Memorandum City of Lawrence Utilities Department

TO:	David L. Corliss – City Manager
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FROM:	Dave Wagner – Director of Utilities
CC:	Mike Lawless – Asst. Director of Utilities
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Date:	May 20, 2011
RE:	Information Requested from the May 17 th Budget Study Session

In response to the City Commissioners' questions concerning Utilities staffing, technology and volume of water treated, and efficiencies at the May 17th Study Session the following information is provided. Time savings as a result of increasing efficiencies realized due to improved work practices and automation have been redirected to three major areas: 1) Maintaining and operating expanded infrastructure, 2) Addressing previously deferred maintenance of infrastructure, 3) Consolidating or taking over services previously performed by other departments. A brief discussion of each follows:

Maintaining and Operating Expanded Infrastructure

Generally reduced water production on an average day basis does not significantly reduce workload. The number of facilities, their size, and peak capacities are more of a driver of staffing needs and workload. Overall, the infrastructure the department is responsible for has, and continues, to increase (see table) and therefore the workload and resource needs have also increased, even though average day water production is lower. When efficiencies have reduced workload, much of that has been redirected to respond to these increased needs.

	2007	April 2011	System Change
Miles of Distribution System (City			
Maintained)	437.4	451.9	3.3%
Number of Valves	10,883	11,498	5.7%
Number of Hydrants	3,040	3,201	5.3%
Miles of Force Main Sewers (City			
Maintained)	20.2	26.1	29.3%
Miles of Gravity Sewers (City			
Maintained)	397.8	406.1	2.1%
Number of Manholes	9,960	10,187	2.3%
Number of Pump Stations	33	32	-3.0%
Number of Pumps at Pump Stations	74	73	-1.4%
Total Pump Station Horsepower	2,182	2,673	22.5%

Collection and Distribution System Infrastructure

In addition to the above, there have been two major facility expansions that have come on line since 2004. The Clinton Water Treatment Plant increased from 10 million gallons per day (MGD) to 22.5 MGD with the \$20 million expansion project that came on line in 2009. From 1998-2004 the Wastewater Treatment Plant was expanded at a cost of \$59 million for increased capacity and treatment quality. Due to efficiencies realized with the installation of enhanced automation with both these major projects, the level of plant operator staffing did not change. However, there were, and are, increases in maintenance and control system maintenance demands, as well as consumption of commodities, such as electricity and chemicals, that are used to increase the quality as well as the peak quantity of treatment at both of these facilities.

<u>Addressing Deferred Infrastructure Maintenance and Improving Services</u> As much as possible manpower and resources have been redirected to increase the level of maintenance and rehabilitation of infrastructure and improve services.

1. Around 2008 the department began and/or expanded several programs intended to address previously deferred maintenance. These include water main replacement and valve exercising programs that provide more efficient operation of the water distribution system through reduced water quality complaints, increased fire protection, and reliable shut downs during water main repairs.

	2007	2008	2009	2010
Valves Exercised	-	304	1,702	1,933
In-house Water Main Replacement	3,210	10,618	10,922	11,985

Programs such as the 10-year TV inspection, 4-year section cleaning, root control, CIPP, and targeted preventative maintenance locations have been in place on the sewer collection system since 1998 and have been continued or expanded. A reduction in the number of the customer service calls is one of the benefits from these types of programs as seen on the attached <u>graph</u>. With continued emphasis on these types of programs on the water distribution system, the department believes similar benefits will result.

- 2. The Department has increased activity and the expectations of staff related to treatment process understanding. All Utility Operators and Technicians are now required to obtain and maintain certain levels of professional certification related to their jobs. Concurrently in-house training and critical analysis of processes has increased. In addition to produce a more reliable and consistent product, this has helped to reduce chemical usage. In 2010, all three treatment facilities reduced the cost of chemical usage per million gallons. Kaw Water Treatment went from \$290 per million gallons (MG) in 2009 to \$233 MG; Clinton \$211 per MG to \$183 per MG; and Wastewater \$122 per MG to \$88 per MG.
- 3. Since 2007, the safety responsibilities and expectations of all employees have increased. The department has expanded and maintains a very active and aggressive safety program consistent with rigorous OHSAS 18001 standards. For example, when working in traffic the department has adopted the practice of following all Manual on Uniform Traffic Control Devices requirements, which improve the safety of the workers and the public. In 2010 Utility Department workers compensation claims totaled \$16,104, which is 2.6% of all City claims. At the same time the department employs more than 12% of the City's full time

work force and engages in some of the more hazardous work in dangerous environments.

- 4. Department inspectors are performing more of the day-to-day inspections on CIP projects. Previously inspection services would often be contracted as part of the construction phases with the design consultant. It is now more typical to limit the design consultant's construction services to contract management and specialized inspections.
- 5. The department formed an automation and process control systems group to design, procure, and install automated control systems. The group performs system design, procures components, constructs and installs controllers and instruments, performs all system application programming and development, and prepares "as constructed" documentation.

Since 2006, the group has designed automated systems for 12 wastewater pump stations, the expansion of the Clinton WTP, construction of the Stoneridge water tower, and replacement of systems at all 5 existing water towers. The group is currently replacing all systems at the Kaw WTP, working on the North Final MCC Replacement, and Anaerobic Digester Expansion projects at the WWTP.

By performing these tasks with in-house staff, the department not only experienced a substantial cost savings (in excess of \$1,000,000 on these projects alone) but we are now self sufficient in maintaining and improving these systems without the cost of third party vendors. From 2007 to 2009, the department spent more than \$50,000 for third party contractors to trouble shoot and repair their SCADA equipment.

6. Engineering and technical staff are already working on learning the software supplied and under development for wastewater and water system modeling that is being acquired as part of the Master Plans. This will allow the department to evaluate in-house the impact of new developments as well as help target ongoing rehabilitation needs and rehabilitation program effectiveness. Previously this service was completely outsourced to consultants.

Work Previously Performed by Other Departments

The department has taken on expanded responsibilities since 2007. These include:

- All city infrastructure locates (previously performed by three departments)
- Fire Hydrant testing (previously performed by Fire and Medical)
- Managing and inspection of all sanitary sewer expansions (previously performed by Public Works)
- Water quality sampling and testing at Farmland

Since 2007, the number of full-time employees (FTE) funded by the water and wastewater rates has decreased by 5 in Utilities and increased by 0.5 in the General Fund for a net decrease of 4.5. See table below.

	2007	2008	2009	2010	2011			
Total 501 FTE	133.76	135.26	134.26	128.26	129.26			
Total Finance/UT Billing FTE	22.26	22.26	22.26	22.26	22.26			
Total Utilities 7100-7610 FTE	108.00	108.00	108.00	102.00	103.00			
Total General Fund FTE	3.50	5.00	4.00	4.00	4.00			

FTE in Fund 501 - Water and Wastewater (as of 5/23/11)

As a priority, the department continues to reinvest in our infrastructure whenever possible. While there are no CIP projects in the 2011 budget that focus on infrastructure maintenance, the 2011 and prior years' Operations and Maintenance Budgets have and do provide funding for some level of infrastructure maintenance. While not at the magnitude of a major CIP effort, it does provide funding to sustain programs for maintenance and rehabilitation of much of the above ground and treatment process mechanical systems.