

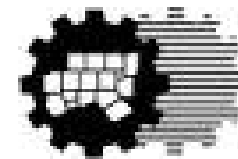


# **The Lake Worth Greenprint**

*(working title)*

**Lake Worth Regional Coordinating  
Committee Meeting**

**December 19, 2013**



North Central Texas  
Council of Governments

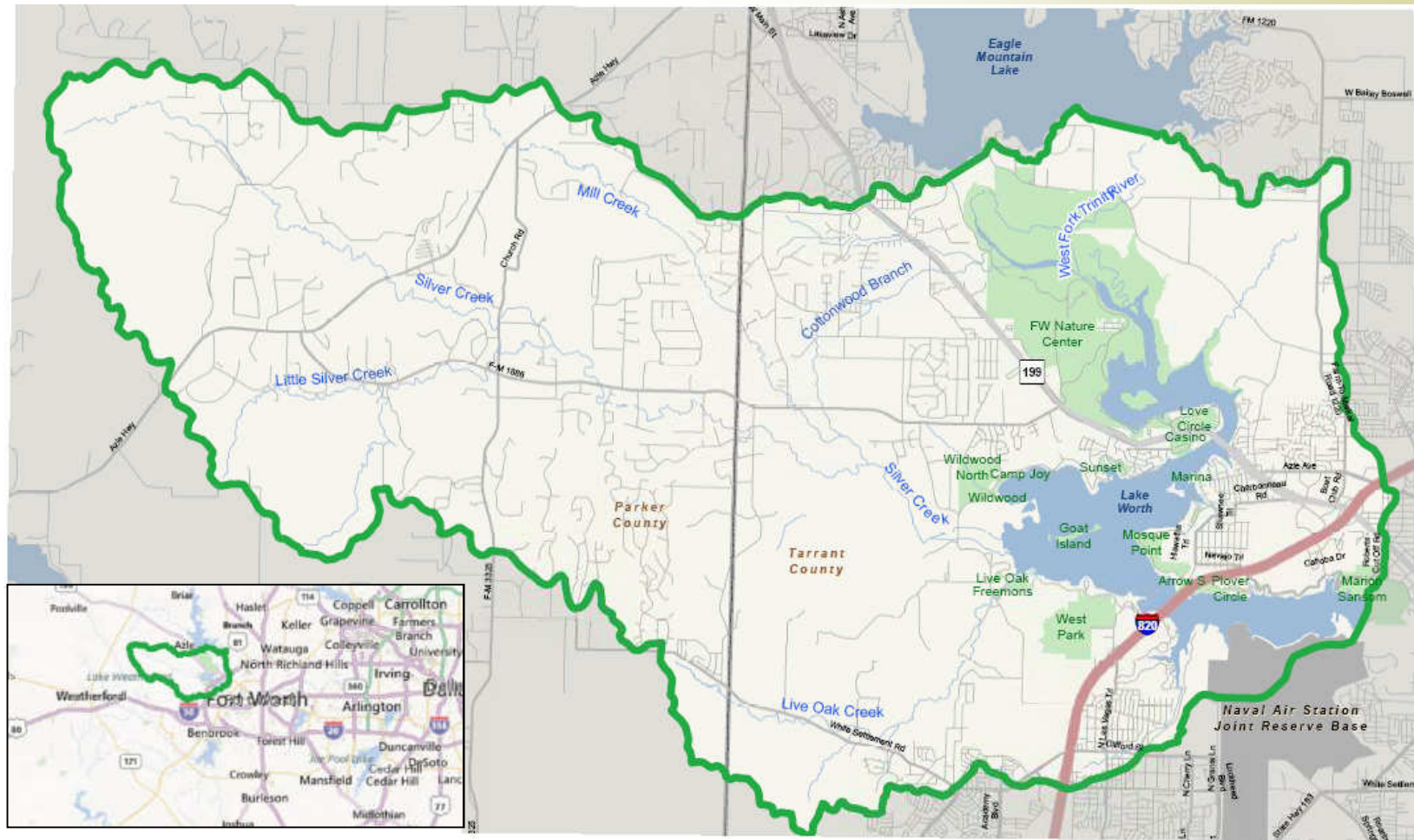
# Presentation Items

- Project background
- GIS mapping/modeling Update
- Economic benefits studies draft results
- Next steps
- Questions/comments?





# The Lake Worth Greenprint Study Area



# The Lake Worth Greenprint

## *Objectives*

1. **Develop** a long-term vision for a Lake Worth open space network, **and involve stakeholders in the decision-making process.**
2. Build upon plans **already complete or underway, e.g. trail alignment study for Lake Worth, Lake Worth Vision Plan, and the Lake Worth CIIP.**
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*Current Conditions Analysis*

*Goal Setting & Public Engagement*

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# Greenprint Mapping Analysis

- Provides a systematic approach to identify lands that offer the best opportunities for water quality protection and recreation access.
- Uses Geographic Information Systems (GIS) to inform long-term strategies for land stewardship.
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# Lake Worth Greenprint - Mapping Goals

Derived from Greenprint Interviews, Greenprint Polling, and Lake Worth Vision Plan

- **Improve Water Quality and Quantity**
  - Protect High Priority Ecosystems
  - Identify Impacted Areas for Stewardship
  
- **Provide Recreation**
  - Provide Recreation Access
  - Provide Recreational  
Connectivity to Lake Worth Trail

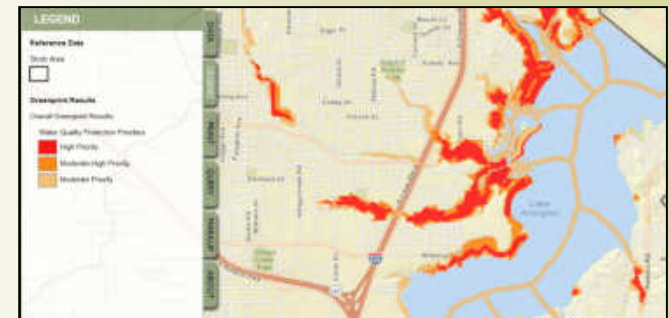




# Protect Drinking Water Quality - Example

**Resource Analysis** - Identify lands with greatest potential for Water Quality protection (would have the greatest negative impact if developed)

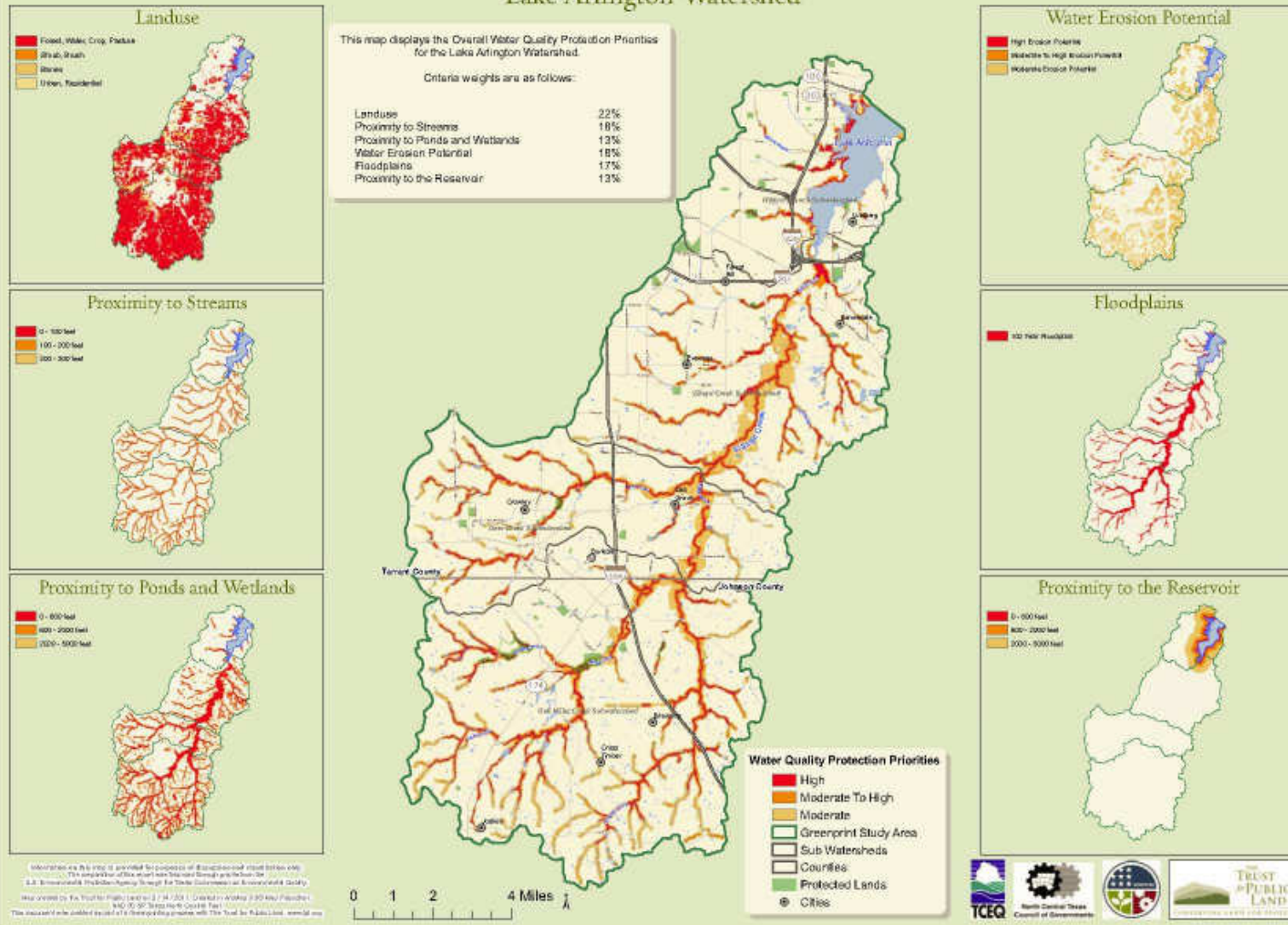
1. Identify protection criteria
2. Assemble data
3. Translate data into ranked criterion maps
4. Assign relative weightings that reflect Lake Worth watershed priorities.
5. Combine the building blocks into a composite conservation priority map for Water Quality Protection.







## NCTCOG Water Quality Protection Greenprint Lake Arlington Watershed





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# Mapping Progress Update

- Improve Water Quality and Quantity:
  - Three Technical Advisory Team meeting conducted thus far:
    - 10/17/13 Kick off meeting and criteria identification
    - 11/6/13 Criteria refinement, data identification, and modeling strategies
    - 12/18/13 Draft results review and refinement
- Provide Recreation:
  - Two Technical Advisory Team meeting conducted thus far:
    - 10/17/13 Kick off meeting and criteria identification
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# Mapping Progress Update

## Improve Water Quality and Quantity Model Criteria:

- **Protect High Priority Ecosystems**
  - Riparian Vegetation
  - Steep Slopes
  - Stream Banks
  - Critical Water Quality Zones and Floodplains
  - Wetlands
  - Soils with Slow Infiltration
  - Erodible Soils
  - Canopy Cover
  - Native Vegetation
  - Proximal (upstream) Threats to High Value Areas
- **Identify Impacted Areas for Stewardship**
  - Impervious Areas
  - Crop Land
  - Ranch Land
  - Discharge Points
  - Impaired Streams
  - Channelized Streams
  - Steep Slopes
  - Floodzones

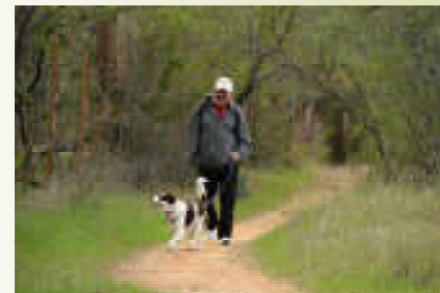
## Provide Recreation Model Criteria:

### **Provide Recreation Access**

- Pedestrian-accessible lakeshore access
- Additional Parking areas
- Playground Improvements
- Opportunities for Outdoor Fitness Zones
- Wildlife Viewing
- Shoreline Fishing
- Camping
- Motorized Boating
- Non-motorized Boating
- View Points

### **Provide Recreational Connectivity to Lake Worth Trail**

- Create Connections to Surrounding Communities and Neighborhoods



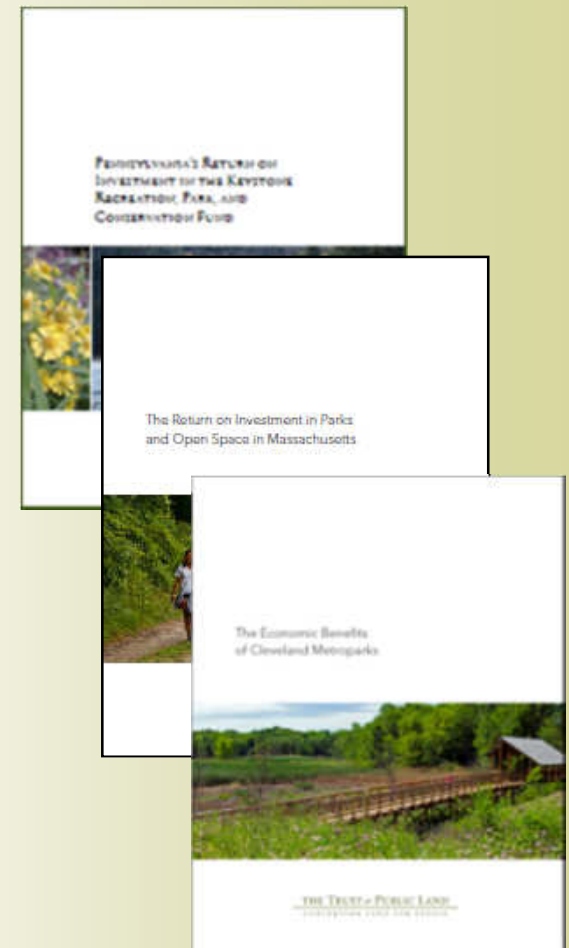


# Economic Benefits Studies

**We have a wealth of experience measuring the economic impacts of land conservation.**

## **Select recent publications**

- **The Economic Benefits of Cleveland Metroparks (2013)**
- **Return on Investment in Parks and Open Space in Massachusetts (2013)**
- **The Economic Benefits of Clean Ohio Fund Conservation (2013)**
- **Pennsylvania's Return on Investment in the Keystone Recreation, Park and Conservation Fund (2013)**
- **Our Lands – Our Future: Larimer County, Colorado (2013)**





# Local Economic Benefits

Benefits accrue to

- Local government(s)
- Residents
- Local businesses





# Enhanced Property Value

**The market values of properties located near a park or trail are frequently higher than those of comparable properties located elsewhere.**

**An increase in property values generally results in increased property tax revenues.**







# Enhanced Property Value

**Preserving open space generally increases neighboring home values, but the values vary.**

**The magnitude of the impact has been shown to be up to 20% for parks and 14% for trails.**





# Enhanced Property Value

## Market value premium

- Parks 5%

## Marginal increase in market value attributable to parks

- Lake Worth Greenprint Study Area: \$6.95 million
- City of Fort Worth: \$260 million

## Additional property tax revenue attributable to parks annually

- Lake Worth Greenprint Study Area : \$144,000
- City of Fort Worth: \$5.82 million





# Direct Recreational Use by Residents

Residents gain value from visiting the park or public open space and engaging in an activity.

Estimate value of visits held by residents.

- General activities between \$2 and \$9
- Specialized activities between \$10 and \$40





# Direct Recreational Use by Residents

**Many residents visit parks or public open spaces at least once a year**

- **79% children**
- **74% adults 18-64**
- **47% adults 65+**

**6.23 million visits annually**

**\$16.1 million in value**





# Improved Health of Area Residents

**When people have access to trails and parks they exercise more. Exercise reduces illness in people of all ages.**

**Estimate the medical cost savings of persons physically active in parks versus inactive persons based on CDC guidelines.**

**Health costs savings of \$329 to \$658 for those who exercise regularly.**

**Health care cost savings: \$13.9 million**



# Value of Riparian Corridor Protection

**Riparian corridor protection can help to improve water quality.**

**The L-THIA model can be used to estimate water recharge, runoff, and nonpoint source pollution impacts of changes in land use.**

**Estimate, with local experts, how changes in water quality determined by the model impact the region.**



A photograph of a long, narrow wooden boardwalk stretching into the distance through a field of tall, dry grasses. The sky is overcast with grey clouds. The text "THANK YOU!" is overlaid in the center of the image.

**THANK YOU!**

December 19, 2013

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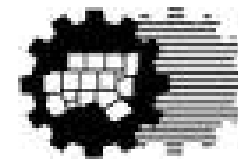


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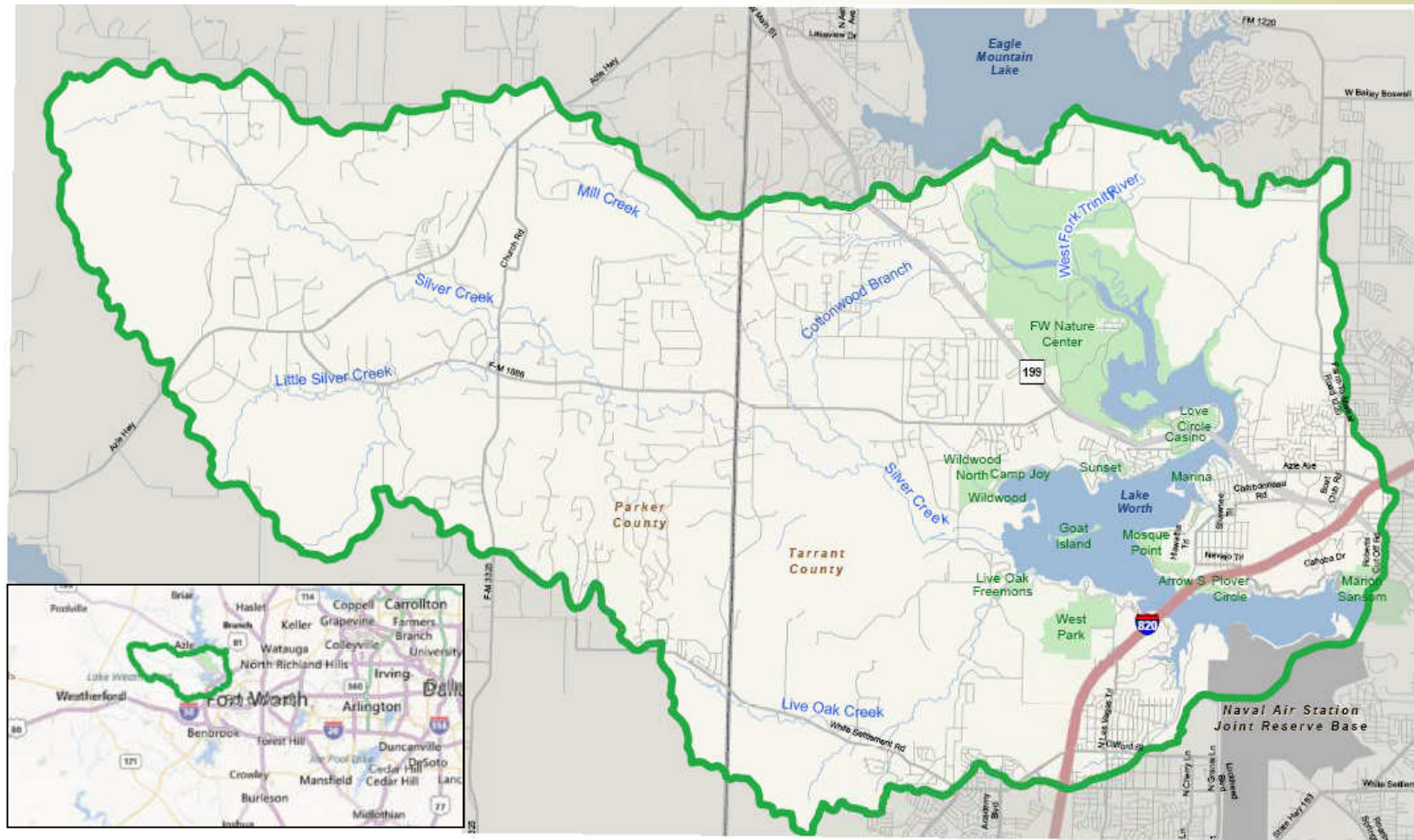
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## Protect Water Quality and Quantity

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**Steep Stream Banks**



**Erodible Soils**



**Steep Slopes**



**Lake Worth Greenprint - High Priority Water Quality Zones**

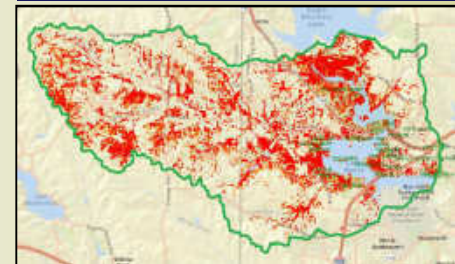


Relative Weighting by Function

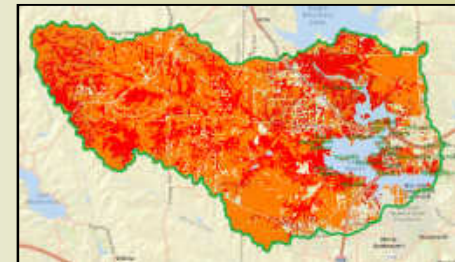
- Nutrient uptake
  - Riparian vegetation 20%
  - Wetlands 13%
- Erosion prevention
  - Steep Stream banks 11%
  - Erodible Soils 11%
  - Steep slopes 11%

- Multiple Benefits
  - Canopy Cover 15%
  - Native Vegetation 4%
  - Floodplains and Buffers 15%

**Canopy Cover**



**Native Vegetation**



**Floodplains and Buffers**



**Riparian Vegetation**

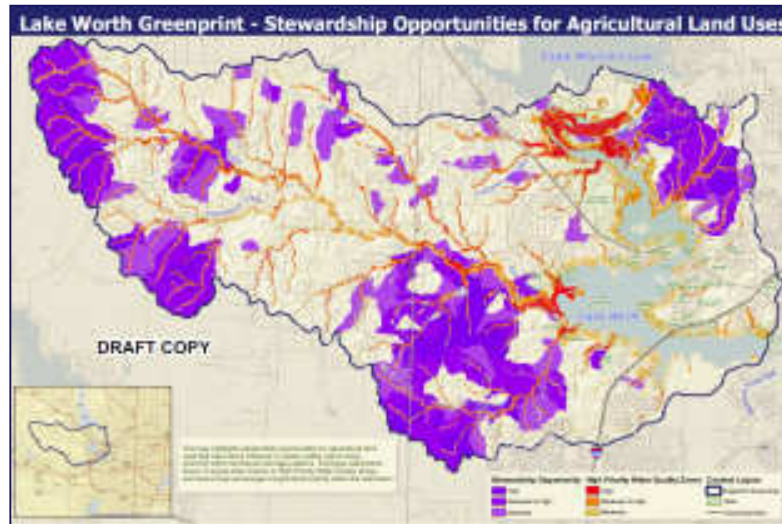


**Wetlands**

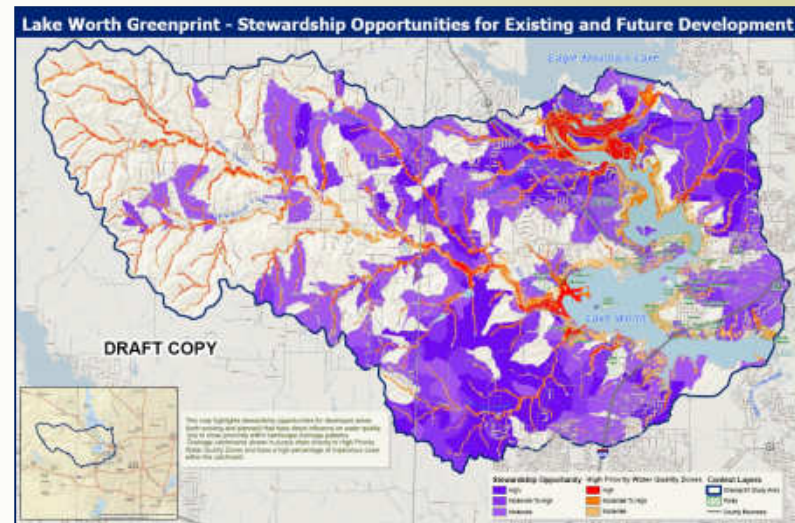




# Stewardship Opportunities



Stewardship Opportunities for Agricultural Land Uses



Stewardship Opportunities Existing and Future Development



## Provide Recreation Access and Connectivity

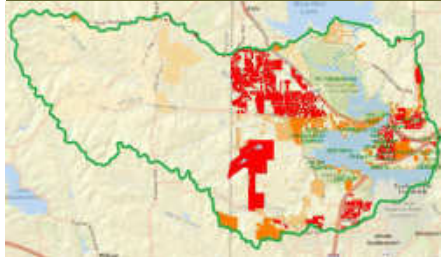
**Analysis** - Identify lands that enhance opportunities for recreational access and connectivity

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**Fitness Zone Priority Neighborhoods**



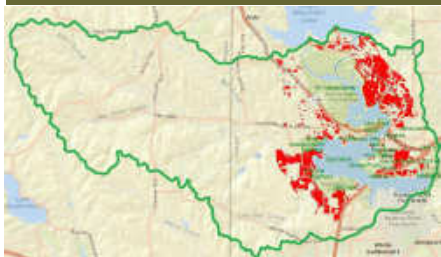
**Wildlife Viewing**



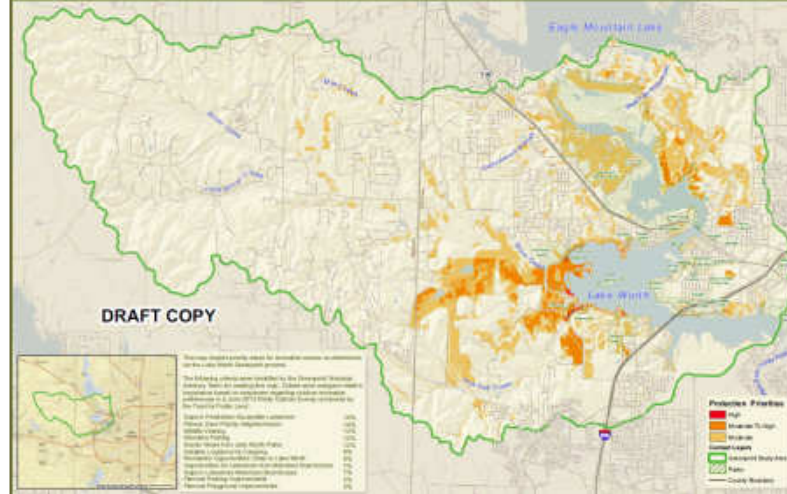
**Suitable Locations for Camping**



**Scenic Views from Lake Worth Parks**



**Lake Worth Greenprint - Provide Recreation Access to Lake**



Relative Weighting based on Outdoor Recreation Preferences Survey  
June 2013

- Gaps in Pedestrian-Accessible Lakeshore 14%
- Fitness Zone Priority Neighborhoods 14%
- Wildlife Viewing 12%
- Opportunities for Shoreline Fishing 12%
- Scenic Views from Lake Worth Parks 12%
- Suitable Locations for Camping 9%
- Recreation Opportunities Close to Lake Worth 8%
- Opportunities for Lakeshore Non-Motorized Boat Access 7%
- Gaps in Lakeshore Motorized Boat Access 7%
- Planned Parking Improvements 2%
- Planned Playground Improvements 2%

**Gaps in Pedestrian Access to Lakeshore**



**Opportunities for Shoreline Fishing**



**Opportunities Non-Motorized Boat**



**Planned Parking Improvements**



**Planned Playground Improvements**

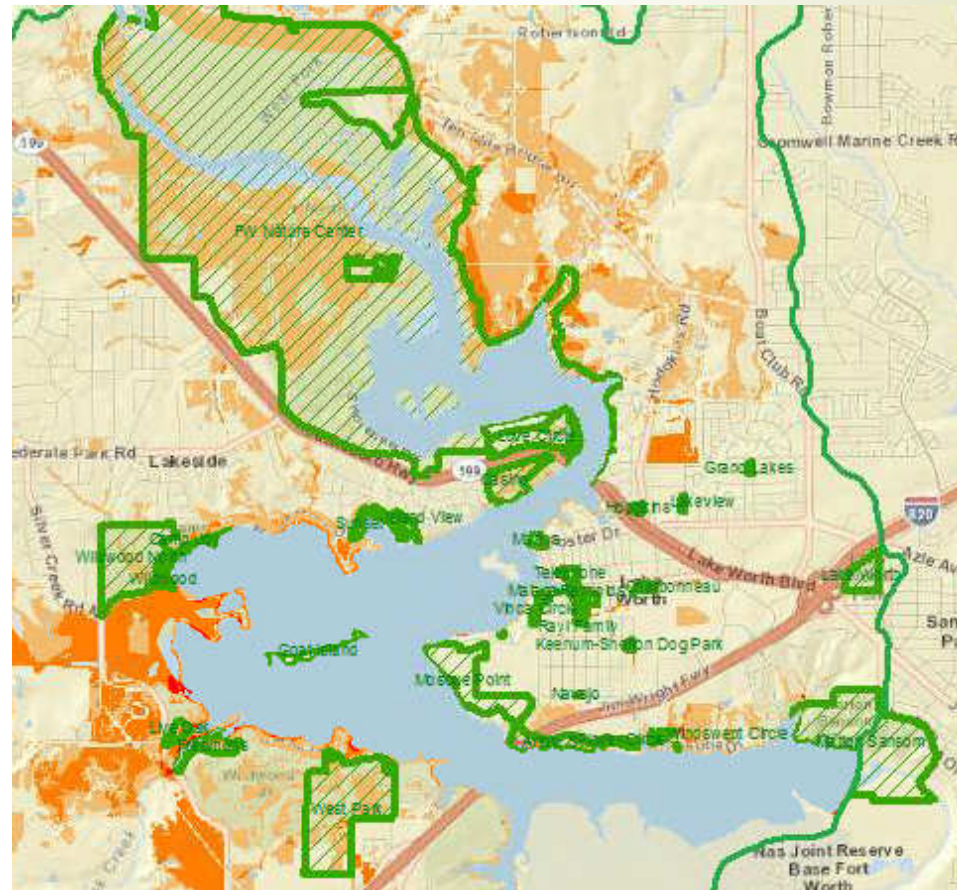


**Gaps in Motorized Boat Access**





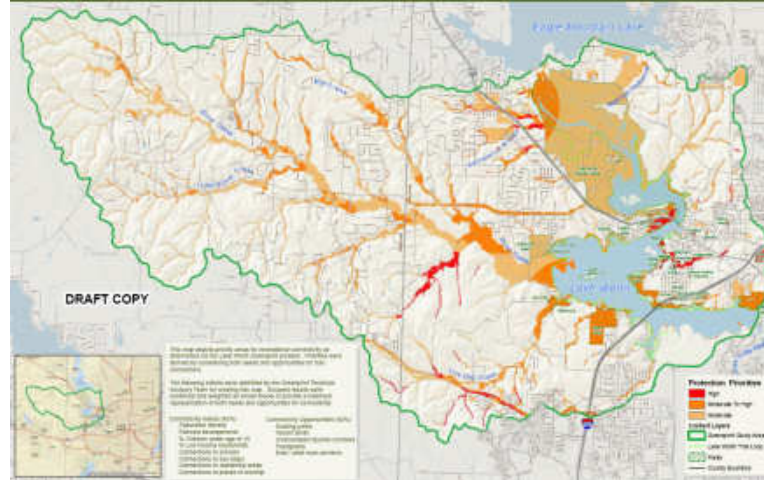
# Recreation Access Opportunities



Recreation Access Priorities within existing parks



**Lake Worth Greenprint - Provide Recreational Connectivity to Lake Worth Trail**



Connectivity Needs and Opportunities

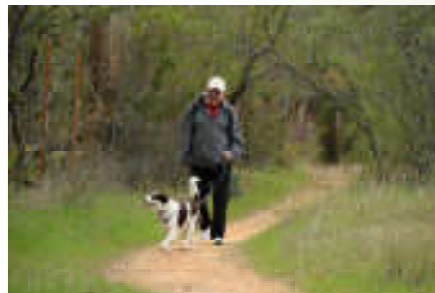
Connectivity Needs (40%)

- Population density
- Planned developments
- % Children under age of 19
- % Low income households
- Connections to schools
- Connections to bus stops
- Connections to residential areas
- Connections to places of worship

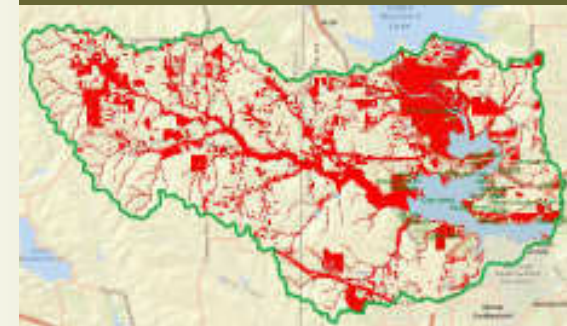
Connectivity Opportunities (60%)

- Existing parks
- Vacant lands
- Undeveloped riparian corridors
- Floodplains
- East / west road corridors

**Connectivity Needs**

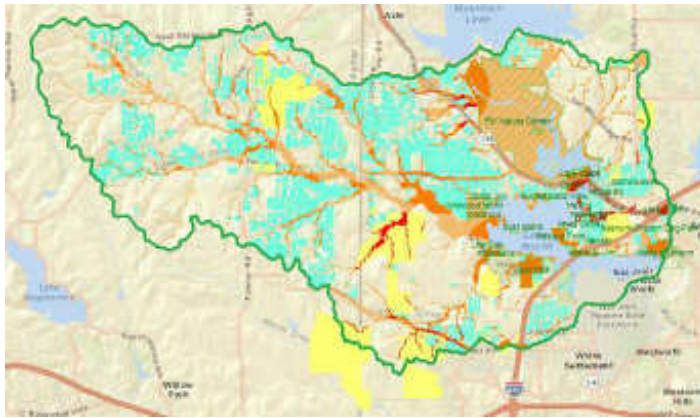


**Connectivity Opportunities**





# Connectivity Opportunities



... connecting existing and future neighborhoods



... compared to conceptual trail corridors







# Next Steps

**Over the next two months:**

- **Refine draft Greenprint maps**
- **Conduct research around conservation funding options**
- **Begin discussions of marketing component**
- **Form implementation subgroup**

**At the next LWRCC meeting (April):**

- **Present results from one additional economic study - Value of riparian corridor protection**
- **Present revised Greenprint maps**
- **Revisit action planning discussion. Includes discussing conservation finance research findings.**

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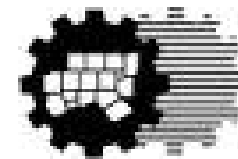


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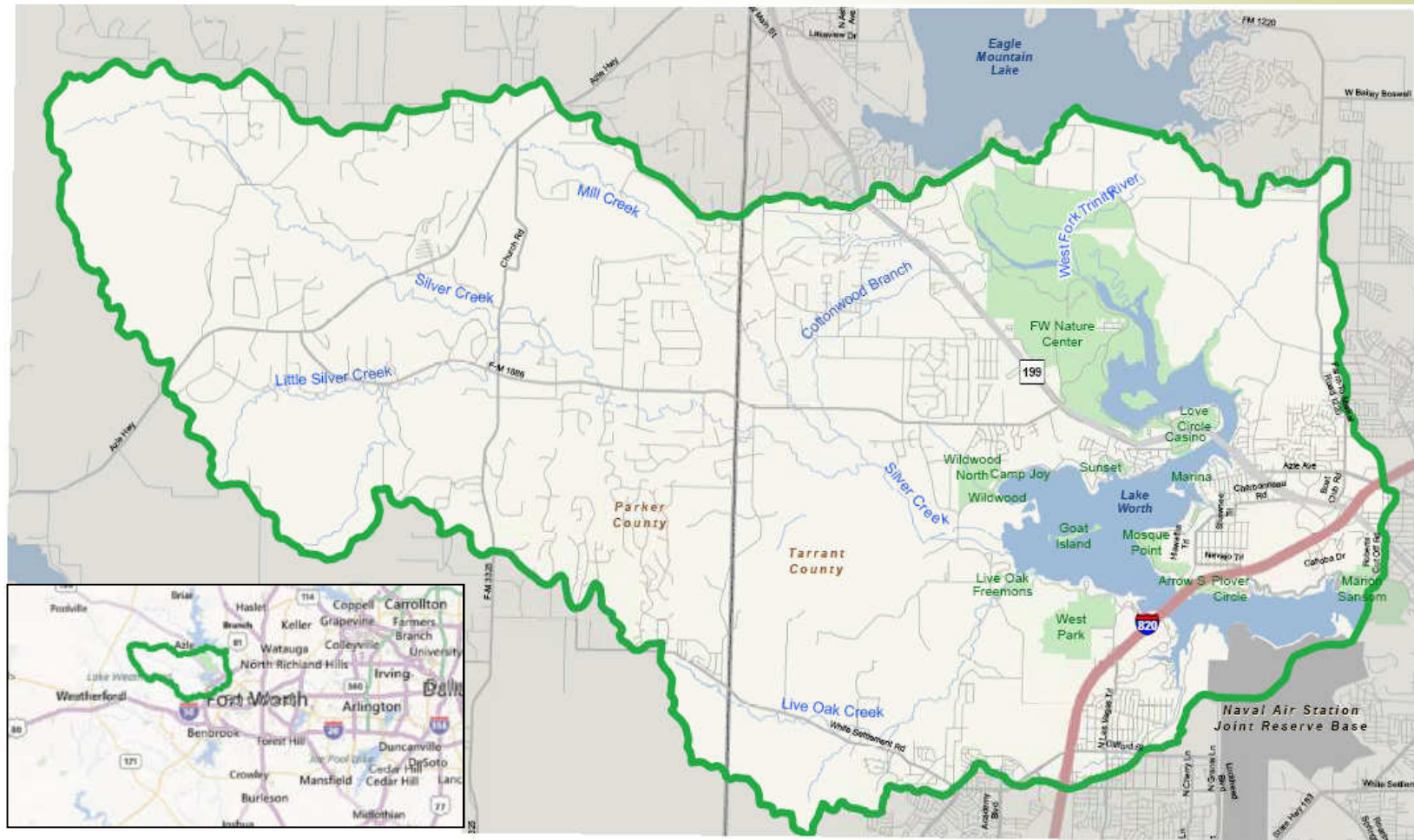
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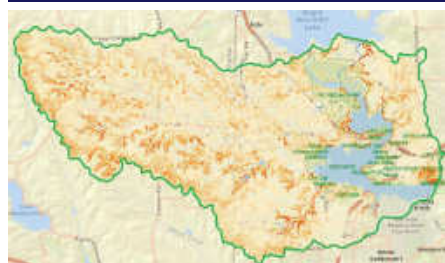
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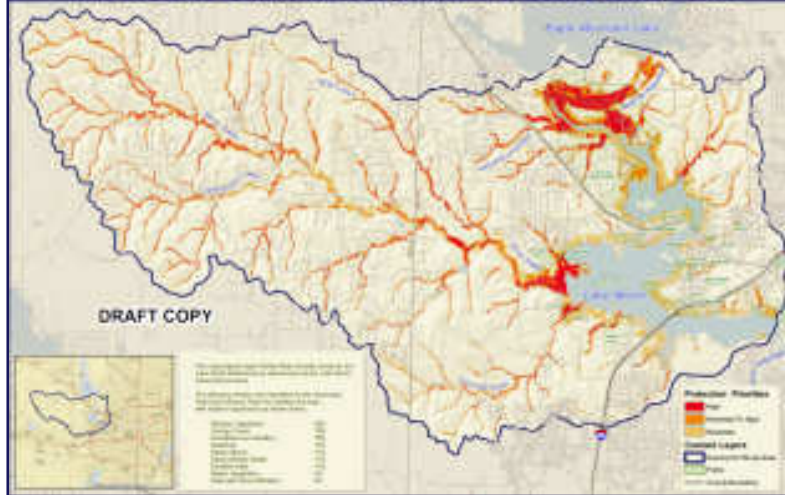
**Erodible Soils**



**Steep Slopes**



**Lake Worth Greenprint - High Priority Water Quality Zones**



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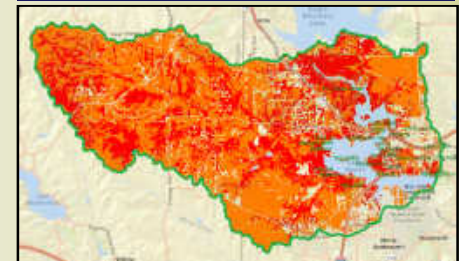
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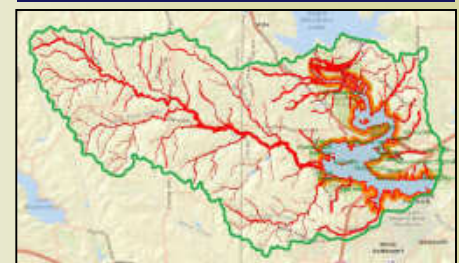
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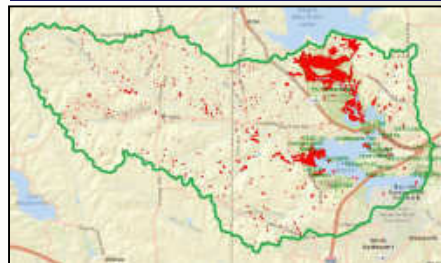
**Floodplains and Buffers**



**Riparian Vegetation**

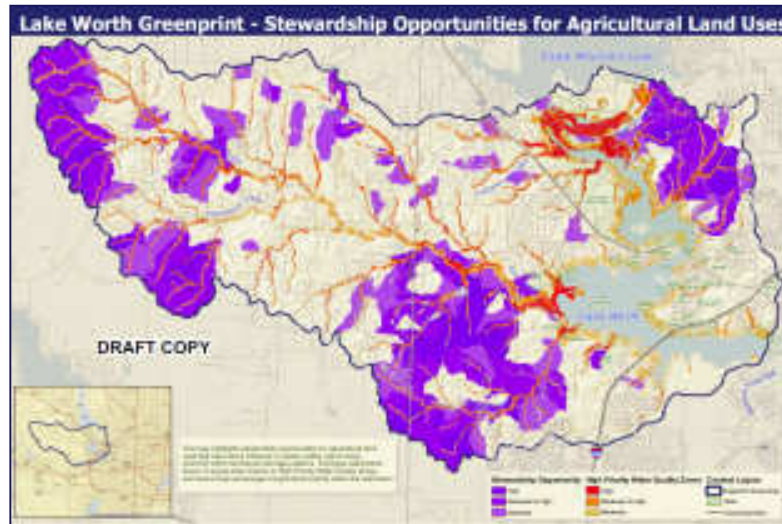


**Wetlands**

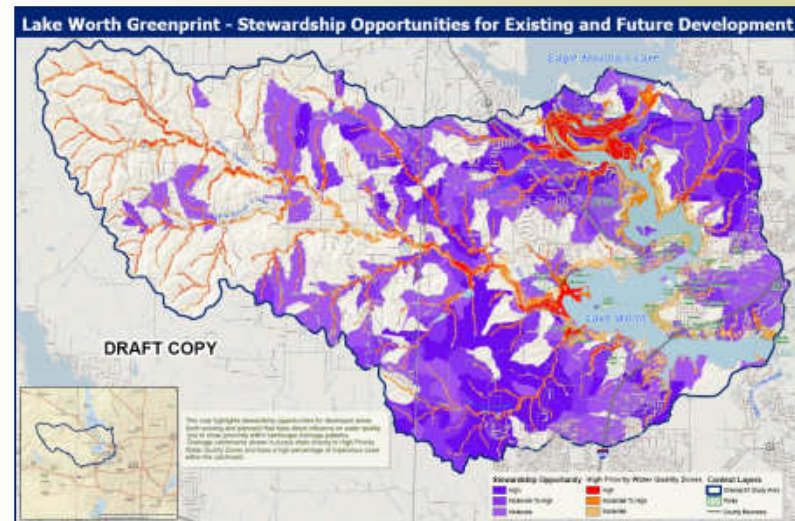




# Stewardship Opportunities



Stewardship Opportunities for Agricultural Land Uses



Stewardship Opportunities Existing and Future Development



## Provide Recreation Access and Connectivity

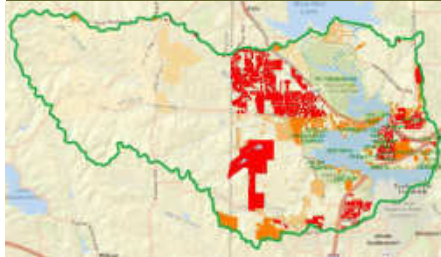
**Analysis** - Identify lands that enhance opportunities for recreational access and connectivity

1. Identify criteria that characterize recreational priorities
2. Assemble data
3. Translate data into ranked criterion maps
4. Assign relative weightings that reflect Lake Worth watershed priorities.
5. Combine the building blocks into a composite priority map for recreational access and connectivity.

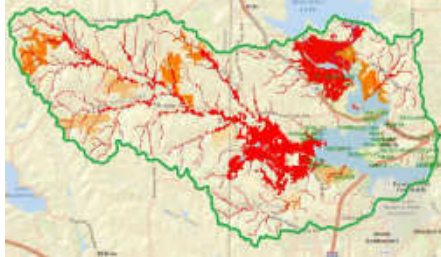




**Fitness Zone Priority Neighborhoods**



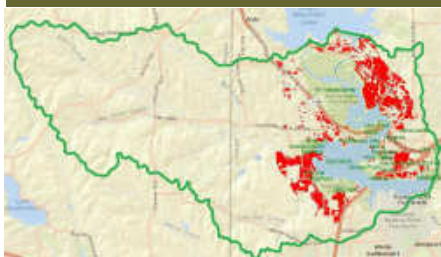
**Wildlife Viewing**



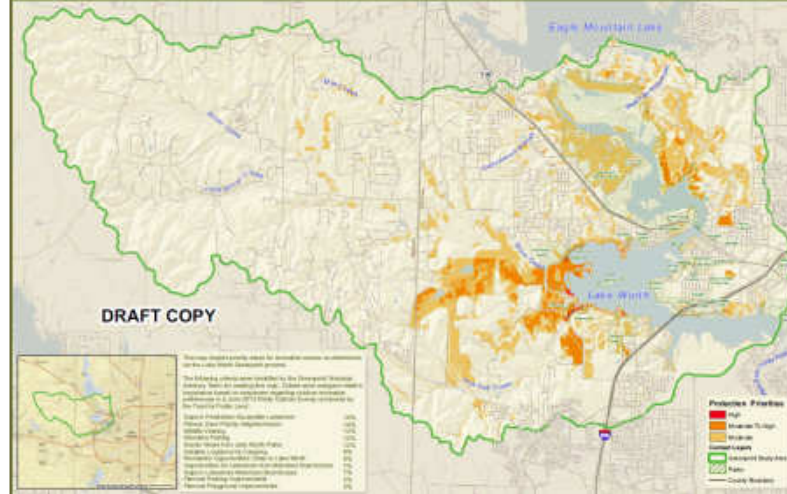
**Suitable Locations for Camping**



**Scenic Views from Lake Worth Parks**



**Lake Worth Greenprint - Provide Recreation Access to Lake**



Relative Weighting based on Outdoor Recreation Preferences Survey  
June 2013

- Gaps in Pedestrian-Accessible Lakeshore 14%
- Fitness Zone Priority Neighborhoods 14%
- Wildlife Viewing 12%
- Opportunities for Shoreline Fishing 12%
- Scenic Views from Lake Worth Parks 12%
- Suitable Locations for Camping 9%
- Recreation Opportunities Close to Lake Worth 8%
- Opportunities for Lakeshore Non-Motorized Boat Access 7%
- Gaps in Lakeshore Motorized Boat Access 7%
- Planned Parking Improvements 2%
- Planned Playground Improvements 2%

**Gaps in Pedestrian Access to Lakeshore**



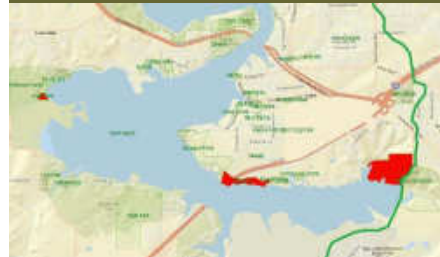
**Opportunities for Shoreline Fishing**



**Opportunities Non-Motorized Boat**



**Planned Parking Improvements**



**Planned Playground Improvements**



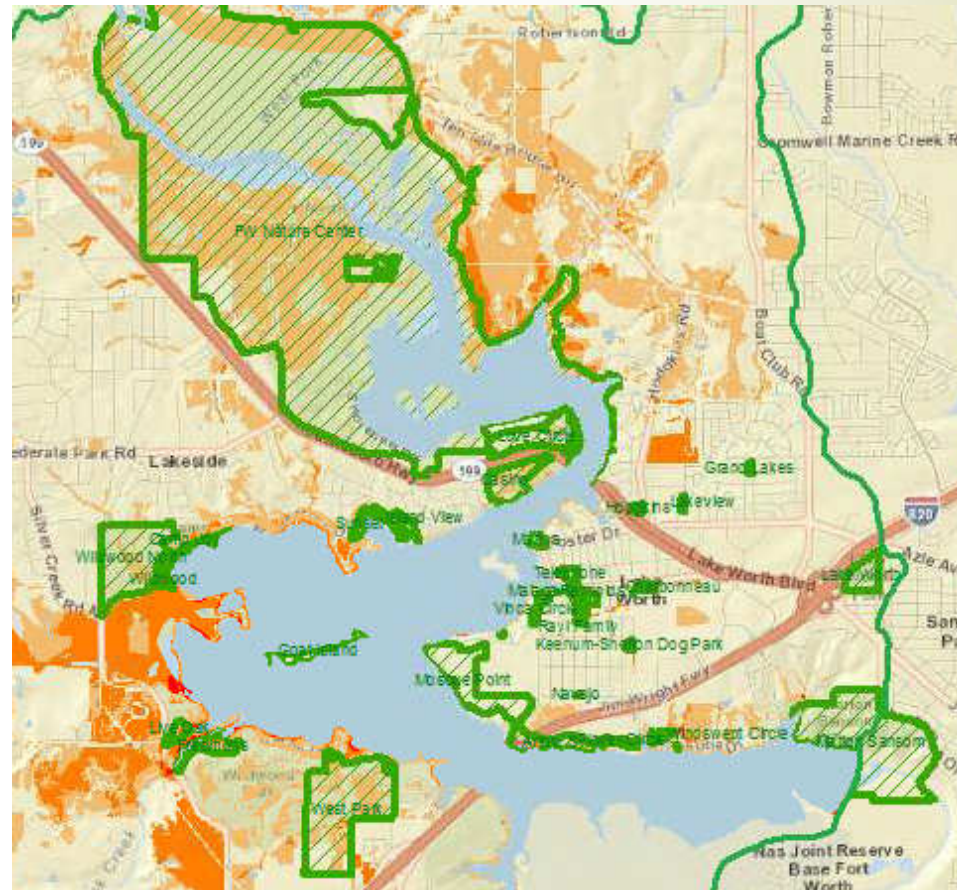
**Gaps in Motorized Boat Access**







# Recreation Access Opportunities



Recreation Access Priorities within existing parks



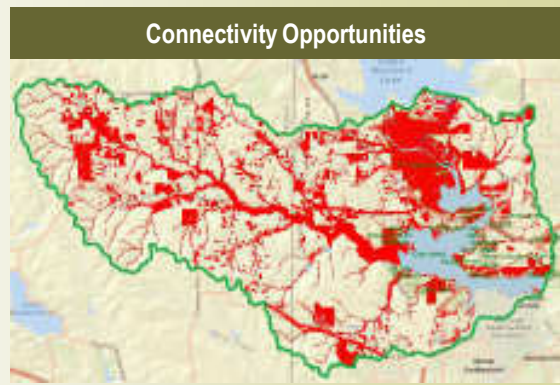
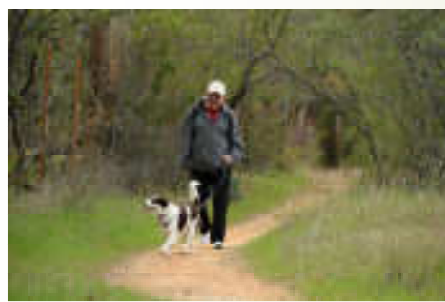
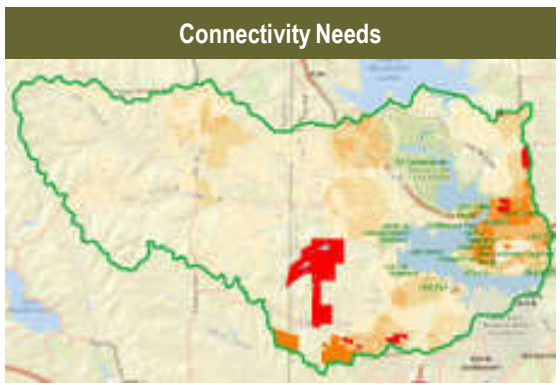
Connectivity Needs and Opportunities

Connectivity Needs (40%)

- Population density
- Planned developments
- % Children under age of 19
- % Low income households
- Connections to schools
- Connections to bus stops
- Connections to residential areas
- Connections to places of worship

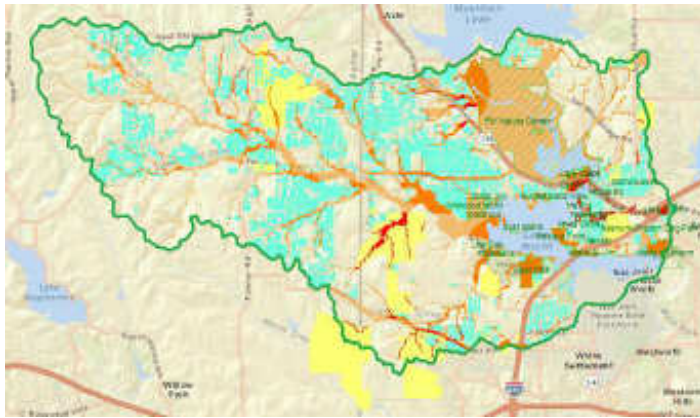
Connectivity Opportunities (60%)

- Existing parks
- Vacant lands
- Undeveloped riparian corridors
- Floodplains
- East / west road corridors





# Connectivity Opportunities



... connecting existing and future neighborhoods



... compared to conceptual trail corridors





# Next Steps

**Over the next two months:**

- **Refine draft Greenprint maps**
- **Conduct research around conservation funding options**
- **Begin discussions of marketing component**
- **Form implementation subgroup**

**At the next LWRCC meeting (April):**

- **Present results from one additional economic study - Value of riparian corridor protection**
- **Present revised Greenprint maps**
- **Revisit action planning discussion. Includes discussing conservation finance research findings.**

A long, narrow wooden boardwalk made of weathered planks and railings stretches from the foreground into the distance, flanked by tall, dry grasses. The path leads towards a line of trees on the horizon under a heavy, overcast sky. The text "THANK YOU!" is centered in the upper half of the image.

**THANK YOU!**

February 20, 2014

19

NAVAL AIR STATION

# FORT WORTH

JOINT RESERVE BASE



**Commanding Officer:  
CAPT Gil Miller**





# Mission



**Provide joint training capability and resources to enable Warfighter readiness while sustaining personnel (and families), community compatibility, and a culture of safety.**

**Mission First; People, Compatibility and Safety Always**



# Our History

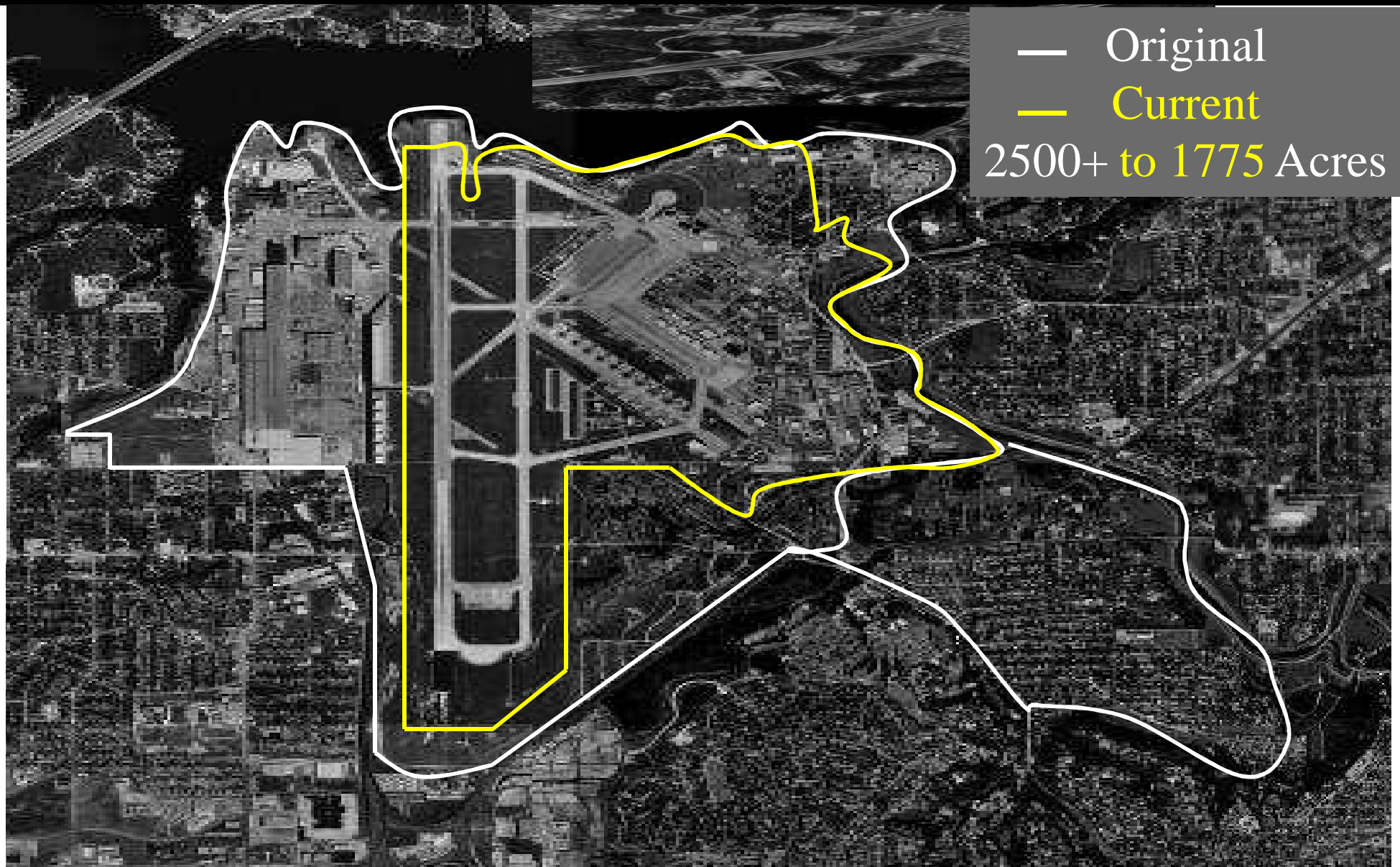


- 1941 – Tarrant Field Airdrome**
- 1942 – Fort Worth Army Air Field**
- 1948 – Carswell Air Force Base  
commissioned**
- 1993 – Carswell AFB closure due  
to BRAC**
- 1994 – Naval Air Station (NAS)  
Fort Worth JRB established**





# Footprint





# Joint Team: 10,406 Warriors



**Active : 14**  
**Reserve: 319**



**Active : 718**  
**Reserve: 1,066**



**Active : 829**  
**Reserve: 2,190**



**Active: 593**  
**Reserve: 1,561**



**Active: 291**  
**Guard: 862**



**Civilian: 1,963**

**3rd Largest Employer in Northern Texas;**  
**\$2.3B Economic Impact**



# 73 Aircraft on Station



**USN:**  
**VR-59 (3) C-40**

**USMC:**  
**VMFA-112 (12) F/A-18**  
**VMGR-234 (14) KC-130**

**USAF:**  
**301 FW (27) F-16**

**TX ANG:**  
**136 TAW (8) C-130**

**USA:**  
**339th Military Intelligence Company/11<sup>th</sup>**  
**Aviation Command (9) C-12**

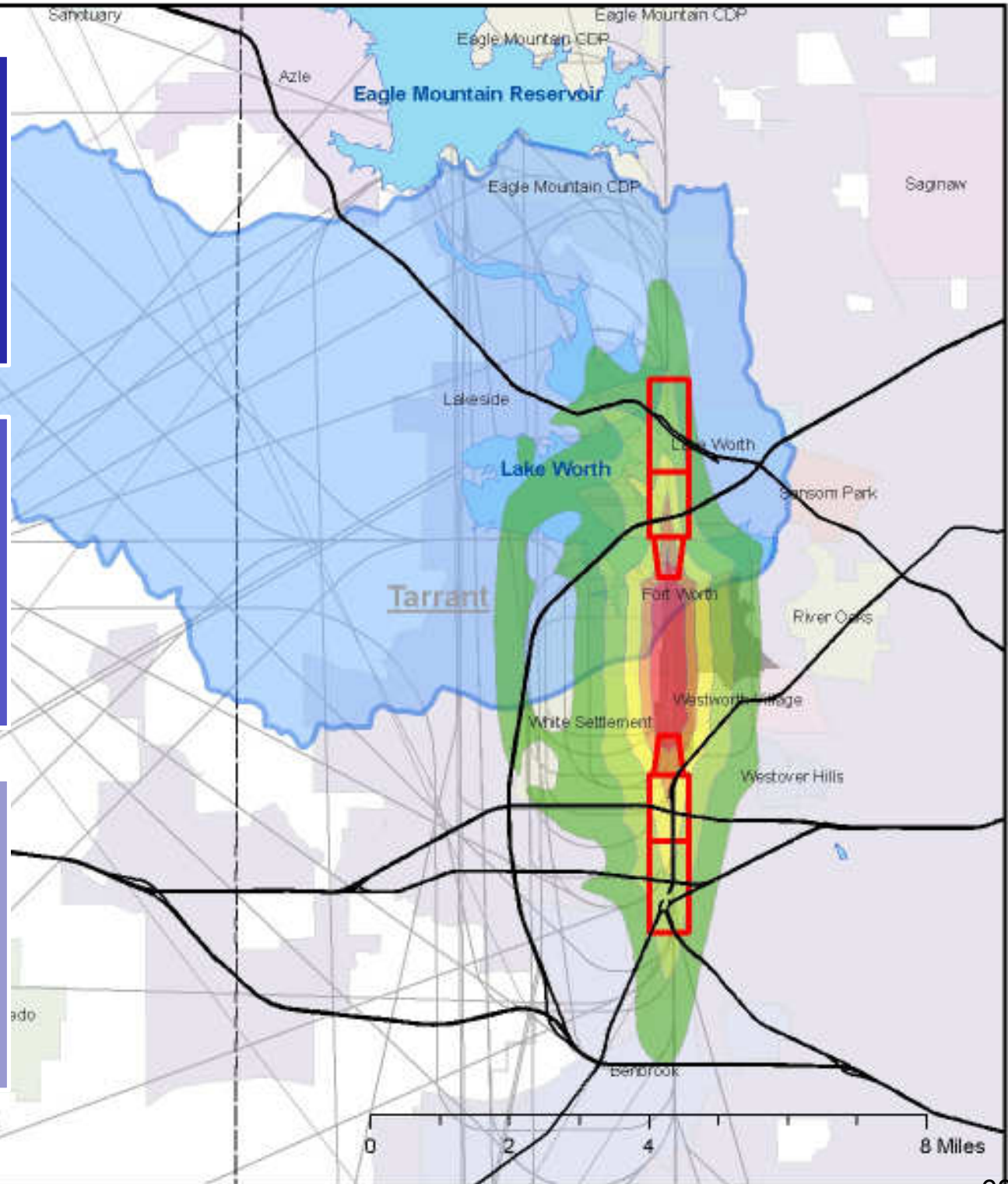
**2013 Sorties: 24,000**

**\$3B worth of Aviation Assets**

NAS supports long-term preservation of open space within key military training areas

NAS recommends against some uses in safety and noise zones

There are not opportunities for easements/access within NAS or Lockheed properties



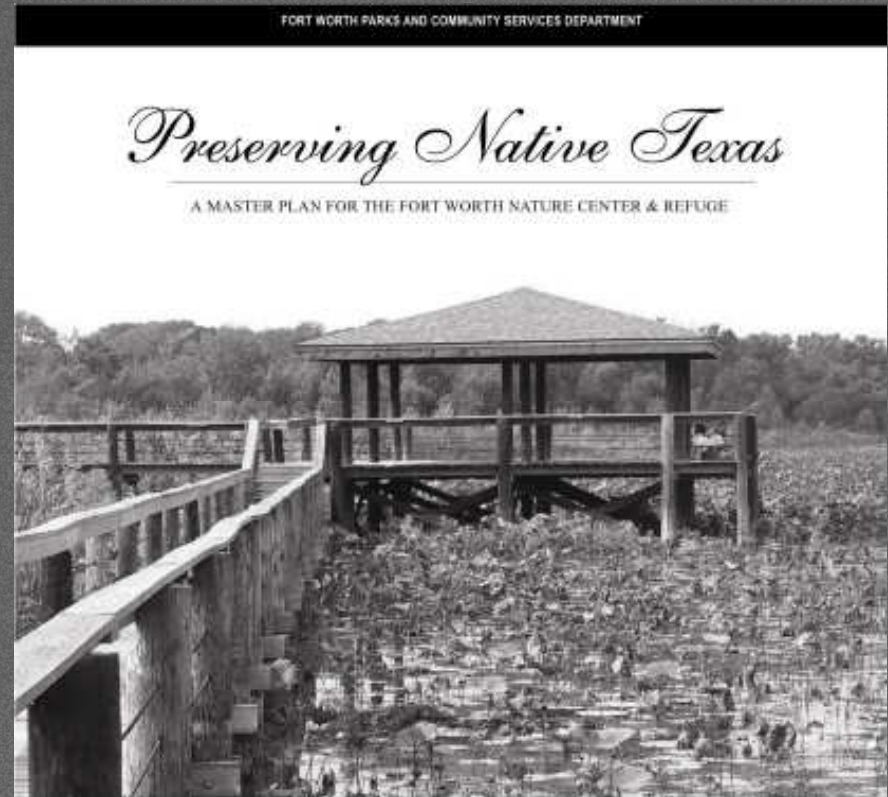
# Ten Year Review of the 2003 Strategic Master Plan for the Nature Center & Refuge

Lake Worth Regional Coordination Committee  
February 20, 2014



# "Preserving Native Texas"

- Nearly two years in development.
- Adopted by City Council on June 17, 2003.
- Recommends over \$67M in improvements (in 2003 dollars) over a 40 year time period.





# The Review Process

- Internal Committee appointed.
- Four work phases.
- Will report back to LWRCC in late fall 2014 after the review has been presented to Park Board and City Council.





# Questions?

Suzanne Tuttle, Nature Center Manager

[suzanne.tuttle@fortworthtexas.gov](mailto:suzanne.tuttle@fortworthtexas.gov)

817.392.7421



## **v1 DRAFT ACTION PLANNING FOR LAKE WORTH GREENPRINT**

### **Background and Instructions:**

This document contains ideas generated at the Lake Worth Regional Coordinating Committee (LWRCC) meeting on February 20, 2014 in response to these questions: What concrete actions can be taken by the municipalities, county, and other local or regional organizations to advance the goals of the Greenprint: **protect water quality and quantity; provide recreation access; and provide recreational connectivity to the Lake Worth Trail?** How can we accomplish these goals?

To help LWRCC narrow the list to the most actionable items that will advance the Greenprint goals, after the meeting in February, staff from The Trust for Public Land asked many local and regional organizations “implicated” by the action plan ideas to review the list (or portions thereof) and assess which ideas are feasible (who would do this and what are the financial and technical resources available to accomplish it?). This document contains the original list of ideas as well as consolidated comments of the 10 individuals consulted. Trust for Public Land staff also made minor revisions to the original list of ideas based on these comments. If you would like a copy of the unedited original compilation of ideas, please contact Kelley Hart at [Kelley.Hart@tpl.org](mailto:Kelley.Hart@tpl.org).

To help refine this list, the LWRCC and other potential action plan “implementers” are asked to select ten (10) ideas that best meet these criteria:

- Importance – Which of these are the most important for accomplishing the Greenprint goals?
- Feasibility – Which of these are most feasible? Consider: are there resources available to accomplish these ideas?

Please also identify five (5) items that should be removed from the list (not important and infeasible).

Once LWRCC and other potential implementers have identified a top tier of ideas, the next step will be to focus on further fleshing them out and estimating a time horizon for completion. Ultimately, project conveners would like to vet the list of ideas with all of the jurisdictions in the watershed (City of Fort Worth, City of Lake Worth, City of Lakeside, Tarrant County, Parker County, and Tarrant Regional Water District) and ask them to endorse in whole or part.

Note: the following acronyms are used in this document:

- NCTCOG = North Central Texas Council of Governments
- PCSD = City of Fort Worth Parks and Community Services Department
- TRWD = Tarrant Regional Water District
- NRCS = Natural Resources Conservation Service
- BMPs = best management practices

**Action Plan Ideas:**

**A. RAISE FUNDS TO SUPPORT ACTION PLAN STEPS**

- **Coordinate with federal agencies to seek grant funding.**
  - *Comments: City staff often seek grant funding, but grant programs typically have local matching funding requirements so the grantee must find private or local dollars too. It's important to be able to leverage public and private dollars.*
- **Use a portion of the oil and gas lease revenue to fund actions related to the Lake Worth Greenprint.**
  - *Comments: there are other water and sewer projects around the lake that are being paid for with Lake Worth oil and gas revenues now. Future revenues from this funding source could be used for ongoing support of water quality projects and recreation. Fort Worth City Council approval may be required.*
- **Set aside revenue from stormwater utility fees for water quality protection/improvement.**
  - *Comments: Fort Worth City Council approval would be needed to increase the Fort Worth stormwater utility fee. Council hasn't yet supported an increase to address the identified backlog of storm drainage projects. A study that identifies a need for certain BMPs (and estimates costs to the city to help provide those BMPs) to protect water quality could provide a basis to ask for a fee increase.*
- **Leverage funds from existing groups that have been known to raise money for related work (examples: NCTCOG, TRWD, and Streams and Valleys).**
  - *Comments: NCTCOG does grant writing for federal grants that could be useful (e.g. TIGER grant for trail work). Streams and Valleys has helped the PCSD with private fundraising (e.g. matching a Texas Department of Transportation grant). TRWD has assisted with some projects on City-owned park property.*
- **Create an open space district that can cross city and county lines.** E.g. Mid-Peninsula Regional Open Space District in California has used property tax dollars to fund acquisition and maintenance/management of more than 60,000 acres.
  - *Comments: City councils of jurisdictions within the new open space district would need to approve this.*
- **Consider tax increment financing.**
- **Pass a city and/or county ¼ or 1 cent sales tax or property tax.**
  - *Comments: This is probably not realistic. The City of Fort Worth is already collecting the state-authorized additional one percent sales tax, the proceeds from which are currently split between the Fort Worth Transportation Authority (The T) and the Crime Control and Prevention District (CCPD). There are very strong constituencies for both these sales tax recipients, with both agencies directly supporting City Council strategic goals. In addition, the City is already at bonding capacity, with the identified capital needs currently outstripping the capacity.*

**B. START A VOLUNTARY OPEN SPACE PRESERVATION PROGRAM**

- **Start a program focused on preserving riparian corridors, creating easements for new trails, or protecting open space generally that is high priority according to the Greenprint.** The idea would be to negotiate donations or purchase interests in land from landowners that want to donate or sell. An open space component of the program could be working with partners such as NAS FW JRB to purchase critical areas that preserve and protect water quality and are in Clear Zones, APZs, or high noise contour areas. This program could be run by a local government or a non-profit.
  - *Comments: Would need to raise funds to purchase property rights from interested landowners. Excellent programs exist through AgriLife extension, Texas Parks and Wildlife Department, and NRCS already. Would need an entity to manage the work with landowners in this area. If there was a need for additional parkland inside Fort Worth that would be something the City of Fort Worth would look at purchasing. However, PCSD's current position is that the Lake Worth area is already well served by parkland while other areas of the city are underserved by parkland. If a private organization wanted to raise funds and there was truly a need to capture a specific property (but not just to increase the inventory in that area), PCSD could potentially assist, but it would depend on anticipated maintenance costs and other factors.*

**C. GATHER MORE INFORMATION TO UNDERSTAND AND ADDRESS WATER QUALITY PROBLEMS**

- **Identify research/monitoring needs related to Lake Worth.**
  - *Comments: It's important that Fort Worth Water Department begin more rigorous monitoring of the lake and its tributaries. Collaborate with TRWD. Should be inventorying sediment loading from the streams themselves.*
- **Evaluate the septic systems in the watershed and review waste treatment improvement opportunities.**
  - *Comments: The City of Fort Worth is extending sewer service around Lake Worth. When someone hooks into the City of Fort Worth's sewer line they are required to decommission the septic system. What about the properties in the watershed on septic that are not likely to get serviced by Fort Worth's sewer system? Still an issue for other jurisdictions.*
- **Monitor septic system discharge into the lake.**
  - *Comments: This is already done with public properties, but not private properties. **Related action plan idea: Consider studying the effects of decommissioning septic systems on the lake.***

#### **D. DEVELOP OR ENHANCE LOCAL GOVERNMENT PROGRAMS/ACTIVITIES**

Generally applicable:

- **Develop a regional feral hog control program.**
  - *Comments: There have been several regional meetings to help get this underway, but nothing is compulsory yet. A regional effort would need to be coordinated by an agency like NCTCOG.*
- **Create a voluntary backyard wildlife habitat program for interested landowners.**

Ideas for realizing the “protect water quality and quantity” goal:

- **Preserve existing City-owned High Priority Water Quality Zones with a High ranking on the Water Quality Zones Greenprint map.**
- **Promote Low Impact Development (LID) for stormwater management. Have a LID design competition for City-owned land that is within High Priority Water Quality Zones.**
  - *Comments: In a sense, the Casino Beach project is an example of this as it is planned to have LID components.*
- **Do more regional stormwater detention.**
  - *Comments: In areas where the land-use is already developed, sometimes small/isolated detention ponds don't really work. Regional detention can sometimes be more effective and incorporate water quality improvement components. If flood control prioritization identifies a need for more detention, then the city can do it. It could be in the future that private entities are willing to build and manage these.*
- **Reduce the need for irrigation on City-owned lands, and use non-potable wastewater where appropriate.**
  - *Comments: The City of Fort Worth will likely address this by using drought-tolerant native vegetation in their parks to reduce irrigation needs. City of Fort Worth's new Water Conservation Plan says: "The City has implemented water conservation measures internally within City Hall and a number of its other buildings and parks and will continue to do so over the next five-year planning period. This includes...development of a landscape program in conjunction with the Parks and Community Services Department." (p. 7-3 of April 2014 plan). Regarding concept of recycling/reclaiming water, this can be controversial with the public and yet nearly all the water we use at this point in the watershed is already reused/reclaimed.*
- **To reduce runoff on public lands in the watershed that are not designated as parkland, use undeveloped savannah grassland open space range management.**
  - *Comments: Many thought this was a good idea. To meet fire hazard requirements can mow around a right-of-way and don't need to mow the whole property. Maintaining and managing the native vegetation will provide excellent first-line runoff reduction and filtration services.*

Ideas for realizing the “enhance recreation” goal:

- **Consider future recreational use for the City-owned land with a High ranking on the Recreational Connectivity and Recreation Access Greenprint maps.**
- **Improve the parking and clean the beaches at City-owned parks around Lake Worth.**
  - *Comments: A related action plan idea would be to expand the “Adopt-a Park” program. Volunteers can help with litter pick-up, mowing and plantings in parks. Re: parking – there is an unfunded capital needs list, City of Fort Worth can double check that that the estimated costs associated with improving the parking in their parks around Lake Worth are on that list so that when funding becomes available, those items can be considered.*
- **Improve existing parks around the lake by providing facilities for more diverse recreation (e.g. lawn bowling, remote controlled airplane fields, disc golf, etc.)**
  - *Comments: PCSD wants to provide a broad range of recreational opportunities city-wide. Individuals or groups should communicate to PCSD what type of amenity they are looking for, and ideally an arrangement can be worked out where the private group can take on some of the maintenance responsibility once the facilities are in place (via the Adopt-A-Park program).*
- **Work with White Settlement, Lake Worth, Eagle Mountain-Saginaw, Castleberry, and Fort Worth Independent School Districts to develop a competitive juniors (high school) rowing program housed at Casino Beach or another shoreline park.** This could be modeled after Dallas Rowing Club’s Juniors Program or the Oklahoma City Boathouse District’s Juniors Program.
  - *Comments: Like this idea. It could be done at Lake Worth. Community would need to advocate for this.*
- **Create a family friendly camp/day use site with shallow beach access.**
  - *Comments: PCSD needs to know what changes would be desired to make Wildwood or another spot a more family friendly day use site with shallow beach access: bring in more sand? Have a designated swimming area with lifeguard security? Would visitors be willing to pay a fee? (There is a spot like this at Eagle Mountain Lake).*
- **Dredge the canal that starts at Silver Creek Road and Huron and ends in the lake for fishing, boating, canoeing, and swimming.**
  - *Comments: Would likely need permitting for this type of dredging, and not a strong case to be made since these types of activities are already available elsewhere at Lake Worth.*
- **Improve systems for selling boat permits for Lake Worth – currently only available at 2 places.**
  - *Comments: There are two places where permits are available from the Water Department- Navajo Burgers and Dobbers Daiquiri - but sometimes they are out stock because those facilities have to advance purchase the tickets to resell to the public. A related action plan idea: Water Marshall to create an on-line system so people have a third option.*
- **Continue to improve existing boat ramps and invest in new boat ramps.** Example: Improve boat ramps to allow use in low water-level situations. Improve facilities to allow ease of loading/unloading, e.g. floating docks.

- *Comments: Don't feel like there is a strong need for this. The Water Department recently re-built two ramps. Also, Lake Worth's boat ramps do relatively well in low water-level situations. What would it mean to invest in new boat ramps? Does that mean more locations, more lanes or other improvements?*

## **E. EDUCATE/PUBLICIZE**

Identify the target audience (general public and landowners in critical areas) and develop an educational outreach program. Ideas of groups to provide information to or through: Social media, websites, or members related to Fort Worth Business Press Adv.; Chamber of Commerce; Real Estate Orgs (Society of Commercial Realtors, Builders Association, and Greater Fort Worth Real Estate Council); other communities of professional practitioners (e.g. architects, landscape architects, and engineers); fitness and cycling shops. May want to include information in water bills. Related ideas:

Generally applicable:

- **Establish a communications strategy to promote the resources, to describe what we have here and what is evolving.** Work with a public relations organization or ad agency. Could be public education campaign like the 1980s Chesapeake Bay “We all Live Downstream” Campaign.
  - *Comments: Need to determine what the focus would be for the messaging campaign and how to pay for it.*
- **Have signage about good stewardship practices at places that people will go to already, like boat ramps and trailheads.**
  - *Comments: Maps are already available on TRWD's and Streams and Valley's website. Related action plan idea: if it's not already in the signage, could add QC (the bar code) that takes a cell phone user to TRWD's webpage associated with that bar code to get more information about the place, stewardship practices, etc.*
- **Approach Texas Parks and Wildlife Magazine about doing an article.**
  - *Comments: Like this idea. May consider broader engagement beyond an article. How could they be an active partner in implementing the Greenprint?*
- **Have a demonstration project, such as putting pervious pavement and bioswales at an existing park.** (Note: there's already some pervious pavement at the Fort Worth Nature Center.)
  - *Comments: As described, this would be a park project in conjunction with Fort Worth Stormwater team. City of Fort Worth staff would prefer to have a demonstration linked with a new facility/development rather than a demonstration for the sake of a demonstration – likely to reach a wider audience and also more likely to get funded. Casino Beach is planned to do this in some sense.*
- **Traveling road show to visit local schools.**
  - *Comments: Not sure how this would get paid for.*

Ideas for realizing the “protect water quality and quantity” goal:

- **Have special events highlighting the importance of water quality, e.g. promote at a paddle race or fishing contest.**
  - *Comments: TRWD already has a public media campaign.*
- **Work with landowners to equip them to voluntarily enhance practices that maintain or improve the water quality.** Education with landowners on the common causes of excessive nutrients. This can be done via 1:1 personal outreach with landowners. There are good models from NRCS, Tarrant County Extension, and Texas Agri-life for this approach. Other approaches are mailings (e.g. water bills), contact through neighborhood associations, and landowner workshops. Consider Texas Watershed Stewards at Texas A&M as model for landowner workshops. Examples of activities that private landowners can/should take, as applicable: proper collection and disposal of manure; erosion control to help stabilize streams; ensure septic systems are intact/working (see also mention of this in section above), etc.
  - *Comments: City of Fort Worth can put information in water bills. Important to consult with the entities mentioned that have model programs/approaches.*
- **Create a computer based brief course about best management practices and then create an incentive for people to take the course, like by offering credit on property taxes.**
  - *Comments: Don't think this would work in practice for these reasons: How would you track and enforce this? Could there be an institution to help with the tracking? Are there state laws limiting the ability to reduce property taxes for this purpose? Consider instead expanding a related program (described in next bullet) which has this same sentiment in mind, but is done through institutions and the incentive relates to stormwater utility fees.*
- **Expand existing program: City of Fort Worth provides stormwater credits to Fort Worth Integrated School District – they do 1 hour of stormwater education per year and they get a 10% rebate on their utility fees. Over 130 schools are potential users of this program, and this year about 30 participated.**
  - *Comments: This is feasible because it's already operational. The “action” here would be expanding the program.*
- **Create development review tool for city and county offices to assist in educating developers - reference Greenprint maps as part of entitlement process and ensure proposed development is consistent with priority areas for water quality protection.**
  - *Comments: Currently, developers go through a pre-development conference and those can be opportunities for the planning department to highlight the Greenprint areas. This action item is in the “education category” because it's voluntary. Could also be approached as a rule with compulsory requirements. (see regulation section below)*
- **Educate the public about application/use of fertilizers and detergents to reduce negative water quality impacts.**
  - *Comments: Yes, some of the water quality problems around the lake can be attributed to fertilizer over use. There are already some resources for educating farmers/ranchers about prudent fertilizer application (for example, through their relationships with the*



fertilizer vendors/applicators). May be opportunity to increase education through the vendors. For more urban landowners, there is typically no relationship currently as people just buy fertilizers from home improvement and hardware stores. Could we start an education program at the point of sale, by working with the home improvement and hardware stores?

- **Coordinate with the State of Texas' existing program to promote agricultural heritage.** This program already provides education and may be able to incorporate best practices recommended from the Greenprint.
  - *Comments: Not sure what program already exists to promote agricultural heritage. Were they referring to 4-H?*

Ideas for realizing the "enhance recreation" goal:

- **Better promote the nature center.** It showcases scenic, historic and heritage of the area.
- **Have signs at the parks and Casino Beach that educate the public around history, the military, and water quality.**
  - *Comments: Like this idea. If there's a group that wants to look at doing something, PCSD can work with them. This could also be through Adopt-A-Park program.*
- **On the PCSD website, give timely updates on progress regarding the Lake Worth Trail.**
  - *Comments: This can be done.*
- **Coordinate with Streams and Valleys about proposed new trails.**
  - *Comments: We are doing this now. Note: the Streams and Valleys trail maps promote existing trails. Regarding proposed trails, the City of Fort Worth has already included most of the likely Greenprint trails on the Bike Fort Worth Plan map, viewable on City of Fort Worth website at [http://fortworthtexas.gov/uploadedFiles/Sustainability/Bike\\_Fort\\_Worth/BFW\\_web.pdf](http://fortworthtexas.gov/uploadedFiles/Sustainability/Bike_Fort_Worth/BFW_web.pdf)*

#### **F. CREATE LANDOWNER INCENTIVES**

The idea here is to financially compensate landowners to undertake certain activity that would benefit water quality or some other public good.

- **Provide private landowners financial incentives to leave natural buffer strips and plant native vegetation.**
  - *Comments: Good idea, but no funds to pay for this sort of thing. Could try to establish a voluntary nutrient trading market, though those are being tested elsewhere in the country (E.g. Bay Bank in Chesapeake) and don't appear to be working yet.*
- **Develop tax incentives to keep critical land in suitable low-impact uses.**
  - *Comments: Would need to work with county on that. Has also been tried and failed at the statewide ballot box, but could discuss another attempt.*

- **Work with county tax authorities to refine the requirements around what qualifies for an ag exemption.** Urbanizing/suburbanizing area needs to be considered in terms of application for the program. If the purpose of this is to reduce agriculture production requirements to obtain an agriculture exemption to reduce the potential for animal waste or fertilizer, pesticide, or herbicide loading in storm runoff from smaller parcels, the criteria used by the Tarrant Appraisal District would probably need to be changed to incentivize water quality protection as well as agriculture production.
  - *Comments: The Ag exemptions are all given by the county, so this change would be within the purview of the county.*

#### **G. UNDERTAKE ADDITIONAL PLANNING AND EVALUATION**

##### Generally applicable:

- **Re-do the public surveys city-wide (i.e. park need assessment) every two years. Look at trends over time in current/recent behavior.**
  - *Comments: would be good to do this if funding exists.*
- **Add a page to the City of Fort Worth’s Comprehensive Plan with Greenprint findings, such as where the water protection areas are located.**
  - *Comments: City of Fort Worth may include the final Lake Worth Greenprint map in the 2015 or 2016 Comprehensive Plan update, either in the Environmental Quality chapter or the Land Use chapter. They may also review Comprehensive Plan policy additions or updates in these chapters or Appendix C based on the Greenprint outcomes.*

##### Ideas for realizing the “protect water quality and quantity” goal:

- **Develop an EPA-acceptable Watershed Protection Plan (WPP).**
  - *Comments: The primary benefit of having this specific plan is that it opens up activities to potential funding through the Clean Water Act §319. Because state and federal agencies have been charged to more closely coordinate, it’s possible that a WPP could also open doors to other resources. For example, the Texas Water Development Board recently added a question about WPPs on its State Revolving Loan applications, providing projects in watersheds with WPPs more points and making them more competitive for the loan program. However, the state and federal process for developing an acceptable WPP can be onerous, and there are only a handful in Texas.*

##### Ideas for realizing the “enhance recreation” goal:

- **Create a committee to create a plan to provide large scale utilization of existing parkland.**
  - *Comments: More detail needed here. Not sure what they had in mind. Note that PCSD is updating their Parks Master Plan though it will not cover activation plans for specific parks. Groups should come to PCSD if they have ideas about specific park activation for parks around Lake Worth.*

- **Ideas for how to focus future trail work:** Have multi-use trails, include some equestrian trails. Follow sustainable design practices so trails aren't contributing to water quality decline. Continue cooperating with Streams and Valleys and other organizations that are working on trail safety protocols.
  - *Comments: Recommend removing from action plan. These are not really action plan ideas, but rather suggestions related to nature of future trail planning.*

## H. REGULATE

*The ideas in this section involve adding a layer of regulation to existing city or county ordinances. All of the items above are voluntary in nature, meaning that private citizens or businesses could choose to take certain action. The items in this section would require private citizens or businesses to take certain action. Some LWRCC meeting participants suggested that there be consistent codes with region-wide enforcement that reflect a shared vision. While each town can come up with its own approach with respect to subdivision regulations, the City of Fort Worth could be a leader in the region by doing some initial draftsmanship that might make it easier for some of the smaller neighboring jurisdictions (who can then use as a model, if desired).*

Generally applicable:

- **Establish urban growth boundaries – urban areas ringed with open space.**
  - *Comments: This would require zoning that prohibits certain land-uses in certain areas. This is not likely to be politically popular.*
- **Limit use of lake water for private drilling gas/oil.**
  - *Comments: TRWD controls the lake water so that is their jurisdiction.*

Ideas for realizing the “protect water quality and quantity” goal:

- **Develop a water protection overlay that triggers certain requirements for development within that overlay zone.** Examples of potential types of regulation: no development abutting lake or creek edge (set minimum buffer zones); landscaping requirements along lake or creek edge; or required construction practices to reduce soil run-off during construction.
  - *Comments: Denton imposed these types of restrictions for a particular specific plan. See “Rayzor Ranch Overlay District Water Quality Protection Plan Requirements and Drainage Map.” It was informed by NCTCOG’s guidance on the topic.*
- **Restrict water that is used for lawns and golf courses.**
  - *Comments: Fort Worth City Council just restricted water use to twice a week permanently and recently adopted a Water Conservation Plan. The plan recommends the City Planning and Development Department consider a landscape ordinance within the next 5 years that would “...identify drought tolerant turf, groundcover, shrubs and trees that are allowed to be planted at new homes.” (p. 7-4). Not clear whether anything is being done to restrict golf course water use.*

- **Limit use of lawn and golf course pesticides, herbicides, and fertilizers; use natural and organic methods instead.**
  - *Comments: There are currently no city regulations for residential lawns around fertilizer applications. This is unlikely to pass and would be very difficult to enforce.*
- **Restrict fuel discharge (gas avail on lake).**
  - *Comments: Could prohibit boaters from refueling their boats at the docks. Casino Beach will have a marina with gas available. State rules will regulate it.*
- **Establish ordinances to protect native plant communities in conservation developments and corporate campuses.**
  - *Comments: To do this, would need to first identify old growth prairies and grasses. Ultimately, this type of ordinance won't easily be passed. Good to recognize that there are areas that are valuable for conservation, but will be hard to protect through regulation.*
- **Develop a committee of implementing jurisdictions, like the RCC, to review large development decisions (not all projects).** RCC refers to the NAS JRB Regional Coordination Committee and a development project information sharing tool hosted by NCTCOG that allows impacted jurisdictions to review and comment on development proposals in participating neighboring jurisdictions. Such a tool would need to include Tarrant County, Parker County, TRWD, and the city or town manager (or their designee) of each of the participating small cities, as well as Fort Worth. The NAS JRB RCC is made up of implementing jurisdictions.
  - *Comments: This is not likely to make sense except for really large projects so would need to think about what types of projects would qualify. One issue is that the review process could be delayed because of the coordination required, so there would need to be a streamlined program to make it more attractive to the development community.*

Ideas for realizing the “enhance recreation” goal:

- **Develop a zoning overlay indicating the conceptual location for new trails (locations determined by the Greenprint maps) and then work with developers to determine exact location of those trails through the development process.**
  - *Comments: This could be done by the Planning Department during the platting stage. Re: who will steward the easement, it might be PCSD, Water Department, Housing and Economic Development or a third-party non-profit.*
- **Limit motorized uses around the Fort Worth Nature Center and any swimming beaches.**
  - *Comments: Could have “no wake zones” indicated with buoys.*
- **Limit boat access in different parts of the lake by vessel type (E.g. sail, paddle, or watercraft).**
  - *Comments: Not recommended. The fish move around and it may be difficult to get to different parts of the lake with such nuanced rules.*
- **For jurisdictions in the watershed that don't already have one, create a parkland dedication ordinance that requires new development to set aside a portion of the land for open space or payment of a fee-in-lieu of setting aside land.**

- *Comments: for some of the study area (City of Fort Worth) there is already a parkland dedication ordinance, which is triggered by new development. It does not extend beyond Fort Worth city boundaries. New developments anticipating annexation into the city are asked to comply with the park dedication policy.*
- **Zoning to keep population growth low so access and availability for recreational lands can be preserved.** Note: there is already low density zoning for development outside of city limits.
  - *Comments: This is not likely to have widespread political popularity. It may be better to focus density where it can be most easily accommodated by existing infrastructure or limited extensions thereof, and encouraging the clustering of development so riparian corridors and other Critical Water Quality Zones can be protected.*

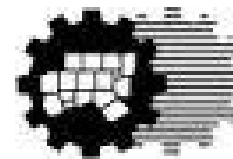


# The Lake Worth Greenprint

*(working title)*

Lake Worth Regional Coordinating  
Committee Meeting

April 24, 2014



North Central Texas  
Council of Governments

# Presentation Items

- Project background
- Water quality and recreation maps
- Conservation Finance Options report with Q&A
- Action Planning, Part II





# Project Background



# The Lake Worth Greenprint

## *Objectives*

1. **Develop** a long-term vision for a Lake Worth open space network, and involve stakeholders in the decision-making process.
2. Build upon plans already complete or underway, e.g. trail alignment study for Lake Worth, Lake Worth Vision Plan, and the Lake Worth CIIP.
3. Identify lands most important for lake water quality, as well as other related community driven open space/conservation goals.
4. **Help the city and stakeholders** evaluate the relative importance of undeveloped land in the watershed.
5. **Evaluate** tools that can be used to protect Lake Worth's water quality.
6. **Provide education about** voluntary conservation easements (CEs) and their tax advantages to potential partners to make CE opportunities more widely understood and employed where appropriate.



# Greenprinting Process

*Current Conditions Analysis*

*Goal Setting & Public Engagement*

*Economic Benefit Study*

*GIS Data Collection & Mapping*

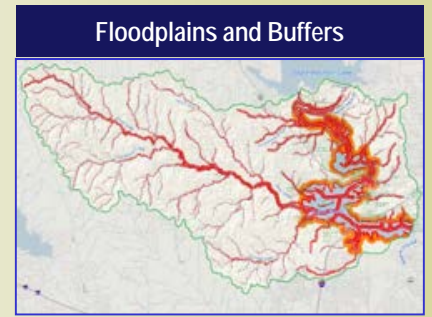
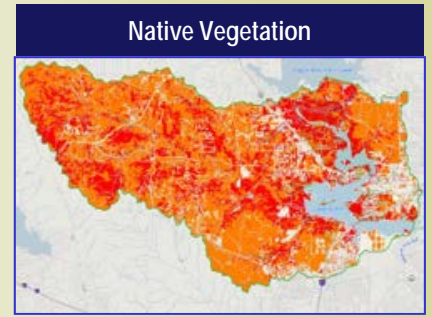
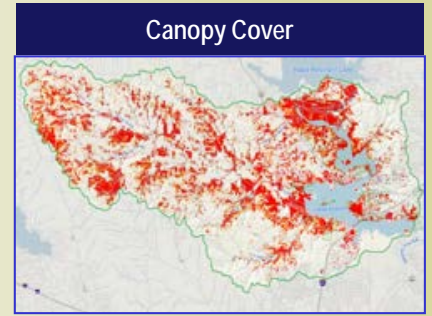
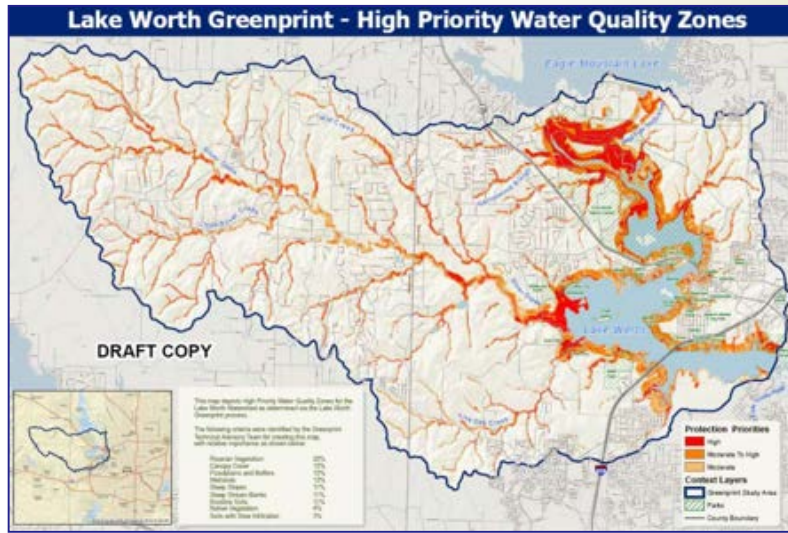
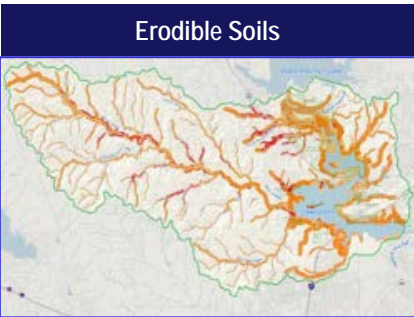
*Conservation Finance Resource Options Report*

*Action Planning / Recommendations*

*Communications Strategy*

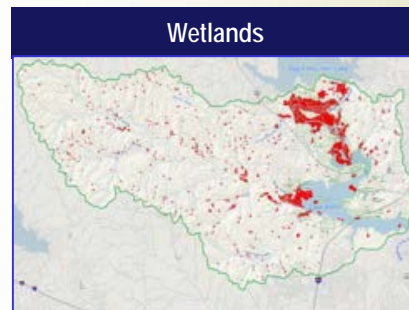
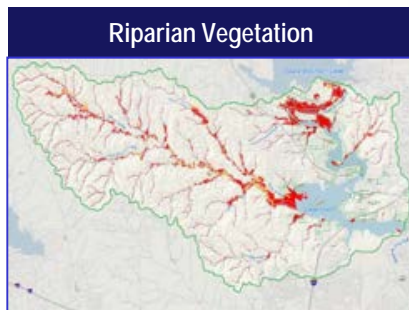


# Mapping Results



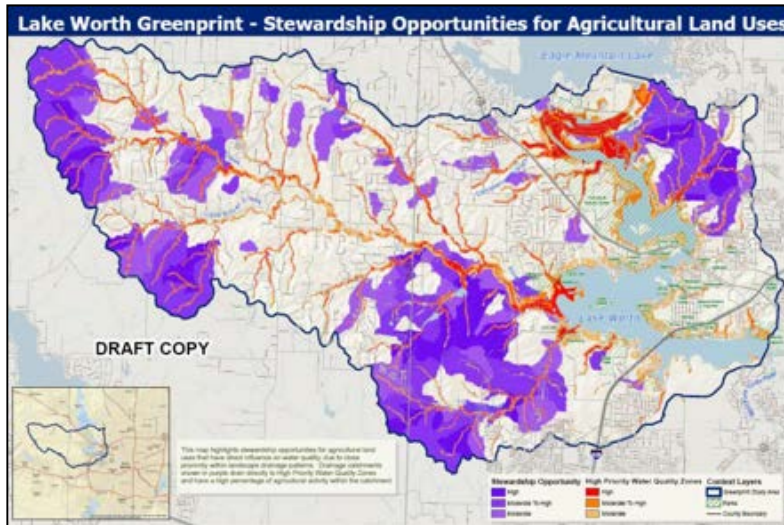
Relative Weighting by Function

- |                         |                             |
|-------------------------|-----------------------------|
| Nutrient uptake         | Multiple Benefits           |
| Riparian vegetation 20% | Canopy Cover 15%            |
| Wetlands 13%            | Native Vegetation 4%        |
| Erosion prevention      | Floodplains and Buffers 15% |
| Steep Stream banks 11%  |                             |
| Erodible Soils 11%      |                             |
| Steep slopes 11%        |                             |

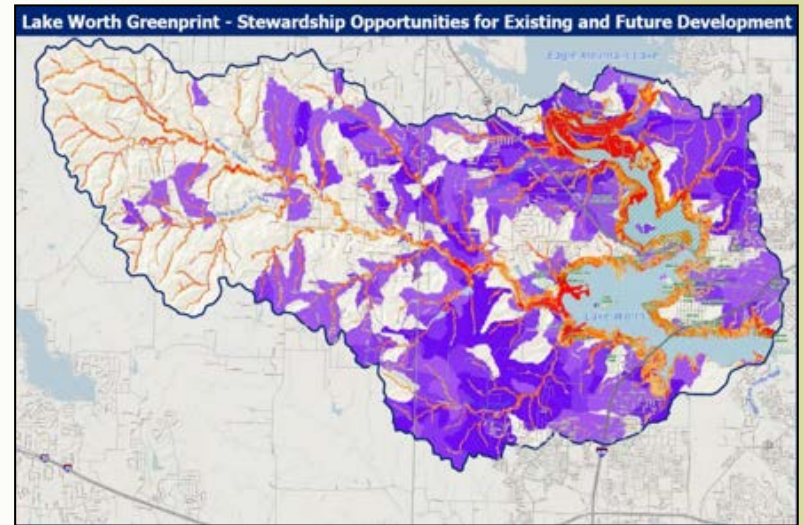




# Stewardship Opportunities

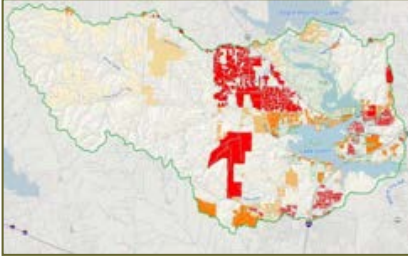


Stewardship Opportunities for Agricultural Land Uses

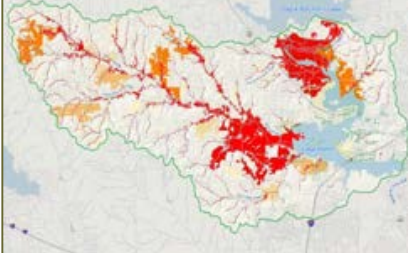


Stewardship Opportunities Existing and Future Development

Fitness Zone Priority Neighborhoods



Wildlife Viewing



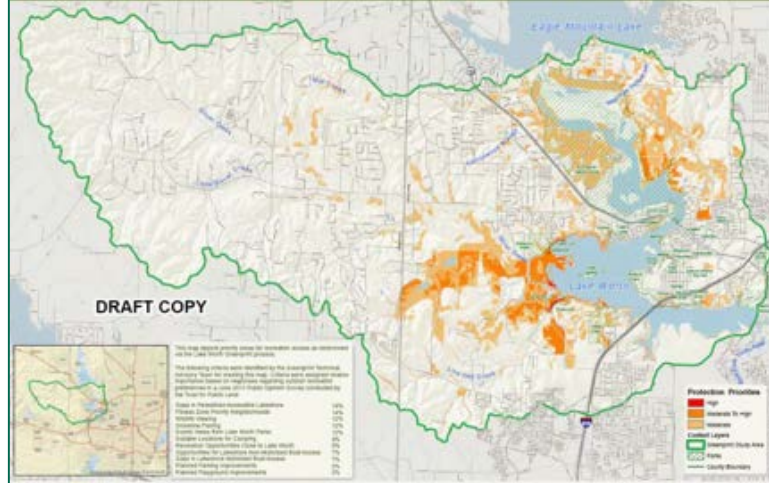
Suitable Locations for Camping



Scenic Views from Lake Worth Parks



Lake Worth Greenprint - Provide Recreation Access to Lake



Relative Weighting based on Outdoor Recreation Preferences Survey  
June 2013

- Gaps in Pedestrian-Accessible Lakeshore 14%
- Fitness Zone Priority Neighborhoods 14%
- Wildlife Viewing 12%
- Opportunities for Shoreline Fishing 12%
- Scenic Views from Lake Worth Parks 12%
- Suitable Locations for Camping 9%
- Recreation Opportunities Close to Lake Worth 8%
- Opportunities for Lakeshore Non-Motorized Boat Access 7%
- Gaps in Lakeshore Motorized Boat Access 7%
- Planned Parking Improvements 2%
- Planned Playground Improvements 2%

Planned Parking Improvements



Planned Playground Improvements



Gaps in Pedestrian Access to Lakeshore



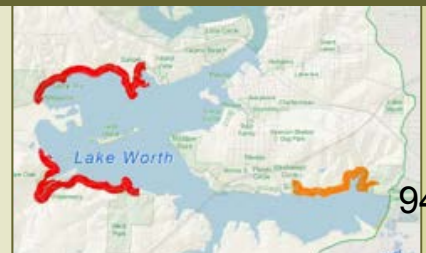
Opportunities for Shoreline Fishing



Opportunities Non-Motorized Boat



Gaps in Motorized Boat Access





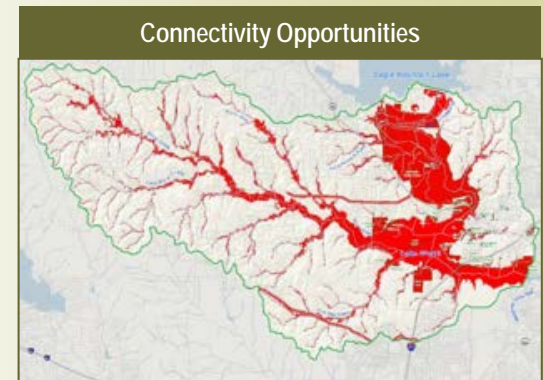
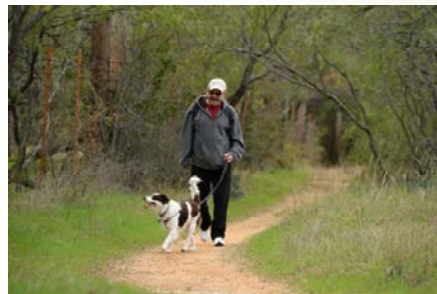
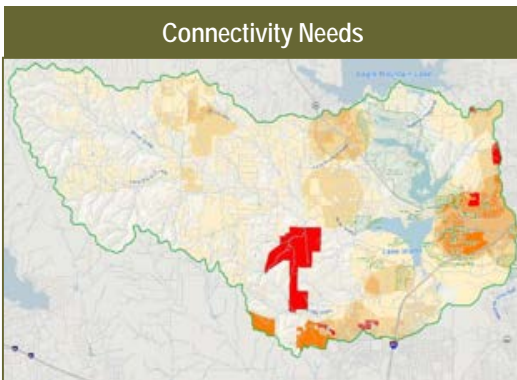
Connectivity Needs and Opportunities

Connectivity Needs (40%)

- Population density
- Planned developments
- % Children under age of 19
- % Low income households
- Connections to schools
- Connections to bus stops
- Connections to residential areas
- Connections to places of worship

Connectivity Opportunities (60%)

- Existing parks
- Vacant lands
- Undeveloped riparian corridors
- Floodplains
- East / west road corridors





# Conservation Finance Resource Options





# TPL's Conservation Finance Program

- **15+ years of experience** in developing, passing, and implementing funding measures for parks and conservation.
- **82 percent success rate** in passing 400+ ballot measures generating \$35 billion for parks and conservation around the country.
- **Nation's foremost experts** on how local and state governments finance parks and conservation.
- **Research capability** to develop and analyze data on funding options, economic benefits, and fiscal impacts.

# Finance Options for Lake Worth

CONSERVATION FINANCE RESOURCE OPTIONS REPORT

APRIL 2014

LAKE WORTH WATERSHED, TEXAS



THE TRUST *for* PUBLIC LAND  
LAND FOR PEOPLE

- Model programs
- Other communities
- Local finance options
- State funding programs
- Federal conservation funding

THE TRUST *for* PUBLIC LAND  
LAND FOR PEOPLE

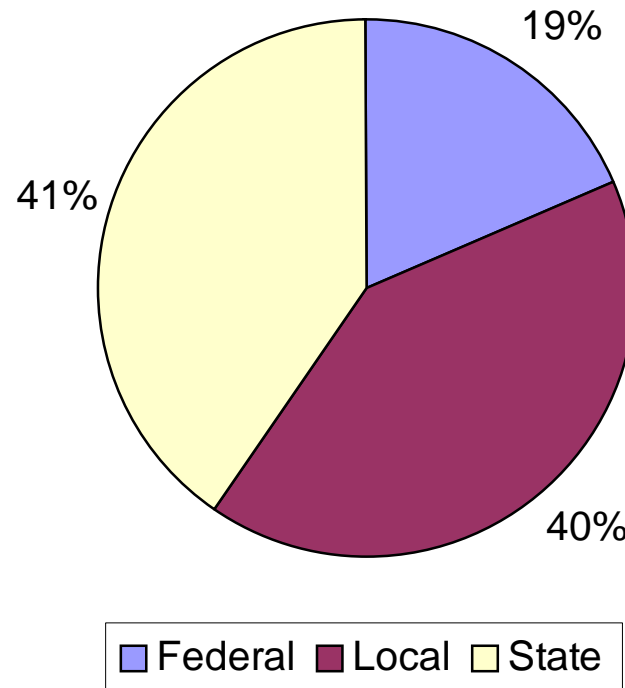


# Finance Resource Options

- A funding quilt is the diverse set of reliable, long-term funding sources that come together to achieve land conservation objectives
- Local, state, federal and private sources of funding all have a role
- Every funding quilt is unique and evolves over time due to changing fiscal and political fortunes

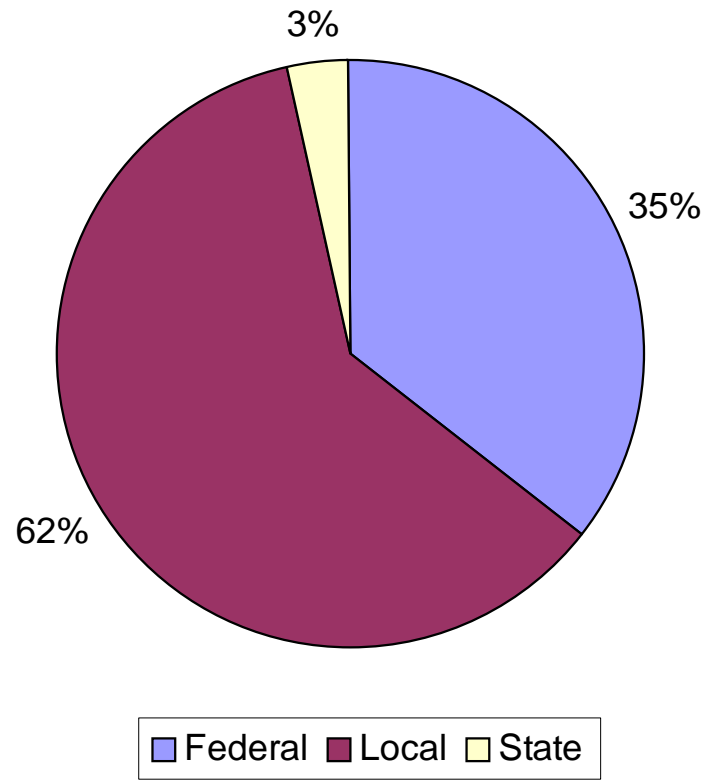
# National Funding Quilt

**Sources of Public Land Conservation Spending 1998 - 2008**



# Texas Funding Quilt

**Sources of Public Land Conservation  
Spending 1998 - 2008**



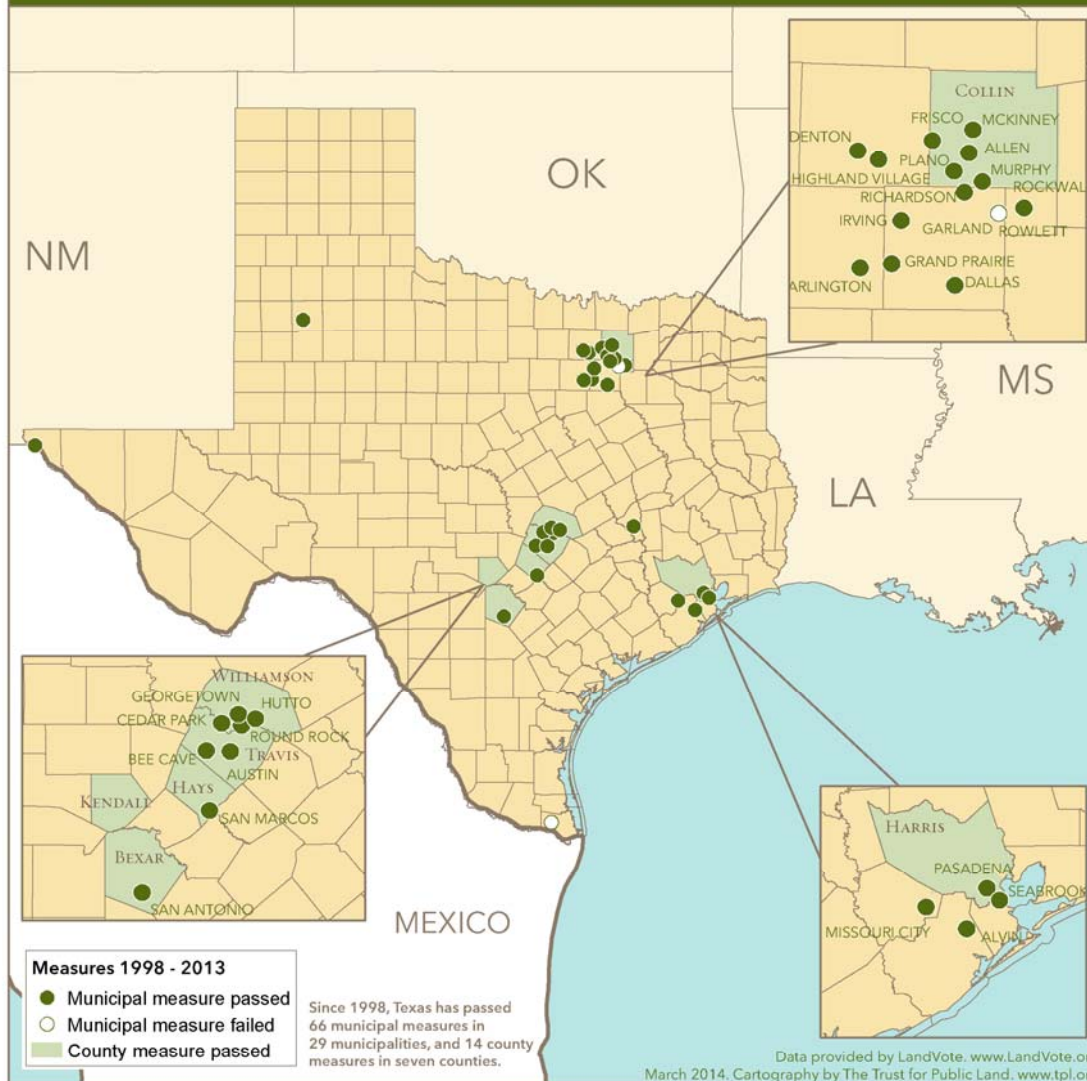


# Why Local Funding is Essential

- Local funding is the foundation of any long-term land conservation efforts, including those to protect drinking water sources
- External funding – federal, state, private– can be an important, but secondary, means of completing a land conservation project
- Competition for external funding is fierce and may not be reliable due to ever-changing state and federal budget circumstances
- Provides a ready match to leverage other sources

# TEXAS

## LOCAL CONSERVATION MEASURES 1998 - 2013





# Local Texas Conservation Success

- 1996 - 2013
- 99 local government measures
- 89 passed (90% success rate)
- Over \$1 billion





# Key Questions in Approaching Conservation Finance

- Jurisdiction
- Funding Mechanisms
- Amount (and duration)
- Voter Support/Tax Tolerance
- Purposes/Uses of Funds
- Timing (choice of election date)
- Management/Accountability
- Opposition



# Watershed Jurisdictions Considered

- City of Fort Worth
- City of Lake Worth
- Town of Lakeside



# Funding Mechanisms

## Local Public Finance Options in Texas for Watershed Protection & Parks

- Bonds (90 of the 99 measures)
- Sales Tax (9 measures)
- Property Tax
- Parkland Dedication / In-Lieu Fees
- User Fees / Utility Rates
- Oil & Gas Lease Revenue
- Tax Increment Financing



# Bonds

- Most common source of conservation funding
- Can be used for watershed acquisition now, while land is still available
- Majority voter approval required
- Costs are spread out over a long time horizon
- Bond proceeds may not be expended for maintenance and operations
- Interest increases the total cost.

# Potential Bond Issue

## Fort Worth Bond Financing Costs

Assumes a 20-year bond issue at 5.0% Interest Rate

2014 Net Taxable Value= \$41,442,385,142

Bond Issue	Annual		Cost/ Ave./
	Debt Svce	Tax Increase	Household*
30,000,000	\$2,407,278	0.006	\$8
50,000,000	\$4,012,129	0.010	\$9
70,000,000	\$5,616,981	0.014	\$13
100,000,000	\$8,024,259	0.019	\$19
150,000,000	\$12,036,388	0.029	\$28

\*Based on average taxable value of single-family residence of \$95,559.

## Lake Worth Bond Financing Costs

Assumes a 20-year bond issue at 5.0% Interest Rate

2014 Net Taxable Value= \$348,043,641

Bond Issue	Annual		Cost/ Ave./
	Debt Svce	Tax Increase	Household*
1,000,000	\$80,243	0.023	\$13
2,000,000	\$160,485	0.046	\$26
3,000,000	\$240,728	0.069	\$39
5,000,000	\$401,213	0.115	\$66
7,000,000	\$561,698	0.161	\$92

\*Based on average taxable value of single-family residence of \$57,054.

## Lakeside Bond Financing Costs

Assumes a 20-year bond issue at 5.0% Interest Rate

2014 Net Taxable Value= \$100,200,066

Bond Issue	Annual		Cost/ Ave./
	Debt Svce	Tax Increase	Household*
100,000	\$8,024	0.008	\$12
200,000	\$16,049	0.016	\$25
300,000	\$24,073	0.024	\$37
500,000	\$40,121	0.040	\$62
1,000,000	\$80,243	0.080	\$124

\*Based on average taxable value of single-family residence of \$154,832.



# Sales Tax

- Majority voter approval required
- Can be used both for acquisition and maintenance purposes
- Sales tax revenues can fluctuate with changing economic conditions.
- Not widely used for open space funding
- *Each of the municipalities in the study area is currently at the maximum allowable sales tax levy*



# Economic Development Corporation

- Lake Worth and Lakeside each have an EDC
- Funded by sales tax revenue
- Can fund projects such as parks, museums, sports facilities and the development of water supply facilities or water conservation programs

# Property Tax

- Can be used both for acquisition and maintenance purposes
- Funding level may be altered or eliminated based on annual budget

Property Tax Capacity				
Jurisdiction	Current	Remaining	Maximum @ \$20/Avg Home	
	M&O Rate		Capacity	Tax Rate
Fort Worth	0.6759	0.1241	0.021	\$8,702,901
Lake Worth	0.14804	0.65196	0.036	\$125,296
Lakeside	0.37926	0.42074	0.013	\$13,026

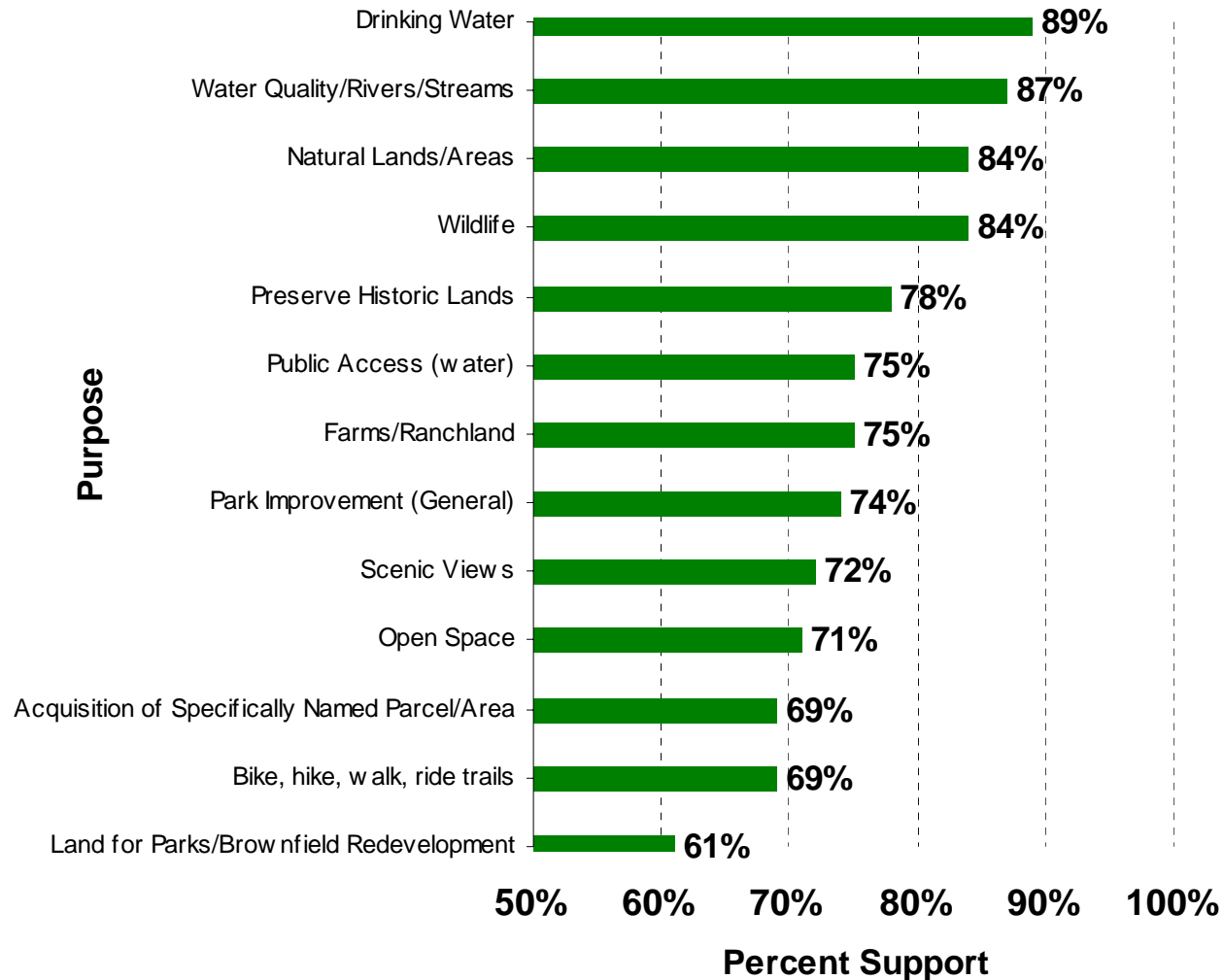




# Additional Revenue Options

- Parkland Dedication / In-Lieu Fees
- User Fees / Utility Rates
- Oil & Gas Lease Revenue
- Tax Increment Financing
  
- State Conservation Programs
- Federal Funding

# Voter Support of Conservation Purposes





# Action Planning: From Brainstorming to Feasibility

- Indicate the 10 best ideas.
- Indicate the 10 worst ideas.



# Action Planning: From Brainstorming to Feasibility

- For 3-5 best ideas, please write in the margins:
  - Who will do it?
  - How can it be done (orchestrated and paid for)?
  - When can it be completed?
- Add any new ideas (to back).

**WORKSHEET FOR v1 DRAFT ACTION PLANNING FOR LAKE WORTH GREENPRINT**

NAME: \_\_\_\_\_

Are you a designee to Lake Worth Regional Coordinating Committee? (circle one): yes / no

**Instructions:**

**Step 1:**

From the list below, please select up to ten (10) ideas that best meet these criteria:

- Importance – Which of these are the most important for accomplishing the Greenprint goals (protecting water quality/quantity and enhancing recreation)?
- Feasibility – Which of these are most feasible? Consider: are there resources available to accomplish these ideas?

*Please indicate your preference by putting a “+” in the “+” column next to 10 ideas.*

**Step 2:**

From the list below, please select up to ten (10) items that should be removed from the list (not important and/or infeasible). *Please indicate your preference by putting a “-” in the “-” column next to 10 ideas.*

*Note: If you select more than 10 ideas for either step, none of your responses will be counted.*

**Action Plan Ideas:**


(+)	(-)	
		<b>RAISE FUNDS TO SUPPORT ACTION PLAN STEPS</b>
		1) Coordinate with federal agencies to seek grant funding.
		2) Use a portion of the oil and gas lease revenue to fund actions related to the Lake Worth Greenprint.
		3) Set aside revenue from stormwater utility fees for water quality protection/improvement.
		4) Leverage funds from existing groups that have been known to raise money for related work.
		5) Create an open space district that can cross city and county lines.
		6) Consider tax increment financing.
		7) Pass a city and/or county ¼ or 1 cent sales tax or property tax.
		<b>START A VOLUNTARY OPEN SPACE PRESERVATION PROGRAM</b>
		8) Start a program focused on preserving riparian corridors, creating easements for new trails, or protecting open space generally that is high priority according to the Greenprint.
		<b>GATHER MORE INFORMATION TO UNDERSTAND AND ADDRESS WATER QUALITY PROBLEMS</b>
		9) Identify research/monitoring needs related to Lake Worth.
		10) Evaluate the septic systems in the watershed and review waste treatment improvement opportunities.
		11) Monitor septic system discharge into the lake.
		12) Study the effects of decommissioning septic systems on the lake.
		<b>DEVELOP OR ENHANCE LOCAL GOVERNMENT PROGRAMS/ACTIVITIES</b>
		13) Develop a regional feral hog control program.

**WORKSHEET FOR v1 DRAFT ACTION PLANNING FOR LAKE WORTH GREENPRINT**

	14) Create a voluntary backyard wildlife habitat program for interested landowners.
	15) Preserve existing City-owned High Priority Water Quality Zones with a High ranking on the Water Quality Zones Greenprint map.
	16) Promote Low Impact Development (LID) for stormwater management. Have a LID design competition for City-owned land that is within High Priority Water Quality Zones.
	17) Do more regional stormwater detention.
	18) Reduce the need for irrigation on City-owned lands, and use non-potable wastewater where appropriate.
	19) To reduce runoff on public lands in the watershed that are not designated as parkland, use undeveloped savannah grassland open space range management.
	20) Consider future recreational use for the City-owned land with a High ranking on the Recreational Connectivity and Recreation Access Greenprint maps.
	21) Improve the parking and clean the beaches at City-owned parks around Lake Worth.
	22) <i>Expand the "Adopt-a Park" program.</i>
	23) City of Fort Worth to double check that that the estimated costs associated with improving the parking in the parks around Lake Worth is on the deferred maintenance list.
	24) Improve existing parks around the lake by providing facilities for more diverse recreation (e.g. lawn bowling, remote controlled airplane fields, disc golf, etc.)
	25) Develop a competitive juniors (high school) rowing program housed at Casino Beach or another shoreline park.
	26) Create a family friendly camp/day use site with shallow beach access.
	27) Dredge the canal that starts at Silver Creek Road and Huron and ends in the lake for fishing, boating, canoeing, and swimming.
	28) Improve systems for selling boat permits for Lake Worth – currently only available at 2 places.
	29) Water Marshall to create an on-line system for selling boat permits.
	30) Continue to improve existing boat ramps and invest in new boat ramps.
	<b>EDUCATE/PUBLICIZE</b>
	31) Establish a communications strategy to promote the resources, to describe what is here and what is evolving.
	32) Have signage about good stewardship practices at places that people will go to already, like boat ramps and trailheads.
	33) Approach Texas Parks and Wildlife Magazine about doing an article.
	34) Have a demonstration project, such as putting pervious pavement and bioswales at an existing park.
	35) Traveling road show to visit local schools.
	36) Have special events highlighting the importance of water quality, e.g. promote at a paddle race or fishing contest.
	37) Work with landowners to equip them to voluntarily enhance practices that maintain or improve water quality.
	38) Create a computer based brief course about best management practices and then create an incentive for people to take the course, like by offering credit on property taxes.
	39) Expand existing program whereby City of Fort Worth provides stormwater credits to Fort Worth Integrated School District for providing stormwater education in exchange for a rebate on their utility fees.
	40) Create development review tool for city and county offices to assist in educating developers - reference Greenprint maps as part of entitlement process and ensure proposed development is consistent with priority areas for water quality protection.
	41) Educate the public about application/use of fertilizers and detergents to reduce negative water quality

**WORKSHEET FOR v1 DRAFT ACTION PLANNING FOR LAKE WORTH GREENPRINT**

		impacts.
		42) Coordinate with the State of Texas’ existing program to promote agricultural heritage.
		43) Better promote the nature center.
		44) Have signs at the parks and Casino Beach that educate the public around history, the military, and water quality.
		45) On the PCSD website, give timely updates on progress regarding the Lake Worth Trail.
		46) Coordinate with Streams and Valleys about proposed new trails.
		<b>CREATE LANDOWNER INCENTIVES</b>
		47) Provide private landowners financial incentives to leave natural buffer strips and plant native vegetation.
		48) Develop tax incentives to keep critical land in suitable low-impact uses.
		49) Work with county tax authorities to refine the requirements around what qualifies for an ag exemption.
		<b>UNDERTAKE ADDITIONAL PLANNING AND EVALUATION</b>
		50) Re-do the public surveys city-wide (i.e. park need assessment) every two years. Look at trends over time in current/recent behavior.
		51) Add a page to the City of Fort Worth’s Comprehensive Plan with Greenprint findings, such as where the water protection areas are located.
		52) Develop an EPA-acceptable Watershed Protection Plan (WPP).
		53) Create a committee to create a plan to provide large scale utilization of existing parkland.
		54) Ideas for how to focus future trail work.
		<b>REGULATE</b>
		55) Establish urban growth boundaries – urban areas ringed with open space.
		56) Limit use of lake water for private drilling gas/oil.
		57) Develop a water protection overlay that triggers certain requirements for development within that overlay zone.
		58) Restrict water that is used for lawns and golf courses.
		59) Limit use of lawn and golf course pesticides, herbicides, and fertilizers; use natural and organic methods instead.
		60) Restrict fuel discharge (gas avail on lake).
		61) Establish ordinances to protect native plant communities in conservation developments and corporate campuses.
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		63) Develop a zoning overlay indicating the conceptual location for new trails (locations determined by the Greenprint maps) and then work with developers to determine exact location of those trails through the development process.
		64) Limit motorized uses around the Fort Worth Nature Center and any swimming beaches.
		65) Limit boat access in different parts of the lake by vessel type (E.g. sail, paddle, or watercraft).
		66) For jurisdictions in the watershed that don’t already have one, create a parkland dedication ordinance that requires new development to set aside a portion of the land for open space or payment of a fee-in-lieu of setting aside land.
		67) Zoning to keep population growth low so access and availability for recreational lands can be preserved.



# **LAKE WORTH REGIONAL COORDINATION COMMITTEE LWCIIP UPDATE**



**Presented by  
Paul Bounds**

**City of Fort Worth  
Water and Sewer Department  
December 18, 2014**





# Outline

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- Completed Projects
- In Progress Projects
- Gas Lease Revenues
  - F Y 2015 Projects
  - FY 2016 Projects
- Property Sales Revenues
  - FY 2015 Projects
  - FY 2016 Projects



# Completed Projects 1

---

- Phase I Dredging Design \$1,519,299
- Northside III 16" Water Main 913,405
- Arrow S Boat Ramp 300,000
- Gas Drilling BMP Study 24,871
- Stump and Hazard Removal 307,207
- Casino Beach Boat Ramp 527,790
- Woodvale Water and Sewer 2,046,640
- Amend. No.1 Dredging Design 878,058



# Completed Projects 2

---

• Phase 2 Dredging Design	\$221,790
• Phase 1&2 Dredging	16,376,481
• Casino Beach/ Watercress Water/Sewer (Design)	735,954
• Mobile LiDAR Study	100,000
• <b>TOTAL</b>	<b>\$23,951,495</b>



# In Progress

---

• Casino Beach/Watercress Water/Sewer (Construction)	\$1,121,370
• Greenprinting Study	280,000
• Love Circle Water /Sewer Improvements (Design)	281,011
• Phase 1 and 2 Trail (Design)	300,000
• Phase 3 Dredging (Design)	50,000
• <b>TOTAL</b>	<b>\$1,778,481</b>



# LWCIIP Funding Requirements

---

- Projects will be funded with gas lease or lease sale revenues.
- Current gas revenues are through royalties only.
- Gas revenue fluctuations make it difficult to accurately predict revenues.
- **Project cannot be let out for bid until full funding is available .**



# Gas Lease Revenues

---

- Lake Worth Lease Bonus
  - Completed Projects \$23,951,495
  - In Progress 1,778,481
  - Total \$25,729,976
- FY 2014 Royalties \$3,913,695
- FY 2015 Projected \$4,000,000



# LWCIIP Projects FY2015

---

- Watershed Protection Study \$230,000
- Love Circle Water/Sewer  
(Construction) 2,300,000
- Phase 3 Dredging  
(Construction) 150,000
- Phase 1 Hike/Bike Trail  
(Const.) \$3,000,000 to \$5,000,000



# LWCIIP Projects FY 2016

---

- Watercress Phase 2  
Water /Sewer (Design) 350,000
- Comanche Creek Drainage  
Improvements (Construction) 600,000





# Property Sales Fund FY 2015

---

• FY 2014 Revenues	\$1,095,123
• Lake Worth Dam Improvements (Design)	\$25,000
• Lake Worth Parks Survey	260,000
• Lake Worth Dam Security Improvements (Construction)	301,500
• TOTAL	\$586,500



# Property Sales Fund FY 2016

---

• FY 2015 Revenues	\$100,000
• Lake Worth Dam Improvements (Construction)	150,000
• Lake Worth Property Disposition Study	200,000
• Love Circle Park (Construction)	200,000
• TOTAL	\$550,000

---

**QUESTIONS?**



# **LAKE WORTH REGIONAL COORDINATION COMMITTEE LWCIIP UPDATE**



**Presented by  
Paul Bounds**

**City of Fort Worth  
Water and Sewer Department  
December 18, 2014**



# Outline

---

- Completed Projects
- In Progress Projects
- Gas Lease Revenues
  - F Y 2015 Projects
  - FY 2016 Projects
- Property Sales Revenues
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**QUESTIONS?**



**FREESE  
AND  
NICHOLS**

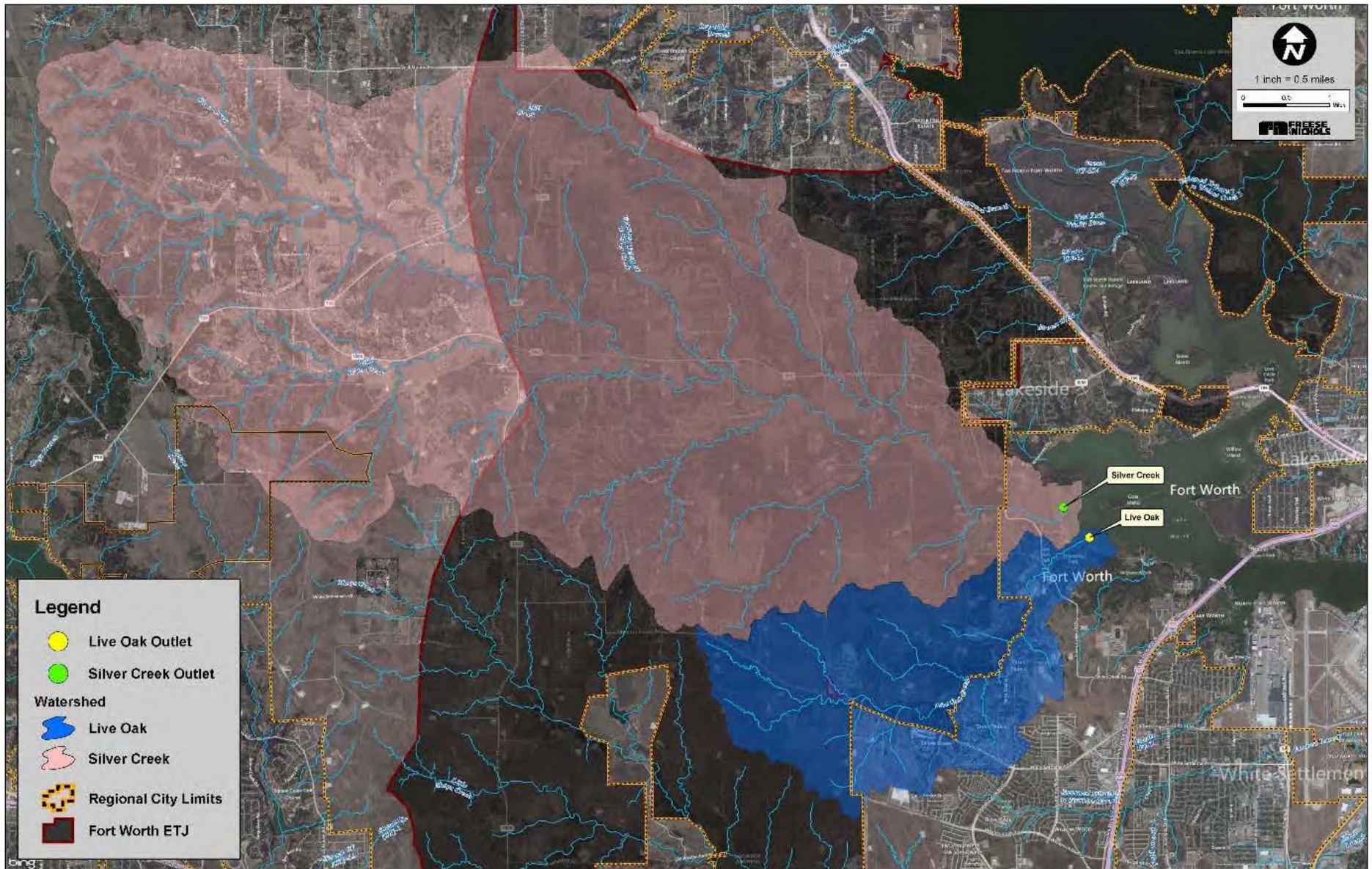
## **Lake Worth Watershed Protection Study**

**LAKE WORTH REGIONAL COORDINATION  
COMMITTEE**

**March 19, 2015**



# Lake Worth Watershed



# Lake Depths Before Dredging



# Lake Depths After Dredging



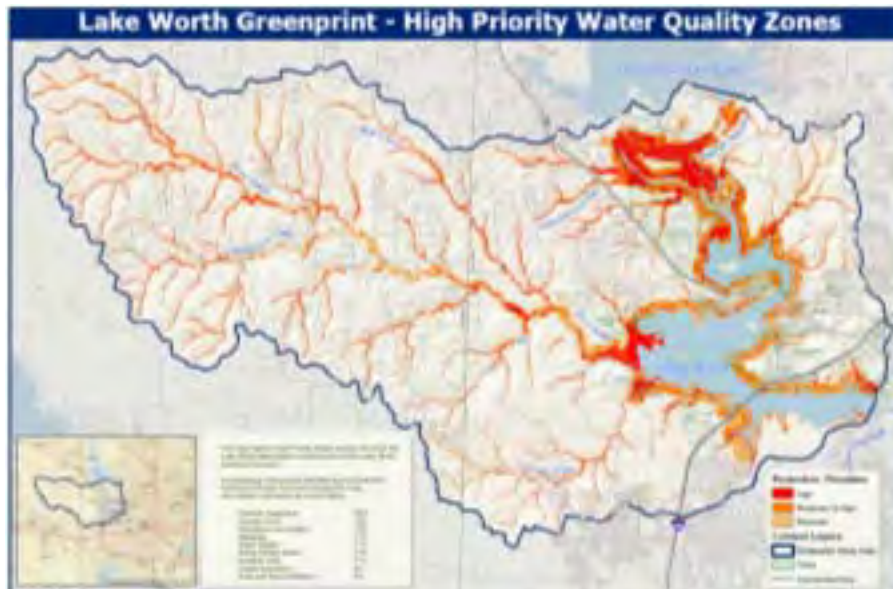
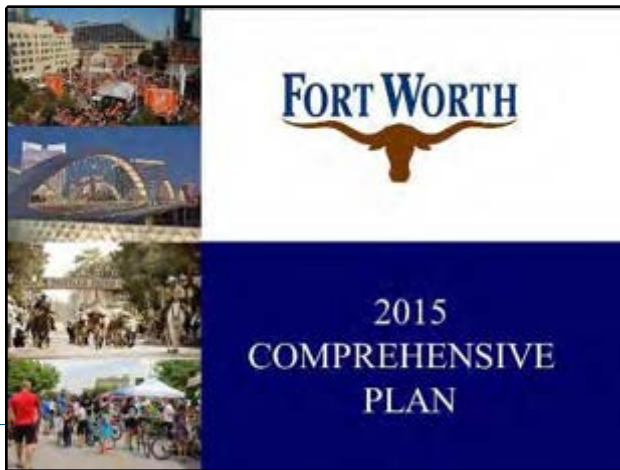
# Pics of Dredge Operation



# Pics of Dredge Disposal Site Silver Creek Materials



# Watershed Protection Drivers

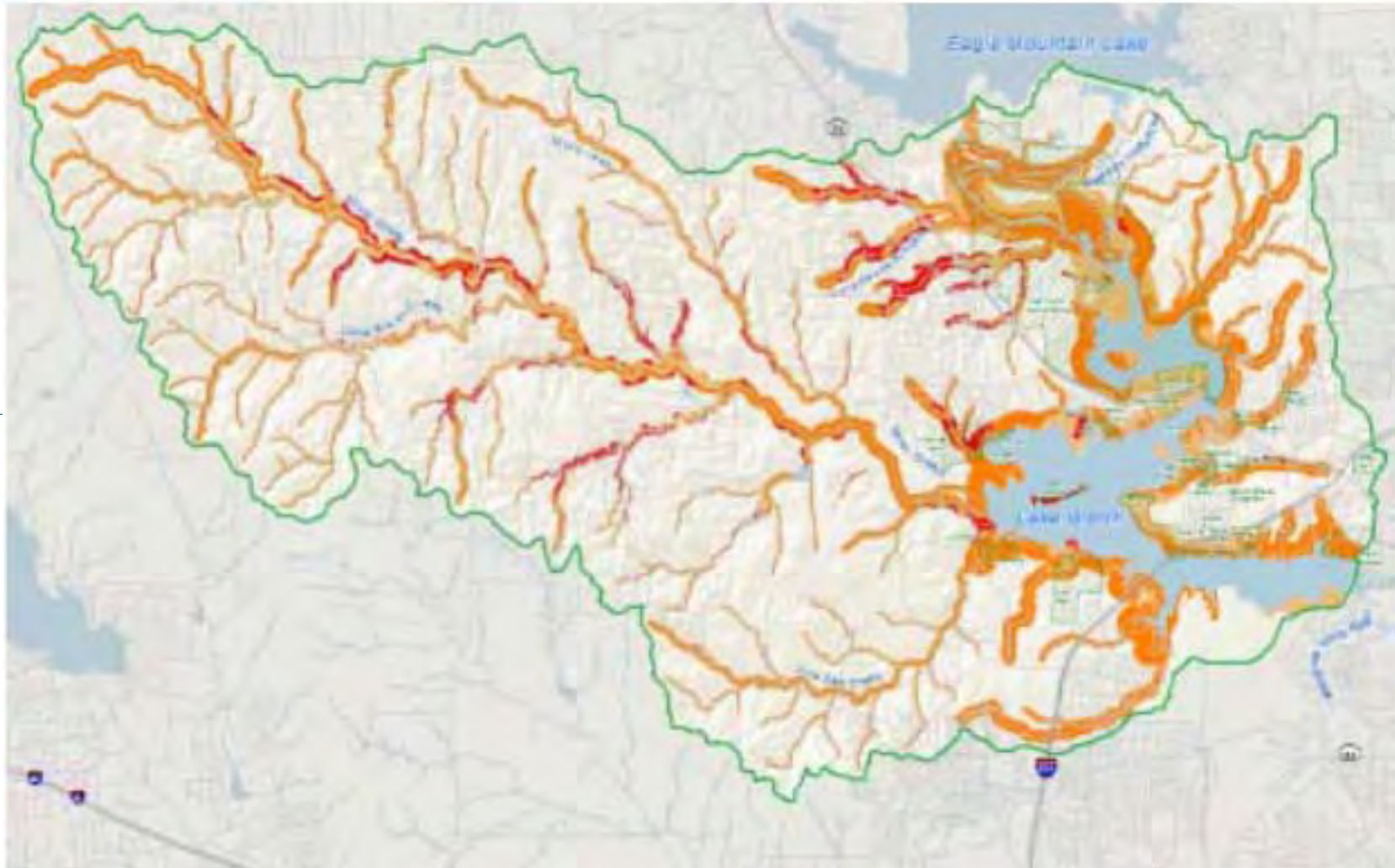


2010 Award Recipient

# Study goals



# Lake Worth watershed erodible soils





## Approaches to be Studied

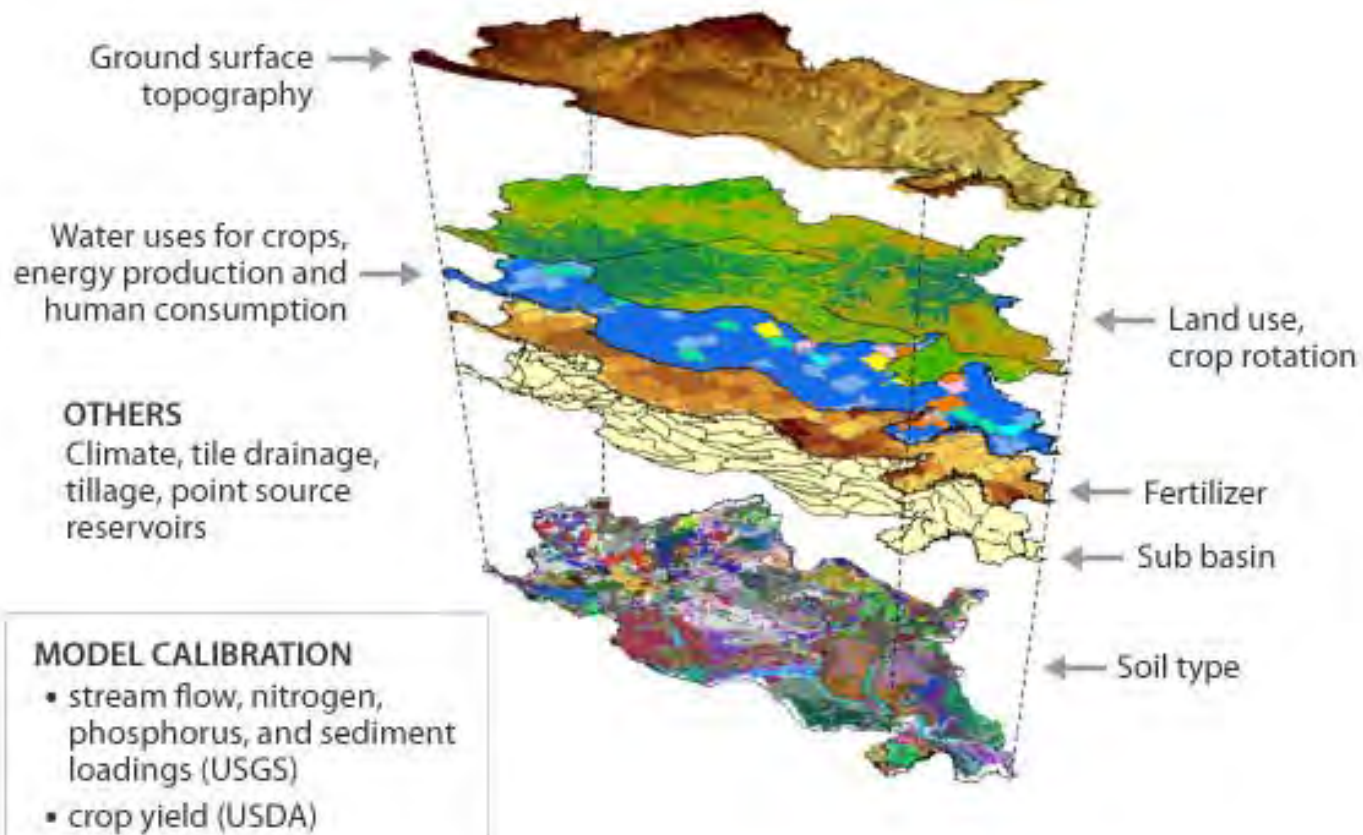


- Sedimentation forebays for Silver Creek and Live Oak watersheds
- Constructed wetlands for water quality polishing
- Watershed BMPs
- Plan for Watershed Monitoring

# Sediment Modeling



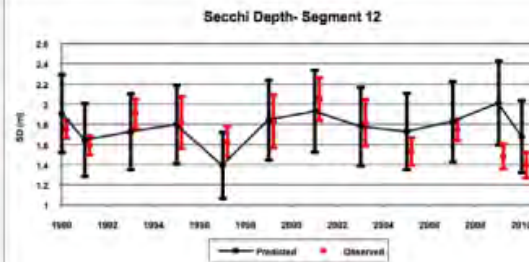
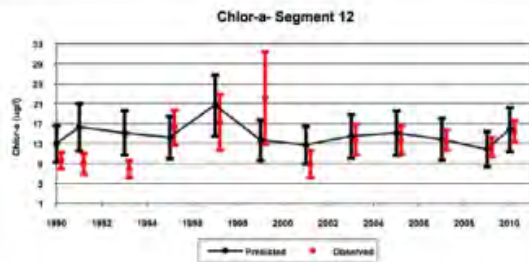
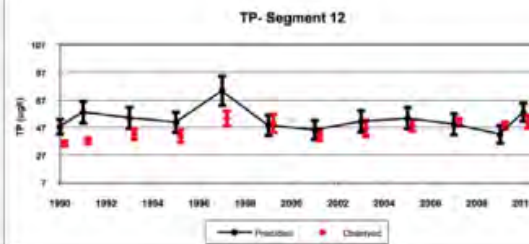
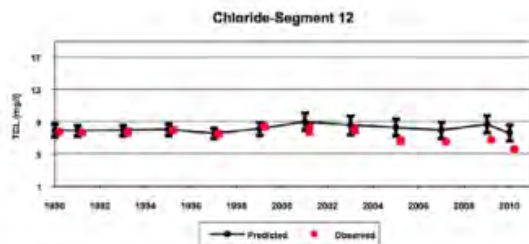
## Soil & Water Assessment Tool | **SWAT**



# In-lake Water Quality modeling



- BATHTUB
- Eutrophication-related water quality projections



## BATHTUB

### Model Uses

BATHTUB is a steady-state water quality model that simulates eutrophication-related water quality conditions in lakes and reservoirs.



# Quarry Sedimentation Site Feasibility Analysis



- Silver Creek Materials (Live Oak Creek watershed)
- HJG Quarry (Silver Creek watershed)



# Constructed Wetlands Feasibility Analysis



# Watershed BMPs



# Watershed Monitoring Plan



2010 Award Recipient

## Feasibility Report Deliverable



- Sediment and nutrient loading existing conditions model
  - Sediment and nutrient loading model with BMPs
  - In-lake water quality model for existing and proposed approaches
- Conceptual costs for quarry sedimentation BMP alternatives
  - Conceptual costs for constructed wetlands
  - Next steps





# Lake Worth Trail

Project Update

March 19, 2015

Lake Worth Regional Coordination Committee Meeting

City of Fort Worth

Parks & Community Services Department

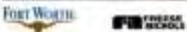


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# Lake Worth Trail – Phase I (A1-A3) Final Design

- 5.6 miles
- Connects 3 Parks: Marion Sansom Park, Windswept Circle Park, Plover Circle Park and Arrow S. Park
- Construction Budget: \$5,000,000
- Estimated Construction Cost: \$7,077,000

# Lake Worth Trail – 25% preliminary design



Lake Worth Regional Trail - Preliminary Design



# Lake Worth Trail – Environmental Walkthrough

- Identified water bodies under the potential jurisdiction of the Corps of Engineers

- 21 water crossings

- 17 stream
- 3 wetland
- 1 lake



- Identified need for an additional bridge near the Trinity River

---

# Lake Worth Trail – Environmental Walkthrough

- Four federally-listed threatened or endangered bird species in Tarrant County
  - Least Tern
  - Whooping Crane
  - Piping Plover
  - Red Knot
- No suitable habitat observed

---

# Lake Worth Trail – Environmental Report

- Water crossing permitting with Corps
  - Nationwide Permit 14, *Linear Transportation Projects*
  - Avoid wetland crossings to avoid Pre-construction Notification requirements
- Threatened or Endangered species
  - No habitat observed
  - No coordination/permitting with U.S. Fish and Wildlife Service
- Archeological/Cultural Resources
  - Coordination required with Texas Historical Commission
  - Archeological Survey may be needed

# Lake Worth Trail – City Arborist walkthrough

## ■ City of Fort Worth Parkland and ROW

- Marion Sansom Park
- Cahoba Drive
- Windswept Circle Park
- Plover Circle Park
- Arrow S. Park
- 125 Trees tagged in parkland
- 27 Trees not needed
- 14 Trees dead/dying/poor shape
- Results in 84 trees for consideration
- ROW group of trees - sta. 206+00



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# Lake Worth Trail – Anticipated Schedule

- Finalize Scope and Fee: March 2015
- City Council approval: May 2015
- Construction Document kick-off: May 2015
- 60%, 90% and 100% Plan submittals and reviews
- Bid project: Winter 2015
- Award Construction Contract: February 2016



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# Lake Worth Trail

Questions?



# Lake Worth Trail

Project Update

June 25, 2015

Lake Worth Regional Coordination Committee Meeting

**City of Fort Worth**

Parks & Community Services Department



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# Lake Worth Trail – Project Update

- May rain
- Phase I Final Design on July 21<sup>st</sup> M&C agenda
- Final Construction Documents (PS&E) Plans, Specifications and Estimates for Section A1 to A3.
- Revised Schedule
- Questions

# Lake Worth Trail – Project Update

- Lake Worth spillway May 25, 2015



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# Lake Worth Trail – Phase I Final Design

- Phase I Final Design includes Construction Documents (PS&E) Plans, Specifications and Estimates for trail improvements at Lake Worth Section A1 to A3.
  
- PS&E to include:
  - Final topographic survey
  - Geo-Technical services
  - Hydrology analysis and permits
  - Environmental analysis
  - Urban Forestry permit
  - Storm Water Pollution Prevention Plan (SWPPP)
  - Construction Documents

# Lake Worth Trail – Phase I Final Design

- From Trinity Trail terminus point near Anahauc Street (A1) to Arrow S. Park (A3).



# Lake Worth Trail – Phase I Final Design

## ■ Trailhead Types:

**A**

Trailhead Type A, Includes:

- Parking
- Kiosk w/Trail Map
- Bench Seating
- Drinking Fountains
- Bike Racks
- Wayfinding Signage
- Portable Restroom Shelter

**B**

Trailhead Type B, Includes:

- Bench Seating
- Drinking Fountains
- Wayfinding Signage

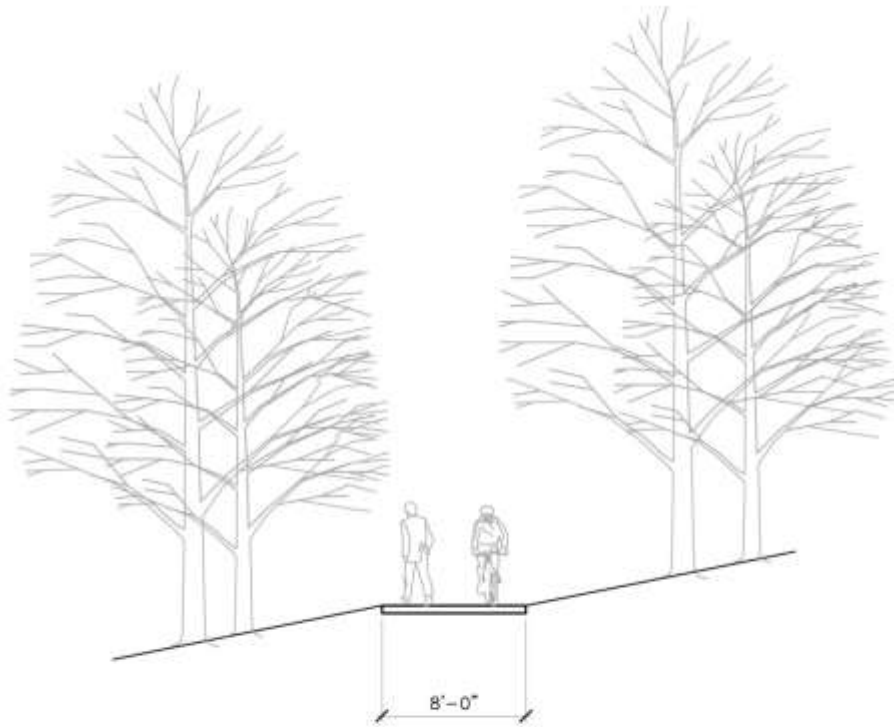
**C**

Trailhead Type C, Includes:

- Bench Seating
- Wayfinding Signage

# Lake Worth Trail – Phase I Final Design

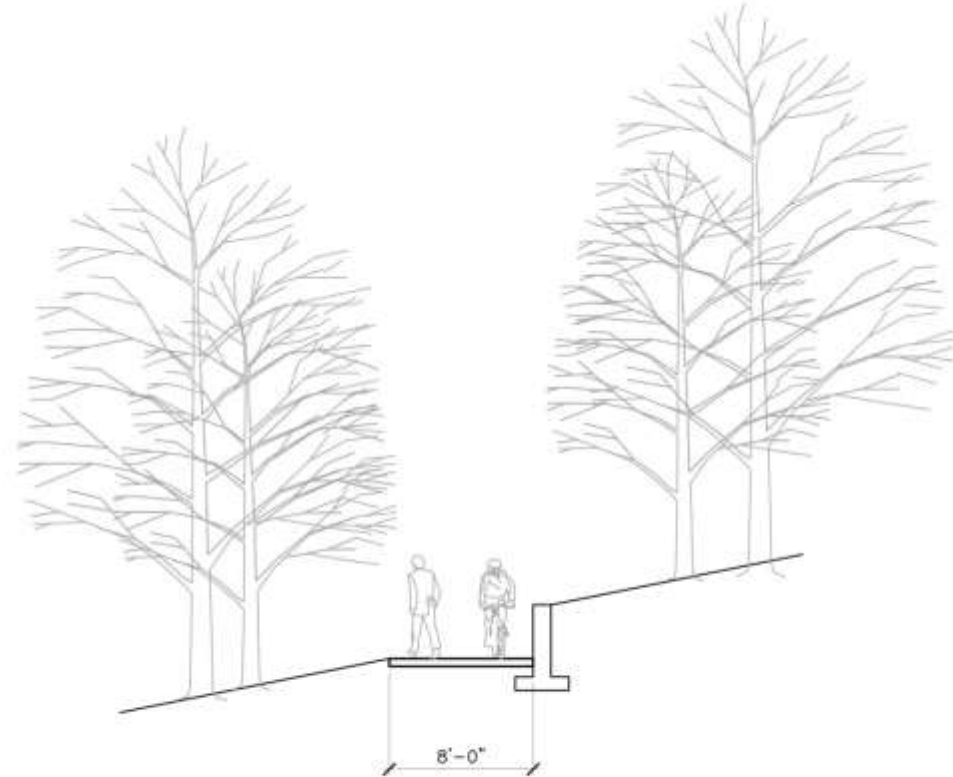
- Typical Trail Sections:



1

TYPICAL TRAIL SECTION  
TRAIL THROUGH OPEN SPACE

NOT TO SCALE



2

TYPICAL TRAIL SECTION – UPHILL RETAINING WALL  
TRAIL THROUGH OPEN SPACE

NOT TO SCALE



# Lake Worth Trail – Phase I Final Design

- Base bid plans (A1-A2)
  - Includes two Type A trailheads (A1) at Trinity Trail terminus point near Anahauc street and trailhead (A2) in Marion Sansom Park
  - Includes two Type C trailheads at both West Fork Trinity River pedestrian bridge locations
  - Includes one potential trail emergency access point at trailhead A1



# Lake Worth Trail – Phase I Final Design

## ■ Bid Alternate (A2-A3)

- From trailhead (A2) in Marion Sansom Park to trailhead (A3) in Arrow S. Park
- Includes one Type B trailhead at Windswept Circle Park
- Includes two Type C trailheads, C3 along 6700 block of Cahoba Dr. and C4 at Arrow S Park 'East' at 7901 Cahoba Dr.
- Includes three potential trail emergency access points



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# Lake Worth Trail – Revised Schedule

- Finalize Scope and Fee: March 2015
- City Council approval: **July 21, 2015**
- Phase I Final Design kick-off: **July 22, 2015**
- 60%, 90% and 100% Plan submittals and reviews
- Bid project: **May 2016**
- Award Construction Contract: **August 2016**

# Lake Worth Trail

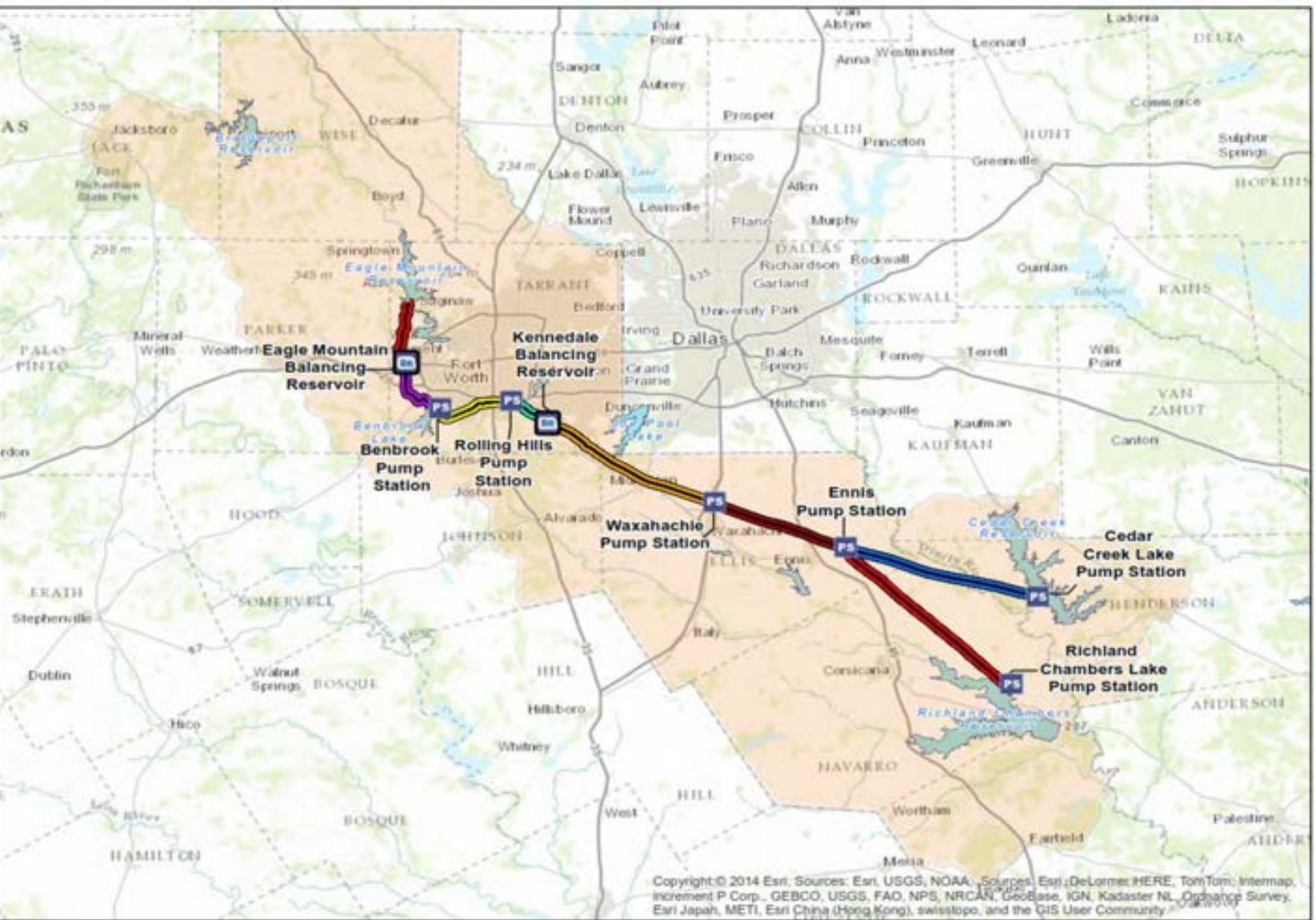




# Reservoir Levels on the West Fork Trinity

David Marshall

Tarrant Regional Water District



Copyright © 2014 Esri. Sources: Esri, USGS, NOAA, Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

# West Fork Water Supply Operations

- By contract we must run the system in the most efficient manner
- We evaluate pumping costs and reliability for operational decisions
- The reservoir levels fluctuate due to use, evaporation, rainfall and pumping from east Texas reservoirs
- The TRWD reservoir system is designed to deliver all the water we will need during the worst drought, so we will not run out of water
- The reservoir levels will be very low at the end of a severe drought
- The Eagle Mountain Connection supplies additional water to the West Fork to permit Fort Worth to use more water and improve reliability for the West Fork System
- During the drought we experienced, the Eagle Mountain Connection provided almost all the water Fort Worth used.

# Water Supply and Reservoir Levels

- Water Supply - Bridgeport
  - Bridgeport serves six municipal customers and seven irrigation/industrial customers whom withdraw water from the reservoir, with a contractual total of 25,500 acre feet
  - Our water right requires 15,000 acre feet of use be set aside for local customers and up to 78,000 acre feet be used or released to Eagle Mountain
  - The most sustainable use from Bridgeport is about 60,000 acre feet
  - On wet years we use up to the limit, on dry years much less.
  - In 2014, an exceptionally dry year, we used 19,110 acre feet from the reservoir, and no water was released to Eagle Mountain



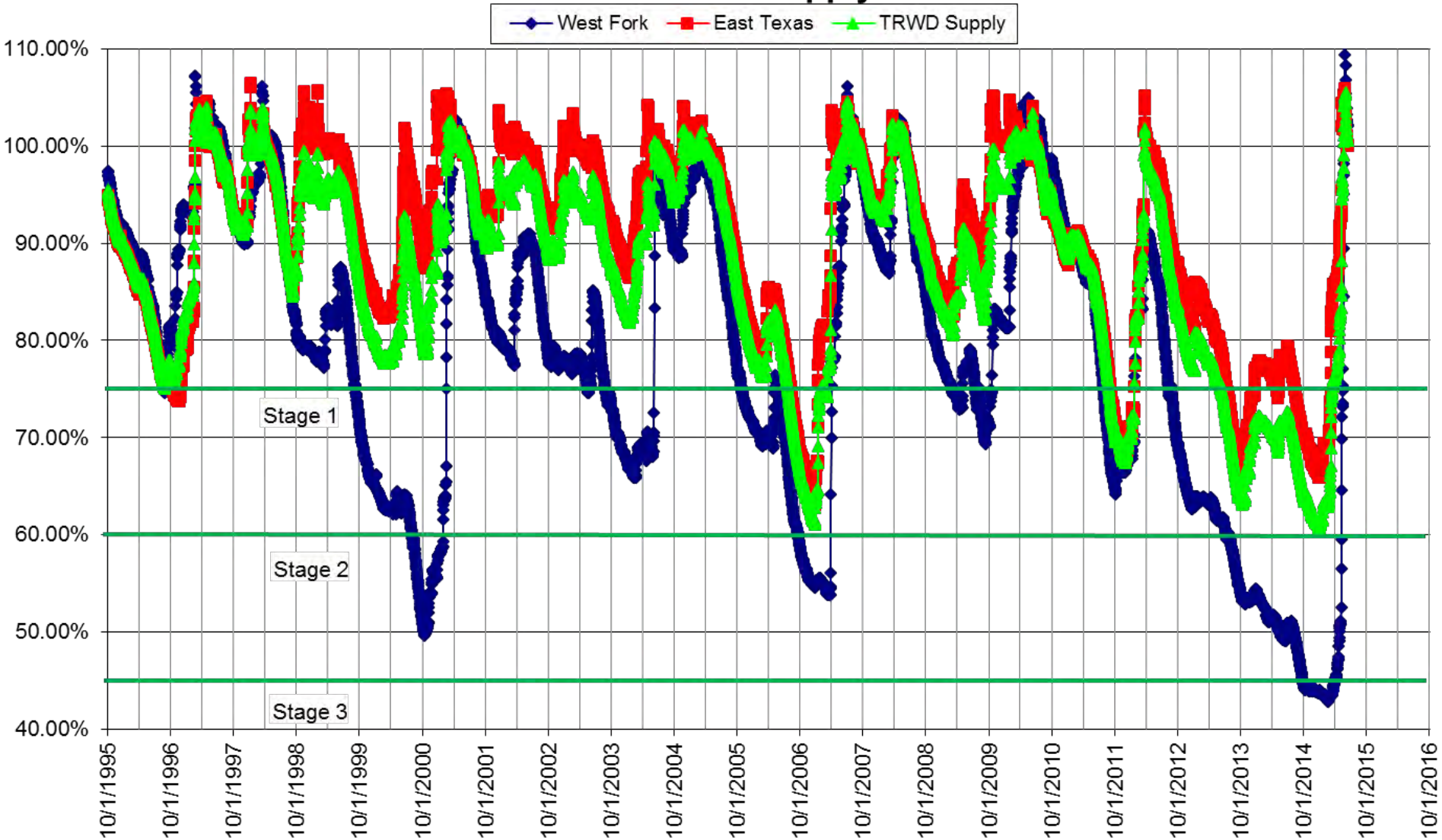
# Water Supply and Reservoir Levels

- Water Supply – Eagle Mountain
  - Eagle Mountain serves four municipal customers and three irrigation/industrial users with a contractual total of 105,000 acre feet
  - Fort Worth is restricted by contract to use no more than 100,000 acre feet of “native” water during normal years and 46,000 acre feet during droughts
  - Our water right allows us to use or release up to 159,600 acre feet
  - Sustainable use is about 102,000 acre feet annually.
  - Eagle Mountain is also supplied by pumping from East Texas. On dry years we add water to the reservoir so use may go above the sustainable level
  - In 2014 we added 58,380 acre feet of water to the reservoir, about 1/3<sup>rd</sup> of Eagle Mountain’s total volume
  - In 2014 total use was 67,975 from Eagle Mountain and Lake Worth, 86% supplied by the Eagle Mountain Connection

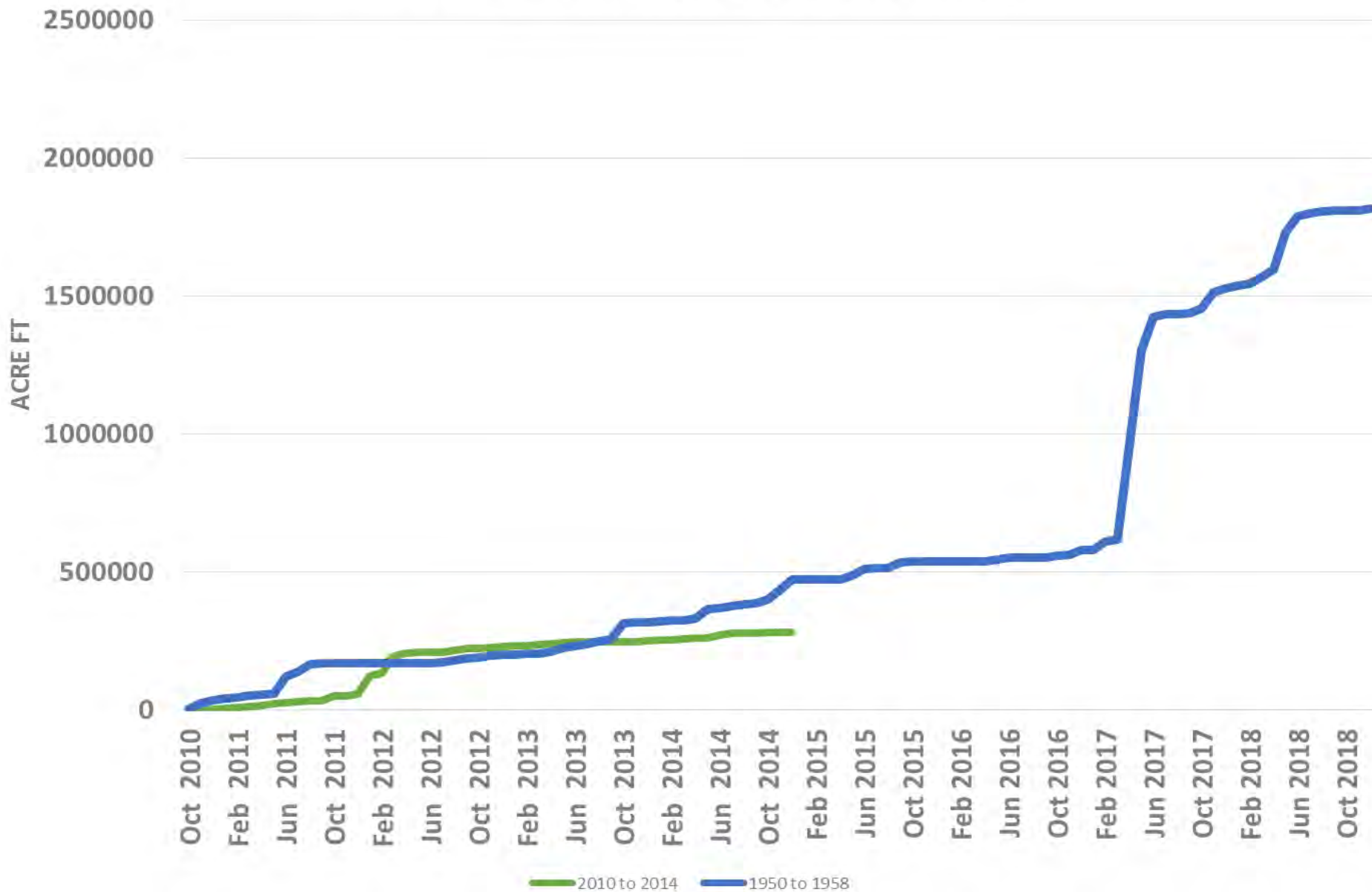
# Water Supply and Reservoir Levels

- Water Supply – Lake Worth
  - Provides water to Fort Worth’s Holly Water Treatment Plant, River Oaks and Lockheed Martin
  - To provide water to the water plant and Lockheed, the lake must be no lower than 4 feet below conservation
  - Fort Worth has the right to take 12,143 acre feet from a water rights permit
  - The sustainable use is very low, a few thousand acre feet at most.
  - During drought, TRWD limits evaporation by lowering the water surface through controlled discharges from Eagle Mountain

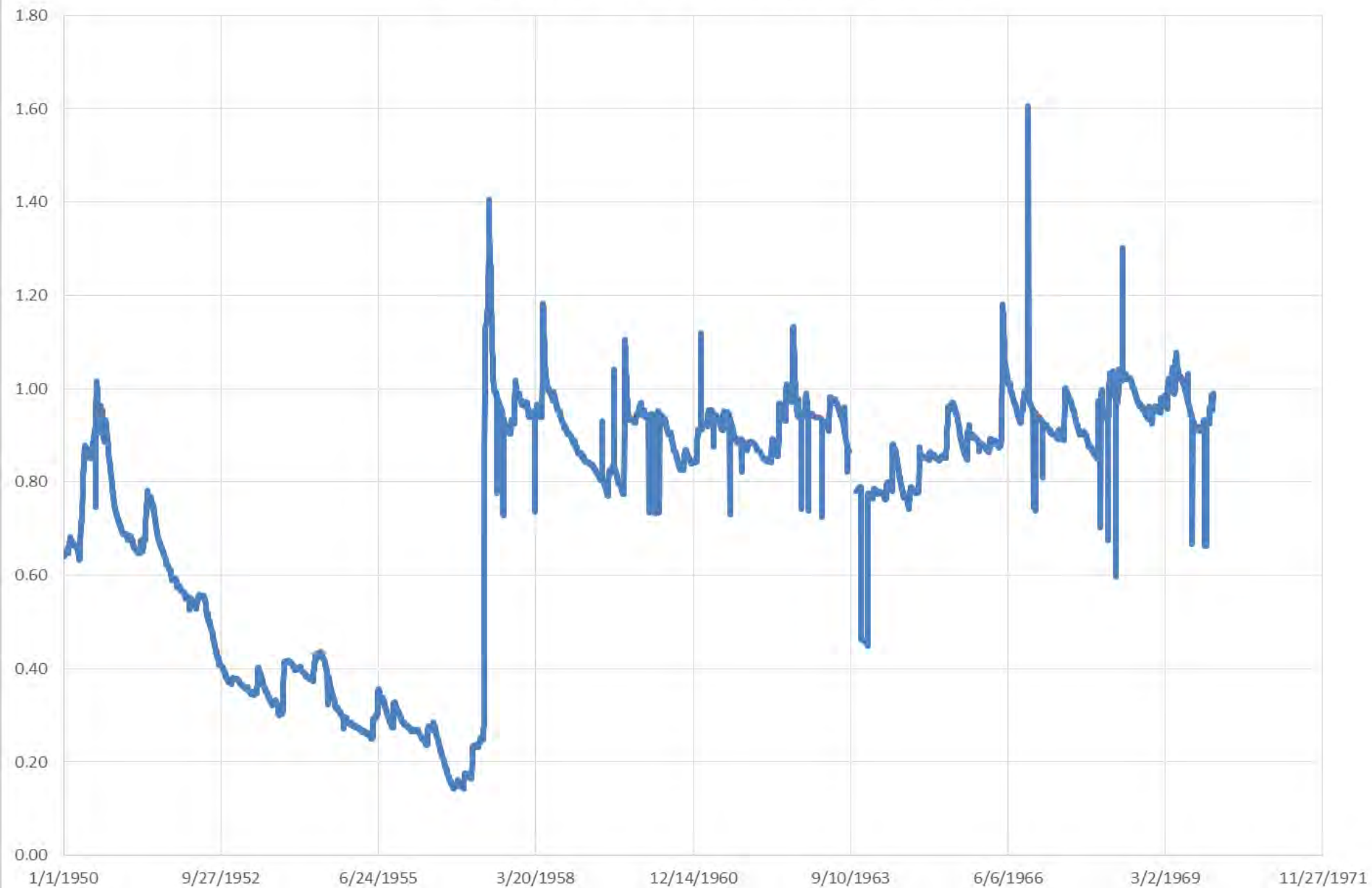
# TRWD reservoir Supply Status



# BP & EM Inflows 2010-2014 & 1950-1958



West Fork Volume, % of Conservation 1950-1969

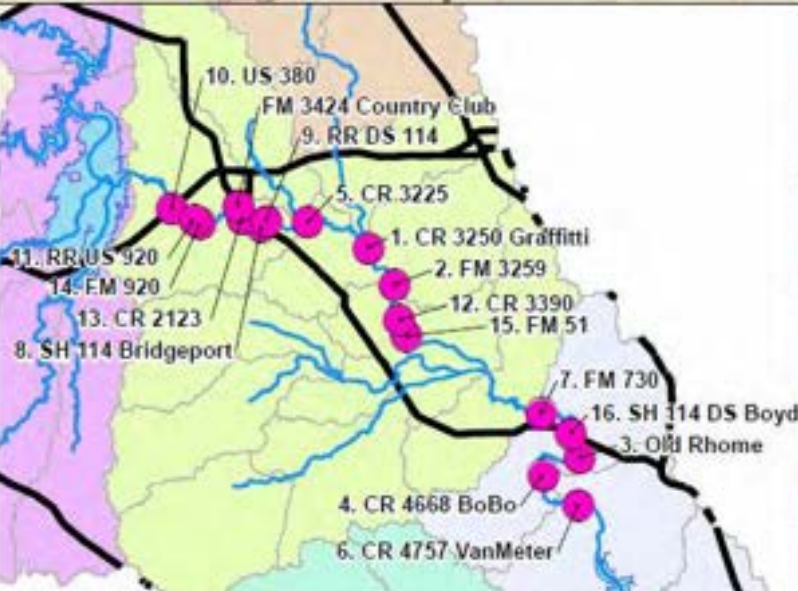
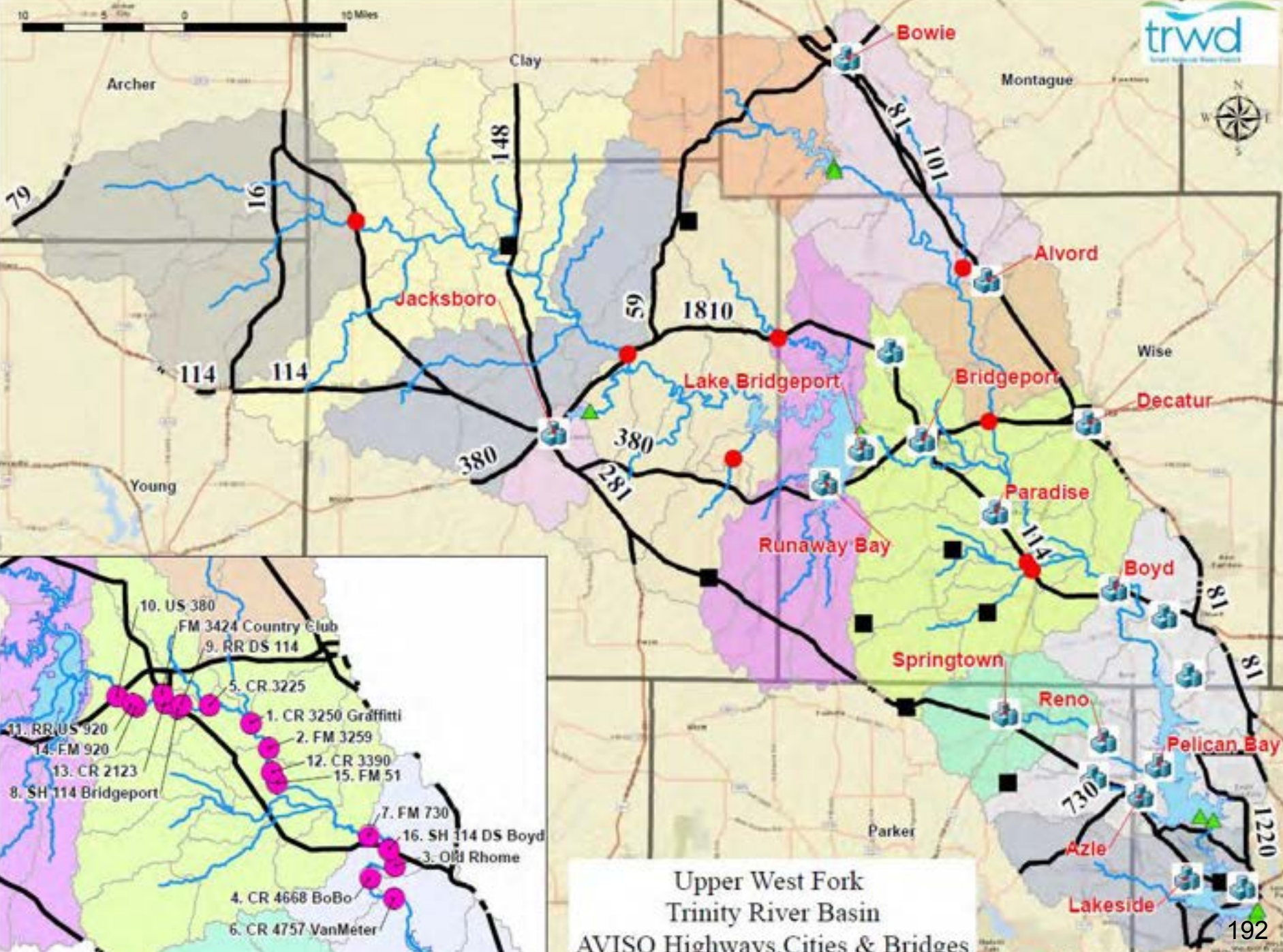


# West Fork Reservoirs as flood control

- Bridgeport and Eagle Mountain were designed in the 1920's as flood control reservoirs and used to protect downstream
- Bridgeport has a flood easement up to 851 feet msl, 15 feet above the 836 feet msl conservation level
- Bridgeport has about 325,000 acre feet of flood storage
- Eagle Mountain has a flood easement up to 668 feet msl, 17 feet above the conservation level of 649.1
- Eagle Mountain as about 156,000 acre feet of flood storage
- Lake Worth has a flood easement of 6 feet, elevation 600 feet msl, a storage of about 24,000 acre feet

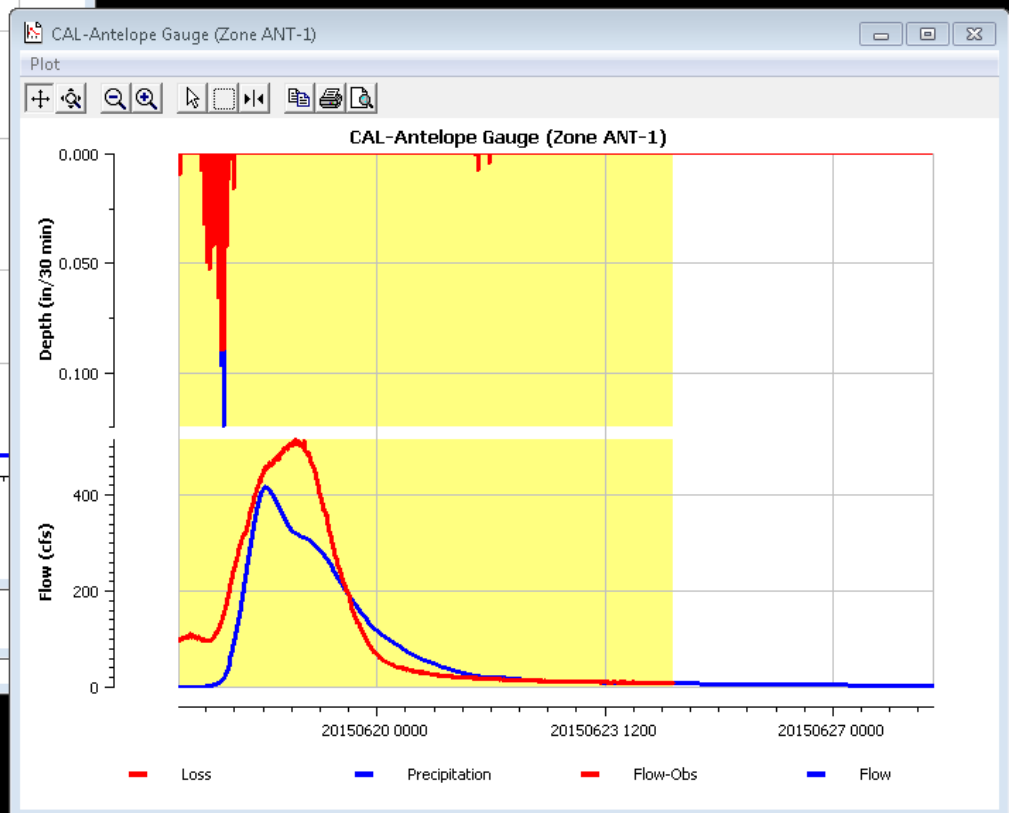
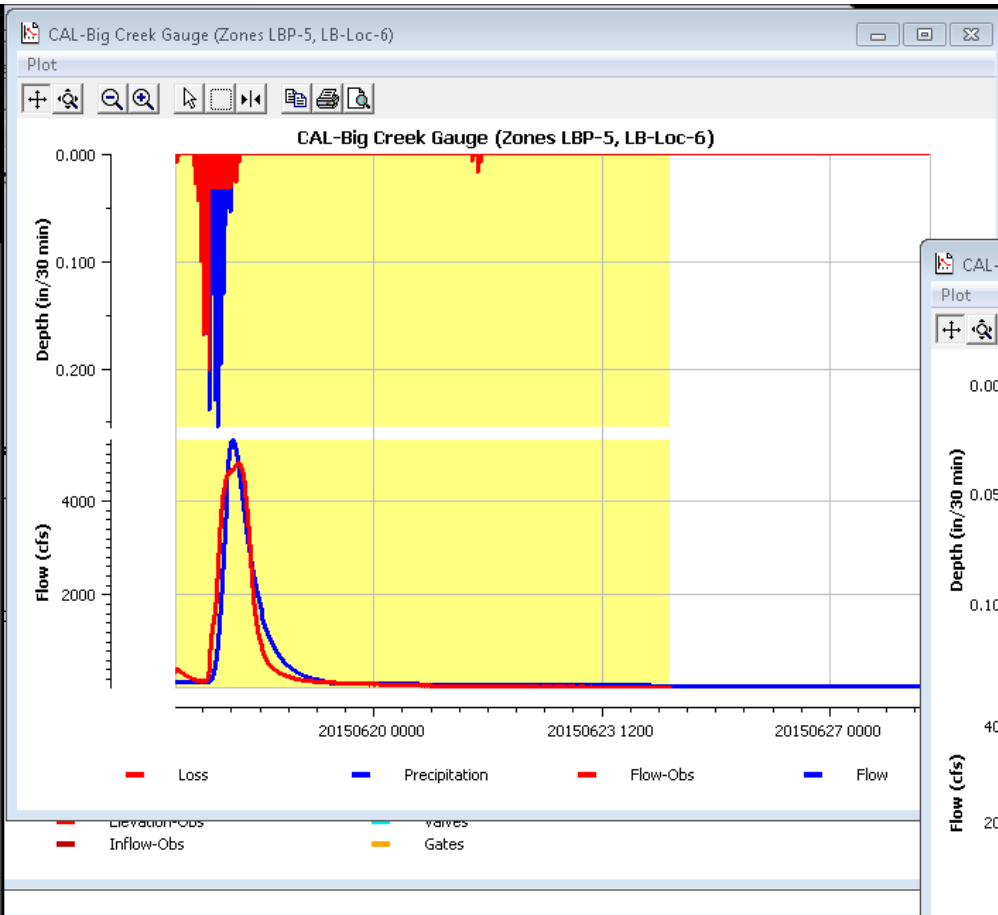
# West Fork Flooding

- Flood releases from the reservoirs are made considering:
  - Dam integrity
  - Public safety
  - Property damage
- The Eagle Mountain discharge works are designed to limit releases to protect the Fort Worth Floodway
- TRWD's flood easements did not give us the right to control building – there are hundreds of homes within the flood pool boundaries



Upper West Fork  
Trinity River Basin  
AVISO Highways, Cities & Bridges



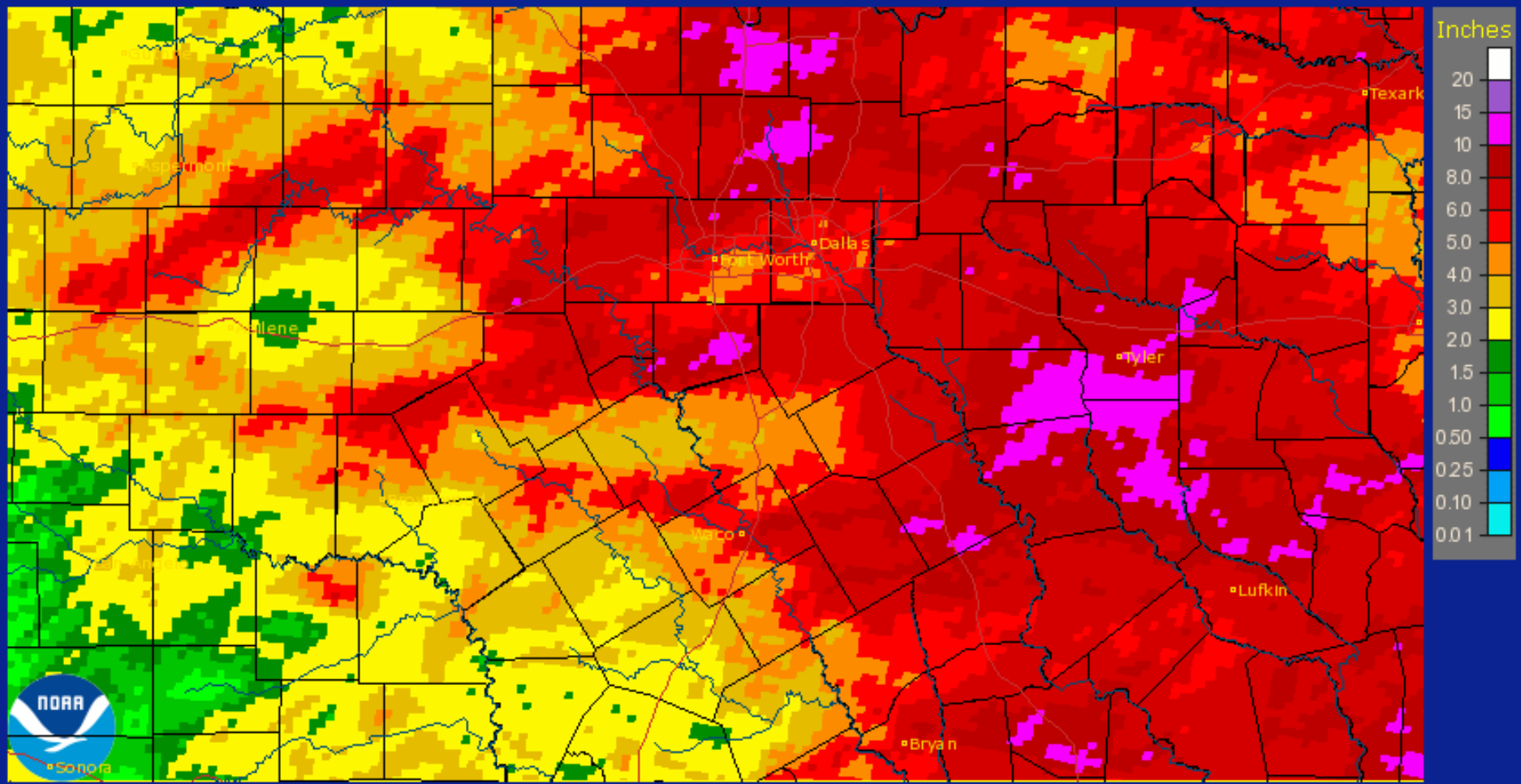


# The 2015 flooding

- Two distinct events
  - May rains
  - Tropical Storm Bill
- May was the wettest on record, recording 16.96 inches of rainfall
- This broke the record of 1982 by 3.3 inches
- Tropical storm Bill recorded 5 to 9 inches of rain in Wise and Jack Counties

# Rainfall- April

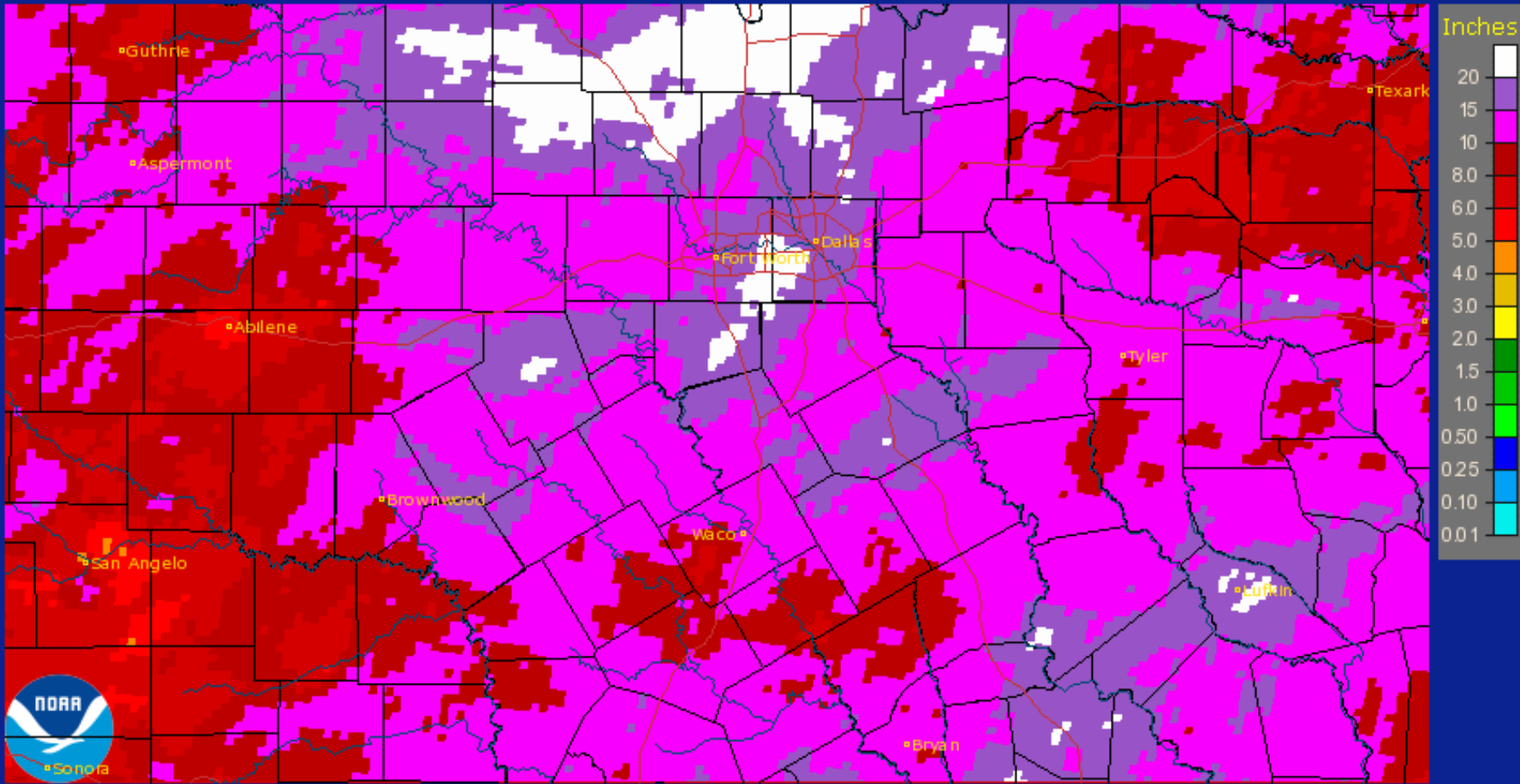
Fort Worth, TX (FWD): April, 2015 Monthly Observed Precipitation  
Valid at 5/1/2015 1200 UTC - Created 5/14/15 10:53 UTC



- Topo
- Pcpn Amount
- Counties
- Rivers
- States
- Highway/City
- RFC Boundary

# May Rains

Fort Worth, TX (FWD): May, 2015 Monthly Observed Precipitation  
Valid at 6/1/2015 1200 UTC - Created 6/11/15 19:22 UTC

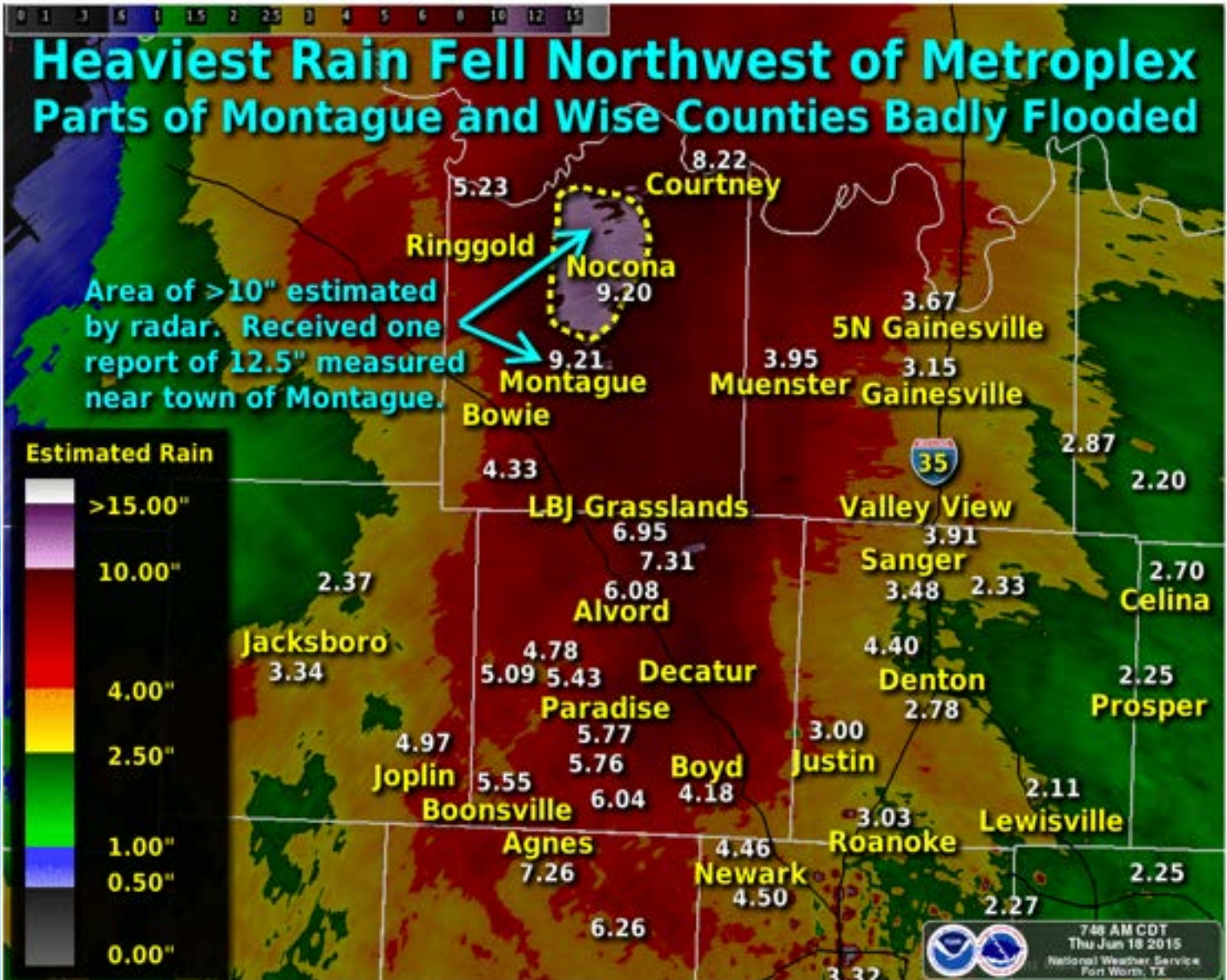


- Topo
- Pcpn Amount
- Counties
- Rivers
- States
- Highway/City
- RFC Boundary

# June 17-18 Tropical Storm Bill



# June 17-18 Tropical Storm Bill



# The May flood (through 6/13) - Bridgeport

- Bridgeport had 405,000 acre feet of flow into the reservoir, about 110% of its conservation volume
- Bridgeport stored 223,000 acre feet to reach conservation
- Maximum inflow was 38,500 cfs and outflow 10,900 cfs.
- Bridgeport rose 4.4 feet above conservation, after starting 24 feet below conservation
- Two homes was flooded and one business.
- Several businesses were flooded downstream and 5 roads closed (pending new information)

# The May Flood – Eagle Mountain & Lake Worth

- 393,000 acre feet flowed into Eagle Mountain, 124% of the conservation volume
- Eagle Mountain stored 51,300 acre feet to reach conservation
- Eagle Mountain rose 2.4 feet above conservation
- Eagle Mountain had a maximum inflow of 15,700 cfs and a release of 11,700 cfs
- One home, possibly two were flooded
- Lake Worth had 342,000 acre feet inflow and stored 11,500 acre feet
- Lake Worth had a maximum inflow of 13,120 cfs and release of 11,582
- Lake Worth rose 2.9 feet above conservation



# TS Bill Flood

- Bridgeport received 100,200 acre feet of inflow. Peak inflow was 41,360 cfs and release 8,806 cfs
- Bridgeport rose 3 feet, and one home was flooded
- Eagle Mountain received 191,500 acre feet of inflow. Peak inflow was 24,800 cfs and release 15,900 cfs
- Eagle Mountain rose 3.4 feet and 5 homes were flooded
- Lake Worth received 204,500 acre feet of inflow. Peak inflow was 23,600 cfs and released 15,300 cfs
- Lake Worth rose 3.5 feet and two homes were flooded

# Flood Frequency – May storm

- Flows above Bridgeport, Trinity at Jacksboro, peaked at 14,600 cfs, a flow that would happen once about every 8 years
- Flow above Eagle Mountain on Big Sandy, peaked at 19,800 cfs, a frequency of once in about 20 years
- Flow above Eagle Mountain, Trinity River at Boyd, peaked at 11,200 cfs, a frequency of one in 6 years
- To fill from 64% to 100% in May had a chance of less than 1 in 100 years.
- The peak flows from the flood were not high, but the total volume of the storm was rare

# Flood Frequency – TS Bill

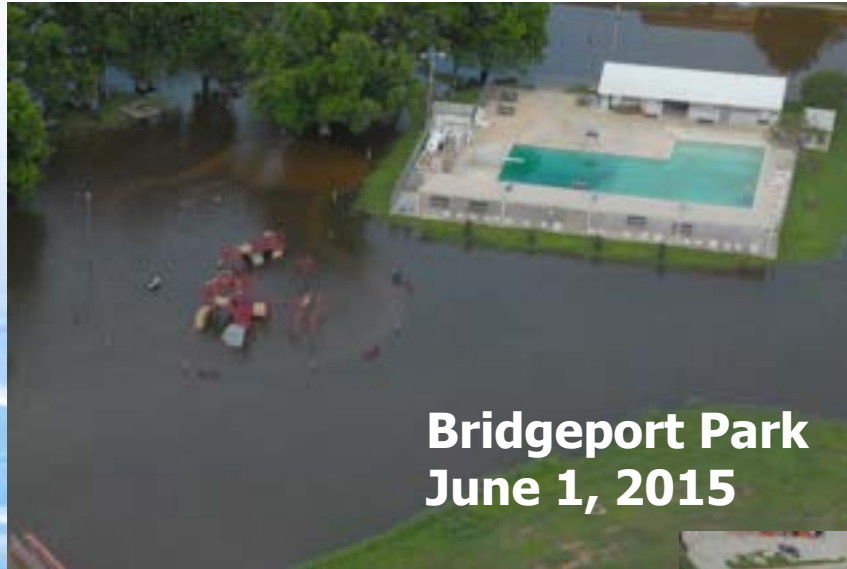
- Trinity River at Jacksboro peak for was 4,100 cfs, a flow to be expected once every three years
- Big Sandy peaked at 17,000 cfs, a flow seen about once in 15 years
- Trinity River at Boyd's peak flow was 18,500 cfs, a 1 in 18 year event
- Trinity River at Fork Worth's peak flow was 15,000 cfs, a flow that happens about every other year
- Flow through Dallas on the Trinity actually peaked on 5/29 at 47,200 cfs, a flow to be expected once in about 7 years.

# Lake Bridgeport



**June 5, 2015**  
**5728 cfs discharging**

# Impacts at Bridgeport



**Bridgeport Park  
June 1, 2015**



**Bridgeport Park  
June 8, 2015**

# Gazebo at Lake Bridgeport

**May 11, 2015**



**June 1, 2015**

# Runaway Bay



**June 1, 2015  
Highway 380**



**June 1, 2015  
Shell Station  
On 380**

# Road Impacts

June 1, 2012  
Bobo Bridge





# FM 730 in Boyd

June 1, 2015



# Eagle Mountain



**June 1, 2015**  
**11,471 cfs discharging**

# Fort Worth Nature Center & Refuge



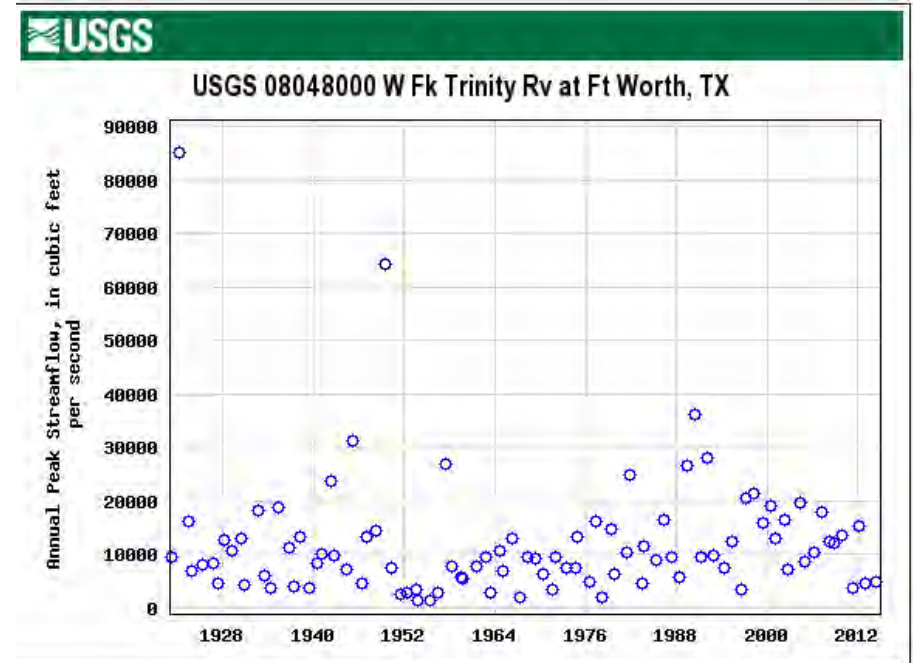
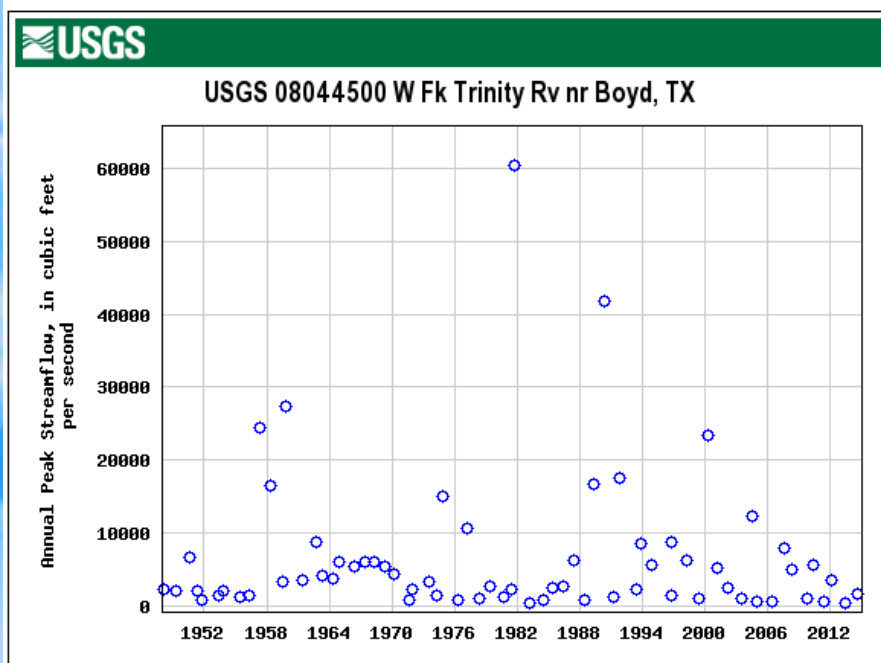
# Floodway

**June 5, 2015**  
**TRWD Dam by Office**



# The flood

- We have been in a very dry period and the flood seems intense
- This flood was not unusually severe
- Historic events show we need to be prepared for much larger events





# Lake Worth Trail

Project Update  
December 17, 2015

Lake Worth Regional Coordination Committee Meeting

City of Fort Worth  
Park and Recreation Department



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# Lake Worth Trail – Project Update

- Phase I Construction Documents Ongoing
- Texas Parks & Wildlife (TPWD) Coordination
- YMCA Coordination
- Tarrant Regional Water District (TRWD) Coordination
- Updated Design / Construction Schedule
- Questions

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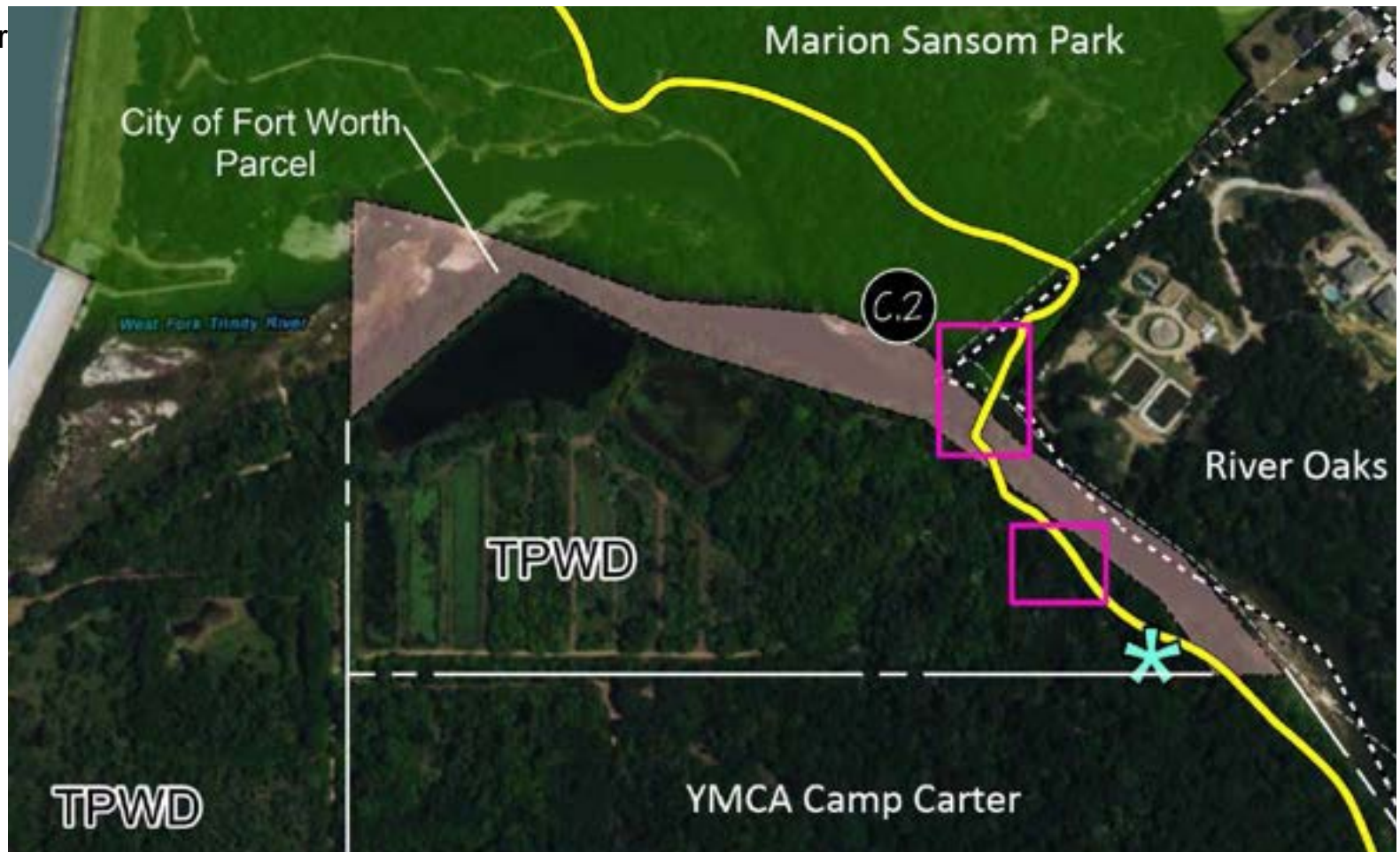




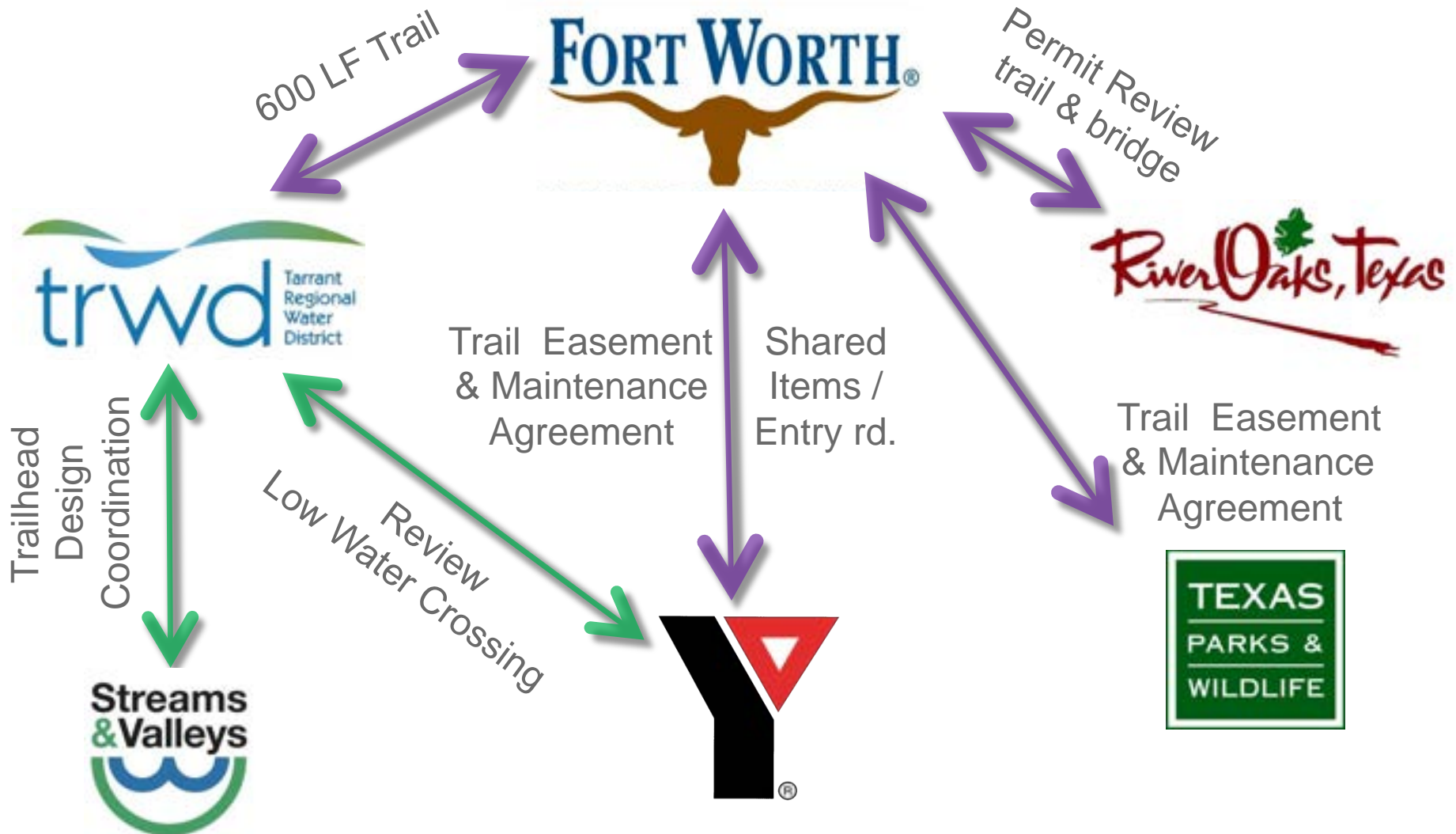
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- Aerial mapping and site surveying today, 40 years after property was deeded to the City have

deter



# Lake Worth Trail – Ongoing Agency Coordination



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- We have had field meetings with TPWD to review property and proposed alignment
- Request for trail easement and use of area is being processed by TPWD staff
- TPWD staff will present information at TPWD Commission Meeting January 20-21, 2016 and then seek approval at the March 22-23, 2016 Commission Meeting.



Trail Easement  
& Maintenance  
Agreement

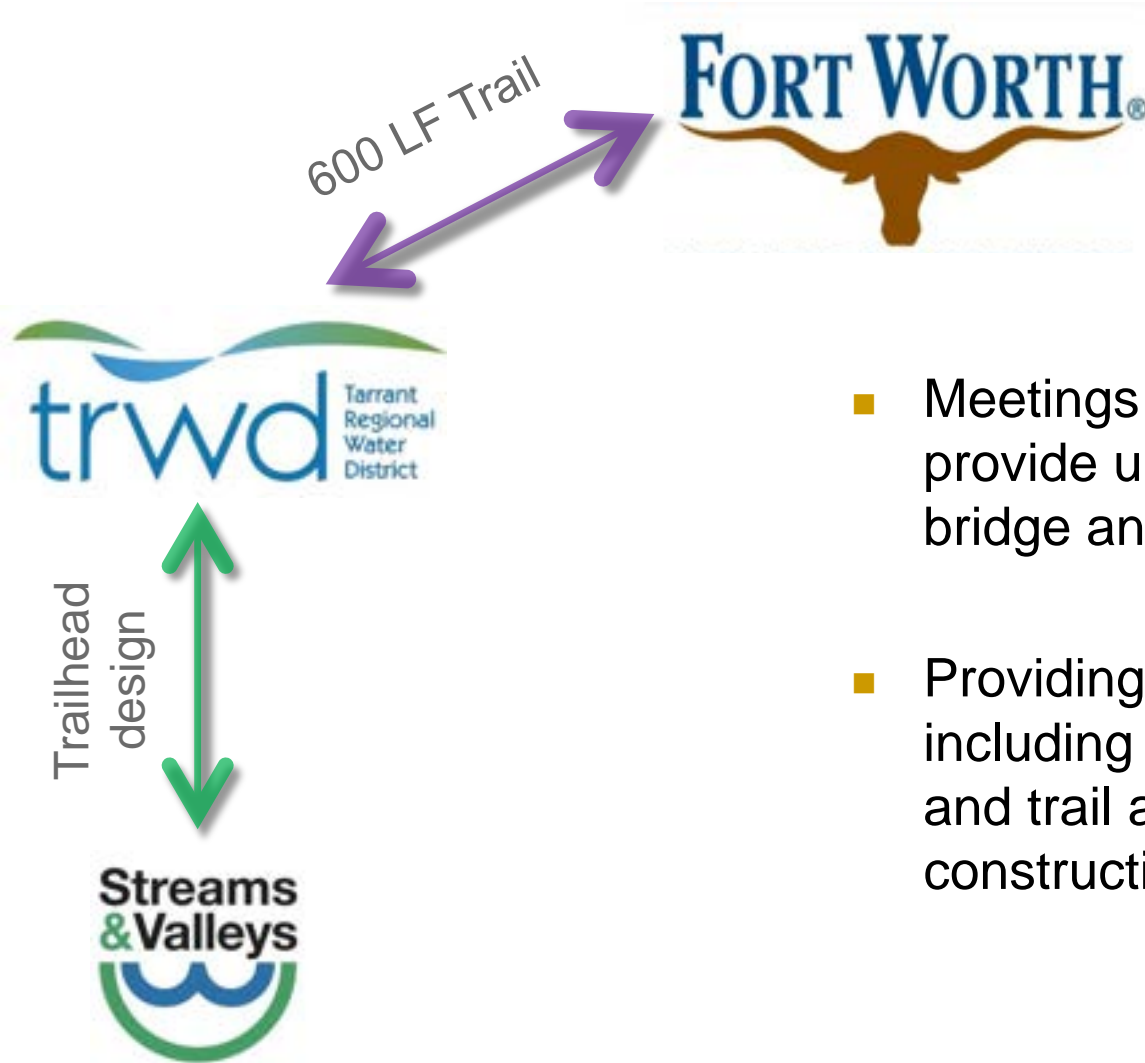


# Lake Worth Trail – YMCA Coordination

- Meeting with YMCA to provide update to latest bridge and trail alignments.
- YMCA provided an update on their current capital campaign and development of the new visitors center at new entry off Anahauc street.



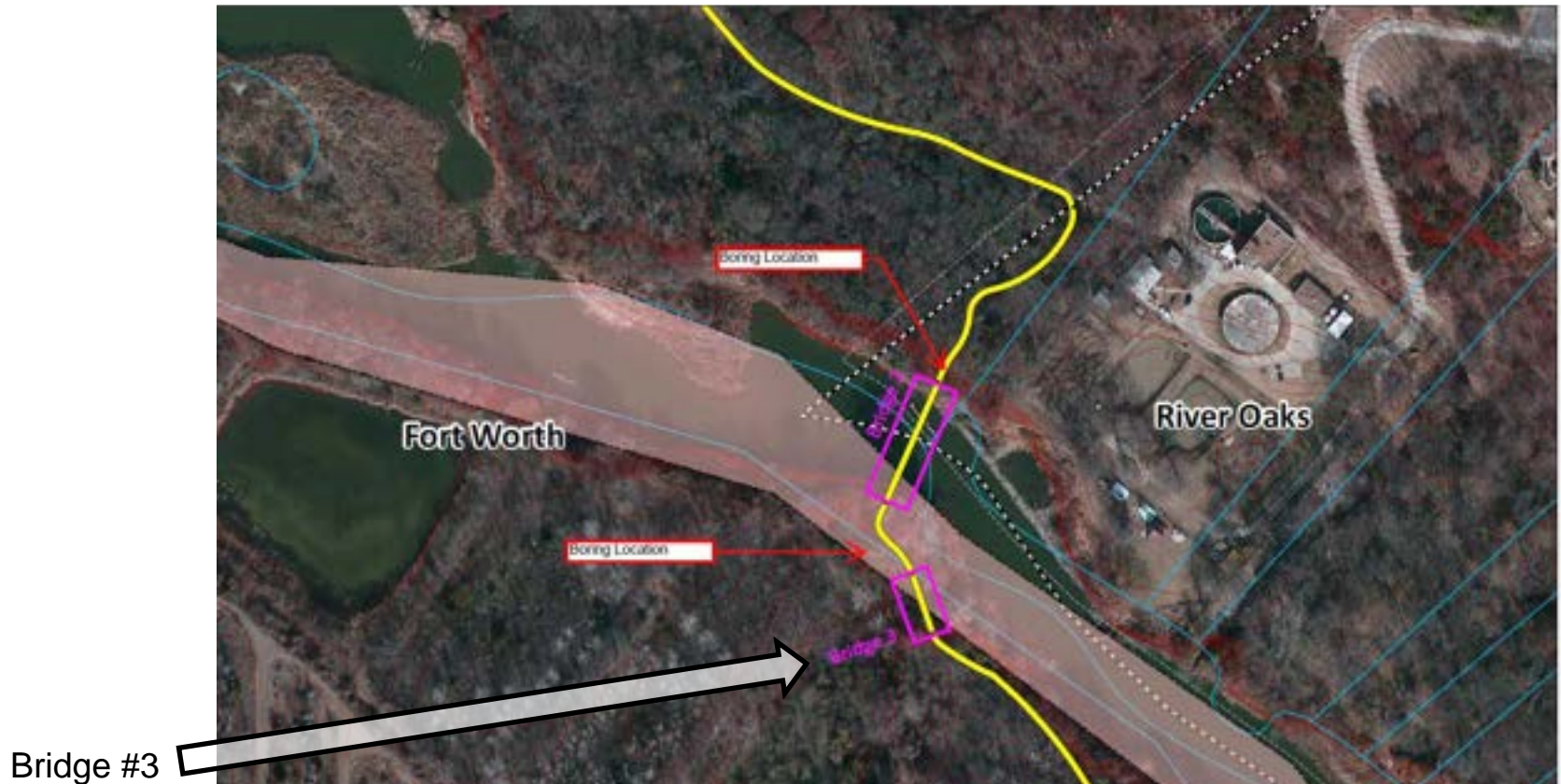
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- Meetings with TRWD to provide update to latest bridge and trail alignments
- Providing in-kind services including value engineering and trail and bridge construction

# Lake Worth Trail – TRWD Coordination

- TRWD will support with in-kind services the design and construction of an approximately 74 foot long pedestrian bridge which would be needed to cross over a stream from City of Fort Worth property to TPWD property as noted below (bridge #3).



---

# Lake Worth Trail – Updated Schedule

- 60% Construction Documents: January 2016
- 95% Construction Documents: April 2016
- Bidding Advertise/Award: May 2016
- Construction Period: August 2016 – August 2017



# Lake Worth Trail

## QUESTIONS?

City of Fort Worth  
Park and Recreation Department





# Lake Worth Trail – TPWD Coordination

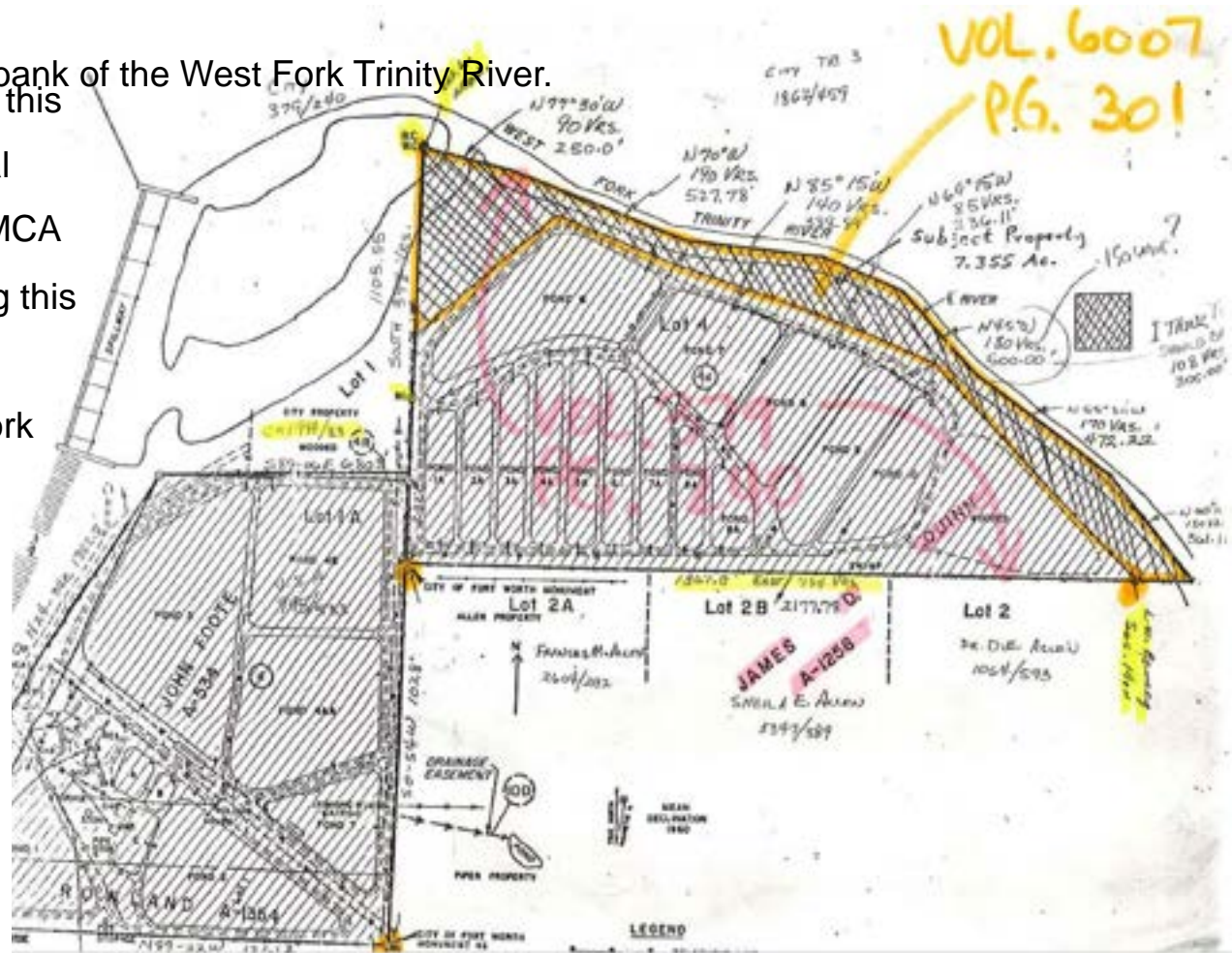
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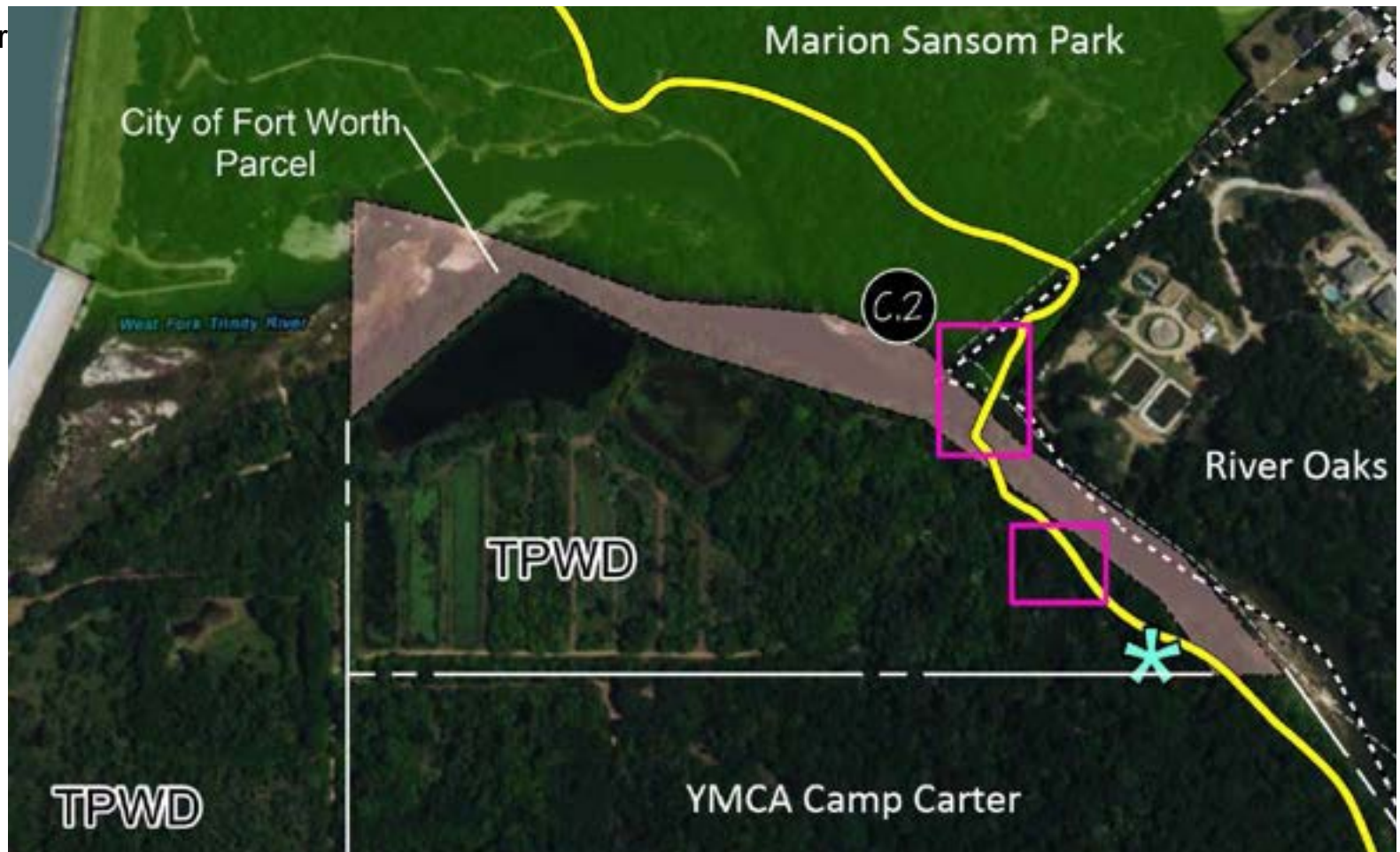
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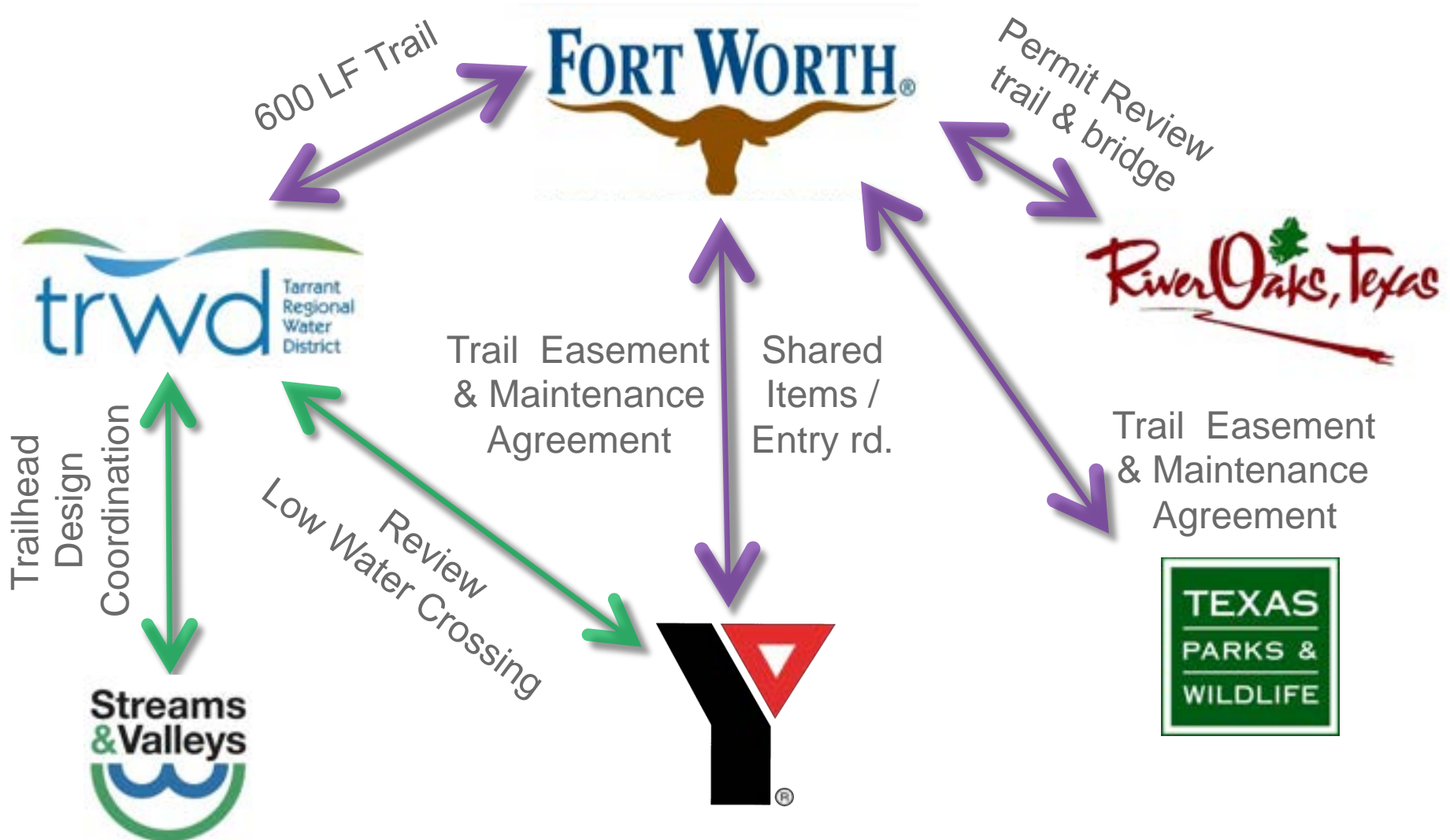
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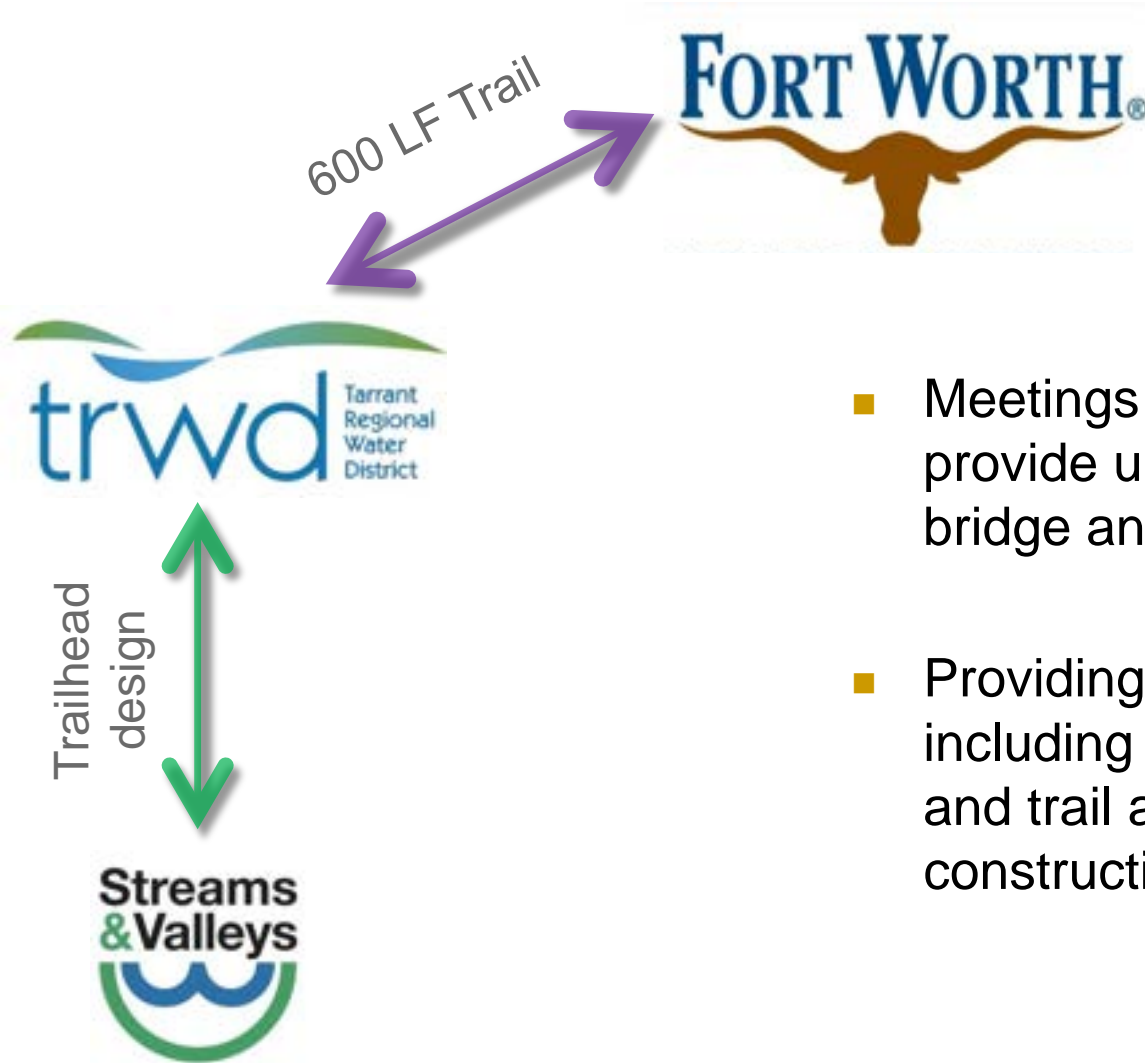


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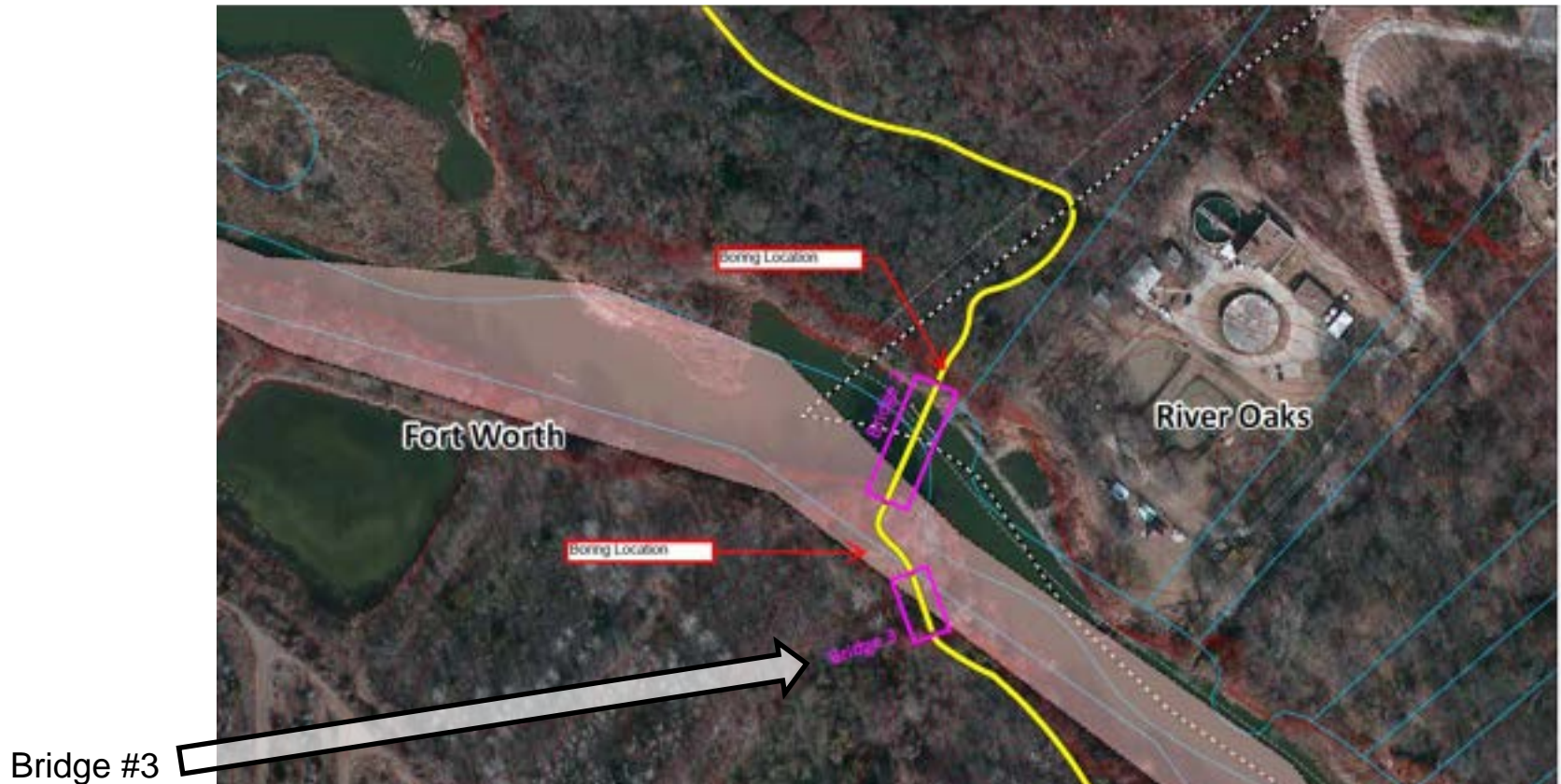
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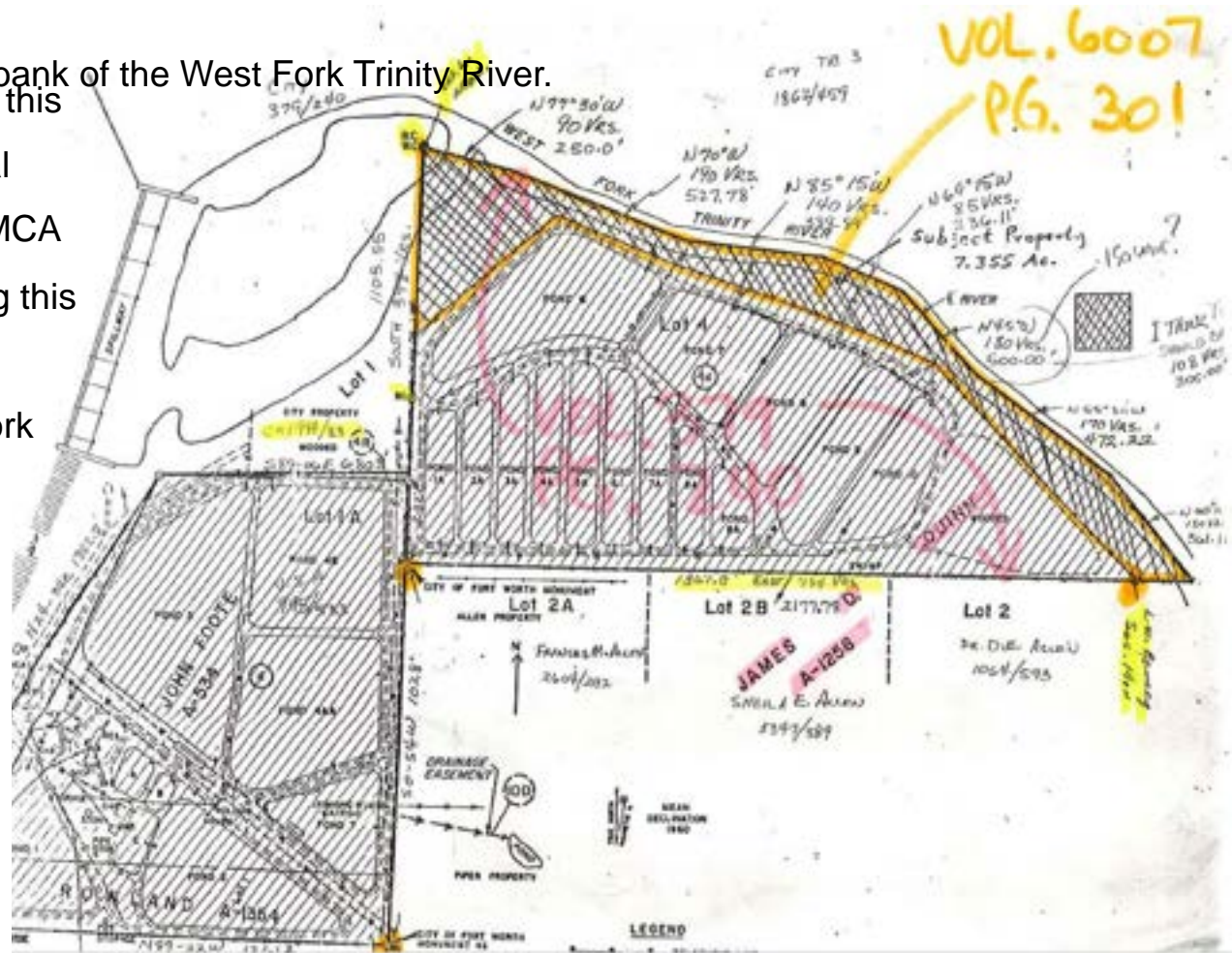
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# **LAKE WORTH STORMWATER CHALLENGES**



**Presented by  
Paul Bounds**

**City of Fort Worth  
Water and Sewer Department  
December 17, 2015**



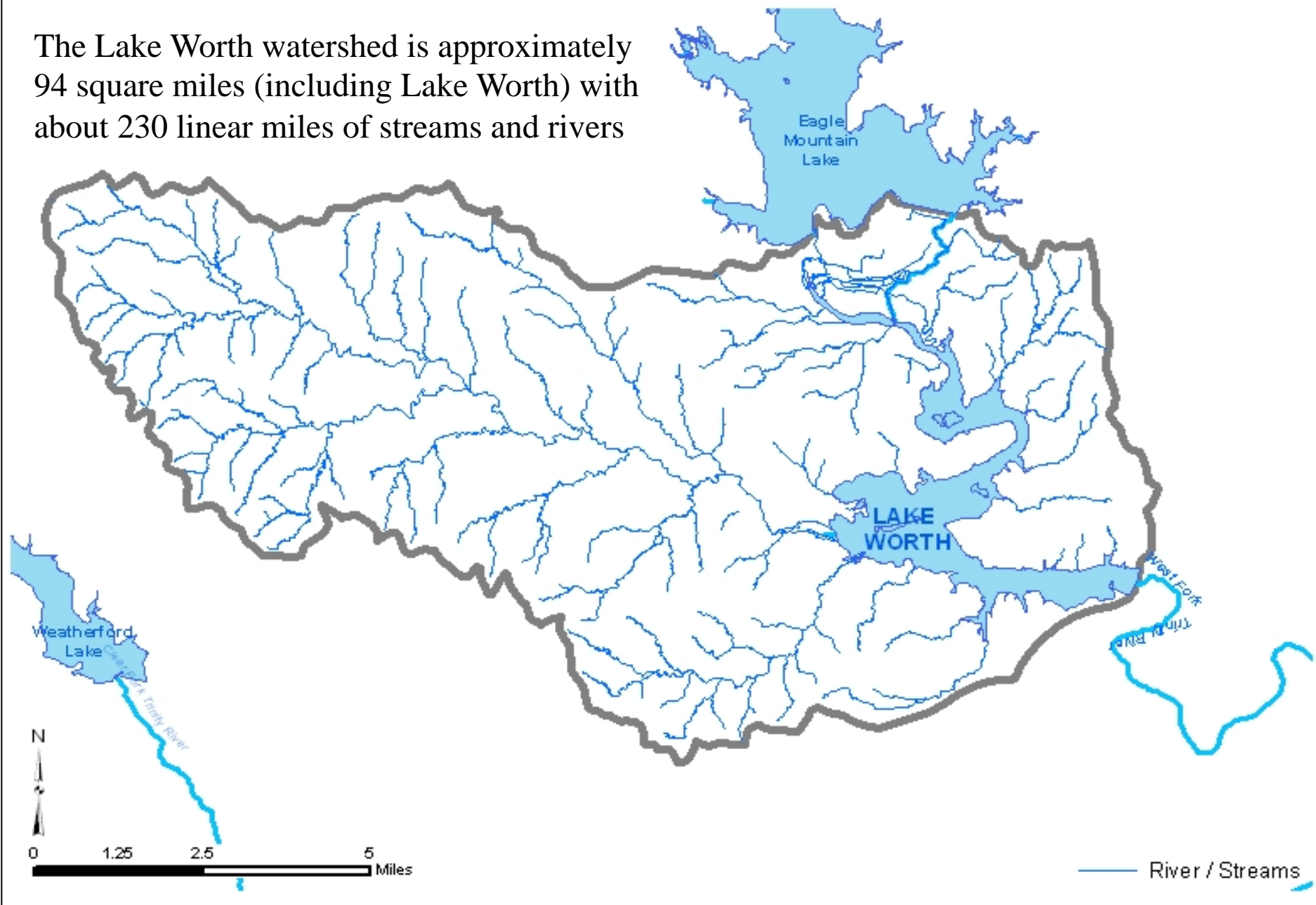
# Outline

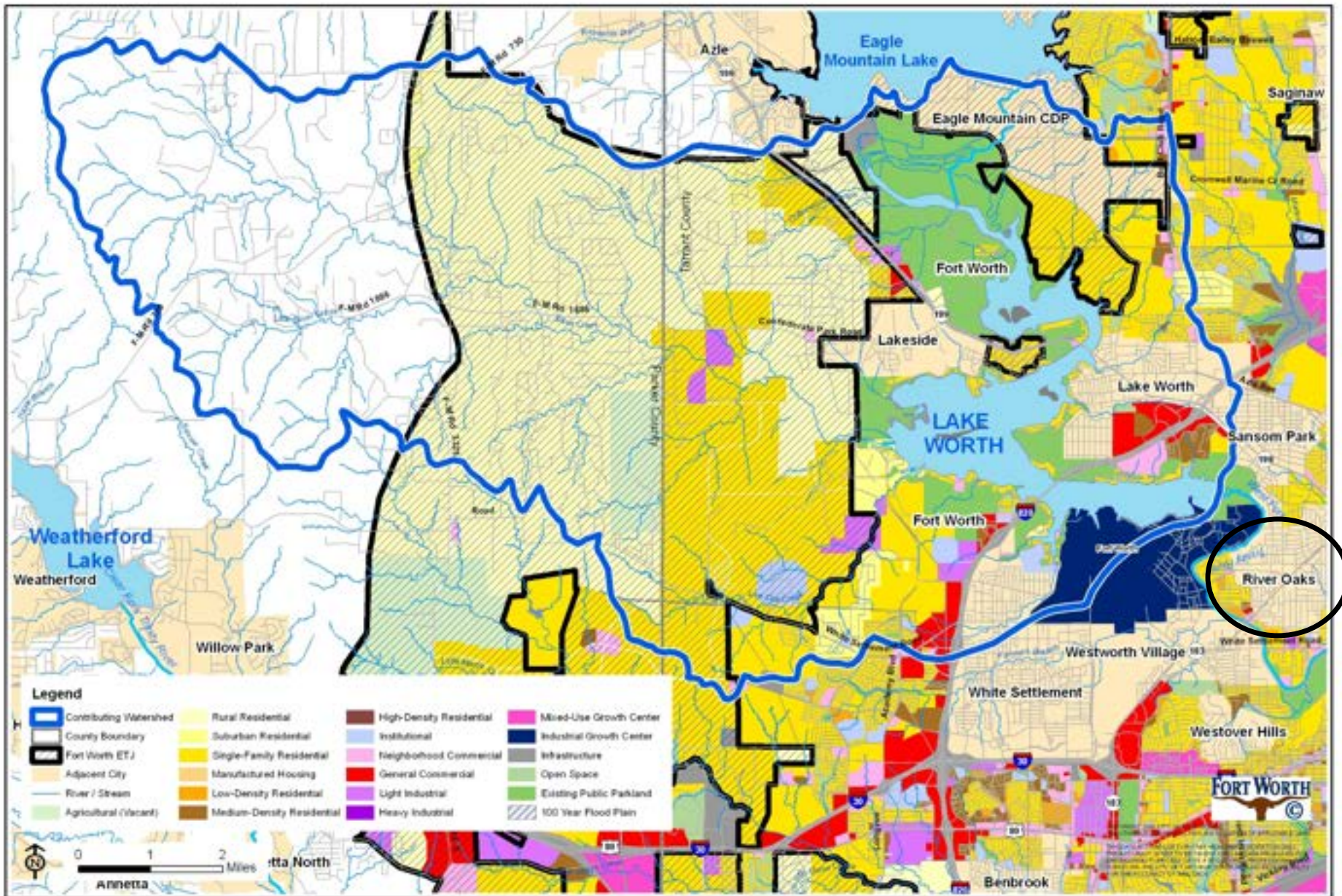
- Watershed Management
- Historical Flood Events
- High Water Event Management

# Comprehensive Watershed Management Plan

- Minimize pollutants at source
  - Conduct Greenprint of Lake Worth watershed
  - Identify high value conservation zones
  - Protect high value zones through conservation easements and development regulations
  - Promote low-impact development
  - Adopt storm water management best practices
  - Promote incentive programs for SWMBP
- Establish and maintain collection points at discharge into Lake Worth
  - Sedimentation basins
  - Catch basins

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





# Flood Categories

- Action Stage 594'
- Flood Stage 597'
- Moderate Flood Stage 598'
- Major Flood Stage 599'

# Historic Crests

- 598.70 on May 3, 1990
- 598.13 on October 14, 1981
- 597.98 on December 20, 1991

# Recent Crests

- 597.78 on June 10, 2004
- 597.47 on June 20, 2015
- 596.72 on November 28, 2015
- 595.33 on March 1, 2001

**National Weather Service  
Advanced Hydrologic Prediction Service**

[water.weather.gov/ahps/](http://water.weather.gov/ahps/)



FLWT2(plotting HPIRG) "Gage 0" Datum: 0'

Observations courtesy of US Geological Survey

Observations courtesy of [US Geological Survey](http://www.usgs.gov).



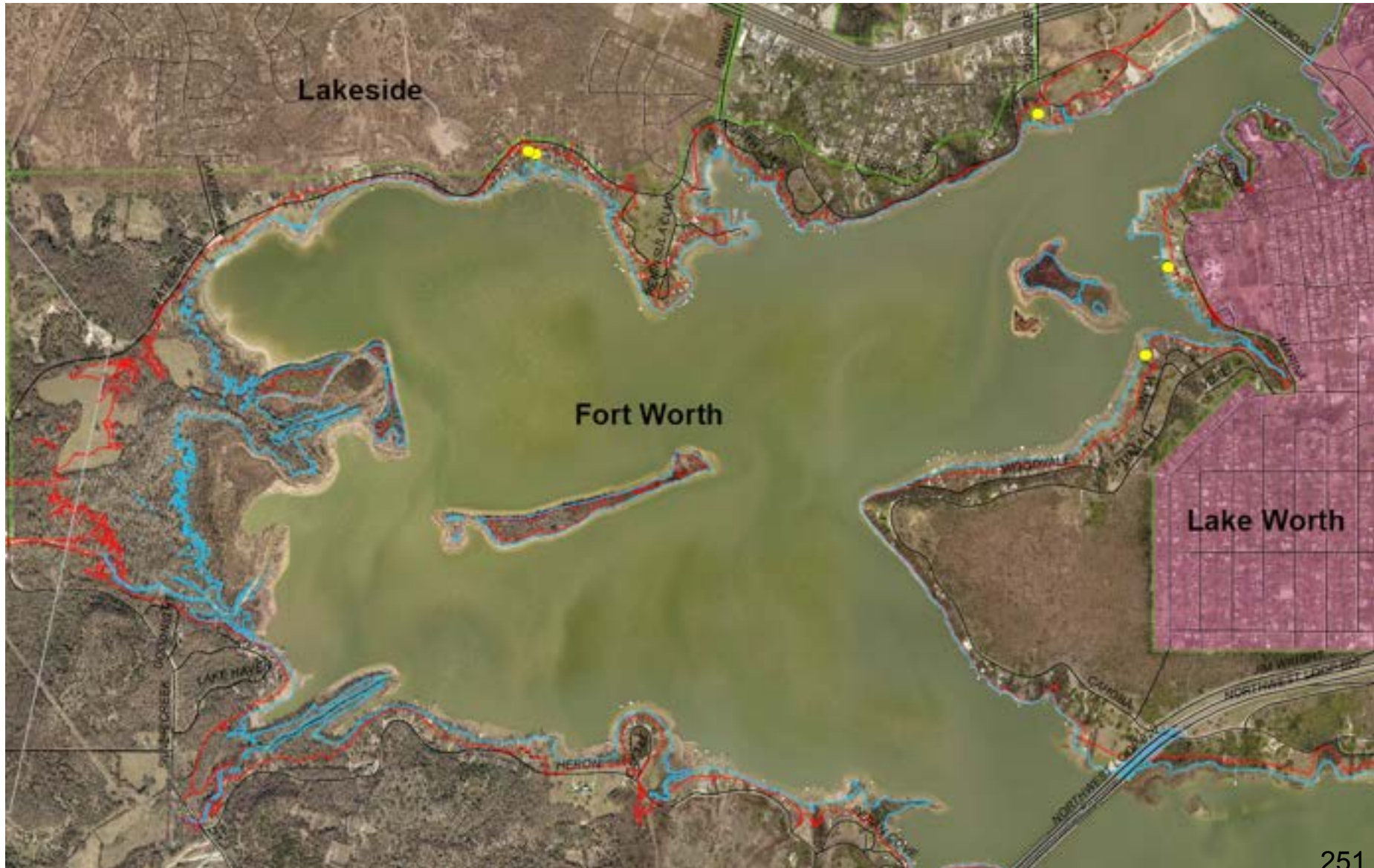
# Residential Flooding Elevations

- Flood event defined as one where flood waters exceed the finished floor elevation of a residential structure.
- City acquired a “flood easement” at the time of sale from 594.0 to 600.0 to provide for water storage during high water events.

# High Water Event Management

- Notification of potential flooding of low lying houses begins at 595.0
- Emergency Operation Center notified at 595.0
- Boating activities are banned when elevations reach 595.5
- Flooding of low lying houses begins at 596
- 100 yr. Flood Elevation is 600

# HOUSES BELOW 598 (5)



# HOUSES BELOW 600 (45)



# Websites

- <http://ww.trwd.com/lake-level-blog>
- <http://water.weather.gov/ahps2/hydrograph.php?wfo=fwd+gage=flw+2>

# Questions?

# **LAKE WORTH REGIONAL COORDINATION COMMITTEE LWCIIP UPDATE**



**Presented by  
Paul Bounds**

**City of Fort Worth  
Water and Sewer Department  
December 17, 2015**

# Outline

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- Revenues
- In Progress Projects
- Future Gas Lease Revenue Projects
- Future Property Sales Funded Projects
- Storm Water Management



# Gas Lease Revenues

---

- Lake Worth Gas Lease Projects
  - Completed Projects \$23,951,495
  - In Progress 2,631,381
  - Total \$26,582,876
- FY 2014 Royalties \$3,913,695
- FY 2015 \$4,264,074
- FY 2016 Projected \$2,800,000

# LWCIIP Funding Requirements

---

- Projects will be funded with gas lease or lease sale revenues.
- Current gas revenues are through royalties only.
- Gas revenue fluctuations make it difficult to accurately predict revenues.
- **Project cannot be let out for bid until full funding is available .**



# City Council Approved Capital Projects for FY2016

---

- Love Circle Water and Sewer \$3,106,000
- Lake Worth Hike and Bike Trail 6,268,400
- Lake Worth Dredging 275,000
- Jenkins Heights Forced Main 200,000
- TOTAL \$9,849,400

**QUESTIONS?**

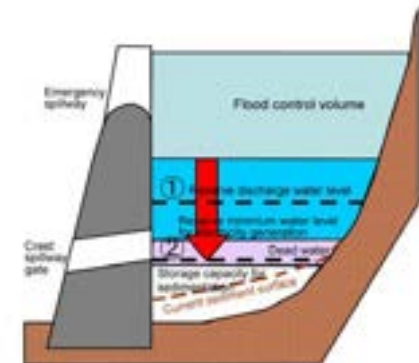
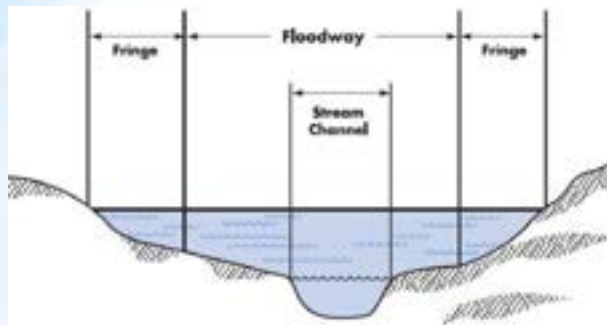


# Effects of El Nino on the West Fork Trinity

David Marshall, P.E.  
Operations and Engineering  
Coordination  
Tarrant Regional Water District

# Anatomy of a flood

- Rainfall driven
  - Storm total volume
  - Peak flow
- Reservoirs rise and store water
- River rises and stores water (valley storage)
- The floodway system stores water in the sumps
- Stored water from the sumps and reservoirs is released after the peak



# The 1922 flood In Fort Worth



**FORT WORTH STAR-TELEGRAM** HOME EDITION  
 WEDNESDAY, APRIL 26, 1922  
 PRICE 5 CENTS

## 38 PERSONS YET MISSING

SEARCHERS BEGINNING TO FIND BODIES THURSDAY IN THE FLOODED DISTRICTS WEST OF THE CITY. Left, the headstone of the family mentioned in the article. Center, a group of the children which spent several days under water. Right, a view along the Camp Street Railroad bridge over the street where "Tom" used to be.

**FLOOD CREST PASSES DALLAS; 1,500 HOMELESS NEAR CITY**  
**STATION OVER NORTH TEXAS IMPROVES**  
**CAT'S DONATE ROOM FOR I. M. C. A.**  
**SEED CRUSHER SCORES WELL ON TRIFF**  
**TELEGRAPHIC GETS THROUGH**  
**WATER RISE IN CITY RIVER HAS BEEN FURTHER**

**Young Wife Sobs for Mother as She Huddles Her Own Baby Saved From Raging Torrent**  
**3 ENTIRE FAMILIES BELIEVED DROWNED; KNOWN DEAD SEVEN**

**REVISOR LIST OF DEAD AND MISSING IN FLOOD**

**Y. M. C. A. Campaign for \$375,000 Building Fund Extended Two Days**

**FORT WORTH STAR-TELEGRAM** HOME EDITION  
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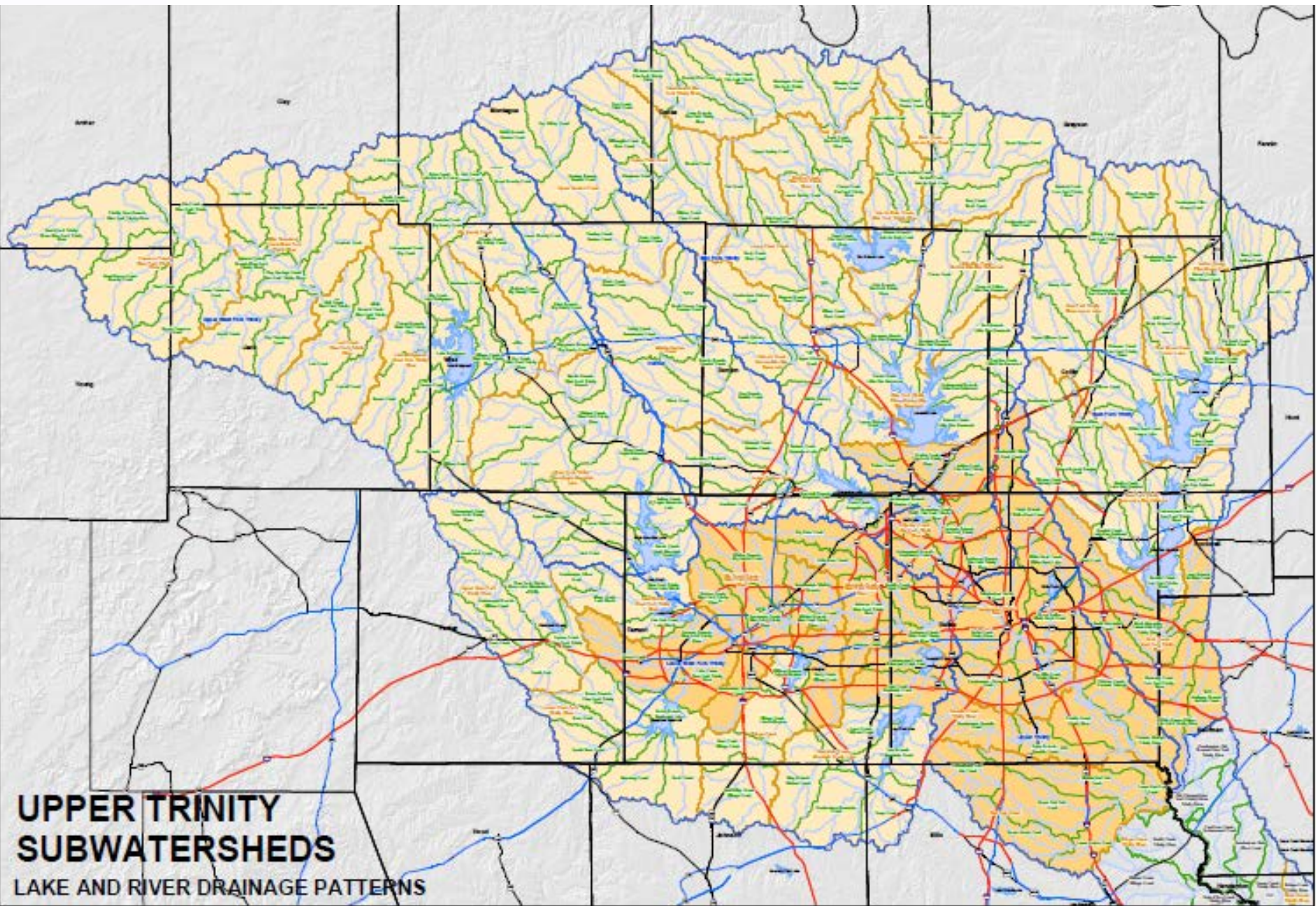
## CITY LAYING PLANS TO AVOID FUTURE FLOODS

On April 26 Mayor Cockrell said a special committee would consider a bond issue to rebuild damaged streets, parks, and bridges. He said a levee would be built to protect the Holly Street waterworks, situated next to the river.

# The 1949 flood



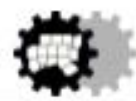




# UPPER TRINITY SUBWATERSHEDS

## LAKE AND RIVER DRAINAGE PATTERNS

- Legend**
- Upper Trinity Basin
  - Upper to Lower Trinity Subwatershed
  - Upper to Trinity River
  - Subwatershed
  - Subwatershed
  - Primary Highway
  - Secondary Highway
  - Access Road
  - Major Road
  - Trinity River
  - Lakes
  - Streams
  - Counties



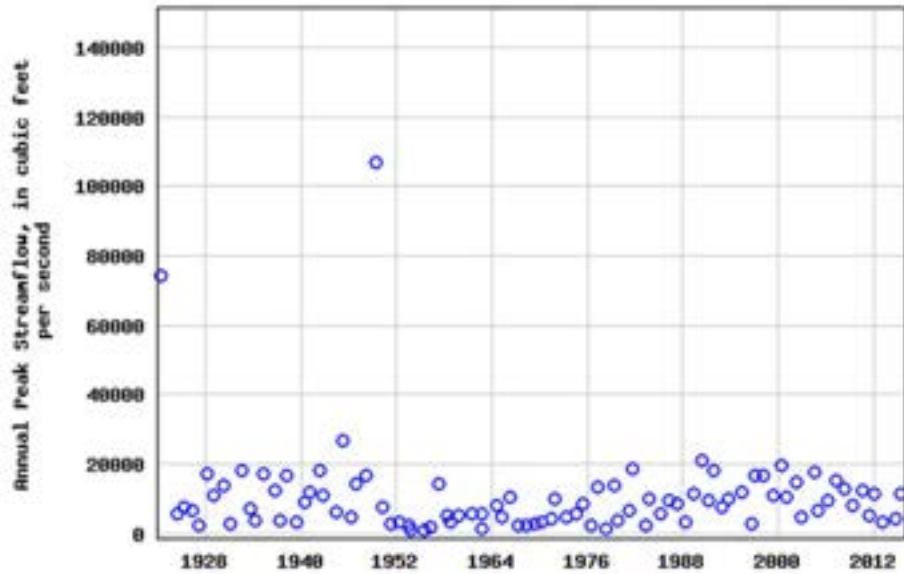
North Central Texas  
Council of Governments  
Environment & Development



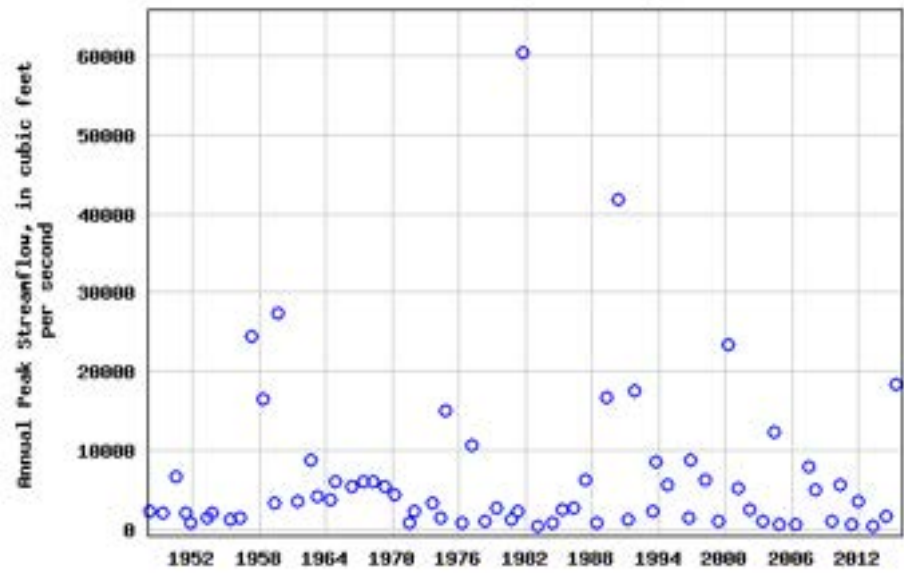
Data Source: Watershed Boundary Dataset (WBD) by  
USDA - National Resources Conservation Service

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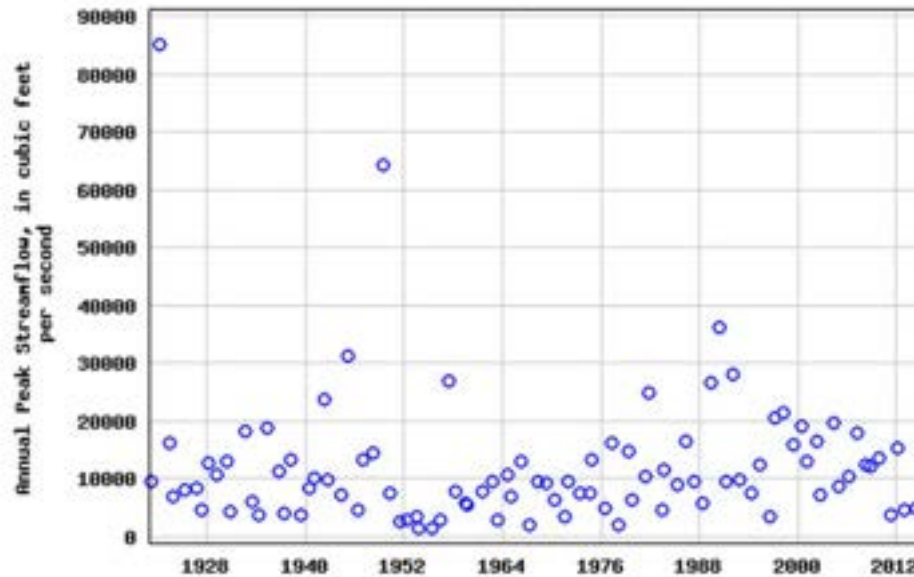
USGS 08047500 Clear Fk Trinity Rv at Ft Worth, TX



USGS 08044500 W Fk Trinity Rv nr Boyd, TX



USGS 08048000 W Fk Trinity Rv at Ft Worth, TX



# West Fork Trinity– 2,052 square mile drainage



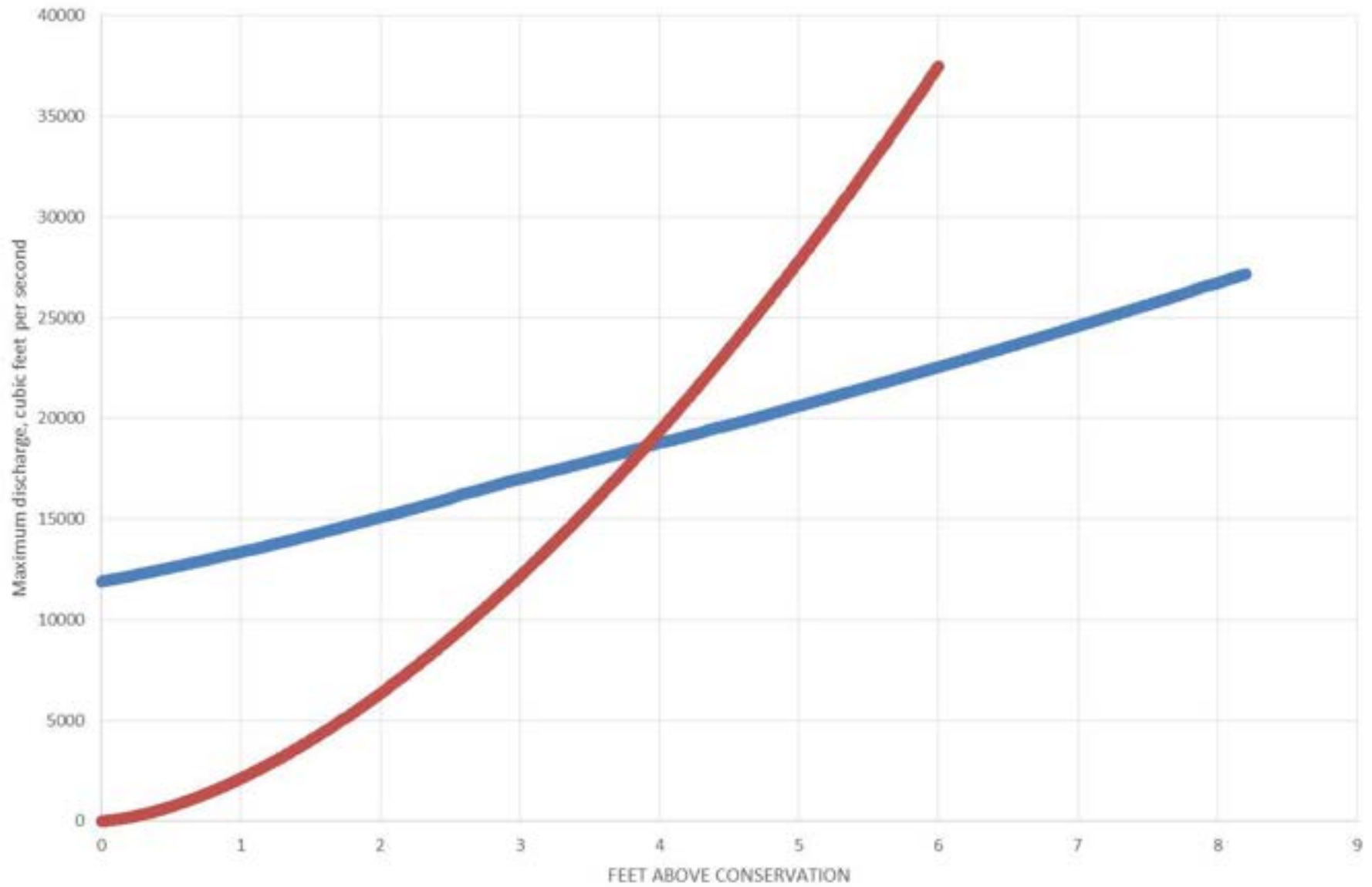
Bridgeport and Eagle Mountain reservoirs spillways act like a bucket with a hole; the higher the water the more is released. Volume is temporarily stored and the peaks reduced through valley storage.



Lake Worth's spillway acts like a bucket with a spout, storing very little floodwater. As the level in the lake increases, the release increases.

# SPILLWAY CAPACITY

— Eagle Mountain — Lake Worth



# West Fork Reservoirs

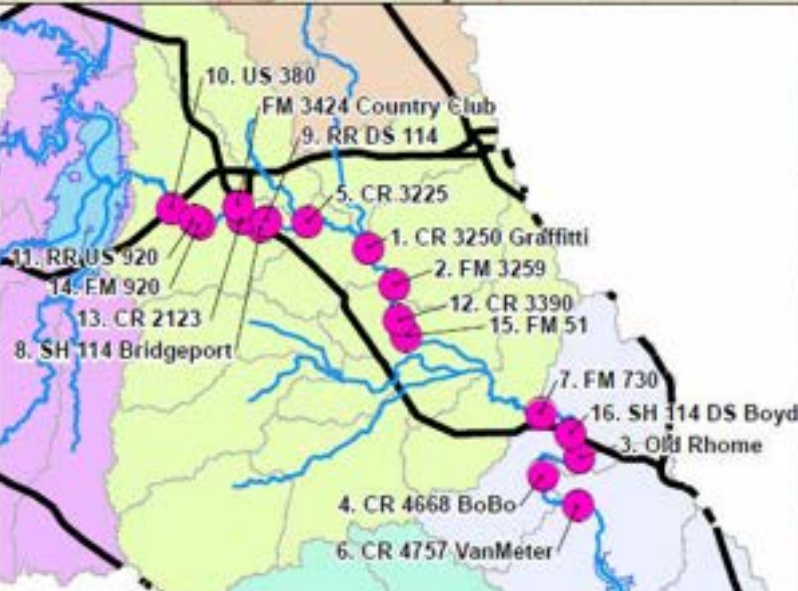
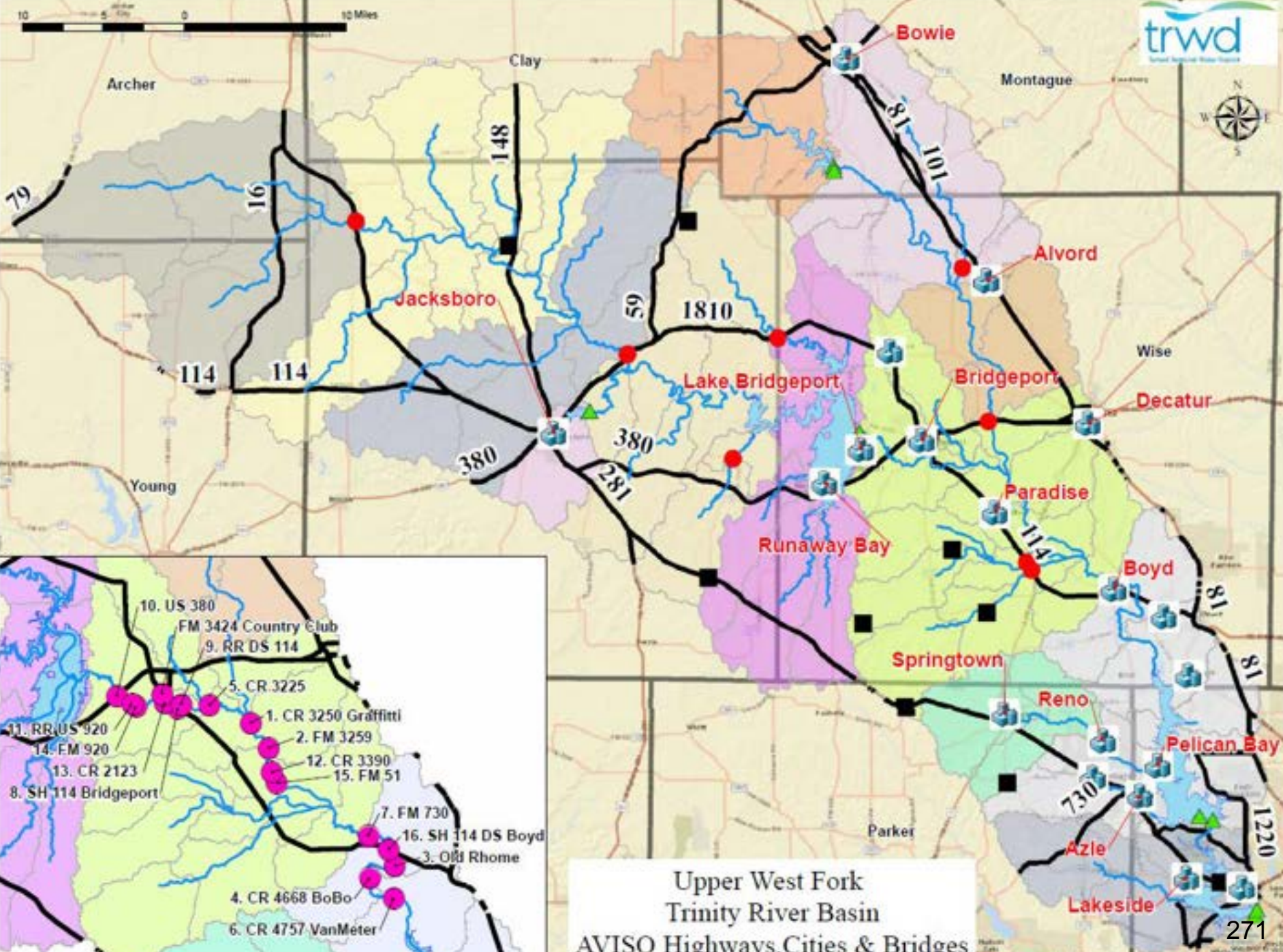
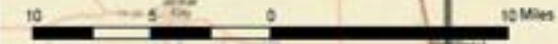
- Bridgeport – conservation level 836 ft msl, flood easement level 851, flood storage about 198,000 acre feet. Peak flood elevation recorded – 844.36 (8.36')
- Eagle Mountain conservation level 649.1, flood easement 668, flood storage volume about 240,000 acre feet of flood storage. Peak flood elevation recorded – 659.9 (10.1')
- Lake Worth Conservation level 594, flood easement to 600, flood storage 23,946 acre feet. Peak flood elevation - 598.70 (4.7')

# LOWEST HOME ELEVATIONS

(above conservation)

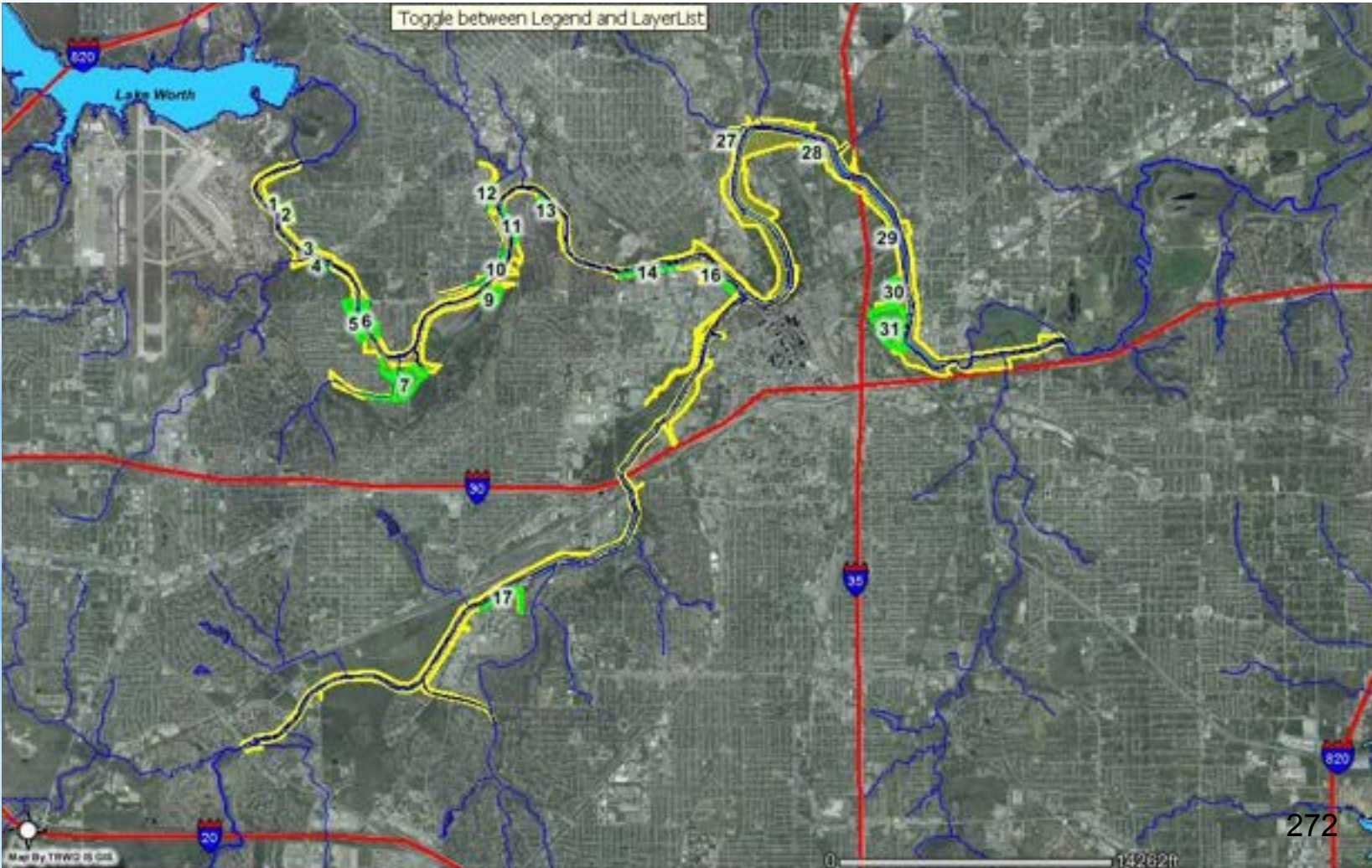


CONSERVATION ELEVATIONS



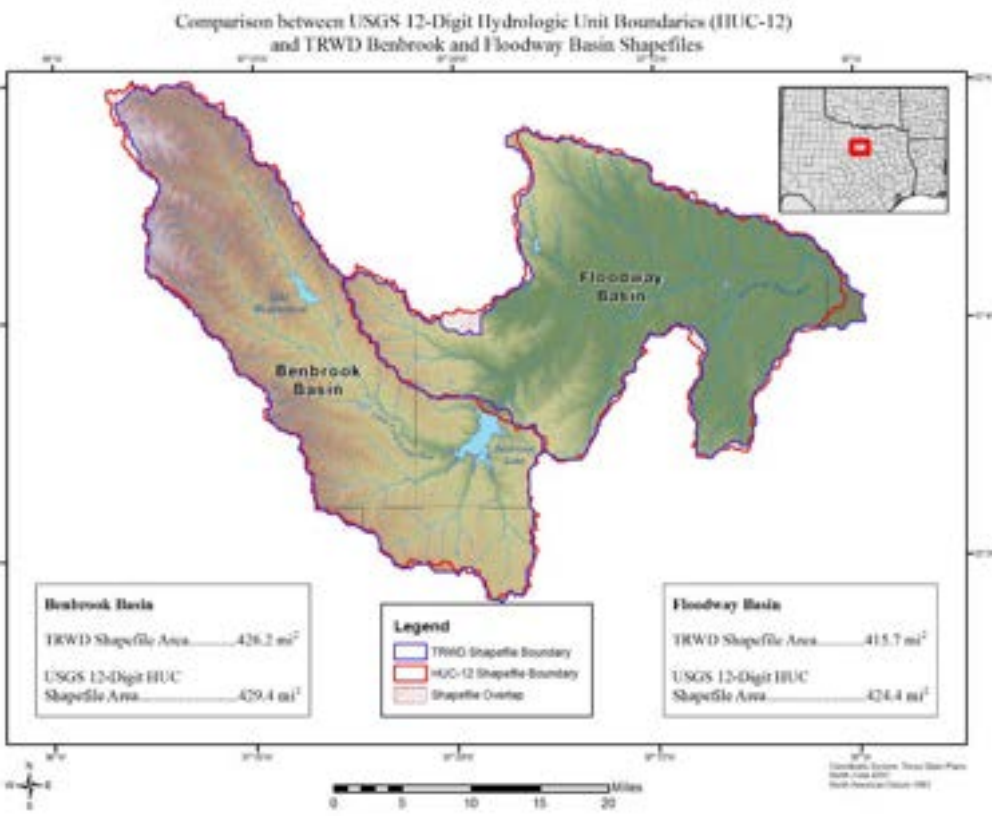
Upper West Fork  
Trinity River Basin  
AVISO Highways, Cities & Bridges

# Fort Worth Floodway



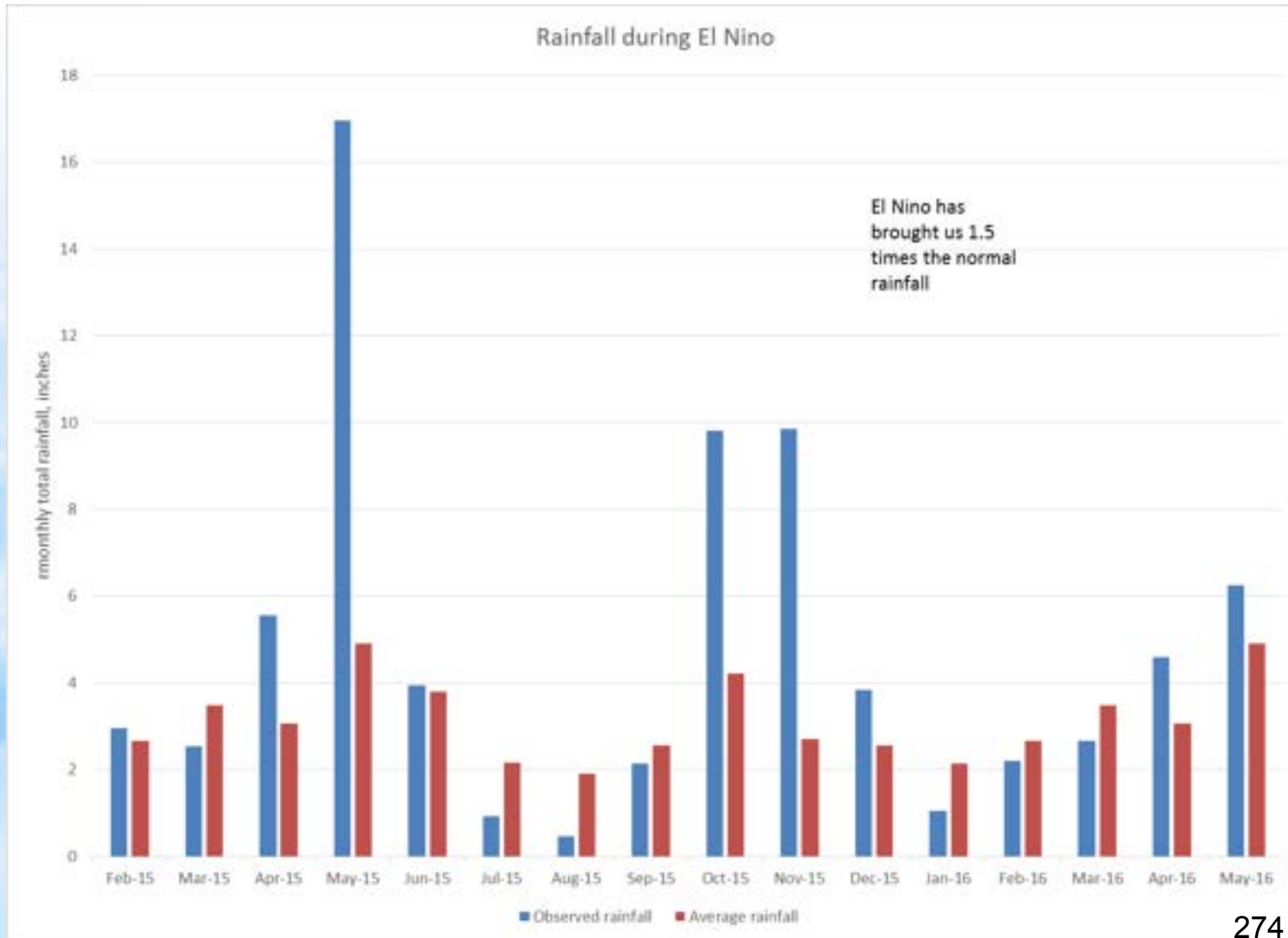


# Lake Benbrook – 429 square mile drainage



Benbrook acts like a bucket with a spout, it fills until it spills. Volume is stored and high flows mitigated through valley storage

# El Nino - Rainfall

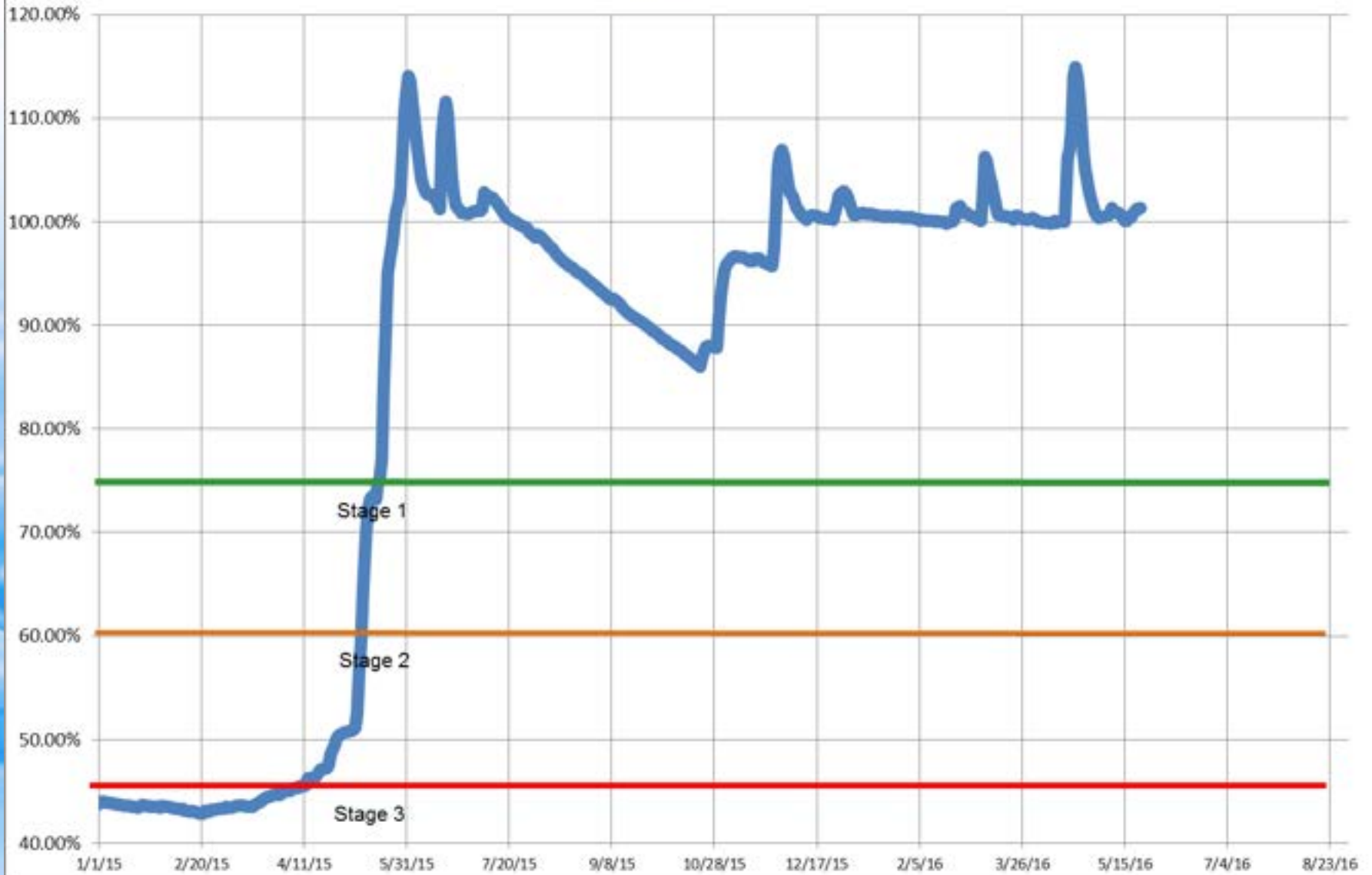


# Flood Discharges

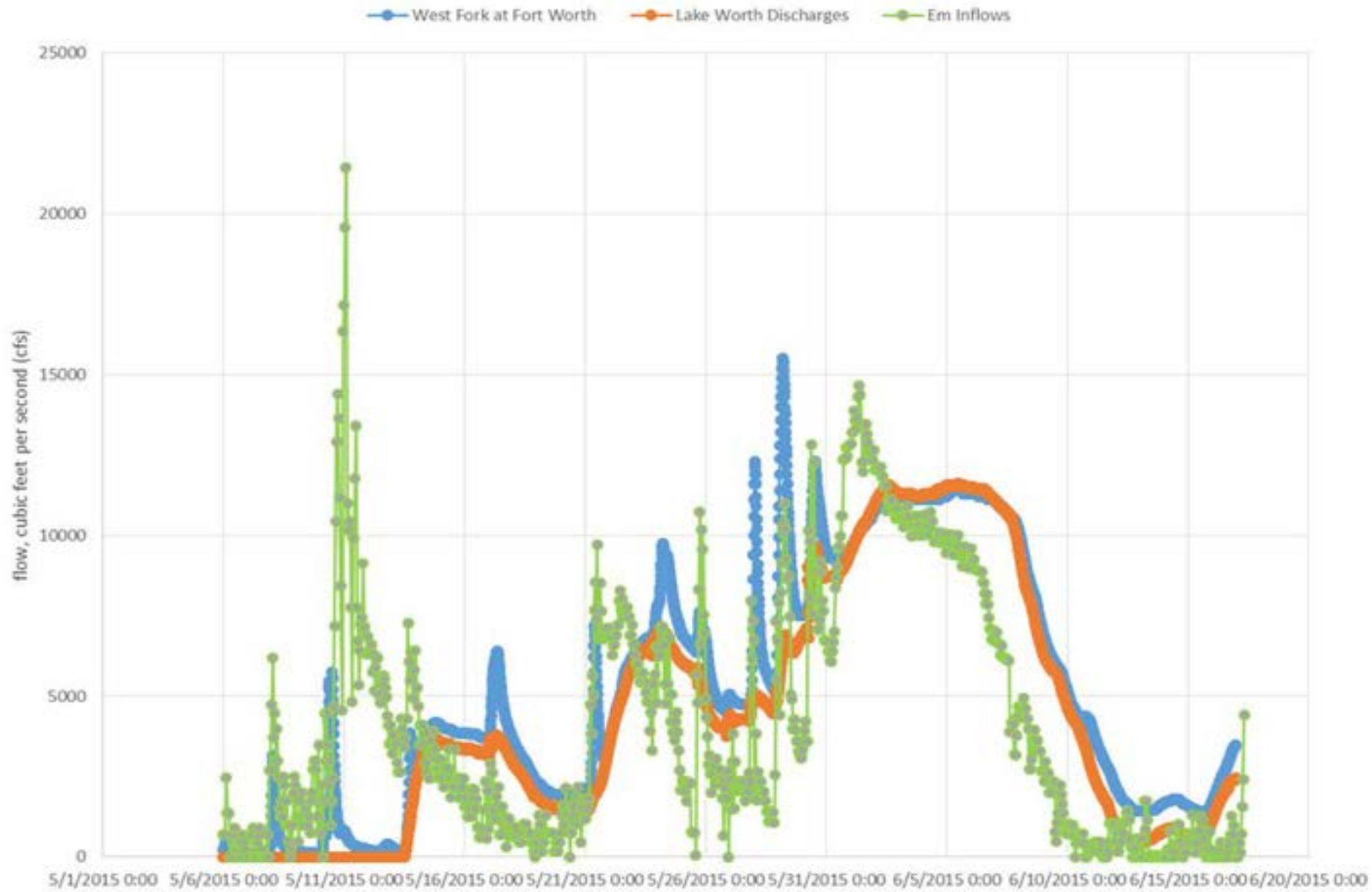
	Bridgeport	Eagle Mountain	Lake Worth
	flood releases	flood releases	flood releases
	acre feet	acre feet	acre feet
2015	374,370	780,587	788,583
2016 through 5/30	286,490	450,430	512,021
total	660,860	1,231,017	1,300,604
% Lake Volume	183%	684%	3883%

# West Fork Water Supply Reservoirs Capacity

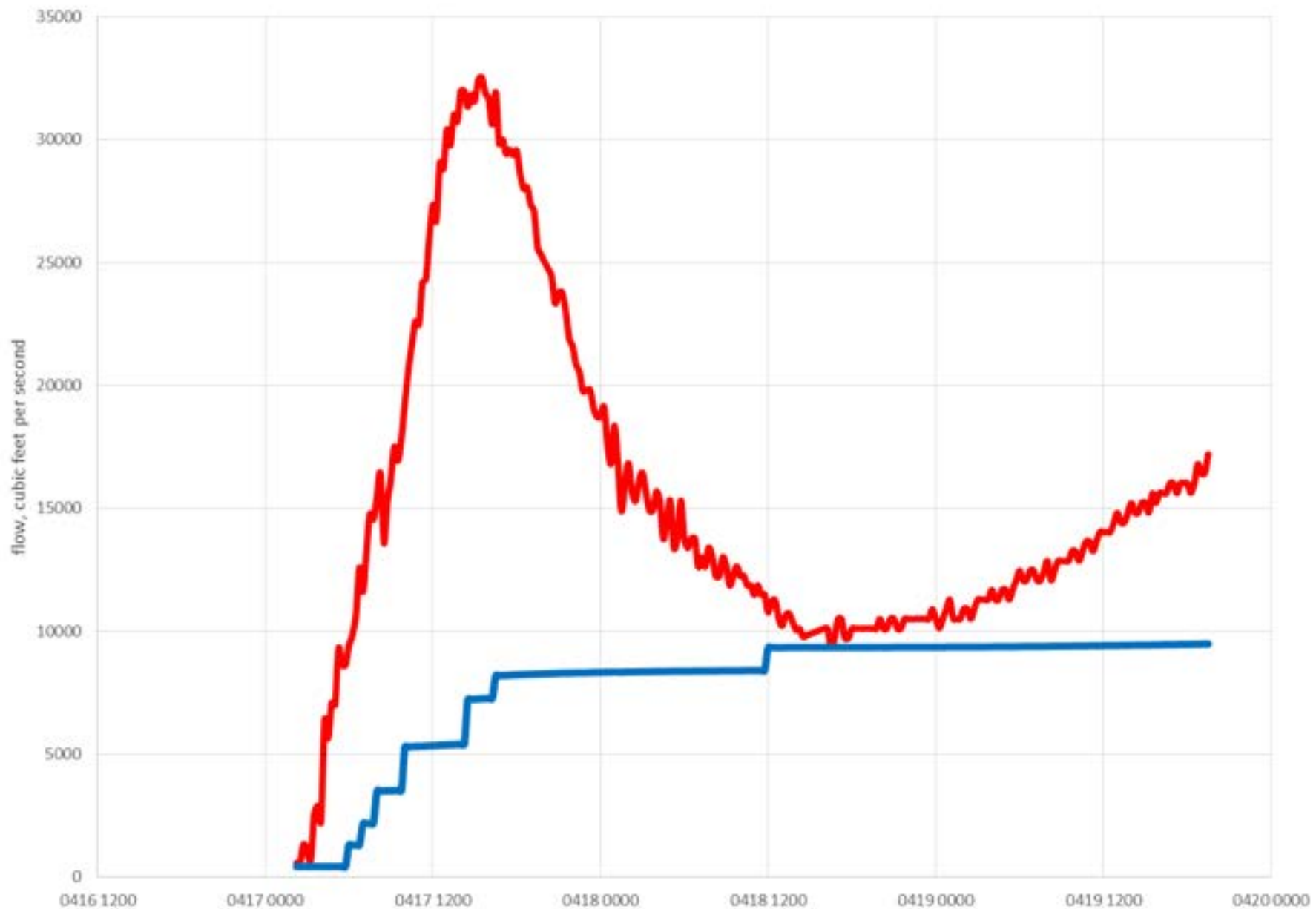
— West Fork



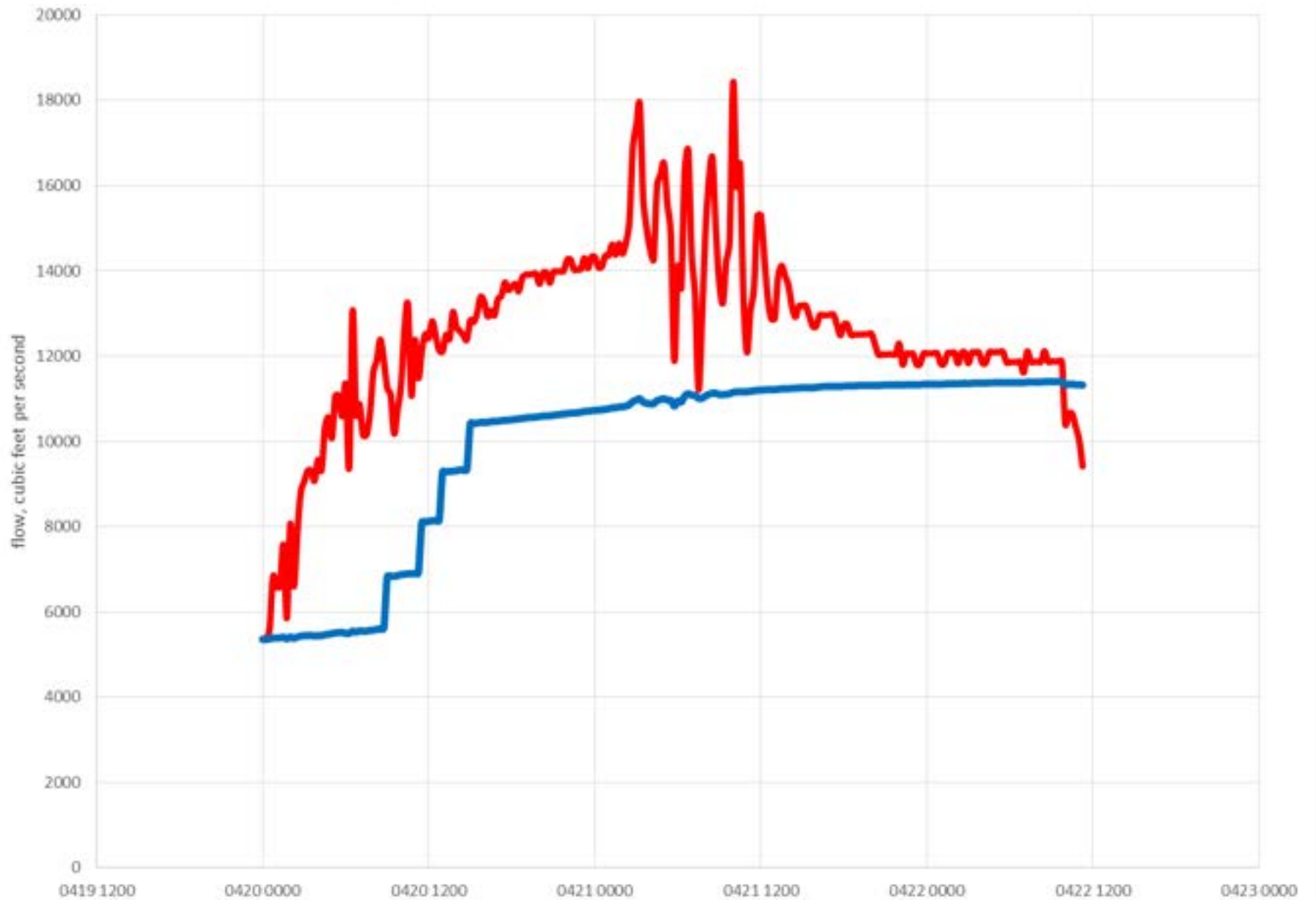
# May 2015 Flooding



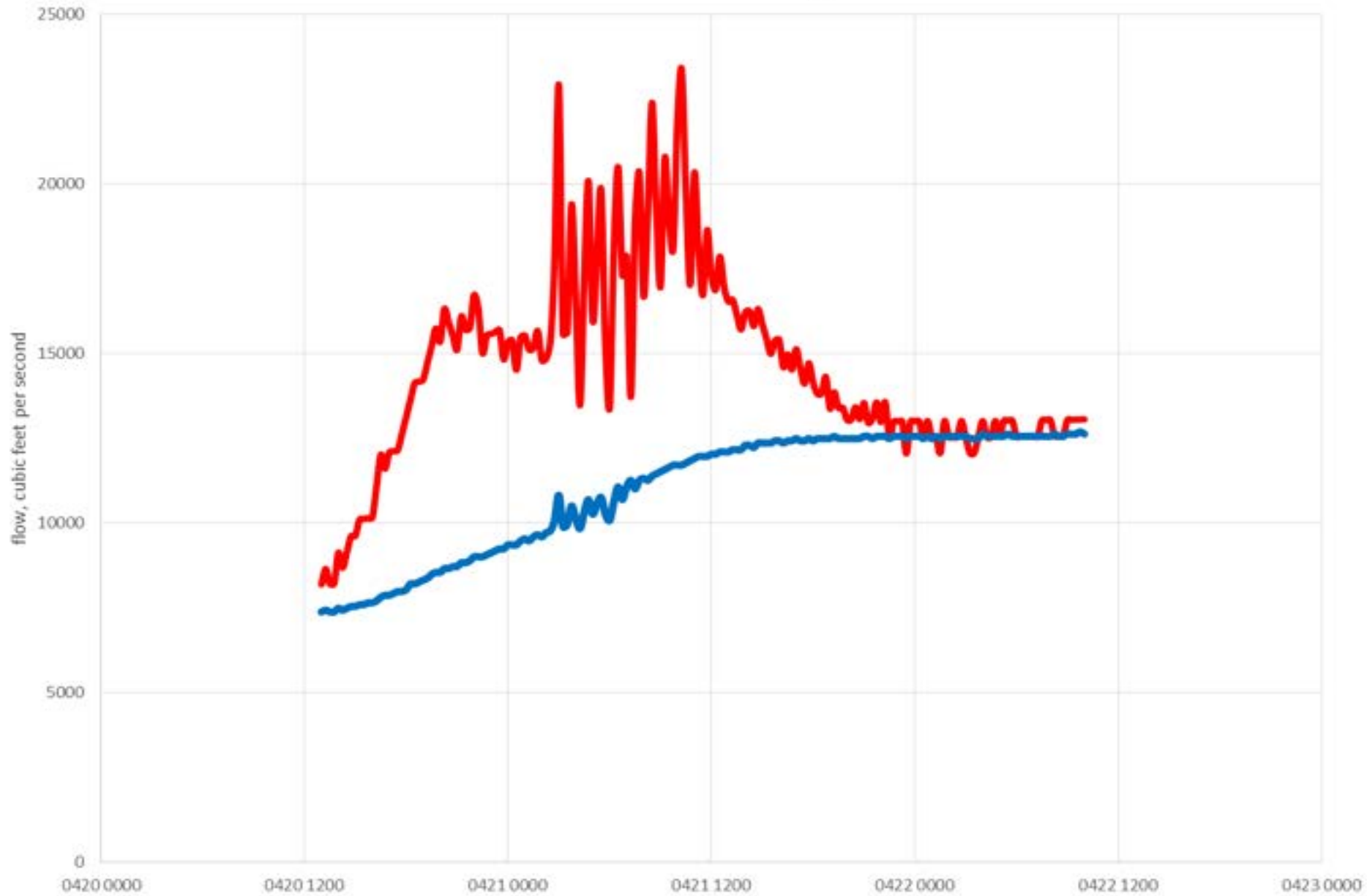
Bridgeport inflows and releases - April 17 flood



Eagle Mountain inflows and releases - April 17 flood

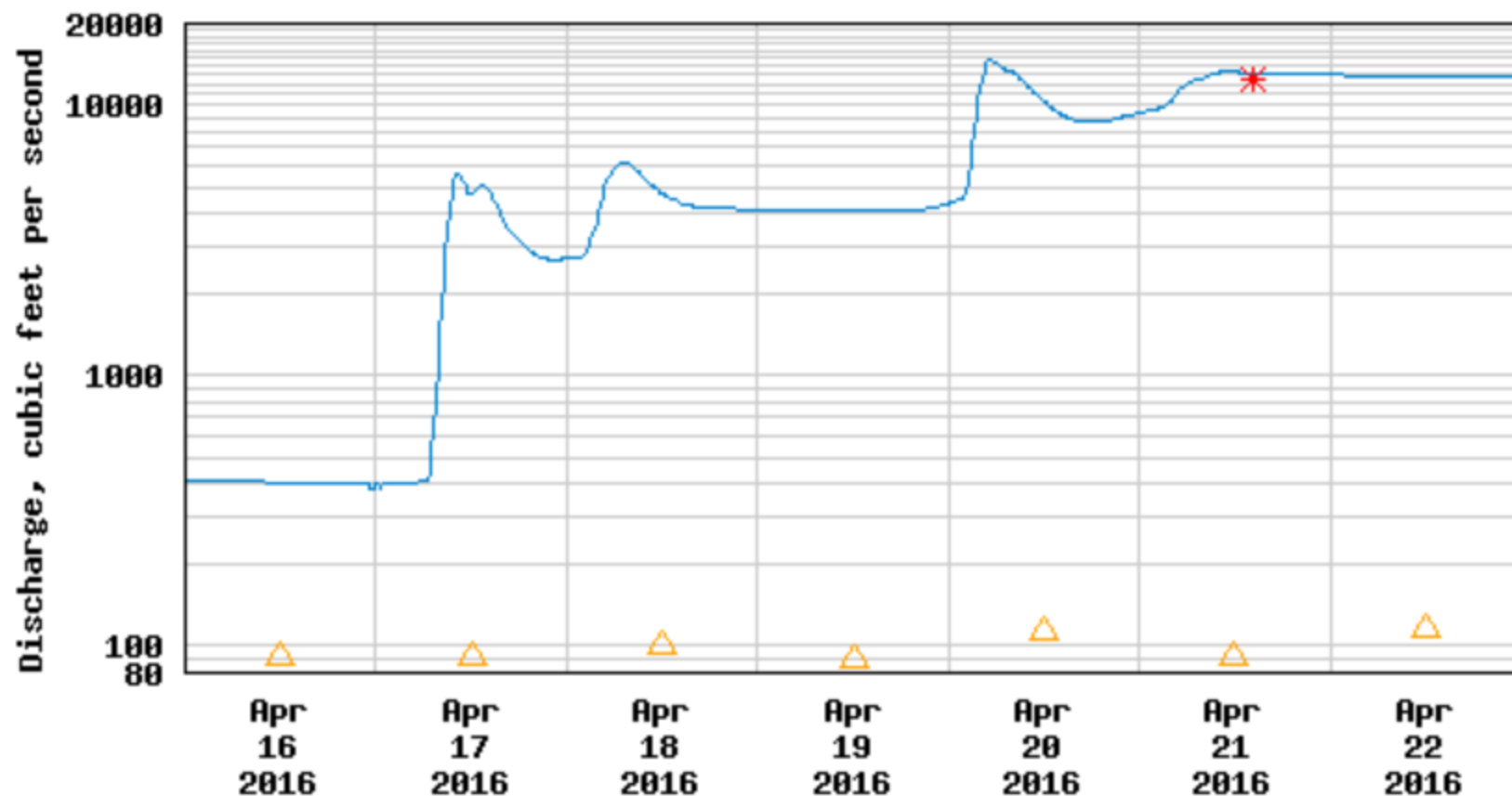


Lake Worth inflows and releases - April 17 flood





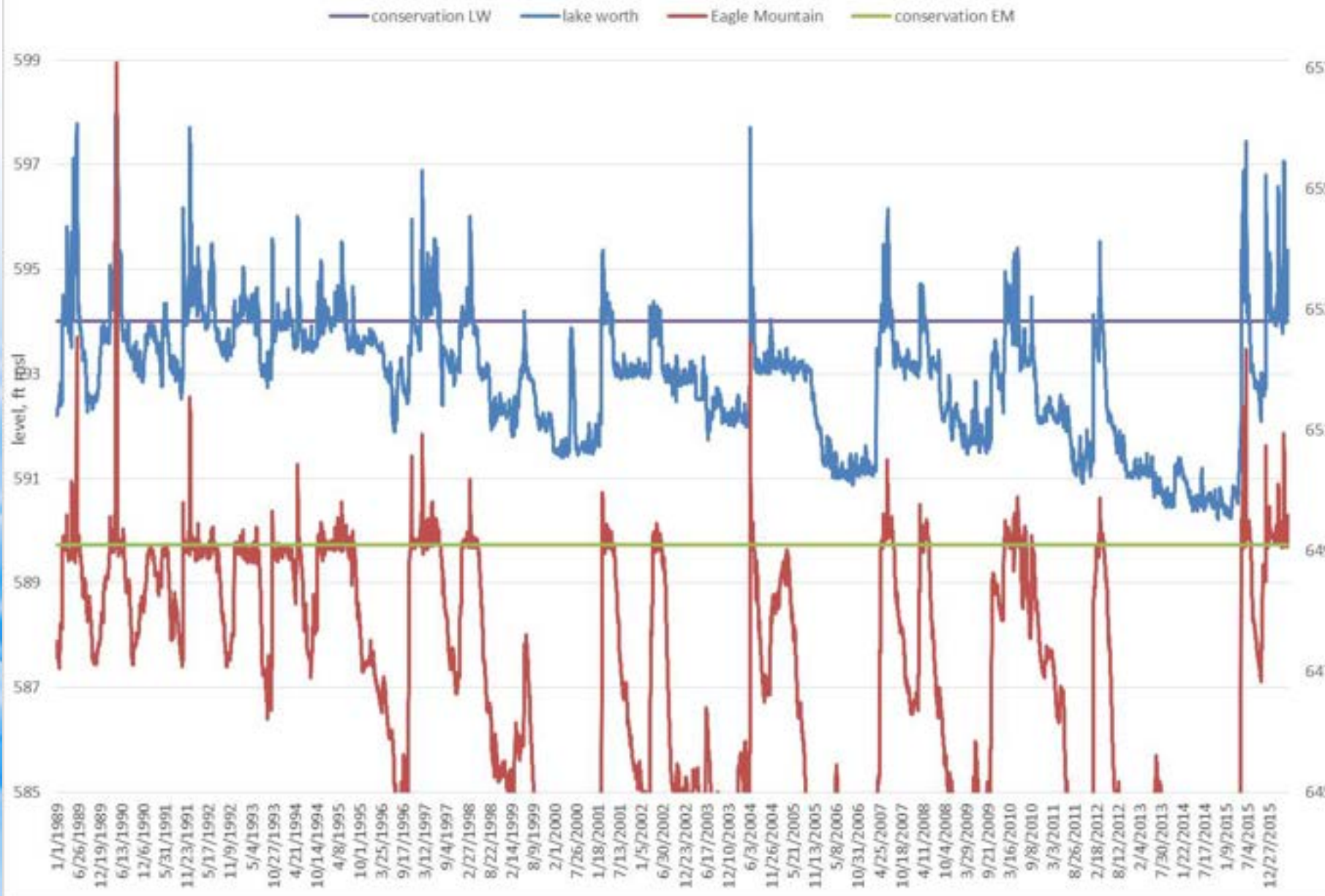
## USGS 08048000 W Fk Trinity Rv at Ft Worth, TX



----- Provisional Data Subject to Revision -----

- Median daily statistic (95 years)    Measured discharge
- Discharge

# Lake Worth and Eagle Mountain Levels



# Effects of El Nino

- 50% more rainfall than average
- Very large volumes of runoff
- Reservoir levels at conservation or above constantly since November
- Floods on all reservoirs, with homes damaged on Bridgeport and Eagle Mountain
- A great water supply for the upcoming La Nina period



# Lake Worth Trail

Project Update  
June 9, 2016

Lake Worth Regional Coordination Committee Meeting

City of Fort Worth  
Park and Recreation Department



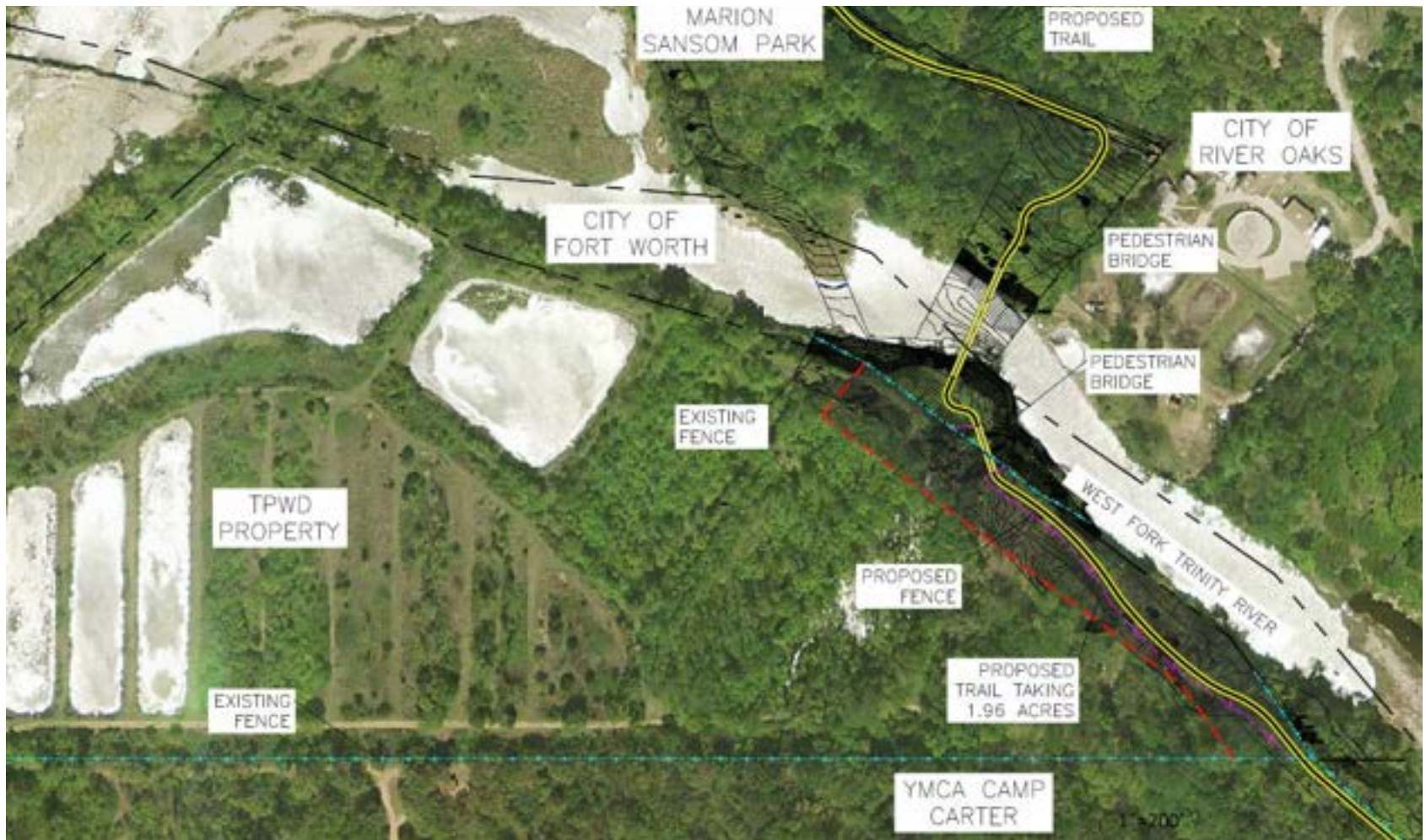
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# Lake Worth Trail – Project Update Topics

- Texas Parks & Wildlife Department (TPWD) Easement
- Construction Manager-At-Risk (CMAR) Process
- Trail Alignment Adjustments (River Bridge/ Trail)
- Design / Pre-Construction & Construction Schedule
- Questions

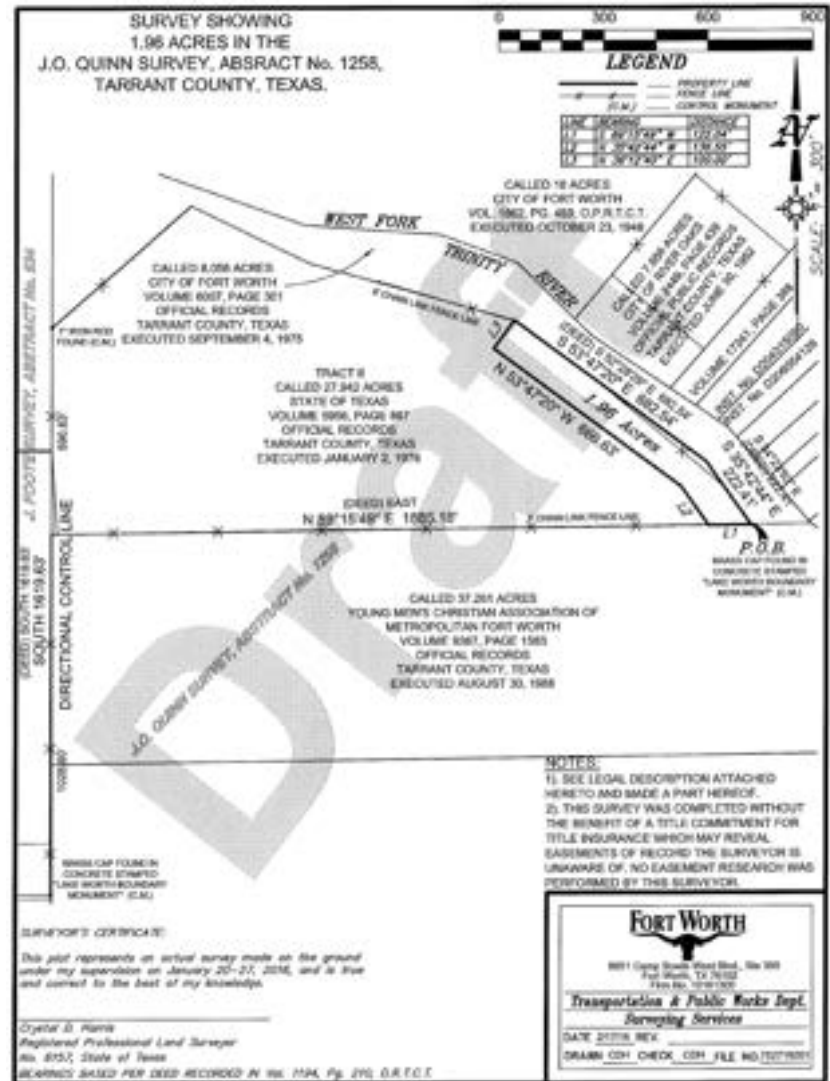
# Lake Worth Trail – TPWD

- Draft Trail Easement receives approval at March TPWD Commission Meeting



# Lake Worth Trail – TPWD

- During pre-construction phase and construction phase the agreement with TPWD will be a surface use agreement, then post construction a final easement will be established and recorded.



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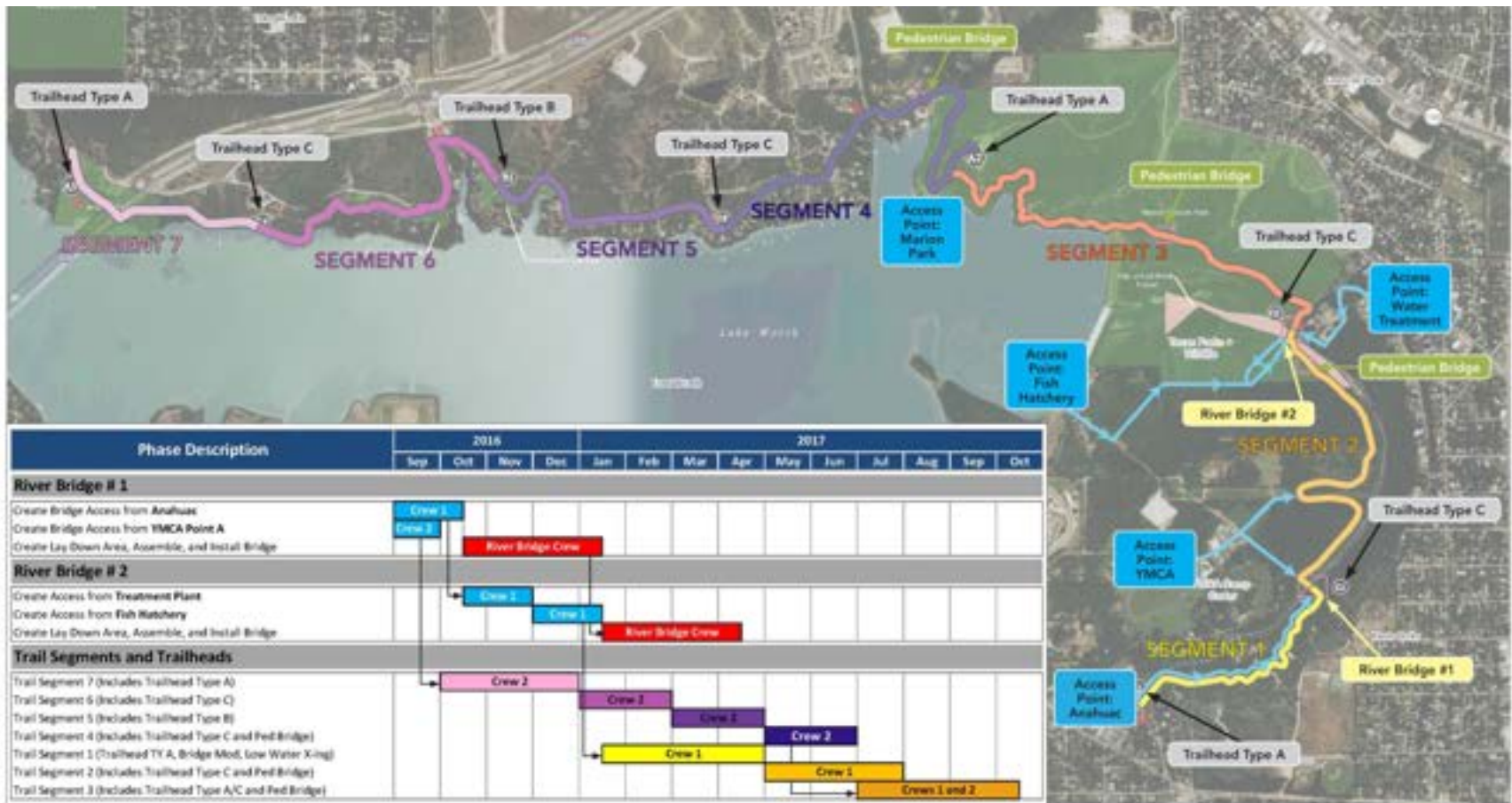
# Lake Worth Trail – CMAR

- A Construction Manager-At-Risk process was evaluated and determined that it would be an added value to the project based on the following factors:
  - Increased and/or enhanced functionality resulting from phasing and sequencing of project delivery to reduce impacts to park users during construction.
  - Cost-savings and/or cost-avoidance identified during the pre-construction design review phase.
  - Reduced risk resulting from early engagement of the CMAR to optimize project delivery in collaboration with City's design team.
  - Reduction in overall delivery timeline (schedule).



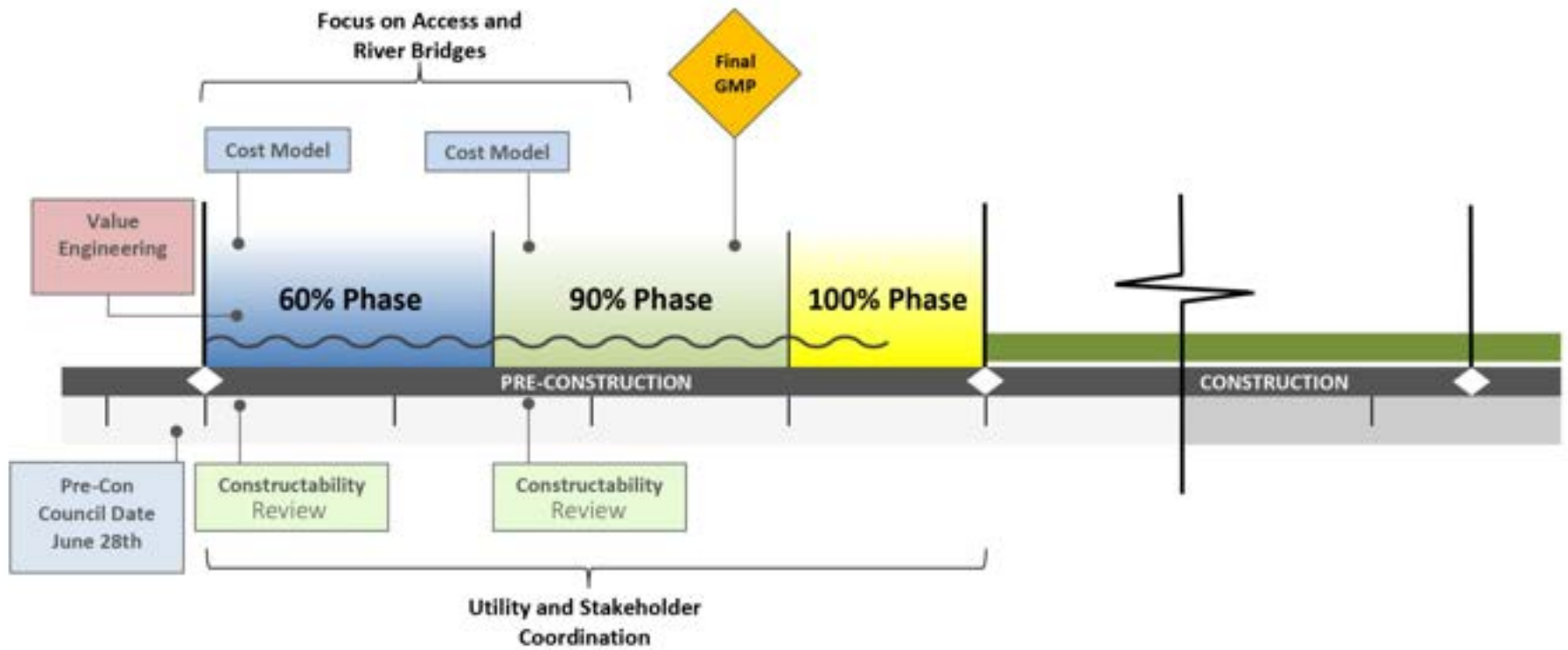
# Lake Worth Trail – CMAR

- The project diverse and unique conditions necessitates a clear understanding of how phasing and sequencing of construction can assist in reaching the project goals.



# Lake Worth Trail – CMAR

- Another key element of the CMAR process:
  - It provides the City a clear understanding of projects costs and delivery schedule as the project reaches 100% pre-construction phase.



# Lake Worth Trail – CMAR

- Six (6) Construction Firms submitted proposals on May 19, 2016
- M&C for CMAR award expected early August, 2016



# Lake Worth Trail – Trail Alignment

- Lake Worth Trail Phase I begins at YMCA property along Anahauc Street at terminus point of Trinity Trails system through Camp Carter, Marion Sansom, Windswept Circle and Plover Circle Park along Cahoba Drive to Arrow 'S' Park



# Lake Worth Trail – Trail Alignment

- Tarrant Regional Water District (TRWD) to improve trail on TRWD property
  - Approximately 600 LF removed from project
- Trail to align with current YMCA drive and to begin going uphill sooner
  - Approximately 1,400 LF adjusted from preliminary alignment



# Lake Worth Trail – Trail Alignment

- FNI reports area to be geologically unstable (Bridge 1 & 3,600 LF trail relocated)



# Lake Worth Trail – Trail Alignment

- Pedestrian bridge & 2,200 LF trail relocated along Cahoba Drive



# Lake Worth Trail – Trail Alignment

- Investigation is on-going along Cahoba Drive for property and ROW information





# Lake Worth Trail – Trail Alignment

- Lake Worth Trail Phase I revised trail alignment



---

# Lake Worth Trail – Updated Schedule

- CMAR selection (M&C early August 2016)
  - Update topographic surveys
  - Archeological Survey
- Pre-Construction Services:
  - August 2016 – November 2016
- Construction Services:
  - December 2016 – March 2018



# Lake Worth Trail

## QUESTIONS?

City of Fort Worth  
Park and Recreation Department



# Transportation Projects in the Lake Worth Area

Presented to: Lake Worth  
Regional Coordination Committee

Dan Kessler,  
Assistant Director of Transportation  
June 9, 2016







# Population Forecast by County

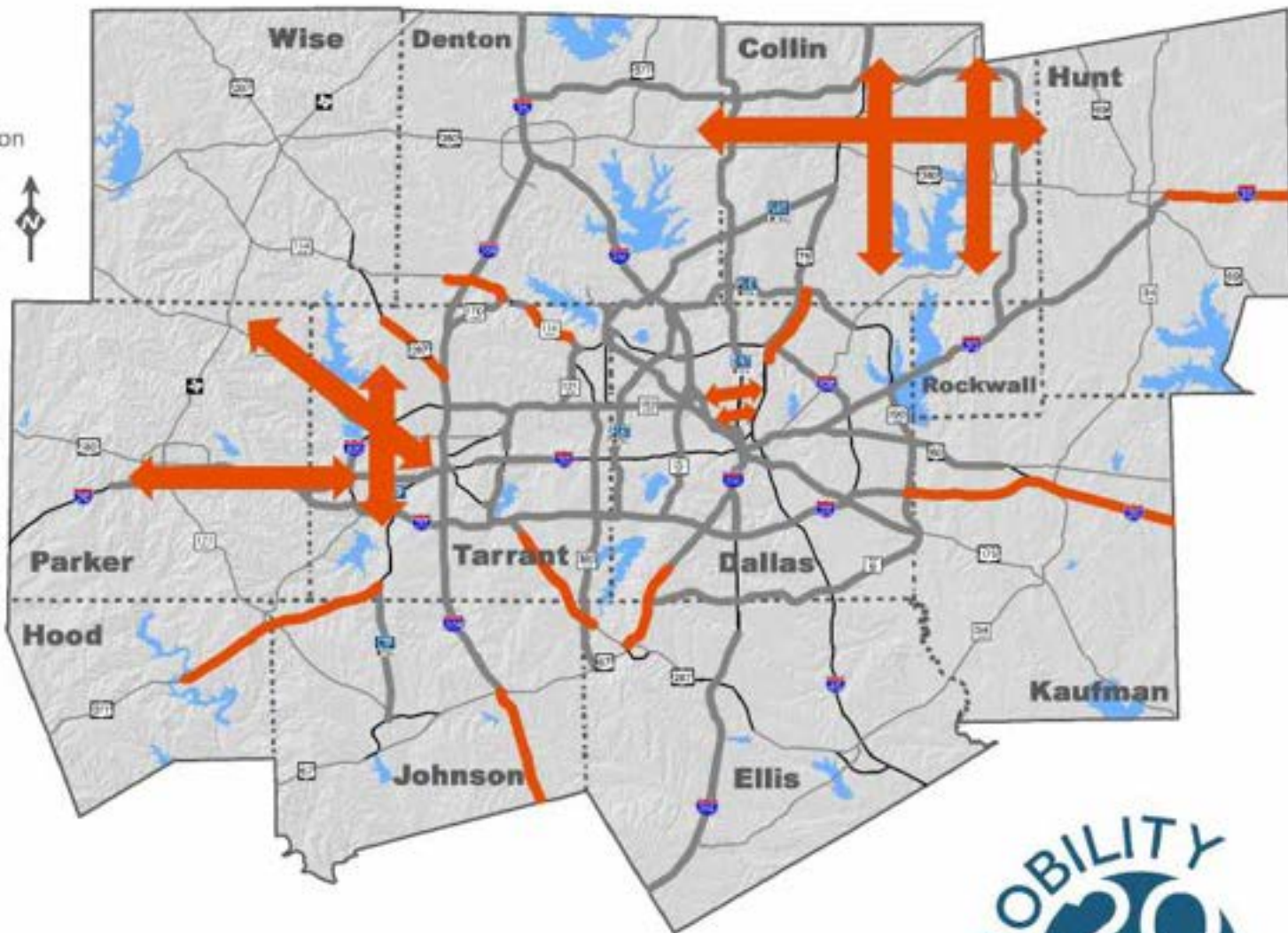
County	2010 Population	2040 Population	2010 – 2040 Change
Collin	778,427	1,560,421	781,994
Dallas	2,337,741	3,357,469	1,019,728
Denton	652,270	1,241,681	589,411
Ellis	148,000	283,898	135,898
Hood	50,481	81,578	31,097
Hunt	84,260	131,022	46,762
Johnson	148,290	252,521	104,231
Kaufman	102,014	210,097	108,083
Parker	113,806	195,286	81,480
Rockwall	77,678	166,357	88,679
Tarrant	1,788,400	3,094,649	1,306,249
Wise	58,147	101,865	43,708
<b>Total</b>	<b>6,339,514</b>	<b>10,676,844</b>	<b>4,337,320</b>

Source : U.S. Census Bureau, NCTCOG

Excludes population in groups quarters such as dorms, jails, and nursing homes.

# Illustrative Major Roadway Corridors for Future Evaluation

-  Corridors for Future Evaluation
-  Mobility 2040 Corridor Recommendation
-  Freeways/Tollways
-  Other Major Roadways



Illustrative roadway corridors indicate an identified transportation need and do not represent recommendations or specific alignments. Recommendations may be developed for future MTPs through feasibility analyses, thoroughfare plans, and environmental studies.

# Planning Livable Military Communities (PLMC)

## Funding

### **HUD Community Challenge Grant**

- \$800,000 for 2-Year Study

## Focus Area

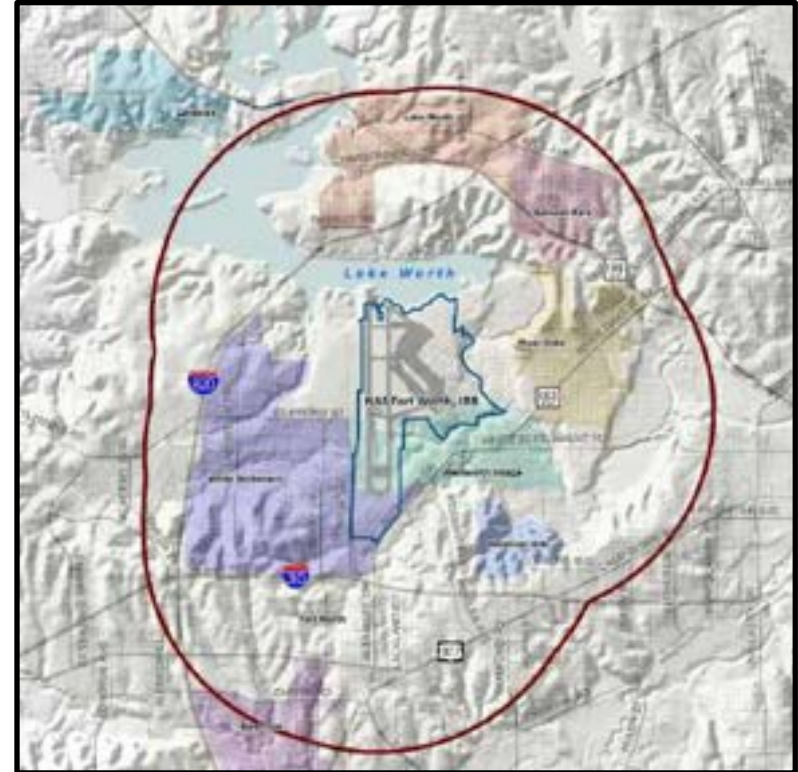
### **2.5 Mile Buffer around NAS Fort Worth, JRB**

- 7 Diverse Communities with Common Challenges
- Changing Demographics

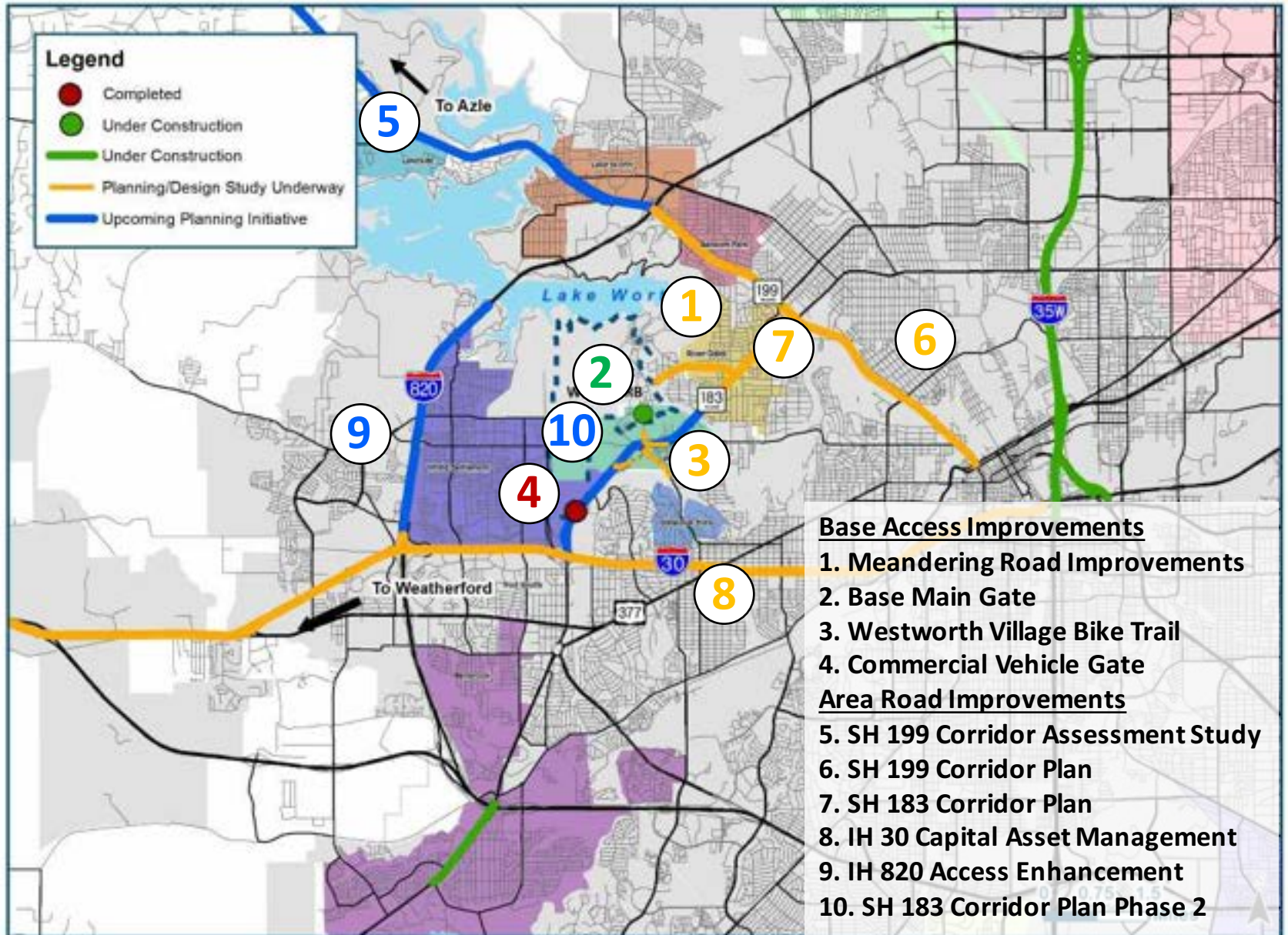
## Project Activities

### **Multidisciplinary Planning Studies**

- Housing and Retail Feasibility
- Enhanced Transportation Options
- Building Code Review
- Comprehensive Plan Updates
- Public Involvement



# PLMC Transportation Implementation





# Meandering Road



# Importance of Meandering Road

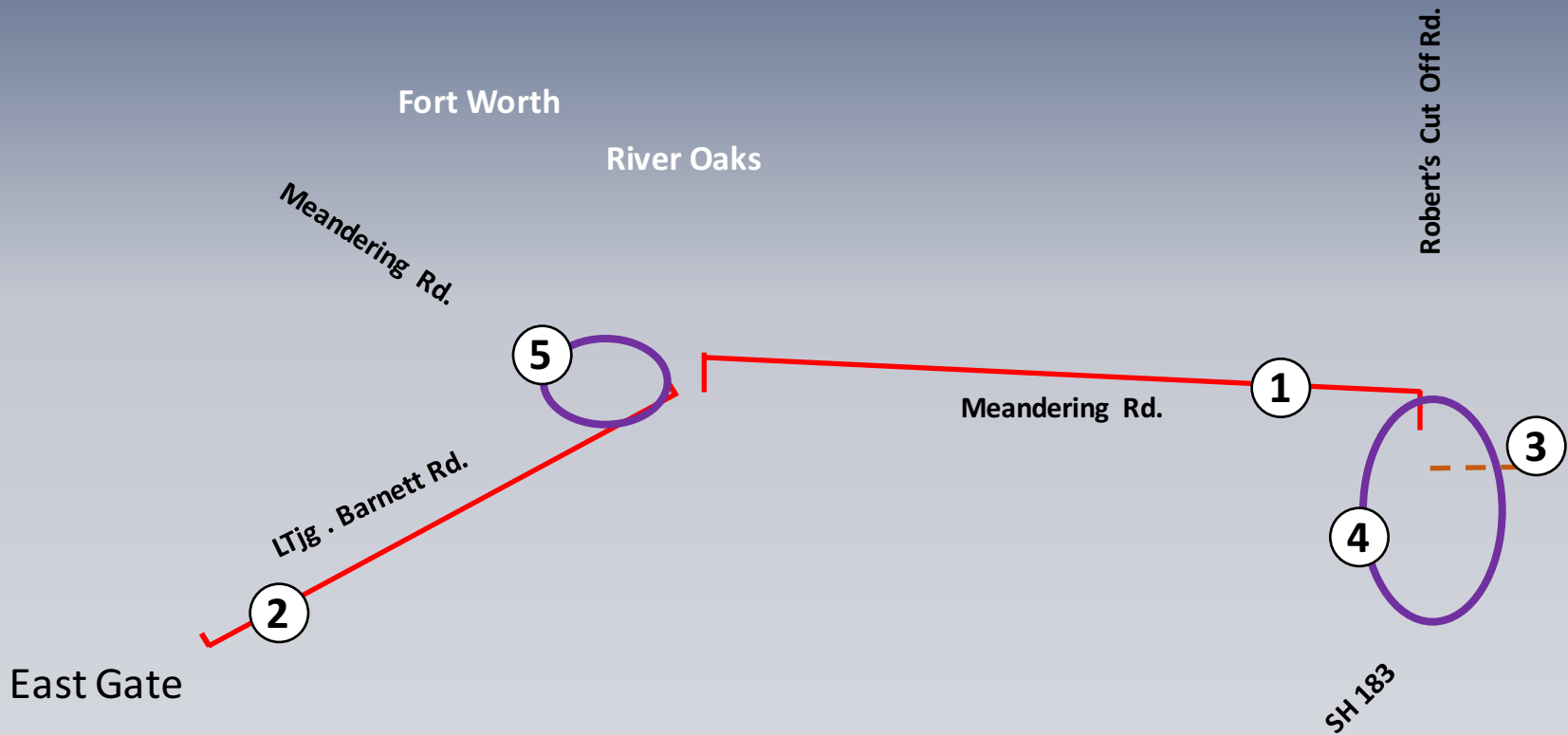
- Serves as main access point for the NAS Fort Worth, JRB east gate entrance
- 1,800 vehicles per day enter through east gate
- Higher traffic counts on drill weekends
- Additional roadway users include FMC Carswell, YMCA Camp Carter, Burger Lake, and gas well traffic

**\$1,000,000 identified for preliminary design and engineering of road improvements.**

# Need for Improvements



# Existing Conditions



1. **Robert's Cut Off to Y-Intersection**: Roadway Reconstruction and Additional Drainage Recommended
2. **Y-Intersection to Bridge**: Construct Curb & Gutter; Additional Signage
3. **Extension to SH 183**: Evaluate Roadway Extension
4. **Meandering/Robert's Cut Off/SH 183 Intersection**: Potential Redesign
5. **Y-Intersection**: Potential Redesign

# Preliminary Design Concepts

**DRAFT**

## Meandering Road/ Roberts Cut Off Road Intersection

### Legend

-  Existing Traffic Signal
-  New Traffic Signal
-  New NAS Fort Worth, JRB Wayfinding Sign



0 50 100 200 300 400 500 Feet

### Basic Design Assumptions:

- 3-lane Meandering Road (2 westbound/1 eastbound)
- 3-lane Roberts Cut-Off Road south of Meandering Rd

### Considerations:

- School Zone on Ohio Garden Road
- School Zone on Roberts Cut Off Road
- Right-Angle Intersections
- Queuing at Intersections
- Base Access from Northbound SH 183
- Base Access from Southbound SH 183
- Base Access from Roberts Cut Off Road

### Pros:

- Concentrates Base Traffic
- Reduces Parking Lot Cut-Through Traffic
- Reduces Traffic through School Zones
- Avoids US Post Office (1008 Roberts Cut Off Road)
- Maintains Traffic Signal Spacing on SH 183
- Ability to Redevelop a Portion of Meandering Road

### Cons:

- Signal Delay for Southbound Roberts Cut Off Road
- Impacts New Quickway (1001 Roberts Cut Off Road)



# Preliminary Design Concepts

**DRAFT**

## Meandering Road, LTJg Barnett Road, Gillham Road and Brocks Lane Intersection

### Roundabout Alternative

**Basic Design Assumptions:**  
3-lane Meandering Road (2 westbound/1 eastbound)

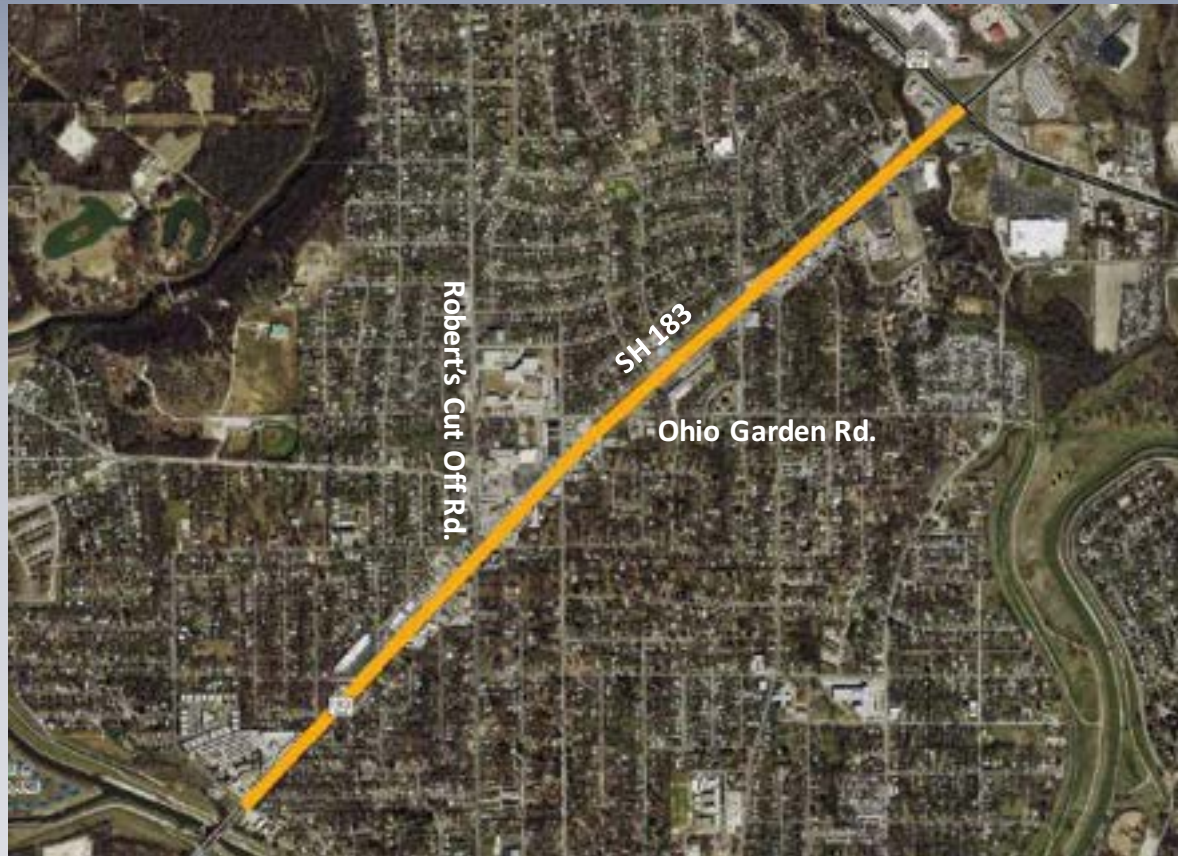
**Considerations:**  
NAS JRB Access  
YMCA Camp Carter Access  
Local Residential Traffic  
Traffic Control Delay  
Driver Expectations  
Drainage

**Pros:**  
Simplifies Current Configuration  
Reduced Traffic Control Delay  
Opportunity for Oversized Vehicles to Turn Around  
Dedicated Pedestrian/Bicycle Movement  
Place-Making/Monument Within Roundabout

**Cons:**  
Grade Changes Considerably in Roundabout  
Roundabout Configuration Learning Curve  
Brocks Lane Dead Ends  
Gillham Road Limited to Right-in/Right-Out Access  
Limited Driveway Access Near Roundabout  
Eastbound Meandering Road Crosses Two Lanes



# River Oaks Boulevard (SH 183) Corridor Master Plan



# River Oaks Boulevard (SH 183)



**BOULEVARD CONCEPT**





# Visual Preference Survey Results

Elements ranking “Very Appropriate” by majority:



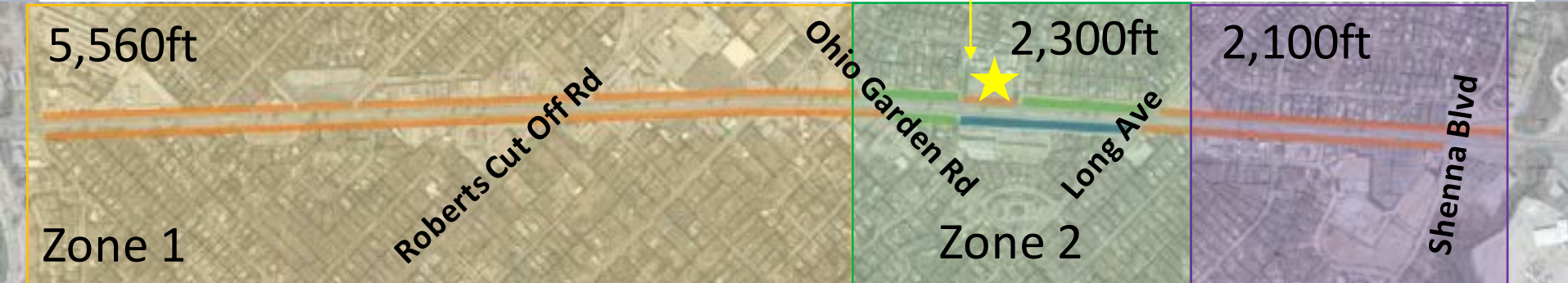
# Proposed Corridor Features

- **Sidewalks**
- **Pedestrian Amenities: lighting, landscaping, benches, signage, trash receptacles, etc.**
- **Off Street Shared-Use Path (Sidepath)**
- **Stormwater improvements: new storm drains, bio-retention, etc.**
- **Roadway/Intersection Improvements and traffic light enhancements**



# Zone Concepts

## Three Context Sensitive Zones Defined by Right-of-Way Width Adjacent Land Uses



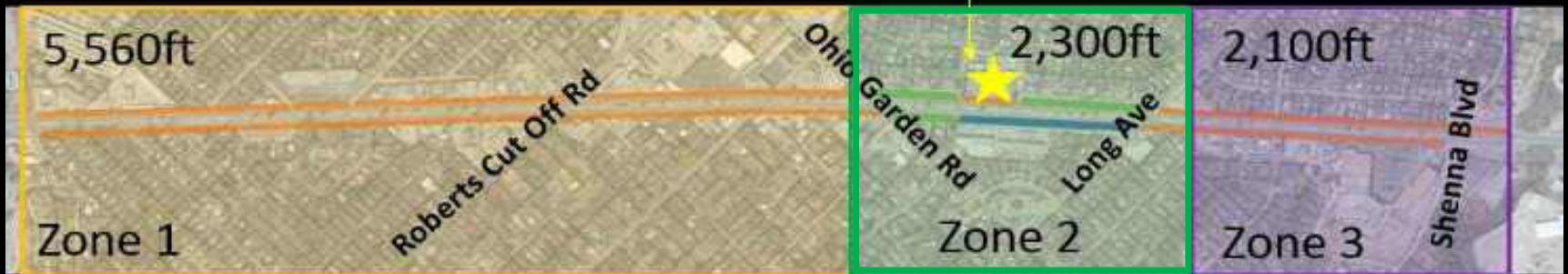
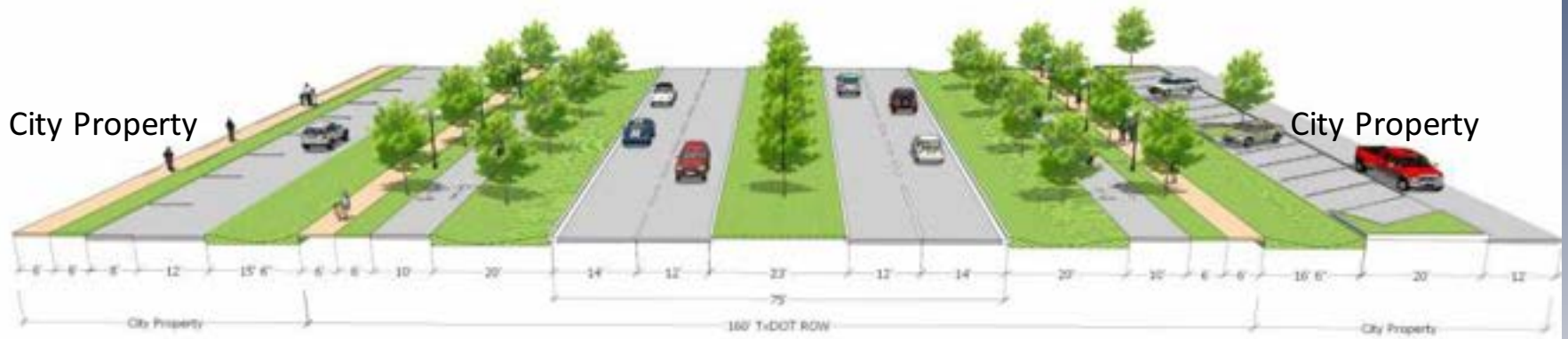
## Three Edge Treatments

Shared Use Path and Sidewalk(s) 

Parallel Parking 

Angled Parking 

# CONTEXT ZONE 2





Greenbrier Dr

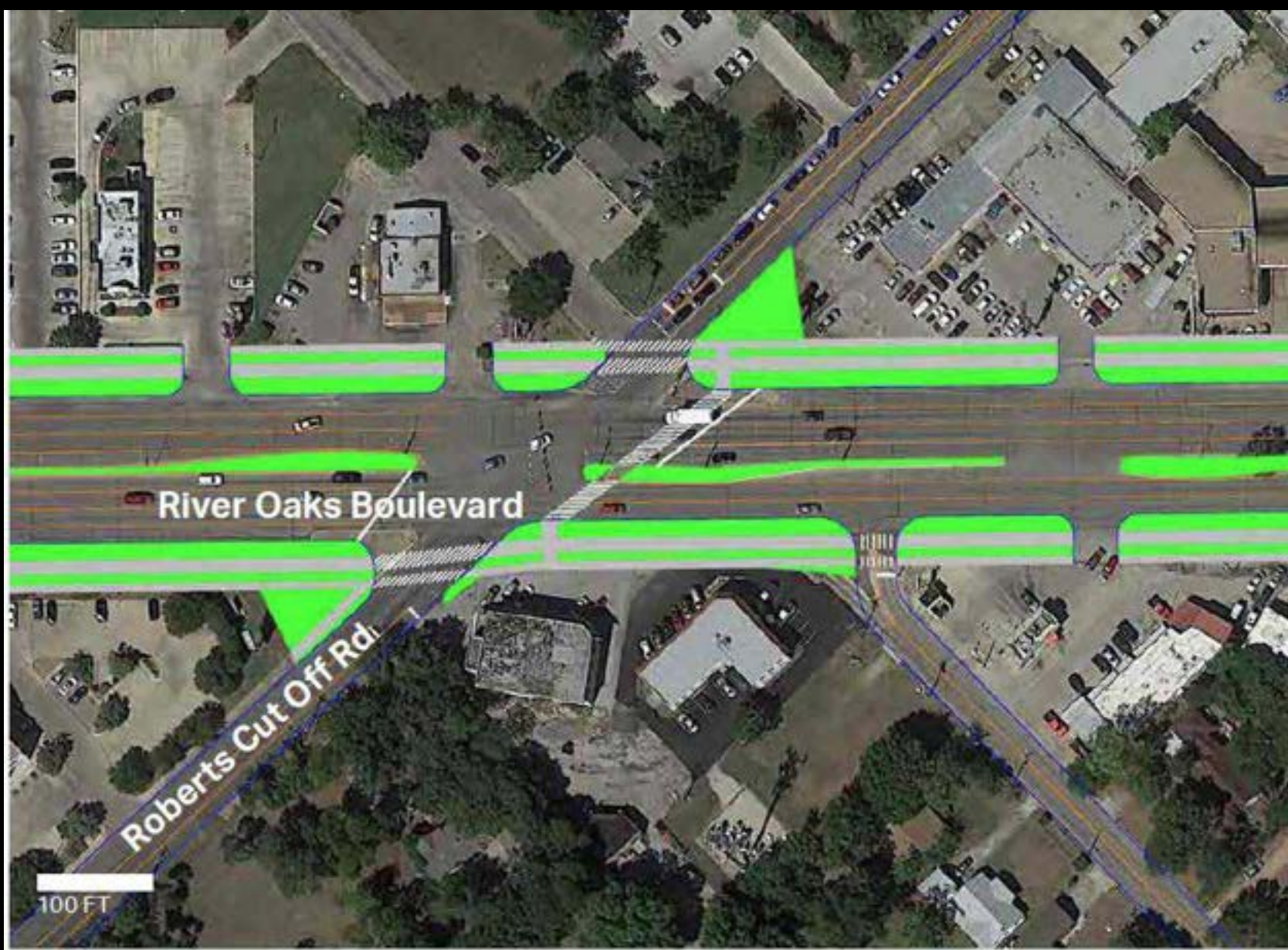
Glenwick Dr

Ohio Garden Rd

Long Ave

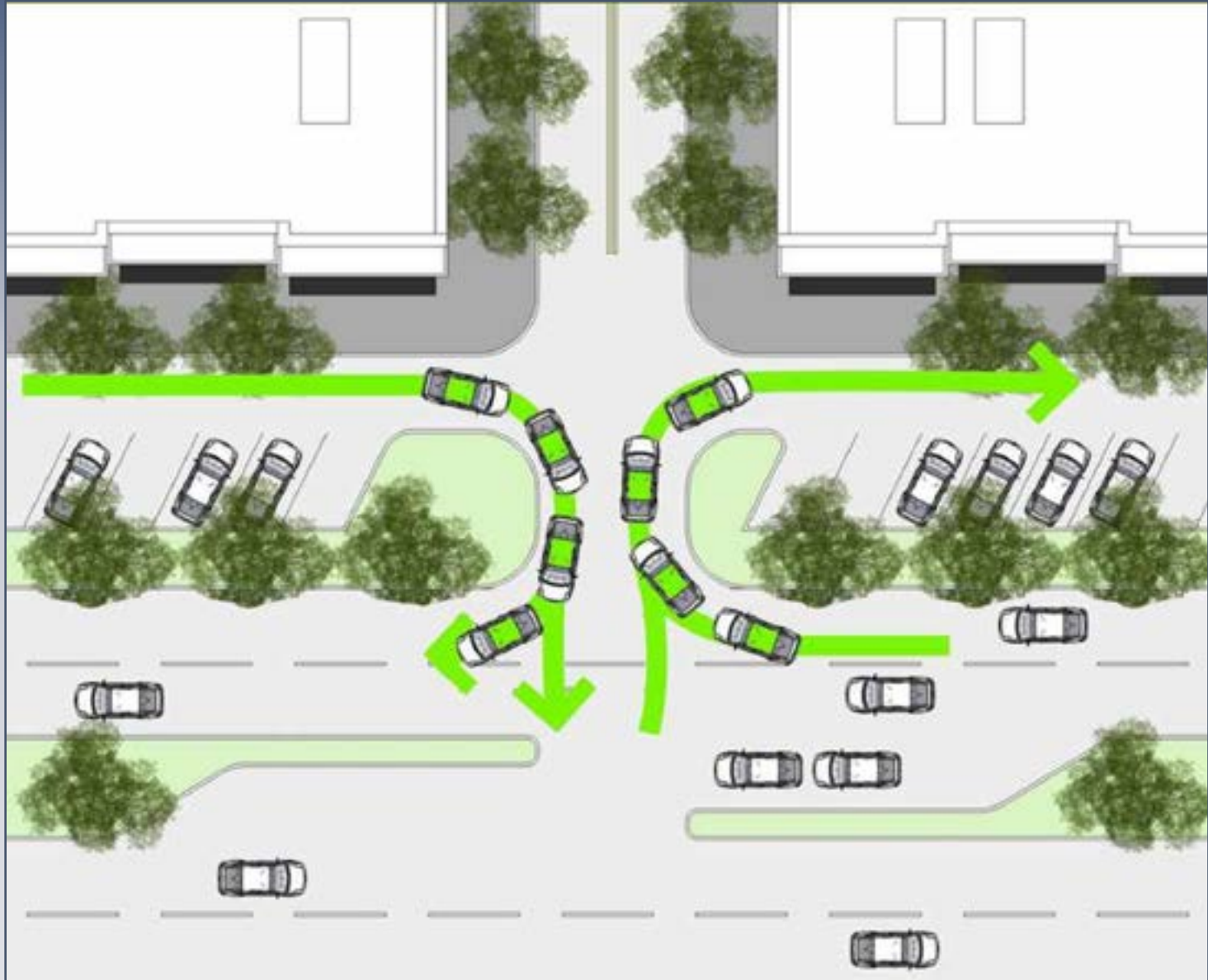
# CONTEXT ZONE 2 – AERIAL VIEW

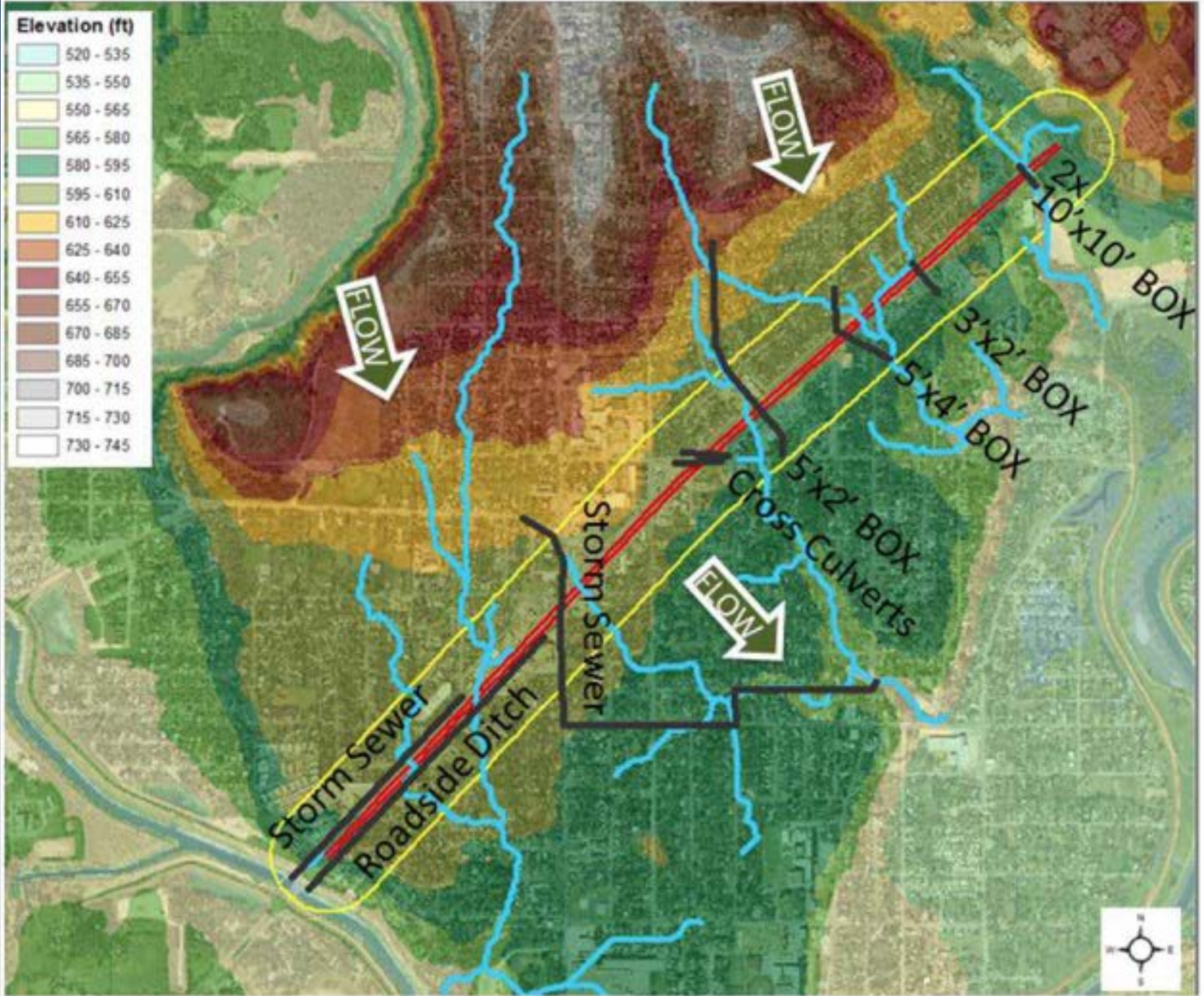
\*87 additional parking spaces shown 18



**PROTOTYPICAL INTERSECTION DESIGN—  
River Oaks Blvd / Robert's Cut Off Rd**

# SH 183 Corridor Enhanced Access Concept







# Stormwater Recommendations

## Coordinate with Regional Agencies

- Request the Texas Department of Transportation (TxDOT) to regrade ditches and clean out culverts
- Coordinate with Tarrant Regional Water District and Tarrant County to seek funding for a more detailed drainage study to document issues and make additional recommendations for improvements

## Implement stormwater management solutions as reconstruction of River Oaks Boulevard occurs

- Incorporate drainage features into the aesthetic landscaping to maximize infiltration and **provide surface storage** for retaining stormwater runoff: bio-swales, bio-retention
- **New storm sewer trunk line** on each side of the road that would connect to the bio-retention underdrains
- The proposed corridor layout provides opportunities to **maximize innovative stormwater management practices**: Low Impact Development (LID), Green Infrastructure (GI), Integrated Stormwater Management (iSWM)

# Reinvestment Nodes



## **Node 1: Mixed-use village center**

Civic and restaurant uses

Blend of residential uses (attached and detached) including seniors, townhomes, lofts, and small lot single family

Central green amenity

Emphasis on placemaking

## **Node 2: Commercial/retail reinvestment zone**

Restaurants, neighborhood shopping, and small service office

Anchored by the new Walmart on the other side of River Oaks Blvd.

# Node 1 – Mixed Use Village Center

## Node 1: Mixed-Use Village Center – 10 Year Project Programming

Development Type	Node 1 Project Programming	Quantity
Retail	Food, Bev. Restaurants	10,000 SF
	Neighborhood Retail	10,000 SF
	Clothing & Accessories	5,000 SF
Office	Small Office	10,000 SF
Residential	Urban Residential	380 DU
	For Sale Residential	65 DU



Three-Story Residential Flats



New and Renovated Single Family Residential



Mixed-Use Community Core

# Node 2 – Commercial/Retail Reinvestment Zone

## Node 2: Commercial/Retail Reinvestment Zone – 10 Year Project Programming

Development Type	Node 2 Project Programming	Square Feet
Retail	Motor Vehicle and Parts	5,000
	Furniture and Furnishings	5,000
	Building Materials/Supply	10,000
	Food, Beverage, Grocery	20,000
	Sporting Goods, Hobby	5,000
Office	Electronics, Office General	20,000
	Small Office	20,000



Village Center Retail and Small Office



Restaurants and Outdoor Dining

# Reinvestment Zoning Strategy



## **Node 1: Mixed-use village properties**

**Form-Based Planned Development District**

**Emphasis on maximum building setbacks, streetscape improvements, building materials, building heights, and special conditions including key corners and potential locations of public open space features**

## **Node 2: Commercial/retail reinvestment properties**

**Updated building material and landscape standards for existing commercial/retail zoning districts**

# Form Based Design Concepts – Focus on Visual Preference Survey



Attached Townhomes



Senior and Independent Living



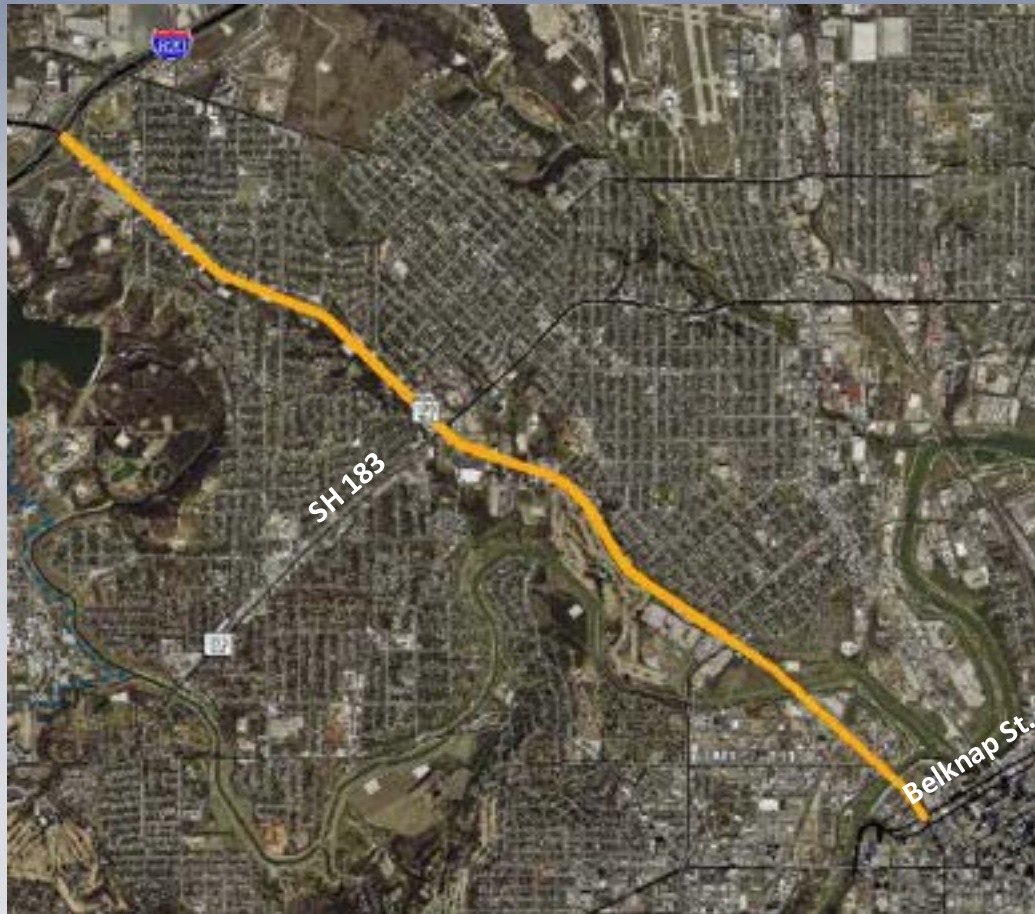
Mixed-Use Residential/Office Retail



Streetscape-Based Development



# State Highway 199 Corridor Master Plan

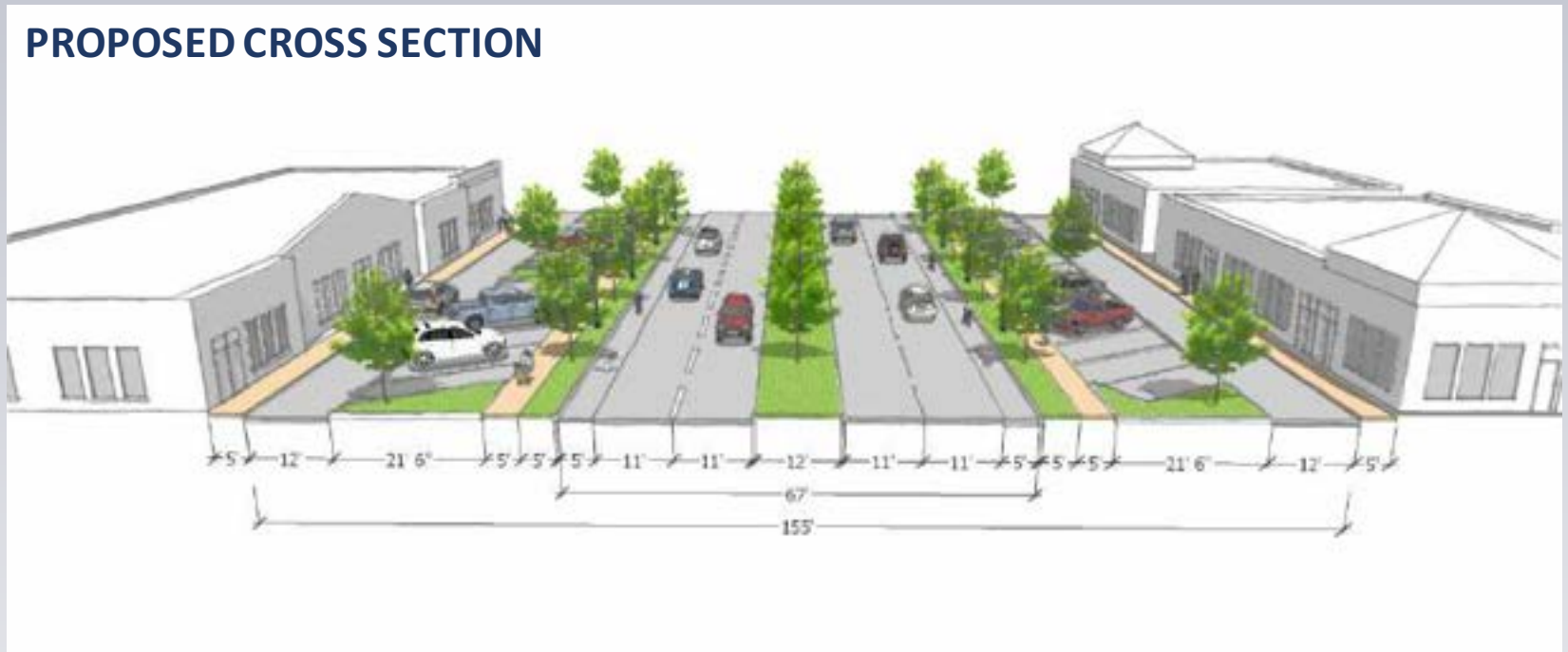


# State Highway 199 Corridor Master Plan

**EXISTING**



**PROPOSED CROSS SECTION**





# State Highway 199 Corridor Master Plan



# State Highway 199 Corridor Master Plan

## **Partners:**

- Sansom Park
- Lake Worth
- Fort Worth
- Tarrant County
- TxDOT
- NCTCOG
- Freese and Nichols

## **Project Limits:**

- Downtown Fort Worth to IH 820

## **Study Emphasis Areas:**

- Drainage Improvements
- Transportation Options
- Economic Development Opportunities
- Context-Sensitive Design Solutions

# NCTCOG Staff Contacts

## **Dan Kessler**

Assistant Director of Transportation

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## **Sandy Wesch, P.E., AICP**

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Project Engineer

(817) 704-5632

swesch@nctcog.org

## **Karla Weaver, AICP**

*SH 183 Study Contact*

Program Manager

(817) 608-2376

kweaver@nctcog.org

*A copy of today's presentation can be found at:*

<http://www.nctcog.org/trans/presentations/index.asp>



# **Update on Lake Worth Water/Sewer Projects and Watershed Protection Study**

Lake Worth Regional Coordination Committee  
June 9, 2016

Presented by:

**Water Department**

# Recent Utility Work



# Love Circle Water/Sewer Project



- 54 water/sewer services
- 8,000 LF water pipe
- 7,000 LF low pressure sewer
- 2,000 LF sewer FM
- Advertise in July, Bid in August



# *Watershed Protection Study*

- Lake Worth Watershed Protection Plan Feasibility Study Authorized by Fort Worth City Council on February 3, 2015
- Cost of the study is \$323,500
  - Builds on the Greenprinting study and lessons learned from the Lake Worth dredging project
  - Goal to reduce sediment and nutrient loading to Lake Worth
  - Focus on removing sediments from Silver Creek and Live Oak Creek through the use of off-channel sedimentation basins
  - Determine the feasibility of utilizing constructed wetlands
  - Develop best management practices
  - Recommend a water quality monitoring plan



# *Study Status*

- Task 1 – Baseline Modeling- Complete
  - SWAT (Soil& Water Assessment Tool) Model developed
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# Sedimentation facilities feasibility - Silver Creek & Live Oak Creek



- Met with quarry owners
  - Site visit
  - Sampling
- Flow with most sediment
- Storage Volumes
- Detention times
- Conceptual design
  - Most sediment at high flows
  - Very large pumps
  - Very large diversion structure
  - High capital cost
  - Pumps run very seldom
  - Maintenance issues



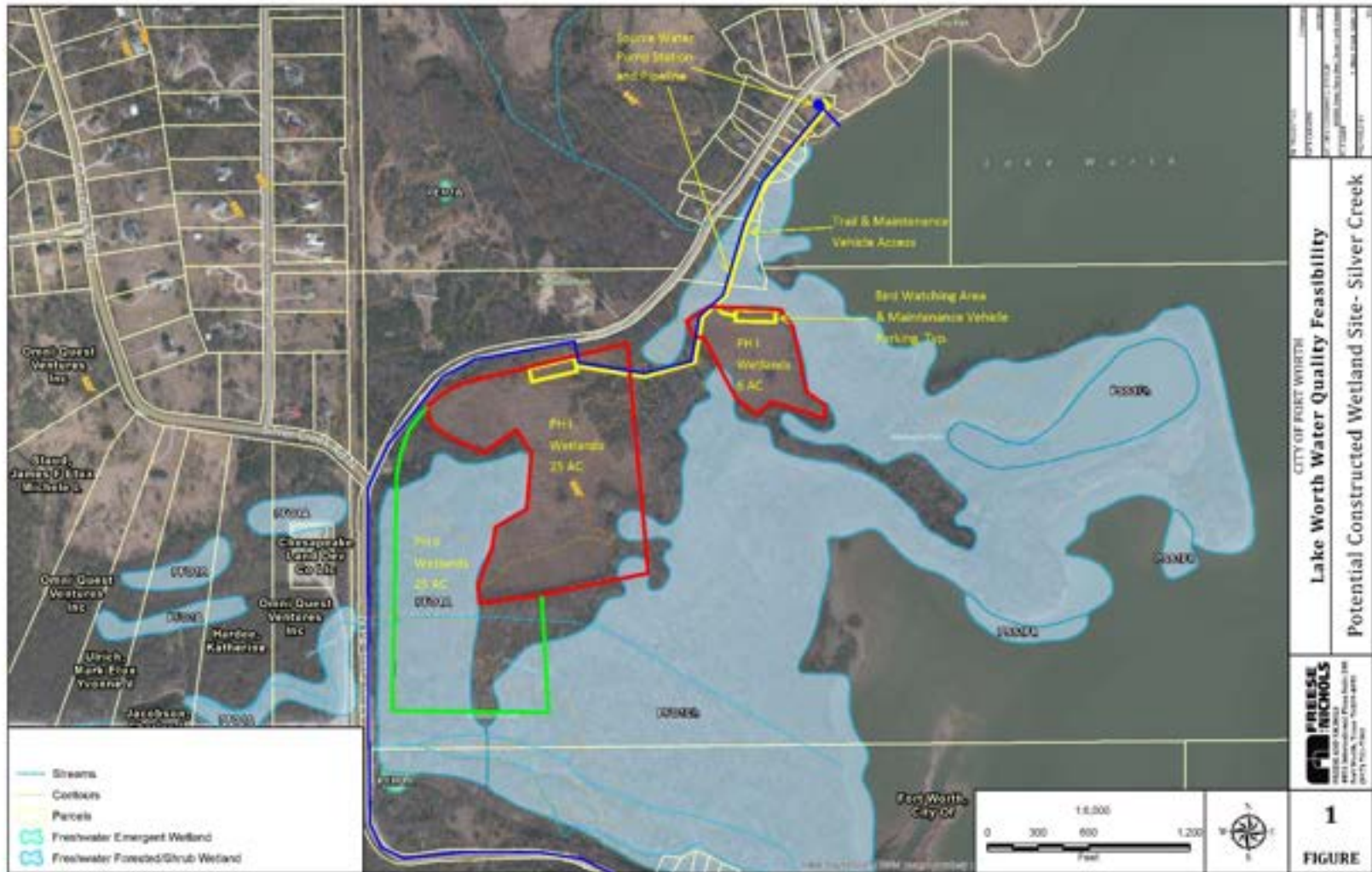
# Sedimentation facilities feasibility - Silver Creek & Live Oak Creek

- Alternate solution
- Streamside Technology Sediment Collector system
  - Infrastructure across streambed
  - Captures sediment by gravity into structure
  - Sediment pumped off-channel site; dewatered
  - Sediment reclaimed as clean sand; water returned to stream
- COE has used this technology
- Developing estimates of sediment removal
- Developing cost estimates, \$/tons removed



# Constructed wetlands feasibility

- 2 phases - Phase I in Red, Phase II in Green (partial, see next slide)



# Constructed wetlands feasibility



- Completed:
  - Conceptual design
  - Estimates of nutrient removal
  - Cost estimates, capital & O&M
- To Complete:
  - Present value cost analysis
  - Meeting with COE
  - Tech Memo





# Summary

- Both Love Circle and Watershed Protection Plan have a common goal of minimizing pollutants to Lake Worth
  - Lake Worth is a water supply source for Fort Worth/wholesale customers and River Oaks
- Both projects consider managing growth in an environmentally responsible manner
- Both projects treat Lake Worth as a valuable resource and asset that is to be valued and protected



# QUESTIONS





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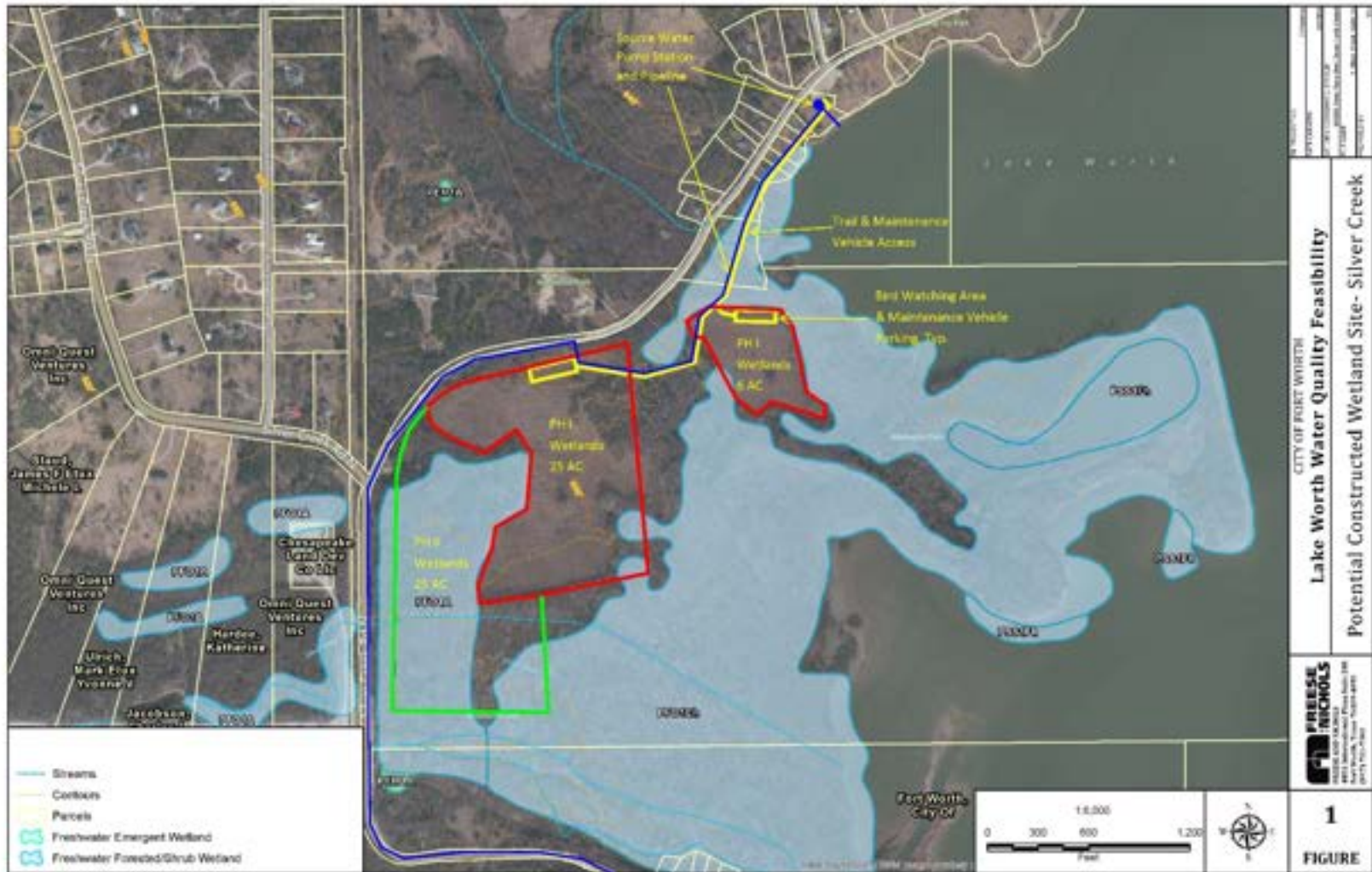
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# QUESTIONS



# Security on the Lake

Increasing safety by working together

# 2016

## Security Issues

- Home and vehicle burglaries
- Stolen mail
- Panhandlers / Homeless / Squatters
- Speeding / Racing / Auto hazard to pedestrians
- Mudders / Drifters
- Poachers
- Suspected drug and prostitution activities
- Trail safety for hike / bike trail
- Vandalism and dumping issues
- Theft of boats and tackle,
- Drowning and injury from lake use,
- And the increase of all types of crime due to the numerous guests who visit the lake.

## Created Plan For:

- **Immediate improvements** on issues which can be addressed under current management and budgets (e.g. pick up dump sites, remove illegal roads, new park cabling, etc.)
- **Initiation of planning processes** on items which require multi-year effort (e.g. create park master plans, etc.).
- **Influence discussions** on future initiatives and plans (e.g. planning policing, future park development, etc.).

# Lake Worth Area Security Plan

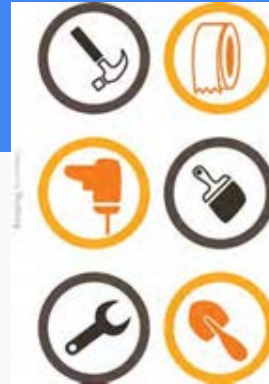
# Areas Addressed



Policing



Resident  
Involvement



Infrastructure  
Improvement



Illegal Roads and  
Dumping

# Successes

Illegal dumping: 20 sites → 1 site



# Successes

Illegal roads: 21 sites → 4 sites



# Successes

## Park Improvements: Marina Park





# 2018

## Lake Worth ENFORCE Committee

### “Engaged Neighborhoods for Crime Elimination”

- 4 Shoreline Neighborhood Associations
- Lake Worth Marshal's Office
- Fort Worth Police Department

# Example Issue

## 911 Location Problems in the Area



Presentation by:

**Michael Dallas**

President - Scenic Shores Neighborhood Association



# Naval Air Station Fort Worth Joint Reserve Base – Command Brief

Presented by:

Captain Jon Townsend, Commanding Officer



# Key Points

1. Significant economic impact
2. Proactive local & regional partners prevent encroachment
3. Robust state support catalyst for pro-military legislation
4. Strong base posture to secure –
  - Current and future mission potential
  - Community partnership opportunities





# Installation History

**1941** Tarrant Field Airdrome

**1942** Fort Worth Army Air Field

**1948** Carswell AFB commissioned

**1993** Carswell AFB closed

**1994** NAS Fort Worth JRB est.



# Installation Overview

Primary Runway:  
18/36: 11,999 x 200



~2,300 Acres  
2.9 Million ft<sup>2</sup> facility space  
Buildings:  
18 TX Air National Guard  
72 Air Force  
194 Navy/Marine  
3 Army



# Installation Overview

## #1 Purpose – Train and Deploy Combat Ready Forces

Others:

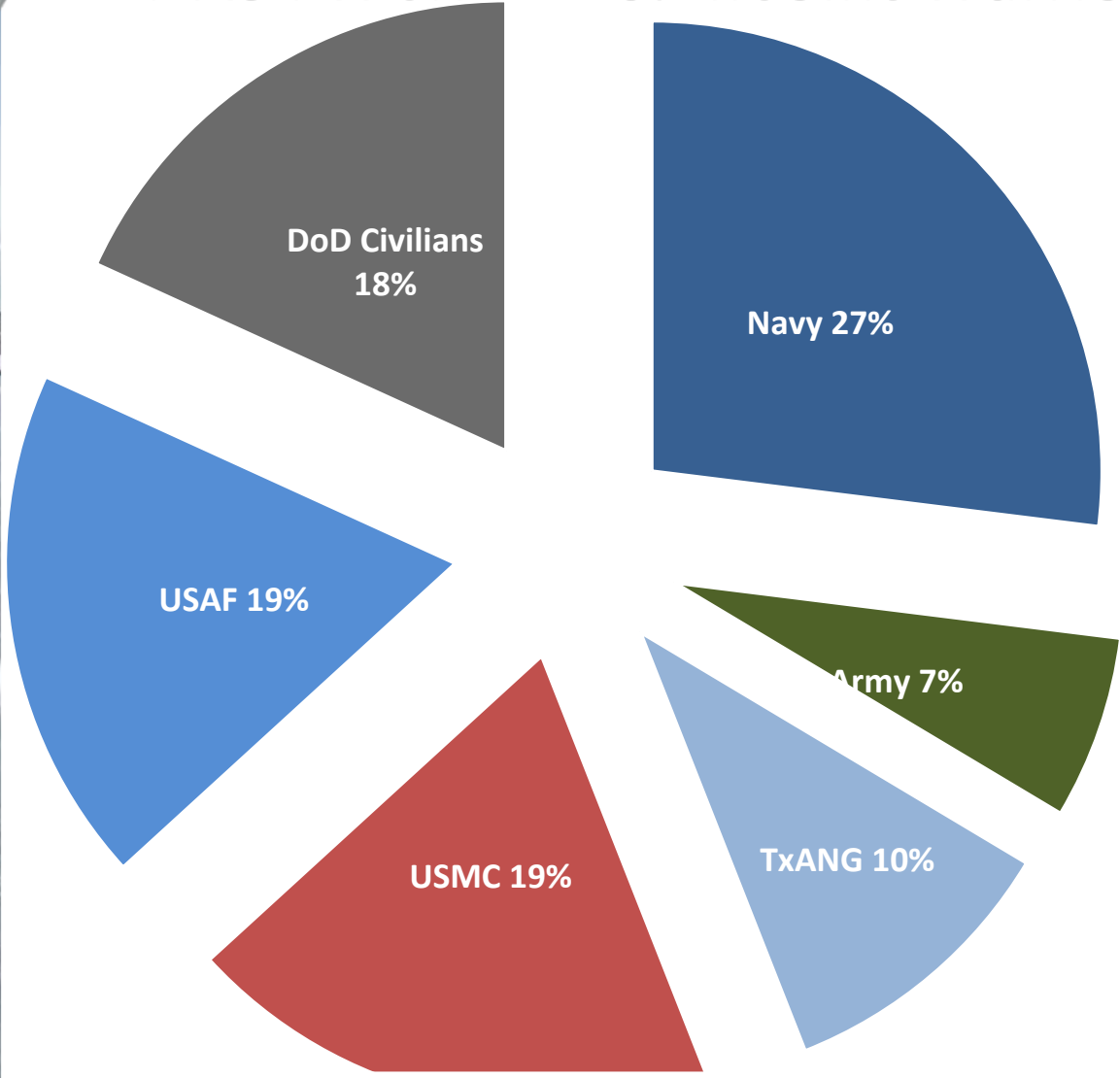
- Legal
- Family services
- Medical/dental
- Commissary and Base Exchange
- Moral, Welfare, Recreation (MWR)







# NAS FW JRB = 10.2k Joint Warriors & Civilians



**North Central Texas is home to ~212k DoD Retirees!**



# Base Economic Impact

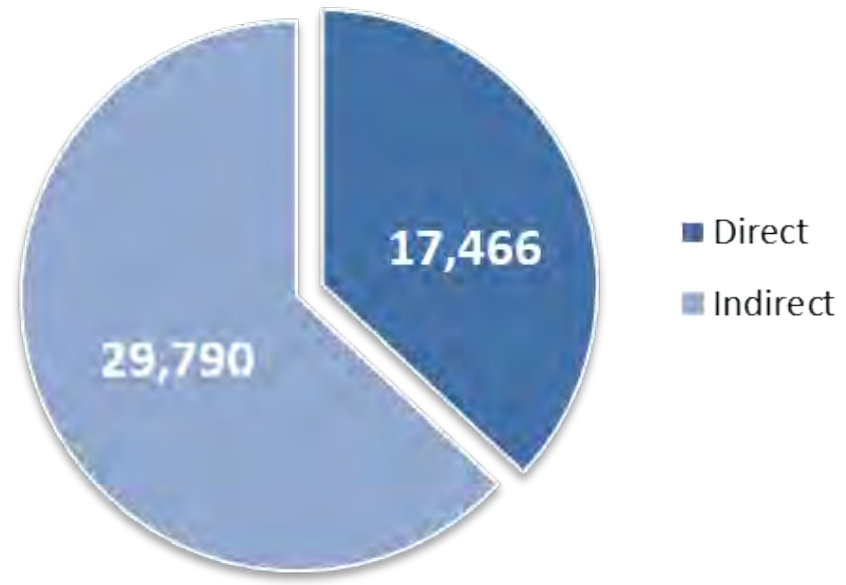
**Total Jobs = 47,256**

**Gross Domestic Product = \$4.3B**

**Aviation**

**Assets = ~\$2.5B**

**Employment**



**Total Est. Economic Impact = \$6.6B\***

Source: Texas Comptroller, \*Includes co-located facilities.



# Air Operations



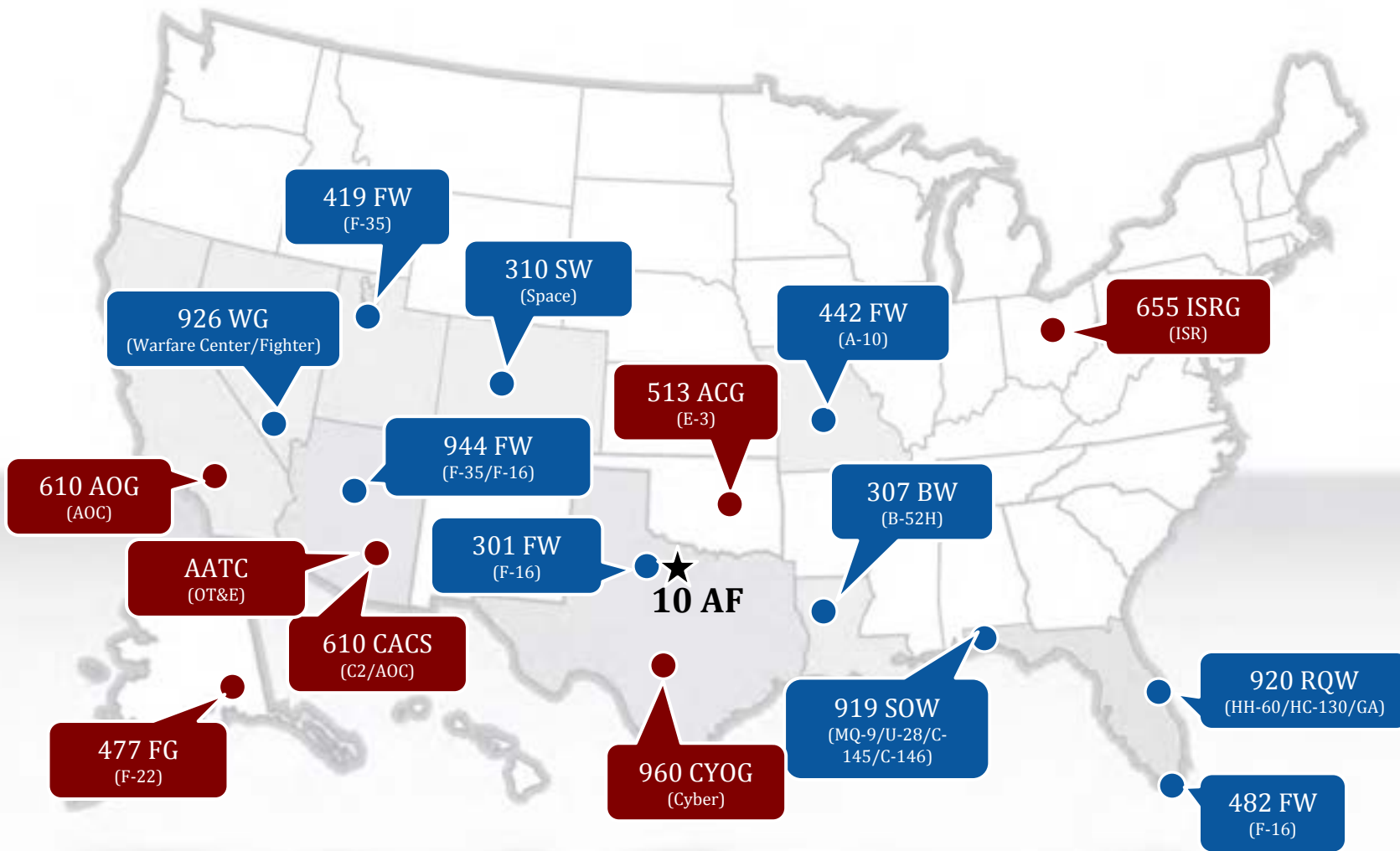
Squadrons		Aircraft	
Navy	1	C40/737	FLSW
Marines	1	F18	MAG 41
Marines	1	KC130J	MAG 41
Army	1	C12/UC35	52 <sup>nd</sup> AR
Army	1	CH47/H60	11 <sup>th</sup> AR
Air Force	1	F16	301 <sup>st</sup> FW
TX ANG	1	C130	136 <sup>th</sup> AW
LM		F35/F16	DCMA



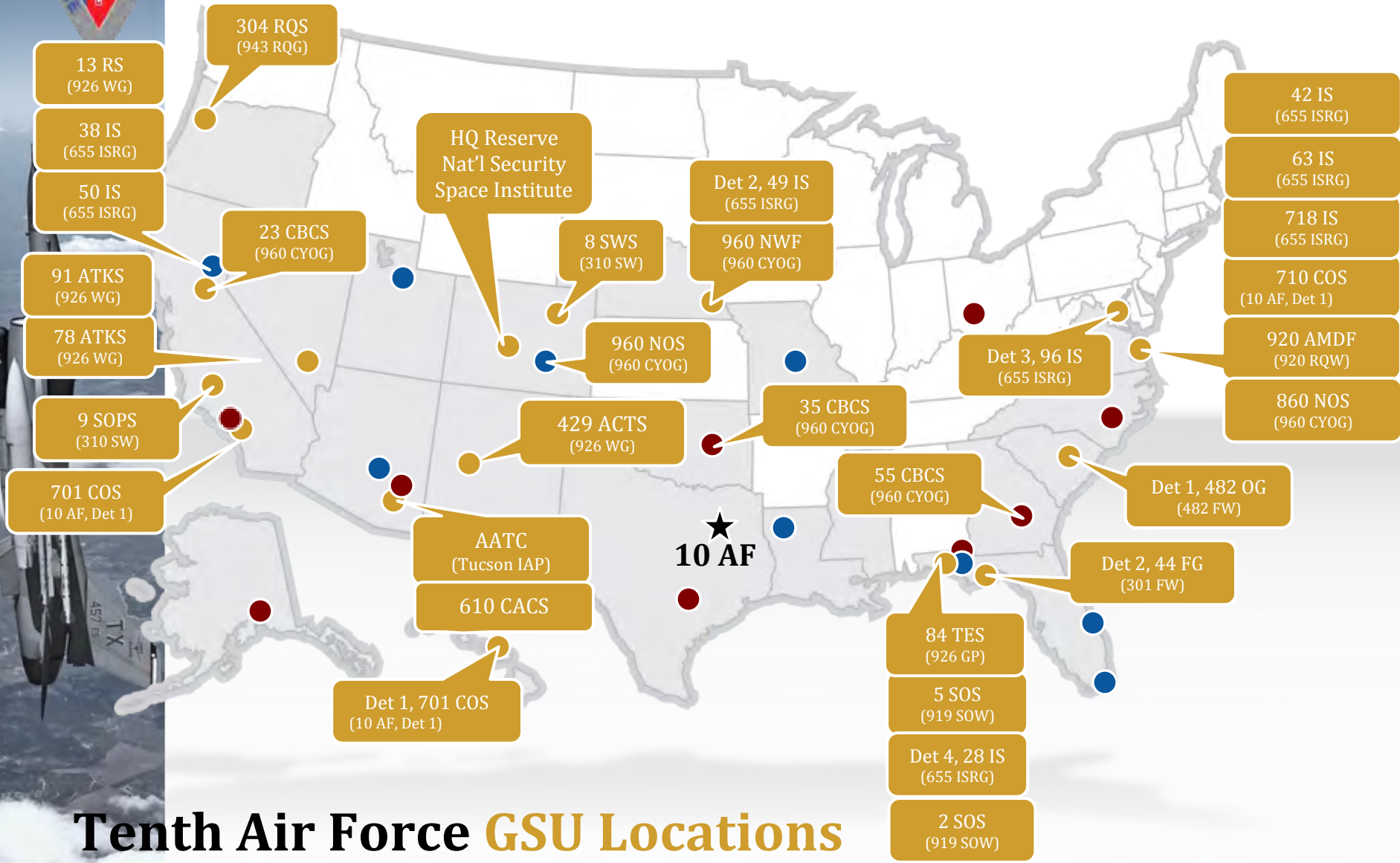


# 2017 Hurricane Relief Efforts





Tenth Air Force **Wing** & **Direct Reporting Group** Locations



# Tenth Air Force GSU Locations

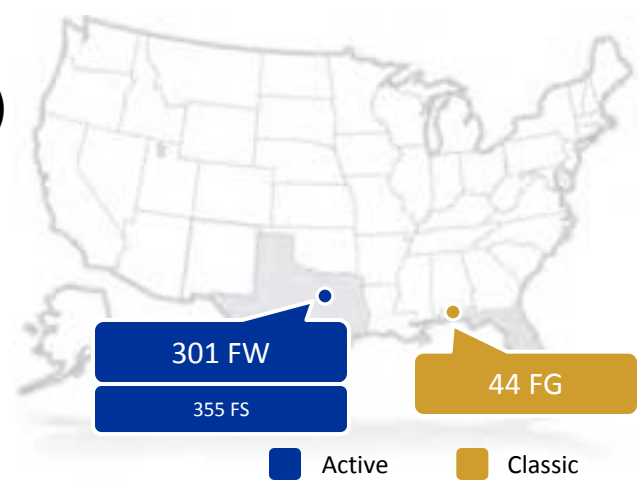


# 301st Fighter Wing Snapshot

Aircraft	Mission	Manpower
28 x F-16C	Combat	~2050

**301st Fighter Wing - NAS Fort Worth JRB (F-16C+)**

**44th Fighter Group - Tyndall AFB (F-22/T-38)**



## SUCCESSSES

- AEF Volunteerism & Mission Execution
- Total Force Integration

## OPPORTUNITIES/CHALLENGES

- Aging F-16 Fleet
- Airmen's Time
- Uncertain Budget / Continuing Resolution Authority



# Marine Aircraft Group 41

## MAG-41

Col Charles Moses  
SgtMaj Robert Christoff



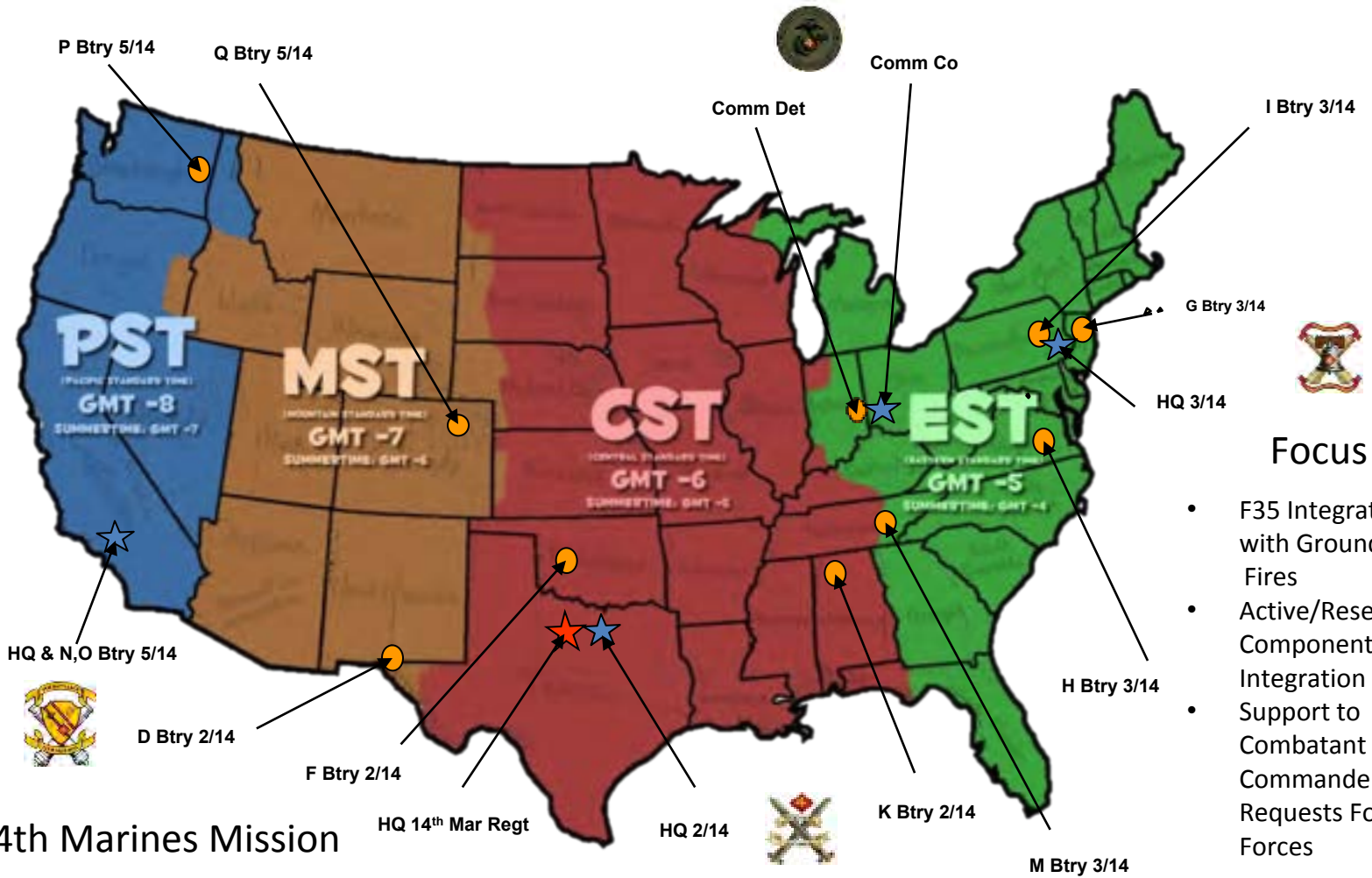
### MAG-41 Mission

**MAG-41 operates from 17 sites in 6 states.**  
 Assigned 60 rotary and fixed wing aircraft to include (12) MV-22B, (5) KC-130J, (12) F-5F/N, (12) F/A-18A++, (6) AH-1W, (4) UH-1Y and (8) RQ-7B UAS. Comprised of ~3000 Marines & Sailors assigned to 9 squadrons. Provides combat forces in support of the current Overseas Contingency Operations, Theater Security Cooperation missions, Unit Deployment Program, TECOM exercises, and daily MEF frag and exercise support.





# 14th Marine Regiment



## Focus

- F35 Integration with Ground Fires
- Active/Reserve Component Integration
- Support to Combatant Commander Requests For Forces

## 14th Marines Mission

Provides Direct Support/General Support and General Support-Reinforcing cannon and missile capabilities in support of the Ground Combat Element/Marine Air Ground Task Force, prepares and deploys trained personnel and detachments in support of the total force, and prepares and deploys Force Artillery capability to facilitate the Marine Expeditionary Force counter-fire fight and command, control and sustainment of surface-to-surface missile fires in support of the Marine Air Ground Task Force.

SMCR: 2688  
 Active: 494  
 Total Force: 3182  
 377



# 136<sup>th</sup> Airlift Wing



## Commander: Colonel G.W. Holt

- Personnel: 948 authorized
- Mission: Tactical airlift, Airdrop, Assault and Medical evacuation using 8 x C-130H2 Hercules



**LOCAL ECONOMIC IMPACT:**  
**\$76,900,814**  
**780 PART TIME JOBS**  
**324 FULL TIME JOBS**  
**353 INDIRECT JOBS**

## ANG Band of the Southwest

- Personnel: 34 authorized
- Mission: Music support of official military functions and community relations programs





# Tactical Support Wing





# Commander Fleet Logistics Support Wing





# Fleet Logistics Support Wing (FLSW) – HQ at NAS Fort Worth JRB



FLSW operates unique, fleet essential airlift aircraft worldwide to provide air logistics support to sustain combat operations at sea.





# Navy Region Southeast Reserve Component Command Fort Worth



## Commander, NRSE RCC FTW

CAPT  
Hebert Frederick III

## Command Master Chief

CMDCM(SW/AW)  
John Cordero



**7 States**

**NOSCs: 20**

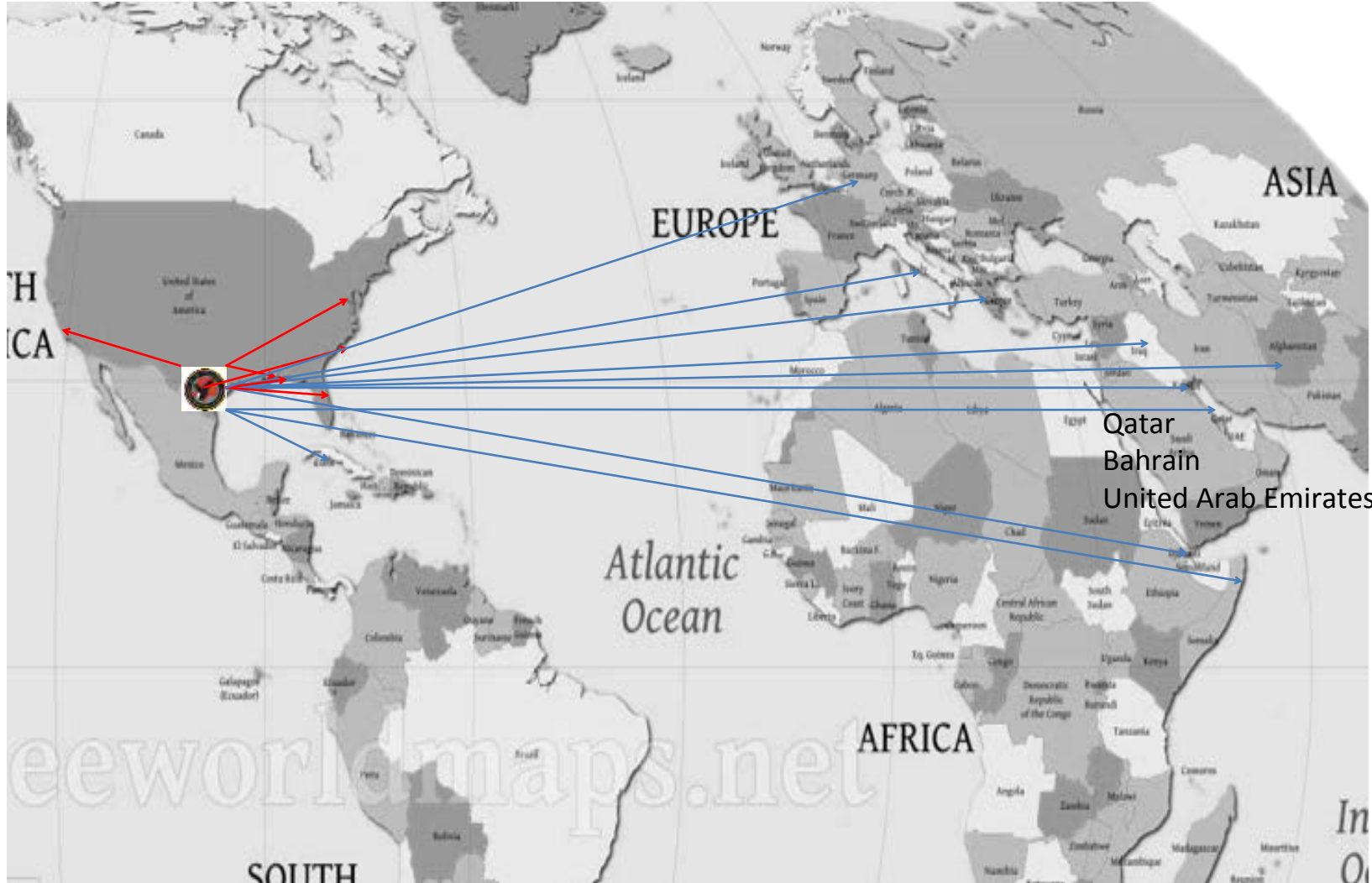
**Total Units: 294**

**Total SELRES: 7,253**





# Navy Region Southeast RCC Fort Worth Deployed Locations



→ CONUS (8 states)

→ OCONUS (12 countries)



# Mission Changes, Future Growth Opportunities



Branch	Unit	Current Location	Timeframe
Marines	VMR-1	MCAS Cherry Point	In Progress
Marines	4 <sup>th</sup> Medical Batt. Surgical Co. A	Pennsylvania & Tennessee	Pending CNIC Approval
Texas Army Guard	CH-47 Maintenance Group	Former NAS Dallas	3-5 Years
USAF Reserve	301 <sup>st</sup> Fighter Wing – F-35 Transition	NAS JRB FTW	5+ Years





# Thank you!





# CO Priorities, Vision

- Mission – training and readiness
  - Inside the fence: facilities & infrastructure
  - Outside the fence: compatible zoning and development
- Strengthening community relationships
  - Formal: RCC/COG, Fire, Police, etc...
  - Informal: Daily interaction, air show, attending civic events
- Base security
  - Active partnership with local Police/Fire (MOUs)
  - Signage, fence-line, and gate hours
- Retain, grow military tenants on base to support mission demands



City of Fort Worth

Co-Permittees

Tarrant Regional Water District

Texas Department of Transportation

# 2016 Annual Report

2011 – 2015 Permit Term

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**List of Attachments**

- Attachment 1: Tarrant Regional Water District 2016 MS4 Annual Report
- Attachment 2: Texas Department of Transportation 2016 MS4 Annual Report
- Attachment 3: North Central Texas Council of Governments Regional Stormwater Monitoring Program Third Term Final Comprehensive Report, July 25, 2016
- Attachment 4: Rapid Bioassessment Characterizations of Six Monitored Watersheds within the City of Fort Worth, Fall 2016 and Spring 2017

## List of Acronyms

BMP	Best Management Practice
CCTV	closed circuit television
CFR	Code of Federal Regulation
CFW	City of Fort Worth
COD	chemical oxygen demand
DWFS	dry weather field screening
ECC	City of Fort Worth Environmental Collection Center
EMD	City of Fort Worth Environmental Management Division
EPCRA	Emergency Planning and Community Right to Know Act
ETJ	Extra-Territorial Jurisdiction
FEMA	Federal Emergency Management Agency
FWFD	Fort Worth Fire Department
HazMat	hazardous materials
HID	high-intensity discharge (light)
I/I	inflow and infiltration
iSWM	<i>integrated</i> Stormwater Management
MBAS	Methylene blue active substances
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
NCTCOG	North Central Texas Council of Governments
NHD	National Hydrographic Dataset
NOI	Notice of Intent
NOT	Notice of Termination
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
PCB	Polychlorinated biphenyl
RWWCP	Regional Wet Weather Characterization Program
ROW	Right of way
SPCC	Spill Prevention, Control and Countermeasures
SOP	Standard operating procedure
SSCA	Sanitary Sewer Condition Assessment Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TPW	City of Fort Worth Transportation and Public Works Department
TRWD	Tarrant Regional Water District
TxDOT	Texas Department of Transportation
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USGS	United States Geological Survey

**Certification Statement**

TPDES Permit No. WQ0004350000  
Review of Stormwater Annual Report  
Permit Year: July 29, 2016–July 28, 2017

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
Fernando Costa  
Assistant City Manager  
Authorized Representative

\_\_\_\_\_  
Date

## MS4 Overview

The City of Fort Worth stormwater management program was fully implemented during the first permit term (NPDES permit No. TXS000901). The City has continued to implement the program during the current permit term for permit, WQ0004350000, as renewed by the Texas Commission on Environmental Quality (TCEQ); including changes to the program as indicated in the permit renewal application and subsequent revisions, and incorporating changes necessitated by additional or changed requirements of the renewed permit. This report is for the sixth permit year. Permit renewal is in process and The City of Fort Worth continues to operate under existing permit terms until a renewal is issued. Annual expenditures are detailed in Appendix A and the Minimum Control Measure Summary can be found in Appendix C. Attachments 1 and 2 are the annual reports for co-permittees Tarrant Regional Water District (TRWD) and the Texas Department of Transportation – Fort Worth Region (TxDOT) respectively. Attachment 3 is the Regional Stormwater Monitoring Report from the North Central Texas Council of Governments (NCTCOG).

## Minimum Control Measures (MCM)

### 1.0 MS4 Maintenance Activities

#### 1.1 Structural Controls

The stormwater collection system's operation was maintained by the following actions for the reporting period of July 29, 2016–July 28, 2017:

Drainage inlet cleaning	9,831 inlets
Culverts cleaned	665 culverts
Channel maintenance	174.8 miles

#### 1.2 Floatables

The City's Solid Waste Division is responsible for citywide trash, garbage, solid waste collection, and a household paper, plastics, and metals recycling program, as well as organizing volunteer activities such as the Cowtown Great American Cleanup and coordinating Keep Fort Worth Beautiful. The Code Compliance Department conducts illegal dumping investigations, initiates appropriate enforcement, and ensures that outdoor accumulations of trash, debris, and garbage are cleaned up. These activities reduce the discharge of floatables (litter and other human-generated solid waste). The following are some examples of the reduction effort:

5,559.2*	tons of debris removed from illegal dumps
71.03*	tons of dead animals removed
7,534	volunteers (Solid Waste sponsored cleanups)
46	number of clean up events
61.61	total tons of litter collected at all clean up events
47,710	tons of material, including paper, plastics and aluminum collected by curbside recycling program

*\*Includes storm damage*



Using a grant that the City helped secure, Downtown Fort Worth, Inc. implemented a downtown recycling program (Recycle on the Go) in 2013, using 68 dual-use containers. Weekly recyclables from this project continue to fill a three-yard dumpster.

Additionally, both co-permittees, TxDOT and TRWD, have active litter cleanup programs. TRWD sponsors annual creek/lake cleanups and manages the regional Reverse Litter campaign. See Attachments 1 and 2 for TRWD and TxDOT programs.

### **1.3 Roadways**

The City's Stormwater Management Plan describes four roadway Best Management Practices (BMPs). They address deicing/sanding operations, limited street sweeping, inlet cleaning, and roadway spill cleanup. The information below is for the reporting period of August 2016 to July 2017.

In January 2017, the City of Fort Worth begin operating two regenerative sweepers to remove litter and grit from the streets along arterial roadways. To date these sweepers have swept 2,112 road miles, which removed 720 cubic yards of debris.

No deicing products were applied to streets in preparation for freezing conditions during the reporting period.

Downtown Fort Worth Inc. (DFWI) employs contractors to mechanically sweep streets, power wash sidewalks, as well as manually sweep sidewalks using the pan and broom method in the downtown Fort Worth area daily and prior to special events. DFWI also contract for vacuuming the curb and gutter line of streets using both vacuum trucks and walk-behind sweepers. These efforts in the downtown area alone contribute 8,400 additional gutter miles of street sweeping and approximately 1,820 acres of sidewalks power washed annually.

## **2.0 Post-Construction Stormwater Control Measures**

### **2.1 Areas of New Development and Significant Redevelopment**

In 2002, 55 local governments kicked off a regional effort to address stormwater issues through the *integrated* Stormwater Management program (*iSWM*). The City of Fort Worth adopted the *iSWM* Stormwater Management Design Manual for Site Development on May 1, 2006. An updated addition of the NCTCOG manual *iSWM* Criteria Manual for Site Development and Construction was adopted by NCTCOG in February 2010. The new manual emphasizes the integration of post construction with construction runoff control with respect to both design and development review processes.

In June 2012, Fort Worth City Council adopted a Grading Ordinance to control earth-disturbing activities within the city which have a disturbed area of 0.5 acres or more to address the new requirements of this MCM. This ordinance contains measures to better ensure proper grading and drainage from all single-family home construction. Previously, only plat-related activities were subject to review for grading and drainage. In addition, a new design manual for stormwater design, Fort Worth *integrated* Stormwater Management Manual for Site Development and Construction, was adopted by reference after more than two years of

review with stakeholders in the community. This manual includes strategies or structural and nonstructural controls specifically selected for the region. In 2015, the City Council amended the Grading permit minimum threshold area requirement from 0.5 acres to 1 acre.

The most significant change in the new design manual relates to the adoption of specific guidelines governing the development and review of construction runoff controls and related Technical Standards adopted by the NCTCOG. Central to the new requirements is an integrated construction and post-construction design review process that includes all parties and a detailed checklist to be completed by the engineer and reviewed by City personnel for all public and private projects exceeding the minimum threshold.

## **2.2 Flood Control Projects**

During the City's first five-year USEPA permit term (1997-2001), 11 existing flood control structures at sumps of the Trinity River were evaluated for retrofit options to improve water quality. The report found that these sites were not good candidates for retrofitting due to site-specific conditions.

Under a new stormwater utility established in 2006, Fort Worth sold \$150 million in revenue bonds to fund stormwater improvements, primarily for flood control purposes. For all flood control projects, consultants are asked to consider the feasibility of incorporating stormwater pollution removal components in each planning study and design project they are given by the City. In 2012, a consultant was retained to provide peer review of flood control projects as an additional means of identifying and evaluating feasible water quality options. Feasibility studies addressing localized neighborhood and street flooding are required to evaluate implementation of the MS4 permit requirement for flood control projects. Additional initiatives with water quality benefits during the reporting period are highlighted below:

- **Eastern Hills Project:** In phase one, a trash rack to collect floatables and improve water quality in the project vicinity was installed at the downstream side of the road culvert draining to the detention area. The second and third phases, which address flooding in the northern part of the watershed, were designed and constructed during the 2013-2014 reporting period. Water quality improvements from these phases include removal of accumulated sediment from a lake, a grate at the lake spillway to reduce downstream flow of debris, and stream bank and bed armoring to reduce erosion at outfalls. Phase 2 of the project is completed. Phase 3 is scheduled to begin in 2017 in conjunction with a street bond project.
- **Luella Merrett Regional Detention Facility:** Building on the experience and partnership from Eastern Hills project between the Fort Worth Independent School District (FWISD) and the City of Fort Worth, a stormwater detention facility to temporarily store runoff during major rainfall events was constructed in the available open space at the Luella Merrett Elementary school. During periods of dry weather, the facility was enhanced to provide community amenities such as: walking trails, soccer and softball practice fields, and a basketball court. The side slopes were planted with native grasses which require less mowing and irrigation. Stormwater discharge is treated with a Bay Separator (structural BMP), which removes sediment and trash before discharge enters the facility.

- **Geomorphological Studies:** Localized erosion problems in urban creeks are symptomatic of reach-wide instability issues as creeks respond to increased flow regimes from urbanization. To address reach-wide erosion processes, a geomorphologist will prioritize erosion hot spots, and perform geomorphologic and engineering analyses to identify underlying contributing instability processes and alternatives for remediation. During the fourth reporting period geomorphological assessments were conducted for Little Dossier Creek, parts of Cottonwood Creek downstream of Sandy Lane crossing within Sandy Lane Park, Edgecliff Creek within Candleridge Park, and Howards Branch Creek within Overton Park north of Bellaire Drive South. During the fifth reporting period, the Sandy Lane design was complete and construction begun. Major components of engineering design guided by geo-morphology were stream bank stabilization with toe protection to scour depth, matching of storm drain flow line to creek flow line, and creek grade control with grouted rock and self-launching stone drop structures. Construction is on-going. New geo-morphological assessments were performed for the culvert and outfalls at the Cooks and Ederville road crossings of an un-named tributary of Cottonwood Creek, and at the 28<sup>th</sup> Street crossing of Lebow Creek. The City-wide erosion potential map is undergoing final reviews for its use as an educational tool in development.

The Sandy Lane stream project was completed during reporting period. The City-wide erosion potential map was completed during reporting period. Geo-morphology based engineering design erosion mitigation at the downstream end of the Cooks culvert was completed during report period. Geo-morphology assessment recommended leaving culvert and stream bed and bank “as is” at the Ederville crossing.

- **Lower Como Erosion Control:** Parts of the channel banks downstream from the Lake Como dam have degraded. In order to restore the channel banks to more natural conditions, natural channel design techniques are being evaluated to reduce stream erosion. Engineering design was completed during the 2013 permit year. Erosion control design consisted of replacing existing concreted riprap, which was being undermined, with articulating block mat and redi-rock blocks along slopes. Along the vulnerable meander sections of the Lower Como Creek bend way weirs and soil retention blankets with native vegetation will be installed. The project was bid on in April 2016, and was completed during the reporting period.
- **Central Arlington Heights:** This area of the City has significantly undersized storm drains. Due to limited availability of open space for flood control, detention is being located below streets in box culverts along Western Avenue and Ashland Street. Additional surface detention with water quality benefit for the first flush runoff is being located on a lot at the southeast corner of Hulen Street and Bryce Avenue. The Ashland Street underground detention was completed in a previous reporting period. Construction of detention at corner of Hulen Street and Bryce Avenue and underground detention below Western Avenue was completed during the reporting period.

- Mercado Channel: This channel has experienced bank erosion and reduced flow capacity. During the reporting period, the banks were stabilized with retaining walls, articulated concrete blocks, and soil retention mats, and the project is complete.
- Trinity Boulevard: This bridge project replaces undersized culverts and raises the roadway to convey a 100-year flood. A stilling basin to dissipate flow energies is being constructed upstream of the bridge to prevent downstream scouring. Articulating blocks are being used for erosion protection of the embankments. This project was completed during the reporting period.
- Dry Branch Detention: The Dry Branch Creek drains a 3.69 square mile area of the north-central portion of the City into the Trinity River. This project aims to relieve downstream flooding by construction of an 8.3 acre detention basin on City-acquired property in an area between Hollis and East 28th Street and Blandin Avenue and North Chandler Drive. A forebay will remove debris and sediment, and the detention basin will detain and slowly release flood waters. The project was bid in May 2016 and has been substantially completed during the reporting period.
- Northside Service Center: Low impact development (LID) features are being incorporated, to the extent practicable, at a proposed new service center. Permeable pavement, bioswales, bioretention, rainwater harvesting, and wet ponds are under consideration. The project will serve as a demonstration site for water quality management practices that could be implemented at development sites. Best management practices will include bioretention areas along parking lot medians, wet ponds, water reuse for irrigation from wet ponds, and structural BMP units to remove trash and suspended solids from runoff. During the reporting period relevant permits were obtained, including mitigation for wetlands, and a construction contract was negotiated. Phase 1 and 2 (of 3 phases) construction began during reporting period, and construction activities are on-going. Wet ponds are on-hold pending water rights approval from TCEQ. The Northside Service Center is a multi-phased capital project established to effectively and efficiently provide City services to the City's northern areas.

The bio-swales associated with Phase 1 of construction has been completed. Phase 2 bio-swales/bio-retention areas are under final design review and will be completed during the next reporting period. The water-rights application for the wet ponds has been given administrative review, and is undergoing technical review.

- Stream Assessment Studies: Stream-wide assessments were conducted on 42 flood control studies. These assessments are being conducted to identify areas of potential stream instability and erosion/sedimentation problems so that corrections can be considered in the planning and design process. For more erosion prone creeks, such as Royal Creek, stream geomorphologic surveys were conducted by specialists. As of the reporting period, 23 studies were completed with the rest at 90% completion. Erosive areas identified from the stream assessments are being investigated and remedied for localized problems as practicable.

All but 2 watershed studies are completed. The remaining 2 watershed studies (Big Bear Creek, and Seybold Creek) are at 90% of completion and anticipate to be complete during the next reporting period.

- **Neighborhood Studies**

During the reporting period 6 neighborhood studies were conducted to resolve closed storm drain and localized street block level flooding. These studies used specialized two dimensional modeling software to evaluate and resolve the localized flooding problem. When feasible and practicable, the neighborhood studies may advance to more detailed engineering design and construction projects.

The following new projects were initiated during the reporting period.

- **Oakwood Trail Storm Drain Improvements:** An earthen channel behind Oakwood Trail Town Homes infalls into a 48-inch line which outfalls into a lower channel at the north side of the townhomes. The existing channels were in very poor condition; including severe erosion adjacent to the townhomes and bank erosion within the channel. The project was constructed as part of the Miscellaneous Contract during the current reporting period. The construction consisted of extending the intermediate pipe section 25' upstream and 40' downstream to address the worst areas of bank erosion. Headwalls were added, as well as, a ShoreFlex mat pilot channel over a portion of the intermediate pipe section where it is currently eroded and exposed.
- **Greenfield Acres Drainage Improvements:** The Greenfield Acres neighborhood has county-type roads with an existing barrow ditch drainage system. An undersized existing channel with a mapped floodplain runs through the neighborhood creating numerous historic drainage problems, and potential flooding downstream to Marine Creek Lake. The drainage improvement project incorporates underground storm drain system with drop inlets or headwalls in the barrow ditches, which are to remain in place. Two detention ponds acting in series will occupy several properties within the extent of the current floodplain, which will reduce flooding of the neighborhoods south and southeast of Greenfield Acres. Additionally, by slowing flows, detention ponds help with sediment removal. The southerly detention basin will be constructed in Phase 2. A channel will be built across this basin site under the current project, and is scheduled for construction during the next reporting period. An early phase, North Hill Lane, was separated out from the major project and was constructed under the miscellaneous contract in January 2017.

### **3.0 Illicit Discharge Detection and Elimination**

#### **3.1 Illicit and Allowable Discharges**

The City of Fort Worth has listed all allowed non-stormwater discharges in the Environmental Protection and Compliance Chapter of City Code. The Environmental Code was formally adopted by the City Council on November 28, 1995 and continues to be updated as necessary.

Chapter §12.5, Article III, Stormwater Protection, describes what constitutes a stormwater violation and what enforcement actions can be taken and can be found online at [http://library.amlegal.com/nxt/gateway.dll/Texas/ftworth\\_tx/cityoffortworthtexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:fortworth\\_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/ftworth_tx/cityoffortworthtexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:fortworth_tx). USEPA made this code available as a model ordinance for use by other cities by publishing it on their national Web Page. A list of 17 prohibited non-stormwater discharges can be found in Chapter §12.5-302 of the City Code.

### **3.2 TRWD and TxDOT Programs**

See Attachments 1 and 2 respectively, for TRWD and TxDOT IDDE programs.

### **3.3 Detection and Elimination of Illicit Discharges**

During the permit year, the following illicit discharge detection and elimination activities were accomplished:

405	Dry weather field screens
50	Wet weather field screens
57	Spill or abandoned waste responses
222	Complaint responses
4,461	Inspections
953	Verbal notice of correction action
105	Corrective notices issued
0	Criminal citations issued

The City of Fort Worth, as per the permit, requires a discharger to eliminate an illicit discharge or stop the improper disposal practice as soon as possible. If it is not possible within 30 days to eliminate the discharge, a schedule or plan to eliminate the discharge must be submitted by the discharger. Until the discharge is eliminated, the discharger shall take all reasonable measures possible to minimize the pollutant discharge to the MS4.

#### **3.3.1 Status of Complying with New Requirements**

The SWMP includes a list of techniques used for detecting illicit discharges which includes dry weather and wet weather field screening as well as complaint investigations and inspections. Appropriate actions and enforcement procedures for removing the source of an illicit discharge are outlined in the SWMP as well. These include corrective notices and issuance of criminal citations.

### **3.4 Overflows and Infiltration**

The City's Water Department participates in TCEQ's voluntary Sanitary Sewer Overflow Initiative (SSOI) program. All sanitary sewer overflows (SSOs) are reported to the TCEQ. The goals of the initiative are to reduce the number of SSOs that occur each year in sewer collection system and to address SSOs before they harm human health, safety, or the environment and before they become enforcement issues. In general, a significant overflow contains a large volume of sanitary sewer discharge (>50,000 gallons or more) that could adversely affect a public or private source of drinking water or the environment.

The following sanitary sewer overflows were reported for permit year:

26	Significant overflows	91,755 gallons
157	Total overflows	123,010 gallons

The Water Department continues a proactive preventative sewer cleaning and maintenance program. The program includes routine city-wide inspections, cleaning, repair, oil and grease removal, utility access point inspections, long-term sewer line rehabilitation and public outreach activities. There are two distinct programs for investigating the condition of its existing sanitary sewer collection system.

The Sanitary Sewer Condition Assessment Program (SSCA) involves the cleaning and inspection of small diameter sanitary sewer lines (less than 24-inch diameter) throughout the City. The SSCA program uses closed-circuit television (CCTV) to inspect the sanitary sewer collection system for pipe defects, blockages, and line capacity. The lines are thoroughly cleaned as part of the process. As problems in the sanitary sewer collection system are identified, field operations staff recommends repairs, replacement, and/or schedules future maintenance.

The program is a comprehensive investigation of all sanitary sewer lines 24-inch diameter and above. The program consists of simultaneous sonar/laser/CCTV investigation of the large diameter sewer lines to identify segments requiring cleaning and those requiring repair. Lines requiring cleaning are cleaned immediately while segments requiring repair are identified for rehabilitation or replacement.

The Water Department responds to sewer collection system discharges or other problems on a seven-day per week, 24-hour per day basis as generated by customer complaints. In an area where a sanitary sewer discharge has occurred, wastewater is removed by impoundment and/or by-pass pumping into the sewer collection system. The area is cleaned and disinfected to lessen or eliminate the impact of wastewater discharge to the environment and public health.

The Water Department aggressively attempts to determine sanitary sewer collection system defects such as cracked pipes or offset joints that allow seepage of wastewater from the sanitary sewer collection system. Joint repairs are conducted as problems are identified. Additionally, recommendations are made for replacement or trenchless rehabilitation. Any potential seepage into the stormwater system is monitored and repairs made as necessary.

### **3.5 Household Hazardous Waste and Used Motor Vehicle Fluids**

In 1997, the City of Fort Worth established a permanent Household Hazardous Waste (HHW) collection facility, the Environmental Collection Center (ECC), to serve residents of Fort Worth and other participating neighboring municipalities. In addition to waste drop off at by residents at the ECC, personnel also conduct mobile collection events throughout the year. Acceptable wastes include acids, aerosol cans, batteries, antifreeze, brake fluid, craft and hobby chemicals, degreasers, drain cleaners, fertilizer, fluorescent and other light bulbs,

cooking oil, herbicides, pesticides, motor oil, paint, stain, paint thinner, photo chemicals, and pool chemicals.

During the first year of operation, Fort Worth established interlocal agreements with 17 other municipalities and served 7,118 households from residents of Fort Worth and the participating cities. The program has grown steadily and now serves more than 26,000 households from Fort Worth and 51 participating entities, collecting approximately 1.7 million pounds of household chemicals and waste, of which 26 percent was recycled or reused. Table 1 shows disposal, recycling, and reuse of materials collected at the ECC during the reporting period. Table 2 illustrates total number of households served for participating cities.

**Table 1 - HHW from Fort Worth residents, disposal, recycling, and reuse of waste (in pounds) collected from Fort Worth Residents at the ECC and mobile events for the reporting period August 2016 – July 2017**

	<b>Pounds of Waste: August 2016 – July 2017</b>
<b><u>DISPOSAL</u></b>	
Aerosols	59,881
Pesticides	76,995
Flammables	46,895
Flammable Liquids	225,968
Dry Cell Batteries	28,164
Corrosives	8,211
Latex Paint & Related Material	983,436
Other HHW (not elsewhere classified)	954
Household Cleaners	29,676
<b><u>RECYCLING</u></b>	
Cooking Oil	26,362
Motor Oil & Filters	163,811
Antifreeze	19,415
Light Bulbs	26,209
Lead Acid Batteries	8,660
<b><u>REUSE</u></b>	
Help Yourself Shelf (mostly paint)	215,695
<b>TOTAL:</b>	<b>1,920,332</b>



**Table 2 - Households served by the ECC (including mobile events) for the reporting period of August 2016–July 2017**

<b>Households Served August 2016 - July 2016</b>			
<b>Municipality:</b>	<b>Households</b>	<b>Municipality:</b>	<b>Households</b>
Alvarado	3	Kennedale	158
Arlington	4,760	Lake Worth	2
Azle	38	Lakeside	3
Bedford	551	Mansfield - City Program exists now	21
Benbrook	410	Midlothian	51
Briaroaks	1	North Richland Hills	300
Burleson	451	Oak Leaf	9
Cedar Hill	281	Pantego	64
Cleburne	210	Parker County	29
Colleyville	595	Reno	1
Crowley	6	Rhome	1
Dalworthington Gardens	55	Richland Hills	88
Decatur	35	River Oaks	104
Edgecliff Village	1	Roanoke	59
Ellis County	-	Saginaw	239
Eules	374	Sherman	40
Everman	1	Southlake	575
Forest Hill	69	Springtown	-
Fort Worth	9,002	Stephenville	-
Glenn Heights	-	Tarrant County	25
Godley	7	Trophy Club	36
Grand Prairie	1,210	TRWD	-
Grapevine	976	Upper Trinity Regional Water District	226
Haltom City	258	Watauga	63
Haslet	4	Waxahachie	81
Hood County	141	Weatherford	11
Hurst	872	Westlake	3
Johnson County	9	Westover Hills	2
Joshua	7	Westworth Village	14
Justin	22	White Settlement	50
Keller	639	<b>Total For All Participating Cities:</b>	<b>23,243</b>

### **3.6 Dry Weather Field Screening**

The permittees have implemented Dry Weather Screening Programs, as described in Section 8.1 of this annual report, to locate portions of the MS4 with suspected illicit discharges and improper disposals. Results of screening efforts during this permit term as well as a more complete description of the program may also be found in Section 8.1 of this report. The entire MS4, but not necessarily each individual outfall, will be screened at least once during the five-year permit term.

### **3.7 NPDES and TPDES Permittee List**

The City of Fort Worth maintains an industrial and a construction database containing a list of operators and construction sites that are located within the city limits. This database contains the name, location and permit number issued by the TCEQ that authorizes stormwater discharges from construction activities.

### **3.8 MS4 Map**

All MS4 assets have been mapped from schematics (drawings/plans) and have been field verified. The field survey was completed in 2013. Waters of the U.S. are encompassed in the National Hydrography Dataset (NHD) as maintained by the United States Geological Survey (USGS). Currently, stormwater infrastructure data are maintained by the Stormwater Management Division within the Transportation/Public Works Department. MS4 assets are mapped in any newly developed areas, annexations or redevelopments.

### **3.9 Spill Prevention and Response**

Spill Prevention is addressed by the Fort Worth Fire Department's (FWFD) Fire Prevention Bureau. The City of Fort Worth has two primary programs to address spills that may impact the MS4. The FWFD has a hazardous materials (HazMat) Squad to address major incidents and Environmental Management has a response team to address minor incidents.

#### **3.9.1 FWFD Prevention Program**

The City of Fort Worth provides spill response via FWFD's five HazMat squads strategically located throughout the city. For most small motor vehicle accidents, FWFD remediates any spills and transports waste absorbent and other materials to the fire station. On a regular basis, the Environmental Management Division picks up collected waste from the fire stations for proper disposal.

#### **3.9.2 Environmental Management Division Spill Response**

Environmental Management staff are on-call to assist FWFD in remediating small spills such as those generated in motor vehicle accidents. They also routinely address incidents such as abandoned waste drums and large chemical spills in or threatening waterways.

During the 2016–2017 permit year, this group responded to 57 spill incidents and disposed of approximately 2,133 gallons of waste (primarily auto fluids from motor vehicle accidents) collected by the FWFD. Large scale spill clean-up and remediation is conducted through two contracts with third party companies.

## **4.0 Pollution Prevention and Good Housekeeping for Municipal Operations**

Because the City of Fort Worth has been under continuous MS4 permit coverage since 1996, some of the components of this MCM, such as reduction of pollutants from road repair and from pesticide, herbicide, and fertilizer applications, were requirements of previous permit terms and were established prior to the current term. Waste handling procedures to ensure proper disposal of waste, although not a previous permit requirement, were in place prior to the current permit term. For the remaining new requirements, programs were developed or existing programs were enhanced to ensure compliance as discussed in this section.

### **4.1 Status of Complying with New Requirements**

Current street maintenance practices and street sweeping activities are described in MCM 1. Discharge of pollutants from road repair disturbing an area of one acre or a common plan of development that is an acre or greater is controlled through BMPs established as part of the required construction permitting (TXR150000). Contracts for road repair and maintenance or other projects that may result in soil disturbance, such as building demolition, include requirements to maintain stormwater permit coverage and stormwater Best Management Practices as necessary. For municipal facilities subject to this MCM, BMP guides have been designed to reduce pollutants to the maximum extent practicable.

For the City's airports and wastewater treatment plant, industrial stormwater permit training is used to satisfy the training requirement of this MCM. For facilities with established Spill Prevention, Control, and Countermeasures (SPCC) plans, stormwater training is incorporated into the required SPCC training. For other facilities, stormwater training is either presented as a stand-alone unit or incorporated as part of safety training, or other established training programs, using videos and other materials developed by NCTCOG. Training was conducted at one City facility: Meacham International Airport during this permit term.

The most effective training may not be scheduled classes but rather reminders provided by environmental personnel regarding proper procedures as they routinely visit sites for collection and disposal of waste, petroleum storage tank inspections, facility inspections, or other purposes. Inspections were conducted at Brennan Service Center and the Southeast Landfill. Technical assistance was provided at James Service Center.

The City of Fort Worth continues to participate in internal recycling. During this permit term, internal recycling was increased from just paper to include plastics (including plastic bags) and metals. One hundred and ten facilities operated by the City of Fort Worth now participate in single-stream recycling efforts. Individual facilities choose the recycling program that works best for their building. A few facilities still haul their own recycling due to logistical issues or lease restrictions.

## 4.2 Waste Handling

For a discussion of management practices associated with MS4 maintenance, refer to the report Section 1.0 MS4 Maintenance Activities.

The City maintains a contract for recycling of used oil and other fluids collected as a result of equipment maintenance activities. Contracts are also held with waste disposal contractors for proper disposal of wastes including, but not limited to hazardous, non-hazardous, special, and solid wastes; a variety of lights including high pressure sodium high intensity discharge (HID) lamps, incandescent bulbs, fluorescent lamps and tubes, vapor lamps, and metal halide HID lamps; light ballasts that may or may not contain PCBs; e-waste; USDA regulated garbage; and biohazardous materials. Staff from the Environmental Management Division oversee these waste disposal activities and ensure that wastes are properly stored to prevent discharge of pollutants prior to collection and disposal.

The following waste amounts (in pounds) were collected and disposed of properly during the sixth permit term.

Hazardous waste	26,551
Universal waste	59,198
Biohazardous waste	3,310
Nonhazardous waste	86,313
Material reused or recycled	41,973

## 4.3 Pesticide, Herbicide, and Fertilizer Application

City staff from the Park and Recreation Department apply pesticides, herbicides, and fertilizers on City owned property. In addition, the City has an herbicide spraying program to minimize vegetative growth in storm drainage channels. Selected ditches are sprayed once or twice per year. Plants such as cattails and young willow trees are specifically targeted, as they are especially disruptive to stormwater flow. To prevent contamination of these storm drains, only products that are EPA approved for application in and around waterways are used. The main cause of pesticide/herbicide/fertilizer problems in waterways concerns proper use and disposal of the products. To assure that these products are used correctly, City staff and contractors must be properly licensed by the State of Texas Structural Pest Control Board to participate in any spraying program. Training for personnel involved in pesticide and fertilizer application was conducted at 13 City facilities (Golf, Parks, Airports) during the permit term. This training is ongoing at City facilities and two trainings for applicators were held during the reporting period by the Parks and Recreation Department.

## 4.4 List of Municipal Facilities

The City maintains a list of all city-owned or leased properties. Nineteen facilities have been identified as being subject to the requirements of the Pollution Prevention and Good Housekeeping for Municipal Operations Minimum Control Measures. The two airports and the

wastewater treatment facility are covered under the TPDES Multi-Sector General Permit for stormwater discharges associated with industrial activity.

## 5.0 Industrial & High Risk Runoff

The City of Fort Worth has an established Industrial and High Risk Runoff program to identify and evaluate facilities with a higher potential to negatively impact stormwater quality. A majority of the facilities identified in this section are governed by the monitoring, reporting, and inspection requirements of their own TPDES or NPDES stormwater permits. The stormwater leaving these sites ultimately reaches the City of Fort Worth's storm drain system and as such, the quality of this water must be in compliance with the goals contained in the City's MS4 TPDES stormwater permit. To ensure that this is the case, the plan outlined below details the priorities and procedures for inspections and for establishing and implementing control measures for these facilities by the City of Fort Worth.

During the permit term, the City of Fort Worth offered two workshops for industrial facilities. One workshop was in September 2016 and focused on renewal of the Industrial Stormwater Multi-Sector General Permit TXR050000 which was renewed and effective on August, 14, 2016. The second workshop focused on stormwater compliance and was held in June 2017. Each workshop included an overview of stormwater compliance for industrial facilities as well as a time set aside for one on one assistance. Facilities were encouraged to bring their Stormwater Pollution Prevention Plan and monitoring results to review with inspectors. Facilities can schedule one-on-one educational and compliance assistance with an inspector throughout the year by appointment.

### 5.1 Priorities & Procedures for Inspecting and Monitoring High Risk Runoff Facilities

Notification data, investigations, inspections, and resulting enforcement actions conducted by the industrial inspection program during the reporting period of July 29, 2016–July 28, 2017 are summarized in the tables below. The Industrial Stormwater Multi-Sector General Permit TXR050000 was renewed and effective on August, 14, 2016. Notification data below represents both new facilities and facilities that the City of Fort Worth has received renewal information from. The City of Fort Worth continues to work with facilities to receive a copy of their renewal paperwork.

#### Notification Data

All Industrial Sites	Notices of Intent	No Exposure Certifications
71	54	7

#### Inspection Data

Investigation Type	Number of Investigations
Industrial inspection	29

### Enforcement Data

Verbal Notice of Violation	Written Notice of Violation	Citations Written	Total
0	0	0	0

## 5.2 Industrial & High Risk Monitoring Program

In an effort to avoid duplication of effort, the City of Fort Worth uses benchmark monitoring data required by the Multi Sector General Permit (MSGP) of certain industries covered under this authorization. Monitoring data collected during this permit term was for the monitoring period of January 2016–December 2016. A summary of the results received by the City is included in this report in Appendix B. A result of “Fail” indicates that one or more parameters reported exceed one or more of the benchmark value for that facility.

Results of analysis are indicators that modifications of the SWP3 may be necessary. The facility’s pollution prevention team must investigate the cause for each exceedance and document results of this investigation in the SWP3 within 90 days following the sampling event. Environmental Management Division staff review these plan modifications during normal site inspections.

## 6.0 Construction Site Stormwater Runoff

The City of Fort Worth and its co-permittees have established Construction Site Stormwater Runoff programs designed to reduce the discharge of pollutants in to the MS4 from construction sites that are one or more acre(s) in size or that are part of a larger common plan of development or sale that is one or more acre(s) in size. Section §12.5-302(a) of the City Code prohibits discharges of pollutants into the MS4 from all sources, including construction sites. EMD has an active TPDES construction site inspection program utilizing multiple inspectors. Enforcement of control measure requirements is through Section §12.5-334 of the City Code giving inspectors the ability to enforce NPDES/TPDES regulations.

### 6.1 Activities operated by the City of Fort Worth or its contractors

#### 6.1.1 Inspection of Construction Sites and Enforcement of Requirements

The City’s permit requires implementation of a construction site runoff program that includes the inspection of construction sites and enforcement of control measure requirements. The program, incorporating the above requirement, has been in operation since May 1999. The program currently includes seven employees for plan reviews, permit compliance inspections, educational activities, and enforcement.

Notification data, investigations, inspections, and resulting enforcement actions conducted by the construction inspection program during the reporting period of July 29, 2016–July 28, 2017 are summarized in the tables below.

**Notification data**

All Construction Sites	Large Construction Sites	Small Construction Sites
223	118	105

**Inspection Data**

Investigation Type	Number of Investigations
Construction Inspection	4,432

**Enforcement Data**

Verbal Notice of Violation	Written Notice of Violation	Citations Written	Total
887	95	0	982

**6.1.2 Education and Training of Construction Site Operators**

The City of Fort Worth participated with the cities of Dallas, Arlington, Irving, Garland, Mesquite, and Plano in assisting NCTCOG in designing a NPDES Construction Inspection Training Program. The final program consists of a one-day workshop offered by NCTCOG multiple times during the year. The course has evolved to cover topics including how to read and interpret a Stormwater Pollution Prevention Plan, how to identify improperly installed BMPs, methods to prevent stormwater pollution, regulatory requirements, techniques for conducting site inspections, and record keeping requirements for site operators. New staff are required to complete the training, and one staff member completed during the reporting period. On-site education is provided as necessary as part of regular compliance inspections. Staff are also available by appointment to give general compliance or topic specific presentations.

**6.1.3 Notification of Requirements to Construction Site Operators**

EMD inspectors continue to be a part of the City’s plan review process and provide information to developers and builders during predevelopment conferences and on-site once construction activities have commenced to ensure operators are aware of TCEQ compliance requirements related to construction.

The recently adopted grading ordinance incorporates the evaluation of planned construction stormwater controls (BMPs) to ensure sites meet TPDES requirements related to construction as well as locally adopted requirements in the Fort Worth /SWM manual. This provides another avenue to ensure construction site operators are aware of regulatory requirements and have designed adequate controls to manage stormwater runoff during construction.

Fliers have been developed and placed in the City of Fort Worth’s permitting center to inform permit applicants of the permitting requirement for construction site operators.

Environmental Management web pages contains information and links providing guidance to construction site operators on the TPDES requirements related to construction and links to the necessary information and resources to ensure compliance.

#### **6.1.4 List of Construction Sites**

The City of Fort Worth maintains a database of operators and construction sites located within the Fort Worth city limits. During the reporting period of July 29, 2016–July 28, 2017, approximately 475 active construction sites were regularly inspected.

### **6.2 Activities operated by TRWD or its contractors**

See Attachments 1 and 2 for TRWD and TxDOT activities.

## **7.0 Public Education, Outreach, Involvement, and Participation**

The City implements a multi-faceted outreach and education program to fulfill permit requirements to promote, publicize, and facilitate the public reporting of the presence of illicit discharges or improper disposal of materials into the MS4; the proper management and disposal of used oil and household hazardous waste; and the proper use, application, and disposal of pesticides, herbicides, and fertilizers by public, commercial, and private applicators and distributors. Table 3 provides a summary of public education and outreach by permit requirement.

To meet these requirements, the City uses interdepartmental and interagency cooperation. Several departments, divisions, and sections within Fort Worth are tasked with promoting stormwater education messages and raising awareness of the issues and providing information on steps that can be taken to improve water quality in addition to providing multiple opportunities for meaningful public engagement. See Table 4 for a summary of City-provided stormwater outreach to the public.

The City also partners with the North Central Texas Council of Governments (NCTCOG) and with co-permittee Tarrant Regional Water District (TRWD) to amplify local and regional campaigns focused on stormwater quality education and outreach.

### **7.1 Public Education and Outreach**

The goal of the City’s public education and outreach efforts is to improve stormwater quality by promoting greater awareness of issues related to stormwater management. This includes topics related to basic water quality, illicit discharges and proper waste disposal, appropriate use and storage of yard chemicals, proper household hazardous waste and used oil disposal, pet waste and yard debris disposal, and correct litter and trash disposal. Program effectiveness is measured by participation at outreach events, educational items distributed, and overall general public feedback on the education efforts.



**Table 3 - Summary of public education and outreach by permit requirement**

<b>Topic</b>	<b>Numbers distributed</b>
Public reporting of illicit discharges or improper disposal of materials	2,813
Proper management and disposal of used oil and household hazardous wastes	12,567
Proper use, application and disposal of pesticides, herbicides, and fertilizers	4,204
Environmental Stewardship	115,887
General stormwater quality	33,059
<b>Total pieces distributed</b>	<b>168,530</b>

**Table 4 - Education and outreach events and presentations**

<b>Litter, Stormwater &amp; Water Quality Events</b>		
<b>Type</b>	<b>Number</b>	<b>Participant Numbers</b>
Neighborhood Association	316	9,380
School & After-School Presentations	656	17,238
Community Events	152	8,546
<b>Total</b>	<b>1,124</b>	<b>35,164</b>

**7.1.1 Public reporting of illicit discharges or improper disposal of materials, including floatables, into the MS4.**

The City has a multi-pronged approach to encourage the public to report illicit discharges and promote proper disposal of floatables.

- Environmental hotline information is displayed prominently at the upper right-hand position on each page of the Environmental Management website.
- A bilingual environmental hotline card for reporting illicit discharges and instances of stormwater pollution includes telephone and online options for reporting. Cards are distributed by Environmental Management, TPW Stormwater Management, Code Compliance, and Community Engagement staff. Cards are also available in the Planning and Development Department permit center.
- Hotline reporting information is also included on the Environmental Collection Center brochure and other stormwater printed materials.
- The marketing logo, “Trash in the Can, Not the Creek,” is used as part of a campaign to help reduce litter and other pollutants in the watershed.
- A bilingual hotline poster, PowerPoint presentation, and fact sheet are used by the Community Engagement office for presentations. How to identify reportable

instances of water pollution is addressed in the presentation in printed and visual formats.

- Rack cards explaining procedures for construction stormwater permits, industrial permits, and power washing permits are distributed through Planning & Development, Code Compliance, Environmental Management, and Stormwater Management employees.
- The city sponsors a host of adopt-a-park, street, waterway, etc. programs to help with litter prevention and general beautification. Several departments help promote and organize these programs. Keep Fort Worth Beautiful continues its efforts with the Green Schools program, volunteer recognitions, and neighborhood clean ups.

#### **7.1.2 Proper management and disposal of used oil and household hazardous wastes.**

- The location, participation levels, and public feedback are annually analyzed to determine the following year's HHW mobile collection locations. Twenty-six mobile events were held within Fort Worth and an additional 73 for participating cities during the reporting period.
- Through the City's water bill insert, 225,000 residential and commercial water customers were alerted to not only the dates, times, and locations of the mobile collection events, but also the location, hours, and contact information for the Environmental Collection Center. An additional 2,000 were printed for distribution by Community Engagement educators.
- Notices of Crud Cruiser events are posted each week on the City of Fort Worth online Calendar of Events and printed elevator calendars. The Calendar is included in City News, the weekly subscriber email sent to over 8,000 households across the city. Specific events were posted on online and community calendars as appropriate. City council members also promote individual events in their district correspondence and on social media.
- All Fort Worth and participating cities mobile collection events are posted on the City of Fort Worth website in two separate lists for easier searchability.
- Updated information regarding the Environmental Collection Center (ECC) and Crud Cruiser is sent periodically to the city call center and Community Engagement educators.
- Bilingual tri-fold brochures containing information about the ECC and Crud Cruiser mobile HHW collection events are distributed at city and regional events, the City's three drop-off stations, community centers, and facilities with high levels of walk-in customer traffic.
- An annual newsletter is sent to participating cities. It contains items of interest, notices, collection statistics, and information in an inviting, graphic format.
- Web banners, print-ready banners, posters, and event signage are available for use by the City of Fort Worth and participating cities to advertise the ECC and Crud Cruiser events.
- Educational YouTube videos about the ECC and Crud Cruiser are posted to the Environmental Management web page. These videos help residents understand the processes of bringing HHW for proper disposal to the facility or mobile events.
- Display materials for the ECC/Crud Cruiser are used by Community Engagement and program coordinator in schools and at presentations. The displays include both full-

size cutouts and tabletop displays of the cartoon characters Captain Crud and the Cruddies.

- Two videos created through the Regional Stormwater Management Program, are being shown by Community Engagement to teach both younger and older students about the deleterious effects of various pollutants on stormwater.

### **7.1.3 Proper use, application, and disposal of pesticides, herbicides, and fertilizers by public, commercial, and private applicators and distributors.**

- Three Master Composter classes were held, teaching 71 residents how to use lawn trimmings and household waste to reduce runoff pollution and use fewer chemicals.
- Garden Smart fliers with recommended residential procedures for protecting stormwater while doing yard work were distributed by Community Engagement educators at events and meetings.
- A bilingual Storm Drain poster, PowerPoint presentation, and fact sheet are used by Community Engagement for presentations. The application, use and disposal of lawn and pool chemicals are addressed in the presentation.
- Code Compliance Environmental Management Water Quality staff are members of the NCTCOG Stormwater Public Education Task Force. The task force created an education program of videos and brochures for lawn care companies regarding disposal of lawn debris, proper use of pesticides and fertilizers, and proper watering techniques. The Task Force continues to work on programs and educational materials to target residential and commercial landscapers.
- A bilingual NCTCOG publication, "Leave It a Lawn," is routinely included in informational packets distributed about stormwater pollution prevention. The tri-fold brochures discuss the proper way to dispose of grass clippings and fallen tree leaves (mulch and leave on the lawn).
- To promote Texas SmartScape, the NCTCOG and several other Metroplex cities, including Fort Worth, teamed up with Home Depot (and in Fort Worth with Weston Gardens) to offer a series of water-conserving, native and adaptive plant sales.. Home Depot agreed to promote the SmartScape brand on its products. NCTCOG, City staff and master gardeners continue to work with Home Depot to have future sales and educational events.
- The Water Department sponsored a series of water-saving seminars that focused on water issues, including sessions on landscape design, landscape basics, new home owner association landscape rules and regulations, container gardening, and proper irrigation operation. All of these sessions promote water conservation which reduces nutrient pollution runoff.

## **7.2 Public Involvement and Participation**

The City engages the community in stormwater related activities to encourage the protection and enhancement of stormwater quality. These activities include opportunities for a wide variety of people who live, work, and recreate in Fort Worth.

- The TPDES Stormwater Permit is posted in easy-to-read, searchable pdf format on the Environmental Management web page.

- Four email addresses are posted on the TPW Environmental Management web page and in print materials to increase public involvement. Each address has a specific distribution list to ensure timely, professional responses to questions and complaints from residents and businesses.
  - environmental@fortworthtexas.gov
  - constructionstormwater@fortworthtexas.gov
  - industrialstormwater@fortworthtexas.gov
  - hhw@fortworthtexas.gov
- Collateral items, including educational posters for Community Engagement educators, are printed in both English and Spanish.
- The stormwater quality pages on City of Fort Worth’s website are regularly spot-checked and updated (includes all permitting information, HHW pages, pollution hotline information/form, general stormwater education, and HHW information contained on ECC participating cities websites) to improve information, navigation, and functionality.
- Updates are provided to the call center and Community Engagement to make sure that all residents have access to current and accurate information.
- Code Compliance Environmental Management Water Quality staff, and the public education program coordinators for Stormwater Management, and a Water Department conservation specialist are members of the NCTCOG Stormwater Public Education Task Force. Regional efforts on stormwater pollution prevention are vital to clean water in North Texas.

### **7.3 TRWD and TxDOT Activities**

See Attachments 1 and 2 for co-permittee activities.

## **8.0 Monitoring, Evaluation, and Reporting**

### **8.1 Dry Weather Screening Program**

The objectives of this program are to continue efforts to detect the presence of illicit discharges and assess dry weather water quality changes. Analyses performed include air and water temperature, pH, color, turbidity, copper, ammonia, phenols, chlorine, specific conductivity, and detergents. Observational characteristics including odor, oil sheen, surface scum, sewage, and flow are also noted. A colorimetric meter that measures pollutants in parts per million is used for the analysis of copper, phenols, ammonia and chlorine. The methylene blue active substances (MBAS) method is used for detergent analysis. The test method results in a measurement given as less than a numerical value (<0.1, <0.2), which indicates the range of the value. Portable meters are used to measure pH, specific conductivity, and turbidity. Tests and observations are performed twice in a 24-hour period, separated by a minimum of four hours, to increase the potential to detect illicit flows. Also, sampling and analyses are only

conducted when there has been no significant precipitation (less than 0.10 inch) within 48 hours.

TPDES Permit WQ0004350000 requires that, "All areas of the MS4 must be screened at least once during the permit term." Between July 29, 2016 and July 28, 2017, 405 sites were visited for the purpose of dry weather field screening. Of these sites, seventeen (4.2%) had enough flow to sample during at least one visit. Table 5 provides a summary of analyses conducted during both visits at these sites. Detections are those cases where the parameter was found above the established trigger level for source tracking in the City or outside the standard range. Standard range used for pH is between 6 s.u. and 9 s.u.; trigger levels for specific conductivity are  $\geq 1500 \mu\text{S}/\text{cm}$ ; turbidity  $> 15 \text{ NTUs}$ , and ammonia  $\geq 1.0 \text{ mg}/\text{L}$ . The trigger level for detergents, chlorine, copper, and phenols is  $\geq 0.20 \text{ mg}/\text{L}$ . Water temperature is presented without an established trigger level. If water temperature is unusually high or low, further investigation is initiated.

### **Pollutant Trace Back**

When screening results indicate the possible presence of illicit discharge, field staff begin a trace back investigation of the pollutants of concern within the MS4. A variety of investigative tools such as: additional DWFs, watershed reconnaissance, videotaping the storm drain lines, dye tracing, and tunnel entries, etc., may be used in follow-up activities as appropriate for each situation. If a responsible party is found, appropriate actions are taken to ensure the discharge is eliminated.

Trace back investigations were performed on nine outfalls with flow during the permit year. There were six outfalls with chlorine levels above trigger levels during at least one of the sampling events. Trace back on one outfall revealed ongoing lawn watering. Four outfalls with chlorinated flow were turned over to the Water Department for water system break investigation. Two of those outfalls also tested with above trigger levels for ammonia. The water department found two City system breaks that were repaired, and two private line breaks that were also repaired. One additional outfall which tested above trigger levels for chlorine and ammonia also was above trigger levels for turbidity (76.8 NTU) and conductivity (above testing range of  $2,000 \mu\text{S}/\text{cm}$ ). Follow up investigation found the industry which was associated with the discharge was powerwashing the roof of their building with a hypochlorite solution and it was discharging to the outfall. Immediate measures were taken to cease the discharge and they will discontinue the practice.

One outfall tested above the trigger level for turbidity (41.8 NTU). The original outfall point is at a concrete crushing operation. The outfall discharges into a retention pond which has a spillway as the discharge point. The site used for testing for dry weather screening was moved to the spillway at the end of the retention pond. There was no flow during the first sampling event, and low flow over the spillway during the second sampling event. The concrete crusher reuses the retention pond water for dust suppression, and regularly pumps water out of the pond. Pumping measures were immediately taken to ensure no flow was going over the spillway from the retention pond.

Two outfalls tested above trigger level for pH. One of those outfalls also had a blue color to the flow. The outfall with only the high pH resolved with no action, although the associated

airport facility will continue to investigate any possible sources. The outfall with a high pH and a blue color is associated with an apartment complex with a pond system which is fed by a groundwater well. The complex was using a blue dye in their ponds to control algae, and the pond water is discharged via an overflow to the storm drain system. They have discontinued using the dye.

**Table 5 - Summary of dry weather field screen data collected from July 29, 2016–July 28, 2017**

	<b>pH s.u.</b>	<b>Conductivity µs/cm</b>	<b>Turbidity NTU</b>	<b>Water temp °C</b>
<b>N of samples</b>	28	28	27	28
<b>Detections</b>	4	1	2	0
<b>Minimum</b>	7.41	290	0.10	6
<b>Maximum</b>	9.21	1000	76.80	30.3
<b>Median</b>	8.25	720	2.01	25.6
<b>Mean</b>	8.29	687	7.55	22.6
<b>Standard Dev.</b>	0.499	182.2	16.294	7.08

	<b>Detergent mg/L</b>	<b>Chlorine mg/L</b>	<b>Copper mg/L</b>	<b>Phenols mg/L</b>	<b>Ammonia mg/L</b>
<b>N of samples</b>	27	29	25	26	27
<b>Detections</b>	0	8	0	0	3
<b>Minimum</b>	0.1	0.00	0.00	0.00	0.15
<b>Maximum</b>	0.2	3.94	0.10	0.19	2.87
<b>Median</b>	0.1	0.06	0.01	0.00	0.34
<b>Mean</b>	0.1	0.63	0.02	0.02	0.54
<b>Standard Dev.</b>	0.03	1.044	0.028	0.054	0.555

## 8.2 Wet Weather Screening Program

The purpose of the Wet Weather Screening Program is to address areas that may be contributing excess levels of pollutants to the MS4 during storm events. Each year, at least 50 runoff samples are collected and analyzed. Locations are selected based on past or previous history, information gathered during dry weather field screens, or other field reconnaissance, industrial monitoring data, information obtained from industrial or construction inspections, or other program emphases. Samples may be collected in-stream, from outfalls, curbs, open ditches, pipes, sheet flow, or other appropriate locations. Sample locations may be clustered within small sub-watersheds to thoroughly characterize the runoff and isolate areas of particular concern, or may be individual locations scattered throughout the City. Samples are collected from runoff resulting from a rain event that is greater than 0.10 inch in magnitude and that occurs at least 72 hours after the last measurable rain event. The greater than 0.10 inch rainfall guideline may be waived during drought conditions. Sample analyses will consist of, at a minimum, pH, specific conductivity, and turbidity. Additional analyses which may be

performed include, but are not limited to ammonia-nitrogen, nitrate-nitrogen, phosphate, chromium, copper, zinc, COD, total coliform, and *E. coli* bacteria. The selection of additional analyses to be performed will be determined by senior personnel on a case-by-case basis based upon land use and potential pollutants present in the sampling area. The data will be reviewed to determine what follow-up activities, if any, should be conducted. Summary statistics for each parameter and results of any follow-up activities are presented in the Annual Report.

During the 2016 permit year, 50 runoff samples were collected during eight rain events at 20 locations (Table 6). Figures 1 and 2 show the sample site locations and watersheds sampled within the permit year. Results of chemical analyses are provided in Table 7 and summary statistics of the chemical analyses is provided in Table 8.

**Table 6 - Sample locations for wet weather field screens conducting during the 2016 permit year**

Site ID	Site location description	Latitude	Longitude
TP1	1545 Old University, north flow	32.729279	-97.360322
TP2	1545 Old University, south flow	32.729323	-97.360297
TP3	1544 Old University, south flow	32.729310	-97.360506
TP4	1544 Old University, north flow	32.729358	-97.360483
TP5	1639 Old University, north flow	32.732120	-97.359184
TP6	1638 Old University	32.732135	-97.359262
TP7	1639 Old University, south flow	32.732014	-97.359192
TP8	Trinity Park Dr at crossing just west of RR crossing, stream flow	32.743211	-97.355993
TP9	Trinity Park Dr at crossing just west of RR crossing, street flow	32.743233	-97.355955
TP10	Trinity Park Dr S of Crestline, street flow	32.743533	-97.356590
TP11	Trinity Park Dr S of Crestline, outfall flow	32.743554	-97.356557
MKS	Behind 2901 Western Center Blvd; grate inlet	32.863006	-97.317774
O982	NE of mailboxes at 7540 Howling Coyote Ln	32.878834	-97.340762
RECE	Receda Ct in cul-de-sac inlet	32.892089	-97.345166
CON1	W inlet on Harmon Rd, south of 287 Service Road	32.895800	-97.331872
PLOT	6490 Spoonwood Ln; at inlet	32.859794	-97.293217
PARK	8575 Blue Mound Rd; south of entrance to park	32.890467	-97.346390
HCBR	N of 7428 Howling Coyote Ln	32.877491	-97.339878
BFC1	6700 Blue Mound Rd; just south of Harmon	32.893778	-97.348185
BFC3	N of 4445 Paula Ridge	32.853588	-97.290401

Figure 1 - Wet weather field screen locations for 2016 permit year

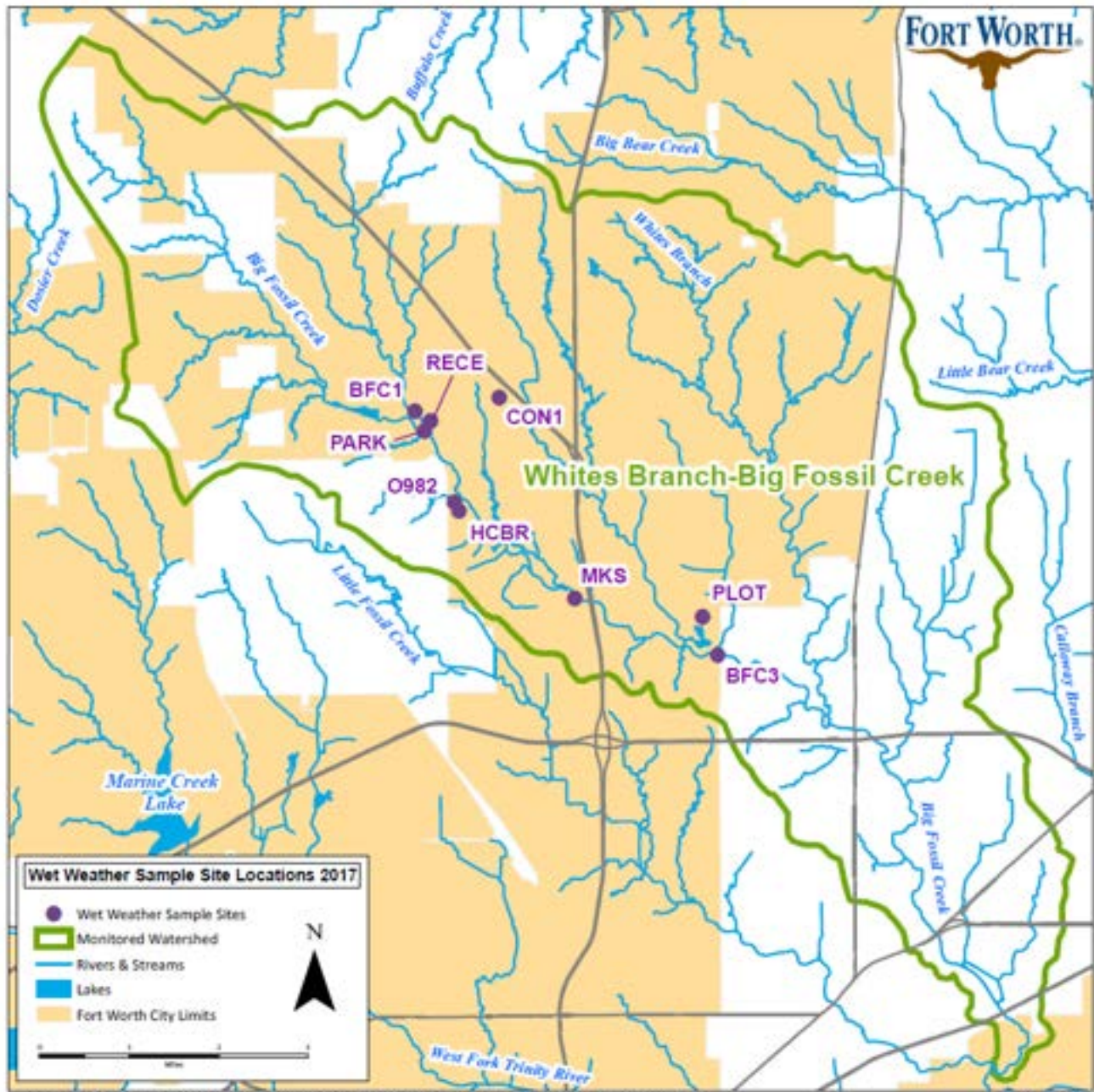
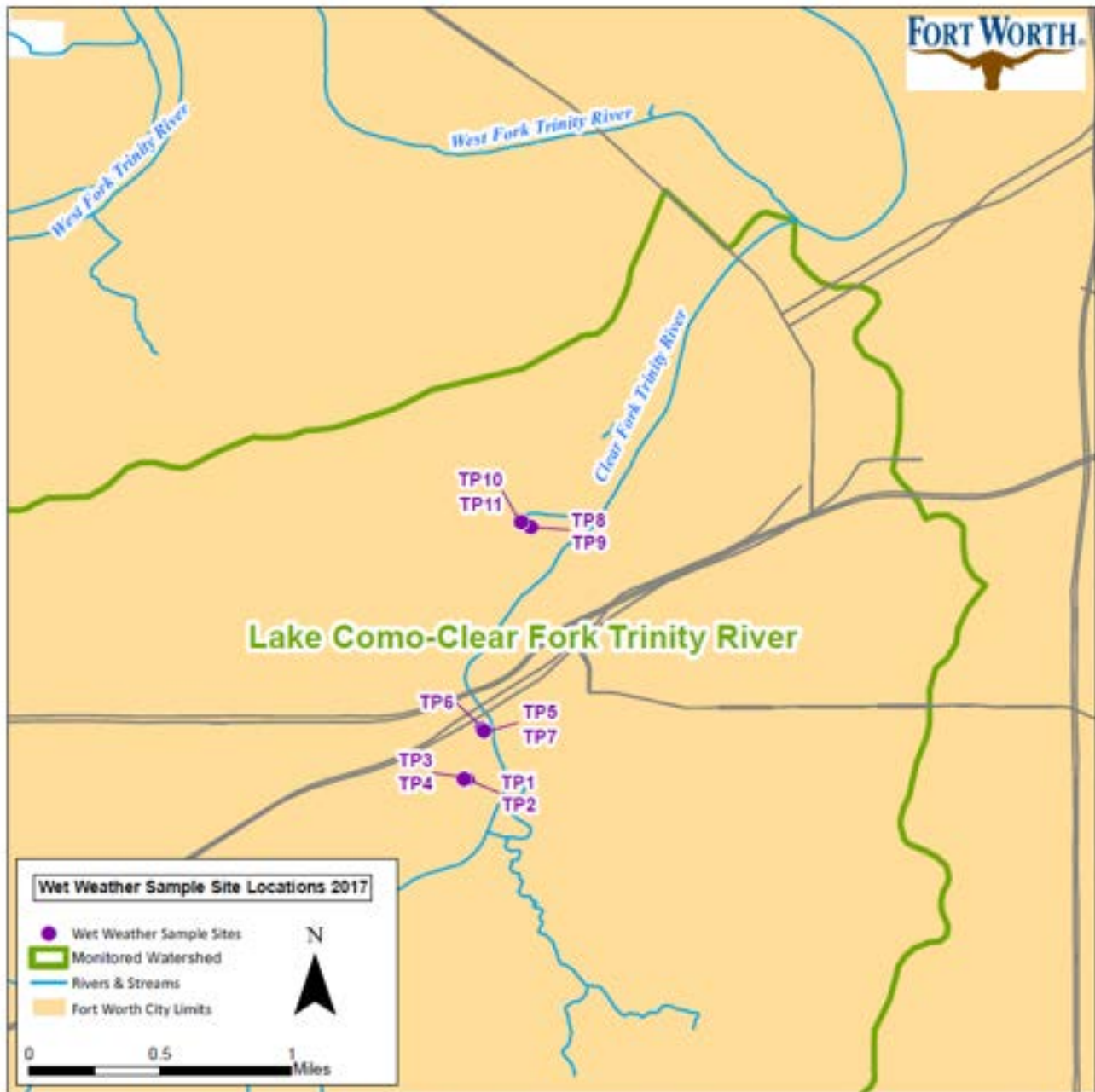




Figure 2 - Wet weather field screen locations for 2016 permit year



Map Source: X:\07\_ENVIRONMENTAL\GIS\WaterQuality\AnnualReport\_2017\WetWeatherFieldScreening

Amy LaMar

**Table 7 - Analysis results for wet weather field screens conducted in 2016 permit year**

Site ID	Date	pH SU	Conductivity us/cm	Turbidity NTU	NH <sub>3</sub> -N ppm	PO <sub>4</sub> ppm	NO <sub>3</sub> -N ppm	Fe ppm	Cu ppm
PLOT	02/13/2017	8.51	80	6.91	0.71	0.3	0.54		0.07
MKS	02/13/2017	8.49	120	11.6	0.58	0.3	0.68		0.04
O982	02/13/2017	8.73	70	6.55	0.34	0.51	0.37		0.05
RECE	02/13/2017	8.82	80	6.04	0.49	0.19	0.36		0.07
PARK	02/13/2017	8.72	140	69.4	0.16	0	0.09		NR
BFC1-first flush	02/13/2017	8.36	450	10.36	0.54	0.1	0.61		0.08
BFC1-comp	02/13/2017	8.43	460	8.06	0.4	0.05	0.45		0.07
BFC3-first flush	02/20/2017	8.16	520	7.05	0.1	0	0.16	0.09	0.12
BFC3-comp	02/20/2017	8.22	510	7.65	0.14	0.08	0.23	0.21	0.05
MKS	02/20/2017	8.61	100	21.5	0.39	0.13	0.48	0.51	0.09
RECE	02/20/2017	8.85	50	5.64	0.54	0.17	0.33	0.14	0.01
O982	02/20/2017	8.16	100	13.9	0.33	0.63	0.53	0.8	0.12
PLOT	02/20/2017	8.27	70	8.74	0.42	0.16	0.25	0.15	0.07
MKS	03/24/2017	8.48	0	8.91	0.37	0.22	0.42	0.31	NR
O982	03/24/2017	8.29	210	1112	0.42	0	0	0.91	NR
PARK	03/24/2017	8.18	220	19.4	1.29	0.69	1.21	0.39	0.33
CON1	03/24/2017	8.05	230	67.9	2.89	0	0.28	0.51	0.07
PLOT	03/29/2017	7.85	80	7.92	2.15	1.07	0.16		0.51
MKS	03/29/2017	8.54	30	3.37	0.42	0.23	0.11		0.05
O982	03/29/2017	8.28	90	17.6	0.74	0.55	0.34		0.2
RECE	03/29/2017	8.41	50	7.03	0.85	0.44	0.19		0.24
CON1	03/29/2017	8.84	50	33.9	0.43	0.06	0		0.11
PLOT	04/02/2017	8.16	70	9.84	1.32	0.84	0.32	0.25	0.16
MKS	04/02/2017	8.32	50	2.39	0.58	0.05	0.32	0.09	0.03
O982	04/02/2017	8.28	60	19	0.43	0.26	0.25	0.52	0.04
PARK	04/02/2017	8.82	90	856	0.22	0	0	1.32	0
RECE	04/02/2017	8.58	50	3.88	0.66	0.19	0.24	0.13	0.06
CON1	04/02/2017	8.39	120	695	0.83	0	0	0.63	NR
O982	05/17/2017	8.22	400	16.6	0.87	0.16	0.87		0.16
PARK	05/17/2017	8.74	120	125	0	0	1.4		NR
CON1	05/17/2017	8.38	130	35.8	2.12	0.18	0.73		0
MKS	05/17/2017	8.72	50	6.91	0.42	0.27	0.35		0.04
MKS	06/02/2017	8.52	90	7.79	0.56	0.21			0.02
HCBR-1st flush	06/02/2017	8.08	90	9.39	0.54	0			0.06
HCBR-60min comp	06/02/2017	8.12	80	11.46	0.3	0.26			0.05
O982	06/02/2017	7.91	140	7.74	0.39	0.66			0.05
PARK	06/02/2017	8.31	140	116	0	0			
RECE	06/02/2017	8.57	50	4.34	0.39	0.14			0
CON1	06/02/2017	8.03	220	79.8	1.71	0			0.67

NR= not reported

**Table 7 - Analysis results for wet weather field screens conducted in 2016 permit year (con't)**

Site ID	Date	pH SU	Conductivity us/cm	Turbidity NTU	NH3-N ppm	PO4 ppm	NO3-N ppm	Fe ppm	Cu ppm
TP1	06/09/2017	8.19	300	50	1.22	0.24		0	0.23
TP2	06/09/2017	8.4	80	25.1	1.47	0.27		0	0.19
TP3	06/09/2017	8.21	190	72.9	2.8	0.52		0	0.38
TP4	06/09/2017	8.12	200	44.4	3.75	NR			0.16
TP5	06/09/2017	8.26	130	25.5	1.61	0.38		0.26	0.1
TP6	06/09/2017	8.45	80	24.3	1.26	0.98		0.07	0.18
TP7	06/09/2017	8.62	70	21.1	1.04	0		0.29	0.11
TP8	06/09/2017	8.86	50	23.1	1.03	0.08		0.01	0.12
TP9	06/09/2017	8.62	60	12.8	1.15	0.51		0.05	0.14
TP10	06/09/2017	8.03	440	10.58	0.17	0.16		0.2	0.04
TP11	06/09/2017	8.01	440	27.2	0.37	0		0.28	0.07

NR= not reported

**Table 8 - Summary statistics of wet weather field screen analyses in 2016 permit year**

	pH SU	Conductivity us/cm	Turbidity NTU	NH <sub>3</sub> -N ppm	PO <sub>4</sub> ppm	NO <sub>3</sub> -N ppm	Fe ppm	Cu ppm
N value	50	50	50	50	49	32	26	44
Min	7.85	0	2.39	0.00	0.00	0.00	0.00	0.00
Max	8.86	520	1112.00	3.75	1.07	1.40	1.32	0.67
Median	8.37	90	13.35	0.54	0.18	0.33	0.23	0.07
Mean	8.38	154	76.11	0.84	0.25	0.38	0.31	0.12
St Dev	0.27	139	213.19	0.78	0.27	0.32	0.32	0.13

### 8.3 Industrial and High Risk Runoff Monitoring Program

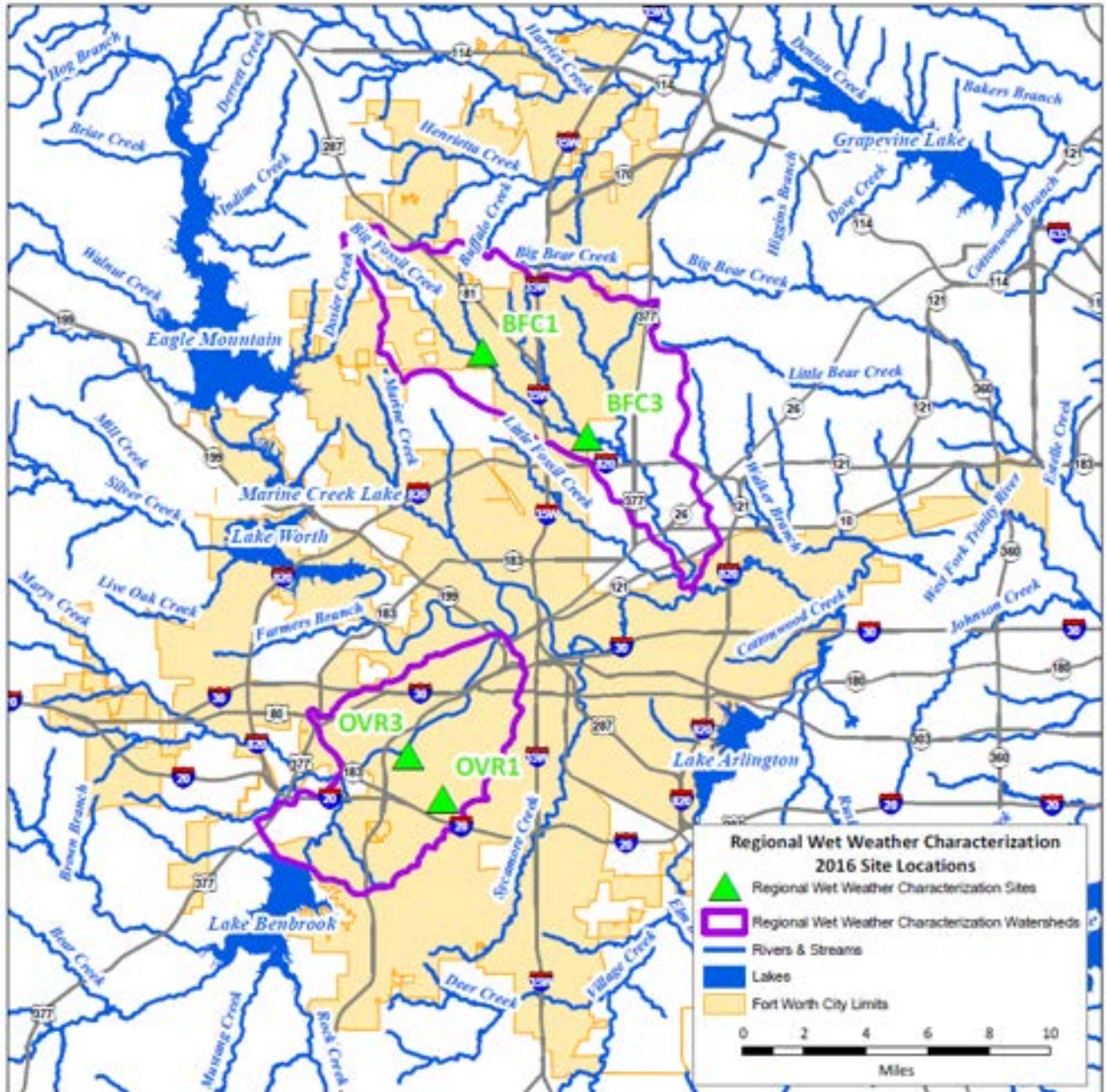
To satisfy this permit requirement, the City requires industries with benchmark monitoring requirements under the MSGP for stormwater discharges related to industrial activity to submit their monitoring results to the City.

The City maintains a database of benchmark monitoring results that are received each spring. The permit required operators to initiate monitoring in the first full six month monitoring period. Sampling must be conducted once per monitoring period for a total of up to four years, or eight periods depending on when a facility obtained coverage. A summary of the results received by the City of Fort Worth is included in this report in Appendix B. A result of "Fail" indicates that one or more parameters reported exceed one or more of the benchmark value for that facility.

### 8.4 Storm Event Discharge Monitoring

The City of Fort Worth and its co-permittee, TRWD, have chosen to comply with Permit Part IV.A 1. monitoring requirements through the North Central Texas Regional Wet Weather Characterization Program (RWWCP) including the Representative Rapid Bioassessment Monitoring option. NCTCOG's Regional Stormwater Monitoring Program Third Term Final Report, July 2016 can be found in Attachment 3. Sites sampled during 2016 are shown in Figure 3. Results from 2016 regional wet weather sampling are provided in Table 9 below. Rapid bioassessment results are provided as Attachment 4.

**Figure 3 - Regional (RWWCP) wet weather sample locations during the 2016 permit year**



**Table 9 - Wet weather data collected under RWWCP during the 2016 permit year**

Station ID	Sampling Date	Rainfall Total (in)	Ambient Air Temp (°F)	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)
BFC3	08-10-16	N/A	90	450	8.9	2.1	<30	3.63
OVR3	08-10-16	N/A	90	364	3.5	2	<30	<0.50
OVR3	11-03-16	0.45	71	202	69	10.2	54	1.69
OVR1	11-28-16	0.09	62	202	39.5	25	72	2.46
BFC1	02-13-17	1.29	57	318	20.9	7.4	<30	0.63
BFC3	02-20-17	0.7	62	304	11	5	<30	<0.50

Station ID	Sampling Date	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Carbaryl (mg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)
BFC3	08-10-16	0.028	<1.00	ND	<0.005	<0.005	0.013
OVR3	08-10-16	0.025	<1.00	ND	<0.005	<0.005	0.018
OVR3	11-03-16	0.055	<1.00	ND	<0.005	<0.005	0.01
OVR1	11-28-16	0.088	<1.00	ND	<0.005	<0.005	0.015
BFC1	02-13-17	0.013	<1.00	ND	<0.005	<0.005	0.016
BFC3	02-20-17	ND	<1.00	ND	<0.005	<0.005	<0.005

Station ID	Sampling Date	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (uS/cm)	pH Field (su)	E. coli (MPN/100 mL)	Total coliforms (MPN/100mL)
BFC3	08-10-16	<0.005	<0.010	<5.00	790	7.85	126	30800
OVR3	08-10-16	<0.005	<0.010	<5.00	680	7.6	34	92100
OVR3	11-03-16	<0.005	0.038	<5.00	520	7.97	NS	NS
OVR1	11-28-16	<0.005	0.051	<5.00	460	7.92	NS	NS
BFC1	02-13-17	<0.005	0.026	<5.00	450	8.36	NS	NS
BFC3	02-20-17	<0.005	<0.010	<5.00	520	8.16	NS	NS

NA= not available; ND= below detection limits; NS= not sampled

### 8.5 Floatables Monitoring

Permit Part IV.B requires co-permittees to establish and maintain two monitoring locations for removal of floatable material in discharges to or from the MS4. In compliance with this requirement, TRWD has established and maintains two floatables collection devices on the Clear Fork Trinity River.

The floatable debris collectors were established in 2006 at two separate locations along the Clear Fork Trinity River. Two net collectors were initially installed across from the Clear Fork

Pump Station under Rosedale Street. The nets were unable to stay intact due to rodent activity and have since been replaced with a boom to trap floatables in the river collection. The floatables are physically removed from the boom boundary following a storm event. A second set of collectors was installed at the outfall of Sump #19 where all water entering the main river must pass through the unit. The collectors consist of metal mesh boxes that trap floating debris as the water passes through. The boxes can be hoisted from the structure in order to empty the debris.

The trash collectors are included in the TRWD routine floodway maintenance program that is triggered into effect with a ½ inch storm event. After such an event, the trash collectors are visually inspected for capacity and damage. The cleaning schedule for the nets is dictated by the frequency of storms. For information regarding the floatable collections made during the 2017 permit year, refer to Attachment 1, the TRWD annual report.

**Appendix A – City of Fort Worth Annual and Projected Expenditures**

The following expenditure information addresses the major elements of the stormwater management program conducted by Environmental Management. The FY 17-18 data is Environmental Management’s current operational budget for the TPDES program. The information for FY 16-17 represents most of the actual expenditures during the fiscal year (October 1, 2016 – September 30, 2017) that encompasses the majority of the permit year.

<b>Program</b>	<b>FY 16-17</b>	<b>FY 17-18</b>
Water Quality Program Pollution investigations Monitoring Spill response Industrial/construction inspections	\$926,310	\$1,010,621
Household hazardous waste	\$939,424	\$1,260,373
Administration & GIS section	\$1,158,411	\$1,548,055
Education/outreach	\$89,275	\$125,840
<b>Totals</b>	<b>\$3,489,979</b>	<b>\$3,944,889</b>

A Stormwater Utility fee was implemented in Fort Worth in 2006 as a way to provide a dedicated and focused revenue stream to reduce flooding, preserve streams, minimize water pollution and operate the stormwater system in a more effective manner. The numbers for FY 15-16 reflect actual expenditures (unaudited) of the Stormwater Utility Fund in the categories noted. The FY 16-17 numbers are projections based on the Stormwater Utility Fund's adopted budget.

<b>Program</b>	<b>FY 2016-17</b>	<b>FY 2017-18</b>
Management/Overhead/Debt Service	\$11,357,863	\$13,966,515
Public Education/Customer Service	\$1,232,604	\$1,535,425
Operations & Maintenance	\$5,601,324	\$5,736,419
Inventory	\$800,001	\$883,252
Floodplain Management	\$805,442	\$1,230,171
Engineering	\$1,204,677	\$1,363,771
Master Planning	\$729,571	\$874,370
Development Plan Review	\$1,684,765	\$2,112,338
Capital	\$10,613,567	\$11,253,996
Training/Tech. Update	\$48,099	\$90,786
<b>Total Utility Expenses</b>	<b>\$34,077,912</b>	<b>\$39,047,046</b>

**Appendix B – Benchmark Monitoring Results**  
**Period 1, January 1, 2016 – June 30, 2016**

Result	Customer/ Job Site	Aluminum (1.2 mg/L)	COD (60 mg/L)	Copper (0.030 mg/L)	Iron (1.3 mg/L)	Lead (0.010 mg/L)	Nitrate + Nitrite (0.68 mg/L)	Phosphorous (1.25 mg/L)	TSS (100 mg/L or 50mg/L)	Zinc (0.16 mg/L)	pH (6.0-9.0 S.U.)
Fail	ALTEX HOMES INC		29.3						214		
Fail	AKZO NOBEL SURFACE CHEMISTRY LLC						0.178			0.255	
Fail	PALM HARBOR HOMES INC		32.0						29.3		
Fail	SIGN COMPANY	0.0738			0.0554		0.2395		5.475	0.0367	
Pass	AMERICAN PLANT FOOD CORP				0.28	0.0005	0.38	0.07	18	0.05	
Fail	TRINITY INDUSTRIES INC	11.4			17.8		0.55		1750	0.69	
Fail	US LIME COMPANY				1.5				23.3		7.5
Fail	ALLIED WASTE SYSTEM INC	No Discharge Occurred									
N/A	WESTEX IRON & METAL CO	No samples									
Pass	TRINITY INDUSTRIES INC						0.79*			0.97	
Pass	EX TEX LAPORTE LP				2.1*				71		
Pass	TRACE METAL INDUSTRIES INC	0.0848			0.18		0.6612		4.922	0.1177	
Pass	GAMTEX INDUSTRIES LP Gachman (Shamrock)	0.5	37.45	ND	0.15	0.0025			34.5	0.025	
Fail	THERMACOR PROCESS LP	0.144			0.29		2.9		1.8	0.46	
Pass	ACTION AUTO RECYCLING	0.395			0.35	ND			ND		



Result	Customer/ Job Site	Aluminum (1.2 mg/L)	COD (60 mg/L)	Copper (0.030 mg/L)	Iron (1.3 mg/L)	Lead (0.010 mg/L)	Nitrate + Nitrite (0.68 mg/L)	Phosphorous (1.25 mg/L)	TSS (100 mg/L or 50mg/L)	Zinc (0.16 mg/L)	pH (6.0-9.0 S.U.)
Pass	COMMERCIAL METALS CO (OLD DECATUR RD)	0.418	<20	0.0150	0.659	0.0070			8	0.0510	
Fail	PRODUCTION METALS INC	No Qualifying Discharges									
Fail	A AND I AUTO INC	0.088			0.256	0.005			4.5		
Pass	COWTOWN EXCAVATING COMPANY		ND		ND				3.0		7.5
N/A	MOSITES RUBBER COMPANY INC	not sampled									
Fail	SOUTHWESTERN PETROLEUM CORP								66.8		
Fail	AAA INDUSTRIAL CHROMIUM COMPANY INC	ND			ND		3.9		46.1	.067	
Pass	APAC TEXAS INC (Tech Blvd)								8.0		
Pass	APAC TEXAS INC (Cold Springs)								16.3		
*Annual average was less than or equal to benchmark value.											

Period 2, July 1, 2016 – December 31, 2016

Result	Customer/ Job Site	Aluminum (1.2 mg/L)	COD (60 mg/L)	Copper (0.030 mg/L)	Iron (1.3 mg/L)	Lead (0.010 mg/L)	Nitrate + Nitrite (0.68 mg/L)	Phosphorous (1.25 mg/L)	TSS (100 mg/L or 50mg/L)	Zinc (0.16 mg/L)	pH (6.0-9.0 S.U.)
Fail	ALTEX HOMES INC		30.7						113.5		
Fail	AKZO NOBEL SURFACE CHEMISTRY LLC						0.494			0.0857	
Fail	PALM HARBOR HOMES INC		68.0*						163.0		
Fail	SIGN COMPANY	0.0492			0.0592		4.735		4.5	0.0431	
Pass	AMERICAN PLANT FOOD CORP				0.06	0.0003	0.43	0.20	1	0.003	
Fail	TRINITY INDUSTRIES INC	39.4			55.4		0.69*		1490	1.7	
Fail	US LIME COMPANY	No Qualifying Discharges									
Fail	ALLIED WASTE SYSTEM INC				3.9				167		
N/A	WESTEX IRON & METAL CO	Not Sampled									
Pass	TRINITY INDUSTRIES INC						0.51			0.74	
Pass	EX TEX LAPORTE LP				0.3				8.4		
Pass	TRACE METAL INDUSTRIES INC	Not Sampled									
Pass	GAMTEX INDUSTRIES LP Gachman (Shamrock)	Not Sampled									
Fail	THERMACOR PROCESS LP	Not Sampled									
Pass	ACTION AUTO RECYCLING	1.43*			1.4*	0.007			17.625		
Pass	COMMERCIAL METALS CO (OLD DECATUR RD)	No Qualifying Discharges									
Fail	PRODUCTION METALS INC	ND			3.7		15.5		ND	0.078	
Fail	A AND I AUTO INC	1.88*			2.255*	0.054			6.0		

Result	Customer/ Job Site	Aluminum (1.2 mg/L)	COD (60 mg/L)	Copper (0.030 mg/L)	Iron (1.3 mg/L)	Lead (0.010 mg/L)	Nitrate + Nitrite (0.68 mg/L)	Phosphorous (1.25 mg/L)	TSS (100 mg/L or 50mg/L)	Zinc (0.16 mg/L)	pH (6.0-9.0 S.U.)
Pass	COWTOWN EXCAVATING COMPANY		ND		ND				5.2		8.0
N/A	MOSITES RUBBER COMPANY INC	Not Sampled									
Fail	SOUTHWESTERN PETROLEUM CORP	Not Sampled									
Fail	AAA INDUSTRIAL CHROMIUM COMPANY INC	ND			0.58		0.52		68.1	.121	
Pass	APAC TEXAS INC (Tech Blvd)	No Qualifying Discharges									
Pass	APAC TEXAS INC (Cold Springs)	No Qualifying Discharges									
*Annual average was less than or equal to benchmark value.											

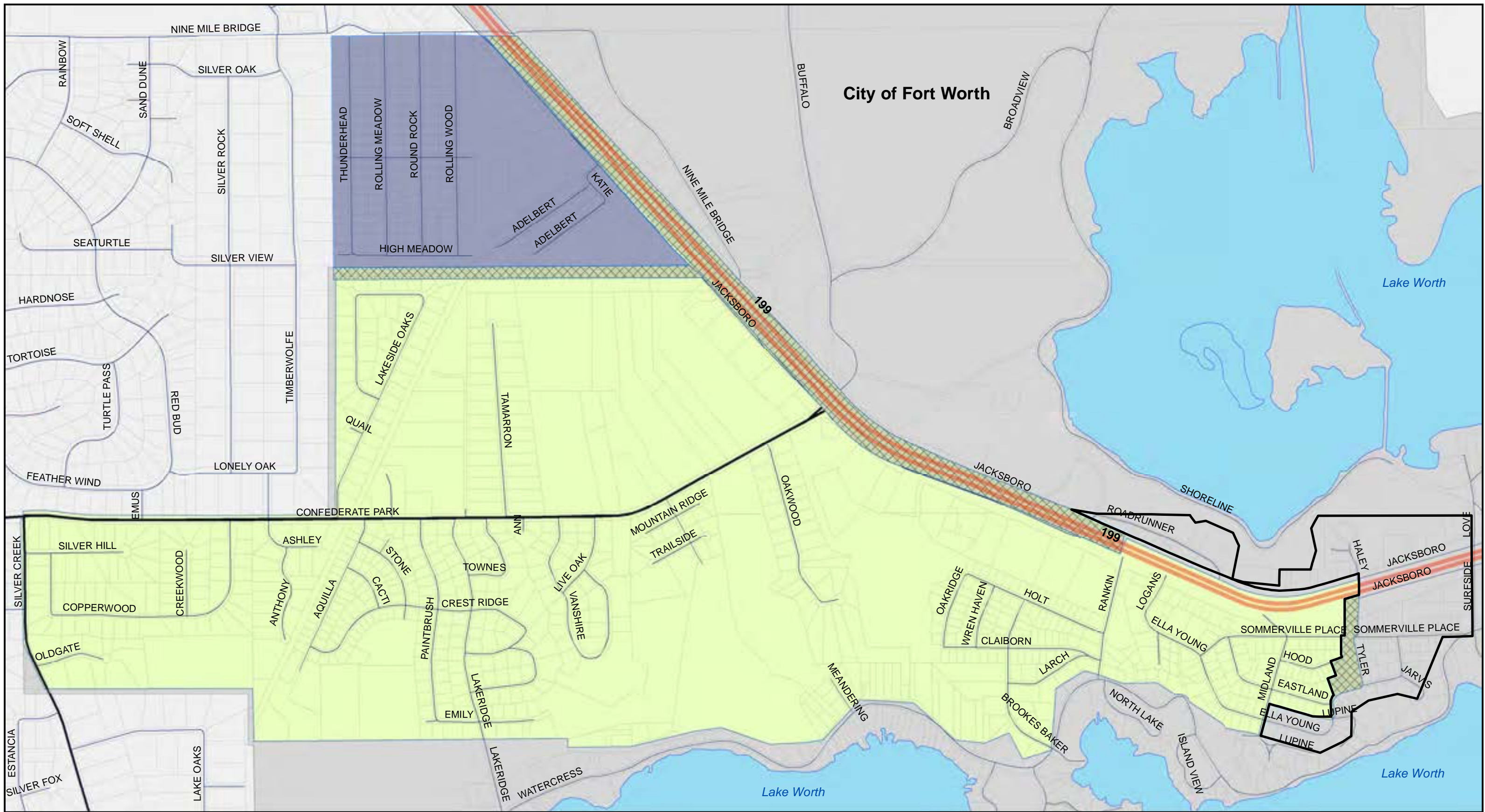
**Appendix C – 2016 - 2017 TPDES Stormwater Permit Annual Report Minimum Control Measures  
Summary Table**

<b>MCM</b>	<b>Description</b>	<b>Requirements</b>	<b>Status</b>	<b>2016 - 2017 Annual Report Page</b>
1	<i>MS4 Maintenance Activities</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	6-7
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	N/A	--
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	N/A	--
2	<i>Post-Construction Stormwater Control Measures</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	7-11
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	The Fort Worth Grading Ordinance was adopted in June 2012 to address the permit requirements for this MCM.	7
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	N/A	--
3	<i>Illicit Discharges Detection and Elimination</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	11-17

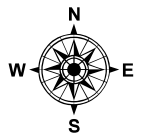
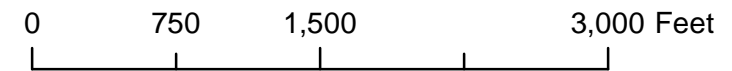
MCM	Description	Requirements	Status	2016 - 2017 Annual Report Page
		<p>Status of implementing the SWMP (status of compliance with any schedules established under this permit)</p>	<p>The SWMP includes a list of techniques used for detecting illicit discharges which includes dry weather and wet weather field screening, as well as, complaint investigation and inspections. Appropriate actions and enforcement procedures for removing the source of an illicit discharge are outlined in the SWMP as well. These include corrective notices and issuance of criminal citations.</p> <p>All MS4 assets have been mapped from schematics (drawings/plans) and have been field verified. Field verification surveys have been completed. Waters of the U.S. are encompassed in the National Hydrography Dataset (NHD) as maintained by the United States Geological Survey (USGS). Currently, stormwater infrastructure data are maintained by the TPW Stormwater Management Division. MS4 assets are mapped in any newly developed areas, annexations or redevelopments. This is currently accomplished by contract.</p>	11,16
		<p>Any proposed changes to the SWMP in the coming reporting year</p>	<p>None at this time.</p>	--
		<p>A summary describing the number and nature of enforcement actions and inspections</p>	<p>N/A</p>	
4	<p><i>Pollution Prevention / Good Housekeeping for</i></p>	<p>Description of the portion of the current program that the permittees have implemented for each SWMP element</p>	<p>MCM has been fully implemented</p>	17-19

MCM	Description	Requirements	Status	2016 - 2017 Annual Report Page
	<i>Municipal Operations</i>	Status of implementing the SWMP (status of compliance with any schedules established under this permit)	Because the City of Fort Worth has been under continuous MS4 permit coverage since 1996, some of the components of this MCM, such as reduction of pollutants from road repair and from pesticide, herbicide, and fertilizer applications, were requirements of previous permit terms and were already established prior to the current term. Waste handling procedures to ensure proper disposal of waste, although not a previous permit requirement, were already in place prior to the current permit term. For the remaining new requirements, new programs were developed or existing programs were enhanced to ensure compliance as discussed in this section.	17
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A Summary describing the number and nature of enforcement actions and inspections	N/A	--
5	<i>Industrial &amp; High Risk Runoff</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	19-20
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	N/A	--
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	Summary data from inspections and resulting enforcement action has been provided.	19-20
6	<i>Construction Site Stormwater Runoff</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	20-22
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	The Fort Worth Grading Ordinance was adopted in June 2012 to address the permit requirements for this MCM. Additional new permit requirements are covered under existing municipal ordinances.	7

<b>MCM</b>	<b>Description</b>	<b>Requirements</b>	<b>Status</b>	<b>2016 - 2017 Annual Report Page</b>
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	Summary data from inspections and resulting enforcement action has been provided.	20-21
7	<i>Public Education and Outreach /Public Involvement and Participation</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	22-26
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	The City uses multiple avenues for education, outreach and participation with residents. Items that are promoted through these messaging methods are identified throughout this report.	22
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	N/A	--
8	<i>Monitoring, Evaluation and Reporting</i>	Description of the portion of the current program that the permittees have implemented for each SWMP element	MCM has been fully implemented	26-36
		Status of implementing the SWMP (status of compliance with any schedules established under this permit)	N/A	--
		Any proposed changes to the SWMP in the coming reporting year	None at this time.	--
		A summary describing the number and nature of enforcement actions and inspections	N/A	--



- Streets
- Major Streets
- Freeways
- Lakes
- Parcels
- Fort Worth City Limits
- Recent Fort Worth Annexation
- Fort Worth Extraterritorial Jurisdiction
- Town of Lakeside
- Future Release to Lakeside ETJ
- Future Release to Lakeside



1:12,000

March 3, 2017

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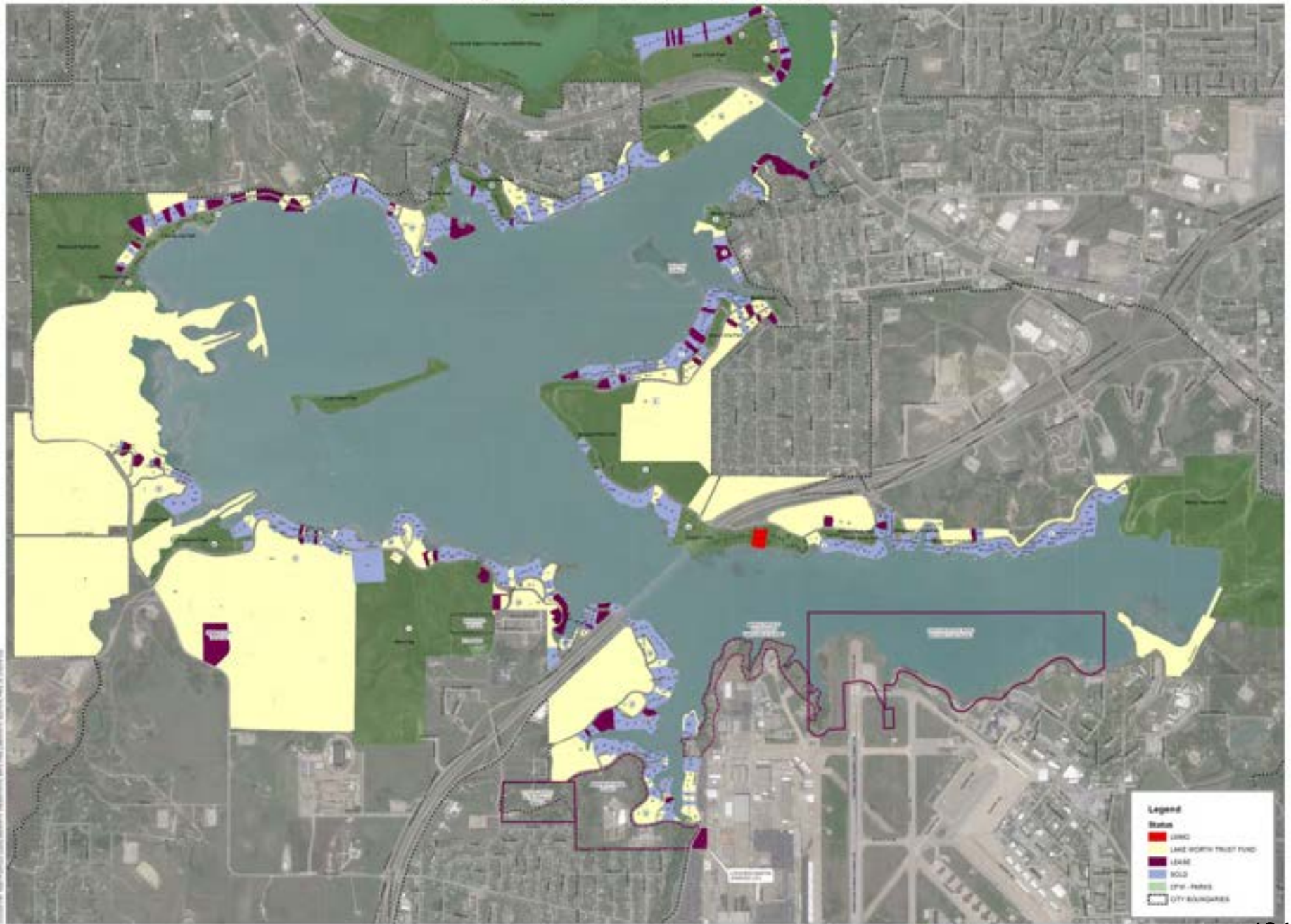


# **Council Approved Plan for Sale Lake Worth Residential Lease Lots**



Presented by  
Property Management Department  
March 23, 2017

# 2016 LAKE WORTH LEASES



# City Council Approves Sale

- On November 8, 2016 the City Council authorized the sale of Lake Worth residential lease lots through
  - Contract for Sale with Current Residential Lessees of Lake Worth residential leased lots at Fair Market Value
  - and*
  - Lease Amendment, contemporaneously with the Contract for Sale, with current residential lessees to amend the lease to provide for a shorter term and the disposition of the improvements upon expiration of the lease

# Property Sales Program to Lessees

## GENERAL CONDITIONS

- Council has provided the opportunity for Lessees to purchase their residential leased lot at **Fair Market Value**
  - If they do not want to purchase their leased lot, they can continue with the existing lease
- **Sewer must be connected** if available to the leased lot
- If a lessee decides to purchase their lot, a **sales contract** and **lease amendment** will be required
- Purchase of the property must be completed within **18 months** of signing the sales contract

# Next Steps

- Leases with No Major Issues
  - Contract with City approved appraiser to appraise the property
  - Consider pre-approval if a mortgage will be required.
  - If sewer is available, property will have to be connected to the sewer at lessee's expense.
  - A written formal request to purchase the lease will need to be sent to the City Land Agent.
  - A Lease Amendment will have to be signed that the lease will terminate at closing or within 18 months.
  - Contact a Title Company to close property with.
  - If during this process the lessee wants to sell his improvements to someone else, the City will transfer the lease.

# Next Steps

- Leases with Platting Issues on leased lots.
  - Contact City Senior Land Agent about purchasing the property
  - Lester England, 817.392.8053
  - The property will be sold at Fair Market Value.
  - Select a Surveyor to start the initial Platting Process
    - Lessee will pay for the Platting
  - Contract with City approved appraiser to appraise the property
  - Lessee will pay for the appraisal. City will get one copy of appraisal.
  - Consider pre-approval if a mortgage will be required.
  - If sewer is available, property will have to be connected to the sewer at lessee's expense.
  - Contact Water Development to schedule. (817.392.8250)

# Council Approved Plan for Sale Lake Worth Residential Lease Lots



Primary Contact for Program

Lester England

817/392-8053

Questions/Comments/Conclusion

# LAKE WORTH TRAIL

## Project Update

March 23, 2017

Lake Worth Regional Coordination Committee Meeting

City of Fort Worth  
Park and Recreation Department



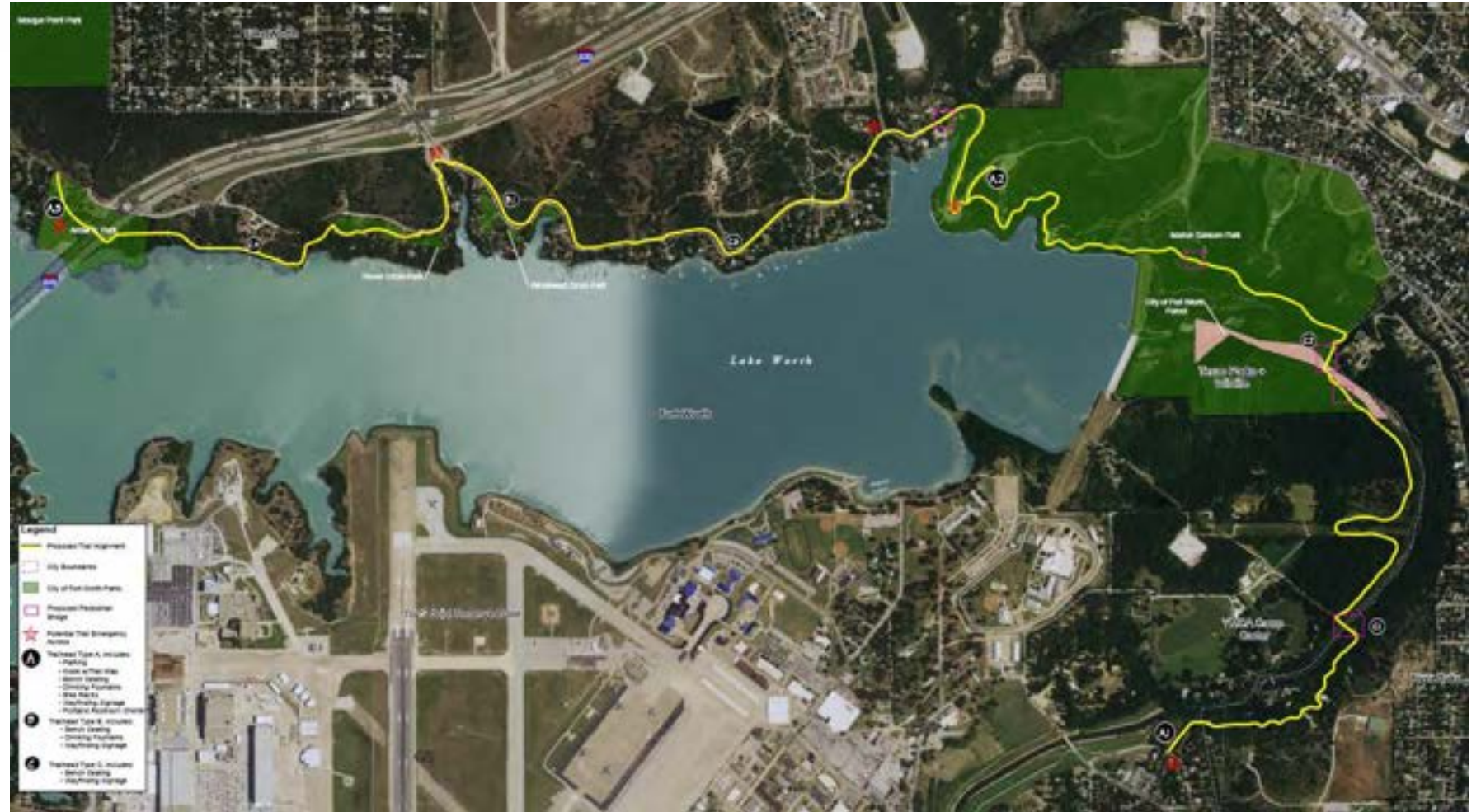
# Project Outline

- Budget: \$7,347,234
- Approx. 5.5 miles
- Challenges
  - Topography
  - Soil Condition
  - Easements
  - Narrow ROW
  - Budget



## Current Status

- CMAR Onboard  
**Haydon Building Corp**  
(M&C Approved on  
Aug 16, 2016)
- Design 90% Set  
Completed  
(Dec 15, 2016)
- Study of Change in  
Alignment due to Soil  
Failure





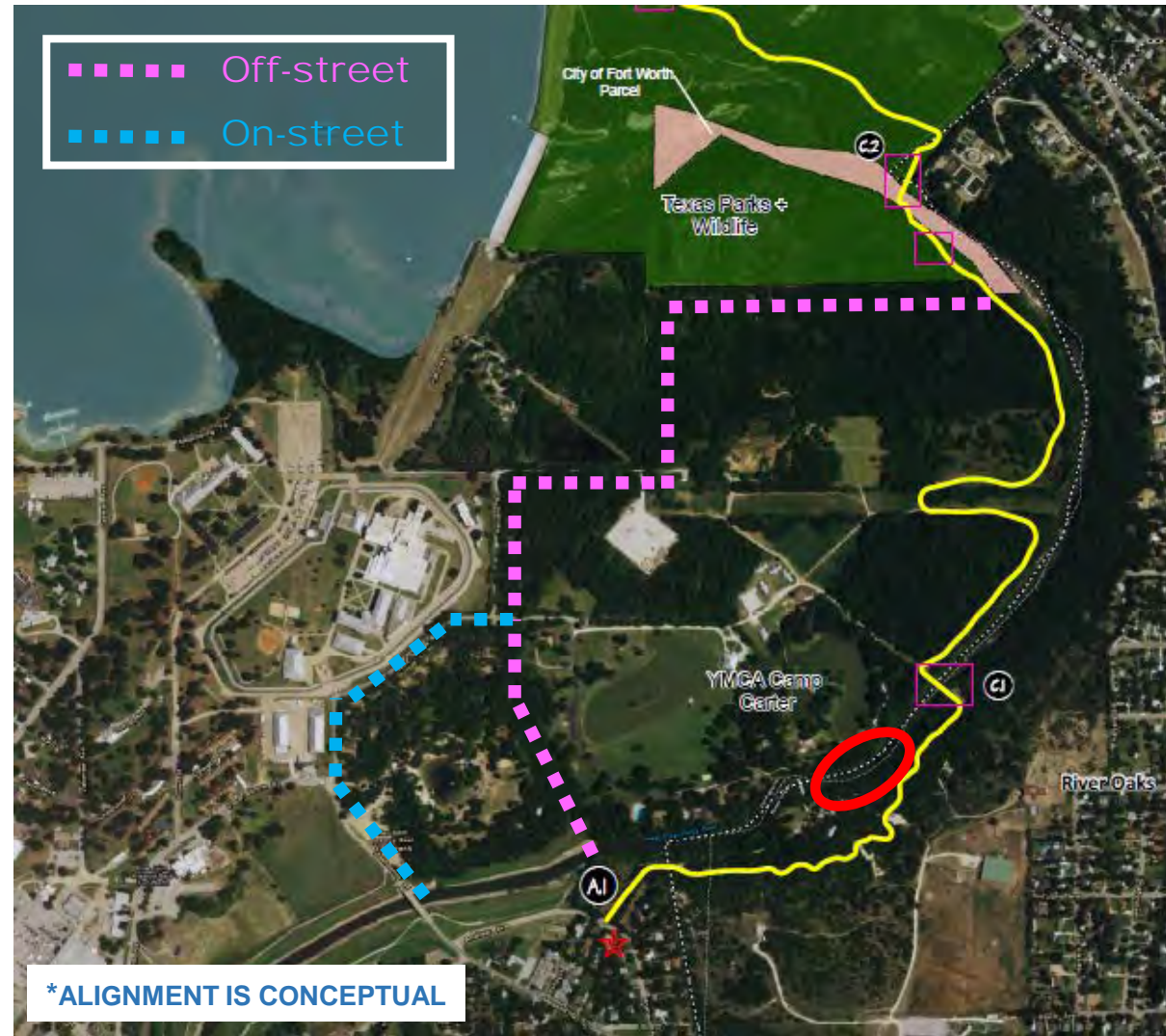
### Mass Soil Failure

Rapid advancement of mass soil movement was observed adjacent to trail alignment at east side of Trinity River in Camp Carter Property



## Alignment Change

- Currently Feasibility Study
  - Coordination Meeting with YMCA:  
December 9, 2016
  - Stakeholders Meeting:  
March 8, 2017
  - Project Team Site Study:  
March 15 & 21, 2017



## Schedule

- Design
  - Contract Amendment: May 2017
  - Design Completion: July 2017
  - Review & Approval: August 2017
  
- Construction
  - GMP: September 2017
  - Construction: October 2017 - January 2019

## Contact:

Project Manager

Naoto Kumazawa, Landscape Architect

[Naoto.Kumazawa@fortworthtexas.gov](mailto:Naoto.Kumazawa@fortworthtexas.gov)

817-392-5742

# **Proposed 2018 Bond Program**

# 2018 BOND PROGRAM PRESENTATION OVERVIEW

- *Program Philosophy and Assumptions*
- *Bond and Debt Capacity*
- *2014 Bond Program Review*
- *Program Goals and Objectives*
- *Proposed Projects*
- *Bond Program Schedule*



## Some Philosophy & Assumptions “Up Front”

- Maintain What We Own Before Building New (use facility life-cycle cost analysis to determine renovation versus replacement)
- We are Balancing Both the Capital Budget and the Operating Budget
- No tax rate increase
- Policy Assumptions:
  - May 2018 is the date to hold the Bond Referenda
  - Public Art percentages set at same rate as 2014 Bond Referenda (1% for Transportation proposition; 2% for all others)

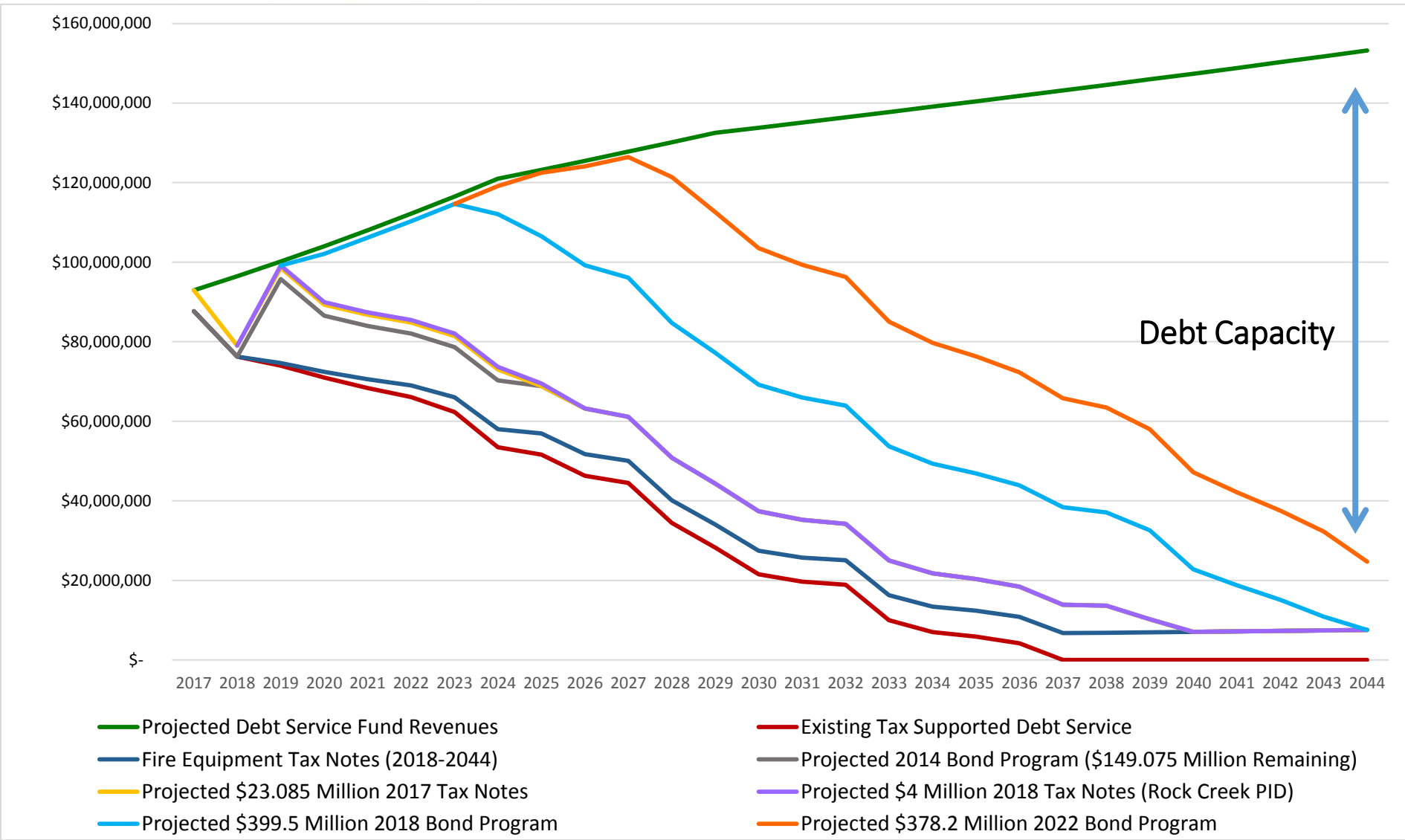
## Capital Infrastructure Planning for a Growing Community

- Population Growth: 20,000-25,000 per year (the equivalent of adding Grapevine twice over every 4 years)
- Infrastructure Planning and Execution
- Backlog/Gap in Maintenance of Existing Infrastructure
- Strategy:
  - Increase cash funding for infrastructure maintenance
  - Plan bond referenda every 4-5 years
  - Continuous capital planning & implementation process

## Bond Capacity

- Dedicated Property Tax Rate of 16.35 cents
- Conservative Assumptions
- Public Finance Best Practices
  - Cash & Debt
  - Align Financing to Infrastructure Life Cycle

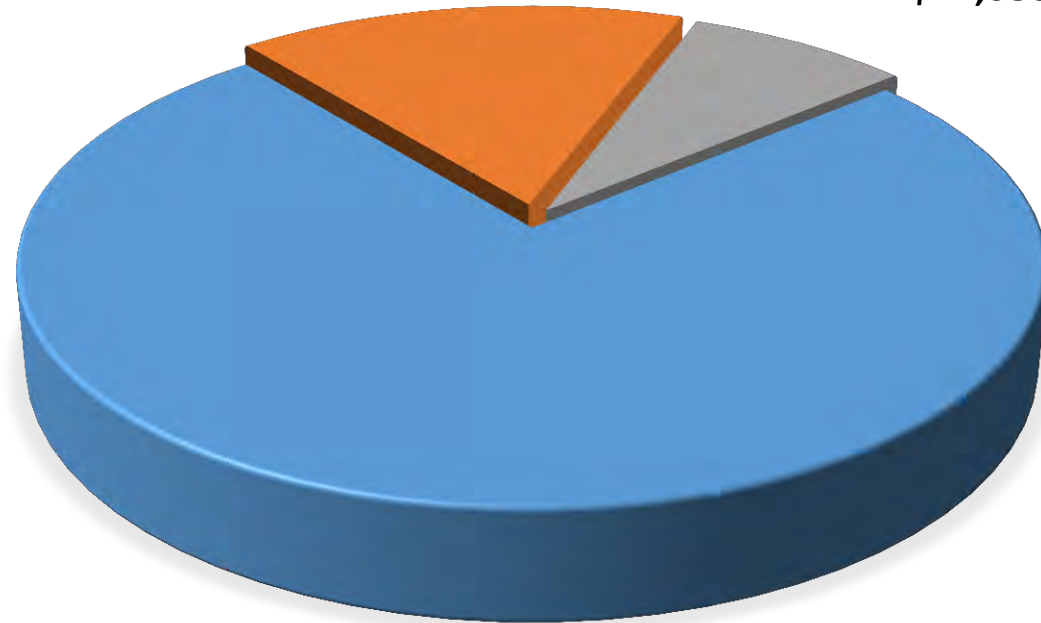
# Long Term Debt Forecast



# 2014 Bond Program Funding Dist. By Category

Facilities \$48,249,150  
17%

PARD \$24,086,000 8%

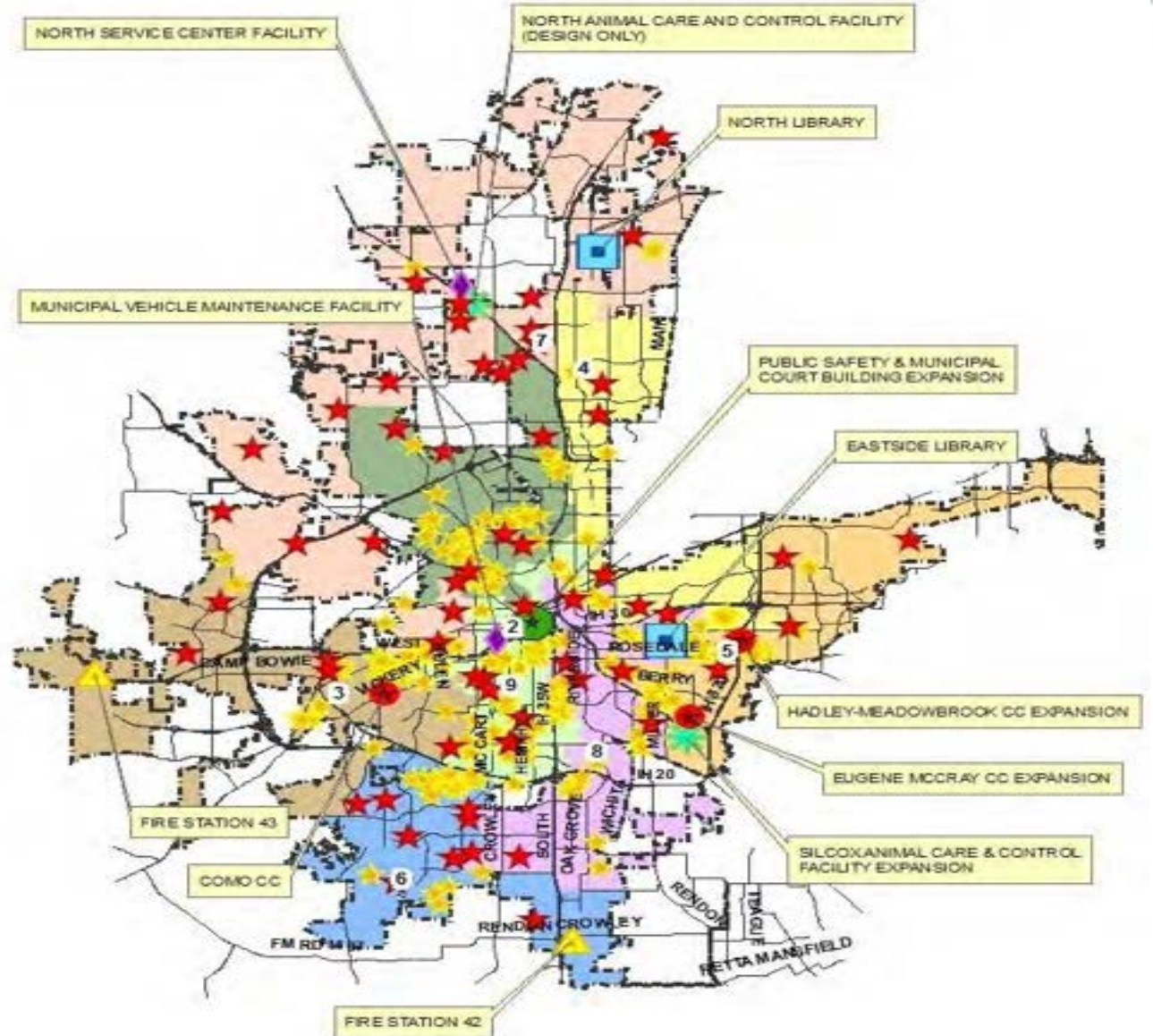


Streets and Transportation  
\$219,740,000 75%

Total - \$292,075,000

## 2014 BOND PROGRAM AUTHORIZED PROJECTS

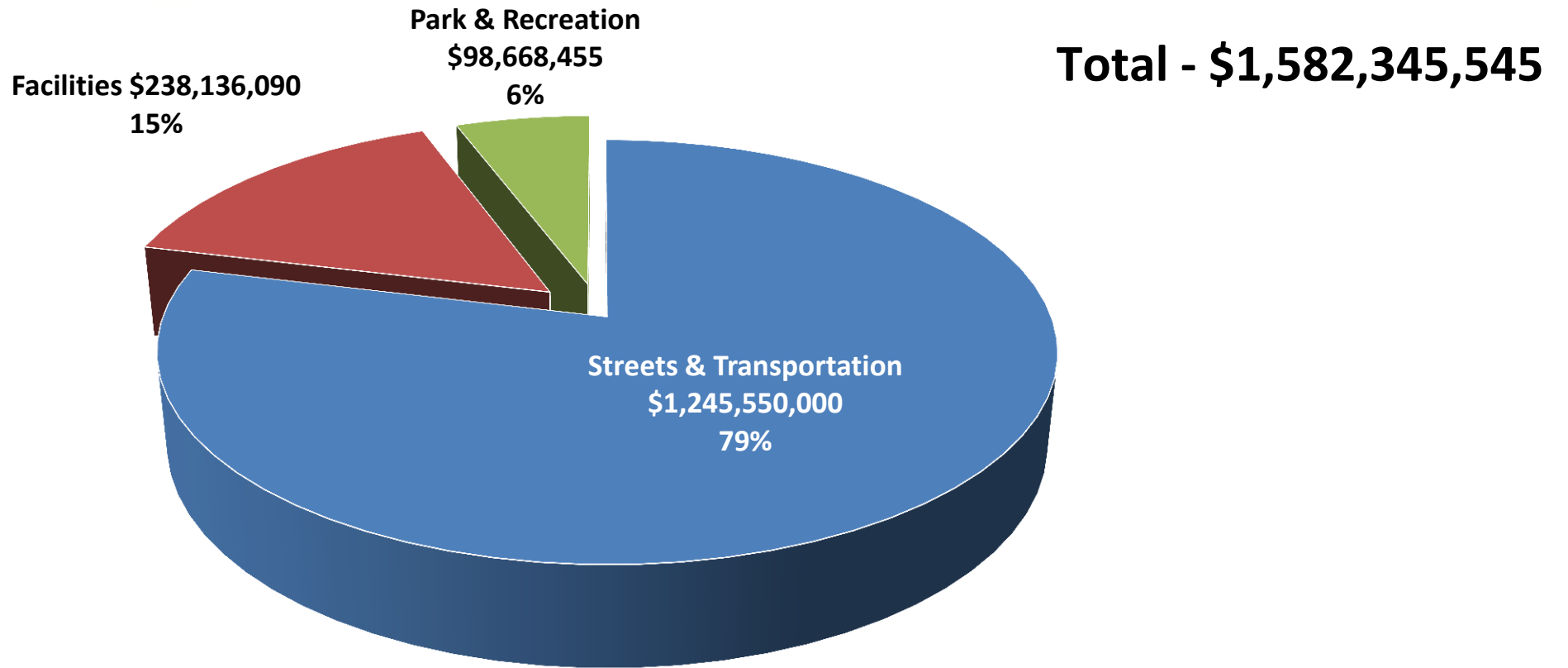
-  STREET CONSTRUCTION, RECONSTRUCTION, REHABILITATION
-  PARKS AND RECREATION
-  COMMUNITY CENTERS (CC)
-  LIBRARY SYSTEM IMPROVEMENTS
-  FIRE SAFETY IMPROVEMENT
-  MUNICIPAL COURT IMPROVEMENTS
-  MUNICIPAL SERVICES FACILITIES
-  ANIMAL CARE & CONTROL FACILITY IMPROVEMENTS



## 2018 Bond Program Goals & Objectives

- Maintain/Improve Existing Infrastructure
- Provide Mobility & City Services in Growth Areas
- Enhance Transportation and Recreational Corridors
- Allow for Flexibility and Partnership Opportunities
- Achieving Balance and Fiscal Stewardship (choices & trade-offs are always required)

## 2018 Bond Program Project Submissions by Category

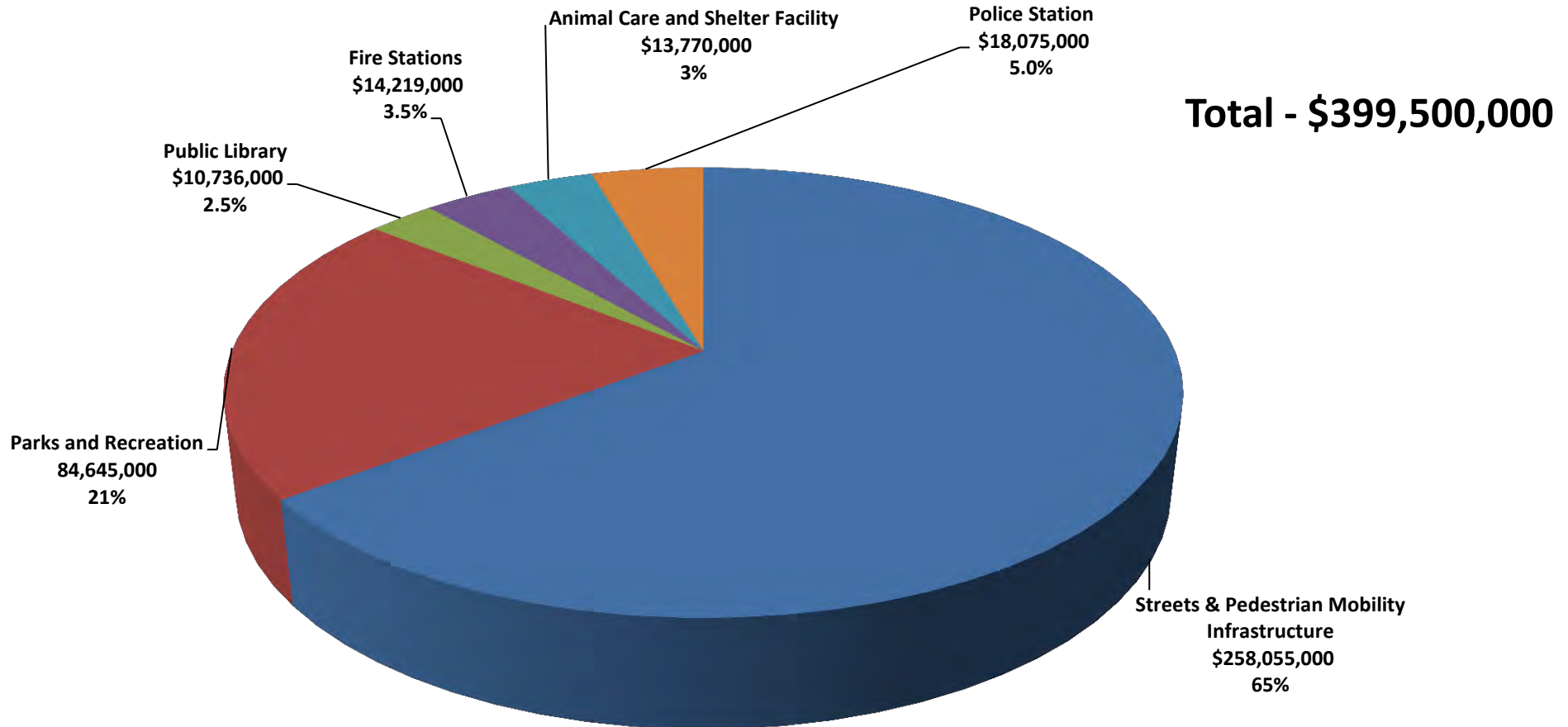




## Project Selection Process

- ❑ Project Evaluation and Prioritization (May 2016 – February 2017)
  - Evaluate prioritized projects submitted by each Department
  - ADA compliance was taken into consideration when staff prioritized:
    - Street improvements such as pavement markings, curb cuts and sidewalks.
    - Improvements to community centers and city facilities.
  - Categorize projects and rank in priority using defined selection criteria
  - Recommendations provided to City Management for final review
- ❑ City Council Review of Recommended Projects List (April 2017)
- ❑ Public Engagement Meetings (June – October 2017)
- ❑ Finalization of Project List (November 2017)
- ❑ City Council Review and Approval of Projects/Propositions (December 2017)

## 2018 Bond Program Projects Funding Request by Category



Includes Public Art Funding -  
 1% for Streets and Pedestrian Mobility and 2% for all other Categories

# Streets and Pedestrian Mobility Infrastructure



# Street Network Priorities

## Maintain Network

- Street Pavement
- Pavement Markings
- Traffic Signals
- Street Lighting

## Key Safety Improvements

- Neighborhood/School Safety
- Bridge Replacements
- Railroad Crossings
- Street Lighting

## Balance of Funding – Capacity Expansion of Network

- Thoroughfare Expansion – New Segments & Additional Lanes



# Maintain Network

## Thoroughfare, Neighborhood & Park Roads

- \$65,500,000 (Pavement Condition Index Maintained at 70 Score)
  - (34 % Increase over 2014 CIP)

## Revitalize Established Thoroughfare Corridors

- \$12,500,000 (New Category from 2014 CIP)

## Traffic Signals

- \$12,500,000 (25% Increase over 2014 CIP)



# Key Safety Improvements

## Neighborhood/School Safety

- \$5,000,000 (New Category from 2014 CIP)

## Bridge Replacement

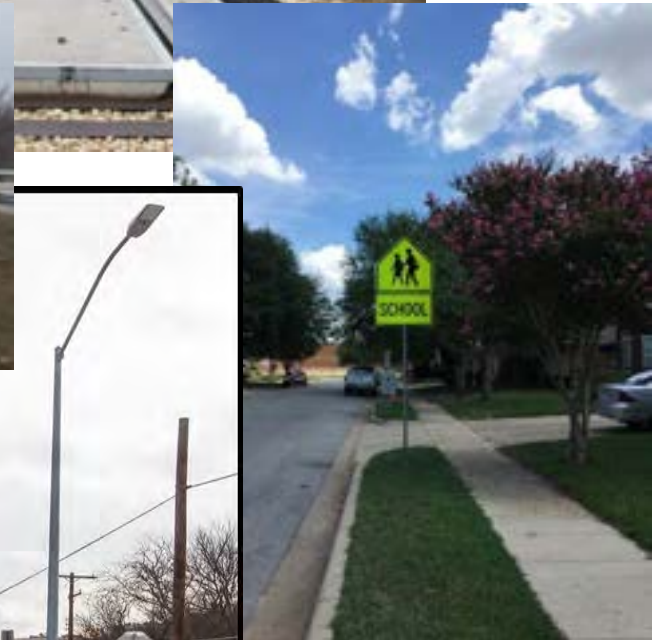
- \$10,000,000 (Unchanged from 2014 CIP)

## Railroad Crossings

- \$5,000,000 (Unchanged from 2014 CIP)

## Street Lights

- \$10,000,000 (100% Increase from 2014 CIP)



# Added Network Capacity

Focus on Stand Alone Intersection Improvements in Addition to New Corridors

## Corridors

- \$90,000,000 (10% Reduction from 2014 CIP)

## Intersections

- \$30,000,000 (330% Increase 2014 CIP)

## Sidewalks/Bicycle Facilities

- \$15,000,000 (12% Increase from 2014 CIP)



## Added Capacity Location Map

**2018 Bond TFW Proposed Intersection Locations**

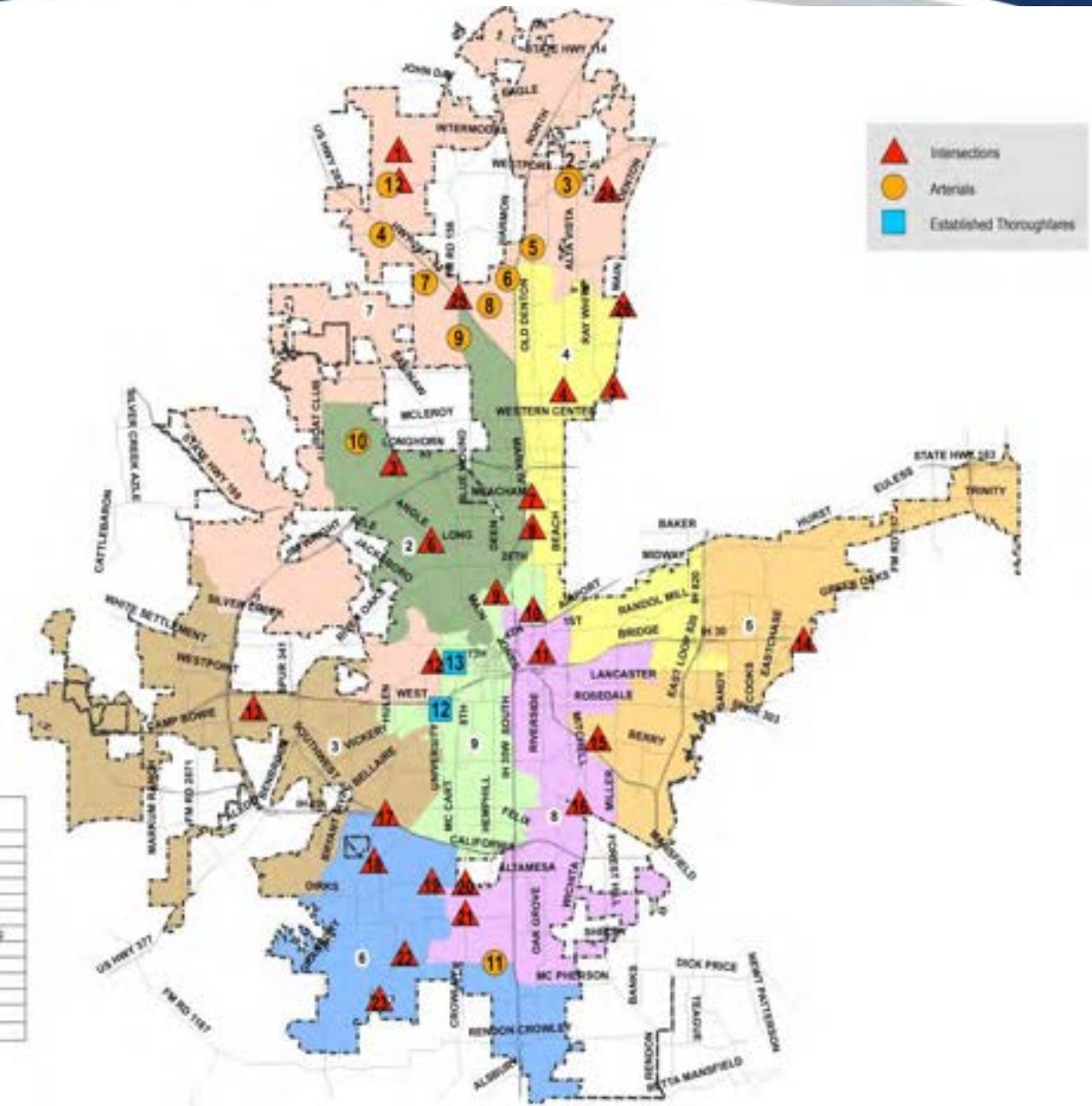
1	Senders Ranch Blvd & Diamondback Ln
2	Senders Ranch Blvd & Avondale Haslet Rd
3	Maine Creek Pkwy & Grayson Ridge Dr
4	Beach St & Basswood Blvd
5	Basswood Blvd & US 377*
6	W Long Ave & Angie Ave
7	N Sylvania Ave & Meacham Blvd
8	N Sylvania Ave & E Long Ave
9	E Northside Dr & Cold Springs Rd
10	N Sylvania Ave & Race St
11	Rivenside Dr & S Sylvania Ave
12	Camp Bowie Blvd & Van Cibus Way
13	S Normandie St & Las Vegas Tr
14	Randol Mill Rd & Meadowbrook Blvd
15	E Berry St & Campbell St
16	E Seminary Rd & Mansfield Hwy
17	S Hulen St & H 20
18	S Hulen St & Grandby Rd*
19	McCar Ave & Alameda Blvd*
20	Alameda Blvd & Crowley Rd
21	Drowley Rd & Sycamore School Rd*
22	W Ringier Rd & Garden Springs Dr
23	S Hulen St & W Osborne Rd
24	Park Vista Blvd & Keller Haslet Rd*
25	Blue Mound Rd & US 287*
26	Kroger Dr & US 377

\*Advanced funding for design

**2018 Bond TFW Proposed Arterial/Established Thoroughfares Locations (Advanced Funding For Design)**

1	Avondale Haslet Rd	Willow Creek Rd	City Limits (F/Howard)
2	Westport Pkwy	W/10th Pkwy	Search St
3	N Beach St	Westport Pkwy	Sanatoga Downs Way
4	Willow Springs Rd	Blue Mound Rd	Eagle Blvd
5	Rivenside Dr (Old Denton Rd)	Golden Triangle Blvd	Keller Hicks Rd
6	Golden Triangle Pkwy	Maple Rowwood Tr	H 20
7	Senders Ranch Rd	Irmonon Rd	BNV/ Wilshire Landing
8	Hannon Rd	Golden Triangle Blvd	US 287
9	Bakley Rowlett Rd	F/10th	US 287
10	Ormond-Maine Creek Pkwy	Scott Club Rd	Maine Creek Pkwy
11	Ringier Rd (West)	N Drowley Rd	Old Buffers Rd
12	University Dr*	Park Hill Dr	Trail Dr
13	W 7th St*	University Dr	Bridge over Tody

\*Established Thoroughfares





# Streets and Pedestrian Mobility Infrastructure














Project Category		GO Funding Request
Bridge Rehabilitation	(Unchanged from 2014 CIP)	\$ 10,000,000
Neighborhood and Arterial Street Reconstruction	(34% Increase over 2014 CIP)	\$ 65,500,000
Railroad Crossings	(Unchanged from 2014 CIP)	\$ 5,000,000
Streetlights	(100% Increase over 2014 CIP)	\$ 10,000,000
Intersection/Signal Improvements	(330% Increase over 2014 CIP)	\$ 30,000,000
Traffic Signals	(25% Increase over 2014 CIP)	\$ 12,500,000
Neighborhood/School Safety	(New Category )	\$ 5,000,000
Revitalize Established Transportation Corridors	(New Category)	\$ 12,500,000
Arterials/Corridors - Added Network Capacity	(10% Reduction from 2014 CIP)	\$ 90,000,000
Sidewalks/Bicycle Lanes	(12% Increase over 2014 CIP)	\$ 15,000,000
	<i>Public Arts Funding (1%)</i>	\$ 2,555,000
	<b>Totals</b>	<b>\$ 258,055,000</b>

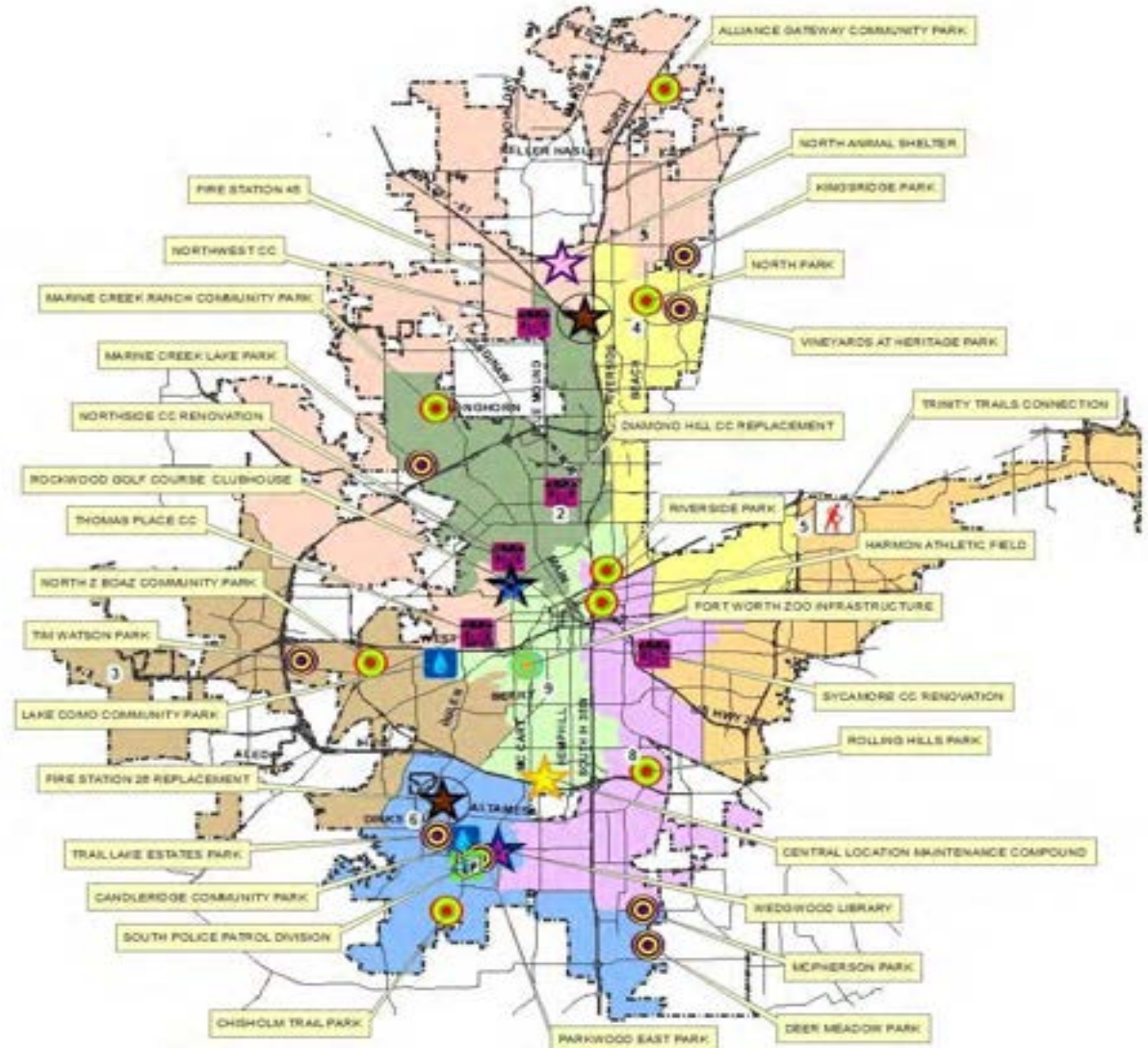
# Parks, Recreation, and Facilities



# Proposed Park, Recreation, and Facility Improvements

## 2018 BOND PROGRAM

<b>PROPOSITION - 2</b>		<b>PROPOSITION - 3</b>	
PARKS AND RECREATION		PUBLIC LIBRARY	
	COMMUNITY PARK DEVELOPMENT		WEDGWOOD LIBRARY
	FORT WORTH ZOO	<b>PROPOSITION - 4</b>	
	NEIGHBORHOOD PARK DEVELOPMENT	FIRE STATIONS	
	COMMUNITY CENTERS (CC)		FIRE STATION(S)
	CENTRAL LOCATION MAINTENANCE COMPOUND	<b>PROPOSITION - 5</b>	
	ROCKWOOD GOLF COURSE CLUBHOUSE	PUBLIC ANIMAL CARE AND SHELTER FACILITY	
	TRINITY TRAILS CONNECTION		ANIMAL SHELTER
	FLOOD PROTECTION & EROSION CONTROL	<b>PROPOSITION - 6</b>	
			SOUTH POLICE PATROL DIVISION
			FORT WORTH CITY LIMIT



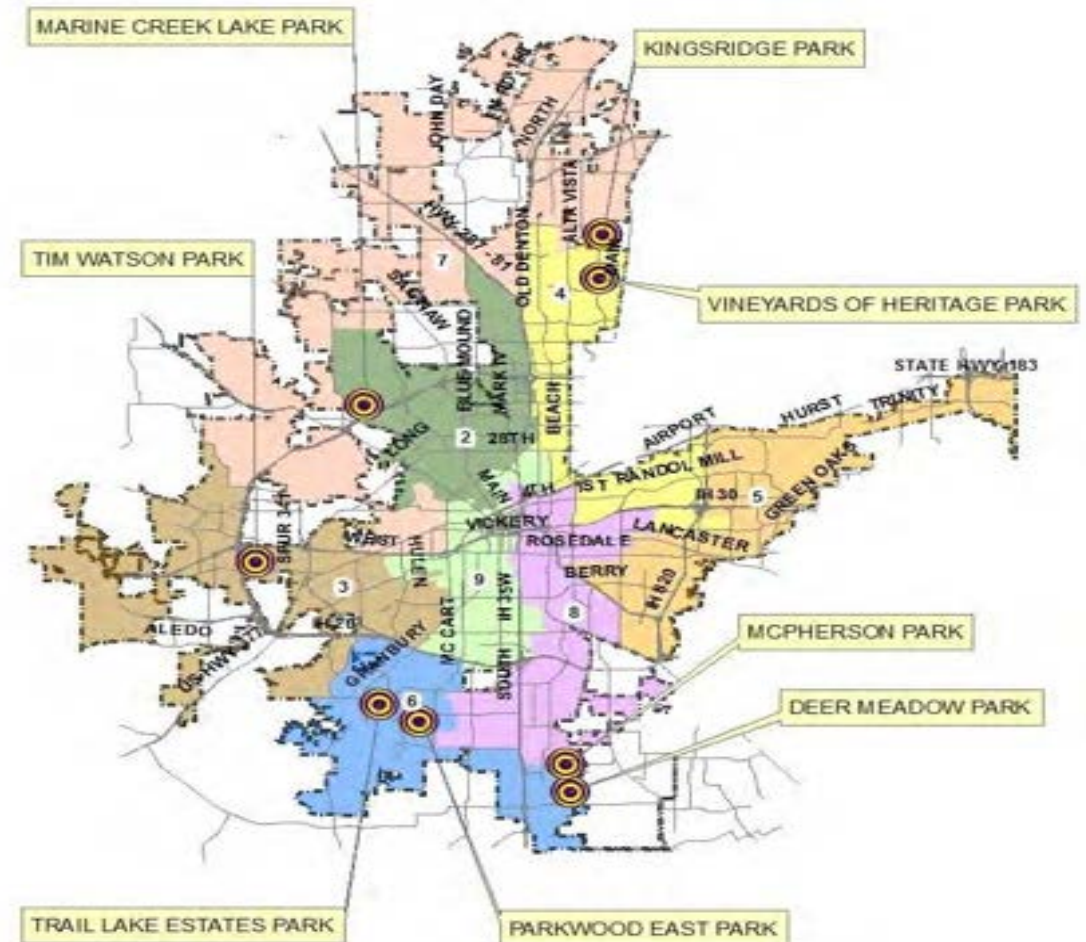
# Neighborhood Park Development

Project includes master planning, design, and construction of 8 Neighborhood Parks

Typical amenities include:

- Playground
- Picnic shelter
- Walking trail
- Practice fields

**Total - \$3,760,000**



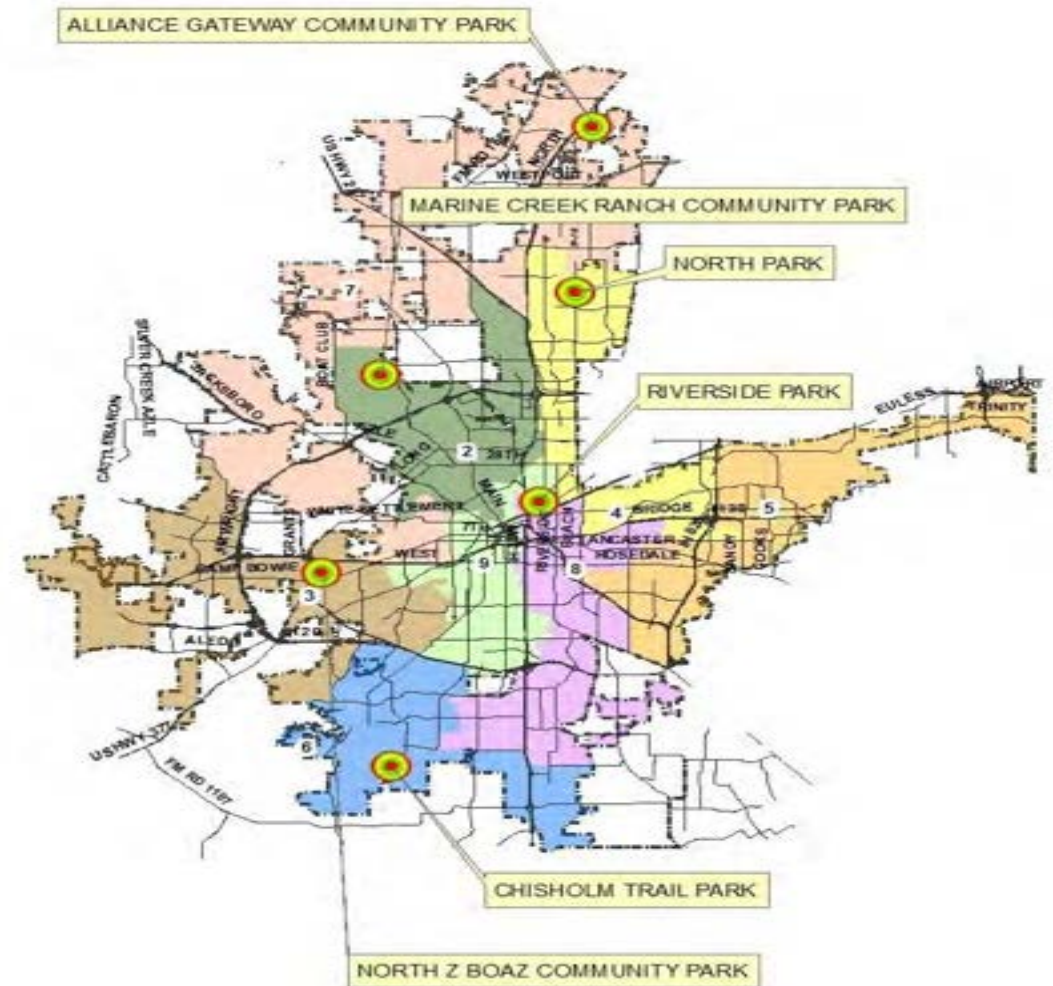
# Community Park Development

Complete development of 6  
Community Parks in accordance with  
**Park and Recreation Open Space  
Master Plan**

Amenities may include, but not limited to:

- Athletic fields
- Walking/biking trails
- Picnic facilities
- Soccer Fields
- Playgrounds
- Park roads and parking

***Total - \$14,500,000***



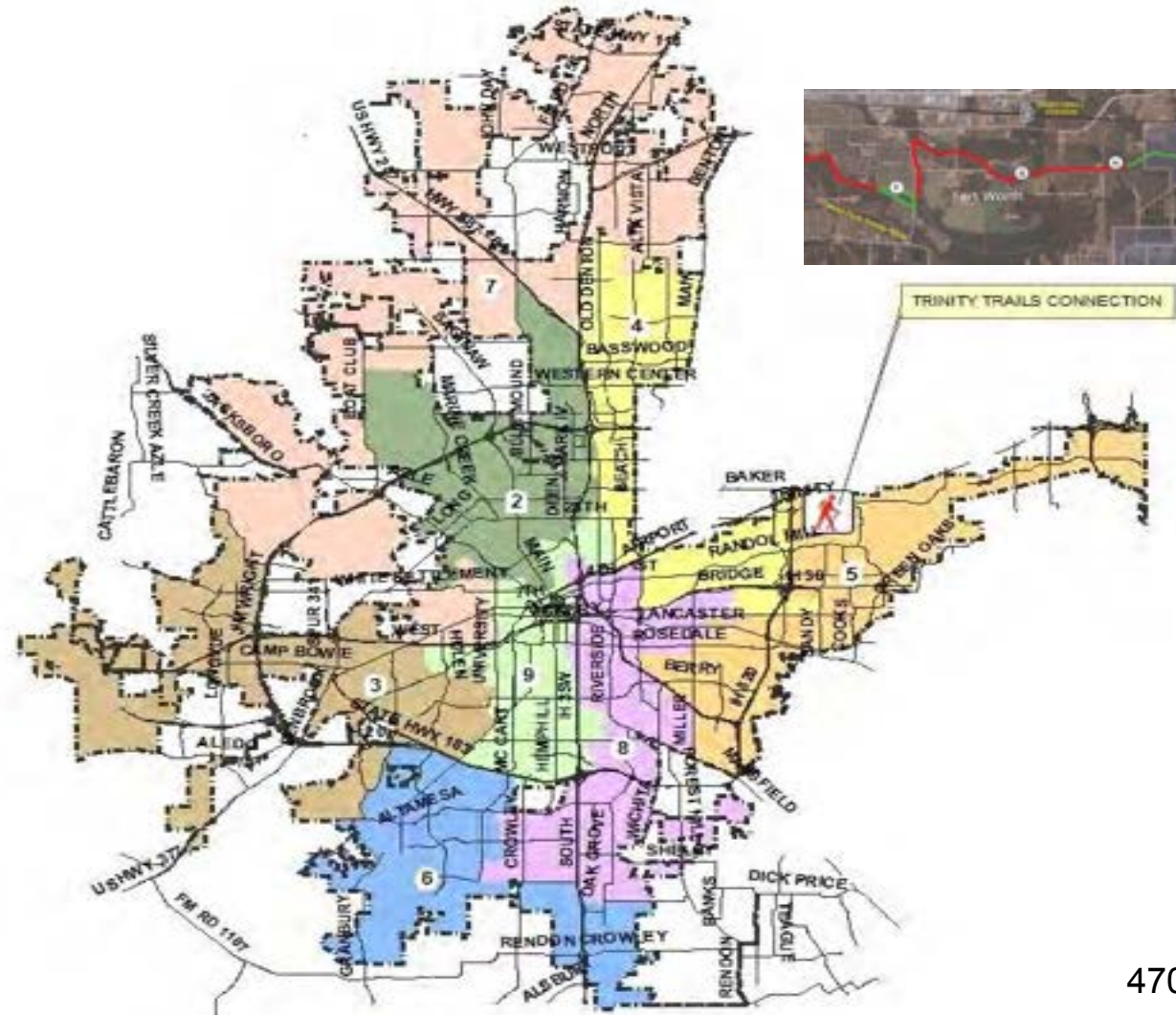
# Walks and Trails

- **Trinity Trails Connection** – complete trail connection from San JoAquin Trail to River Legacy Park trail

***\$4,000,000***

- **Trail Gap Connections** – citywide construction of new trails to address gaps in connection

***\$3,500,000***



# Community Centers

## **Northwest Community Center - \$11,350,000**

Design and construction of 25,000 sq.ft. facility with gymnasium, fitness equipment, and meeting rooms.

## **Diamond Hill Community Center (Replacement) \$11,450,000**

Design and construction of new 25,000 sq.ft. facility to replace existing center. Facility amenities to include boxing gym, gymnasium, fitness area, and meeting rooms.

## **Northside Community Center (Renovation) \$5,806,000**

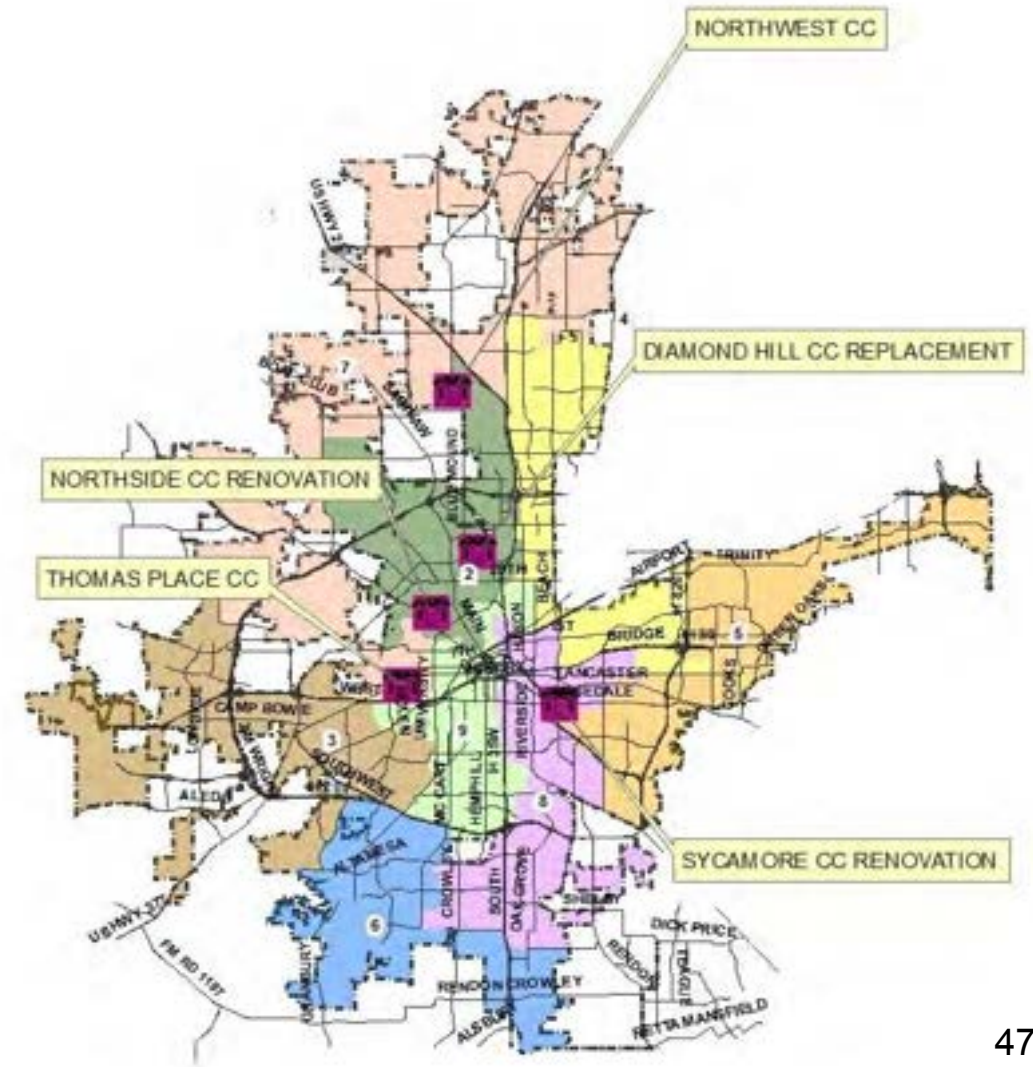
Design and renovation of 19,338 sq.ft. of building area to provide more meeting/rental space and program expansion.

## **Sycamore Community Center (Renovation) \$2,710,000**

Design, renovation and repair to 8,053 sq.ft. of building area to increase programming services and address structural issues, gym floor replacement and restoration of lighting for outdoor court.

## **Thomas Place Community Center \$1,000,000**

Acquisition of property only



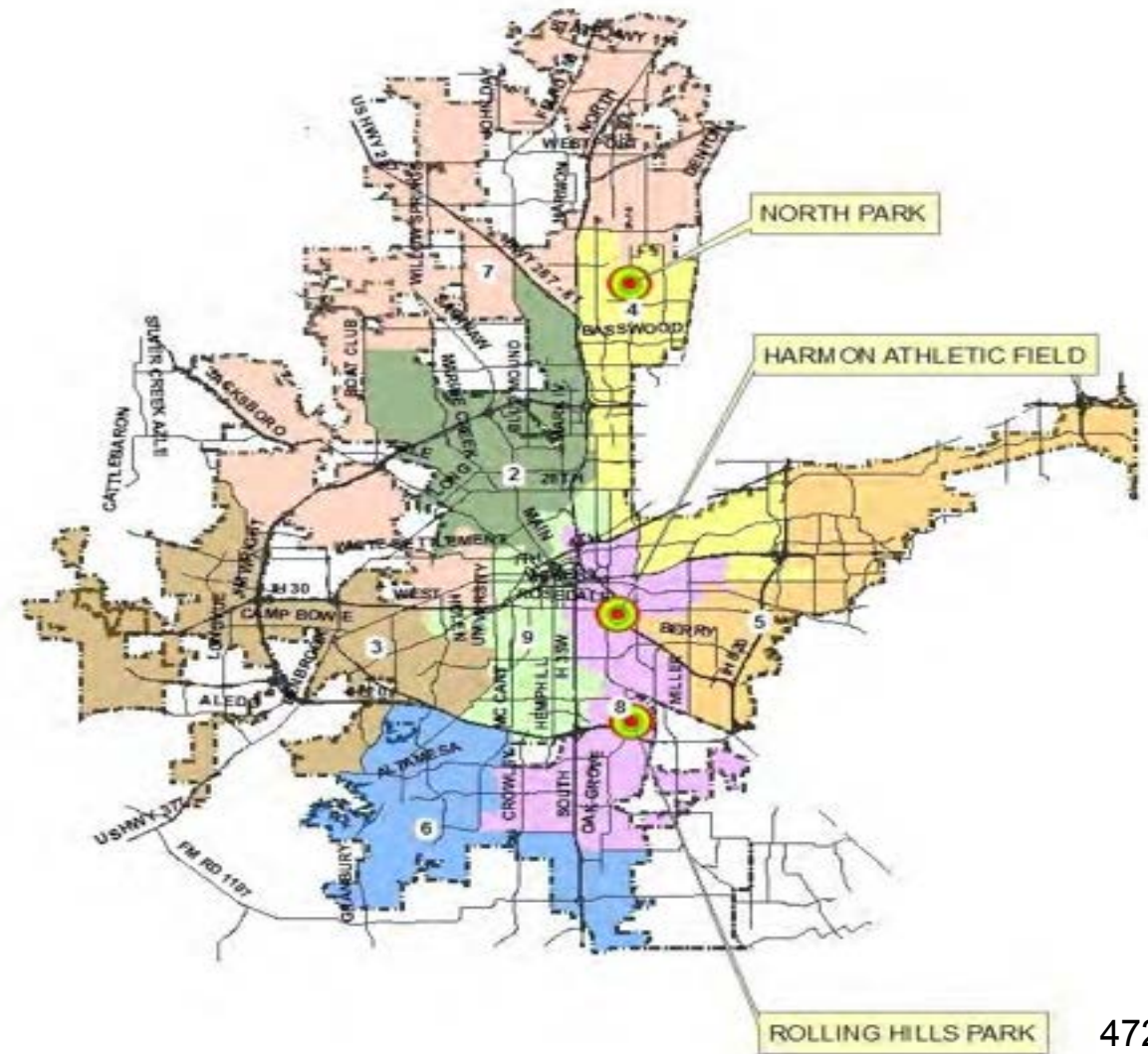
# Athletic Field Lighting

Construction of athletic field lighting at 3 Community Parks to provide evening competitive play

- Harmon Athletic Field
  - 2 Fields
- North Park
  - 2 Fields
- Rolling Hills
  - 6 Fields



**Total - \$3,000,000**





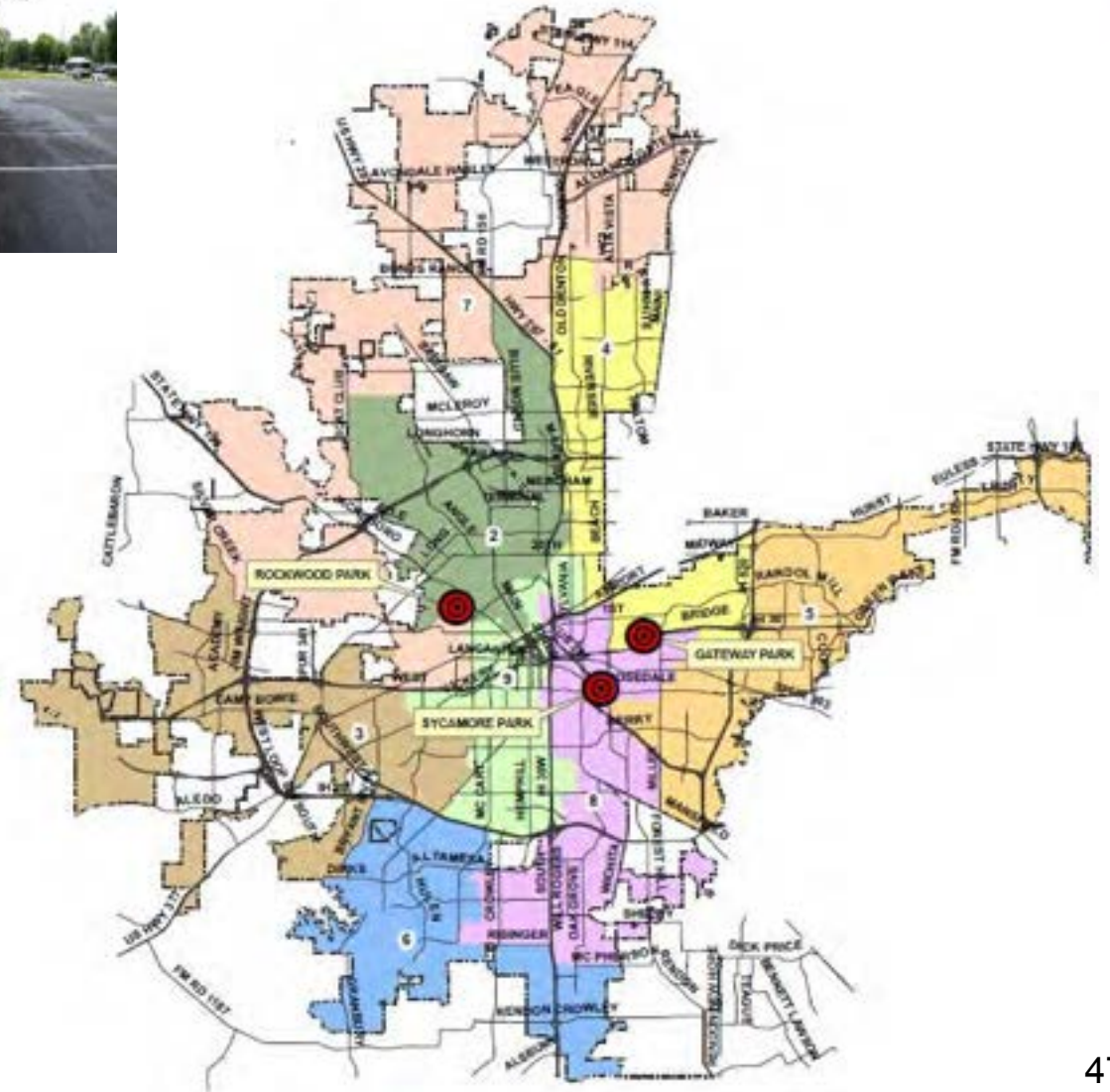
# Road and Parking Replacement



Replacement of Parking Lots and Road at the following Parks:

- Gateway Park (East 1<sup>st</sup> Street Entrance)
- Sycamore Park
- Rockwood Park

**\$3,000,000**



# PARD Maintenance Facility

Project includes the design and construction of new facilities to house:

- Trades maintenance personnel
- Central District operations
- Citywide Mowing operations
- Graffiti Abatement
- Athletics maintenance operation
- Inventory and equipment

***\$9,055,000***

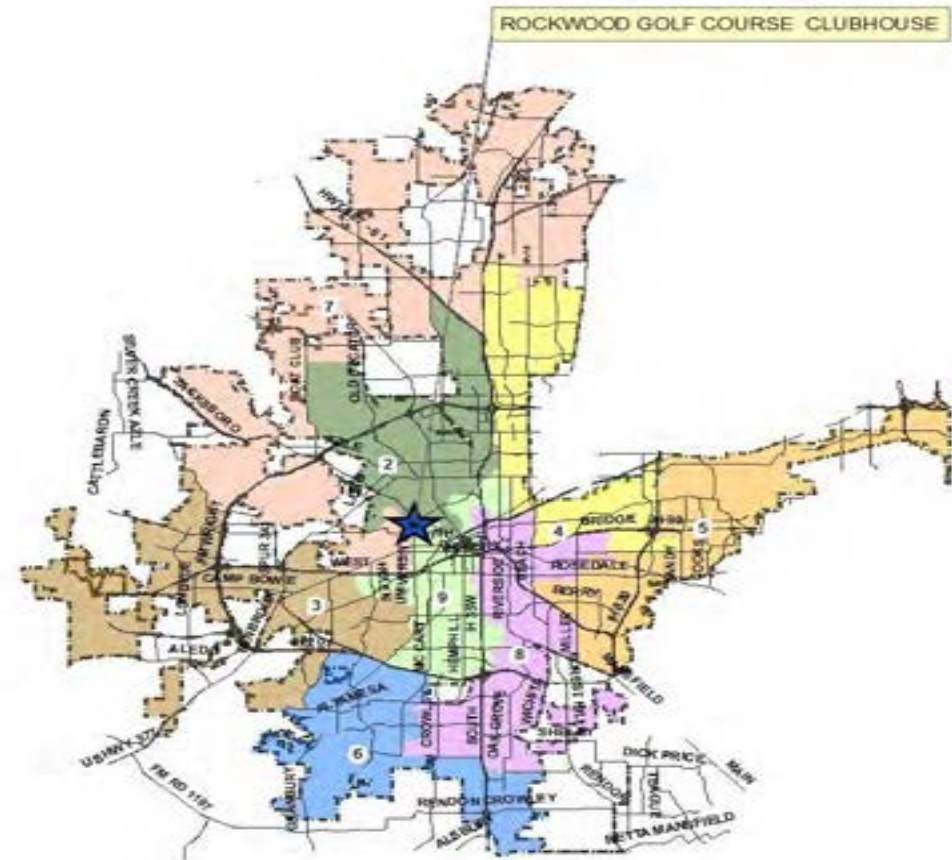


# Rockwood Clubhouse

Design and construction of a new clubhouse/cart barn and renovation to existing maintenance facility.



**\$6,600,000**



# Other Park Projects

**Universal Playground** – Design and construction of 15,000 – 20,000 sq.ft. playground with resilient surfacing, connecting walks and supporting furnishing.

***\$750,000***



**Neighborhood and Community Park Land Acquisition**

- Funding for acquisition of park land in areas of the City that are deficient in neighborhood and community parks

***\$3,500,000***

**Fort Worth Zoo Infrastructure**

- Design and construction of public utility infrastructure to support new zoo facilities

***\$1,339,000***

**\*Flood Protection and Drainage Control**

- Design and construction of dam improvements at Lake Como Community Park and Candleridge Community Park

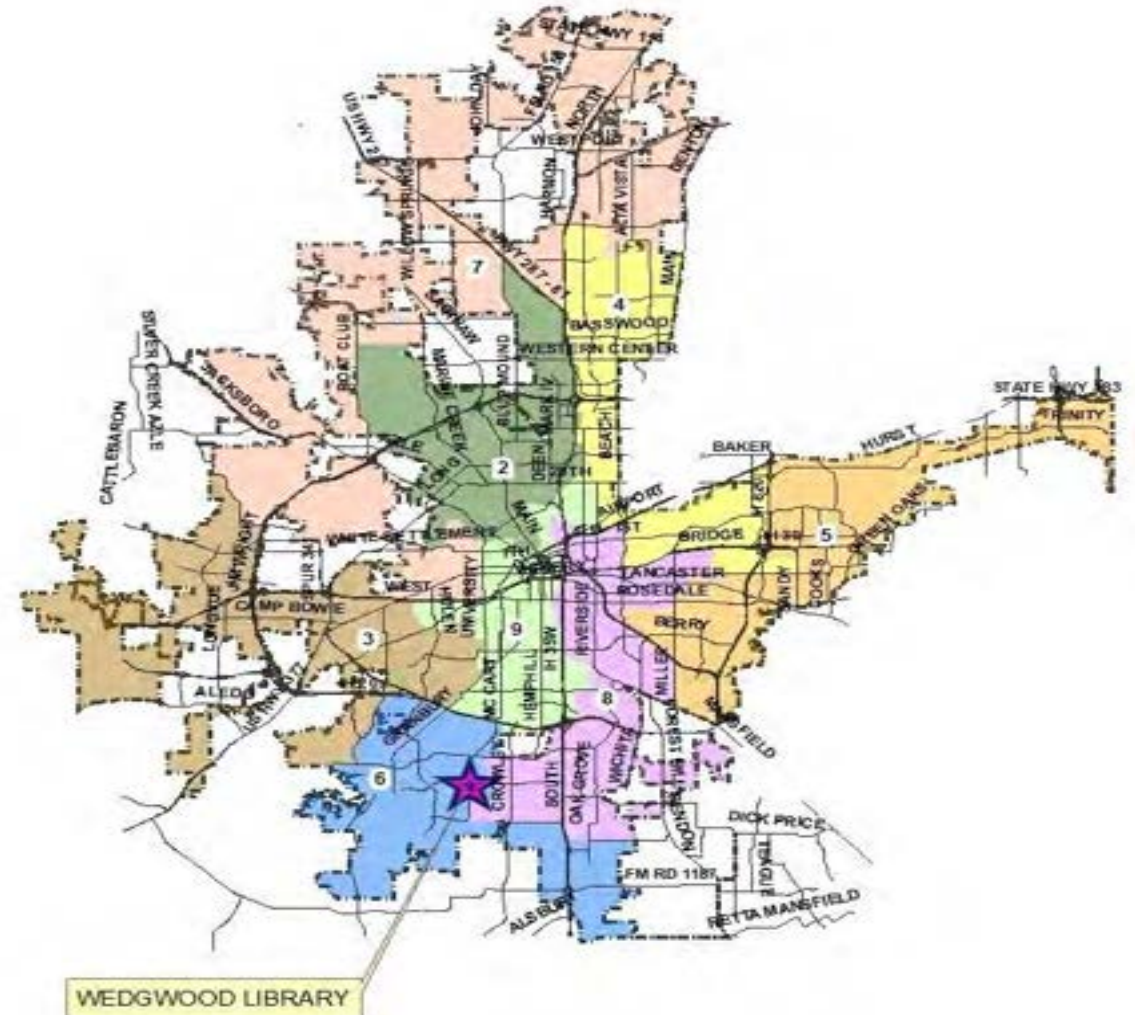
***\$661,000***

# Library System Improvement

## Wedgwood Library Replacement

- Project includes land acquisition, design and construction of new approximately 16,000 sq.ft. library
- Current facility is too small at 4,900 sq.ft., and site lacks sufficient parking
- Proposed new location near McCart Ave. and Sycamore School Road
- New Library
  - ✓ Improves overall service delivery with larger collection
  - ✓ Provides opportunity for more educational classroom and computer lab space

***\$10,525,000***



# Fire Safety Improvements

## Fire Station #45

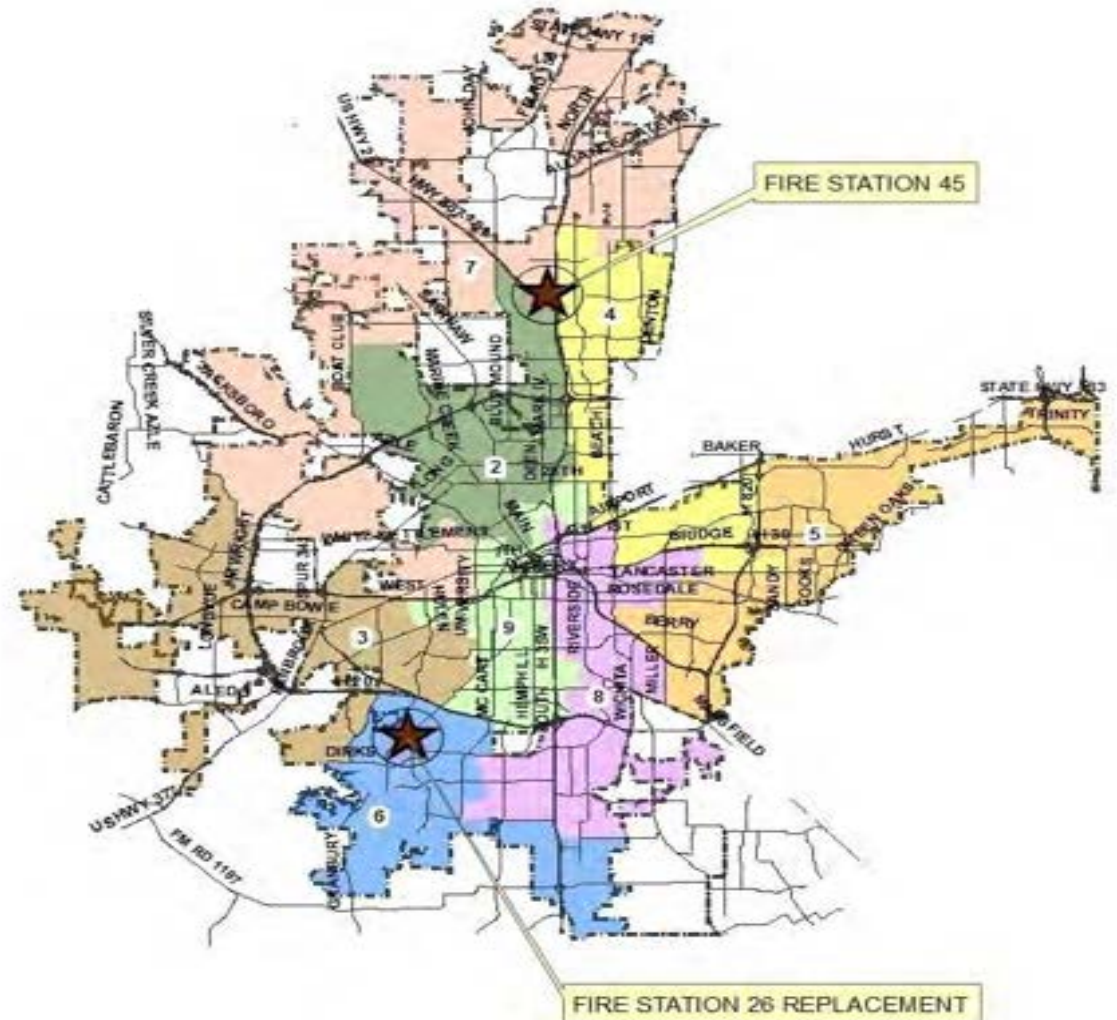
- Project includes land acquisition, design and construction of new 3-bay, double company fire station to serve growing population

**\$7,800,000**

## Fire Station #26 Replacement

- Project includes design and construction of 3-bay, double company fire station (2 story) and demolition of existing station

**\$6,140,000**





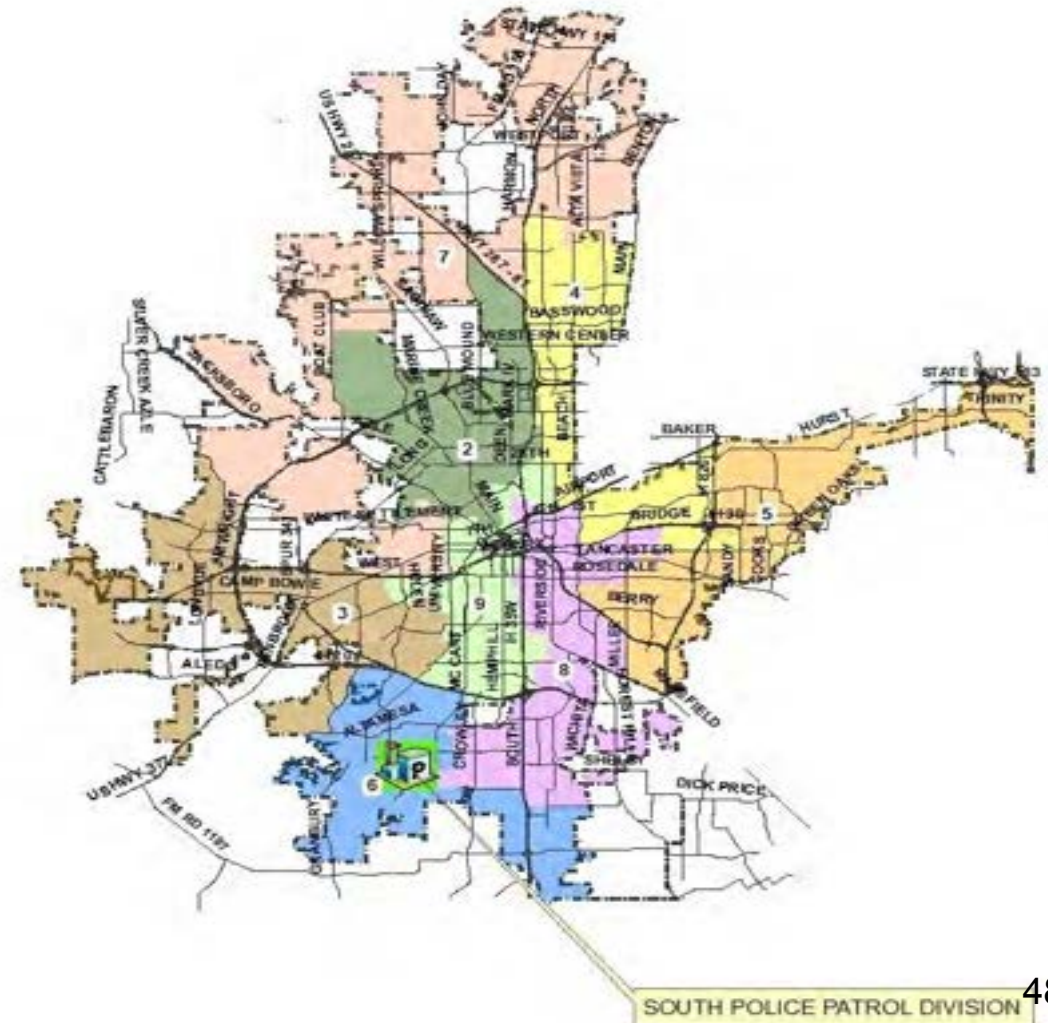
# Police Facility

Land acquisition, design, and construction of an approximately 28,000 sq.ft. facility to house the South Patrol Division.

## *Project Objectives:*

- Centralize police operations in southern part of City
- Meet expected population growth demands
- Eliminate financial obligation associated with current leased facilities at Hemphill Street and McCart Ave.

**\$17,720,000**





# Funding Summary by *Sample* Proposition

<b>Streets and Pedestrian Mobility Infrastructure</b>	<i>Proposition 1</i>	<b>\$ 258,055,000</b>
<b>Parks and Recreation</b>	<i>Proposition 2</i>	<b>\$ 84,645,000</b>
<b>Public Library</b>	<i>Proposition 3</i>	<b>\$ 10,736,000</b>
<b>Fire Stations</b>	<i>Proposition 4</i>	<b>\$ 14,219,000</b>
<b>Public Animal Care and Control Facility</b>	<i>Proposition 5</i>	<b>\$ 13,770,000</b>
<b>Police Station</b>	<i>Proposition 6</i>	<b>\$ 18,075,000</b>
	<b>Grand Totals</b>	<b>\$ 399,500,000</b>

# Future Budget Impact

## Projected Increase for Operations and Maintenance

Project	FY2019	FY2020	FY2021	FY2022	FY2023	Totals
<b>Facilities</b>						
Fire Station 45 (Far North Station)		\$654,000	\$1,285,000			\$1,939,000
North Animal Shelter		\$2,129,000				\$2,129,000
Wedgwood Library Replacement			\$1,233,000			\$1,233,000
South Police Patrol			\$289,000	-\$435,000		-\$146,000
Central Location Maint. Compound				\$214,000		\$214,000
Rockwood Clubhouse				\$69,000		\$69,000
Diamond Hill Community Center				\$173,000		\$173,000
Northwest Community Center				\$518,000		\$518,000
Facilities Subtotal	\$0	\$2,783,000	\$2,372,000	\$539,000	\$0	\$6,129,000
	<b>FY2019</b>	<b>FY2020</b>	<b>FY2021</b>	<b>FY2022</b>	<b>FY2023</b>	<b>Totals</b>
<b>Parks</b>						
Parks (Includes Trails) Subtotal	\$76,000	\$0	\$214,000	\$613,000	\$168,000	\$1,071,000
<b>Grand Total</b>	<b>\$76,000</b>	<b>\$2,783,000</b>	<b>\$2,586,000</b>	<b>\$1,152,000</b>	<b>\$168,000</b>	<b>\$7,200,000</b>

## Proposed 2018 Bond Program Schedule

- **April 2017**– Staff presentation to City Council on proposed public presentations schedule of meetings
- **June – October 2017** Public engagement meetings
- **November 2017** – Finalization of recommended projects
- **December 2017** - City Council review and approval of projects/propositions
- **February 2018** – City Council action calling for May 2018 Bond election (ordinance)
- **February – May 2018** – Public education of Bond Propositions
- **May 5, 2018** – Bond Election day

# 2018 Bond Program

Questions/Comments



# Lake Worth Gas Funded Projects

Lake Worth Regional Coordination Committee  
September 14, 2017

Presented by:

Water Department



## *Fund and CIP Responsibilities* *Lake Worth Gas Revenue Funds*

- CIP Development and Scheduling – Water Department
  - Requires regular coordination with Parks Department and TPW
- Gas Lease Contracts – Property Management Department
- Expenditures and Fund Balance – Finance Department



## Lake Worth Gas Funded CIP

- 2008 Lake Worth Comprehensive Capital Improvement Implementation Project Identified 14 Projects with a total project cost estimate of \$117M.
- Gas Well Revenues for FY 17 (11 months) total \$4,093,325

Month	Revenue
Oct 16	\$445,346.42
Nov 16	\$377,864.12
Dec 16	\$408,476.30
Jan 17	\$366,499.39
Mar 17	\$363,106.58
Apr 17	\$425,615.86
May 17	\$344,640.31
Jun 17	\$298,033.83
Jul 17	\$361,361.52
Aug 17	\$384,702.28



## Lake Worth CIP Projects In Progress

Gas Well Funded Project	Year	Amount
Lake Worth Hike and Bike Trail, Phase I	FY 16	\$6,268,400
Love Circle Water and Sewer Project	FY 17	\$3,933,495
TOTAL COST		\$10,201,895





## *CIP Projects, FY 18 – FY 22*

<b>Gas Well Funded Project</b>	<b>Year</b>	<b>Amount</b>
Watercress Low Pressure Sewer Line (eng)	FY 18	\$400,000
Love Circle Park Improvements	FY 18	\$200,000
Lake Worth Maintenance Dredging (Permitting)	FY 18	\$400,000
Watercress Low Pressure Sewer Line (const)	FY 19	\$3,100,000
Hike and Bike Trail System – Phase II (const)	FY 19	\$6,000,000
Hike and Bike Trail System – Phase III (eng)	FY 20	\$900,000
Hike and Bike Trail System – Phase III (const)	FY 21	\$5,100,000
<b>TOTAL COST</b>		<b>\$16,100,000</b>

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# QUESTIONS





## *CIP Projects Remaining*

<b>Gas Well Funded Project</b>	<b>Amount</b>
Northside II Water Line Improvements	\$26,554,064
20" Northside III Water Main along IH 820	\$2,200,000
SW Silver Creek Road Expansion	\$9,073,855
Sunset Park/Freemons Park Boat Ramp Improvements	\$1,023,823
Access Control Improvements	\$1,715,612
<b>TOTAL COST</b>	<b>\$40,567,354</b>



# Readiness and Environmental Protection Integration (REPI)

Lake Worth Regional  
Coordination Committee  
14 SEPT 2017

Presented by: Mike Branum,  
Community Planning and Liaison Officer



# Overview

- Public-Public, Public-Private (P4) Initiatives
- REPI Background
- REPI Process
- Buffer Partnership Locations
- REPI Stakeholders in Texas
- NAS Fort Worth JRB Strategy
- Next Steps



# P4 Initiatives

## *Partnership Program Types*

### Federal

- Innovative Readiness Training
- Intergovernmental Service Agreement
- Readiness and Environmental Protection Integration (REPI)



### State

- Defense Economic Adjustment Assistance Program (DEAAG)

### **Focus Areas:**

**Military value, encroachment,  
security, construction, service contracts**





# REPI Background

- Tool to mitigate encroachment restricting military training, testing, and operations
- Protects military missions thru:
  - Removal or avoidance of land-use conflicts
  - Addressing regulatory restrictions on military activities
- Enhances military readiness by promoting compatible development and protecting valuable habitat

The Department of Defense's Readiness and Environmental Protection Integration (REPI) Program is a key tool for promoting innovative and land conservation partnerships that benefit national defense, neighboring communities and the environment.



Parachute training is halted when housing developments are built near drop sites

Realistic combat training, pristine test environments, and operational capability are keys to keeping our service members safe. However, encroachment issues are creating obstacles that threaten military activities.



Flight testing, training, and operations are impeded by cellphone towers, wind farms, and developments

80% of military bases have surrounding development that is higher than the national average



Weapons testing and training causes noise, dust, and smoke complaints from nearby communities

Night training is compromised when light pollution from nearby commercial areas spreads

Urban sprawl decreases habitat and may cause Federally protected species to seek sanctuary on military lands







# REPI Process

Program Management:  
Office of the Secretary of Defense

- REPI guidance
- Interpret law
- Fund proposals
- Reports progress to Congress

Program Implementation:  
Military Services & Installations

- Identify mission priorities
- Submit projects to OSD
- Identify partners and **WILLING** sellers
- Conduct transactions



# Buffer Partnership Locations





# Buffer Partnership Locations





# Example Stakeholders in Texas

## Conservation Groups



## Example State & Local Governments





# NAS Fort Worth JRB Strategy

- Regional Focus
  - NAS Fort Worth JRB (Lead)
  - Fort Wolters (Texas Military Department)
  - Ancillary training areas
- Cost sharing: federal, state, local, private
- Capture environmental & conservation opportunities where able
- Complement Joint Land Use Study
- Model multiple datasets to guide data-driven analysis to identify focus areas

**REPI  
Agreement  
Areas**

**Noise Contours (db)**



**DRAFT**



Contact: Mike Branum, CPLO  
NAVFAC Southeast  
September 2017



# Thank you!





# TEXAS DEPARTMENT OF TRANSPORTATION



## SH 199 AT I-820 INTERCHANGE

SH 199: FROM AZLE AVENUE TO AZLE WAY  
I-820: FROM NAVAJO TRAIL/CAHOBA DRIVE TO MARINE  
CREEK PARKWAY

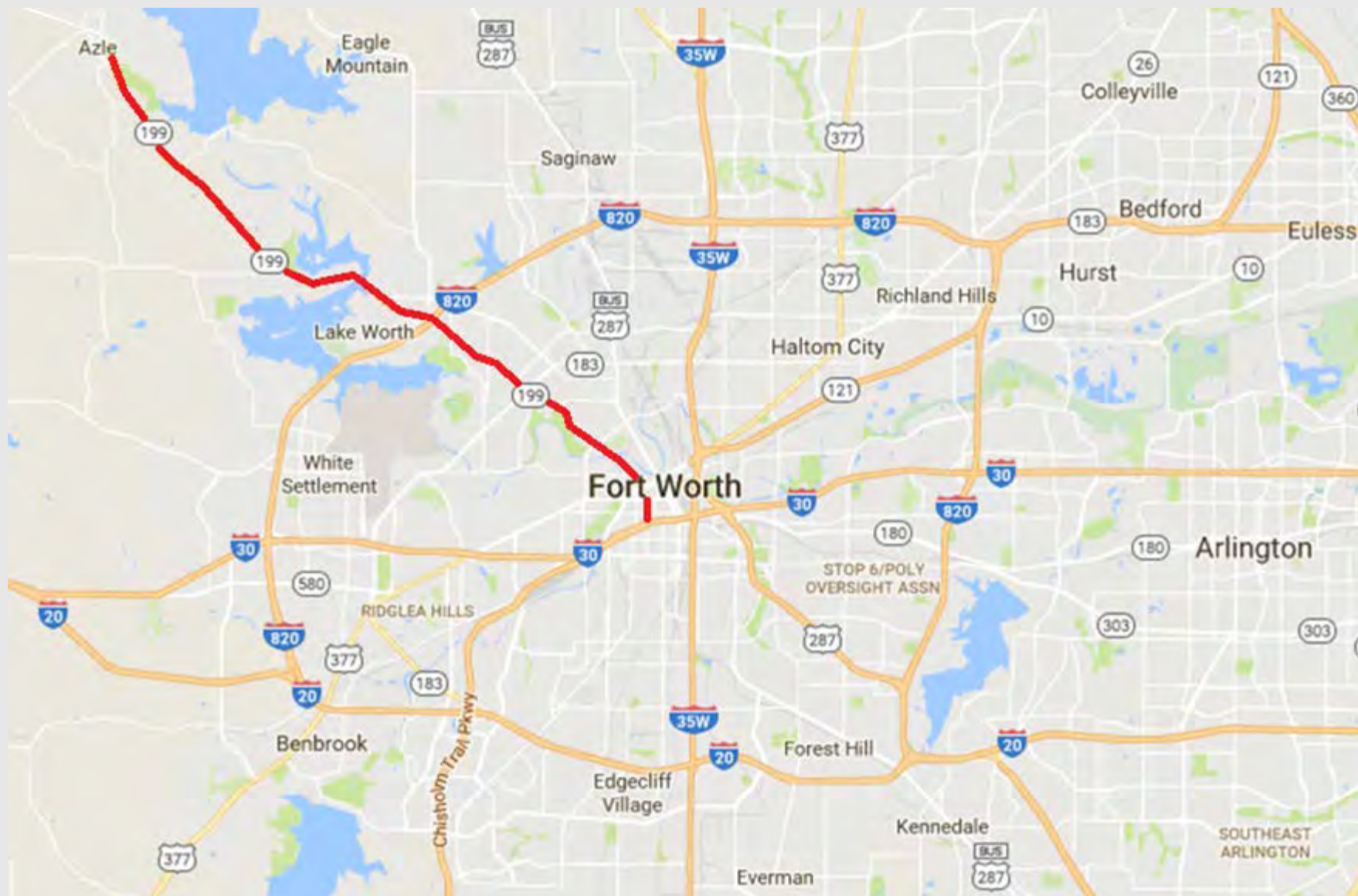
Public Meeting



June 6, 2019



# SH 199 at I-820 Interchange – Corridor History



# SH 199 at I-820 Interchange – Corridor History



1987 - Corridor study along 17 miles of SH 199 from Azle (FM 730) to Downtown Ft. Worth to determine the need for a freeway.

# SH 199 at I-820 Interchange – Corridor History

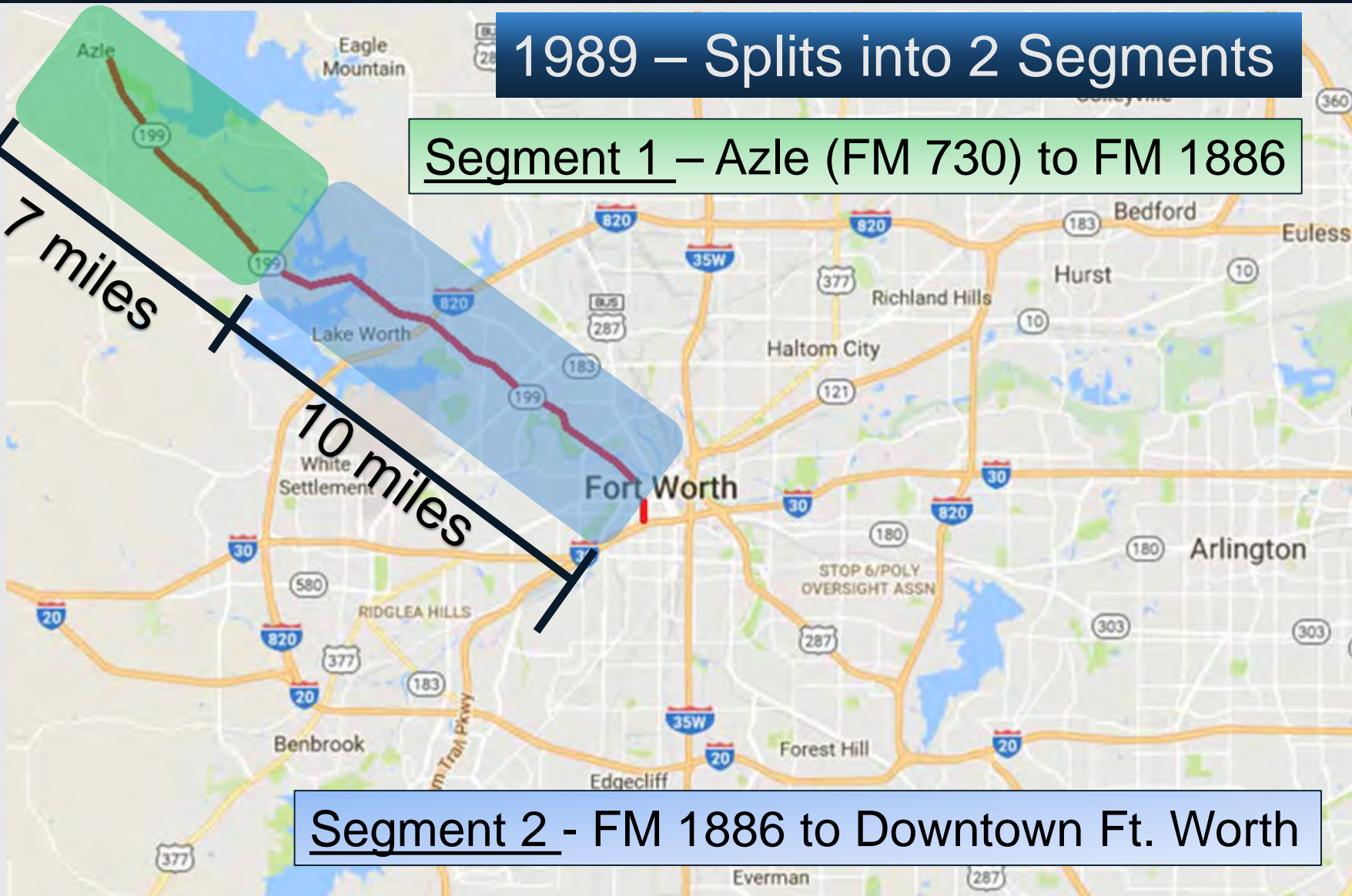
1989 – Splits into 2 Segments

Segment 1 – Azle (FM 730) to FM 1886

7 miles

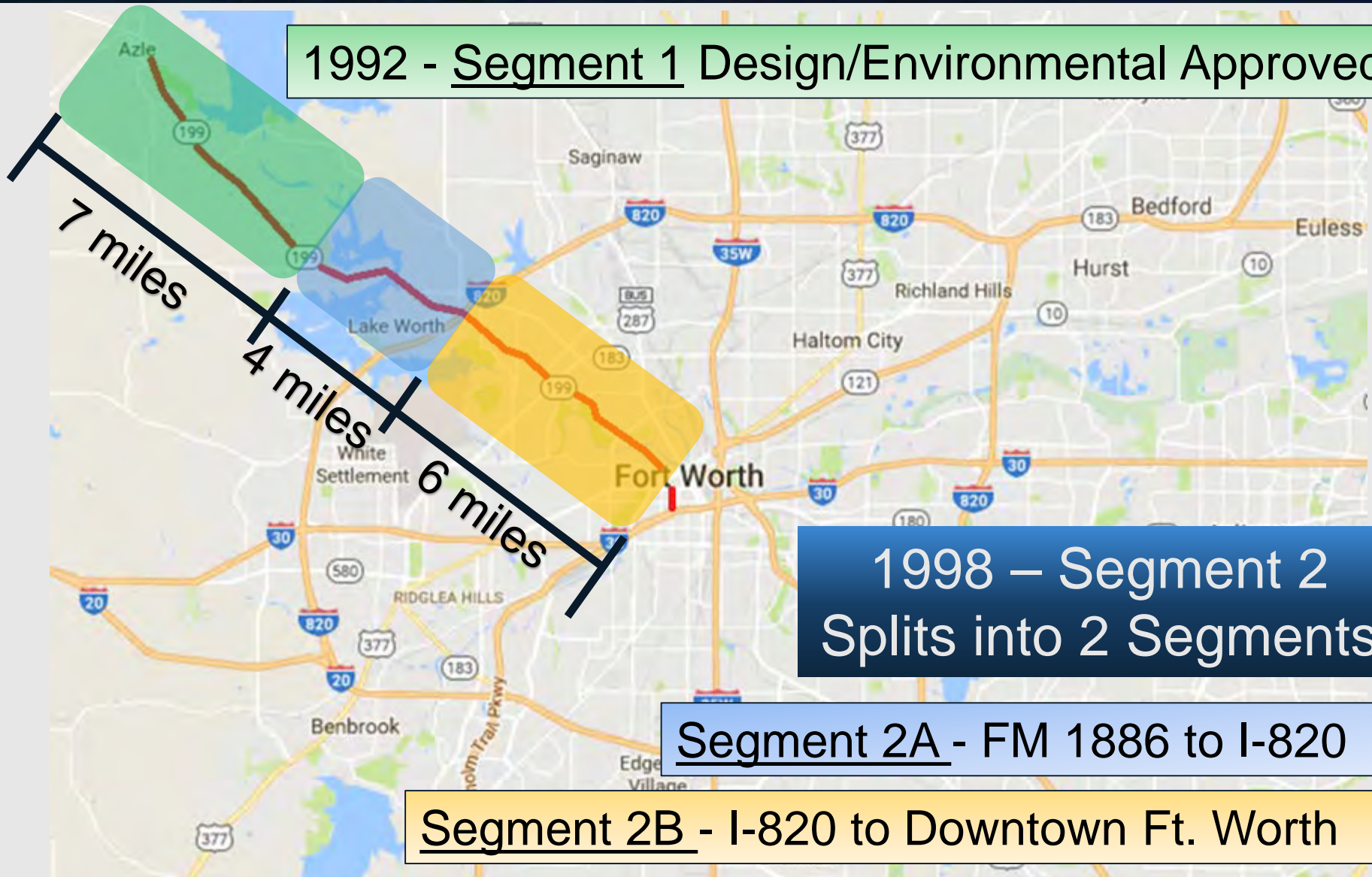
10 miles

Segment 2 - FM 1886 to Downtown Ft. Worth



# SH 199 at I-820 Interchange – Corridor History

1992 - Segment 1 Design/Environmental Approved



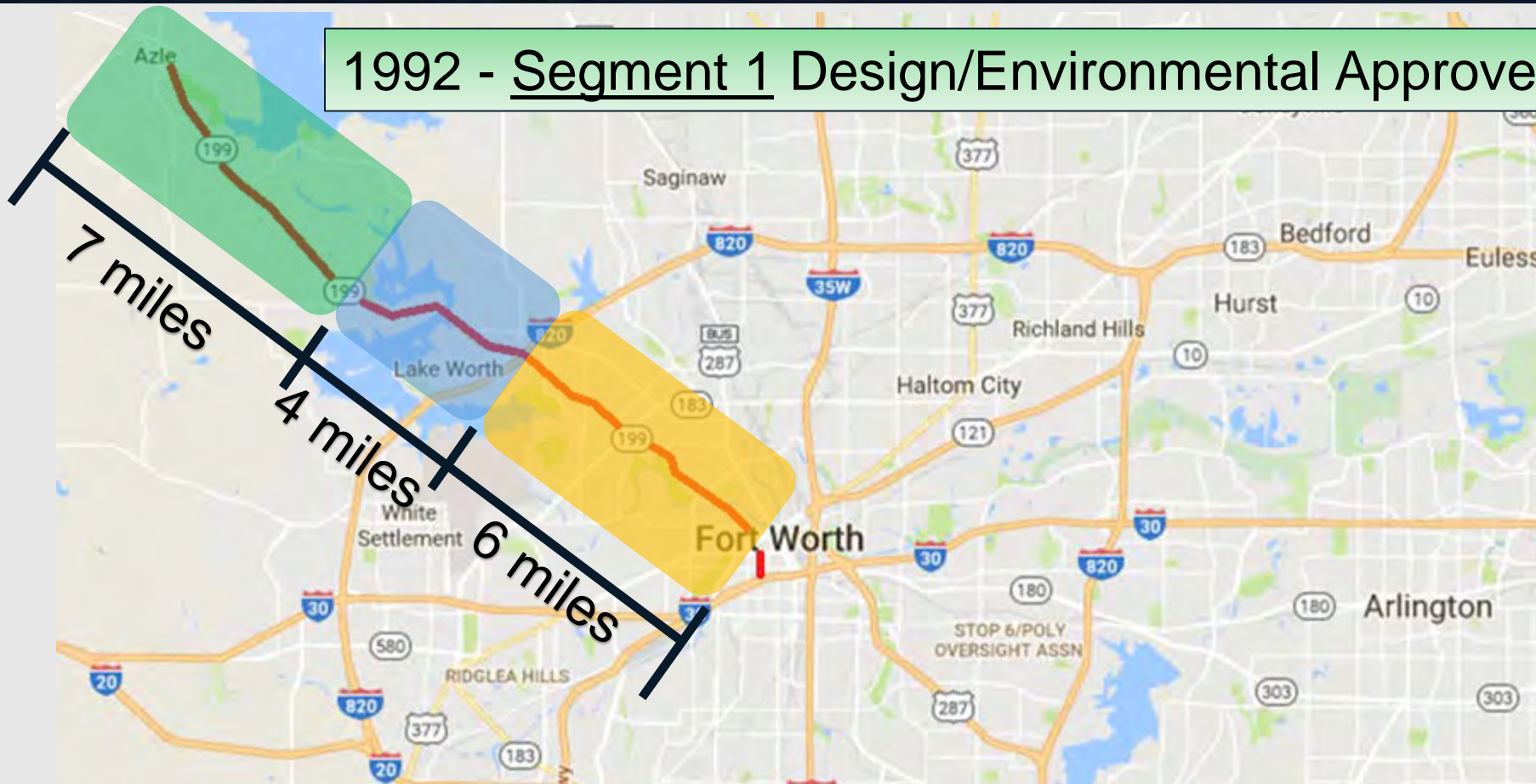
1998 – Segment 2  
Splits into 2 Segments

Segment 2A - FM 1886 to I-820

Segment 2B - I-820 to Downtown Ft. Worth

# SH 199 at I-820 Interchange – Corridor History

1992 - Segment 1 Design/Environmental Approved



1999 - Segment 2A – Design/Environmental Approved

Segment 2B - I-820 to Downtown Ft. Worth

# SH 199 at I-820 Interchange – Corridor History

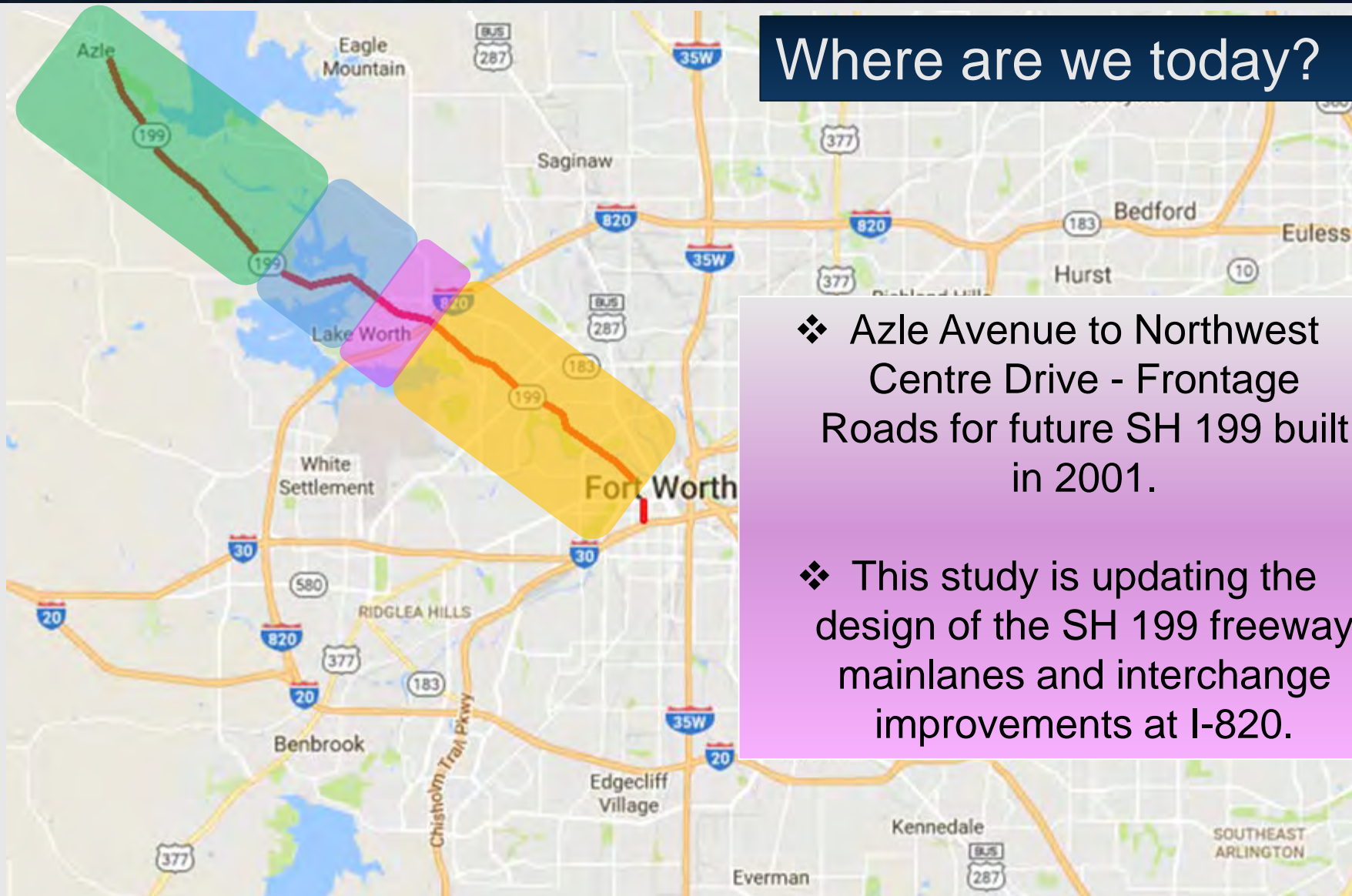
Where are we today?

Segment 1 – Azle (FM 730) to FM 1886  
Freeway and frontage roads for almost 7 miles under construction.

Segment 2A - FM 1886 to Azle Avenue  
Freeway and other roads for almost 3 miles (with new bridge across Lake Worth) under design by TxDOT.

Segment 2B - I-820 to Downtown Ft. Worth  
Under study by NCTCOG to create an improved urban arterial with more pedestrian access.

# SH 199 at I-820 Interchange – Corridor History



Where are we today?

- ❖ Azle Avenue to Northwest Centre Drive - Frontage Roads for future SH 199 built in 2001.
- ❖ This study is updating the design of the SH 199 freeway mainlanes and interchange improvements at I-820.

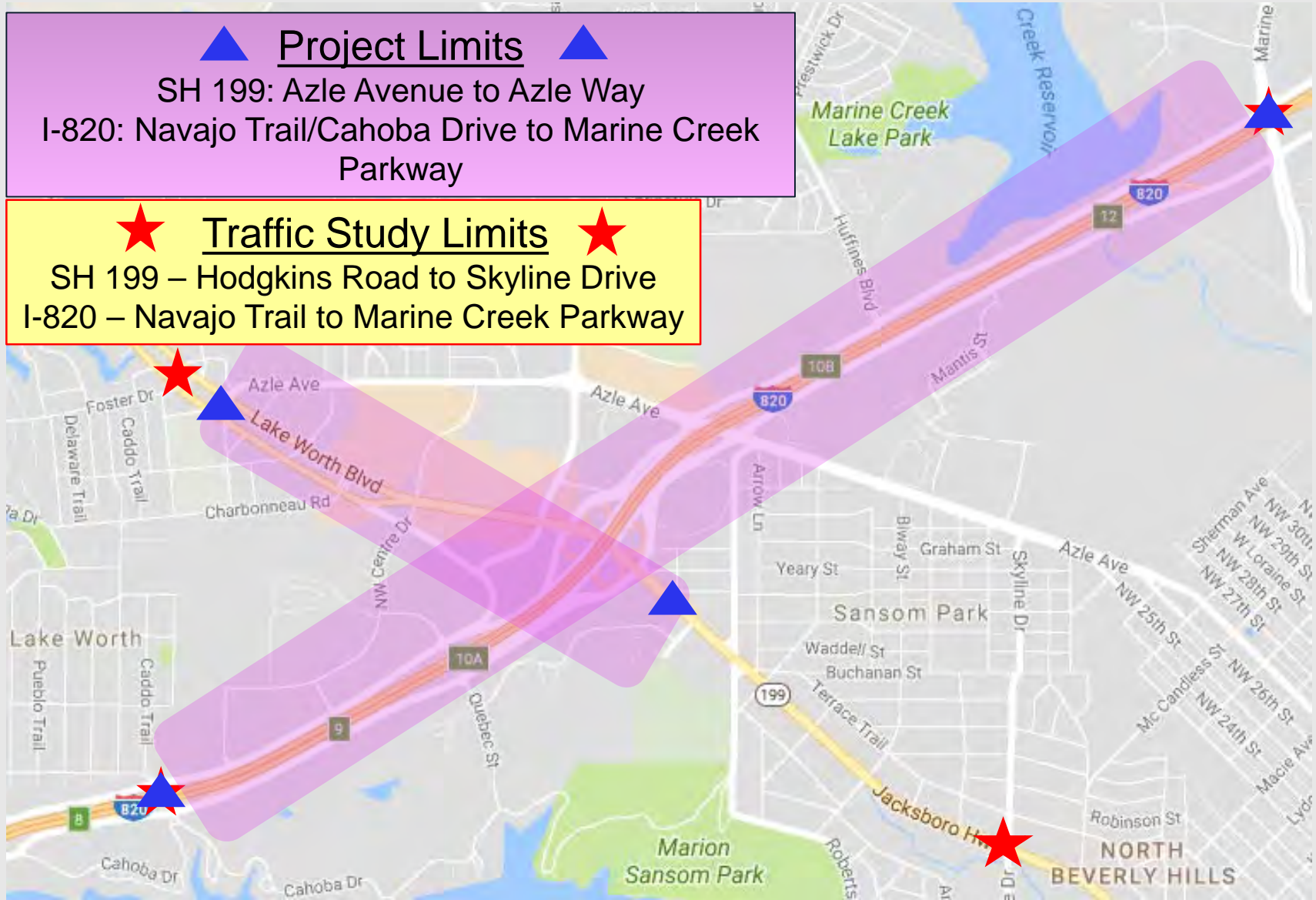
# SH 199 at I-820 Interchange– Project Limits & Traffic Study Limits

## ▲ Project Limits ▲

SH 199: Azle Avenue to Azle Way  
I-820: Navajo Trail/Cahoba Drive to Marine Creek Parkway

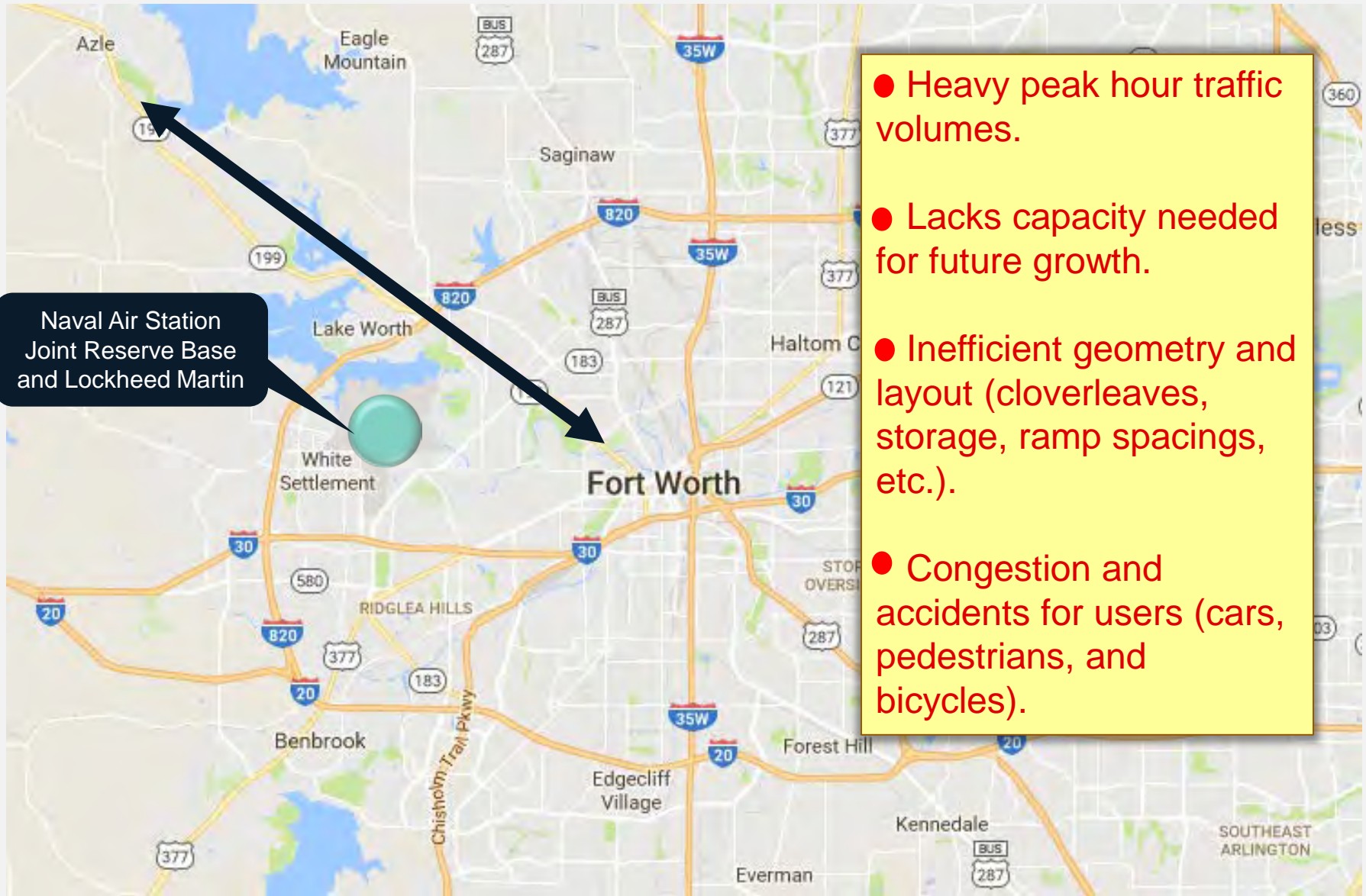
## ★ Traffic Study Limits ★

SH 199 – Hodgkins Road to Skyline Drive  
I-820 – Navajo Trail to Marine Creek Parkway





# SH 199 at I-820 Interchange– Project Issues



Naval Air Station  
Joint Reserve Base  
and Lockheed Martin

- Heavy peak hour traffic volumes.
- Lacks capacity needed for future growth.
- Inefficient geometry and layout (cloverleaves, storage, ramp spacings, etc.).
- Congestion and accidents for users (cars, pedestrians, and bicycles).

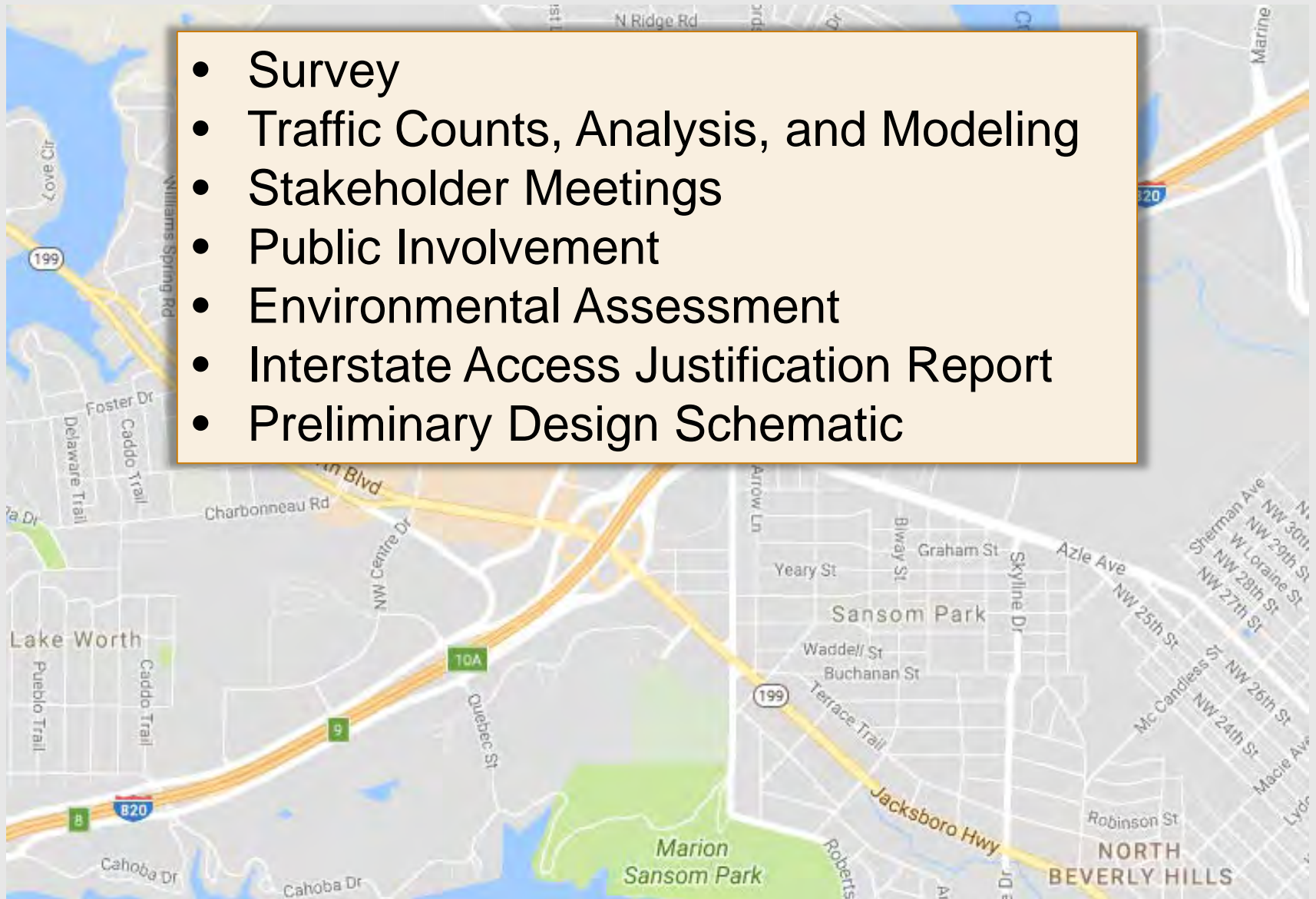
# SH 199 at I-820 Interchange– Project Need/Purpose

- Add capacity and improve mobility
- Improve SH 199/I-820 interchange
- Improve geometry and layout
- Improve safety for cars, pedestrians, and bicycles



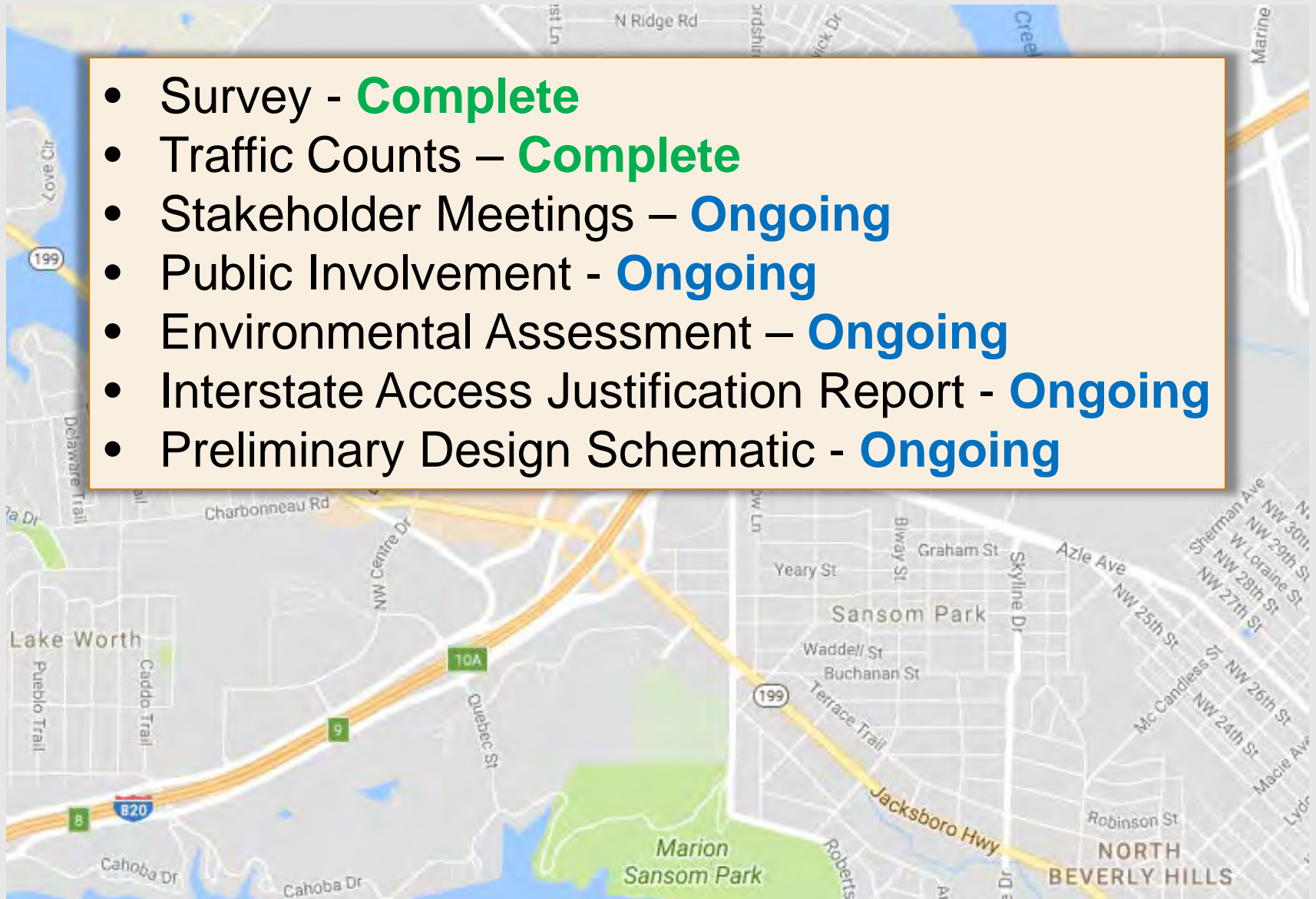
# SH 199 at I-820 Interchange– Project Scope

- Survey
- Traffic Counts, Analysis, and Modeling
- Stakeholder Meetings
- Public Involvement
- Environmental Assessment
- Interstate Access Justification Report
- Preliminary Design Schematic



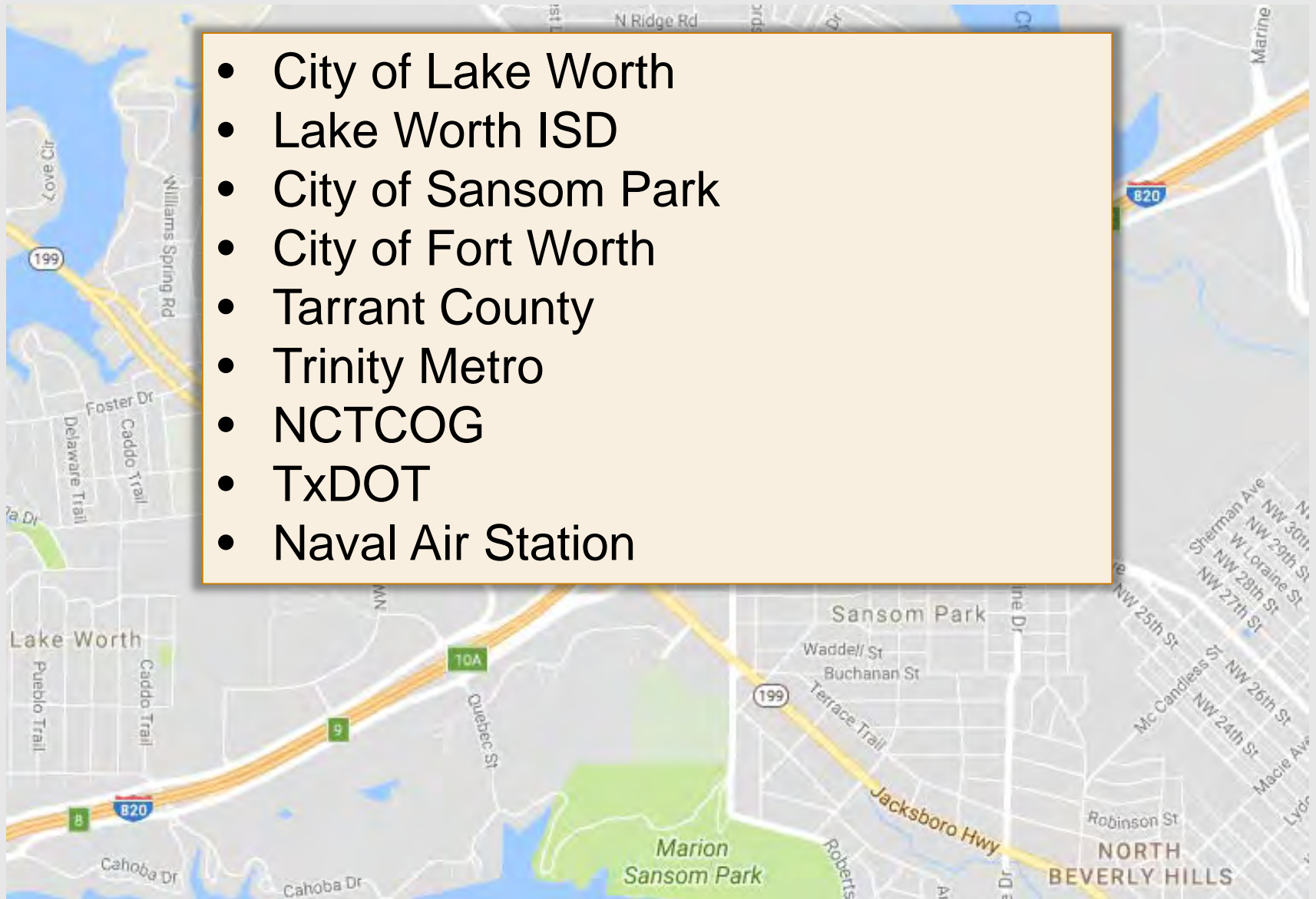
# SH 199 at I-820 Interchange – Project Status

- Survey - **Complete**
- Traffic Counts – **Complete**
- Stakeholder Meetings – **Ongoing**
- Public Involvement - **Ongoing**
- Environmental Assessment – **Ongoing**
- Interstate Access Justification Report - **Ongoing**
- Preliminary Design Schematic - **Ongoing**



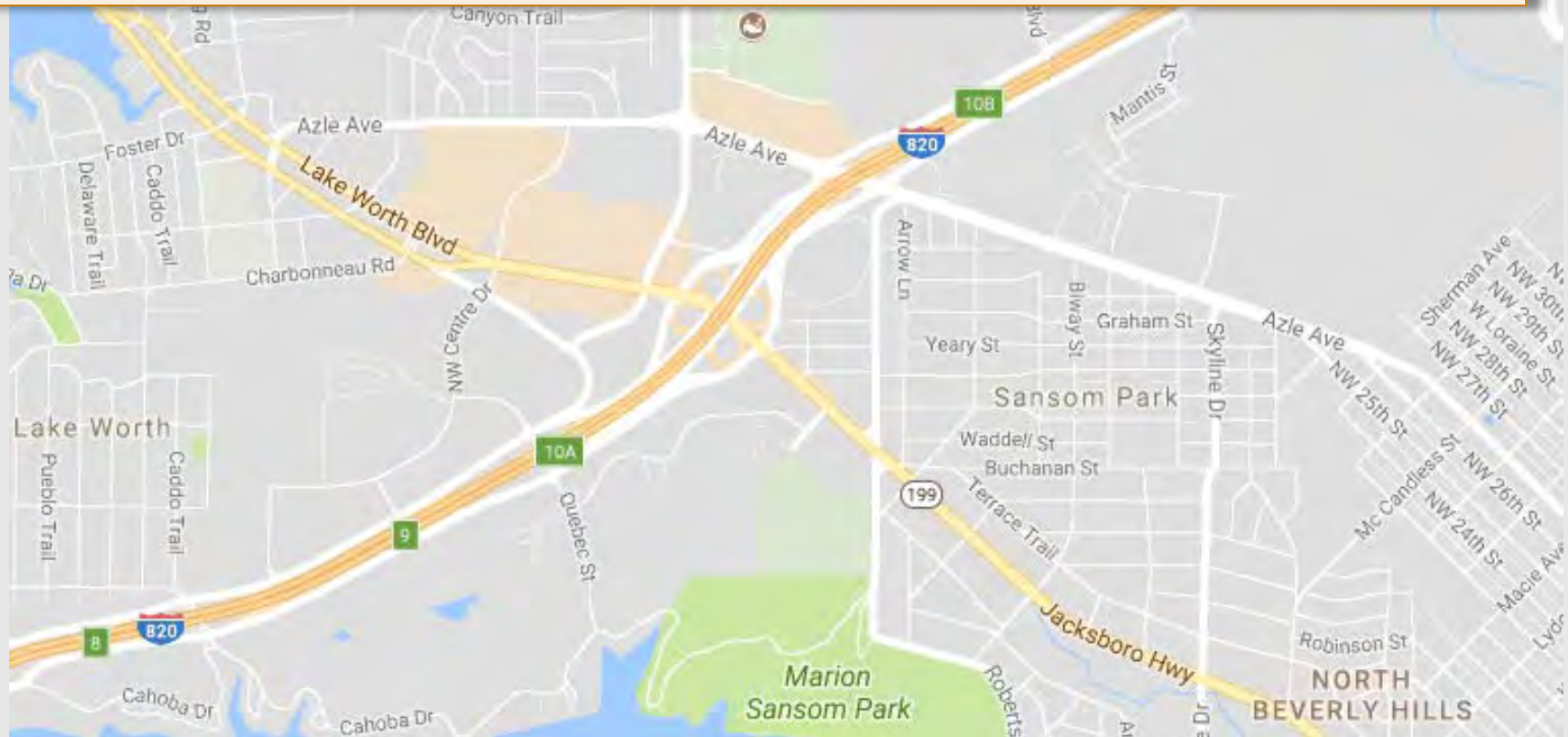
# SH 199 at I-820 Interchange– Major Stakeholders

- City of Lake Worth
- Lake Worth ISD
- City of Sansom Park
- City of Fort Worth
- Tarrant County
- Trinity Metro
- NCTCOG
- TxDOT
- Naval Air Station



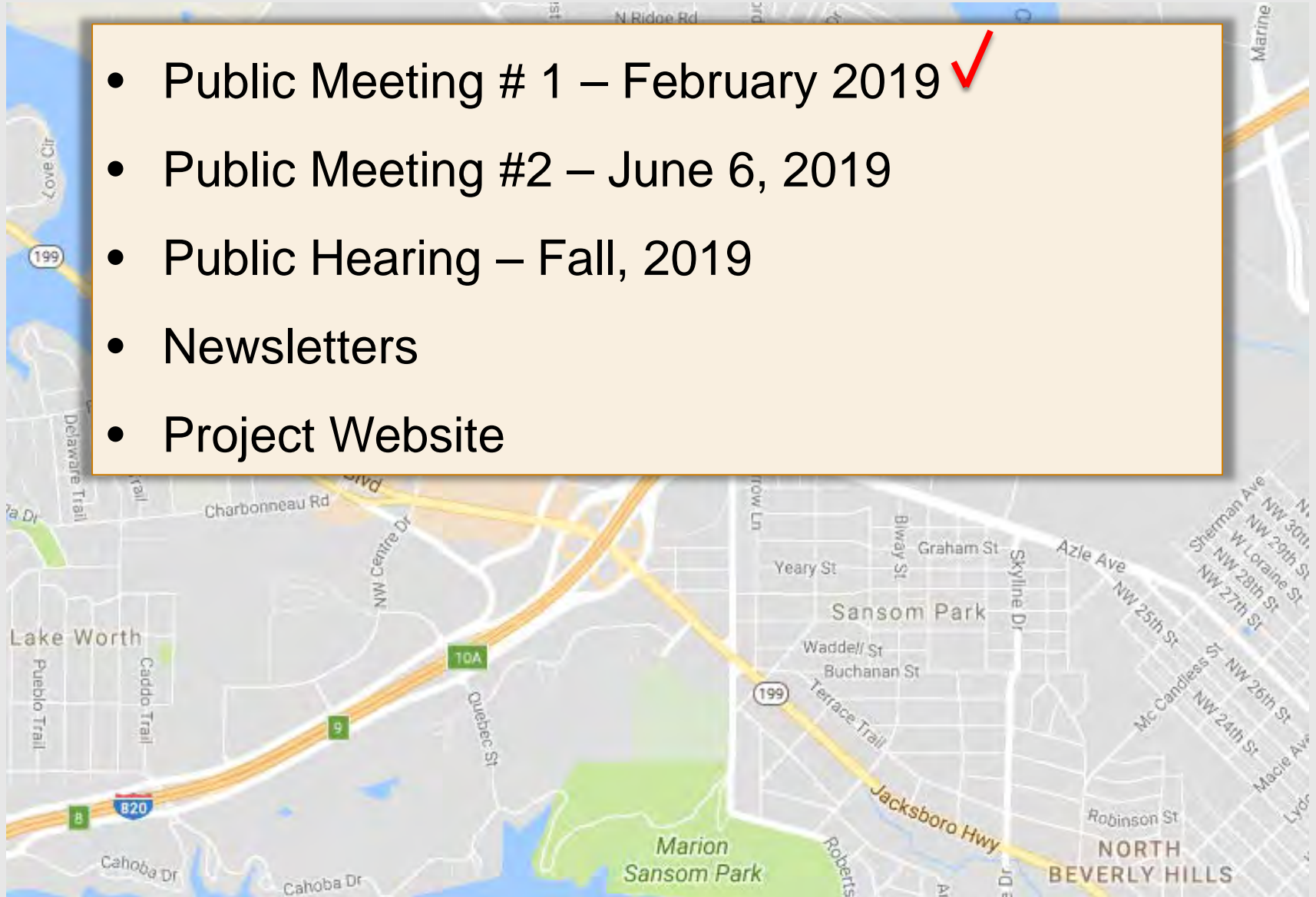
# SH 199 at I-820 Interchange– Preliminary Design Schematic

- Refine preferred alternative
- Display the preferred alternative at 2nd Public Meeting
- Final schematic revision
- Display final schematic at a Public Hearing



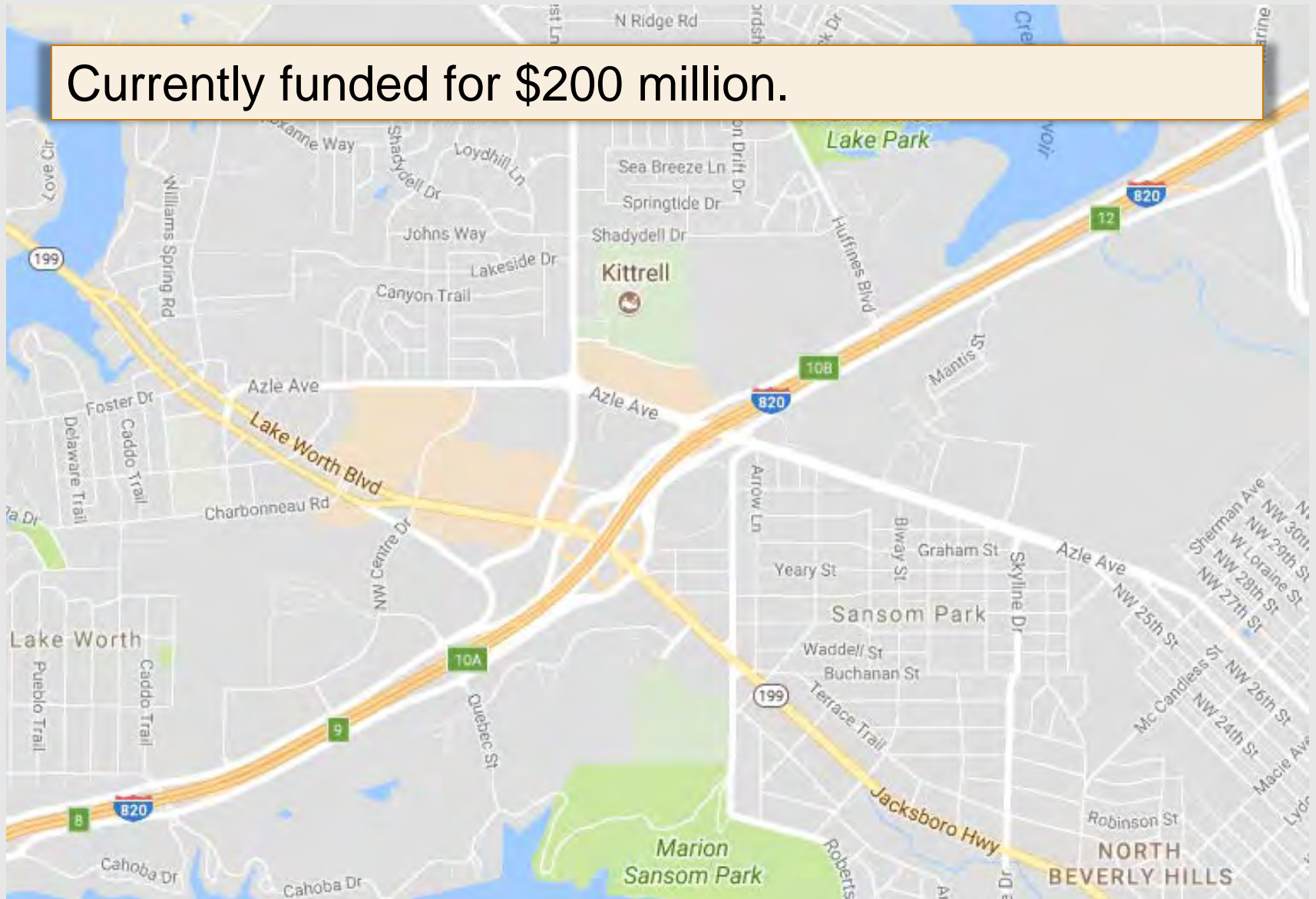
# SH 199 at I-820 Interchange– Public Involvement

- Public Meeting # 1 – February 2019 ✓
- Public Meeting #2 – June 6, 2019
- Public Hearing – Fall, 2019
- Newsletters
- Project Website



# SH 199 at I-820 Interchange – Project Funding Status

Currently funded for \$200 million.





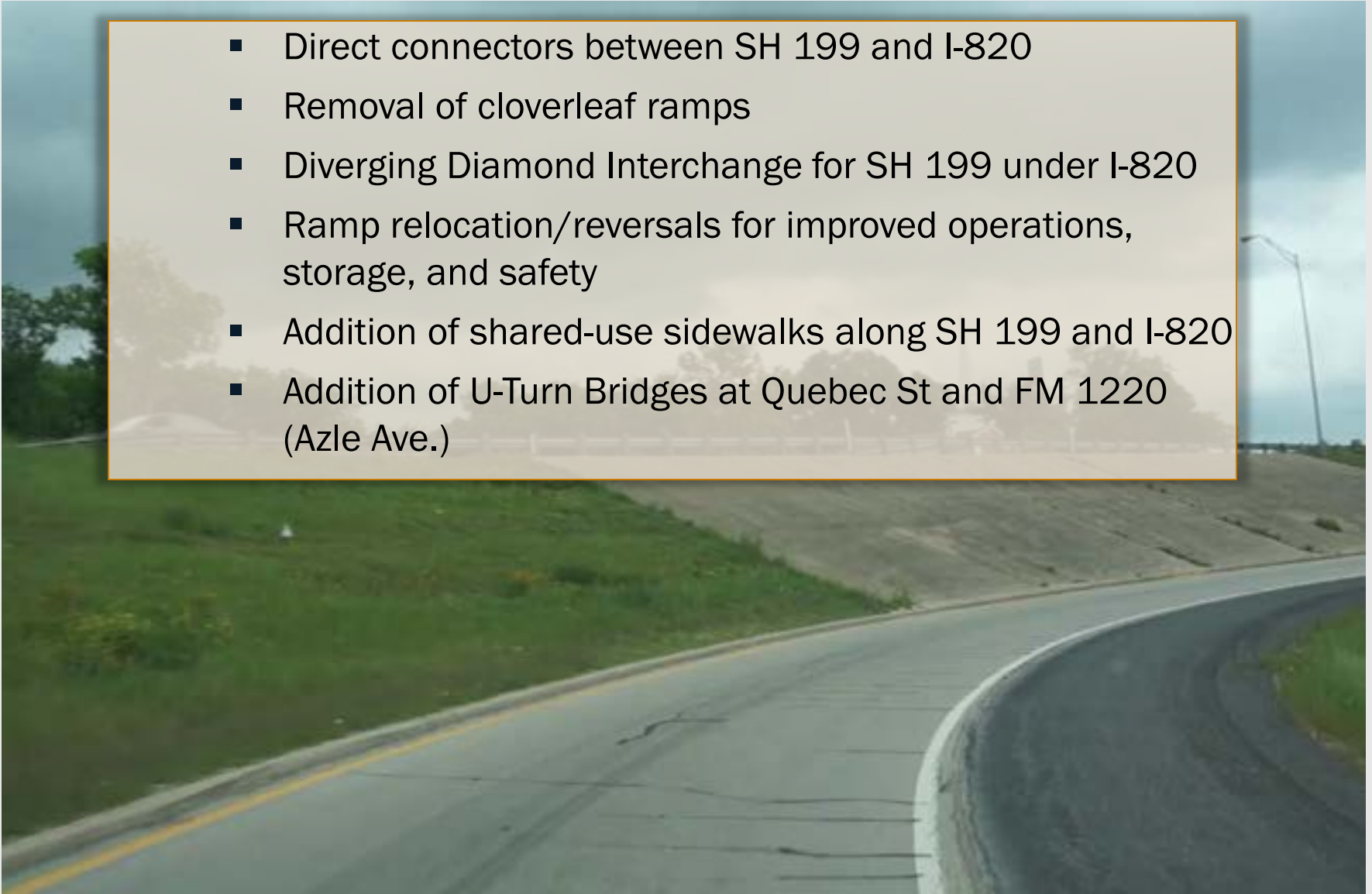
# SH 199 at I-820 Interchange– Overall Project Schedule\*



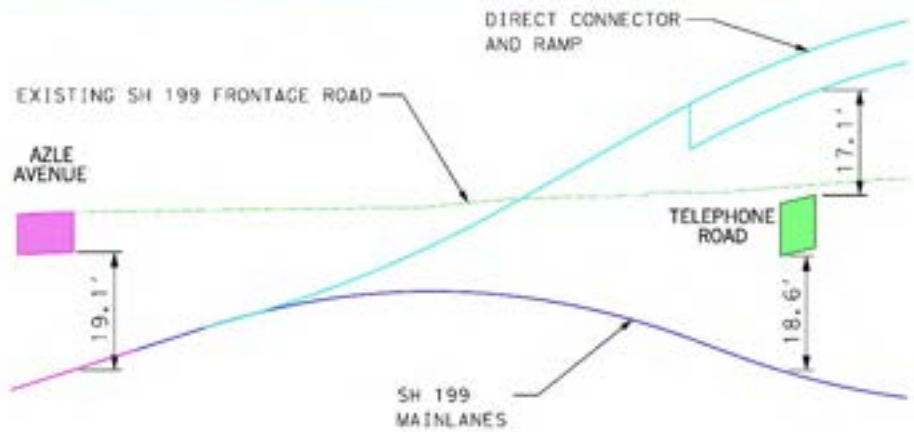
**\*This project schedule and dates are preliminary and subject to change.**

# SH 199 at I-820 Interchange– Improvement Tools

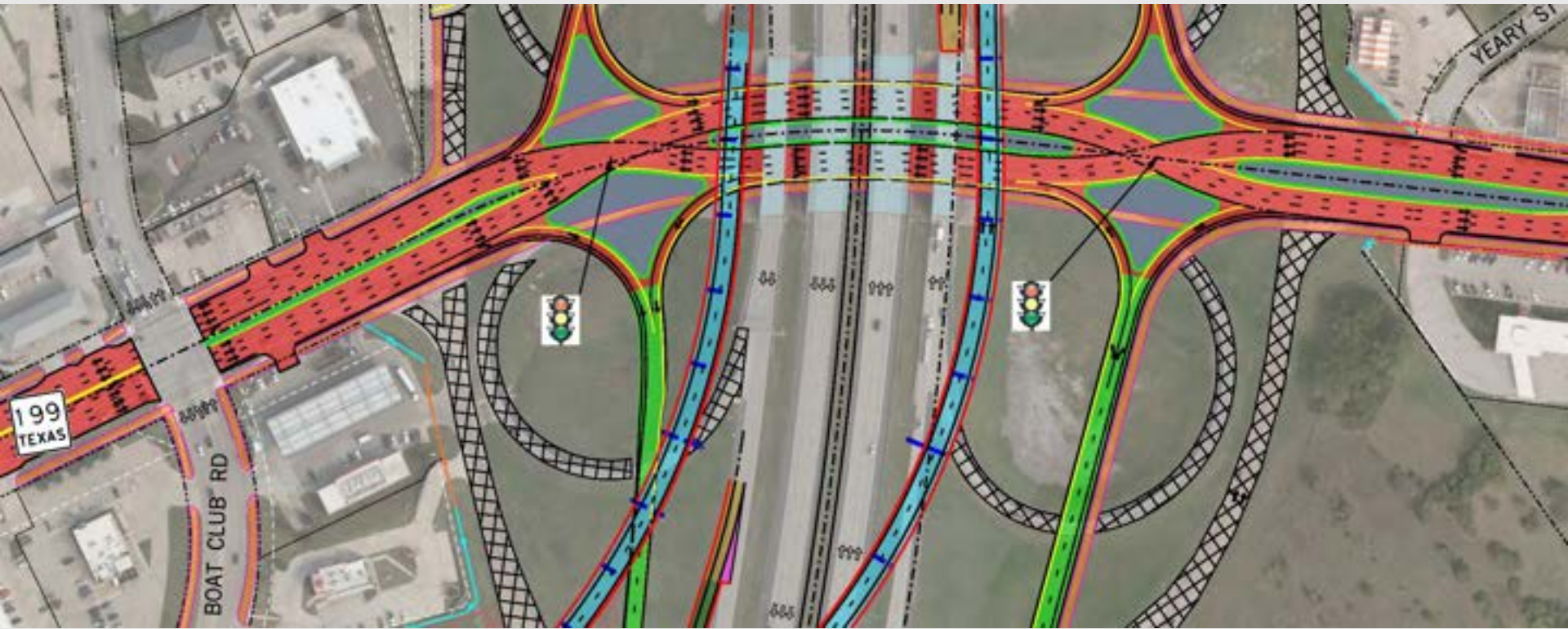
- Direct connectors between SH 199 and I-820
- Removal of cloverleaf ramps
- Diverging Diamond Interchange for SH 199 under I-820
- Ramp relocation/reversals for improved operations, storage, and safety
- Addition of shared-use sidewalks along SH 199 and I-820
- Addition of U-Turn Bridges at Quebec St and FM 1220 (Azle Ave.)



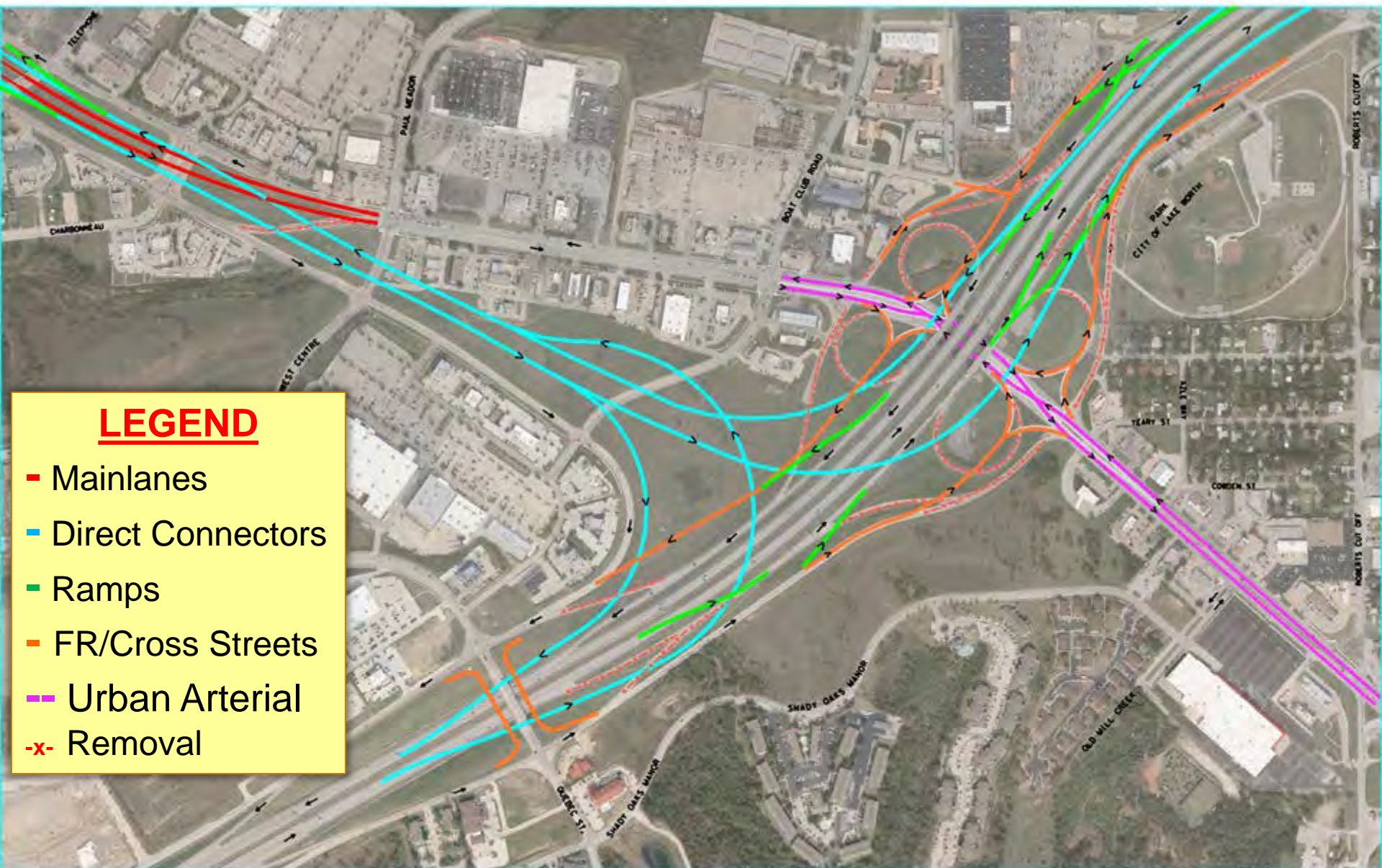
# SH 199 at I-820 Interchange – Design Challenges



# *Diverging Diamond*



# SH 199 SH 199 at I-820 Interchange – Simplified Preferred Alternative Layout



## LEGEND

- Mainlanes
- Direct Connectors
- Ramps
- FR/Cross Streets
- Urban Arterial
- x- Removal



# TEXAS DEPARTMENT OF TRANSPORTATION



## THANK YOU

FOR MORE INFORMATION CONTACT:

SAM YACOUB, PE, PMP

TXDOT PROJECT MANAGER

2501 SW LOOP 820

FORT WORTH, TX 76133

817-370-6560

[sam.yacoub@txdot.gov](mailto:sam.yacoub@txdot.gov)

---

SH 199 at I-820 Interchange

Public Meeting



February 19, 2019

# LAKE WORTH TRAIL

## Project Update

June 28, 2018

Lake Worth Regional Coordination Committee Meeting

City of Fort Worth  
Park & Recreation Department

# Master Plan

( September 2015)

- Lake Worth Gas Lease Capital Projects Fund



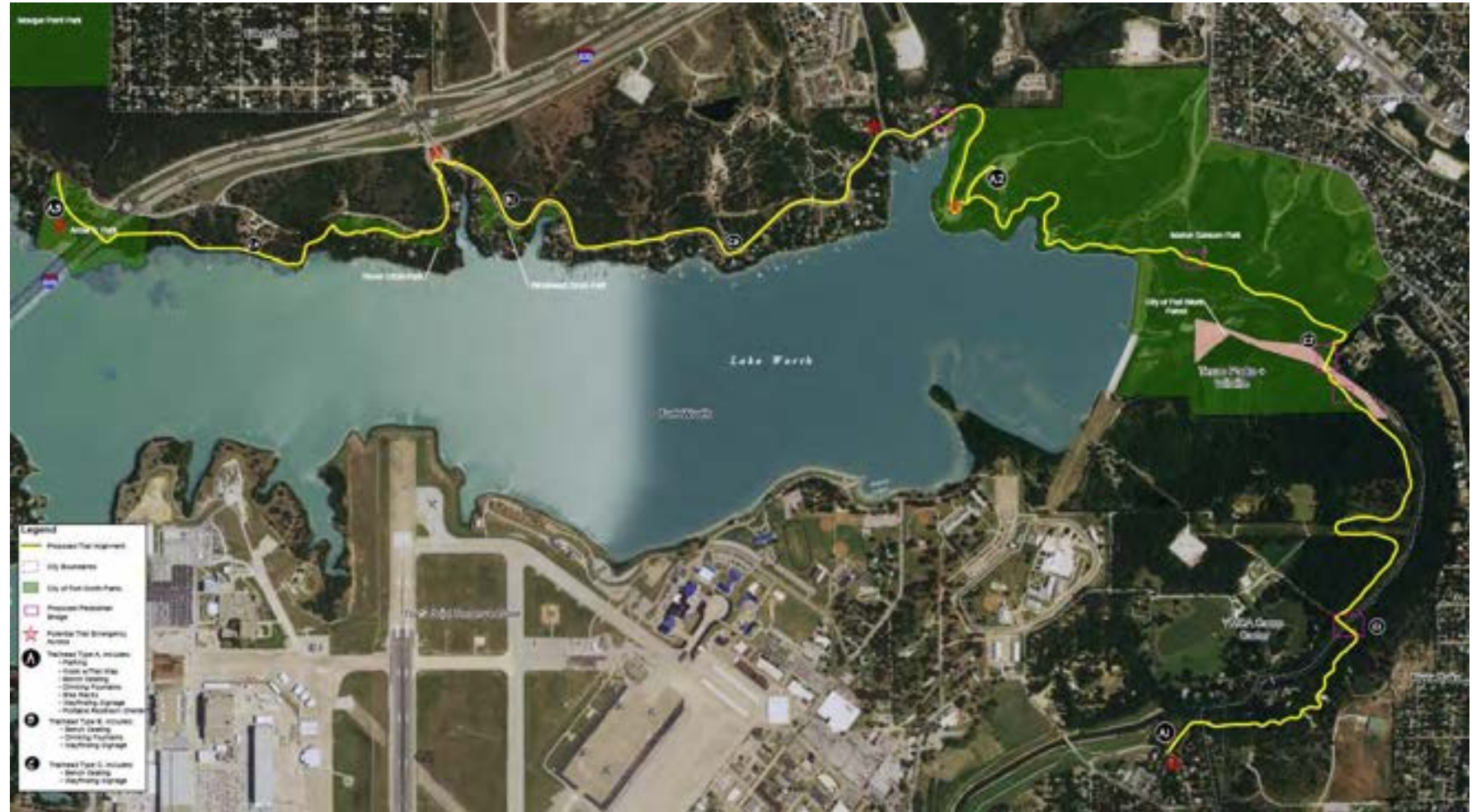


## Phase 1 Project Outline

- Budget: \$7,347,234
- Approx. 5.5 miles
- Challenges
  - Topography
  - Soil Condition
  - Easements
  - Narrow ROW
  - Budget

## Current Status

- Redesigning New Alignment



**Current Alignment**

**Green:** Same with previous Off-street

**Yellow:** **NEW:** Off-street

**Blue:** **NEW:** On-street

**Previous Alignments**

**Red:** Abandoned due to Soil Failure

**Purple:** Reported as being studied in June, 2017





**Marion  
Sansom  
Park**

**Off-street  
Alignment**

**ENLARGEMENT**





On-street  
Alignment

River Oaks

**ENLARGEMENT**





## Schedule

### ○ Design

- Complete Widening (10 FT wide)  
of Western Segment: August 2018
- Alignment Study of Eastern Segment: Late Summer 2018

### ○ Construction

- Western Segment: Starts in Late Summer 2018
- Eastern Segment: Starts in Mid 2019

# Lake Worth Trail

## Contact:

Naoto Kumazawa, Landscape Architect

[Naoto.Kumazawa@fortworthtexas.gov](mailto:Naoto.Kumazawa@fortworthtexas.gov)

817-392-5742



# LOVE CIRCLE PARK IMPROVEMENTS

## Project Update

June 28, 2018

Lake Worth Regional Coordination Committee Meeting

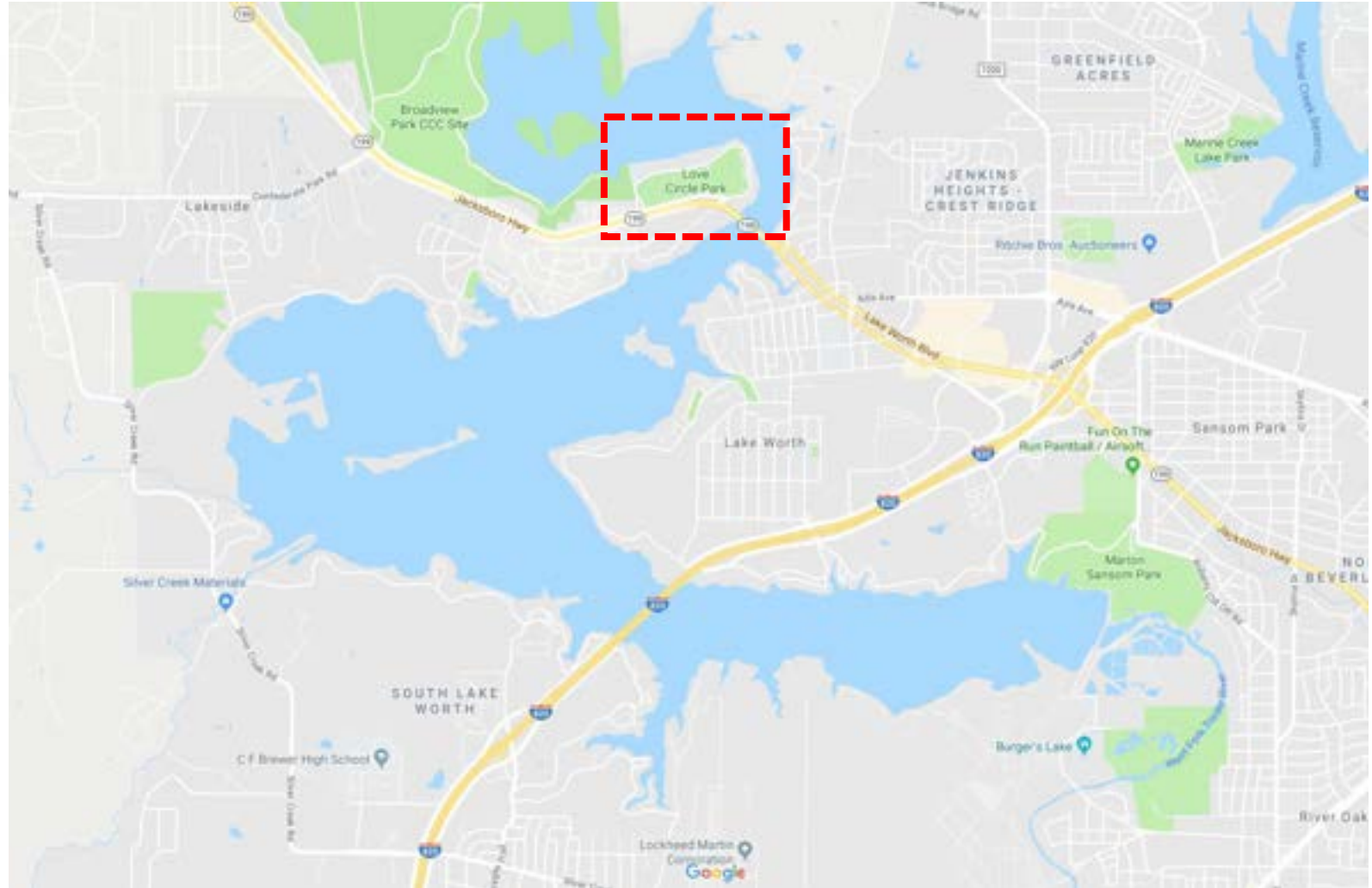
City of Fort Worth  
Park & Recreation Department

## Project Outline

- Budget: \$200,000.  
(Lake Worth Gas Lease Capital Projects Fund)
- Mayor & Council Approved on Feb 6, 2018
- 6 FT wide Tail approx. 0.9 mile long

## Current Status

- Approx. 50% Completion
- Schedule to Complete in August 2018



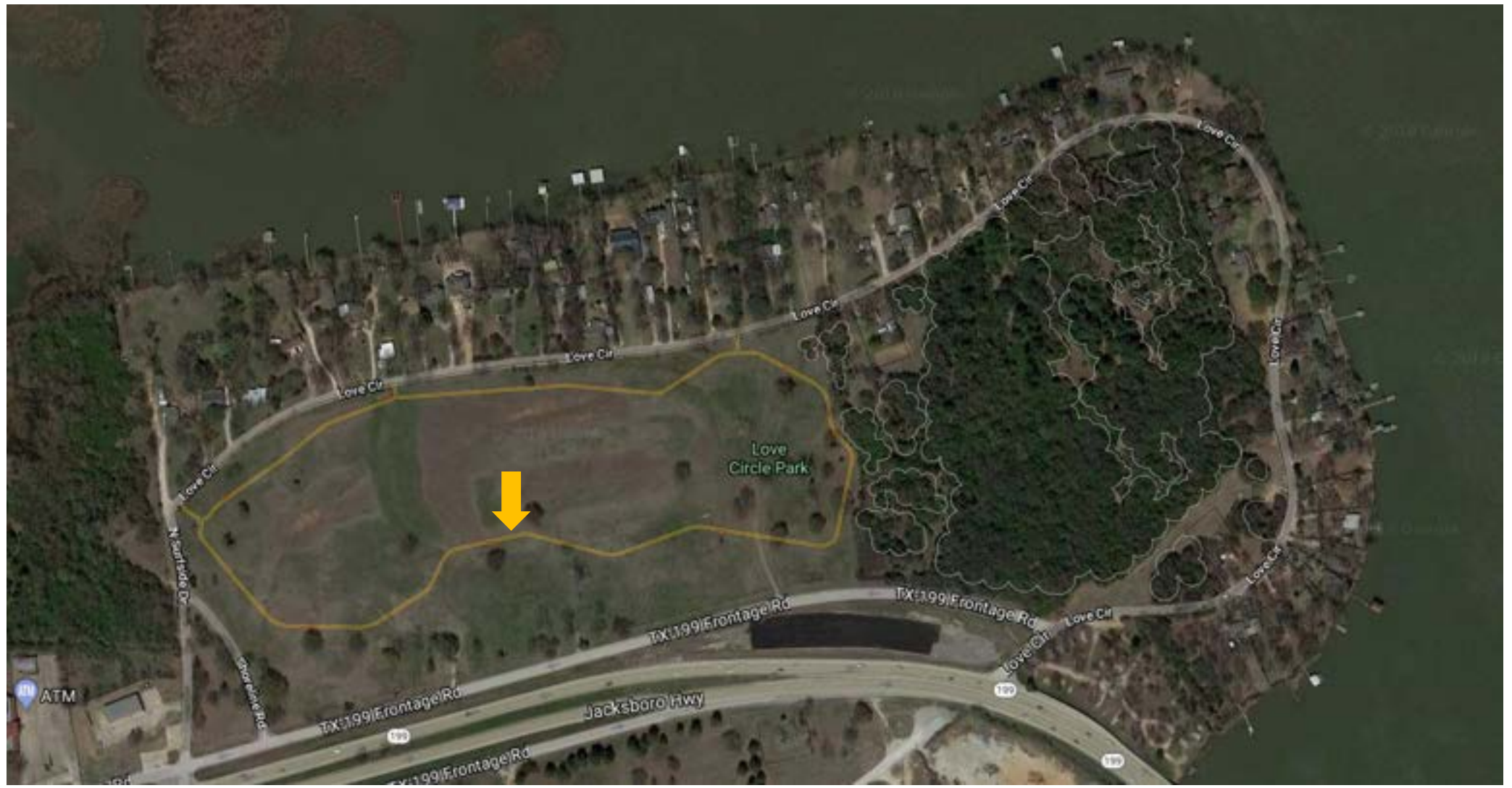




Photo: June 25, 2018

# Love Circle Park Improvements

## Contact:

Scott Penn, District Superintendent

[Scott.Penn@fortworthtexas.gov](mailto:Scott.Penn@fortworthtexas.gov)

817-392-5750

# Gas Lease Revenue

Walter Norwood, Water Department

# Gas Lease Revenue

- Total Appropriated                      \$38,026,682
- Unappropriated Revenue    \$7,370,028
- Projects to be Funded
  - Watercress Low Pressure Sewer \$3.1M
  - Hike and Bike Trail            \$6M



Lake Worth Gas Funded Capital Projects			
PROJECT NAME	Gas Well Funding	Project #	Status
Woodvale Water Improvements	\$1,718,863	C00391	Complete
Lake Worth Dredging	\$17,694,830	C01166	Complete
Northside III 16 inch Waterline	\$991,477	C01300	Complete
Lake Worth Restoration and Maintenance	\$587,791	C01310	Complete
Casino Beach/Watercress	\$5,501,720	C01829	Active
Casino Beach/Watercress CO#1	\$1,200,000	B14108	Complete
Stormwater Structural Control Devices	\$118,600	C01904	Complete
Lake Worth Trail Phase 1	\$6,927,234	C01920	Active
Lake Worth Area Parks Survey	\$280,000	C02604	Active
Jenkins Heights Lift Station	\$200,000	100072	Active
Legal Fees - Total Gas Settlement	\$206,938	100446	Active
Legal Fees - Chesapeake Settlement	\$311,119	100452	Complete
Gas Lease Bank Fees	\$341,712	100801	Active
Watercress LP SS Extension	\$577,935	101002	Active
Love Circle Park - Trail	\$200,000	101338	Complete
Lake Worth Hazard Stump Removal	\$307,027	FE70	Complete
Mobile LiDAR Project - FEMA Floodplain Mapping	\$99,707	PE69	Complete
Greenprinting Study W/NCTCOG	\$293,655	GG01	Complete
Reimburse General Fund Admin Cost	\$59,753	GG01	Complete
Reimburse General Fund Admin Cost	\$22,334	GG01	Complete
Reimburse General Fund Admin Cost	\$215,522	GG01	Complete
Reimburse General Fund Admin Cost	\$57,815	GG01	Complete
Reimburse General Fund Admin Cost	\$112,650	GG01	Complete
<b>TOTALS</b>	<b>\$38,026,682</b>		

Revenue Unappropriated by Fund	33001	39301
	\$7,256,820	\$113,208



# Lake Patrol FY2019

# FY2019 – Lake Patrol Budget

- All positions are currently funded from General Fund but had been previously offset by revenue generated from the Lake Worth Leases
- General Fund for FY2019 - \$328,618\* (Already funded)
  - Salaries for 3 Deputies
  - Employee Benefits
  - Allocations
  - Utilities/Repairs
  - Supplies

# FY2019 Budget – Personnel

Lake Worth Patrol		10100 / 0385000
ACCOUNT	ACCOUNT NAME/ITEMS (Include unit costs, where available)	Dept Request
5110101	REGULAR EMPLOYEE SALARIES	168,480
5110302	SHIFT DIFFERENTIAL	0
5110303	HOLIDAY PAY	5,000
	Funding for holiday pay for the Lake Patrol	
5110304	INCENTIVE PAY	4,320
5110401	LONGEVITY PAY	1,800
5130101	REGULAR - OVERTIME	250
	Funding for overtime for the Lake Patrol	
	<b>TOTAL CHARACTER 01- PERSONNEL SERVICES</b>	<b>179,850</b>

# FY2019 Budget – Benefits and Allocations

			Lake Worth Patrol	10100 / 0385000
ACCOUNT			ACCOUNT NAME/ITEMS (Include unit costs, where available)	
	TOTAL CHARACTER 02- PERSONNEL SERVICES BENEFITS		90,414	
	TOTAL CHARACTER 03- PURCHASED PROF AND TECH SERVICES		39,390	
	TOTAL CHARACTER 04- PURCHASED PROPERTY SERVICES		16,967	
	TOTAL CHARACTER 05- OTHER PURCHASED SERVICES		800	
	TOTAL CHARACTER 06 - SUPPLIES		1,197	

# Lake Patrol Staffing

- Peak Season – April 1<sup>st</sup> through September 30<sup>th</sup>
  - Staff the Lake with 4 deputies and 1 Sergeant
    - (3 deputies paid for with Lake Budget, Marshals absorb costs for two additional deputies during peak season)
- Non-Peak Season – October 1<sup>st</sup> through March 31<sup>st</sup>
  - Staff the Lake with 2.5 deputies and 1 Sergeant
    - (Non-peak season is reduced to the number of budgeted deputies.)

# Lake Patrol Calls for Service FY2018

- Dispatched or Self-initiated calls – 930 incidents
  - More than 200 calls were outside of the normal lake patrol duties, such as stolen vehicles, burglaries, burglar alarms, suicidal persons, motor vehicle accidents, traffic stops, domestic disturbances, and assaults

# Lake Patrol Calls for Service FY2018

- Over 3,000 Water Safety Checks
- Over 800 Water Patrol hours
- Over 2200 Park Patrol hours

## 2019: Calls for Service

- Lake Patrol will continue to work closely with the Fort Worth Police Department to ensure a safe recreational environment for the citizens of Fort Worth and visitors to the Lake Worth waterway and adjacent City of Fort Worth parks.



# Thank you



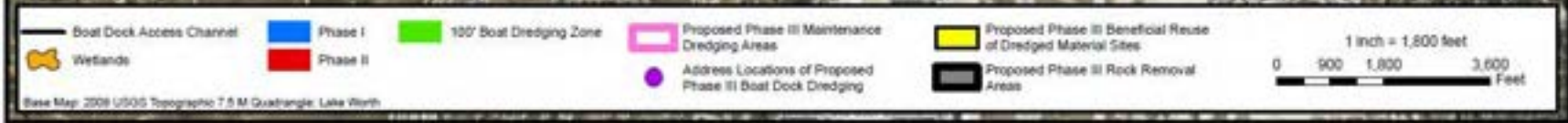


# Lake Worth Dredging

Lake Worth Regional Coordination Committee  
September 20, 2018

Presented by:

Water Department



<b>FIGURE 1</b>	
PROJECT NO.	DATE
SCALE	BY
DEIGNED	1:1000
DRAFTED	AMF
City of Fort Worth Water Department	
Lake Worth Phase III Dredging Project	



## *Permitting – Scope of Work*

- Regulated under Section 404 of Clean Water Act
- Administered by US Army Corps of Engineers (USACE)
- Previously issued USACE permit has expired
- Permitting would include the following components
  - Section 404 Permitting
    - Maintenance dredging around private docks adjacent to previously authorized dredging areas where owners expressed interest in cost participating.
    - Cleaning out of previously dredged areas that filled during 2015 flood
  - Seeking a Letter of Permission II, Excavation Activities
  - Sediment Characterization
    - Determine concentrations of potential chemicals of concern
    - Will dictate sediment disposal options



## *Engineering Scope of Work*

- Evaluate bidding and dredging methods
- Evaluate potential material disposal locations
- Perform survey of maintenance dredging locations
- Perform survey of rock dredging locations
- Determine boat dock dredging locations, perform surveys
- Coordinate development of construction plans with environmental permitting requirements.
- Prepare bidding plans and specifications
- Bidding and construction phase services



## *Boat Dock Dredging*

- Boat dock dredging cost estimate ranges from \$10,000 to \$25,000 depending on the site.
- Sites would need to be identified as part of the permitting, surveyed, and included in the construction plans.
- A contract between the City and homeowner would need to be executed prior to permitting, survey and design.
  - This would likely include payment or payments of the estimated boat dock dredging costs as part of the contract requirements.
- Potential benefit to property owners by including boat dock dredging into permitting, design, and large scale dredging contract.

# *Boat Dock Dredging*

- Hydraulic Dredging Alternative
- Simplified Permitting Process – usually by Contractor
  - USACE 404 Nationwide 16 Permit (Application and Questionnaire)
  - TCEQ Clean Water Permit - letter
- Cost could be approximately \$8,000 to \$10,000 per dock
- If contiguous boat dock owners work together, then price drops.





# *Cost and Timelines*

- Cost Estimates
  - Permitting and Engineering - \$400,000
  - Maintenance Dredging - \$4M to \$5M
  - Boat Dock Dredging - \$10,000 to \$25,000 per location
  - **Achieve “Economies of Scale” by incorporating with the maintenance dredging contract.**
- Timelines
  - Environmental Permitting – Six months from NTP
  - Design and Contract Documents – Six months
  - Construction – Nine Months from NTP
- Next Steps
  - Work with legal to develop contracting methodology and documents
  - Evaluate interest from public in boat dock dredging
  - If interest is there, move forward with permitting and engineering
  - Program funding for dredging project



FORT WORTH®



# QUESTIONS



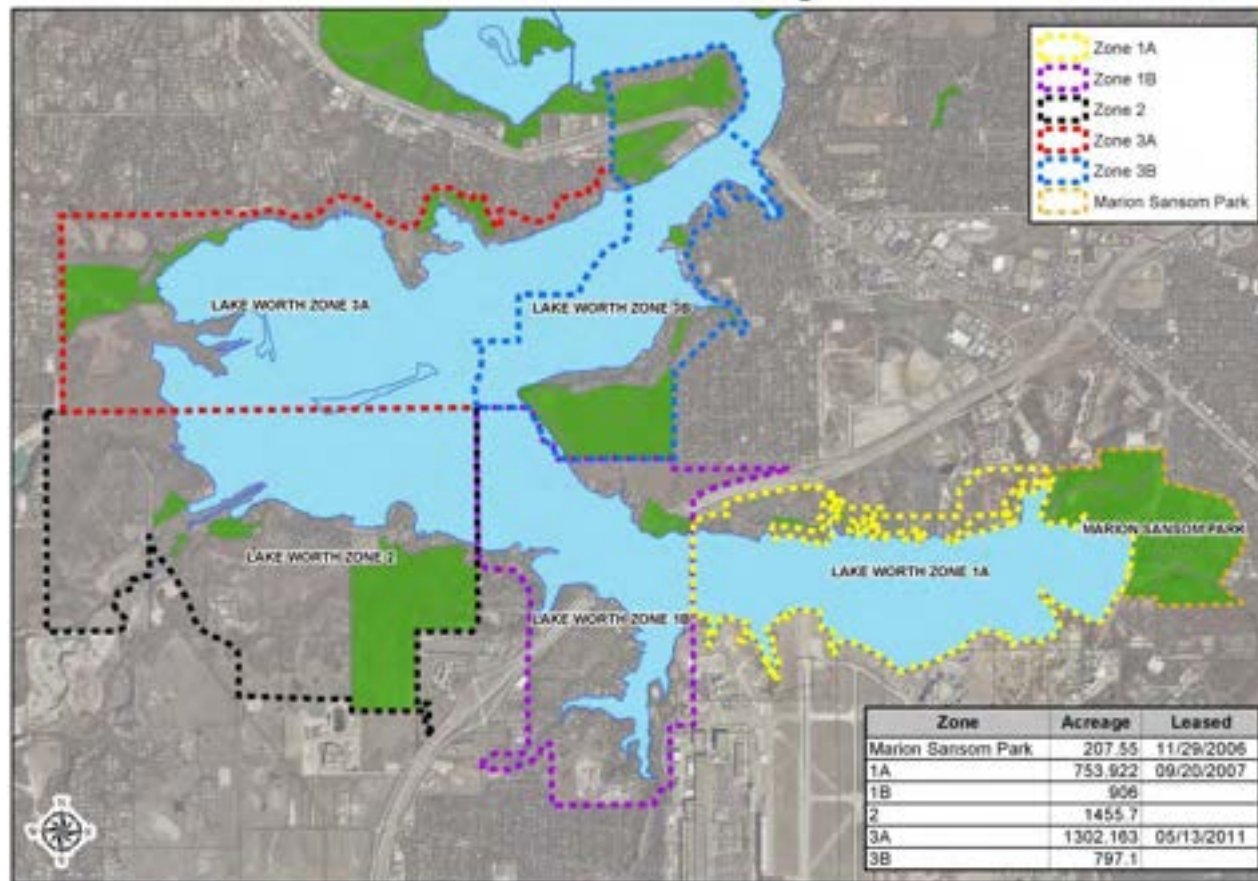
# Lake Worth Natural Gas Leases

Presented by Jean Petr

For Lake Worth Regional Coordination Committee

September 20, 2018

# Lake Worth Natural Gas Lease Zones



Copyright 2011 City of Fort Worth. Unauthorized reproduction is a violation of applicable laws. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or planning purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. The City of Fort Worth assumes no responsibility for the accuracy of said data.

0 0.25 0.5 1 1.5 2 Miles

# Lake Worth Natural Gas Leases Held by Production

LOCATION	LEASE DATE	BONUS/ACRE	TOTAL ACRES	BONUS REVENUE	PROJECTED ROYALTY*	TOTAL	ACTUAL BONUS AND ROYALTY
<b>ACTUAL</b>							
MARION SANSOM PARK*	11/29/2006	\$ 10,111.00	207.55	\$1,993,611	\$ 7,004,813	\$8,998,423.65	
LAKE WORTH ZONE 1A*	9/20/2007	\$ 9,111.00	753.922	\$6,525,534	\$ 25,444,867	\$31,970,401.17	
ZONE 3A - NE LAKE TO 199	5/13/2011	\$ 8,277.00	1302.163	\$10,678,003	\$ 46,068,750	\$56,746,753.00	
<b>TOTAL</b>			<b>2263.635</b>	<b>\$19,197,148</b>	<b>\$ 78,518,430</b>	<b>\$97,715,577.82</b>	<b>\$ 43,654,201.00</b>

UNAUDITED

\*Royalty projections based on the following which is subject to actual production and natural gas market fluctuations:

20 year life of well

25% Royalty

\$3.00/MCF

Recovery of 20%

# Producing Wells at Lake Worth

- Revenue from 28 producing wells
- Annual net revenue for 2018 estimated at \$3.5 million
- Monthly revenue in 2018
  - Average \$250,000+

# Revenue dedicated to Lake Worth

- The City's Financial Management Policy Statements dedicate revenue from gas leases at Lake Worth to the 2007 Capital Improvement Implementation Plan (2007 CIIP) until \$117,077,508 in revenue reached
- 2007 CIIP included 14 major capital projects
  - Water Department manages the projects and expenditures
- Nature Center property is separate from Lake Worth
  - Future gas lease(s) revenue is dedicated to the Nature Center

## 2007 LAKE WORTH CIIP PROJECT LIST

PROJECT	COST ESTIMATE	DESIGN START	CONSTRUCTION START
Lake Dredging	\$30,706,885	2008	2011
Arrow S/Casino Beach Boat Ramp Improvements	\$630,804	2008	2009

PROJECT	COST ESTIMATE	DESIGN START	CONSTRUCTION START
Nature Trail (Phase I) and Lake Worth Parks Improvements	\$9,000,000	2008	2010
Comanche Creek Drainage Channel	\$1,300,000	Under Design	2008
Woodvale Low Pressure Sewer System	\$2,200,000	Under Design	2008
20" Northside III Water Main Along IH820 (Water Project #1)	\$2,200,000	Under Design	2008
Access Control Improvements	\$1,715,612	2009	2010
Love Circle/Casino Beach Water (Water Project #2) & Sewer	\$9,057,875	2010	2011
Sunset Park/Freemons Park Boat Ramp Improvements	\$1,023,823	2010	2011
Nature Trail (Phase II)	\$9,636,014	2012	2013
Watercress Low Pressure Sewer System	\$4,428,576	2012	2013
Maintenance Fund	\$9,550,000	2013	2013
Northside II Water Improvements (Water Project #3)	\$26,554,064	2015	2017
SW Silver Creek Road Expansion	\$9,073,855	2015	2016
<b>Total:</b>	<b>\$117,077,508</b>		

# Future Lease Zones

LOCATION	LEASE DATE	PROJECTED BONUS/ACRE	TOTAL ACRES	PROJECTED BONUS REVENUE	PROJECTED ROYALTY	TOTAL	ACTUAL BONUS AND ROYALTY
<b>PROJECTED**</b>							
ZONE 1B - W OF 820		\$1,000.00	906	\$ 906,000	\$ 30,577,500	\$ 31,483,500	\$ -
ZONE 2 - SOUTH LAKE		\$1,000.00	1465	\$ 1,465,000	\$ 49,443,750	\$ 50,908,750	\$ -
ZONE 3B - NW LAKE		\$1,000.00	797	\$ 797,000	\$ 26,898,750	\$ 27,695,750	\$ -
TOTAL PROJECTED LAKE			3168	\$ 3,168,000	\$ 106,920,000	\$ 110,088,000	\$ -

**\*\*Note: Revenue above is an estimate based on market prices and willingness of gas companies to lease**



# Future Natural Gas Leases

- Leasing is dependent on several factors
  - Market rate for natural gas
    - \$4.00 to \$6.00 per mcf (thousand cubic feet)
    - Current market rate in last 12 months ranges from \$2.64 to \$3.63 per mcf
  - Interest and budgets of gas companies
    - Budgets are going to oil production
- Leases will be advertised for public bid by zone
- Leases are not anticipated to include drillsites on City property

# Thank you



# Lake Worth Leases - Platting

Presented by Ricky Salazar

For Lake Worth Regional Coordination Committee

September 20, 2018

# History

- Originally a one year permit for fishing camps only.
- Gradually moved to 50 year leases between 1982-2032.
- Some leased properties with municipal water or sewer were offered for sale by sealed bid.
- In 2002, the leased properties that could be platted were offered for sale when municipal water and/or sewer was available.

# History

- The option to purchase the leased platted properties was for a 10 year period with the expectation that water and/or sewer would be completed by 2012.
- Some of the Lessees did not exercise the option to purchase the platted properties within the 10 year time period.
- Due to existing conditions some lots were unable to be platted.

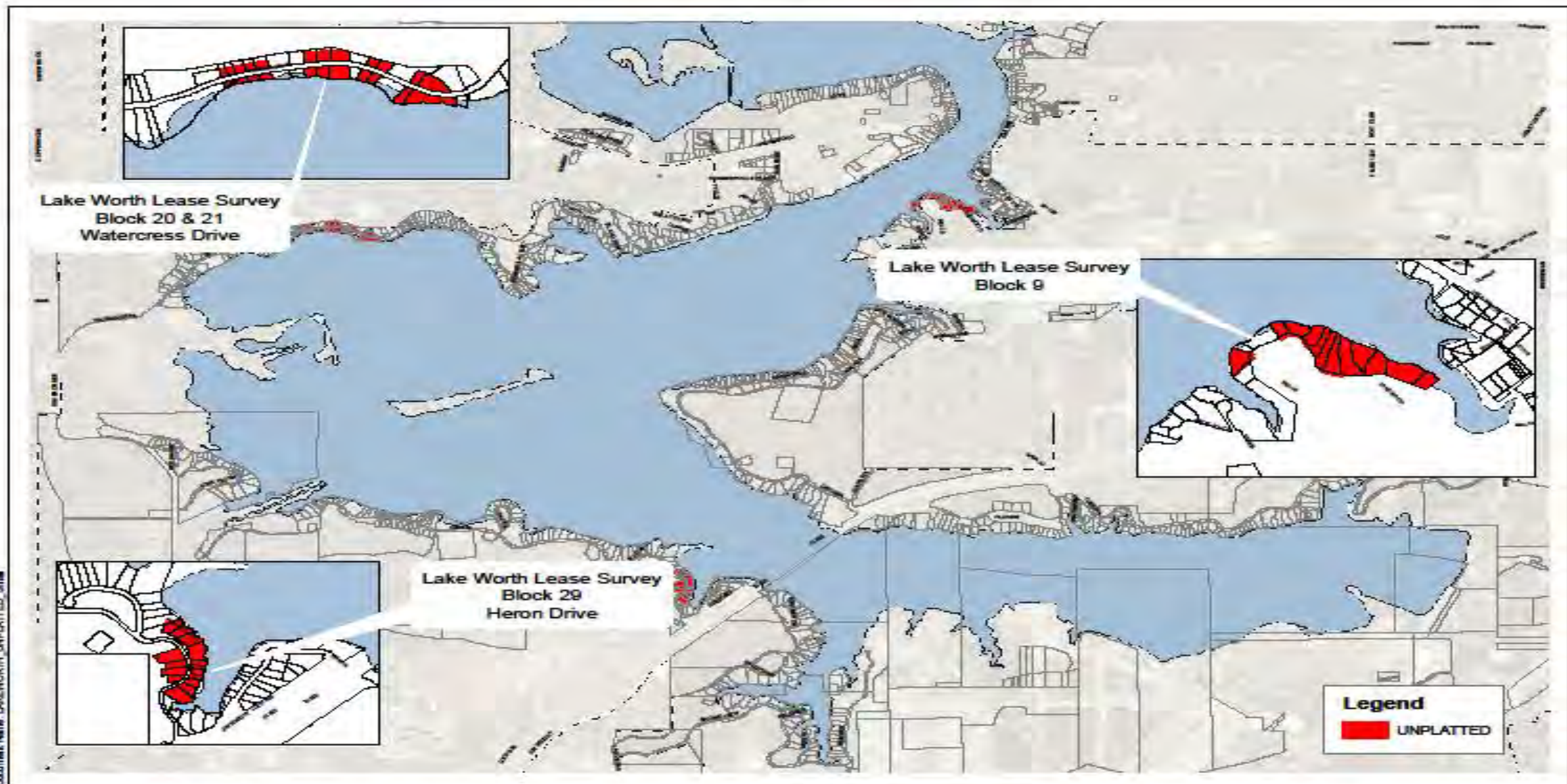
# City Council Approves Sale

- On November 8, 2016 Mayor and Council Communication (M&C L-15964) again authorized the sale of Lake Worth residential leased lots through
  - Contract for Sale with Current Residential Lessees of Lake Worth residential leased lots at Fair Market Value
  - Lease Amendment, contemporaneously with the Contract for Sale, with current residential lessees to amend the lease to provide for a shorter term and the disposition of the improvements upon expiration of the lease
- Lessees of residential unplatted properties to plat their leased lot

# City Council Approves Platting

- Upon further review, Staff recommends unplatted properties at Lake Worth be platted by the City at City's initial expense.
- On October 24, 2017, (M&CL-16088) council authorized Staff to proceed with platting unplatted residential leased lots.
- The cost of platting to be reimbursed by the individual who purchases the property at the time of the sale.

# LAKE WORTH UNPLATTED LOTS



Document Name: LAKEWORTH\_UNPLATTED\_Small



# City Council Approves Platting

- Allowing the City to be the developer provided a cost effective method to pull together Staff resources to complete the platting process.
- Major issues need to be solved.
- With the help of Planning and Development, Law and Water Department, the City was able to assure the completion of the platting process for all unplatted lots.

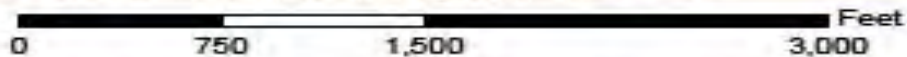
# City Council Approves Platting

- Goals
  - Plat remaining unplatted residential leased lots
  - Preserve views of Lake Worth
  - Protect the quality of water
  - Follow form and standards all within a timely manner

# Platting Issues

- Block 20 & 21
  - Platting of Watercress Drive between Silver Creek Road and Island View Drive
    - Existing road alignment vs proposed platted right-of-way
  - Access
    - Survey description
  - Sewer service
- Block 9 & 29
  - Lot boundaries
  - Access
  - City limit boundary

# LAKE WORTH LEASES WATERCRESS DRIVE

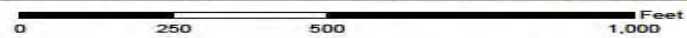


Date: 1/5/2018

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LAKE WORTH LEASES  
BLOCK 9



Date: 4/17/2018

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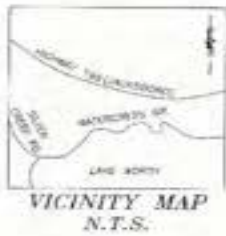


# Update

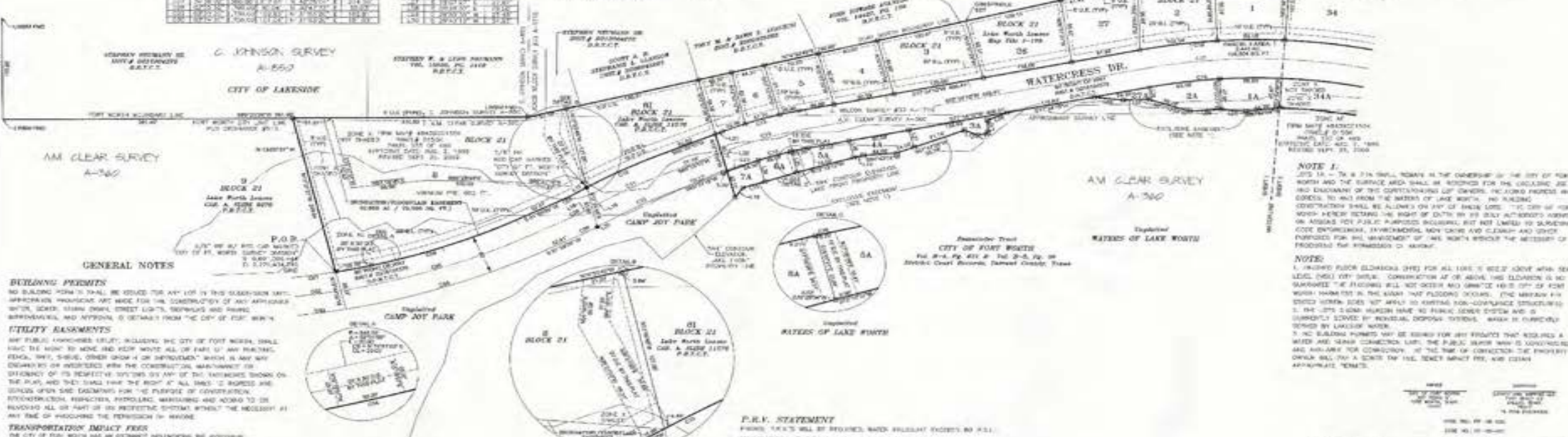
- Watercress Drive Right-of-Way
  - Instrument Number D218101598
  - Filed - May 11, 2018
- Block 20 & 21
  - Instrument Number D218189798
  - Filed – August 24, 2018
- Block 29
  - Approved for final plat July 25, 2018

# Update

- Block 9
  - Surveyor is setting boundary lines
  - Verifying existing encumbrances
  - Researching historical data
- Conveyance documents
  - Lake/Use Access Easements for A designated lots
    - Ownership to remain with City
    - Surface area will be reserved for the exclusive use and enjoyment of the corresponding lot owner
    - Ingress and egress, to and from lake
    - No **building** construction
    - City retains right to entry for the management of Lake Worth



Block	Lot	Area	Owner	Remarks
21	1	0.15	...	...
21	2	0.15	...	...
21	3	0.15	...	...
21	4	0.15	...	...
21	5	0.15	...	...
21	6	0.15	...	...
21	7	0.15	...	...
21	8	0.15	...	...
21	9	0.15	...	...
21	10	0.15	...	...
21	11	0.15	...	...
21	12	0.15	...	...
21	13	0.15	...	...
21	14	0.15	...	...
21	15	0.15	...	...
21	16	0.15	...	...
21	17	0.15	...	...
21	18	0.15	...	...
21	19	0.15	...	...
21	20	0.15	...	...
21	21	0.15	...	...
21	22	0.15	...	...
21	23	0.15	...	...
21	24	0.15	...	...
21	25	0.15	...	...
21	26	0.15	...	...
21	27	0.15	...	...
21	28	0.15	...	...
21	29	0.15	...	...
21	30	0.15	...	...
21	31	0.15	...	...
21	32	0.15	...	...
21	33	0.15	...	...
21	34	0.15	...	...
21	35	0.15	...	...
21	36	0.15	...	...
21	37	0.15	...	...
21	38	0.15	...	...
21	39	0.15	...	...
21	40	0.15	...	...
21	41	0.15	...	...
21	42	0.15	...	...
21	43	0.15	...	...
21	44	0.15	...	...
21	45	0.15	...	...
21	46	0.15	...	...
21	47	0.15	...	...
21	48	0.15	...	...
21	49	0.15	...	...
21	50	0.15	...	...



**GENERAL NOTES**

**BUILDING PERMITS**  
NO BUILDING PERMIT SHALL BE ISSUED FOR ANY LOT IN THIS SUBDIVISION UNLESS APPROVED PLANS AND SPECIFICATIONS FOR THE CONSTRUCTION OF ANY APPROVED WATER, SEWER, STORM DRAIN, STREET LIGHTS, SIGNALS AND TRAFFIC SIGNALS, SIGNAGE, AND APPROVAL IS OBTAINED FROM THE CITY OF FORT WORTH.

**UTILITY EASEMENTS**  
ANY PUBLIC UTILITIES EXISTING, INCLUDING THE CITY OF FORT WORTH, SHALL HAVE THE RIGHT TO MOVE AND RELOCATE ANY PART OF ANY PAVING, SEWER, WATER, GAS, OR IMPROVEMENT WHICH IS ANY WAY EGRESS TO OR INTERFERES WITH THE CONSTRUCTION, MAINTENANCE OR OPERATION OF ITS RESPECTIVE SYSTEMS ON ANY OF THE EASEMENTS SHOWN ON THE PLAN, AND THEY SHALL HAVE THE RIGHT AT ALL TIMES TO BORROW AND CONDUIT OVER AND UNDER ANY OF THE PURPOSES OF CONSTRUCTION, RECONSTRUCTION, REPAIRS, MAINTENANCE AND ADD TO OR REMOVE ALL OR PART OF ITS RESPECTIVE SYSTEMS, WHETHER THE NECESSITY AT ANY TIME OF INTERRUPTING THE FLOW OF TRAFFIC.

**TRANSPORTATION IMPACT FEES**  
THE CITY OF FORT WORTH HAS AN OBLIGATION IMPROVING THE ACCESSIBILITY AND QUALITY OF TRANSPORTATION. THE CITY OF FORT WORTH HAS A POLICY TO ENCOURAGE DEVELOPMENT THAT PROVIDES FOR THE PROPER DESIGN AND CONSTRUCTION OF TRANSPORTATION. THE CITY OF FORT WORTH HAS A POLICY TO ENCOURAGE DEVELOPMENT THAT PROVIDES FOR THE PROPER DESIGN AND CONSTRUCTION OF TRANSPORTATION. THE CITY OF FORT WORTH HAS A POLICY TO ENCOURAGE DEVELOPMENT THAT PROVIDES FOR THE PROPER DESIGN AND CONSTRUCTION OF TRANSPORTATION.

**WATER/WASTEWATER IMPACT FEES**  
THE CITY OF FORT WORTH HAS AN OBLIGATION IMPROVING THE ACCESSIBILITY AND COLLECTION OF WATER AND WASTEWATER IMPACT FEES. THE CITY OF FORT WORTH HAS AN OBLIGATION IMPROVING THE ACCESSIBILITY AND COLLECTION OF WATER AND WASTEWATER IMPACT FEES.

**FLOODPLAIN RESTRICTIONS**  
NO CONSTRUCTION SHALL BE ALLOWED WITHIN THE FLOODPLAIN EXTENDING OUTSIDE THE WATER APPROVAL OF THE DIVISION OF TRANSPORTATION AND PUBLIC WORKS. IN ORDER TO SECURE APPROVAL, DETAILED ENGINEERING PLANS AND/OR STUDIES FOR THE IMPROVEMENTS, SUBMITTALS TO THE DIVISION OF TRANSPORTATION AND PUBLIC WORKS FOR THE PARTIALLY SUBMITTED TO CONSTRUCT WITHIN THE FLOODPLAIN. IN ORDER TO SECURE APPROVAL, DETAILED ENGINEERING PLANS AND/OR STUDIES FOR THE IMPROVEMENTS, SUBMITTALS TO THE DIVISION OF TRANSPORTATION AND PUBLIC WORKS FOR THE PARTIALLY SUBMITTED TO CONSTRUCT WITHIN THE FLOODPLAIN.

**FLOODPLAIN STATEMENT**  
THE SUBJECT PROPERTY, BY STATE APPEARS TO BE IN ZONE A-100 (SHALL) A-100 AND AS ACCORDING TO FLOOD PLANNING MAP AND FLOOD PLANNING MAP, PART 106 OF THE FLOOD PLANNING MAP, AS OF 1982, AND REVISION THEREOF, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 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3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 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# Sale of Lake Worth Residential Lease Lots

- Contract with City approved appraiser to appraise the property
- Consider pre-approval if a mortgage will be required.
- If sewer is available, property will have to be connected to the sewer at lessee's expense.
- A written formal request to purchase the lease will need to be sent to the City Land Agent.
- A Lease Amendment will have to be signed that the lease will terminate at closing or within 18 months.
- Contact a Title Company to close property with.
- If during this process the lessee wants to sell his improvements to someone else, the City will transfer the lease.

# Thank you

Ricky Salazar  
Lease Management – Real Property Division  
Property Management  
817-392-8053





# Meandering Road

Design of Meandering Road from East Gate of NASJRB to River Oaks/SH 183

September 20, 2018



# Study Limits



MEANDERING ROAD - FROM ROBERTS CUT-OFF ROAD TO THE NAVAL AIR STATION EAST ENTRANCE

# Existing Conditions









# Safety



# Comparison of Alternatives

Signalized vs. Roundabout

						
Evaluation Criteria	Meandering Rd/LTJg Barnett Rd	Grayed Out	Meandering Rd/Yale St	Grayed Out	Meandering Rd/Roberts Cut Off Rd	Meandering Rd/Roberts Cut Off Rd
Year 2040 Peak Hr Intersection LOS (AM/PM)	A/A	C/C	A/A	B/B	B/B	C/C
Estimated ROW (SF)	-	-	-	-	-	-
Estimated Constr Costs (\$M)*	TBD	TBD	TBD	TBD	TBD	TBD
Estimated 20-Yr Maintenance Cost (\$M)	\$0.02	\$0.06	\$0.02	\$0.06	\$0.02	\$0.06
Estimated 20-Yr Collision Cost (PC, \$M)	\$0.44	\$1.89	\$0.48	\$2.05	\$0.63	\$2.67
<b>Total 20-Yr Costs (PC, \$M)</b>	<b>\$0.46</b>	<b>\$1.95</b>	<b>\$0.50</b>	<b>\$2.11</b>	<b>\$0.65</b>	<b>\$2.73</b>

\* Estimated Construction Costs\* data will be provided after Lamb-Star's review of MSA's intersection geometries.

Grayed out columns indicate proposed traffic signals that, based on our observations from the traffic data collected as part of this project, will not meet any of the TMUTCD traffic signal warrants.

# Project Overview





# Compact Roundabouts (Mini)



# Stakeholders



City of River Oaks Town Hall Meetings:

- \* December 5, 2017
- \* April 3, 2018
- \* Sept. 4, 2018
- \* Oct. 9, 2018 (tentative)

# Public Involvement

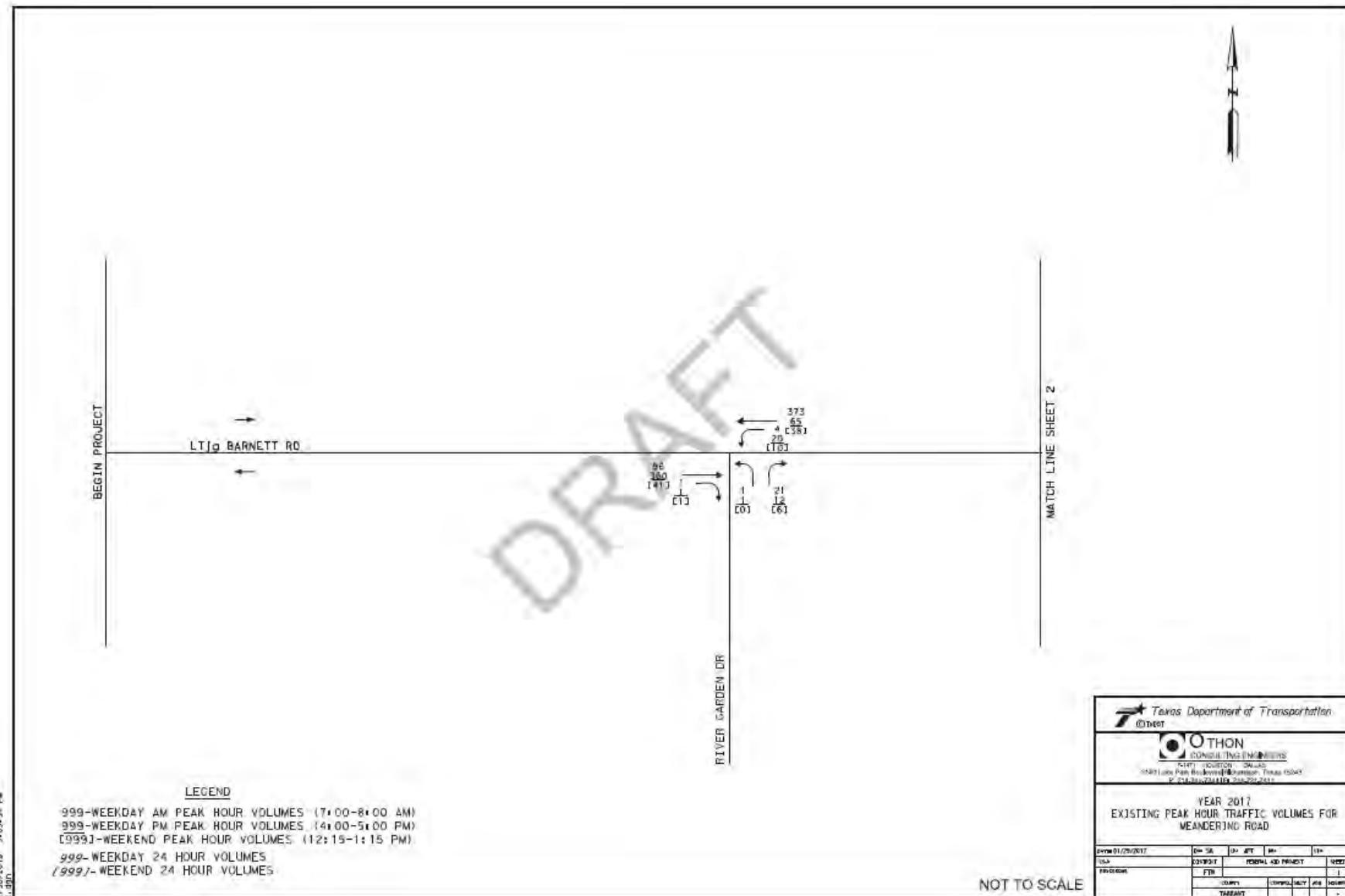


City of River Oaks Town Hall Meetings

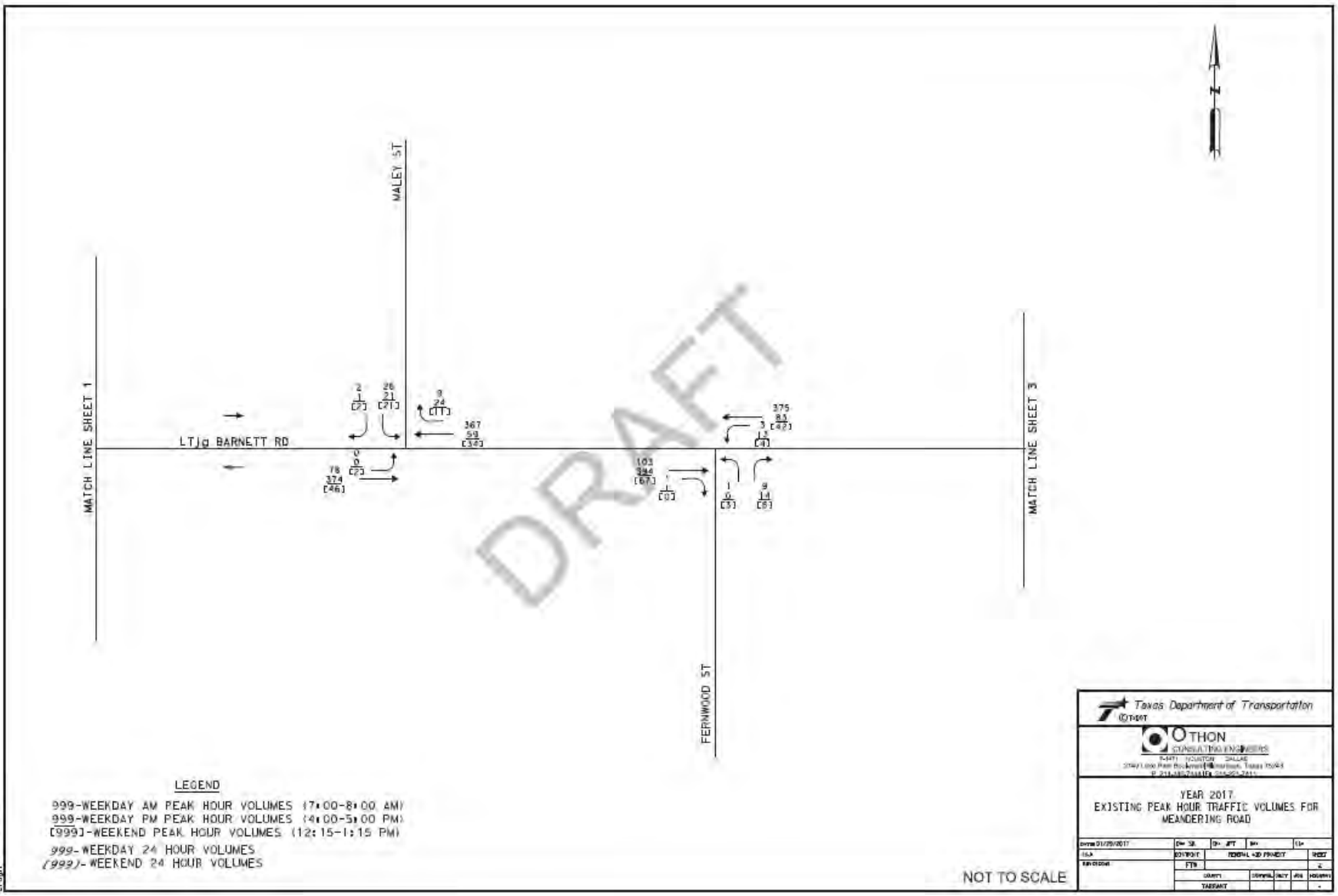
# Scheduling

Description	2017					2018												2019
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Jan
Field Work & Existing Conditions			██████████	██████████	██████████													
<b>Town Hall Meeting #1 (Existing Conditions)</b>			██████████	██████████	██████████													
Draft Environmental Assessment/Geometric Alternatives					██████████	██████████	██████████	██████████	██████████	██████████	██████████							
<b>Town Hall Meeting #2 (Conceptual Design)</b>						██████████	██████████	██████████	██████████	██████████								
Field Work & Draft Technical Reports* (ID env'l issues)							██████████	██████████	██████████	██████████								
Draft EA & Client Review / Revisions								██████████	██████████	██████████	██████████							
TxDOT District EA Review / Revisions											██████████	██████████						
<b>Town Hall Meeting #3 (Recommended Alternative)</b>										██████████	██████████	██████████	██████████	██████████	██████████			
EA Updates & TxDOT ENV Review / Revisions													██████████	██████████	██████████	██████████		
<b>Town Hall Meeting #4</b>													██████████	██████████	██████████			
Public Hearing, TBD																		
FONSI Documentation/Checklists & Approval of FONSI																	██████████	██████████
<b>Final Plan Development</b>																	██████████	██████████

# Traffic Data – LT JG Barnett

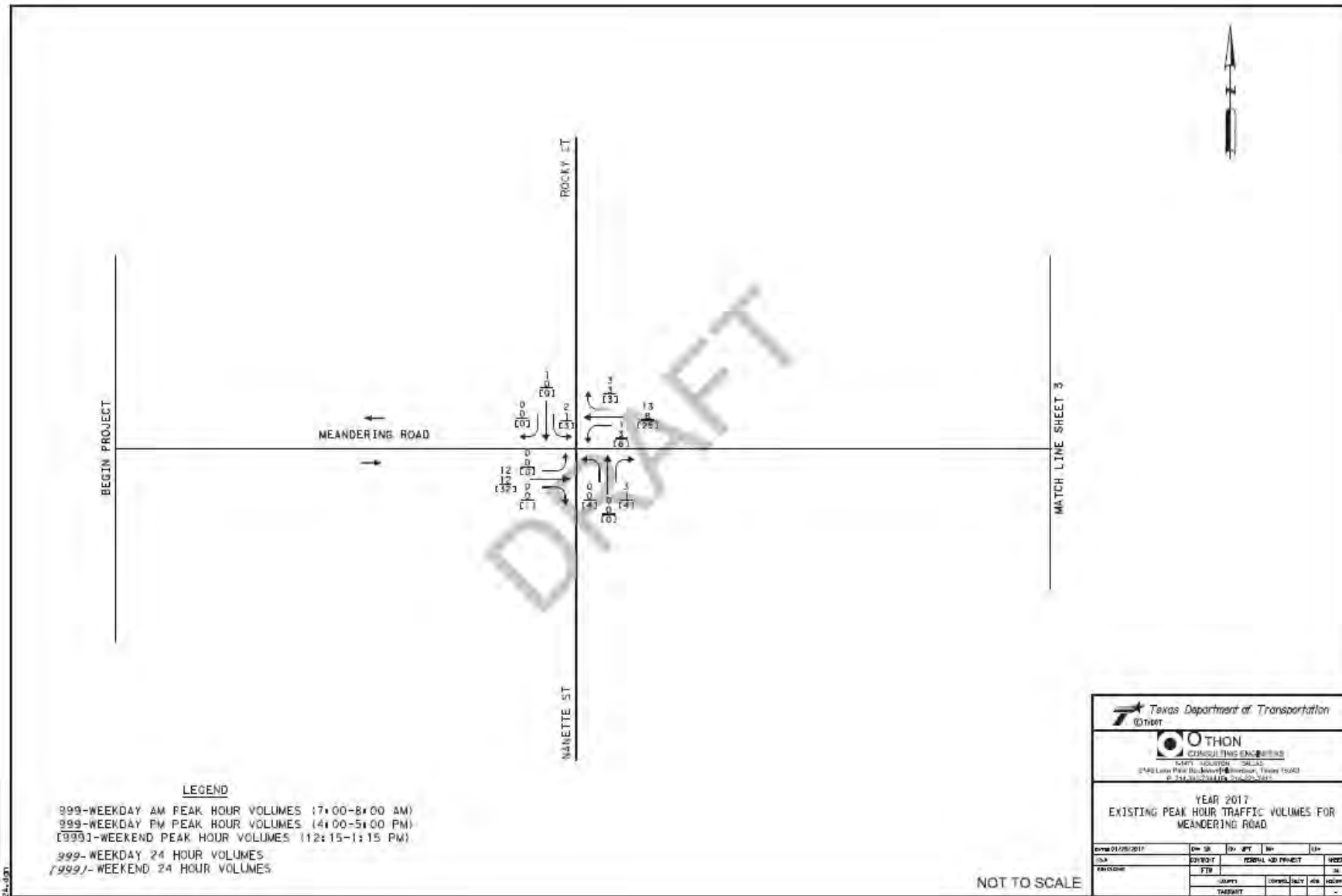


# Traffic Data – LT JG Barnett

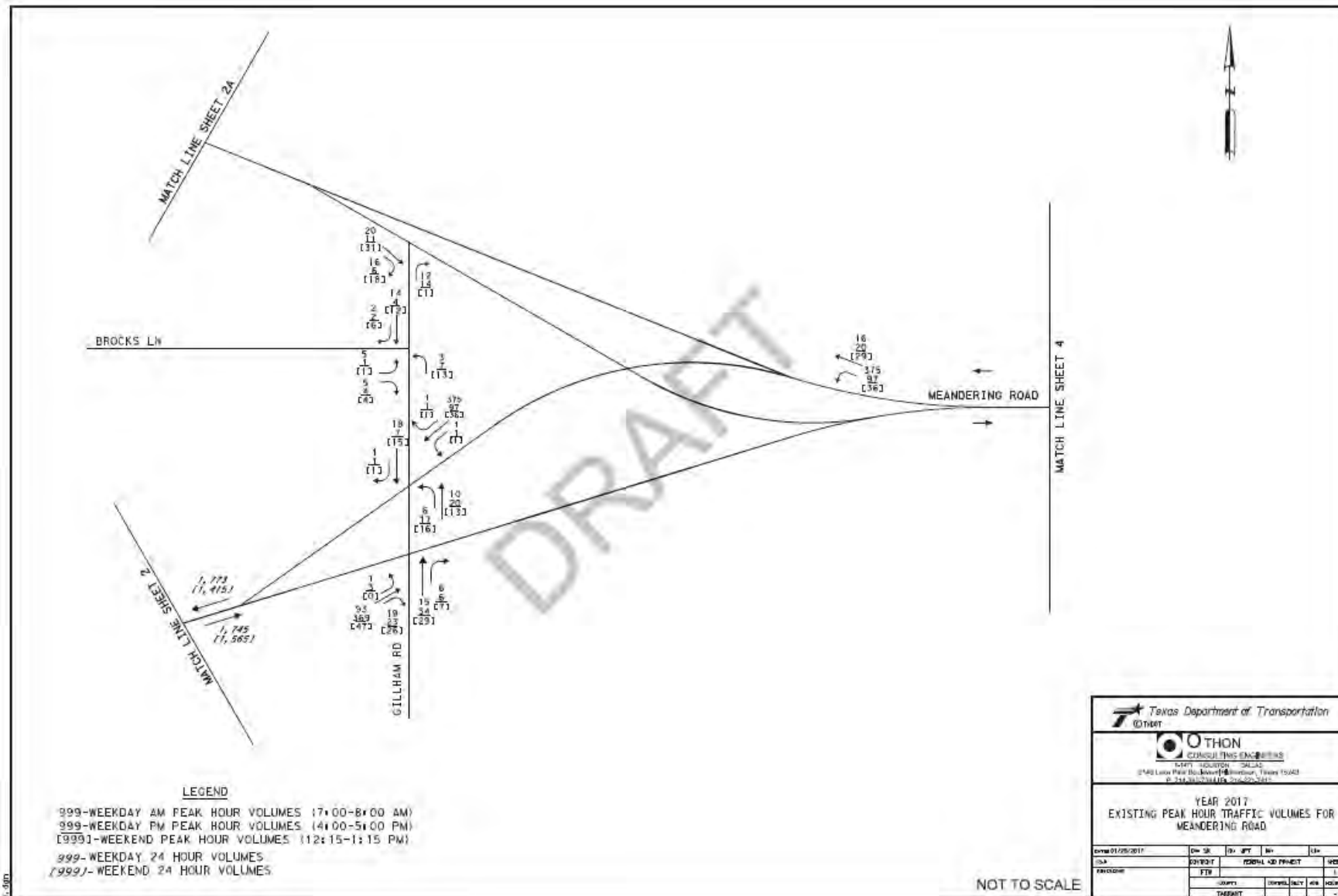


NOT TO SCALE

# Traffic Data-Meandering Rd

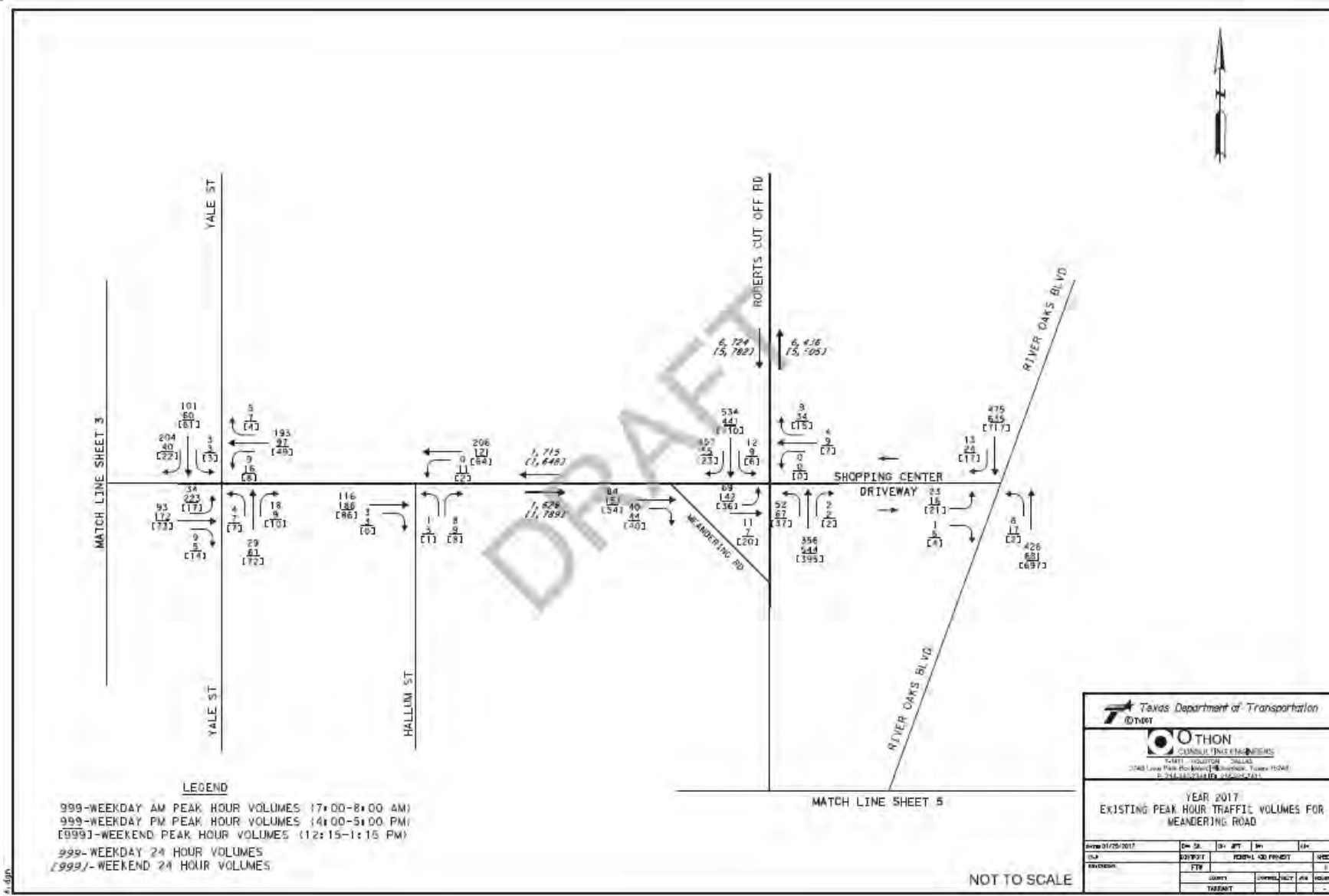


# Traffic Data

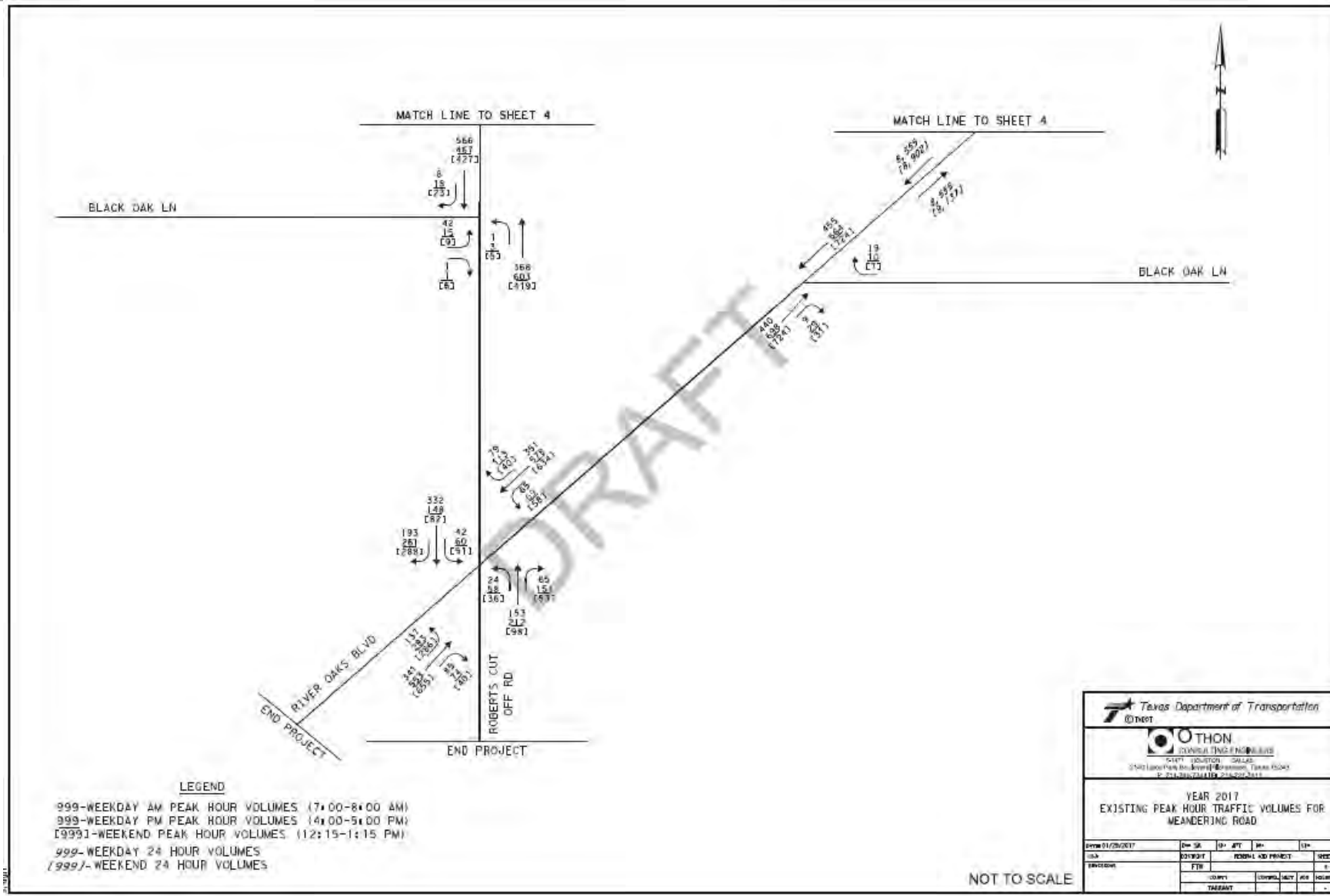




# Traffic Data-Meandering Rd



# Traffic Data-Roberts Cut Off



# Project Overview





# Meandering Road

Design of Meandering Road from East Gate of NASJRB to River Oaks/SH 183





**Lake Worth Regional Coordination Committee Meeting**

**20 September 2018**

**Rob Denkhaus  
Nature Center Manager**

# Infrastructure



# Lotus Marsh Boardwalk

Dedicated 03/17



# Cross Timbers Levee

Dedicated 11/17





# Todd Island Bridge

Under Construction  
Fall 2018



# Restoration Greenhouse

Under Construction  
10/18



# Natural Resources



# Wildlife Populations



# Wildlife Management



# Programs



# Camp Paddle & Cast



# Wednesday Walks

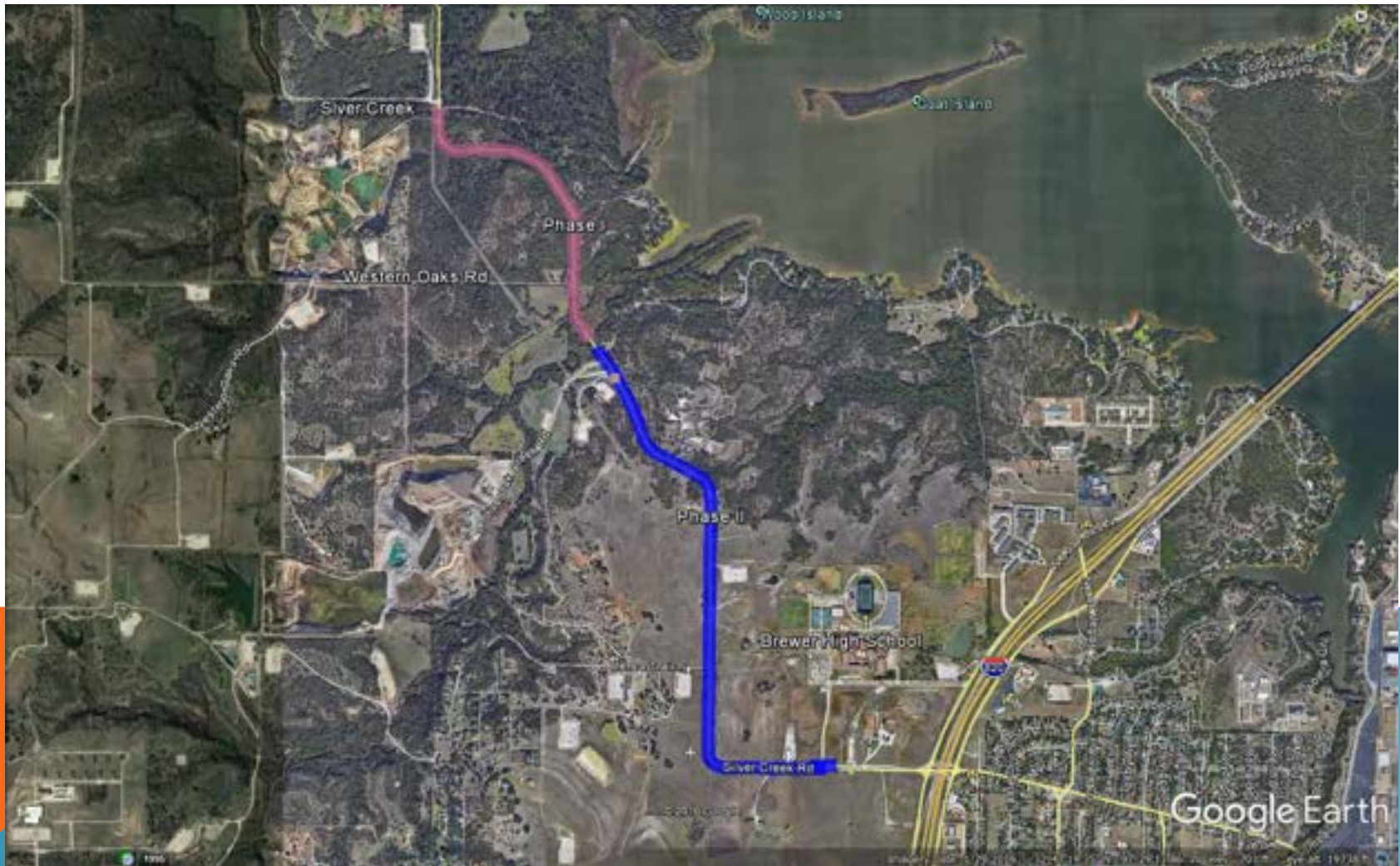


**Lake Worth Regional Coordination Committee Meeting  
20 September 2018**

**Rob Denkhaus  
Nature Center Manager**



# SILVER CREEK ROAD - PROJECT NO. 02101



## PHASING

### PHASE I

- Limits: Live Oak Creek bridge to Silver Creek bridge
- Scope: pulverize and overlay - completed in 2016

### PHASE II (Brewer Dr. to Silver Creek bridge)

#### Phase IIA

- concrete pavement panel replacement (Brewer Dr. to beginning of asphalt)
  - Pulverize, overlay and add shoulders on segments not requiring ROW \*
- \* Where feasible and practical

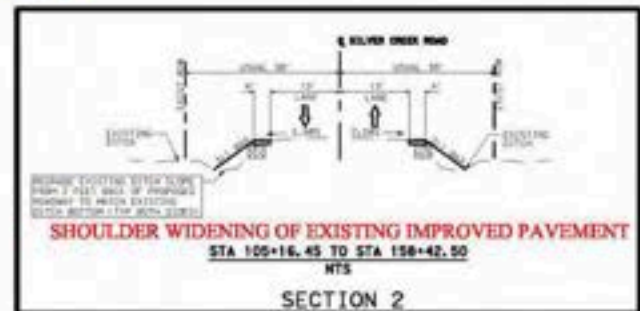
#### Phase IIB

- Replace undersized culverts
- Construct auxiliary lanes at Silver Creek Materials
- Improve two 90-degree curves
- Pulverize, overlay and add shoulders on segments requiring ROW

# PROPOSED SILVER CREEK ROAD IMPROVEMENTS

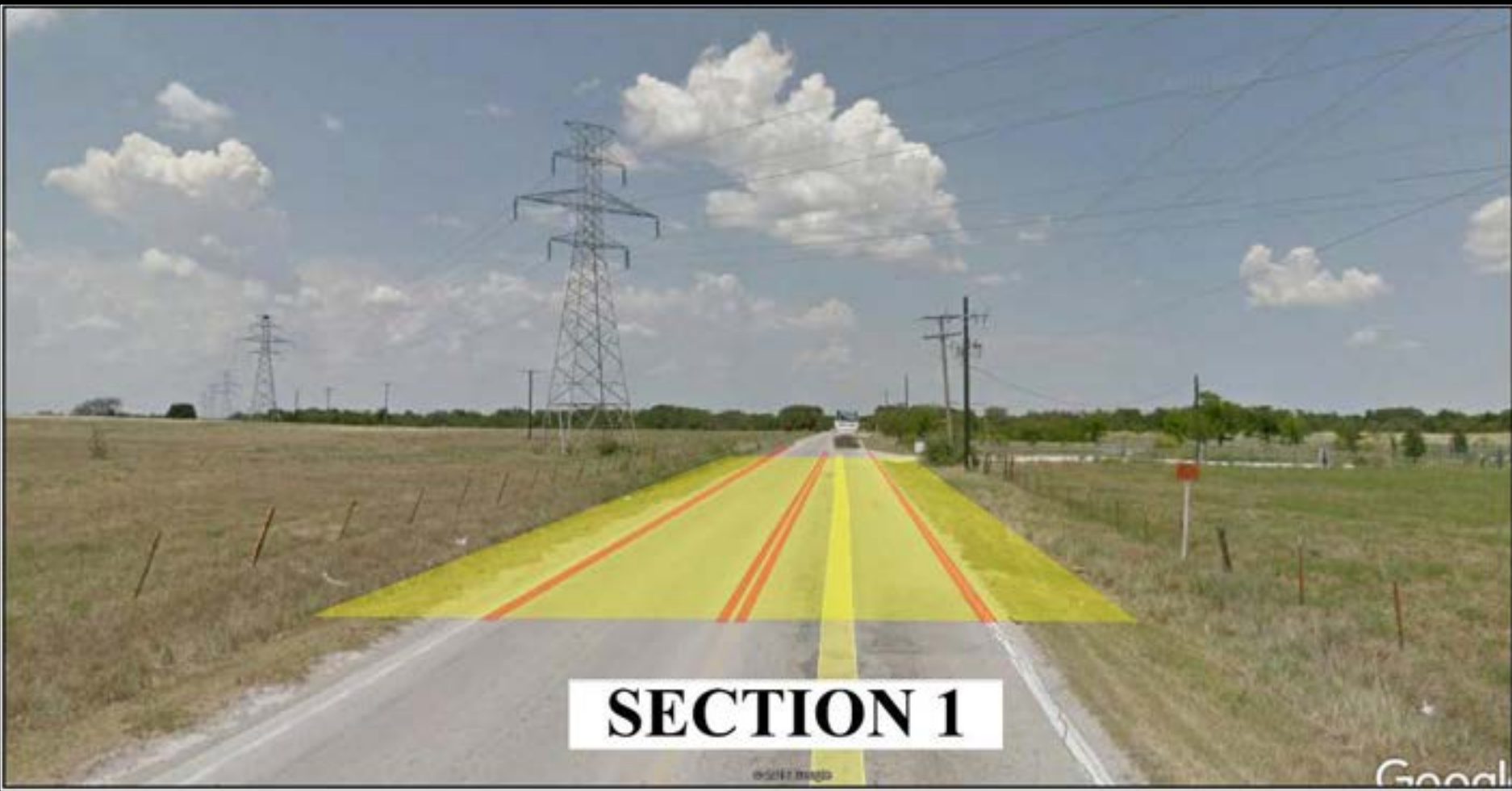


- The project will include:
- Reconstruction of the existing pavement from the end of the boulevard section at Brewer High School entrance to Live Oak Creek bridge (excluding the bridge) with wider shoulders
  - Construction of shoulders throughout Phase 1 (from Live Oak Bridge to Silver Creek Bridge)
  - Consideration for acceleration and left turn lanes at Silver Creek Materials



**PRELIMINARY**  
**NOT FOR CONSTRUCTION PURPOSES**  
 03/17/2017









**SILVER CREEK MATERIALS**

# CONSTRUCTION SCHEDULE

PHASE I scope (pulverize and overlay) complete

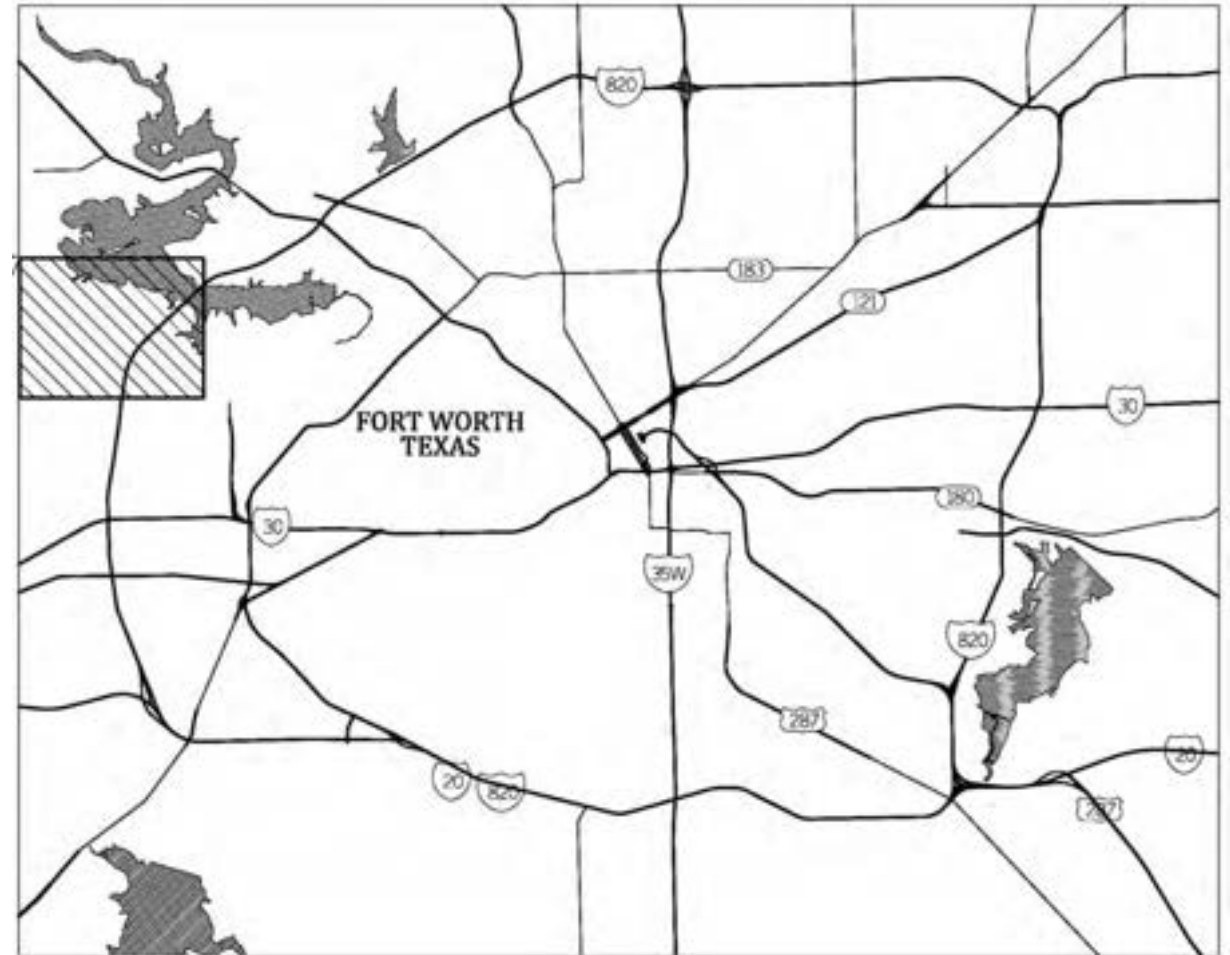
## PHASE II

- Phase IIA - start Nov 2017
- Phase IIB
  - Early start Fall 2018
  - Late start Spring 2019

Construction duration depends on scope to be included in each phase

# Silver Creek Road

Mitch Aiton, P.E.  
City of Fort Worth - TPW

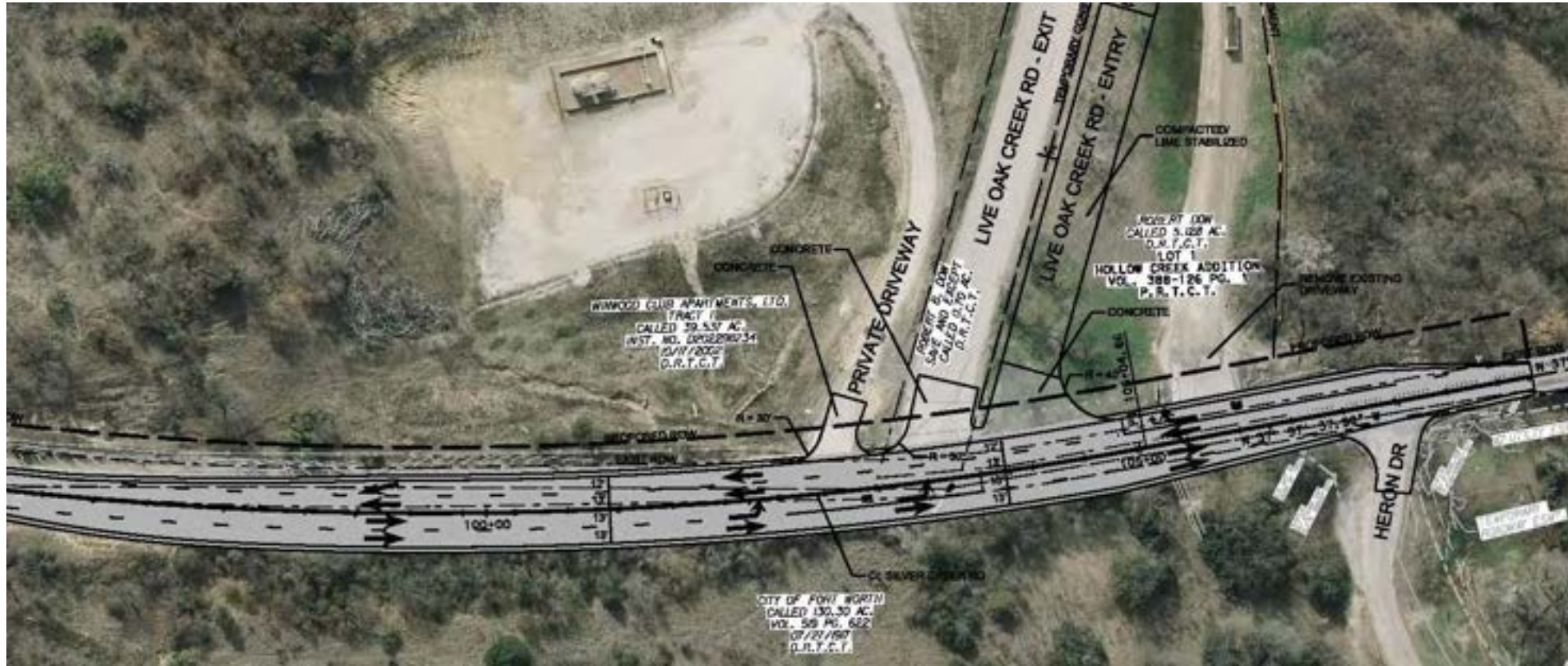




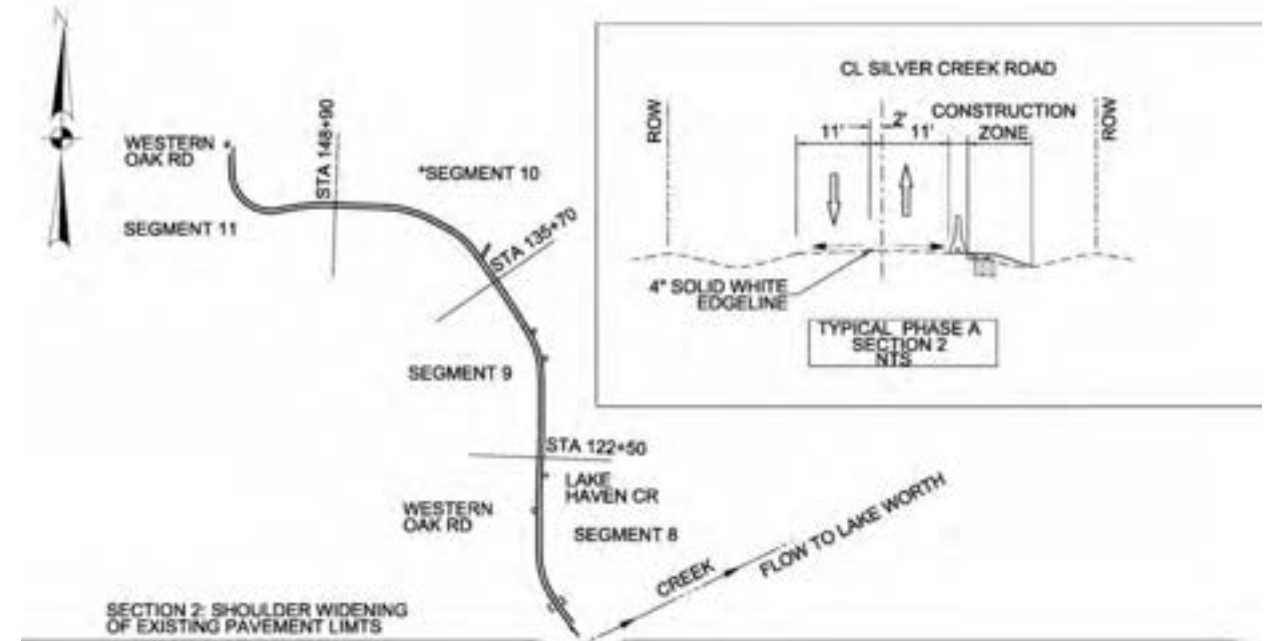
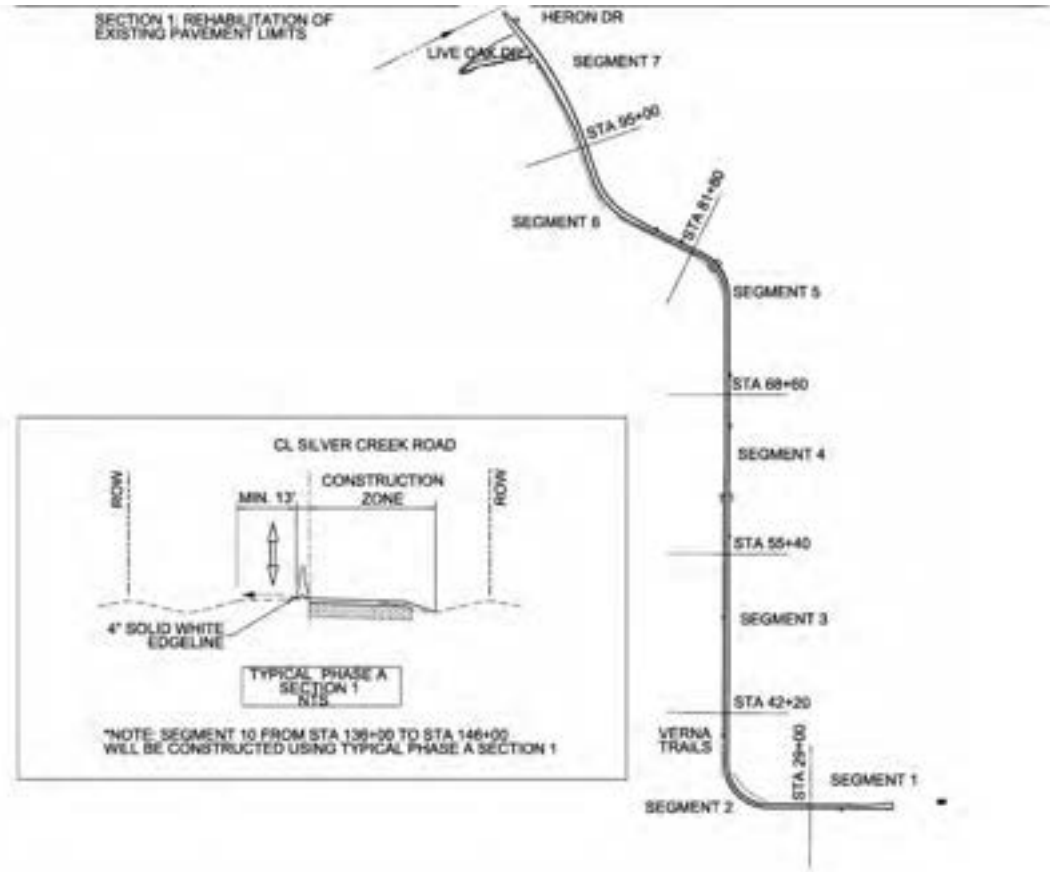
# Project Improvements

- Rebuild Subgrade, New Asphalt Driving Surface
- Improved Drainage – Cross Culverts and Ditches
  - Will Improve Future Road Performance
- Add 4' Shoulder to Existing 13' Lane
- Flatter turns where available
- Turn Lanes at Silver Creek Materials

# Silver Creek Materials



# Construction Phasing



# Remaining Project Schedule

- Plans are in Final Review
- Right of Way Acquisition is in Final Stages
  - Complete Late Fall 2018
- Franchise Utility Relocation
  - 2 Oncor Poles to Relocate (Complete Late Fall 2018)
- Advertise For Construction Late Fall 2018
- Begin Construction Late Spring 2019

# Bonus Improvements – Restriping Near 820



# Thank You



# Lake Worth Trail

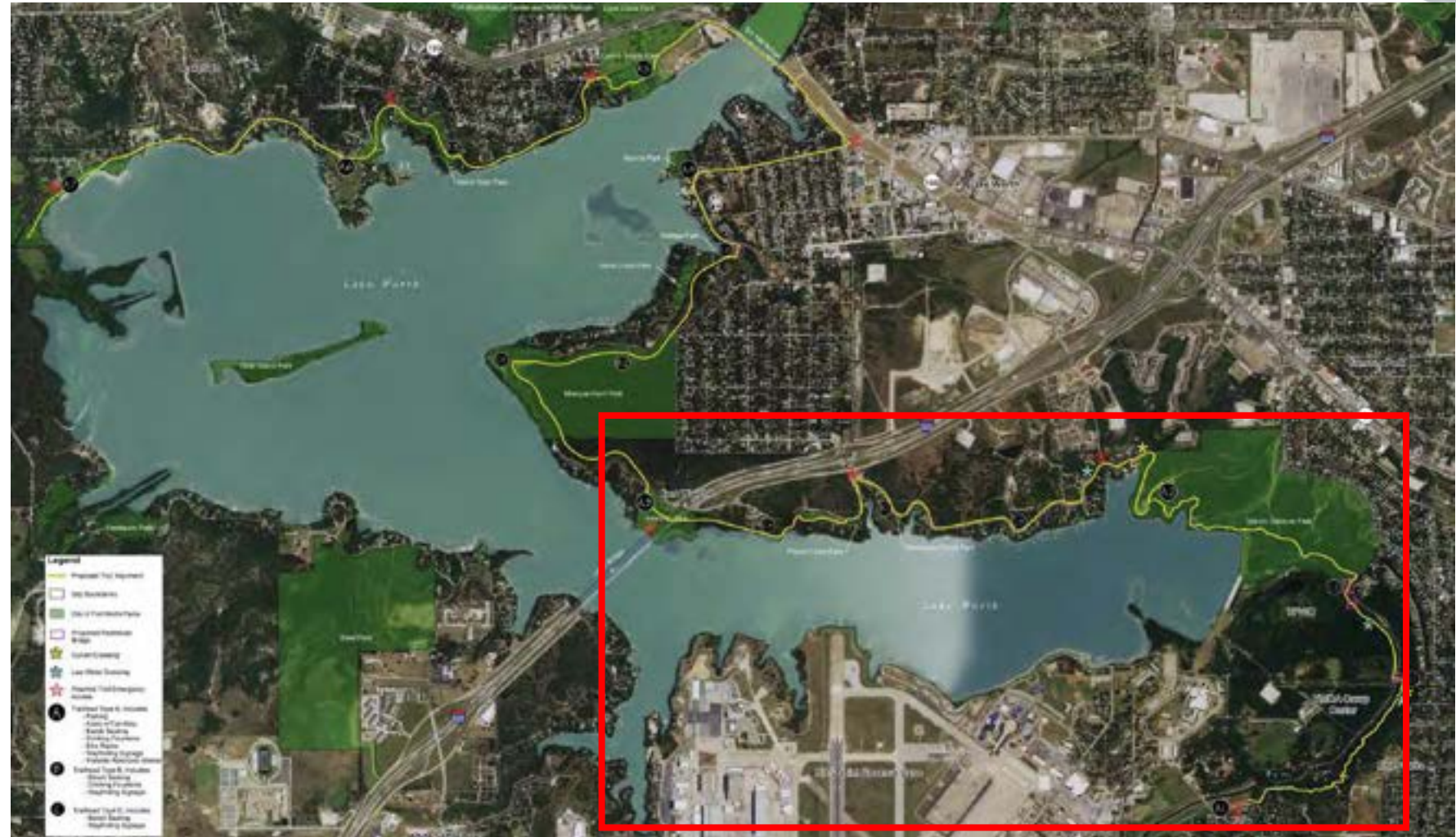
## Project Update

Lake Worth Regional Coordination Committee Meeting  
December 13, 2018

Presented by: Carlos Gonzalez

City of Fort Worth  
Park & Recreation Department

- Funding: Lake Worth Gas Lease Capital Project Funds
- Preliminary Alignment Study – completed in 2015
- Phase 1 – currently underway





- Phase 1

- Has been divided into two sections due to the challenges in this area

- Phase 1A

- Arrow S. Park to Marion Sansom Park

- Phase 1B

- Marion Sansom Park, River Oaks and YMCA Camp Carter Welcome Center



## Phase 1A Status

- Preparing an Interlocal agreement with TRWD for two pedestrian bridges
- Consultant is finalizing plans for bid advertisement
- Preparing the an application for use of TxDOT ROW



## Phase 1B Status

- Preparing an Interlocal agreement with River Oaks for access
- PARD construction staff is working at Marion Sansom Park
- Once Phase 1A Design is completed, the City will initiate the design for Phase 1B



# Schedule

## Phase 1A

- Design Completion February 2019\*
- Advertisement March 2019
- Bid Opening April 2019
- Construction Start July 2019
- Construction Completion May 2020

## Phase 1B

- Design start March 2019
- Design completion August 2019
- Advertisement September 2019
- Bid Opening October 2019
- Construction Start February 2020
- Construction Completion November 2020

\*Contingent on TxDOT permit application review schedule

# Lake Worth Trail

## Contact:

Carlos Gonzalez, Park Planner

[Carlos.Gonzalez@fortwrothtexas.gov](mailto:Carlos.Gonzalez@fortwrothtexas.gov)

817-392-5742

# Thank you



**FORT WORTH**<sup>®</sup>  


# Lake Worth Action Plan

Presented by Ricky Salazar, Property Management Department

# Lake Worth Action Plan

- General Information
  - Lake Worth has an uncontrolled spillway. There are no gates or sluices to regulate water flow from the dam.
  - City Marshals Office Lake Patrol monitors lake elevation and conditions, including debris in the lake.
  - Elevation Information
    - Spillway Elevation: 594 Feet
    - Emergency Spillway Elevation: 603.5 Feet



# National Flood Categories

- 599.0 Major Flood Stage
- 598.0 Moderate Flood Stage
- 597.0 Flood Stage
- 594.0 Action Stage

(All Data from National Weather Service Advanced Hydrologic Prediction Center Website)

# Flood Impact Elevations – Lake Worth

- 599.0 – Major flooding with many houses flooded.
- 598.7 – Major flooding along the lake shore.
- 598.5 – Major flood problems along the lake shore.
- 598.0 – Moderate flooding along the lake shore. Some houses begin to flood.
- 597.0 - Minor flood problems occur. Water begins to flood low areas.
- 595.0 - Minor water flow over the spillway is expected but no flooding is forecast.
- 594.0 – No flood problems are expected. Water will flow over the spillway.

# Flood Impact Elevations

- Lowest elevation for a residence is **596.9165** feet

# Lake Worth Action Plan - Responsibilities

## Office of Emergency Management (OEM)

When the lake reaches an elevation of **595.5 feet**, schedule a meeting with the following to consider implementation of this plan.

- City of Fort Worth City Marshals Office
- City of Fort Worth Communication and Public Engagement Office
- City of Fort Worth Fire Department
- City of Fort Worth Property Management Department
- City of Fort Worth Police Department
- City of Fort Worth Water Department
- Fort Worth Transportation Authority
- American Red Cross
- Tarrant County Public Health
- Texas Division of Emergency Management
- Fort Worth Park and Recreation Department – Nature Center
- Fort Worth Transportation and Public Works
- City of Fort Worth Neighborhood Services Department
- Tarrant Regional Water District
- City of Lake Worth
- MedStar
- Fort Worth ISD

# Office of Emergency Management – Responsibilities

- Receive reports from the National Weather Service and the Tarrant Regional Water District regarding weather and lake conditions.
- Make determination to activate and coordinate the implementation of this plan.
- Issue notifications to property owners and residents as necessary via Nixle.
- Communicate with the City of Lake Worth regarding street closures.
- Disseminate notice of lake closing and reopening by voice message through Nixle. A message template can be found in Appendix 3 - Lake Worth Action Plan Nixle Message Template.
- Coordinate with Tarrant County Public Health to determine if prophylactic tetanus vaccinations are necessary and determine the need for vaccinations.
- Contact Neighborhood Services Department to open shelters.
- Contact The American Red Cross to staff the shelters.
- Contact Fort Worth Transportation Authority for transportation to the shelters.
- Notify Fort Worth Police Department for evacuation assistance.
- Notify City Manager's Office when this plan is implemented.
- During heavy/prolonged rain events the OEM Duty Officer will monitor the Lake Worth elevation.
- Maintain an updated Telephone Contact List.

# Fort Worth Property Management -Responsibilities

- Receive reports from the National Weather Service and the Tarrant Regional Water District (TRWD) regarding weather and lake conditions.
- Make decisions regarding closing (596) and reopening (595) the lake to boat traffic.
- Notify Police dispatch and the Office of Emergency Management.
- Notify the Communications and Public Engagement Office

# Fort Worth Property Management -Responsibilities

- Factors Considered
  - Safety of Citizens
    - Storm debris
    - Boat traffic
    - Flooding
  - Weather forecast
  - Lake Levels
    - TRWD Lake Level Blog
      - Daily reports
      - Monitor discharge levels
    - Corp of Engineers
      - Bridgeport
      - Eagle Mountain

Home  
 Executive Summary  
 Daily Reports  
 Hydrologic Data  
 Pertinent Data  
 Recreation Info  
 Gaging Data  
 Related Sites

**Status of U.S. Army Corps of Engineers and Other Lakes in the Ft Worth District**
[Want to print report?](#)

Report Generated 15 MAY 2019 1346 CDT

Reservoir	Elevation (feet)	Conservation Pool	Difference	24 Hour Change	Release (cfs)	Flood Pool
<b>Red River Basin</b>						
<a href="#">Jim Chapman/Cooper Dam</a>	<a href="#">442.86</a>	440.0	+2.86	(-0.18)	2302	446.2
<a href="#">Wright Patman</a>	<a href="#">239.25</a>	226.7*	+12.56	+0.32	9175	259.5
<a href="#">Bob Sandlin</a>	<a href="#">338.00</a>	337.5	+0.50	(-0.09)	1700	----
<a href="#">Lake O' The Pines</a>	<a href="#">241.44</a>	228.5*	+12.94	+0.01	3239	249.5
<a href="#">Caddo</a>	<a href="#">176.01</a>	168.5	+7.51	+0.00	18900	----
<b>Neches River Basin</b>						
<a href="#">Palestine</a>	<a href="#">346.72</a>	345.0	+1.72	(-0.22)		----
<a href="#">Sam Rayburn</a>	<a href="#">167.85</a>	164.4	+3.45	+0.22	0	173.0
<a href="#">B.A. Steinhagen</a>	<a href="#">81.95</a>	81.0**	+0.95	+0.05	20600	83.0**
<b>Trinity River Basin</b>						
<a href="#">Bridgeport</a>	<a href="#">836.08</a>	836.0	+0.08	(-0.02)	220	----
<a href="#">Eagle Mountain</a>	<a href="#">649.19</a>	649.0	+0.19	(-0.01)	1796	----
<a href="#">Lake Worth</a>	<a href="#">595.11</a>	594.0	+1.11	(-0.22)	2614	----
<a href="#">Benbrook</a>	<a href="#">709.69</a>	694.0	+15.69	+0.16	412	710.0
<a href="#">Joe Pool</a>	<a href="#">529.54</a>	522.0	+7.54	+0.02	6	536.0
<a href="#">Mountain Creek</a>	<a href="#">457.80</a>	457.0	+0.80	+0.04	0	----
<a href="#">Ray Roberts</a>	<a href="#">636.69</a>	632.5	+4.19	+0.01	16	640.5
<a href="#">Lewisville</a>	<a href="#">528.17</a>	522.0	+6.17	+0.06	391	532.0
<a href="#">Grapevine</a>	<a href="#">548.38</a>	535.0	+13.38	+0.04	17	560.0
<a href="#">Lavon</a>	<a href="#">498.70</a>	492.0	+6.70	+0.05	1	503.5
<a href="#">Ray Hubbard</a>	<a href="#">435.46</a>	435.5	(-0.04)	+0.01	0	----
<a href="#">Cedar Creek</a>	<a href="#">322.33</a>	322.0	+0.33	(-0.15)	5376	----
<a href="#">Navarro Mills</a>	<a href="#">434.98</a>	424.5	+10.48	+0.07	0	443.0
<a href="#">Bardwell</a>	<a href="#">434.46</a>	421.0	+13.46	+0.22	0	439.0
<a href="#">Richland Chambers</a>	<a href="#">315.71</a>	315.0	+0.71	(-0.18)	9398	----
<b>Brazos River Basin</b>						
<a href="#">Possum Kingdom</a>	<a href="#">998.67</a>	999.0	(-0.33)	(-0.12)	8627	----
<a href="#">Granbury</a>	<a href="#">692.48</a>	692.7	(-0.22)	(-0.05)	11043	----
<a href="#">Whitney</a>	<a href="#">554.89</a>	533.0	+21.89	(-0.36)	23386	571.0
<a href="#">Aquilla</a>	<a href="#">548.25</a>	537.5	+10.75	(-0.35)	873	556.0
<a href="#">Waco</a>	<a href="#">478.31</a>	462.0	+16.31	+0.02	3874	500.0
<a href="#">Proctor</a>	<a href="#">1172.66</a>	1162.0	+10.66	(-0.81)	3620	1197.0
<a href="#">Belton</a>	<a href="#">605.78</a>	594.0	+11.78	+0.31	4534	631.0
<a href="#">Stillhouse</a>	<a href="#">629.86</a>	622.0	+7.86	(-0.04)	1789	666.0
<a href="#">Georgetown</a>	<a href="#">802.75</a>	791.0	+11.75	+0.10	133	834.0
<a href="#">Granger</a>	<a href="#">513.29</a>	504.0	+9.29	(-0.12)	1034	528.0
<a href="#">Somerville</a>	<a href="#">253.28</a>	238.0	+15.28	(-0.03)	950	258.0
<a href="#">Limestone</a>	<a href="#">363.08</a>	363.0	+0.08	(-0.13)	469	----
<b>Colorado River Basin</b>						
<a href="#">Twin Buttes</a>	<a href="#">1933.81</a>	1940.2	(-6.39)	+0.02	0	1969.1
<a href="#">O.C. Fisher</a>	<a href="#">1873.72</a>	1908.0	(-34.28)	+0.00	0	1938.5
<a href="#">Hords Creek</a>	<a href="#">1894.03</a>	1900.0	(-5.97)	+0.01	0	1920.0
<a href="#">Buchanan</a>	<a href="#">1017.90</a>	1020.5	(-2.60)	+0.40		----
<a href="#">Marshall Ford</a>	<a href="#">682.22</a>	681.0	+1.22	(-1.31)	18012	714.0
<b>Guadalupe River Basin</b>						
<a href="#">Canyon</a>	<a href="#">911.35</a>	909.0	+2.35	(-0.16)	2393	943.0



**15**

05, 2019



## Reservoir Monitoring Update

May 15th, 2019

TRWD continues to monitor reservoir conditions 24 hours a day. Another rain-free day is expected today. Saturday is still the next chance for rain. Follow the [National Weather Service \(NWS\)](#) and the [River Forecast Center \(RFC\)](#) for the latest information regarding the weather and river conditions, respectively.

All TRWD reservoirs are discharging, and either receding or within 3 inches of conservation level. TRWD will continue to evaluate conditions at the reservoirs and downstream to determine the safest way to manage the excess flood water.

Please be advised that forecasts and projections are subject to change, and TRWD reservoir operations are based on observed rainfall conditions. Until further notice, updates will be provided daily by 10 a.m. Please check back tomorrow.

### Reservoir Conditions as of May 15, 2019 at 9:00 AM

Reservoir	Current Level feet-msl	Conservation Level feet-msl	Departure from Conservation feet	24-Hour Change feet	Discharge cfs
<b>Bridgeport</b>	836.10	836.00	0.10	-0.04	221
<b>Eagle Mountain</b>	649.20	649.10	0.10	-0.01	2,200
<b>Cedar Creek</b>	322.35	322.00	0.35	-0.13	5,370
<b>Richland Chambers</b>	315.75	315.00	0.75	-0.17	9,400
<b>*Lake Worth</b>	595.13	594.00	1.13	-0.23	3,020

*ft-msl - feet above mean sea level; cfs - cubic feet per second*

\*Lake Worth is owned and operated by the City of Fort Worth. See City of Fort Worth [news feed](#) for updates on Lake Worth.

Please call the Flood Hotline for further information.

817-720-4296.

If prompted to leave a message, the flood monitor on duty will return your call within 30 minutes.

# Fort Worth Communications and Public Engagement Office – Responsibilities

- Issue a media release advising closing and reopening of the lake to boat traffic. A message template can be found in Appendix 2 - Lake Worth Action Plan Media Release Template.
- Issue notifications to residents.
- Post webpage and social media information for the general public.

# Fort Worth City Marshal's Office -Responsibilities

- Monitor the lake level and flood conditions.
- Close and reopen boat ramps on the lake per direction from the Fort Worth Property Management.
- Assist in the notification and evacuation of residents.
- Make recommendations as to whether the lake is open for boating or swimming.
- Coordinate with the Office of Emergency Management and other departments as necessary.
- Notified the Federal Bureau of Prisons before or near the Emergency Spillway Elevation of 603.5.

# Fort Worth Police Department - Responsibilities

- In coordination with the City Marshal's Office, conduct door-to-door notification of the evacuation order.
- Provide warning to residents of the affected area via vehicle siren and public address systems.
- Secure the evacuated areas.
- Provide a mobile command post vehicle, if necessary.
- Provide security at the shelter location(s).
- Respond to calls for assistance at the shelter location(s).
- Coordinate with the Office of Emergency Management and other departments as necessary.

# Fort Worth Fire Department - Responsibilities

- Provide support and personnel to assist the Fort Worth Police Department in notifying residents.
- Rescue stranded residents as flooding makes residences uninhabitable.
- Rescue stranded motorists as roads become impassible.
- Provide Emergency Medical Services (or MedStar) if needed to the affected areas.
- Coordinate with the Office of Emergency Management and other departments as necessary.

# Important Lake Elevations

- **595.5 feet** - Schedule a meeting with COFW departments and stakeholders to consider implementation of this plan
- **596 feet** – Property Management Departments makes to the decision to close the lake to boat traffic.
- **596.9165 feet** – Lowest elevation for at risk residential structure.

# Websites

- <http://feeds.fortworthtexas.gov/cfwnews>
  - Lake Worth boat ramp closing and reopening
- <https://www.trwd.com/flood-protection/blog/>
  - TRWD Lake Level Blog
- <http://www.swf-wc.usace.army.mil/cgi-bin/rcshtml.pl>
  - Lake Level

# Thank you

Ricky Salazar

Property Management Department

817-392-8053

[Ricardo.Salazar@fortworthtexas.gov](mailto:Ricardo.Salazar@fortworthtexas.gov)



# Security for Fort Worth at the Lake

Increasing safety by working together

# Security Issues

- Home and vehicle burglaries
- Stolen mail
- Panhandlers / Homeless / Squatters
- Speeding / Racing / Auto hazard to pedestrians
- Mudders / Drifters
- Poachers
- Suspected drug and prostitution activities
- Trail safety for hike / bike trail
- Vandalism and dumping issues
- Theft of boats and tackle,
- Drowning and injury from lake use,
- And the increase of all types of crime due to the numerous guests who visit the lake.

# Lake Worth ENFORCE Committee

## “Engaged Neighborhoods for Crime Elimination”

- 4 Shoreline Neighborhood Associations
- Lake Worth Marshal's Office
- Fort Worth Police Department
- Fort Worth Code Enforcement

# Areas Addressed



Policing



Resident  
Involvement



Infrastructure  
Improvement

# WORKING DOCUMENT:

## *Lake Worth Area Security Plan*

- **List immediate improvements**
- **Keep focused on goals**
- **Influence future discussions**

# What we want from Councilman Shingleton in 2019:

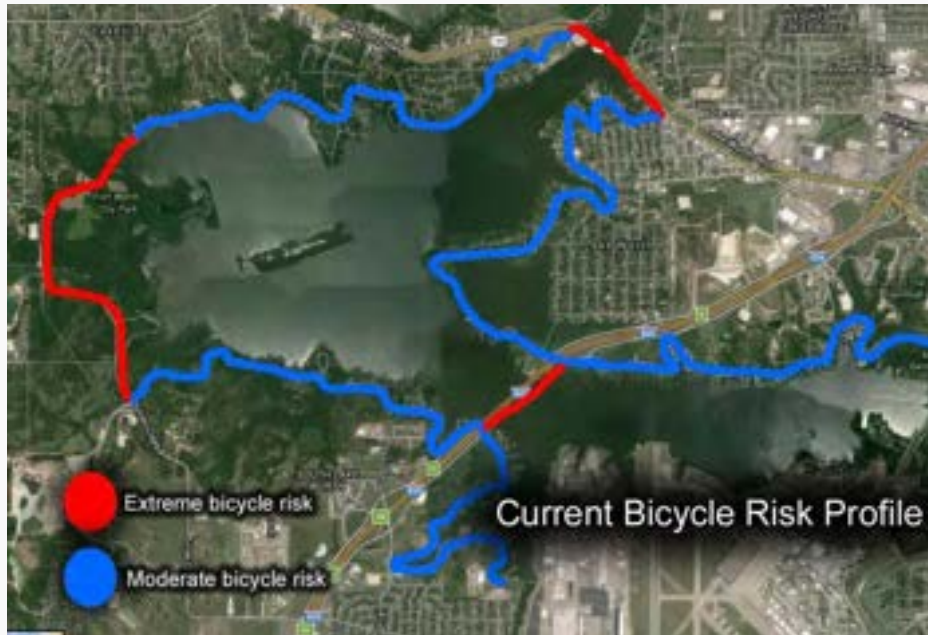
## Enthusiastic leadership to:

- Move bike trail construction forward
  - Break “log jam” on moving construction forward
  - Set priorities to address dangerous locations FIRST
- Initiate park master planning on “big five” parks
- Install badly needed cabling and barriers

# Bike Trail “LOG JAM”

- Bike trail construction has experienced repeated delays
- No indication of overall planning for lake trail

# Bike Trail Priorities - EXTREME RISK AREAS





# Park Planning - ‘BIG FIVE’



# Park Planning - ‘BIG FIVE’

## Example: Malaga Park



# Cabling / Barriers - KEEP THE TRUCKS OUT

Barriers are desperately needed in specific places to reduce:

- Illegal dumping
- Illegal parking
- Illegal off roading

# What we want from Councilman Shingleton in 2019:

We need enthusiastic leadership to:

- Move bike trail construction forward
  - Break “log jam” on moving construction forward
  - Set priorities to address dangerous bicycling locations FIRST
- Initiate park master planning on “big five” parks
- Install badly needed cabling and barriers

# Presentation by:

**Michael Dallas**

President - Scenic Shores Neighborhood Association

Phone: 817 733 9056

# Lake Worth Trail

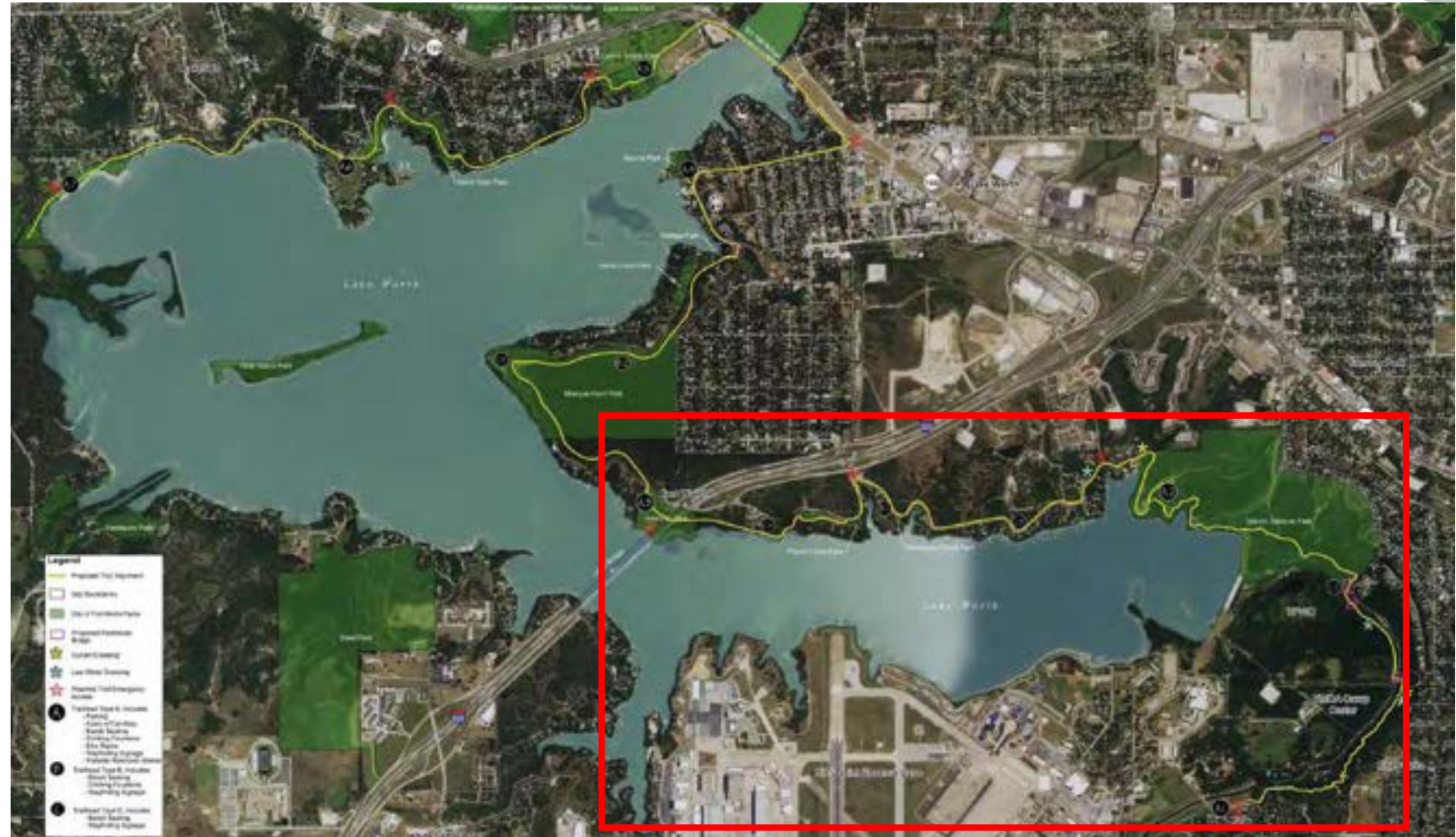
## Project Update

Lake Worth Regional Coordination Committee Meeting  
May 16, 2019

Presented by: Carlos Gonzalez

City of Fort Worth  
Park & Recreation Department

- Funding: Lake Worth Gas Lease Capital Project Funds
- Preliminary Alignment Study – completed in 2015
- Phase 1 – currently underway



- Phase 1

- Has been divided into two sections due to the challenges in this area

- Phase 1A

- Arrow S. Park to Marion Sansom Park

- Phase 1B

- Marion Sansom Park, River Oaks and YMCA Camp Carter Welcome Center





## Phase 1A Status

- Preparing the an application for use of TxDOT ROW
- Consultant is finalizing plans for bid advertisement
- Trail is about 16,000 Linear Feet or 3 Miles



## Phase 1B Status

- Executed an Interlocal agreement with River Oaks for access
- PARD construction staff is working at Marion Sansom Park
- Trail estimated to be 21,000 Linear Feet or 4 Miles (Including Marion Sansom Park Trail)



# Schedule

## Phase 1A

- |                           |                |
|---------------------------|----------------|
| • Design Completion       | July 2019*     |
| • Advertisement           | August 2019    |
| • Bid Opening             | September 2019 |
| • Construction Start      | November 2019  |
| • Construction Completion | October 2020   |

## Phase 1B

- |                           |                |
|---------------------------|----------------|
| • Design start            | June 2019      |
| • Design completion       | April 2020     |
| • Advertisement           | May 2020       |
| • Bid Opening             | June 2020      |
| • Construction Start      | September 2020 |
| • Construction Completion | August 2021    |

\*Contingent on TxDOT permit application review schedule

# Lake Worth Trail

## Contact:

Carlos Gonzalez, Park Planner

[Carlos.Gonzalez@fortwrothtexas.gov](mailto:Carlos.Gonzalez@fortwrothtexas.gov)

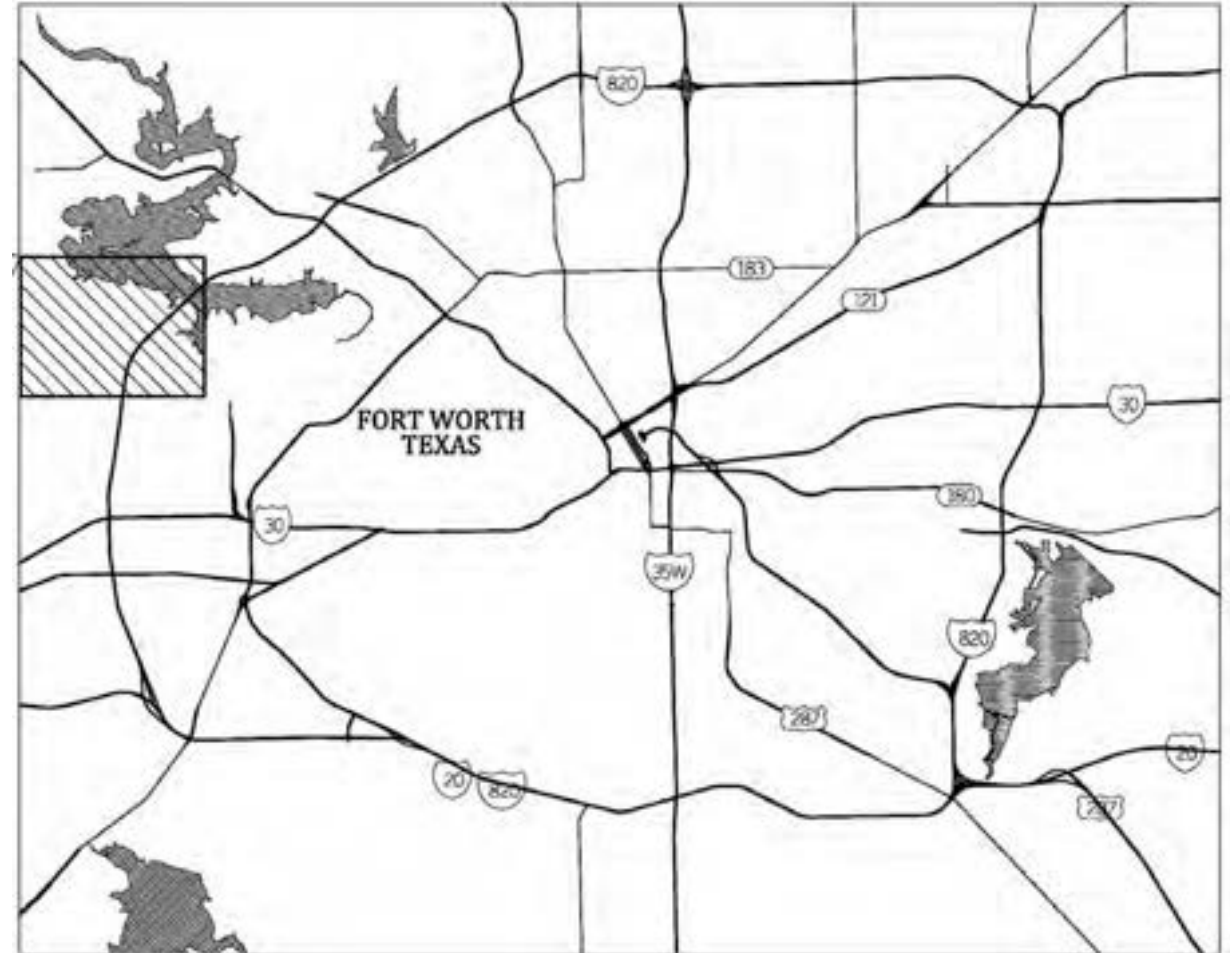
817-392-5742

# Thank you



# Silver Creek Road

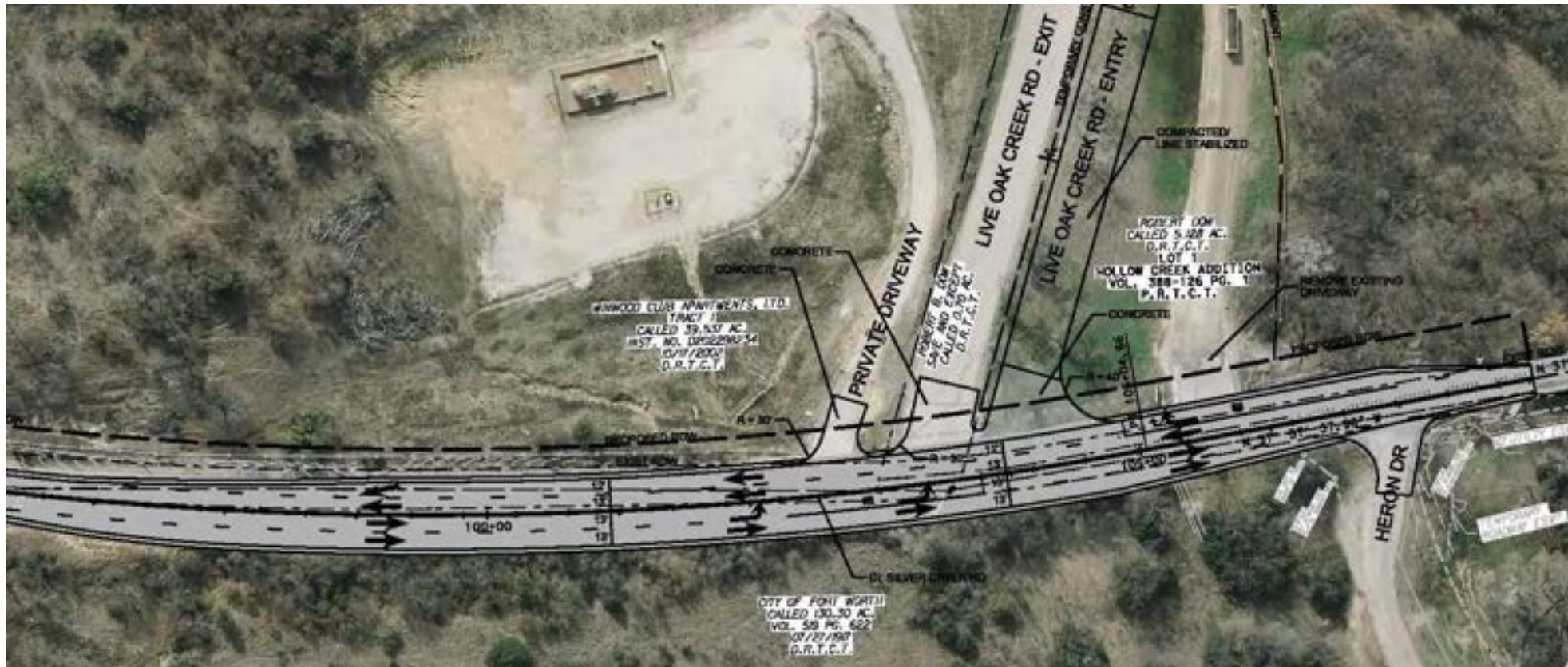
Mitch Aiton, P.E.  
City of Fort Worth - TPW



# Project Improvements

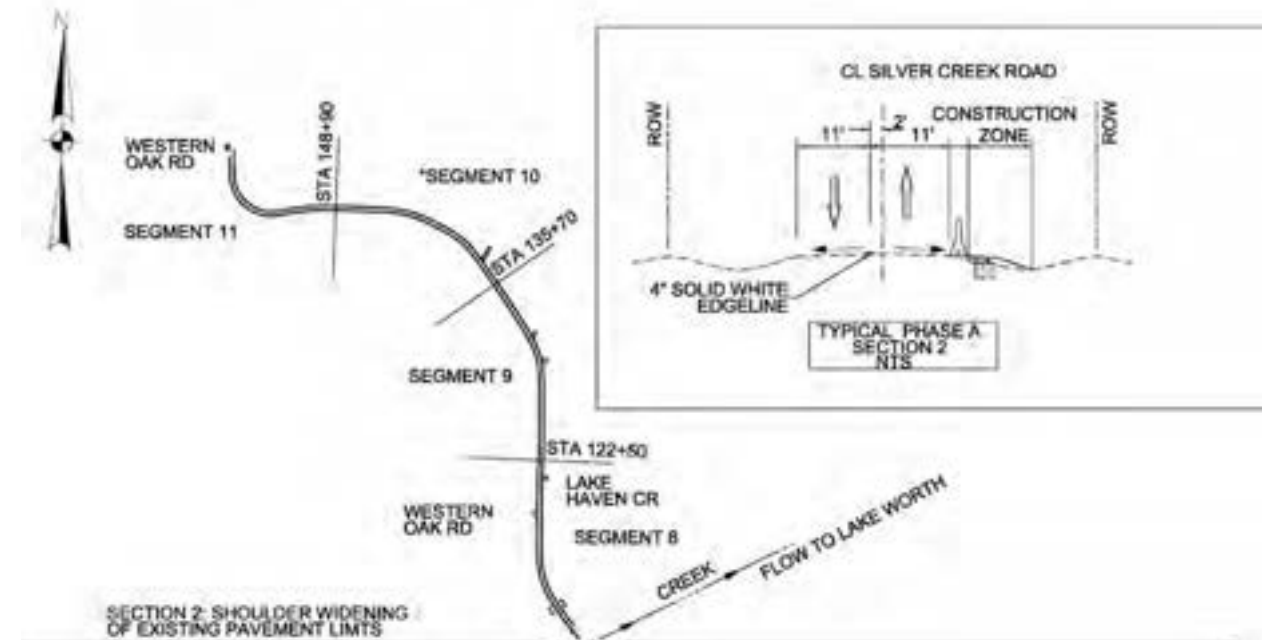
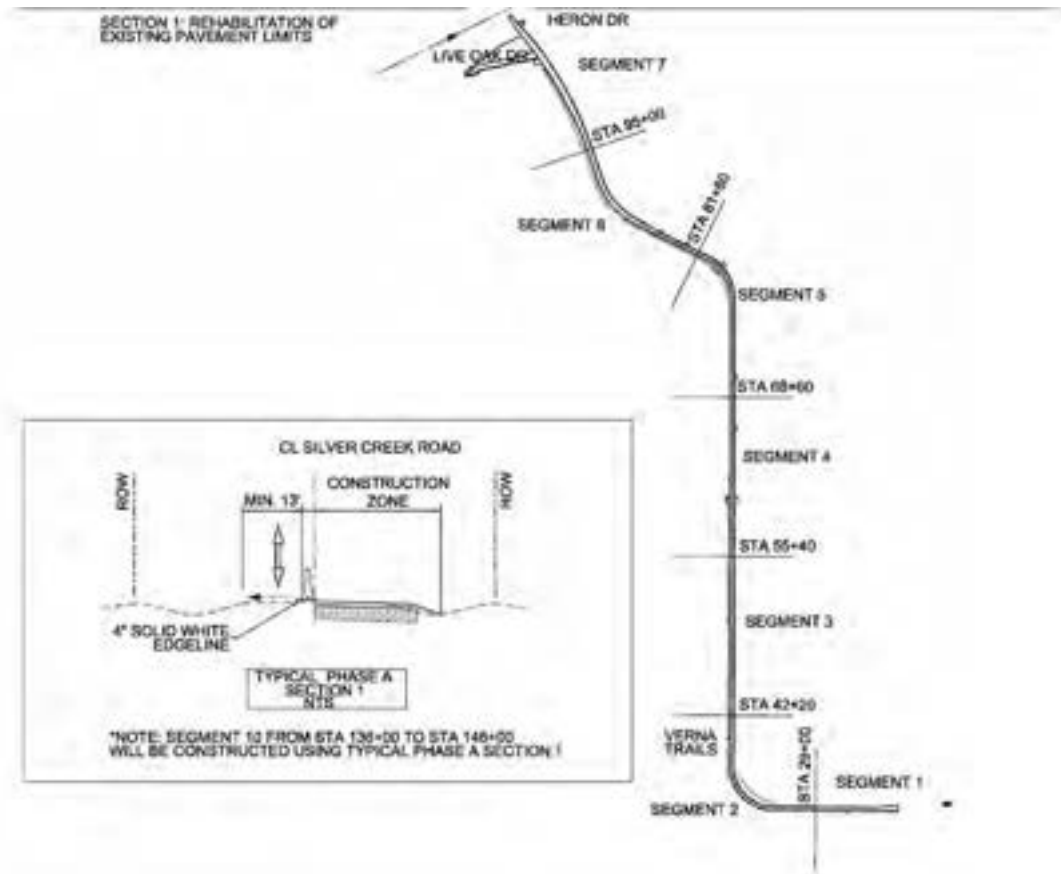
- Rebuild Subgrade, New Asphalt Driving Surface
- Improved Drainage – Cross Culverts and Ditches
  - Will Improve Future Road Performance
- Add 4' Shoulder to Existing 13' Lane
- Flatter turns where available
- Turn Lanes at Silver Creek Materials

# Silver Creek Materials





# Construction Phasing



# Remaining Project Schedule

- Plans are in Final Review
- Right of Way Acquisition is in Final Stages
- Franchise Utility Relocation
  - 2 Oncor Poles to Relocate Advertise For Construction
- Begin Construction

# Restriping Near 820



# Thank You





# Naval Air Station Fort Worth Joint Reserve Base

## Lake Worth RCC May 2019

Captain Jonathan Townsend, Commanding Officer



# Base Improvements

- \$15 million airfield lighting project
- NCIS HQ Bldg
- New AF Family Services Bldg (Old BurgerKing)
- New EOD Facility behind Base Security
- New Dog Kennel (Finished in '18)
- Upcoming—New Pharmacy
- New Simulator Facility for MAG 41 underway





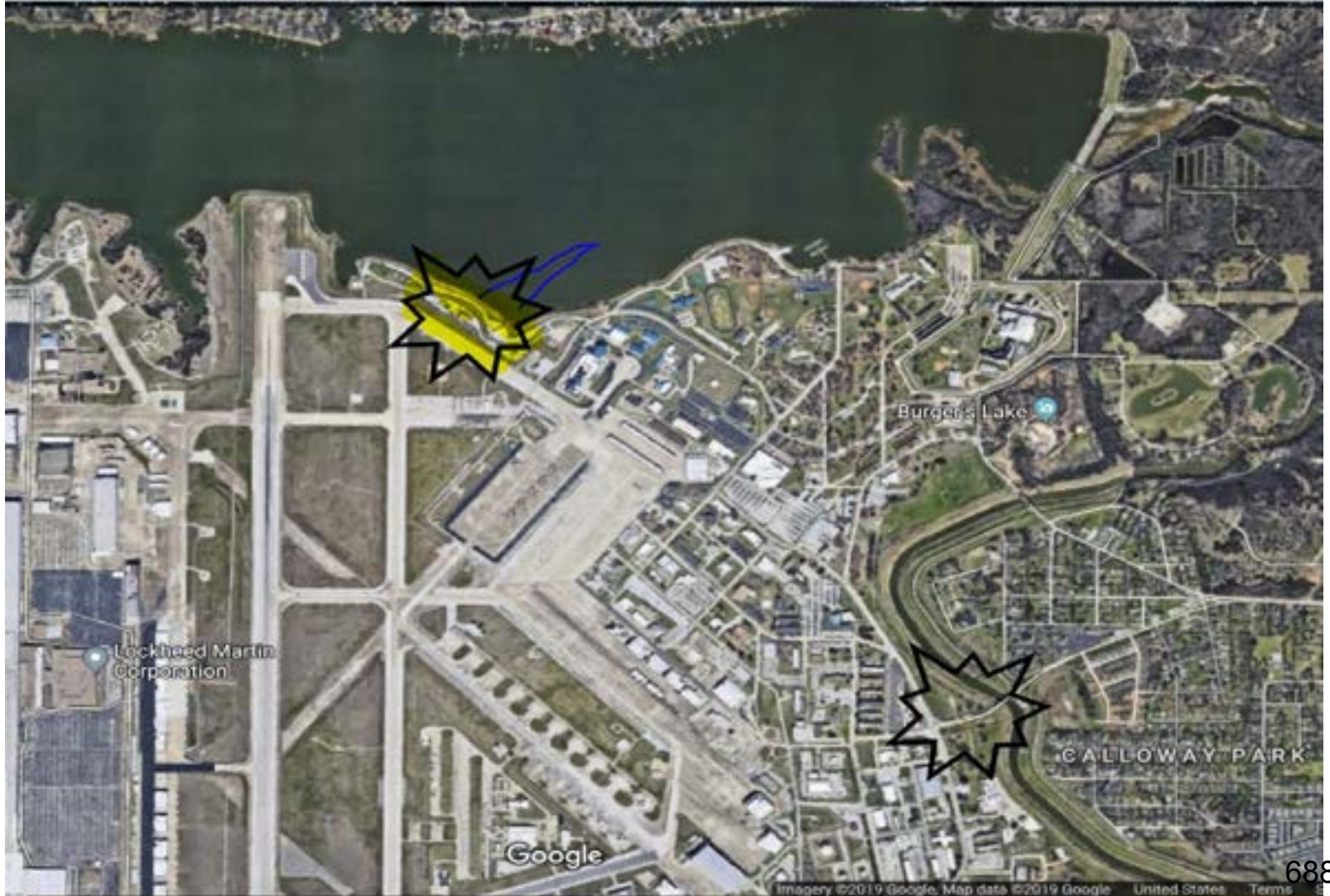
# NAS JRB Benefitting Partnerships

- F-35 Environmental Impact Study (EIS) public hearing tentative August 2019
- Meandering Road Re-design, east gate access 2019
- 183/Pomphrey intersection re-design, main gate access point
- Trinity Trail Connection with Westworth Village





# UAS Sighting







# Key Points

- **NAS FW Base is a No Drone Zone**
  - *Can hobbyist fly in surrounding neighboring communities?* YES ~ but federal/state/local rules apply.
  - *Hobbyist:* Flights within 5 miles of airports must notify nearby air operations center.
- Flights: not over 400 ft. and should notify prior to flight on Know B4U Fly app.
  - Follow altitudes per FAA requirements
  - <http://knowbeforeyoufly.org/>





# UAS Legislation

- SB2299 to include Military installations as Texas critical infrastructure.
- SB 2299 UAS: language: “close enough to interfere with the operations of or cause a disturbance to the facility.”
- **SB 2299 passed Texas Senate.** Pending in the House.



# Thank you Lake Worth!

