

JULY 19, 2016

# **KC Water Cost of Service Task Force**

## **Meeting #4**



# Agenda

- Welcome and Introductions
- Overview of KC Wastewater Utility
- Overflow Control Program
- Overview of Wastewater Utilities across the U.S.
- KC's Wastewater Utility Financial Overview
- Follow-up Items from June 14<sup>th</sup> Stormwater Meeting
- Public Comment
- Task Force Discussion



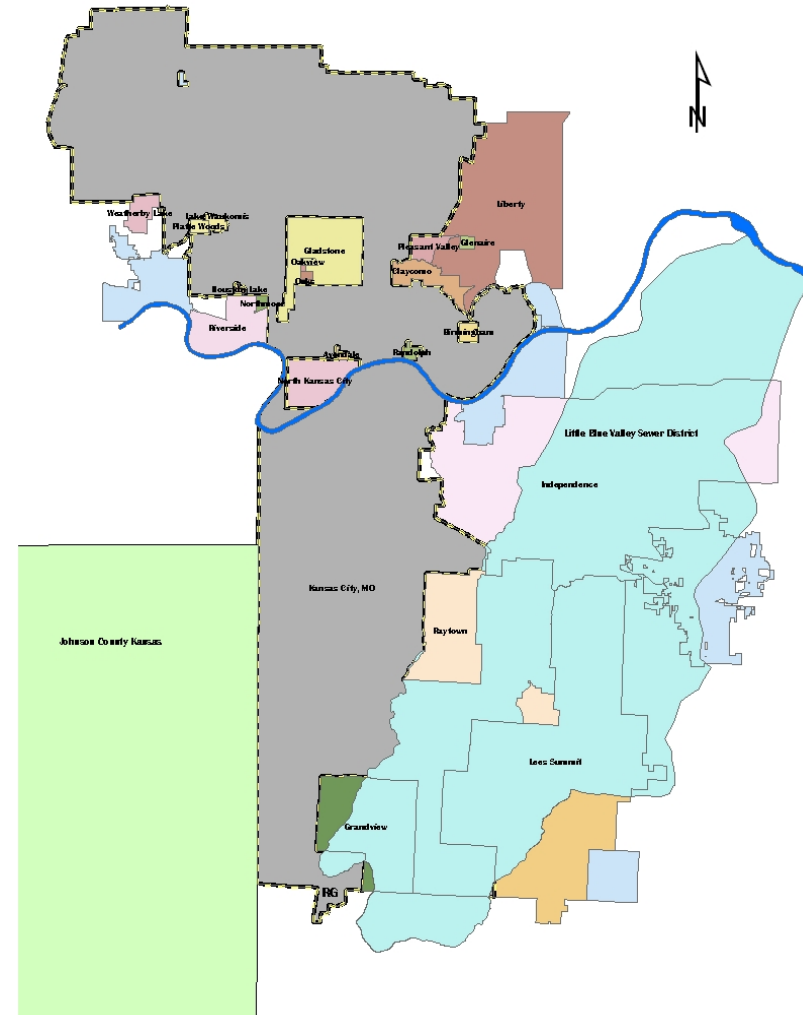
# Welcome and Introductions



# KC Water – Wastewater Utility Overview

# Wastewater Utility Overview

- KCMO is a 318 square mile area
- 6 Wastewater Treatment Plants
- 37 Wastewater Pump Stations
- 15 Flood Pumping Stations
- 3 Effluent Pumping Stations
- 2,800 Miles of Sewers
  - 2,200 Miles of Sanitary Sewers
  - 600 Miles of Combined Sewers



# Wastewater Treatment Process

## Kansas City's Wastewater Treatment Process



### Wastewater From Customers

Every household and business produces liquid and solid wastes. When these wastes are flushed, they go through miles of sewer pipes and end up at our wastewater treatment plant.

↓ When you flush a toilet in Brookside, for example, under normal flows it will travel 17-20 miles and take 10 hours to reach the treatment plant.

### Pretreatment

Wastewater and stormwater flow in and through the rock box where small and large rocks are removed. The water flows through bar screens where the trash is removed.

↓ Pretreatment takes 5 to 15 minutes.

### Primary Treatment

The water flows to the wet well where it is pumped up to the grit basins where the fine sand is removed. Finally, the water flows to primary clarifiers. Here the water is contained in large tanks and 65 percent of the solids drop out of the water and are collected.

↓ Once inside the plant primary treatment takes 1.5 to 3.5 hours.

### Secondary Treatment

Water overflows the primary clarifiers and then is pumped on top of the biotowers, where the water is sprayed on the top of the media. Nitrogen, biological oxygen demands (BODs) and ammonia are removed during this process. The water goes to the final clarifiers where suspended solids are removed. The water over flows the final clarifiers and then the final treatment process begins.

↓ The secondary treatment takes 3 to 6 hours.

### Disinfection

Finally, the water is disinfected. Bleach is added to the water as it leaves the final clarifiers. Water and bleach are held in contact for 30-50 minutes. Then bisulfite is added to remove any chlorine from the water. Final sampling of water is taken.

↓ Disinfection under average flows can take 24 to 53 minutes.

### Missouri River

Water is then released back into the Missouri River.

↓ Water then flows back to the Missouri River within 5 minutes.

### Solids Processing Begins

Once solids are collected, they enter their own treatment process. Solids are pumped to a holding tank at our treatment plant where they are stored. The solids are mixed and grinded over and over again. From the holding tank the solids are pumped to either the digesters or the incinerator.

### Dewatering

The solids are pumped to the belt filter press and the water is squeezed out.

↓ 20 minute process

### Incineration

The solids are dropped onto a conveyor and then pumped into the incinerator. The solids are then incinerated.

↓ 2 hour process

### Ash Storage

The left-over ash from the incinerator is pumped across the street to the ash lagoon.

↓ Stored for 50+ years

### Thickening

The Secondary Solids are thickened in the Dissolved Air Flotation Thickener and then pumped to the holding tank.

↓ 2 hours for thickening

### Digestion

Solids are fed into the digesters where they are held for 15-20 days. Within that time, 25 percent of the solids convert to water and biogas. There is an overflow line that runs the digested solids to a holding tank. It takes three or four days to fill the holding tank.

↓ Digestion takes 15 to 20 days.

### Lagoon Storage

Next, the tank is pumped across the river to the farm lagoons.

↓ Lagoon storage up to 6 months.

### Land Application

Twice a year the lagoons are emptied and pumped onto the farm fields to be incorporated into the soil and be used as fertilizer to grow corn, soybeans and trees.

↓ The fertilizer is applied twice a year for 4 weeks.



# KC Wastewater Treatment Plants

- 6 Wastewater Treatment Plants
- First plant built in 1963
- Capacity available during dry weather is 155 million gallons per day



# Blue River Wastewater Treatment Plant

## Primary Treatment

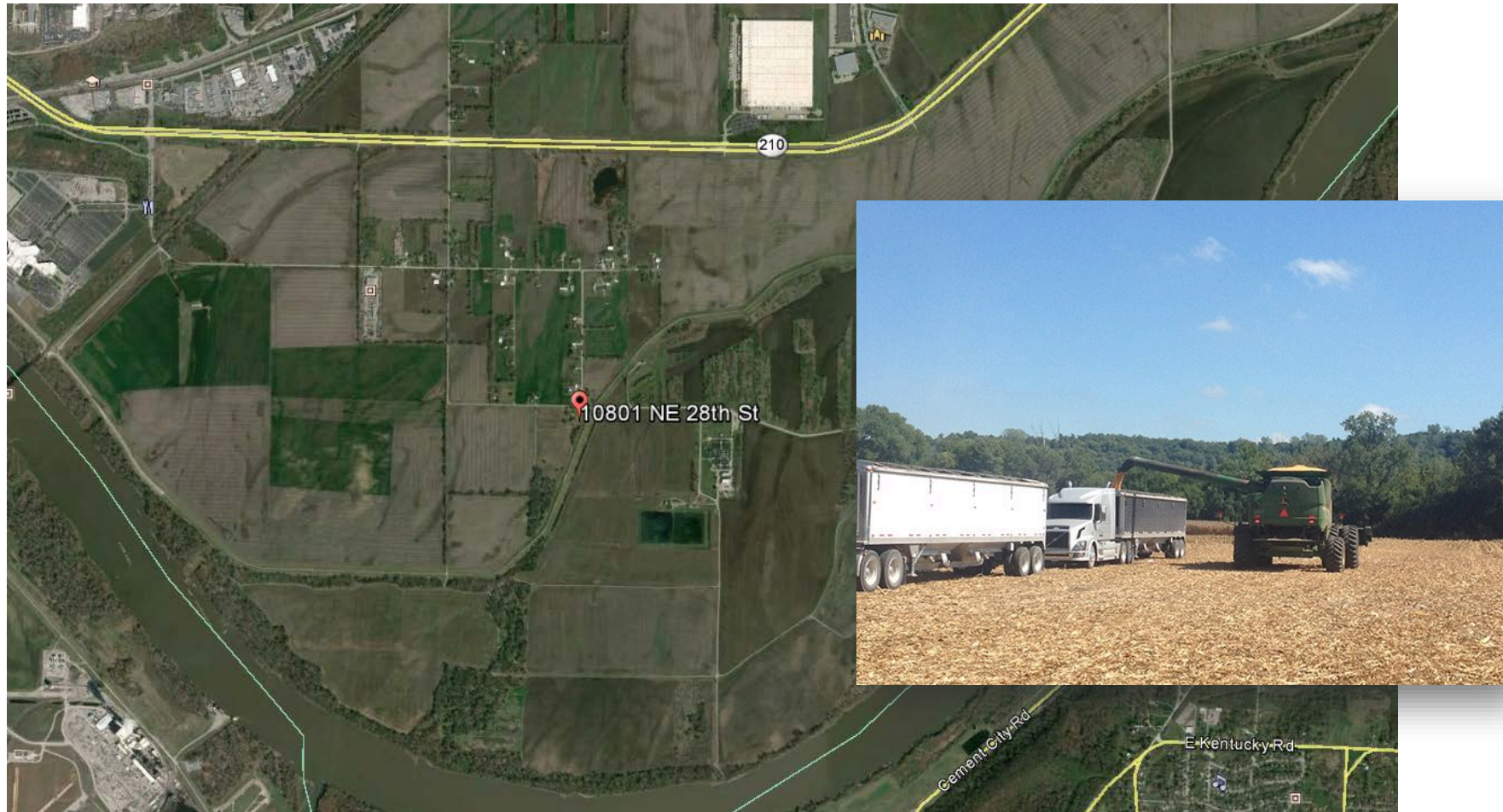


## Secondary Treatment





# Birmingham Farm



# Regulatory

- Federal Clean Water Act
- Federal Clean Air Act
- NPDES (National Pollutant Discharge Elimination System)
- Vulnerability Assessment

# KC Wastewater Master Plan

- Currently in the process of updating
- Plan drives Capital Improvement Plan (CIP)
- Analyzes:
  - Performance
  - Condition
  - Capacity
  - Improvements
    - Treatment
    - Collection
    - Pumping
    - Storage





# KC Water – Wastewater Overflow Control Plan (OCP)

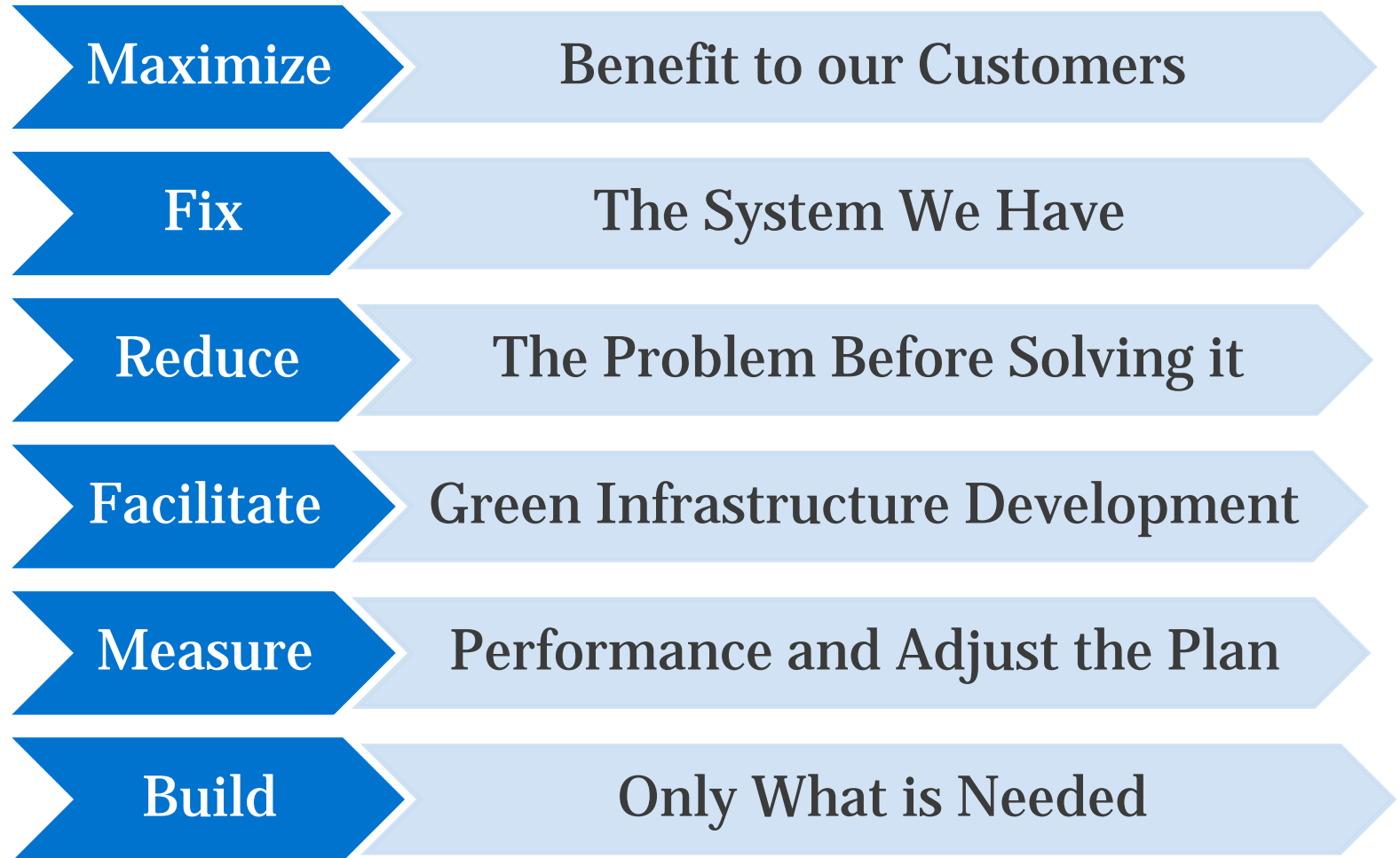


# What is the Overflow Control Program?

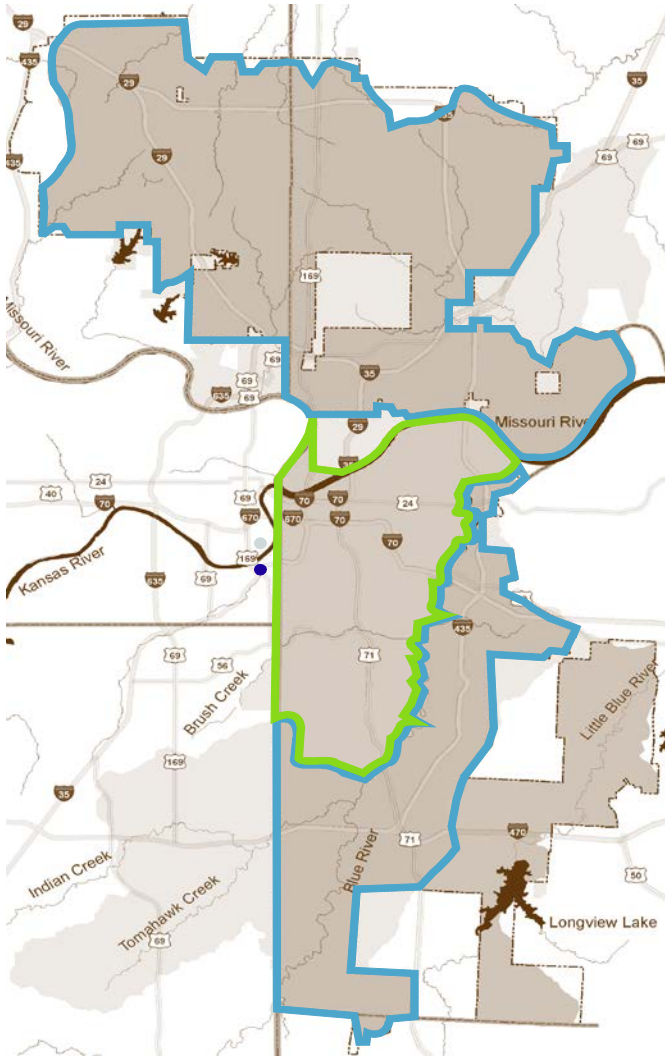


- Developed plan to meet regulatory requirements related to reducing and preventing sewer overflows
- City-wide approach
- Address overflows in combined and separate sewer systems
- \$4.5 to \$5 billion when complete (year 2035)
- Largest infrastructure project in Kansas City history

# OCP Strategy



# Kansas City's Sewer System



- Over 650,000 people served
- 58 sq. miles of Combined Sewer:
  - State Line east to the Blue River & Missouri River south to 85<sup>th</sup> St. plus the downtown airport
- 260 sq. miles of Separate Sewer:
  - North of the river, south of 85<sup>th</sup> Street and east of the Blue River

# Separate Sanitary Sewer System – How It Works

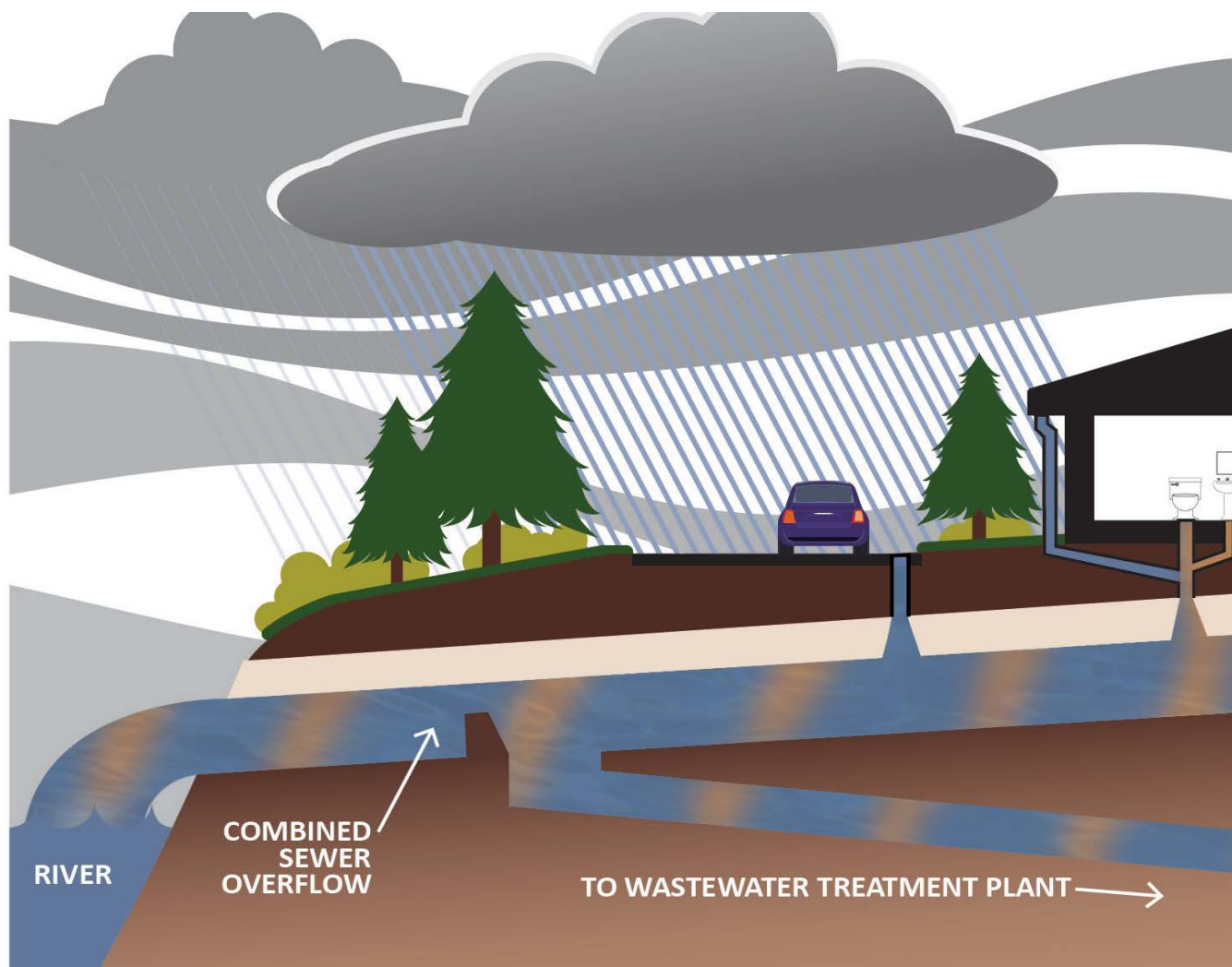




# Combined Sewer System – How It Works



# Combined Sewer System – How It Works

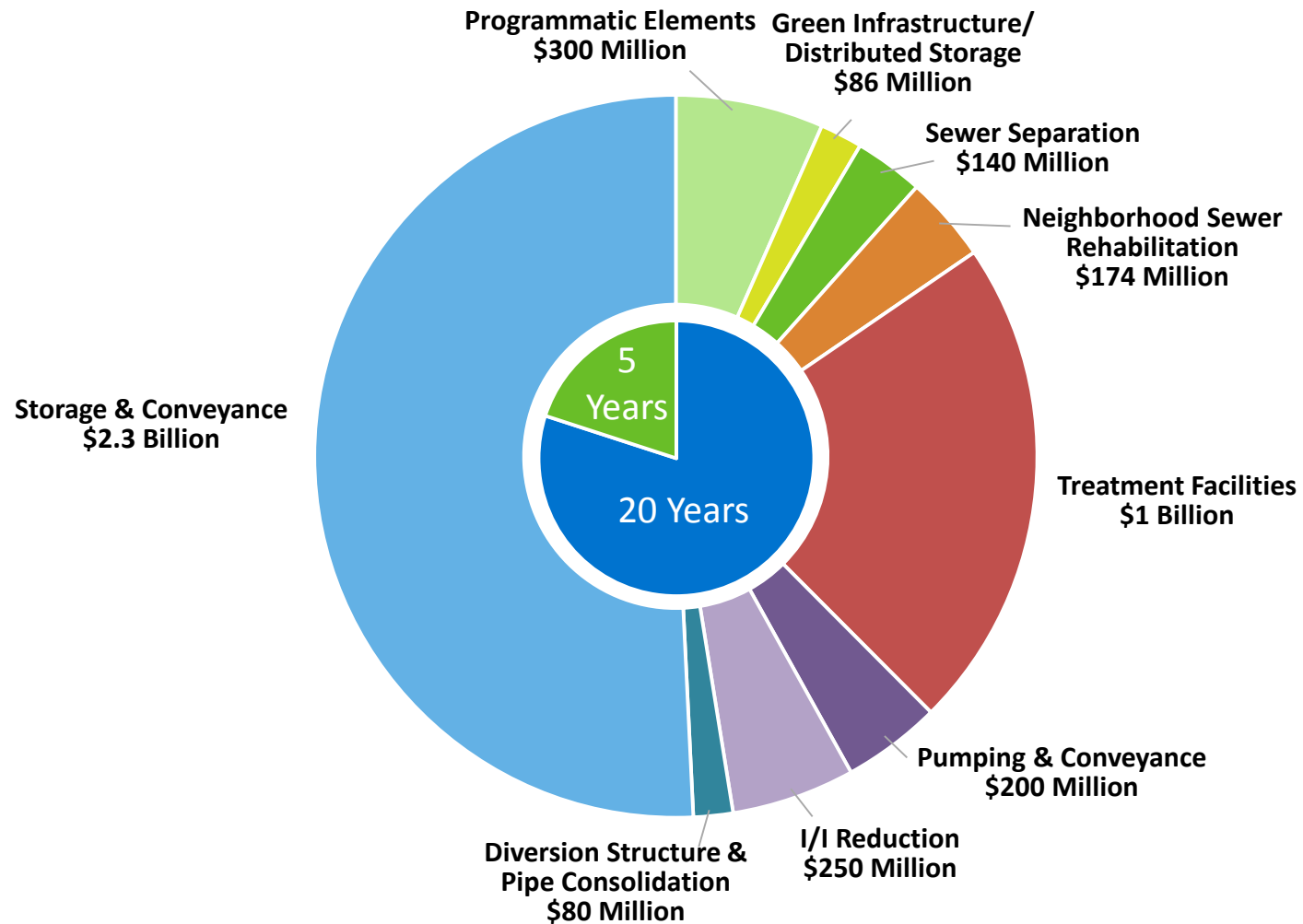


# Kansas City's Challenge

- Sewer overflows during wet weather
- Aging wastewater infrastructure
- Sewer backups
- Water quality in local streams, urban lakes, and rivers
- Past rates did not reflect the true cost of maintaining wastewater infrastructure



# Program Overview \$4.5-5 Billion





# Overflow Control Program Elements



## Storage & Conveyance

• \$2.3 Billion | 5 Projects



## Neighborhood Sewer Rehabilitation

• \$174 Million | 6 Projects



## Treatment

• \$1 Billion | 12 Projects



## Sewer Separation

• \$140 Million | 9 Projects



## Inflow & Infiltration

• \$250 Million | 20 Projects



## Diversion Structure & Pipe Consolidation

• \$80 Million | 23 Projects



## Pumping & Conveyance

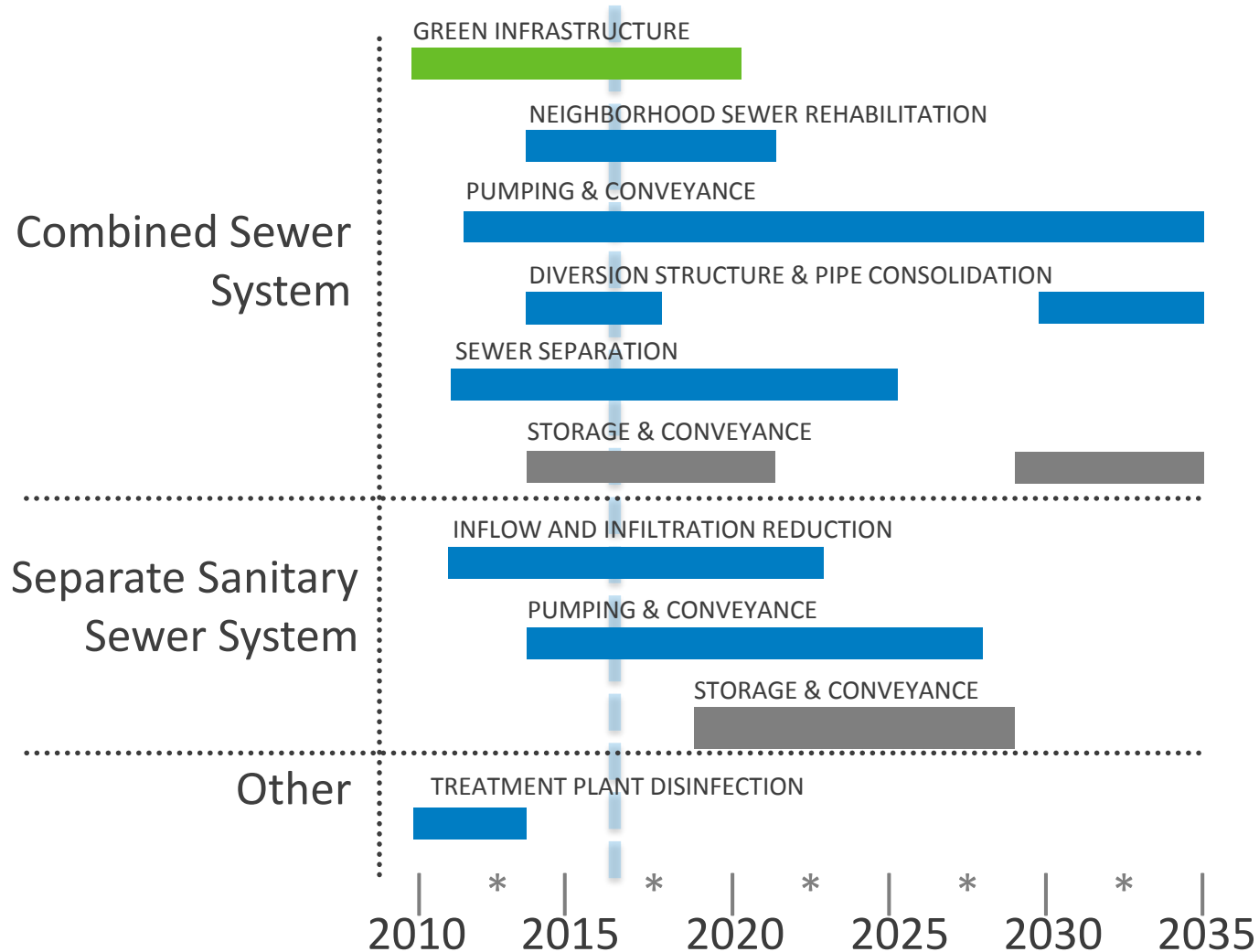
• \$200 Million | 20 Projects



## Green Infrastructure

• \$86 Million | 6 Projects

# Program Implementation – Schedule





## Progress Report: *2010-2015*

On Time

On Budget

\$211.2M Investment

10 Completed Projects

33 Projects Underway



# Overview of Wastewater Utilities across the U.S.



# Industry Challenges

- Affordability
- Regulatory Compliance
- Infrastructure needs
- Conservation impacts
- Long-term customer demand/growth

# Affordability

In addition to aging infrastructure, increased regulatory requirements drive increased capital and operating costs

## Combined Sewer Overflows

32 States and the District of Columbia have combined sewer and stormwater systems

## Sanitary Sewer Overflows

Sanitary Sewer Overflows occur when inadequate capacity exists to handle flows in wet weather.

# Current CSO Consent Decrees Greater than \$1 billion

	<u>City</u>	<u>Estimated Costs</u>	<u>Initial Consent Decree Entered Date</u>
Metropolitan St. Louis Sewer District	St. Louis, MO	\$4,700,000,000	2012
Hamilton County	Cincinnati, OH	\$3,290,000,000	2004
Northeast Ohio Regional Sewer District	Cleveland, OH	\$3,000,000,000	2011
District of Columbia Water and Sewer Authority	Washington, DC	\$2,574,300,000	2003
<b>City of Kansas City</b>	<b>Kansas City, MO</b>	<b>\$2,500,000,000*</b>	<b>2010</b>
City of Indianapolis	Indianapolis, IN	\$1,860,000,000	2006
Metropolitan Water Reclamation District	Chicago, IL	\$1,770,000,000	2014
Allegheny County Sanitary Authority	Pittsburgh, PA	\$1,400,000,000	2008
City of Atlanta, GA	Atlanta, GA	\$1,149,999,999	1998
Sanitation District of Northern Kentucky	Erlanger, KY	\$1,100,000,000	2007

**\*Estimated total in 2035 is  
\$4.5-5.0 Billion**

# Infrastructure Needs

## Wastewater

2013  
GRADE **D**



Capital investment needs for the nation's wastewater and stormwater systems are estimated to total \$298 billion over the next twenty years. Pipes represent the largest capital need, comprising three quarters of total needs. Fixing and expanding the pipes will address sanitary sewer overflows, combined sewer overflows, and other pipe-related issues. In recent years, capital needs for the treatment plants comprise about 15%-20% of total needs, but will likely increase due to new regulatory requirements. Stormwater needs, while growing, are still small compared with sanitary pipes and treatment plants. Since 2007, the federal government has required cities to invest more than \$15 billion in new pipes, plants, and equipment to eliminate combined sewer overflows.



# Conservation Impacts

- Long term conservation trends will impact wastewater revenue:
  - Budgets based on usage assumptions to recover costs
  - When water sales are lower, revenues are lower (conservation). Since wastewater rates are based on winter water usage, wastewater revenues are lower over time
  - More difficulty in conveying the relationship to wastewater revenue
  - Future rates may need to be adjusted to make up for shortfall



## Low-Flow Faucets



# Long-Term Customer Demand/Growth

- With departure of wholesale customers, decreases in demand will impact revenues but could also decrease certain longer term capital needs
- Potential growth to the north along with new wholesale customers will increase revenues but also could contribute need for additional new infrastructure
  - System Demand Charges will be evaluated for growth related infrastructure.

# Wholesale Customers

- Departing Wastewater Wholesale Customers
  - Johnson County, Kansas
  - Liberty, Missouri
- Impact on Infrastructure and Operations and Maintenance (O&M) Expenses
  - Initial increase in revenue (Johnson County)
  - Long-term decrease in infrastructure costs and O&M expenses



# KC Water – Wastewater Utility Financial Overview



# Wastewater Customers by Type (Fiscal Year)

## Sanitary Sewer Customers

	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
Residential	139,496	142,535	145,985	146,855	147,475
Commercial / Industrial	13,949	15,947	16,500	16,609	16,585
Wholesale / Inter-Jurisdictional*	28	28	28	28	28
<b>Total Customers</b>	<b>153,473</b>	<b>158,510</b>	<b>162,513</b>	<b>163,492</b>	<b>164,088</b>

*\*Includes 21 inter-jurisdictional provided on a wholesale basis, 6 on a retail basis and 1 that provides services to the City.*

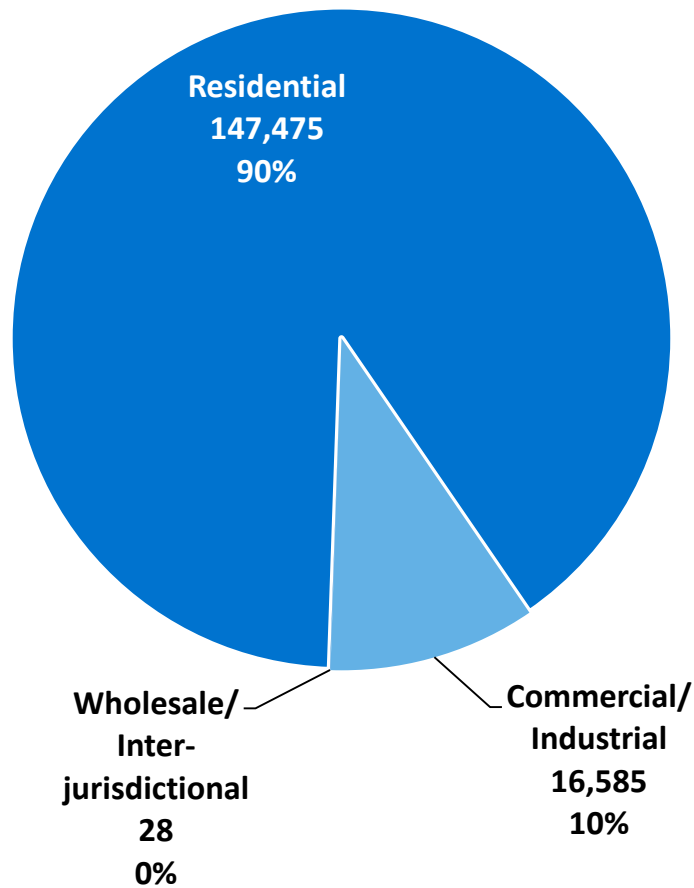
# Wastewater Revenue by Customer Type

## Sanitary Sewer Revenues

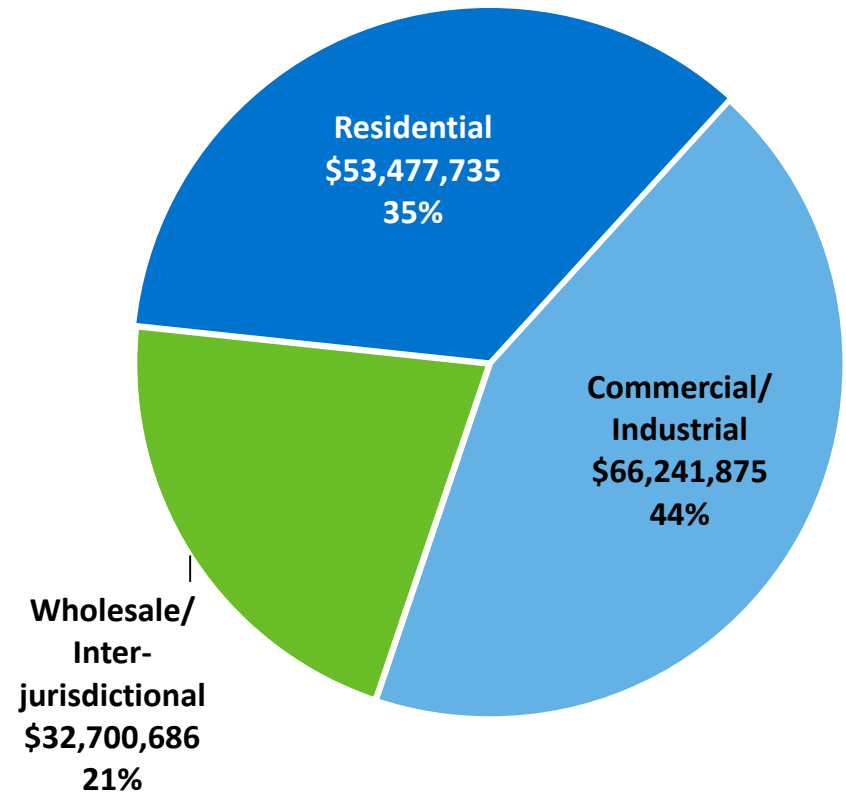
	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
Residential	\$37,568,002	\$38,097,564	\$46,509,246	\$53,982,712	\$53,477,735
Commercial/ Industrial	\$32,658,410	\$38,351,324	\$47,442,084	\$52,706,978	\$66,241,875
Inter- Jurisdictional	\$23,123,947	\$23,925,569	\$24,508,149	\$28,047,478	\$32,700,686
<b>Total Revenue</b>	<b>\$93,350,359</b>	<b>\$100,374,457</b>	<b>\$118,459,479</b>	<b>\$134,737,168</b>	<b>\$152,420,296</b>

# Wastewater Customers and Revenue

## Wastewater Customers (FY2015)



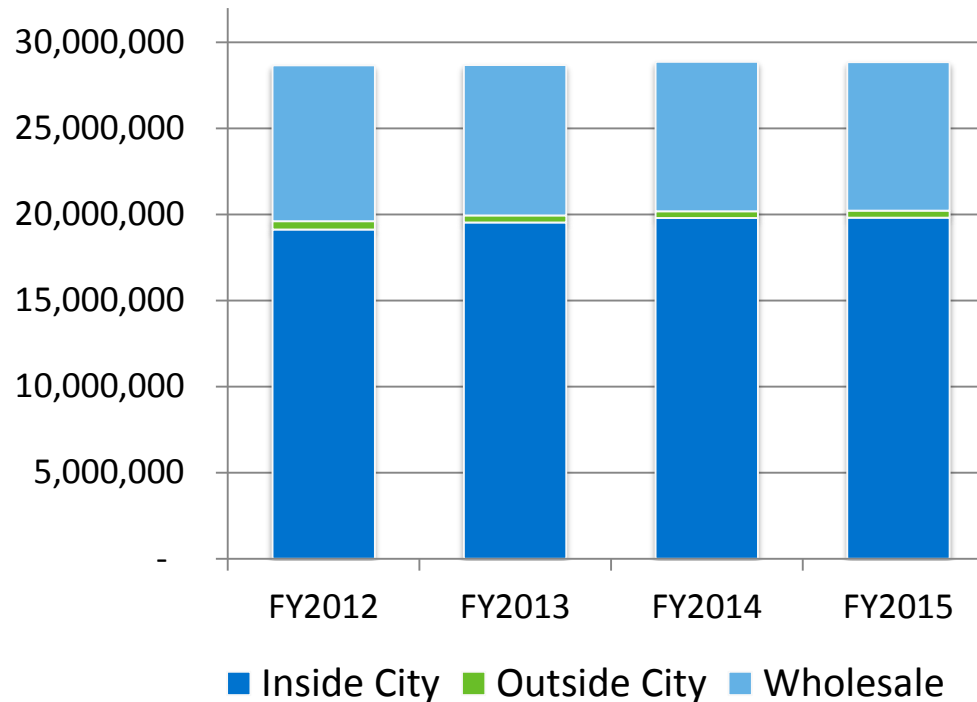
## Wastewater Revenue (FY2015)



# Wastewater Services (All Customers)

- For the last 4 fiscal years (FY12 to FY15) the Wastewater utility has seen a slight increase in service inside the city.

**Wastewater Services (FY2012 - FY2015 in CCFs)**





# Top Wastewater Customers (FY2015)

## 10 Largest Users of the Sewer System Based on Percent of Total Sewer Charges

<u>Rank</u>	<u>Customer</u>	<u>Total Sewer Charges</u>	<u>Percent of Total Sewer Charges</u>
1	Johnson County, Kansas	\$15,251,626	10.01%
2	Liberty, Missouri	\$4,577,859	3.00%
3	Gladstone, Missouri	\$4,124,261	2.71%
4	Veolia Electric Utility	\$3,196,015	2.10%
5	North Kansas City, Missouri	\$2,943,041	1.93%
6	Ford Motor Company	\$1,892,613	1.24%
7	Honeywell	\$1,299,177	0.85%
8	Raytown, Missouri	\$1,065,575	0.70%
9	Independence, Missouri	\$871,575	0.57%
10	Roberts Dairy	\$850,097	0.56%

# Residential Wastewater Charges (FY2017)

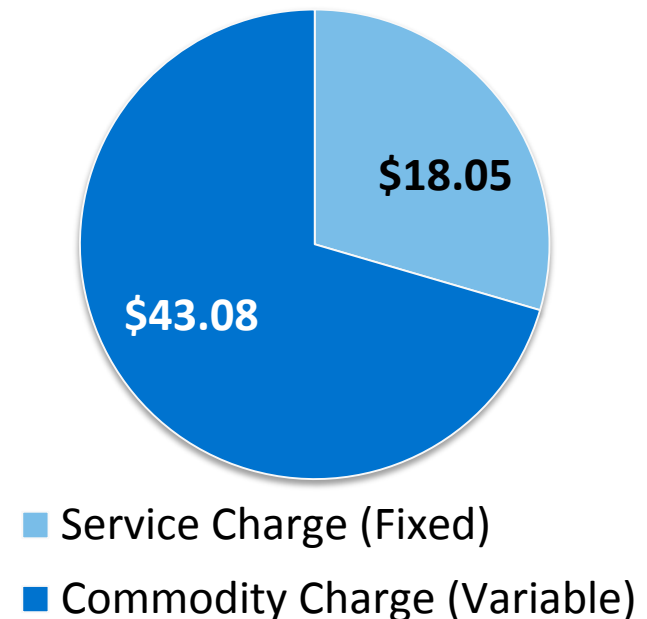
## Service Charge (Fixed):

- Pro-rated per day during the billing period
- Fixed charge applied to all connections in the system
- Covers readiness to serve (capacity), meter maintenance, billing, collections, accounting services, etc.

## Commodity Charge (Variable):

- Total volume of wastewater discharged by the customer
- Rates vary depending on whether the customer is inside the city, outside the city or wholesale
- Excess strength charges apply when the BOD (biochemical oxygen demand), SS (suspended solids), and/or O&G (oil and grease) concentrations are in excess of the average strength concentration

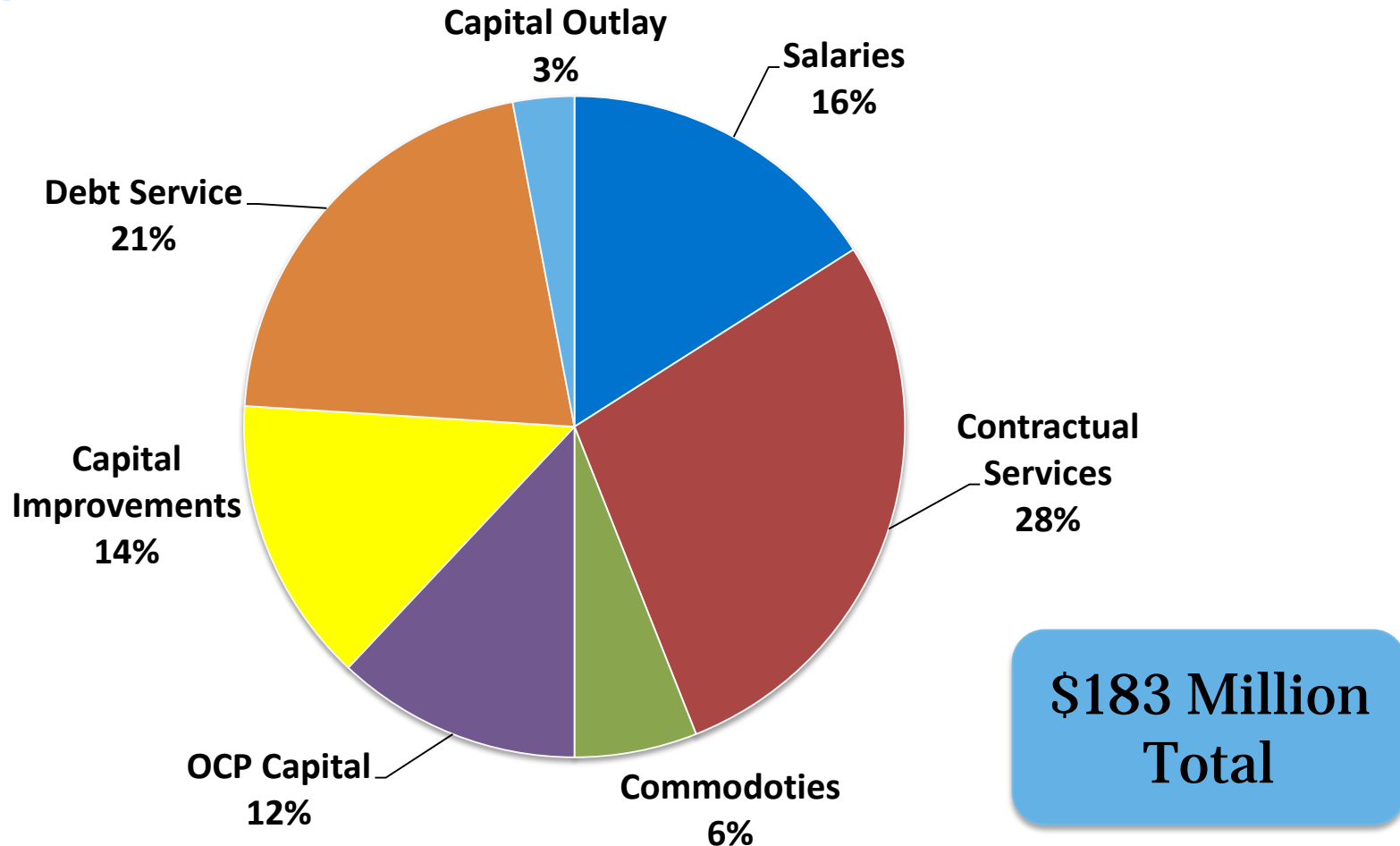
## Average KC Residential Wastewater Bill (FY2017)



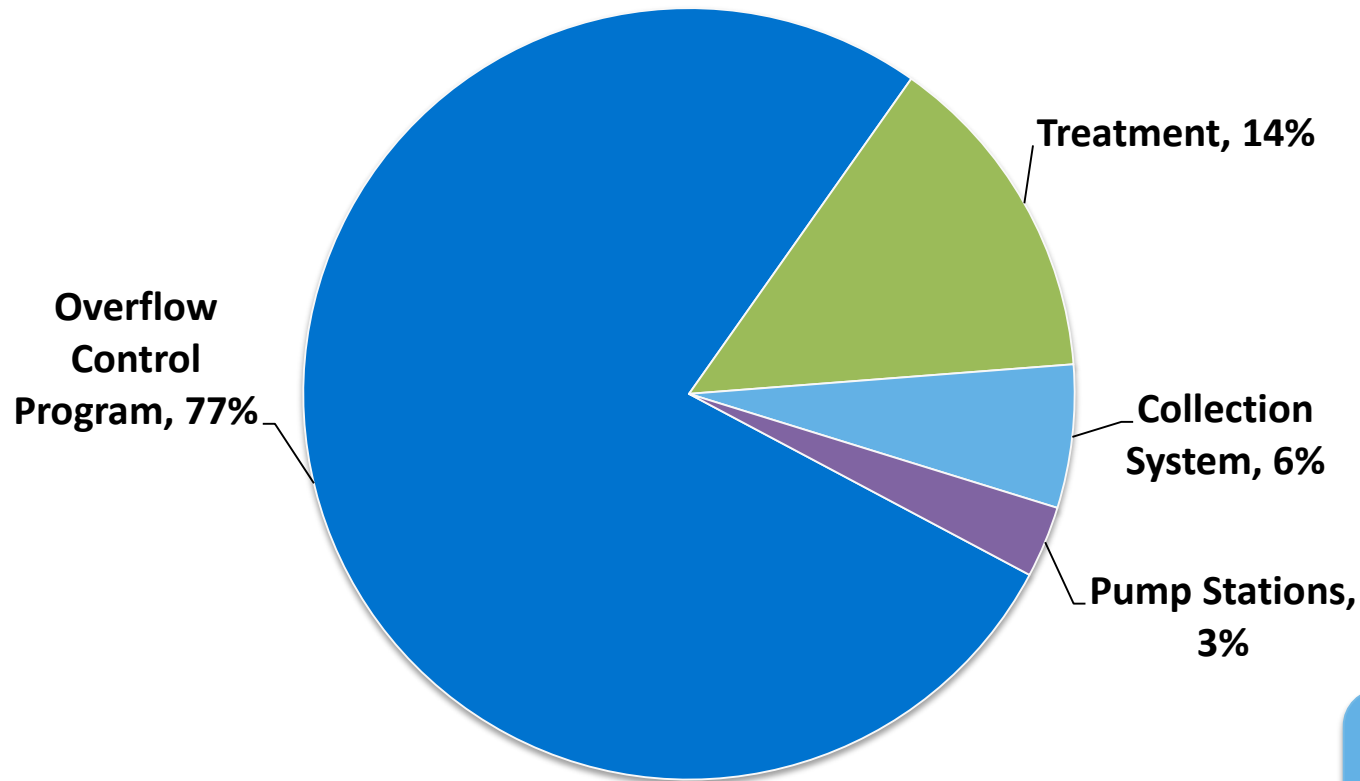
# Kansas City's Wastewater Rate Structure

Sewer Charges (FY2017)	
<u>Inside City Rates</u>	<u>Charge</u>
Monthly Service Charges (\$/Bill)	\$18.05
Volume Charge (\$/CCF)	\$7.18
<i>Excess Wastewater Strength Surcharge (\$/lb.)</i>	
Biochemical Oxygen Demand Over 250mg/l	\$0.320
Suspended Solids Over 250 mg/l	\$0.190
Oil & Grease Over 30 mg/l	\$0.140
<u>Outside City Rates</u>	-
Metered Volume Charge (\$/CCF)	\$3.00
<i>Unmetered Connections with Water Records</i>	
Monthly Service Charges (\$/Bill)	\$12.50
Volume Charge (\$/CCF)	\$3.85
<i>Unmetered Connections without Water Records</i>	
Monthly Service Charges (\$/Bill)	\$41.00
<i>Individual Customers Billed by the City</i>	
Monthly Service Charges (\$/Bill)	\$25.55
Volume Charge (\$/CCF)	\$9.35
<i>Excess Wastewater Strength Surcharge (\$/lb.)</i>	
Biochemical Oxygen Demand Over 250mg/l	\$0.400
Suspended Solids Over 250 mg/l	\$0.215
Oil & Grease Over 30 mg/l	\$0.141

# FY2017 Wastewater Utility Expense Budget



# Wastewater Planned CIP: FY2017



**\$237 Million  
Total**



# Debt Financing

- 80% majority vote in April 2012 to authorize the issuance of \$500 million in wastewater revenue bonds
- Completed 2016 Wastewater Bond Sale  
~\$150 Million in new debt with average yield to maturity of 3.01%.

Wastewater Bonds	
<b>2005 Authorization</b>	<b>\$250,000,000</b>
<b><u>Issuances</u></b>	
2007A	\$40,000,000
2009A	\$69,480,000
2009B	\$14,387,758
2011A	\$82,605,000
2012A	\$43,527,242
<b>Remaining Authorization</b>	<b>\$0</b>
<b>April 2012 Authorization</b>	<b>\$500,000,000</b>
<b><u>Issuances</u></b>	
2012A	\$25,262,758
2016A	\$150,000,000
<b>Remaining Authorization</b>	<b>\$324,737,242</b>

# Projected Revenue for Debt Service and Coverage Ratio for KC Wastewater Utility

Projected Wastewater Utility Debt Metrics				
	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>FY2019</u>
Net Revenue for Debt Service	\$78,950,600	\$99,627,600	\$119,294,000	\$141,607,400
Aggregate Debt Service	\$31,236,900	\$38,788,727	\$51,685,500	\$58,862,800
Debt Service Coverage Ratio	2.53	2.57	2.31	2.41



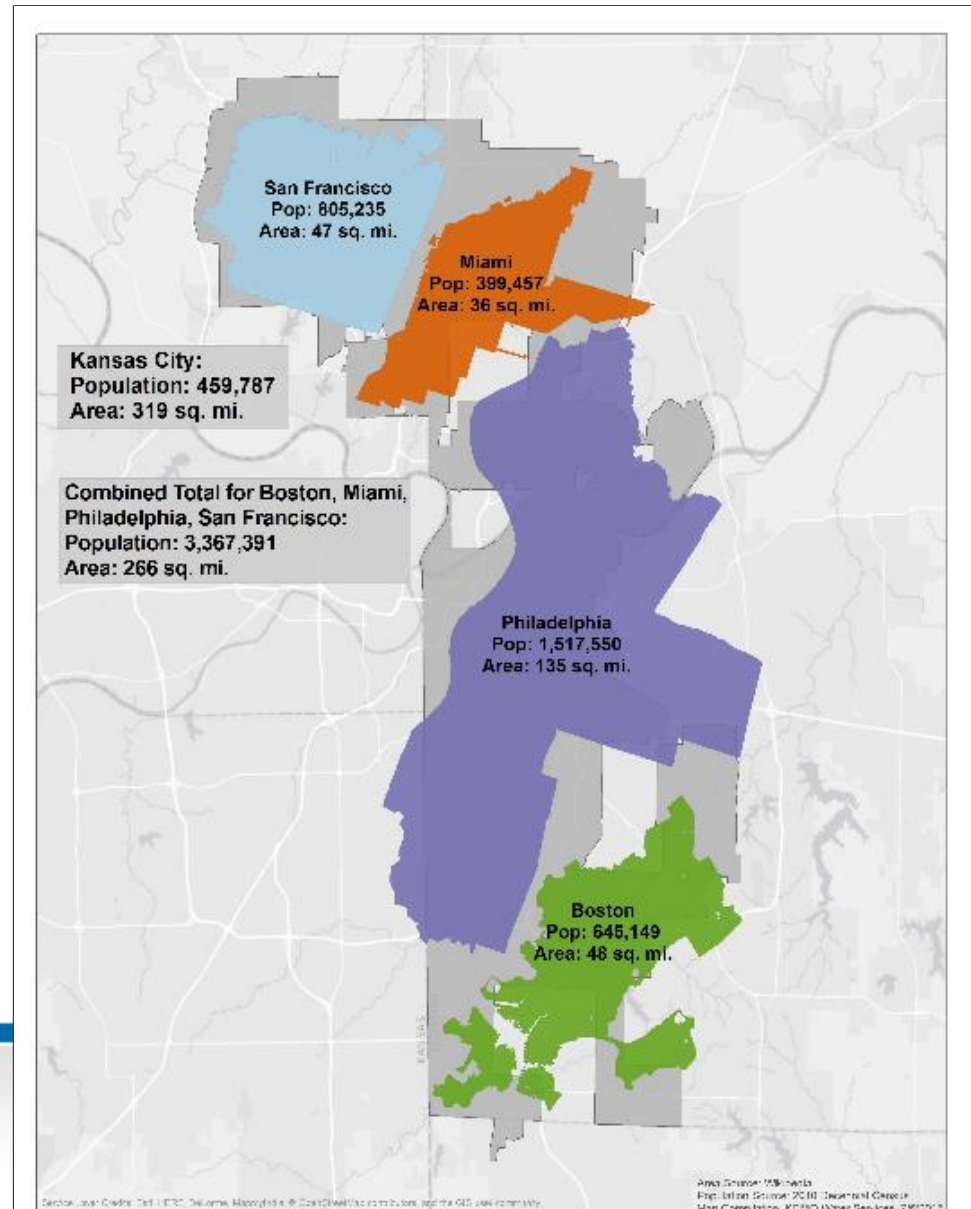
## Follow-up Items from June 14<sup>th</sup> Task Force Meeting

# Items from June 14<sup>th</sup> Task Force Meeting on Stormwater

- Other Stormwater utilities that have considered sustainable alternatives.
- Climate change impacts on Stormwater and climatology reports.

# Large Service Area + Small Population = Higher Cost of Service relative to other cities

- KC Water services an area larger than San Francisco, Miami, Philadelphia and Boston combined (318 square miles vs 266 square miles)
- Kansas City's population represents less than 14% (460,000 vs 3.4 million) of the combined population of the 4 other cities embedded on the map.







# Public Comment



# Task Force Discussion



## Schedule and Next Steps

# Anticipated Schedule

Date	Topics
April 2016	<ul style="list-style-type: none"><li>• Roles/Member Orientation</li><li>• Water Services Overview</li><li>• Customer Profile</li><li>• Current Rate Structures</li><li>• History of Previous Task Force</li><li>• Funding Challenges</li><li>• Topics and Schedule</li></ul>
May 2016	<ul style="list-style-type: none"><li>• Guiding Principles questionnaire</li><li>• Water utility overview</li><li>• Water utility – cost recovery options</li></ul>
June 2016	<ul style="list-style-type: none"><li>• Stormwater utility overview</li><li>• Discussion of stormwater funding sources and levels needed</li><li>• Guiding Principles discussion</li></ul>
July 2016	<ul style="list-style-type: none"><li>• Wastewater utility overview</li><li>• Wastewater utility – cost recovery options</li></ul>

# Anticipated Schedule, continued

Date	Topics
<b>August 2016</b>	<ul style="list-style-type: none"> <li>• Guiding Principles Draft</li> <li>• Overview of Customer Assistance Program</li> <li>• Overview of System Development Charge options</li> </ul>
<b>September 2016</b>	<ul style="list-style-type: none"> <li>• Water rate structures</li> </ul>
<b>October 2016</b>	<ul style="list-style-type: none"> <li>• Wastewater utility rate structures</li> <li>• Water utility and wastewater utility fixed charges</li> <li>• All utilities – infrastructure replacement funding</li> </ul>
<b>November 2016</b>	<ul style="list-style-type: none"> <li>• Water utility draft recommendations presentation</li> <li>• Public hearing</li> </ul>
<b>December 2016</b>	<ul style="list-style-type: none"> <li>• Stormwater utility draft recommendations and presentation</li> <li>• First Southwest Securities presentation (tentative)</li> <li>• Public hearing</li> </ul>
<b>January 2017</b>	<ul style="list-style-type: none"> <li>• Wastewater utility draft recommendations presentation</li> <li>• Public hearing</li> </ul>
<b>February 2017</b>	<ul style="list-style-type: none"> <li>• Consider public input and finalize recommendations</li> </ul>
<b>March 2017</b>	<ul style="list-style-type: none"> <li>• Finalize recommendations</li> </ul>





Meeting Adjourned