



# Drainage Master Plan Workshop

**March 9, 2019**





# Storm Drainage & Flood Risk Mitigation Utility (SD&FRMU)

- Prior to the creation of the SD&FRMU, the Parks Department Right-of-Way (ROW) crew mowed approximately 170 acres of ROW once per month using 2 employees
- After the creation of the SD&FRMU, the new ROW crew currently mows approximately 220 acres every 2 weeks during the growing season or as needed
- Adding existing HOA drainage infrastructure would add approximately 200 acres of detention ponds and approximately 105 acres of drainage easements totaling 305 additional acres
- If additional HOA acreage is approved, the ROW Crew would be responsible for mowing a total of **525 acres**



# SD&FRMU Program Background

**November 15, 2017** – City Council Approves SD&FRMU Ordinance establishing program and fees

**January 1, 2017** – stormwater fee assessment begins

- Residential – \$5/month
- Commercial – fee calculation based on sq. ft. of impervious cover
  - Monthly Base Rate x Impervious Cover (sq. ft.) x Adjustment Factor

**February 2017** – staffing and equipment acquisition begins



# SD&FRMU Program Background

## Current Staffing

### Drainage Crew

- 1 Crew Lead and 4 Technician I positions
- Responsible for
  - channel clearing, regrading, slope reconstruction
  - revegetating and erosion control of repairs
  - infrastructure maintenance - inlet boxes, storm sewer manholes, culverts

### Right of Way (ROW) Crew

- 1 Crew Lead and 4 Technician I positions
- Responsible for
  - mowing/tree trimming of all City ROW, including drainage easements
  - removal of illegal dumping within ROW



# SD&FRMU Program Background

**March 2017 to present** – Equipment acquisition for newly formed utility

## Drainage Equipment

- 2 - one ton work trucks
- 2 - flatbed equipment trailers
- 1 - Gehl VT320 Skid Loader with multiple hydraulically operated attachments including tree shear, trencher, grapple bucket, dozer blade, brush mower, auger drive
- 1 - Gehl RT250 Skid Loaders with multiple hydraulically operated attachments including tree shear, trencher, grapple bucket, dozer blade, brush mower, auger drive
- 4WD Backhoe – John Deere 310SL
- Excavator – John Deere 210 GLC
- Dump truck – 15yd
- Vermeer Wood chipper
- Lowboy Haul Trailer





# SD&FRMU Program Background

**March 2017 to present** – Equipment acquisition for newly formed utility

## ROW Equipment

- 1 - one ton work truck
- Flatbed equipment trailer
- (4) Zero turn radius mowers ExMark Lazer Z-X
- trimmers, chainsaws, other hand tools
- John Deere Tractor 6110M w/boom mower
- Street Sweeper – Tymco Model 600





# SD&FRMU Program Background

Most activities have been restorative measures at this point – channel clearing, regrading, slopes, etc.

Drainage Master Plan (Halff & Associates) completed in November 2018

- Prioritizes scope and order of larger projects





 **Masonwood** Dr



TOTAL PROJECT = 2.66 ACRES



**Upstream inlet at Masonwood Dr. – prior to drainage restoration<sup>10</sup>**



**Upstream inlet at Masonwood Dr. – channel restoration**



**Upstream inlet at Masonwood Dr. – final revegetation**



# Dashelle

Run



TOTAL PROJECT = 1.04 ACRES



**Dashelle**

**Run**



**Dashelle Run – before maintenance**



**Dashelle**

**Run**





**Dashelle**

**Run**



**Dashelle Run – initial mowing**





**Dashelle Run – upstream SE inlet after maintenance**



# Brent

## Blvd

BRENT BOULEVARD



TOTAL PROJECT = 0.71 ACRES



 **Brent** Blvd



**Facing downstream from Brent Blvd. – preliminary clearing** 19

 **Brent** Blvd




**Facing upstream towards Brent Blvd. – channel regrading**

 **Brent** Blvd



**Facing upstream towards Brent Blvd. – outfall clearing**



 **Brent** Blvd



**Outfall clearing**

# Steeplechase Blvd



TOTAL PROJECT = 2.56 ACRES



**Facing upstream towards Philomena Rd. – initial clearing**



 Steepchase Blvd



Facing upstream towards Bunton Creek Rd. – channel regrading<sup>25</sup>

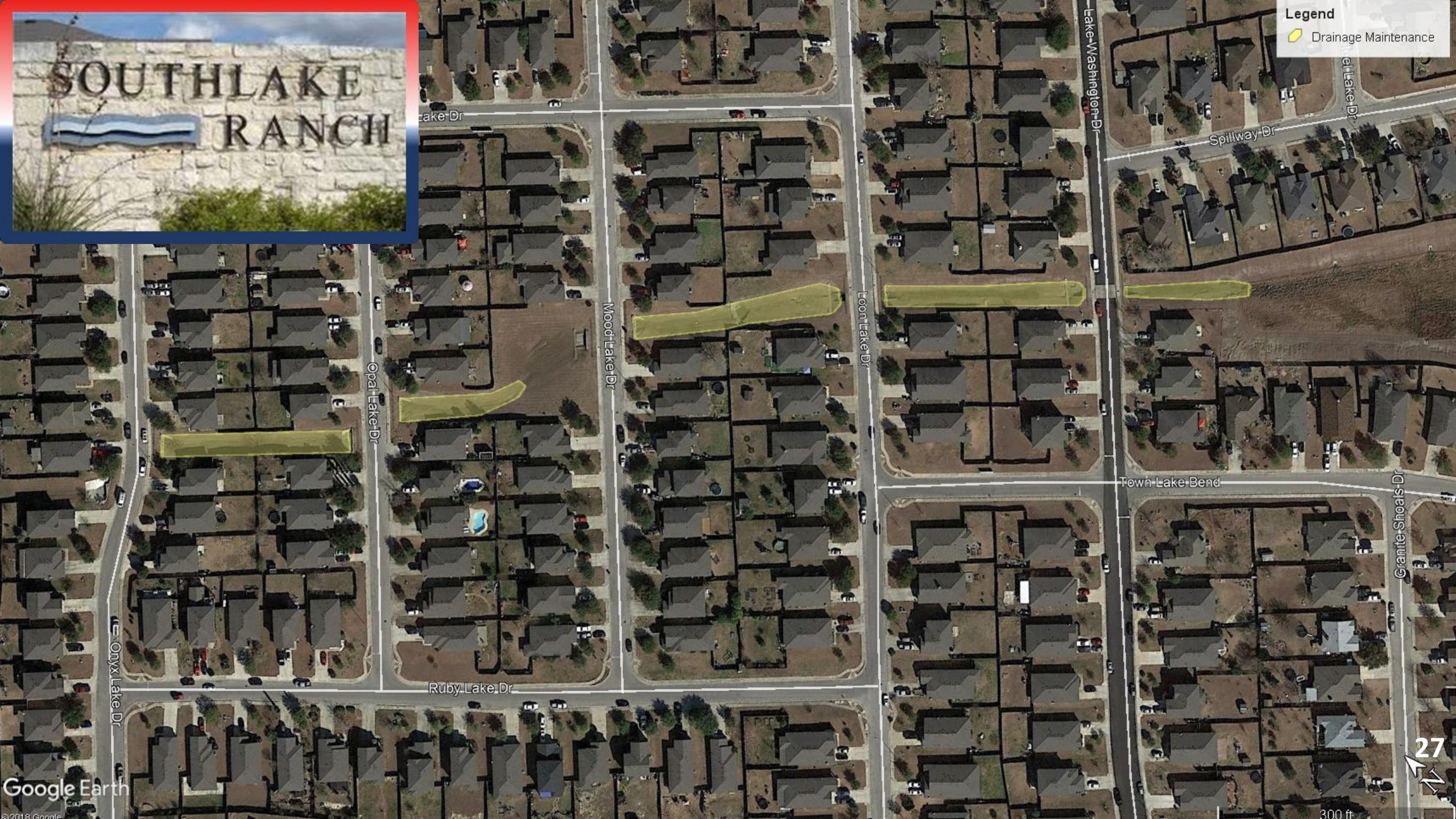
 Steeplechase Blvd

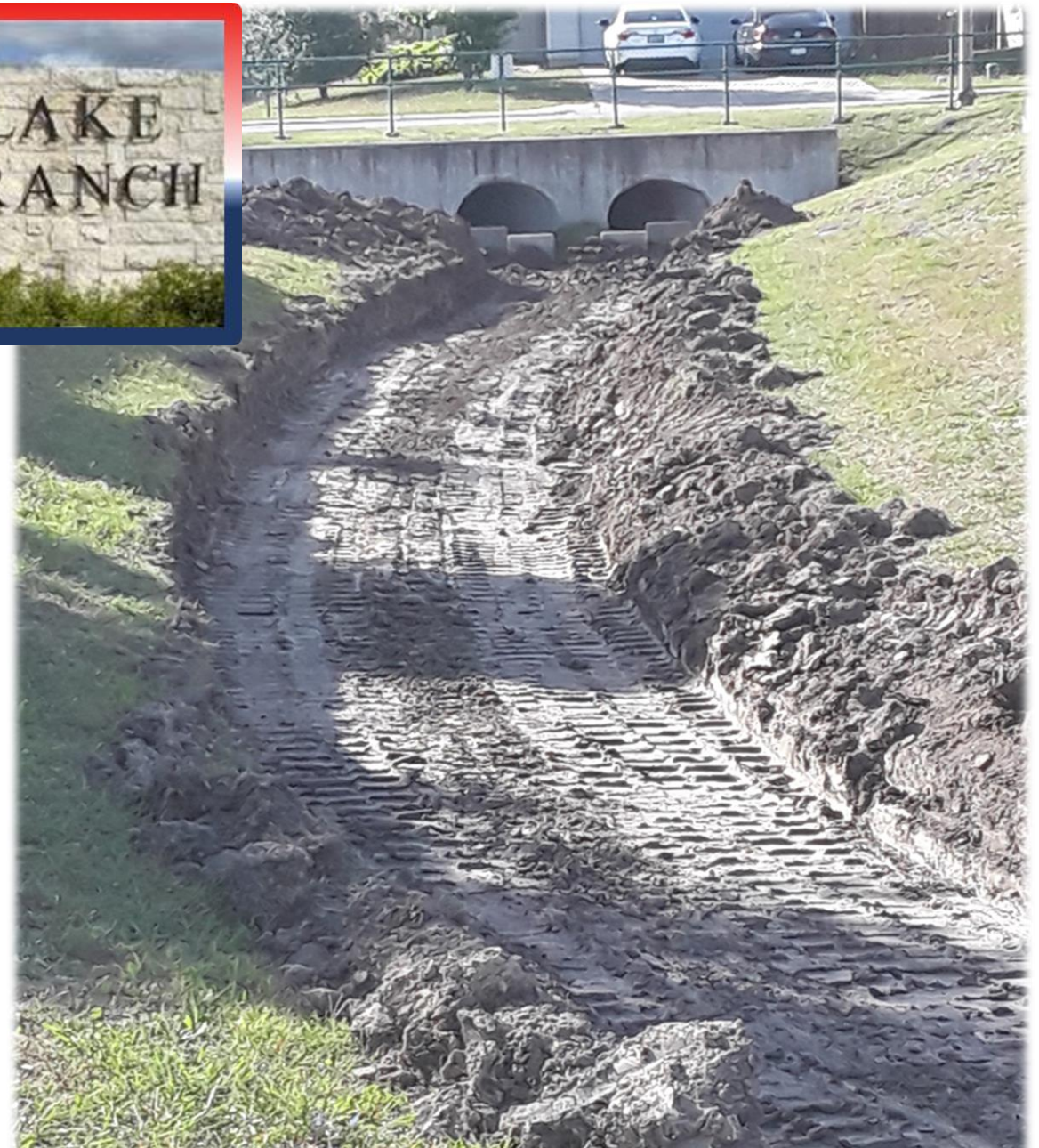


**Final Revegetation**



Legend  
Drainage Maintenance





**Restoring channel depth and grade**



**Installing revegetative matting**




**Finished channel restoration**



# N Front

St

**Legend**

-  Drainage Maintenance



## Front Street channel regrading from Lockhart St to North St



# SD&FRMU Program Background

## **Roadside drainage channels that were re-graded/re-worked include but not limited to:**

- E. Post Road from Quail Ridge to IH35
- Dacy Lane outfall at Dacy Ln bridge
- Dacy Lane Between Windy Hill Rd and Kelly Smith
- Sewell St From S. Main to the Corner  $\pm$  450' East of S. Main
- Various spot locations in Old Town Kyle

## **During rain days and “too wet to work” days the Drainage Crew inspected all mapped infrastructure:**

- $\pm$  2600 Stormwater Inlets
- $\pm$  370 Stormwater Outfalls
- $\pm$  1030 Stormwater Manholes

Inspection includes cleaning of immediate hazards, and cataloging/prioritizing/scheduling repairs

Drainage crew will cross train with the Wastewater crew to learn how to operate the TV Camera to start an inspection program for the underground infrastructure





# Mowing vs Maintenance

For this presentation:

**Mowing** means the act of leveling or cutting down grass, grain, etc., with a mowing machine.

**Maintenance** means inspecting and clearing streams, ditches, and other channels; inspecting and cleaning retention and detention basins; cleaning storm sewers; stabilizing stream banks; reconstructing channels; trash removal including human-made objects, such as garbage, shopping carts, tires, lumber, furniture, appliances, animal carcasses, vegetation growth, tree limbs, and other “naturally” occurring debris; sedimentation removal in retention/detention basins; obstructions including fallen trees, culvert damage, large appliances that, by itself, obstructs the flow of the ditch, inlet or outlet structures; structural projects such as bridge and/or culvert replacement; bank stabilization; dredging; or other major projects.

(Note: Water quality ponds and Best Management Practices (BMPs) are required in the newer subdivisions on the west side of IH-35 over the Edwards Aquifer Recharge and Contributing Zones. These water quality ponds & BMPs require additional maintenance and the cleaning of these ponds generate special waste, which adds additional disposal costs and record keeping requirements.)



# Drainage Capital Improvements Program (CIP) Projects

The Drainage Master Plan identified 29 Drainage (CIP) Projects

The City's Drainage Crew can potentially complete nine (9) of the projects:

<b><i>Potential</i> In-House Projects for City Crews</b>			
<b>Project ID</b>	<b>Location</b>	<b>DMP Estimate**</b>	<b>Notes</b>
ABT – 01	Dacy Lane LWC Between Kelly Smith and Windy Hill	\$326,428.00	City can perform work depending on the extent of the raising on the roadway
CFP – 01	Quail Ridge	\$675,000.00	Would require City to re-build ± 175 driveways (Time/Duration - This project might be better fit as a contract)
PCT1 – 01	Sweet Gum Erosion 1	\$60,353.00	Channel Armoring
PCT1 – 02	Sweet Gum Erosion 2	\$80,000.00	Channel Armoring (extensive armoring)
PCT4 – 03	Meyers St. Drainage	\$75,630.00	Roadside Ditch Improvements
PCT4 – 04	S. Burleson Drainage	\$77,955.00	Roadside Ditch Improvements
PCT4 – 05	Scott St	\$566,130.00	Roadside Ditch Improvements and LWC upgrades ( LWC has been partially upgraded)(Scope will need to be changed due to Stagecoach Forest Improvements)
PST – 01	Live Oak St. Drainage	\$96,700.00	Roadside Ditch Improvements
PST – 03	Jose Addition Channel Improvements	\$78,663.00	Contingent on PST – 02 Under Rail Road, Roadside Ditch Improvements along Deleon (potentially join PST-02 and PST-03 for one project)
		<b>\$2,036,859.00</b>	

\*\*Costs to complete these projects are based on engineer's estimates provided in DMP; in-house costs are expected to be less than amounts shown; however, actual cost savings are indeterminate at this time.



# Drainage Capital Improvements Program (CIP) Projects (cont.)

The City’s Drainage Crew can complete portions of the following projects:

<b><u>Potential Shared Projects</u></b>			
Project ID	Location	Estimate	Notes
RIC – 02	Kelly Smith at IH35	\$595,600.00	Culvert Improvements and Roadway Raising (RIC-01 implemented before, or soon thereafter) (City to assist depending on the extent of the roadway elevation changes)
BCT1 – 01	Beebe Rd. Crossing Improvements	\$326,322.00	Culvert Improvements and Roadway Raising (City to assist depending on the extent of the roadway elevation changes)
BR – 01	Roland Lane at IH35	\$841,754.00	Culvert improvements and Roadway elevation changes (City to assist depending on the extent of the roadway elevation changes)
BR – 02	Roland Lane at Texas Old Town	\$682,240.00	Culvert improvements and Roadway elevation changes (City to assist depending on the extent of the roadway elevation changes)
Bun – 04	Goforth Rd. LWC North of curve at PEC substation	\$287,870.00	Culvert Improvements
		<b>\$2,733,786.00</b>	



# Drainage Capital Improvements Program (CIP) Projects (cont.)

The following projects can be either wholly or partially outsourced:

<b>Contracted and Others</b>			
<b>Project ID</b>	<b>Location</b>	<b>Estimate</b>	<b>Notes</b>
AND – 01	Dove Lane Homes	\$1,241,300.00	Currently Hays County – Buy Out
BUN – 01	Bunton Ln. at Twin Estates (1st Crossing)	\$617,908.00	Crossing Improvements with 60' Span bridge and Roadway elevation changes (cost based on 25y improvements)
BUN – 02	Bunton Ln. at Twin Estates (2nd Crossing)	\$902,110.00	Crossing Improvements with 60' Span bridge and Roadway elevation changes (cost based on 25y improvements)
BUN – 03	Bunton Ln. at Twin Estates (3rd Crossing)	\$824,716.00	Crossing Improvements with 60' Span bridge and Roadway elevation changes (cost based on 25y improvements)
CTR – 01	Center St. From Old Stagecoach to Saucedo St.	\$1,009,152.00	Multiple Crossing Improvements and Roadside ditch improvements
FPM – 01	Floodplain Modeling	\$90,000.00	Upgrade FPM
FPM – 02	LOMR	\$150,000.00	LOMR Update Modeling
PCT4 – 06	Sledge St South of Third St.	\$566,128.00	Crossing Improvements with 60' Span bridge and Roadway elevation changes (cost based on 25y improvements)
PLU – 01	2770 Near Barton MS	\$973,881.00	3 Culvert upgrades within TXDOT ROW
PLU – 02	Steeplechase Park US Det	\$4,310,300.00	Channel Improvements
PLU – 04	Isabel Ln Area	\$1,381,440.00	Channel Improvements - Channel Benching
POR – 01	Cotton Gin Rd. Area	\$780,000.00	Buyout of Three Structures
PST – 02	RR Near Deleon east of Moreno St.	\$527,000.00	Culvert improvements under Rail Road (Cost based on 25y improvements)
RIC – 01	Windy Hill att Indian Paintbrush	\$595,600.00	Culvert Improvements (for 25y) (bridge and roadway raising for 100y) (cost based on 25y improvements)
PCT4 – 01	Hitching Post	\$257,523.00	Roadside Ditch Improvements, Underground storm to Park Pl.. Will Need to be implemented with PCT4-05
		<b>\$14,227,058.00</b>	



## SD&FRMU Fee Breakdown

Based on FY2019 (10/01/2018 - 02/28/2019) there are:

- **11,372** Residential customers have contributed \$288,910.00 (46%)
- **561** Commercial customers have contributed \$340,054.89 (54%)



# Examples of HOA Drainage Projects

Prairie on the Creek - Carriage Way = \$26,815.69

## Project Description:

- Regrading of channel off Wagon Cross, extending approximately 100 feet north of culvert and 200 feet south of culvert, restoring slope conditions on west side and flow line for positive drainage (no significant erosion detected on eastern channel slopes)
- Placement of Futerra 7020 Turf Reinforcement Matting along restored slopes (see spec sheet for details)
- Infilling of TRM with topsoil
- Stabilization of disturbed area with ProMatrix FGM using native seed and fertilizer



# Examples of HOA Drainage Projects (cont.)

Silverado Pond = \$700,000-\$2,600,000

- Current design is for less than 50-year storm event (not taking Atlas 14 into account)
- Freese & Nichols Memorandum dated July 6, 2015 for the N. Burleson Street Improvements

Alternative	Construction Cost	Mitigates Flooding in Eastside Neighborhood?	Flow to Outfall No. 2	Flow to Outfall No. 3	Public Impacts
1	\$1.0 million	Yes	Decrease	Decrease	Improved flood conditions in neighborhood and at both outfalls
2	\$2.6 million	Yes	Largest Decrease	Decrease	Improved flood conditions in neighborhood and at both outfalls
3	\$2.5 million	Yes	Decrease	Decrease	Improved flood conditions in neighborhood and at both outfalls, but pond does not safely store 100-year storm flow
4	\$0.7 million	Yes	Slight Decrease	Decrease	Improved flood conditions in neighborhood
5	\$1.5 million	Yes	Slight Decrease	Slight Decrease	Improved flood conditions in neighborhood



# Options

## **Option 1**

- No changes to existing operations
- ROW Crew continues mowing existing 220 acres and Drainage Crew continues current maintenance operations
- HOAs continue to mow all existing drainage infrastructure
- Allows approximately \$300,000 annually for CIPs or equipment
- No increase in monthly fee





## Options (cont.)

### **Option 2**

- One Drainage Crew maintains all current drainage infrastructure, HOA detention ponds and drainage easements
- Outsource all mowing to 3rd party (525 acres)
- Public Works absorbs existing ROW Crew with no layoffs
- Will increase the number of CIPs by the number of HOA detention ponds (currently 25 ponds but will increase with new development)
- Drastically increases the length of time to complete all drainage CIPs as funding allows
- All HOA detention ponds and drainage easements will require a condition assessment conducted by a 3rd party
- HOAs will be required to fix any deficiencies noted in the condition assessment prior to City acceptance and detention ponds/drainage easements would need to be dedicated as a public easement
- No increase in monthly fee



## Options (cont.)

### Option 3

- Outsource all mowing to 3<sup>rd</sup> party (525 acres)
- Convert existing ROW Crew to a second Drainage Crew
- Purchase of additional equipment for second Drainage Crew
- Will increase the number of CIPs by the number of HOA detention ponds (currently 25 ponds but will increase with new development)
- All HOA detention ponds and drainage easements will require a condition assessment conducted by a 3<sup>rd</sup> party
- HOAs will be required to fix any deficiencies noted in the condition assessment prior to City acceptance and detention ponds/drainage easements would need to be dedicated as a public easement
- Allows approximately \$1,000,000-\$1,300,000 annually for CIPs starting in year 3 after acquisition of equipment
- Requires monthly fee increase of \$3.50 (Residential)



## Options (cont.)

### Option 4

- Maintain current ROW Crew mowing all 525 acres
- Add a second Drainage Crew
- Purchase of additional equipment for second Drainage Crew
- Will increase the number of CIPs by the number of HOA detention ponds (currently 25 ponds)
- All HOA detention ponds and drainage easements will require a condition assessment conducted by a 3rd party
- HOAs will be required to fix any deficiencies noted in the condition assessment prior to City acceptance and detention ponds/drainage easements would need to be dedicated as a public easement
- Allows approximately \$1,000,000-\$1,300,000 annually for CIPs starting in year 2 after acquisition of equipment
- Requires monthly fee increase of \$4.95 (Residential)



## Options (cont.)

### **Option 5**

- Issue bond debt for 29 CIP projects
- Will expedite CIP project completion
- Keep current ROW Crew and Drainage Crew
- Does not include HOA detention ponds or drainage easements
- Requires monthly fee increase of approximately \$5.01 (Residential) to pay annual debt service



# Drainage CIP List

- Dacy Lane
- Dove Lane Homes
- Bebee Road
- Roland (East)
- Roland (West)
- Bunton Lane Low Water Crossing (1st)
- Bunton Lane Low Water Crossing (2nd)
- Bunton Lane Low Water Crossing (3rd)
- Goforth Road Low Water Crossing
- Quail Ridge
- Center Street Flooding
- Upstream Floodplains FEMA Mapping
- FEMA LOMR
- Sweet Gum 1 (Hometown Kyle)
- Sweet Gum 2 (Hometown Kyle)
- Hitching Post
- Meyers Street
- Burleson Road/South Street
- Scott Street
- Sledge Street
- FM 2770 @ Barton Middle School
- Steeplechase Park US Detention
- Isabel Lane
- Cotton Gin Road
- Live Oak/St Anthony's
- DeLeon Street/St Anthony's
- Jose Addition
- Kelly Smith
- Windy Hill Low Water Crossing



Questions?