Horizon 2020 Steering Committee Water and Wastewater Master Plan Overview



City of Lawrence

August 11, 2014

System Overview

Let's Look at the Numbers

Water System

- 2 Raw Water Sources
 - Clinton Reservoir
 - Kansas River
- 2 Water Treatment Plants
 - Clinton WTP
 - Kaw WTP
- 6 Finished Water Pump Stations
- 10 Water Storage Tanks
- 11.2 Million Gallons of Storage
- 509 Miles of Watermains
- 3,356 Fire Hydrants
- 12,993 Water Valves

Wastewater System

- 1 Wastewater Treatment Plant
- 4 Wet Weather Storage Basins
- 10 Million Gallons of Wet Weather Storage
- 26 Miles of Force Main Sewers
- 31 Sewer Pump Stations
- 414 Miles of Gravity Sewers
- 10,457 Manholes

Introduction

The Master Plan's objectives are to assess our needs and recommend Capital Improvement Plans (CIP) that address the following:

Infrastructure Maintenance

Including previously deferred and projected future needs

• Community Growth

Expands capacities to support projected community growth and future economic development

Regulatory and Product Quality Needs
 WWTP wet weather overloading
 Future WWTP effluent nutrient reductions
 Water contaminants of concern such as microtoxins
 Taste and Odor of the drinking water

The Good News

- Water treatment capacity is sufficient for two decades due to recent expansion of the Clinton WTP.
- Sanitary sewer overflows have been significantly reduced as we have improved the mechanical reliability of lift stations and the WWTP, and rehabilitated the collection system.
- Budgeted FTEs and chemical usage has been reduced as staff has expanded their knowledge and the use of technology.
- Utilities staff responded to near record water demand in 2012 without incident because of previous investments in water treatment infrastructure.

The Not-So-Good News

- The WWTP is significantly overloaded during rain events. Capacity is 65 MGD versus peak wet weather flows at 81 MGD.
- The existing WWTP is projected to be out of dry weather capacity as early as 2018.
- Infrastructure maintenance of current facilities has been deferred and is falling further behind.

Water lines - \$19 million backlog of pipes that have exceeded expected design life, Oread Water Tanks (Ike and Hoover), previous major expansion projects' equipment is reaching 15 years in service.

 There is insufficient collection system capacity along the 31st Street corridor during wet weather events, which limits growth west of K-10, south of 6th Street, and in southeast Lawrence.

31st Street Corridor



The Not-So-Bad News...

We can implement programs that...

- Construct new WWTP capacity to meet projected community needs through 2030.
- Reduce wet weather flows to a manageable level.
- Address collection system limitations along the 31st street corridor.
- Catch up on deferred infrastructure maintenance and establish programs that keep up with future maintenance needs.
- Enhance systems to meet future regulatory requirements and improve quality of services.

	<u>Major Programs</u>	Program Duration	<u>Cost (in 2012 \$)</u>
•	Water Main Replacement Program	32-Year	\$72.3 million
•	Wakarusa Wastewater Treatment Plan	nt 5-Year	\$54.7 million
•	Rapid Inflow/Infiltration Reduction Program	8-Year	\$19.4 million
•	Sewer Rehabilitation, Replacement, Cured-In-Place-Pipe & Manhole Rehabilitation Program	17-Year	\$33.5 million

	Water Major Projects	Project Year	Project Cost	
•	Kaw Intake	2014	\$ 5.0 million	
•	Kaw Transmission Main	2014	\$ 7.4 million	
•	Oread Tank Replacement	2016	\$ 3.9 million	
•	Booster Pump Stations	2015	\$ 1.0 million	
•	Taste & Odor Phase 1	2016	\$ 6.0 million	
•	Clinton Intake	2016	\$ 1.8 million	
•	Stratford Tank	2018	\$ 3.0 million *	
•	Tower Coatings	To 2025	\$ 1.1 million *	
•	Taste & Odor Phase II	TBD	\$10.8 million *	
•	Kaw Transmission Main Phase 2 & 3	TBD	\$13.3 million *	
•	Annual WTP Maintenance - Clinton &	To 2030	\$ 9.9 million *	
	Kaw			

* 2012 Dollars

	Wastewater Major Projects	Project Year	Project Cost	
•	Gravity Sewer to Remove PS #8	2019	\$	3.5 million*
•	PS #9 Expansion	2020	\$	2.3 million *
•	Kansas River WWTP – Nutrient Remova	2023	\$	9.0 million *
	Conversion			
•	PS #25 Expansion	2030	\$	1.5 million *
•	Gravity Relief Sewers	TBD	\$	1.5 million *
•	Field Ops Building	TBD	\$	5.0 million *
•	Annual WWTP Maintenance – Kansas	To 2030	\$	8.4 million *
	River & Wakarusa			
•	Pump Station Rehabilitation	To 2030	\$	3.3 million *

* 2012 Dollars

Water Improvements



Wastewater Improvements



Key Takeaways

- Generally residential and commercial development does not drive the size/capacity of water and sewer mains.
 - Water Fire Protection
 - Sewer Wet Weather
- New Wakarusa WWTP provides flexibility but is more complex in how flows are managed.
- Rates that fund the CIP are not sufficient to construct all development driven improvements.
- Lawrence has made large investments in utilities infrastructure in the northwest and southeast.
- Capital and Operating & Maintenance costs for Leap Frog Development are much higher than the costs for contiguous development.

Questions

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