

## City Council Work Session Handouts

June 6, 2016

- I. Review and Discuss the North Texas Municipal Water District Water and Wastewater Plan and Projects
  
- II. Review and Discuss Maintenance Strategies: Streets, Screening Walls, Bridge Railings, and Traffic Signs and Markings

**NORTH TEXAS  
MUNICIPAL  
WATER  
DISTRICT**

**NTMWD's Vision**

Regional Service  
Through Unity...

Meeting Our Region's  
Needs Today and  
Tomorrow

**NTMWD's Mission**

Meet the Various Needs  
of Member Cities and  
Customers

**Top 5 Priorities:**

- Provide superior water, wastewater, and solid waste services today.
- Secure the future for water, wastewater, and solid waste supplies and services.
- Maintain strong relationships with Member Cities, Customers, and partners.
- Maintain our infrastructure to provide reliable service today and tomorrow – through emphasis on preventive/predictive maintenance.
- Take care of our people – develop our leaders and work force, hire and retain the right people, build our bench, and be safe.



# North Texas Municipal Water District

*“Regional Service Through Unity ...  
Meeting Our Region’s Needs Today and Tomorrow”*

**Richardson City Council  
June 6, 2016**



# Agenda

- **Overview of Our Mission & Services – *Tom Kula***
- **Key Water Projects and Programs – *Mike Rickman***
- **Key Wastewater Projects and Programs – *Mike Rickman***
- **Wastewater & Water System Rate Projections – *Tom Kula***
- **Questions**



# OVERVIEW

**Tom Kula**  
**Executive Director**



# NTMWD Systems

*Serve 1.6 million in North Texas area nearly twice the size of Rhode Island*

## Water

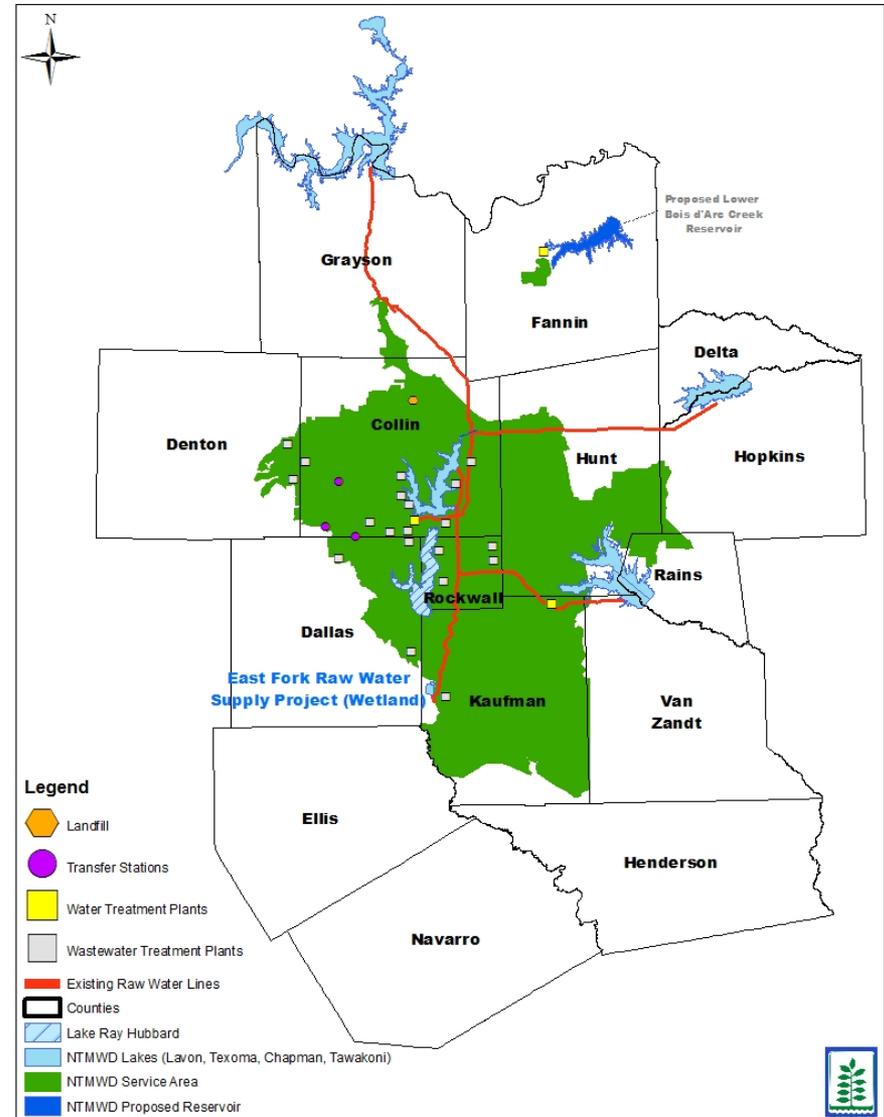
- 370 MGD average raw water supply
- 6 water treatment plants – 806+ MGD capacity
- 566 miles of transmission pipelines
- 9 raw water pump stations
- 8 treated water pump stations
- 77 City delivery points

## Wastewater

- Operate 14 wastewater treatment plants
- 151+ MGD treatment capacity
- 8 interceptor systems with 250+ miles of large-diameter pipelines and 23 lift stations

## Solid Waste

- 3 transfer stations, 3,295 combined permitted tons/day
- 800,000+ tons/year accepted at landfill





# Focused on Serving Growing Region

## NTMWD Largest Member Cities Population Growth

City	1950	1960	1970	1980	1990	2000	2010	2015
Frisco	736	1,184	1,845	3,420	6,138	33,714	116,989	145,510
Garland	10,291	38,501	81,437	138,857	180,635	215,768	226,876	232,960
McKinney	10,560	13,763	15,193	16,249	21,283	54,369	131,117	154,840
Mesquite	1,684	27,526	55,131	67,053	101,484	124,523	139,824	142,230
Plano	2,115	3,695	17,872	72,331	127,885	222,030	259,841	271,140
Richardson	1,289	16,810	48,405	72,496	74,840	91,802	99,223	102,430

*Note: Collin County recently updated growth projections to include 1.3 million more residents than previous estimates.*

## NTMWD Total Population: Historical and Projected

Year	1956	1961	1974	1994	2015	2040	2070
Population Served	32,000	60,000	200,000	800,000	1,600,000	2,500,000	3,700,000



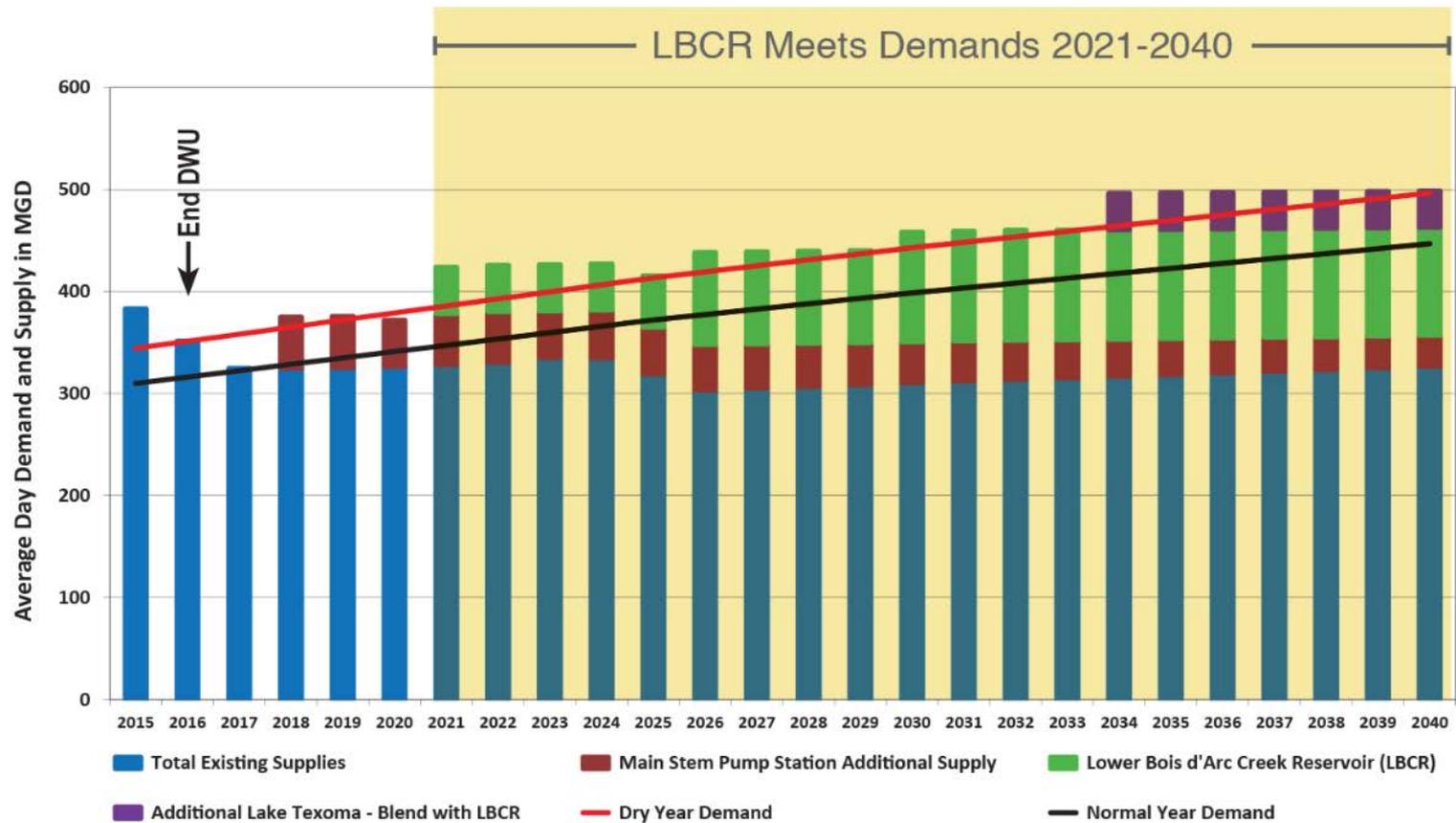
# Water Essential for Economic Growth

*Water supply infrastructure is the driving force of community and business vitality*





# Water Demand and Supply Projections from 2015 to 2040



Dry Year - Below average rainfall without drought response restrictions

Normal Year - Average year rainfall that results in normal year demand

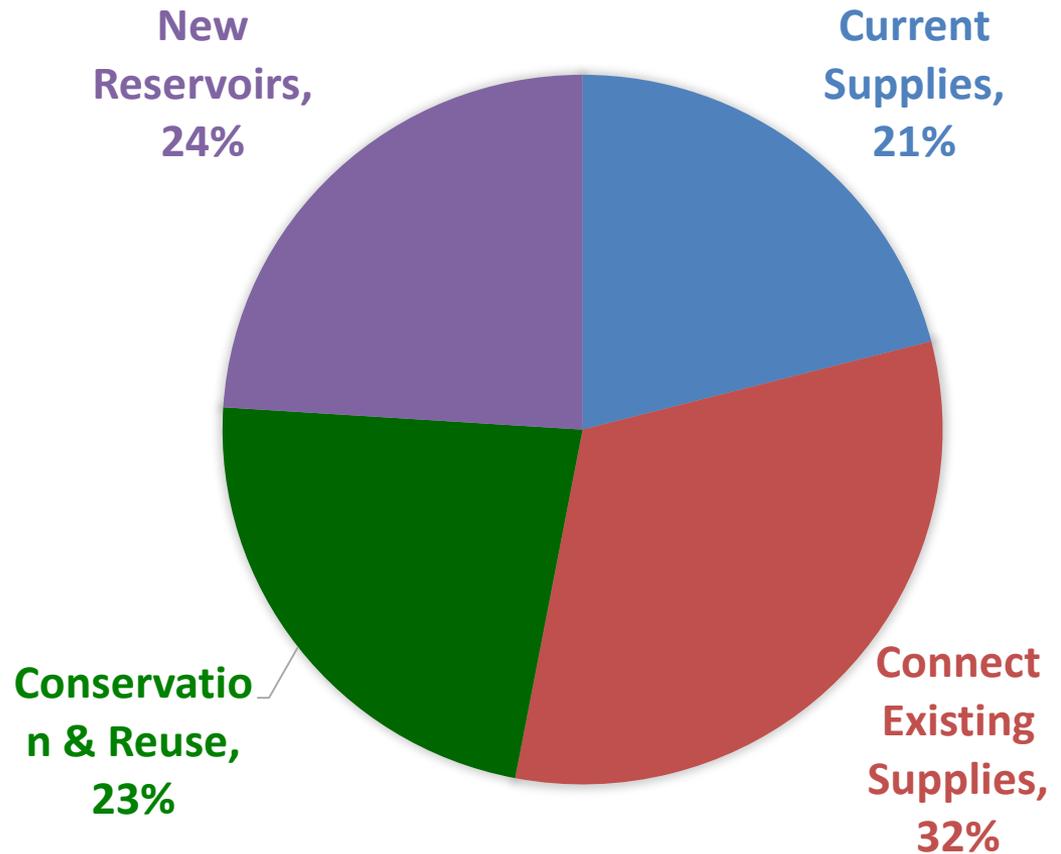




# Water Supply Planning: Future Sources

Conservation and Reuse = 23%

New Sources, Reservoirs = 24%





# **WATER SYSTEM**

**Mike Rickman**

**Deputy Director - Operations**



# Lower Bois d'Arc Creek Reservoir (LBCR)

*First major reservoir to be constructed in Texas in the last 30 years*

**Location: Fannin County, TX**

**Area: 16,526 acres**

**Supply: up to 108 MGD**

**Average/ Max Depth: 22/70 ft**

**Lake Elevation: 534 ft msl**

**Owner & operator: NTMWD**

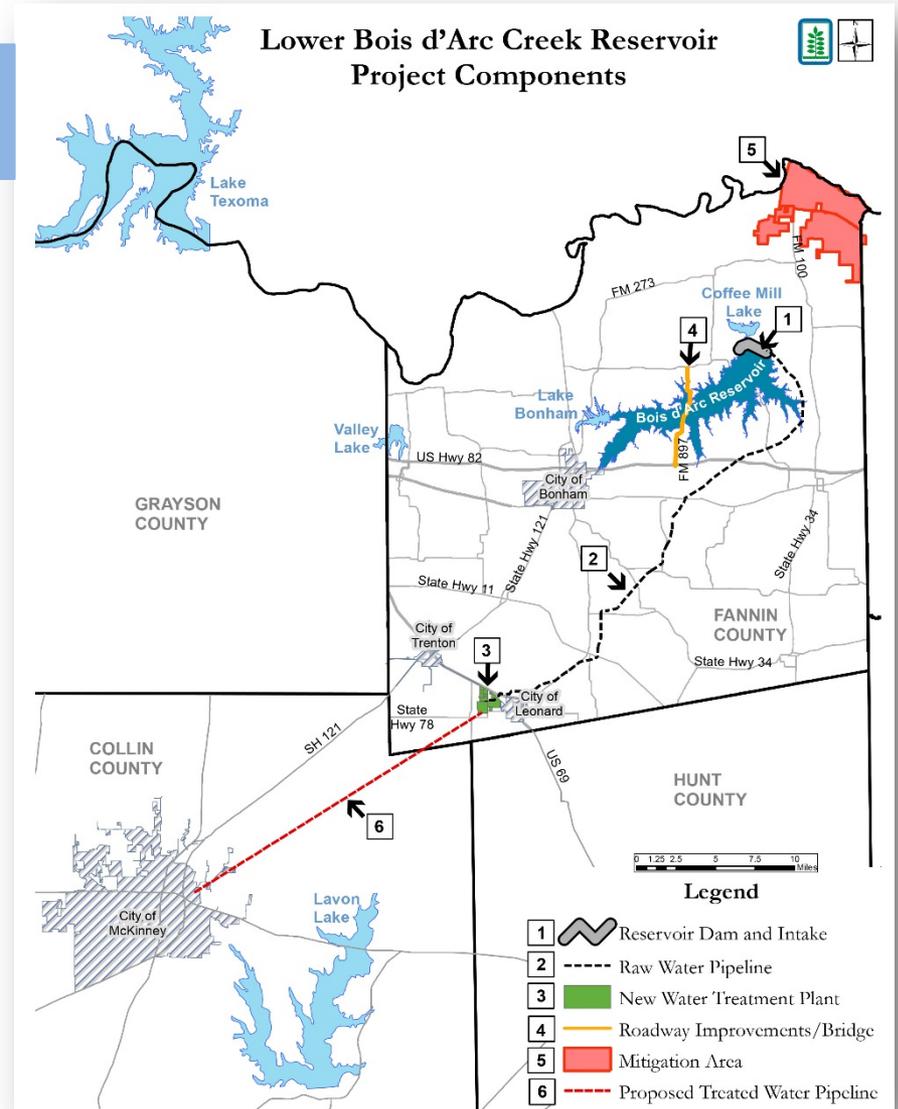
**Cost Estimate: ~\$1B**

**Permitting Required:**

- Water Rights – received June 2015
- USACE Section 404 – under review

**Need construction to start in 2017 to deliver treated water 2021\***

*\*Final schedule dependent on permitting*





# Lower Bois d'Arc Creek Reservoir

## District Actions to Minimize Delays:

- Support for HR 4466 bill to exempt project from federal permit
- Lobbying efforts in Washington D.C. and Austin
- Letter writing from regional partners
- Continued close coordination with permitting agencies

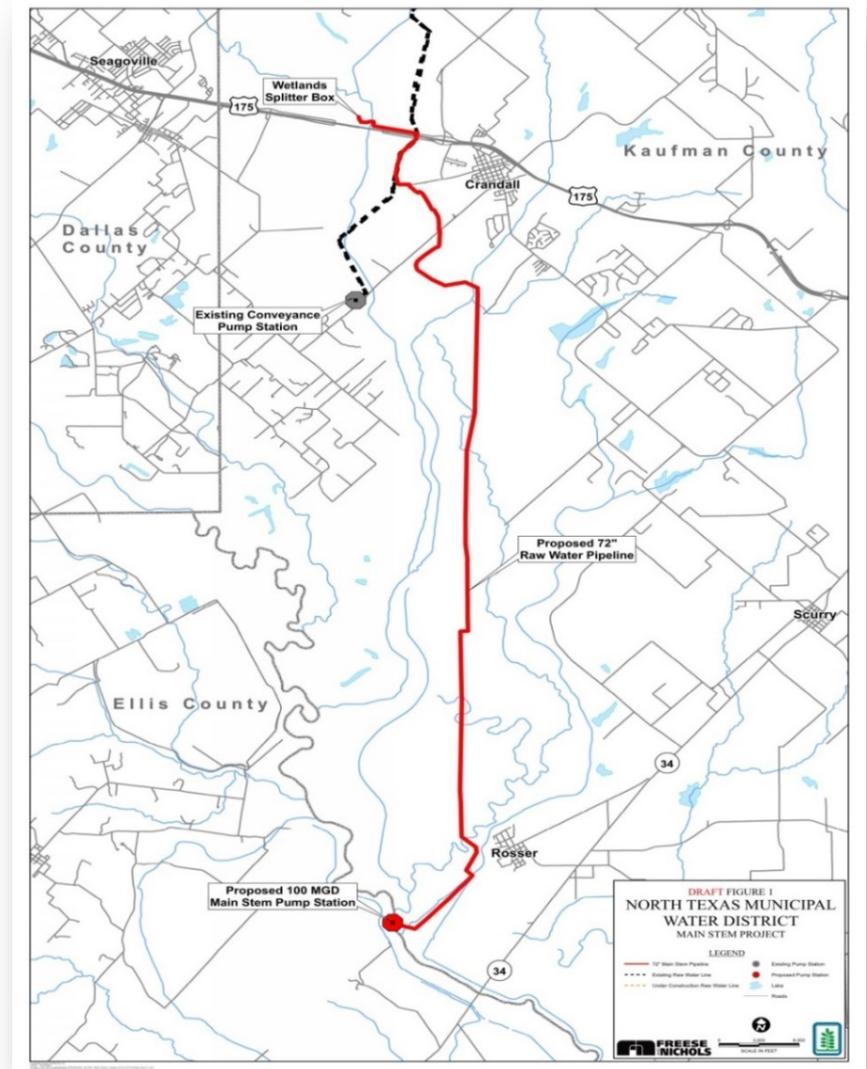


*H.R. 4466 Introduced Feb. 4, 2016  
by Rep. Sam Johnson  
Co-Sponsors:  
Rep. Pete Sessions  
Rep. John Ratcliffe*



# Future Supplies: Reuse

- **New project: Trinity River Main Stem Pump Station**
  - 90 MGD Pump Station
  - 17 miles, 72-inch-diameter Pipeline
  - Add One Pump at Conveyance Pump Station
  - Cost approx. \$99 million
  - Completion by mid-2018\*



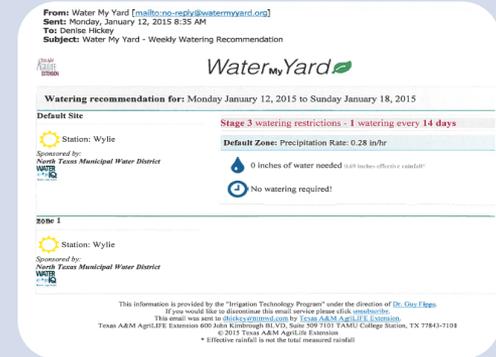
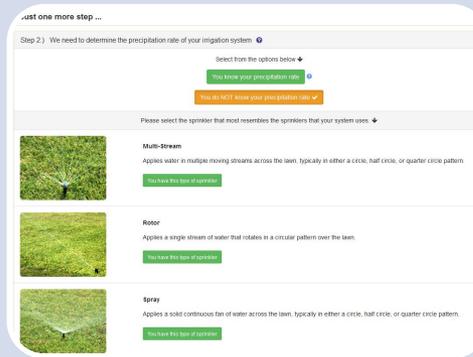
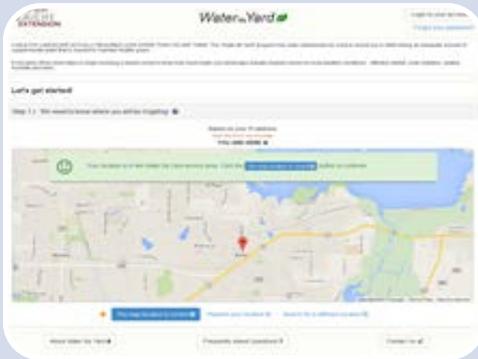
\*Experiencing delays from project partners and permitting



# Future Supplies: Conservation

[www.WaterMyYard.org](http://www.WaterMyYard.org)

Water<sub>My</sub>Yard



Sign-up for a FREE ACCOUNT :  
[www.WaterMyYard.org](http://www.WaterMyYard.org)

## Set up your profile:

- \* Where you live
- \* What type of system components you have
- \* Your email address

## Receive a weekly email:

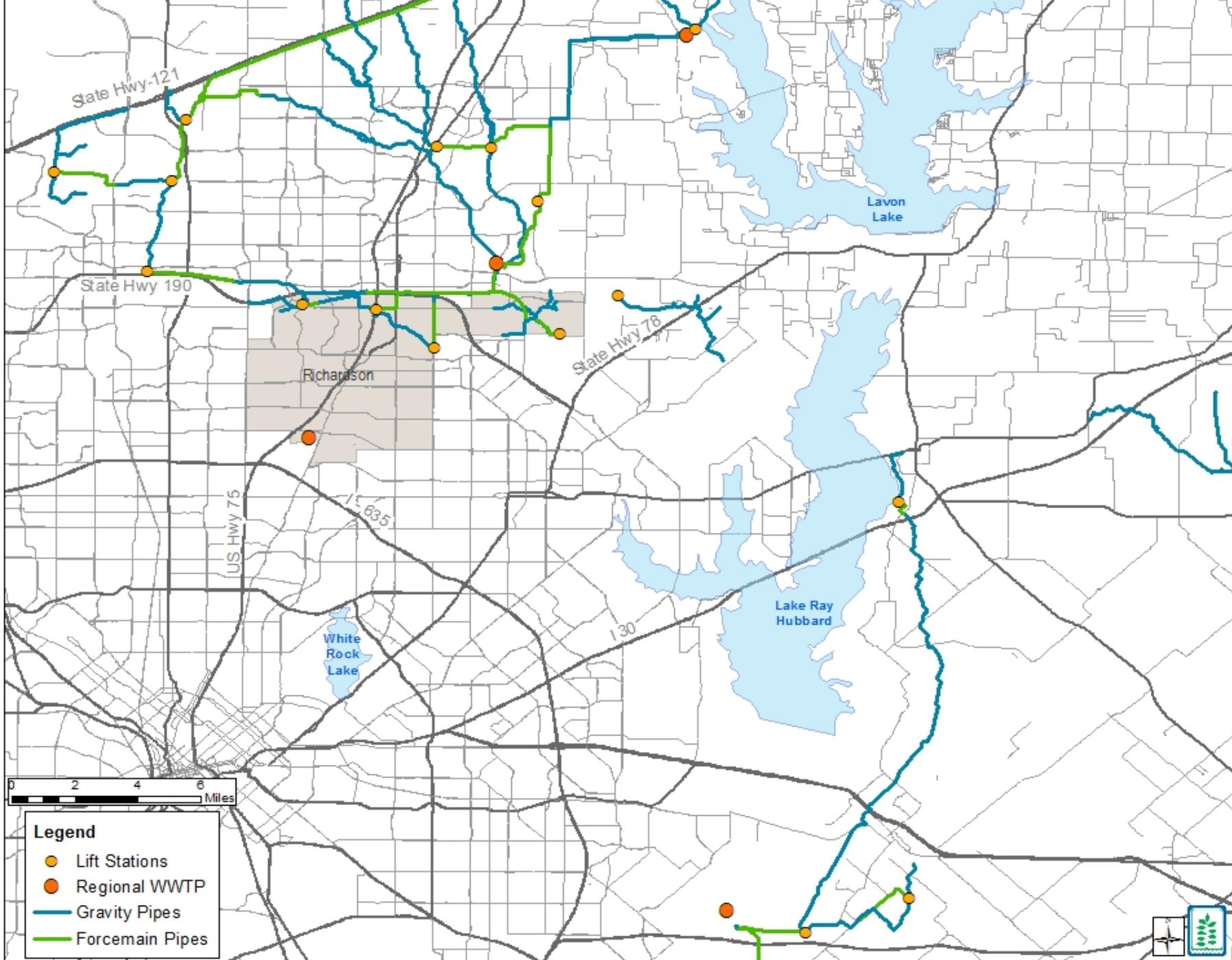
- \* Pulls data from closest weather station
- \* Returns a weekly email to the subscriber based on a 7- day weather on how much watering is needed to supplement natural rainfall
- \* Many weeks, no watering is recommended



# **WASTEWATER SYSTEM**

**Mike Rickman**

**Deputy Director - Operations**



**Legend**

-  Lift Stations
-  Regional WWTP
-  Gravity Pipes
-  Forcemain Pipes

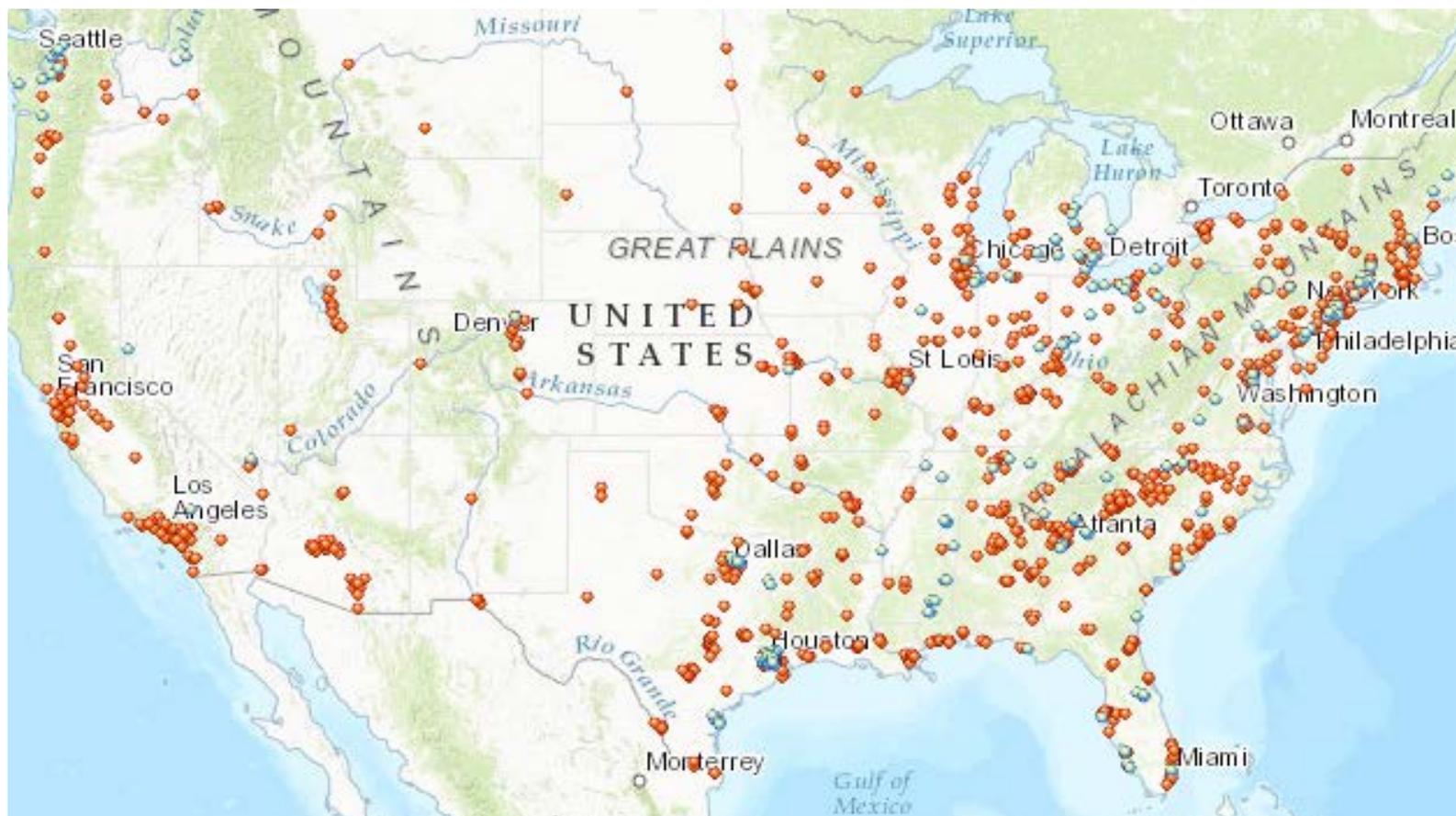




# NTMWD Wastewater CMOM Implementation Update



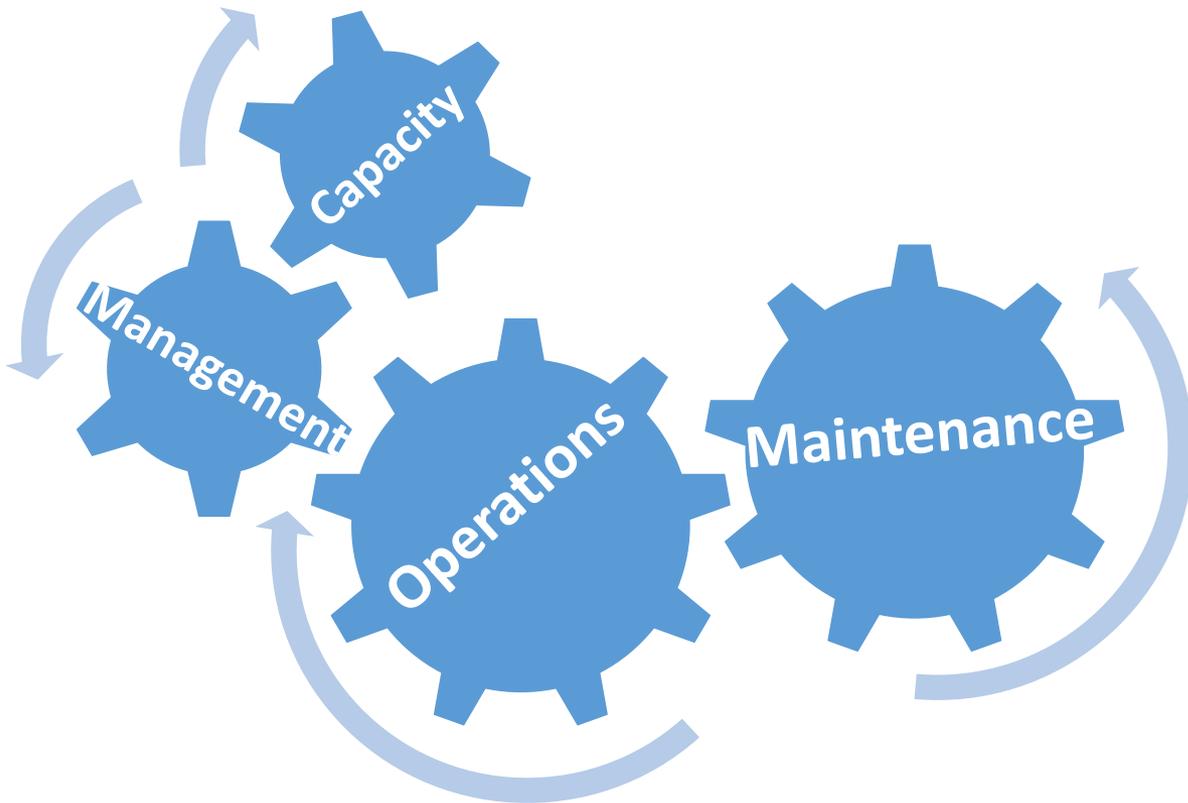
# EPA National Enforcement Initiative: Sanitary Sewer Systems Improvement



<https://www.epa.gov/enforcement/national-enforcement-initiative-keeping-raw-sewage-and-contaminated-stormwater-out-our>



# CMOM Implementation Aligns with EPA Expectations and Industry Practices



## Examples

- **Capacity**
  - Flow Monitoring
  - Modeling
- **Management**
  - Training
  - Performance measures
- **Operations**
  - Operating procedures
  - Flow metering
- **Maintenance**
  - Maintenance management system
  - Condition assessment
  - Sewer cleaning



# Collaborative Regional Approach Yielding Positive Results

- Demonstrated to EPA that **right steps are being taken**
- Administrative Order requirements **align with regionally developed solution**
- **Saved hundreds of millions of dollars** compared to consent decrees
- CMOM implementation **aligns with EPA expectations and industry practices**
  - District, Community, and Regional CMOM Plans in development in current year
  - Implementation coordinated regionally and builds upon current practices

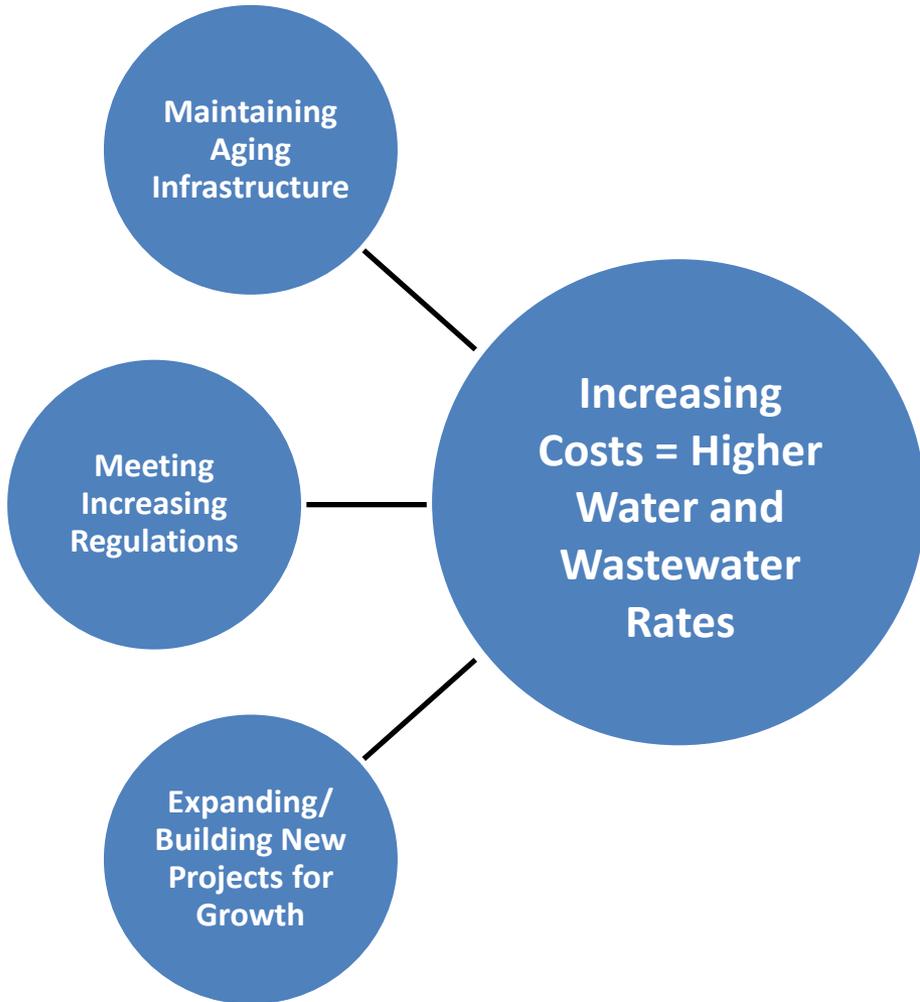


# **RATES**

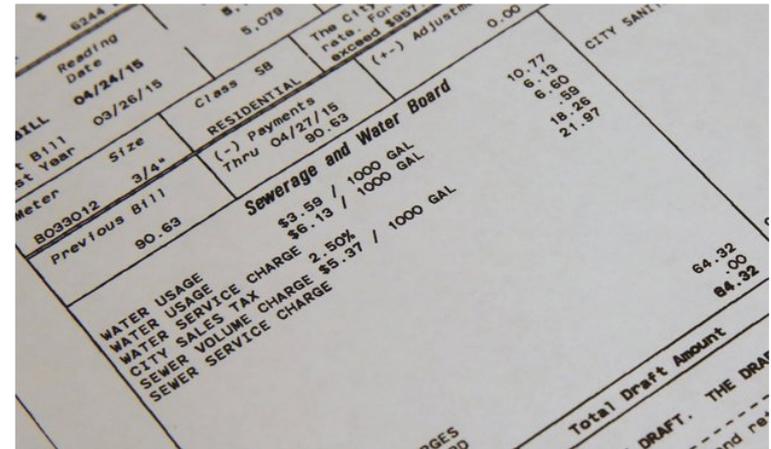
**Tom Kula**  
**Executive Director**



# Water Service Costs Going Up Across U.S.



## Water rates rising across nation



This Jan. 20 photo shows a detail of a water bill showing usage and rates in New Orleans. With all the questions surrounding the nation's water supplies and systems, one thing seems certain: Customers will be paying more to keep their taps flowing. (AP files)

**AP** By The Associated Press | Wire reports  
on September 27, 2015 at 5:00 AM, updated September 27, 2015 at 5:02 AM

Print  
Email

With all the questions surrounding the nation's water supplies and systems, one thing seems certain: Customers will be paying more to keep their taps flowing.

Rates have been shooting up nationwide in drought-stricken states and in cities trying to upgrade their aging infrastructure. Experts say the trend is sure to accelerate as the cost of water, treatment and delivery comes into line with how essential water is to our daily lives.

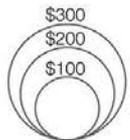
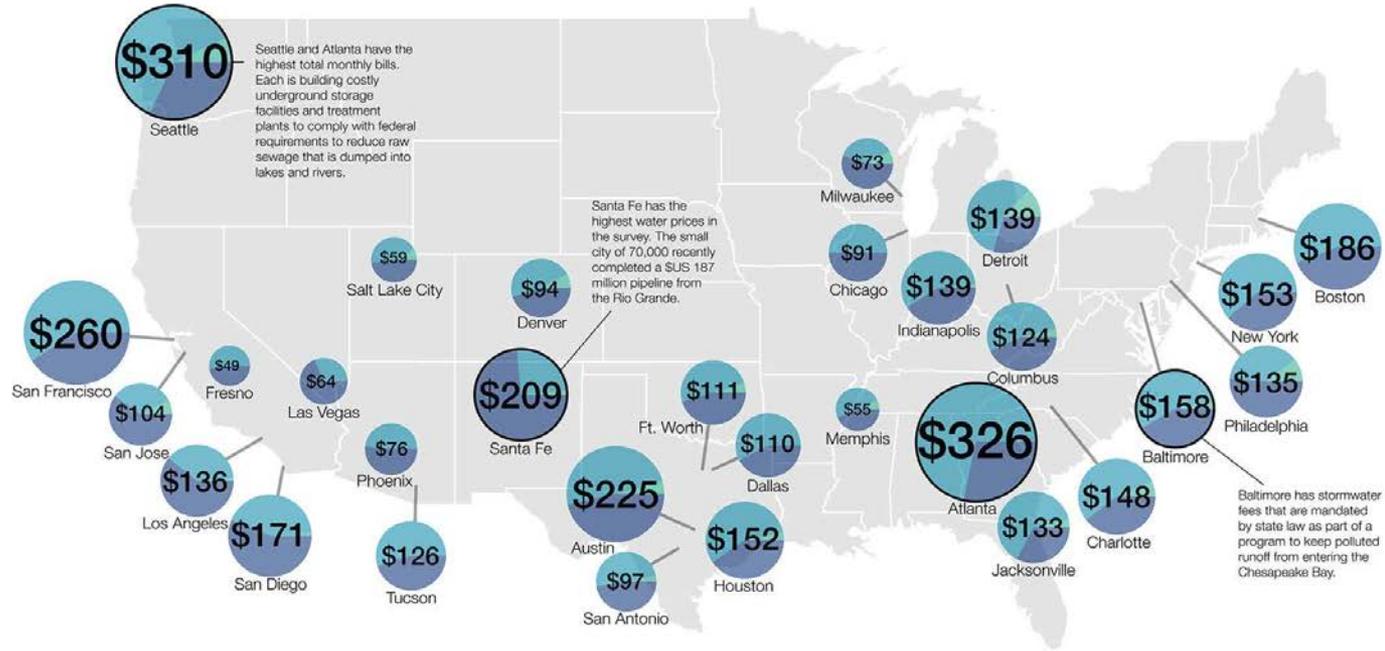
The price for tap water still amounts to about a half-cent per gallon. Elected leaders have long fought to maintain cheap rates, but those prices don't cover the full expense of finding and treating new water sources or upgrading old pumps and pipes.



# Average Monthly Costs Water, Wastewater

## THE PRICE OF WATER: 2015

Combined water, sewer and stormwater prices for households in 30 major U.S. cities.



**Water** prices pay for treating, pumping, and delivering water, while sewer prices cover the cost of cleansing the water that goes down the drain.



**Sewer** prices are often higher than water prices because more energy and chemicals are required for treatment. Following the Clean Water Act, the federal government gave grants for new treatment plants during the 1970s and 1980s. Over the past three decades, however, new spending has been cut for local sewer infrastructure.



**Stormwater** fees are not included in every city's monthly bill. Some cities use general tax revenues to pay for projects to reduce polluted runoff from streets and parking lots. However, these projects must then compete for funds with other departments like police and schools.

Rates current as of April 1, 2015.  
Monthly bill calculated for a family of four using 100 gallons per person per day.  
Source: Circle of Blue research, based on utility water rates.

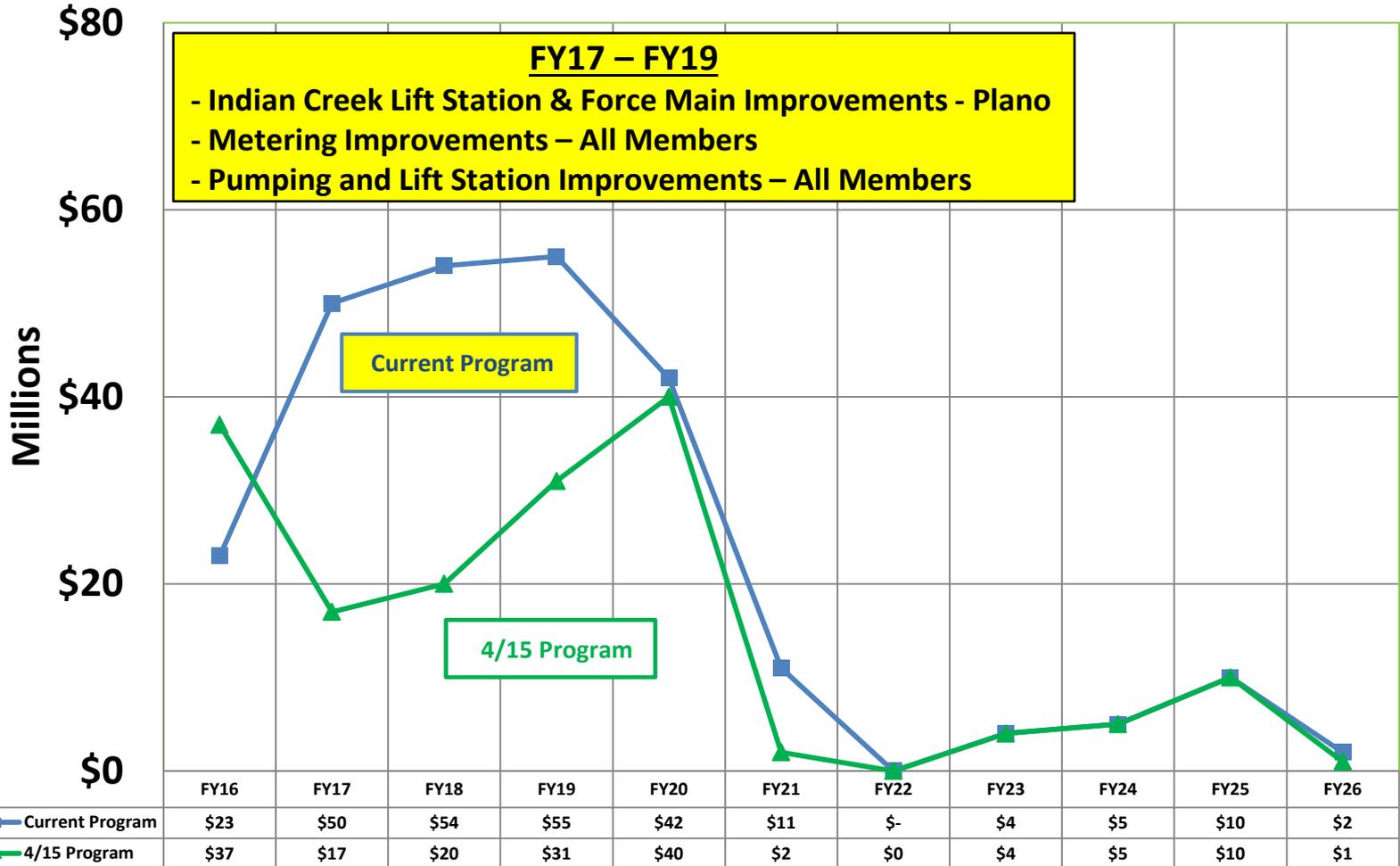


# **UPPER EAST FORK INTERCEPTOR SYSTEM (UEFIS)**



# UEFIS CAPITAL PROGRAM

**PRELIMINARY**



**FY17 – FY19**  
 - Indian Creek Lift Station & Force Main Improvements - Plano  
 - Metering Improvements – All Members  
 - Pumping and Lift Station Improvements – All Members

Current Program

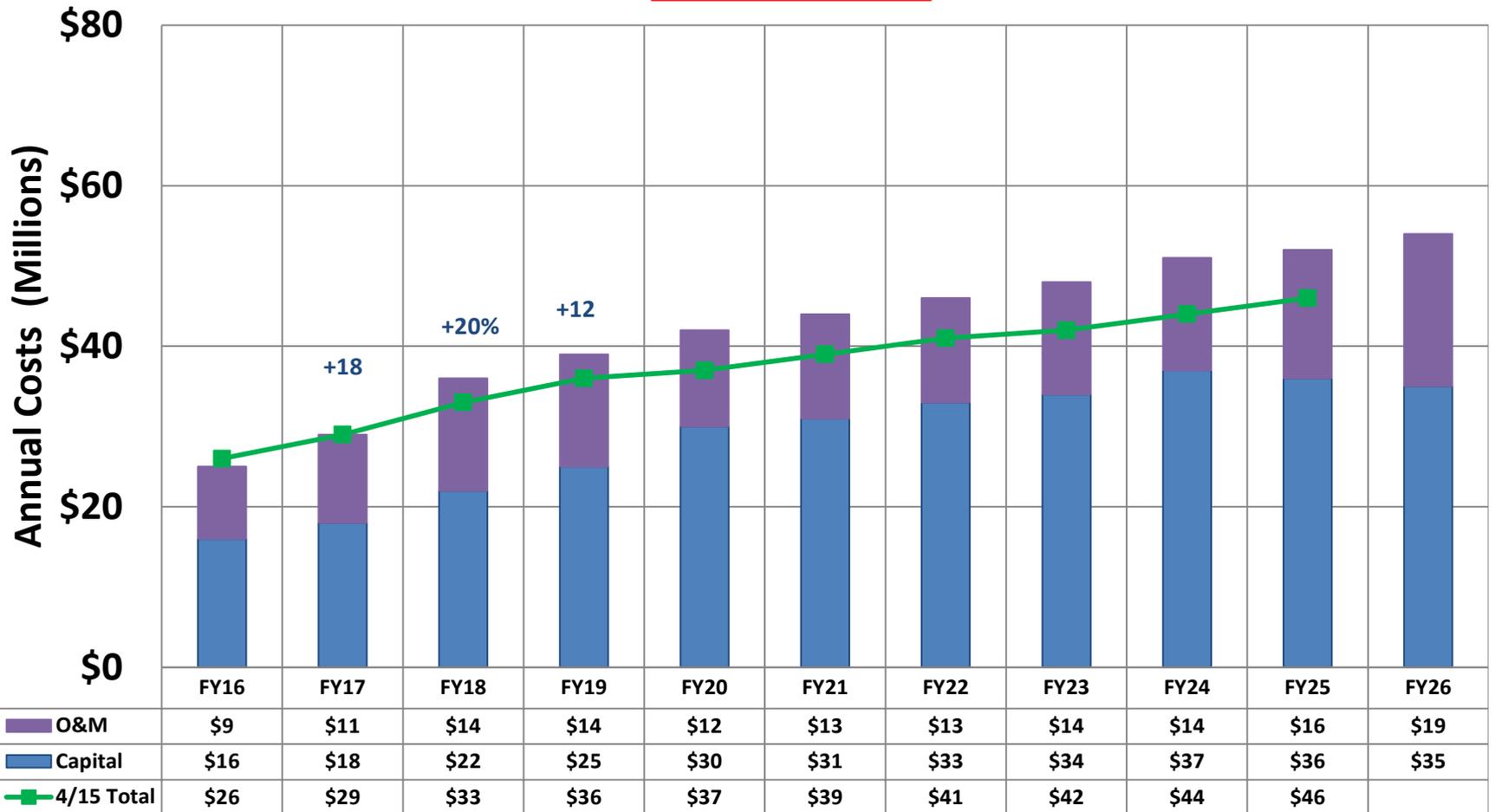
4/15 Program

Current Program  
 4/15 Program



# UEFIS TOTAL COSTS

**PRELIMINARY**





# UEFIS PRELIMINARY CHARGES (\$M)

Subject to change based on Actual Expenditures & Flows

	FY16 Bdgt	FY17 Est	FY18 Est	FY19 Est
Allen	\$3.10	\$3.47	\$4.20	\$4.73
Frisco	\$1.33	\$1.43	\$1.73	\$1.95
McKinney	\$5.83	\$6.97	\$8.43	\$9.50
Plano	\$10.60	\$12.55	\$15.18	\$17.10
Princeton	\$0.26	\$0.33	\$0.40	\$0.46
Prosper	\$0.62	\$0.68	\$0.80	\$0.87
<b>Richardson</b>	<b>\$2.50</b>	<b>\$2.96</b>	<b>\$3.58</b>	<b>\$4.03</b>

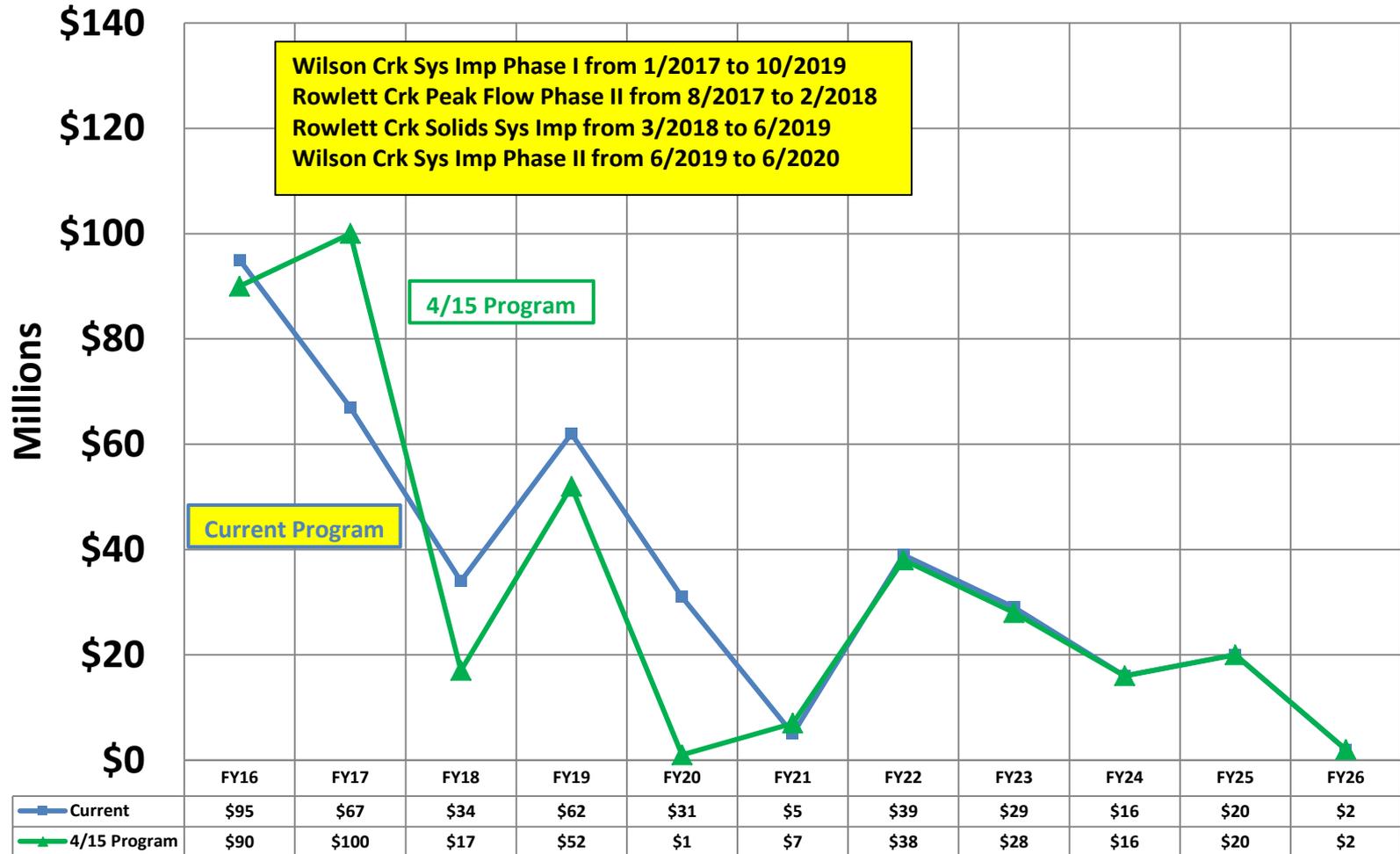


# REGIONAL WASTEWATER SYSTEM



# Regional WW CAPITAL PROGRAM

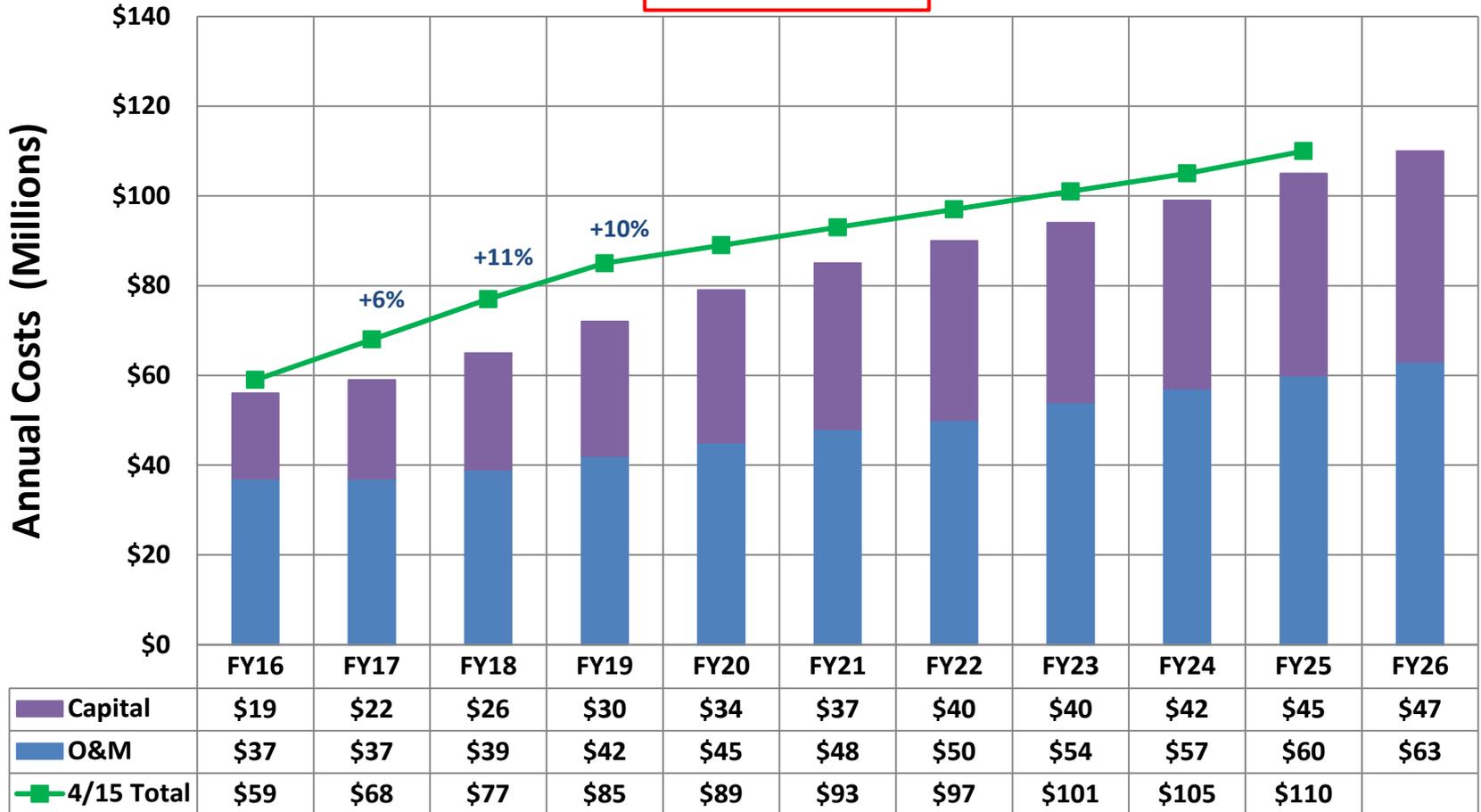
**PRELIMINARY**





# Regional WW TOTAL COSTS

**PRELIMINARY**





# Regional WW PRELIMINARY CHARGES (\$M)

Subject to change based on Actual Expenditures & Flows

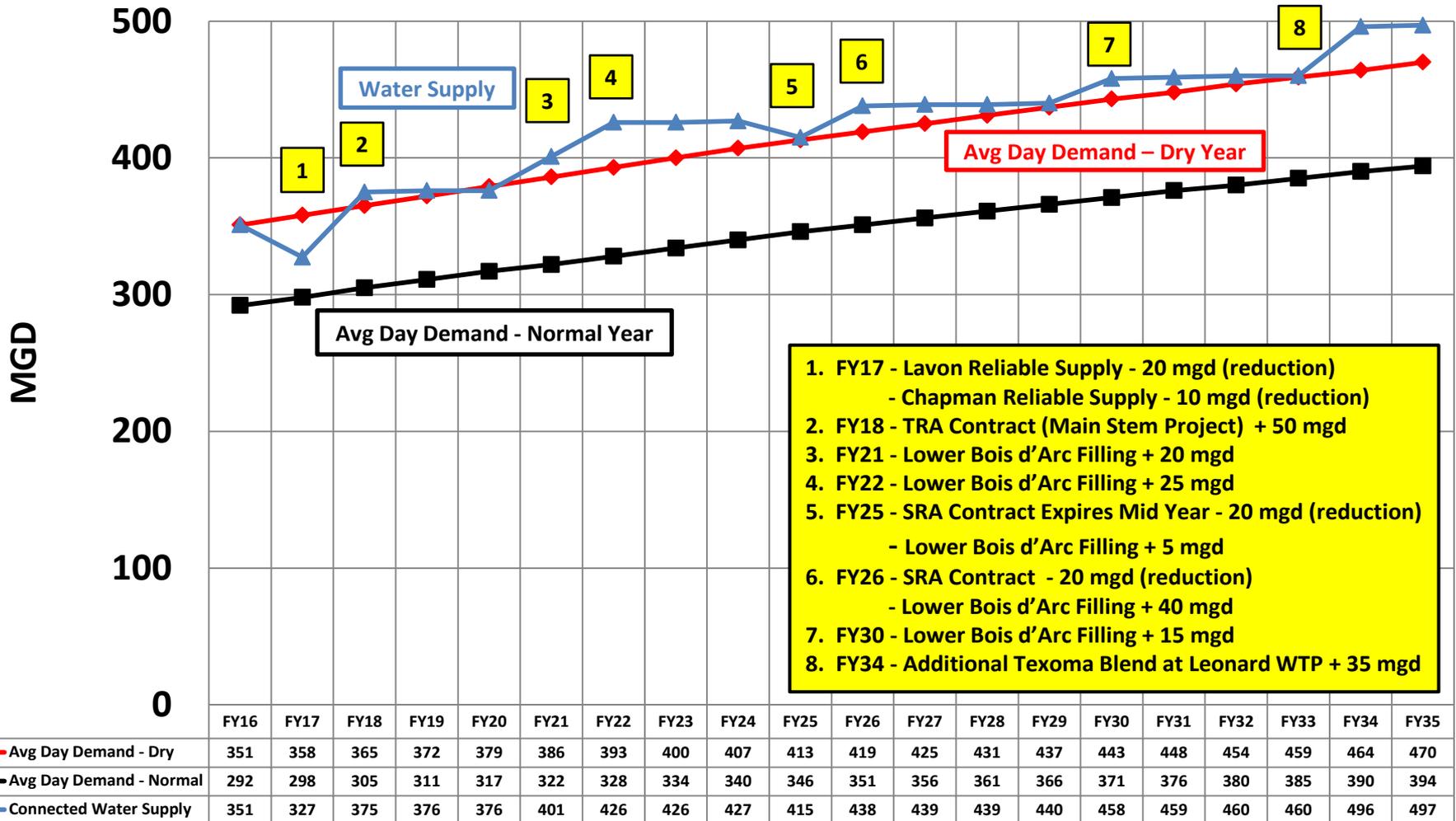
	FY16 Bdgt	FY17 Est	FY18 Est	FY19 Est
Allen	\$5.19	\$5.14	\$5.72	\$6.32
Forney	\$1.30	\$1.54	\$1.71	\$1.89
Frisco	\$2.22	\$2.13	\$2.36	\$2.61
Heath	\$0.63	\$0.75	\$0.84	\$0.93
McKinney	\$9.75	\$10.34	\$11.49	\$12.71
Mesquite	\$8.00	\$8.44	\$9.38	\$10.37
Plano	\$17.74	\$18.61	\$20.68	\$22.88
Princeton	\$0.44	\$0.50	\$0.55	\$0.61
Prosper	\$0.70	\$0.81	\$0.90	\$1.00
<b>Richardson</b>	<b>\$5.61</b>	<b>\$6.28</b>	<b>\$6.98</b>	<b>\$7.72</b>
Rockwall	\$1.24	\$1.18	\$1.31	\$1.45
Seagoville	\$1.15	\$1.12	\$1.21	\$1.30



# REGIONAL WATER SYSTEM

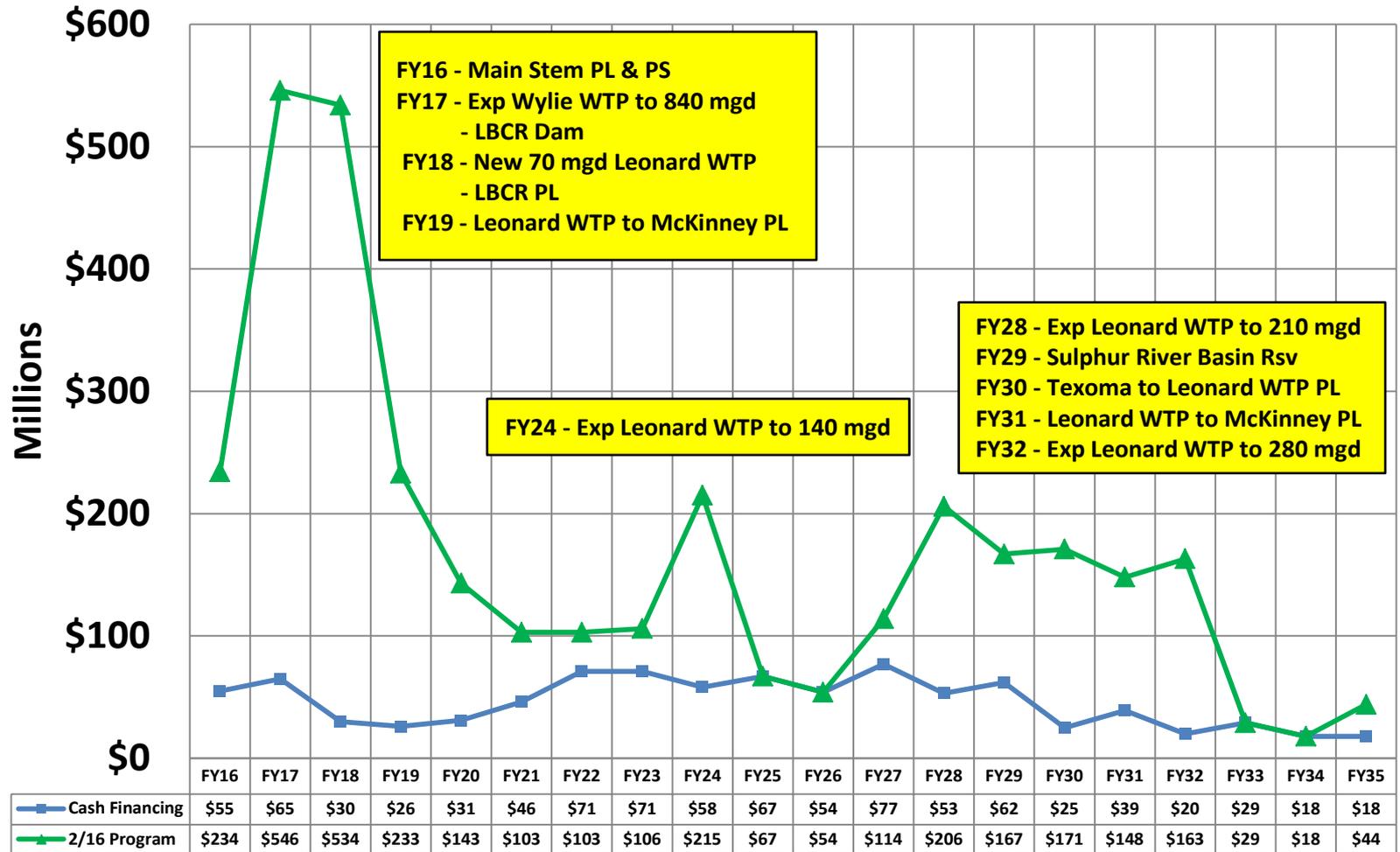


# CONNECTED WATER SUPPLY & DEMAND



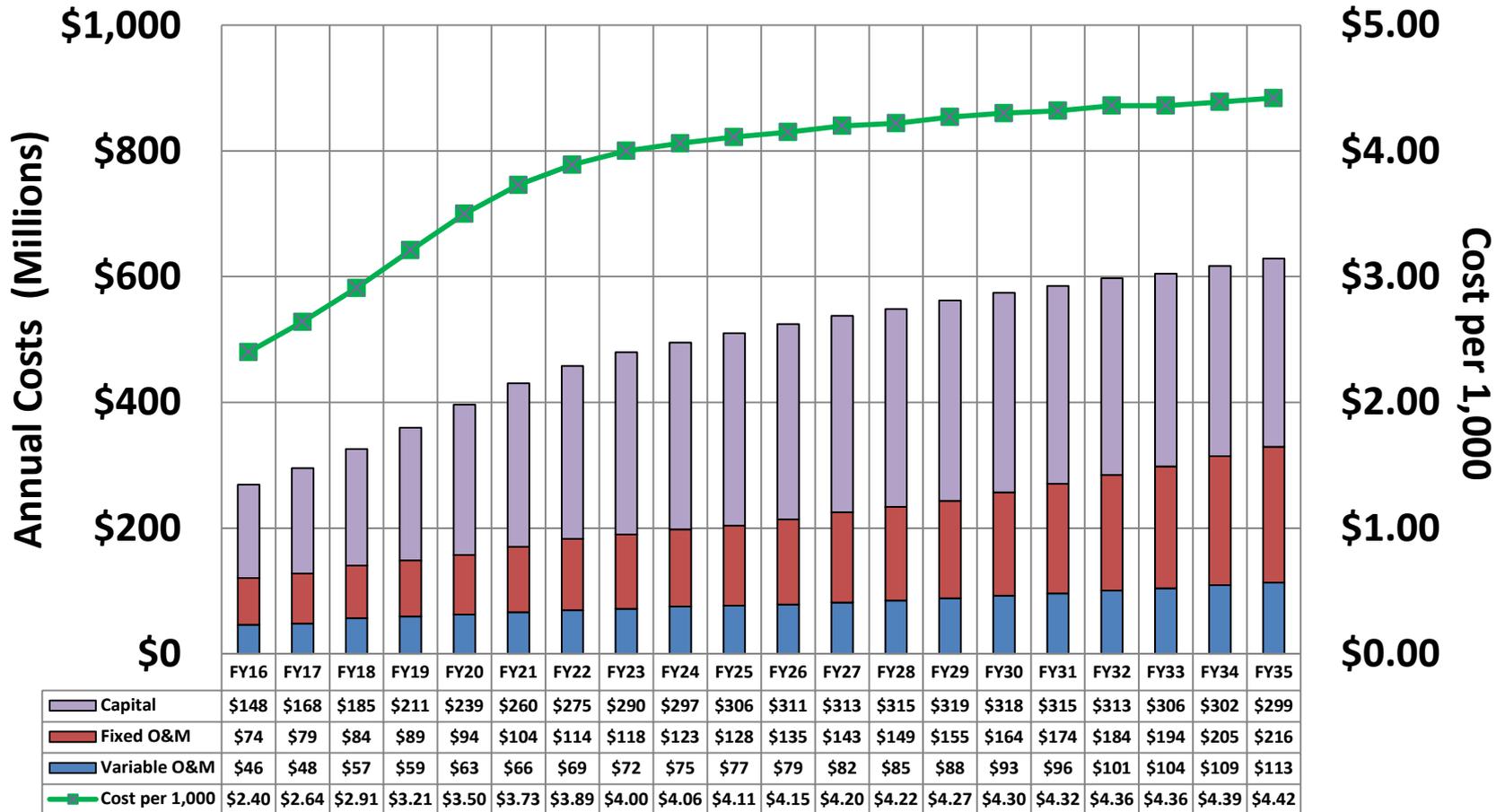


# WATER SERVICE CAPITAL PROGRAM



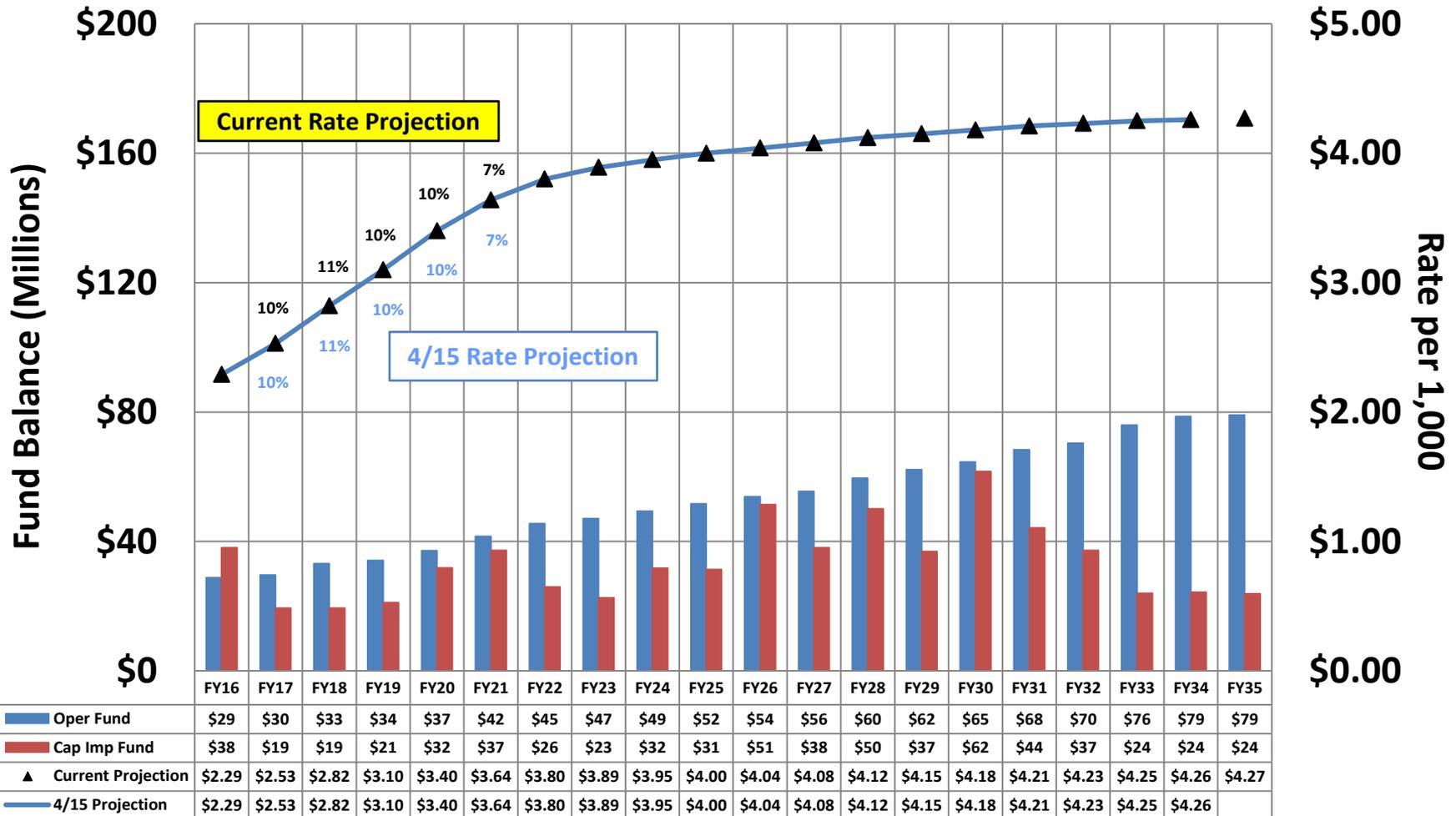


# WATER SERVICE TOTAL COSTS



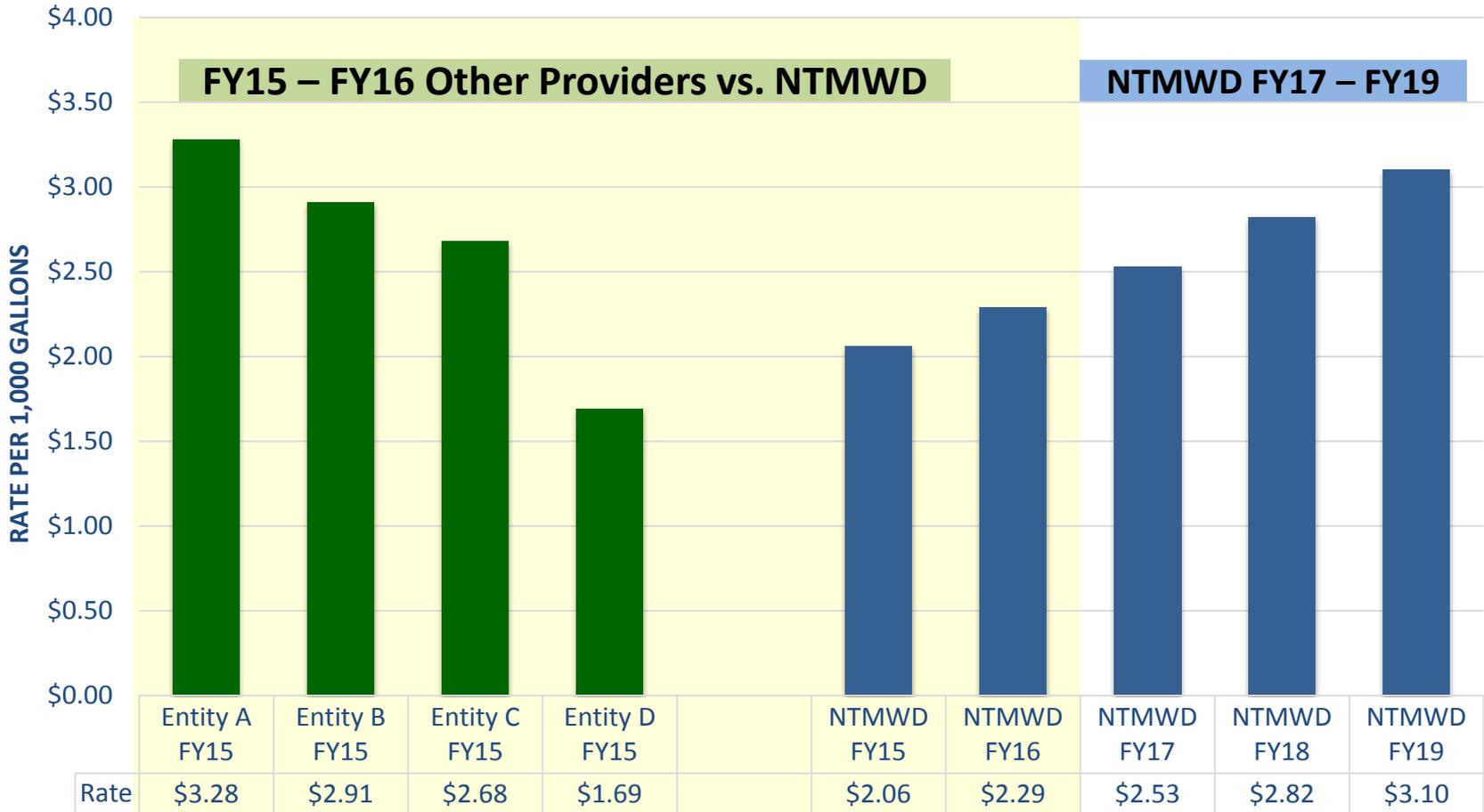


# WATER FUND BALANCE & MEMBER RATE





# Wholesale Water Rate Comparisons



*Note: Assumes a 2.21 Peaking Factor*



## Current Member Cities Wholesale Rate

- **Current rate = \$2.29/1000 gallons**
  - **\$1.88 covers system fixed costs (ex. infrastructure, debt)**
  - **\$0.41 covers variable costs (ex. chemicals, energy)**
  - **Cities receive annual rebate based on actual consumption**
  - **2015 Richardson rebate = \$1,948,872**
- **FY17 projected rate = \$2.53/1000 gallons**
  - **Approx. 83% of this will fund fixed system costs**
  - **Still 1/4 penny per gallon of treated water delivered**



# Water Historically Undervalued

- Providers need to lead in new ways
- Need help educating consumers on true cost and value of water
- Paying for water SERVICE, not just commodity



$\frac{1}{4}$  penny = cost of ONE gallon of water from NTMWD

*Best to work together to inform consumers about costs & challenges we face*



# Questions and Discussion

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# FY 16/17 Maintenance Strategies

City Council: June 6, 2016



# Introduction

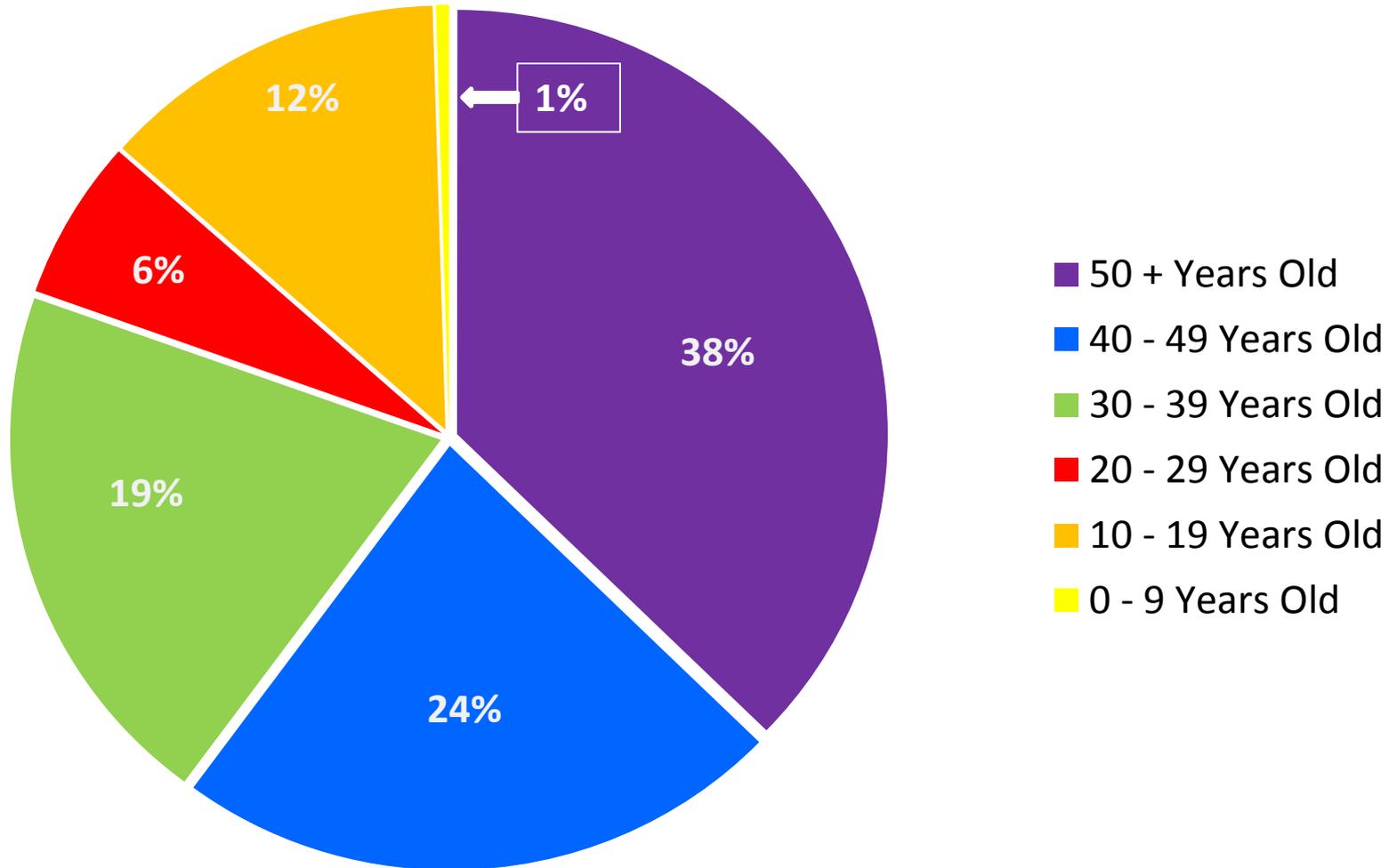
- The purpose of tonight's briefing is to:
  1. Provide status reports on FY 15/16 Maintenance Strategies
    1. Streets & Screening Walls
    2. Water & Wastewater
    3. Bridge Railings
    4. Traffic Signs & Markings
  2. Propose FY 16/17 Maintenance Strategies in advance of Budget Workshop and related discussions

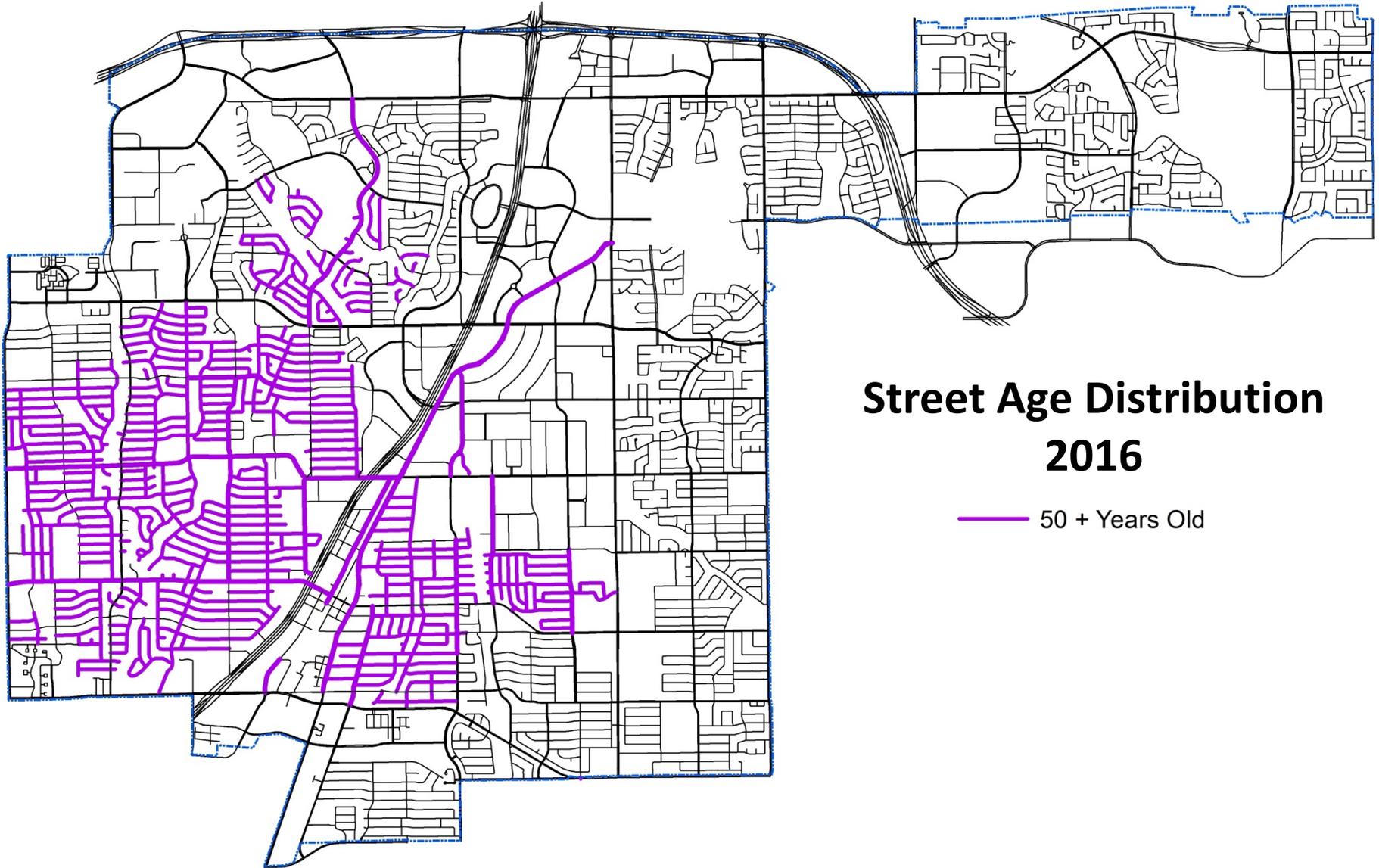


# Streets Maintenance Strategy



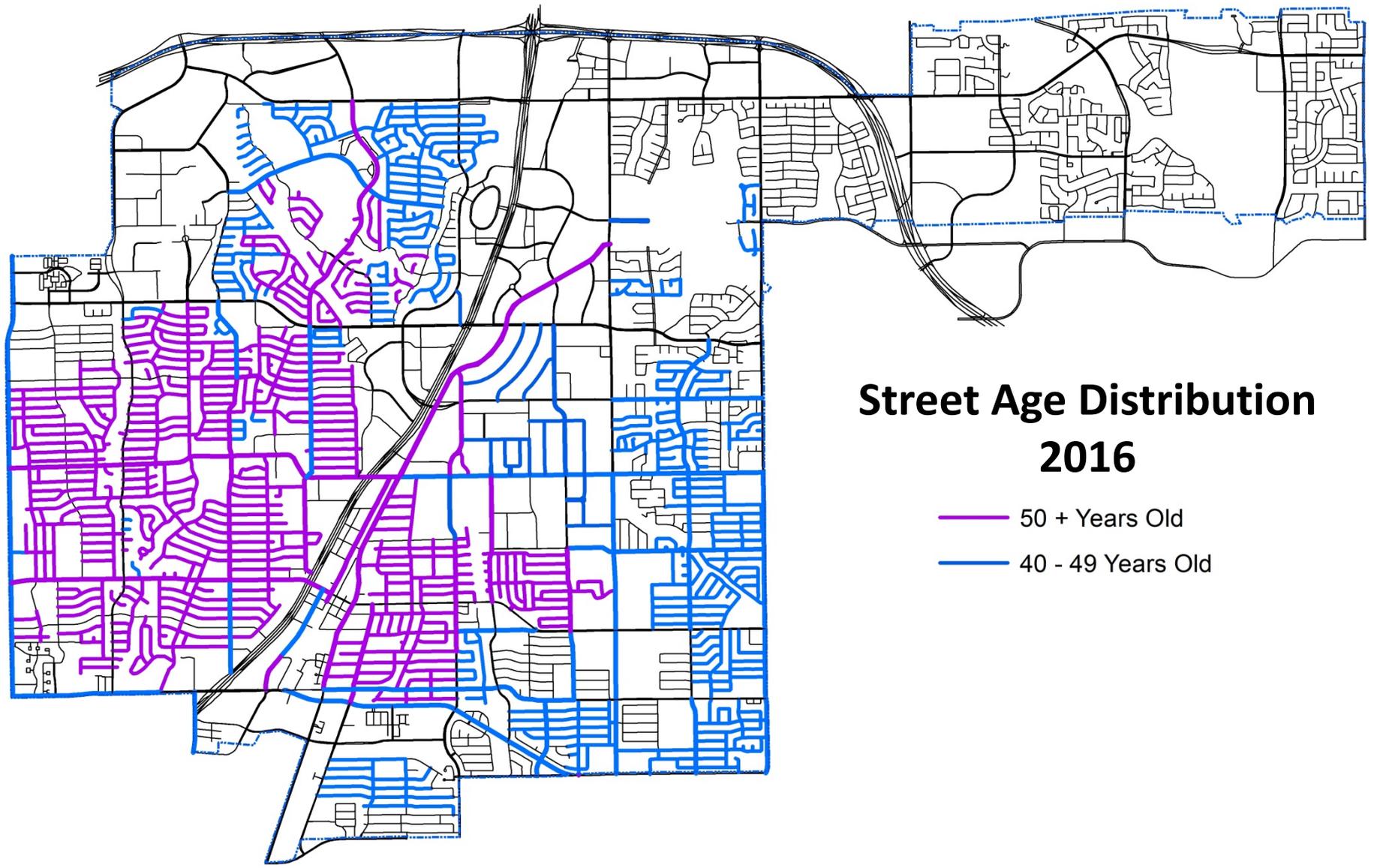
# Street Age Distribution 2016





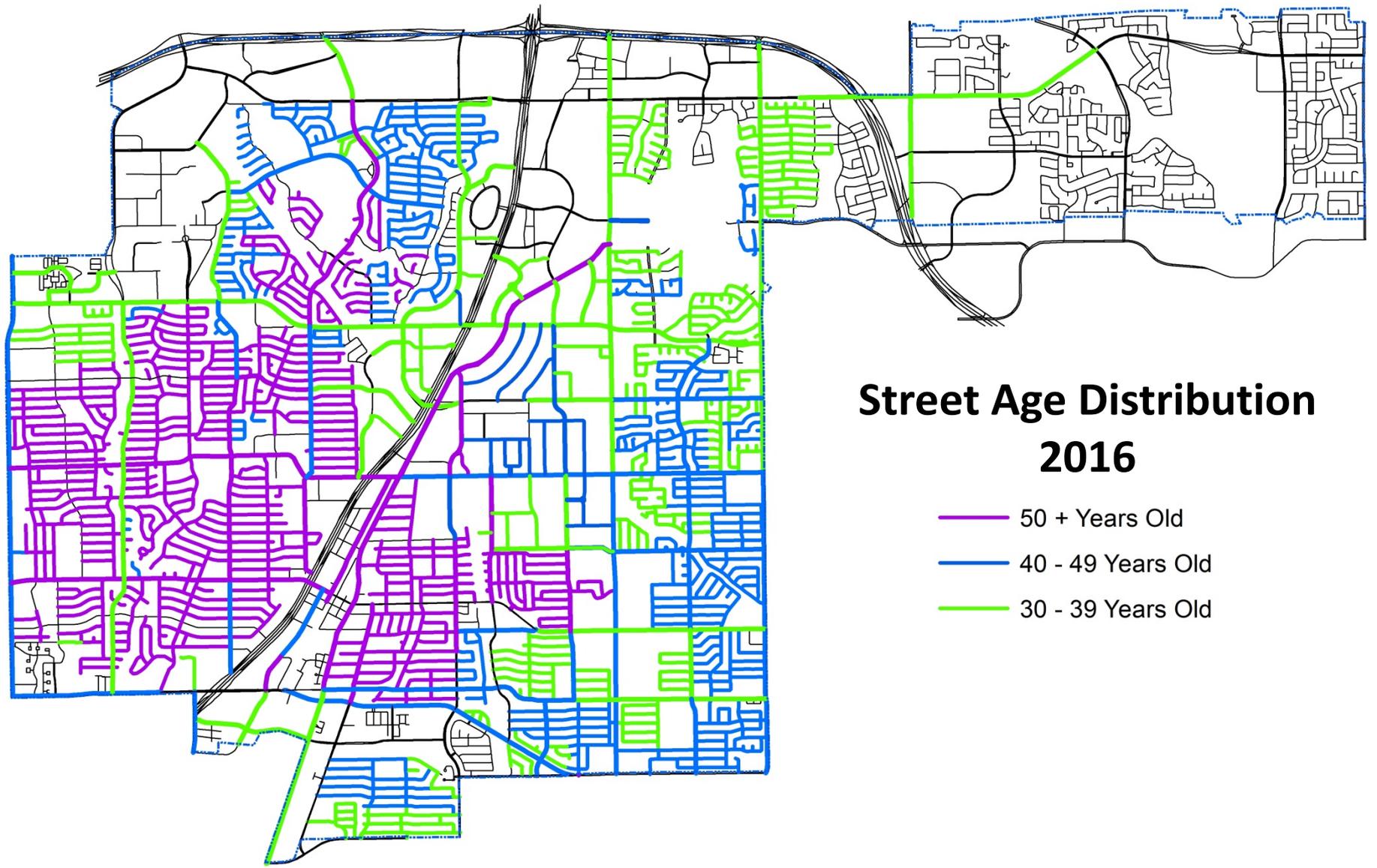
# Street Age Distribution 2016

— 50 + Years Old



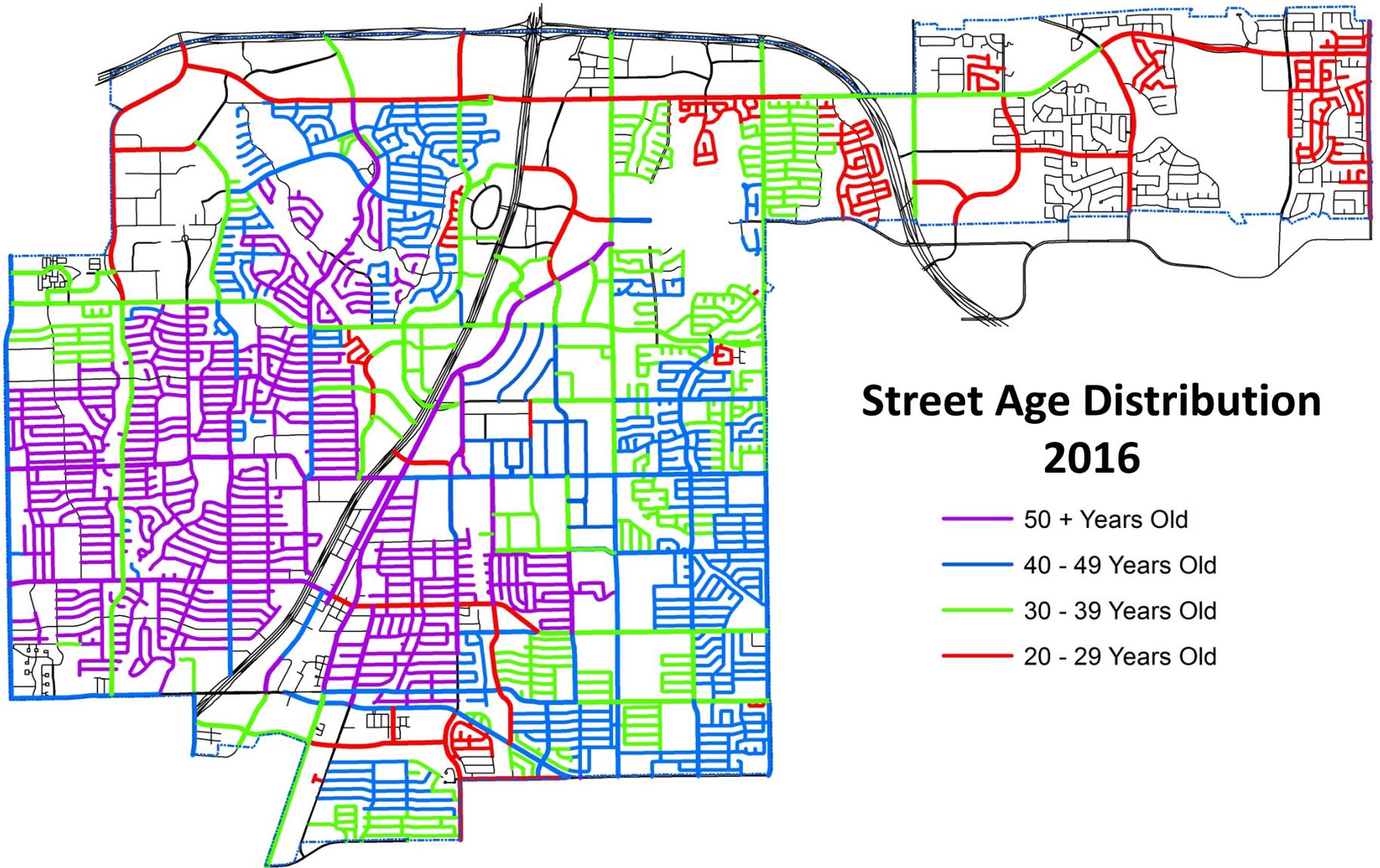
# Street Age Distribution 2016

- 50 + Years Old
- 40 - 49 Years Old



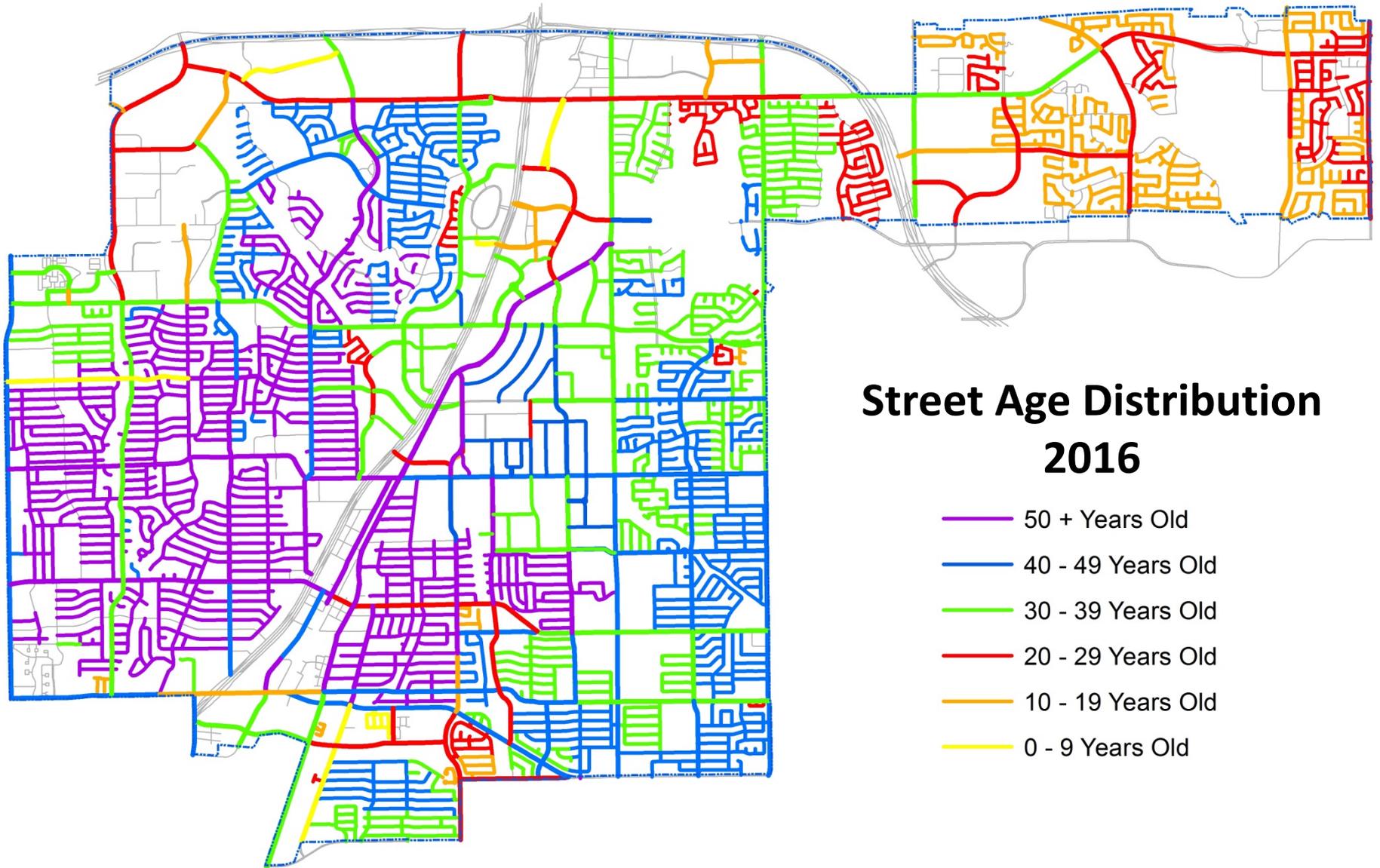
# Street Age Distribution 2016

- 50 + Years Old
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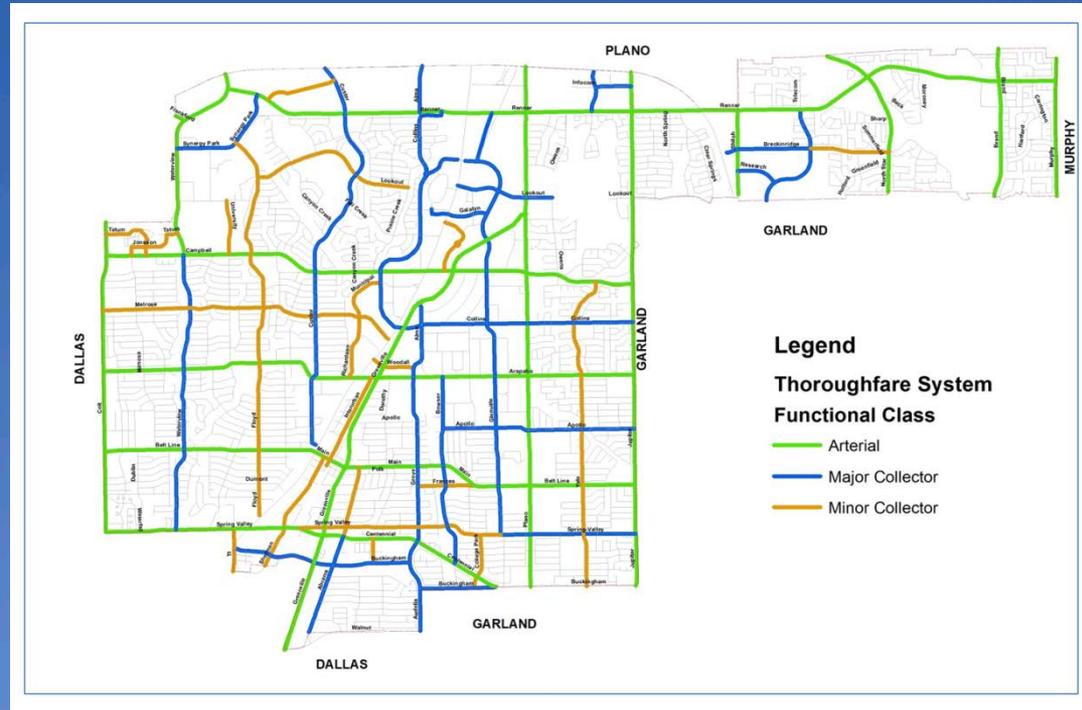
## Street Age Distribution 2016

- 50 + Years Old
- 40 - 49 Years Old
- 30 - 39 Years Old
- 20 - 29 Years Old



# Streets Classification

- Arterials - 57 Miles
- Major Collectors - 36 Miles
- Minor Collectors - 25 Miles
- Neighborhood Collectors - 31 Miles
- Residential – 228 Miles
- Alleys - 223 miles
- **Total – 600 miles**



# Street Types

- Concrete
  - 311 miles



La Salle Drive



# Street Types

- Concrete
  - 311 miles
- Asphalt Overlay
  - 60 miles



Bowser Road



# Street Types

- Concrete
  - 311 miles
- Asphalt Overlay
  - 60 miles
- Full Depth Asphalt
  - 10 miles



Edgehill Drive



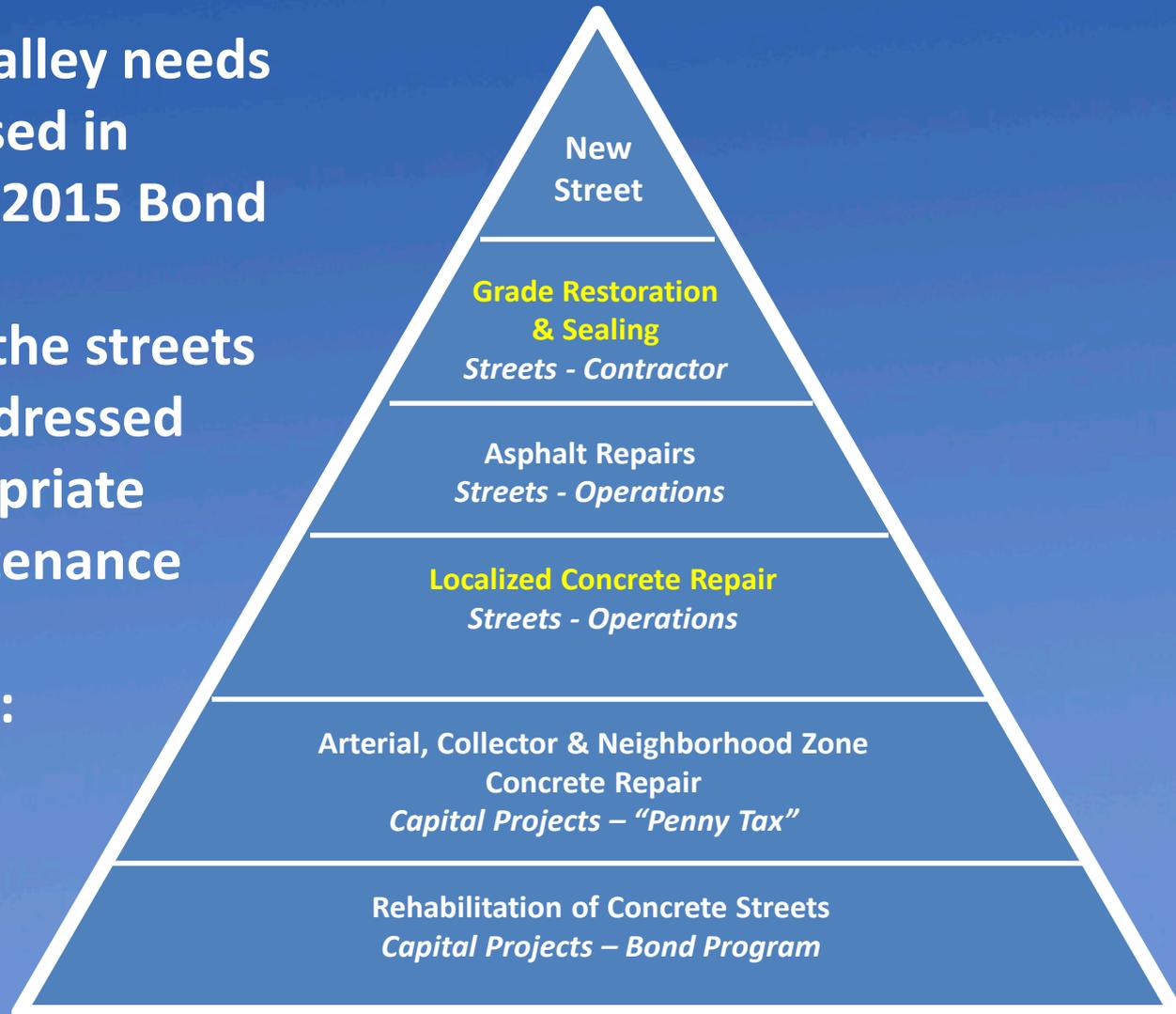
# Street Maintenance Cycle

- Many street and alley needs are being addressed in conjunction with 2015 Bond Program.
- The condition of the streets and alleys not addressed dictate the appropriate provisional maintenance strategy.
- Street Conditions:
  - Good
  - Fair
  - Poor



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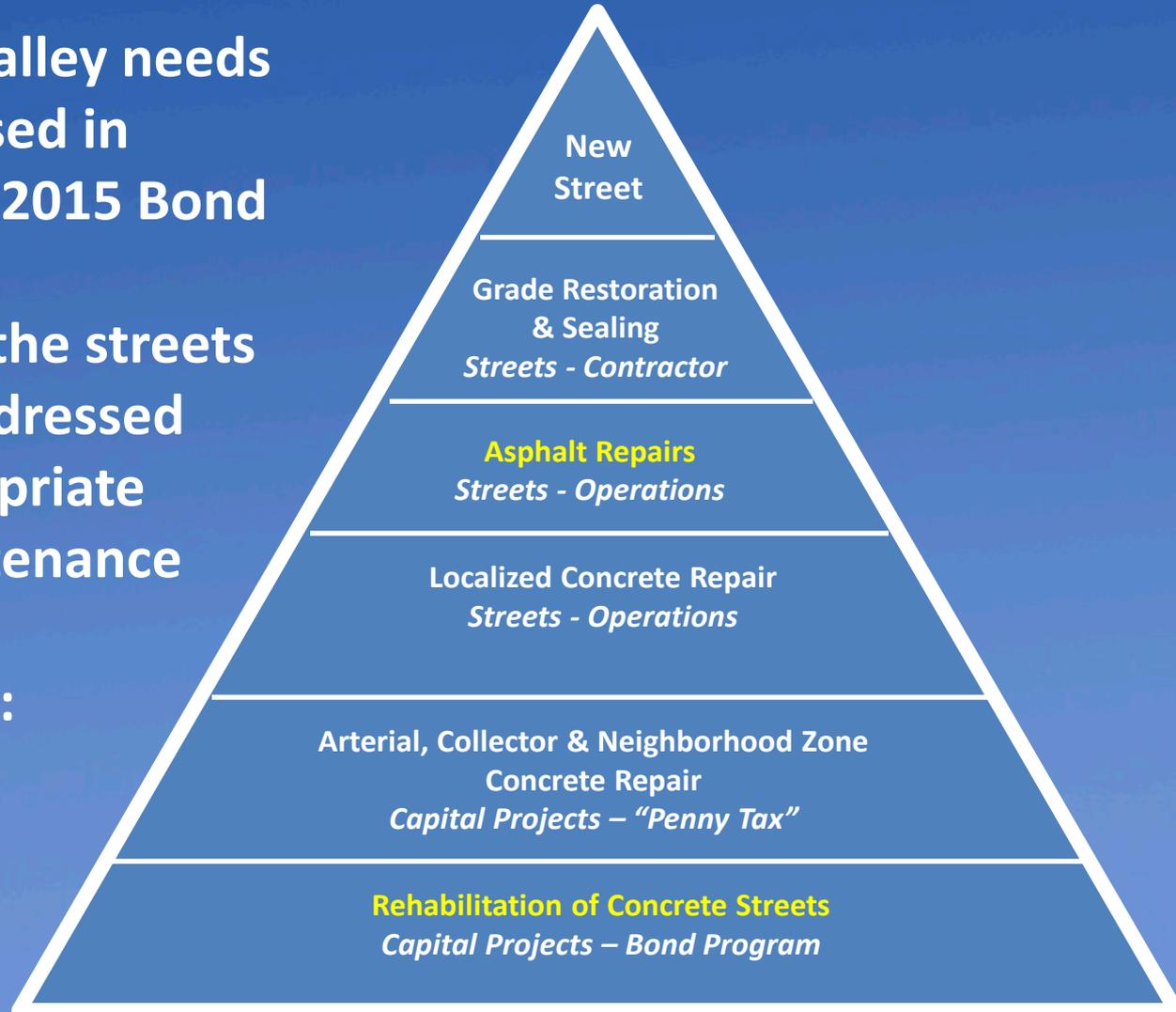
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# Street Maintenance Cycle

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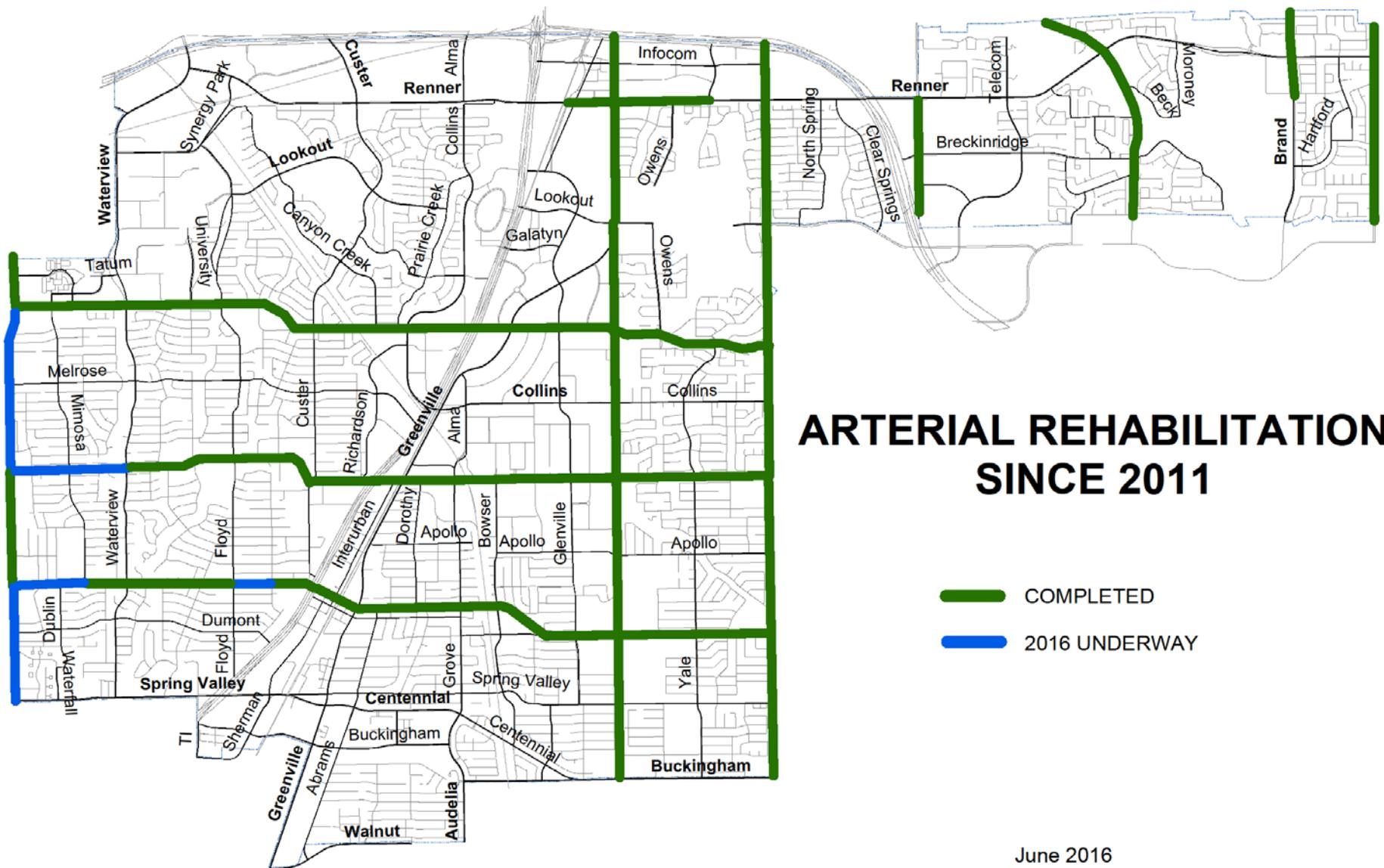


# Streets Management Strategy

	FY 12/13 Actual	FY 13/14 Actual	FY 14/15 Actual	FY15/16 Actual
Preventative Maintenance- Grade Leveling / Sealing*	\$500,000	\$250,000	\$210,000	\$150,000
Arterial Street Repair Program*	\$500,000	\$350,000	\$450,000	\$1,250,000
Collector Street Repair Program*	\$0	\$450,000	\$525,000	\$0
Neighborhood Street Repair Program*	\$0	\$750,000	\$1,000,000	\$800,000
Streets Operations	\$235,000	\$185,000	\$280,000	\$416,000
<b>Total</b>	<b>\$1,235,000</b>	<b>\$1,985,000</b>	<b>\$2,465,000</b>	<b>\$2,616,000</b>

\*Penny Tax



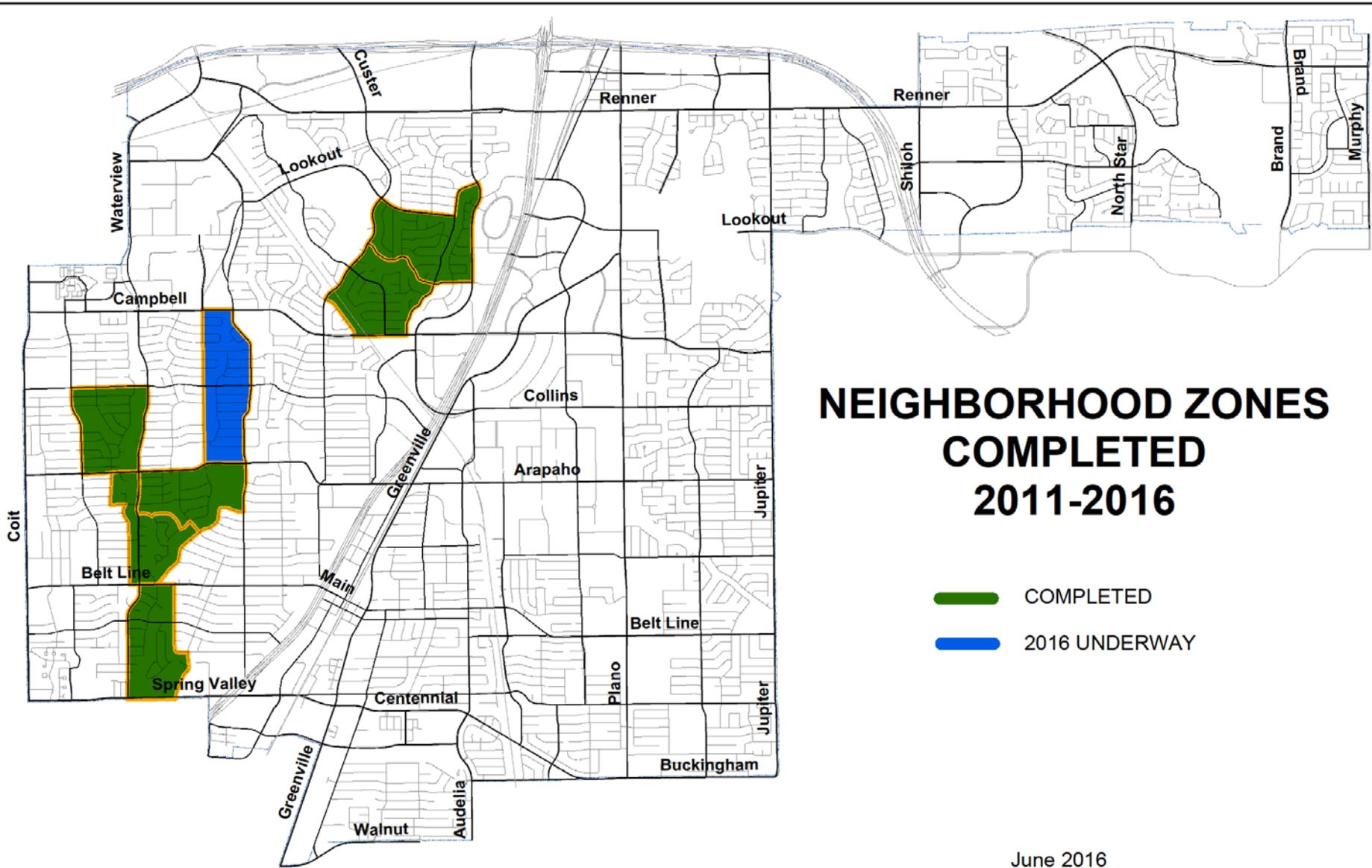


# ARTERIAL REHABILITATION SINCE 2011

- █ COMPLETED
- █ 2016 UNDERWAY

June 2016

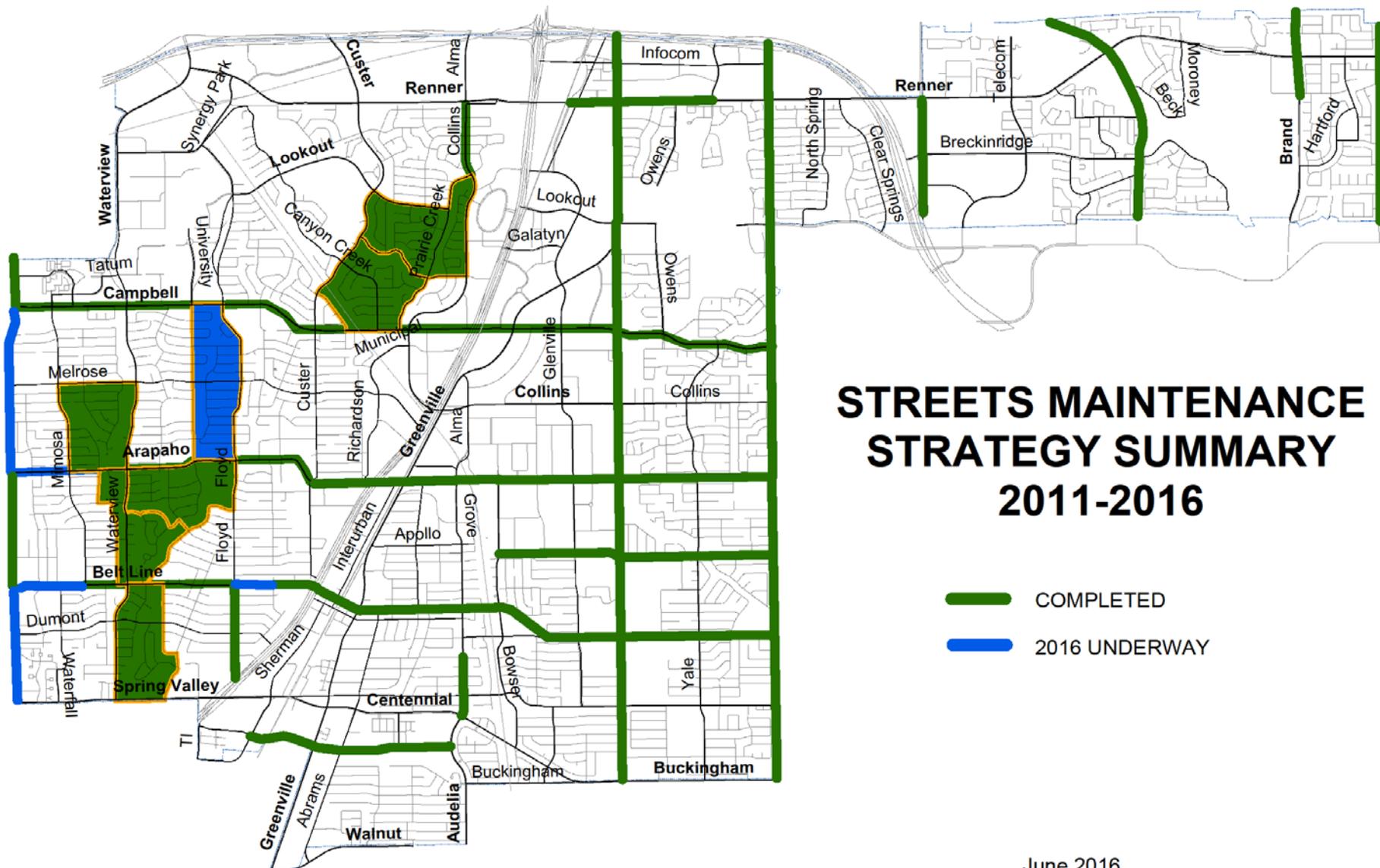




# NEIGHBORHOOD ZONES COMPLETED 2011-2016

- COMPLETED
- 2016 UNDERWAY

June 2016



# STREETS MAINTENANCE STRATEGY SUMMARY 2011-2016

June 2016

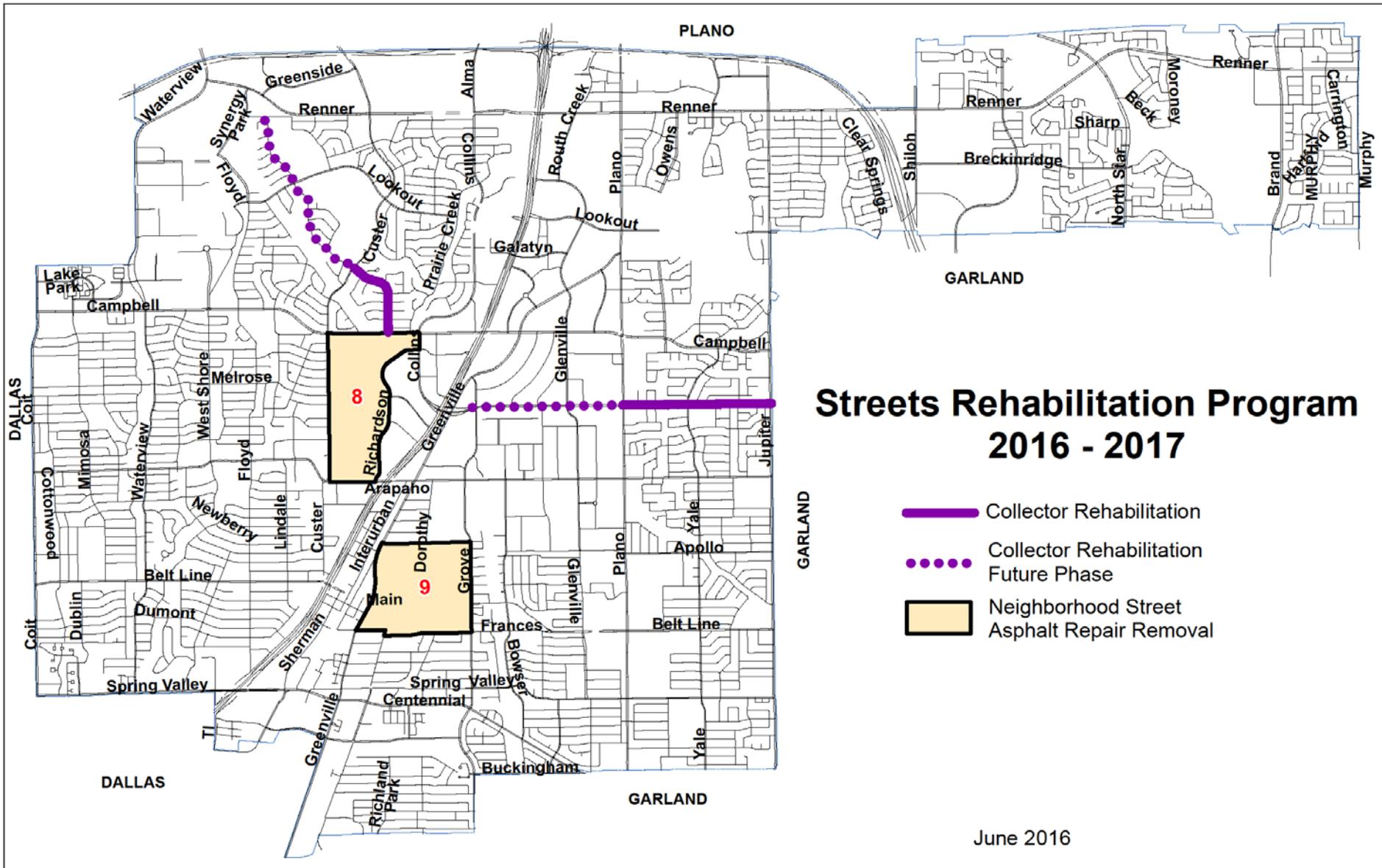
# FY 16/17 STREETS MANAGEMENT STRATEGY



# Guiding Principles

- Plan addresses arterials, collectors and residential streets
  - Focus on good and fair condition streets
  - Larger project will may require phased approach
- Focus on the driving surface – between the curbs
- Plan should be fluid, adaptable
  - If external funding opportunities arise, plan should be updated to leverage city funds to maximize repair areas
  - Priorities may change due to unanticipated failures that result in dangerous conditions or utility infrastructure needs





June 2016

# Streets Management Strategy

	FY 12/13 Actual	FY 13/14 Actual	FY 14/15 Actual	FY15/16 Actual	FY 16/17 Proposed
Preventative Maintenance- Grade Leveling / Sealing*	\$500,000	\$250,000	\$210,000	\$150,000	<b>\$150,000</b>
Arterial Street Repair Program*	\$500,000	\$350,000	\$450,000	\$1,250,000	<b>\$0</b>
Collector Street Repair Program*	\$0	\$450,000	\$525,000	\$0	<b>\$1,450,000</b>
Neighborhood Street Repair Program*	\$0	\$750,000	\$1,000,000	\$800,000	<b>\$900,000</b>
Streets Operations	\$235,000	\$185,000	\$280,000	\$416,000	<b>\$610,000</b>
Total	\$1,235,000	\$1,985,000	\$2,465,000	\$2,616,000	<b>\$3,110,000</b>

\*Penny Tax





# Screening Wall Maintenance Strategy



# Introduction

- **Screening Walls Management Strategy**
  - **Construction of new walls as required by the City's current development standards**
  - **Construction of end cap enhancements on existing walls at neighborhood entry points**
  - **Reconstruction and repair of damaged brick and stone walls**
  - **Washing and painting concrete and stucco walls**



# Screening Wall Inventory

- Over 340 walls inventoried (Approximately 41 miles)
- Catalogued location, dimensions, material, finish, etc.
  - Visually assessed physical condition of panels, columns and foundations
  - Visually assessed appearance of surface and finish
  - Assessment included the severity and extent of each deficiency
- Wall types
  - The most common wall materials are concrete and brick
    - Concrete - cast in place, concrete block, or precast panels
    - Additional types include stone, stucco, and vinyl panels



# Wall Maintenance

- **Maintenance**
  - **City Maintained**
    - **129 walls totaling 16.6 miles**
      - All cast in place walls have been washed and painted a uniform color
  - **Privately Maintained**
    - **214 walls totaling 24.4 miles**
      - Commercial and Multi-Family
      - Homeowner Associations
      - Private individuals



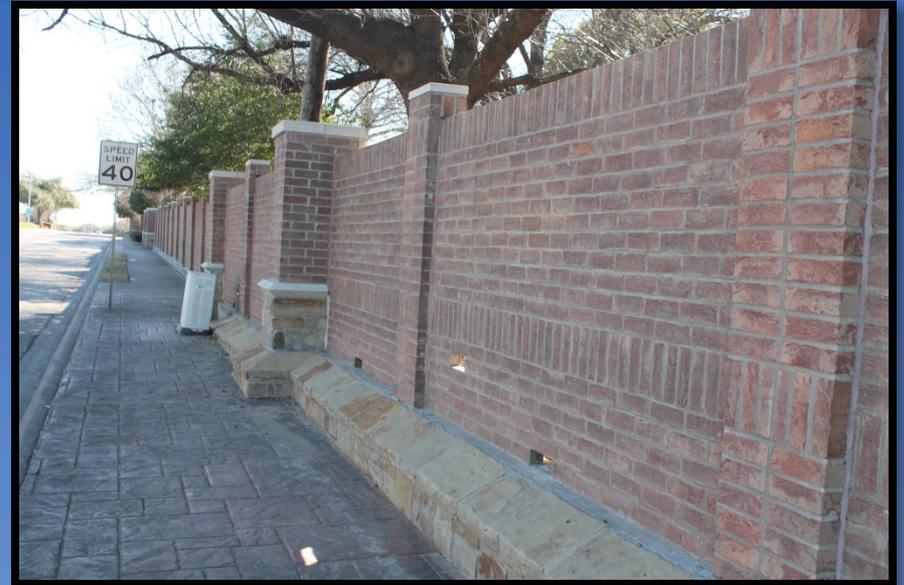
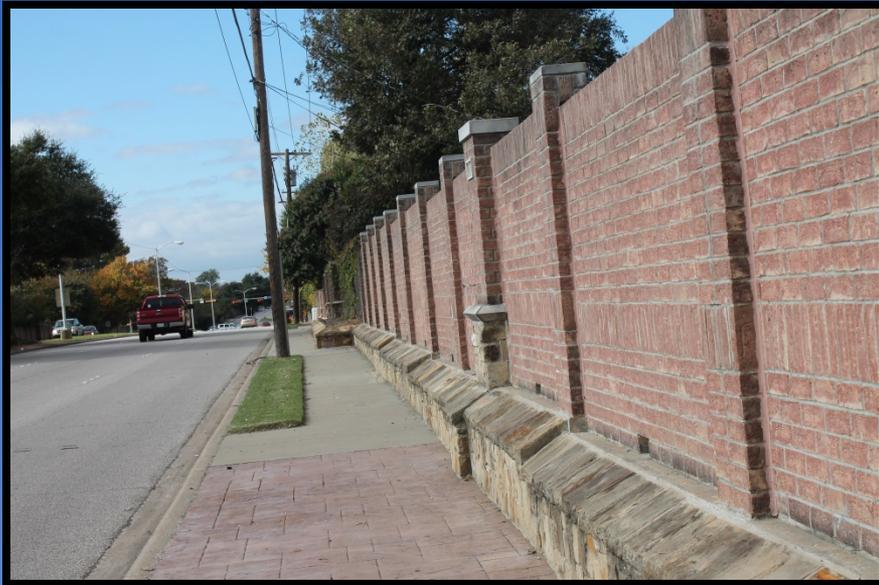


# Wall Washing / Painting Completed Work

FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
\$40,000	\$40,000	\$120,000	\$120,000	\$50,000
<b>26,379 SF</b> washed / painted	<b>60,908 SF</b> washed / painted	<b>106,004 SF</b> washed / painted	<b>86,435 SF</b> washed / painted  <b>70</b> neighborhood entry features power washed	<b>38,016 SF</b> washed as of May 12, 2016  Additional <b>38,000</b> to be washed before the end of September 2016



# Arapaho Rd - Waterview to Woodland Way North Side



# Arapaho Rd - Waterview to Crestview South Side



# FY 16/17 Screening Wall Management Strategy

- Funding: \$50,000
- City owned walls will continue to be washed/painted on a rotation determined by the following criteria:
  - Date since last washing/painting
  - Amount of traffic on adjacent roads
  - Environmental impacts
  - Overall aesthetic integrity
- Next year's rotation will be determined subsequent to completion of current year projects.





# Water/Wastewater Maintenance Strategy

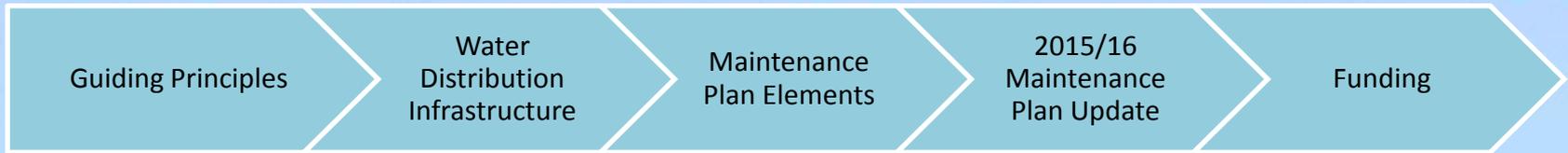




# Water Maintenance Strategy

City of Richardson  
Public Services

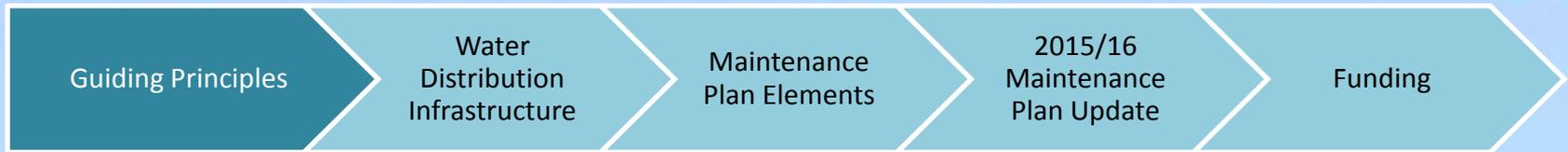




# Water Distribution System Overview

- Guiding Principles
- Water Distribution System Infrastructure
- Water Maintenance Plan Elements
- 2015/16 Maintenance Plan Update
- Funding Sources





## Guiding Principles

- Comply with all federal, state and local regulations
- Efficiently and effectively manage, operate and maintain all parts of the distribution system
- Maintain “Superior” water system rating from Texas Commission on Environmental Quality
- Provide adequate capacity to deliver water during peak demand while transporting water through the distribution system as expeditiously as possible to ensure water quality
- Continue to closely partner with NTMWD on water related projects



Guiding Principles

Water  
Distribution  
Infrastructure

Maintenance  
Plan Elements

2015/16  
Maintenance  
Plan Update

Funding

# Water Distribution System



## PUBLIC SERVICES:

**5** PUMP STATIONS  
75.9 MGD FIRM CAPACITY

**7** GROUND STORAGE  
TANKS 27.5 MG TOTAL

**7** ELEVATED STORAGE  
TANKS 8.75 MG TOTAL

**585** MILES OF  
WATER MAIN

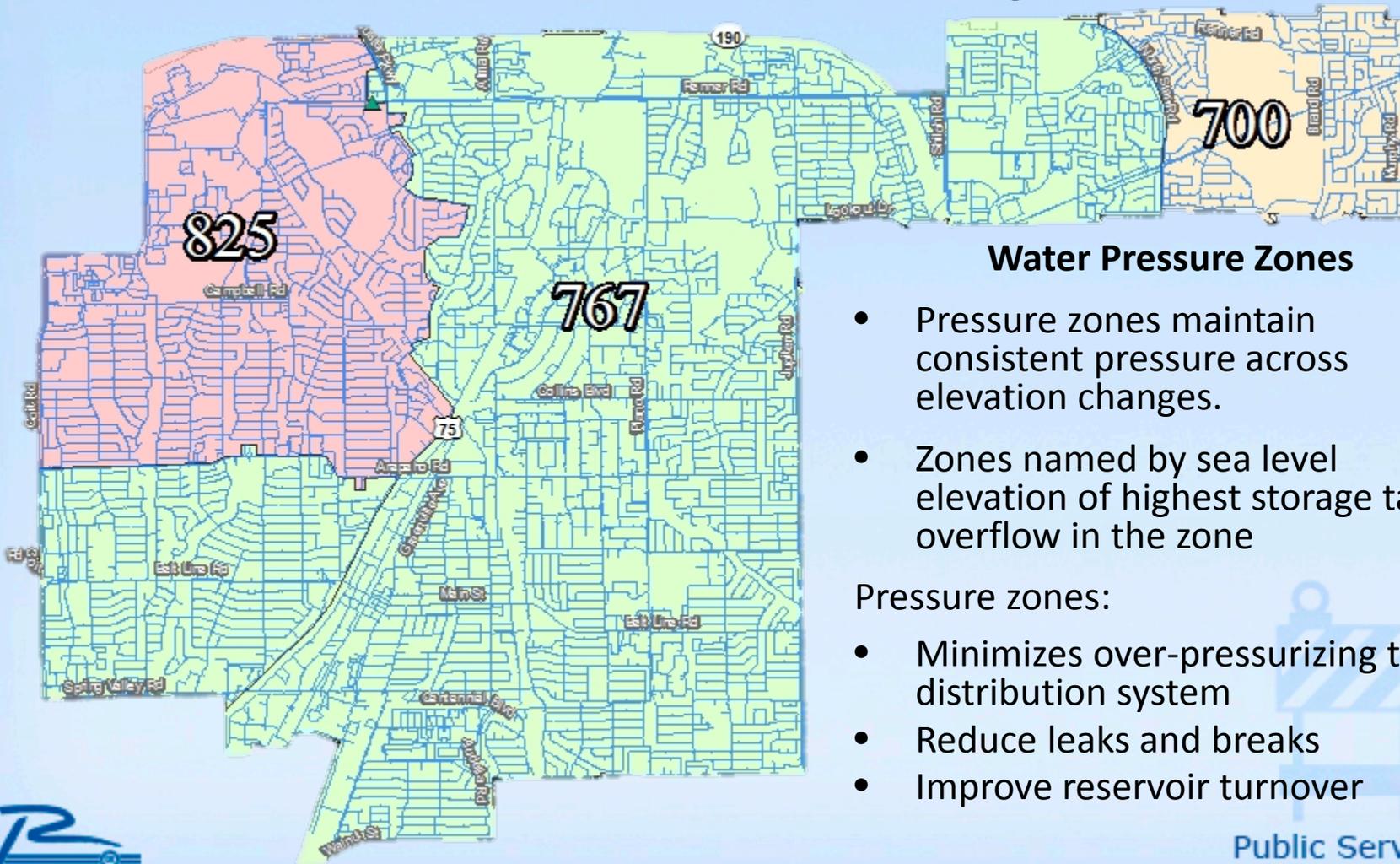
**34,652** SERVICE  
CONNECTIONS

**13,800** VALVES

**4,470** HYDRANTS



# Water Distribution System



## Water Pressure Zones

- Pressure zones maintain consistent pressure across elevation changes.
- Zones named by sea level elevation of highest storage tank overflow in the zone

### Pressure zones:

- Minimizes over-pressurizing the distribution system
- Reduce leaks and breaks
- Improve reservoir turnover





# Water Maintenance Plan Elements

- Elevated/Ground Storage and Facilities Maintenance
- Water meter replacement program
- Water main maintenance
- Hydrant maintenance
- Valve replacement program





# Elevated Storage

## Elevated Storage Evaluation Program

- Program evaluates all elevated storage using American Water Works Association (AWWA) standard of 3 to 5 years.
- Tank evaluations are performed by licensed engineers for structural integrity and degree of metal corrosion and provides guidance on maintenance, rehabilitation and/or replacement

## 7 Elevated Storage Tanks

Three types of evaluations:

- Dry – Tank is drained
- Dive – Tank not drained, certified divers
- Remote Operated Vehicle (ROV) – Tank remains in service

## FY 2017, Scheduled rehabilitation for Centennial Elevated Storage Tank

- Project will included maintenance on all internal and external surfaces of the tank



Guiding Principles

Water  
Distribution  
Infrastructure

Maintenance  
Plan Elements

2015/16  
Maintenance  
Plan Update

Funding

# Ground Storage and Facilities Maintenance

## Water Facilities Maintenance and Operations Study

- Comprehensive evaluation of water delivery infrastructure to include multiple critical components essential to uninterrupted water service

Study will include:

7 Ground Storage Tanks

5 Water Pump Stations

- 18 Distribution Pumps
- 5 Transfer Pumps
- 2 Booster Pumps





# Water Meter Replacement Program

34,652 active metered accounts

- 5/8" – 1-1/2" = 32,371 Meters
- 2" – 10" = 2,281 Meters

Meter replacement program currently underway

- Multi year plan is scheduled based on age of meters
- Annual replacement goal of 3,000 meters per year

Meter Maintenance program

- Meters repaired and replaced throughout the system in response to service request
- Continuing to replace meters in conjunction with construction projects

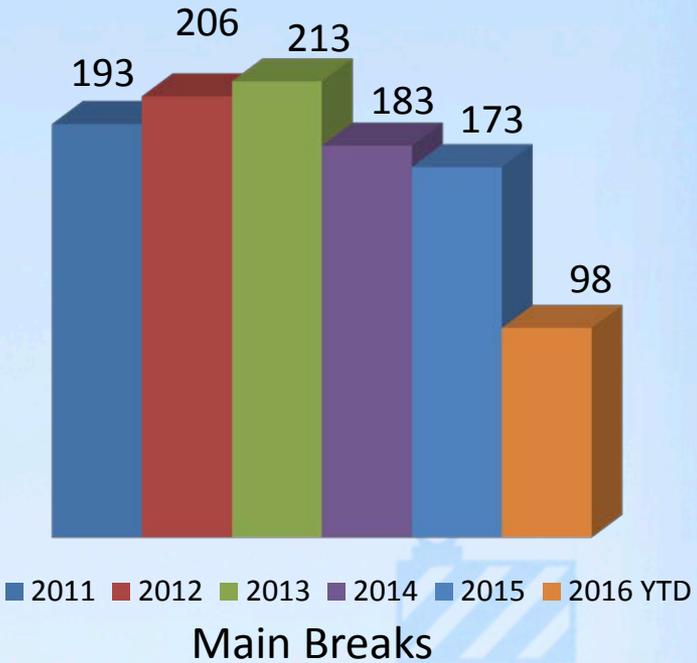




# Water Main Maintenance

## Water Main Repair

- Perform routine and emergency repairs throughout the distribution system on 585 miles of water main
- Utility crews respond to 2,800 water service requests annually
- Climate, age, material and construction activities contribute to water main failures
- Aging infrastructure and natural ground movement increases maintenance frequency and cost



# Water Main Maintenance

## Water Main Replacement

Projects are identified based on historical maintenance records mapped by GIS using the following criteria:

- Condition of water main and other related infrastructure, street condition and overall age

FY 2017, nine locations identified for replacement totaling 10,000 linear feet of main and 230 services

- Complete replacement of water main, valves, service connections, water meters and improvement of street condition



# Hydrant Maintenance

## Hydrant Repair or Replacement

4,470 hydrants

### Hydrant Assessment Program

- Expanded Program for 2017
- Performed by CoR Staff and Contractor
- Testing and flushing hydrant for proper operation and water quality
- Painting of Hydrants, Replace/Repair missing components

### Installation of new hydrants

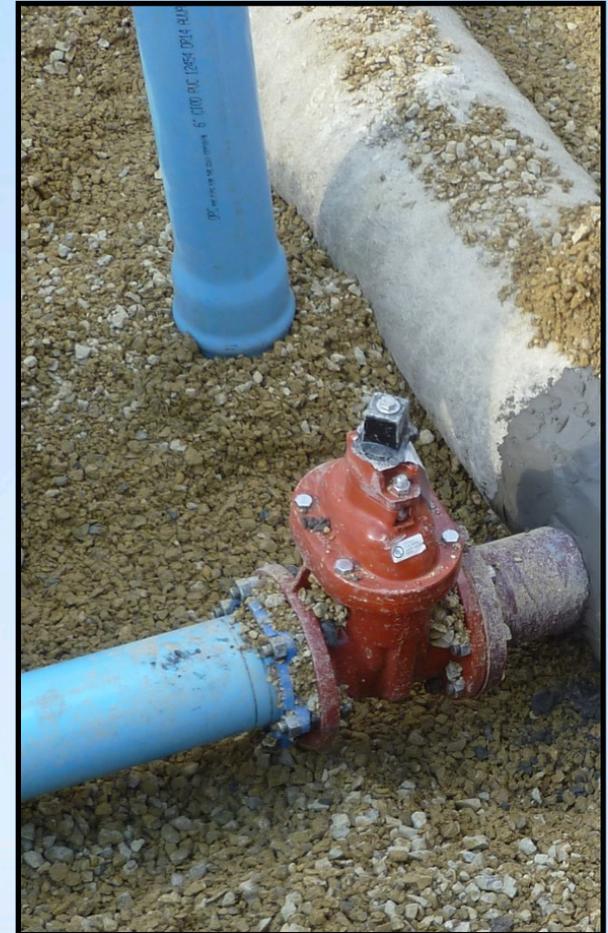
- Relocation, unable to repair or damaged (struck by vehicles)
- 40 hydrants replaced annually



# Valve Replacement Program

## Small Valve Replacement

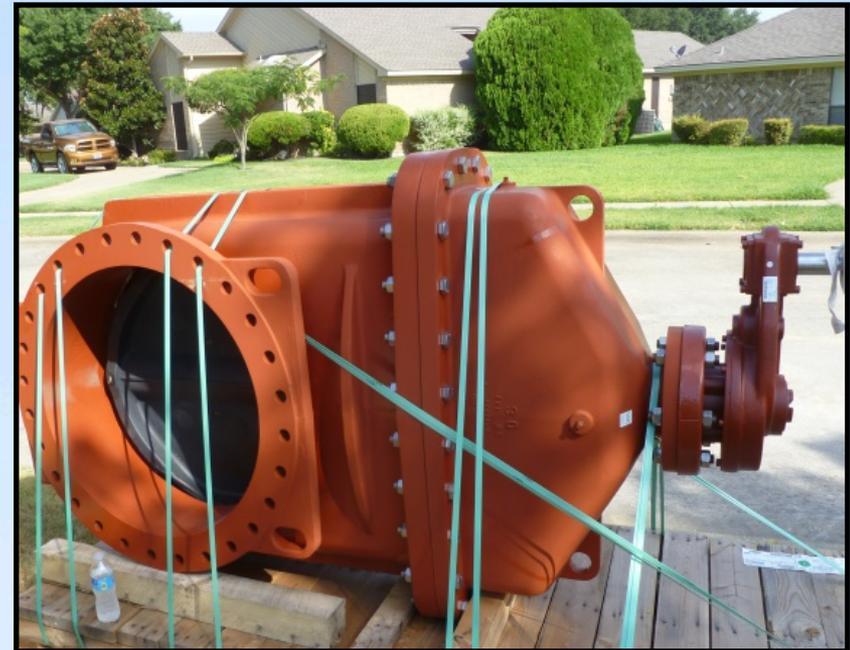
- 13,800 Total Valves
- 13,464 valves 12” or smaller
- 97% of total valves
- Small valves are critical components of maintaining an efficient water system
- Narrows impact to customers during emergency repairs and limits outage area
- Small valve replacements are identified based on location, depth, current valve condition and service connections affected



# Valve Replacement Program

## Large Valve Replacement

- 336 valves 14" and larger
  - 14" - 22" = 287 valves
  - 24" - 36" = 49 valves
- 3% of total valves
- Large valves allow isolation of transmission mains
- Large valve replacements are scheduled after condition assessment using specialized valve operating equipment



Guiding Principles

Water  
Distribution  
Infrastructure

Maintenance  
Plan Elements

2015/16  
Maintenance  
Plan Update

Funding

# Maintenance Plan Update

## 2015/16 Strategy Update

- Evaluation and Planning
  - Copper Ridge EST – ROV
  - Glenville EST – Drained
- Valve Replacement Program
  - Yale & Apollo
    - 30" and 20" valves
  - Renner & Foxboro
    - 20" valve
- Water Main Repair and Replacement
  - 100 Main break repairs to date
  - Four locations totaling 4,300 linear feet
  - City Hall service connection improvements
- Storage Tank Water Mixer Installation
  - 2 Elevated Storage Tanks
  - 1 Ground Storage Tank



Guiding Principles

Water  
Distribution  
Infrastructure

Maintenance  
Plan Elements

2015/16  
Maintenance  
Plan Update

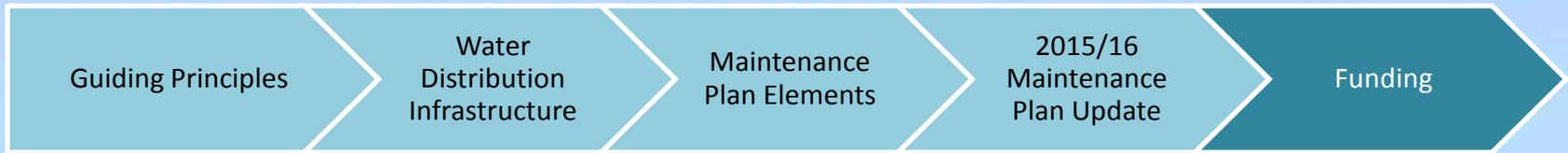
Funding

# Maintenance Plan Funding

The Water Distribution System Maintenance funding comes from two primary sources:

- Utility Fund Operations
- Utility Fund Certificates of Obligation (CO)





# Utility Fund - Operations

Programs	FY 14/15	FY 15/16	FY 16/17 (proposed)
Elevated/Ground Storage and Facilities Maintenance	\$185,000	\$162,000	\$222,500
Water Main Repair	\$263,000	\$317,000	\$348,000
Hydrant Repair/Replacement	\$50,000	\$55,500	\$133,500
Small Valve Replacement Program	\$20,000	\$22,500	\$23,000
Water Meter Maintenance	\$50,000	\$140,000	\$75,000
<b>Total</b>	<b>\$568,000</b>	<b>\$697,000</b>	<b>\$802,000</b>



Guiding Principles

Water  
Distribution  
Infrastructure

Maintenance  
Plan Elements

2015/16  
Maintenance  
Plan Update

Funding

# Utility Fund – Certificates of Obligation

Programs	Series 2017 (proposed)	Series 2018	Series 2019	Series 2020	Series 2021	Series 2022
Water Main Construction G.O.	\$370,000	\$225,000	\$200,000	\$200,000	\$400,000	\$175,000
Water Main Replacement	\$830,000	\$1,150,000	\$650,000	\$650,000	\$1,350,000	\$650,000
Large Valve Replacement	\$200,000	\$0	\$500,000	\$0	\$225,000	\$0
New Water Tower Design	\$0	\$500,000	\$0	\$0	\$0	\$0
New Water Tower Construction	\$0	\$0	\$4,000,000	\$0	\$0	\$0
Tank Rehab	\$1,250,000	\$75,000	\$675,000	\$600,000	\$75,000	\$650,000
Water Tower Mixers	\$0	\$0	\$0	\$0	\$0	\$0
Meter Replacement	\$425,000	\$1,175,000	\$425,000	\$1,175,000	\$425,000	\$1,175,000
<b>Total</b>	<b>\$3,075,000</b>	<b>\$3,125,000</b>	<b>\$6,450,000</b>	<b>\$2,625,000</b>	<b>\$2,475,000</b>	<b>\$2,650,000</b>



# Wastewater Maintenance Strategy

City of Richardson  
Public Services





# Wastewater Collection System

- Guiding Principles
- Wastewater Collection System Infrastructure
- Wastewater Maintenance Plan Elements
- 2015/16 Maintenance Plan Update
- Funding Sources



Guiding Principles

Wastewater  
Collection  
Infrastructure

Wastewater  
Maintenance Plan  
Elements

2015/16  
Maintenance Plan  
Update

Funding

## Guiding Principles

- Comply with all federal, state and local regulations
- Efficiently and effectively manage, operate and maintain all parts of the wastewater collection system
- Provide adequate capacity to convey peak flows
- Minimize the frequency of sanitary sewer overflows
- Mitigate the impact of sanitary sewer overflows
- Implement Capacity, Management, Operations and Maintenance (CMOM) Initiatives
- Closely partner with NTMWD on regional wastewater initiatives and programs



Guiding Principles

Wastewater  
Collection  
Infrastructure

Wastewater  
Maintenance Plan  
Elements

2015/16  
Maintenance Plan  
Update

Funding

# Wastewater Collection Infrastructure

Treatment of wastewater is provided by the North Texas Municipal Water District, City of Dallas, and City of Garland; The City operates and maintains the collection system.



WASTEWATER:

428 MILES OF  
SEWER MAIN

8,338 TWO-WAY  
CLEANOUTS

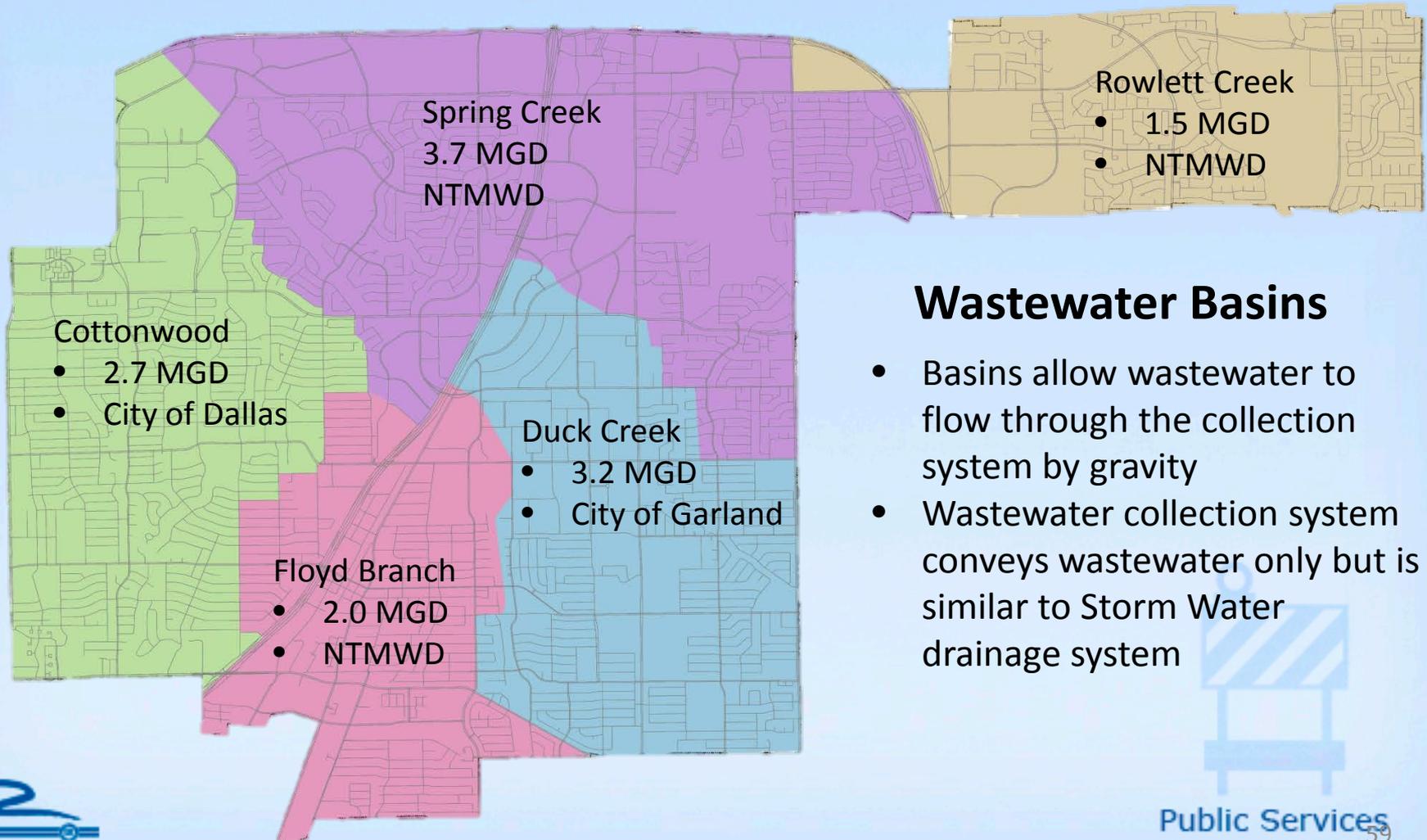
4,756 MANHOLES

5 LIFT STATIONS

2,222 MAIN LINE  
CLEANOUTS

10 WASTEWATER  
PUMPS

# Wastewater Collection Infrastructure



## Wastewater Basins

- Basins allow wastewater to flow through the collection system by gravity
- Wastewater collection system conveys wastewater only but is similar to Storm Water drainage system



# Wastewater Maintenance Plan Elements

- Capacity
- Management
- Operations
- Maintenance



Guiding Principles

Wastewater  
Collection  
Infrastructure

Wastewater  
Maintenance Plan  
Elements

2015/16  
Maintenance Plan  
Update

Funding

# Capacity, Management, Operation and Maintenance (CMOM)

CMOM programs incorporate many of the standard operation and maintenance activities that are routinely implemented by collection systems using a set of information management requirements

CMOM program allows systems to:

- Demonstrate to the Environmental Protection Agency (EPA) that the right steps are being taken by the City of Richardson in regards to the EPA's national enforcement initiative
- Better manage, operate, and maintain collection systems
- Investigate capacity constrained areas of the collection system
- Proactively prevent Sanitary Sewer Overflows





# Capacity

Capacity evaluations supplement the everyday preventive maintenance that takes place in a system. Capacity evaluations include an inventory of all system components to determine if additional capacity is required.

Goals include:

- Flow Monitoring
  - Long-term
  - Short-term
- Modeling of collection system
- Hydraulic analysis of individual basins
- Capital improvement of collection system components





# Management

Collection system management includes protection of public health and prevention of unnecessary property damage.

Goals include:

- Minimization of Infiltration and Inflow (I&I)
- Short/Long term staffing plans
- Enhanced work order management systems
- Sanitary Sewer Overflow notification Standard Operating Procedures and response to overflows
- Equipment management
- Legal updates to regulatory entities



Guiding Principles

Wastewater  
Collection  
Infrastructure

Wastewater  
Maintenance Plan  
Elements

2015/16  
Maintenance Plan  
Update

Funding

# Operation & Maintenance

City of Richardson's collection system is managed using a well-planned, systematic, and comprehensive operation & maintenance program.

Goals of the program include:

- Condition assessments and Infrastructure reliability
- Training of field and office staff
- Emergency preparedness and response
- Lift Stations assessment and failure analysis
- Sewer Line Televising and Cleaning
- Planned and Unplanned Maintenance





# Maintenance Plan Update

## 2015/16 Strategy Update

- CMOM development and implementation outlined in agreement with the City of Richardson and the Environmental Protection Agency (EPA)
- Developed and implemented an Overflow Emergency Response Plan
- Developed and implemented Wastewater Standard Operating Policies
- Selected an engineering firm to conduct an assessment of the Wastewater Collection System
- Increased sewer main cleaning and TV program consistent with the CMOM program
- Implemented refined maintenance activities and staff training



Guiding Principles

Wastewater  
Collection  
Infrastructure

Wastewater  
Maintenance Plan  
Elements

2015/16  
Maintenance Plan  
Update

Funding

# Wastewater Maintenance Plan Funding

The Wastewater Collection System Maintenance funding comes from two primary sources:

- Utility Fund Operations
- Utility Fund Certificates of Obligation (CO)





# Utility Fund – Operations

Programs	FY 14/15	FY 15/16	FY 16/17 (proposed)
Capacity	\$355,000	\$610,000	\$1,375,000
Management	\$148,000	\$300,000	\$360,000
Operations & Maintenance	\$163,000	\$857,000	\$2,559,000
<b>Total</b>	<b>\$666,000</b>	<b>\$1,767,000</b>	<b>\$4,294,000</b>





## FY 16/17 Enhanced Operations & Maintenance Monitoring and Inspection Programs

Main Televised Inspections & Cleaning (Establishes a 10 year rotation)

Smoke Testing to identify defects in collection system (Establishes 10 year rotation)

Force Mains & Air Release Valves (Annual Inspection)

Manholes ( Establishes 10 year rotation)

Development of Lift Station Failure Response Plan  
Lift Station Condition Assessment





# Utility Fund – Certificates of Obligation

Programs	Series 2017 (proposed)	Series 2018	Series 2019	Series 2020	Series 2021	Series 2022
Wastewater Construction G.O.	\$350,000	\$200,000	\$200,000	\$200,000	\$350,000	\$175,000
Wastewater Line Replacement	\$200,000	\$300,000	\$350,000	\$500,000	\$500,000	\$700,000
Manhole Replacement	\$200,000	\$300,000	\$350,000	\$300,000	\$400,000	\$700,000
<b>Total</b>	<b>\$750,000</b>	<b>\$800,000</b>	<b>\$900,000</b>	<b>\$1,000,000</b>	<b>\$1,250,000</b>	<b>\$1,575,000</b>



# Bridge Railing Maintenance Strategy



# Background

- Bridge Rail Management Strategy
  - Richardson maintains bridge railing at 135 locations.
  - 72 locations have rails and guardwalls that have been enhanced aesthetically. 10 additional locations are in progress
    - Aesthetic enhancements began on bridges in the 1980's as part of new capital projects.
    - Subdivision developments then constructed new bridges with aesthetics as neighborhood amenities.
    - Neighborhood Vitality projects have upgraded bridges at 31 locations. Eight more are currently under away.



# Background

- Bridge Rail – 2012 Condition Assessment

- Condition assessment in 2012 of 39 enhanced bridges.

- The assessment did not include the newer bridge rails enhanced as part of neighborhood vitality projects.
- 14 of 39 were in good condition
- 25 of 39 needed maintenance presently or in the near future.
- Three year plan to address needs at these 25 locations



# Bridge Rail Maintenance Completed Projects

## ▣ Campbell at Prairie Creek South Trib



# Bridge Rail Maintenance Completed Projects

- ▣ Collins at Prairie Creek



# Bridge Rail Maintenance Completed Projects

- ▣ Lookout at Campbell Creek



# Bridge Rail Maintenance Completed Projects

- ▣ Abrams at Lois Branch
- ▣ Centennial at Lois Branch
- ▣ Belt Line at Huffhines Branch
- ▣ Campbell at South Trib.
- ▣ W. Renner at Prairie Creek
- ▣ W. Belt Line at Hunt Branch
- ▣ W. Belt Line at Cottonwood Creek
- ▣ Centennial at Floyd Branch
- ▣ Collins at Prairie Creek
- ▣ Lookout at Campbell Creek
- ▣ Telecom at Renner Branch
- ▣ Meadow Wood at Renner Branch
- ▣ N. St Andrews at Sherrill Park Trib
- ▣ E. Renner at Beck Branch
- ▣ E. Renner at Rowlett Creek
- ▣ Greenville at Campbell Creek
- ▣ Breckinridge near Breckinridge Ct



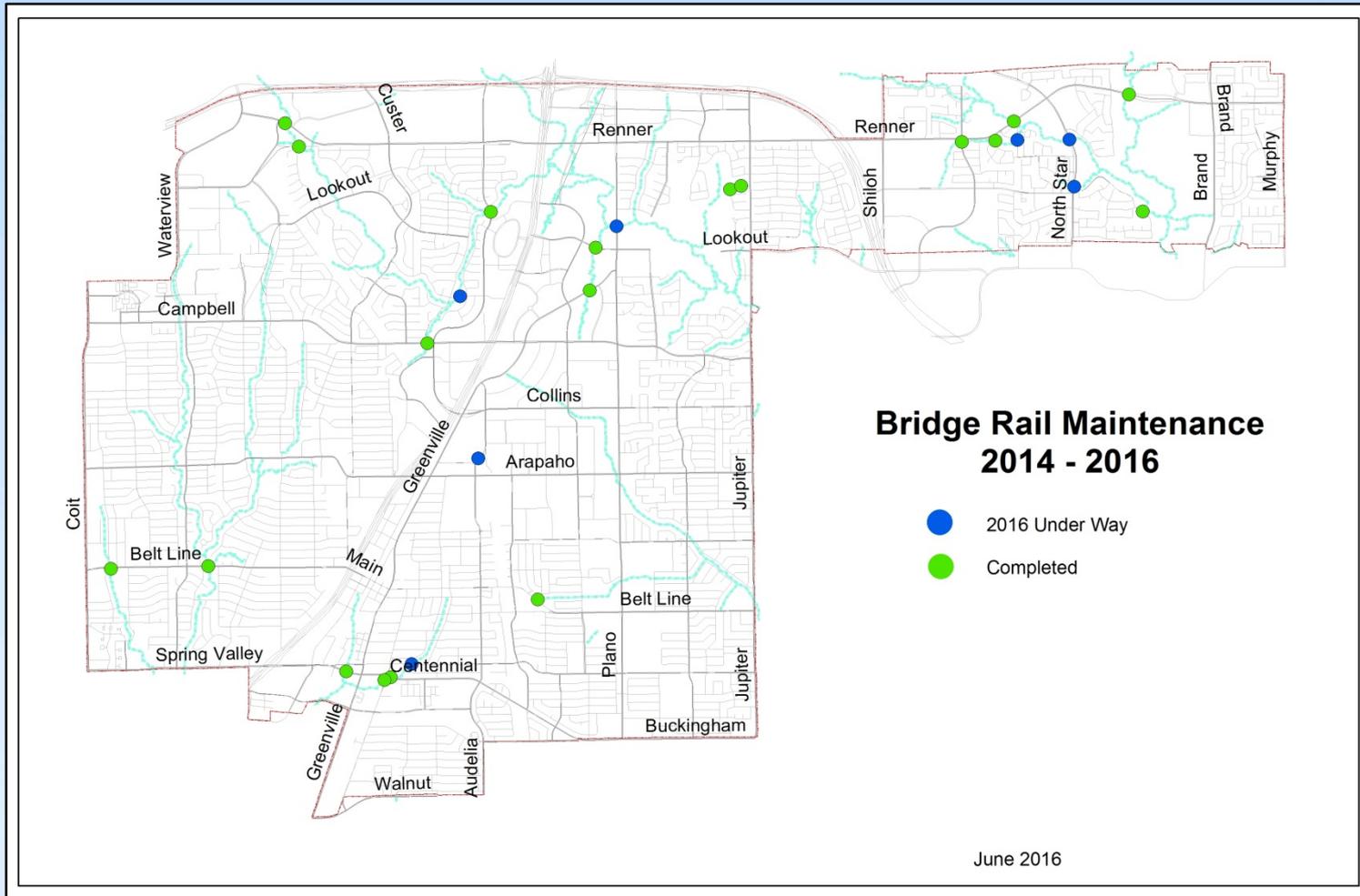
# Bridge Rail Maintenance FY15/16 Projects in progress

- ▣ North Star at Beck Branch
- ▣ North Star At North Star Branch
- ▣ Fall Creek Dr. at Prairie Creek
- ▣ Plano Rd. at Spring Creek
- ▣ Point North at Prairie Creek
- ▣ Alma at KCS Rail Road
- ▣ Sharps Lane at Renner Branch
- ▣ E. Spring Valley at Lois Branch

This will complete the work for all 25 of the locations identified for the first three years of the bridge rail maintenance program based on the 2012 Condition Assessment.



# Bridge Rail Maintenance Three Year Program



June 2016



# Bridge Rail Maintenance 2016 Inventory

- The bridge rail inventory was updated and locations classified by aesthetic treatment level
  - Unimproved (plain concrete parapet w/ aluminum rail, metal beam guard rail or pipe rail)
  - Painted Treatment (painted metal rail or painted concrete parapet, no brick or stone)
  - Improved Bridge (some elements enhanced but not all)
    - Stone or brick guard wall w/ standard rail or no rail
  - Enhanced Bridge Treatment (decorative metal rail, masonry columns and/or guard walls)



# Bridge Rail Maintenance FY2016-17

Unimproved –

Plain concrete parapet.  
aluminum rail

Metal beam guard rail

Pipe rail



# Bridge Rail Maintenance FY2016-17

Painted Treatment -

Painted metal rail or

Painted concrete parapet  
(no brick or stone)



# Bridge Rail Maintenance FY2016-17

Improved Bridge -

Stone guard wall  
with aluminum rail



Stone wall with no rail



# Bridge Rail Maintenance FY2016-17

Enhanced Bridge Treatment  
(decorative metal rail, masonry columns and/or guard walls)



# Bridge Rail Maintenance 2016 Inventory

- In 2012 the condition assessment rated 39 “enhanced” bridges
- The 2016 assessment was expanded to include bridges with all types of aesthetic treatment
- 112 bridge locations were included in the 2016 assessment and are considered for this maintenance program
  - 23 locations without aesthetic treatment were not assessed



# Bridge Rail Maintenance 2016 Assessment

	Enhanced	Improved	Painted	Total
Total number of locations	69	27	16	112
Good Condition	62	23	6	91
Needing Maintenance	7	4	10	21



# Bridge Rail Maintenance 2016 Inventory

- 91 of the 112 locations are in good condition
- 21 locations were identified for maintenance
- Two of the locations are proposed to be added to the current year program
  - S. Greenville at Lois Branch
  - Lookout at Prairie Creek
- Ten locations are proposed for FY2016-17
- The remaining 9 locations are planned for the two following years



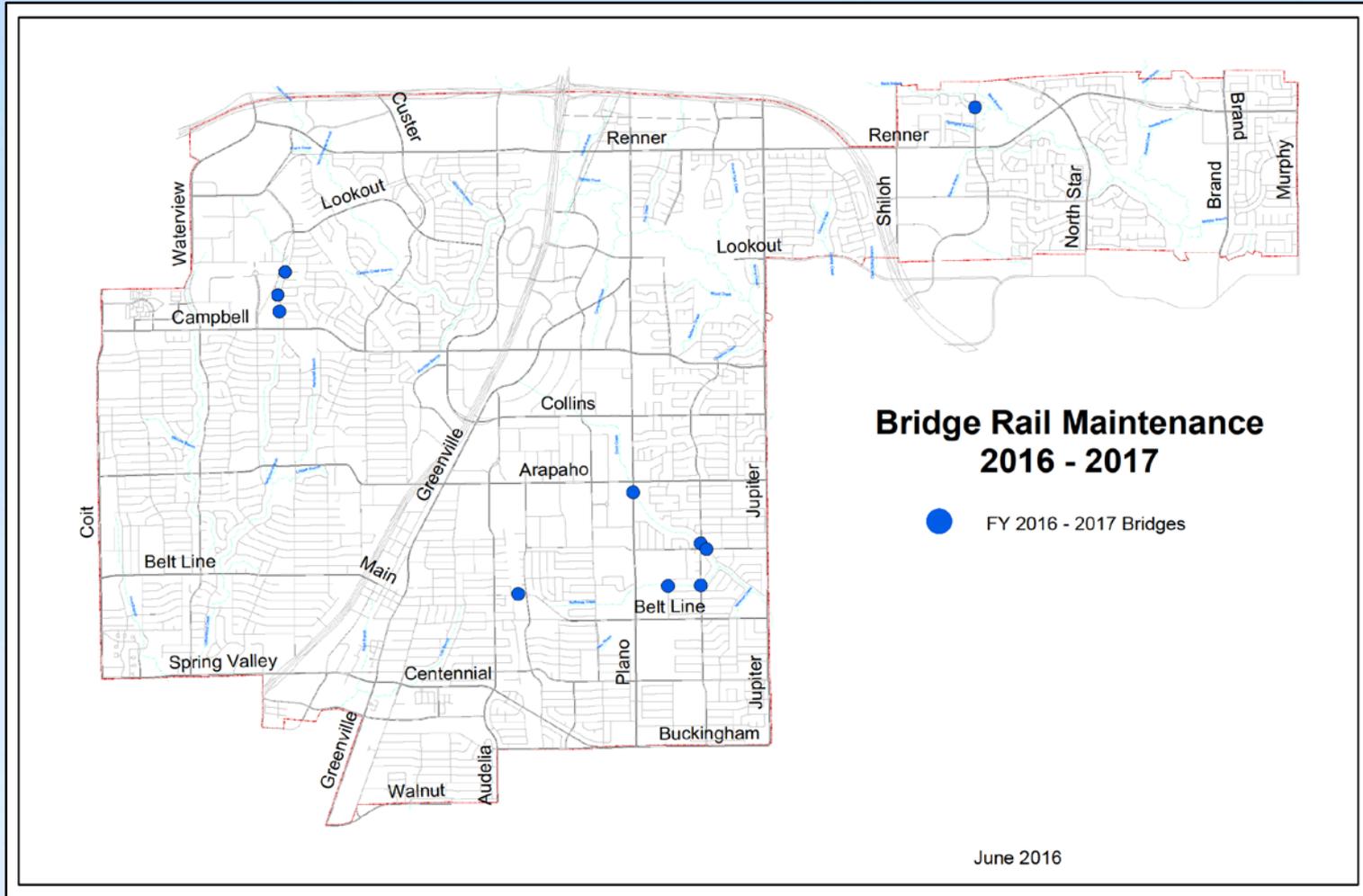
# Bridge Rail Maintenance FY2016-17

	FY 13/14	FY 14/15	FY 15/16	FY 16/17 Proposed
Bridge Rail Maintenance	\$225,000	\$320,000	\$300,000	\$300,000

- ▣ Telecom at Beck Branch
- ▣ Plano Road at Duck Creek
- ▣ Apollo at Duck Creek
- ▣ Yale at Duck Creek
- ▣ Yale at Huffhines
- ▣ St. Johns at Huffhines
- ▣ Floyd Road at Vicksburg
- ▣ Floyd Road at Lundy's
- ▣ Floyd Road at Crampton's Gap
- ▣ Belt Line at KCS RR



# Bridge Rail Maintenance FY2016-17



June 2016



# Bridge Rail Maintenance Summary

- All 25 locations identified for the first three years of the program are scheduled to be completed as planned
- A new expanded assessment was completed of 112 bridge locations with aesthetic treatments
- 91 locations are in good condition
- 21 locations were identified for maintenance to be scheduled over the coming years
- 10 locations have been selected for FY2017
  - Two locations added to this year
  - The remaining 9 locations will be scheduled over the next two years
- Next assessment of bridge aesthetics anticipated in 3 years





City of Richardson  
Capital Projects





# Traffic Signs & Markings Maintenance Strategy



# Sign Maintenance

- Signage installation and maintenance
  - 21,462 Total Signs
    - 16,395 Traffic Control Signs
    - 4,560 Small Street Name Signs
    - 507 Large Overhead Street Name Signs



# Sign Maintenance

## Traffic Control Signs

- Replacement every ~12+ years with newer High Intensity Sign Sheeting now required by Feds for regulatory signs. replace 1,500 to 2,000 signs per year.
- Only ~7.4% of the Traffic Control Signs are more than 12 years old so they are now on a routine replacement schedule.

## Overhead Street Name Signs on Signal Mast Arms

- All Overhead SNS in city have been replaced in past 3 years with high reflectivity sheeting and block numbers.



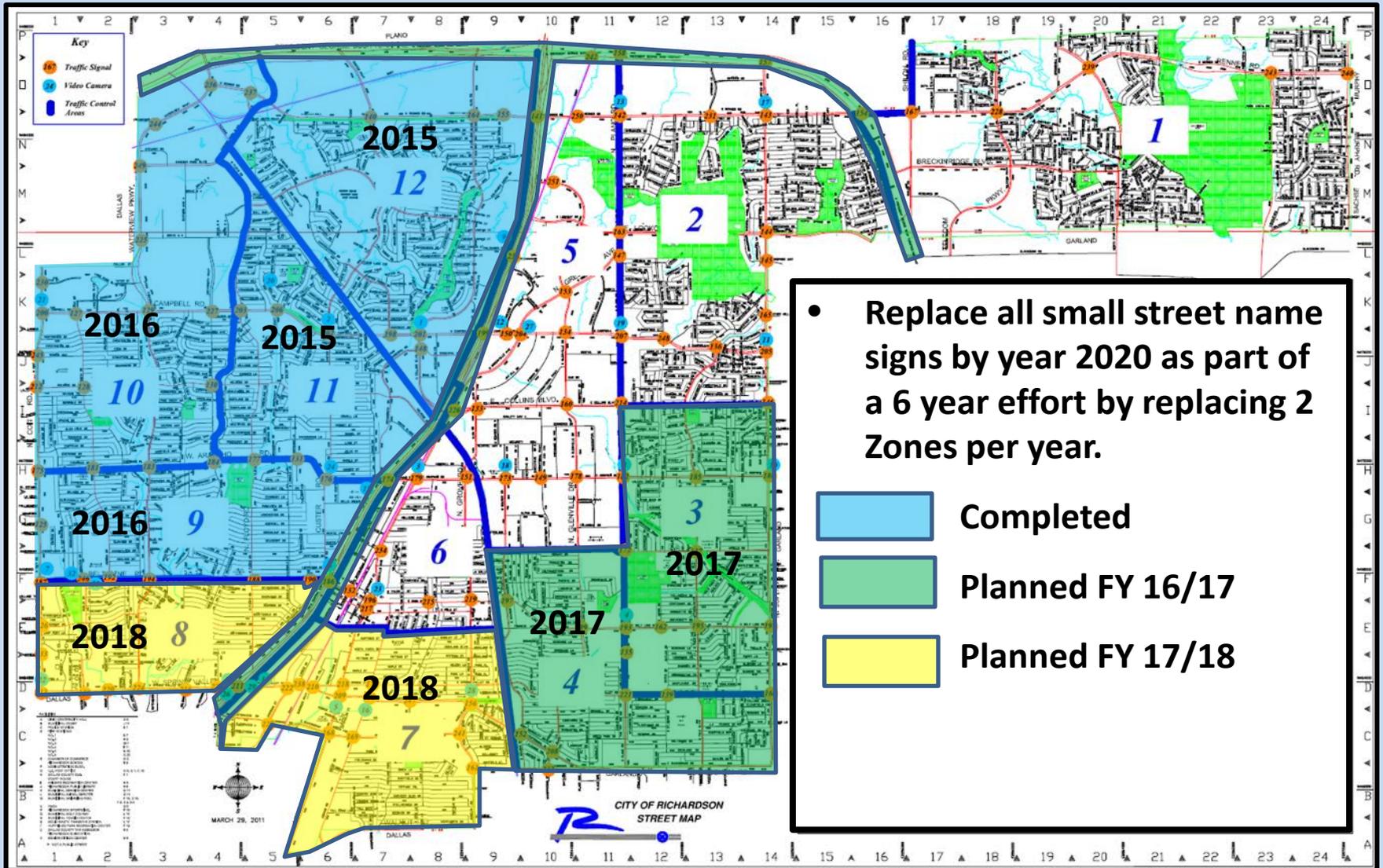
# Sign Maintenance

## Small Street Name Signs

- 2,936 of 4,560 (64%) - 13+ years old and need replacement
- Current schedule is to replace ~400 to 500 SNS per year over a 6 year period. Will be replacing them by area doing 2 Zones per year as shown below and on next slide graphic.
  - FY 14/15 - completed Zones 11 & 12
  - FY 15/16 - completed Zones 9 & 10, working on US 75 and PGBT Frontage Road SNS this summer.
  - FY 16/17 – scheduled to do Zones 3 & 4
  - FY 17/18 – scheduled to do Zones 7 & 8



# Small Street Name Sign Plan



# Small Street Name Signs



- These signs were installed back to back at same time 17 years ago and the side facing to the west is very faded. The side facing the east in the shade during morning hours and is only slightly faded.



# Sign Management 3 Year Strategy

	FY 13/14 Actual	FY 14/15 Actual	FY 15/16 Estimated	FY 16/17 Proposed
Traffic Control and Street Name Sign Replacement	\$100,000	\$100,000	\$100,000	\$100,000

- Increased funding from \$72k to \$100k per year starting in FY13
- Small post-mounted SNS replacement plan will be completed by ~2020 by doing 2 zones per year (~400 to 500 locations per year).
- In the future, all Traffic Control and SNS signs will be replaced every 12 years to ensure reflectivity standards are met.



# Pavement Marking Maintenance

## Pavement Marking Inventory

- 180 School Zone Crosswalks
- 127 Signalized Intersections - stop bars, crosswalks, lane assignment arrows, puppy tracks
- 400 miles of lane line buttons
  - ~60,000 reflective & ~190,000 non-reflective buttons
- 15 Railroad Crossings
- 18 miles of Bike Lanes (~1 additional mile to be added this year along Synergy near UTD)
- 38 City Facility Parking Lots include parking spaces and fire lanes



# Pavement Markings – School Areas



- School Zones and other higher pedestrian crossing locations are assessed every year and replaced as needed each summer while school is out of session

# On-street Bike Facilities

Signed bike routes: 34 miles planned

19 completed

Dedicated bike lanes: 25 miles planned

18 completed

Connections to parks, trails, schools, employment,  
DART stations, other cities



# Bike Lane Implementation Planning

- Initial Installation ~\$30K per mile including signs
- Marking Maintenance (4 to 5 years life expectancy) ~\$25k per mile
- Plan: Add one new segment of bike lane per year and replace/update between 3 and 4 miles of existing bike lane markings per year.



# Future Bike Lane Implementation Plan

## Segments to be added (2016-2021)

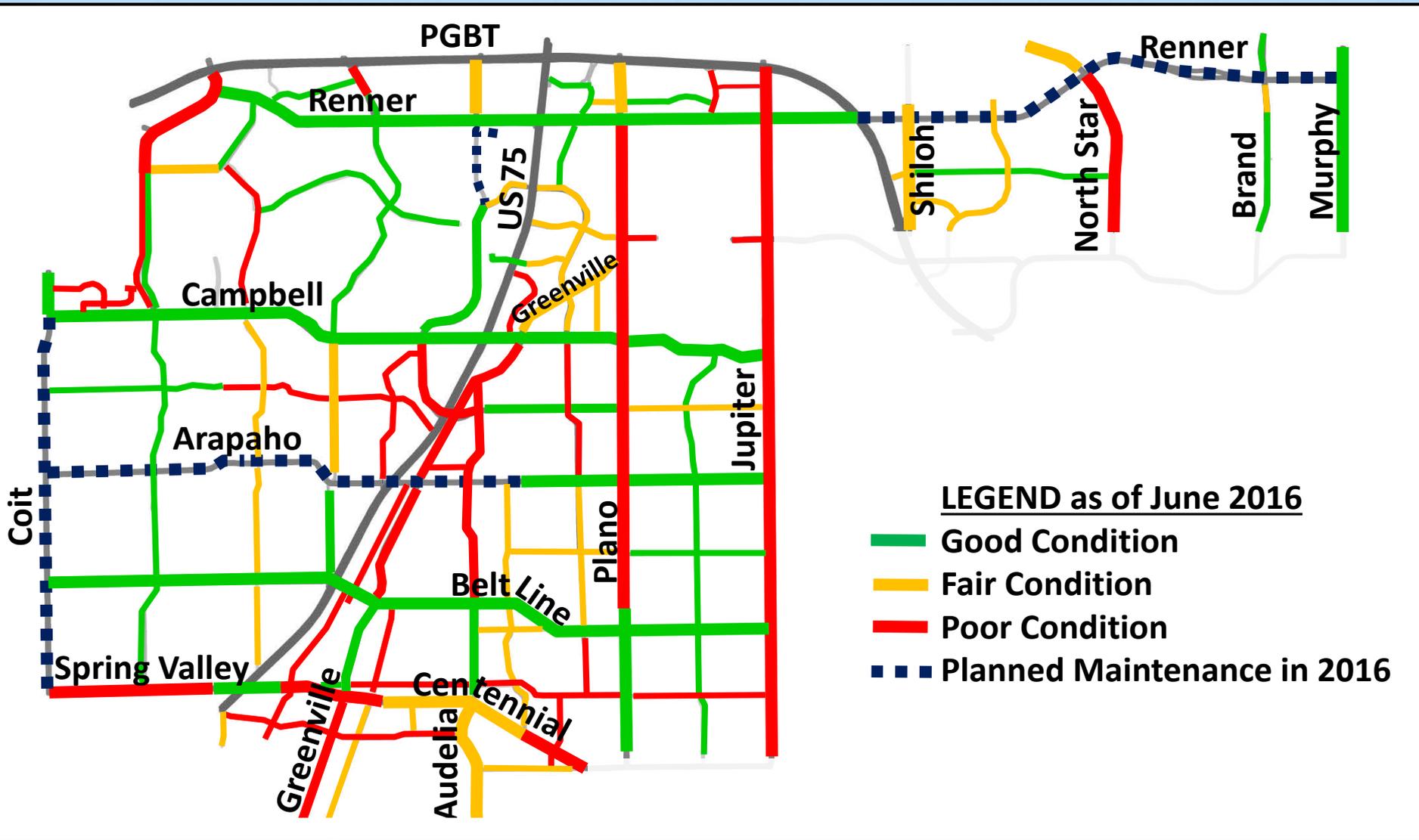
Synergy	(Waterview to Floyd) – *2016
Alma	(Arapaho to Greenville)
SB Waterview	(Synergy to Campbell)
Waterview	(Synergy to PGBT)
Spring Valley	(Grove to Jupiter)
Owens	(Renner to Braeburn)

## Other Funds/Capital Improvements are needed for:

Collins Blvd. and Bridge over US75 (Campbell to Alma)



# Pavement Marking Condition



# Markings Management 3 Year Strategy

	FY 13/14 Actual	FY 14/15 Actual	FY 15/16 Estimated	FY 16/17 Proposed
Pavement Markings	\$250,000	\$300,000	\$350,000	\$400,000

- Ensure markings around schools are in good shape each summer
- Update one bike lane and add ~1 mile of new bike lane each year.
- Replace buttons and markings along arterial and collector streets that are in the pavement rehab program.
- Continue to Prioritize Pavement Marking maintenance and new bike lane installation based on safety and roadway volume criteria





# Summary / Next Steps



# Summary

- Strong ongoing efforts in streets, water/wastewater and traffic signs and markings has resulted in many improvements in recent years.
  - We continue to implement efficiencies that will allow us to accomplish more with the resources we currently have
    - Adding new contractors
    - Updating existing contracts
- Completion of first cycle of screening walls and bridge railings has resulted in more vibrant arterial and collector corridors
  - Second cycle has commenced with updated inventories and new, multi-year maintenance plans being implemented



# Next Steps

- Receive City Council suggestions and feedback. Future considerations may include:
  - Enhancing existing efforts to include:
    - Add an additional neighborhood zone
    - Complete multi-phase projects in fewer phases
    - Increase bike lanes to 2 miles per year
  - Expand scheduled infrastructure maintenance to include:
    - Neighborhood alleys
    - Commercial streets and/or sidewalks
    - Bridge structures





# FY 16/17 Maintenance Strategies

City Council: June 6, 2016

