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LAKE WORTH VISION PLAN 2011



A Resolution

NO. 3895-05-2011

ADOPTING A LAKE WORTH VISION PLAN AND AMENDING THE COMPREHENSIVE PLAN TO INCORPORATE THE VISION PLAN

WHEREAS, Fort Worth is the fastest growing large city in the United States and the 16th largest city overall with 741,206 residents; and

WHEREAS, the City of Fort Worth constructed Lake Worth in 1914 as a municipal water supply reservoir and a recreational resource for the region; and

WHEREAS, the Lake Worth Vision Plan study area included approximately 14,900 acres within the Far Northwest and Far West planning sectors of Fort Worth, which have been two of the fastest growing sectors of the city over the last decade; and

WHEREAS, the Lake Worth Vision Plan is the result of a planning process spanning two and a half years that engaged expert consultants, lakeshore residents, nearby property owners, nonprofit stakeholders, the Naval Air Station Joint Reserve Base, and neighboring jurisdictions; and

WHEREAS, the Lake Worth Vision Plan describes and depicts appropriate long-range future land uses, development pattern and forms, and recreational uses and facilities on and around the lake; and

WHEREAS, the recommendations of the Lake Worth Vision Plan are based on the following four principles: 1) Protect and enhance Lake Worth's water quality, natural beauty, and recreational character, 2) Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities, 3) Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs, and 4) Connect communities, resources, and amenities with parkways, greenways, and trails; and

WHEREAS, on April 27, 2011, the City Plan Commission recommended that the City Council adopt the Lake Worth Vision Plan with certain minor revisions related to community involvement in implementing the plan.



NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS THAT:

1. The Lake Worth Vision Plan is hereby adopted incorporating the attached revisions to the implementation measures; and
2. The Comprehensive Plan shall be amended to incorporate the Lake Worth Vision Plan by reference.

Adopted this 10th day of May 2011.

ATTEST:

By: 
Marty Hendrix, City Secretary



Fort Worth City Council and City Plan Commission

Michael J. Moncrief, Mayor

City Council

Carter Burdette

Joel Burns

Sal Espino

Kathleen Hicks

Jungus Jordan

Frank Moss

Danny Scarth

Zim Zimmerman

City Plan Commission

Namon Hollis, Chair

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Kim Martin

Robert Mohler

Charles Rand

Jim Tidwell

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Veronica Zerpa

Robert Kelly, Alternate

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Caryn Ernst, Associate Director of Conservation Vision, Trust for Public Land

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Stephen Plunkard, FASLA, Senior Principal, Stantec Consulting

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David Jodray, Project Manager

Lake Worth Stakeholders

The following stakeholders met individually with the five-member consultant panel to express their suggestions and ideas for the future of Lake Worth.

Neighborhood Associations

East Lake Worth Neighborhood Association
Lake Worth Alliance
Neighborhood Association on South Lake Worth
North Lake Worth Neighborhood Association
Scenic Shores Neighborhood Association

Recreational Users

Boy Scouts of America
Fort Worth Mountain Bikers' Association
Hip Pocket Theatre
Lake Worth Boat & Ski Club
Lake Worth Sailing Club
Lockheed Martin Recreation Association Bicycle Club

Local Governments

Town of Lakeside
City of Lake Worth
City of River Oaks
City of Sansom Park
City of White Settlement
Eagle Mountain-Saginaw Independent School District
Tarrant County

Other Agencies

Lockheed Martin Aeronautics Company
Fort Worth Naval Air Station Joint Reserve Base
North Central Texas Council of Governments
Streams and Valleys, Inc.

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Executive Summary

On November 17-19, 2008, a Lake Worth Vision Workshop was conducted by the City of Fort Worth as an opportunity for stakeholders to express their ideas and suggestions for the future of Lake Worth and its surrounding area. The City of Fort Worth Planning and Development Department organized the workshop and assembled a five-member consultant panel that conducted the workshop with support from City staff. The panel consisted of professionals with expertise in master planning, waterfront development, sustainable design, watershed management/restoration, and conservation planning. The consultant panel members are listed below.

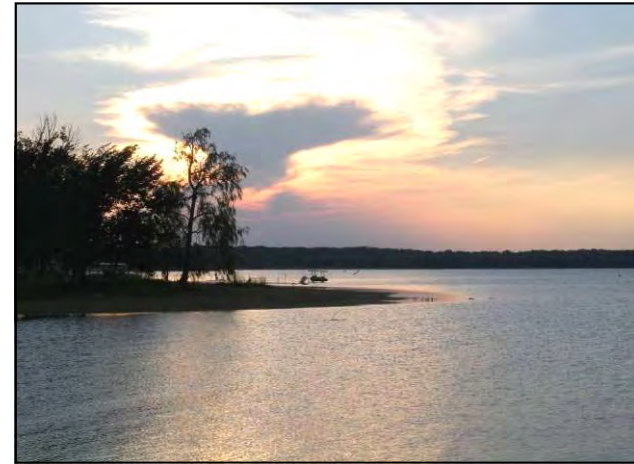
- Mark Dawson, ASLA, Sasaki Associates
- Caryn Ernst, Trust for Public Land
- Cales Givens, ASLA, EDAW
- Stephen Plunkard, FASLA, Stantec Consulting
- Scott Stoodley, PhD., Entrix, Inc.

The primary objectives of the workshop were to seek input from stakeholders and to engage the expertise of the consultant panel to describe and depict the most appropriate future land use plan, development pattern and forms, and recreational uses and facilities on and around Lake Worth. The consultant panel worked with a **broad range of Lake Worth stakeholders** and City staff to determine a shared vision for the future of Lake Worth.

After meeting with multiple stakeholders during the first two days of the workshop, the consultant panel established the following four **Lake Worth Vision Principles** to guide future decision-making for Lake Worth:

1. Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.
2. Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.
3. Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.
4. Connect communities, resources, and amenities with parkways, greenways, and trails.

The consultant panel emphasized the importance of determining and promoting a sustainable future for Lake Worth. The panel reminded workshop participants that a sustainable future must concurrently address social, environmental, and economic factors and presented two alternative scenarios to stakeholders and City staff: the Great Parks Scenario and the Sustainable Future Scenario. After additional public input, the panel refined its recommendation by combining key elements of the two scenarios into a vision plan that captured and expressed a **shared vision of Lake Worth's future**.



Sunset at Lake Worth



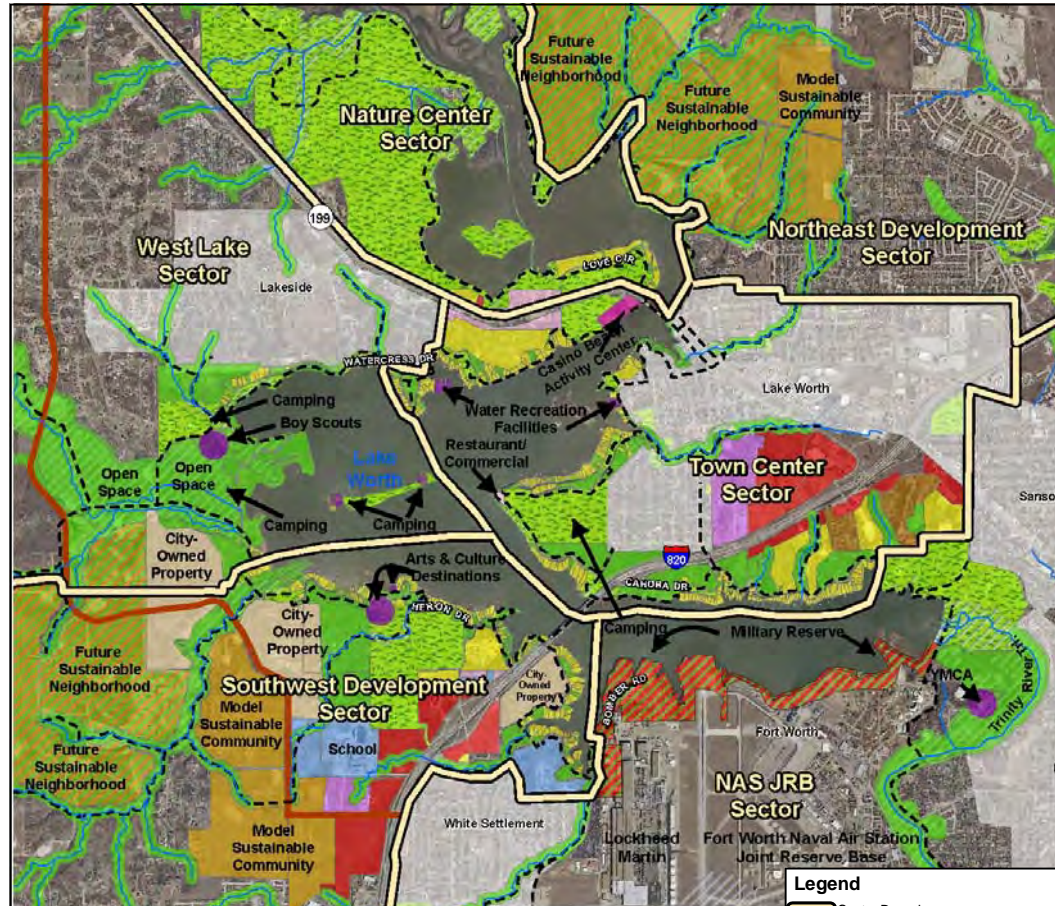
Existing boat ramp at Sunset Park on Lake Worth

Highlights of the vision plan for the Lake Worth area include protecting water quality, balancing open space and natural areas with new sustainable development, and providing more recreational opportunities on and around the lake.

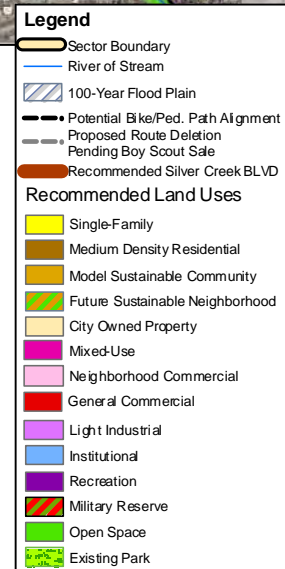
To aid in describing the recommendations within the Lake Worth Vision Plan, the map has been carved into six sectors: Nature Center, Northeast Development, NAS JRB (Naval Air Station Fort Worth Joint Reserve Base), Southwest Development, West Lake, and Town Center. Although the most significant development proposals are shown in the Town Center Sector, Southwest Development Sector, and Northeast Development Sector, all sectors depict proposals that are important to achieving the Vision Plan for the future of Lake Worth. Sector descriptions are located in Part Three: Vision Plan. A few elements of the Vision Plan sector descriptions are listed below as examples. Additional recommendations and corresponding implementation measures are described in Part Four: Recommendations and Implementation.

The **Nature Center Sector** is expected to play a central role in the development of a linear regional park that links the Trinity Trails system to a greenbelt along the shores of Lake Worth, through the expanded Fort Worth Nature Center envisioned in the Nature Center Master Plan, and on to the shores of Eagle Mountain Lake. See Page 38 for a full description of the Nature Center Sector.

The Lake Worth Vision Plan foresees two forms of sustainable development occurring in the **Northeast Development Sector** between the Nature Center and Boat Club Road. Nearest Boat Club Road, the plan envisions development of a Model Sustainable Community. Model Sustainable Communities are intended to serve as showcases of Low-Impact Development techniques to control and filter storm water runoff before it reaches Fort Worth’s raw drinking water supply in adjacent Lake Worth. In addition, Model Sustainable Communities are expected to demonstrate sustainable community design principles, such as mixed-use neighborhood centers, well connected and pedestrian-friendly street grids, provision of a broad range of housing choices, and off-street pathway linkages between neighborhoods and nearby destinations such as schools, shopping, and Lake Worth’s lakeshore path.



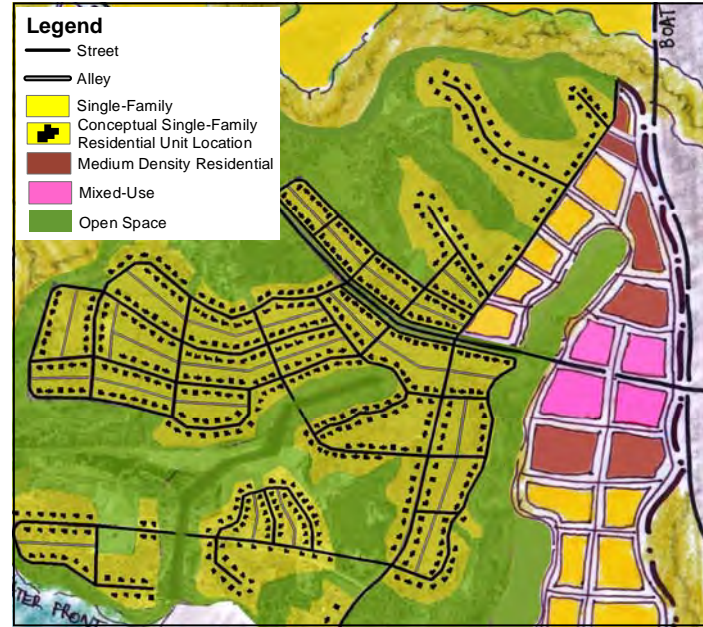
Lake Worth Vision Plan Sectors



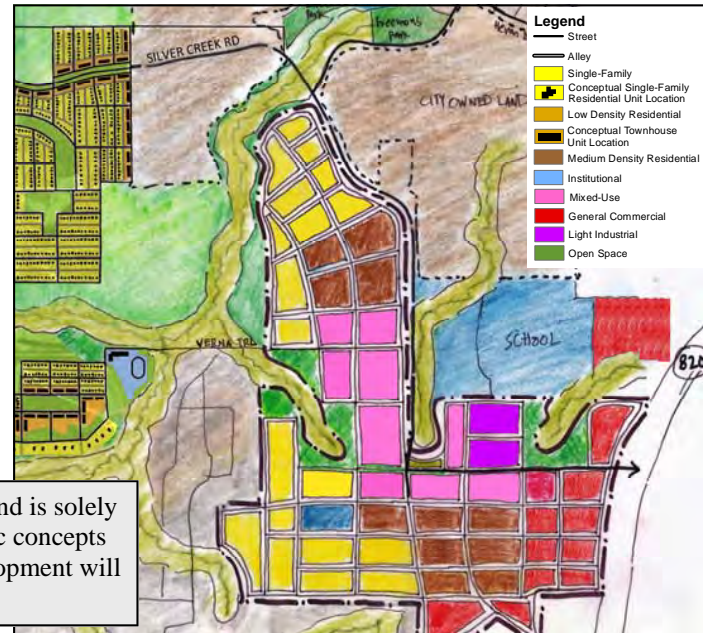
West of Hodgkins Road where the topography is more rolling, Future Sustainable Neighborhoods are envisioned that reflect current landowner development desires. These neighborhoods are expected to offer low-density residential areas designed around natural drainage ways and open spaces, with greenway trails providing access to the integrated open space areas and the lakeshore trail. Low Impact Development techniques in these future neighborhoods will extend natural drainage system elements into the residential areas, providing amenities to future residents while protecting water quality. The concept plan sketch below depicts one possible development scenario for this area. Additional information on the Northeast Development Sector begins on Page 40.

The most important future development in the **NAS JRB Sector** as it relates to the Lake Worth Vision Plan involves the completion of the Trinity Trails extension from its existing terminus adjacent to the base, through Marion Sansom Park, to connect to the proposed lakeshore bicycle/pedestrian path on the opposite side of the lake from the base.

Allowing for known development plans associated with several large parcels, the plan anticipates a mix of office, light industrial, and commercial uses near Loop 820 in the **Southwest Development Sector**. As in the Northeast Development Sector, Model Sustainable Communities are envisioned along Silver Creek Road between Loop 820 and the Live Oak Creek floodplain. These communities would incorporate one or more mixed-use village cores surrounded by appropriate medium to lower density residential neighborhoods connected to the lake via bike and walking trails. The large tracts to the west of the Live Oak Creek floodplain are identified in the plan as Future Sustainable Neighborhoods, which would be designed around integrated open spaces and include trails along the natural drainage ways leading to Lake Worth. More information and sketches of potential development concepts for the Southwest Development Sector can be found beginning on Page 43. Based on lakeshore neighborhood feedback, the large tracts of City-owned land on both sides of Loop 820 are not identified for future development in the Lake Worth Vision Plan.



Model Sustainable Community and Sustainable Neighborhood concepts in Northeast Development Sector

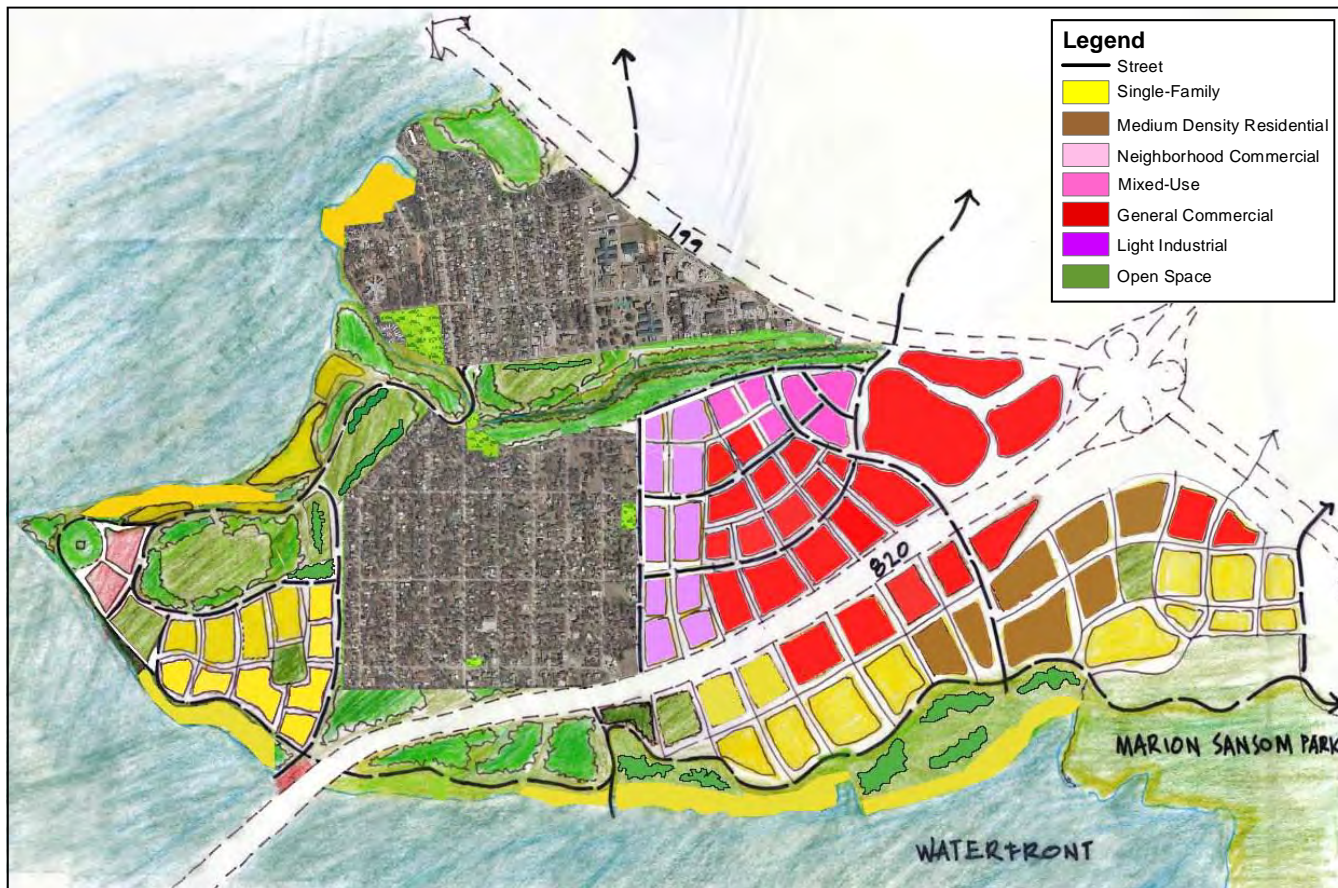


Model Sustainable Community and Sustainable Neighborhood concept in Southwest Development Sector

This sketch is a concept plan prepared by City staff and is solely to assist readers of the plan in understanding the basic concepts behind different development patterns. Actual development will not necessarily reflect the concept plan shown.

The **West Lake Sector** includes large swaths of land located within 100-year floodplains, including the Silver Creek floodplain, and these floodplain areas are expected to remain largely undeveloped, while potentially supporting organic farming opportunities or ranching activities. An opportunity exists in the West Lake Sector for a new Boy Scout camp to be located near the lakeshore, with direct access to the lake. In addition, the West Lake Sector may provide the best opportunity to construct a lakeshore bike path immediately adjacent to the shoreline.

The Casino Beach area in the **Town Center Sector** will be redeveloped as a mixed-use, recreation-oriented environment with a distinct sense of place. A compact, walkable mix of restaurants, specialty retail establishments, water-oriented recreation, and perhaps some higher-density housing or lodging facilities would be an appropriate future for the Casino Beach area. The base-friendly Lake Worth Town Center concept envisions intensive commercial uses from Quebec Street/Northwest Centre Drive to a well-designed light industrial park to the west, which transitions to the existing City of Lake Worth residential neighborhood west of Dakota Trail. Because roadway infrastructure typically outlives many big-box commercial uses, near-term commercial development projects should incorporate a basic street grid pattern so as to not preclude future cost-effective redevelopment, even if the street grid is intended to serve as private parking lot access roads. To the south along the lakeshore, existing single family uses are protected, and new residential uses are prohibited within the NAS JRB safety zones. The Town Center Sector is described more fully beginning on Page 48.



Town Center concept as modified by staff



PART ONE: THE CONTEXT

Lake Worth History

The City of Fort Worth constructed Lake Worth in 1914 as a municipal water supply reservoir and for recreation. Lake Worth is located approximately ten miles northwest of Downtown Fort Worth, Texas and is comprised of more than 3,700 acres (see Map 1). When constructed, the lake was the first man-made reservoir in Texas. From the start, Lake Worth was a center of activity, with people from all over North Texas visiting the lake.

During the Depression Era, the Civilian Conservation Corps was active around the lake, and remnants of the Corps' projects can still be found. Much of the lake's original circumnavigating access roadway, Meandering Road, still exists today.

Small fishing cottages proliferated around Lake Worth on land leased from the City of Fort Worth, which owned the entire lakefront and significant acreage beyond. Casino Beach Park on the north side of the lake became the site of a popular amusement park and a large dance hall. Fort Worth leased the property to investors that operated the park. Casino Beach Park experienced its heyday in the 1930s, and remained active through the 1950s.

Over time, some fishing cottages on the lakeshore were replaced by new residential structures. More recently, higher-end homes have been built on City-owned, leased lakeshore property or on lots that the City platted and sold. As years passed, recreational conditions on and around the lake deteriorated, primarily due to siltation and the increasingly shallow lake depths. Accordingly, funding for dredging the lake has consistently been an issue. However, other factors conspired to reduce the importance of Lake Worth as a recreational destination, including the lack of funding to maintain Casino Beach Park. The park structures were demolished in the early 1970s. The demise of the attractions at Casino Beach Park led to a decrease in visitors to Lake Worth, because there was no longer a special recreational destination on the lake. Additionally, other North Texas lakes became increasingly popular to boaters and other users.



Aerial view of Casino Beach Park on the north side of Lake Worth in 1930s



Water view of Casino Beach Park on the north side of Lake Worth



Nine Mile Bridge, Lake Worth from the Jack White Collection of Historic Fort Worth Photos, University of Texas at Arlington

Lake Worth History (cont.)

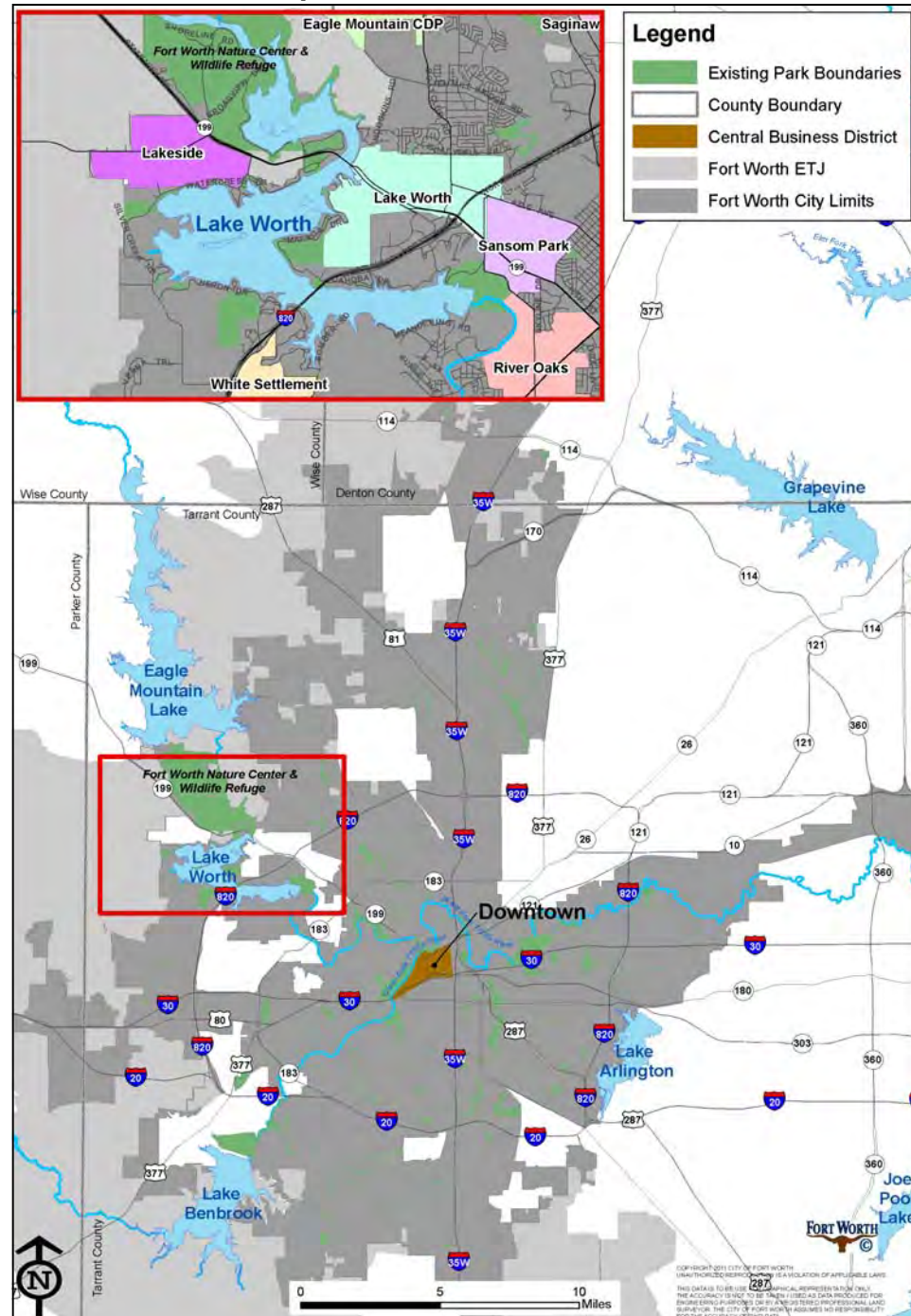
The City of Fort Worth still owns many acres of property near the lake (see Map 2). However, beginning in the mid-1990s the City platted and sold more than half of the residential lease property along the shore, primarily to long-time leaseholders. Many of the remaining leaseholders have options to purchase the land from the City when Fort Worth water and sewer infrastructure to serve the properties is made available.

There are some areas around the lake where existing residential properties cannot be easily platted due to property configurations that do not comply with zoning or subdivision regulations. The City currently owns a total of 950 acres of non-park property around the lake, and approximately 885 acres of dedicated parkland abutting the lake.

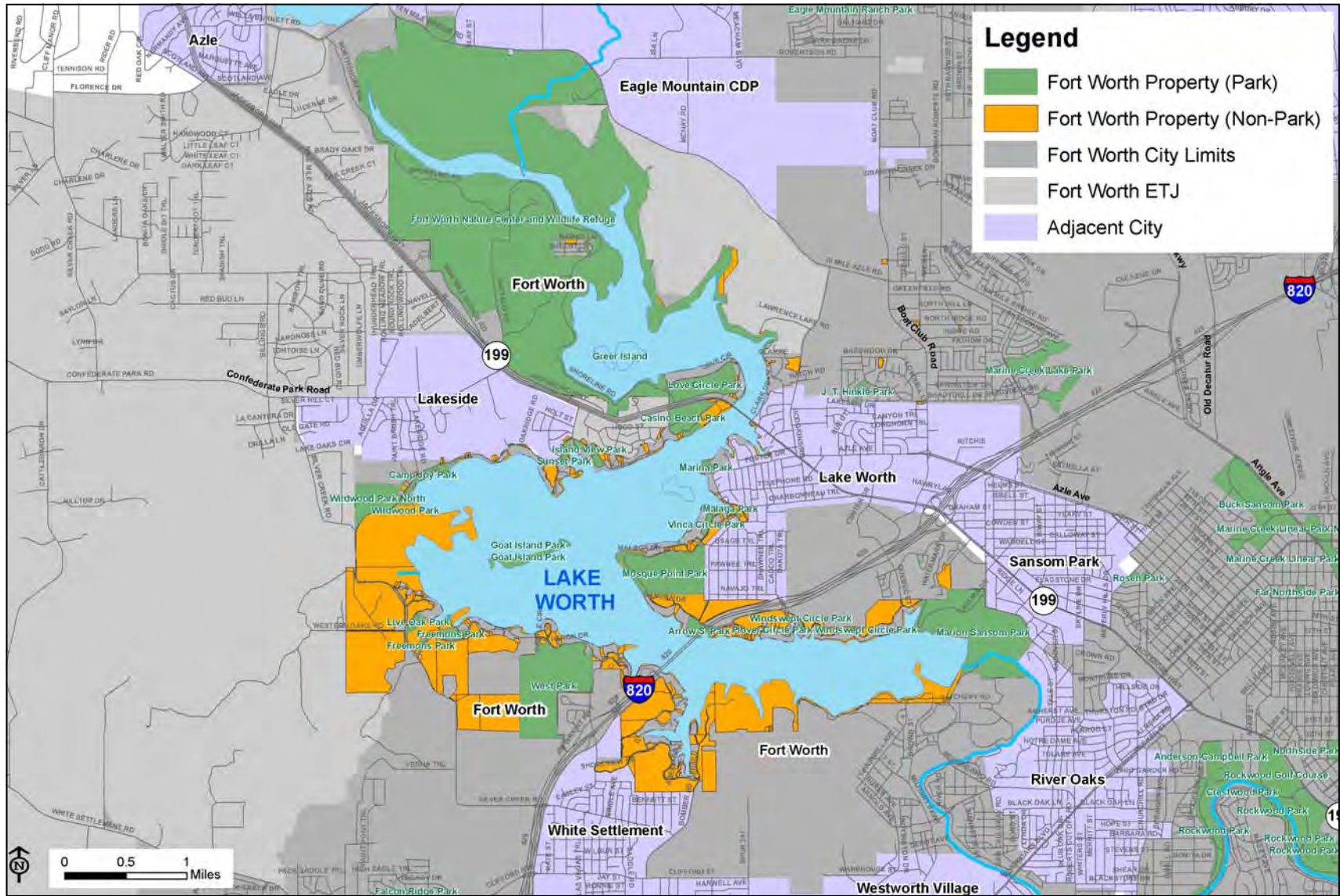
The Town of Lakeside, the City of Lake Worth, the City of River Oaks, the City of Sansom Park, and the City of White Settlement developed within close proximity to Lake Worth, but the City of Fort Worth is the only local government that owns property abutting the lake. These jurisdictions are viewed as important stakeholders in determining the future of Lake Worth.

For additional Lake Worth history provided by Quentin McGown, please see Appendix A.

Map 1: Lake Worth Location



Map 2: City of Fort Worth-Owned Property



Source: City of Fort Worth, TAD Parcel Data

Citywide Context

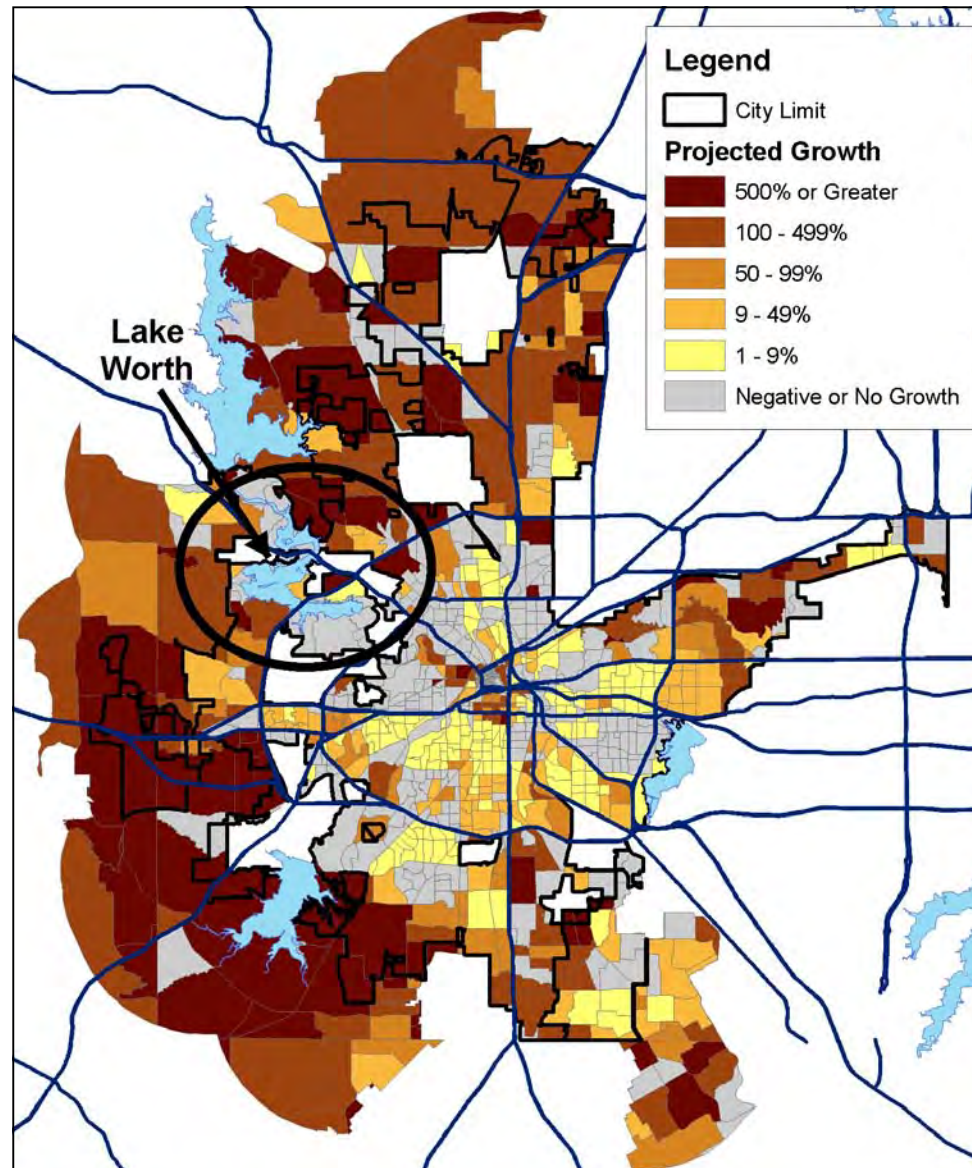
Fort Worth has been the fastest growing large city of more than 500,000 population in the nation since April 1, 2000. The population of Fort Worth as of January 1, 2010, is estimated to be 736,200 persons. From 2000 to 2010, Fort Worth's total population increased by 201,506 persons. This represents an average annual increase of approximately 20,150 persons since the 2000 Census, a growth rate of approximately 3.9 percent per year. By 2030, Fort Worth's population is projected to approach one million. The Far Northwest sector, which includes Lake Worth, is projected by the North Central Texas Council of Governments (NCTCOG) to be one of the fastest growing areas of the city through 2030.

The rapid population growth projected to continue in the area around Lake Worth is depicted on the population growth rate map to the right. Darker colors on the map indicated a higher population growth rate.

Once dependent on agriculture, oil, and defense, Fort Worth is a major center for industry, technology, distribution, and transportation. The State Comptroller projects that job growth in the State of Texas is expected to slow from 2.1 percent annually from 1990 through 2004 to 1.5 percent annually from 2009 through the year 2030. These projections take into account the slowing of the national economy in the face of increasing global competition and tightening labor markets. Major employers near Lake Worth include the Naval Air Station Joint Reserve Base and Lockheed Martin Aeronautics Company.

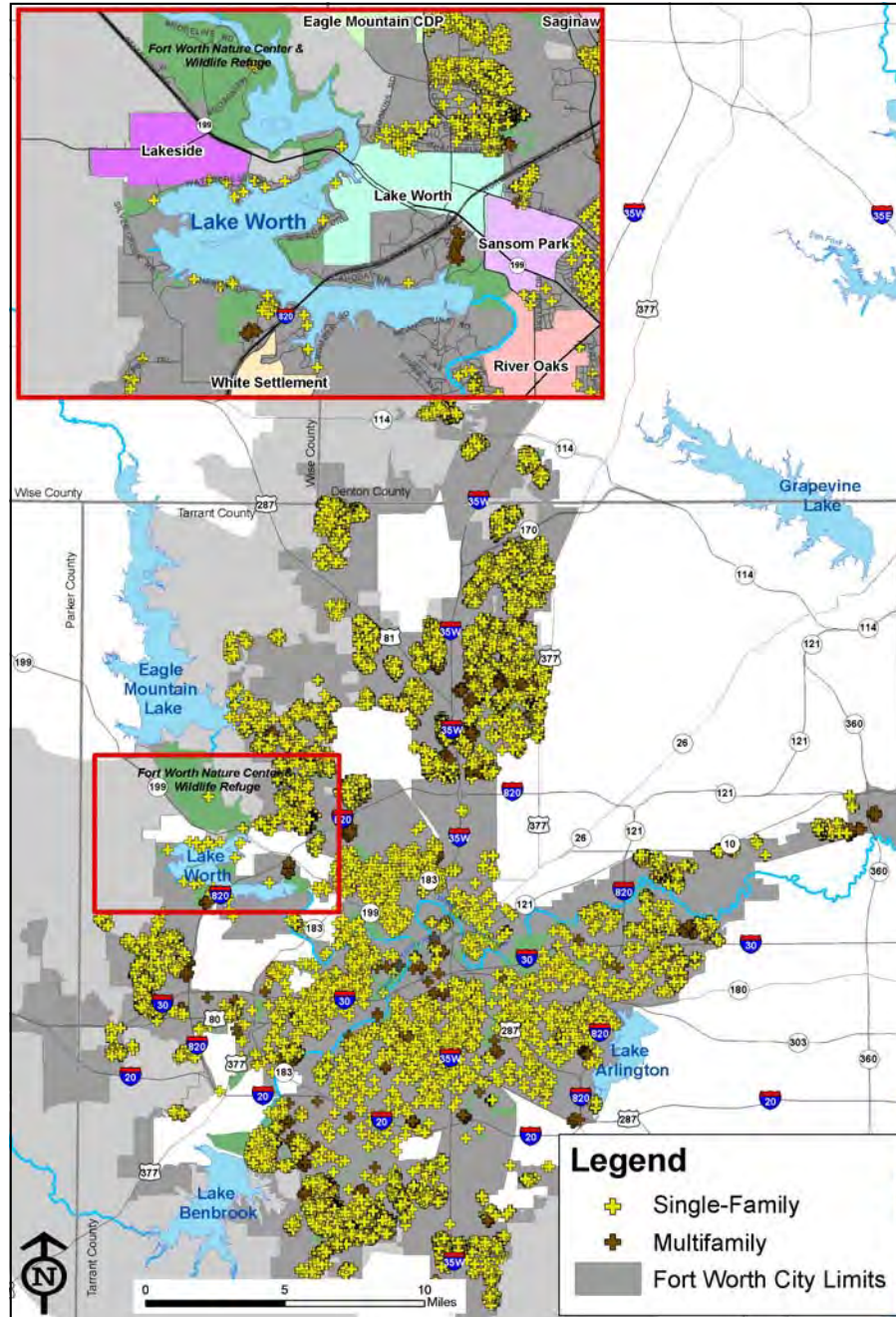
The map on the next page show the location of new single-family and multifamily building permits issued throughout the City and near Lake Worth since 2000. The area has experienced significant growth in the last decade. More residential growth is expected near Lake Worth through 2030, as privately-owned agricultural parcels close to the lake attract developers.

Map 3: Fort Worth Population Growth Rates, 2005-2030



Fort Worth's population growth is expected to be highest in the northern and western parts of the city. The darker colors indicate increasingly high population growth rates within Transportation Survey Zones, as projected by NCTCOG.

Map 4: Residential Building Permits, 2000-2010



Areas near the lake have experienced significant permit activity since 2000.

Lake Worth Existing Conditions

Future Land Use

The City of Fort Worth is divided into 16 planning sectors. Lake Worth is located within the Far Northwest and Far West planning sectors. The workshop focused primarily on the area around Lake Worth that is located within the Far West planning sector. The area located within the Far Northwest planning sector is located adjacent to the Fort Worth Nature Center and Refuge, outside of the city limits of Fort Worth but within its Extraterritorial (planning) Jurisdiction.

The 2010 City of Fort Worth Comprehensive Plan depicts the existing Future Land Use designations for the Lake Worth area as primarily single family, suburban, and rural residential, with significant areas of public park and open space, as well as some scattered light industrial, general commercial, neighborhood commercial, and medium density residential as shown on Map 5. The Naval Air Station Joint Reserve Base and the adjacent Lockheed facilities are designated as an industrial growth center.



Existing house on Lake Worth

Zoning

The majority of property around Lake Worth is zoned A-5 single-family residential (5,000 square-foot minimum lot size), as shown on Map 6. There is also dedicated public park land around the lake. Although unbuildable, the lake itself is also zoned A-5.

The unincorporated land on the north side of the lake, across from the Nature Center, is not zoned. Texas counties do not have statutory authority to enact or apply zoning regulations. Under the City’s existing Future Land Use designation for that area, the property would be zoned for residential use upon annexation.

Transportation

The Lake Worth area is primarily served by Highway 199/Jacksboro Highway and Loop 820. Watercress Drive, Silver Creek Road, Cahoba Drive, Bomber Road, Heron Drive, Shoreview Drive, and Love Circle provide access to the lakefront. Shoreline Drive provides access within the Fort Worth Nature Center. In the 2008 bond program election, voters approved the reconstruction of Silver Creek Road as a four-lane divided arterial from Loop 820 to the White Settlement School District’s C.F. Brewer High School. The reconstruction project should be complete in 2010. To the north of the lake and the study area, the 2008 bond program also included the expansion of Robertson Road to a four-lane undivided arterial from Boat Club Road to Lake Country Drive. That project should be complete in 2012 or 2013. No other major street projects are currently programmed for the area.

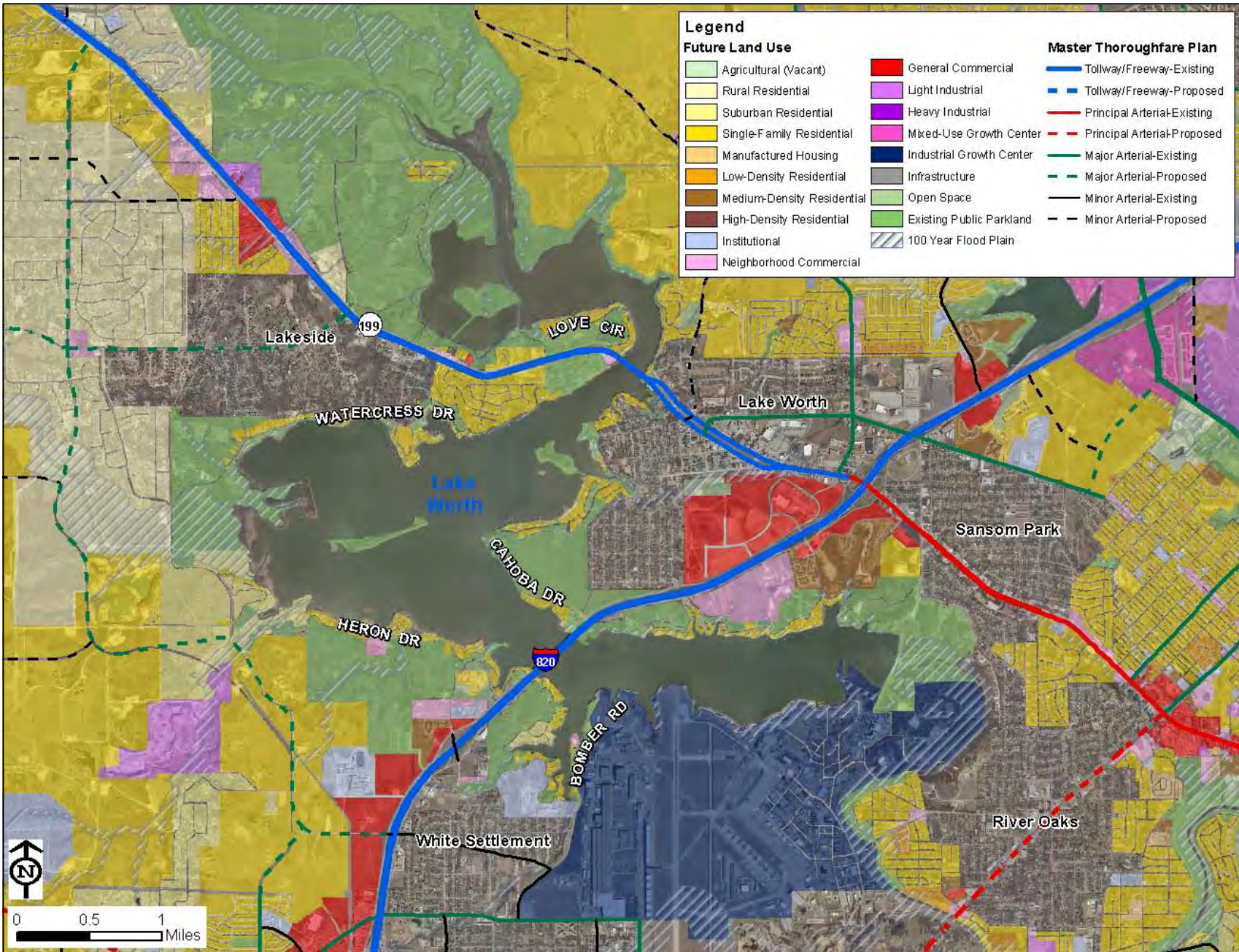


Silver Creek Road

Silver Creek Road is designated as a major arterial in the City’s Master Thoroughfare Plan, as shown on Map 5. Silver Creek Road is ultimately intended to extend around the west side of the lake, connecting via Billings Road to Highway 199. Completion of this route will create the first functional loop around the west side of Lake Worth. Silver Creek Road will become a major access route serving the extensive developable lands west of Lake Worth.

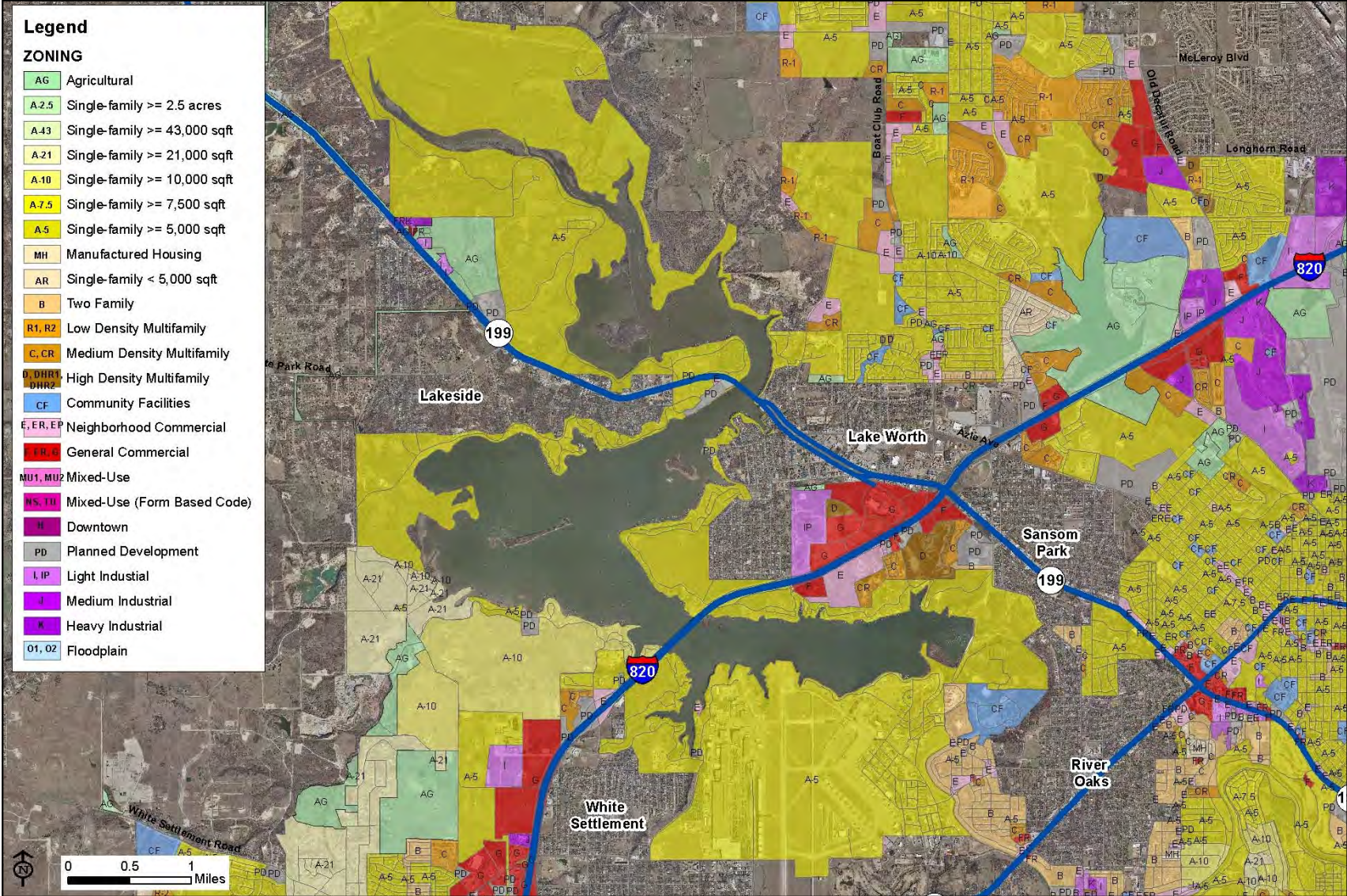
The Bike Fort Worth Plan recommends improved bicycle access near and encircling Lake Worth. An off-street trail connected to the Trinity Trails system is recommended around the lake, supplemented by a signed-route system on some low-volume streets and bike lanes on some of the future arterial streets surrounding the lake, such as Silver Creek Road and Ten Mile Bridge Road. See Map 7 for proposed routes .

Map 5: Future Land Use and Master Thoroughfare Plan



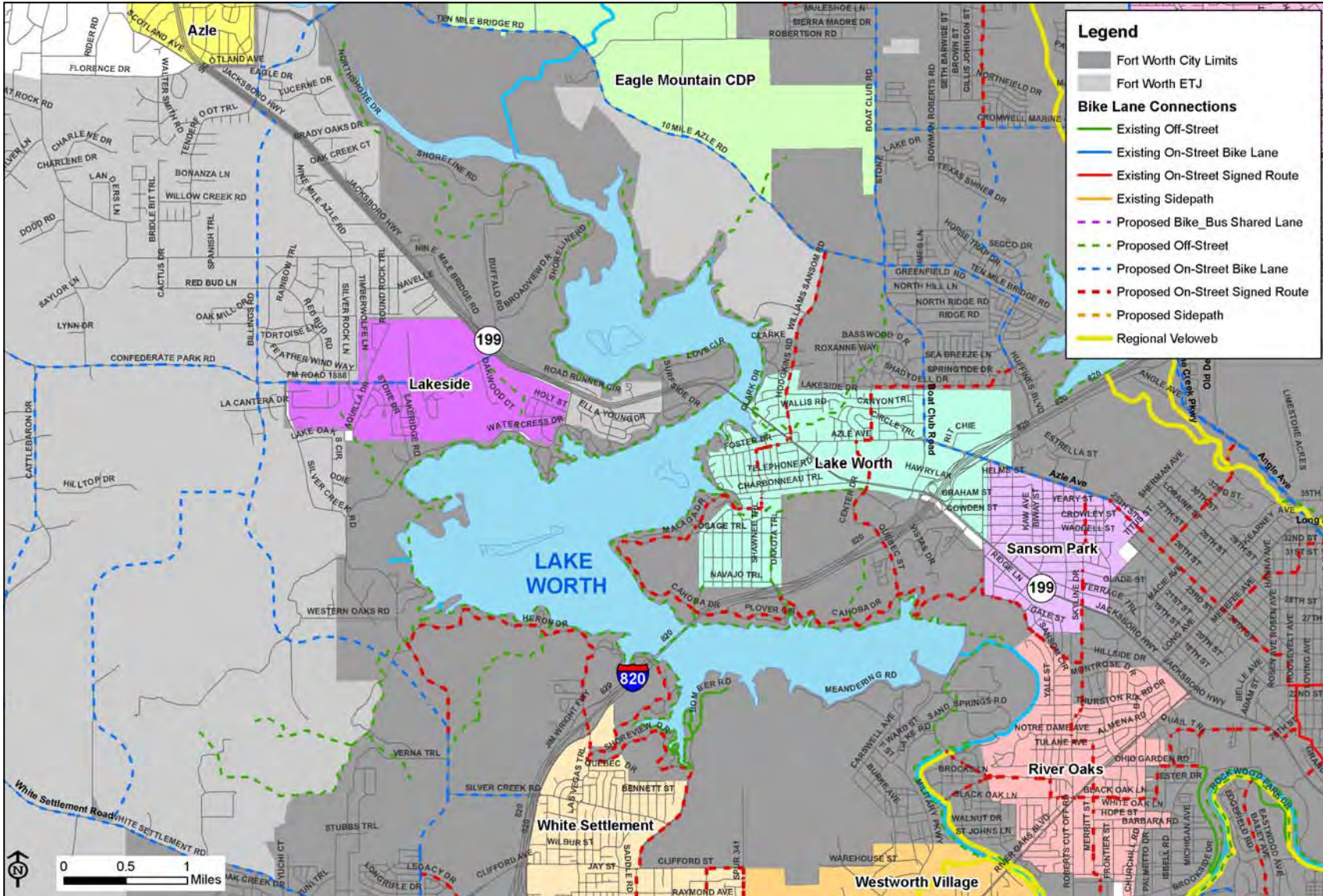
Source: City of Fort Worth

Map 6: Zoning



Source: City of Fort Worth

Map 7: Current Street Pattern and Bike Routes



Source: City of Fort Worth

Parks

There are 18 individual public parks that surround Lake Worth totaling 913 acres, not including the 3,621-acre Fort Worth Nature Center that encompasses the lake's headwaters. The 18 parks currently provide 137 acres of parkland per 1,000 population within the Lake Worth area. In 2030, these parks will provide 102 acres of parkland per 1,000 projected population, which will continue to exceed the national standard. There is an opportunity to connect these existing parks through the implementation of the Lake Worth Vision Plan. Some parks have outdated equipment in need of repair or replacement. The Lake Worth Capital Improvement Implementation Plan recommends upgrading the parks.



Camp Joy Park on Lake Worth

Environmental Constraints and Opportunities (See Maps 8-13)



Lake dredging equipment

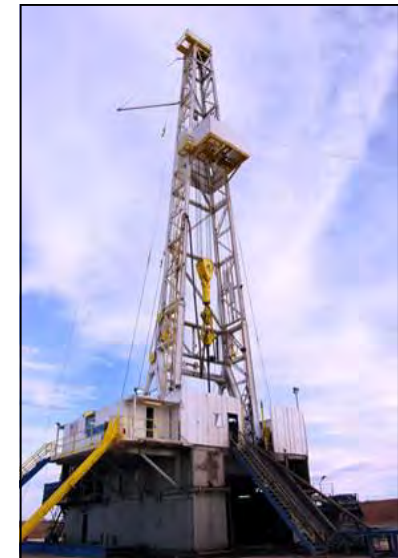
The topography around Lake Worth ranges in elevation from 594 feet at the shoreline to approximately 870 feet at the highest point south of the lake. Receiving waters feeding the lake are contained by relatively flat 100-year floodplain areas characterized by the presence of arable land and soils that are saturated for some parts of the year. Moderately steep slopes and bluff areas adjacent to the lake shore provide opportunities for scenic views of the lake.

Soils beyond the immediate lake area, especially in the watershed west of Lake Worth, include some highly erodible types. Unmanaged siltation over the years has significantly reduced the depth of the lake in many areas, resulting in intrusion of wetlands beyond the former lake shore.

There are several existing gas wells and pipelines on private land around Lake Worth that could represent a constraint to future development. Leasing of the City's Lake Worth properties for development of the underlying Barnett Shale natural gas is expected to provide revenue to fund capital improvements at Lake Worth. This significant, if temporary, revenue stream creates an opportunity to develop Lake Worth as a premier recreation destination to benefit all the citizens of Fort Worth, as well as surrounding communities. To limit negative environmental impacts and preserve opportunities for recreational and other future uses of the land, City staff is working to ensure that best practices are used in the extraction and transportation of natural gas from under the City's Lake Worth properties.

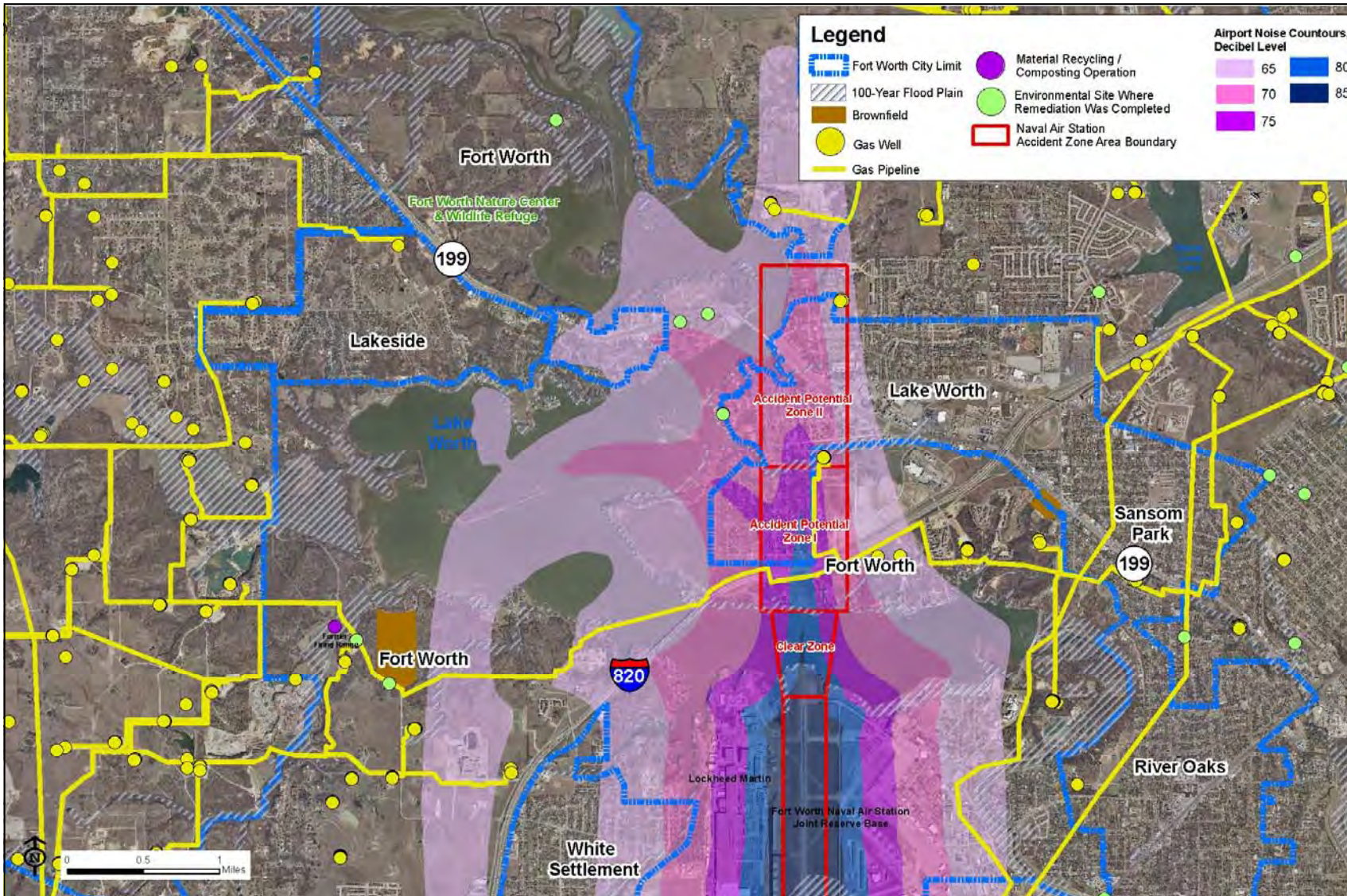
There are two identified Brownfield sites around Lake Worth. A 43-acre site on Silver Creek Road is a former rifle and pistol club. The City has prepared a proposal to remediate existing lead contamination at the site. Remediation is expected to begin in 2011, following concurrence by the Texas Commission on Environmental Quality. The second site on Highway 199 has been classified as property that may require some level of environmental remediation due to an automotive repair shop previously operating on the site.

Lake Worth water quality is crucially important to the City, as the lake is a source of raw drinking water for the citizens of Fort Worth. Heightened levels of PCBs have been found in sediment at the east end of the lake, adjacent to the Naval Air Station Joint Reserve Base and the Lockheed Martin aircraft manufacturing facility. Currently, the City's approach is to not dredge in these areas in order to avoid disturbing this contaminated sediment, and the possible ramifications of having to mitigate for this impact.



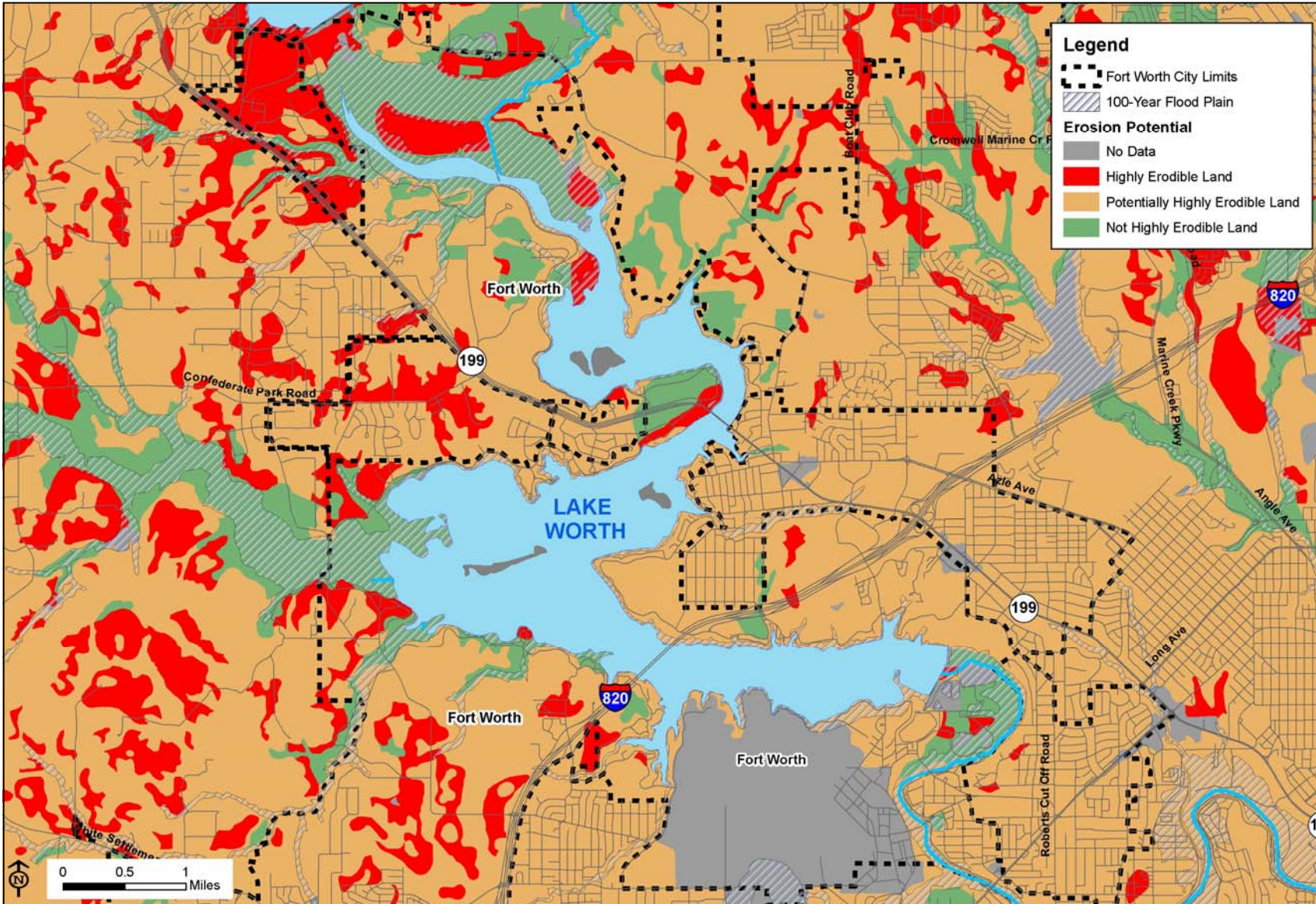
Gas Drilling Rig

Map 8: Environmental Constraints



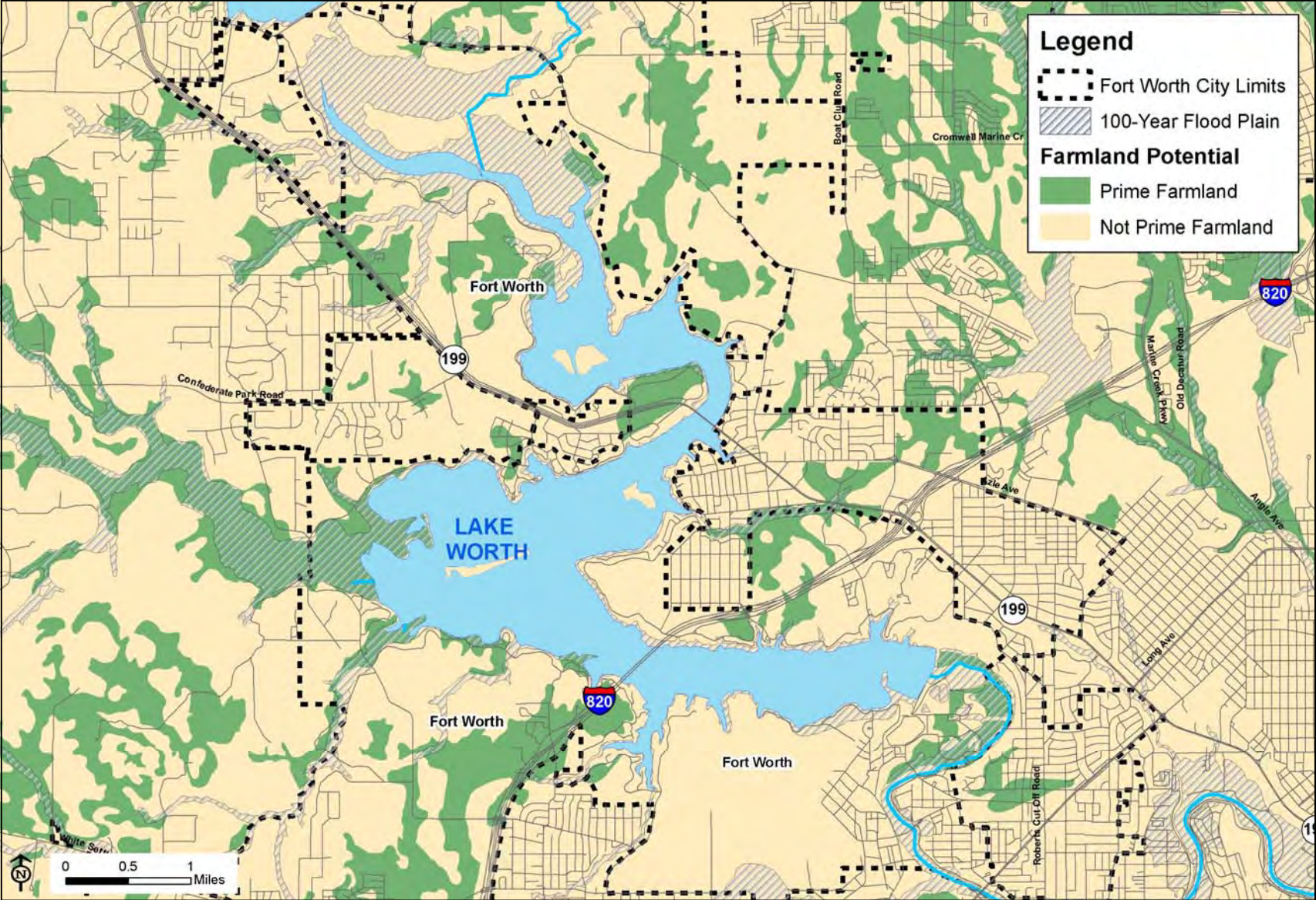
Source: City of Fort Worth

Map 9: Erodible Soils



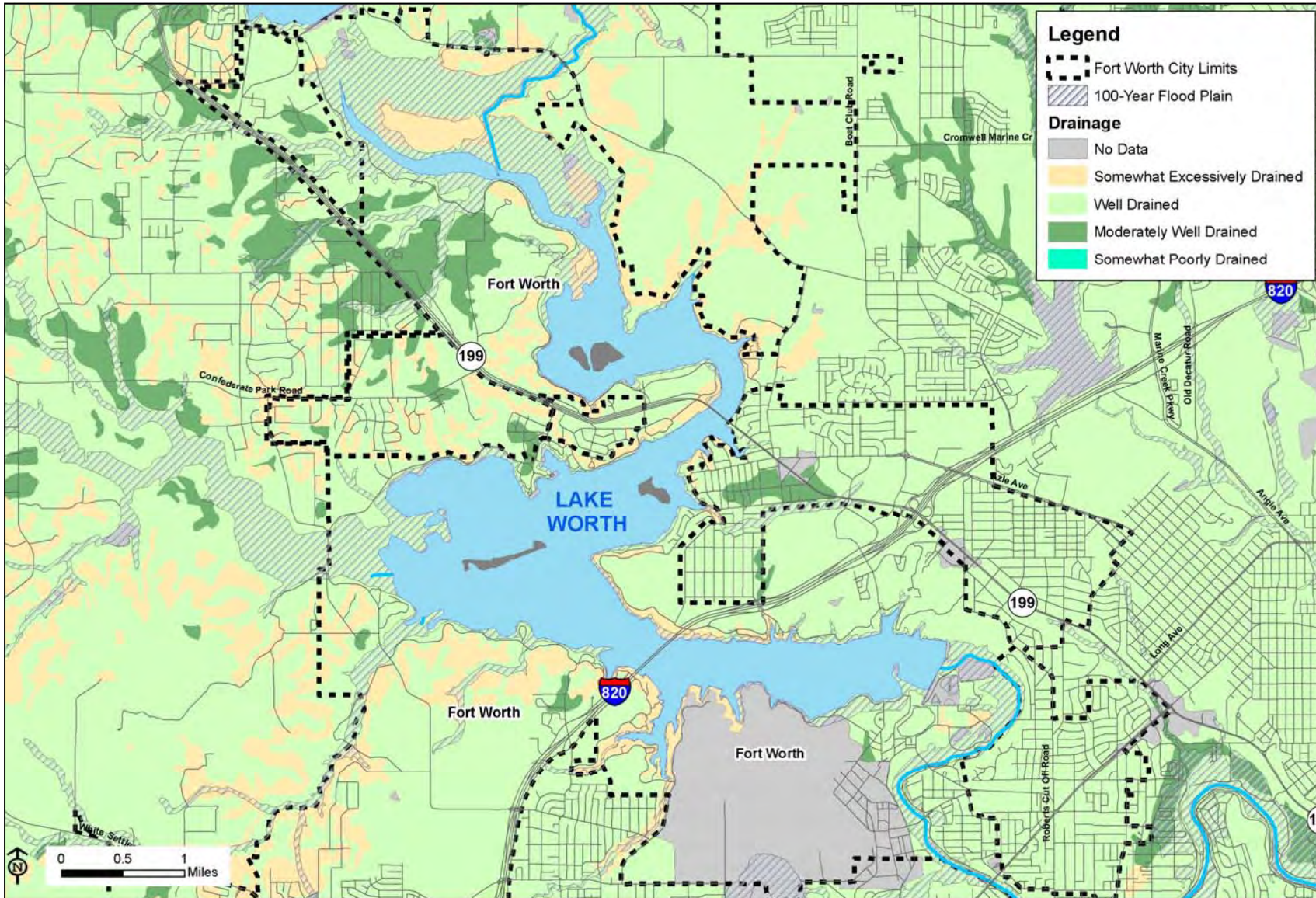
Source: North Central Texas Council of Governments

Map 10: Prime Farmland



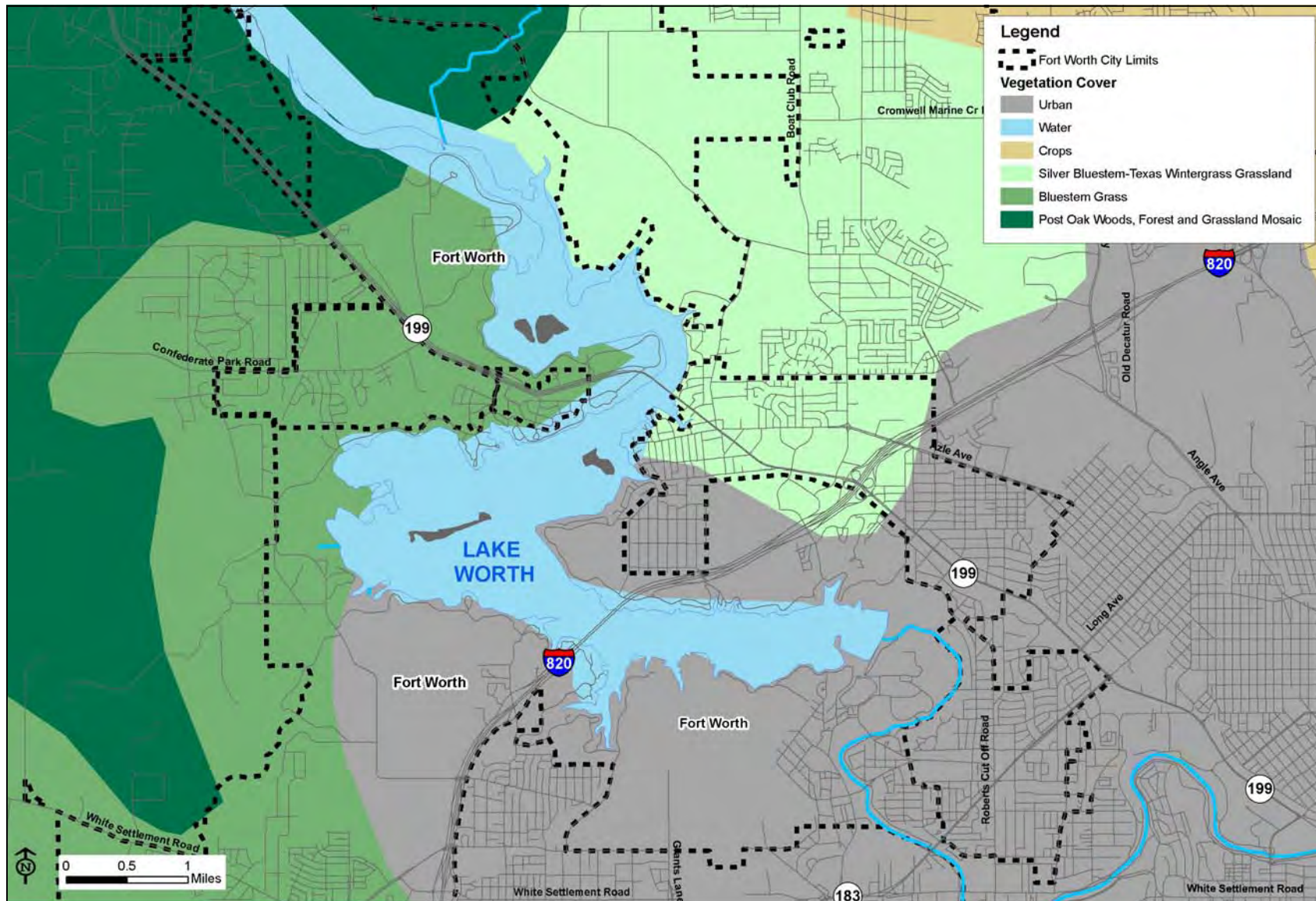
Source: North Central Texas Council of Governments

Map 11: Soil Drainage



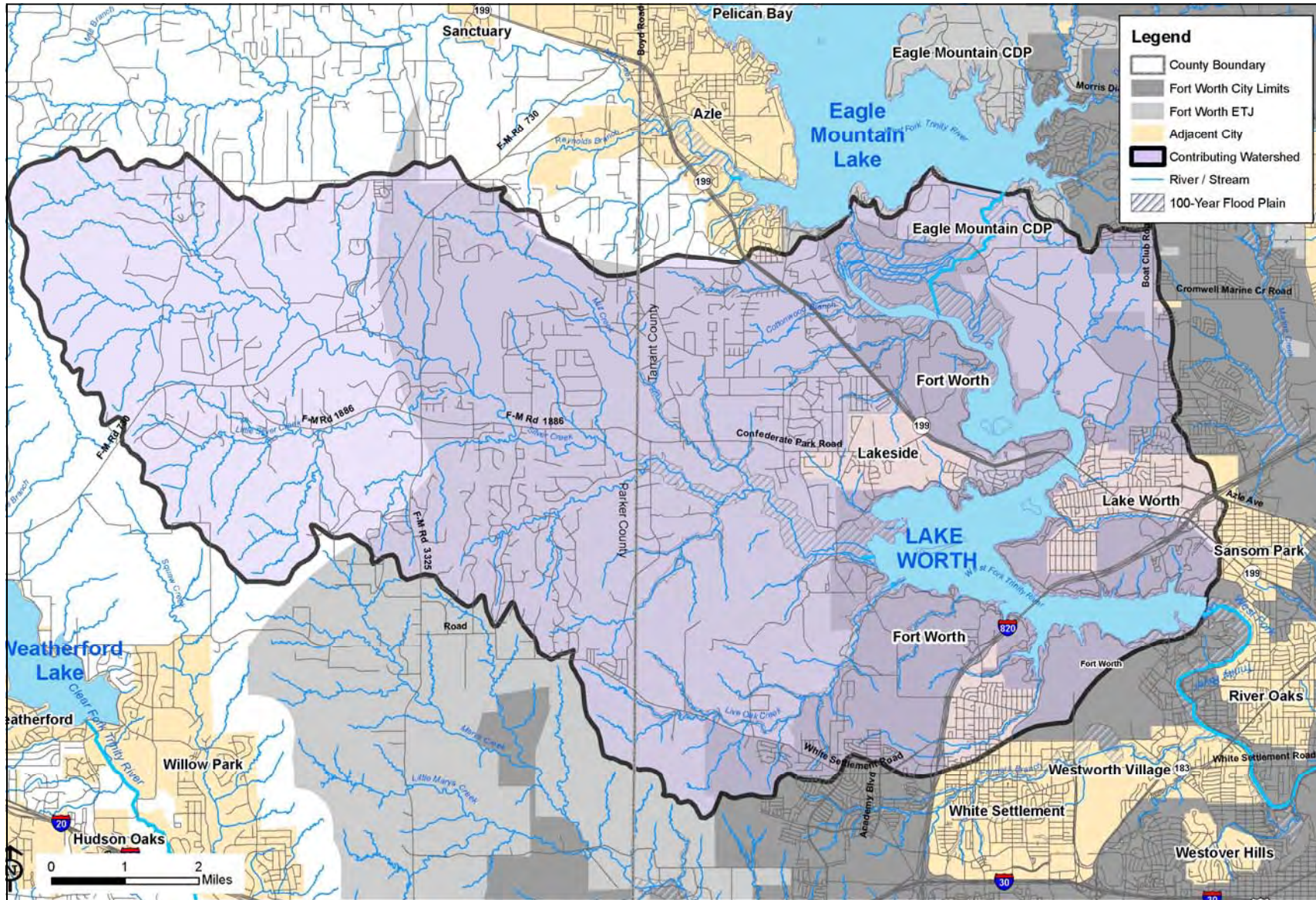
Source: North Central Texas Council of Governments

Map 12: Vegetation Cover



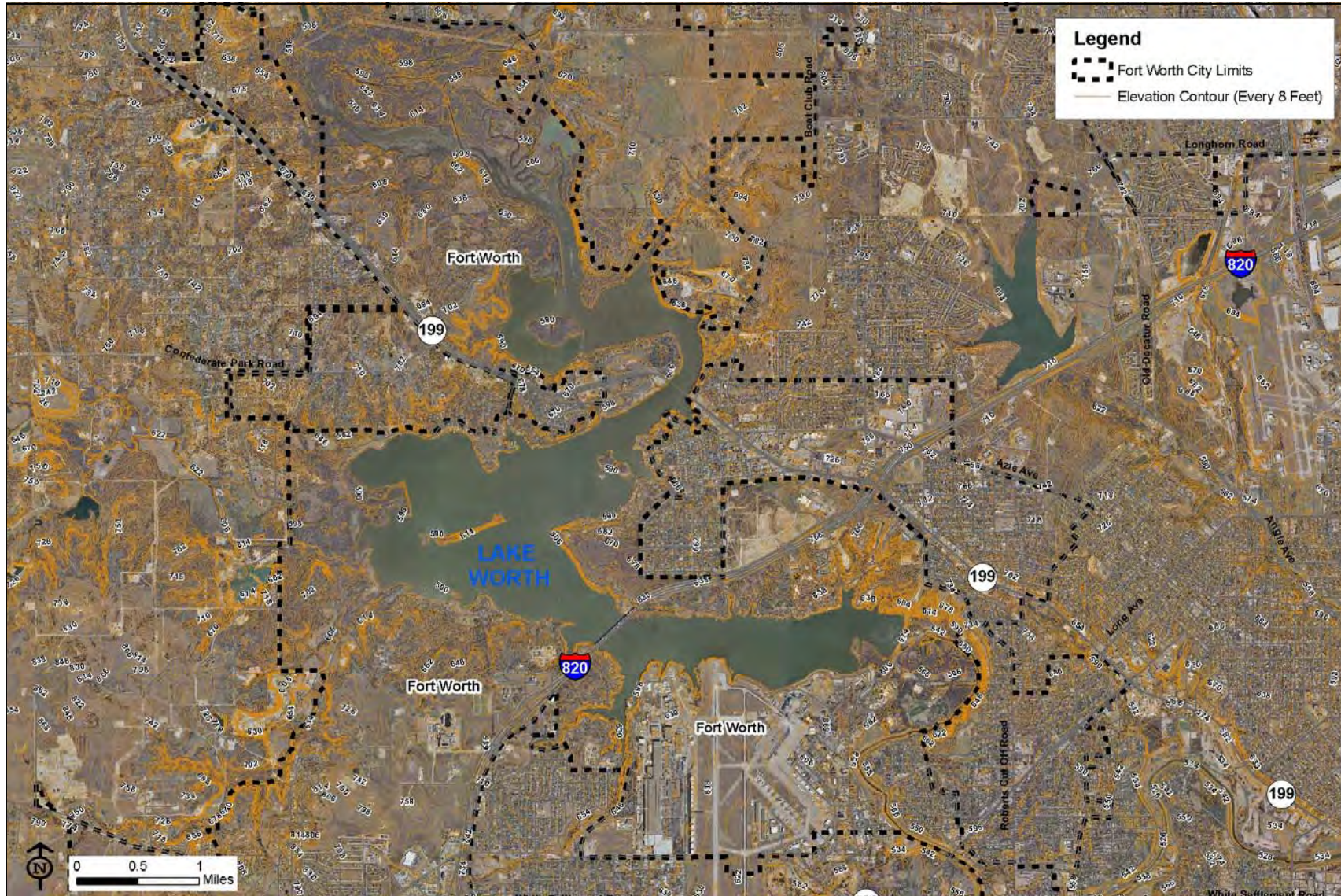
Source: North Central Texas Council of Governments

Map 13: Water Features



Source: City of Fort Worth, North Central Texas Council of Governments

Map 14: Elevation Contours

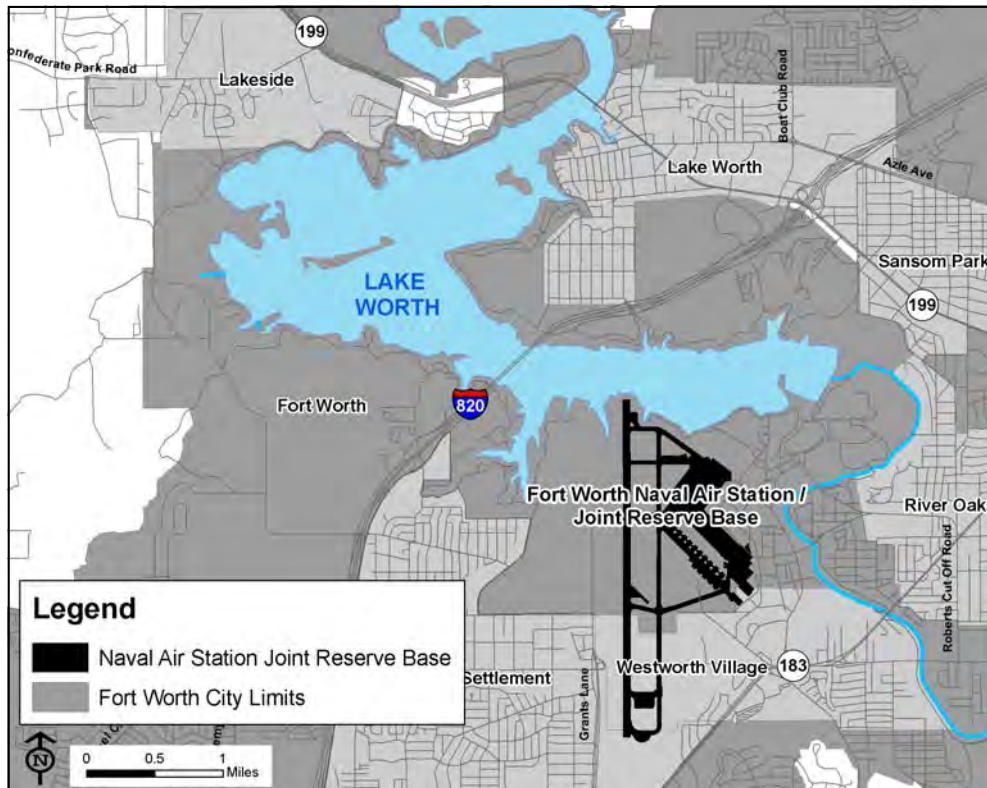


Source: City of Fort Worth

Naval Air Station Joint Reserve Base

The Naval Air Station Joint Reserve Base (NAS JRB), located on the south shore of Lake Worth, has generated between 30,000 and 60,000 flights annually in recent years. NAS JRB is a vital national military asset that serves the operational needs of the United States Navy (as the host unit), United States Air Force, United States Army, United States Marine Corps, and the Texas Air National Guard.

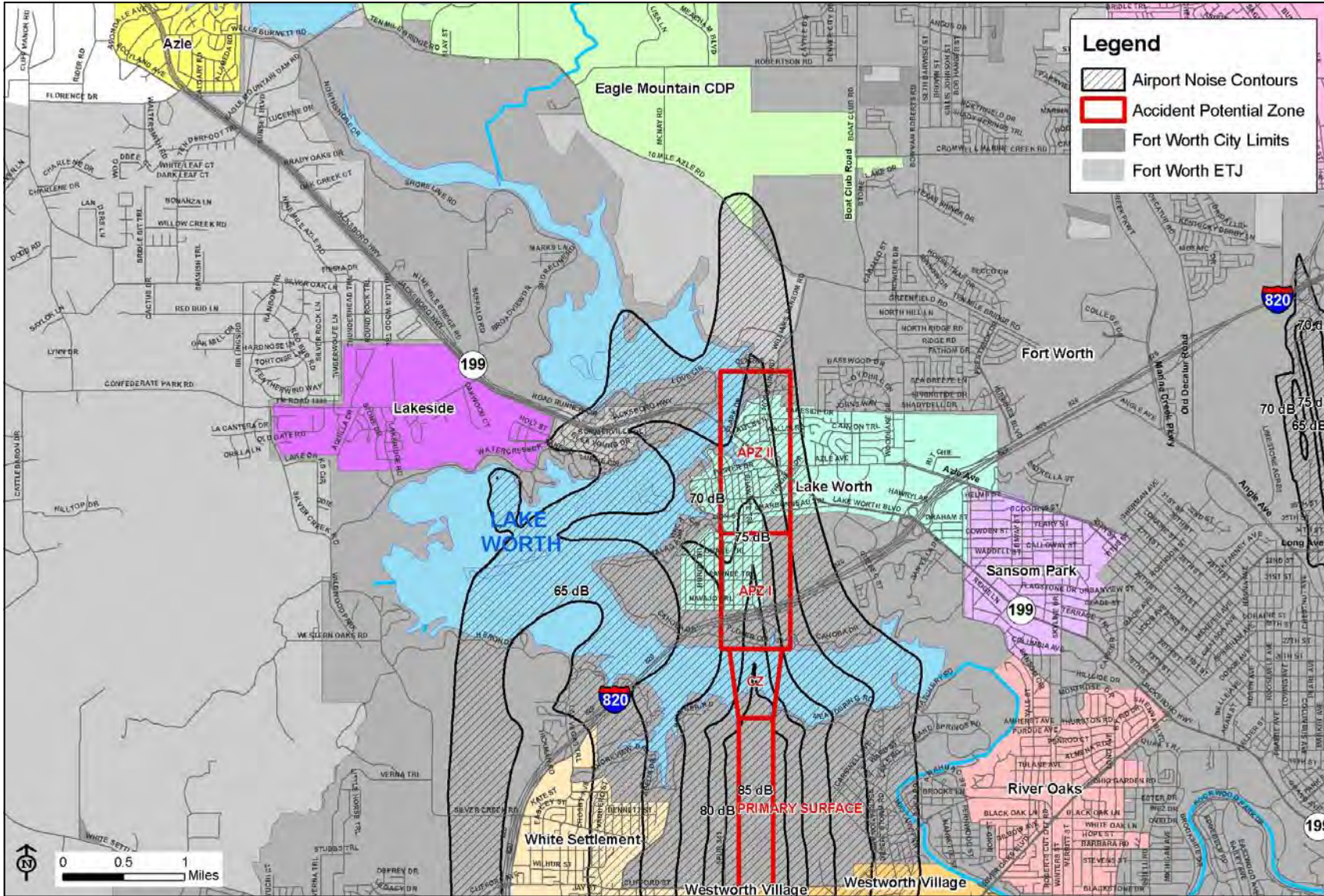
Following the introduction of the Base Realignment and Consolidation (BRAC) efforts by the U.S. Department of Defense, it has become apparent that land use near a military base can complement or compromise the utility and effectiveness of the installation and its mission. For this reason, a Joint Land Use Study (JLUS) was recently conducted. The JLUS is a cooperative planning initiative between the NAS JRB and the surrounding cities. The goal of the JLUS is to promote compatible community growth that supports military training and operational missions. The inter-jurisdictional partnership will result in the identification of actions that can be taken jointly by the community and the installation to promote compatible development and address current and future encroachment. Completed in 2008, the JLUS identified 65 decibel day-night level (dB DNL) noise contours generated by the flight operations. The study also designated Clear Zones and Accident Potential Zones. These identified zones, together with the 65 dB DNL noise contours, define areas adjacent to the lake within which some types of development should be restricted.



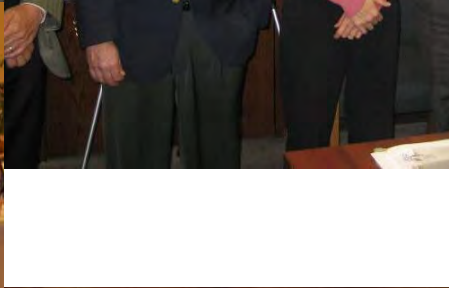
Naval Air Station Joint Reserve Base is located south of Lake Worth

A Regional Coordination Committee (RCC) was formed to oversee the implementation of the JLUS. Membership on the RCC includes the local governments in close proximity to the NAS JRB including: City of Benbrook, City of Fort Worth, City of Lake Worth, City of River Oaks, City of Westworth Village, City of White Settlement, and Tarrant County. Non-voting members of the RCC include: Department of Defense Office of Economic Adjustment, NAS JRB, area Chambers of Commerce, Lockheed Martin, and North Central Texas Council of Governments. Voting members may also invite Economic Development Corporations and military support organizations as additional non-voting members.

Map 15: NAS JRB Accident Potential Zones and Noise Contours



Source: City of Fort Worth



PART TWO: PLANNING PROCESS

Workshop Process

The purpose of the Lake Worth Vision Workshop was to determine and describe the community's vision for the future of the Lake Worth area, and to leverage the combined expertise of a consultant panel to begin formulating ways to achieve the vision plan for the future of Lake Worth. The panel was asked to present recommendations concerning land use, development forms, watershed management, and recreational facilities around the lake. The consultant panel presented their recommendations at the conclusion of the workshop to an audience primarily of stakeholders and other workshop participants. The recommendations of the consultant panel are sound, but it will require the combined efforts of citizens and the adjacent local governments to bring the vision to life.

The City of Fort Worth Planning and Development Department organized the three-day, intensive workshop that included staff presentations to the panel on existing conditions around the lake, a van tour of the lake, and interviews with a broad range of stakeholders. Existing conditions presentations provided by staff included information on future land use, zoning, transportation, parks, and gas wells. The remainder of the workshop time was dedicated to the panel, allowing them to analyze the information and public input they had received, to depict and describe the vision, and to develop their final recommendations. The panel included the following five consultants:

Mark Dawson, ASLA, Sasaki Associates
Caryn Ernst, Trust for Public Land
Cales Givens, ASLA, EDAW
Stephen Plunkard, FASLA, Stantec Consulting
Scott Stoodley, PhD., Entrix, Inc.



Lake Worth Vision Consultant Panel, from left: Cales Givens, Scott Stoodley, Caryn Ernst, Stephen Plunkard, and Mark Dawson.

Public Involvement and Stakeholder Interviews

Public involvement was at the center of the Lake Worth Vision Workshop process. An informal opportunity for all interested parties to meet the consultants and discuss the future of Lake Worth was provided early in the workshop at the only restaurant located on the lake. In addition, City staff identified a wide variety of stakeholders that use the lake or would be particularly interested in the future of Lake Worth, and extended specific invitations to these groups to participate in developing the Lake Worth Vision Plan. The consultant panel met with many stakeholders during the three-day workshop. The panel met individually with neighborhood associations around the lake, recreational users, neighboring jurisdictions, and other groups.



The Point Restaurant on Lake Worth

The Point Restaurant Informal Gathering

To provide an opportunity for identified stakeholders and the general public to meet the consultant panel and discuss the future of Lake Worth, an informal gathering for stakeholders and the public was held on the first night of the workshop at The Point Restaurant on Lake Worth. There were approximately 50 people at the event. The panel heard many insightful stories and suggestions for Lake Worth. The gathering at The Point was publicized in the local Lake Worth area newspaper, the Times-Record, and the Fort Worth Star-Telegram.

Neighborhood Association Interview Results

The consultant panel interviewed representatives from neighborhood associations at the Lake Worth Management Office. The neighborhood associations interviewed include the Scenic Shores Neighborhood Association, Neighborhood Association on South Lake Worth, East Lake Worth Neighborhood Association, North Lake Worth Neighborhood Association, and the Lake Worth Alliance.

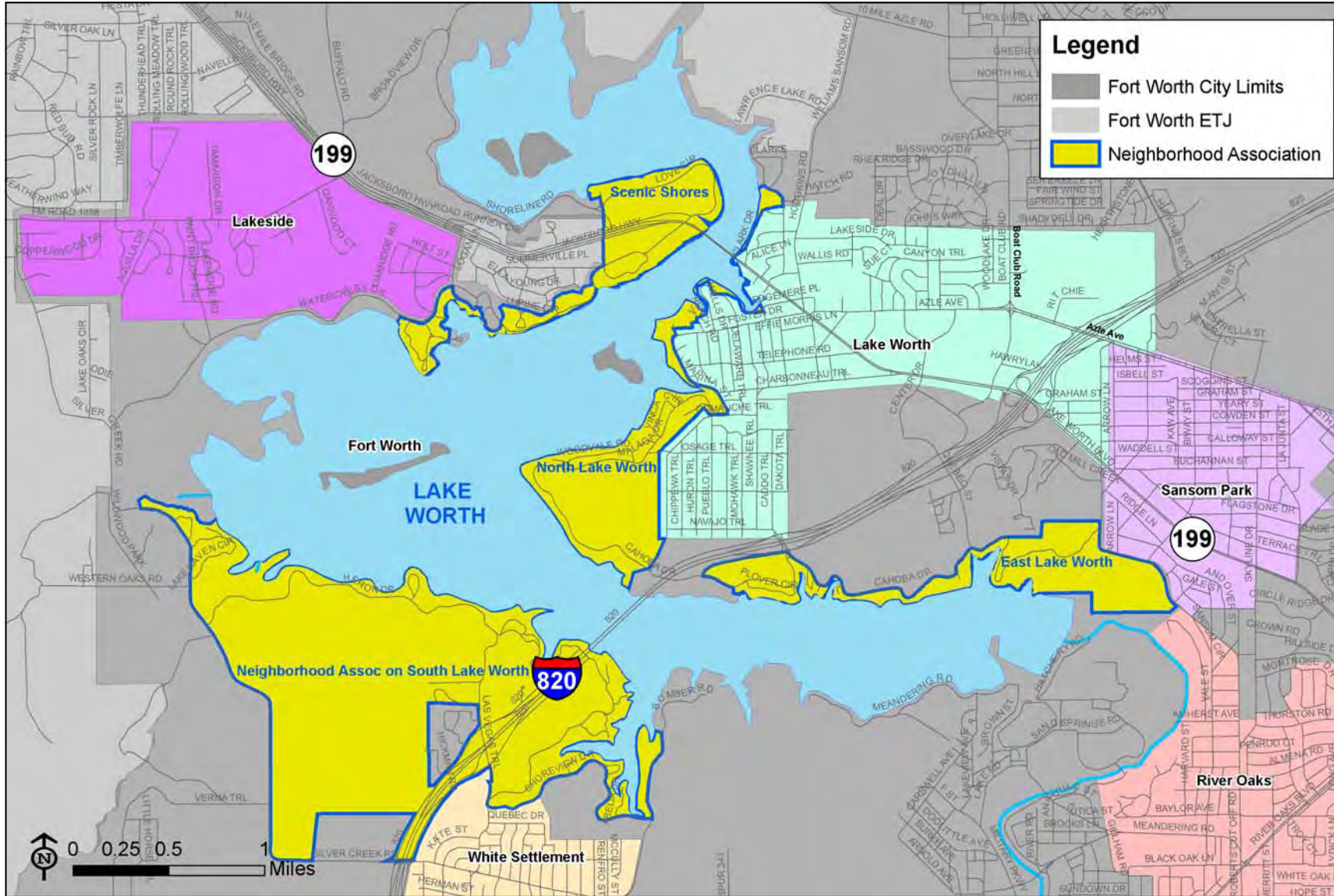
The panel heard the following suggestions from neighborhood associations around the lake:

1. Dredging Lake Worth should be a top City priority.
2. New residential development is not desirable around the lake.
3. New commercial development should only be allowed at Casino Beach Park and near Loop 820.
4. Property around the lake that is currently undeveloped should be preserved as open space or parks.
5. Construct Silver Creek Road bypass as a scenic parkway.
6. Amenities within most existing parks around the lake are in need of repair; prefer existing parks to include only passive uses such as walking trails and natural habitat areas.
7. Love Circle Park should remain a passive park with no playground equipment and no lighting; multi-use, unpaved trails are desired in the park; Love Circle Park could be connected to the Fort Worth Nature Center and Refuge.
8. Integrating bike/walking trails around the lake is encouraged.
9. Location of gas wells and pipelines is a concern; City needs to create more stringent gas well standards; use best management practices.
10. Dilapidated boat ramps need repairs, but boat ramps should not be located in swimming areas.
11. Silver Creek Materials is an incompatible use near the lake, has adverse environmental impacts on the lake, and should be relocated away from any water source.
12. A bulk trash drop off station should not be located within the Lake Worth watershed.



Home on Lake Worth

Map 16: Lake Worth Neighborhood Associations



Source: City of Fort Worth

Recreational Users Interview Results

The Recreational Users Group included representatives from the Lake Worth Boat and Ski Club, Lake Worth Sailing Club, Boy Scouts of America, Hip Pocket Theatre, Lockheed Martin Recreation Association Bicycle Club, and the Fort Worth Mountain Bike Association. The following comments were received from these groups:

- The Lake Worth Boat and Ski Club and the Lake Worth Sailing Club were described as two of the best enterprises on the lake. They should be promoted to the public more so that people know about the organizations. Both clubs are solely funded through member dues. Both clubs have operated at the lake for many years and are an asset to the lake. The Sailing Club sponsors competitions on the lake, but emphasized that there is nowhere on the lake to purchase gas for boats. Both clubs look forward to the lake being dredged, and both want long-term leases with the City.
- The Boy Scouts of America have operated a summer camp at the lake since 1917, but efforts to improve their facility have not been successful. They lease land from the City and have been working to renew their lease. The facility has no water access and therefore no water-based programs for scouts. The facility is not for public use. They want a long-term lease from the City to make improvements. The Boy Scouts have recently stated that they might be interested in leasing a different location on the lake.
- Hip Pocket Theatre, an outdoor performance theatre, has operated on City-owned land at Lake Worth for five years. Their lease expires in 2009, but they hope to renew at their existing location. The organization receives funding from various supporters including the Texas Commission on the Arts, National Endowment for the Arts, and the Arts Council of Fort Worth and Tarrant County. More than 40,000 people have attended a performance in the last five years. The property was previously the home of the Fort Worth Gun Club. Hip Pocket Theatre wants to stay in the same location and create some indoor space and facilities where guest artists can stay. They are concerned about noise from Silver Creek Road and gas wells.
- The Lockheed Martin Recreation Association Bicycle Club works closely with the City and other agencies to improve access, safety, and facilities for commuters. Club members participated in the City's Bicycle Study Technical Committee, and played an important role in the creation of the 2009 Bike Fort Worth Plan. Major barriers for Lockheed cyclists that want to commute to work include the Highway 199 and Loop 820 bridges over the lake.
- The Fort Worth Mountain Bikers' Association currently operates a 7-mile long trail in Marion Sansom Park. The association is modeled after the Dallas Off-Road Bicycle Association, which is the largest mountain bike association in the country. The association has removed more than 700 tires from the park. Neighbors report that the association is a conscientious steward of the land. Members work to keep the park clean and usable. Because four-wheel drive vehicles that traverse the park are a nuisance to trail riders and contribute to park maintenance problems, the association wants the public vehicle access blocked. The association supports the concept of developing bike trails to connect the entire area around Lake Worth with Marion Sansom Park, the Nature Center, and Eagle Mountain Lake, but would like water and bathroom facilities included.



Lake Worth Boat and Ski Club

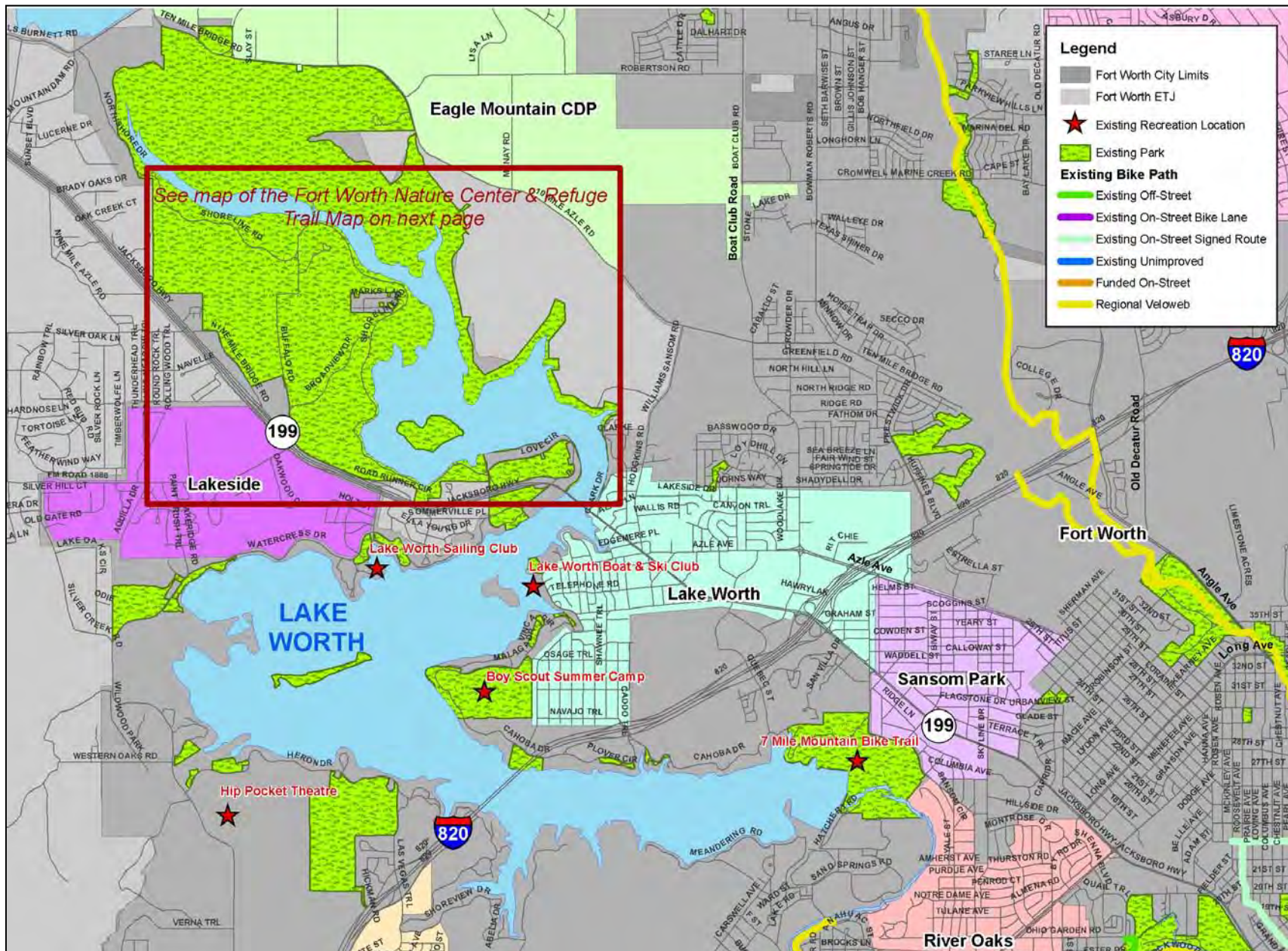


Hip Pocket Theatre



Sansom Park

Map 17: Lake Worth Current Recreation



Source: City of Fort Worth

Map 18: Fort Worth Nature Center Trails



Military and Industrial Users Interview Results

The panel met with representatives from the Naval Air Station Joint Reserve Base (NAS JRB), Lockheed Martin Aeronautics Company, and the North Central Texas Council of Governments (NCTCOG).

Below are the key comments received from these stakeholders:

- NAS JRB and NCTCOG expressed concern over existing residential development within the runway clear zone and accident potential zones. Both agencies strongly support restricting incompatible land uses, especially new homes, apartments, schools, and hospitals within these areas.
- The public needs to be aware of the base when construction is proposed.
- Only compatible uses should be permitted on City-owned land around the lake.
- Lockheed leases its property from the United States Air Force.
- NAS JRB is concerned about new development in west Fort Worth due to drainage that flows east onto the airfield. A storm water project is underway to reduce flooding on the airfield.
- NAS JRB and Lockheed Martin prefer no public boating around their facilities.
- NAS JRB and Lockheed Martin want to be good neighbors and remain engaged in discussions on proposed new developments near the base.
- There is currently no public transit to either facility. There are some access and security issues, but a park-and-ride facility could be supported.



Lockheed Martin Aeronautics Company

Streams and Valleys, Inc. Interview Results

The panel also met with Streams and Valleys, Inc., a non-profit organization that oversees the 42 miles of existing Trinity Trails within the City. Streams and Valleys shared the following insights:

- The group is sensitive to greenspace on the Trinity River, but is not anti-development.
- Streams and Valleys is working on a 10-year implementation plan and evaluating new trails and funding opportunities.
- The group supports extending existing trails to Lake Worth, but funding will need to be secured for design and construction of this trail extension.
- Any Lake Worth trail would need to be linked to existing trails.
- Linking trails would help create a regional veloweb, as planned by NCTCOG.
- Major bridges on Lake Worth could pose a logistical and financial constraint to linking trails across the lake, while security issues with respect to NAS JRB could limit development of a trail that completely encircles the lake.
- The YMCA, which operates the existing Camp Carter on the east side of the lake, has security concerns about a trail abutting their camping area. The area is currently gated, so no link is possible at this time.



Trinity Trails near Lake Worth

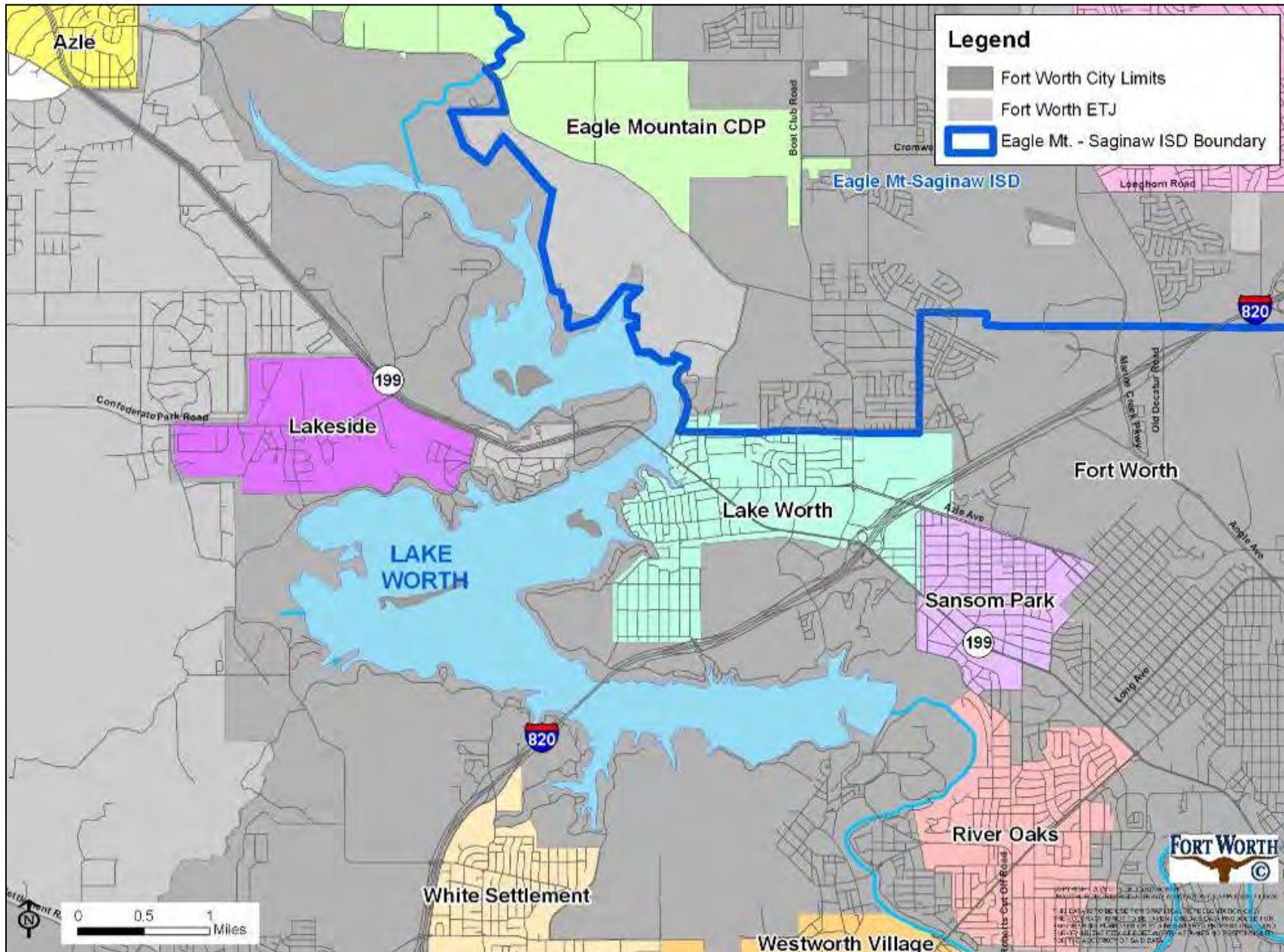
Surrounding Jurisdictions Interview Results

The panel met with representatives from the Town of Lakeside, City of Lake Worth, City of River Oaks, City of Sansom Park, City of White Settlement, Eagle Mountain-Saginaw Independent School District, and Tarrant County.

The panel heard the following remarks from these jurisdictions:

- Eagle Mountain-Saginaw ISD prefers single-family development with some commercial within its district and around the lake. The ISD prefers no industrial or intense uses. They want to know about new development, so they can plan for district needs. There is currently no existing infrastructure in undeveloped areas of the district.
- The City of Lake Worth is currently working on a park plan and would prefer to own some lake frontage within its city limits. Due to limited public access, Lake Worth citizens rarely use the lake. Many people travel through the City of Lake Worth to access the lake. The City wants public access within its jurisdiction.
- The center of the Town of Lakeside is located off of Highway 199 and Confederate Park Road. The City is primarily a residential community with some policing issues.
- The City of River Oaks supports expanding and linking the existing Fort Worth trail system. Many of their residents do use Marion Sansom Park, but there is a lot of vandalism in the park. Residents fish at the lake and on the Trinity River.
- The City of White Settlement does not have any lake views, but many people travel through the City to access the lake.
- Tarrant County authority around the lake is limited, since they do not have land use or code oversight. Tarrant County is part of the NAS JRB Joint Land Use Study Regional Coordination Committee.

Map 19: Lake Worth Surrounding Jurisdictions



Source: City of Fort Worth



PART THREE: VISION PLAN

Alternative Scenarios and Workshop Vision Plan

After hearing existing conditions presentations from City staff, touring the lake, and interviewing stakeholders, the consultant panel developed two alternative future scenarios for the Lake Worth area from which they could draw elements for their recommended vision plan: the Great Park Scenario and the Sustainable Future Scenario. Prior to presenting the two alternative scenarios to workshop participants, the panel emphasized the importance of addressing the entire Lake Worth watershed in developing future land use and infrastructure plans for the area around the lake.

The Lake Worth watershed is a large area that extends into Parker County to the west. All property within the watershed drains into Lake Worth. For this reason, the panel noted that the City of Fort Worth will have to dredge the lake again in the future if environmental and construction standards are not implemented that restrict sediment from entering the lake. The panel highlighted a variety of best management practices (BMPs) to control sediment and nonpoint source pollution, and noted particularly that riparian areas throughout the watershed are the last line of defense for filtering sediment and protecting the lake.

The following pages provide descriptions of the two alternative scenarios presented by the panel.



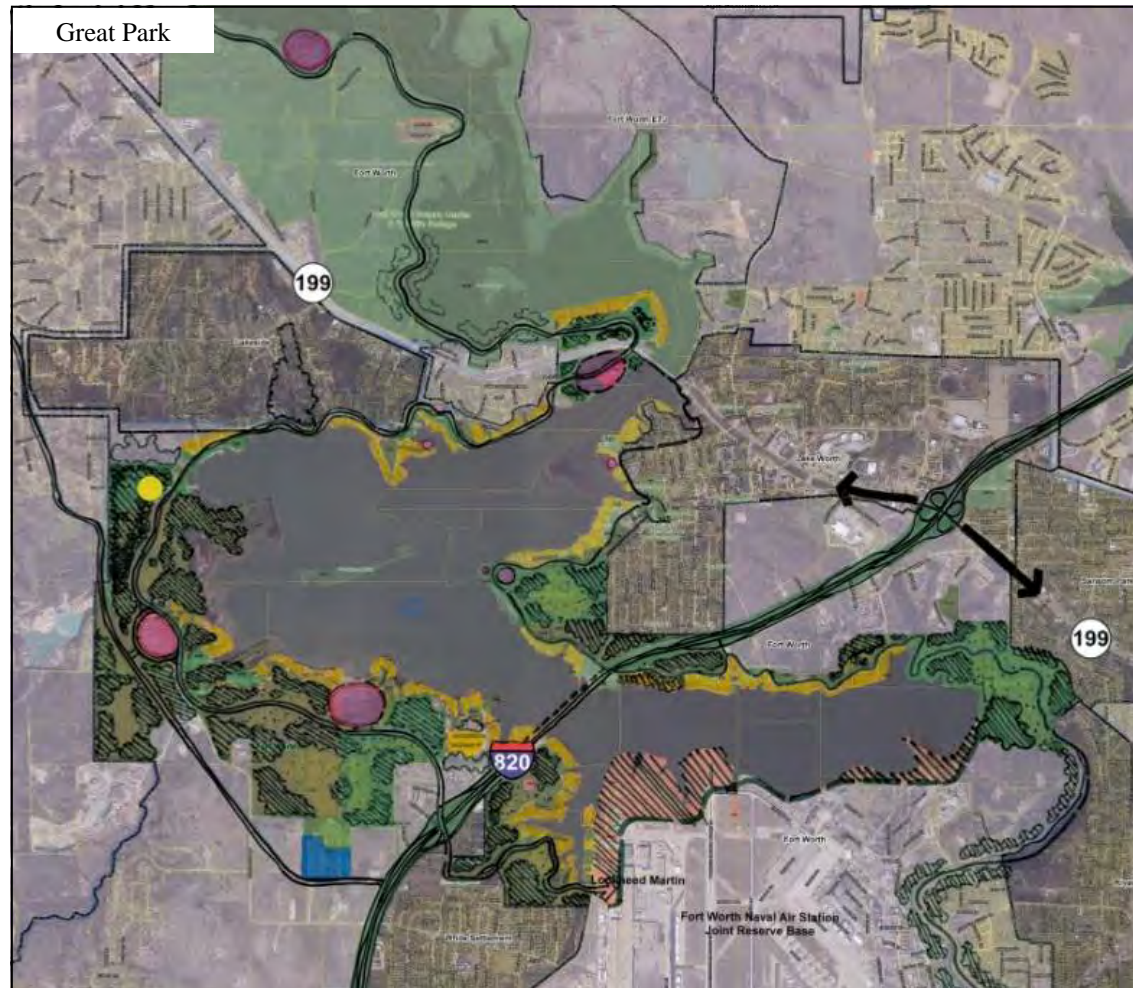
Lake Worth Aerial Map

Great Park Scenario

The first of two scenarios described by the consultant team in preparation for recommending a workshop Vision Plan was the Great Park Scenario. This scenario focused primarily on creating a world-class park system around the lake on property that is currently undeveloped. The scenario includes creating bike/walking trail connections between the existing Trinity Trails system and Marion Sansom Park, Lake Worth, Fort Worth Nature Center and Refuge, and Eagle Mountain Lake. These connections would help create a regional park with state-wide significance. The panel emphasized that it would be a tremendous missed opportunity to not connect these areas.

The Great Park Scenario also envisions cultural centers on the lake, such as the Hip Pocket Theatre, and using the existing abandoned castle for cultural purposes. In the Great Park Scenario, Casino Beach Park becomes a mixed-use development area at the heart of the regional park, providing attractions and additional cultural activities. The scenario also identifies restaurant uses within Mosque Point Park to take advantage of unique overlook opportunities that will attract more visitors to the lake. Mosque Point Park would still be maintained as an inviting and very public park, but with specialized commercial uses included. A key element of the Great Park Scenario was the co-location of the YMCA camp and the Boy Scouts on the west side of the lake where they could share facilities to reduce leasing costs and have a better location for both groups.

The Great Park Scenario identifies limited residential and commercial development except around Casino Beach Park and Mosque Point Park.



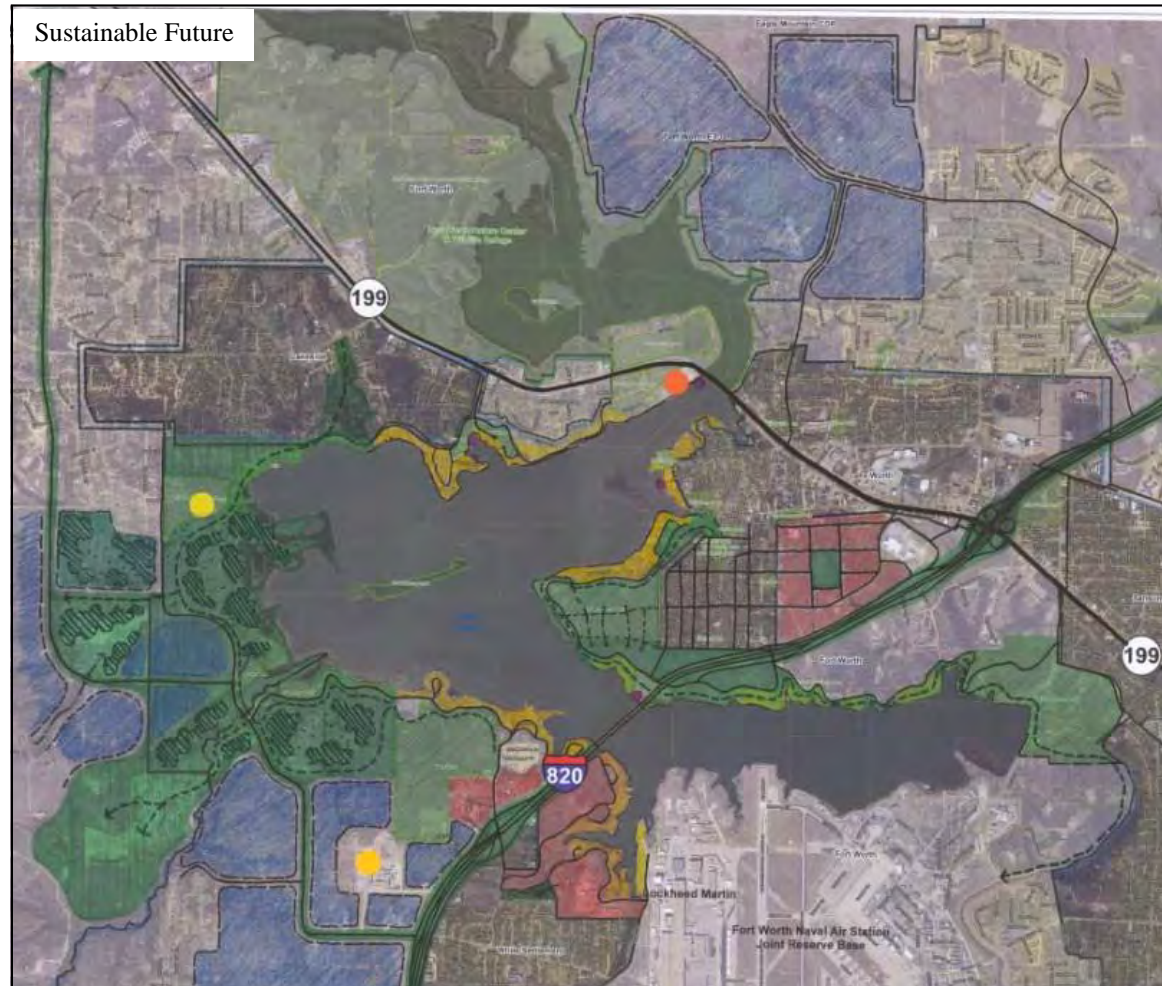
Great Park Scenario Map

Sustainable Future Scenario

The second scenario described by the consultant team was the Sustainable Future Scenario that included many recommendations from the Great Park Scenario. The primary difference between the two scenarios is the addition of the Model Sustainable Communities concept. Because new growth and development are coming to the Lake Worth Watershed, the Sustainable Future Scenario envisions harnessing that growth pressure and focusing new development in master-planned Model Sustainable Communities. These communities would be designed as mixed-use neighborhoods using low-impact development techniques to minimize sediment and nonpoint-source pollution entering the lake. The Sustainable Future Scenario places these communities in locations set back from the lake to the south and west. The consultant panel recommended that the City of Fort Worth partner with a master developer through an RFP process to develop an example of a Model Sustainable Community on City-owned property. This City-sponsored design would provide developers with an example of a more sustainable and walkable mixed-use community that includes residential, commercial, office, and recreational uses.

The scenario also recommends creating a new town center for Lake Worth, because Highway 199 splits the town in half and effectively eliminates pedestrian activity in the existing commercial center of Lake Worth. The panel recommended the Cities of Fort Worth and Lake Worth work together to create an appropriate town center to be implemented in both cities using new design standards, perhaps through a form-based code.

The consultant panel emphasized the importance of promoting a sustainable future for Lake Worth where social, environmental, and economic factors are considered in planning efforts and development decisions.



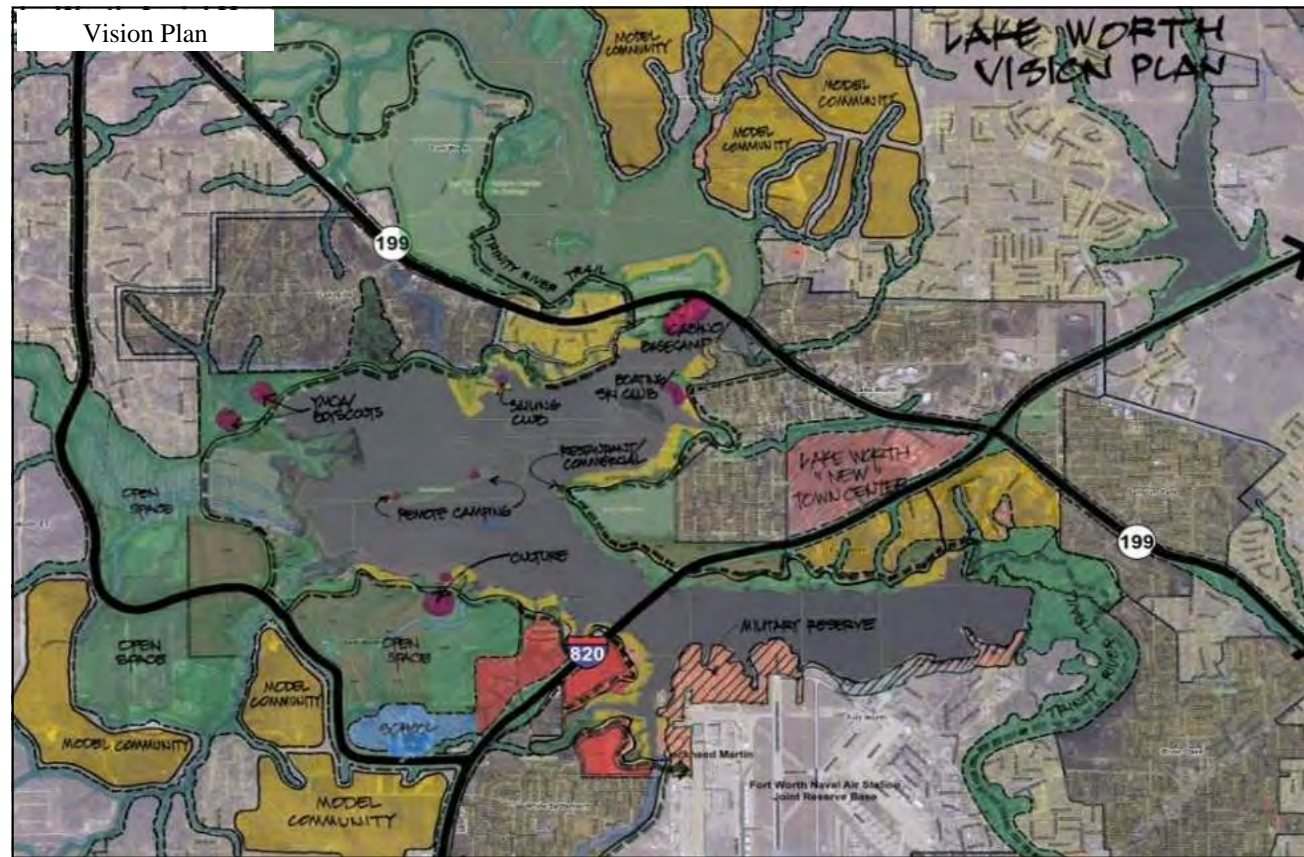
Sustainable Future Scenario Map

Workshop Vision Plan

The consultant panel captured and depicted the community's vision, which includes elements of both the Great Park Scenario and the Sustainable Future Scenario in the map below. The panel expressed the importance of providing a high-quality park system around Lake Worth while showcasing low-impact, mixed-use development through the Model Sustainable Community concept.

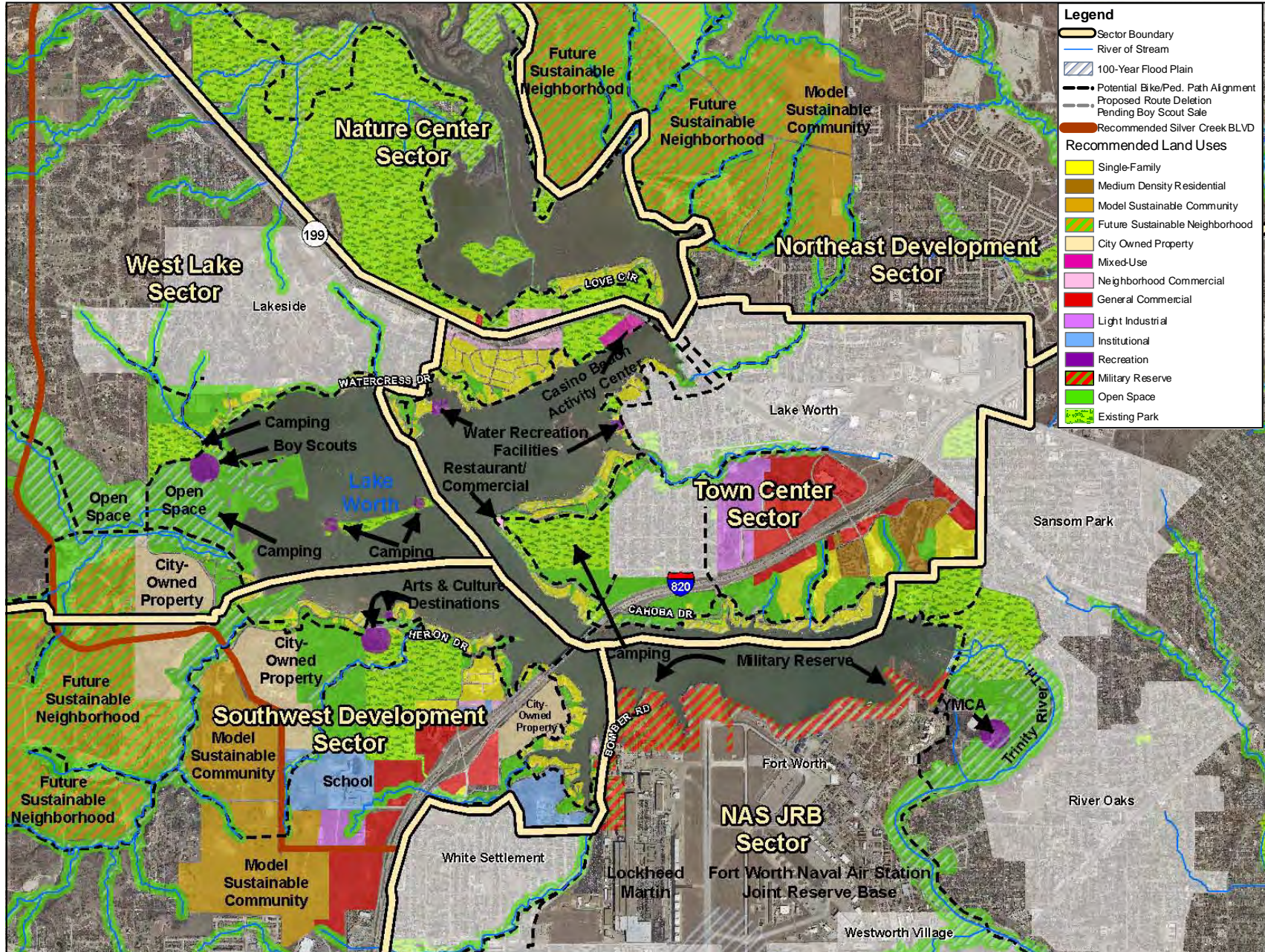
The Workshop Vision Plan map depicts the concepts outlined in the final workshop presentation made to the stakeholders by the consultant panel. Fort Worth Planning and Development Department staff assembled the map drawings, sketches, and PowerPoint presentation materials prepared by the consultants during their three days in Fort Worth and expanded and refined them. Planning and Development Department staff recreated the Workshop Vision Plan map in the City's Geographic Information System (GIS), and expanded on the concepts presented by including the consultants' recommended Model Sustainable Communities. Staff refined the lakeshore bicycle/pedestrian path's location and its connections to neighborhoods, prepared concept sketches of the Model Sustainable Communities, and revised the consultants' images to address the needs of the Naval Air Station Joint Reserve Base and the Joint Land Use Study. City staff developed implementation measures intended to bring about the Lake Worth Vision Plan, and prepared the Vision Plan document.

To aid in describing the component proposals within the Lake Worth Vision Plan, the map has been carved into six sectors as shown on the following page: Nature Center, Northeast Development, NAS JRB, Southwest Development, West Lake, and Town Center. Although the most significant development proposals are shown in the Town Center Sector, Southwest Development Sector, and Northeast Development Sector, all sectors depict proposals that are important to achieving the Workshop Vision Plan for the future of Lake Worth.



Workshop Vision Plan Map

Map 20: Lake Worth Vision Plan Sectors



Vision Plan Sector Descriptions

Nature Center Sector

The northern section of the Lake Worth Vision area is bounded on the south by Jacksboro Highway/SH 199 and is dominated by the Fort Worth Nature Center and Wildlife Refuge. The Nature Center occupies over 3,600 acres of forests, prairies, and wetlands, along with a portion of the West Fork of the Trinity River constituting the primary headwaters of Lake Worth below adjacent Eagle Mountain Lake. The Nature Center is owned by the City of Fort Worth and managed as a division of its Parks and Community Services Department.

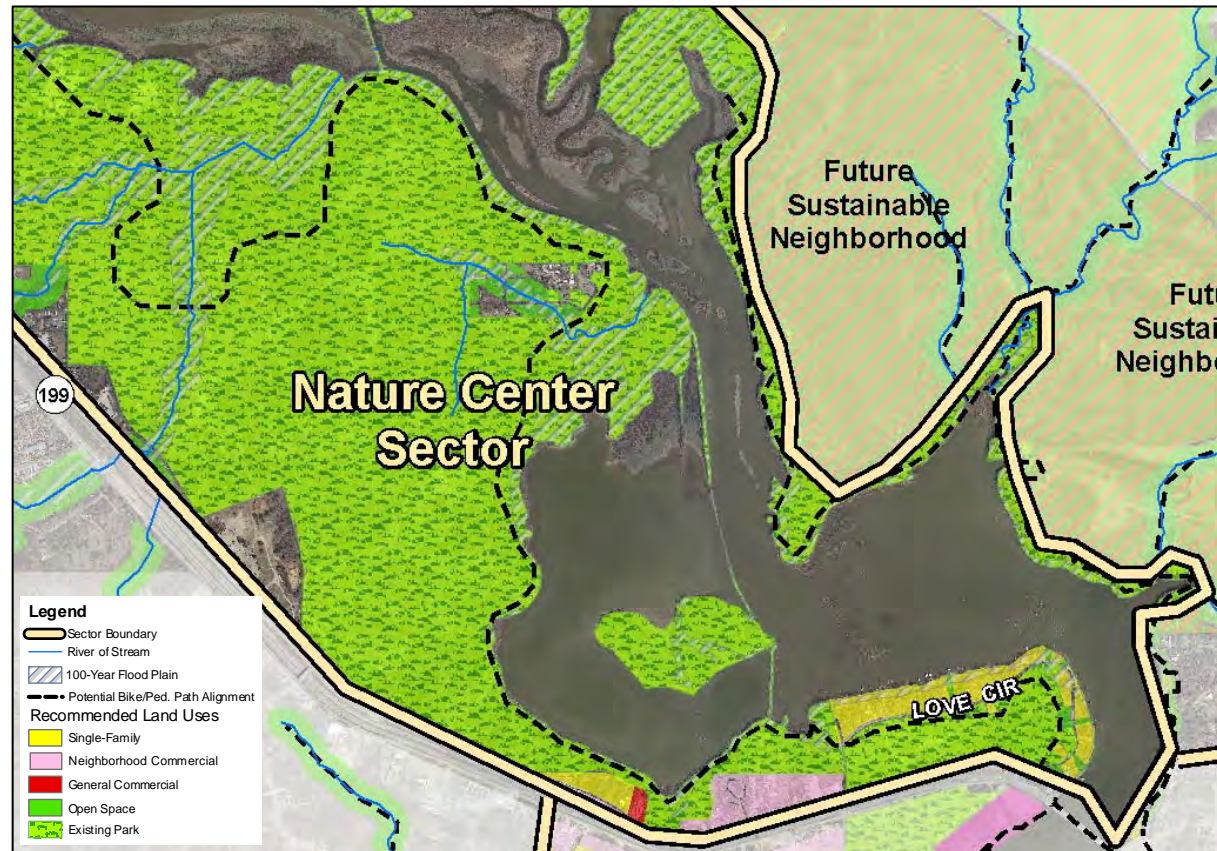
The Fort Worth Nature Center & Refuge Master Plan was adopted by the City in 2003. The following components of the master plan are particularly important in determining the future of the Nature Center Sector.

From the Planning/Site Context & Aesthetic Goals section of the master plan:

- Protect the integrity of the natural and cultural resources through land acquisition. First priority would be the in-holdings. Secondary would be land that falls within conservation easements, leased properties that become available, and properties along Jacksboro Highway.
- Enhance and maintain the quality of the site for long-term sustainability.
- Change the overall character of the FWNC&R to a more inviting and accessible public center.
- Visually define the boundaries of the site.
- Utilize adjacent city owned parkland to create an economic catalyst to generate funding for the FWNC&R.

From the Land Use Recommendations section:

5. Annex property along Jacksboro Highway and all farmland within the watershed.

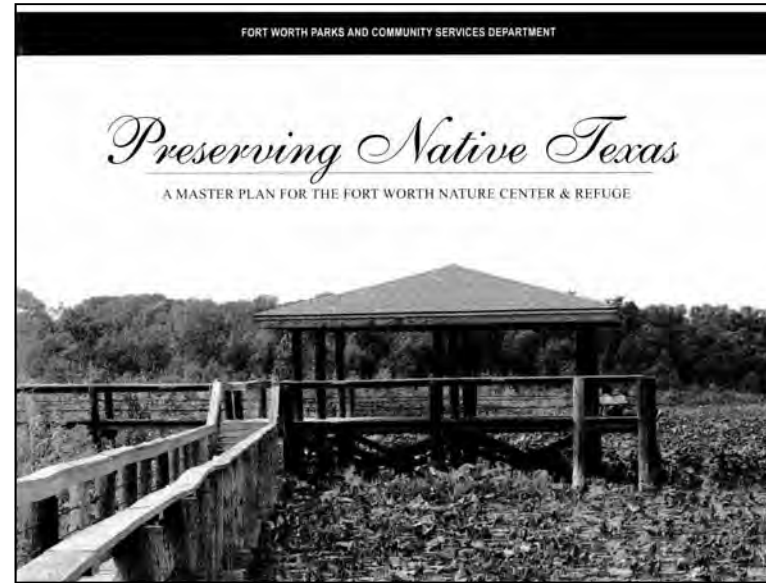


Nature Center Sector (cont.)

In accordance with these goals and recommendations, the Nature Center Sector is expected to play a central role in the development of a linear regional park that links the Trinity Trails system to a greenbelt along the shores of Lake Worth, through the expanded Fort Worth Nature Center & Refuge envisioned in the Nature Center Master Plan, and on to the shores of Eagle Mountain Lake. Cyclists, hikers, and joggers will be inspired and challenged to traverse the park on shoreline off-street paths from Marion Sansom Park or the new sustainable neighborhoods along Silver Creek Road to Eagle Mountain Lake. The lakeshore multi-use path (black dotted line on map) will connect in the Love Circle area to existing park roads and shoreline paths within the Nature Center, ultimately extending beyond the Nature Center boundary to reach the Eagle Mountain Lake shoreline.

The Lake Worth Vision Plan is intended to support and enhance the role of the Nature Center, while raising its visibility and importance as a focal point within the proposed linear regional park. The Lake Worth Vision Plan foresees little additional development within the Nature Center Sector. While redevelopment along Jacksboro Highway/SH 199 may provide opportunities for limited neighborhood and visitor-serving commercial and recreation-oriented uses, the unincorporated land immediately adjacent to the Nature Center could be acquired and incorporated into the Nature Center in the future, as indicated in the above Nature Center Master Plan goals.

Jacksboro Highway north of Lake Worth is expected to remain a major transportation corridor for the next 20 years and beyond, as development continues northwest of Loop 820 and in outlying communities and distant towns. Effective coordination with TxDOT will be important as the State seeks to increase capacity on Jacksboro Highway/SH 199 in the future.

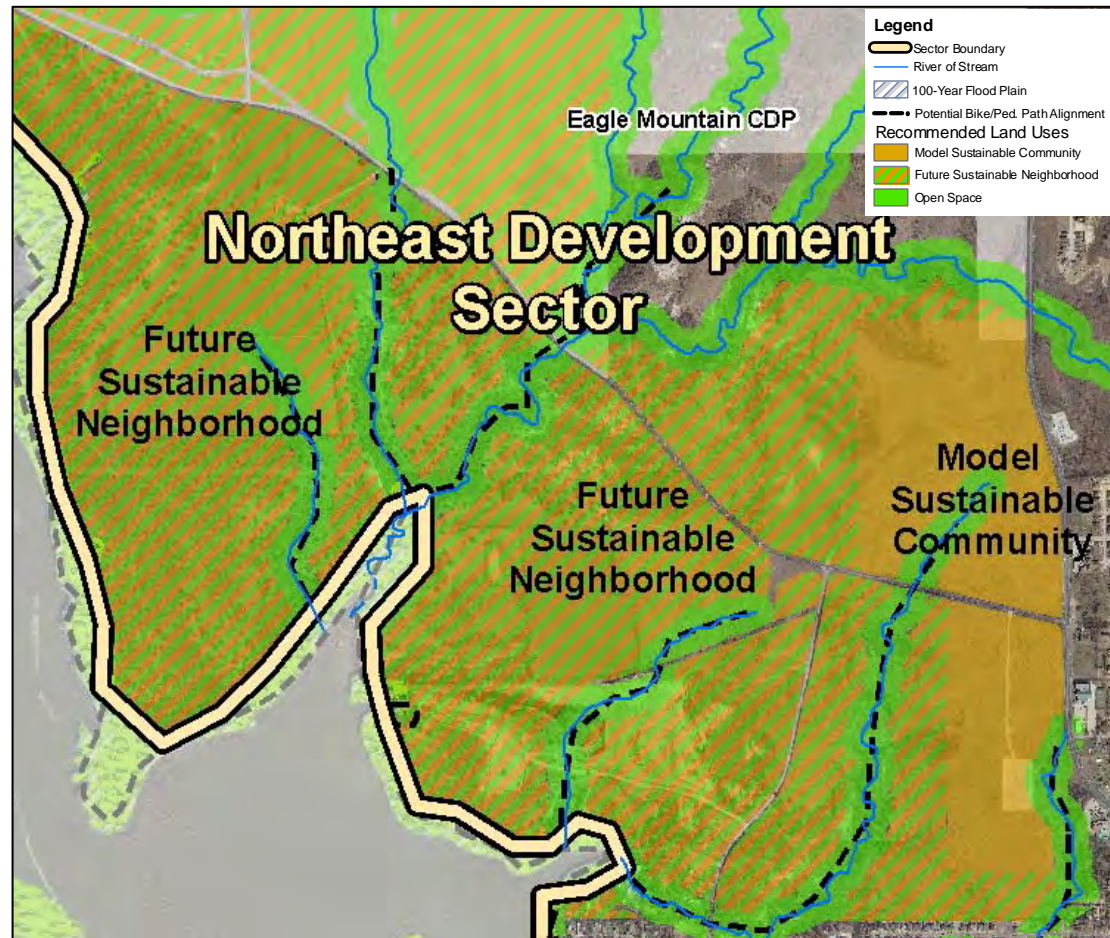


Northeast Development Sector

The Northeast Development Sector includes the ranch land east of the Nature Center within Fort Worth's Extraterritorial Jurisdiction (ETJ), as well as the growing residential areas north of the City of Lake Worth. This sector has already experienced rapid growth, particularly between Boat Club Road and Marine Creek Parkway within the City of Fort Worth. Most of this area has developed as low-density suburban sprawl. Much of the developed area contains entry level or second-tier single-family residences built within automobile-oriented neighborhoods. A significant proportion of the new housing in the area continues the trend of developers and builders focusing on a more affordable housing market segment in developing areas outside Loop 820 in Fort Worth.

While undeveloped land remains in the portion of the Northeast Development Sector within Fort Worth's city limits, perhaps the greatest opportunity for innovative development and neighborhood place-making lies in the ranchland along Ten Mile Bridge Road. This land is in an unincorporated area located within Fort Worth's ETJ. Extending from the eastern boundary of the Fort Worth Nature Center and Refuge across Ten Mile Bridge Road to Boat Club Road, the land is predominantly grazed grassland featuring flat to gently rolling topography and numerous natural drainage ways, some retaining their pre-existing wooded riparian buffers.

The Lake Worth Vision Plan foresees two forms of sustainable development occurring in the Northeast Development Sector between the Nature Center and Boat Club Road. Nearest Boat Club Road, the plan envisions development of a Model Sustainable Community. Model Sustainable Communities are intended to serve as showcases of Low-Impact Development techniques to control and filter storm water runoff before it reaches Fort Worth's raw drinking water supply in adjacent Lake Worth. In addition, Model Sustainable Communities are expected to demonstrate sustainable community design principles, such as mixed-use neighborhood centers, well connected and pedestrian-friendly street grids, provision of a broad range of housing choices, and off-street pathway linkages between neighborhoods and nearby destinations such as schools, shopping, and Lake Worth's lakeshore path.



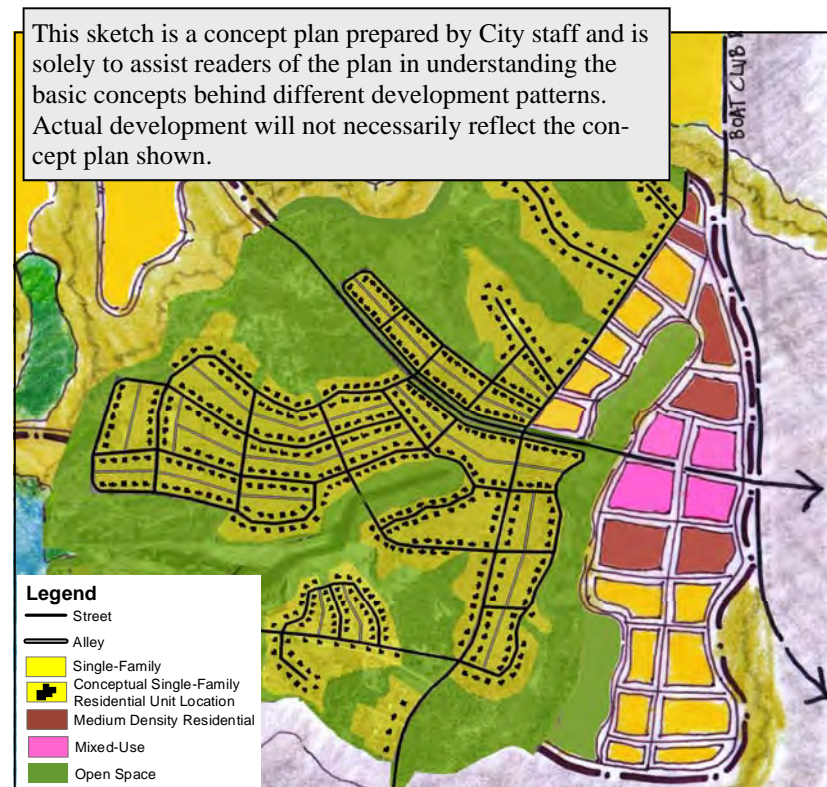
Northeast Development Sector (cont.)

West of Hodgkins Road where the topography is more rolling, Future Sustainable Neighborhoods are envisioned that reflect current land-owner development desires as expressed in meetings on the Lake Worth Vision Plan. These neighborhoods are envisioned as offering low-density residential areas designed in clusters around natural drainage ways and open spaces, with greenway trails providing access to the integrated open space areas and the lakeshore trail. Low Impact Development techniques in these future neighborhoods will extend natural drainage system elements into the residential areas, providing amenities to future residents while protecting water quality.

As a visualization tool, the concept plan sketch shown on the right, depicts one possible development scenario that reflects both the Model Sustainable Community and Sustainable Neighborhood approaches. Near Boat Club Road, the sketch depicts a walkable street grid that takes advantage of the relatively flat topography of this site, while framing potential locations for commercial and mixed-use development, medium-density housing, and lower density subdivisions. The more active commercial and mixed-use core of the community is centered around the intersection of Boat Club Road and Ten Mile Bridge Road, where commercial opportunities are high and topography supports relatively easy connection to public infrastructure. The mixed-use and commercial core is surrounded by walkable blocks of medium-density housing, perhaps similar to the type supported by the City's new design-focused Urban Residential (UR) zone. Lower density neighborhoods of primarily single-family homes would complete the Model Sustainable Community, extending westward toward Hodgkins Road. Public streets are envisioned along the exterior boundaries of the Model Sustainable Community, providing distinct edges to the community, while enhancing public access to adjacent parks, open space, and creekside riparian buffers/greenways.



Example of Model Sustainable Community in Colleyville, TX



Concept plan sketch of potential Model Sustainable Community and Sustainable Neighborhood in Northeast Development Sector

Northeast Development Sector (cont.)

The western part of the sketch depicts a lower density Sustainable Neighborhood concept that clusters development around shared open spaces. In this area, the street network addresses the topography of the site more directly, while retaining some elements of a walkable grid. Topography, natural drainage ways, open spaces, and views play a defining role in the Sustainable Neighborhoods, establishing the structure of neighborhood by determining the street layout and the location of development pockets within a network of open spaces. Individual homesites would be located to make the best use of scenic views and adjacent open spaces. While an appropriate level of neighborhood density is supported, this density is achieved by clustering homes around undeveloped open space areas that serve as neighborhood amenities while slowing and filtering storm water runoff.

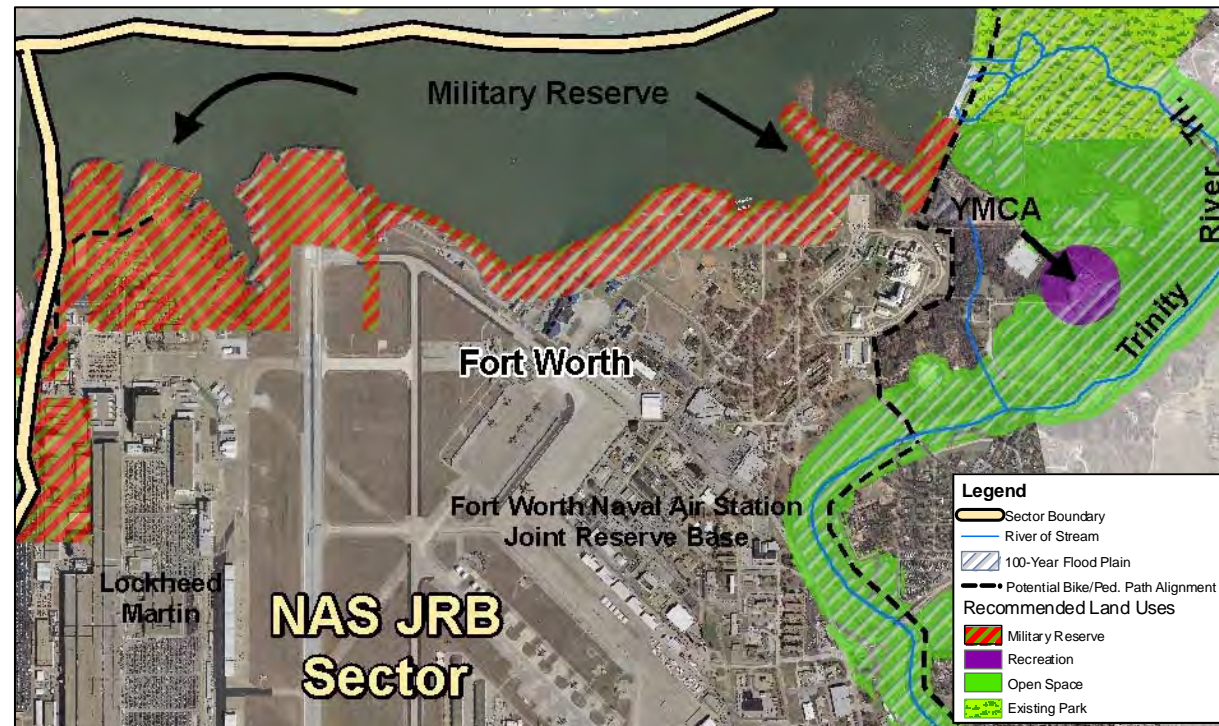


Example of Sustainable Neighborhood in Australia

NAS JRB Sector

The NAS JRB Sector (for Naval Air Station Joint Reserve Base) includes all the existing neighborhoods east of the City of Lake Worth and south of Loop 820, with the exception of the land within the City of Fort Worth that is located between Loop 820 and the north shore of Lake Worth, across from NAS JRB. Also excepted from this sector is the land between the northern boundary of the City of White Settlement and Loop 820, west of the Lockheed Martin facility.

The NAS JRB Sector includes the existing major employment center created by the co-location of the Lockheed Martin aircraft manufacturing plant and the Naval Air Station Joint Reserve Base. These adjacent facilities together employ more than 25,000 citizens of Fort Worth and surrounding communities. The NAS JRB Sector also includes portions of the City of White Settlement, the City of Sansom Park, and the City of River Oaks.



Little new development is anticipated within the NAS JRB Sector outside of any facilities expansions conducted by the base or by Lockheed. The Lake Worth Vision Plan identifies the south shore of Lake Worth adjacent to NAS JRB and Lockheed as a Military Reserve, in order to prevent new development in this area that would likely conflict with base operations and/or diminish base security.

The most important future development in the NAS JRB Sector as it relates to the Lake Worth Vision Plan involves the completion of the Trinity Trails extension from its existing terminus adjacent to the base, through Marion Sansom Park, to connect to the proposed lakeshore bicycle/pedestrian path on the opposite side of the lake from the base. The Lake Worth Vision Plan foresees the Trinity Trails extension (dotted line on the map) as a paved multi-use path located along the shoreline of the West Fork of the Trinity River, passing west of the YMCA camp on or along surface streets before crossing the West Fork near the Lake Worth Dam to make the lakeshore path connection at the western edge of Marion Sansom Park.

The Trinity Trails extension would include a paved trail connection to upgraded parking areas on Roberts Cut-Off Road. The existing Fort Worth Mountain Bikers' Association trails in Marion Sansom Park would be improved as needed and remain an important recreational feature of the park.

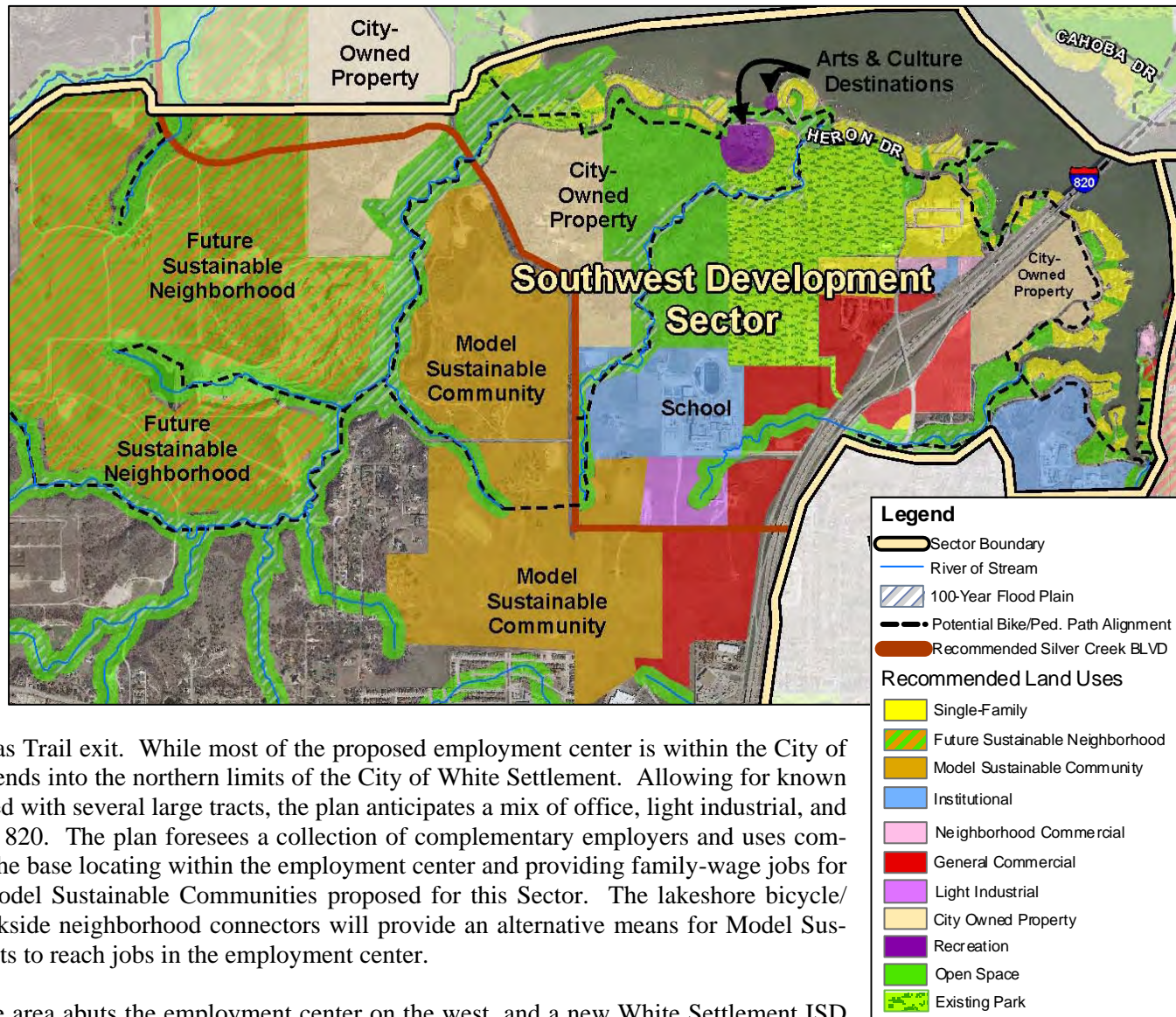
Southwest Development Sector

The Southwest Development Sector extends from Bomber Road north of the White Settlement city limits, westward across Loop 820 to Western Oaks Road. This sector includes the lakefront homes along Shoreview Drive and Heron Drive, while reaching westward as far as Cattlebaron Drive, and southward to White Settlement Road.

The Southwest Development Sector contains more acres of developable land than any other sector of the Lake Worth Vision Plan. The eastern end of the sector includes approximately 115 acres identified as a future employment center adjacent to Loop 820 at the Las Vegas Trail exit.

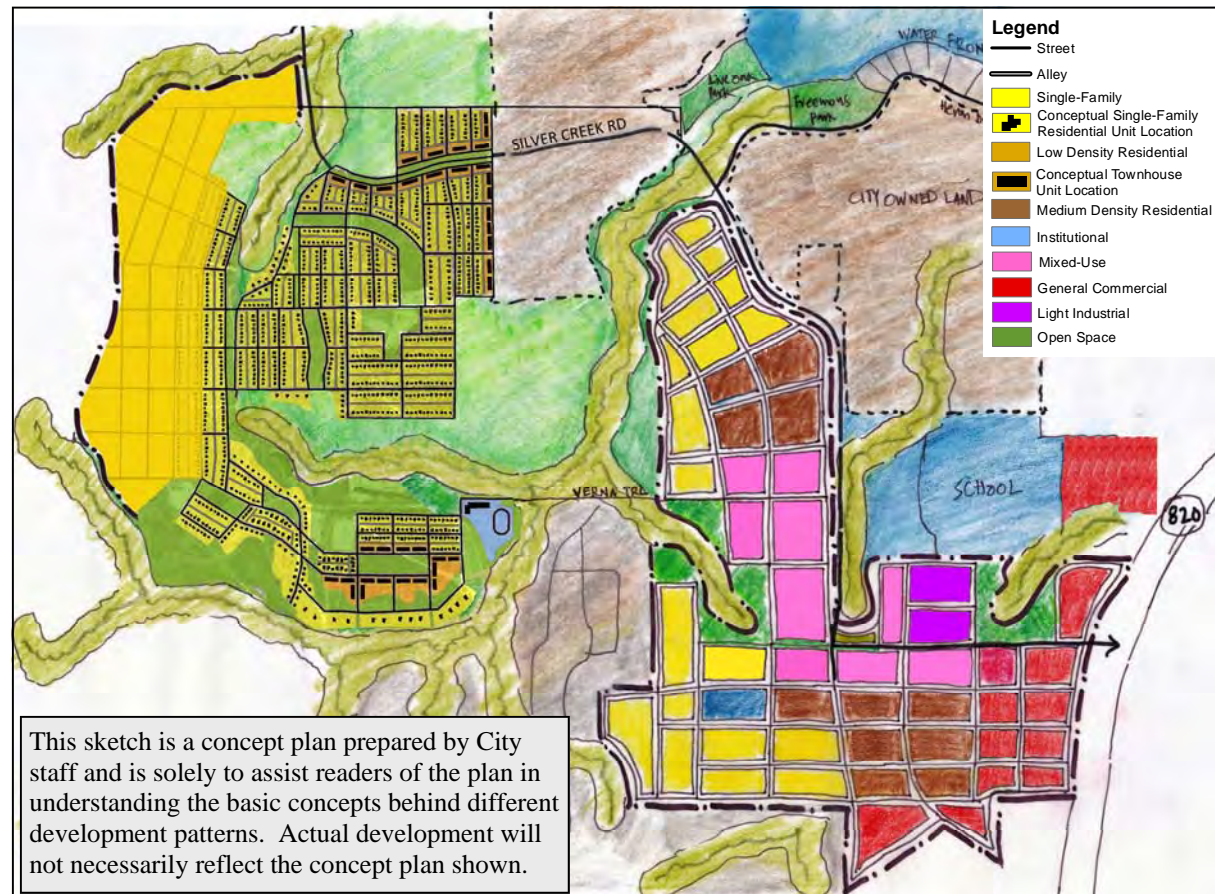
While most of the proposed employment center is within the City of Fort Worth, the concept extends into the northern limits of the City of White Settlement. Allowing for known development plans associated with several large tracts, the plan anticipates a mix of office, light industrial, and commercial uses near Loop 820. The plan foresees a collection of complementary employers and uses compatible with Lockheed and the base locating within the employment center and providing family-wage jobs for the residents of the new Model Sustainable Communities proposed for this Sector. The lakeshore bicycle/pedestrian path and its creekside neighborhood connectors will provide an alternative means for Model Sustainable Community residents to reach jobs in the employment center.

An existing park/open space area abuts the employment center on the west, and a new White Settlement ISD high school is located adjacent to the park. Riparian buffer areas on the east and west side of the high school are traversed by natural drainage ways. The park area in particular provides opportunities for the creation of retention/detention ponds and constructed wetlands to help slow and filter storm water runoff from the nearby Model Sustainable Communities before it reaches Lake Worth. Students from the high school could use the sites as outdoor classrooms, while contributing to the long-term study and maintenance of these storm water management facilities.



Southwest Development Sector (cont.)

The City of Fort Worth owns a large tract of land between the high school and the lake. This 320-acre area was initially identified as open space in the consultant's Great Park Scenario, and then as a combination of open space and a Model Sustainable Community in the Sustainable Future Scenario. The consultant team recommended that one or more Model Sustainable Communities be developed on City-owned land. The City-owned tract north of the high school is one of two locations where this recommendation could be implemented. (The other City-owned location straddles the boundary between the Southwest Development Sector and the West Lake Sector, north and west of the Silver Creek Road/Parkway crossing of Live Oak Creek.) A portion of the 320-acre tract is shown as open space directly west of West Park. The Water Department has retained a consultant to perform a land disposition and trail alignment study for City-owned property around Lake Worth. These large tracts will be included in that study, which is to be completed in 2011.



Concept plan sketch of potential Model Sustainable Community and Sustainable Neighborhood in Southwest Development Sector

Model Sustainable Communities are intended to serve as a showcase of Low-Impact Development techniques to control and filter storm water runoff before it reaches Fort Worth's raw drinking water supply in Lake Worth. In addition, Model Sustainable Communities are expected to demonstrate sustainable community design principles, such as mixed-use neighborhood centers, connected and pedestrian-friendly street grids, provision of a broad range of housing choices, and off-street pathway linkages between neighborhoods and nearby destinations such as schools, shopping, and Lake Worth's lakeshore path. Model Sustainable Communities are expected to retain and protect significant trees and woodland areas, preserve and enhance riparian buffers along drainage ways, and co-locate off-street paths alongside or within creek buffers.

Southwest Development Sector (cont.)

The Southwest Development Sector contains two Model Sustainable Communities located along Silver Creek Road (which could be re-named Silver Creek Parkway or Lake Worth Parkway upon reconstruction, if Recommendation 4.1(b) on Page 78 is implemented). Silver Creek/Lake Worth Parkway may be realigned somewhat to take advantage of topography and to provide better access to the proposed Model Sustainable Communities. The road is envisioned as a relatively low-speed, four-lane divided parkway, within a broad park-like right-of-way containing parallel off-street bicycle-pedestrian paths. Where the parkway passes through Model Sustainable Community neighborhood centers, context-sensitive street design is expected to dictate a modified street cross-section that reflects the needs of a walkable urban neighborhood center. These communities would incorporate one or more walkable mixed-use village cores surrounded by appropriate medium to lower density residential neighborhoods connected to the lake via bike and walking trails. Public streets are envisioned along the exterior boundaries of the Southwest Development Sector's Model Sustainable Communities to provide distinct edges to the community and to enhance public access to adjacent parks, open space, and creekside riparian buffers/greenways.

The concept plan sketch on the previous page depicts one possible development scenario that reflects both the Model Sustainable Community and Sustainable Neighborhood approaches. East of Live Oak Creek, the sketch depicts a walkable street grid that takes advantage of the relatively flat topography of this site, while framing potential locations for commercial and mixed-use development, medium-density housing, and lower density subdivisions. The more active mixed-use core of the community is centered around the intersection of Silver Creek Road and Verna Trail, but the activity core could extend eastward along Silver Creek Road toward Loop 820. At the Loop 820 interchange, general commercial and perhaps some well designed light industrial are planned by the landowner.



Examples of Model Sustainable Communities

Southwest Development Sector (cont.)

A “green boulevard” or linear urban park space is envisioned between the southerly extensions of the two creeks that frame the northernmost Model Sustainable Community area. This greenway connection would serve as a distinct edge of the two adjacent Model Sustainable Communities depicted on the Southwest Development Sector map. The mixed-use core is surrounded by walkable blocks of medium-density housing, perhaps similar to the type supported by the City’s new design-focused Urban Residential (UR) zone. Lower density neighborhoods of primarily single-family homes would complete the Model Sustainable Communities, extending westward to Live Oak Creek.

The western part of the concept plan sketch depicts a lower density Sustainable Neighborhood concept that clusters development around shared open spaces. In this area, the street network addresses the topography of the site more directly, while retaining some elements of a walkable grid. Topography, natural drainage ways, open spaces, and views play a defining role in the Sustainable Neighborhoods, establishing the structure of neighborhood by determining the street layout and the location of development pockets within a network of open spaces. Individual homesites would be located to make the best use of scenic views and adjacent open spaces. While an appropriate level of neighborhood density is supported, this density is achieved by clustering homes around undeveloped open space areas that serve as neighborhood amenities while slowing and filtering storm water runoff.

Live Oak Creek and its tributaries bisect the Southwest Development Sector. As in other sectors, this network of drainage ways is expected to be protected by designated riparian buffers as shown on the Lake Worth Vision Plan map. Throughout the Southwest Development Sector, these stream buffers are intended to be retained and enhanced with appropriate native and adapted plantings. Paved multi-use paths are envisioned along all drainage ways throughout the sector to connect the lakeshore path with the new neighborhoods proposed for the Southwest Development Sector.



Green Boulevard example



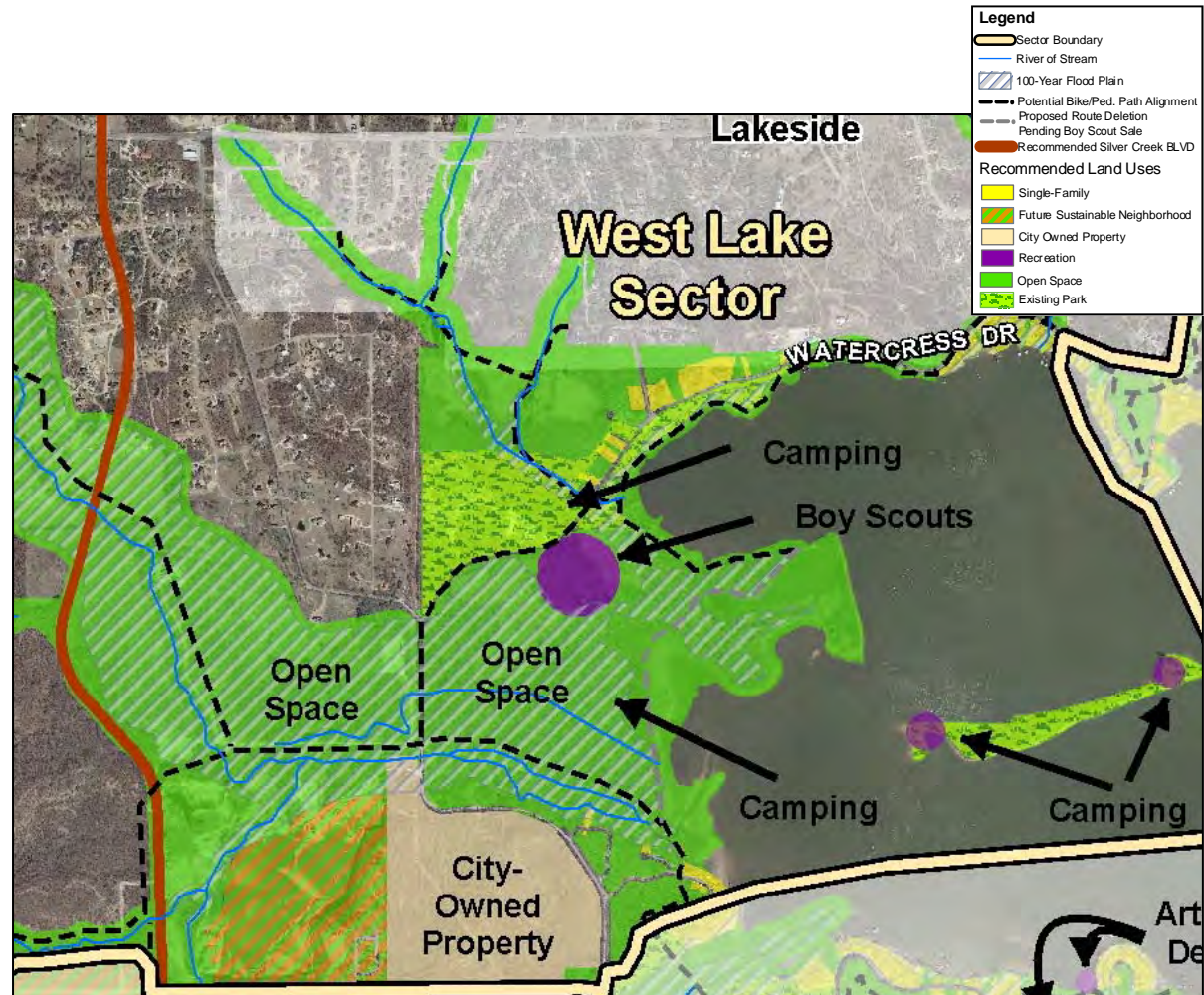
Examples of Sustainable Neighborhoods

West Lake Sector

The West Lake Sector covers all the land between Western Oaks Road/Live Oak Park and Jacksboro Highway/SH 199, with the exception of the land located east of the Town of Lakeside. As with the Southwest Development Sector, the western boundary of West Lake Sector is considered to be Cattlebaron Drive, which is approximately two miles west of the expected northern alignment of Silver Creek Road/Parkway.

The West Lake Sector includes the northern half of one of the two large tracts of vacant City-owned property that had been originally identified as a potential site of a proposed Model Sustainable Community. North and east of that City-owned land, open space is envisioned along the lakefront to enhance opportunities for visual and physical access to the lake in this last significant remaining stretch of publicly-owned lakeshore. To the west of the City-owned land, the northern extension of a Future Sustainable Neighborhood described in the Southwest Development Sector is indicated. Silver Creek and its tributaries bisect the West Lake Sector. As in other sectors, this network of drainage ways is expected to be protected by designated riparian buffers as shown on the Lake Worth Vision Plan map. Silver Creek passes a large area depicted as Open Space on the map, as well as the Future Sustainable Neighborhood located to the south of the Open Space area. The lakeshore bicycle/pedestrian path continues along the shoreline throughout the West Lake Sector, dramatically improving public access to Lake Worth.

The West Lake Sector includes large swaths of land located within 100-year floodplains, including the Silver Creek floodplain, and these floodplain areas are expected to remain largely undeveloped, while potentially supporting low-impact organic farming opportunities or ranching activities. The riparian corridors within the 100-year floodplain in this area would be enhanced with native or adapted plantings, particularly tree plantings along the creek banks. Ideally, the riparian corridor would be fenced in areas where cattle are present to reduce the opportunities for sediment and animal waste to enter Lake Worth in storm water runoff from streambanks disturbed by cattle encroachment. Conservation of this large open space area may require the implementation of one or more innovative approaches, such as transfer of development rights to neighborhood center areas within the Model Sustainable Communities, inclusion of an Urban Farm category in an agricultural zoning designation applied to the property, or other measures.



West Lake Sector (cont.)

An opportunity exists in the West Lake Sector for a new Boy Scout camp to be located near the lakeshore, with direct access to the lake. City staff has already begun talks with the Boy Scouts about the possibility of moving their camp from a leased portion of Mosque Point Park to the western end of Lake Worth. An approximate site of the potential Boy Scout camp is shown on the Lake Worth Vision Plan map.

The workshop consultants originally identified an opportunity to co-locate the Boy Scouts and the YMCA's Camp Carter on the western end of Lake Worth, where a large area of City-owned land along the shoreline could have provided a location for both groups to share some facilities and reduce the cost of leasing land. It was thought that the move would allow both groups to have direct access to the lake for the first time. However, following preliminary discussions between City staff and key representatives of the YMCA's Camp Carter, it became apparent that the original concept of co-locating these two community partners in the West Lake Sector would not proceed at this time. While the YMCA expressed some interest in having direct lake access at some point in the future, a move from the existing Camp Carter location on the east side of the dam to the west side of Lake Worth would, at best, be a long range opportunity due to the improvements already constructed at Camp Carter.

The West Lake Sector may provide the best opportunity to construct a long segment of the lakeshore bike path immediately adjacent to the shoreline, thereby supporting public health by creating new opportunities for active recreation and ensuring new public access to the lakeshore for fishing and enjoying lake views. In discussions with the Boy Scouts and other potential users of City-owned lakeshore land, it will be critical to preserve City ownership of significant areas of shoreline in order to protect the alignment of the lakeshore bicycle/pedestrian path – and with it the opportunity to improve access to the Lake Worth shoreline for all existing and future Fort Worth residents.

Goat Island in Lake Worth is included in the West Lake Sector. The Lake Worth Vision Plan envisions Goat Island as a remote camping facility accessible by boat. The Boy Scouts could use Goat Island for camping, and the Scouts could contribute to the island's improvement and maintenance.



Lakefront camping at Lake Lewisville , TX

The Town of Lakeside lies north of the Lake Worth shoreline, extending west to the existing Silver Creek Road alignment and north to Jacksboro Highway/SH 199. Several small drainage ways cross the town, and each of these is shown with the standard recommended 100-foot riparian buffer depicted throughout the entire Lake Worth area. The riparian buffer is intended to protect creekside land from development activities that can increase the sediment load and other pollutants entering the raw water supply of Fort Worth and surrounding communities. The riparian buffers also provide locations for future bicycle/pedestrian paths to Lake Worth, while conserving valuable natural open space within neighborhoods. Such 100-foot riparian buffers are also shown extending into the western part of the West Lake Sector, and these serve the same purposes of protecting the water quality in Lake Worth, reducing the need to dredge the lake in the future, and protecting the most valuable open space and bicycle/pedestrian path corridors as the West Lake Sector develops in the future.



Lake Itasca boardwalk, Ramsey, MN

Town Center Sector

The Town Center Sector includes the entire small city of Lake Worth and the surrounding Lake Worth shoreline, as well as land within the city of Fort Worth between the east end of the lake and Jacksboro Highway/SH 199. The Town Center Sector also includes the land south of Jacksboro Highway from Casino Beach Park to the eastern limits of the Town of Lakeside.

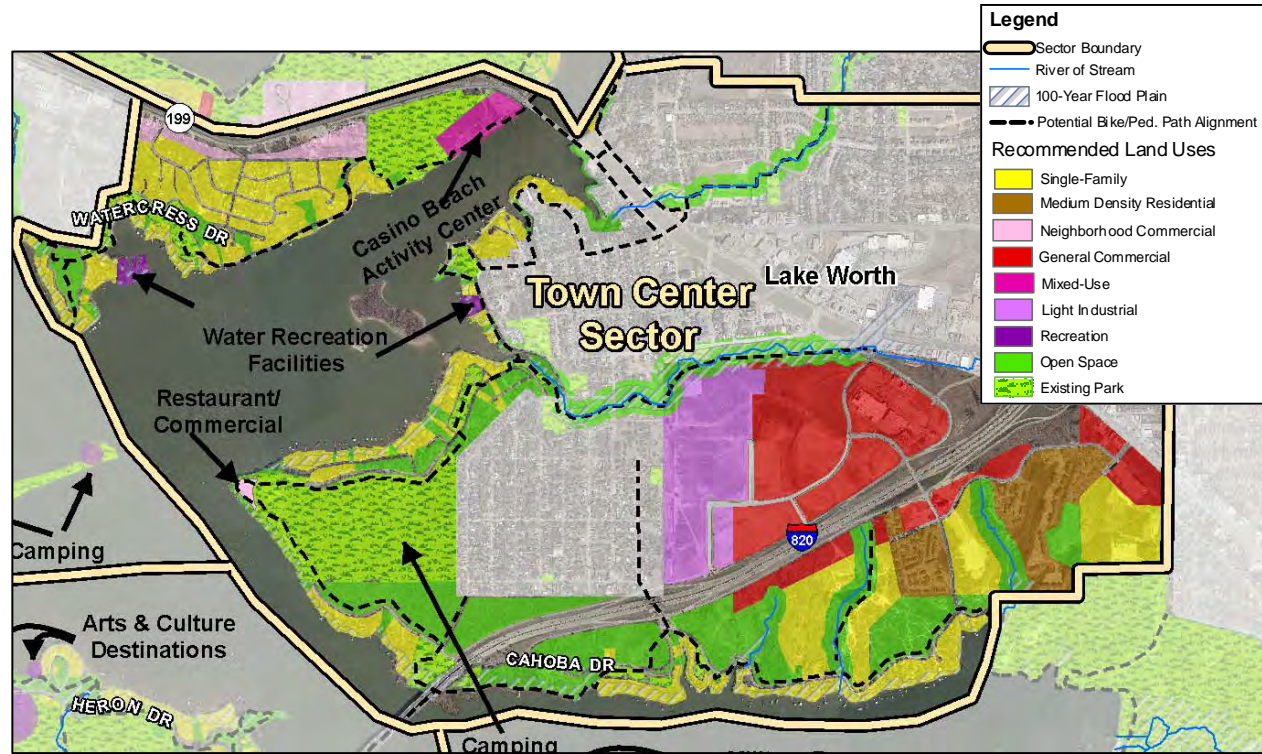
Many of the existing parks and recreational facilities around Lake Worth are located in the Town Center Sector. The City property used by the Lake Worth Sailing Club is located in the far western end of this sector near Sunset Park and the Town of Lakeside. The City property used by the Lake Worth Boat and Ski Club is located across the lake, near Marina Park and Willow Island.

The Lake Worth Vision Plan supports the boating recreation activities offered by both clubs, and calls for increased opportunities for Fort Worth residents to participate in water recreation activities at Lake Worth, whether through the expansion of existing clubs or the creation of new organizations and the development of new facilities. In the short term, the Lake Worth Vision Plan supports consideration of long-term leases for the existing clubs at their current location or at another suitable location on the lake.

The Casino Beach Park area on the west end of the Jacksboro Highway/SH 199 bridge over Lake Worth is the historic center of recreational activity at Lake Worth. The photos included in the Lake Worth History section of this plan document the rich history of Casino Beach Park. The Lake Worth Vision Plan foresees Casino Beach Park as once again playing a central role in the revitalization of Lake Worth as a recreational resource for all the citizens of Fort Worth and surrounding communities.



Excelsior, MN town dock



The Lake Worth Vision Plan calls for the Casino Beach area to be redeveloped as a mixed-use, recreation-oriented environment with a distinct sense of place. A compact, walkable mix of restaurants, specialty retail establishments, water-oriented recreation, and perhaps some higher-density housing or lodging facilities would be an appropriate future for the Casino Beach area. A portion of the existing park east of the north-south segment of Watercress Drive and adjacent to the highway could become part of the mixed-use recreational area development in the future, if an appropriate parkland swap can be arranged or long-term leases can be established that facilitate such uses.

Town Center Sector (cont.)

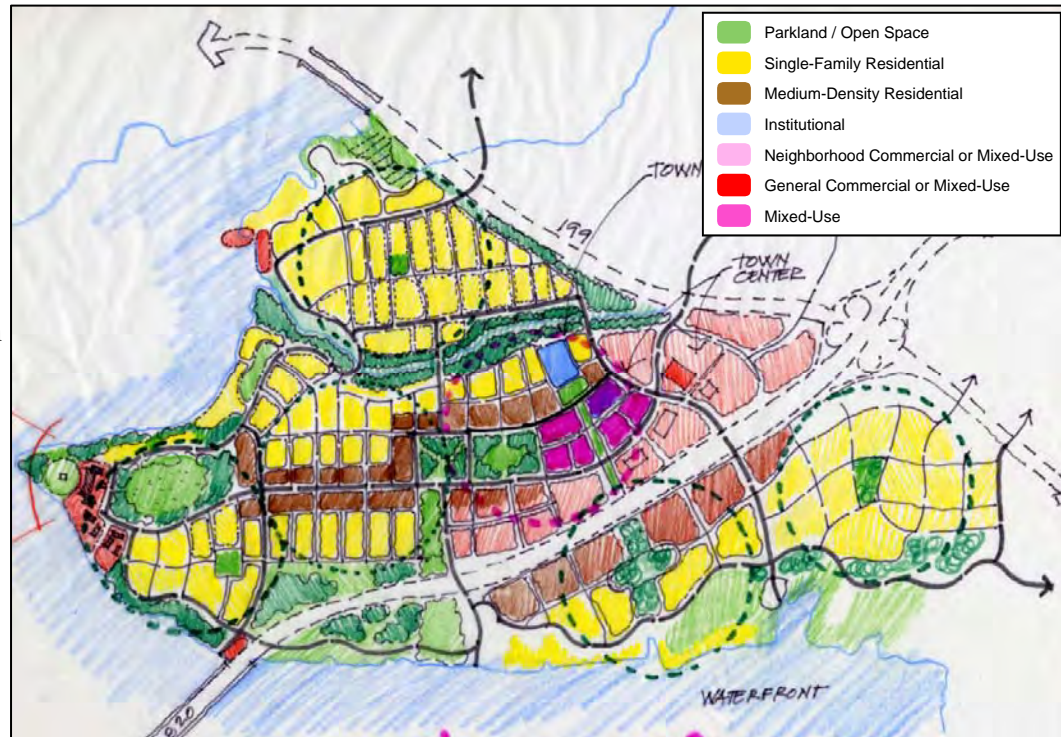
As a complement to the Casino Beach area mixed-use redevelopment, the unincorporated land on the south side of Jacksboro Highway should be annexed by the City of Fort Worth. The Lake Worth Vision Plan map depicts the unincorporated land along Jacksboro Highway as Neighborhood Commercial, which could support some mixed-use development in addition to smaller scale commercial uses. Much of the unincorporated land between Jacksboro Highway and Watercress Drive is already developed as a single-family residential neighborhood. No change in land use is contemplated within the existing neighborhood, although redevelopment of individual properties might be anticipated once City water and sewer service become available.



Lakeshore trail at Lake Harriet, MN

East of the Jacksboro Highway/SH 199 bridge, the Town Center Sector is split almost equally between the City of Lake Worth and the City of Fort Worth. A key recommendation made by the consultant team at the Lake Worth Vision Workshop was that the two cities work together to create a Lake Worth Town Center that would extend across their shared city limits boundary and result, over time, in a new, more pedestrian-friendly development pattern south of Jacksboro Highway. To illustrate the alternative Town Center future envisioned during the workshop, the consultants created a sketch of their Town Center concept, which is depicted to the right.

Activities at Casino Beach and the adjacent park will be connected to the surrounding communities by the lakeshore bicycle/pedestrian path, providing local residents with the option of leaving their cars at home when visiting Casino Beach. Weekend or evening rides around the lake or through the Nature Center are envisioned as ending with a choice of eateries at Casino Beach. A safe bicycle/pedestrian path connection across the Jacksboro Highway/SH 199 bridge is needed to improve connectivity between the future Casino Beach development and the neighborhoods in the City of Lake Worth, including the potential future neighborhoods described in the Lake Worth Town Center concept.



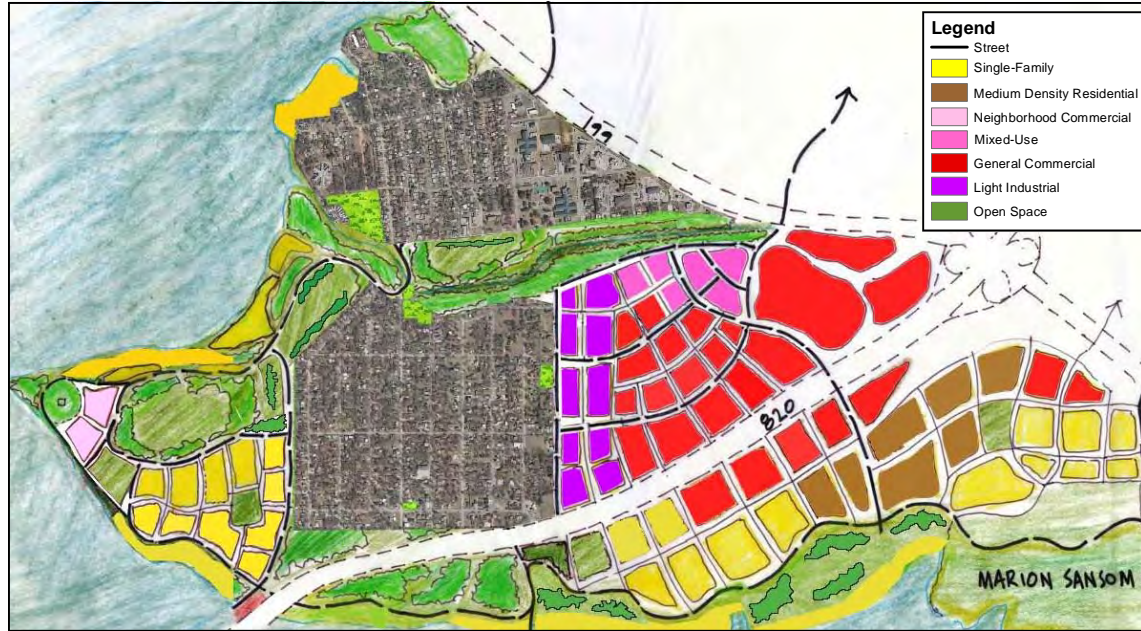
Consultants' illustration of Lake Worth Conceptual Town Center, before changes

Town Center Sector (cont.)

The town center concept was modified by City staff to be more compatible with the recently completed Fort Worth Naval Air Station Joint Reserve Base (NAS JRB) Joint Land Use Study (JLUS) and to reflect commercial development that is underway. In accordance with JLUS land use guidelines (see Appendix D) vacant land within the Accident Potential Zone (APZ) is envisioned as a well-designed light industrial park or similar low-density employment area rather than the residential uses depicted in the consultants' sketch.

The base-friendly Lake Worth Town Center concept envisions a long-term future that includes a walkable street grid stretching west from Quebec Street/Northwest Centre Drive to Mosque Point, with a strong commercial core near the Loop 820/Jacksboro Highway interchange and lower density employment areas between Buda Lane and Dakota Trail. While the focus of pedestrian activity would likely be east of Buda Lane, the light industrial park or similar low-density employment area should transition smoothly between the commercial uses east of Buda Lane and the existing City of Lake Worth residential neighborhood west of Dakota Trail. To achieve the longer-term vision for the future Town Center area, near-term commercial development projects should incorporate a street grid that yields walkable block sizes, even if the street grid is intended to serve as private parking lot access roads in the near term.

Located on land that is currently mostly vacant, the commercial core is intended to serve as the pedestrian-oriented center of the Lake Worth community, regardless of whether the residents served are in the City of Lake Worth or the City of Fort Worth. Functionally, the Town Center concept provides the core elements of a walkable community that, in the consultants' view, are currently lacking in this area. An institutional use, such as a hospital, government offices or a community center, is depicted in the Town Center concept plan immediately adjacent to the core, on the south side of a greenway riparian buffer and bicycle/pedestrian path to the lake. Charbonneau Road runs along the north side of the riparian buffer.



Town Center concept as modified by staff



Examples of walkable industrial and commercial developments

Town Center Sector (cont.)

In consultation with the property owners, a small portion of the Lake Worth Town Center along the Charbonneau Road greenway is depicted as a mixed-use area contained within several walkable blocks abutting the greenway. This series of mixed-use blocks could provide the beginning of the pedestrian-oriented Lake Worth Town Center envisioned by the consultant team.

The land to the south of Loop 820 could also be served by a walkable street grid, with the blocks adjacent to Loop 820 identified as general commercial with a mix of low- and medium-density residential development extending southward toward the lake outside of the Accident Potential Zone. The lakeshore bicycle/pedestrian path would be easily accessible from these residential areas by bicycle/pedestrian paths within riparian buffers, or by local street connections.

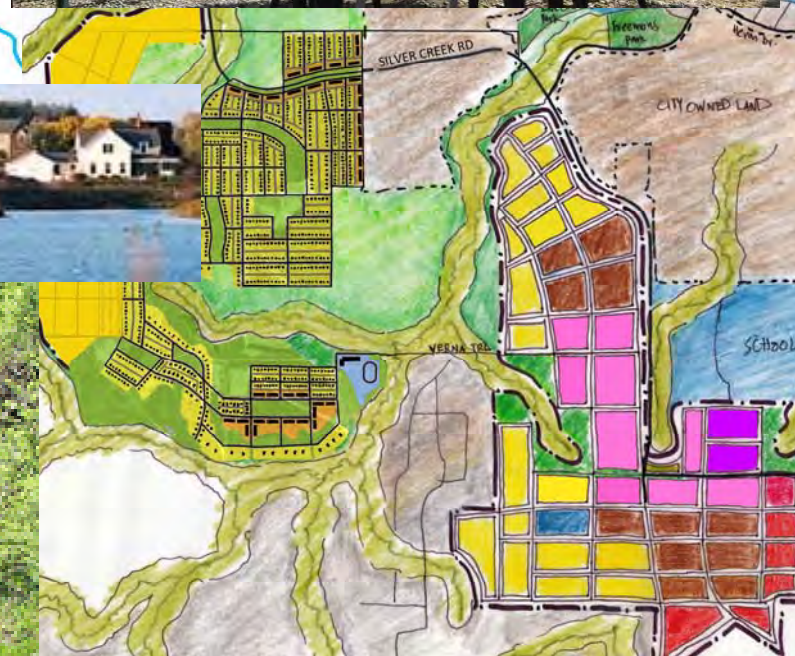
At Mosque Point Park, there is an opportunity to provide a long-term lease for a restaurant to be located on the point, overlooking Lake Worth. The consultant team identified such a restaurant development as an unmet need in the area, and an effective way to showcase Lake Worth and generate broader interest in visiting the lake for other recreational purposes.

As depicted on the Lake Worth Vision Plan map, a future bicycle/pedestrian path connection between the Town Center sector and the Southwest Development Sector is envisioned, perhaps spanning the existing low-elevation bridge abutment cross-beams as a foundation for a near-water, light-duty bicycle/pedestrian bridge underneath Loop 820. Such a connection would create a safe and scenic bicycle/pedestrian crossing where one does not currently exist, and more effectively link the proposed employment center on the south end of the bridge with the existing and proposed neighborhoods at the north end of the bridge.

The panel recommended that the City and stakeholders use the following **four guiding principles** in implementing the workshop vision:

- 1. Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.**
- 2. Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.**
- 3. Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.**
- 4. Connect communities, resources, and amenities with parkways, greenways, and trails.**

Part Four: Recommendations and Implementation outlines the consultant panel's recommendations for implementing the workshop



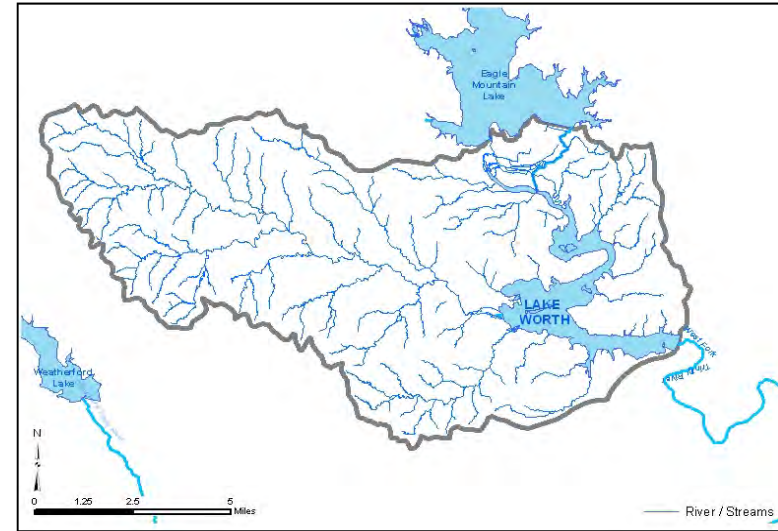
PART FOUR: PRINCIPLES, RECOMMENDATIONS, AND IMPLEMENTATION

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.1 Include the entire Lake Worth watershed when planning for development around Lake Worth. The consultant panel highlighted the importance of the entire Lake Worth watershed and its connection to water quality, sedimentation, and pollution levels in Lake Worth. Planning should not be limited to the areas immediately surrounding the lake. To protect Fort Worth's drinking water supply, standards should be established and implemented to control sedimentation and pollution along all perennial and intermittent streams that flow into Lake Worth. The consultant panel believes the City of Fort Worth will have to repeatedly dredge the lake unless measures are implemented to improve current conditions along waterways within Lake Worth's watershed.

The consultant panel recommended that a thorough study be conducted during normal and flash flood rain events for the entire Lake Worth watershed. Sediment and pollution yields increase substantially during flash flood events. Often, studies are conducted during normal rain events only, which could miss critical information in identifying areas contributing most to sediment buildup and pollution. The study would identify these critical areas and allow communities to focus resources to achieve best results.



The Lake Worth watershed is approximately 94 square miles (including Lake Worth) with about 230 linear miles of streams and rivers



Sediment that has made it through silt fences north of Loop 820/South of Jacksboro Highway



Sediment runoff from new development on White Settlement Road

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.1 Include the entire Lake Worth watershed when planning for development around Lake Worth. (cont.)

Implementation Measures:

1.1(a) Create a Lake Worth Regional Coordination Committee (LWRCC) to review and recommend to the City of Fort Worth and participating jurisdictions relevant actions regarding development activity around the lake. The committee should include representatives from the City of Fort Worth, Tarrant County, surrounding jurisdictions, watershed neighborhood leaders, major property owners, and nonprofit stakeholders. The consultant panel suggested using the Trinity River Vision Authority as a template for Lake Worth. However, an authority may not be the appropriate body since an authority typically receives funds from all participating jurisdictions. A coordinating committee similar to the NAS JRB Regional Coordination Committee is recommended for Lake Worth. A Lake Worth Watershed Council made up primarily of landowners within the watershed may also be a future implementing body of the Vision Plan.

1.1(b) One of the first tasks for the Lake Worth Regional Coordination Committee should be to commission a study to assess the entire Lake Worth watershed during normal and flash flood rain events. The results from the study would provide essential information for the watershed master planning process.

1.1(c) The LWRCC should lead a detailed master watershed planning process, with input from all stakeholders in the Lake Worth watershed, to identify areas contributing excessively to sediment and pollution runoff into Lake Worth, and to determine the most appropriate strategies and actions to implement throughout the watershed to control erosion, reduce sediment pollution loading, and minimize nonpoint source pollution within the watershed.

1.1(d) Lake Worth stakeholders may wish to form a committee to provide input to the Lake Worth Regional Coordination Committee, the Fort Worth City Council, and other agencies to support implementation of the Lake Worth Vision Plan. This committee might include but is not limited to watershed neighborhood leaders, property owners, business owners, recreational users, environmental interests, and development interests.



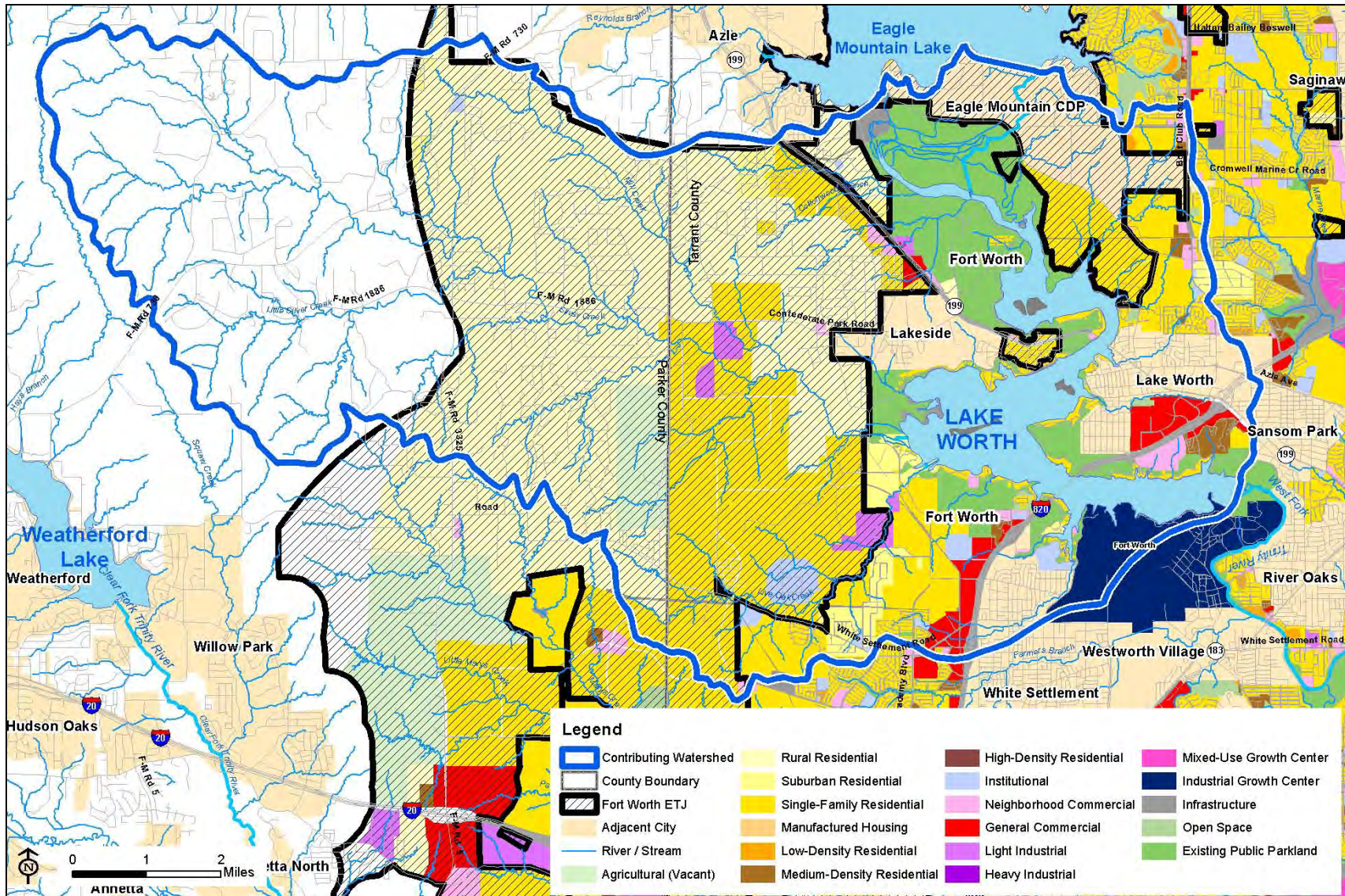
New development on Lake Worth; silt fence in place; grass buffer good aid in catching silt runoff

Nonpoint source (NPS) pollution results when small amounts of contaminants from a large number of sources are carried by rainfall runoff into streams, lakes, or bays.



Sediment deposited on abutments from runoff at FM 1886 and Silver Creek Road

Map 21: Watershed Jurisdictions



Source: City of Fort Worth

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

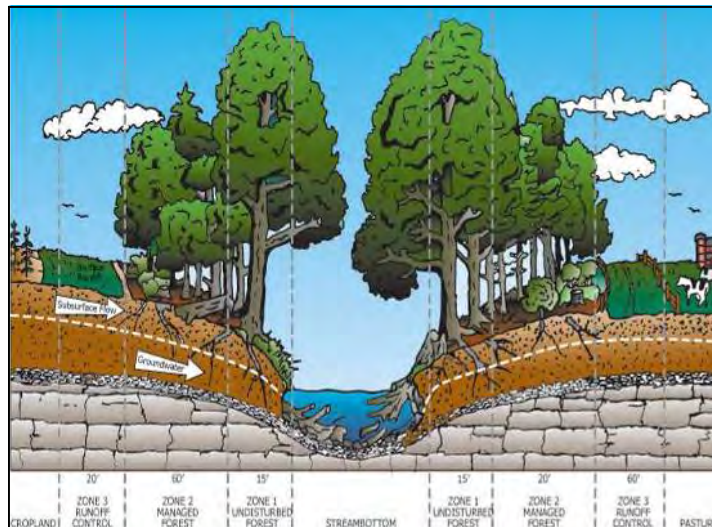
Recommendations

1.2 Protect riparian areas, 100-year floodplains, steep slopes, and highly erodible soils. The consultant panel emphasized the need to prohibit development and agricultural uses within riparian buffer areas while also prohibiting development within the 100-year floodplain. Additionally, limited development should be allowed on steep slopes and areas with highly erodible soils, and best practices should be implemented where development does occur.

Riparian areas are the transition zones between open water and developable or arable dry land. In order to protect streams and rivers from sediment and pollution carried by storm water runoff, a riparian buffer is often established as a last line of defense. The consultant panel recommended establishing a 100-foot riparian buffer from the edge of streams and rivers where development as well as agricultural uses would be prohibited. By prohibiting development and agricultural uses, and allowing native and adapted vegetation to flourish in the riparian buffer, streams, rivers, and lakes are better protected against excessive sediment buildup and nonpoint source pollution.

The 100-year floodplain includes areas that have a one-percent chance of flooding in any given year. Development should be prohibited in these areas to preserve the natural function of floodplains and to further protect Lake Worth from sediment buildup and nonpoint source pollution during flood events.

Undeveloped floodplains reduce the number and severity of floods in developed areas downstream by slowing and storing storm water runoff. Natural floodplains also improve water quality by filtering sediment and impurities carried by storm water. The resulting reduction in nonpoint source water pollution entering drinking water supply reservoirs helps to reduce water treatment costs and preserve drinking water supply capacity over the long term.



Typical riparian buffer with thick vegetation close to the rivers edge.

Principle One: Protect and enhance Lake Worth’s water quality, natural beauty, and recreational character.

Recommendations

1.2 Protect riparian areas, 100-year floodplains, steep slopes, and highly erodible soils. (cont.)

Implementation Measures:

1.2(a) Strengthen the existing subdivision and storm water ordinances to better protect riparian areas, steep slopes, and floodplains from development, and to more effectively facilitate and reward clustering of development away from these sensitive areas. Consider creating a riparian buffer overlay zone for use in drinking water supply watersheds.

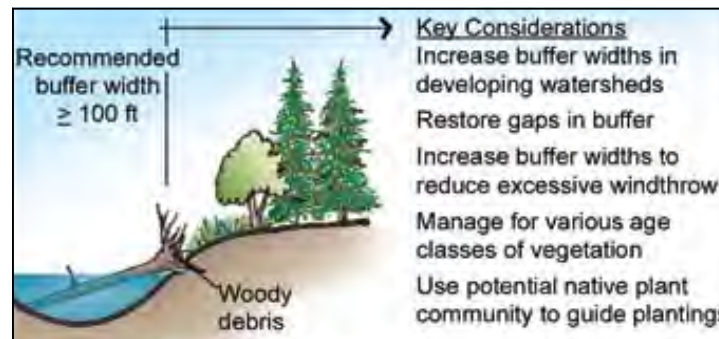
1.2(b) Consider amending the Fort Worth Tree Ordinance to highlight the importance of creating and maintaining an appropriate tree canopy for protecting riparian buffer areas, steep slopes, and highly erodible soils. This amendment could add an enhanced riparian buffer zone tree planting requirement, such as requiring plantings to provide a specified percentage of mature tree canopy coverage within 100 feet of natural drainage ways. To support such an amendment, conduct a study to determine appropriate strategies to protect sensitive areas around Lake Worth, and implement such strategies through amendments to the tree ordinance and other pertinent ordinances.

1.2(c) Consider adopting policies, principles, and standards to authorize and direct Transfer of Development Rights (TDR) and/or other innovative approaches to steer development clear of riparian areas and 100-year floodplains while relocating development density to Model Sustainable Communities and other appropriate locations.

1.2(d) Ensure that large 100-year floodplain areas remain undeveloped, while potentially supporting low-impact organic farming opportunities or ranching activities in areas where the floodplain is particularly broad, such as along Silver Creek in the West Lake Sector. Riparian corridors within floodplain areas should be enhanced with native or adapted plantings, particularly appropriate tree plantings along stream-banks



Urban riparian zone buffer example.



From “Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways”, United States Department of Agriculture, General Technical Report SRS-109, September 2008, Page 70.

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.2 Protect riparian areas, 100-year floodplains, steep slopes, and highly erodible soils. (cont.)

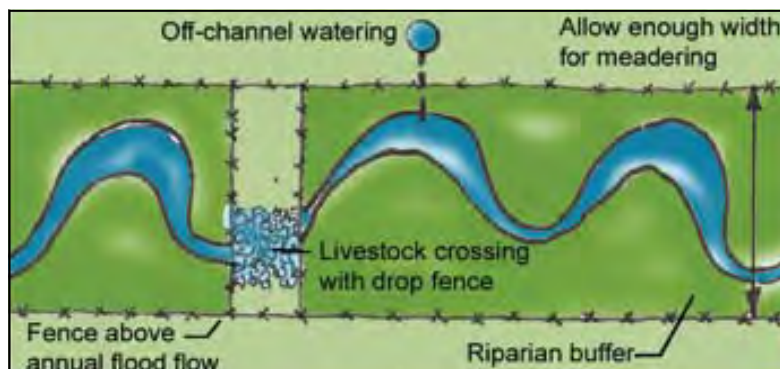
Implementation Measures: (cont.)

1.2(e) Ideally, riparian buffers should be fenced in upstream areas where cattle are present to reduce opportunities for sediment and bacteria from animal waste to be carried to Lake Worth in storm water runoff from streambanks disturbed by cattle encroachment. Work with agricultural agencies and willing landowners to identify funding sources and appropriate demonstration projects to protect and enhance rural riparian buffer areas that support municipal drinking water supplies.

1.2(f) Share ordinance amendments with Lake Worth Regional Coordination Committee partners and encourage them to adopt similar measures.

1.2(g) Evaluate legislative opportunities and impediments at the state level, and pursue appropriate changes to state law to better support local actions designed to protect riparian areas and floodplains from development that paves, fills, or builds on these areas.

1.2(h) Support local programs that educate landowners and citizens on watershed management and the natural functions of floodplains and riparian areas, such as the watershed management workshops sponsored by the Texas Agrilife Extension Service.

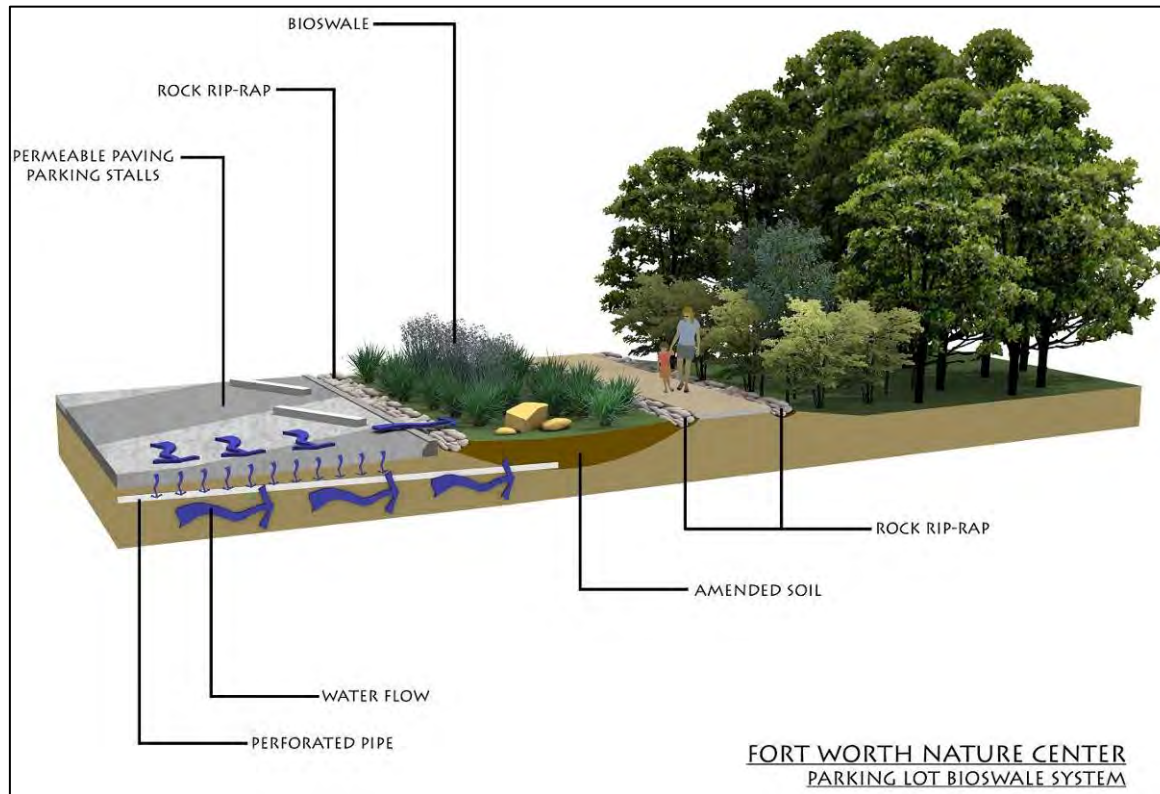


From “Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways”, United States Department of Agriculture, General Technical Report SRS-109, September 2008, Page 41.

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.3 Use Low-Impact Development techniques such as street edge alternatives, rain gardens adjacent to parking lots, permeable pavement, bioswales, bio retention, scourstops, and green roofs to reduce the amount of sediment and nonpoint source pollution entering Lake Worth. Low-Impact Development techniques mimic natural drainage systems to manage storm water and enhance natural movement of water within the watershed, allowing more storm water to be absorbed and filtered through the water table. Each of these storm water management techniques used alone helps to reduce runoff and lighten the load on streams, rivers, and lakes. However, using all of these techniques as part of a Low-Impact Development approach can reduce the pollutant load in storm water runoff substantially, and in some cases can virtually eliminate it. (See examples of Low-Impact Development methods on the next two pages.)



Fort Worth Nature Center Parking Lot Bioswale System

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.3 Use Low-Impact Development techniques such as street edge alternatives, rain gardens adjacent to parking lots, permeable pavement, bioswales, bio retention, scourstops, and green roofs to reduce the amount of sediment and nonpoint source pollution entering Lake Worth. (cont.)

Implementation Measures:

- 1.3(a) Coordinate with the Fort Worth Water Department's storm water best management practice (BMP) study being prepared by Freese and Nichols to identify appropriate BMPs to implement within the Lake Worth watershed.
- 1.3(b) Implement pertinent City of Fort Worth Sustainability Action Plan items within the Lake Worth watershed.
- 1.3(c) As opportunities arise and funding allows, implement urban stream restoration projects within the Lake Worth watershed.

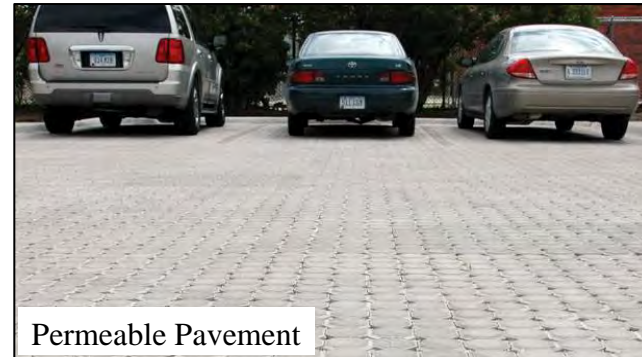


Stream restoration before and after Austin, TX

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Examples of Low-Impact Development Techniques

The following techniques slow the speed and reduce the volume of storm water runoff, while filtering out sediment and pollutants before storm water reaches water supplies. In addition, such practices help to recharge aquifers that supply well water in rural areas.



Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

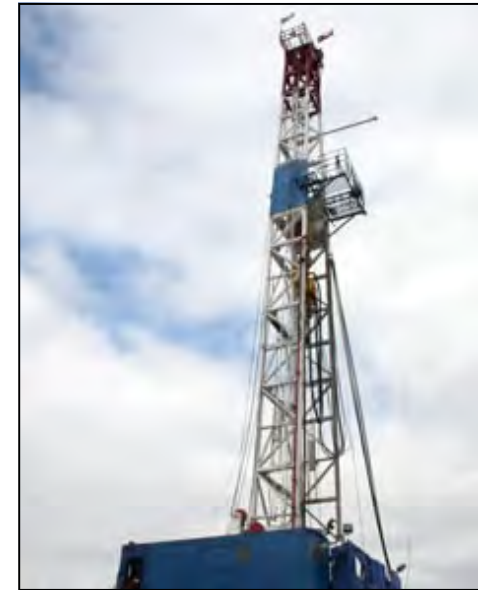
Recommendations

1.4 The City should seek appropriate areas to drill that do not negatively affect sensitive habitat, drainage, or riparian areas, and that maximize the use of existing drill sites on private land. As pipelines are developed, opportunities to include trail development and public access easements along the pipeline routes should be explored. All decisions on gas wells and pipelines should be weighed against the principles and recommendations of the Lake Worth Vision Plan, and any subsequent land use plans. Additionally, sites should be selected so that gas well impacts and benefits are balanced among all stakeholders.

Implementation Measures:

1.4(a) Amend the City of Fort Worth Gas Drilling Ordinance to require that proposed drilling pad sites and gas wells within 600 feet of the shoreline of Lake Worth be reviewed by the Gas Drilling Review Committee.

1.4(b) If gas drilling on parkland is permitted by the City, establish enhanced requirements and mandate use of City-identified best practices in such activities.



Gas drilling rig



Gas well pad site



Typical storage tanks

Principle One: Protect and enhance Lake Worth's water quality, natural beauty, and recreational character.

Recommendations

1.5 As development occurs south and west of Lake Worth, portions of the undeveloped land should be dedicated as parkland or platted as common open space, and made available for passive or active recreation. Specifically in response to lake-shore residents' concerns about additional development around the lake, the consultant panel suggested establishing areas of undeveloped land abutting and close to the lake as park or open space to protect water quality, enhance natural beauty, and conserve wildlife habitat.

Implementation Measures:

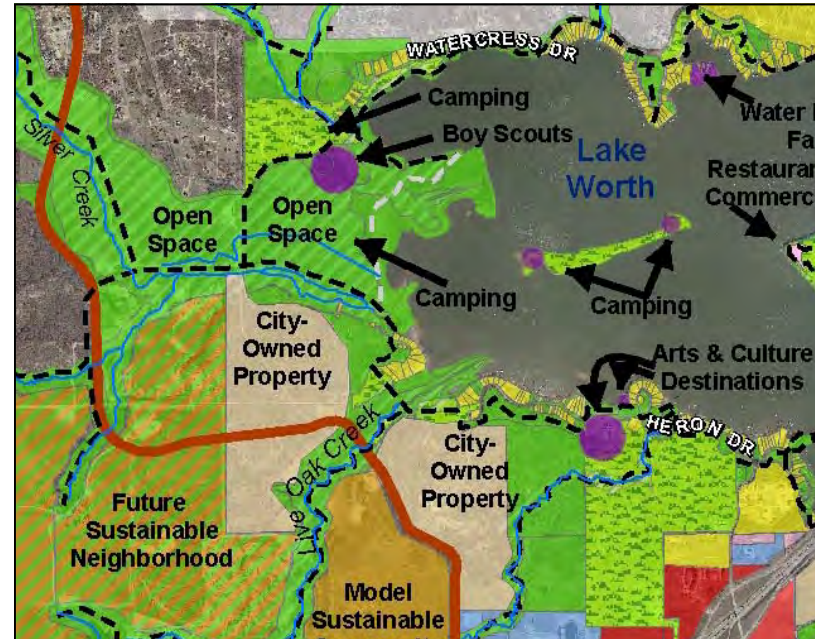
1.5(a) Prepare a refined Future Land Use Plan intended to begin implementing the adopted Lake Worth Vision Plan.

1.5(b) Prepare Lake Worth park boundary surveys where necessary to document park boundaries. Revise the Lake Worth Vision Map if necessary to ensure that the map is consistent with surveyed park boundaries.

1.5(c) Conduct a Lake Worth historic resource inventory and incorporate appropriate elements into the Fort Worth Parks, Recreation, and Open Space Master Plan.

1.5(d) Amend the 2004 Fort Worth Parks, Recreation, and Open Space Master Plan to reflect, to the extent possible and appropriate, the adopted Lake Worth Vision Plan.

1.5(e) In model sustainable communities and other future developments around Lake Worth, work with developers to dedicate as parkland or plat as common open space all riparian areas, 100-year floodplains, and areas of steep slopes within each development.



Potential open space areas south and west of Lake Worth



Bear Creek Park, Keller, TX

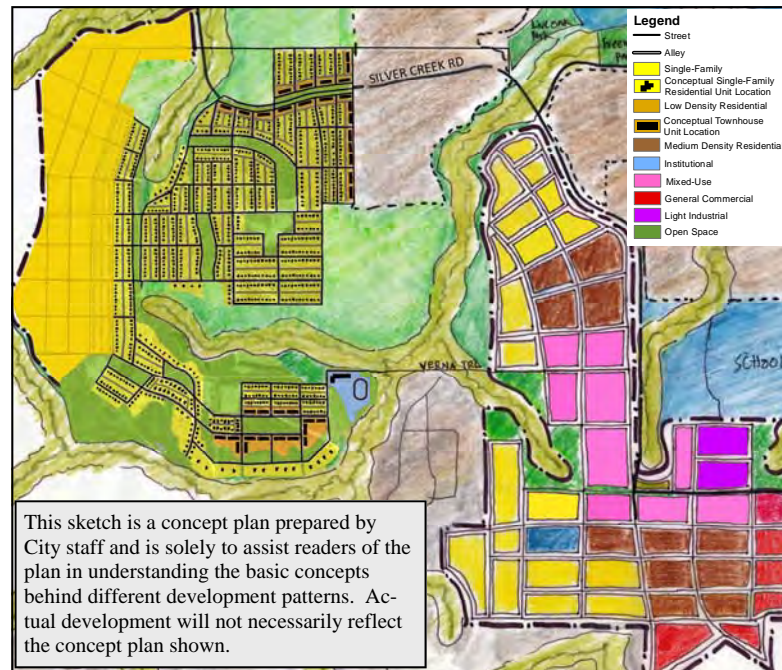
Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

2.1 Implement one or more Model Sustainable Communities around Lake Worth to serve as an example of Low-Impact Development.

With limited examples of Low-Impact Development currently in Fort Worth, and none in the sensitive watershed of Lake Worth, the consultant panel recommended establishing a Model Sustainable Community on City-owned property near Lake Worth as a guide for future development in the Lake Worth watershed and other parts of the city. The Model Sustainable Community should incorporate a variety of best management practices, creating a livable, walkable, mixed-use community with significantly reduced and highly filtered storm water runoff. Lakeshore residents felt strongly that any new development near Lake Worth should be located on private property rather than City-owned land.

Low-Impact Development is an approach to land development that uses various land planning and design practices and technologies to simultaneously reduce infrastructure costs while protecting natural resource systems. Low-Impact Development uses site and subdivision design techniques in coordination with storm water management engineering to mimic or enhance the hydrologic conditions associated with an undeveloped site to the greatest practical extent. One of Low-Impact Development's primary goals is to reduce runoff volume by infiltrating rainfall to groundwater, evaporating rainwater back to the atmosphere after a storm, and finding beneficial uses for rainwater rather than exporting it as a waste product down storm sewers. Particularly in water supply watersheds like Lake Worth's, Low-Impact Development can be an effective sustainable landscaping approach to restore natural watershed functions in order to protect the City's drinking water supply.



This sketch is a concept plan prepared by City staff and is solely to assist readers of the plan in understanding the basic concepts behind different development patterns. Actual development will not necessarily reflect the concept plan shown.

Concept plan sketch of potential Model Sustainable Community and Sustainable Neighborhood in Southwest Development Sector

Implementation Measures:

2.1(a) Study the opportunities and constraints associated with developing vacant land near Lake Worth. Develop a more detailed land use plan evaluating and recommending future uses of land, including location and layout of riparian buffers, conservation areas, and appropriate mixed-use development patterns and residential neighborhoods with Low-Impact Development features.

2.1(b) Prepare a Model Sustainable Community feasibility study that evaluates the carrying capacity of non-park land in this area and examines the market potential for, and financial feasibility of, partnering with a developer to create a walkable, mixed-use community highlighting Low-Impact Development techniques.

Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

2.1 Implement one or more Model Sustainable Communities around Lake Worth to serve as an example of Low-Impact Development. (cont.)

Implementation Measures: (cont.)

2.1(c) Begin a dialogue with property owners in areas identified in the Lake Worth Vision Plan as Model Sustainable Communities to encourage their interest in developing their property in accordance with Model Sustainable Communities Development Standards and Guidelines.

2.1(d) Pursue funding to create detailed development plans for the Model Sustainable Community sites depicted in the Lake Worth Vision Plan. Funding options could include grants from the North Central Texas Council of Governments or other organizations/foundations.

2.1(e) Prepare Development Standards and Guidelines or a form-based code for the Model Sustainable Communities identified in the Lake Worth Vision Plan.

2.1(f) To clarify the City's expectations of especially sustainable development patterns around Lake Worth, and to provide property owners and developers with certainty that the Model Sustainable Communities will be implemented, prepare and adopt a Zoning Ordinance amendment creating a Model Sustainable Community Overlay District or form-based code and apply it by Zoning Map amendment to the locations identified in the Lake Worth Vision Plan.

2.1(g) Provide the Model Sustainable Community Overlay District text and maps, including the associated Standards and Guidelines or the form-based code, to surrounding jurisdictions and encourage them to consider adopting a similar zoning ordinance amendment.



Example of Model Sustainable Community walkable core area in Mt. Laurel, AL

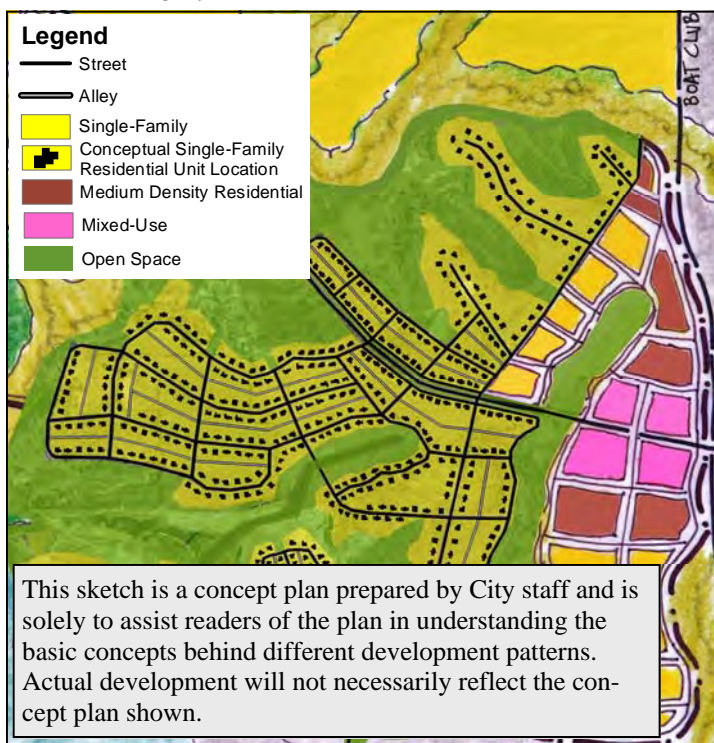


Example of a Low-Impact Development in Prairie Crossing, IL

Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

2.2 In areas near Lake Worth where Low-Impact Development should be implemented, but existing development patterns or lack of public sewer service limit opportunities for Model Sustainable Communities, encourage development of Sustainable Neighborhoods. Future Sustainable Neighborhoods are shown on the Lake Worth Vision Plan map in areas where landowners have expressed a desire to develop their property at very low densities in harmony with the natural landscape, or where significant constraints to developing at Model Sustainable Community densities may exist. As envisioned for these specific areas within the Lake Worth watershed, Sustainable Neighborhoods would be expected to offer primarily lower density residential areas designed around enhanced natural drainage ways and open spaces. Greenway trails that connect the neighborhoods to Lake Worth and provide access to the integrated open space areas within the neighborhoods would be integral components of Sustainable Neighborhood designs. Low Impact Development techniques in these neighborhoods will mimic natural drainage system elements and extend them into the residential areas, providing amenities to future residents while protecting water quality. Sustainable Neighborhoods should incorporate a variety of best practices in their design, and provide enhancements to encourage active and healthy lifestyles in order to create desirable, walkable, more sustainable neighborhoods with significantly reduced and highly filtered storm water runoff.



Concept plan sketch of potential Model Sustainable Community and Sustainable Neighborhood in Northeast Development Sector

Implementation Measures:

- 2.2(a) Begin a dialogue with property owners in areas identified in the Lake Worth Vision Plan as Future Sustainable Neighborhoods to encourage their interest in developing their property in accordance with Sustainable Neighborhoods Development Standards and Guidelines.
- 2.2(b) Prepare Development Standards and Guidelines for the Sustainable Neighborhoods identified in the Lake Worth Vision Plan.



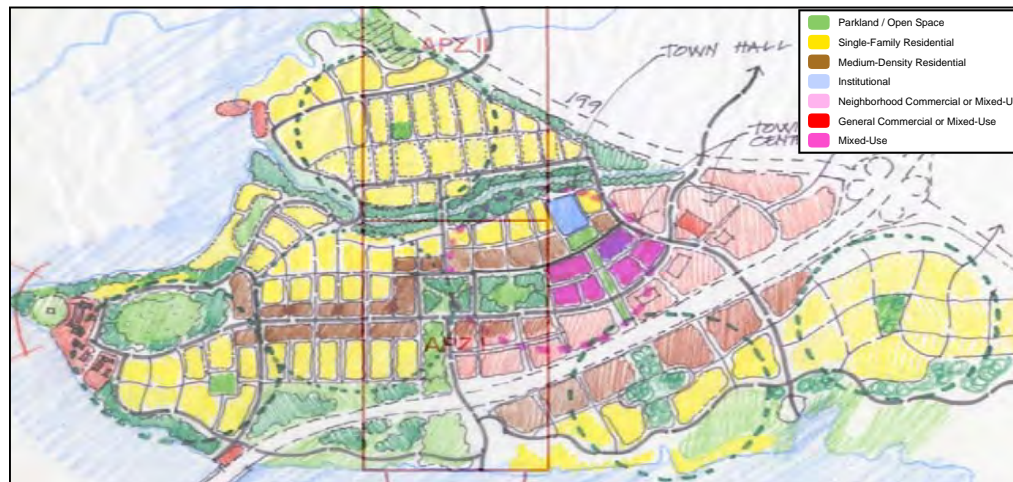
Lake Sylvia, IN

Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

2.3 The City of Fort Worth and the City of Lake Worth should work together to create a town center implemented through appropriate development standards that are consistent with the NAS JRB Joint Land Use Study.

The consultant panel and stakeholders expressed significant concern about the continuation of the current development pattern along Jacksboro Highway (SH 199) and its negative impact on neighborhood connectivity and water quality. As an alternative to the likely expansion of large parking lots, big-box rooftops, and other impervious surfaces that will physically divide the community and potentially affect Lake Worth’s water quality, the consultant panel created an illustration of a conceptual town center which encompasses land in both the City of Fort Worth and the City of Lake Worth. The panel emphasized the opportunity to collaborate and create a true town center with a mix of uses and densities. While full implementation of this concept may require modification of some existing and planned streets within the area, and a long-term conversion of some existing land uses, adoption of the concept plan can begin the long transition to a more sustainable town center development pattern in the area.



Consultants’ illustration of Lake Worth Conceptual Town Center, before changes and including Accident Potential Zones

The base-friendly Lake Worth Town Center concept shown on the next page envisions a long-term future that includes a walkable street grid stretching west from Quebec Street/Northwest Centre Drive to Mosque Point, with a strong commercial core near the Loop 820/Jacksboro Highway interchange and lower density employment areas between Buda Lane and Dakota Trail. While the focus of pedestrian activity would likely be east of Buda Lane, the light industrial park or similar low-density employment area should transition smoothly between the commercial uses east of Buda Lane and the existing City of Lake Worth residential neighborhood west of Dakota Trail. To achieve the longer-term vision for the future Town Center area, near-term commercial development projects should incorporate a street grid that yields walkable block sizes, even if the street grid is intended to serve as private parking lot access roads in the near term.

In consultation with the property owners, a small portion of the Lake Worth Town Center along the Charbonneau Road greenway is depicted as a mixed-use area contained within several walkable blocks abutting the greenway. This series of mixed-use blocks could provide the beginning of the pedestrian-oriented Lake Worth Town Center envisioned by the consultant team.

Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

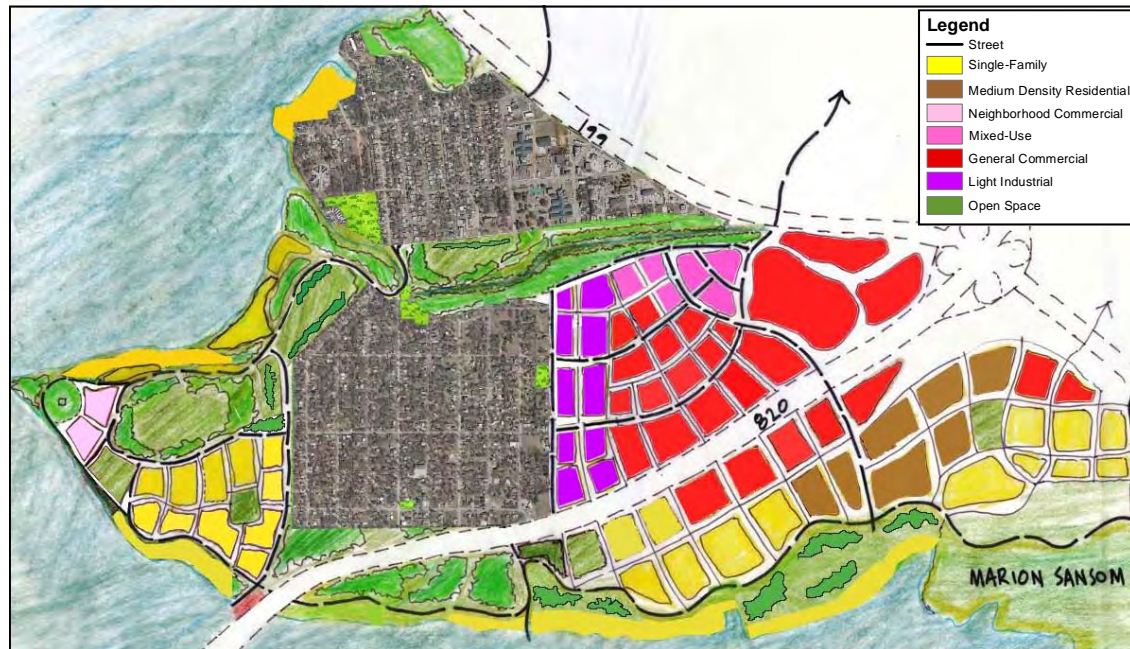
2.3 The City of Fort Worth and the City of Lake Worth should work together to create a town center implemented through appropriate development standards that are consistent with the NAS JRB Joint Land Use Study. (cont.)

Implementation Measures:

2.3(a) Amend the Future Land Use map of the City of Fort Worth as needed to reflect the uses depicted in the revised concept plan.

2.3(b) To achieve the longer-term vision of a walkable mixed-use Town Center area, near-term commercial development projects should incorporate a street grid that yields walkable block sizes, even if the street grid is intended to serve as private parking lot access roads in the near term. The presence of a walkable street grid will facilitate future redevelopment of big-box retail sites and similar single-use commercial products.

2.3(c) To protect the NAS JRB from potential negative Base Realignment and Closure Commission (BRAC) actions in the future, pursue avigation easements on City-owned property and on single-family property located within the Accident Potential Zones.



Town Center concept as modified by staff



Southlake Town Center, TX

Principle Two: Develop Model Sustainable Communities in the Lake Worth area that create desirable places to live and work while enhancing livability of existing communities.

Recommendations

2.4 Create an employment center at Loop 820 and Las Vegas Trail near Lockheed Martin and the Naval Air Station Joint Reserve Base. The consultant panel and stakeholders envisioned this area as a key employment center with office, high-tech, and commercial uses due to its proximity to Lockheed Martin and the Naval Air Station Joint Reserve Base. This employment center will provide job opportunities to residents of nearby Model Sustainable Communities.

Implementation Measures:

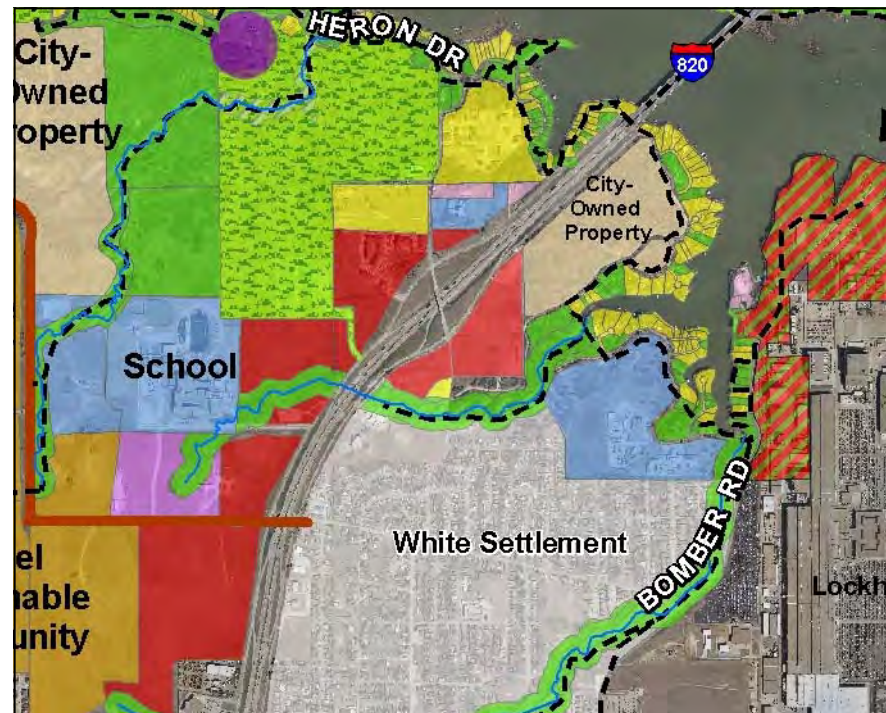
2.4(a) Amend the City of Fort Worth Future Land Use Map to reflect the location of the NAS JRB employment center, in accordance with the adopted Lake Worth Vision Plan.

2.4(b) Amend the City of Fort Worth Zoning Map as necessary and appropriate to implement the NAS JRB employment center.

2.4(c) Consider developing and adopting an NAS JRB Employment Center Overlay District with Low-Impact Development standards and design guidelines intended to ensure compatibility with adjacent residential areas, protect water quality, facilitate trail access, and encourage pedestrian access and connectivity.

2.4(d) Encourage the City of White Settlement to amend its Future Land Use Plan to reflect the location of the NAS JRB employment center, and to expand it to appropriate parcels within its jurisdiction.

2.4(e) In the context of creating a refined Future Land Use Plan for the area around NAS JRB, seek to align compatible uses with the facility's high noise contours, to the extent practicable.



The red area on the map indicates an employment center with office, high-tech, and commercial uses near the Model Sustainable Communities

Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.1 Maximize visual and physical access to the lake and improve water access within walking distance of neighborhoods. Enhance the attractiveness and use of the lake access by developing recreational hubs, amenities, and points of interest at regular intervals and developing a continuous bicycle/pedestrian path around the lake. The consultant panel and stakeholders expressed that it was essential to the success of Lake Worth as a public asset to maximize visual and physical access to the lake for all the citizens of Fort Worth, as well as the residents of adjacent cities and those living near Lake Worth. Many of the stakeholders living in communities near Lake Worth feel that lakeshore access is too limited, making it necessary to use an automobile to reach a destination point on the lake, even when the water's edge is nearby. This reduced public access is mainly due to expanding private ownership around the lake, brought about by previous City sales of leased property, and limited access points that are not connected by a pathway system.

To halt the decline of public access to this City-owned lake, the City has a responsibility to all citizens of Fort Worth to return the remaining City-owned lakefront property that is not identified for sale to public access and use for the benefit of all its citizens. Additionally, sidewalks and pathways should connect surrounding communities and neighborhoods to the lake, allowing residents to walk or bike to the lake.

Implementation Measures:

3.1(a) To maximize physical and visual access to the lake, maintain all City-owned lakefront property — including City-owned individual lots that are not identified for sale — as public parkland or open space, whether the property is improved as public parkland or simply set aside as open space.

3.1(b) As funding allows, purchase existing improvements and option contracts from willing lease holders around Lake Worth. Notify all lease holders of this buy back opportunity, but particularly target unplatted properties and areas where City water and sewer service is not yet in place.



Bicycle/pedestrian path on Lake Calhoun in Minneapolis (above and below), with public ownership of the lakefront retained



Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.1 Maximize visual and physical access to the lake and improve water access within walking distance of neighborhoods. Enhance the attractiveness and use of the lake access by developing recreational hubs, amenities, and points of interest at regular intervals and developing a continuous bicycle/pedestrian path around the lake. (cont.)

Implementation Measures: (cont.)

3.1(c) As soon as opportunities arise to do so, reassemble unneeded City-owned lots by vacating their plats or combining them through a replat to reduce potential future pressure on the City to sell such lots to private interests. Plat parkland as necessary to ensure its protection for park uses.

3.1(d) As property becomes available, seek to fulfill the Fort Worth Nature Center & Refuge Master Plan goal of acquiring land on the north side of Jacksboro Highway/SH 199, including the Love Circle leases and the commercial properties within the unincorporated area.

3.1(e) To facilitate retention or acquisition of strategically important leased or owned lakeshore land, consider offering trades of vacant City-owned lakeshore lots within neighborhoods where privately-owned residential neighborhoods already exist.

3.1(f) As a long-term strategy, seek to buy back at market rates properties that have already been sold if the properties are deemed important for expanding recreational uses or public access to the lake.

3.1(g) In discussions with the Boy Scouts and other potential users of City-owned lakeshore land, it is critical to preserve City ownership of significant areas of shoreline in order to protect the alignment of the lakeshore bicycle/pedestrian path – and with it the opportunity to improve access to the Lake Worth shoreline for all existing and future Fort Worth citizens.



Shoreline trail in Northfield, MN

Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.2 The Casino Beach Park area should be developed as the heart of Lake Worth Regional Park, with a mix of uses and development types. Historical significance, location, access, and availability of developable land make the Casino Beach Park area ideal for a mix of commercial and recreational uses. The consultant panel identified this location as best-suited for key recreational uses, such as a fueling station for motor boats and a place to provide boat rentals. The area could accommodate an appropriate mix of higher-density commercial and residential uses. The unincorporated property along Jacksboro Highway/SH 199 between the Town of Lakeside and Casino Beach Park is likely to redevelop when City water and sewer become available and the land is annexed by the City of Fort Worth. Appropriate future uses of this land should be considered and land use plans amended accordingly.

Implementation Measures:

3.2(a) Evaluate existing and potential land uses and development opportunities within the unincorporated area along Jacksboro Highway/SH 199 between the Town of Lakeside and Casino Beach Park.

3.2(b) Amend the City of Fort Worth Future Land Use Map to reflect the desired mix of recreational, commercial, and higher-density residential uses around the Casino Beach Park area.

3.2(c) Change the zoning in the Casino Beach Park area to accommodate an appropriate mix of uses.

3.2(d) Coordinate with the Texas Department of Transportation (TxDOT) on the characteristics and timing of improvements to Jacksboro Highway (SH 199), and work to ensure appropriate vehicle, bike, and pedestrian access is provided to the Casino Beach Park area.

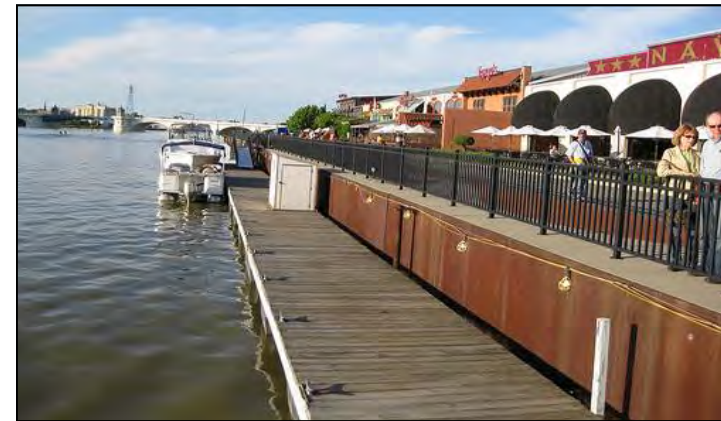
3.2(e) Work with TxDOT to provide a safe bicycle/pedestrian pathway across the Jacksboro Highway/SH 199 bridge over Lake Worth.

3.2(f) Prepare a more detailed concept plan for future development of the Casino Beach Park area.

3.2(g) Investigate options for increasing the amount of developable land around Casino Beach Park, such as parkland swaps.



Casino Beach Park at Lake Worth



Restaurants overlooking Maumee River in Toledo, OH

Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.3 Mosque Point Park should be maintained as an inviting park and public space, but with some destination commercial uses. The consultant panel recognized the significant opportunities around Mosque Point Park. They suggested improving the area with more park amenities, but also recommended other destination uses for the area, such as one or more restaurants overlooking the lake.

Implementation Measures:

3.3(a) Provide opportunities for new restaurants and similar destination commercial development overlooking Lake Worth, especially at Mosque Point, by offering long-term leases for such destination uses at sites identified in the Lake Worth Vision Plan.

3.3(b) Prior to development of a restaurant or other destination commercial use at Mosque Point, ensure that adequate infrastructure exists to support the use, and preserve significant trees on the site.



Mosque Point Park at Lake Worth



Gardens Restaurant in Botanic Gardens, Fort Worth



Restaurant overlooking Lake Carmel, NY

Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.4 Cultural uses should become focal points on Lake Worth and should stimulate redevelopment of the existing Lake Worth Castle and areas around Casino Beach Park. The consultant panel and stakeholders emphasized the importance of creating cultural hubs around Lake Worth. The existing castle is an excellent location for cultural activities. Access to cultural activities near the shoreline could occur by boat as well as by car. Cultural amenities should be incorporated into future development projects around the Casino Beach Park area as well.

Implementation Measures:

3.4(a) Encourage increased cultural use of the lake by offering long-term leases of appropriate City-owned lakefront property to existing and new cultural uses, such as the Hip Pocket Theatre, in accordance with the Lake Worth Vision Plan.



Lake Worth Castle, on the south side of the lake, could house the Hip Pocket Theatre and other cultural uses, or be redeveloped as a Bed and Breakfast



Arts festival on Lake Canandaigua, NY



Music festival on Watts Bar Lake, TN

Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.5 Water-based recreation sites, such as the Lake Worth Boat & Ski Club and the Lake Worth Sailing Club, should be more publicly accessible and should be focal points on the lake for all citizens of Fort Worth. Both clubs have a rich history on Lake Worth. Improving facilities and access to such sites could increase public participation and attract more visitors to Lake Worth.

Implementation Measures:

3.5(a) Encourage increased water-based recreational use of the lake by offering long-term leases of appropriate City-owned lakefront property to existing and/or new recreational uses, such as the Lake Worth Sailing Club and the Lake Worth Boat & Ski Club.

3.5(b) Assess the feasibility of adding new locations and/or enlarging existing water-based recreational facilities, whether managed by public or private entities.

3.5(c) Address opportunities to enhance water-based recreation at Lake Worth in the next update of the Parks and Open Space Master Plan.

3.6 The Boy Scouts could benefit from relocating their Mosque Point camp to the west side of the lake, where they could have better access to the shoreline.

While the Boy Scouts have long had facilities near Lake Worth, they currently lack access to the lake. Relocating the Boy Scout Camp to the west side of Lake Worth could provide significant benefits to the Scouts, including providing opportunities for enhanced facilities and more direct lake access for water-based activities.

Implementation Measures:

3.6(a) Encourage relocation of the Boy Scout Camp to the west side of the lake by offering a long-term lease of appropriate City-owned property, by selling near-lakeshore property to the Boy Scouts, or by a combination of the two options. As noted in Recommendation 3.1(g), ensure that City ownership of the shoreline area is preserved as much as possible in order to protect the alignment of the lakeshore bicycle/pedestrian path.



Lake Worth Sailing Club



Principle Three: Create Lake Worth Regional Park, a linear park that encompasses the lake and provides high-quality recreational amenities and cultural hubs.

Recommendations

3.7 Camping facilities should be available on Goat Island and elsewhere in appropriate locations. Goat Island is only accessible by boat. The island could become a destination spot for boaters, including the neighboring Boy Scout Camp, if camping areas on the island are designated and minimal facilities provided.

Implementation Measures:

3.7(a) Address Goat Island in the next Fort Worth Parks, Recreation, and Open Space Master Plan update by identifying opportunities for its use, including as a remote camping facility, and determining facility needs and maintenance requirements.

3.7(b) Coordinate with the Boy Scouts to determine their interest in using Goat Island as a remote camp, and their capacity to contribute to its development and maintenance as a public permit-only camping facility.



Campgrounds should be available on Goat Island

3.8 Consider developing a limited-duration stay RV park on City-owned property on the west side of the lake. Facilities are not currently available on the lake for recreational vehicle users. Such a facility could provide RV enthusiasts with access to Lake Worth.

Implementation Measures:

3.8(a) Conduct a feasibility study to determine appropriate locations for an RV park.

3.8(b) Determine appropriate Low-Impact Development techniques to require in the design and construction of any RV park near Lake Worth, and describe the techniques in a future update to the Fort Worth Parks, Recreation, and Open Space Master Plan if parkland is identified for RV park use.



Campground at Canyon Lake Park, TX

Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.1 Silver Creek Road should be reconstructed as a relatively low speed scenic parkway using context sensitive street design practices.

Silver Creek Road, located on the southwest side of Lake Worth, is currently a two-lane rural road. Silver Creek Road is listed in the City's Master Thoroughfare Plan to be developed as a four-lane divided major arterial roadway. There is currently no funding for the project, apart from the short segment between Brewer High School and Loop 820. Due to current industrial uses along the road, large trucks contribute to heavy traffic in the area and deterioration of the roadway.

The Federal Highway Administration defines **Context Sensitive Solutions** as "a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist."

The consultant panel and stakeholders agreed that improving and increasing the capacity of the road should be a priority, but also recommended enhancements using context sensitive solutions (CSS) and complete street design strategies. The consultant panel emphasized the opportunity to use context sensitive solutions to improve the design of Silver Creek Road, building the road to fit the land instead of altering the land to fit the road. In addition, a CSS design approach to the improvement of Silver Creek Road would allow flexibility in the street's design as it moves from Model Sustainable Community urban centers to surrounding park and open space areas.



Silver Creek Road



Paris Pike Parkway, KY

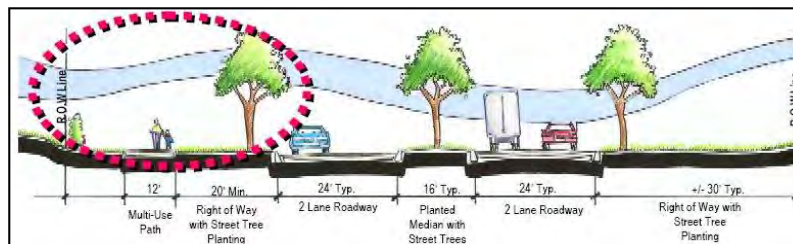


Paris Pike Parkway, KY

Implementation Measures:

4.1(a) Amend the Fort Worth Master Thoroughfare Plan (MTP) map and cross-section schematics to designate and depict Silver Creek Road as a more urban and walkable thoroughfare within the Model Sustainable Community areas, and as a limited-access four-lane divided parkway with a continuous off-street bicycle/pedestrian path outside of the Model Sustainable Communities. Low-Impact Development techniques should be incorporated into the design of Silver Creek Road to effectively filter storm water runoff from the roadway while creating amenity value for the surrounding neighborhoods.

4.1(b) Consider changing the name of the street from Silver Creek Road to Silver Creek Parkway or Lake Worth Parkway upon or prior to reconstruction.



Cross-section diagram of a scenic parkway. The red circle highlights a multi-use path that runs parallel to the parkway.

Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.2 Establish F.M. 1886, Confederate Park Road, as a scenic, rural, main street in the Town of Lakeside. The consultant panel had concerns about dividing the Town of Lakeside by the potential future construction of a major arterial through the town. By maintaining the roadway as a two-lane rural road, the town will remain a quaint, lakeside community.

Implementation Measures:

4.2(a) Provide planning information and assistance to the Town of Lakeside, if requested and as staff resources allow, related to ensuring that Confederate Park Road continues to support the principles and recommendations of the Lake Worth Vision Plan and the Town of Lakeside



Confederate Park Road

Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.3 Create a lakeshore bicycle/pedestrian path around the perimeter of Lake Worth and connect it to the Fort Worth Nature Center and Eagle Mountain Lake, so as to link them together and provide recreational access to all park amenities. Along the recommended bicycle/pedestrian path, visual and physical access to the lake should be provided wherever possible. Unless prohibited by topographical, property ownership patterns, or other constraints, the path should be constructed immediately adjacent to the shoreline, within 50 feet of the water. The bicycle/pedestrian path should be designed to provide connections between neighborhoods and the many recreation and open space opportunities surrounding Lake Worth.

Implementation Measures:

4.3(a) Determine the most appropriate conceptual alignment of the bicycle/pedestrian path, ensuring that the path alignment remains as close to the shoreline as possible, and create a map of the conceptual alignment in the City's Geographic Information System (GIS). Use this map to identify access issues or constraints due to topography, water features, existing ownership patterns, etc.

4.3(b) Conduct a preliminary engineering study of the bicycle/pedestrian path alignment, including determining the feasibility of linking the trail under Loop 820 by adding a bicycle/pedestrian bridge to the existing structure, and (if use of federal or state funds are anticipated) obtain appropriate environmental clearances to improve the chance of obtaining grant funding for the construction of the path.

4.3(c) As part of the City's Lake Worth Dredging Study and subsequent engineering and implementation, consider using in-lake dredging spoils placement to create one or more naturally landscaped peninsulas or islands linked by bicycle/pedestrian bridges to extend the public's ability to access and enjoy Lake Worth. Also consider directing the bicycle/pedestrian path onto causeways built with dredging spoils to create the sediment settling basins within the lake that will isolate and reduce future dredging needs.

4.3(d) Program and fund the final design and construction of a lakeshore bicycle/pedestrian path.

4.3(e) Work with surrounding jurisdictions to ensure that lake access is efficiently provided to existing and planned neighborhoods around Lake Worth.



White Rock Lake path in Dallas



View of Lake Worth under Loop 820

Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.4 Use riparian buffers as greenways with bicycle/pedestrian paths to create connections between new or existing neighborhoods and Lake Worth. Where appropriate, consider locating equestrian trails within riparian buffers also. Riparian buffers can serve a dual purpose by providing greenway connections between neighborhoods, schools, parks, and Lake Worth, while serving as a last line of defense to protect waterways from sediment build up and pollution.

Implementation Measures:

4.4(a) Determine the most appropriate conceptual alignments of the bicycle/pedestrian paths and equestrian trails within riparian buffer areas, and create a map of their conceptual alignments in the City's Geographic Information System (GIS). Use the GIS to identify access opportunities or constraints due to topography, water features, existing ownership patterns, physical obstructions, etc.

4.4(b) Identify locations where riparian buffers cross dedicated parkland or land owned by the City of Fort Worth and establish appropriate mechanisms for documenting the location of the riparian buffers and their associated bicycle/pedestrian path or equestrian trail conceptual alignments.

4.4(c) Conduct a preliminary engineering study of the bicycle/pedestrian path alignments within riparian buffers that pass through parklands or City-owned property.

4.4(d) Where riparian buffer areas cross private lands, discuss with affected landowners the importance of conserving riparian buffer areas near Lake Worth either in the immediate future or at the time of future development. Also describe the goal of connecting existing and future neighborhoods to Lake Worth by using bicycle/pedestrian paths or equestrian trails within public access easements or rights-of-way.



From "Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways", United States Department of Agriculture, General Technical Report SRS-109, September 2008, Page 125.



Trinity River Trail

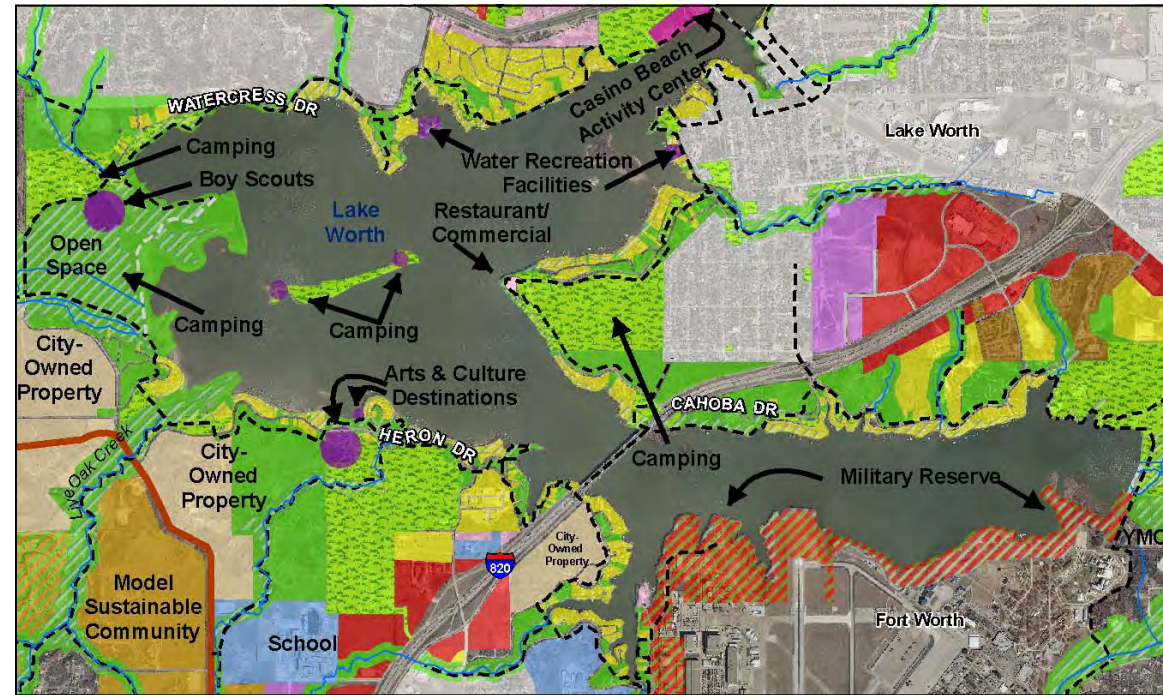
Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.4 Use riparian buffers as greenways with bicycle/pedestrian paths to create connections between new or existing neighborhoods and Lake Worth. Where appropriate, consider locating equestrian trails within riparian buffers also. (cont.)

Implementation Measures: (cont.)

- 4.4(e) Amend the Bike Fort Worth Plan to include bicycle/pedestrian paths located within riparian buffer areas near Lake Worth.
- 4.4(f) Program and fund the final design and construction of bicycle/pedestrian paths and, where appropriate, equestrian trails within designated riparian buffer areas.
- 4.4(g) Encourage neighboring jurisdictions to plan, design, and construct bicycle/pedestrian paths within riparian buffer areas that connect their neighborhoods to Lake Worth.



Recommended lakeshore trail map (portion)

Principle Four: Connect communities, resources, and amenities with parkways, greenways, and trails.

Recommendations

4.5 Connect the Trinity River Trail system to Marion Sansom Park. By connecting a Lake Worth bicycle/pedestrian path system with the Trinity River Trails, recreation and open space opportunities surrounding Lake Worth will be accessible to more residents of the region. This key link will connect a regional veloweb and trail system to the Lake Worth Regional Park.

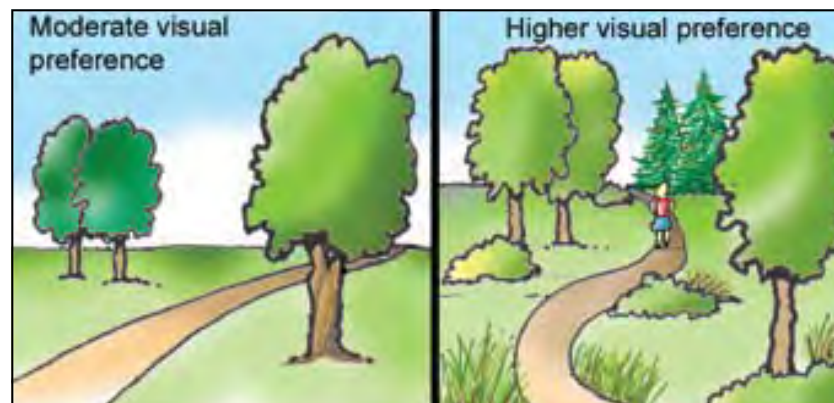
Implementation Measures:

4.5(a) Secure a public access easement, right-of-way dedication, or direct acquisition of land as needed for an extension of the Trinity Trails system to connect with a Lake Worth perimeter bicycle/pedestrian path.

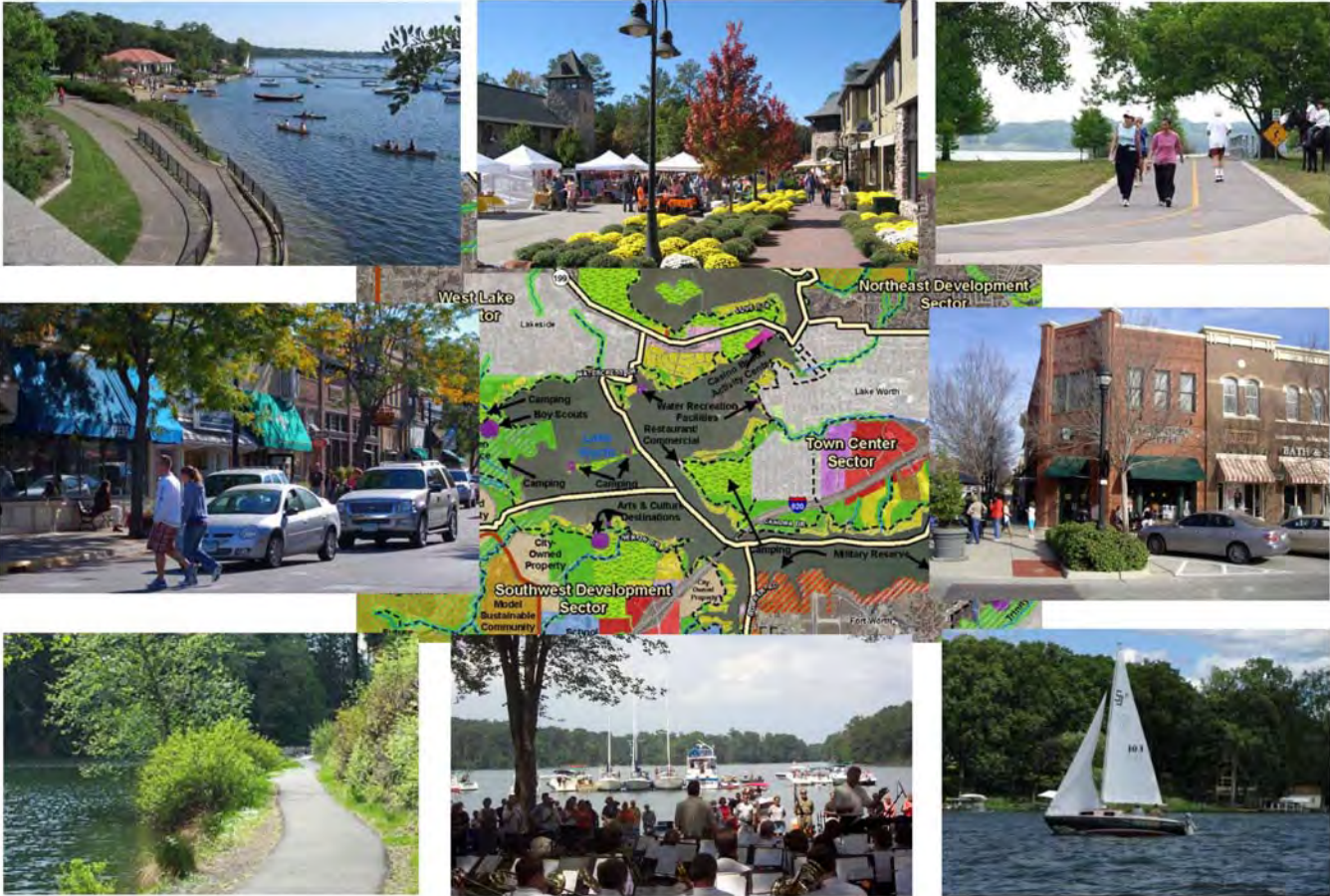
4.5(b) Coordinate with Streams and Valleys, Inc. on a Trinity Trails extension to Lake Worth and, ultimately, to an Eagle Mountain Lake perimeter trail.



Trinity River Trail



From "Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways", United States Department of Agriculture, General Technical Report SRS-109, September 2008, Page 126.



APPENDICIES

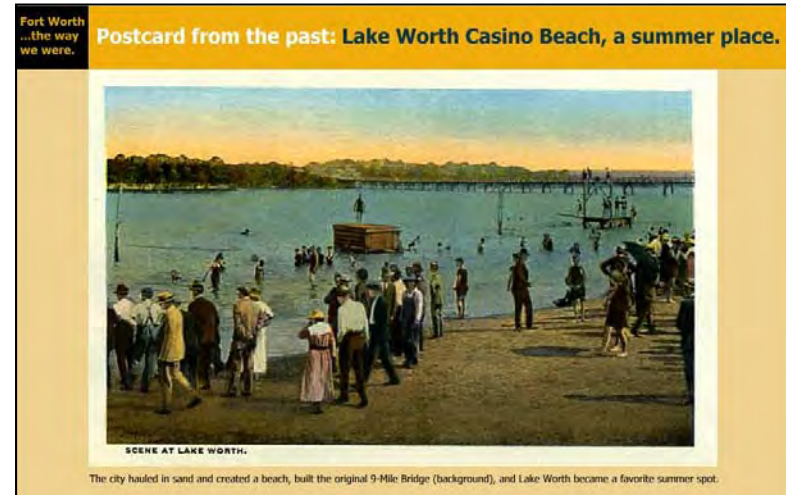
APPENDIX A: LAKE WORTH HISTORY BY QUENTIN MCGOWN

Early Years

“The largest municipal park in the world!” declared Fort Worth Parks Commissioner Harry Vinnedge, as Lake Worth formally opened to recreational visitors in June, 1917. By the end of that first summer season, nearly 75,000 people, equal to the total population of the city at the time, visited the newest resort in the country. What began as a reservoir to provide an adequate water supply to the growing city, remains today one of the most unique and valuable urban park resources in Texas.

Fort Worth at the turn of the 20th century was a dynamic and vibrant community witnessing an explosive growth. Between 1900 and 1910, the population nearly tripled, from 23,000 to 73,000, and city services strained under the pressure. The city still drew the bulk of its water supply from a series of artesian wells drilled along the western edge of downtown. Even though some city leaders were concerned about the availability of water for the future, the “Fort Worth Record” newspaper in 1907 declared the artesian supply “inexhaustible.” Then, in April, 1909, a fire swept across the South Side, destroying nearly three hundred buildings across twenty-six square blocks. The water demand to control the fire virtually depleted the artesian supply temporarily and the city immediately began to explore solutions.

Engineer John B. Hawley was appointed to head a team to locate the ideal site for a reservoir. He had come to Fort Worth nearly twenty years earlier to design the city’s first municipal water plant (today’s Holly Treatment Facility), and had then recommended the creation of a reservoir. City leaders at the time, however, decided that a reservoir was not necessary, an attitude that prevailed until the 1909 fire. Following Hawley’s report in 1911 that a dam should be built on the West Fort of the Trinity, about six miles northwest of town, the city spent \$1.5 million to acquire the land and construct the dam. The West Fork of the river ran through the heart of the Peters Colony, the Republic of Texas era colonization effort that brought the earliest settlers to the Tarrant County region. By the time the city began land purchases for the new reservoir, much of the proposed land was part of the extensive G.T. Reynolds Ranch, although scattered Native American pictographs and campsites provided evidence of life in the river valley prior to the arrival of Anglo settlement. Following completion of the three thousand foot dam with its seven hundred foot spillway, engineers expected it would take up to two years to fill the lake, but heavy summer rains in 1914 pushed up the schedule and the first water tipped over the spillway on August 10 of that year. The City considered several names for the new lake, including Lake Minnetonka, Panther Lake and Lake Tonkaway, before settling on Lake Worth in December, 1913.



Lake Worth’s Casino Beach from the Jack White Collection of Historic Fort Worth Photos, University of Texas at Arlington.

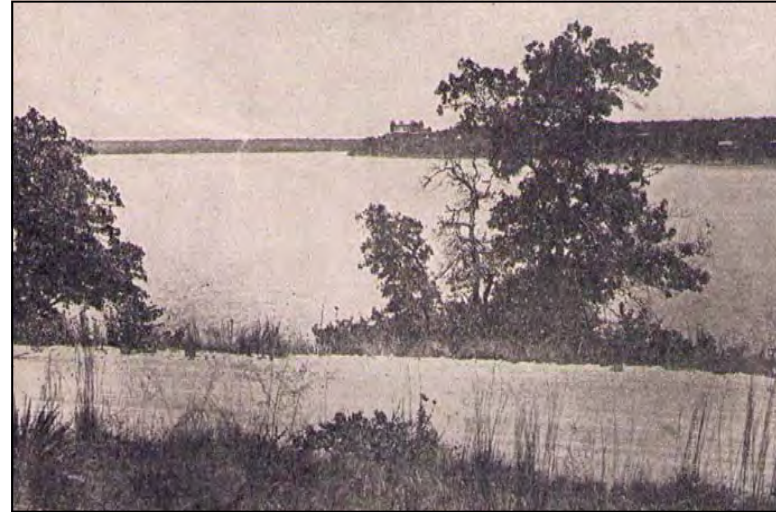


Dam construction, 1912. Freese and Nichols.

APPENDIX A: LAKE WORTH HISTORY BY QUENTIN MCGOWN (cont.)

In May, 1916, the City of Fort Worth completed the land acquisition for a proposed pipeline from the lake to the Holly Plant near downtown, paving the way for the annexation that month of an additional eleven square miles that included the lake and surrounding land. A couple of months later, work began on the first leg of the Meandering Road that would eventually encircle the entire lake with nearly fifty miles of park roadway. Beginning at the formal entrance to the lake park just south of the dam, and initially running west along the south shore, the new road stopped at the old 19th century wagon and stagecoach road now named Silver Creek Road. The new scenic drive, costing the Parks Department \$25,000.00 to grade, instantly became a preferred Sunday outing as automobile ownership expanded and family picnics took advantage of the lakeshore views.

The demands for recreational use began even before the lake had filled. E.P. Haltom, son of the city's most prominent jeweler, launched his home-built sailboat, the Kingfisher, into what water there was in the lake in 1913, beginning a long tradition of inland sailing in Fort Worth. It wasn't long before bathers began to appear along the lake shore, taking advantage of the cool waters during the Texas summer. The city administration was criticized for not keeping swimmers out of the new drinking water supply, but, by 1915, so many people were visiting the lake that the city realized that stopping the public from using their new playground would be impossible. Fort Worth taxpayers had paid for the lake and many loudly insisted that they should have full access to its attractions. City leaders ordered the lake stocked with four thousand rock bass and perch and began planning a resort development to accommodate the increasing numbers of tourists.

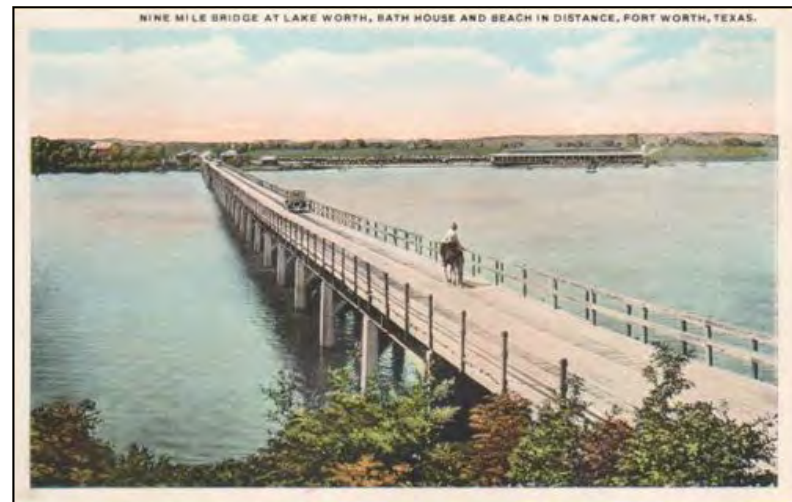


Meandering Road (now Heron Dr.), 1919.

On the northwest shore, where the old wooden Nine-Mile Bridge crossed the river, just south of the present Jacksboro Highway Bridge, the city built a \$30,000 pavilion, complete with changing rooms, observation decks and diving platforms. 15,000 attended the opening on June 17, 1917, many catching the first motor buses to run in Fort Worth, connecting the lake to the Rosen Heights streetcar line near the Stockyards. The next month, the city hosted an "aquatic meet" with boat races, water fencing and tug-of-war. Between June and August, more than 73,000 people visited the lake. Lake Worth would remain the centerpiece of the Fort Worth park system for the next thirty years.



First sailboat on Lake Worth, EP Haltom, 1913.



Nine Mile Bridge, Lake Worth from the Jack White Collection of Historic Fort Worth Photos, University of Texas at Arlington.

APPENDIX A: LAKE WORTH HISTORY BY QUENTIN MCGOWN (cont.)

Development of the Lake

While soldiers training at Camp Bowie and the army airfields surrounding Fort Worth took advantage of the recreational facilities at Lake Worth, local business leaders raised the money to open the Ruth Lubin Camp for Underprivileged Children, and the Boy Scouts opened Camp Leroy Schuman. Large pleasure boats, including “Miss Lake Worth,” “Panther City” and “Alvez” began operations, taking passengers on leisurely excursions around the scenic park. The last two were destroyed by fire and sank in the lake, but with no casualties. While the city offered lakeshore recreational campsite leases to a handful of local hunting, fishing and church organizations as early as 1915, 1918 saw a dramatic increase in leasing activity.

Over the next few years many of Fort Worth’s most prominent businesses and organizations developed camps, including Swift, Armour, the YMCA, Travis Avenue Baptist Church and the Panther Boys Club. To meet the demand for public camping, several families began operating small lakeside resorts with fishing piers and rental cabins, including Huffman’s, Roach’s, Getting’s and Shady Grove. By 1926, there were 800 individual campsite leases recorded around the lake.

Over the years, a handful of large-scale properties were developed along the shores of Lake Worth. On July 4, 1919, the Masonic Mosque opened its doors and welcomed guests to the largest dance floor in the Southwest. Designed with the Middle Eastern themes adopted by Texas Masons for their chapters, the imposing building, complete with four-story minarets and spectacular stained glass windows towered over the lake at Reynolds Point, later renamed Mosque Point. Hosting special events and Masonic conventions, the building was sold to the Methodist Church Conference in 1924 and used as a church retreat until 1926, when it was returned to Masonic control. It was destroyed by fire in January, 1929.



Mosque Point from Lake Worth.

With the Mosque still towering above the lake, another enormous facility took shape on the opposite shore. In 1926, the city gave a thirty year, two thousand acre lease to the Lake Worth Amusement Company, headed by French L. Wilgus, developer of the acclaimed Indian Lake resort in Ohio. Wilgus built on the old bathing beach a \$1.5 million dollar facility dubbed “The Coney Island of the Southwest,” and featuring a boardwalk, a small zoo, amusement rides and a dance floor that could hold 1,000 people. Sand was trucked in and pumped along the old beach to create a larger swimming area, and a dance pavilion styled after the Mormon Tabernacle opened with enough floor space for five hundred couples. Visitors crowding the new Casino Beach when it opened Labor Day weekend in 1927 enjoyed music, dancing and, for the adventurous, a fleet of ten Dart motor launches that could speed across the lake at up to 40 mph. With the crowds expanding and Mayor William Bryce declaring that he no longer felt safe driving over the old wooden Nine Mile Bridge to attend events at the amusement park, work began on a replacement bridge in 1928. Construction was about halfway completed when the casino and boardwalk burned in June, 1929.

Rebuilding bigger and better, the boardwalk was extended to become the longest west of Atlantic City. A new roller coaster, the Thriller, was one of the largest in the South and boasted a mile of track with a 72 foot drop. The casino ballroom came back to life with enough room under its new Mission style arcade to welcome 2,000 dancers. By the time the new bridge was dedicated in May, 1930, with speeches, a parade and, interestingly, fireworks, the revamped Casino Beach became the leading attraction in town. Even during Prohibition, liquor sales along the length of Jacksboro Highway did a booming business as dancers headed toward the mirror-balled pavilion, where one woman recalled that “you couldn’t tell where the lights ended and the stars began.”



The Thriller roller coaster at Casino Beach.

APPENDIX A: LAKE WORTH HISTORY BY QUENTIN MCGOWN (cont.)

About 1930, local businessman Samuel Whiting began construction of “Iveness,” a massive stone house on the South shore of the lake. Built around an old rock cabin dating from the 1860’s, the Lake Worth Castle, as it became known, remains one of the most unique properties in Fort Worth. Reportedly using some materials salvaged from the Mosque when he began construction, Whiting spent the next ten years completing the castle and five guest cottages. He welcomed the pleasure boaters on the lake to stop at his long stone pier, complete with lighthouse and special fishing enclosure. The castle was for a time used as a recreation resort by Consolidated Vultee, and hosted actor Jimmy Stewart during his filming of “Strategic Air Command.”

Amon G. Carter, owner and publisher of the Fort Worth Star-Telegram, opened his famous Shady Oak Farm on 900 acres on Lake Worth in 1923. Over the next thirty years, Carter would host virtually every major dignitary who visited Fort Worth, including several presidents. The famous “Frontier Bar” is described in the WPA Guide to Fort Worth: “Immediately beyond the farm house is the Frontier Bar, with a sign ‘Howdy Stranger’ over its front; this was the gateway to the 1936 Fort Worth Frontier Fiesta... Scattered over the walls are crude signs reminiscent of early Texas such as: ‘No shooting, check your pistol.’ ‘no checks cashed not even good ones.’ ‘Dallas passport must be okayed.’ On the walls are mounted specimens of native longhorn steers, one of which entertains with ribald songs including a humorous tirade against Dallas, Texas and during its rendition the steer, symbolic of Carter’s hatred of Fort Worth’s sister city, will emit snorts and smoke from its nostril.” Nothing remains today of the famous farm except a few foundations and the small stock tanks from which President Franklin Roosevelt fished for Carter’s specially bred bass.

Beginning in 1923, the city commissioned the nationally renowned Kansas City landscape design firm of Hare and Hare to develop a comprehensive design for the city’s parks, including Lake Worth. The firm developed a plan for the lake that would create picnic areas, sheltered pavilions and long vistas, taking advantage of the natural features of the lake. The first improvements completed, in 1926, were three pavilions at Inspiration Point, overlooking the dam and the 1925 Federal Fish Hatchery, a project championed by Congressman Fritz G. Lanham of Fort Worth. Additional park improvements were planned but were delayed by lack of funding. Hare and Hare completed several other designs for the city, including the Botanic Gardens and the Monticello and Park Hill neighborhoods.



Whiting Castle, 1935.



Amon Carter and Charles Lindbergh at Shady Oak Farm, 1927.

APPENDIX A: LAKE WORTH HISTORY BY QUENTIN MCGOWN (cont.)

Further development of the park plans for the lake became a reality with the opening of Camp 1816 of the Civilian Conservation Corps. Between 1934 and 1937, the men of the CCC constructed roads, built bridges, and completed most of the recommendations in the Hare and Hare plan. From the headquarters camp located in the center of Peninsula Club Circle, CCC workers, making \$30.00 a month, built 110 stone picnic tables, 37 roadside fireplaces, 4 public toilets and 3 water fountains. More than ten miles of park drives and paths were graded and rocks cut from the cliffs along the lake shore decorated drainage culverts and nature trails and were used to build magnificent shelter houses and lookouts, many still standing today. A monument in the Fort Worth Nature Center chronicles the tremendous work of the CCC. Other federal program funding helped expand the fish hatchery and build two WPA bridges on the old stage road section of the Meandering Road at Silver and Live Oak Creeks.

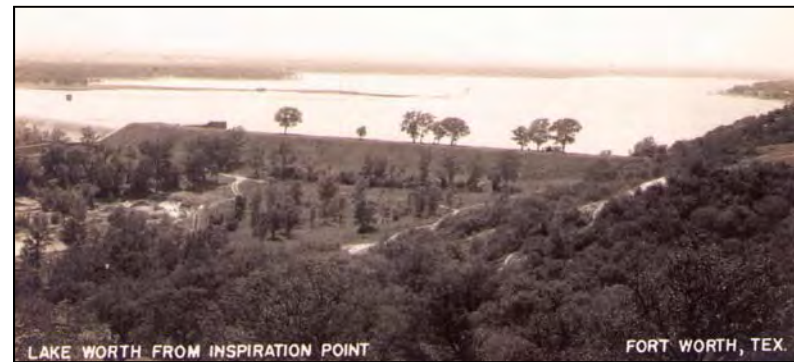
As the United States prepared to enter World War Two, the City purchased 526 acres on the south shore of the lake owned by Mrs. Ben Tillar. That land, along with the lake frontage already owned by the city was turned over to the U.S. Army for the construction of Air Force Plant Number Four, a bomber factory operated by Consolidated Vultee Corporation, known more familiarly as Convair. Opening in 1942, the plant produced three thousand B-24s by 1944 when production shifted to the B-32. The adjacent Tarrant Army Air Field became home to the 7th Bombardment Group in 1946 and the Field was renamed for Major Horace Carswell, the first Fort Worth native to be awarded the Congressional Medal of Honor after his plane went down in the South China Sea in 1944. By 1944, Convair, and the related military operations on Lake Worth, became the largest employment center in Fort Worth.

Other milestones in the lake's history include the founding of the Fort Worth Power Boat Club in 1926 and its transition to the Fort Worth Boat Club in 1929. Following a move to the new Eagle Mountain Lake in 1932, the Boat Club's legacy of Texas inland sailing continued with the Lake Worth Sailing Club, chartered in 1935. While Lake Worth was once the premier park in the southwest, its popularity as a destination declined during the period after the war with the development of municipal swimming pools, air-conditioning, television and the distractions of modern life. The spectacular Casino Beach development limped along until the 1960's when many of the attractions were demolished. The lake made international headlines for a brief time in 1969 when the Lake Worth Monster made his appearance near Greer Island. His story is celebrated each year at the Monster Bash in the Fort Worth Nature Center and Preserve. The opening of the Loop 820 bridge over the lake in 1975 reintroduced the treasures of what had been proposed back in the 1920s as Lake Worth State Park.

As Fort Worth grows to surround this urban park, its treasures will again attract visitors to the natural settings and the magnificent landscapes so carefully designed and painstakingly executed. A drive around Lake Worth today is as inspirational as it was when the first cars rolled along Meandering Road and Fort Worth families discovered the wonders of nature in the city's own backyard. Many of the CCC built picnic sites, trails and pavilions still welcome visitors. A few of the original fishing camps survive along with stone houses and other reminders of the lake's heyday as the recreation center of North Texas. What began in 1958 as a mission-run rehabilitation farm for recovering addicts has grown into the 3,600 acre Nature Center. The rock pavilions first built in 1926 await restoration and renewed use. A new vision for Lake Worth will reinstate the lake as an urban park and recreation oasis in the middle of a growing city and region.



Casino Beach Boardwalk, 1944.



Inspiration Point, 1920.

APPENDIX B: PREVIOUS LAKE WORTH PLANS

Numerous dredging and environmental studies have been completed for Lake Worth since 1930. Determining the proper way to dredge the lake was the primary purpose of these studies. A new dredging study is currently underway for the lake. The purpose of the study is to determine how the lake should be dredged to increase the lake's capacity as a water supply reservoir and to optimize its recreational benefits. Funding for dredging will be provided through gas well revenues and royalties from the Barnett Shale formation, a major natural gas field extending across Fort Worth and 15 surrounding counties, including beneath Lake Worth and the surrounding City-owned land. The current dredging study is the result of the Lake Worth Capital Improvement Implementation Plan described below. Dredging could begin in 2011.

Lake Worth Capital Improvement Implementation Plan, 2007.

In December 2007, the Fort Worth City Council adopted the Lake Worth Capital Improvement Implementation Plan (CIIP) for improvements in and around the Lake Worth reservoir. The primary focus of the plan was to identify projects from previous studies, and to create a timed CIIP that would maximize the use of the lake as a natural resource, a recreation destination, and a center of appropriate new development. The plan includes current maps and descriptions of conditions around Lake Worth.

Joint Land Use Study (JLUS), 2008.

The Joint Land Use Study, approved in March 2008, defines the impact that land development has had, and could have in the future, on the operational capabilities of the Naval Air Station Joint Reserve Base located on the south side of Lake Worth. The study also provides an analysis of the impact of the current mission and possible future mission changes on the surrounding communities, including Fort Worth.

The purpose of the Joint Land Use Study program is to encourage both present and future land development and land use decisions to be made in a cooperative environment. The program aims to lessen the effects of military operations on lands near installations; restrict incompatible development in areas having accident potential or high exposure to noise; safeguard operational capability by encouraging compatible land use; and ensure pilots are not exposed to flight hazards, bird strikes, and interference from visual as well as electromagnetic sources.

Fort Worth Nature Center and Refuge Master Plan, 2003.

The Fort Worth Nature Center & Refuge Master Plan was completed in 2003. At more than 3,600 acres, the nature center, which is located on the north end of Lake Worth, is one of the largest nature centers in the United States. The plan includes resource management, land use, and operations/governance/economic growth recommendations.

Lake Worth Development Plan and Management Program, 1981.

The Lake Worth Development Plan and Management Program was completed in the early 1980s. The plan included a comprehensive management approach to Lake Worth. The plan goals and objectives focused on environmental, fiscal, social, recreational, and functional issues on and around the lake. None of the major recommendations in the plan were implemented.

APPENDIX C: CONSULTANT PANEL BIOS

Mark Dawson, ASLA, Principal, Sasaki Associates

Mark has over twenty-four years of professional experience with a wide range and variety of project types, including complex urban mixed-use developments, brownfields, corporate and commercial headquarters, colleges and universities, waterfront parks, tourism planning and leisure designs. His experience includes designs for Jacksonville Shipyards, Jacksonville, Florida; Davis Park in Kansas City, Missouri; America's World Trade District in San Juan, Puerto Rico; the first-prize winning landscape design for the 2008 Summer Olympics in Beijing, China; Reading Riverfront Park in Reading, Pennsylvania; and Cincinnati Central Riverfront Park, Cincinnati, Ohio.

Trained as a landscape architect, Mark's focus is to create and develop designs that integrate a public process that encourages and welcomes public participation. These designs must endure over time and be able to sustain the demands put upon them as the public enjoys and uses these spaces. Mark believes these designs must be innovative, creative, sustainable, and grounded in fundamental ecological principals that will last and be enjoyed by the public for a lifetime. He is active in the Utah State University College of Humanity's Arts and Social Sciences Academic Council and the Council of Landscape Architects Review Board (CLARB), and he lectures widely on landscape architecture and professional practice.

Caryn Ernst, Associate Director of Conservation Vision, Trust for Public Land

Caryn Ernst is Associate Director of TPL's Conservation Vision Services. She oversees conservation visioning and greenprinting projects for TPL, working particularly on community engagement strategies and water resource protection. She provides services to TPL's field offices and local partners in community outreach, planning, fundraising, facilitation and watershed analysis, and builds TPL's national leadership in conservation vision watershed protection through publications, research, presentations and partnerships.

Before coming to TPL, Ms. Ernst worked in neighborhood and park planning for the Community Design Center of Pittsburgh, after having spent a number of years as a program manager and community organizer with the Allegheny Policy Council. Ms. Ernst has a B.A. in Political Science from Rutgers University (1991) and a Masters in Public Administration from the University of North Carolina at Chapel Hill (2000).

Cales Givens, ASLA, Principal, EDAW

Throughout his career, Cales Givens has used his consensus-building skills to guide diverse groups in crafting successful project visions and moving projects to implementation. Due to his focus on urban revitalization, community planning and design, and parks and greenways, many of Cales' projects are very much in the public domain. He has led planning and design efforts for high-profile new communities such as Stapleton, CO, which is destined to become a national model for urban revitalization, as well as an award-winning downtown planning project and national urban regeneration effort in St. Louis, MO. Many of his projects have received local and national awards from ASLA and APA.

Cales has been an active ULI member since 1988. He has served on Advisory Service Panels in Pennsylvania, North Carolina, Illinois, Ohio, and California, tackling issues associated with neighborhood retail and downtown plans, transit corridors, and base realignment and closure.

APPENDIX C: CONSULTANT PANEL BIOS (cont.)

Stephen Plunkard, FASLA, Senior Principal, Stantec Consulting

Stephen Plunkard is a principal of Stantec Planning and Landscape Architecture. He has been practicing landscape architecture for more than 30 years and is a Fellow of the American Society of Landscape Architects. In his current position, he is the practice leader for 90 landscape architects and civil engineers. Prior to joining Stantec, he was Senior Vice President of a 300-person multi-disciplinary consulting firm for 12 years, and managing principal of a 37-person planning, architecture, landscape architecture and graphic design firm for 16 years.

Mr. Plunkard has been involved in waterfront planning and design projects from Florida to Maine in the United States. US waterfront projects have been designed for inland waterways, ocean and lake front properties in urban and rural settings. Projects he has been involved in have won awards from the Urban Land Institute, the American Planning Association, the American Institute of Architects, the American Council of Engineering Companies, the American Society of Landscape Architects, and the National Trust for Historic Preservation. In 2006, Mr. Plunkard was selected by the National Trust for Historic Preservation to work with a team to develop a post-Katrina master plan for Gulfport, MS. Based on the Gulfport plan, over \$900 million in private and public sector investments were made in the waterfront and downtown. He has traveled extensively throughout North America and Europe studying waterfronts and is a frequent guest lecturer at universities and colleges.

Central to his success as a designer has been his ability to motivate stakeholders to create constructive changes without controversy. He has been at the forefront of creative thinking processes, including: design charrettes, workshops, preference surveys, metaphorical thinking and modeling for more than 30 years and was a Colleague at the Creative Problem Solving Institute for 5 years.

Scott H. Stoodley, Ph.D., Vice President, Water Resources Senior Consultant, Entrix, Inc.

Dr. Stoodley has over 20 years of experience in water quality, watershed management and other environmentally-related issues. His background in watershed modeling, GIS, and use of remote sensing provides unique problem solving abilities to complex ecosystem applications. Dr. Stoodley has applied remotely sensed data for watershed-related applications, including targeting implementation of best management practices (BMPs) and total maximum daily load (TMDL) development. During his career, he has worked for private industry, academia, non-profit organizations, and state government. He has directed or overseen state-wide water quality monitoring programs, watershed assessment and planning, large and small-scale watershed restoration/implementation projects, environmental education, and working with the legislature.

Dr. Stoodley has served on the United States Water Resources Steering Committee and numerous Mid-West and New England regional water quality management committees. He is an expert in non-point source pollution and is often invited to speak at national and regional EPA Non-point Source Conferences.

APPENDIX D: WORKSHOP SCHEDULE

Monday, November 17

8:00 a.m. – 10:00 a.m.

Consultant team breakfast with City staff in pre-Council Chamber room at Fort Worth City Hall; staff briefs consultants on Lake Worth existing conditions; various City department staff provide presentations and answer questions.

10:00 a.m. – 1:00 p.m.

Lake Worth tour by van.

1:00 p.m. – 2:00 p.m.

Consultant team lunch with tour staff at Lake Worth.

2:00 p.m. – 5:15 p.m.

Stakeholder meetings at Lake Worth Management Office.

5:30 p.m. – 7:00 p.m.

Consultant team dinner.

7:00 p.m. – 9:00 p.m.

Informal gathering attended by stakeholders and staff at The Point Restaurant, 1349 Bomber Road.

Tuesday, November 18

7:30 a.m. – 8:30 a.m.

Breakfast.

8:30 a.m. – 12:30 p.m.

Various stakeholder meetings in Room 293 at Fort Worth City Hall.

12:30 p.m. – 6:00 p.m.

Consultant team has working lunch and formulates preliminary plans and recommendations with City staff.

6:00 p.m. – 9:00 p.m.

Dinner with staff; consultant team reviews and prepares preliminary alternative scenarios presentation for Wednesday morning stakeholder meeting.

Wednesday, November 19

7:30 a.m. – 8:30 a.m.

Breakfast. Consultant team checks out of hotel and walks to City Hall.

8:30 a.m. – 10:00 a.m.

Team presents preliminary alternative scenarios to stakeholders in Pre-Council Chamber.

10:30 a.m. – 4:30 p.m.

Consultant team, with staff support, finalizes preferred alternative; prepares graphic depictions, implementation recommendations, and final presentation to stakeholders. Lunch provided.

4:30 p.m. – 5:30 p.m.

Consultant team gives final presentation in Development Conference Room on lower level.

5:30 p.m.

Consultant team travels to airport or back to hotel depending on flight arrangements.

**APPENDIX E: NAS JRB
JOINT LAND USE STUDY
COMPATIBILITY TABLES**

Benbrook, Fort Worth, Lake Worth
River Oaks, Westworth Village,
White Settlement, and Tarrant County



Defending the Sound of Freedom

U.S. Department of Defense, Office of Economic Adjustment, Project Manager
North Central Texas Council of Governments, Study Sponsor

**TABLE 4.2 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES**

Source: OPRNAV 11010.36B

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation | APZ-I Recommendation | APZ-II Recommendation | Density Recommendation |
|-----------|---|---------------------------|----------------------|-----------------------|---|
| 10 | Residential | | | | |
| 11 | Household Units | | | | |
| 11.11 | Single units: detached | N | N | Y ² | Maximum density of 1-2 Du/Ac |
| 11.12 | Single units: semidetached | N | N | N | |
| 11.13 | Single units: attached row | N | N | N | |
| 11.21 | Two units: side-by-side | N | N | N | |
| 11.22 | Two units: one above the other | N | N | N | |
| 11.31 | Apartments: walk-up | N | N | N | |
| 11.32 | Apartment: elevator | N | N | N | |
| 12 | Group quarters | N | N | N | |
| 13 | Residential Hotels | N | N | N | |
| 14 | Mobile home parks or courts | N | N | N | |
| 15 | Transient lodgings | N | N | N | |
| 16 | Other residential | N | N | N | |
| 20 | Manufacturing³ | | | | |
| 21 | Food & kindred products; manufacturing | N | N | Y | Maximum FAR 0.56 |
| 22 | Textile mill products; manufacturing | N | N | Y | Same as above |
| 23 | Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing | N | N | N | |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 25 | Furniture and fixtures; manufacturing | N | Y | Y | Same as above |
| 26 | Paper and allied products; manufacturing | N | Y | Y | Same as above |
| 27 | Printing, publishing, and allied industries | N | Y | Y | Same as above |
| 28 | Chemicals and allied products; manufacturing | N | N | N | |
| 29 | Petroleum refining and related industries | N | N | N | |

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**TABLE 4.2 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES
(Continued)**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation | APZ-I Recommendation | APZ II Recommendation | Density Recommendation |
|-----------|---|---------------------------|----------------------|-----------------------|--|
| 30 | Manufacturing³ (continued) | | | | |
| 31 | Rubber and misc. plastic products; manufacturing | N | N | N | |
| 32 | Stone, clay and glass products; manufacturing | N | N | Y | Maximum FAR 0.56 |
| 33 | Primary metal products; manufacturing | N | N | Y | Same as above |
| 34 | Fabricated metal products; manufacturing | N | N | Y | Same as above |
| 35 | Professional scientific, & controlling instrument; photographic and optical goods; watches & clocks | N | N | N | |
| 39 | Miscellaneous manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I & 0.56 in APZ II |
| 40 | Transportation, communication and utilities⁴ | | | | See Note 3 below. |
| 41 | Railroad, rapid rail transit, and street railway transportation | N | Y ⁵ | Y | Same as above. |
| 42 | Motor vehicle transportation | N | Y ⁵ | Y | Same as above |
| 43 | Aircraft transportation | N | Y ⁵ | Y | Same as above |
| 44 | Marine craft transportation | N | Y ⁵ | Y | Same as above |
| 45 | Highway and street right-of-way | N | Y ⁵ | Y | Same as above |
| 46 | Auto parking | N | Y ⁵ | Y | Same as above |
| 47 | Communication | N | Y ⁵ | Y | Same as above |
| 48 | Utilities | N | Y ⁵ | Y | Same as above |
| 485 | Solid waste disposal (Landfills, incineration, etc.) | N | N | N | |
| 49 | Other transport, comm. and utilities | N | Y ⁵ | Y | See Note 3 below |
| 50 | Trade | | | | |
| 51 | Wholesale trade | N | Y | Y | Maximum FAR of 0.28 in APZ I, & .56 in APZ II. |
| 52 | Retail trade - building materials, hardware and farm equipment | N | Y | Y | Maximum FAR of 0.14 in APZ I & 0.28 in APZ II |

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**TABLE 4.2 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES
(Continued)**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation | APZ-I Recommendation | APZ-II Recommendation | Density Recommendation |
|-----------|---|---------------------------|----------------------|-----------------------|--|
| 50 | Trade (Continued) | | | | |
| 53 | Retail trade - shopping centers | N | N | Y | Maximum FAR of 0.22. |
| 54 | Retail trade - food | N | N | Y | Maximum FAR of 0.24 |
| 55 | Retail trade - automotive, marine craft, aircraft and accessories | N | Y | Y | Maximum FAR of 0.14 in APZ I & 0.28 in APZ II |
| 56 | Retail trade - apparel and accessories | N | N | Y | Maximum FAR 0.28 |
| 57 | Retail trade - furniture, home, furnishings and equipment | N | N | Y | Same as above |
| 58 | Retail trade - eating and drinking establishments | N | N | N | |
| 59 | Other retail trade | N | N | Y | Maximum FAR of 0.22 |
| 60 | Services * | | | | |
| 61 | Finance, insurance and real estate services | N | N | Y | Maximum FAR of 0.22 for "General Office/Office park" |
| 62 | Personal services | N | N | Y | Office uses only. Maximum FAR of 0.22. |
| 62.4 | Cemeteries | N | Y | Y | |
| 63 | Business services (credit reporting; mail, stenographic, reproduction; advertising) | N | N | Y | Max. FAR of 0.22 in APZ II |
| 63.7 | Warehousing and storage services | N | Y | Y | Max. FAR 1.0 APZ I; 2.0 in APZ II |
| 64 | Repair Services | N | Y | Y | Max. FAR of 0.11 APZ I; 0.22 in APZ II |
| 65 | Professional services | N | N | Y | Max. FAR of 0.22 |
| 65.1 | Hospitals, nursing homes | N | N | N | |
| 65.1 | Other medical facilities | N | N | N | |
| 66 | Contract construction services | N | Y | Y | Max. FAR of 0.11 APZ I; 0.22 in APZ II |
| 67 | Government Services | N | N | Y | Max FAR of 0.24 |
| 68 | Educational services | N | N | N | |
| 69 | Miscellaneous | N | N | Y | Max. FAR of 0.22 |

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**TABLE 4.2 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES
(Continued)**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation | APZ-I Recommendation | APZ-II Recommendation | Density Recommendation |
|--|--|---------------------------|----------------------|-----------------------|--|
| 70 Cultural, entertainment and recreational | | | | | |
| 71 | Cultural activities | N | N | N | |
| 71.2 | Nature exhibits | N | Y ¹ | Y ² | |
| 72 | Public assembly | N | N | N | |
| 72.1 | Auditoriums, concert halls | N | N | N | |
| 72.11 | Outdoor music shells, amphitheaters | N | N | N | |
| 72.2 | Outdoor sports arenas, spectator sports | N | N | N | |
| 73 | Amusements - fairgrounds, miniature golf, driving ranges; amusement parks, etc | N | N | Y | |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y ³ | Y ⁴ | Max. FAR of 0.11 APZ I; 0.22 in APZ II |
| 75 | Resorts and group camps | N | N | N | |
| 76 | Parks | N | Y ⁵ | Y ⁶ | Same as 74 |
| 79 | Other cultural, entertainment and recreation | N | Y ⁷ | Y ⁷ | Same as 74 ¹ |
| 80 Resource production and extraction | | | | | |
| 81 | Agriculture (except live stock) | Y ¹ | Y ² | Y ³ | |
| 81.5, 81.7 | Livestock farming and breeding | N | Y ^{9,10} | Y ^{9,10} | |
| 82 | Agriculture related activities | N | Y ⁸ | Y ⁸ | Max FAR of 0.28 APZ I; 0.56 APZ II no activity which produces smoke, glare, or involves explosives |
| 83 | Forestry Activities ¹¹ | N | Y | Y | Same as Above |
| 84 | Fishing Activities ¹² | N ¹¹ | Y | Y | Same as Above |
| 85 | Mining Activities | N | Y | Y | Same as Above |
| 89 | Other resource production or extraction | N | Y | Y | Same as Above |
| 90 Other | | | | | |
| 91 | Undeveloped Land | Y | Y | Y | |
| 93 | Water Areas | N ¹⁴ | N ¹⁴ | N ¹³ | |

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**KEY TO TABLE 4.2
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES**

Y*– (Yes with restrictions) The land use and related structures are generally compatible. However, see notes indicated by the superscript.

N*– (No with exceptions) The land use and related structures are generally incompatible. However, see notes indicated by the superscript.

FAR – Floor Area Ratio A floor area ratio is the ratio between the square feet of floor area of the building and the site area. It is customarily used to measure non-residential intensities.

Du/Ac – Dwelling Units per Acre This metric is customarily used to measure residential densities.

**NOTES FOR TABLE 4.2
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES**

1. A "Yes" or a "No" designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist installations and local governments, general suggestions as to floor/area ratios are provided as a guide to density in some categories. In general, land use restrictions which limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ I, and 50 per acre in APZ II are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ I, and maximum assemblies of 50 people per acre in APZ II.
2. The suggested maximum density for detached single-family housing is one to two Du/Ac. In a Planned Unit Development (PUD) of single family detached units where clustered housing development results in large open areas, this density could possibly be increased provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.
3. Other factors to be considered: Labor intensity, structural coverage, explosive characteristics, air-pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.
4. No structures (except airfield lighting), buildings or aboveground utility/communications lines should normally be located in CZ areas on or off the installation.

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Benbrook, Fort Worth, Lake Worth,
River Oaks, Westworth Village,
White Settlement, and Tarrant County



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The CZ is subject to severe restrictions. See NAVFAC P-80.3 or Tri-Service Manual AFM 32-1123(I);

TM 5-803-7, NAVFAC P-971 "Airfield and Heliport Planning & Design" dated May 1, 1999 for specific design details.

5. No passenger terminals and no major above ground transmission lines in APZ I.
6. Low intensity office uses only. Accessory uses such as meeting places, auditoriums, etc. are not recommended.
7. No chapels are allowed within APZ I or APZ II.
8. Facilities must be low intensity, and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc. are not recommended.
9. Includes livestock grazing, but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.
10. Includes feedlots and intensive animal husbandry.
11. Lumber and timber products removed due to establishment, expansion, or maintenance of CZ will be disposed of in accordance with appropriate DOD Natural Resources Instructions.
12. Controlled hunting and fishing may be permitted for the purpose of wildlife management.
13. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.

Land Uses Located Within the 2004 Noise Contour Boundaries

A summary of the approximate acreage of existing land uses located within the 2004 noise contour boundaries is as follows:

| 2004 Wyle Noise Study | |
|-----------------------------------|---------------------|
| 65-dB Contour: | 15,048 acres |
| 70-dB Contour: | 6,698 acres |
| 75-dB Contour: | 3,083 acres |
| 80-dB Contour: | 1,484 acres |
| 85-dB Contour: | 774 acres |
| Total Acreage | 27,087 Acres |
| Includes base and bodies of water | |

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Table 4.4: AICUZ Land Use Compatibility by Noise Zone

| Land Use | | Suggested Land Use Compatibility | | | | | | |
|----------|---|----------------------------------|----------------|--------------------------------|----------------|--------------------------------|----------------|-----|
| | | Noise Zone 1 (DNL or CNEL) | | Noise Zone 2 (DNL or CNEL) | | Noise Zone 3 (DNL or CNEL) | | |
| SLUCM NO | LAND USE NAME | < 55 | 55- 64 | 65 - 69 | 70 -74 | 75- 79 | 80 -84 | 85+ |
| | Residential | | | | | | | |
| 11 | Household Units | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.11 | Single units: detached | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.12 | Single units: semidetached | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.13 | Single units: attached row | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.21 | Two units: side-by-side | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.22 | Two units: one above the other | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.31 | Apartments: walk-up | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 11.32 | Apartment: elevator | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 12 | Group quarters | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 13 | Residential Hotels | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| 14 | Mobile home parks or courts | Y | Y ¹ | N | N | N | N | N |
| 15 | Transient lodgings | Y | Y ¹ | N ¹ | N ¹ | N ¹ | N | N |
| 16 | Other residential | Y | Y ¹ | N ¹ | N ¹ | N | N | N |
| | Manufacturing | | | | | | | |
| 21 | Food & kindred products; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 22 | Textile mill products; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 23 | Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 24 | Lumber and wood products (except furniture); manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 25 | Furniture and fixtures; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 26 | Paper and allied products; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 27 | Printing, publishing, and allied industries | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 28 | Chemicals and allied products; manufacturing | Y | Y | Y | Y ² | Y ² | Y ³ | N |
| 29 | Petroleum refining and related industries | Y | Y | Y | Y ² | Y ² | Y ³ | N |

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**Table 4.4: AICUZ Land Use Compatibility by Noise Zone
(Continued)**

| Land Use | | Suggested Land Use Compatibility | | | | | | |
|--------------|--|----------------------------------|---------|--------------------------------|-----------------|--------------------------------|----------------|-----|
| | | Noise Zone 1 (DNL or CNEL) | | Noise Zone 2 (DNL or CNEL) | | Noise Zone 3 (DNL or CNEL) | | |
| SLUCM No. | LAND USE NAME | < 55 | 55 - 64 | 65 - 69 | 70 - 74 | 75 - 79 | 80 - 84 | 85+ |
| 30 | Manufacturing (continued) | | | | | | | |
| 31 | Rubber and misc. plastic products; manufacturing | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 32 | Stone, clay and glass products; manufacturing | Y | Y | Y | Y ² | Y ³ | Y ⁴ | N |
| 33 | Primary metal products; manufacturing | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 34 | Fabricated metal products; manufacturing | Y | Y | Y | Y ² | Y ³ | Y ⁴ | N |
| 35 | Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks | Y | Y | Y | 25 | 30 | N | N |
| 39 | Miscellaneous manufacturing | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 40 | Transportation, communication and utilities. | | | | | | | |
| 41 | Railroad, rapid rail transit, and street railway transportation | Y | Y | Y | Y ² | Y ³ | Y ⁴ | N |
| 42 | Motor vehicle transportation | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 43 | Aircraft transportation | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 44 | Marine craft transportation | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 45 | Highway and street right-of-way | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 46 | Automobile parking | Y | Y | Y | Y ² | Y ³ | Y ⁴ | N |
| 47 | Communication | Y | Y | Y | 25 ⁵ | 30 ⁶ | N | N |
| 48 | Utilities | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 49 | Other transportation, communication and utilities | Y | Y | Y | 25 ⁶ | 30 ⁷ | N | N |
| 50 | Trade | | | | | | | |
| 51 | Wholesale trade | Y | Y | Y | Y ¹ | Y ² | Y ³ | N |
| 52 | Retail trade - building materials, hardware and farm equipment | Y | Y | Y | Y ² | Y ³ | Y ⁴ | N |
| 53 | Retail trade - shopping centers | Y | Y | Y | 25 | 30 | N | N |
| 54 | Retail trade - food | Y | Y | Y | 25 | 30 | N | N |

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**Table 4.4: AICUZ Land Use Compatibility by Noise Zone
(Continued)**

| Land Use | | Suggested Land Use Compatibility | | | | | | |
|-------------|--|----------------------------------|----------------|--------------------------------|----------------|--------------------------------|-------------------|-------------------|
| | | Noise Zone 1 (DNL or CNEL) | | Noise Zone 2 (DNL or CNEL) | | Noise Zone 3 (DNL or CNEL) | | |
| SLUCM NO | LAND USE NAME | < 55 | 55- 64 | 65 -69 | 70 -74 | 75-79 | 80 -84 | 85+ |
| 50 | Trade (Continued) | | | | | | | |
| 55 | Retail trade – automotive, marine craft, aircraft and accessories | Y | Y | Y | 25 | 30 | N | N |
| 56 | Retail trade – apparel and accessories | Y | Y | Y | 25 | 30 | N | N |
| 57 | Retail trade – furniture, home, furnishings and equipment | Y | Y | Y | 25 | 30 | N | N |
| 58 | Retail trade – eating and drinking establishments | Y | Y | Y | 25 | 30 | N | N |
| 59 | Other retail trade | Y | Y | Y | 25 | 30 | N | N |
| 60 | Services | | | | | | | |
| 61 | Finance, insurance and real estate services | Y | Y | Y | 25 | 30 | N | N |
| 62 | Personal services | Y | Y | Y | 25 | 30 | N | N |
| 62.4 | Cemeteries | Y | Y | Y | Y ² | Y ³ | Y ^{4,11} | Y ^{8,11} |
| 63 | Business services | Y | Y | Y | 25 | 30 | N | N |
| 63.7 | Warehousing and storage | Y | Y | Y | Y ¹ | Y ¹ | Y ⁴ | N |
| 64 | Repair Services | Y | Y | Y | Y ² | Y ² | Y ⁴ | N |
| 65 | Professional services | Y | Y | Y | 25 | 30 | N | N |
| 65.1 | Hospitals, other medical fac. | Y | Y ¹ | 25 | 30 | N | N | N |
| 65.16 | Nursing Homes | Y | Y | N ¹ | N ¹ | N | N | N |
| 66 | Contract construction services | Y | Y | Y | 25 | 30 | N | N |
| 67 | Government Services | Y | Y ¹ | Y ¹ | 25 | 30 | N | N |
| 68 | Educational services | Y | Y ¹ | 25 | 30 | N | N | N |
| 69 | Miscellaneous | Y | Y | Y | 25 | 30 | N | N |
| 70 | Cultural, entertainment and recreational | | | | | | | |
| 71 | Cultural activities (& churches) | Y | Y ¹ | 25 | 30 | N | N | N |
| 71.2 | Nature exhibits | Y | Y ¹ | Y ¹ | N | N | N | N |
| 72 | Public assembly | Y | Y ¹ | Y | N | N | N | N |
| 72.1 | Auditoriums, concert halls | Y | Y | 25 | 30 | N | N | N |
| 72.11 | Outdoor music shells, amphitheaters | Y | Y ¹ | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | Y | Y | Y ¹ | Y ¹ | N | N | N |
| 73 | Amusements | Y | Y | Y | Y | N | N | N |
| 74 | Recreational activities (include golf courses, riding stables, water rec.) | Y | Y ¹ | Y ¹ | 25 | 30 | N | N |
| 75 | Resorts and group camps | Y | Y ¹ | Y ² | Y ¹ | N | N | N |
| 76 | Parks | Y | Y ¹ | Y ¹ | Y ¹ | N | N | N |
| 79 | Other cultural, entertainment and recreation | Y | Y ¹ | Y ¹ | Y ¹ | N | N | N |

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**Table 4.4: AICUZ Land Use Compatibility by Noise Zone
(Continued)**

| Land Use | | Suggested Land Use Compatibility | | | | | | |
|-----------|---|----------------------------------|--------|--------------------------------|----------------|--------------------------------|--------------------|--------------------|
| | | Noise Zone 1 (DNL or CNEL) | | Noise Zone 2 (DNL or CNEL) | | Noise Zone 3 (DNL or CNEL) | | |
| SLUCM NO. | LAND USE NAME | < 55 | 55- 64 | 65 -69 | 70 -74 | 75-79 | 80 -84 | 85+ |
| 80 | <i>Resource Production and Extraction</i> | | | | | | | |
| 81 | Agriculture (except live stock) | Y | Y | Y ⁸ | Y ⁹ | Y ¹⁰ | Y ^{10,11} | Y ^{10,11} |
| 81.5, | Livestock farming | Y | Y | Y ⁸ | Y ⁹ | N | N | N |
| 81.7 | Animal breeding | Y | Y | Y ⁸ | Y ⁹ | N | N | N |
| 82 | Agriculture related activities | Y | Y | Y ⁸ | Y ⁹ | Y ¹⁰ | Y ^{10,11} | Y ^{10,11} |
| 83 | Forestry Activities | Y | Y | Y ⁸ | Y ⁹ | Y ¹⁰ | Y ^{10,11} | Y ^{10,11} |
| 84 | Fishing Activities | Y | Y | Y | Y | Y | Y | Y |
| 85 | Mining Activities | Y | Y | Y | Y | Y | Y | Y |
| 89 | Other resource production or extraction | Y | Y | Y | Y | Y | Y | Y |

Source: OPRNAV 11010.36B

KEY TO TABLE 4.4 - AICUZ Land Use Compatibility by Noise Zone

- SLUCM Standard Land Use Coding Manual, U.S. Department of Transportation
- Y (Yes) Land Use and related structures compatible without restrictions.
- N (No) Land Use and related structures are not compatible and should be prohibited.
- Yx (Yes with Restrictions) The land use and related structures are generally compatible. However, see note(s) indicated by the superscript.
- Nx (No with exceptions) The land use and related structures are generally incompatible. However, see notes indicated by the superscript.
- NLR (Noise Level Reduction) Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise

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| | |
|---------------|--|
| | attenuation into the design and construction of the structure. |
| 25, 30, or 35 | The numbers refer to Noise Level Reduction levels. Land Use and related structures generally compatible however, measures to achieve NLR of 25, 30 or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers. |
| DNL | Day-Night Average Sound Level. |
| CNEL | Community Noise Equivalent Level (Normally within a very small decibel difference of DNL) |
| Ldn | Mathematical symbol for DNL. |

NOTES FOR TABLE 4.4 - AICUZ Land Use Compatibility by Noise Zone

1.
 - a) Although local conditions regarding the need for housing may require residential use in these Zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these Zones.
 - b) Where the community determines that these uses must be allowed, measures to achieve and outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB in DNL 65-69 and NLR of 30 dB in DNL 70-74 should be incorporated into building codes and be in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in DNL 75-79.
 - c) Normal permanent construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation, upgraded Sound Transmission Class (STC) ratings in windows and doors and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
 - d) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor noise exposure NLR particularly from ground level sources. Measures that reduce noise at a

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site should be used wherever practical in preference to measures that only protect interior spaces.

2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
6. No buildings.
7. Land use compatible provided special sound reinforcement systems are installed.
8. Residential buildings require a NLR of 25
9. Residential buildings require a NLR of 30.
10. Residential buildings not permitted.
11. Land use not recommended, but if community decides use is necessary, hearing protection devices should be worn.

