be placed along trails, with no need for staff. Exhibits that involve hands-on experiences will need staffing for coordination, monitoring and up-keep.

Interpretive Materials

There is a wide variety of choices for interpretive material, including the following:

- Trail guides
- Park Maps
- Booklets to sell in local bookstores (flora, fauna, geology, archeology, history, etc.)
- School curricula to engage students in stewardship and develop awareness
- Checklists of flora and fauna

Interpretive Programs

Interpretive programs can also be simple or more complex, depending upon budget and assessment of need. Examples of interpretive programs include the following:

- School tours
- Guided tours for general public
- Work projects involving general public (restoration, clean-up, etc.)
- Involvement of public in scientific research
- Adopt-a-preserve projects

Eco-tourism Potential

Developing eco-tourism possibilities would be a way to generate revenue that could possibly help support less lucrative programs on other properties. Several eco-tourism ideas include:

- Comprehensive guided tour of all preserves that would give visitors a sense of the interconnectedness between the properties and a general overview of the entire area.
- Guided tours for each separate preserve.
- Bed and breakfast hotel with guided tours and seminars.

Develop Relationship with Local Schools and Youth Organizations

- Develop programs that fit with school curricula requirements
- Potential trips for summer camp groups.

Support of Interpretive Programs Through Public Relations

- Establish a newspaper column about all of the properties.
- Write periodic newspaper articles about notable events in the Natural Areas including sightings of animals, birds, unusual finds, and updates on scientific research of interest to general public.
- Encourage television and radio coverage with similar topics as covered in newspaper articles.
- Facilitate communication between visitors with venues such as a web site page or newsletters.
- Develop partnership with other conservation and/or outdoor educational groups.

Educational Use

Educational use is defined as those activities whose primary intent is to present or interpret information about the ecology of the Natural Area sites or the target species. Daytime field trips by school groups are typical of this public use category.

Guided Tours

Commercial and non-commercial tour groups may be allowed to schedule tours of preserve sites, as appropriate, subject to provision that such groups abide by prevailing guidelines for that Natural Areas tract. Non-commercial groups include nonprofit organizations, schools, and educational groups that request visitation to an appropriate Natural Area for educational purposes or research. This use should be encouraged as long as it is monitored for possible habitat degradation and adverse impacts. These groups should be issued permits by the Natural Areas management. The permit process should include user guidelines that protect target species and their respective habitats.

Research Access

Research use activities include those activities that will gather and interpret site-specific data in a way that improves understanding of the ecology of Natural Area species, plant communities, and aquatic and subterranean environments. Such activities should be coordinated through Natural Areas management.

PART III: PUBLIC INVOLVEMENT

Establishment of Natural Areas is a relatively new concept for the citizens of San Antonio. Characteristically, most land acquired by the Parks and Recreation Department have been used for development of neighborhood parks and other recreation areas. These types of parks are high-impact and usually accommodate high-impact activities such as picnic areas, sports fields, and swimming areas. San Antonians are also familiar with the National Parks and City Parks that have been established to preserve historic sites and structures as evidenced by the Missions and the Alamo. Prior to Proposition 3, Natural Areas in Bexar County were restricted to Freidrich Park, Government Canyon State Park, and Mitchell Lake.

Because of the newness of the Natural Area concept to San Antonio citizens, it is extremely important that the establishment of these Natural Areas be accompanied by a well-planned public relations program. This document by no means attempts to establish public relations programs, but it will provide some recommendations as to how public relations can be focused during the establishment of Natural Areas.

At the present time, a citizen's group similar to Friends of Friedrich Park should be established to provide support for all Natural Areas owned and operated by the City of San Antonio. As Natural Areas are acquired, citizens' groups associated with each individual Natural Area could also be formed. It is extremely important that these Natural Area support groups be comprised of a well-balanced group of citizens and not be dominated by specific interest groups. This can only be accomplished by careful oversight by the Parks and Recreation Department. Candidates should be dedicated to the purpose and mission of the Natural Areas as described in this document.

As individual Natural Areas are developed, citizens across San Antonio and the surrounding areas should be kept abreast of developments in those Natural Areas. In addition, each individual Natural Area should establish a close relationship with citizens and special interest groups located in close proximity to the Natural Area. It is extremely important to provide some level of "ownership" of the Natural Area to citizens in close proximity, as well as citizens in the surrounding areas.

Some of the public relations strategies that should be considered by the Parks and Recreation Department for individual Natural Areas as well as the overall Natural Area system include the following (grouped according to when they can be initiated):

- Public relation strategies that can be initiated immediately:
    - Prepare Natural Area managers to provide presentations to organizations and neighborhood associations delineating the needs and the goals of the Natural Area. These meetings could also be used to educate the public as to the true meaning of "Natural Area" and how it can be a positive impact to the community.
    - Generate monthly or bi-monthly editorial columns, news articles, and press conferences regarding various activities and public involvement in the Natural Area program.
    - Establish close relationships with industrial associations, trade journals, trade shows, and seminars in the San Antonio area to increase interest in Natural Areas.
    - Encourage the development of work groups to assist Natural Area personnel in the maintenance of the Natural Area. These groups can

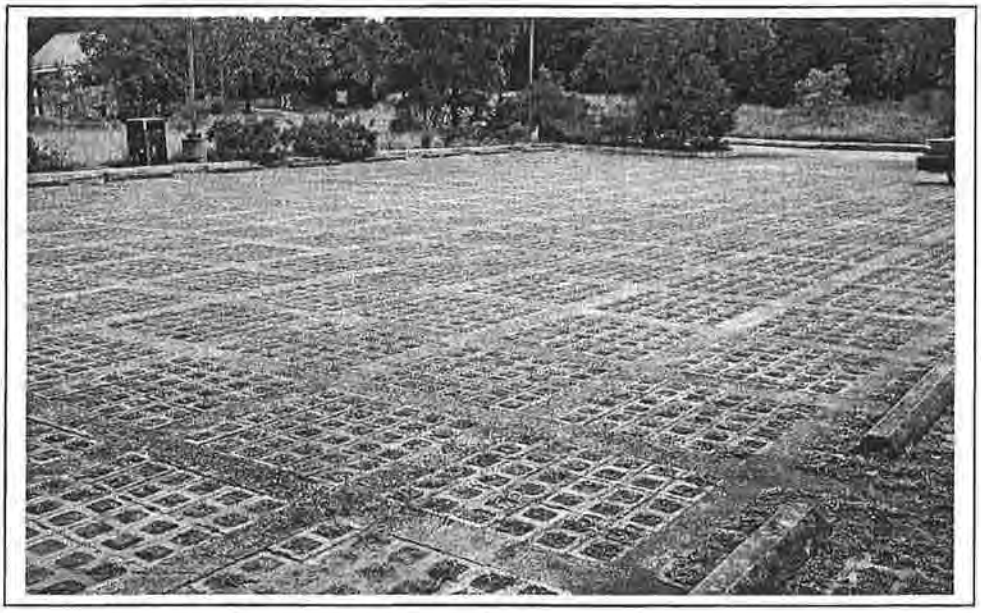
even be used for assisting in the establishment of trails and other improvements.

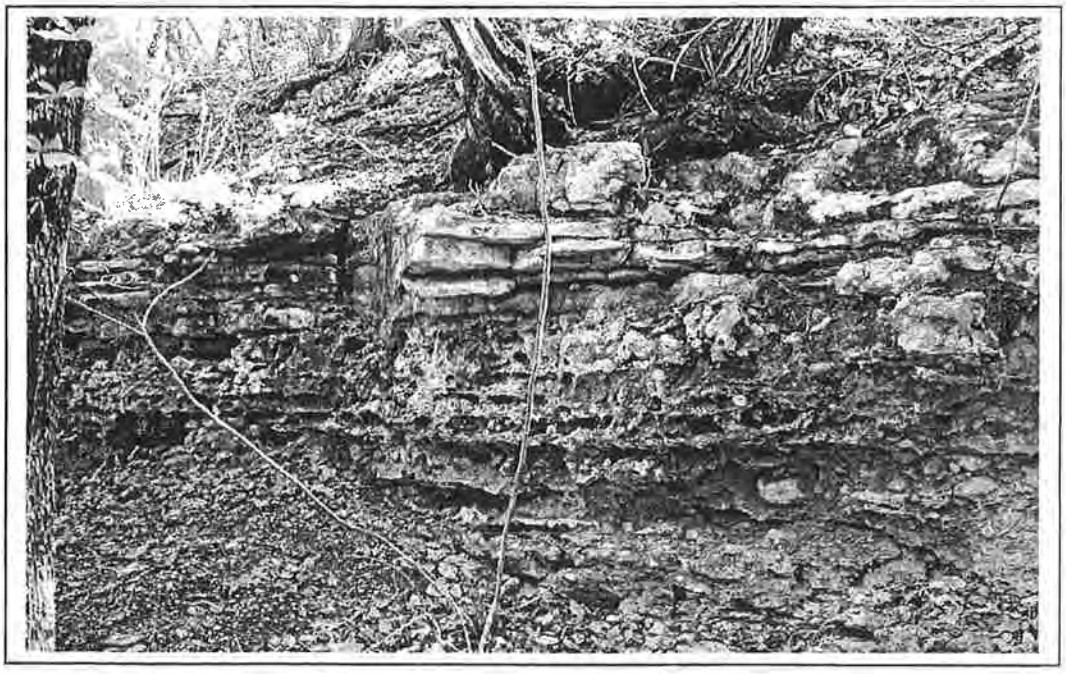
- Public relation strategies that can be initiated when a specific Natural Area is being improved:
    - Establish signage inside and outside the Natural Area to assist in instilling interpretive values to the public at large as they travel by the Natural Area or through the Natural Area. Every opportunity should be taken to bring the public into a better understanding of Natural Areas and their place in San Antonio.
    - Encourage volunteer groups to assist in improvement of the Natural Area. For example, volunteer groups could assist in trail construction, wildlife and habitat surveys, and other activities. This requires careful coordination and oversight by the Natural Area Manager. All activities should be under direct supervision by Natural Area staff or volunteer supervisors approved by the Natural Area manager.

- Public relation strategies that can be initiated after the Natural Area is opened for public use:
    - Create public awareness by inviting the public to groundbreaking ceremonies for the Natural Area.
    - Encourage bus tours, field trips, and other activities for local school, Boy and Girl Scout groups.
    - Sponsor hiking and educational events for the public at large.
    - Send mailings and brochures describing the needs and opportunities of the Natural Area to citizens living in close proximity.
    - Provide periodic classes and nature events for the public at large at e the Natural Area. These events would require direct supervision by the Natural Area manager.
    - Encourage use of local biologists, geologists, archaeologists, and other experts to participate in educational events at the Natural Area. The establishment of an educational committee for Natural Areas would be an excellent tool for future development of interpretive opportunities as well as educational uses.
    - Develop educational group tours for school districts in San Antonio and all surrounding communities. These tours could even include the establishment of "eco-camps" where appropriate. At eco-camps, elementary, middle school, and high school students have the opportunity to spend several days at the Natural Area to learn details concerning our environment and natural resources.
    - Encourage the establishment of eco-tourism to attract interested citizens from across the nation to visit San Antonio, and give them the opportunity to discover the natural resources that make San Antonio a unique place in our country.

These are only a few of the potential opportunities that are available for improving public relations with citizens in close proximity to Natural Areas as well as those living in San Antonio and surrounding communities. The continued support and preservation of these Natural Areas is in the hands of the citizens of San Antonio. Education and public relations with those citizens is mandatory if we want to preserve our natural resource legacy for generations to come.

PART IV: RECOMMENDATIONS





Some general recommendations for Natural Area use and management are listed below.

1. Acquire historic and contemporary high-quality aerial photographs and 2 ft. contour topographic maps for each property area.

2. The Natural Area should have appropriate fencing, preferably unobtrusive or inconspicuous, particularly around sensitive areas and maintenance buildings.

3. The Natural Area manager should be cognizant of scheduling construction and other activities around time periods when natural resources may be most sensitive, such as the nesting and breeding times for species of concern.

4. Off-road vehicles should be outlawed in and around public property, especially Natural Areas. Significant penalties should be assessed to violators to deter others from engaging in this practice.

5. Horseback riding and bicycling should be allowed in corridors between Natural Areas and within the Natural Areas, as appropriate.

6. If possible, entry and exit should be through the same point. Roads traversing through the property and exiting through a separate point should be avoided if possible.

7. A fire suppression program should be established for protection of the natural area and for protection of surrounding properties.
   - Start a dialog with responding agencies (volunteer firefighters, EMS). Provide maps showing location of fire hydrants and areas of access.
   - Establish fire lanes where appropriate
   - Use brush control to minimize spread of fires

8. Strategize for success. Ensure success of the first Natural Area developed so that the entire program will be successful. Establish relationships with school systems and develop programs for students to encourage them to return with their families.

9. Establish good public relations:
   - Organize a "Friends of Natural Areas" group for volunteerism and funding
   - Contact neighboring landowners and establish good relationships with neighbors; e.g. host events on the Natural Area
   - Work with homeowners associations in the area
   - Utilize newspapers and other media, such as a weekly column about current events in the Natural Areas.

10. Take advantage of opportunities to purchase quarries. They provide unique opportunities for habitat development and are probably available at a low cost.

11. In planning each Natural Area, seek possible linkages or other forms of connectivity to adjacent Natural Areas.

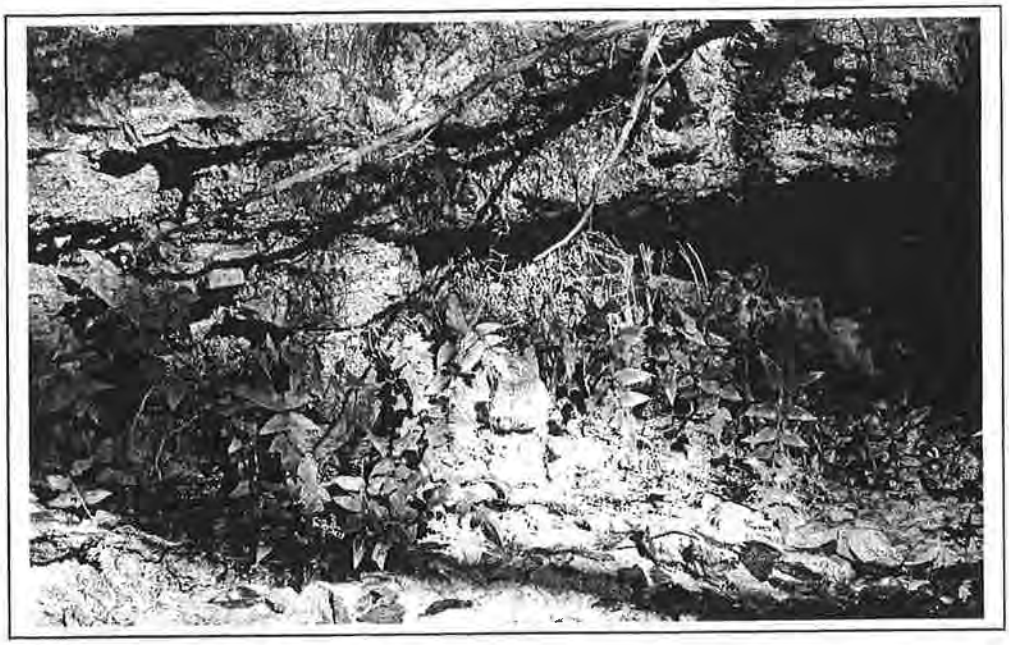
12. Establish an educational staff to develop programs for Natural Areas within the Natural Area System.

13. Do not allow use of natural area acreage to compensate for development in the area. However, incorporation of new properties into the Natural Area program to compensate for impacts by development in the area is encouraged.

Recommended Natural Area Rules

1. No dogs or other pets
2. No camping: Day use only
3. Off-road vehicles
4. Carry water at all times
5. No skateboards
6. No radios or "boom boxes"
7. No littering
8. No open fires
9. Remain on designated trails at all times
10. Do not remove living or non-living artifacts from Natural Area

PART 6: REFERENCES



Geology References

Edwards Aquifer Recharge and Transition Zones, Rules Protecting the Edwards Aquifer Recharge and Transition Zones, TCEQ Publication RG-011, 2001, available online.

Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices, RG-348, TCEQ, 1999, available online.

Edwards Aquifer Rules: Administrative Guidance, Complying with the Edwards Aquifer Rules, RG-349, 1999, available online.

Edwards Aquifer Contributing Zone, Rules Protecting the Edwards Aquifer Contributing Zone, RG-362, 2001, available online.

Introduction to the Edwards Aquifer, from The Edwards Aquifer Homepage, Gregg A. Eckhardt.

Veni, George, *The Caves of Bexar County*, Second Edition, 1988.

Carrying Capacity References

Mount Rogers National Recreation Area, US Forest Service
http://www.southernregion.fs.fed.us/gwj/mr/lac/index.htm)

B.C. Forest Service Training Manual, Rutledge, 1992
http://www.gov.bc.ca/for/

Winter Use Draft, Grand Teton and Yellowstone National Parks, October 2000
http://www.nps.gov/grte/winteruse/seis/appf.pdf

Vegetation References

Natural Vegetation Types of Texas and Their Representation in Conservation Areas, by David Bexanson, Thesis, University of Texas at Austin, December, 2000
http://tconr.home.texas.net/Vegetation/

Society for Ecological Restoration International Science & Policy Working Group. 2002. The SER Primer on Ecological Restoration.
www.ser.org.

"The Vegetation Types of Texas," by Craig A. McMahan, Roy G. Frye, and Kirby L. Brown, Texas Parks & Wildlife, 1984.
http://www.tpwd.state.tx.us/gis/veg

"The Process of Habitat Restoration: with Specific Applications to the Upper Glen Rose Geologic Formation of Central Texas," by David Mahler and Judy Walther, City of Austin Department of Public Works, 1987.

Planning and Design References

Dines, T. Nicholas and W. Charles Harris. 1998. *Time Savers Standards for Landscape Architecture*. McGraw Hill, Inc. U.S.

McPherson, E. Gregory. 1984. *Energy-Conserving Site Design*. Consolidated Edison Company, NY.

Hellmund, Paul and Daniel Smith. 1993. *Ecology of Greenways*. University of Minnesota Press, Minneapolis, MN.

Harriss-Olson, Molly. June 1995. *Sustainable Cities Designs*. Progress on Sustainable Development, p. 77.

Dramstad, E. Wenche, Richard T.T. Forman, and James D. Olson. 1996. Landscape Ecology Principles in Landscape Architecture and Land-Use Planning. Harvard University Graduate School of Design, & Island Press, Washington DC

Ryan, Karen-Lee. 1993. Trail for the Twenty-First Century. Island Press, Washington DC.

Archaeological and Cultural Resource References

Black, S. L. 1989. Central Texas Plateau Prairie. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos, Texas*, edited by T. R. Hester, S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. J. Reinhard, and L. C. Bement, pp. 17-38. Arkansas Archeological Survey Research Series No 33. University of Arkansas, Fayetteville.

Campbell, T. N., and T. J. Campbell. 1985. Indian Groups Associated with Spanish Missions of the San Antonio Missions National Historical Park. Special Report, No. 16. Center for Archaeological Research, The University of Texas at San Antonio.

City of San Antonio. 2001. Article VI, Unified Development Code. Draft. Available at <http://www.sanantonio.gov/dsd/udc/index.asp> (Accessed September 5, 2002).

Collins, M. B. 1995. Forty Years of Archaeology in Central Texas. *Bulletin of the Texas Archeological Society* 66:361-400.

Creel, D. G. 1986. A study of prehistoric burned rock middens in west central Texas. Unpublished Ph.D. thesis. Department of Anthropology, University of Arizona, Tucson.

Creel, D. G. 1974. Late Quaternary Bison Population Changes on the Southern Plains. *Plains Anthropologist* 19(64):180-196.

Givens, R. D. 1968. A preliminary report on excavations at Hitzfelder Cave. *Bulletin of the Texas Archeological Society* 38:47-56.

Greaves, R. D. and R. Mauldin. 2002. *An Archaeological Survey of Trail Locations in a Portion of Government Canyon State Natural Area, Bexar County Texas.*

Archaeological Survey Report No. 329, Center for Archaeological Research, the University of Texas at San Antonio. Review Draft.

Henderson, J. and G. T. Goode. 1991. Pavo Real: An Early Paleoindian Site in South-Central Texas. *Current Research in the Pleistocene* 8:26-28.

Hester, T. R. 1995. The Prehistory of South Texas. *Bulletin of the Texas Archeological Society* 66:427–459.

Howard, M., L. McNatt, and C. G. Ward. 2000. Prehistoric Background. In *Archeological Survey and History of Government Canyon State Natural Area, Bexar County*, Texas, by L. C. McNatt, C. Beceiro, M. D. Freeman, M. Howard, S. A. Tomka, P. Schuchert, and C. G. Ward. Pp. 11-26. Texas Parks and Wildlife, Cultural Resources Program, Austin.

John, E. A. H. 1975. *Storms Brewed in Other Men's Worlds: The Confrontation of Indians, Spanish, and French in the Southwest, 1540-1795*. Texas A&M University Press, College Station.

Johnson, L. and G. T. Goode. 1994. A New Try at Dating and Characterizing Holocene Climates, as Well as Archeological Periods, on the Edwards Plateau. *Bulletin of the Texas Archaeological Society* 65:1-51.

Lukowski, P. D. 1988. *Archaeological Investigations at 41BX1, Bexar County, Texas.* Archaeological Survey Report, No. 135. Center for Archaeological Research, The University of Texas at San Antonio.

Orchard, C. D. and T. N. Campbell. 1954. Evidence of early man from the vicinity of San Antonio, Texas. *The Texas Journal of Science* 6 (4):454-465.

Potter, D. R., S. L. Black. and K. Jolly. 1995. *Archeology Along the Wurzbach Parkway Module 1: Introduction, Conceptual Framework, and Contents of Archaeological Investigations in Bexar County, South-Central Texas.* Studies in Archeology 17. Texas Archeological Research Laboratory, The University of Texas at Austin.

Prewitt, E. R. 1981. Cultural chronology of central Texas. *Bulletin of the Texas Archaeological Society* 52:65-89.

Prewitt, E. R. 1985. From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society* 54:201–238.

Scott, A. M., K. W. Kibler, M. D. Freeman, and S. P. Austin. 1998. *Archeological Survey and Testing at Camp Stanley Storage Activity, Bexar County, Texas.* Reports of Investigations No. 115, Prewitt & Associates, Austin, Texas.

Story, D. A. 1985. Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain. In *Prehistoric Food Production in North America*, edited by R. I. Ford, pp. 19–56. Anthropological Papers No. 75. Museum of Anthropology, University of Michigan, Ann Arbor.

Taylor, F. B. and C. L. Highley. 1995. *Archeological Investigations at the Loma Sandia Site (41LK28): A Prehistoric Campsite in Live Oak County, Texas*, 2 volumes. Studies in Archeology no. 20. Texas Archeological Research Laboratory. The University of Texas at Austin.

Tennis, C. L. 1996. *Archaic Land Use of Upper Leon Creek Terraces: Archaeological Testing in Northern Bexar County, Texas.* Archaeological Survey Report No. 234. Center for Archaeological Research, The University of Texas at San Antonio.

Tennis, C. L., and R. J. Hard. 1995. *Archaeological Survey of the Upper Leon Creek Terraces, Bexar County, Texas.* Archaeological Survey Report, No. 233. Center for Archaeological Research, The University of Texas at San Antonio.

APPENDIX A
SITE-SPECIFIC CHECKLIST

APPENDIX B
PILOT STUDIES

APPENDIX C
ACKNOWLEDGMENTS

ACKNOWLEDGMENTS

CITY OF SAN ANTONIO:

Mayor Ed Garza

Bobby Perez, *District 1 Councilman*
John H. Sanders, *District 2 Councilman*
Toni Moorhouse, *District 3 Councilwoman*
Enrique "Kike" Martin, *District 4 Councilman*
David A. Garcia, *District 5 Councilman*
Enrique Barrera, *District 6 Councilman*
Julian Castro, *District 7 Councilman*
Bonnie Conner, *District 8 Councilwoman*
Carroll W. Schubert, *District 9 Councilman*
David Carpenter, *District 10 Councilman*

Malcolm Matthews, *Parks and Recreation Department Director*
Scott Stover, *Acting Park Projects Manager*
Eric Lautzenheiser, *Natural Areas Coordinator*
Susan Crane, *Special Project Manager*

The Quality of Life Committee

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Parks and Recreation Advisory Board
Open Space Advisory Board

PROJECT TEAM:

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