



# Water Quality Program Rate Study

City of Chattanooga  
Public Works Committee Meeting



# Purpose & Topics

Purpose - Present Recommended Rate Structure

Topics:

- Existing Programs
  - MS4 Permit Program Components
  - Drainage & Capital Programs
- Fiscal Sustainability
  - Recommended Rate Study
  - TN Program Comparison
  - Q & A

# Water Quality Program Rate Study

- Last Rate Study 2008
- Business Plan based Level and Cost of Service Rate Study
  - LOS/COS
- April 2016 to Present
- Audit of Current LOS
- Planning of Required Level of Service
  - FY-19 thru FY-23
- Projection of Future Costs & Rates



# Major Program Elements

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping
- Drainage System Maintenance



# Existing Programs / Required Responsibilities

# **Pollution Prevention Activities**

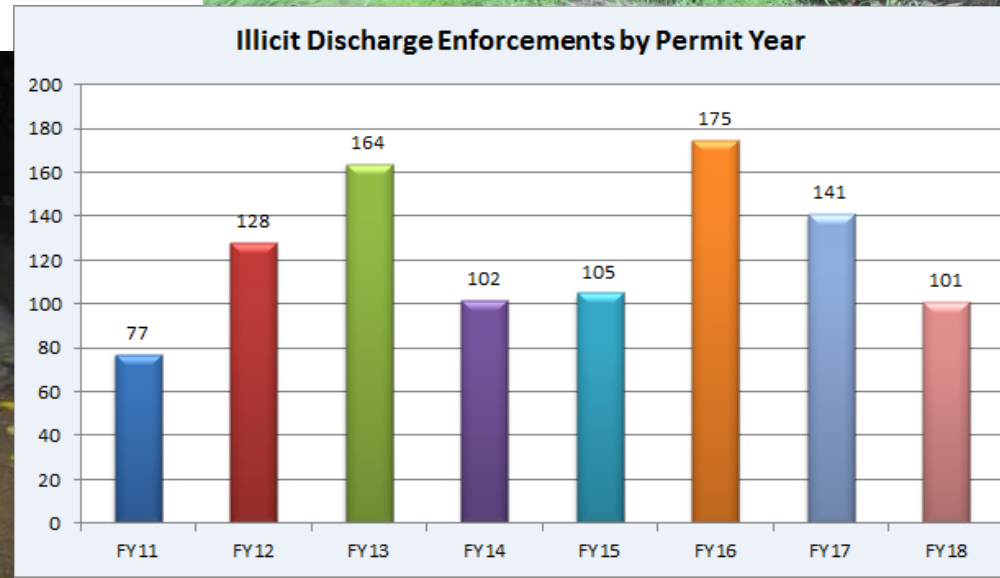
# Illicit Discharge Detection and Elimination (IDDE)

IDDE is a complex and broad reaching program element.

Purpose: Eliminate “non-stormwater” discharges to the MS4 or “Waters of the State”.

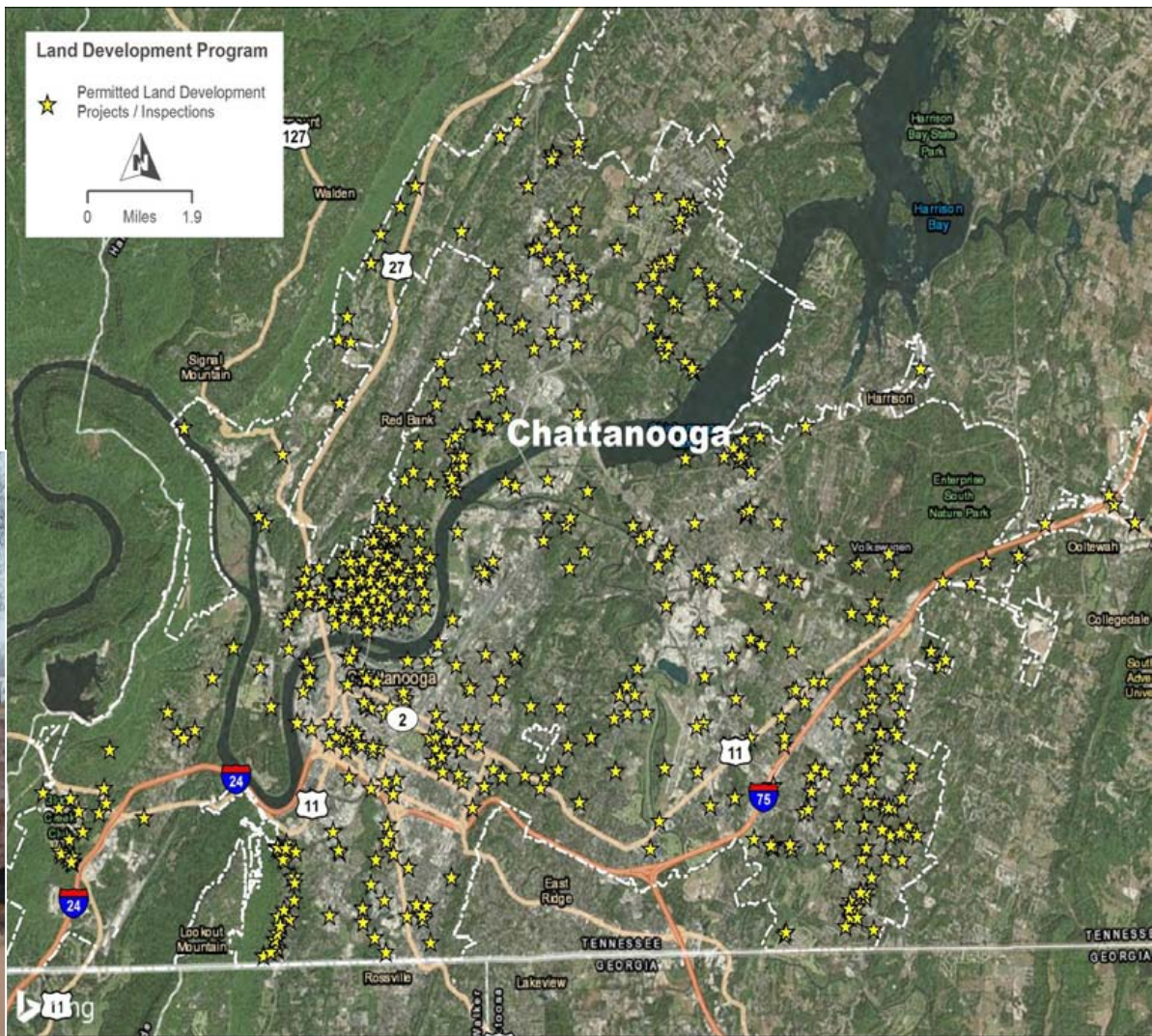
Key components of the City’s IDDE program include education, investigations, inspections, and enforcement.

- Approximately 125 anomalies corrected yearly
- Multiple inspections required per anomaly

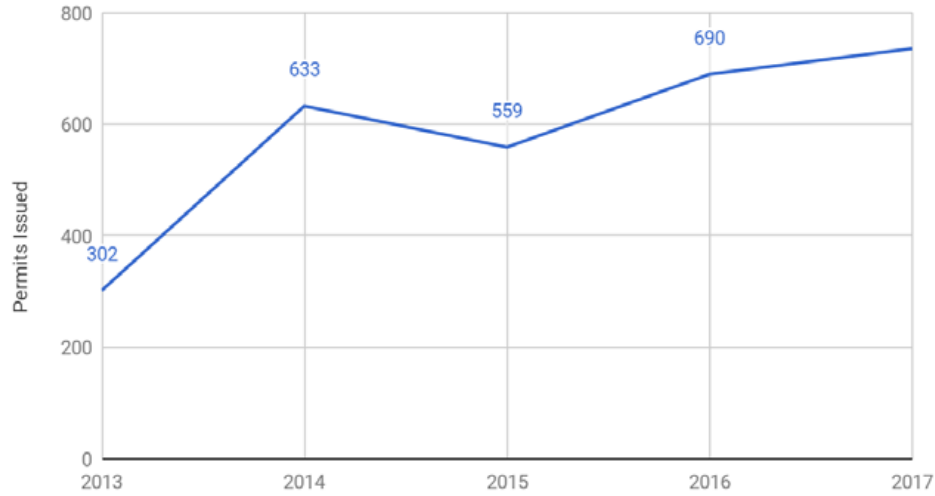


# Construction Site Runoff Control - TMDL

- Performed by ECD/LDO
- Via plans review & inspections
- E&SC significantly protects the environment
- 665 permitted sites in 2017

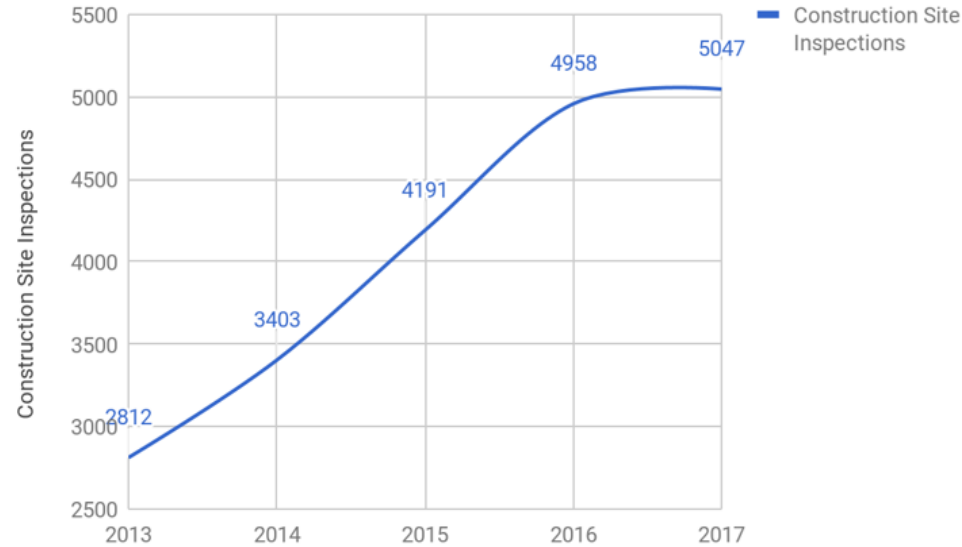


## Permits Issued



## LDO Construction Site Oversight

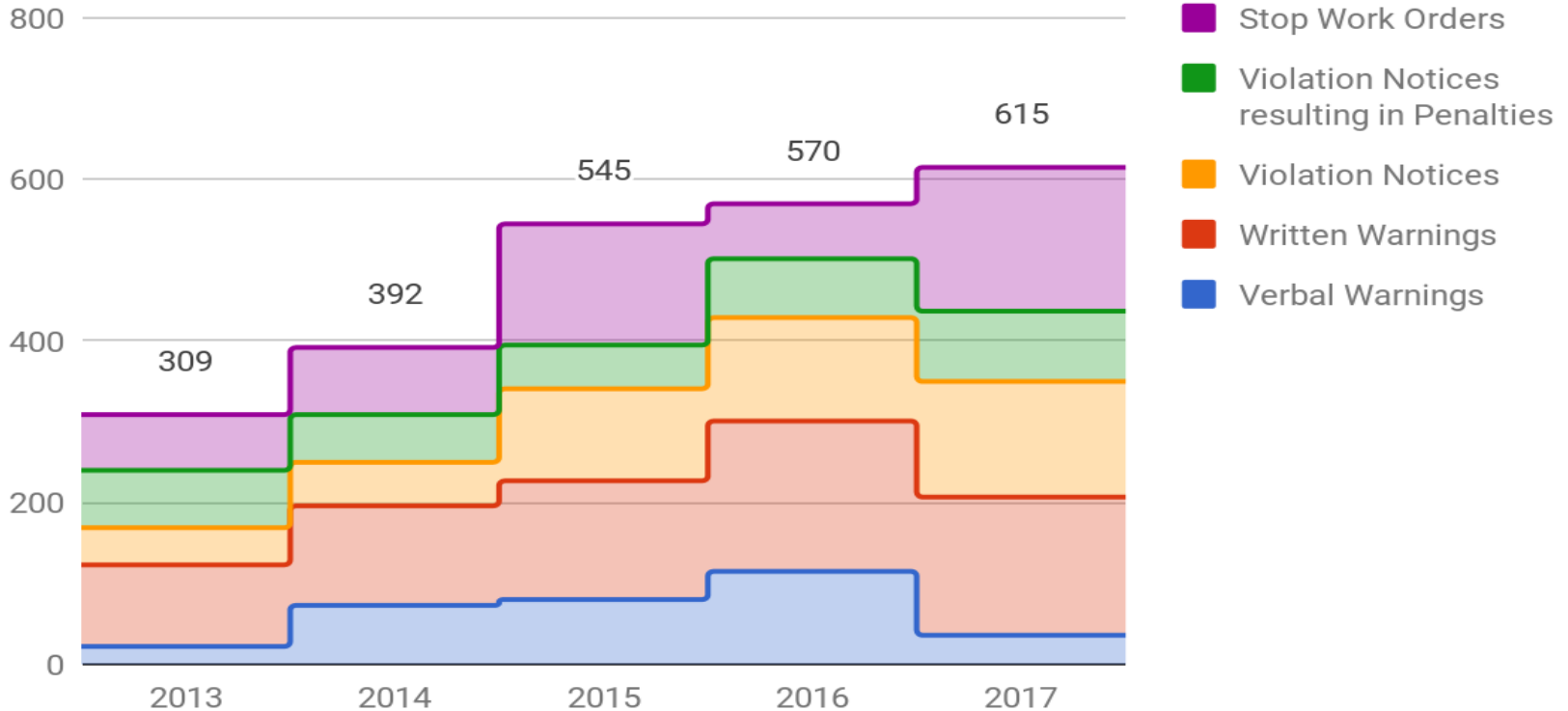
### Construction Site Inspections





# LDO Construction Site Oversight

## Land Disturbing Enforcement



# Post-Construction Runoff Control - TMDL

- Performed by DPW
- Managing conveyance, flood control & pollutants
- ~400 sites inspected annually
  - +/- 1,000 BMP's (Best Management Practices)
  - Oil Skimmers
  - Bioswales
  - Rain Gardens / Vegetation
  - Green Roofs
  - Pervious Pavements
  - Retention / Detention Ponds



# Industrial Inspections

230 sites w/NPDES permit

- 100 high risk (chemical facility)
  - 3-year cycle

Commercial sites “near” industrial distinction

- distribution site (not manufacturer)

2,000 annual hrs staff time managing

- 33 high risk + 15 other = 48 annual

Industrial Pollutants:

- nitrates/phosphates from fertilizer
- petroleum
- heavy metals
- temperatures



# Pollution Prevention / Good Housekeeping

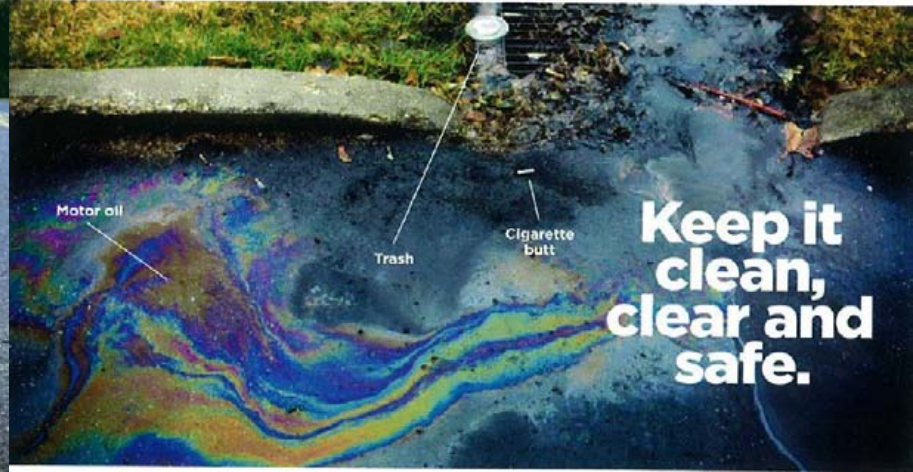
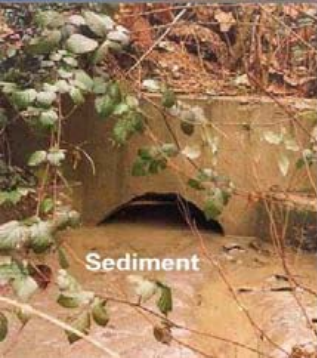
- What's good for the goose...
- Goals: Inspection procedures, reducing pollutants from roadways and city owned facilities
- 12 Municipal sites inspected quarterly
- Employee training mandates: Maintenance of parks, open space, fleet, buildings, new construction, land disturb, sw systems



# Public Education / Involvement

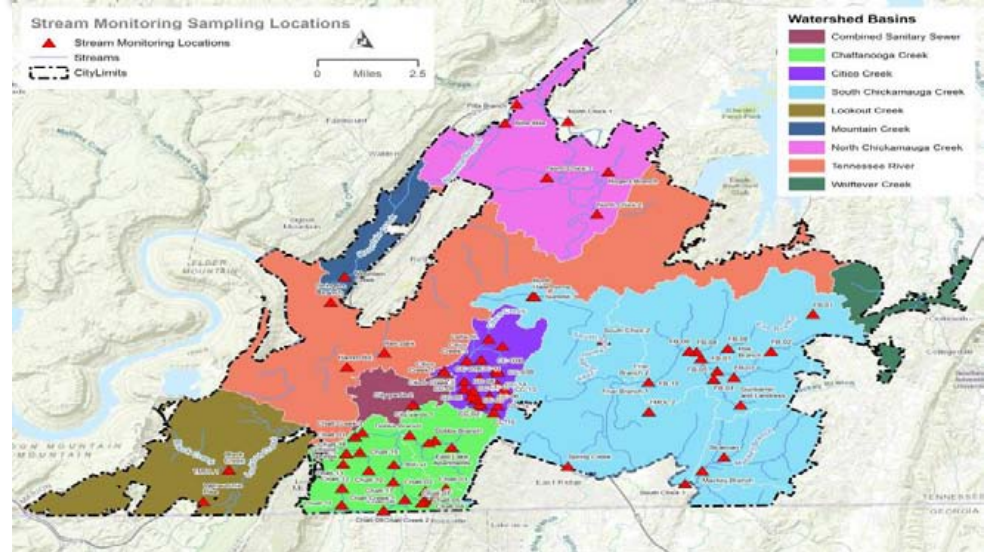
- Examples - stream cleanups, volunteer days, demonstration projects
- Thousands of staff hours per year

- Public Education
- Storm Drain Stenciling
- Community Meetings
- On-line Watershed Academy



# Biological Sampling & Monitoring

- Wet-Weather Sampling:
  - 5 Homogeneous Land use – 3 times/yr
  - 4 Industrial Sites – 1 time/yr
    - COD, pH, BOD5, TSS, TP, TOC, N, Temp
  - 5 Municipal Sites – 1 time/yr
    - muni. WM facilities, CWS, Summit LF, Moccasin Bend LF, 36th St.
    - Metals, chromium, copper, lead, nickel, zinc, **nutrients**.....
- Watershed Characterizations (7 Total):
  - Sampled monthly, quarterly, semiannually
- Biological Monitoring: 3 sites semiannually
- TMDL Monitoring: 28 locations
- Staffing Levels:
  - 6 employees + 1 supervisor



# Spill Response

Spill can be of caustic and toxic chemicals requiring quick response.

- ~22 responses per year
- Responsible to develop Enforcement Response Plan
- Address Repeat Violations
- Document:
  - event,
  - environmental impact,
  - response,
  - remediation,
  - subsequent measures,
  - and follow-up training for prevention



# **Drainage System Maintenance**

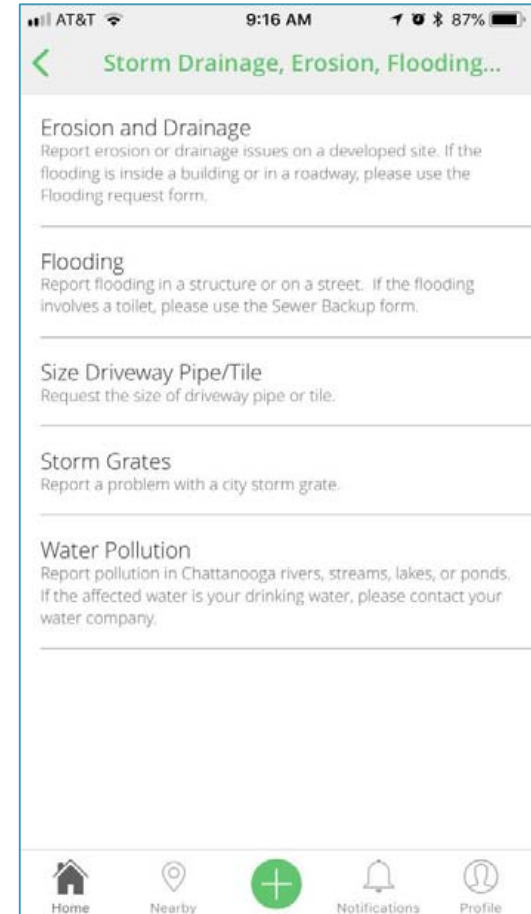
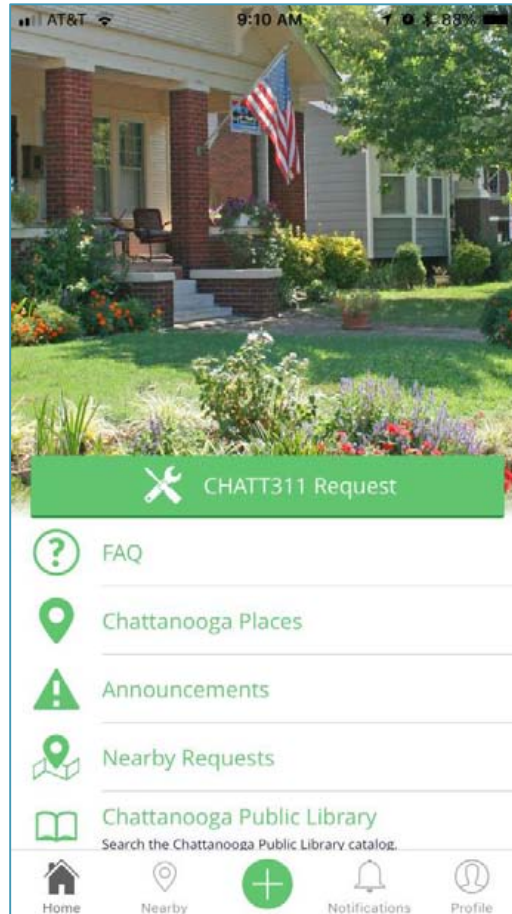
**CHATT<sub>311</sub>**

**Operation & Maintenance Crews**



# 311 Response

- CHATT311 App
- Over 2,000 Annual Water Quality Inquiries and Requests for Investigation
- **6 FTE's to manage investigations,** citizens, documentation and design.



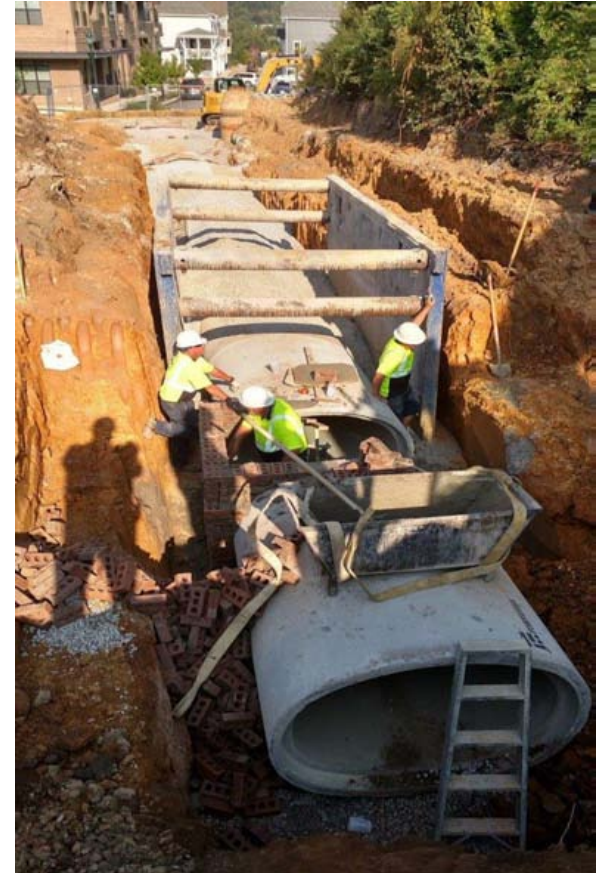
# Operations & Maintenance Crews

- CCTV Rodding / Camera Crews
- Rodding and Vacuum Crews
- Floodplain Preservation Program Crew
- Beaver Control Crew
- Street Superintendent
- Street Foreman
- General Stormwater Maintenance Crews
- Flood Events Crews



# Construction Crews

- Culvert Crews
  - 2 Operator's with backhoe
  - 2 Drivers / Laborers with various trucks
- Pipe Crews
  - 2 Operator's with backhoe
  - 2 Drivers / Laborers with various trucks
- Masonry Crews
  - 1 Operator                   ○ 1 Driver
  - 1 Tech                         ○ 1 Laborer



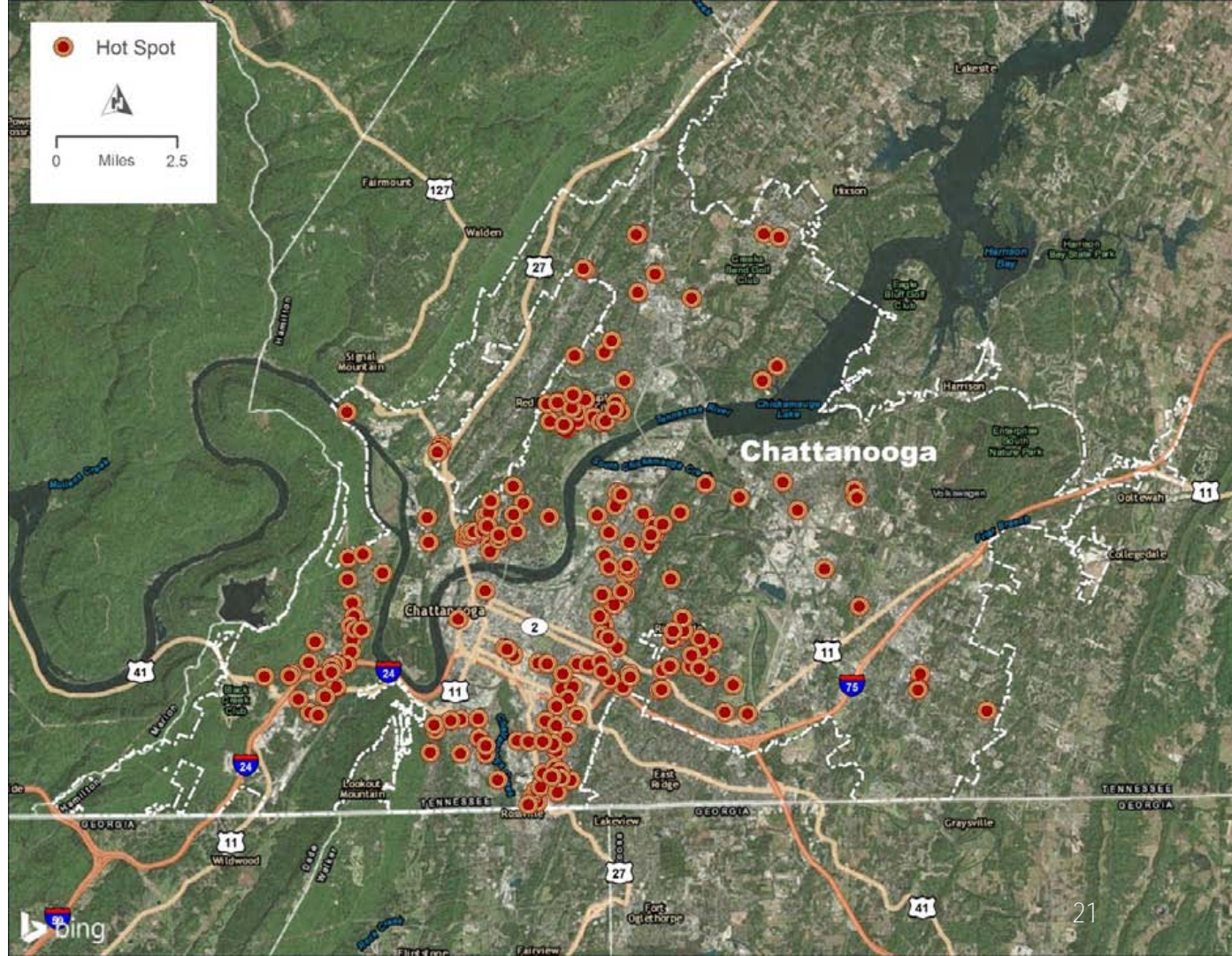
# Ditch Maintenance Crews

- Ditch Maintenance Crews
  - 2 Operators
  - 2 Drivers
  - 2 Techs
  - 2 Laborers



# Inspection & Vacuum Cleaning Crews

- 230 Hotspots checked before/during/after major rain events
- 630 miles of pipe
- 1,350 miles of open channel



# **Drainage & Capital**

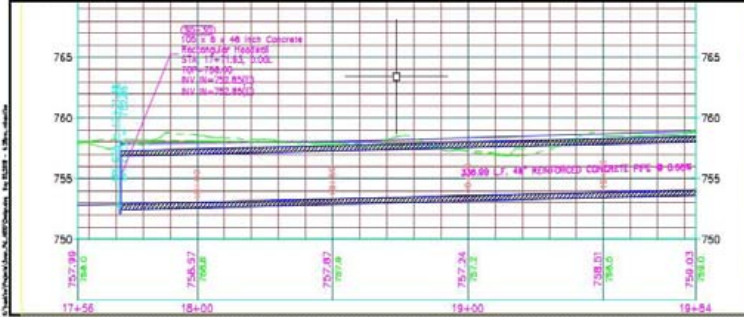
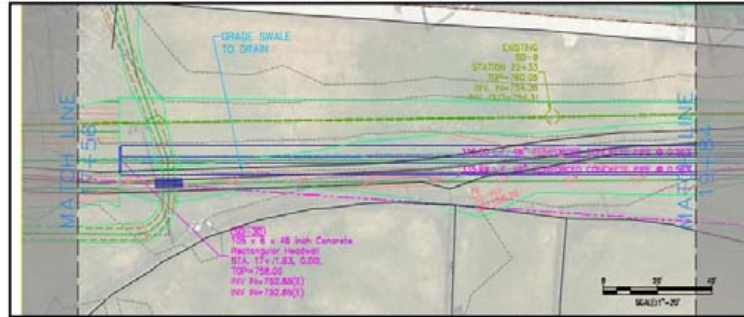
**Engineering Design**

**Construction Management**

**Capital Projects**

# Engineering Design

- 8 Design and Engineering staff members
- ~16,000 hours annually
- 265+ hours on typical drainage project: Swan Rd. modeling & design



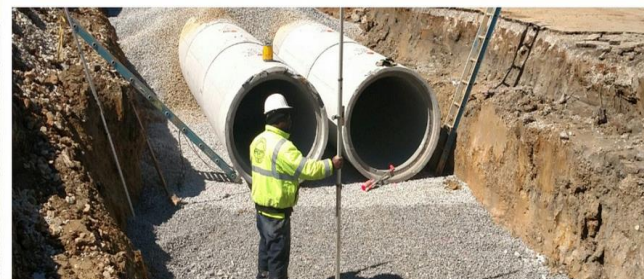
**CHATTANOOGA SEAL**  
 CITY OF CHATTANOOGA  
 DEPARTMENT OF PUBLIC WORKS

ADMINISTRATOR  
 DONALD L. MORRIS  
 CITY ENGINEER  
 WILLIAM C. PANK, P.E.  
 60 MAY ELYSIUM DR. SE  
 CHATTANOOGA, TN 37404

1837 SWAN ROAD  
 DRAINAGE IMPROVEMENTS

CONTRACT# W09 141232  
 SCALE: 1" = 20'  
 DRAWN: MDH  
 DESIGN: MDH  
 CHECKED: MDH

**JACKY D. BARKLEY SEAL**  
 JACKY D. BARKLEY  
 332  
 CITY OF CHATTANOOGA  
 INDEPENDENT REGISTERED PROFESSIONAL ENGINEER  
 STATE OF TENNESSEE  
 STORAGE 108 588  
 SHEET 6 OF 15



# Construction Management & Inspection

North St. Elmo (Big Dig) Drainage Improvements Project

- To Optimize & Avoid
- 1 Inspector
- 1 Engineering Coordinator
- Staff hours to manage = 3,000+ hrs





# Capital Projects

## Anderson Ave. Green Infrastructure

- GI neighborhood retrofit
- Located in ROW of the 900 block of South Holly Street, and the 1600-1700 blocks of Anderson Avenue
- Improving drainage and water quality to Dobbs Branch
- Planning & in-house design started in 2013
- GI mitigates the effects of urbanization on the water quality - sustainable systems
- Storm conveyance reduces incidents in localized flooding.
- *Construction (Complete): June 26, 2017 – March 2018*
- *Total Cost: \$1,760,715.53*



# Anderson Ave. Green Infrastructure

Before



# Anderson Ave. Green Infrastructure

After



# Capital Projects

## Valleybrook Subdivision

- Two major road crossings
- Upland watershed delivers more
- Roadway and private property flooding
- Crossing #1 - City crews worked from 4/17 to 10/17
- Crossing #2 - located at the tributary to Rogers Branch & Valleybrook Road; beginning this summer
- Increase conveyance from 2-yr to 25-yr storm
- Total Cost \$304,000
- In-house Design & Construction





Valleybrook  
Subdivision

# Capital Projects

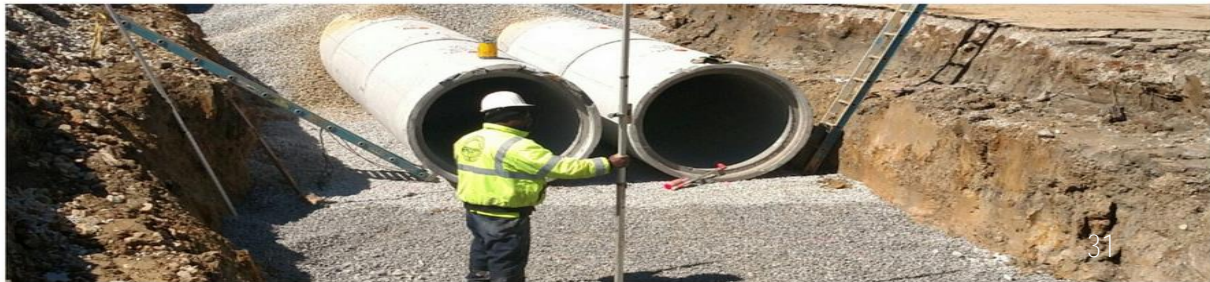
## Swan Road

- Current infrastructure replacement project
- **Hwy 58 area. Existing, 18" pipe being replaced with ~1,200-feet of 48" pipe.**
- Property flooding issues, High flow depths across Swan Road and the parking lot at the Lakeside Youth Sports Complex.
- Alleviate localized flooding and mitigate parking lot and ditch heavy scour issues.
- Construction Costs to date = \$213,000
- In-house Design & Construction
- Work began Oct. 2017 & is estimated to be complete Oct. 2018





Swan Road



# Capital Projects

## Agawela Dr. Stream Restoration

- 1500 LF of Stream Stabilization to address Sediment Erosion into South Chick Creek
- Contract Value: \$900,000
- Designer: HDR
- Construction Completed: 2017
- Reestablish:
  - Pools, riffles, velocity dissipation, stabilization and groundwater reconnect





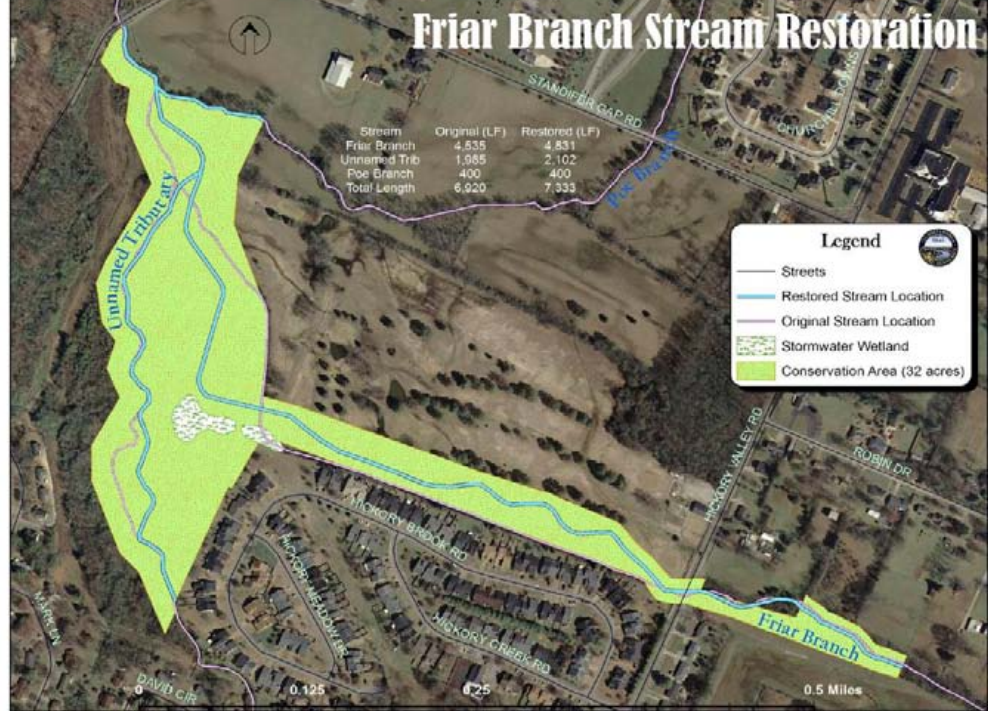
# Agawela Dr. Stream Restoration



# Capital Projects

## Hickory Valley Stream Restoration

- 7,333' of restored stream in the Friar Branch watershed.
- Increased channel sinuosity created over 400 feet of additional stream habitat
- Stormwater wetland was installed to treat polluted runoff. Contract Value: \$1,500,000
- Construction Completed: July-Dec. 2010 with plantings in Feb. 2011



# Capital Projects

## North St. Elmo Ave. Improvements “Big Dig”

- Collapsed CMP under former Wheland Foundry Landfill up to 75' deep
- Aware ~2000 (negotiations), 2008 - 8 years of planning, permitting, funding, design
- **New 1,400 LF of 10' x 10' box culvert, 30' deep**
- 4 connections installed via Tunnel Bore Machine
- Cost: \$17,000,000



# North St. Elmo Ave. - "Big Dig"





# North St. Elmo “Big Dig”



# Fiscal Sustainability

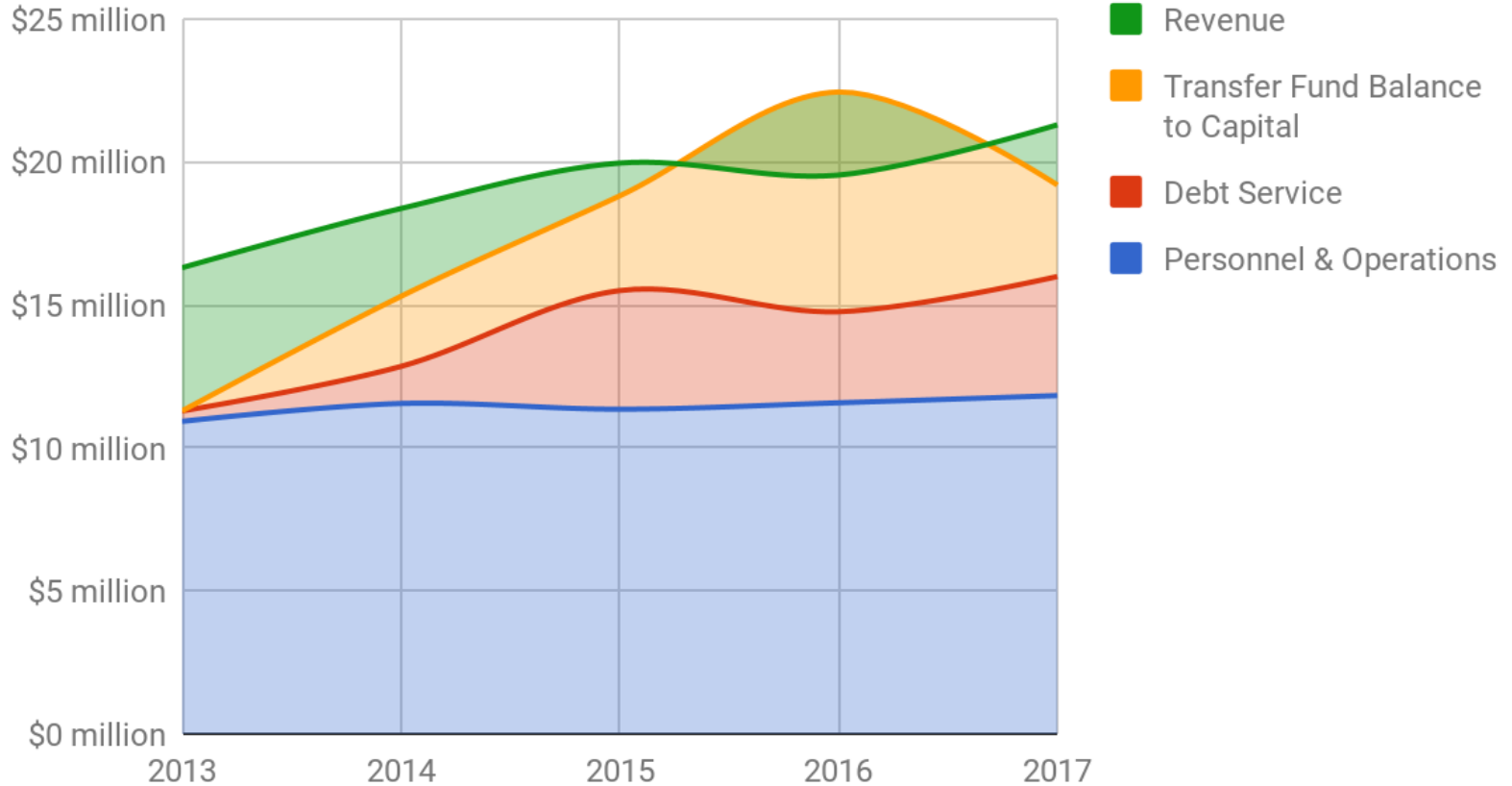
Revenue & Expense Overview

Recommended Rate Study

TN Program Comparison

Q & A

# Historical Water Quality Revenue & Expenses





# How will we invest?

Recommended Level of Service

Current Programs

New Programs

# Additional Capital Projects To Address TMDL's

## Stream Bank Stabilization

- Avg. \$2M per year for new TMDL Operations & CIP
  - ~20% of proposed increase



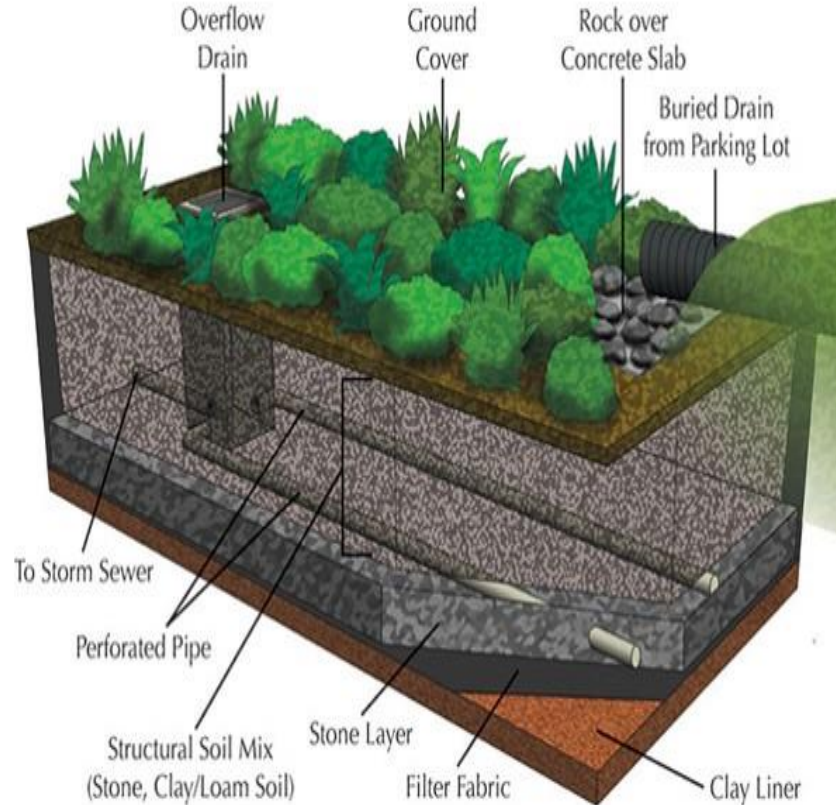
# SFR Detention Pond Maintenance Program

- ~30 Ponds annually
- Requires heavy & light equipment, crews, structures, installed & expended materials, erosion controls, seed, spoils hauling
- Annual Cost: \$500,000



# Green Infrastructure Installations and Maintenance

- ~21 City Owned properties with BMP's
- More coming each year
- \$400,000 per year
- Installation, maintenance, repair, replacement of:
  - plants
  - underdrains
  - stone
  - filter-fabric
  - monitoring stations
  - inlet and outlet structures



# Drainage Infrastructure Improvements

Reduce Backlog of Drainage Projects

- \$1.0 Million Per Year
- Plus Major Capital Projects
- **Upland watersheds contributing “more”.**
- Work in the ROW
- Addressing the following:
  - citizen requests
  - aging infrastructure
  - backlog of projects



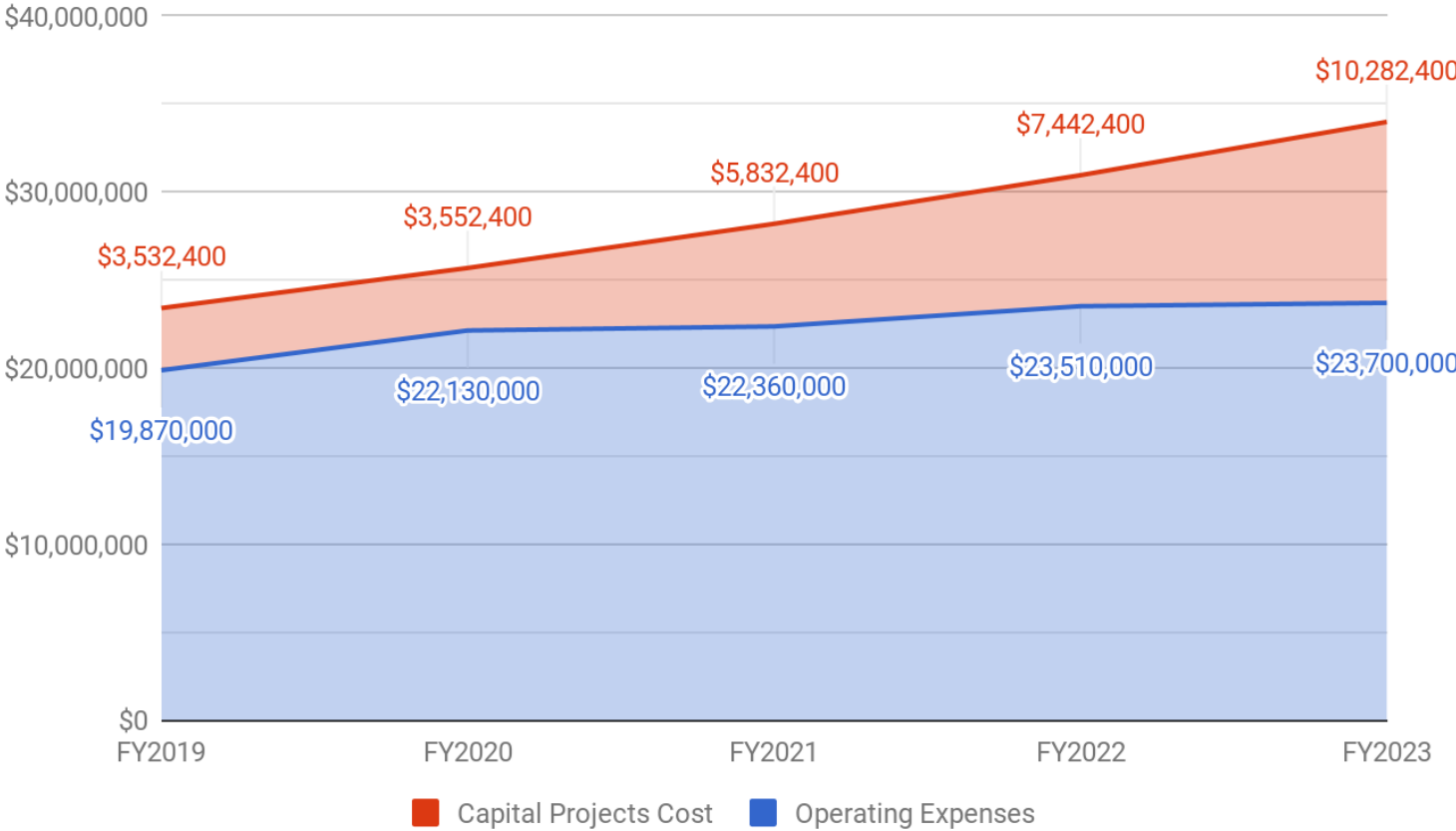
# Non-TMDL Capital Projects

Non-TMDL Capital Projects	Total 5 Year Request
Culvert Upgrades - Citico Creek	\$1,120,000
USACE/FEMA Floodplain Culvert Replacements Projects	\$450,000
Green Infrastructure of the Avondale YFD Center	\$800,000
Automated flood warning system	\$450,000
Combined sewer separation/attenuation Projects	\$12,269,000
Storm sewer collection system improvements	\$2,440,000
Water quality improvements, Stay On Volume Coupon Bank	\$750,000
Landscape Design	\$300,000
Home buyout program	\$1,050,000
Conveyance and water quality wetland improvements	\$250,000
Conveyance, detention and water quality improvements	\$2,850,000
Heavy Equipment Purchases	\$1,370,000
On-Call Floodplain Modeling	\$600,000
WQ Operations Building at City Wide Services Yard	\$450,000
Pump Station Repairs	\$2,500,000
WQ Lab/Storage	\$150,000
<b>Total</b>	<b>\$28,149,000</b>

# TMDL Capital Projects

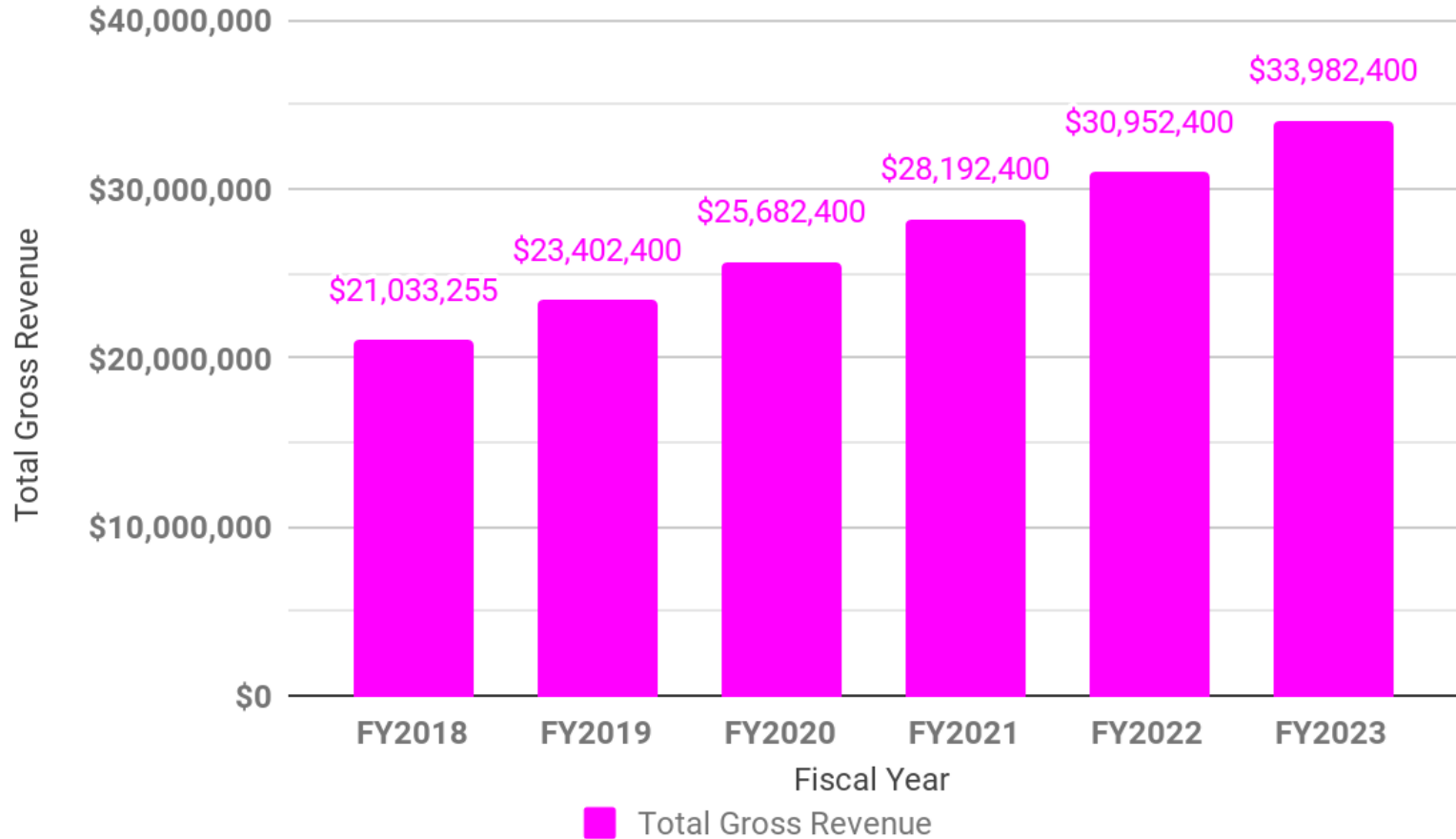
TMDL Capital Projects	Total 5 Year Request
Prioritizing GI Projects to address TMDLs	\$100,000
Various stream restoration projects	\$750,000
Stream Restoration - Citico Creek	\$2,290,000
Stream Restoration - Lynnbrook WPA Ditch	\$200,000
East Lake Water Quality Restoration	\$400,000
Various areas of stream buffer purchased into conservation to protect streams.	\$450,000
Green Infrastructure of City Alleyways	\$750,000
Total	\$4,940,000

# Recommended Operating Expenses and Capital Projects





# Recommended Total Gross Revenue



# Recommended Land Disturbance Permit Fees

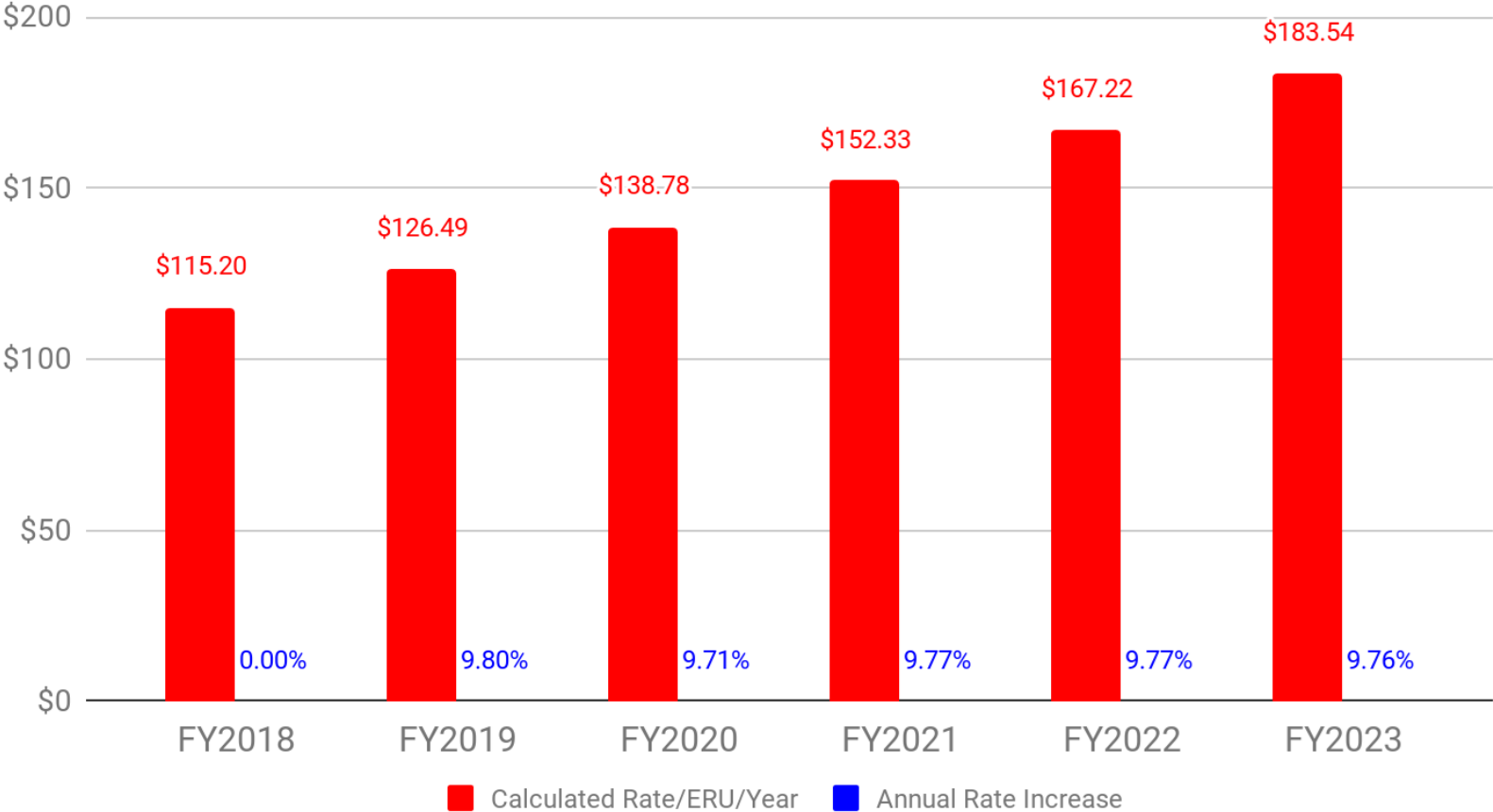
Recent Annual Revenue  
~\$75,000



Estimated Annual Revenue  
Next 5 Years  
\$362,400

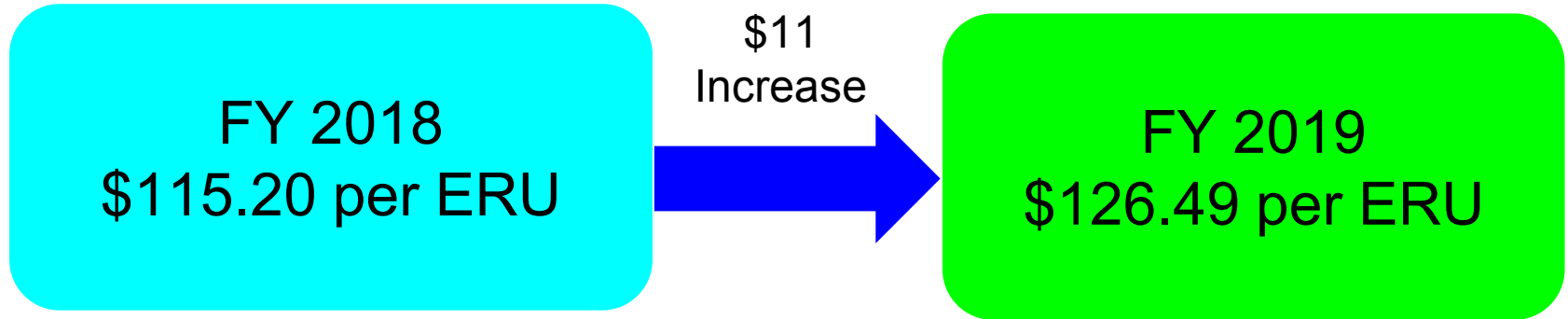
Description	Itemized Fee
Simple Residential - \$ 250 min. (up to 1 acre disturbed area)	\$250
Complex - \$ 250 per acre	\$250
Revision after second review (each)	\$1,000
Post-issued revision (each)	\$1,000
Variance or Infeasibility Request	\$1,375
Bonds/Letter of Credit (each)	\$675
Driveway Tile/Culvert Sized By City (each)	\$500
As-Built Survey/Certification Review (each)	\$675
Grading Only - per acre	\$250
Timber Removal Permit - per acre	\$250
Tree Ordinance (each)	\$500

# Recommended Annual ERU's



## Recommended Level of Service

Average 9.75% increase per year for five years



**How do we compare?**

# Quality of Life

- Factors
  - Environment
  - Drainage
  - Flood Control
- Funding
  - Property Tax
  - Water Quality Fee

# Program Funding Comparison

## Tennessee Phase 1 Programs

					Funding Sources					
					General Revenue			WQ User Fee		
City	Property Tax/\$100 Assessed Value	ERU sq ft	\$ ERU/Yr	Program Budget	MS4	ROW	Flood Ctrl	MS4	ROW	Flood Ctrl
<b>Memphis, TN</b>	\$3.271481	Tiered	7 Tiers	\$30,110,000				x	x	x
<b>Nashville/Davidson County, TN</b>	\$3.1255	Tiered	15 Tiers	\$34,275,000				x	x	x
<b>Knoxville, TN</b>	\$2.4638	N/A	N/A	\$14,985,000	x	x	x			
<b>Chattanooga, TN</b>	\$2.2770	3,200	\$115.20	\$19,500,000				x	x	x

# Final Thoughts

- Required Permit Programs
- Expected Quality of Life - Constituent Expectations
- Balanced Funding
- Funding Efficiency
- Program Transparency & Accountability





THE END