

Schumaker & Company



**Draft Report
for the
City of Toledo**

**Performance Audit
of the
Department of Public Utilities**

December 2014

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I. Executive Summary

This chapter represents a summary of the results of the performance audit of the Toledo Department of Public Utilities (DPU) completed by Schumaker & Company. It includes a synopsis of the objectives and scope of our work, a functional evaluation summary, and several exhibits, for amplification purposes, that encapsulate the recommendations and estimated benefits associated with these improvement opportunities.

The remaining report chapters contain a discussion of our findings, conclusions, and recommendations for each discrete area of review within the scope of the audit. They include:

- ◆ Chapter I – Executive Summary
- ◆ Chapter II – Study Background
- ◆ Chapter III – Performance Measurement
- ◆ Chapter IV – Utilities Administration
- ◆ Chapter V – Safety
- ◆ Chapter VI - Operating Divisions
- ◆ Chapter VII – Organization and Human Resources

These chapters provide the detailed facts and analyses that support, and provide context for, the recommendations we have made. The findings and recommendations contained in this audit report are the findings and recommendations of the consultant only and are not necessarily agreed to by DPU or City of Toledo.

During conduct of the review, our consultants allocated considerable time to interviewing DPU and City of Toledo personnel, riding around with DPU field personnel, reviewing reports and documentation, analyzing work flow processes, and assessing any changes being planned by DPU management. The consultant team focused on identifying areas for improvement, rather than areas where operations performed well. Although some recommendations were associated with areas that had been identified prior to the review as improvement opportunities, we endeavored to formulate more detailed action steps in our recommendations.

This review was performed in accordance with generally accepted auditing standards (GAAS), as contained in the United States General Accounting Office’s “Standards for Audit of Government Organizations, Programs, Activities, and Functions,” related to issues of management economy, efficiency, and effectiveness as applicable to public utilities (“Yellow Book”), and in accordance with the standards as defined in the RFP and set forth in the National Association of Regulatory Utility Commissioners’ “Consultant Standards and Ethics for Performance of Management Analysis.”



A. Summary of Recommendations

The audit produced _____ recommendations, which are contained in this report. A summary of the number of priority items, and estimated benefits, is grouped by phase. Following is a brief explanation of these categories of information.

Priority

To assist DPU management in developing implementation plans, each recommendation has been assigned a priority of “high,” “medium,” or “low” according to the following criteria:

- ◆ *High* – Designated recommendations are high priority because of their importance and urgency. These represent significant benefit potential, major improvements to service, or substantial improvements to methods or procedures.
- ◆ *Medium* – Designated recommendations are of medium priority. In some instances, the implementation of these recommendations is expected to provide moderate improvements in profitability of operations, or management methods and performance. In other instances, implementation may provide significant longer-term benefits which are less predictable.
- ◆ *Low* – Designated recommendations reflect a lower priority. In many instances, they should be studied further or implemented sometime during the next few years. Potential benefits are perceived to be either modest or difficult to measure.

In many recommendations, it is not possible or practical at this time to measure “quantitative” benefits. The benefits associated with these recommendations fall primarily into four categories:

- ◆ Reduction in actual costs of operations within a DPU area
- ◆ Increase in a revenue source within a DPU area
- ◆ Change in work flow processes used in the provision of services to DPU customers on a more effective or efficient basis
- ◆ Change in other processes resulting in good business practices being implemented

Particularly in instances where a new management practice or procedure is recommended (where one either did not exist or was not fully implemented), it may be difficult to estimate the actual benefit to be derived. It is believed, however, that the overall benefit will be improved effectiveness and efficiency of the specified DPU area. Additionally, qualitative benefits may occur that cannot be easily quantified. They could include improved effectiveness and efficiency in operations, increased customer satisfaction, additional cost savings, increased revenues, etc. It should also be noted that, because it is not possible in all instances to estimate expected benefits prior to implementation, any implementation plan should include a reliable measurement tool to track benefits after implementation.

Quantifiable benefits (increased revenues or additional cost savings) have been provided where they could be estimated. This quantification is subject to some judgment and would require additional effort beyond the scope of this review to refine the estimates. The actual benefits from these recommendations are, therefore, subject to a degree of uncertainty. For other recommendations the benefits to be derived are of a more qualitative nature or, simply stated, the expectations of prudent management. Those areas where major quantifiable benefits have been identified in the report are described on the following pages.

As DPU will have varying ways to implement recommendations, Schumaker & Company did not estimate the impact of implementing audit recommendations on DPU's expense. However, the short-term impact could be considerable. Additionally, implementation of recommendations often requires a phase-in period before benefits can be achieved.

B. Recommendations Listing

The actual recommendation statements contained in the audit report are shown by phase and work plan area on the following pages. We have also indicated the recommendation number, page number in the report, priority, estimated time-frame to initiate implementation efforts, and estimated benefits following implementation. The details of each recommendation can be found in the individual chapters where the subject matter is evaluated.

Chapter III – Performance Measurement

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
III-1	Undertake steps to address all areas of the organization best practices assessment. (Refer to Finding III-1.)	50	High	6 – 12 months	TBD
III-2	Undertake steps to address all of the areas of bottom quartile performance to move the DPU to a top quartile performer. (Refer to Finding III-2.)	51	High	6 – 12 months	TBD

Chapter IV – Administrative Services

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-1	Improve the annual DPU budgeting process to formally incorporate detailed goals/objectives/performance measures included as part of the annual process. (Refer to Finding IV-1 and Finding IV-2.)	84	High	0 – 6 months	TBD



	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-2	Require all DPU operating divisions to formally monitor actual-to-budget financial figures on a monthly basis and provide explanation to management for any significant variance. (Refer to Finding IV-3.)	84	High	0 – 6 months	TBD
IV-3	Work with the City Finance and ICT Departments to expand DPU's SAP capabilities. (Refer to Finding IV-4 and Finding IV-11.)	85	Medium	6 – 12 months	TBD
IV-4	Establish standard rules for rebilling and provide formal training not only to Accounting & Financial Analysis employees but also Customer Service Unit employees who discuss bills with customers. (Refer to Finding IV-5 and Finding IV-19.)	85	Medium	6 – 12 months	TBD
IV-5	Establish a formal performance measurement process for all DPU divisions that supports the Utility's strategic planning process. (Refer to Finding IV-6.)	86	High	0 – 6 months	TBD
IV-6	Have agents contact Supervisors immediately when escalation of calls is necessary. (Refer to Finding IV-7.)	86	High	0 – 6 months	TBD
IV-7	Regularly monitor customer calls at least once per week for each agent. (Refer to Finding IV-8 and Finding IV-9.)	86	High	0 – 6 months	TBD
IV-8	Modify service request and implementation procedures to improve customer interactions. (Refer to Finding IV-10.)	86	Medium	6 – 12 months	TBD
IV-9	Assign at least one dedicated training staff to the Utilities Administration group to provide regular training to Customer Service Unit and Billing & Records employees. (Refer to Finding IV-12.)	87	High	6 – 12 months	TBD
IV-10	Integrate DPU billing and water emergency calls into one Customer Service Unit. (Refer to Finding IV-14.)	87	High	6 – 12 months	TBD
IV-11	Incorporate into the Adjustment Committee at least one external individual who is not part of the DPU service process. (Refer to Finding IV-15.)	87	Low	12 + months	TBD
IV-12	Perform a formal investigation and study focusing on determining the costs and benefits of using collection agencies and collection law firms. (Refer to Finding IV-16.)	87	Low	12 + months	TBD
IV-13	Develop a formal write-off policy for the DPU organization. (Refer to Finding IV-16.)	88	Low	12 + months	TBD

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-14	Combine the Billing & Records group and the Water Distribution Collections group into one entity located at the Water Distribution facility and improve electronic workflow between groups. (Refer to Finding IV-17 and Finding IV-18.)	88	Medium	6 – 12 months	TBD
IV-15	Assign a Supervisor who supervises the Legal Technicians and Clerk currently located in the Utilities Administration group. (Refer to Finding IV-20.)	88	Medium	6 – 12 months	TBD

Chapter V – Safety

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
V-1	Analyze high-injury work processes and identify work method changes to reduce associated occupational injuries. (Refer to Finding V-1 Finding V-2, Finding V-3, and Finding V-8.)	99	High	0 – 6 months	TBD
V-2	Measure and report safety performance. (Refer to Finding V-3 and Finding V-4.)	99	High	0 – 6 months	TBD
V-3	Recognize and reward good performance. (Refer to Finding V-4.)	100	Medium	12 + months	TBD
V-4	Strengthen safety accountability at every level of the organization. (Refer to Finding V-4.)	100	Medium	12 + months	TBD
V-5	Create a safety committee scorecard. (Refer to Finding V-3, Finding V-4, Finding V-5, and Finding V-6.)	101	High	0 – 6 months	TBD
V-6	Implement a training management system. (Refer to Finding V-6.)	101	Medium	12 + months	TBD
V-7	Hire a least one additional safety professional (Refer to Finding V-3, Finding V-4, Finding V-5 and Finding V-6.)	102	Medium	12 + months	TBD



Chapter VI – Operating Divisions

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VI-1	Initiate a formal annual strategic planning process. (Refer to Finding VI-1.)	120	High	0 - 6 months	TBD
VI-2	Complete the implementation of Cityworks throughout DPU. (Refer to Finding VI-3.)	121	Medium	6 – 12 months	TBD
VI-3	Create higher-level performance reporting tied to the Cityworks software. (Refer to Finding VI-7.)	121	High	6 – 12 months	TBD
VI-4	Investigate incorporation of risk into the main replacement program and closely monitor the pipe breaks per mile to assure a decreasing number of breaks based on the additional funding. (Refer to Finding VI-12.)	123	High	12 + Months	TBD

Chapter VII – Organization and Human Resources

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VII-1	Develop a comprehensive workforce plan that addresses future needs, including staffing and associated skill levels. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)	137	High	6 – 12 months	TBD
VII-2	Develop a comprehensive management succession plan that that addresses future needs and defines recruitment and retention strategies, including compensation. (Refer to Finding VII-2, Finding VII-5, Finding VII-6, Finding VII-7, Finding VII-8, Finding VII-9, and Finding VII-10.)	138	High	6 – 12 months	TBD
VII-3	Combine jobs, where possible, and implement a competency/certification based job-progression system to encourage professional development, employee retention, deployment flexibility and productivity. (Refer to Finding VII-1, Finding VII-2, Finding VII-4, Finding VII-9, Finding VII-11, Finding VII-13, Finding VII-14, Finding VII-15, and Finding VII-16.)	138	Medium	12 + months	TBD
VII-4	Implement a formal employee training system and a learning management system to deliver and document training. (Refer to Finding VII-11, Finding VII-12, and Finding VII-14.)	140	Medium	12 + months	TBD

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VII-5	Consider reducing the number of Commissioners and streamlining the management and supervisory structure. (Refer to Finding VII-1, Finding VII-5, Finding VII-6, Finding VII-7, Finding VII-8, and Finding VII-9)	141	Medium	12 + Months	TBD
VII-6	Integrate customer service functions under Utilities Administration. (Refer to Finding VII-17.)	142	Medium	12 + Months	TBD

DRAFT



II. Study Background

A. High-Level Evaluation Criteria – Utility of the Future

A management support study of a water utility brings to bear:

- ◆ The specific knowledge and skills of the individual consultant relative to the state of today's management practices
- ◆ The specific knowledge of what other similar utilities have in place or plans for managing the specific activities involved in a utility

An assessment of management performance must take into consideration both of these items in developing an overall assessment of a water utility such as Philadelphia Water Department (PWD). It should go without saying that some utilities are more advanced in some areas of their organization than others. Some are still in the planning stages, some are well into the implementation phases, and some are simply unaware of areas within their organization that need to be strengthened or improved. However, the utilities we usually rank as higher performers in management support study have at their core the certain types of vision, mission, and values. At a minimum, they also strive to:

1. Foster a safe, accident-free work environment.
2. Develop employees who are highly skilled, empowered, motivated, and ambassadors for the organization.
3. Deliver high-quality products and services that meet or exceed customer expectations and all regulatory requirements.
4. Be held in esteem by the communities they serve.
5. Maintain competitive rates.
6. Operate a highly reliable, efficient distribution system constructed of appropriate materials.
7. Maintain a current strategic plan that fosters management through objectives with relevant metrics and through reportage at all levels that link to the plan (such as planned versus emergency work, % travel time).
8. Have a flexible, robust, and easy-to-use reporting and data inquiry system.
9. Organize themselves in a lean, flat, effective structure.
10. Optimize the use of electronic data entry and retrieval, and eliminate paper reporting and data gathering.
11. Proactively pursue continuous improvement in technology (both Information Technology (IT) and non-IT), work practices, and processes



12. Maintain very few and flexible job classifications that address all work crews/individuals, thereby enabling work across functions (e.g., combining distribution and collector systems crews), and having one job classification to perform Meter, Delinquency and Repair, and Customer Service work.
13. Operate a single call center manned by empowered employees who have access to information that enables them to handle all inquiries, including accounting and billing, scheduling field visits, complaints, and job status.
14. Plan, schedule, dispatch, and supervise all work using a comprehensive work management system. Supervision has access to all jobs and crew locations via global positioning system (GPS) and the crew/individual work queues.
15. Field operations crews and single dispatch employees work out of efficient, strategically placed reporting locations with sufficient capacity for onsite parking for all company vehicles, materials, equipment administrative functions, and employee facilities.
16. Deploy two-man crews with the proper vehicles, tools, and equipment and communication devices as the “standard work crew.” Recognize that combining multiple crews for specific jobs or having a one-man “crew” is appropriate when needed.
17. Equip crews and individuals with electronic communications devices that enable the entry and retrieval of data as required for their jobs (e.g., service orders, customer appointments, meter data, customer account data, work orders, crew locations and job assignments, asset data and location, safety standards, construction standards, time reporting, job completion data, etc.). The objective of this is that data entry and retrieval need to be handled only once, at the source.
18. Leverage geographic information system (GIS) technologies in all mapping and records systems and GPS location services in field force dispatching operations

In future operations, all work performed and the metrics relating to that work will be linked directly the DPU strategic plan. It is expected that the work performed and products provided will be of the highest quality and will meet or exceed customer expectations. It is given that the inside plant infrastructure will continue to be right sized for changes in demand and will be maintained to be reliable and efficient. It is envisioned that the transition of the piping systems from cast iron to material such as malleable iron pipe in an effort to eliminate the breakage occurring in winter will proceed as quickly as economically feasible with prioritization of replacements being based on risk. A single call center manned by empowered employees will handle all customer inquiries. Field operations will work out of well-equipped reporting locations. All work, both planned and emergent, is initiated, planned, scheduled, and dispatched using a comprehensive work management system. A typical crew will consist of two employees using a vehicle that is equipped with an onboard compressor and that is towing a mini-excavator. “Customer service” personnel will be able to be dispatched to perform all service inquiries including meter and disconnection and connection work. Crews and customer service personnel will be regularly monitored for quality. Field employees will receive and report on all activities using an electronic device. This device will also enable them to do time reporting, access asset data from GIS, look up constructions standards and procedures, look up safety standards and procedures, create work

orders, and complete work orders. In essence, all data required to be communicated to and from field associates will be done using this device. Customers will be regularly asked for their feedback on service.

It is realized that there are many initiatives underway within DPU to achieve a number of the goals mentioned above (such as the implementation of Cityworks). Incorporating the recommendations contained in this report into the plan and executing the plan puts DPU well on its way to fulfilling its vision “to become America’s model 21st Century urban water utility—one that fully meets the complex responsibilities and opportunities of our time and our environment.”

B. Toledo Department of Public Utilities (DPU)

DPU is one of the largest units in the City of Toledo with approximately 659 employees serving within seven divisions: Water Treatment, Water Distribution, Sewer and Drainage Services, Water Reclamation, Engineering Services, Environmental Services, and Utilities Administration. Schumaker & Company review only addressed the first four division (Water Treatment, Water Distribution, Sewer and Drainage Services, Water Reclamation) and Utilities Administration.

DPU operates a water treatment system that produces 26 billion gallons of high-quality drinking water per year to an estimated 500,000 people in Toledo, and Lucas, Wood and Fulton Counties in Ohio, and Momoe, Michigan. The Collins Park Water Treatment Plant draws from Lake Erie and produces an average of 73 million gallons per day (MGD) with a capacity of 150 MGD. The City's water distribution system is comprised of 1165 miles of transmission lines.

The sanitary sewage system operated by DPU collected and treated approximately 88 million gallons of wastewater per day from 103,287 residential, commercial, institutional and industrial customers within Toledo and approximately 7,686 customers outside of the City. An estimated 320,000 people are served by the sewer system. Wastewater is collected by 961 miles of local and interceptor sanitary sewers owned by the City. The City's Bay View Wastewater Treatment Plant is an activated sludge plant that practices nitrification and chemical phosphorous removal sized with an average daily flow of 102 million gallons per day. The plant is designed with a firm capacity to provide full treatment to 195 MGD. The plant is also equipped with a High Rate Treatment process that has a firm capacity to treat 185 MGD of storm flows. This brings its total capacity to 380MGD.

DPU Rates

DPU's rates compared to other similar municipalities are shown in *Exhibit II-1*. DPU's rates compare favorably with other similar municipal utilities.



Exhibit II-1
2013 Residential Rates Comparison
Based on 1,000 Cubic Feet per Month, 5/8" Meter
as of December 31, 2012

City	Water Rates	Wastewater Rates	Total
Ann Arbor, MI	\$29.12	\$38.32	\$67.44
Cleveland, OH	\$33.69	\$58.90	\$92.59
Columbus, OH	\$59.16	\$48.06	\$107.22
Detroit, MI	\$25.12	\$61.77	\$86.89
Fort Wayne, IN	\$26.53	\$45.64	\$72.17
Average of Above Cities	\$34.72	\$50.54	\$86.26
Average of Reporting Water Systems	\$31.51	\$40.79	\$72.30
TOLEDO, OH	\$14.53	\$48.71	\$62.24

Source: Information Response 112 – 2013 Water and Wastewater Rate Survey – American Water Works Association (AWWA)

In a similar manner, DPU's industrial rates are shown in *Exhibit II-2*.

Exhibit II-2
2013 Industrial Rates
Based on 1 Million Cubic Feet per Month, 4" Meter
as of December 31, 2013

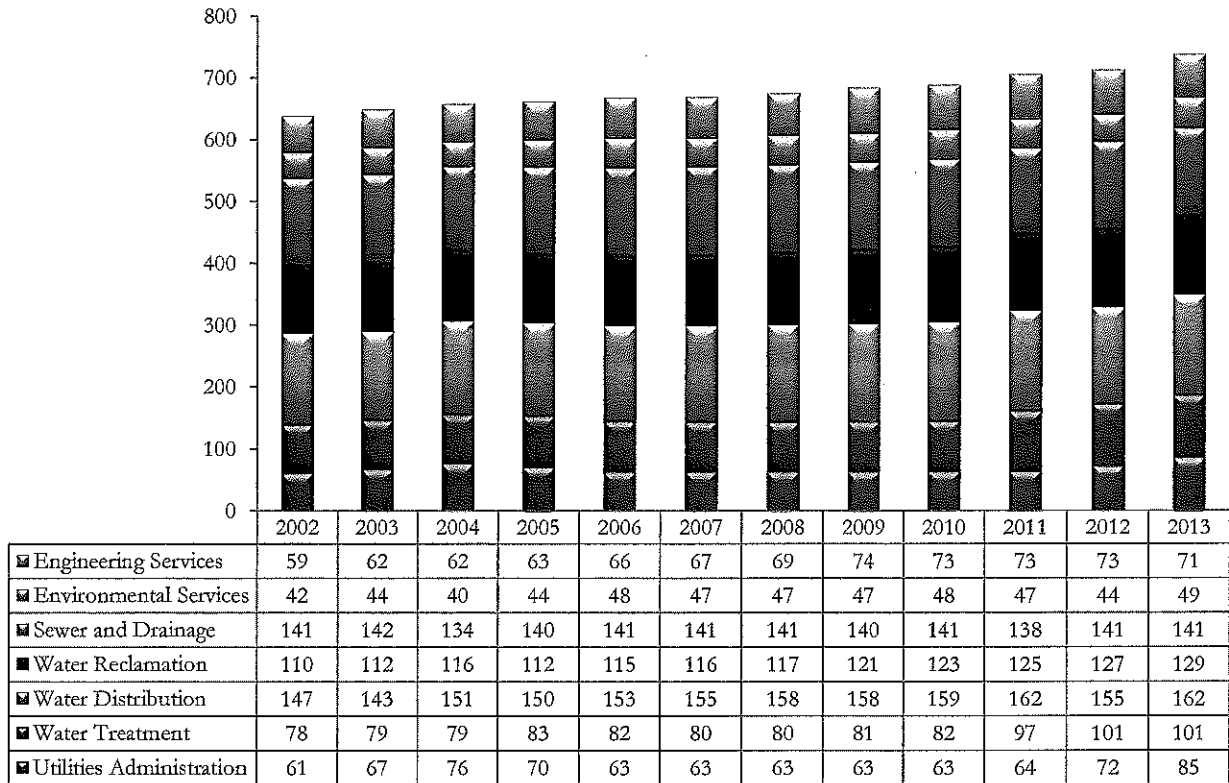
City	Water Rates	Wastewater Rates	Total
Ann Arbor, MI	\$30,302.67	\$34,888.33	\$65,191.00
Cleveland, OH	\$29,523.87	\$56,802.10	\$86,325.97
Columbus, OH	\$20,087.28	\$40,110.86	\$60,198.14
Detroit, MI	\$16,486.83	\$41,273.89	\$57,760.72
Fort Wayne, IN	\$15,017.13	\$39,967.68	\$54,984.81
Average of Above Cities	\$22,283.56	\$42,608.57	\$64,892.13
Average of Reporting Water Systems	\$25,659.91	\$34,552.20	\$60,212.11
TOLEDO, OH	\$11,640.90	\$37,672.99	\$49,313.89

Source: Information Response 112 2013 Water and Wastewater Rate Survey – American Water Works Association (AWWA)

Staffing Levels

The increase in budgets staffing levels over the last 11 years is shown in *Exhibit II-3*. Overall staffing levels have increased by 13.7% over this time period.

**Exhibit II-3
Budgeted Staffing Levels
as of December 31, 2013**

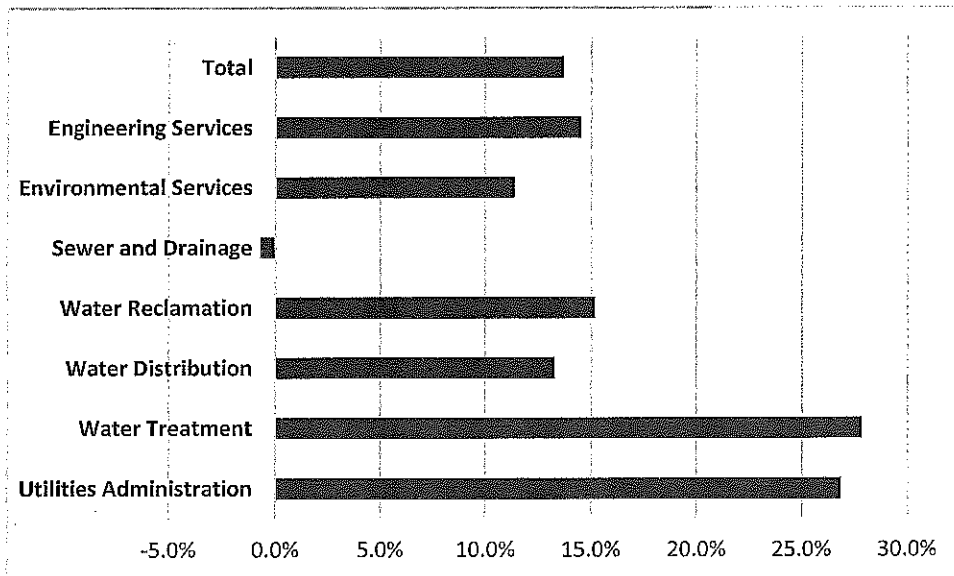


Source: Information Response 5
Utilities Administration is now referred to as Administrative Services

However, not all areas have increased at that rate as shown in *Exhibit II-4*. In fact during this time period, the Sewer and Drainage area has had a slight decrease in staffing levels, whereas all of the other areas have experienced an increase in budgeted staffing levels as shown in *Exhibit II-4*.



**Exhibit II-4
10 Year Changes in Staffing Levels
as of December 31, 2013**



Source: Information Response 5
Utilities Administration is now referred to as Administrative Services

However, a slightly different conclusion would be drawn if the organization charts are studied in detail. The above figures are “budget” figures and therefore must be adjusted for “vacancies” i.e. budgeted but not filled. In short, many of the division have not been operating at their budgeted staffing levels during this timeframe.

C. Objectives and Scope

Schumaker & Company understands that the scope of work to provide performance audit services will include, but not be limited to, the following five themes as defined in the RFP. Quantitative evaluation is expected for each already identified performance measure, as follows:

A. Strategic Planning

- i) Identify to what degree the Utility has planned and implemented progressive strategies in the areas of water and wastewater system management, customer service, finance, human resources management and business process improvement.
- ii) Evaluate how the department communicates its long-term strategic vision to DPU’s stakeholders, including: the Mayor, City Council, ratepayers, citizens, businesses, and other governmental partners.
- iii) Provide examples of ways to improve external and internal communication.

- iv) For each performance measure above, consider the following:
- (1) In what ways has the Utility fostered an innovative culture?
 - (2) How might technology be utilized more effectively/or business process improvements and reaching other overarching objectives throughout the organization?
 - (3) Does the Utility assess its strengths and opportunities/or improvement over the short- and long-terms?
 - (4) Does it have short- and long-term action plans, including how resources will be directed toward achieving goals and strategies the Utility has adopted?
 - (5) Does it have a process for strategic plan development and annual review or updates, including review a/vision, mission and organization value statements?
 - (6) How does the City engage other community partners? Is there a process in place which gives these community partners a “seat at the table?” Seek input from outlying communities about their experiences with the City.

B. Financial Planning

- i) Do long-term financial plans include development of adequate rates, fees and charges to support costs associated with ongoing operation and maintenance, including asset management, capital improvements, and reserves?
- ii) Review the following business operation key performance indicators (KPIs):
 - (1) System Renewal/Replacement Rate (%)
 - (2) Return on Assets (%)
 - (3) Cash Reserve Days (Number of days)

C. Performance Measurement System

- i) How does the Utility measure performance?
- ii) Does it provide measures focused on quality, efficiency, and effectiveness?
- iii) Does it include regular monitoring and reporting?
- iv) Has it established targets in conjunction with the budgeting process that reflect broad internal, external, and financial improvement goals?
- v) Water Operations KPIs include:
 - (1) Drinking Water Compliance Rate (%)
 - (2) Distribution System Water Loss (%)
 - (3) Water Distribution System Integrity (per 100 miles of pipe)
 - (4) Operation & Maintenance Cost Ratios for Water (\$)
 - (5) Planned Maintenance Ratio for Water (% per 100 miles of pipe)
 - (6) Water Plant Capacity (MOD)
- vi) Wastewater Operations KPIs include:
 - (1) Sewer Overflow Rate (per 100 miles of pipe)
 - (2) Collection System Integrity (per 100 miles of pipe)



- (3) Wastewater Treatment Effectiveness Rate (%)
- (4) Operations & Maintenance Cost Ratios for Wastewater (\$)
- (5) Planned Maintenance Ratio for Wastewater (% per 100 miles of pipe)

D. Customer Satisfaction

- i) Does the Utility efficiently resolve customer issues and complaints?
- ii) Does the Utility solicit input on projects and programs under consideration, in planning or under construction?
- iii) Measure customer relations against Customer Service Complaints (per 1,000 accounts)
- iv) Analyze existing customer appeals process
- v) Evaluate complaint resolution tracking mechanisms
- vi) Identify any customer call routing issues/opportunities using the following KPIs:
 - (1) Disruptions of Water Service (per 1,000 accounts)
 - (2) Disruptions of Sewer Service (per 1,000 accounts)
 - (3) Residential Cost of Water Service (\$ per 111onth)
 - (4) Residential Cost of Sewer Service (\$ per month)
 - (5) Residential Cost of Storm Water Service (\$ per month)
 - (6) Customer Service Cost per Account (\$)
 - (7) Billing Accuracy (per 10,000 billings)
 - (8) Service Affordability-As compared to other Ohio and Midwestern region water utilities.

E. Human Resource Management

- i) Evaluate the impact of the following aspects on the overall strength of the organization:
 - (1) Appropriate Staffing Levels
 - (2) Appropriate Administrative Staffing Levels
 - (3) Job Classifications & Descriptions
 - (4) Recruitment & Retention
 - (5) Continuing Training & Education
 - (6) Management Compensation
 - (7) Succession Planning
 - (8) Labor Contracts
 - (9) Safety

- ii) Use the following impact Staff Efficiency Indicators:
 - (1) Customer Accounts per Employee-Water, calculated as $(\text{Number of active accounts-water}) / (\text{FTE's-water})$
 - (2) Customer Accounts per Employee-Wastewater, calculated as $(\text{Number of active accounts-wastewater}) / (\text{FTE' s-wastewater})$
 - (3) Million Gallons per Day (MGD) of Water Delivered per Employee, calculated as $(\text{Average MOD water delivered}) / (\text{FTE's-water})$
 - (4) Million gallons per day (MGD) of Wastewater Processed per Employee, calculated as $(\text{Average MOD wastewater processed per employee}) / (\text{FTE's wastewater})$

This project was designed to help the Toledo Department of Public Utilities (DPU) identify, evaluate, and improve its organizational and operational processes that can help to improve customer service, level of service, service delivery, and identify opportunities to reduce costs. The focus of this proposed assignment was to perform a detailed field activities review to assess the appropriateness of the current organizational structure, review overall staffing issues, identify opportunities for streamlining services, and develop performance measures and management reporting systems to achieve customer service excellence. We recognized that the current integration of Cityworks is providing additional tools to capture and manage field activities. Any suggestions for improvements were based on the Cityworks effort, instead of replace or be separate from that program.

We conducted this audit in a three-step review process which has been custom tailored to meet the DPU's objectives. This process provided the Schumaker & Company project team with a structured approach that is comprehensive and logical, as well as interactive and participative with the City and DPU. The process was originally designed to establish and sustain vital, interactive working relationships among City, DPU, and Schumaker & Company representatives during the course of management and operations review projects. We have refined this three-step process over many reviews, audits, and studies conducted with the same team members proposed for this project.



D. Review Standards

Schumaker & Company subscribes to the audit standards set forth by the U.S. Government Accountability Office’s “Standards for Audit of Government Organizations, Programs, Activities, and Functions,” (commonly referred to as the “Yellow Book”), as applicable to performance audits. Our project documentation system, PMIA, has been specifically developed to meet the requirements of these standards.

E. Project Organization & Staffing

The single most important element a consulting firm brings to an assignment is the qualifications of the individual members of the consultant team. A team composed of individuals who have worked together successfully in the past; their talents and expertise complementing one another.

Schumaker & Company’s team has a strong working knowledge of utility company operations, as well as current industry issues. Our consultants typically hold advanced degrees and average more than 25 years of professional experience. The educational and professional designations of each proposed consultant are summarized in *Exhibit II-5*.

Exhibit II-5
Consultant Team Experience

Name	Responsibility	Years Exp.	Education and Professional Designations
Dennis J. Schumaker	Engagement/Project Manager & Senior Consultant	30+	BME (Mechanical Engineering), MS (Nuclear Engineering), MBA (Strategic & Corporate Planning) CMC®, PMP®, MCSE, MCSA
D. Kerry Laycock	Senior Consultant	29+	BS (Business Administration and Management), MS (Organizational Development), CMC®
Patricia H. Schumaker	Senior Consultant	30+	BSBA (Accounting), MBA (Operations Research) CMC®, CPA, PMP®
Jaye M. Kain	Project Administrator & Analyst	22+	BS (Environmental Geoscience), BS/MS (Geology)

F. Methodology Summary

To accomplish the scope of work in this project, Schumaker & Company will review the DPU executive group’s compiled data concerning DPU operations and benchmark comparisons and link the performance audit process with the formal strategic benchmarking process already underway.

Our project team will follow a three-phase study process designed to establish and sustain vital, interactive working relationships among the DPU personnel and the Schumaker & Company project team. We have used a similar approach on other projects of this type, including past projects for over

50 different entities and have found it to be very effective in achieving the intended goals of the project. Specifically, the three phases of our proposed work plan are:

- ◆ Phase I – Initial Assessment and Roadmap
- ◆ Phase II – Operational Review & Assessment
- ◆ Phase III – Implementation Plan and Final Report Development

Phase I: Initial Assessment and Roadmap

Schumaker & Company will engage the Mayor's Office, DPU department heads, and key staff. These initial meetings and onsite interviews will be essential to gain a better understanding of the DPU's current operations and areas for improvement. Review information obtained will allow for benchmarking and comparison between departments selected and other similarly-situated communities. This phase will culminate with a presentation by Schumaker & Company summarizing key findings and recommending additional analyses of specific departments, services, or City Mayor functions based on anticipated cost savings.

- ◆ *Task 1: Meetings with City & DPU Leadership* – Meet with key City & DPU leadership to identify the priorities and areas of critical concern. The results of these meetings will help to frame the kickoff meeting proposed for *Task 2*.
- ◆ *Task 2: Kickoff Meeting* – Conduct a kickoff meeting to introduce Schumaker & Company to key staff members, clarify deliverables, and align expectations. This meeting, attended by senior directors and department heads, will also provide Schumaker & Company with an opportunity to answer questions posed by City/DPU staff and clarify objectives. The final activity of this task will be to schedule proposed department head and key staff member interviews.
- ◆ *Task 3: Conduct Onsite Interviews* – Prepare and conduct interviews with department heads and other key staff identified. Approximately four key staff members per department will be interviewed unless it is determined additional interviews are critical to the success of the performance audit.
- ◆ *Task 4: Benchmarking* – Review information already obtained by the executive team to develop their best practices initiative plan during *Task 3* to enable a comparison between the DPU and other similarly-situated communities. The review shall include at least three communities of similar population and services provided.
- ◆ *Task 5: Prepare and Present Key Preliminary Findings* – Prepare and present preliminary findings after completing *Tasks 1 – 4* for the DPU's review and comment. We will prepare a presentation based on the feedback and comments from the chosen DPU areas. The presentation will identify the areas and functions with the greatest opportunities for efficiency savings and quality improvement.



Phase II: Operational Review & Assessment

Schumaker & Company will perform an operational review and assessment for the selected DPU groups identified for future study as part of the initial assessment and roadmap. We will assess operational efficiency effectiveness for each selected group, service, or function identified for review, by identifying existing work processes and determining modifications to these work processes or addition of new work processes, plus cataloging and reporting of required staffing and associated skill sets. A draft report to summarize recommendations for changes needed to match recommended work processes will be prepared and presented to the Mayor and other City leadership for comment and feedback.

- ◆ *Task 1: Analysis of Existing Processes* – Identify existing work processes for each selected DPU area or service identified for review during the meetings with City leadership. Identify existing work processes and determining modifications to these work processes or addition of new work processes, plus cataloging and reporting of required staffing and associated skill sets.
- ◆ *Task 2: Develop Recommended Efficiency Improvements* – Work with key City leadership and key staff members to develop recommendations for addressing *Task 1* activities.
- ◆ *Task 3: Prepare and Present Draft Report Findings & Recommendations* – Prepare a draft report, including background, findings/conclusions, and recommendations for City review and comment. This draft report will provide recommendations for business processes, staffing charts, and anticipated efficiency improvements. We will prepare a final report to include the City's comments. The final report, prepared during *Phase III* activities, will summarize recommendations for changes needed.

Phase III: Implementation Plan and Final Report Development

Information and data collected during the operational review and assessment phase will be used to analyze potential service delivery options and to identify solutions, training, and change management courses of action to address recommendations. All recommendations will be based on findings/conclusions and prioritized for the City leadership's consideration. An implementation plan will be prepared in draft format for review and comment, final format to match the optimized state of operations, and presentation format to present to the City leadership at the conclusion of the *Implementation Plan and Final Report Development* phase.

- ◆ *Task 1: Analysis of Service Delivery Options and Recommendations* – Identify potential service delivery options for the City to consider. The options identified will help move the DPU from the existing state of operations to an optimized state of operations.
- ◆ *Task 2: Provide Recommendations Based on Delivery Options* – Provide suggestions for training and change management services based on the *Task 1* recommendations.
- ◆ *Task 3: Prepare and Present Final Report and Implementation Plan* – Prepare three deliverables: a draft report/implementation plan, a final report/implementation plan, and a presentation of findings

and recommendations. We will prepare the final report/implementation plan after completing the analysis of service delivery options and recommendations for the City's review and comment. The final report will include background, findings/conclusions, and recommendations and the final implementation plan will summarize recommendations for service delivery to match the optimized state of operations. The final report and implementation plan will be presented to the City at the conclusion of *Phase III* activities.

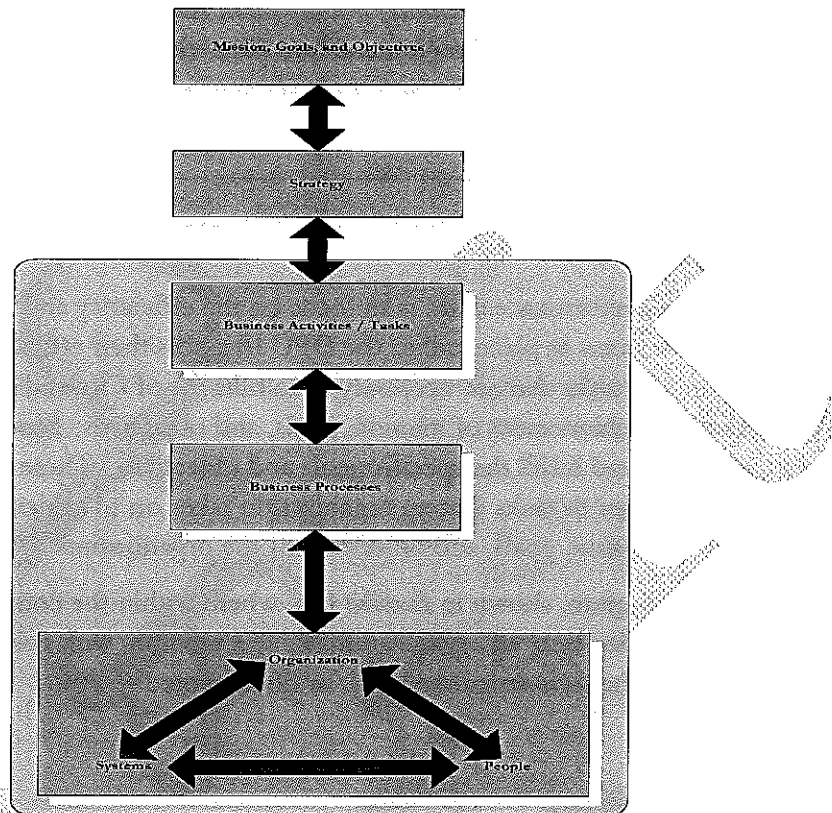
G. Framework

The overall thrust of this performance audit is to focus on the efficiency and effectiveness of the business processes, staffing, and systems in place within the DPU to assess their efficiency and effectiveness in delivering the activities and tasks that are necessary in fulfillment of City and DPU overall strategies resulting in the successful achievement of mission, goals, and objectives. Strategies are developed to fulfill the organization's mission and fulfill the specific goals and objectives. These strategies result in the definition of specific activities or tasks that an organization takes on to achieve the strategy which in turn, again, fulfills the overall mission, goals, and objectives of the organization.

This is represented by a diagram, shown in *Exhibit II-6*, where within the context of a framework (the boxes within the gray rounded box) all organizations have a mission, with goals and objectives for fulfilling that mission, whether it is articulated and/or documented.



Exhibit II-6
Strategic and Functional Assessment of Business Process Framework



The framework involves the development of specific business processes with an organization that are designed to fulfill these activities and tasks. As illustrated in *Exhibit II-6*, business processes are composed of the following three separate, yet interrelated, components that need to be structured to create effective business processes:

- ◆ *Organization* – The creation of a specific grouping of resources (in this case people and systems) that are charged with the specific activities/tasks – the performance of which fulfills the strategies identified within the organization.
- ◆ *People* – The staffing of the organization with skilled, knowledge personnel that can perform the necessary activities within the systems developed to support the overall business processes.
- ◆ *Systems* – The creation of effective and efficient systems, whether they be manual processes or computer processes that support the overall business processes.

One of the key work products for this project will be to recommend to the DPU management a series of mechanisms where the departments, boards, commissions, or agencies can regularly collect, track, review, and analyze performance and management information and data, identify key issues and questions, and query these organizations pertaining to such information and data.

Our approach will revolve around addressing the scope of work's five themes mentioned earlier and the questions shown below for each identified area reviewed:

- ◆ What key tasks/activities are performed by the group?
- ◆ Does each task/activity support a strategic or operational objective?
- ◆ What are the primary performance indicators currently being used and if not applicable, what data is available?
- ◆ Is each task/activity a key competency?
- ◆ What are the resources (staff hours and other resources) currently committed to each task/activity?
- ◆ What can be done to improve the cost efficiency of the task/activity?
- ◆ Can a task/activity be made more efficient and/or consolidated with another to achieve efficiencies (and how quickly), performed elsewhere or outsourced, or eliminated?

These questions will serve as a starting point for accessing the DPU's tasks and activities and the associated performance information and data that should be collected so as to allow management to collect, track, review, and analyze indicators as input to improving the efficiency and effectiveness of the DPU's business processes. This information would be compiled through a combination of individual and group interviews to supplement any documents initially received at the beginning of the project. This information would be loaded into a SharePoint site for further analysis and presentation purposes.

Our project approach assumes that we will be creating various steering committees and teams to facilitate the information gathering and review/feedback activities of the project.



III. Performance Measurement

One of the themes identified in the RFP was performance measurement. When talking about performance measurement as it relates to an organization, it can be thought of as two distinct components:

- ◆ **Internal Performance Measurement** – This type of measurement includes activities that an entity takes to measure its performance based on internal systems that have been implemented within the organization. In the case of the Toledo Department of Public Utilities (DPU), this could involve the creation of measurements using the Cityworks application or other internal systems and measuring this performance indicator on an ongoing basis. For instance, the number of jobs completed in a day could be measured as a performance indicator or the percentage of preventive work orders versus corrective work orders could be measured.
- ◆ **External Performance Measurement** – This type of measurement includes activities that an entity takes to measure its performance to other similar entities. This involves collecting information in a similar manner and then comparing it to similar information from another entity and determining if the difference in the numbers is in a positive (beneficial) or negative (less than beneficial) direction.

All performance measurement indicators can be changed as new systems or capabilities are implemented within an organization. In particular, internal performance measurement is driven by the capabilities of internal measurement systems and is typically used to drive performance by measuring the performance over a period of time – i.e. one might expect the jobs per day to improve with changes in operations to improve that performance. Ideally, these actions would also drive improvement in external performance measures.

Internal performance measurement has been addressed in each of the other chapters of this report. This chapter presents external performance measurements that have been developed using [2012 American Water Works Association Benchmarking Study – Performance Indicators of Water and Wastewater Utilities: Survey Data and Analyses Report \(2012 AWWA Benchmarking Report\)](#).

A. Organization Best Practices¹

The 2012 AWWA Benchmarking Report includes a section on Organizational Best Practices. Schumaker & Company used this metric to provide an overall DPU assessment.

According to the AWWA, this metric summarizes the integration of eleven specific utility management practices. A self-scoring system is used to assign between 1 and 5 points for each practice, resulting in an aggregate score between 11 and 55. Points are assigned based on the following guidance:

- ◆ This activity is fully implemented (5 points)



- ◆ This activity is largely implemented but there is room for improvement (4 points)
- ◆ This activity is implemented but there is room for substantial improvement (3 points)
- ◆ This activity is implemented, but only occasionally or without uniformity (2 points)
- ◆ This activity is not currently practiced (1 point)

This type of self-assessment is necessarily subjective, and a single respondent may have only limited knowledge to make a selection. However, a team composed of executive, managerial, and operations personnel can provide a deeper and broader collective view and is likely to offer a truer assessment. For this reason, an inclusive process involving all stakeholders is recommended when assessing an organization's performance in these areas.

The practices that comprise the Organizational Best Practices index are as follows:

1. Strategic Planning

Good strategic planning practice can include:

- ◆ Analyses and selection of strategies for improvement in the areas of organizational development, business operations, customer service, water operations and/or waste-water operations
- ◆ An assessment of the utility's strengths, weaknesses, opportunities, and threats for the upcoming 3 to 10 years
- ◆ Short- and long-term action plans, including allocation of resources directed at achieving the goals and strategies the utility has adopted
- ◆ A process for strategic plan development and annual review or updates that facilitates input from customers, employees, and other stakeholders
- ◆ Vision, mission, and organizational values statements

2. Long-Term Financial Planning

Long-term financial plans include development of adequate rates, fees, and charges for costs associated with operation and maintenance, asset management, capital improvements including renewal and replacement, and justifiable reserves. Planning horizons typically range from 5 to 25 years.

3. Risk Management Planning

Risk management planning is used to identify potential risks to the utility within the context of its strategic plan and for developing plans to mitigate physical and financial losses. Elements of risk management planning include:

- ◆ Health and safety programs for employees and the general public
 - ◆ Security and resiliency of resources, facilities, and service delivery systems
 - ◆ Disaster readiness and emergency operations
 - ◆ Assessment and mitigation of potential public and environmental liability
 - ◆ Hazardous material contingency planning
 - ◆ Insurance procurement (or alternative self-insurance policies), including property and casualty insurance, health and worker's compensation insurance, and liability insurance
-

4. Performance Measurement System

An effective performance measurement system will:

- ◆ Provide measures focused on quality, efficiency, and effectiveness
- ◆ Establish targets, usually in conjunction with the budgeting process, that reflect broad internal, external, and financial improvement goals
- ◆ Include regular monitoring and reporting
- ◆ Support both routine work and special projects as done by staff or outside parties

Performance measurement systems beyond AWWA's Utility Benchmarking Program include the Kaplan and Norton balanced scorecard and the GASB performance measurement framework. These tools offer additional approaches for organizing performance measurement.

5. Optimized Asset Management Program

An optimized asset management program strikes a balance between performance, risk, and cost to support infrastructure renewal and replacement decisions. Such asset management programs include:

- ◆ A complete inventory of infrastructure assets and their locations in the system
- ◆ Condition assessment for all asset classes
- ◆ Replacement cycle estimates (i.e., typical life-spans) for each asset class
- ◆ Estimates of asset maintenance and replacement costs
- ◆ Risk rankings based on the impacts of specific asset failure



6. Customer Involvement Program

A formal customer involvement program ensures customers participate effectively in the utility management process. Examples of good practices include:

- ◆ Offering consumer education programs and materials and assessing their effectiveness
 - ◆ Conducting customer satisfaction surveys and responding to the results
 - ◆ Soliciting input on projects and programs under consideration, in planning, or under construction
 - ◆ Efficiently resolving customer issues and complaints
-

7. Governing Body Transparency and Accountability

Accountability is an obligation or willingness to explain actions to stakeholders. Accountability means holding individuals and organizations responsible for executing their powers properly (in accordance with the rules and duties of their post), and for paying particular consideration to vulnerable parties.

Transparency is an obligation or willingness to publish and make available critical data about the organization. Transparency involves clear public disclosure of information, rules, plans, processes, and actions. It is the principle that public affairs need to be conducted in the open. Areas where transparency is encouraged include financial management and financial record keeping.

8. Drought Response/Water Shortage Contingency Plan

From AWWA Manual of Water Supply Practices M60, Drought Preparedness and Response, a water shortage contingency plan (WSCP) enables a supplier to assess the risks and reduce the vulnerability of a community to drought impacts and establish priorities that will provide water for public health and safety that minimize impacts on economic activity, environmental resources, and the region's lifestyle.

There are seven steps to a WSCP:

- ◆ Form a water shortage response team
- ◆ Forecast supply in relation to demand
- ◆ Balance supply and demand, and assess mitigation options
- ◆ Establish triggering levels
- ◆ Develop a staged demand reduction program
- ◆ Adopt the plan
- ◆ Implement the plan

9. Source Water Protection Plan

From ANSI/AWWA Standard G300, Source Water Protection, a Source Water Protection Plan (SWPP) is a highly site-specific process that must account for local conditions, incorporate diverse stakeholder interests, require commitment to the source water protection process by all involved parties, and be sustainable over the long term. There are six essential steps in the SWPP:

19. Formalize a vision to align priorities and resources
20. Characterize the source water and the land or subsurface area from which the source water is derived
21. Set goals and objectives to resolve problems identified in the characterization of source water
22. Develop an action plan to map the activities to achieve the goals and objectives
23. Implement the action plan
24. Evaluate the results of implementing the action plan and make revisions to steps 1 through 4 as necessary

10. Succession Planning

- ◆ Identify key roles for succession or replacement
- ◆ Define the competencies required to undertake those roles
- ◆ Assess people against these criteria
- ◆ Identify pools of talent that could potentially fill and perform highly in key roles
- ◆ Develop employees to be ready for advancement into key roles

11. Continuous Improvement Program

A continuous improvement program helps employees examine their work practices with the goal of identifying and implementing improvements to service quality, effectiveness, and efficiency. Good practice includes examining the following improvement programs in addition to AWWA's Utility Benchmarking Program and participating in those aligned with the utility's mission and goals.

- ◆ AWWA's Partnership for Safe Water
- ◆ AWWA's Utility Management Standards
- ◆ Water Environment Federation's (WEF's) National Bio solids Partnership
- ◆ ISO 9000 series
- ◆ ISO 14001
- ◆ Work process documentation programs
- ◆ Self-assessment and peer or consultant reviews



B. Findings and Conclusions

Finding III-1 DPU is in the bottom quartile with respect to Organizational Best Practices.



Schumaker & Company's assessment of DPU's Organizational Best Practices is shown in *Exhibit III-1*. The DPU scored low in many areas of the metrics resulting in a lower quartile ranking when compared to other entities participating in the ranking, as shown in *Exhibit III-2*.

Exhibit III-1
Schumaker & Company Organizational Best Practices Assessment
as of December 31, 2014

	Organizational Best Practices	Score
1	Strategic Planning	3
2	Long-Term Financial Planning	3
3	Risk Management Planning	1
4	Performance Measurement Systems	2
5	Optimized Asset Management Program	1
6	Customer Involvement Program	3
7	Governing Body Transparency and Accountability	2
8	Drought Response/Water Shortage Contingency Plan	2
9	Source Water Protection Plan	2
10	Succession Planning	1
11	Continuous Improvement Program	1
	Total	21

Source: Schumaker & Company Assessment

Exhibit III-2
AWWA Aggregate Data for the Organization Best Practices Indicator
 as of December 31, 2012

Aggregate data for the organizational best practices indicator (1-5 self-assessed points in each category; 55 points possible)

Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
44	39	34	40	30	26	45	41	35

Source: 2012 AWWA Benchmarking Report

The DPU scored 21 points, whereas the bottom quartile combined operations bottom quartile was 35 points. There were many areas where the DPU could raise its score by initiating activities in areas where it was only given a rating of 1.



Finding III-2

The DPU's performance relative to other entities reporting in the AWWA Benchmarking Report tends to be in the lower to mid quartile indicating room for improvement.

The AWWA's Utility Benchmarking Report uses performance indicators that are broadly categorized into five areas of water and wastewater utility operations: organizational development, business operations, customer service, water operations and wastewater operations. The report identified and reported on over 60 different metrics. On this study, Schumaker & Company used approximately 25 of those metrics to compare DPU's performance to the reporting utilities. In some cases, assumptions had to be made to develop somewhat comparable information and in some cases it was not possible to develop the information in a similar format, because the information had not been kept that way by the DPU. The following metrics have been developed.

- ◆ System Renewal and Replacement
- ◆ Return on Assets
- ◆ Cash Reserves
- ◆ Drinking Water Compliance
- ◆ Distribution System Water Losses
- ◆ Water Distribution System Integrity: Leaks and Breaks
- ◆ Maintenance – Water



- ◆ Water Supply
- ◆ Sewer Overflow
- ◆ Collection System Integrity
- ◆ Wastewater Treatment Effectiveness
- ◆ O&M Costs for Wastewater Services
- ◆ Service Complaints
- ◆ Water Service Disruptions
- ◆ Wastewater Service Disruptions
- ◆ Residential Cost of Service
- ◆ Billing Accuracy
- ◆ Service Affordability



System Renewal and Replacement

These indicators quantify the renewal and replacement activities into four broad asset categories, specifically:

1. Water treatment and pumping facilities
2. Water pipelines and distribution
3. Wastewater pipelines and collection
4. Wastewater treatment and pumping facilities

In one sense, this indicator measures the extent to which the utility renews and replaces its aging facilities to ensure current day and future availability – in essence, the more you invest in renews and replacements, the better you are maintaining the system. The aggregate data for System Renewals and Replacement are shown in *Exhibit III-3*. DPU was not able to provide the data by the four categories identified above but more on a water treatment and distribution and wastewater collection and treatment basis. However, the numbers estimated for the DPU were:

- ◆ Water Treatment and Distribution – 14%
- ◆ Wastewater Collection and Treatment – 6.7%

These numbers would place DPU in the top quartile. In a sense, it would be expected that with the major construction taking place at the water treatment plant and the Toledo Waterways Initiative spending, it is not too surprising.

**Exhibit III-3
AWWA System Renewal and Replacement
as of December 31, 2012**

Aggregate data for the system renewal and replacement indicators for water treatment and pumping facilities					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
9.1%	1.4%	0.5%	3.7%	1.5%	0.8%
Aggregate data for the system renewal and replacement indicators for water pipelines and collection					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
2.6%	1.2%	0.6%	4.1%	1.7%	0.6%
Aggregate data for the system renewal and replacement indicators for wastewater treatment and pumping facilities					
WasteWater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
			3.4%	1.9%	0.7%
Aggregate data for the system renewal and replacement indicators for wastewater pipelines and collection					
WasteWater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
			6.4%	1.6%	0.3%

Source: 2012 AWWA Benchmarking Report





Return on Assets

This indicator provides an estimate of the utility's financial effectiveness. Investor-owned and enterprise-fund utilities are particularly interested in this indicator seeking higher ratios where possible and allowable. The aggregate data for the Return on Asset indicator by service is shown in *Exhibit III-4*.

Exhibit III-4
AWWA Return on Assets Indicator
 as of December 31, 2012

Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
3.1%	2.2%	1.0%		0.6%		2.6%	1.7%	0.5%

Source: 2012 AWWA Benchmarking Report

The comparable information for the DPU is:

- ◆ Water Operations – 1.3%
- ◆ Wastewater Operations – 3.1%

The number of wastewater utilities report this metric was relatively low (3). Therefore the metric reported is based on a limited sample. However, the DPU is in the bottom quartile in the water operations area.



Cash Reserves

This indicator quantifies the number of days of available cash reserve as a measure of financial liquidity. The aggregate data for the Cash Reserves indications is shown in *Exhibit III-5*.

Exhibit III-5
AWWA Cash Reserve Indicator
 as of December 31, 2012

Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
474	265	159		555		391	225	118

Source: 2012 AWWA Benchmarking Report

The comparable metrics from the DPU are:

- ◆ Water Cash Reserve – 107.67 days
- ◆ Sewer Cash Reserve – 357.64 days



Drinking Water Compliance

This indicator quantifies the percentage of time each year that a utility meets all health-related drinking water standards required by primary regulation. As shown in *Exhibit III-6*, all water utilities have met this indicator.

**Exhibit III-6
AWWA Drinking Water Compliance
as of December 31, 2012**

Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
100%	100%	100%	100%	100%	100%

Source: 2012 AWWA Benchmarking Report

The DPU has similarly meet this indicator with a 100% number.





Distribution System Water Losses

This indicator quantifies the percentage of water that fails to reach customers and cannot otherwise be accounted for through authorized consumption. The other utilities' distribution water losses are shown in *Exhibit III-7*.

Exhibit III-7
AWWA Distribution Water system Loss
as of December 31, 2012

Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.2%	2.2%	4.8%	3.2%	7.4%	12.9%
Aggregate data for the distribution system water loss indicators - Real Loss					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
1.0%	5.9%	9.5%	2.5%	5.0%	13.8%

Source: 2012 AWWA Benchmarking Report

The DPU's water loss (Real Loss) calculation of 20.09% places it in the bottom quartile.



Water Distribution System Integrity: Leaks and Breaks

These indicators quantify the condition of a water distribution system, expressed as an annual number of leaks or breaks per 100 miles of distribution piping. These numbers from the reporting utilities are shown in *Exhibit III-8*. The DPU does not differentiate between breaks and leaks. The DPU number is 33.1 breaks and leaks/100 miles. Thus if you assume that the number is all leaks or that the number is all breaks, in either case the DPU is in the bottom quartile.

**Exhibit III-8
AWWA Water System Integrity Indicators
as of December 31, 2012**

Aggregate data for the water distribution system integrity indicators (leaks/100 miles of pipe)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
2	16	28	9	25	63

Aggregate data for the water distribution system integrity indicators (breaks/100 miles of pipe)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
6	14	20	3	11	23

Source: 2012 AWWA Benchmarking Report





Maintenance – Water

These indicators quantify a utility’s effort regarding planned (proactive) and corrective (reactive) maintenance. The metrics are divided into water production and water distribution. The reporting utility numbers are shown in *Exhibit III-9*.

**Exhibit III-9
AWWA Maintenance Water
as of December 31, 2012**

Aggregate data for maintenance - Planned maintenance					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
75%	55%	42%	70%	48%	29%
Aggregate data for the maintenance - Corrective maintenance to production (hours/MG)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.1	1.1	2.4	0.6	1.3	2.4
Aggregate data for the maintenance - Planned maintenance to production (hours/MG)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
1.5	0.8	0.2	1.8	0.9	0.4
Aggregate data for the maintenance - Corrective maintenance to distribution (hours/100 mile of pipe)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
114	930	3,052	545	996	2,112
Aggregate data for the maintenance - Planned maintenance to distribution (hours/100 miles of pipe)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
3,070	595	124	1,900	895	604

Source: 2012 AWWA Benchmarking Report

The DPU distribution numbers are:

- ◆ Corrective Maintenance to Distribution – 773 hours/100 miles of pipe
- ◆ Planned Maintenance – 684 hours/100 miles of pipe

These numbers place the DPU near the median of the reporting utilities with a significant improvement potential with respect to planned maintenance to reach the top quartile.

With respect to water treatment (production), the numbers had to be estimated due to the lack of a computerized maintenance management system at the water treatment plant. These number were estimated at:

- ◆ Corrective Maintenance to Production – 1.86 hours/MG
- ◆ Planned Maintenance – 1.24 hours/MG

These estimated numbers place the DPU at or below the median of the reporting utilities.



Water Supply

This indicator provides a gauge of water resources, including an assessment of current water demand compared to supplies and an estimate of future requirements. The DPU excels in this area in that the water supply is Lake Erie – notwithstanding algae bloom considerations.



Sewer Overflow

This indicator measures the total number of sewer overflow events expressed as the ratio of the number of events per 100 miles of sanitary collection system piping. The aggregate data for the sewer overflow indicator for the reporting utilities is shown in *Exhibit III-10*.

Exhibit III-10
AWWA Sewer Overflow Indicator
as of December 31, 2012

Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.7	2.2	3.3	0.9	2.7	6.7

Source: 2012 AWWA Benchmarking Report

The DPU number is 3.709, which places DPU close to the bottom quartile.





Collection System Integrity

This indicator quantifies the condition of a wastewater collection system, expressed as the annual number of failures per 100 miles of collection system piping. The data reported by the utilities is shown in *Exhibit III-11*.

Exhibit III-11
AWWA Collection System Integrity Indicator
as of December 31, 2012

Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.7	2.2	3.3	0.9	2.7	6.7

Source: 2012 AWWA Benchmarking Report

In that the DPU number is 59 that places DPU well below the bottom quartile.



Wastewater Treatment Effectiveness

Wastewater treatment effectiveness is expressed as the percentage of days during which the utility meets or exceeds all of the effluent quality standards in effect at a facility. The data reported by the utilities is shown in *Exhibit III-12*.

Exhibit III-12
AWWA Wastewater Treatment Effectiveness
as of December 31, 2012

Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
100.00%	98.08%	96.99%	100.00%	100.00%	99.73%

Source: 2012 AWWA Benchmarking Report

The DPU number is 99.73%, placing the DPU near the bottom quartile.



O&M Costs for Wastewater Services

The operations and maintenance (O&M) costs for wastewater services can be compared between utilities once normalized by production rate to give a unit cost (\$/MG) or on a basis of the accounts served or the length of the collection pipe network. The data reported by the utilities is shown in *Exhibit III-13*.

**Exhibit III-13
AWWA O&M Costs for Wastewater Services
as of December 31, 2012**

Aggregate data for the O&M cost of wastewater services indicators (\$/account)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$166	\$227	\$272	\$250	\$373	\$463
Aggregate data for the O&M cost of wastewater services indicators (\$/MG)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
	\$2,399		\$2,056	\$3,122	\$4,259
Aggregate data for the O&M cost of wastewater services indicators (\$/100 miles of pipe)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$1,396,453	\$1,763,789	\$2,479,952	\$1,573,765	\$2,143,610	\$3,109,259

Source: 2012 AWWA Benchmarking Report

The DPU's numbers are:

- ◆ O&M Cost of Wastewater – \$295.75/account
- ◆ O&M Cost for Wastewater Service – Collection per Customer - \$72.67
- ◆ Total O&M Cost for Wastewater = \$295.75 + \$72.67 = \$368.42/account
- ◆ O&M Cost of Wastewater Services – \$1,711.97 /MG
- ◆ O&M Cost of Wastewater Service – Per 100 miles of pipe - \$900,495

This places DPU near the median to the top quartile in all categories.



Maintenance – Wastewater

These indicators quantify a utility's efforts regarding planned (proactive) and corrective (reactive) maintenance.



Exhibit III-14
AWWA Maintenance - Wastewater
as of December 31, 2012

Aggregate data for the maintenance - Planned maintenance					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
73%	83%	95%	51%	62%	82%
Aggregate data for the maintenance - Corrective maintenance to wastewater processed (hours/MG)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.2	0.5	0.8	0.6	1.7	3.7
Aggregate data for the maintenance - Planned maintenance to wastewater processed (hours/MG)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
1.9	1.6	1.3	4.6	2.0	0.9
Aggregate data for the maintenance - Corrective maintenance to collection (hours/100 miles of pipe)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
181	361	808	401	996	2,546
Aggregate data for the maintenance - wastewater indicators - Planned maintenance to collection (hours/100 miles of pipe)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
2,487	2,141	1,751	4,854	1,882	810

Source: 2012 AWWA Benchmarking Report

The DPU's numbers are:

- ◆ Planned Maintenance to Wastewater – 71%
- ◆ Planned Maintenance to Collection – 86%
- ◆ Corrective Maintenance to Wastewater – 0.54 hr/MG
- ◆ Planned Maintenance to Wastewater – 1.3 hr/MG
- ◆ Corrective Maintenance to Collection – 326 hours/100 mile of pipe¹
- ◆ Planned Maintenance to Collection – 2,044

¹ / documentation reported 3.26 but on review it should be 326

This places the DPU in the median quartile for planned maintenance – (note: the information was reported as per AWWA, but the quartiles should be reversed – i.e. Top Quartile 82% Bottom Quartile 51%). The planned and corrective maintenance to wastewater places the DPU at the median. The corrective maintenance to collection and the planned maintenance to collection places the DPU at the median.



Service Complaints

These indicators provide the complaint frequency related to customer service or core utility services, which are expressed as the number of complaints per 1,000 customer accounts per reporting period. The two categories allow a utility to track complaints that are people-related and those that are product-related. The data reported by the utilities is shown in *Exhibit III-15*.

Exhibit III-15
AWWA Service Complaints
 as of December 31, 2012

Aggregate data for the customer service complaints indicators								
Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.7	1.9	14.4	0.0	0.0	0.0	0.2	0.8	0.5
Aggregate data for the technical service complaints indicators								
Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.2	0.3	0.5	0.2	0.2	0.2	0.2	0.4	0.5

Source: 2012 AWWA Benchmarking Report

The DPU's numbers are:

- ◆ Customer Service Complaints – 53.67 complaints per 1,000 accounts
- ◆ Technical Service Complaints – 32.11 complaints per 1,000 accounts + 9.5 complaints/1,000 customers in SDS + 41.61 total complaints per 1,000 accounts

These numbers place the DPU in the bottom quartile in both categories.



Water Service Disruptions

The AWWA contains a suite of indicators to quantify the number of water outages experienced by utility customers per 1,000 customer accounts and the time to address them. The DPU does not collect this information to the level of detail report in the AWWA study. The data reported by the utilities is shown in *Exhibit III-16* and *Exhibit III-17*.

Exhibit III-16
AWWA Water Service Disruptions
as of December 31, 2012

Aggregate data for the disruption of water service - planned disruptions less than 4 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.52	1.27	3.07	0.14	0.77	4.56
Aggregate data for the disruption of water service - planned disruptions less than 4-12 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.08	0.44	1.12	0.00	0.15	0.68
Aggregate data for the disruption of water service - planned disruptions greater than 12 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Quartile	Median	Quartile	Quartile	Median	Quartile
0.00	0.00	0.01	0.00	0.00	0.01

Source: 2012 AWWA Benchmarking Report

Exhibit III-17
AWWA Restoration Time
as of December 31, 2012

Aggregate data for the disruption of water service - Average time to address planned disruptions (hours)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
3.00	7.90	21.30	2.00	5.00	20.00
Aggregate data for the disruption of water service - unplanned disruptions less than 4 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.38	2.23	3.90	0.00	0.75	3.39
Aggregate data for the disruption of water service - unplanned disruptions 4-12 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.18	0.75	1.57	0.00	0.09	0.59
Aggregate data for the disruption of water service - planned disruptions greater than 12 hours (per 1,000 accounts)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.00	0.01	0.08	0.00	0.00	0.01
Aggregate data for the disruption of water service - Average time to address unplanned disruptions (hours)					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
5.40	9.70	34.40	0.00	5.00	18.80

Source: 2012 AWWA Benchmarking Report

The DPU's numbers are

- ◆ Water Service Disruptions – 1.312 per 1,000 customers
- ◆ Restoration Time – 2 hours



These numbers place the DPU near the median for Water Service Disruptions, although in the top quartile for Restoration Time.



Wastewater Service Disruptions

The AWWA contains a suite of indicators to quantify the number of wastewater outages experienced by utility customers per 1,000 customer accounts and the time to address them. The DPU does not collect this information to the level of detail report in the AWWA study. The data reported by the utilities is shown in *Exhibit III-18* and *Exhibit III-19*.

Exhibit III-18
AWWA Wastewater Service Disruptions
as of December 31, 2012

Aggregate data for the disruption of sewer service - planned disruptions less than 4 hours (disruptions per 1,000 accounts)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.00	0.00	0.00	0.00	0.00	0.00
Aggregate data for the disruption of sewer service - planned disruptions greater than 12 hours (disruptions per 1,000 accounts)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.00	0.00	0.00	0.00	0.00	0.00

Source: 2012 AWWA Benchmarking Report

**Exhibit III-19
AWWA Restoration Time
as of December 31, 2012**

Aggregate data for the disruption of wastewater service - Average time to address planned disruptions (hours)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
			16.90	22.10	30.90

Aggregate data for the disruption of wastewater service - unplanned disruptions less than 4 hours (disruptions per 1,000)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
	0.90		0.00	0.75	3.39

Aggregate data for the disruption of wastewater service - unplanned disruptions 4-12 hours (disruptions per 1,000 accounts)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
	0.00		0.00	0.09	0.59

Aggregate data for the disruption of wastewater service - unplanned disruptions greater than 12 hours (disruptions per 1,000 accounts)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
	0.00		0.00	0.00	0.01

Aggregate data for the disruption of wastewater service - Average time to address unplanned disruptions (hours)					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
			0.00	5.00	18.80

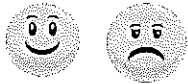
Source: 2012 AWWA Benchmarking Report

The DPU's numbers are

- ◆ Wastewater Service Disruptions – 0.00 per 1,000 customers
- ◆ Restoration Time – 7.76 hours



These numbers place the DPU in the bottom quartile for Wastewater Service Disruptions and Restoration Time.



Residential Cost of Service

This family of indicators allows utilities to compare the residential cost of water or sewer service based on either a defined quantity of water use or an average residential bill. The data reported by the utilities is shown in *Exhibit III-18* and *Exhibit III-19*.

**Exhibit III-20
AWWA Residential Cost of Service
as of December 31, 2012**

Aggregate data for the residential cost of water service indicator - Amount billed for 7,500 gallons/month					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$28.00	\$35.00	\$40.00	\$27.00	\$33.50	\$42.00
Aggregate data for the residential cost of water service indicator - Average residential water bill for one month of service					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$25.00	\$30.00	\$45.00	\$23.00	\$29.50	\$37.50
Aggregate data for the residential cost of sewer service indicator - Amount billed for 7,500 gallons/month					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$29.00	\$36.00	\$37.00	\$30.00	\$41.50	\$53.25
Aggregate data for the residential cost of sewer service indicator - Average residential water bill for one month of service					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
\$27.00	\$29.00	\$31.00	\$23.50	\$31.00	\$39.75

Source: 2012 AWWA Benchmarking Report

The DPU’s numbers are:

- ◆ Water (Cost of 7,500 gallons) – \$14.59 per month
- ◆ Sanitary (Cost of 7,500 gallons) – \$34.79 per month
- ◆ Fixed Cost Per Month – \$14.07 per month
- ◆ Total Sanitary – \$48.86 per month

These numbers place the DPU in the top quartile for water and lower quartiles for wastewater.



Billing Accuracy

This indicator measures the effectiveness for a utility’s billing practices and is reported as errors per 10,000 billings. The data reported by the utilities is shown in *Exhibit III-21*.

Exhibit III-21
AWWA Billing Accuracy
 as of December 31, 2012

Aggregate data for the billing accuracy indicators								
Water Operations			Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
99.90%	99.96%	99.87%				100.00%	99.95%	99.83%

Source: 2012 AWWA Benchmarking Report

The DPU’s numbers is 95.78%, which places it in the lower quartile.



Service Affordability

This indicator provides a measure for the affordability of water or sewer service as a percentage of local median household income. The data reported by the utilities is shown in *Exhibit III-22*.



Exhibit III-22
AWWA Service Affordability
as of December 31, 2012

Aggregate data for water service affordability indicators					
Water Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.62%	0.79%	1.10%	0.60%	0.74%	0.86%

Aggregate data for wastewater service affordability indicators					
Wastewater Operations			Combined Operations		
Top Quartile	Median	Bottom Quartile	Top Quartile	Median	Bottom Quartile
0.43%	0.63%	0.73%	0.52%	0.77%	0.95%

Source: 2012 AWWA Benchmarking Report

The DPU's numbers are:

- ◆ Water Service Affordability – 0.36%
- ◆ Wastewater Service Affordability – 1.28%

These numbers place the DPU in the top quartile for water and bottom quartile for wastewater.

C. Recommendations

Recommendation III-1 Undertake steps to address all areas of the organization best practices assessment. (Refer to Finding III-1.)

There are several areas where DPU scored very low in the organizational best practices assessment. In some cases, such as management succession planning, we found little evidence of anything being done in the area and in other cases, such as strategic planning, activities have just been initiated. The strengthening of these practices within the DPU should become a focus of the strategic planning committee.

Recommendation III-2 Undertake steps to address all of the areas of bottom quartile performance to move the DPU to a top quartile performer. (Refer to Finding III-2.)

A major focus of the strategic planning committee should be to insure that steps are taken to address all of the lower quartile areas identified in this benchmarking process, so as to improve the DPU's performance and move it to a top quartile performer. Specific plans should be developed for each area identified in this report chapter.

Additionally the DPU should also include the following:

- ◆ Updating the above performance indicators by comparing these results to the indicators being reported in the 2013 American Water Works Association Benchmarking Study – Performance Indicators of Water and Wastewater Utilities: Survey Data and Analyses Report. – The DPU information reported above is 2013 information whereas the AWWA information is 2012 information. The 2013 AWWA information is scheduled to be out in February 2015. Therefore, it should be obtained and the above results compared to the newer information.
- ◆ Participating in the next several AWWA benchmarking surveys as a part of the ongoing strategic planning effort.

DRAFT



IV. Administrative Services

The Administrative Services (AS) organization provides the primary administrative, fiscal, and operational control functions for the Toledo Department of Public Utilities (DPU). It consists of the following sections: Administration, Accounting & Financial Analysis (Accounting & Float Pool, Financial Analysis, and DPU/SAP Support), and Utilities Administration (Customer Service, Billing & Records, and Legal).² It provides services to approximately 131,000 customers estimated to represent over 500,000 people. Its service area includes Toledo, Maumee, Perrysburg, Sylvania, Monroe County, Lucas County, Rossford, Wood County, Fulton County, and Northwood.³

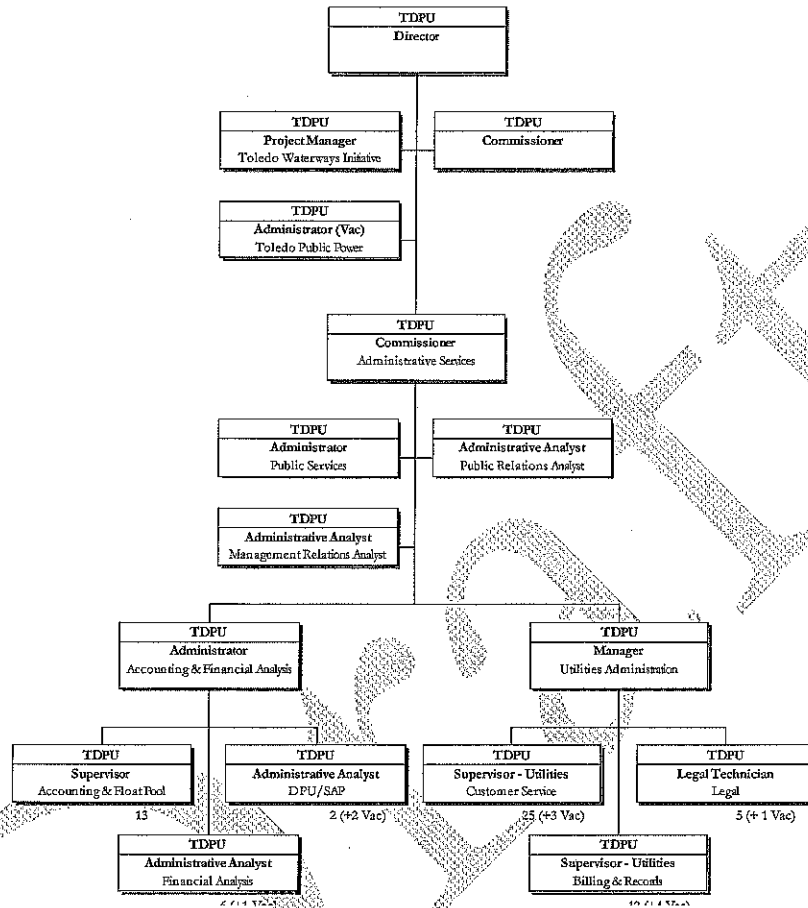
A. Background & Perspective

Organization

The Administrative Services organization within the Toledo Department of Public Utilities is shown in *Exhibit IV-1*.⁴



**Exhibit IV-1
Administrative Services
2014 Organization**



Source: Information Response 2

Goals & Objectives

Administrative Services 2013 Highlights

According to DPU management, this group’s highlights included:⁵

1. Extended the amount of time for customers to pay their bills from 15 calendar days to 15 business days. This extension generally provides an additional two to four days for citizens to pay their bills without suffering late payment charges.
2. Successfully completed the DPU/SAP upgrade to enhance internal stakeholder fiscal accuracy and availability, and to improve external customer service.

- a. Continued to implement best business practices from the Benchmarking initiative into the DPU/SAP Customer Billing and Information System.
- b. Increased notification time of overdue account reminder notices sent to customers' tenants to give them 30 days' notice prior to disconnection.
3. Extended the DPU Call Center's hours by 1 ½ hours per day to improve customer service by adding one hour in the morning (7:00 a.m. to 8:00 a.m.) and one-half hour in the evening (5:30 p.m. to 6:00 p.m.).
4. Increased the number of occasions in which there were zero calls in Customer Service's call line queue and reduced overall wait time by almost 41% from 2011 to 2013 year-to-date (YTD). After that point, hired an additional four Customer Service Representatives to even further reduce customer wait times.
5. Established a "Continuous Improvement Process" for all sections to enhance communication among employees in order to streamline operations and improve customer service.
6. Hired a Water Loss Investigator in the effort to increase revenue and to reduce the number of incidents and the magnitude of theft of utility services.
7. Created the DPU Customer Advisory Committee, made up of private sector business leaders and other stakeholders, to advise DPU regarding how to improve communication with and customer service to business and rental property owner communities. This initiative also followed the results of Benchmarking efforts.
8. Hosted the Ohio American Water Works Association's 2013 Annual Conference to much acclaim from the 527 delegates who paid to attend.
9. Issued over \$190 million in water bonds (including a refunding of the 2005 Series Bonds) to continue to design and construct the needed major improvements for the water treatment and distribution systems.
10. Refunded \$13.6 million in 2003 Series Sewer Bonds to obtain lower debt service payments.
11. Received Toledo City Council's approval to enact a new Section 100.04 in Appendix C entitled "Customer Bill of Rights & Responsibilities."
12. Purchased and installed hardware and software to digitally process and transmit checks to the bank.
13. Began to implement the hardware and design the software to accommodate the online billing initiative. Implementation is scheduled for 2014.
14. Hired a Safety & Training Program Coordinator to prioritize employee safety and training across DPU.
15. Began to serve its first industrial customer, OmniSource, enabling this local firm to save on its energy bills and thus expand its operations on N. Detroit Avenue.



Administrative Services 2014 Goals

This group's 2014 goals included:⁶

1. Consistently endeavor to decrease customers' waiting time in the telephone call queue to improve customer service.
 - a. Increase employee training in customer service precepts.
 - b. Implement cross-functional training.
 - c. Employ best practices and continuous improvement principles learned from Benchmarking efforts.
16. Increase positive perception of the Utility through enhanced communication, customer outreach, and collaborative activities.
 - a. Continue to use the DPU Customer Advisory Committee for input and feedback.
 - b. Improve knowledge of customers through increased content available through the website and in public presentations.
 - c. Implement strategies identified through the performance audit.
 - d. Continue to communicate with largest contract customers through participation on the Regional Water Advisory Board.
17. Continue to aggressively reduce meter tampering and water theft by allocating sufficient resources to investigate and prosecute perpetrators, then exact restitution from them once judgments have been obtained in court.
 - a. Publicize to customers and the general public the results of these enforcement activities to raise awareness of the existence of and the consequences resulting from the commission of such crimes.
18. Continue to improve the DPU/SAP Customer Service and Billing computer system.
 - a. Continue to make needed enhancements and implement best business practices to improve internal and external customer service.
19. Implement Online Monthly Billing
 - a. Create and implement a cost-effective online monthly billing function to allow customers to view their meter reading and billing data, then make payments electronically in "real time." Such implementation will improve overall service to customers and reduce the average waiting time in the call queue.
20. Collaborate with the Department of Finance to greatly improve the timely and accurate exchange, matriculation, and reporting of financial data to benefit all internal and external stakeholders.

Accounting & Financial Analysis

Accounting & Float Pool

Activities performed by the Accounting & Float Pool group include:⁷

- ◆ At roughly 4:15 p.m. daily, meter reads are uploaded to SAP. At roughly 5:30 p.m. the upload is then typically complete, and billing can be processed for that day's cycles. (DPU has 19 monthly and 54 quarterly cycles.)
- ◆ Bill and correspondence printing (2,200 to 2,300 bills daily) then goes to the Billing & Records group for reconciliation of the number of items against records. Finally, it goes to the Mail-It organization, which in turn mails out the bills to DPU customers.
- ◆ Process cash and check payments received via mail on the same day; open mail, digitize items, record stubs to customer accounts, and submit dollars to bank electronically (typically 600 to 1,000 daily, although sometimes as high as 2,500 based on daily cycles). Then the next day verify stubs and payments. At roughly 2:00 p.m. daily, the Supervisor submits information to Treasury, which submits it to DPU's bank.
- ◆ Also receive FedEx/UPS shipments twice daily, which may need processing.
- ◆ Process email/fax payments from Paymentus, which were credit card payments received by Paymentus via online web or IVR access; download file to SAP through ICT (City IT department) organization; and verify that information has been posted correctly. Paymentus also sends a file to DPU for verification purposes.
- ◆ Payments can be made at the Cashier's Office on the first floor of the Ohio Building. At the beginning of this project, customers could only make cash, check, or money order payments, although starting in July 2014 customers are also now able to make credit card payments. Only security number, account number, and amount needs to be input. The remainder is fully automated.
- ◆ Customers may also make payments electronically through several organizations, which in turn send payments electronically to DPU:
 - Checkfree (100 to 200/day)
 - IPay (50/day)
 - Metavante (100 to 200/day)
 - Huntington (75 to 200/day)
- ◆ There is a drop box in front of the Ohio Building where customers may drop off payments. Each day someone from the Accounting & Float Pool group goes with a security person to pick up any payments, which are processed immediately.
- ◆ Also coming into the drop box are payments (identified by customer) from "unauthorized" vendors; Kroger and Meijer stores typically make drops at night and send a total payment via Checkfree.



- ◆ Also available is the Bank Plan, which deducts customers' cash payments directly from their bank accounts, sends a file (roughly 500 items/day) for specific customers, and transmits dollars for the total amount to DPU for processing. On a weekly basis, the Accounting & Float Pool group downloads information showing those customers who have signed up. Each day, a file is also downloaded, which automatically posts to accounts. This file is typically run two days in advance of due date. As the information in the file "hits" customer accounts and DPU's bank account, it is then also sent to Treasury. Typically this process takes approximately four days.
- ◆ Process transfers and refunds, remove late fees if Customer Service approves, as documented on forms, etc.
- ◆ Besides picking up mail from the United States Postal Service (USPS) each morning for processing by the Accounting & Float Pool group, the mail clerk also goes to the locations of the other six DPU divisions and picks up interoffice and outgoing mail (often twice daily). Then the Accounting & Float Pool group determines the number of items in the outgoing mail and charges the divisions for postage costs.
- ◆ Additionally the mail clerk stops at the government center (twice daily) and drops off bills to the Mail-It organization for mailing. Occasionally the mail clerk will also fill up vehicles with gas, if one of the Administrative Services management staff needs a vehicle to use.
- ◆ At roughly 1:00 p.m. daily, return mail is received and sorted. It is then possibly processed or goes to the Legal/Bankruptcy organizations.
- ◆ Regarding the Cashier's Office, the Accounting & Float Pool performs a daily over/short reconciliation of cash.

Financial Analysis

The Financial Analysis group is the general accounting group within the DPU organization, which includes:⁸

- ◆ Oversight responsibility of the other DPU divisions regarding budgeting activities
 - Typically 2014 budgets were created by limiting them to 3% over last year's actuals.
 - To monitor actuals versus budgets, DPU must create two reports, one for revenues and one for expenses to monitor DPU in total and by division.
 - Operations and maintenance (O&M) expenses as well as DPU Capital Improvements Program (CIP) construction projects.
 - DPU CIP activities also include quarterly bond analysis and funding/refunding bond analyses.
- ◆ Review and log all proposed contracts prior to the Director's signature
- ◆ Consolidations
- ◆ Analyses

- ◆ Reconciliation of water sent to other government entities in DPU’s service territory; besides Toledo, DPU does customer billing only for Lucas County and Sylvania; other entities do their own.
- ◆ Working with the City Finance Department regarding corrections
- ◆ Working with the City Debt Officer regarding bond financing
- ◆ Reconciliation of general ledger accounts
- ◆ Providing monthly reports to DPU Commissioners and Director
- ◆ Help with SAP testing
 - New reports and processes involved with trust funds; what pay based on received funds
 - Online billing
 - Main/sub ledger reconciliations
- ◆ Monitoring travel expenses and educational reimbursements to ensure funds exist and rules are being complied with
- ◆ Answering questions and helping with due dates and timelines associated with accounting requirements
- ◆ Performing monitoring of multiple funds (25) and public power
- ◆ Performing legislative review using systems and newspapers
- ◆ Generating the annual information statement (AIS) used for bond funding, not the Comprehensive Annual Financial Report (CAFR), but also performing fund breakdown for CAFR
- ◆ Asset management activities
- ◆ Write RFPs and legislation, as needed, for Administrative Services use only

DPU/SAP

The DPU/SAP group is currently comprised of two Administrative Analysts and one alternate Administrative who lead and manage SAP customer billing support and troubleshooting. These individuals also perform data warehouse administration. SAP was implemented at DPU during approximately the 2005–2006 timeframe. The DPU groups primarily using SAP customer billing are Customer Service, Legal, Billing, and Water Distribution (meter reads, taps, etc.).⁹ This group also provides notifications when SAP changes occur. In addition, it provides training (often train-the-trainer type) or presentations when changes occur. Then Supervisors within the groups, using SAP customer billing, typically train their own employees. This group also provides “how to” training documentation for call center agent training.¹⁰

One of the reports provided monthly by the DPU/SAP group is a “garbage report.” Because Republic now performs garbage pickup for Lucas County, the City wants to know the number of properties and the number of units, because a DPU bill can include water, waste water, storm water, and garbage billing items, if they apply.¹¹



One of the Administrative Analysts is the Project Manager for an online billing project. On DPU's website, customers can currently pay bills, but they cannot view bills nor can they see any billing history. By summer or fall 2014, DPU expects that customers will be able to view their current bill plus 12 months' history. That means commercial customers will be able to see 12 bills (monthly billing), while residential customers will be able to see four bills (quarterly billing). Utegration, AT&T, and ICT are helping DPU by implementing this capability. Eventually DPU expects to allow mobile access to these items.¹²

Also currently underway is a pilot test involving selected landlords/tenants to perform monthly billing instead of quarterly billing. Following the pilot, DPU will assess if a change to monthly billing for selected or all residential customers is warranted.¹³

Utilities Administration

Customer Service

The Customer Service Unit within the Utilities Administration organization is the primary call center for DPU (419-425-1800) based on the amount of data tracked and the volume of inbound calls and customers who "walk in" for service to the walk-in center (first floor of the Ohio Building) on a daily basis. This group is available from 7:00 a.m. to 6:00 p.m. Mondays through Fridays.¹⁴ As of September 2014 there is one Customer Service Supervisor and two approved alternates beginning training to back up the Supervisor. There are 20 agents, with six vacancies, providing billing help on calls, doing realtor/title work, doing electronic messages, doing account upgrades such as refuse and storm billing, and two in the walk-in center.¹⁵ For the months of July, August, and September 2014, three Customer Service agents were assisting the Billing & Records group to catch up on their backlog; however, as of October 2014, they were back on the telephones full-time, as the backlog was caught up.¹⁶

The Customer Service Unit considers itself a "Customer Contact Center," because it also takes requests for service from customers in person and via email, phone, fax, and postal mail. Its primary functions are to assist DPU customers with questions and concerns related to services for which they are billed (water, sewer, storm, refuse), whether it is through opening or closing accounts, scheduling meter read exchanges, closing accounts, or explaining bills.¹⁷ The unit's agents can also help determine if a call is an emergency and, if so, can forward the call to the Call City Hall (CCH) organization.¹⁸ This group can also schedule Field Technician visits (specific days according to geographic areas; only the Tuesday zone has another day that can be used, which is Fridays) based on a four-hour window (8:00 a.m. to noon or noon to 4:00 p.m. on Mondays through Thursdays) or an eight-hour window (8:00 a.m. to 4:00 p.m. on Fridays). Sometimes the Customer Service Unit agents must call the Water Distribution Meter Reading & Inspections group) to ask that special permission be granted to schedule appointments outside of the normal window of time for a certain area or request a 30-minute call ahead, which can be an issue if it is early in the morning or beyond 3:30 p.m., when the Supervisor of that group leaves.¹⁹

Any calls regarding DPU water and sewer services and emergencies are typically taken by the CCH organization at 419-936-2020. Prior to 2007, CCH was part of the Department of Neighborhoods,

primarily taking nuisance complaints. Then in 2007, it began taking city-wide calls and moved to the Water Distribution building at 401 South Erie. Call City Hall reports to the Field Operations Commissioner; however, it is not officially part of the DPU organization. Besides DPU water and sewer service and emergency calls, this call center also takes calls regarding streets, code inspections, trees, potholes, health, and other Lucas County matters.²⁰ Approximately 50% of calls are information only, while the other 50% require action on the City's part. Of this latter 50%, 40% are DPU calls, 50% are nuisance calls, and 10% are other calls.²¹ Three CCH employees work from 7:00 a.m. to 3:00 p.m. and two employees work from 8:00 a.m. to 4:00 p.m., with four employees working from 3:00 p.m. to 11:00 p.m. on Wednesdays and two or three employees working this shift on other days. Only one employee works from 11:00 p.m. to 7:00 a.m. unless many emergencies are occurring. In that case, other agents are called in.²² When CCH gets three calls in a particular geographic area, the organization assumes that a pervasive issue exists. Information is then conveyed back and forth with Field Services (or other departments), including scripts agents should use when talking with customers. Other mechanisms used include a foreman using radio to call the field staff, the website, an alert system (text message or email messages), etc. For non-emergency requests, it usually takes about a day to get service requests to Cityworks and converted to work orders so field workers can address the request. However, for emergency requests, calls are transferred immediately to the Water Distribution group. If an emergency call comes in after Field Services hours, then agents will call the general foreman no matter what time.²³

Billing & Records

The Billing & Records group is involved in many activities related to billing functions, such as:²⁴

- ◆ One of the activities taking up a considerable amount of this group's time until October 2014 was entering completed work orders into SAP once paperwork had been received from the Field Services organizations, at which point the backlog was eliminated. Based on inspections, this group may do bill adjustments, as necessary, because up-to-date information is not in SAP as a result of a large backlog. A simple work order may take five minutes to enter; however, it can easily take a minimum of 20 minutes if adjustment reversals are necessary. In that case, the person addressing the work orders must send them to the Billing & Records Supervisor, who in turn sends them to an Administrative Analyst in the Financial Analysis group. From there, they are sent to an Administrative Analyst in the DPU/SAP group to handle, especially if a full reversal is needed, which can take two to three days.
- ◆ When the prior legacy system was used, a late fee was reversed if billing was redone. Now, although not frequently done, a clerk in the Billing & Records group requests the full reversal from the DPU/SAP group and copies his or her supervisor.
- ◆ Addressing the EL70 implausible report is essentially an eight-hour job each day and is done by one Billing & Records employee. This report highlights bad reads, in versus out discrepancies, etc. Once reviewed, this employee gives the information to Customer Service Unit agents, particularly one, who makes proactive calls to customers and asks for customer rereads. If customers can't read, then the agent may schedule inspections.



- ◆ Addressing the EL70 two error code report, which highlights zero consumption as well as high consumption, is done by another Billing & Records employee. This employee either releases the item and a bill is sent or alerts the Water Distribution Collections group to have field workers leave a green card notice at the customer's location.
- ◆ These activities also include testing SAP, as necessary, each time something changes, including upgrades and rate changes.

Also assisting Billing & Records with entering work order completions in SAP was the Water Distribution Collections group, located at 401 South Erie. DPU Water Distribution field workers complete a work order and manually complete paperwork. When they come back to South Erie, the paperwork is then sent to the Billing & Records group at 420 Madison. The Billing & Records group, which was trying to reduce a six-month backlog of entering completed work order data in SAP, then sent many of the simpler work orders back to the Collections group for entering into SAP.²⁵ Subsequently, by October 2014, the backlog has been caught up. These activities are in addition to the group's regular work of giving four Field Services Water Technicians a listing of turnoffs and reconnects (along with a routing for work using Street Sync) and then updating SAP. All accounts over \$200 that are 90 days late are printed daily using the non-pay ZMAS report. They are then put into a spreadsheet and routing is done, so the Collections group can give routes to the Field Services Water Technicians by 8:00 a.m. the following day. A green card notice is left, and then roughly three business days later, a shutoff occurs if no payment has been made; however, roughly 25% to 50% of customers pay if a green card is left. When a payment occurs at the Ohio Building, a form is filled out and an email message is sent to the Collections group, who must check each item before Water Technicians go back out to turn off service.²⁶

Also part of the Billing & Records group is a separate unit which performs records activities. This unit is comprised of two clerks that are responsible for maintaining the business records of the Administrative Services division.

Legal Technicians

Currently four Legal Technicians, who each report administratively to the Utilities Administration (UA) Manager, are in the UA Legal Unit. They are assisted by an Intermediate Clerk, who primarily helps with filings at common pleas and probate courts involving tax foreclosures and liens. In addition, she also picks up mail for the UA Legal unit. The employees in this unit are assisted functionally by City attorneys who are co-located in the same office area.²⁷

The Legal Technicians' specific focus areas include:²⁸

- ◆ Primarily bankruptcy cases, in which the Legal Technician gets notifications, updates the system, and files proof of claims; also lien payments and auditing of books²⁹
- ◆ Primarily interaction with collection law firms, in which approximately 30 days after turnoffs, if no payment is received, referrals are made to collection law firms; also reviewing closed accounts and sending them to collection law firms; involvement in theft investigations by

preparing pre-trial documents and going to pre-trial meetings, although the UA Manager is the person typically going to trials and is also involved with lien letters³⁰

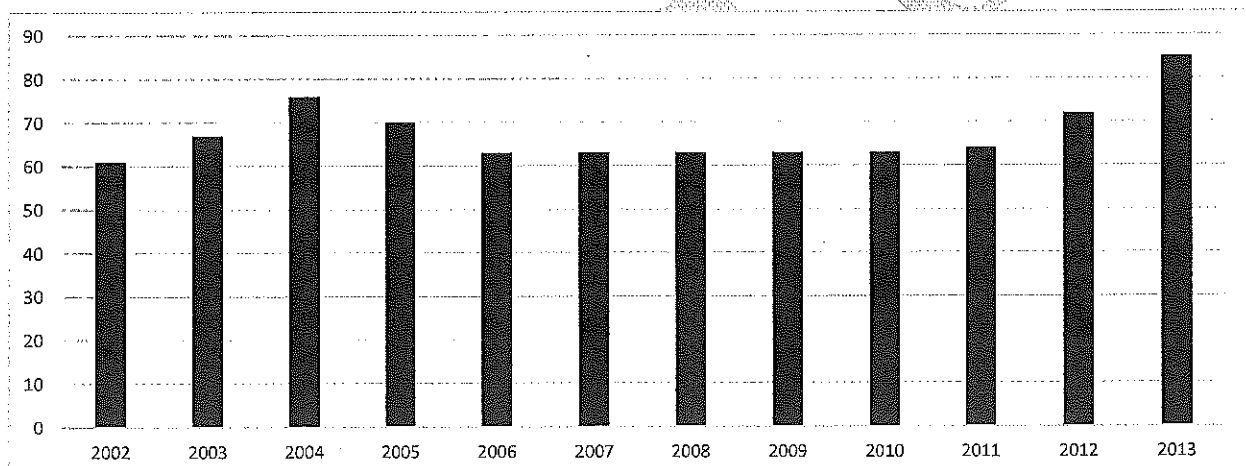
- ◆ Primarily sheriff sales, lien preparation, and creation of certification list³¹
- ◆ Primarily foreclosures involving both taxes and mortgages³²

Legal Technicians, along with the UA Manager, can go to court to testify regarding knowledge of accounts.

Staffing Levels

Exhibit IV-2 illustrates the Administrative Services staffing levels from 2002 to 2013.³³

**Exhibit IV-2
Administrative Services
Staffing Levels
2002 to 2013**



Source: Information Response 5



Systems

The systems currently in place for Customer Service & Accounting functions include:³⁴

- ◆ SAP (current customer service system)/CIS (prior system)
- ◆ Internet
- ◆ Microsoft Office Suite – Word, Excel, PowerPoint, and Outlook
- ◆ Auditor’s Real Estate Information System (AREIS)
- ◆ Court Dockets
- ◆ Secretary of State website
- ◆ Cityworks
- ◆ Paymentus (online bill payment)
- ◆ Check 21 (check verification)
- ◆ CISCO Viewpoint (network security)
- ◆ JIRA (bug and issue tracking)
- ◆ OnBase (workflow, document, and records management)
- ◆ Stop Process
- ◆ Multiline telephone systems
- ◆ Standard copy machines

Currently, the City of Toledo has a Cisco Internet protocol (IP) Telephony system being used at 10 locations. This Cisco IP Telephony system includes Call Manager, Unity Voice Mail, IP Contact Center, RSI Call Accounting Software, voice gateways, 7900 Series IP phones, and ATA analog adapters.³⁵

Financial Results

DPU's financial results for the year ending December 2013, broken down by water, sewer, utility administrative services, and storm are illustrated in *Exhibit IV-3*.³⁶

Exhibit IV-3
Toledo Department of Public Utilities
2013 DPU Financial Results
Statement of Revenues, Expenses, and Changes in Fund Net Position
Proprietary Funds
for the Year Ended December 31, 2013
(thousands)

	Water	Sewer	Utility Administrative Services	Storm Sewer
OPERATING REVENUES				
Charges for Services	\$ 52,413	\$ 69,522	\$ 9,945	\$ 9,605
Other Revenue	63	197	-	15
Total Operating Revenue	52,476	69,719	9,945	9,620
OPERATING EXPENSES				
Personal Services	13,192	18,484	7,248	
Contractual Services	7,017	4,605	3,329	3,476
Materials and Supplies	7,797	3,036	604	1,347
Utilities	2,713	3,196	33	464
Depreciation	5,169	14,395	71	-
Total Operating Expenses	35,828	43,716	11,285	1,514
Operating Income (Loss)	16,648	26,003	(1,340)	6,801
NONOPERATING REVENUES (EXPENSES)				2,819
Investment Earnings	873	8	95	
Interest Expense and Fiscal Charges	(11,034)	(7,504)	-	
Total Nonoperating Revenues (Expenses)	(10,211)	(7,506)	95	29
Income (Loss) Before Transfers and Contributions	6,437	18,417	(1,245)	29
Capital Contributions	-	640	-	
Transfers In	-	-	-	2,848
Transfers Out	(75)	(75)	-	
Change in Net Position	6,362	18,982	(1,245)	(75)
Net Position at January 1, as restated	150,833	251,426	2,546	2,773
Net Position at December 31	\$ 157,195	\$ 270,408	\$ 1,301	47,568

Source: City of Toledo 2013 CAFR Pages 44 (Water, Sewer, and Utility Administrative Services) and



B. Findings & Conclusions

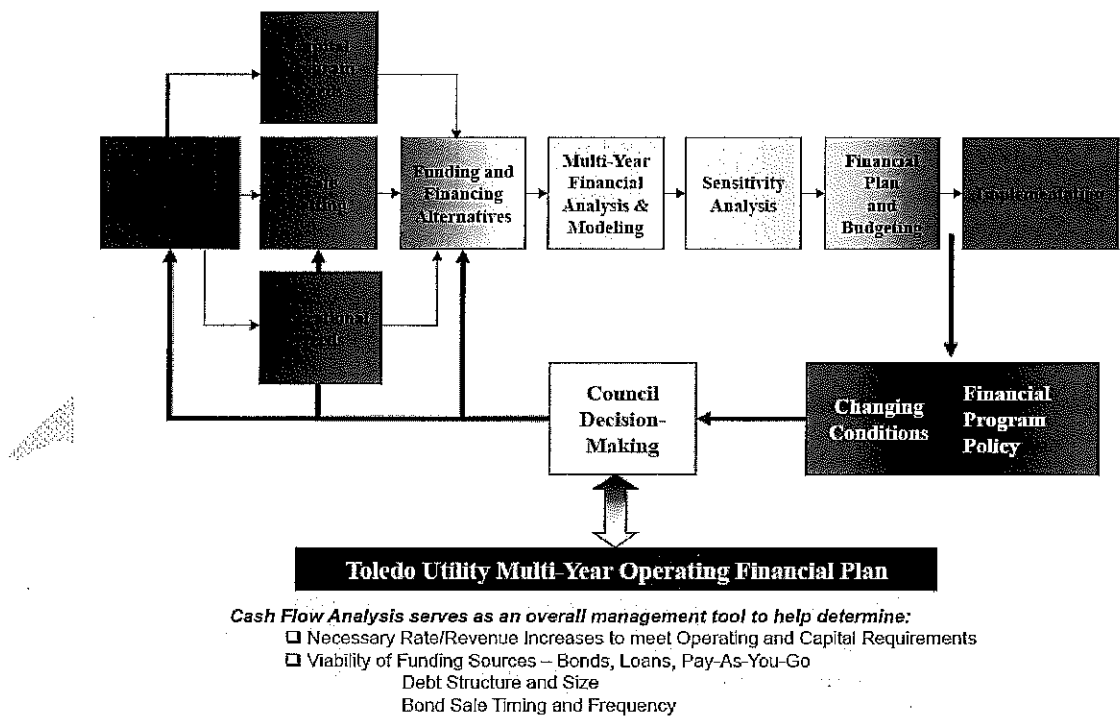
Strategic Planning/Financial Planning

Finding IV-1 DPU’s strategic planning and financial planning activities focus primarily on budgeting, not strategic planning activities, although the rates model is used for comparative purposes when developing the yearly budget.

Financial Planning

Exhibit IV-4 illustrates DPU’s financial planning process to develop a multi-year operating financial plan.³⁷

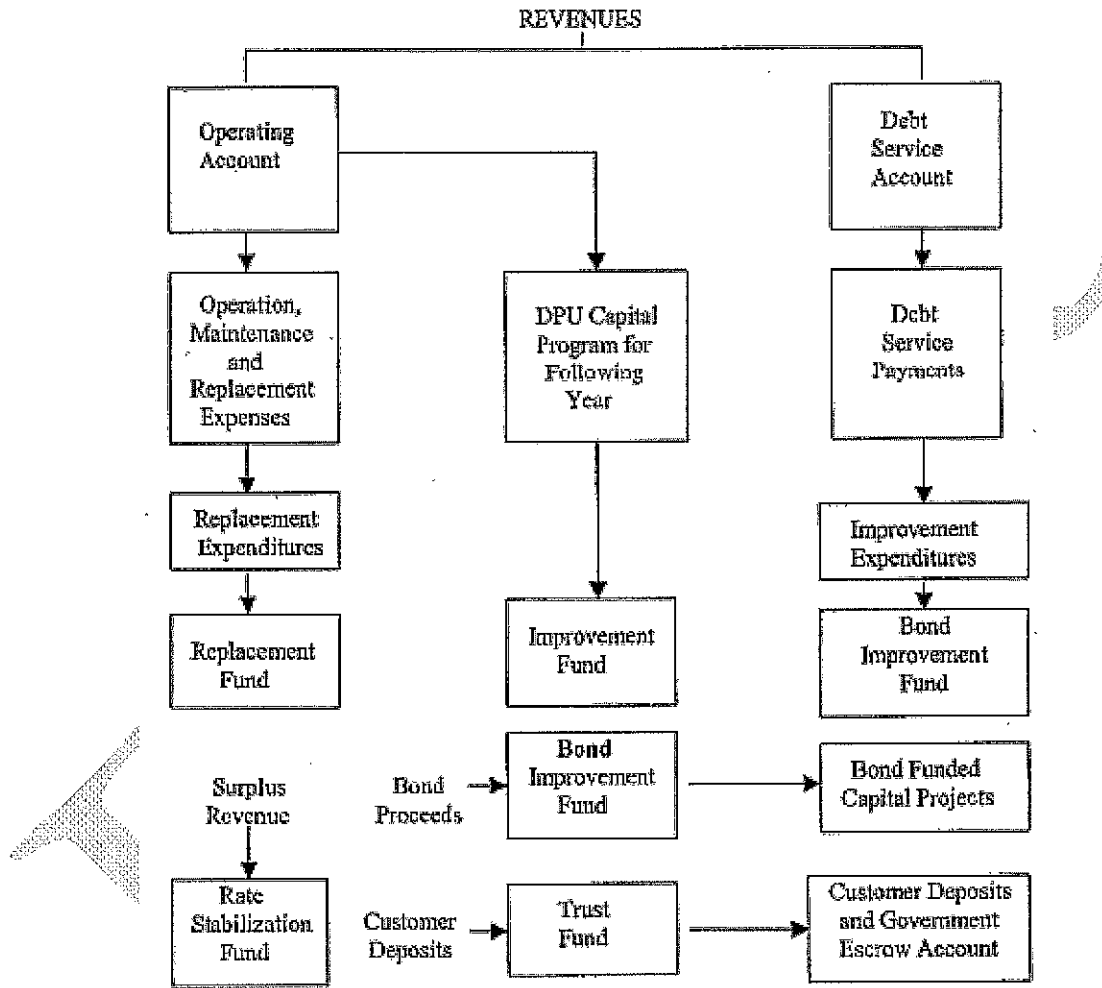
**Exhibit IV-4
Financial Planning Process
2014**



Source: Information Response 23

Several funds are used to account for water and sanitary sewer revenues and expenditures, as shown in Exhibit IV-5.³⁸

**Exhibit IV-5
Flow of Utility Revenues
2014**



Source: Information Response 21

Funds placed in the replacement reserve accounts are intended to replace existing assets; the reserves are funded with revenues in excess of operations and maintenance expense requirements that are transferred from operating funds.³⁹ Funds placed in bond improvement reserve accounts (Funds 62 and 72) are intended for capital additions that are funded with bond proceeds.⁴⁰ Funds for the improvement accounts (Funds 61 and 71) are taken from operating account revenues, with targeted funding equal to the following year’s capital improvements budget plus \$ 1million.⁴¹

Budgeting

The recent changes to the operating budget processes in Toledo represent a significant departure from past practices. The individual departments and divisions are much more involved with the process and there has been positive movement toward matching available resources with spending patterns. According to City management, the monitoring of the budget has become much more rigorous in the past two years, in part because of the City department's work with City Council to pass the budget much earlier than required by the City's charter.⁴²

The format and presentation of the budget changed significantly with the 2013 budget. The 2014 budget process continued to refine and enhance this budget presentation. The finished budget product included charts and graphs, as well as additional narrative to supplement the accumulated data. The document is meant to be user friendly for not only City of Toledo employees but also the public at large. To accomplish this goal, departments were called upon to provide information about their goals, accomplishments, and performance measures.⁴³

Like 2013, the 2014 budget also incorporated the City's Capital Improvements Program budget into the operating budget process. While the operating and CIP budget ordinances will remain as separate pieces of legislation, the merging of the processes represents a tacit recognition that the two impact one another tremendously and neither can exist outside the context of the other.⁴⁴ Additionally, DPU has a capital budget process that specifically incorporates DPU-only capital expenditures.

The 2014 budget, in both its development and implementation, continued to emphasize the role of City departments and divisions in all stages of the process, including the initial crafting of the budget, the presentation to City Council, and the ongoing monitoring of the budget throughout the year. This budget works from the assumptions that (1) the role of departments is to fully know and understand the programs that their department is responsible for, including the budgetary implications of the programs, and (2) the roles of the City Finance Department are to coordinate the budget process, provide technical assistance to departments as needed, and moderate the budgetary requests of departments given scarce resources. The process as a whole is expected to be an iterative one, with the City Finance Department constantly in communication with departments and divisions. The departments and divisions, however, are also able to use the City's SAP financial system's reporting capacity to guide decision making on their own within the parameters of an approved budget. In other words, divisions are able to (and will be expected to) monitor and manage their own budgets, making many spending decisions without the involvement of the City Finance Department, provided they stay within their budgets.⁴⁵

The 2014 budget cycle again used a "modified zero based" budgeting approach, which is closely monitored by the City Budget Office.⁴⁶ With regard to DPU specifically, the 2014 budget was essentially limited to 3% over 2013's actual figures.⁴⁷

The budget development schedule for the 2014 budget was as shown in *Exhibit IV-6*.⁴⁸

**Exhibit IV-6
Budget Development Schedule
2014 Budget Cycle**

May 31, 2013	Budget guidance released to departments
May 31 – August 2, 2013	Meetings between departments and Budget Office
June 11, 2013	CIP budget guidance released to departments
August 2, 2013	Departments submit draft operating budget materials
August 12, 2013	Departments submit draft CIP budget materials
August 30, 2013	City Finance Department completes draft budget
August 30 – September 20, 2013	Review by Mayor and Deputy Mayor
September 20 – October 4, 2013	Communication with departments about revisions Appeal period for departments
October 4 – November 15, 2013	Budget staff prepares and formats final documents
November 15, 2013	Submit budget to City Council
December 3, 2013	Clerk of Council publishes legislation per Section 46 of charter
November 15, 2013 – January 28, 2014	Departmental budget hearings before Council
December 3, 2013	CIP proposed budget presented to Council
December 10, 2013	Target date for Council-passed temporary appropriations ordinance for January – March 2014
November 15, 2013 – January 28, 2014	Public meetings
January 28, 2014	Target date for Council-passed budget
January 28, 2014	Target date for Council-passed CIP budget
March 31, 2014	Statutory deadline for Council-passed budget

Source: Information Response 17

Historically DPU developed a one-year budget; however, DPU is now looking at a three-year budget at the new Director's request.⁴⁹

Finding IV-2 Detailed goals/objectives/performance measures are not typically part of DPU's planning/budgeting process.

The development of the City's 2014 budget also included steps in the direction of performance-based budgeting. Two departments included detailed performance measures as part of their budget submission and presentation.⁵⁰ At DPU, however, neither goals and objectives nor detailed performance measures were always included in the budgeting process.

Finding IV-3 Formal monitoring of actual versus budget reporting is not being done by DPU management or staff in all divisions

In the past, DPU created monthly reporting of actual versus budget information and data. In addition, DPU held monthly meetings, but these activities are not necessarily now being done.⁵¹ Also the ongoing monitoring of DPU actual versus budget figures, including developing an explanation of why significant variances exist, has not generally occurred at the various DPU divisions, although recently the Accounting & Financial Analysis group has begun to focus on these activities.⁵²



Other Financial Management Practices, including SAP Issues

Finding IV-4 **The way in which the SAP enterprise resource planning (ERP) system and data warehouse is currently being used results in various issues.**

Several SAP issues within the Accounting & Financial Analysis group currently exist:⁵³

- ◆ *DPU does not have access to its monthly financial statements from the SAP ERP system, but must take data from the data warehouse and create such reports manually.* – DPU cannot see its financial statements directly from the SAP ERP system. It would like to be able to do so, even if such visibility was read-only access. Now DPU must run the business warehouse to separately format retrieve revenue and expense data. The Utility must then take both types of data and put them into a financial statement format.
- ◆ *The Accounting & Financial Analysis group is unable to directly make journal entries into the SAP ERP system.* – Journal entries can't be done directly by DPU's Accounting & Financial Analysis group, but must go the City Finance Department to be made. The DPU Accounting & Financial Analysis group would like to do entries, and then use workflow to have the City Finance Department approve.
- ◆ *DPU cannot produce reports using the SAP ERP data warehouse but must use ICT or others to do it.* – Currently DPU does not use the business warehouse for creating custom reports; DPU originally purchased the warehouse, but later gave it to the City SAP ERP system. Now, if it wants custom reports, DPU must go to ICT (or others) for programming of reports. According to Accounting & Financial Analysis management, there are several reasons why DPU can't get the customization ability back at this time: (a) limited staff resources and (b) limited dollars. That is because DPU would need to buy additional server equipment to do so.

Finding IV-5 **The elimination of full reversals has complicated DPU's ability to explain billing adjustments to customers, and call center agents are not fully trained on understanding the process.**

The Accounting & Financial Analysis group has essentially stopped full reversals (except in a few cases), because such activities got rid of all documentation involving reversals. Instead an adjustment reversal was implemented, which doesn't get rid of all documentation. However, the Customer Service/Billing & Records groups find it extremely difficult to explain to customers what is happening now that the adjustment reversals are being used. The Customer Service/Billing & Records groups believe it's a control issue, but the Accounting & Financial Analysis group indicates that the process is needed to eliminate full reversals for accounting purposes.⁵⁴

Performance Measurement System

Finding IV-6 **DPU has no formal performance measurement processes or systems in place.**

While the City Budget Office has some key performance indicators (KPIs), DPU does not do anything official regarding KPIs.⁵⁵ The only similar action taken is to monitor compliance with rate and bond financing targets,⁵⁶ or to compare DPU rates to other entities through mechanisms such as the American Water Works Association (AWWA) or regional surveys.⁵⁷

Financial Management

Schumaker & Company requested information regarding DPU's financial KPIs (targets and results) for the last five years (2010–2014), including but not limited to system renewal/replacement rate (%), return on assets (%), and cash reserve days (number of days), to review results against any targets. Included in *Exhibit IV-7* are selected KPIs, including return on assets and cash reserve days.⁵⁸



**Exhibit IV-7
Financial KPIs
2010 to 2014**

WATER						
	2010	2011	2012	2013	2014	
Current Ratio (Current Assets/Current Liabilities)	0.97	1.31	1.78	3.27	4.15	
Quick Ratio (Cash & Cash Equivalents/Current Liabilities)	0.30	0.10	0.82	2.13	2.98	
Operating Ratio (O&M/Total Operating Revenue)	0.66	0.75	0.75	0.59	0.67	
Net Take-Down Ratio (Operating Income - O&M/Gross Revenue)	0.43	0.61	0.60	0.27	0.42	
Liabilities to Total Assets	0.39	0.37	0.46	0.66	0.65	
Debt to Equity Ratio (Total O/S Debt/Equity)	0.64	0.60	0.85	1.94	1.88	
Debt Ratio (Total O/S Debt/Total Assets)	0.34	0.32	0.42	1.25	1.24	
Debt Service Safety Margin (Net Operating Income-Debt Service/G	0.42	0.54	0.52	0.39	0.14	
Restricted Assets/Restricted Liabilities	0.22	-	0.08	0.05	0.06	
Debt Service Ratio (Gross Revenue - Operating Expense(Net of Dep	3.77	4.54	4.33	4.05	1.54	
System Renewal/Replacement Rate	TDPU Does Not Calculate					
Return on Assets	0.04	0.02	0.02	0.04	0.01	
	4.49%	2.49%	2.47%	4.35%	1.04%	
Cash Reserve Days	0.50	43.26	83.63	216.38	608.07	
SEWER						
	2010	2011	2012	2013	2014	
Current Ratio (Current Assets/Current Liabilities)	0.97	1.32	1.81	5.45	4.95	
Quick Ratio (Cash & Cash Equivalents/Current Liabilities)	0.59	0.93	1.13	3.74	3.64	
Operating Ratio (O&M/Total Operating Revenue)	0.59	0.58	0.60	0.52	0.42	
Net Take-Down Ratio (Operating Income - O&M/Gross Revenue)	0.44	0.43	0.47	0.10	(0.04)	
Liabilities to Total Assets	0.52	1.26	0.78	1.14	1.08	
Debt to Equity Ratio (Total O/S Debt/Equity)	1.12	1.20	1.29	1.38	1.29	
Debt Ratio (Total O/S Debt/Total Assets)	0.46	1.13	0.71	1.10	1.05	
Debt Service Safety Margin (Net Operating Income-Debt Service/Gross Revenue)	0.16	0.22	0.20	0.12		
Restricted Assets/Restricted Liabilities	0.04	0.08	0.07	0.17	0.17	
Debt Service Ratio (Gross Revenue - Operating Expense(Net of Depreciation)/Debt Service)	2.65	3.11	2.85	1.54		
System Renewal/Replacement Rate	TDPU Does Not Calculate					
Return on Assets	0.02	0.03	0.03	0.08	0.05	
	1.79%	2.64%	2.82%	8.49%	4.66%	
Cash Reserve Days	0.00	0.58	11.74	78.03	689.43	

Source: Information Response 113

According to DPU management, DPU does not calculate the system renewal/replacement rate. \$50 million supported by the five-year increase in water rates, which commenced in January 2014, was set aside specifically to quadruple the previous replacement rate of the water distribution system (from 377 years to 100 years). However, because the Utility was already behind in its replacement of this infrastructure, the improvement, while significant, is not a panacea. Prior to 2014, approximately \$2.5 million was spent annually on water line replacement. Beginning in 2014, that amount is now approximately \$10 million on an annual basis. The plan calls to replace at least 1% of the system per year (based on 100 years of expected life); replace all 4" mains serving hydrants within 10 years, and close all significant dead-end mains within 10 years.⁵⁹

Other information received as part of this request included:⁶⁰

- ◆ Investment activity report (April 2014)
- ◆ Investment portfolio (as of April 30, 2014)
- ◆ Outstanding investments by fund (daily since December 31, 2002)

Customer Service

Schumaker & Company requested information regarding DPU's customer satisfaction KPIs (targets and results) for the last five years (2010–2014) regarding each of the following metrics: customer service complaints per 1,000 accounts; disruptions of water service per 1,000 accounts; disruptions of sewer service per 1,000 accounts; residential cost of water service (\$ per month); residential cost of sewer service (\$ per month); residential cost of storm water service (\$ per month); customer service cost (\$) per account; and billing accuracy per 10,000 billings.⁶¹ Included in *Exhibit IV-8* are selected KPIs provided by DPU, although none of those requested was provided.



**Exhibit IV-8
Customer Satisfaction KPIs
2010 to 2014**

COSTS					DISRUPTIONS OF SERVICE/1,000 ACCOUNTS				
Approved Ordinances 2/8/2011					BASINENT FLOODING COMP. (PRIVATE)				
9% Water, TWI Sewer Fixed, 3% Sewer & 0% Storm (No Refuse Fees)					MONTH 2010 2011 2012 2013				
Quarterly Cost - Sr/Homeslead Discount					Jan 44 53 48 165				
5/8" Meter Based on 1,000 Cubic Feet					Feb 41 101 41 121				
	2011	2012	2013	2014	Mar 91 116 116 76				
TWI Fixed	11.87	11.87	11.87	11.87	Apr 157 129 27 159				
Sewer Fixed	18.66	19.22	19.80	20.39	May 76 97 45 24				
Sewer Volume	24.49	25.22	25.98	26.76	Jun 60 45 72 438				
SEWER	55.02	56.31	57.65	59.02	Jul 36 30 48 84				
					Aug 25 46 31 28				
Water	9.17	10.00	10.90	12.34	Sep 40 53 35 51				
Storm Water	8.54	8.54	8.54	8.54	Oct 42 77 48 20				
					Nov 31 168 48 30				
					Dec 33 86 58 83				
					679 999 567 1,279				
					6 9 5 11				
TOTAL	\$ 72.73	\$ 74.85	\$ 77.09	\$ 79.90	BASINENT FLOODING COMP. (MAIN FLOODS)				
					MONTH 2010 2011 2012 2013				
					Jan 22 15 17 46				
					Feb 10 39 22 35				
					Mar 36 31 30 19				
					Apr 17 42 14 52				
					May 17 17 19 14				
					Jun 9 5 14 14				
					Jul 13 6 8 32				
					Aug 4 7 15 2				
					Sep 11 12 6 12				
					Oct 18 16 18 16				
					Nov 12 23 17 12				
					Dec 17 30 32 38				
					186 243 212 272				
					2 2 2 2				
					BASINENT FLOODING COMP. (OVERLAPED)				
					MONTH 2010 2011 2012 2013				
					Jan 0 0 0 19				
					Feb 0 0 0 3				
					Mar 0 0 9 0				
					Apr 47 9 1 2				
					May 0 16 3 0				
					Jun 0 0 7 0				
					Jul 2 0 4 7				
					Aug 0 10 0 11				
					Sep 0 1 0 0				
					Oct 0 3 0 1				
					Nov 0 28 0 0				
					Dec 0 3 0 0				
					49 70 24 43				
					0.433628 0.603448 0.208096 0.377193				
					SANITARY SEWER REPAIRS				
					MONTH 2010 2011 2012 2013				
					Jan 35 42 47 56				
					Feb 29 48 62 23				
					Mar 34 81 68 65				
					Apr 32 61 68 49				
					May 33 40 45 38				
					Jun 44 80 69 40				
					Jul 42 72 50 39				
					Aug 59 67 65 49				
					Sep 27 46 58 60				
					Oct 42 43 52 40				
					Nov 22 67 25 21				
					Dec 30 40 39 22				
					420 687 647 496				
					4 6 6 4				
					STORM SEWER REPAIRS				
					MONTH 2010 2011 2012 2013				
					Jan 8 12 7 5				
					Feb 4 7 7 7				
					Mar 9 10 12 7				
					Apr 11 13 12 8				
					May 6 18 14 12				
					Jun 6 4 13 11				
					Jul 9 15 14 11				
					Aug 21 18 60 11				
					Sep 16 10 15 10				
					Oct 15 9 15 10				
					Nov 7 8 7 7				
					Dec 5 8 7 10				
					117 127 183 109				

Source: Information Response 111

Customer Satisfaction

Customer Service Unit

Finding IV-7 Escalation of calls to Supervisors is not done electronically or at the time the issue is identified.

Escalation of calls to Supervisors is not done in a timely manner. When required, agents complete a paper form, which is put into a box for Supervisors to address. When they have time, typically within 72 hours of the original call, Supervisors listen to the call, then call the customer back.⁶²

Finding IV-8 Little monitoring of Call Center agent calls is being done regularly by Supervisors.

Currently Customer Service Unit Supervisors generally do not monitor calls performed by agents. In most cases, Supervisors should monitor at least one to two calls per week for each agent. However, the Manager listens to calls at night and on weekends and lets Supervisors know if there are specific concerns regarding an agent's calls that need addressing.⁶³

Finding IV-9 No Team Leaders who could help with call monitoring activities exist for the Customer Service group, and such activities are generally not done due to lack of Supervisor time.

If the Customer Service Unit had Team Leaders to assist Supervisors, then call monitoring could be done on a regular basis. As a result, feedback could be provided to agents in a timely manner based on agent calls being monitored weekly.⁶⁴

Finding IV-10 Customer complaints occur due to how DPU does scheduling of service requests.

According to Utilities Administration management, a lot of customer complaints occur based on how DPU does scheduling of service requests. Not only can't agents guarantee that times will be met, but they also schedule visits on specific days based on specific geographic areas within the service area. The agents can specify either morning or afternoon when scheduling service request visits, but they cannot schedule visits in which field workers call ahead to customers, unless it is the last resort.⁶⁵

Customer Service Unit employees also indicated that it is often difficult for employees, such as the Utilities Administration Manager or the Customer Service Unit Supervisors, to reach Water Distribution management, especially at the beginning or end of the day, to discuss the specific scheduling needs of customers.⁶⁶



Finding IV-11 The SAP billing system requires DPU agents to type in information that should be available in drop-downs.

In SAP, agents must currently type in the following information in a freeform field when scheduling service requests, because no drop-downs are available:⁶⁷

- ◆ Morning (a.m.)/afternoon (p.m.) preference by customer for service visit by field worker
- ◆ Description of what is needed of the service visit by field worker occurs
- ◆ If the customer (or someone for the customer) will be onsite during the service visit, and if so, whom
- ◆ Telephone number and name of person making call (however, field workers, including Meter Shop, often won't call if there's a problem)

The freeform field should augment what information can be done through SAP drop-downs. It would help make the process more efficient, plus increased use of drop-downs would help provide consistency in how agents complete information and data regarding calls. Additionally, while a freeform description may be appropriate, there is no coding an agent can do that will help in later identifying what types of problems or issues typically exist when a customer calls in.⁶⁸

Finding IV-12 The DPU Call Center and Billing groups do not have trainers to regularly provide training to employees.

Schumaker & Company's experience is that a group having a dedicated training staff typically results in better training for employees; however, neither the DPU Call Center nor the Billing group has dedicated staff to regularly provide training to employees.⁶⁹

Finding IV-13

The DPU’s Customer Service Unit Call Center performance statistics are improving.

The DPU Customer Service Unit has available statistics by month, day, and hour, as illustrated for the March 2014 in *Exhibit IV-9*.⁷⁰

**Exhibit IV-9
Call Center Work Study by Day and Hour
March 2014**

	HOURS											Daily Totals		
	7-8am	8-9am	9-10am	10-11am	11-12pm	12-1pm	1-2pm	2-3pm	3-4pm	4-5pm	5-6pm			
Number of Inbound Calls Received														
3/3/2014	33	88	103	101	88	72	86	82	83	50	23	809	Monday	
3/4/2014	15	52	76	65	66	60	55	73	62	51	17	582		
3/5/2014	16	49	56	58	51	56	71	61	66	67	20	571		
3/6/2014	19	46	68	63	63	61	61	61	61	47	12	562		
3/7/2014	14	59	83	56	74	50	62	76	84	47	25	600		
3/10/2014	13	71	99	71	63	61	62	58	58	54	23	635	Monday	
3/11/2014	13	38	46	56	52	49	53	49	60	48	14	476		
3/12/2014	CLOSED-LEVEL 3 SNOW EMERGENCY											0		
3/13/2014	20	64	73	78	67	56	62	65	75	40	33	633		
3/14/2014	15	60	56	53	68	56	57	50	52	36	29	522		
3/17/2014	22	97	79	76	68	56	75	82	64	42	31	673	Monday	
3/18/2014	14	51	57	67	89	71	66	72	91	49	23	630		
3/19/2014	16	65	75	74	66	63	63	63	56	50	23	614		
3/20/2014	13	41	36	64	57	67	56	59	72	51	29	545		
3/21/2014	8	42	59	63	56	76	60	72	63	49	12	560		
3/24/2014	19	76	67	81	67	62	78	61	55	31	26	648	Monday	
3/25/2014	13	40	54	53	58	68	59	67	77	51	30	570		
3/26/2014	9	71	53	82	49	62	45	70	58	42	10	551		
3/27/2014	13	49	60	60	54	63	59	66	71	45	21	559		
3/28/2014	8	67	70	53	46	51	56	55	57	53	31	525		
3/31/2014	21	86	96	100	99	82	67	75	78	49	17	764	Monday	
AVERAGE	16	60	67	69	65	62	63	69	67	49	22	Total	12052	

1st Heaviest Call Hour 2nd Heaviest Call Hour

Source: Information Response 52

Abandoned calls include calls where customers use other options (including going to other agents if one doesn't pick up), not just truly abandoned calls.⁷¹



Exhibit IV-10 illustrates the DPU Contact Service Queue Activity Report for 2013 and 2014 (through April 8, 2014).⁷³

**Exhibit IV-10
Contact Service Queue Activity Report
2013 and 2014 YTD**

2013

<u>CSO Name (ID) (Call Skills)</u>	<u>Calls Presented</u>	<u>Avg / Max Queue Time</u>	<u>Calls Handled</u>	<u>Avg Speed of Answer</u>	<u>Avg / Max Handle Time</u>	<u>Calls Abandoned</u>	<u>Avg / Max Time to Abandon</u>	<u>Avg / Max Abandon Per Day</u>	<u>Calls Dequeued</u>	<u>Avg / Max Time to Dequeue</u>	<u>Calls Handled by Other *</u>
DPL(1) 0	168,534	0:08:46 04:32:54	125,962	0:10:27	0:04:02 01:10:51	42,969	0:03:47 08:32:54	117.90 698	0	0:00:00 0:00:00	0

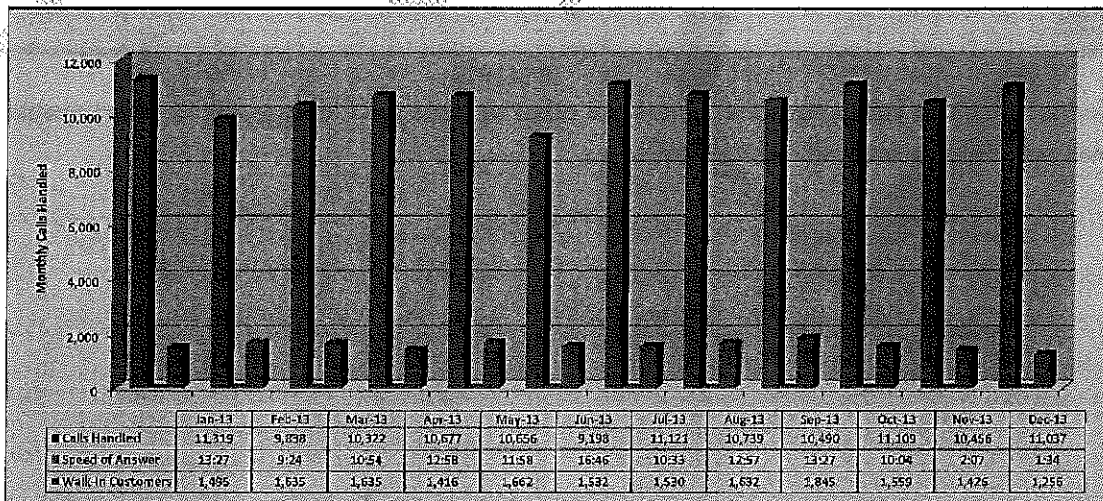
2014 Through April 8, 2014

<u>CSO Name (ID) (Call Skills)</u>	<u>Calls Presented</u>	<u>Avg / Max Queue Time</u>	<u>Calls Handled</u>	<u>Avg Speed of Answer</u>	<u>Avg / Max Handle Time</u>	<u>Calls Abandoned</u>	<u>Avg / Max Time to Abandon</u>	<u>Avg / Max Abandon Per Day</u>	<u>Calls Dequeued</u>	<u>Avg / Max Time to Dequeue</u>	<u>Calls Handled by Other *</u>
DPU(1) 0	40,831	0:04:27 0:37:27	39,063	0:01:26	0:04:53 01:02:57	1,778	0:01:45 8:23:50	18.14 136	0	0:00:00 0:00:00	1

Source: Information Response 52

Average speed of answer statistics improved by late 2013 as additional staff were hired, as shown in Exhibit IV-11. This improvement occurred even though Customer Service Unit call volumes remained roughly the same throughout the year (and into 2014).⁷³

**Exhibit IV-11
Monthly Customer Service Unit Call Center Statistics
2013**



Source: Information Response 52

The CCH's call volumes are lower than the Customer Service Unit's call volumes are, as shown in *Exhibit IV-12*, but similarly the volume by month is relatively stable.⁷⁴

Exhibit IV-12
Monthly Call City Hall Statistics
2013

Month	Received	Handled	Average Wait (Seconds)	Average Talk Time (Minutes)	Average Call Duration (Minutes)
January	7654	6330	15	1:14	1:47
February	5855	4745	15	1:18	1:50
March	6383	5112	14	1:20	1:48
April	7760	6265	16	1:24	1:46
May	8956	7223	39	1:31	2:22
June	9057	7369	30	1:20	2:08
July	9105	7151	45	1:29	2:28
August	8778	7048	29	1:32	2:15
September	7040	5601	37	1:35	2:22
October	6073	4739	16	1:32	2:21
November	5288	4248	13	1:25	1:55
December	6019	4896	13	1:14	1:50
	87968	70727	23.5	1:24	2:04

Source: Information Response 128

Similarly, in May 2014 CCH was offered roughly 8,900 calls and handled 7,300 calls. As with the Customer Service Unit, abandoned calls include calls diverted to other departments. In May 2014 the average wait time was 24 seconds, although CCH management indicates it is usually roughly 13 seconds.⁷⁵

Finding IV-14 **Multiple call centers typically confuse customers, reduce staffing efficiency, and increase costs.**

When contacting DPU, customers have two telephone contact points, including:⁷⁶

- ◆ DPU Customer Service Unit (Ohio Building) for billing issues
- ◆ Call City Hall (Water Distribution facility) for water emergency issues

The utilization of multiple contact points often results in an increase in call transfers, plus the need for additional staffing. These factors increase call volumes (multiple handles) and associated staffing requirements, while also potentially increasing the total time a customer spends on the telephone trying to get an issue resolved.



Appeals Process

Finding IV-15 Appeals to the Adjustment Committee include only DPU management employees and appear to be generally done without bias; however, the lack of outside involvement on the committee may give the perception that this is not true.

Any customers who question or dispute any charges on the DPU utility bill pursuant to § 104.04 (Council Proceedings section) should contact the Customer Service Unit for clarification or correction of disputed charges.⁷⁷

If the dispute is not resolved by the Customer Service Unit, the customer may write a letter within 30 days of contact with the Customer Service Unit to the DPU's Adjustment Committee.⁷⁸ The letter should clearly set forth the issue or issues in dispute, the basis for seeking an adjustment pursuant to §104.04, along with any proof, such as copies of bills, necessary to help the Adjustment Committee understand the basis for and support for the customer's claim. Any appeal requests received after thirty (30) days are denied.⁷⁹ The Adjustment Committee is generally made up of representatives from each unit within the Utilities Administration and Water Distribution areas, specifically:⁸⁰

- ◆ Meter Shop
- ◆ Meter Reading
- ◆ Customer Service
- ◆ Billing

The Adjustment Committee reviews a customer's letter and supporting documents and renders a decision. A letter or other written communication, such as a corrected bill, is then sent to the customer explaining the approval, partial approval/denial, or denial of the claim. Any customers who receive a denial letter from the Adjustment Committee and who still, in good faith, believe the previous denials were in error pursuant to §104.04 may request an administrative hearing. For the hearing to be granted, the customer must demonstrate that the Adjustment Committee failed to follow the DPU's rules and regulations or applicable law or that the denials ignored evidence that demonstrated an adjustment was warranted. Hearings cannot be granted if a customer merely does not like the previous rulings, if no justification exists to provide an adjustment pursuant to §104.04, or if the customer raises new issues that were not previously brought before the Adjustment Committee.⁸¹

At an administrative hearing, the customer bears the burden of proof. The customer presents his or her case at the administrative hearing and provides all proof or documentation to justify the claim for relief. DPU will also present a case that responds to the customer's case. The administrative hearings are presided over by an Administrative Hearing Officer appointed by the DPU Director. The decisions of the Administrative Hearing Officer are final appealable orders of the City pursuant to Ohio Revised Code (ORC) Chapter 2506.⁸²

Additionally, the Adjustment Committee was several months behind this summer in addressing customer letters. This lag was due to increased activity this past winter; however, by July 2014 the committee was caught up and back on schedule.⁸³

Collections & Write-offs

Finding IV-16 DPU’s collections and write-off processes are substantially different from those used by other utility organizations.

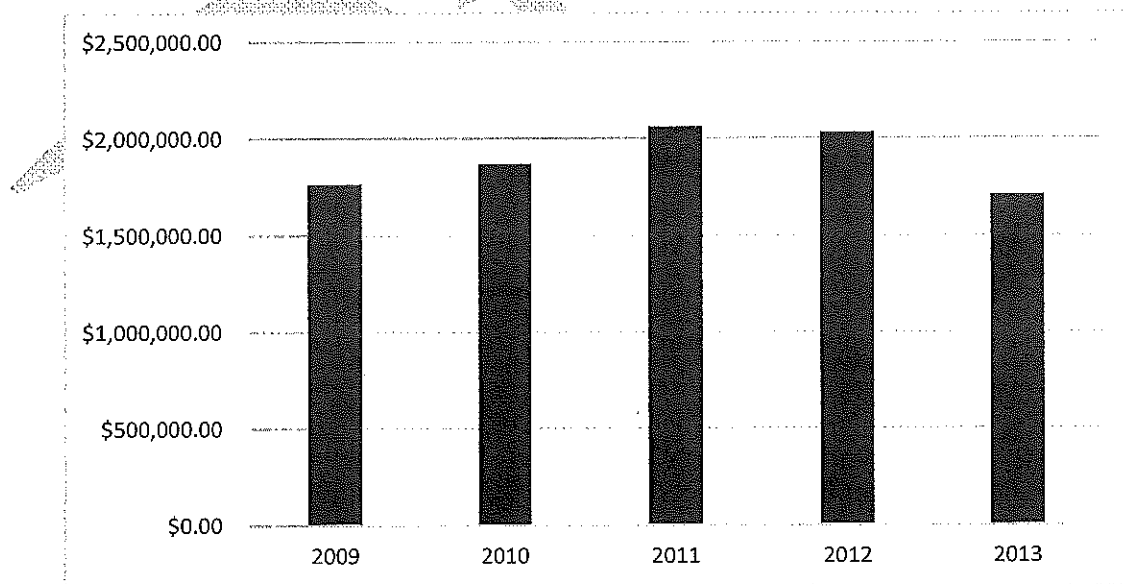
The DPU programs available to trouble customers include:⁸⁴

- ◆ 30-Day Waiver/Medical Certification
- ◆ Social Service Agencies/Vouchers for Payment
- ◆ Salvation Army
- ◆ Veterans Assistance
- ◆ Community Parish Contributions

Statistics for the above-referenced agencies have not been tracked by DPU.⁸⁵

Late fees for unique contract amounts by year are displayed in *Exhibit IV-13*.⁸⁶

Exhibit IV-13
Late Fees
2009 to 2013



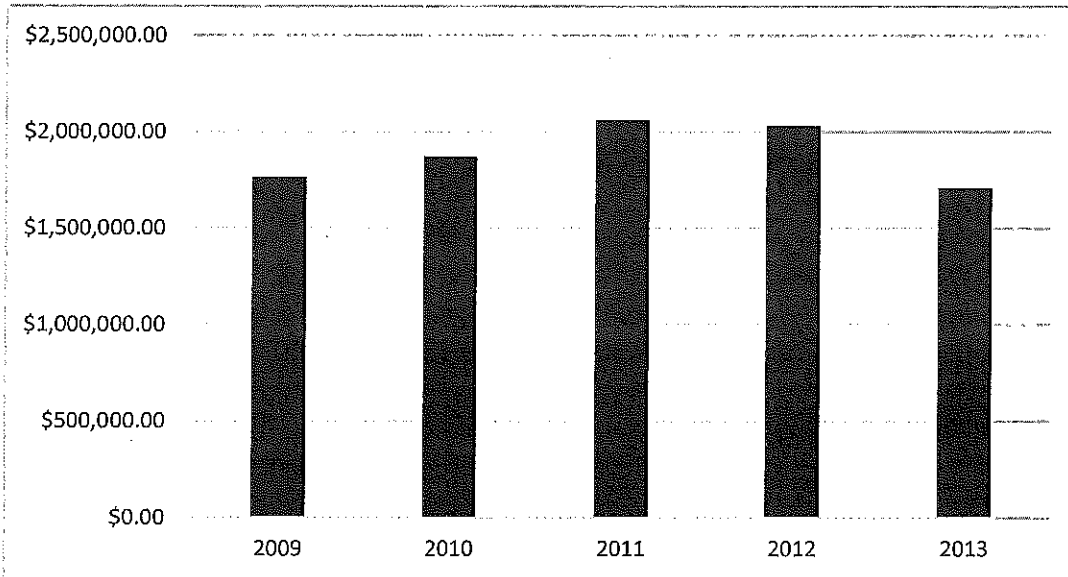
Source: Information Response 62



Collections

Over the last couple of years, the 12-month average arrears has generally been climbing, although 2013 was lower than other years, as shown in *Exhibit IV-14*.⁸⁷

Exhibit IV-14
12-Month Average Arrears
February 2012 to December 2013



Source: Information Response 63

Prior to 2007, once they hit a certain point (if more than \$195 balance) most accounts went to collection agencies. Now, since 2007, they go to collections law firms instead, which is extremely unusual for utility accounts.

Write-offs

The City-wide write-off policy must be uniform; therefore, currently no policy exists,⁸⁸ unlike it does in most utility organizations.

Also, DPU accounts are written off only due to bankruptcies, court orders, or adjustments, not if they have been determined to be uncollectible by collection law firms.⁸⁹ Again this is unlike the situation in most utility organizations.

When accounts are written off, a write-off form is completed with account number, name, service address, write-off amount, and explanation for write-off. Screen shots of the final balance are attached to the original write-off form. The form is approved and signed by the Commissioner of Administrative Services and DPU Director. The form is then given to an Administrative Analyst in the Accounting Department to record in DPU's customer account in SAP.⁹⁰

Billing & Records

Finding IV-17 Although the Billing and Water Distribution Collections groups are now both working to input work orders to SAP, the lack of using electronic workflow for sending documents, coupled with these groups' different locations, results in inefficiencies in workflow activities.

Two different DPU groups are now working to input work orders to SAP, particularly due to the increased backlog, as discussed in Finding IV-18. The group primarily responsible for these and other billing activities is the DPU Billing group located at the Ohio Building. Recently the DPU Water Distribution Collections group, which is located at the Water Distribution facility, added input of "simple" work orders to their regular duty of developing routes on a daily basis for field workers in the Water Technicians group.⁹¹

When Water Technicians complete a work order, they bring paperwork back to the Water Distribution facility, which is then sent to the Billing group at the Ohio Building. The Billing group then goes through the paperwork and sends selected ones, usually "simple" work orders, back to the Collections group at the Water Distribution facility. Furthermore, imaging of these work orders and using electronic workflow capabilities (such as can be done with OnBase) to send these documents is not being used.⁹²

This oversight results in inefficiencies due to the need to send this paperwork via interoffice mail. Moreover, it is more difficult for these two groups to communicate because they are in different buildings.⁹³

Finding IV-18 A large backlog of work order items has resulted in confusion to customers due to the increased need for re-billing.

The backlog of these work orders during this study was typically six to nine months, which results in confusion to customers as to the status of their account. In addition, it can increase the extent to which re-billing is required due to the lag of getting work orders input to SAP.

By October 2014, the backlog was eliminated. Currently the Billing & Records group is working with the Water Distribution Collections group to ensure that work orders are processed in a timely manner.

Finding IV-19 No standard rules exist for re-billing.

Some of these backlogs include simple items, plus others, such as exchanges and rebills; however, DPU does not have standard rules for rebilling. This tendency further complicates the situation because Customer Service Unit agents often do not understand what is occurring when customers call in.⁹⁴



Legal Technicians

Finding IV-20 Each of the Legal Technicians reports directly to the Manager, as do other groups, without having a Supervisor for their group.

The Legal Technicians within the Utilities Administration organization provide support to City attorneys assigned to DPU; however, their administrative supervision is provided by the UA Customer Service Unit Manager. This type of supervision is unusual for a utility organization.⁹⁵

C. Recommendations

Strategic Planning/Financial Planning

See *Chapter IV – Operating Divisions* for specific recommendations regarding strategic planning suggestions.

Recommendation IV-1 Improve the annual DPU budgeting process to formally incorporate detailed goals/objectives/performance measures included as part of the annual process. (Refer to Finding IV-1 and Finding IV-2.)

As formal goals/objectives/performance measures for each DPU division are incorporated into the DPU's strategic planning processes, as discussed in *Chapter IV – Operating Divisions*, they should also be incorporated into the annual budgeting process.

Recommendation IV-2 Require all DPU operating divisions to formally monitor actual-to-budget financial figures on a monthly basis and provide explanation to management for any significant variance. (Refer to Finding IV-3.)

Each of the DPU operating divisions plus the Administrative Services division should be required to formally monitor actual-to-budget financial figures on a monthly basis. When “significant” variances are found, detailed explanations should be provided to the Accounting & Financial Analysis group, so they can be compiled and provided to senior management. Either minimum percentages or dollar limits should be developed that designate a variance as “significant” and that require comment in their monthly explanations reporting.

Other Financial Management Practices, including SAP Issues

Recommendation IV-3 Work with the City Finance and ICT Departments to expand DPU’s SAP capabilities. (Refer to Finding IV-4 and Finding IV-11.)

The DPU Accounting & Financial Analysis group should begin formal discussions with the City Finance and ICT Departments to have expanded SAP capabilities, such as:

- ◆ Change security features such that DPU can, at a minimum, have access to financial statements for DPU and each of its divisions directly from the SAP ERP system, without having to separately format retrieve revenue and expense data and then take both types of data and put them into a financial statements format.
- ◆ Implement workflow capabilities in SAP such that designated Accounting & Financial Analysis employees in DPU can directly make journal entries into SAP, thereby letting the City Finance Department employee(s) review these entries.
- ◆ Explore adding server equipment so the Accounting & Financial Analysis group can produce reports using the SAP ERP data warehouse data. This group’s members would also need to have training so they know how to produce such reports without having to ask ICT employees for assistance.

The DPU Utilities Administration group should also begin formal discussions with the ICT Department to allow more drop-downs within the SAP modules used by the Customer Service Unit agents.

The City of Toledo will need to make additional investments into SAP, including changing procedures, how the system is configured, and possibly adding equipment, so that changes can be made to address these issues.

Recommendation IV-4 Establish standard rules for rebilling and provide formal training not only to Accounting & Financial Analysis employees but also Customer Service Unit employees who discuss bills with customers. (Refer to Finding IV-5 and Finding IV-19.)

The DPU Administrative Services organization should develop standard rules for rebilling. Then all appropriate Accounting & Financial Analysis employees performing the rebilling and all Customer Service Unit employees explaining bills, including rebilling, to customers should be extensively trained on this topic.



Performance Measurement System

Recommendation IV-5 **Establish a formal performance measurement process for all DPU divisions that supports the Utility’s strategic planning process. (Refer to Finding IV-6.)**

Goals and objectives are being created during the strategic planning process that has been developed as a part of this project. These will be quantified with specific performance measures to the extent possible.

Customer Satisfaction

Customer Service Unit

Recommendation IV-6 **Have agents contact Supervisors immediately when escalation of calls is necessary. (Refer to Finding IV-7.)**

Rather than having agents complete a paper form that is given to Supervisors for later call back to customers, which is frustrating to customers, agents should be able to transfer calls immediately to Supervisors when escalation is necessary.

Recommendation IV-7 **Regularly monitor customer calls at least once per week for each agent. (Refer to Finding IV-8 and Finding IV-9.)**

As part of an agent’s ongoing development and training, his or her calls should be regularly monitored by Supervisors or Team Leaders at least once per week. Currently the Customer Service Unit has one Supervisor and another Alternative Supervisor (who is also responsible for training agents). To ensure that proper monitoring of calls is being done, the configuration of the Customer Service Unit should be reassessed to determine the number of Supervisors needed and to consider the possibility of adding Team Leader positions to the group.

Also, refer to *Finding IV-12* and *Recommendation IV-9* for additional discussion regarding training requirements.

Recommendation IV-8 **Modify service request and implementation procedures to improve customer interactions. (Refer to Finding IV-10.)**

Whenever possible, Customer Service Unit agents should schedule service calls on designated days for the morning or afternoon. Also, in all cases, field workers should be required to call ahead to customers when they are close to arriving at the customer’s location.

Because communications between the Utilities Administration Manager or Customer Service Unit Supervisors and Water Distribution management is frequently difficult, formal backup employees should

be provided to the Customer Service Unit when discussions with Water Distribution management are necessary to handle specific scheduling situations.

Recommendation IV-9 Assign at least one dedicated training staff to the Utilities Administration group to provide regular training to Customer Service Unit and Billing & Records employees. (Refer to Finding IV-12.)

Such dedicated staff understand what Customer Service Unit and Billing & Records employees should be doing to perform their jobs with regard to best practices. It is also especially important that staff who are trainers have a background in providing training, because training itself is a skill set that is imperative to this position. Training of these groups should be performed regularly, not just when an individual assumes a new position. All employees should receive refresher training at least annually or more frequently when changes occur.

Recommendation IV-10 Integrate DPU billing and water emergency calls into one Customer Service Unit. (Refer to Finding IV-14.)

Having a CCH group to handle calls for all non-DPU complaints is not an issue; however, having this group perform DPU water emergency calls, while the DPU Customer Service Unit handles only DPU billing issues, can confuse DPU customers, reduce staffing efficiency, and increase costs. The DPU organization, along with other City representatives, should take steps to integrate customer service functions under the Utilities Administration Customer Service Unit.

Appeals Process

Recommendation IV-11 Incorporate into the Adjustment Committee at least one external individual who is not part of the DPU service process. (Refer to Finding IV-15.)

To ensure that bias is not part of the appeals process, DPU should incorporate at least one person who is not part of the DPU processes into the Adjustment Committee. Most appeal processes for utility organizations involve both internal employees and external individuals. This involvement by both will help ensure that bias is not part of the DPU appeals process and also that there is no perception that bias occurs when the committee makes its decisions.

Collections & Write-Offs

Recommendation IV-12 Perform a formal investigation and study focusing on determining the costs and benefits of using collection agencies and collection law firms. (Refer to Finding IV-16.)

One of the concerns that Schumaker & Company has is that use of collection law firms, rather than collection agencies, for attempting to collect amounts owed by customers that have reached a long-



overdue period would be the possibility that the use of collection law firms might be more costly and not necessarily more beneficial than using collection agencies. Our firm has never seen a utility organization use collection law firms for collections activities.

Once a formal investigation and study has been done to identify the costs and benefits of each type of collections organization, if the results show the collections agencies would be a better practice, then formal changes should be made to convert from collection law firms to collection agencies.

Recommendation IV-13 Develop a formal write-off policy for the DPU organization. (Refer to Finding IV-16.)

Not only should DPU develop a formal policy for writing off accounts due to bankruptcies, court orders, or adjustments, but it should also include accounts which, once they have gone to a collections organization, have been determined to be uncollectible, even though they do not fall into one of these three categories.

Billing & Records

Recommendation IV-14 Combine the Billing & Records group and the Water Distribution Collections group into one entity located at the Water Distribution facility and improve electronic workflow between groups. (Refer to Finding IV-17 and Finding IV-18.)

The Billing & Records group and the Water Distribution Collections group should be combined into one group. This combined group should be located at the Water Distribution facility so that group members can be located close to field workers. This proximity would allow proper interaction, plus it would improve efficiencies in workflows and reduce the work order backlog. Also, DPU should image work order documents so electronic workflow can be used for communicating between groups.

Legal Technicians

Recommendation IV-15 Assign a Supervisor who supervises the Legal Technicians and Clerk currently located in the Utilities Administration group. (Refer to Finding IV-20.)

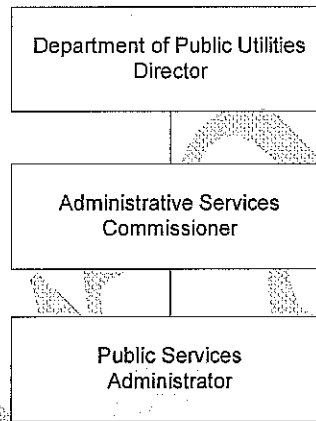
Having the Legal Technicians and Clerk report directly to the Utilities Administration Manager causes this manager to have too many employees reporting directly to her. In addition, she has only administrative duties with regard to these employees because the City attorneys located close by provides functional oversight. A Supervisor position should be added, possibly filled by one of the City attorneys, to supervise these employees. It may also make sense to transfer this group out of the Utilities Administration group.

V. Safety

A. Background & Perspective

The City of Toledo Department of Public Utilities has an Administrator of Public Services (Safety Administrator) that serves as the safety coordinator. The Safety Administrator reports to the Commissioner for Administrative Services as shown in *Exhibit V-1*. There are no additional staff dedicated to occupational health and safety within the DPU.

**Exhibit V-1
DPU Safety Organization
2014**



The Safety Administrator supports seven safety committees – one for each division. These committees are central to assuring occupational health and safety within the organization. The Safety Administrator also supports works compensation claims management, manages safety training and supports incident response and water quality issues.

B. Findings & Conclusions

Finding V-1 DPU occupational injury rates exceed comparable industry benchmarks.

Using standard metrics, Schumaker & Company analyzed DPU occupational injury rates and found that DPU’s safety performance falls far below that of comparable organizations. Benchmarks used were utilities across the country, municipalities across the country, and water utilities data from the American Water Works Association (AWWA). In every case, DPU’s safety performance was substantially worse.

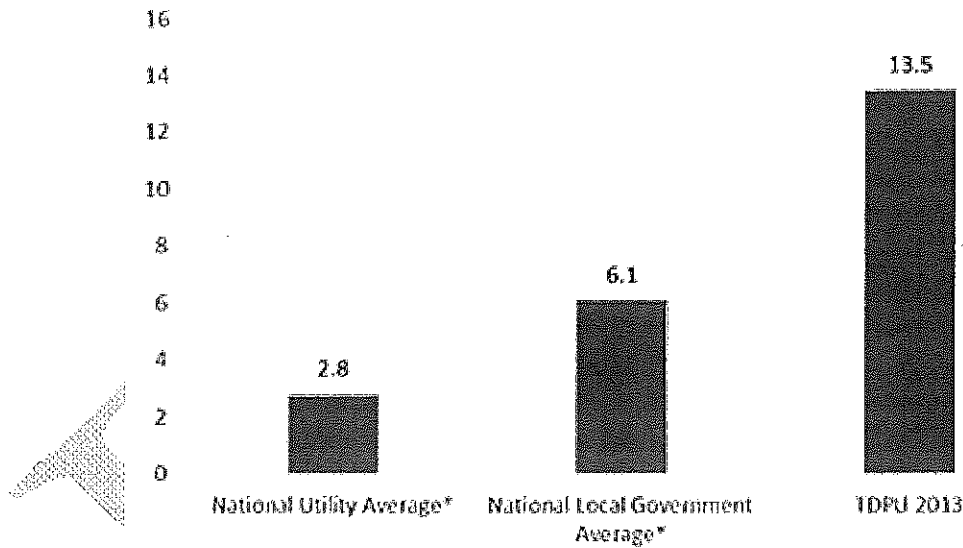
To perform any of the standard safety metric calculations it is necessary to know the total number of hours worked (not paid) by all employees in the organization. Ohio reports data somewhat differently



than the standard Occupational Safety & Health Administration (OSHA) numbers. A precise figure for total DPU employee hours worked was not available (although good data for several of the divisions was provided). Using the total average full-time equivalent (FTE), adjusted for leave usage and overtime, we were able to make an estimate of total hours worked that we feel very confident using it to calculate standard occupational safety metrics.

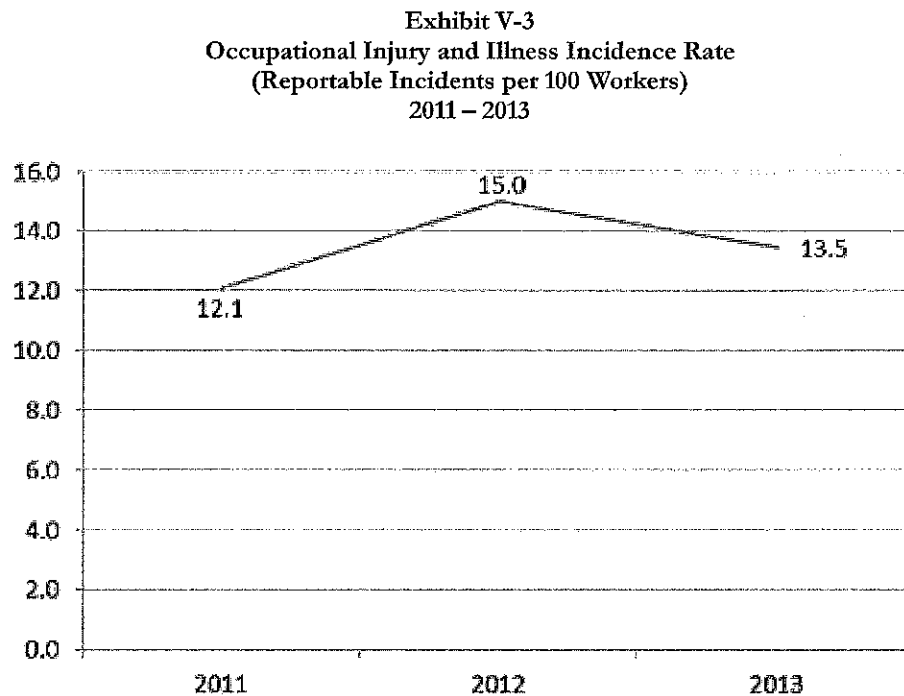
Perhaps the most basic safety metric is the incidence rate. This measures the total number of reportable occupation illnesses and injuries and standardizes the figure for organizations of different size. DPU’s incidence rate for 2013 was 13.5. This was more than twice that of any comparable benchmark group. *Exhibit V-2* provides incidence rate comparisons.

Exhibit V-2
Occupational Injury and Illness Incidence Rate
(Reportable Incidents per 100 Workers)
2012/2013



Source: * Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses, 2012

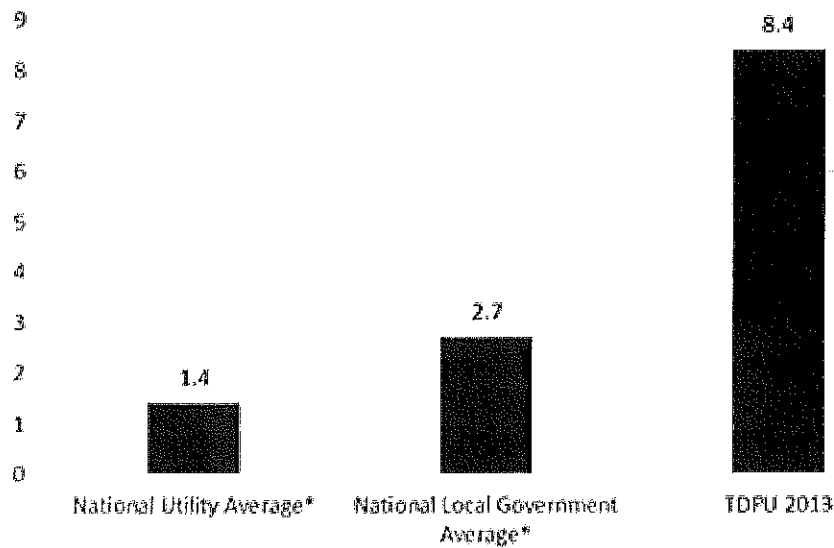
The incidence rate has fluctuated somewhat over the last three years, but in each year was significantly higher than benchmark rates. *Exhibit V-3* provides the DPU incidence rate for the past three years.



The incidence rate includes first-aid only cases. Although an important safety indicator, a high incidence rate may reflect aggressive reporting of minor injuries. The day-away, restricted, and transferred (DART) measures cases with lost work-days and provides insight into the severity of injuries. Here again, DPU's safety performance falls far below benchmark measures and is three times as high as any of the benchmark comparisons. DART rate comparisons are provided in *Exhibit V-4*.



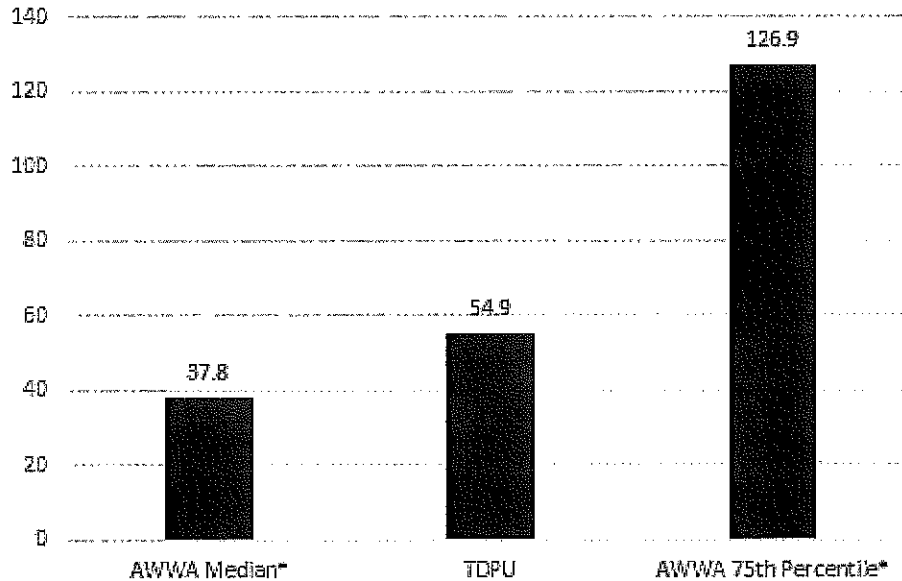
Exhibit V-4
DART Rate
 (Day Away, Restricted or Transferred Cases per 100 Workers)
 2012/2013



Source: * Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses, 2012

The American Water Works Association uses total lost days as the key measure of occupational injuries. Whereas the other measures examined here count the number of cases, this measure looks at lost time. This is an important measure of both severity and costs. These cases typically incur the highest workers' compensation medical and indemnity costs on top of the direct and indirect costs associated with lost work time. This information is summarized in *Exhibit V-5*.

Exhibit V-5
Occupational Injury and Illness Severity Rate
(Lost Workdays per 100 Workers)
2013

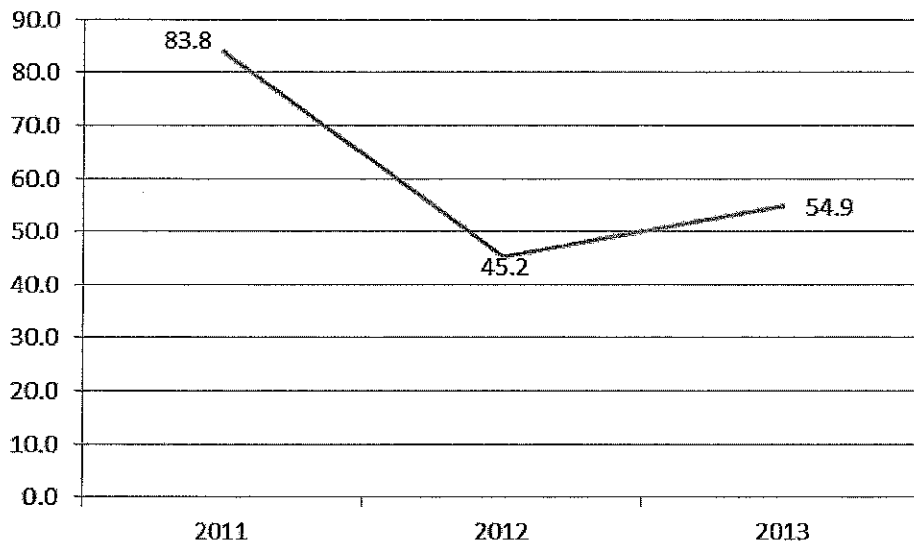


Source: * Lafferty, A. K. and Lauer, W. C., Benchmarking Performance Indicators for Water and Wastewater Utilities. American Water Works Association, 2012, Page 56.

The severity rate can move independently of the overall incidence rate and a single, severe injury can have a very significant effect on this rate but is, of course, a single incident. The severity rate at DPU declined significantly in 2012 but ticked back up again in 2013. This trend is summarized in *Exhibit V-6*.



Exhibit V-6
Occupational Injury and Illness Severity Rate
(Lost Workdays per 100 Workers)
2011 - 2013



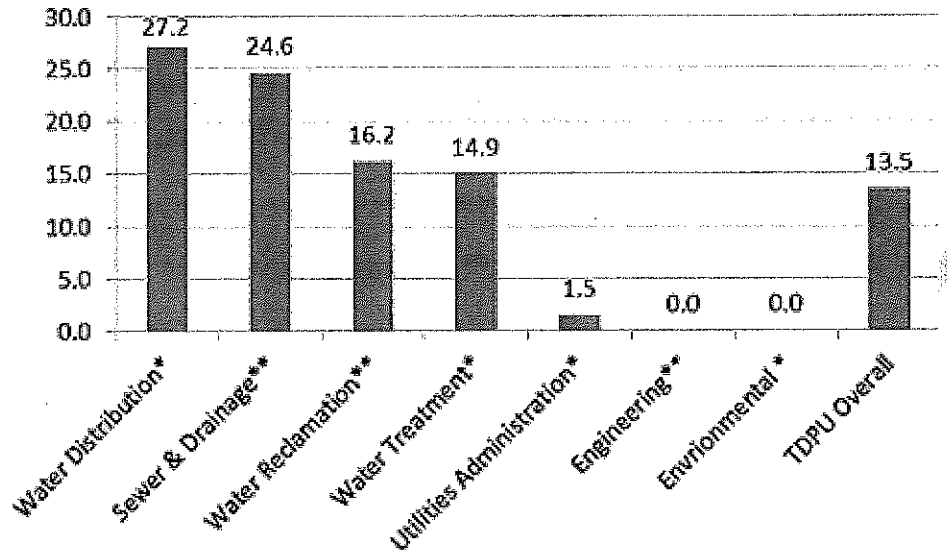
These safety measures indicate that DPU's occupational safety performance, as measured in terms of number of injuries and in severity of injuries, is far below that of comparable organizations. Although not specifically measured here, the associated costs are surely far above what would be considered reasonable.

Finding V-2 Safety performance varies by division.

Predictably, the two divisions with the most external maintenance and construction work experience the highest injury incidence rates. The water treatment and reclamation plants have a considerable amount of physical labor, but more typically indoors and without heavy equipment, experience fewer employee injuries. Technical and administrative work have almost no employee injuries. Although predictable, this data presents a clear focus for safety resources and initiatives and, perhaps, calls into question the allocation of resources to support safety committees in the technical and administrative areas.

The incidence rates for each division are provided in *Exhibit V-7*.

Exhibit V-7
Occupational Injury and Illness Rate By Division
(Reportable Incidents per 100 Workers)
2013



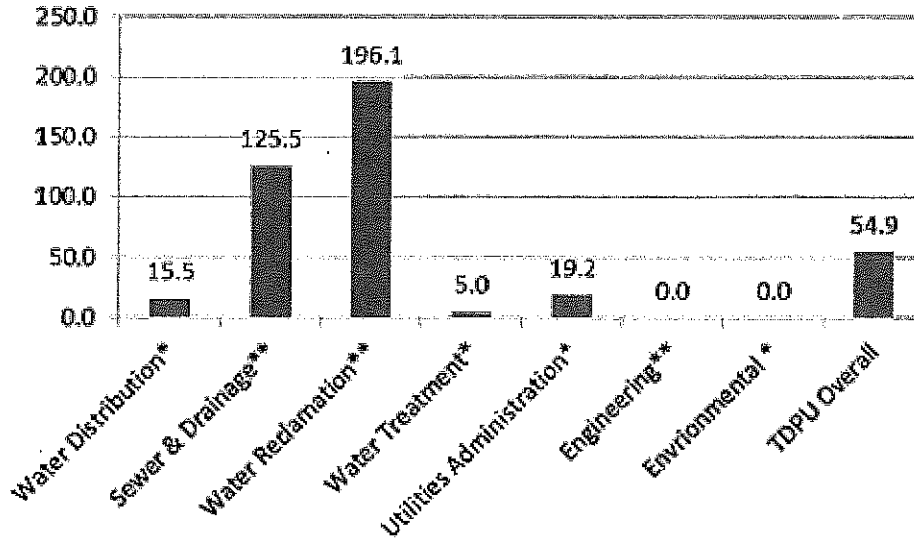
*Based on estimated total employee hours

**Based on actual employee hours



Exhibit V-8 provides a comparison of severity rates by division. Water Reclamation, with a substantially lower incidence rate, has the highest severity rate. As mentioned in Finding V-1, the severity rate can be influenced by a single significant injury in the way the incidence rate is not.

Exhibit V-8
Occupational Injury and Illness Severity Rate by Division
 (Lost Workdays per 100 Workers)
 2013



** Based on estimated total employee hours
 * Based on actual employee hours

Finding V-3 Safety performance is not measured and communicated.

Any business improvement initiative requires performance measures. At DPU, safety measures are not routinely calculated and do not appear to be shared with managers and safety committees. Safety activities appear to be policy and compliance driven, but are not informed by any data regarding actual performance. Schumaker & Company believes the relatively poor performance documented in Finding V-1 reflects the lack of data and drive to improve.

Finding V-4 Safety accountability at the operational level is weak.

A 2010 report by the Water Research Foundation (formerly AWWA Research Foundation) and the U.S. Environmental Protection Agency (USEPA) found that a lack of accountability for safety and health programs was a key factor in poor safety performance.⁹⁶

The comparatively poor safety performance of water utilities can be attributed to the widespread lack of accountability for safety and health program performance. This research provides more evidence that without leadership accountability, organizations are unlikely to develop organizational structure or to apply the resources necessary to achieve even average safety performance. An advanced safety and health culture, i.e., one that places worker safety and health at the top of organizational priorities, is the result of a sustained leadership commitment to improving worker safety and health. Utilities with top-flight safety programs realize the benefits of fewer injuries / illnesses, including decreased direct costs of worker's compensation and property damage, as well as substantially lower indirect costs associated with lost time and operating inefficiency. Indirect costs are typically not tracked at water utilities, but have been shown to exceed direct costs in general industry by several times.

Schumaker & Company believes the lack of accountability is evident at DPU. Although the Director appears to be very committed to employee safety, we did not see evidence of this at the commissioner and supervisory level. Front line supervisors appear to believe that the safety staff is accountable for safety performance. Supervisors (and safety committees, for that matter) are not provided with safety performance data to drive improvements (as discussed in Finding V-3). The Safety Administrator is burdened with many other duties and has no staff to support a comprehensive safety program.

A high performing safety culture begins at the top of the organization. Performance data is routinely collected, consistently analyzed, widely shared, and used to drive improvements. Accidents and injuries are openly discussed and prevention strategies are identified and implemented. Hazard identification is widely taught and reporting of work hazards is rewarded. Most of all, senior management is accountable, visible, and provides the resources necessary for creating a safe work environment.

Finding V-5 DPU operates with insufficient staffing of occupational health and safety professionals.

There is no accepted standard for safety staffing levels but water utilities are generally considered to be understaffed.⁹⁷ Factors such as number of employees, system complexity and age, number of locations and geographic dispersion, the degree of responsibility the safety office has for policy and procedure development, the degree to which accountability rests with operating supervisors, and injury experience are key variables. DPU operates with single occupational safety professional. The large number of employees, the lack of formalization of occupational health and safety programs, and the relatively poor safety performance level all point to this being insufficient.

Finding V-6 Safety training and documentation is inadequate.

We appreciate the fact that DPU has provided some safety training and is working to do more. That said, we found this effort to be limited and insufficiently documented. Training and certifications records appear to be mostly the responsibility of frontline supervisors. This approach lacks consistency and does not support adequate needs assessment. It also limits DPU's ability to document training and certification when accidents do occur. This has the potential to increase liability exposure.

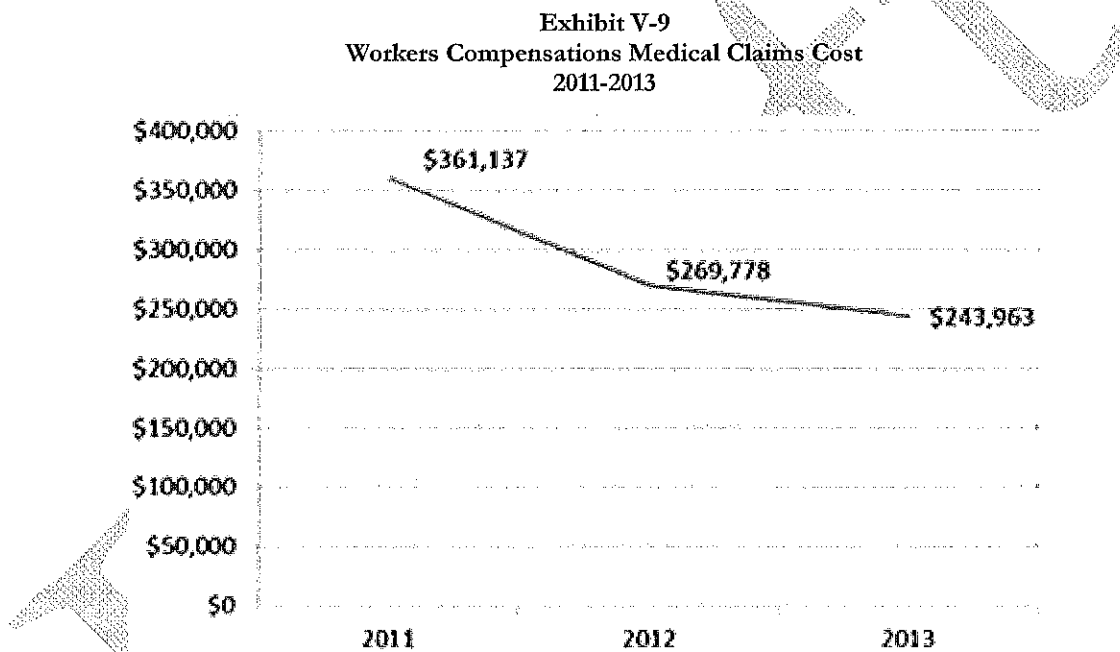


Training is generally conducted in a classroom session utilizing a train-the-trainer model. While this has some benefit for employee engagement in safety, it is an inefficient approach and subject to varying degrees to delivery effectiveness.

Finding V-7 Workers’ compensation costs have declined over the last three years.

In spite of persistently high injury and severity rates, workers’ compensation medical claims costs for DPU has declined 32% over the past three ears. This reflects effective claims management by the City of Toledo Human Resources Department and their third-party administrator (TPA).

Exhibit V-9 shows the decline of medical claims over the past three years.



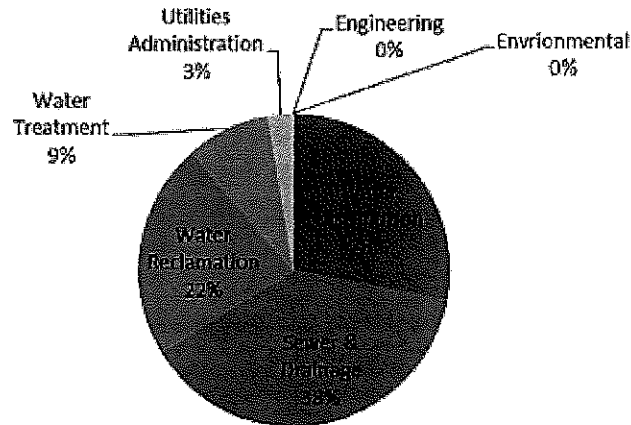
Of course, effective claims management does nothing to prevent occupational injuries, but it plays a critical role in controlling costs and getting employees back on the job. It should also be noted that these figures reflect amounts paid in the given year and can include claims cost from prior years.

Finding V-8 Sewer and Drainage has the highest workers’ compensation medical claims cost.

The Sewage and Drainage division accounts for 38% of the overall medical claims cost for DPU workers’ compensation costs for the past three years combined. Water Distribution, with a higher injury incidence rate, has the second highest rate of 28%. Once again, the data suggest focusing considerable

attention on these two areas. *Exhibit V-10* details the percentage of total DPU workers' compensation medical costs for each division.

Exhibit V-10
Workers' Compensation Medical Claims Cost by Division
2011 – 2013



C. Recommendations

Recommendation V-1 Analyze high-injury work processes and identify work method changes to reduce associated occupational injuries. (Refer to Finding V-1 Finding V-2, Finding V-3, and Finding V-8.)

It is Schumaker & Company's experience that work processes that produce the highest injury rates tend to also be inefficient. Analysis of injury causes and high-injury work processes can often yield insights into improvements that make the work safer and more efficient. Often new equipment can significantly reduce injuries – especially back and muscle strain injuries. In other cases, simply changing work practices with greater attention to ergonomics can reduce the injury rates. Safety committees can provide key insights into unsafe and inefficient work practices. With some technical support, significant improvements can be identified. While reducing occupational injuries is an important goal unto itself, the business case for change is driven by cost reductions. Reducing the direct and indirect costs of occupational injuries can pay for new, safer, more efficient equipment.

Recommendation V-2 Measure and report safety performance. (Refer to Finding V-3 and Finding V-4.)

It is often said that you cannot improve what you don't measure. Calculating safety performance measure and widely sharing the information is essential to building awareness of safety. Every work group should know its statistics and be conscious of how their behavior and work practices affect safety performance. As noted in the Water Research Foundation report on Water Utility Safety and Health,



“the greatest value of metrics in an organization is to drive change and improvement. By far, the most frequently cited metrics driving change in water utility safety and health programs involved injury/accident statistics and trends in some form.”⁹⁸

Recommendation V-3 Recognize and reward good performance. (Refer to Finding V-4.)

High performing organizations with strong safety cultures recognize individuals and groups who work safely and consistently strive to improve. Safety awards build awareness of safe work practices. Incentives for meeting goals, like number of days without a lost work day, are another tool to build awareness. Reward and recognition for employee reporting of work hazards encourages attention and also communicates that the organization values safety. Obviously to be effective, these incentives need to be associated with the right equipment and training, but in the end, it is awareness and behavior that matters most.

Recommendation V-4 Strengthen safety accountability at every level of the organization. (Refer to Finding V-4.)

Perhaps a statement of the obvious, accountability begins at the top of the organization. Quoting again from the Water Research Foundation Report; “Without exception, the most important factor for achieving excellence in water utility safety and health performance is the active participation and high visibility of senior leadership in driving a safety culture. This can include participation (at least occasionally) in safety committee meetings, reward and recognition mentioned above, holding others managers accountable and accepting personal responsibility for poor safety performance. Safety should become a key element in management performance reviews and have a significant impact on incentive compensation where appropriate.

Accountability should extend to all levels – but the role of the first line supervisor is critical. Supervisors give work direction, set priorities and set the standards for behavior on the work site. We recommend that supervisors whose work group experiences a lost time accident should be required to present the results of the accident investigation and the remediation plan at a senior management meeting. Schumaker & Company believes this drives accountability in both directions.

We have certainly tried to emphasize the importance of positive incentives, but we don’t want to exclude the possibility of discipline as well. Any employee, management or not, found responsible for unsafe work practices should be subject to discipline within the guidelines of civil service and collective bargaining agreements.

Overall, safety culture is a reflection of what the organization values. Values are manifested in behavior and behavior is shaped through rewards and punishment. In other words, culture reflects what we teach. Building a system of accountability, consistent with training and support will build a strong safety culture at DPU. This in turn will lead to fewer occupational injuries and dramatically lower costs.

Recommendation V-5 Create a safety committee scorecard. (Refer to Finding V-3, Finding V-4, Finding V-5, and Finding V-6.)

However many safety committees DPU decides to support, it is important to have a way to evaluate committee effectiveness and to offer support for performance improvement. At minimum, there should be a scorecard that is produced quarterly. This will provide safety committees with important feedback and provide an *apples-to-apples* comparison across the organization. *Exhibit V-11* provides a sample scorecard:

**Exhibit V-11
Sample Safety Committee Scorecard Elements**

Element	Metric(s)
Meeting frequency	Number of safety committee meeting held during the period
Participation level	Percent of members present at meetings
Record keeping	Agenda and minutes submitted Hazard Identification and Risk Assessment reports
Training	Hours of safety training per employee
Hazard identification	Number of hazards identified Number of recommendations for remediation implemented
Safe work duration	Number of days since a lost work accident
Performance	Incidence rate DART rate Severity rate

Source: Schumaker & Company Experience

Recommendation V-6 Implement a training management system. (Refer to Finding V-6.)

Improving training is essential to creating a strong safety culture and reducing occupational accidents. Given the limited safety professional staffing at DPU, we recommend, at a minimum, adding an experienced safety trainer to develop, manage, and deliver training as part of a comprehensive annual safety improvement plan.

In addition, we recommend the adoption of a training content management, delivery and documentation system. Several products exist for this purpose. Schumaker & Company is particularly impressed with Target Solutions (<http://www.targetsolutions.com/home>).² This product offers content developed specifically for water and wastewater utilities. It also allows for the uploading and sharing of practically any content developed in-house or purchased elsewhere. It also allows for testing and will record employee training completion and scores. Perhaps most importantly, it has a comprehensive training records system. This system allows for easy documentation of training and certifications, tracks expirations and notifies employee and supervisors of pending certification expirations or training refresher requirements. This

² Schumaker & Company has no relationship with Target Solutions and we are not recommending purchase of this specific system without appropriate needs assessment and review of multiple vendors.



system has the added benefit of being applicable beyond safety training and can be utilized for operating licensing and other professional certification requirements. This would include competent persons for confined space entry and excavation.

Recommendation V-7 Hire a least one additional safety professional (Refer to Finding V-3, Finding V-4, and Finding V-5 and Finding V-6.)

We noted in Finding V-4 that there is no standard for determining occupational health and safety staffing levels. Factors such as number of employees, system complexity and age, number of locations and geographic dispersion, the degree of responsibility the safety office has for policy and procedure development, the degree to which accountability rests with operating supervisors, safety experience are all to be considered. Depending on how you weight these factors, we would expect a two to three person occupational health and safety staff for DPU. A degreed industrial hygienist and a training coordinator (to be shared with other training needs) would be appropriate additions.

Draft

VI. Operating Divisions

The City of Toledo Department of Public Utilities (DPU) is organized into four operating divisions (not counting the administrative services division, which is covered in a separate chapter), specifically:

- ◆ Water Treatment
- ◆ Water Distribution
- ◆ Sewer & Drainage
- ◆ Water Reclamation

Each of these divisions is responsible for certain aspects of water treatment through the reclamation process and each is briefly discussed in the background section that follows.

A. Background & Perspective

Water Treatment

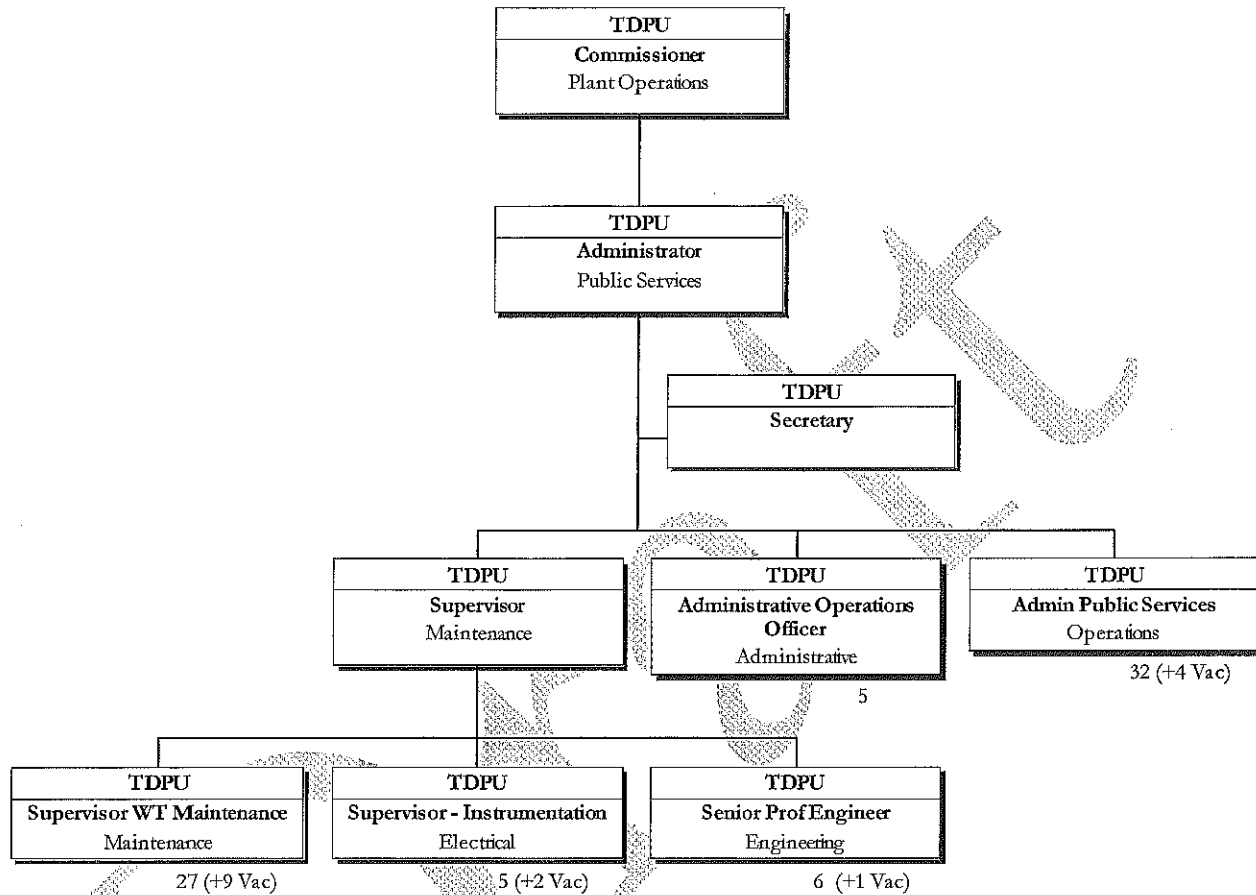
Water Treatment personnel manage a system that produces 26 billion gallons of high-quality drinking water per year for an estimated 500,000 people in the greater metropolitan Toledo area, including Lucas County and portions of Wood, Fulton, and Monroe Counties. The Collins Park Water Treatment Plant uses surface water drawn from Lake Erie as its source. Plant operations purify and transport an average of 73 million gallons per day (MGD) with a capacity of 120 MGD to enhance the lives of residents and to support business and industry.⁹

Organization

The Water Treatment organization is shown in *Exhibit VI-1*.¹⁰⁰



**Exhibit VI-1
Water Treatment Organization
as of December 31, 2012**



Source: Information Response 2

Water Treatment 2013 Highlights

During 2013, Water Treatment provided an uninterrupted supply of potable, high-quality, good-tasting water 24 hours per day, seven days a week for 365 days of the year to 500,000 consumers. The division continues implementation of the 20-year Master Plan for the Collins Park Water Treatment Plant,¹⁰¹ concentrating on site-specific actions required by the Ohio Environmental Protection Agency (EPA). These efforts are undertaken to maintain and enhance DPU’s ability to serve Toledo and the surrounding population and industries with superior award-winning water.¹⁰²

- ◆ To remain in compliance with new EPA mandates, DPU is expanding and improving its present capabilities to meet new and more stringent testing requirements. Toledo Department of Public Utilities has identified multiple projects to increase redundancy and efficiency and has secured \$190 million in funding to implement the first phase of the improvements.

- ◆ To complete the construction phase, which expands the area and capabilities of the lab, DPU is in the process of installing new equipment.
- ◆ Outside contracts have been entered into for assistance with construction services to implement the 20-year Master Plan.
- ◆ Projects under design, in construction, or completed in 2013 at a cost of more than \$28 million include:
 - Water Treatment Main Building and Roof Rehabilitation
 - Chlorine Disinfection Facility
 - Sedimentation Basin Access Hatch Rehabilitation
 - Chemical Feed Improvements
 - Heatherdowns Pumping Station Rehabilitation
 - Spent Lime Lagoon Cleaning

Water Treatment 2014 Goals

Numerous projects identified in the 20-year Master Plan have been or are being designed and built. Systematic capital improvements to the plant and making major improvements to the pumping stations are major goals for 2014. A detailed construction schedule was developed and agreed upon by the Ohio EPA and the City of Toledo by February 2014.¹⁰³

- ◆ Continue to meet each and every deadline imposed by the Ohio EPA to comply with the deficiency letter and the sanitary survey mandates.
- ◆ In 2014, DPU will complete training and certification of current and new chemists, including cross-training individuals in various disciplines and certification to enhance the DPU's compliance and flexibility. This last phase should be completed by August of 2014.
- ◆ Continue with the apprenticeship program for the skilled trades positions and the shadowing program for the administrative positions.
- ◆ Due to requirements for the Journeyman status to fill skilled trades positions, develop an apprenticeship program to fill these positions from within DPU's system.
- ◆ Continue to work with Owens Community College to implement this formal apprenticeship program to full scale by December 31, 2014.

Water Distribution

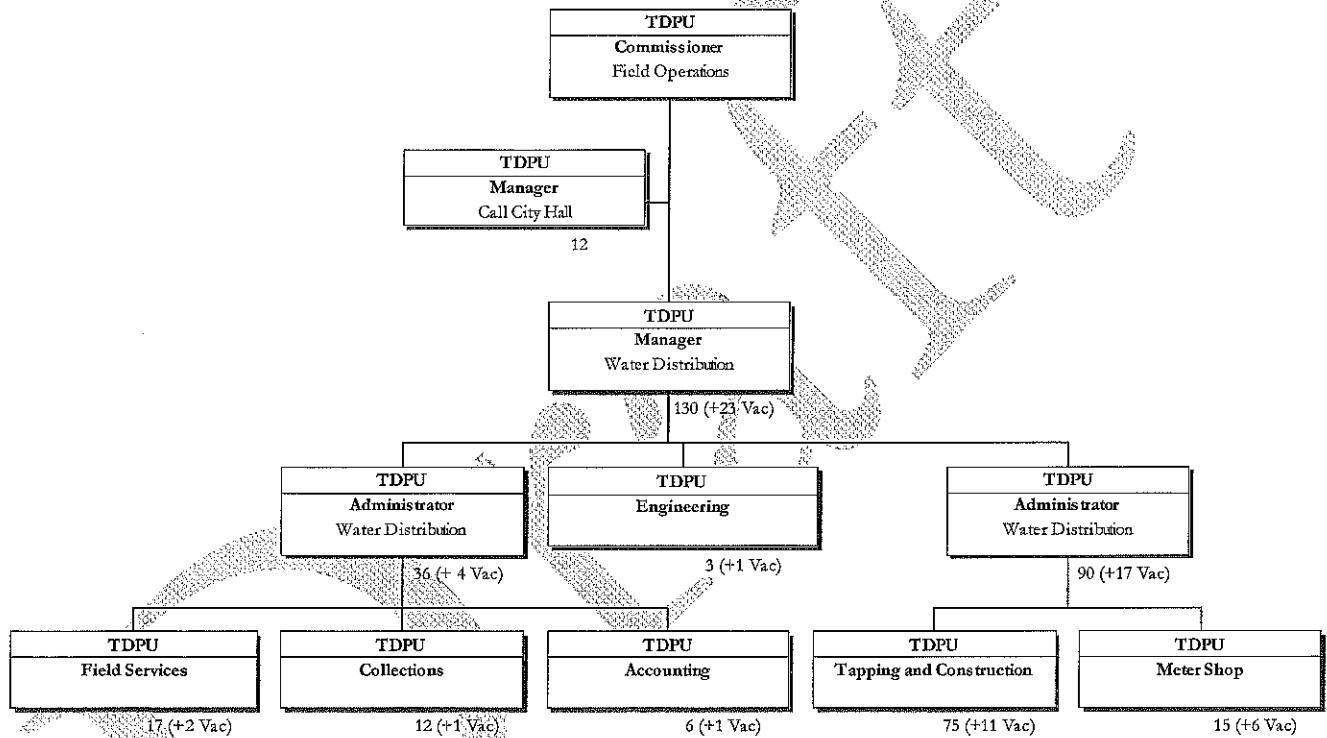
The Water Distribution division's professional employees are responsible for the maintenance and repair of 1,188 miles of water mains and 10,430 fire hydrants located in the City of Toledo water distribution system. Additionally they read approximately 135,000 meters on a quarterly or monthly basis, and they repair, replace, and install water meters daily.¹⁰⁴



Organization

The Water Distribution division is composed of seven different sections and has a staffing level of about 140 employees, as shown in *Exhibit VI-2*. A satellite maintenance section from Fleet and Facilities and the Call City Hall Call Center are housed at Water Distribution.¹⁰⁵

**Exhibit VI-2
Water Distribution Organization
as of June 30, 2014**



Source: Information Response 2

Each of the major areas is briefly described in the following section.

Tapping & Construction – The Tapping and Construction section is responsible for the maintenance of the water distribution system including the village of Berkey. This responsibility encompasses main repairs, service repairs, valve repairs and replacements, and hydrant maintenance and replacements. The team members perform any new private development connections to the distribution system along with the connecting and re-tapping service lines on new water line installations. They also perform service repairs, new service taps, and re-taps in Lucas County. Also included with the maintenance of the system is the surveying of the water lines for possible leaks and breaks that do not surface.¹⁰⁶

Tapping & Construction section statistics:

	2010	2011	2012	2013
Water Main Breaks	442	287	330	291
Valves Operated	1,222	4,216	3,186	1,636
Landscaping	1,363	1,667	1,556	358
Repair Hydrant	853	326	364	198
Collections Turn-Offs	676	412	625	213
Curb Boxes Dug Up & Put in Shape	409	409	439	518
Large/Fire Taps	45	26	24	14
Small Taps	261	119	91	136
Services Killed	497	372	606	64
Valves Replaced	13	32	45	16
Surveyed Water Lines for Leaks (in miles)	185.9	97	325	148.9
Hydrants Operated	9,670	13,560	13,650	10,829
Water Emergency Responses	6,638	7,346	8,212	5,967

Engineering – The Engineering section is responsible for inspection of private water line installations, large meter settings (3” and above), and backflow preventers. Its team members also perform hydrant flow tests to determine the pressure and amount of flow in various areas of the distribution system. In addition, they are in charge of the Boil Advisory Program and the Backflow Prevention Program. The Engineering section is also responsible for maintaining the existing distribution system to the Ohio EPA standards. This responsibility includes working with the Division of Engineering Services on water construction standards and new water line construction projects. The Engineering staff serves as the liaison between large project contractors and the division’s Tapping and Construction section. The Engineering section performs the major role of Cityworks’ setup, implementation, and training for all divisions.¹⁰⁷



Engineering section statistics:

	2011	2012	2013*
Projects Completed	20	13	19
Private Waterline Installations	21	34	25
Large Meter and Backflow Preventer Inspections	12	36	19
Hydrant Flow Tests	35	40	39
Boil Advisories	226	183	193

*2013 figures are through 11/19/13

Meter Shop – The Meter Shop is responsible for the installation, replacement, and removal of water meters within the water distribution system. Additionally, employees of this section perform the duties of turning on and water service and making repairs to City of Toledo equipment that may already be installed at a customer’s location. A 30-day tag procedure on exchange orders was implemented to provide the customer with ample time to make the needed repairs and avoid disconnection.¹⁰⁸

Meter Shop statistics:

	2010	2011	2012	2013*
Radio Transmitters Installed	4,088	6,393	4,620	7,184
Completed Work Orders	16,291	17,627	17,719	17,654
Water Meters Tested to American Water Works Association (AWWA) Standards	540	665	1,061	1,152
Hydrants Rented	156	167	185	141

*2013 figures are through 11/19/13

Meter Reading & Inspection – The Meter Reading & Inspection section is responsible for all data collection, both manual and automated, for some 135,000 residential and commercial water meters located throughout the City of Toledo’s water distribution system. This section responds to all customer inquiries, complaints, and concerns with regard to water meters. Additionally, Meter Reading & Inspection is responsible for enforcing the Department of Public Utilities’ rules and regulations inclusive of small and large meter regulations; domestic, irrigation, and process metering regulations; and new service line installations. StreetSync routing software is used to efficiently and effectively plan Meter Reading & Inspection routes.¹⁰⁹

Meter Reading & Inspection statistics:

	2011	2012	2013
# of Reads	523,025	490,514	395,140
Inspection Performed	3,803	4,513	2,757

Call City Hall – Call City Hall is operated 24 hours per day, 365 days per year and is promoted as the number where citizens can reach city services, report nuisance issues, convey concerns, offer suggestions, or obtain general information on all city departments and divisions including the Mayor’s Office, the Department of Public Service, the Department of Public Utilities, and the Department of Inspection. Call City Hall also provides referrals to Lucas County for citizens needing the dog warden, marriage licenses, birth certificates, or the Auditor’s Office. In 2013 Call City Hall received 90,639 calls, making 19,937 database entries.¹¹⁰

Call City Hall 2014 goals area as follows:

- ◆ Provide superior customer service to the citizens of Toledo.
- ◆ Ensure information provided to City departments is highly accurate.
- ◆ Promote increased communication from City divisions to Call City Hall.

Sewer & Drainage Services

Sewer & Drainage Services (SDS) operates and maintains the sanitary sewer, storm sewer, and ditch drainage systems for the City of Toledo. The Sewer & Drainage Services division is responsible for the following items:¹¹¹

- ◆ Annual Budget Total – \$18,189,835.16
- ◆ Sanitary Sewer Miles – 1,100
- ◆ Storm Sewer Miles – 986
- ◆ Open Ditch Miles – 64
- ◆ Enclosed Ditch Miles – 32
- ◆ Funded Full Time Equivalents (FTEs) – 140

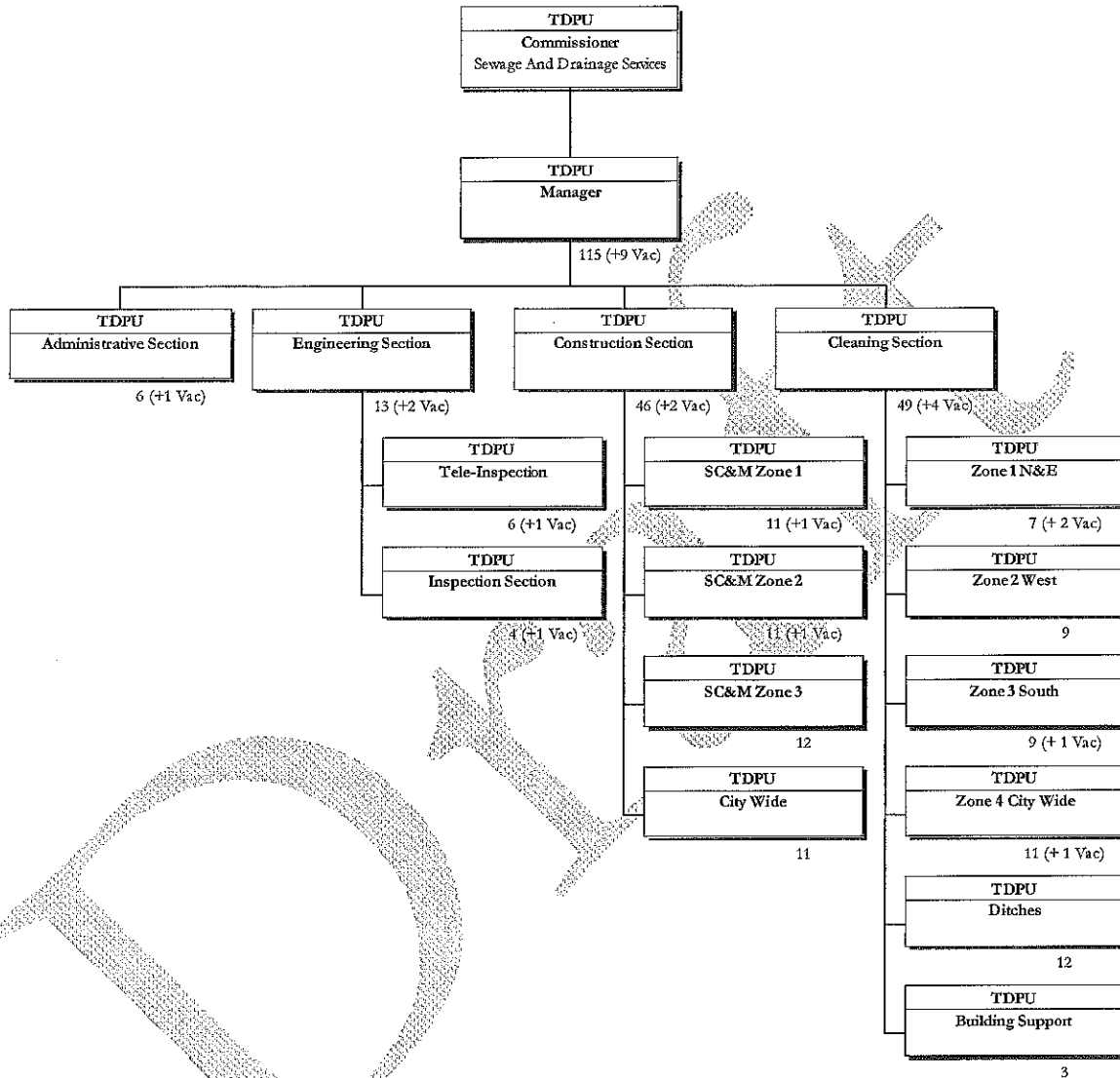
Organization

The group is organized as shown in *Exhibit VI-3*. There are approximately 115 individuals assigned to the Sewer & Drainage Services area. They are organized into four major sections as shown in *Exhibit VI-3*.¹¹²

- ◆ Administrative
- ◆ Engineering and Inspection
- ◆ Construction
- ◆ Cleaning
 - Sewers Maintenance
 - Ditch Maintenance



**Exhibit VI-3
Sewer & Drainage Services
as of June 30, 2013**



Source: Information Request 2

Each of these sections is briefly discussed below.

Administration – Manages the budget and provides administrative support to field personnel with clerical tasks, payroll duties, supplies and material, maintenance of physical facilities, and maintenance of equipment.¹¹³

Engineering & Inspection – Provides direct support to field personnel engaged in the cleaning and repair of storm and sanitary sewers. The section also does CCTV (closed circuit television) inspection of the system, which assists in the diagnosis of problems and maintenance of the system. The section

inspects private and contractual city repairs as well as water and sewer taps and kills. Its activities for 2013 included:¹¹⁴

- ◆ Sanitary Repairs, Main – 15
- ◆ Sanitary Repairs, Lateral – 127
- ◆ Storm Repairs, Lateral – 2
- ◆ Sewer Kills – 613
- ◆ Sanitary Taps – 82
- ◆ Storm Taps – 64

Cleaning – Holds responsibility for maintaining the sanitary and storm sewer drainage system by routinely cleaning the system's sewer lines, cross-overs, catch basins, and inlets in the public right of way. In 2013, this section's activities resulted in the following actions:¹¹⁵

- ◆ Sanitary Footage – 1,555,379 linear feet cleaned
- ◆ Storm Footage – 101,056 linear feet cleaned
- ◆ Basins, Inlets, and Manholes Cleaned – 4,803
- ◆ Basement Flooding Private – 1,279
- ◆ Basement Flooding Main Plugged – 272
- ◆ Basement Flooding Overload – 43

Construction – Holds responsibility for the repair of the sanitary and storm sewer drainage system located within the public right of way. This section replaces and rebuilds damaged lines, catch basins, and inlets. The following activities were performed in 2013:¹¹⁶

- ◆ Sanitary Repairs, Main – 45
- ◆ Sanitary Repairs, Lateral – 220
- ◆ Storm Repairs, Main – 76
- ◆ Storm Repairs, Laterals – 7
- ◆ Water in the Basement – 122
- ◆ Inlet Repairs – 29

Ditch Maintenance – Maintains the proper flow of the City's open ditch drainage system. This section removes blockages and trees and repairs erosion and obstructions from storm inlets, basins, and cross-overs in the public right of way. Its activities for 2013 included:¹¹⁷

- ◆ Removal of Major Blockages: Swan Creek, Half Way Creek, and Silver Creek
- ◆ Major Dredging Projects: Peterson Ditch, Shantee Creek, Van Gunten Ditch, and Smith Ditch
- ◆ Erosion Control: Hill Ditch, Shantee Creek, and Brock Ditch

2013 Highlights

Cityworks – In March 2013, SDS launched Cityworks and initiated foreman use of laptops in the field to check service requests, create work orders, check GIS sewer maps, and update the status of work orders.¹¹⁸

Detroit and Bancroft – On July 3, 2013, a major sinkhole at Detroit and Bancroft was a major event for Sewer & Drainage Services. In concert with sister divisions and an outside contractor, SDS coordinated rapid evaluation and repairs to the intersection within one week. SDS also applied to the Ohio Public Works Commission for grant funding of \$73,136 of the total \$89,590 emergency repair expense. This funding was awarded.¹¹⁹

CCTV Equipment – In July SDS purchased a CCTV truck equipped with a digital camera system and a lateral launch. Using a small video-camera housed within a flexible hose, the inspection of underground sewer pipes was enabled, with 34.38 miles recorded in 2013.¹²⁰

Water Reclamation

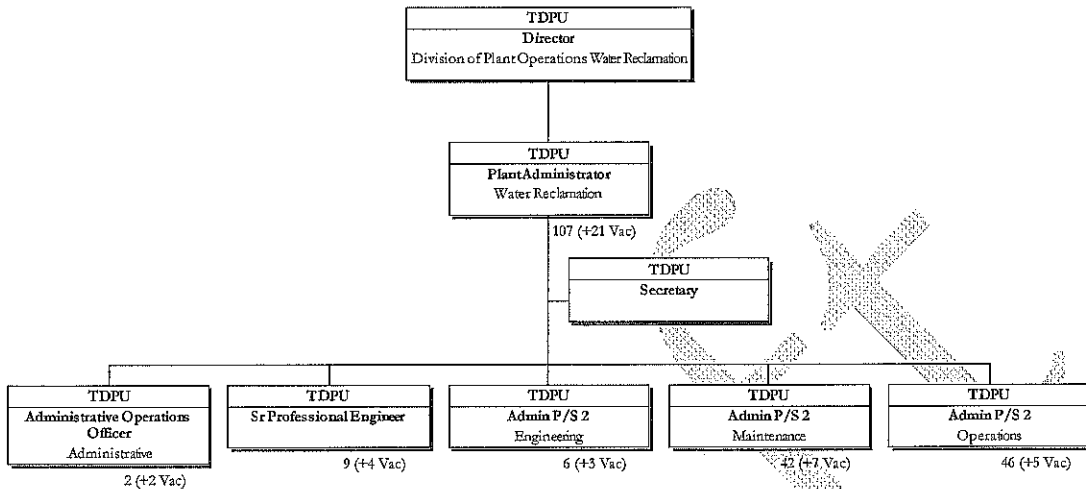
The major function of Water Reclamation division is to protect and enhance public health, property, and the environment through the efficient and progressive treatment of wastewater at the Bay View Waste Water Treatment Plant in compliance with State of Ohio and national standards. The facility provides treatment services to an area of some 100 square miles. Approximately 84 square miles is located within the City of Toledo. Other areas serviced by Bay View include the City of Rossford, the Villages of Walbridge and Ottawa Hills, Northwood, and portions of Wood and Lucas Counties. The population of the service area is approximately 398,000 people.¹²¹

Water Reclamation staff also operate and maintain interceptor sewers, four large pump stations, 35 lift stations, and 33 combined sewer overflow regulators.¹²²

Organization

The Water Reclamation division is composed of four different sections and has a staffing level of about 128 employees, as shown in *Exhibit VI-4*.¹²³

**Exhibit VI-4
Water Reclamation Organization
as of June 30, 2014**



Source: Information Response 2

Water Reclamation 2013 Highlights

- ◆ Received a Gold Peak Performance Award from the National Association of Clean Water Agencies for zero EPA violations.
- ◆ Operated Co-Generation facility, which burns Hoffman Road Landfill methane gas and digester gas to create electricity for the plant.
- ◆ Operated the Wet Weather facility, which is capable of chemically treating 200+ million gallons of sewage per day.
- ◆ Completed renovation of the Mechanical and Electrical building.

Water Reclamation 2014 Goals

- ◆ Maintain compliance with federal and state EPA regulations.
- ◆ Continue construction of three TWI Phase II projects:
 - Grit Facility project
 - CSO Tunnel Optimization project
 - Oakdale Equalization Basin and Pumping Station
- ◆ Complete design and initiate construction of the Secondary Improvement project.
- ◆ Complete replacement of the Dorr Street Storm Water Pump Station.
- ◆ Complete construction of the Grit Facility at Bay View Waste Water Treatment Plant.



B. Findings & Conclusions

Finding VI-1 There is no overall integrated strategic plan or strategic planning process.

One of the expectations of a well-run water utility would be the existence of a thorough, integrated strategic plan and strategic planning process. DPU has developed various plans on an as-needed basis, such as the:¹²⁴

- ◆ Collins Park Water Treatment Plant 20-Year Master Plan and Needs Assessment
- ◆ Wastewater Treatment Plans

However, there is not an ongoing strategic planning process in place at DPU. As part of the extensive benchmarking undertaking in 2013, the preliminary steps for creating a strategic plan and strategic planning process were performed; however, the effort was terminated prior to completion. During that timeframe three versions of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis were developed and some preliminary missions, visions, services, and goals and objectives were created but the effort was cancelled. Some of the individual divisions had developed goals and objectives but nothing has been created from the top to institutionalize this process.¹²⁵

Finding VI-2 Field and plant activities appear appropriate, although there are opportunities for improvement in two areas in particular (discussed in subsequent findings).

Schumaker & Company consultants visited areas from which field crews are dispatched and also rode with supervisors to observe operations in the field (i.e., primarily for water distribution and sewerage and drainage personnel). We also visited each water reclamation and water treatment plant, toured their facilities, and conducted interviews. With the exception of the water treatment plant, which is currently in some disarray from the ongoing construction, all of the field facilities appeared well organized and very functional. All facilities are secured via a security gate and/or guard personnel. The plants typically have guard personnel whereas the field depots are secured via security gates that require a key code to operate. Most facilities have sufficient space for DPU personnel to park their personal vehicles behind the security perimeter. Most of the DPU vehicles and equipment can be stored in a covered building with some level of heat available, such that the vehicles can be started during winter conditions. Most of the materials and equipment inventory is also stored inside, with only some items (shoring boxes) stored outside, but everything is contained within the security perimeter. The facilities appeared to be generally well maintained.¹²⁶

Finding VI-3 Cityworks has been implemented to some level of success throughout DPU.

The level of implementation of Cityworks (a geographic work order system for managing activities) varies among the four divisions as summarized in *Exhibit VI-5*.¹²⁷

**Exhibit VI-5
Status of Cityworks Implementation
as of July 31, 2014**

Key Elements of Maintenance Systems	Water Distribution Division	Sewer and Drainage Division	Water Reclamation Division	Water Treatment Division
Equipment Database	Yes	Yes	Yes	No
Equipment Histories	Yes	Yes	No	No
Materials Inventory	Yes	Yes	Yes	No
Work Order Generation	Yes	Yes	Yes	No
Preventive WO	Yes	Yes	No	No
Use for Maintenance Planning	No	No	No	No
Field Forces Computer Usage	Some	No	No	No
Use of Maintenance Records For Analysis	No	Some	No	No

Source: Schumaker & Company Analysis

Cityworks is a tool that can be used to more effectively manage all maintenance activities in the field and in the plants. However, it is currently only partially implemented within DPU. The left-hand column of *Exhibit VI-5*, lists some of the key features that are necessary for managing effective maintenance. Each of the divisions is displayed for each of the columns and an assessment of the degree to which the key element has been implemented within that division, using a simple yes/no/some designation, is provided. In short, the Water Distribution division is furthest along in an effective maintenance system whereas Water Reclamation's implementation has stalled, and Water Treatment has not even begun. As old as the Water Treatment plant is, there is no longer even a card (manual system) at the facility. The system has been installed in Water Reclamation but it is not currently being used to manage preventive maintenance.¹²⁸

Finding VI-4 Multiple organizations and narrow job definitions reduce deployment flexibility and increase costs.

DPU has organized its field forces into various specialized groups with somewhat narrow job definitions. For example, there are opportunities within Water Distribution and the plants to combine some job classifications to provide greater workforce flexibility.¹²⁹

In many utilities that we have observed, these activities are performed by one individual—a field service technician who can read meters. The only specialized group that exists within those organization is one related to large meter installation and testing—which is a more specialized craft.¹³⁰

In general, narrow job definitions and task assignments drive larger crews and inefficiencies in staffing. One of the primarily nonproductive times in the field is windshield time or travel time. Various techniques have been used to minimize travel time, such as the assignment of technicians to districts (geographic territories) and GPS routing; however, another often overlooked improvement is an in-depth look at reorganizing the job definitions and creating more flexibility in how and by whom the work can be performed.¹³¹



There are several utilities that have undertaken thorough reviews of job definitions (classifications) and that have significantly reduced the number of positions while also increasing workforce flexibility.¹³²

- ◆ *City of Ann Arbor Water and Wastewater Operations* – The original project was limited to the water utility and was intended to: 1) accommodate the effects of an early retirement program and 2) achieve permanent staffing reductions and operational efficiencies. Working with union and management design teams, operations and mechanic jobs were combined into a single classification. This classification is divided into five levels with each level having progressively higher licensing and competency requirements. Using the combined classification, the water treatment plant now operates with five fewer employees, including one less supervisor. This staffing reduction has produced an annual operating cost reduction of more than \$300,000. Similar results were achieved in the wastewater treatment plant. In short the total number of separate job classifications was reduced.
- ◆ *Detroit Water and Sewerage Department (DWSD)* – DWSD is in an era of significant organizational change in an effort to control rates charged to customers, achieve long-term financial sustainability, and continue to provide quality services to its customers. In 2012, an optimization assessment identified significant opportunities to modernize technology, streamline business processes, and redeploy the workforce. In 2013, newly designed, broad-banded jobs were created that will enable the workforce to go from 257 job classifications to approximately 57 classifications. Pilots of the new business processes and job designs are currently in process throughout the customer service, field, water, and wastewater operations.

Finding VI-5 **One area where DPU has excelled is with respect to its use of commercial driver's licenses (CDLs).**

In some utilities, crews sometimes stand down due to the unavailability of heavy equipment operators and inability to upgrade from a lower classification. The result is lost crews or overstaffed crews. DPU has created leveled classifications and has incentivized individuals to obtain CDL designation and other skills that would create a more flexible and efficient organization. Furthermore, the driver of the vehicle is a working crew person on the job.¹³³

Finding VI-6 **Crew sizes appear reasonable.**

With respect to crew sizes, all utilities are reducing the size of their crews. DPU has many one- and two-man crews but it also had three- and four-man crews. The purpose behind reducing crew sizes is to create more efficient crews to match the work. The truck sizes appear reasonable, with smaller crew sizes supporting smaller vehicles (meaning fewer personnel to carry). If more people are needed for a particular job, crews can be combined.¹³⁴

Finding VI-7 Performance measures have not been developed based on installed systems.

There are a limited number of productivity measures and they do not appear to drive performance improvement. For instance, we did not see any performance measures against a target. One of the key management systems used within the operating divisions is the Cityworks software. The reporting capabilities of Cityworks have not been developed to the extent possible. The software has been installed in each operating division and has been implemented to a varying extent; however, a greater benefit could be achieved if some key management reports/dashboards were created to leverage the use of Cityworks. These concepts are further described in our recommendations.¹³⁵

Finding VI-8 The fleet mix appears reasonable, although there are some older vehicles.

Most of the DPU vehicles and equipment can be stored in a covered building with some level of heat available such that the vehicles can be started during winter conditions. DPU has crew vehicles with on-board compressors, which has become a characteristic of the industry (as opposed to having a tow-behind compressor). A fair number of vacuum trucks are available for cleaning sewer facilities, multiple camera (CCTV) trucks exist for videotaping sewers, and specialized equipment, such as the Menzi Muck Spider all-terrain excavator, has been procured. The Spider is a piece of equipment that mows, dredges, trims trees, and picks up logs from waterways then loads them in trucks for disposal.¹³⁶

Finding VI-9 Facilities appear well maintained and not crowded (except maybe Water Treatment, which is in a state of construction).

Schumaker & Company consultants visited each of the division's facility locations to tour them, to conduct interviews of both management and labor personnel, and to observe management practices and procedures. In addition, we went "out in the field" or "into the plant" to observe activities and to conduct standup interviews with field and plant personnel.¹³⁷

Most of the materials and equipment inventory is also stored inside, with only some items (shoring boxes) stored outside, but everything is contained within the security perimeter. In general, we found the facilities to be well organized. All of the facilities are well maintained and have sufficient room for ongoing operations. The only possible exception is the Water Treatment facility, which is undergoing extensive construction at this time, making organization and maintenance a more challenging issue.¹³⁸

Finding VI-10 Property security is reasonable.

All facilities are secured via a security gate and/or guard personnel. The plants typically have guard personnel whereas the field depots are secured via security gates that require a key code to operate. Most facilities have sufficient space for DPU personnel to park their personal vehicles behind the security perimeter.¹³⁹



Finding VI-11 **There are good basic systems in place (GIS & Cityworks) that need to be further developed for management of activities.**

DPU has developed a geographic information system (GIS) based on what is becoming an industry standard GIS. The Environmental Systems Research Institute (Esri) is an international supplier of GIS software, web GIS, and geodatabase management applications. Esri products (particularly ArcGIS Desktop) have 40.7% of the global market share. By 2002, Esri had approximately a 30% share of the GIS software market worldwide, more than any other vendor.¹⁴⁰

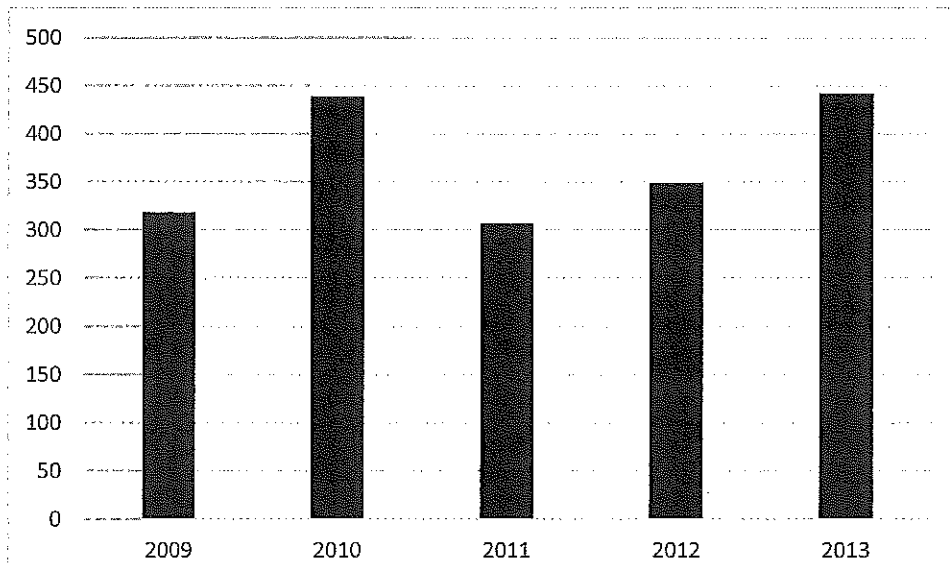
More recently, within the last several years, DPU has added Cityworks as a work order management system. It is somewhat unique in that it handles both service requests and work orders. It also integrates with the Esri GIS such that when viewing a work order it will also present a geographical depiction of the particular facility or equipment on a screen map.¹⁴¹

Much of the implementation of both products has been handled by personnel in Water Distribution and Engineering Services. However, more work is needed for each division to begin to use these systems for management purposes.¹⁴²

Finding VI-12 **The main replacement program has not yet achieved positive results.**

DPU uses a point system similar to other water and gas utilities to determine which mains get replaced. The Water Capital Improvement Plan includes \$10 million per year for water main replacement. These earmarked funds are designed to provide for approximately 12.4 miles of 8"-diameter main replacement. This corresponds to a little over 1% of the system, which provides for less than a 100-year replacement cycle. The City is using a 100-year expected useful life for water mains. Water mains are prioritized for replacement based on a point scale that considers factors such as year constructed, ongoing road projects, number of main breaks, age, corrosion potential, etc. Projects are then selected from this list in priority order to come up with each year's replacement program. This list is further refined to take into account the roadway improvement plan and condition of the roads.¹⁴³ The results of this program do not show the desired downward trend in breaks (ideally this would be in breaks per mile) of main, as shown in *Exhibit VI-6*. With the extremely cold winter of 2013–2014, it would be expected that the number of breaks would continue to increase. It is too early to tell if the increase in spending on main replacement is having the desired effect or if more money will be required to reverse the upward trend shown in *Exhibit VI-6*.¹⁴⁴

**Exhibit VI-6
Last Five Years Water Main Breaks Total
2009–2013**



Source: Information Response 47

Finding VI-13 The sewer replacement program needs more emphasis.

Sewer “replacement” generally falls into two categories: large diameter (greater than 36” diameter) and small diameter (less than or equal to 36” diameter). The City has a goal of inspecting all large-diameter sewers on a 10-year cycle. Since 1994, five inspection projects have been completed, encompassing all sewers 48” in diameter and larger, including re-inspection of some of the earlier projects. The City is still somewhat behind on the 10-year inspection cycle goal. As inspections uncover deficiencies and recommend improvement, those projects are programmed for future years. A number of large-diameter replacement and rehabilitation projects have been performed to date but there is a backlog of known deficiencies that must be corrected.¹⁴⁵

Small-diameter sewer “replacement” usually involves lining existing sewer as opposed to total replacement. There have been a number of extensive sewer-lining projects in the past 10 or 15 years. Most of these have been associated with Sewer System Evaluation Surveys (SSESs) of particular areas that were targeted due to known sewer overflow, high infiltration and inflow, or as part of the Toledo Waterways Initiative.¹⁴⁶

We understand that the proposed Sewer Capital Improvements Program (CIP), which is subject to approval of rate increases (which was approved during our review) and is based on a Sanitary Sewers Capital Needs Assessment being prepared by an outside consultant, provides for approximately \$600,000 every two years to perform large-diameter condition analysis, between \$2.5 million and \$6



million per year for large-diameter sewer replacement and rehabilitation, and \$2 million per year for small-diameter sewer lining. The large-diameter program will continue to strive for the 10-year inspection cycle, followed up with correction of identified deficiencies. The small-diameter program will address sewer deficiencies uncovered through tele-inspection by the Sewer & Drainage division or under contract by the Engineering Services division. These tele-inspection programs target areas of known basement backups and sewers under roadways that are planned for reconstruction. A special emphasis will be made to address 24" brick sewers, which have been a chronic source of sewer cave-ins.¹⁴⁷

C. Recommendations

Recommendation VI-1 **Initiate a formal annual strategic planning process. (Refer to Finding VI-1.)**

An ongoing strategic planning process needs to be implemented, one that leverages off some of the earlier work discussed in *Finding VI-1* but not completed to implementation at that time. Schumaker & Company has begun working with DPU personnel to implement such a program and has proposed the following rapid development project.

There have been numerous planning efforts (especially multiple-year capital planning efforts), but currently there is not an integrated strategic planning process initiated by upper management. These steps would put such a program in place in a short period of time. The eight-step process is as follows:

1. ***Develop and Revalidate DPU's Vision & Mission*** – We understand that some of these items have already been created, but we should revalidate the following items before proceeding
 - a. Vision
 - b. Mission
 - c. Values
2. ***Review and Revalidate Prior Strength, Weakness, Opportunity, and Threat (SWOT) Analyses*** – Three iterations of SWOT analysis had been performed as part of the benchmarking/best practices initiative by Dr. Steve Cady. DPU needs to review the final version for changes and other considerations and must adopt a Version 4 for the strategic plan to be developed.
3. ***Develop Higher-Level Goals and Objectives to Address*** – The results of items 1 and 2 above should be used to formulate overall, relatively near-term goals and objectives that support the vision, mission, and values; leverage strengths and opportunities; and mitigate weaknesses and threats.
 - a. Vision, Mission, and Values
 - b. SWOT Findings

4. **Work with Individual Units on Developing Supporting Goals and Objectives** – Water Treatment, Water Reclamation, Water Distribution, Sewer & Drainage, and Utilities Administration each need to develop specific unit-level goals and objectives that support the higher-level DPU goals and objectives. In many cases, these units have developed their own mission statement with goals and objectives that now need to be tied into the higher-level goals and objectives.
5. **Create a Summary-Level Strategic Planning Document** – This document would summarize the current strategic plan, which would include vision, mission, values, SWOT, and unit-level goals and objectives.
6. **Create a Quarterly Review Process** – Individual units would be responsible for reporting their progress in completing the lower unit-level goals and objectives on a quarterly basis to the DPU Director. A process of summarizing these results against the higher-level goals and objectives would need to be created for the strategic plan.
 - a. Report to DPU Director
 - b. Progress to date
7. **Incorporate Strategic Plan Summary into the Current Annual Report** – The current year's strategic plan and results from the prior year's strategic plan would be summarized as part of the Annual Report to City Council, Mayor, and other parties.
 - a. Prior-year results
 - b. Next year's updated strategic plan
8. **Turn Over Strategic Planning Process to DPU** – This is envisioned as an ongoing process within DPU and would have to be assigned to an internal individual, as a part of that individual's responsibilities, as such.

**Recommendation VI-2 Complete the implementation of Cityworks throughout DPU.
(Refer to Finding VI-3.)**

As discussed in *Finding VI-3*, the Cityworks implementation is not completed. A cross-functional team (with the Commissioners acting as a Project Steering Committee) needs to be created to ensure that Cityworks implementation is completed. In particular, Water Reclamation and Water Treatment need to be brought up to the level of Water Distribution and Sewer & Drainage services.

Recommendation VI-3 Create higher-level performance reporting tied to the Cityworks software. (Refer to Finding VI-7.)

If you look at each division's organization charts, they show many unfilled positions. Whether each of these positions is really needed from a long-term perspective is difficult to determine due to the lack of basic reporting from Cityworks. The following reporting needs to be implemented from Cityworks in the order that each one is presented:



- ◆ **Backlog Reporting** – All work that is performed from a maintenance perspective is to be entered into Cityworks. This would include corrective (something broke and now we need to fix it), preventive (work performed in advance to help ensure things do not break), inspections (work performed to assess the condition of a piece of equipment or facility to determine if maintenance should be done), and other types of items. Therefore, at any point in time, Cityworks will contain a listing of “jobs” that need to be performed by maintenance crews. One indication of appropriate staffing levels is that the backlog should not be growing significantly over time. Therefore, the following reports would be useful:
 - **Monthly Backlog Reports**
 - **Outstanding Backlog (Number of Jobs) Open – end of month**
 - **Jobs Completed During Prior Month (Number of Jobs)**
 - **Jobs Added to Backlog During Month (Number of Jobs)**
- ◆ **Backlog Schedule Performance** – A look into Cityworks reveals that each job has an initiation date (or something similar). This date would correspond to the date the job was added to the backlog. Each job also probably has an “assigned” date, the date it was assigned to a crew for completion. Each job has a “completion” date as well, the date the crew completed the work. And finally, each job has a “closed” date, the date the supervisor or foreman closed out the job as completed (all I’s dotted and t’s crossed). Therefore, monthly schedule performance reports could be created from this information, including:
 - **Average Time from Initiation to Assignment** – monitoring the time it takes for a job to be assigned to a crew: Average, High, Low
 - **Average time from Assignment to Completion** – monitoring the time from a job being assigned to crew completion: Average, High, Low
 - **Average Time from Completion to Closure** – monitoring the time from a job being crew complete to closed by the supervisor
- ◆ **Job Profile Demographics** – A look at Cityworks reveals that each job can collect the amount of crew time spent in completing the work. The amount of time expected to complete the work can also be estimated (up front), but we do not believe that such estimation is being used at this time. Therefore, we have decided to collect the actual time being spent on jobs. The following reports could be created:
 - **Average Time Per Job** – Total Time Spent on Jobs in a Month/ Total Number of Jobs Completed
 - **High Time Per Job** – Time on Spent on Top 10% Highest Time on Jobs
 - **Low Time Per Job** – Time Spent on 10% Lowest Time on Jobs
- ◆ **Job Hours Projections** – translating the backlog numbers into hours of workload using the average time per job numbers

- ◆ **Backlog Profile** – portraying backlog jobs by type on a monthly basis
 - Number of preventive versus corrective jobs
 - Predictive- or condition-based maintenance
 - Other information being collected
- ◆ **Monthly Resources Available** – total resources used in the month to apply to the backlog. Over time, this would provide the total resources available to apply to a workload (backlog) in a given month.
- ◆ **Contract Resources Applied** – total contractor resources applied to the backlog in a given month. Ideally, contractor resources would eventually be a part of Cityworks resources.

All of the above information would be reported on a monthly basis to the Director of Public Utilities, although more frequent reporting might be desired within each division. All of these reports could be developed such that this information could be drilled down by division, district, group, and even person. Cityworks is an SQL database, so this information should be readily available in report or dashboard form.

Recommendation VI-4 **Investigate incorporation of risk into the main replacement program and closely monitor the pipe breaks per mile to assure a decreasing number of breaks based on the additional funding. (Refer to Finding VI-12.)**

Although the main replacement program has not yielded positive results to date, DPU needs to begin to incorporate risk into its point system and must consider increased spending. The gas industry has already been motivated or, perhaps more appropriately, forced via the need for a Distribution Integrity Management Program (DIMP) to incorporate risk into its decision criteria. In layman's terms, a pipe on which a break could cause more damage (such as one near electrical facilities) would be given a larger number of points versus one that is traversing an open field. Other water utilities are beginning to migrate their main replacement program along these lines.



VII. Organization and Human Resources

A. Background & Perspective

The Toledo Department of Public Utilities (DPU) does not have an internal Human Resources (HR) function. It receives HR support from the City of Toledo Human Resources Department. The City of Toledo operates under a Civil Service Commission and the DPU must confirm to Civil Service requirements. This includes the approval of job descriptions and requirements.

Most DPU employees are represented by American Federation of State, County and Municipal Employees (AFSCME) Ohio Council 8, Local 7. Supervisory employees are represented by AFSCME Ohio Council 8, Local 2858. Water Reclamation employees are represented by International Brotherhood of Teamsters, Local 8.

The Director is appointed by the Mayor and approved by City Council. The Commissioners are appointed by the Mayor and approved by City Council based on a recommendation from the Director. Other Fair Labor Standards Act (FLSA) exempt managers are employed under Civil Service rules and protections.

B. Findings & Conclusions

Finding VII-1 **DPU staffing levels are average in terms of per-employee productivity measures.**

Productivity in a water utility is difficult to measure and comparisons to other utilities are even more so. Different utilities structure jobs differently and have differing levels of technology. Nonetheless, standard benchmarks compare number of employees it takes to process a million gallons per day (MGD) of water produced and wastewater processed, and the number of customer accounts per employee. It should also be noted that these numbers are difficult to calculate as they require the allocation of administrative and other non-operating/maintenance staff to the two sides of the utility. Obviously, assumptions and estimations are used in the calculation. In an effort to make these calculations, Schumaker & Company consulted directly with American Water Works Association (AWWA) benchmark data analysts to assure that our approach was consistent with theirs and that we were making a valid comparison.

Our calculations produce adjusted staffing figures above those that are used internally at the DPU (leading to somewhat lower productivity ratios). We believe that the DPU calculations under-count staff to a degree. Of course, making a perfect apples-to-apples comparison to a benchmark is not possible as different utilities operate under different circumstances and certain assumptions are made in the calculations. Nonetheless, Schumaker & Company is confident that our approach is in line with that used by the AWWA.



Because the DPU has been operating at a staffing level below that which is authorized in the budget, we did our comparisons for both authorized (budgeted) staffing and average actual (average) staffing levels for FY2014 and FY2015. In general, DPU productivity is in line with the median levels reported by comparably sized utilities. The comparison of MGD for water production is provided in *Exhibit VII-1*.

Exhibit VII-1
MGD of Water Produced per Employee
2012/FY2014 & FY2015

AWWA Data for Combined Operations Utilities (2012)			DPU (FY2014)	DPU (FY2015)
Top Quartile	Median	Bottom Quartile		
0.35	0.24	0.16	Budgeted FTE: 0.21	Budgeted FTE: 0.22
			Average FTE: 0.27	Average FTE: 0.26

Source: 2012 AWWA Benchmarking Report

The comparison of MGD for wastewater processed is provided in *Exhibit VII-2*.

Exhibit VII-2
MGD of Wastewater Processed per Employee
2012/FY2014 & FY2015

AWWA Data for Combined Operations Utilities (2012)			DPU (FY2014)	DPU (FY2015)
Top Quartile	Median	Bottom Quartile		
0.35	0.23	0.13	Budgeted FTE: 0.17	Budgeted FTE: 0.17
			Average FTE: 0.20	Average FTE: 0.20

Source: 2012 AWWA Benchmarking Report

Although DPU productivity is close to the median for both water and wastewater operations, the data suggests that the DPU could be doing more to enhance productivity.

When looking at staff size compared to the number of accounts, the DPU falls well into the bottom quartile. The comparison of customer accounts per employee is provided in *Exhibit VII-3*.

Exhibit VII-3
Customer Accounts per Employee
2012/FY2014 & FY2015

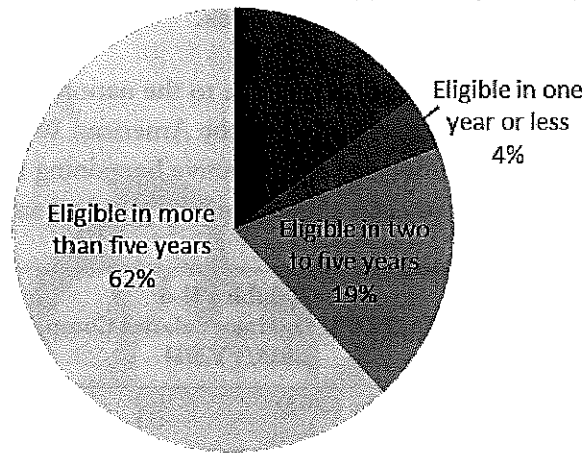
AWWA Data for Combined Operations Utilities (2012)			DPU (FY2014)	DPU (FY2015)
Top Quartile	Median	Bottom Quartile		
836	616	433	Budgeted FTE: 319	Budgeted FTE: 330
			Average FTE: 393	Average FTE: 383

Source: 2012 AWWA Benchmarking Report

Finding VII-2 DPU has an aging workforce.

The average age of a DPU employee age is 48. Although somewhat older than the average age in the general workforce, this is about average for utilities – especially in the public sector. That said, a closer look at the data suggests that the DPU has a very large proportion of its workforce eligible for retirement and, as we will discuss in the following finding, does not have a plan to address the potential loss of institutional knowledge and experience. As described in *Exhibit VII-4*, 15% of DPU employees are eligible for retirement today and another 4% will be eligible in the next twelve months.

**Exhibit VII-4
Retirement Eligibility
as of October, 2014**



Source: 2012 AWWA Benchmarking Report

A common metric for workforce planning is the percentage of employees eligible for retirement in the next five years. American Water Works Association reports that the median percentage of the workforce eligible for retirement in the next five years is 21%. At the DPU, fully 38% of employees are eligible to retire in the next five years. This figure place the DPU well into the bottom quartile of comparable water utilities for this metric. These figures are provided in *Exhibit VII-5*.

**Exhibit VII-5
Percent of Employees Eligible to Retire in Five Years or Less
2012/FY2014**

AWWA Data for Combined W/WW Operations Utilities (2012)			DPU (2014)
Top Quartile	Median	Bottom Quartile	
9%	21%	30%	38%

Source: 2012 AWWA Benchmarking Report

Finding VII-3 DPU does not have a workforce plan and employs limited recruitment and retention strategies.

During the course of our interviews, Schumaker & Company heard of difficulty hiring qualified operators, given that a license is a requirement at entry. This, combined with aging workforce and the possibility of significant retirements, suggests the need to for a comprehensive plan with recruitment targets, retention strategies, and job designs that address the growing need for technical skills. The DPU has no such plan. Hiring is further constrained by a Civil Service process that is slow to respond to changing workforce requirements and is not designed to produce the most qualified candidates for a position.

Finding VII-4 DPU operators pay rates are comparable, although somewhat lower, to benchmark median pay rates.

DPU pay rates for operator positions are comparable to the national average median rates for large city/county municipal water systems as reported by the American Water Works Association in *Exhibit VII-6*. These wages likely reflect strong collective bargaining and suggest that the DPU should be able to attract qualified workers to enter these relatively good paying jobs.

**Exhibit VII-6
AWWA/FDPU Operator Salaries Comparison
2013/FY2014**

AWWA Data for City/County Utilities (2013) (Average utility in sample has 547 employees)				DPU (FY2014)		
AWWA Position	Min.	Mid	Max	DPU Position	Min	Max
Entry Level Wastewater Treatment Plant Operator (Operator In Training)	\$33,151	\$40,990	\$50,327	Water Reclamation Operator	\$41,904	\$46,559
Wastewater Treatment Plant Operator (Intermediate)	\$38,339	\$48,193	\$58,097			
Senior/Lead Wastewater Treatment Plant Operator	\$46,202	\$58,205	\$71,181			
Entry Level Water Treatment Plant Operator (Operator In Training)	\$36,412	\$44,062	\$52,546	Water Control Room Operator	\$33,966	\$45,288
Water Treatment Plant Operator (Intermediate)	\$37,850	\$47,010	\$56,790			
Senior/Lead Water Treatment Plant Operator	\$47,464	\$58,752	\$70,018	Senior Water Control Room Operator	\$46,675	\$54,914

Source: 2012 AWWA Benchmarking Report

Finding VII-5 The DPU does not have a management succession plan.

Identifying future skill and leadership needs, developing employees to assume greater responsibility, and identifying key positions where no internal candidate is available and documenting this in a succession plan with clear strategies to assure qualified individuals will be ready to lead the utility in the future is an essential practice. Most utilities have robust succession planning processes aligned to comprehensive employee development processes and market-based recruitment strategies. Succession planning is identified as a best practice by the American Water Works Association. The DPU has no succession planning process.

Finding VII-6 DPU management salaries are below market.

When compared to national averages for large city/county municipal water systems, DPU management salaries fall considerably short. Top (maximum) rates for senior management positions at the DPU are near or below the minimum reported salaries in the AWWA national survey for comparable positions. Example comparisons are provided in *Exhibit VII-7*.

Exhibit VII-7
AWWA/FDPU Management Salaries Comparison
2013/FY2014

AWWA Data for City/County Utilities (2013) (Average utility in sample has 547 employees)				DPU (FY2014)		
AWWA Position	Min.	Mid	Max	DPU Position	Min	Max
Top Executive	\$110,781	\$145,274	\$175,651	Director	\$75,625	\$115,625
Top Engineering Executive	\$86,279	\$113,025	\$136,346	Commissioner	\$65,000	\$98,875
Top Administration Executive	\$91,735	\$116,628	\$134,883			
Water Operations Manager	\$75,045	\$94,296	\$115,778			
Environment Manager	\$70,618	\$90,316	\$110,382	Manager	\$60,625	\$85,625
Water Treatment Plant Manager	\$64,049	\$80,889	\$99,154			
Wastewater Treatment Plant Manager	\$65,983	\$84,347	\$105,311			

Source: 2012 AWWA Benchmarking Report



Non-competitive compensation makes it very difficult to attract highly qualified leaders for the organization. During our interviews, Schumaker & Company heard many comments that individuals did not want to accept promotions as they would have to take a cut in pay, or accept much more responsibility and longer hours with relatively little increase in pay.

The situation appears to have been worsened, at least temporarily, by recent (September 2014) changes to City of Toledo FLSA exempt employee pay. Schumaker & Company was told there had not been a pay increase for exempt employees since 1998. The September increase appears to have been more than offset by an increase in medical insurance premium co-pay, as well as termination of city pension contributions. The net effect of these changes was a decrease in total compensation for exempt employees. Exempt employee pay should rise in the subsequent years, but remains well below comparable market rates.

Schumaker & Company understands the difficult financial situation that many municipalities, including the City of Toledo, face. That said, the water utility is an enterprise and must be able to attract and retain talented managers to oversee and improve the utility. A continuation of this trend will render the DPU, at best, a good place for young, talented individuals to gain experience before moving on to more lucrative opportunities.

Finding VII-7 DPU management has had frequent restructurings and significant turnover of senior management that limit its ability to plan and execute performance improvement initiatives.

In the last eighteen months, DPU has had three Directors. The utility has had three Water Treatment Commissioners in less than six months. A review of DPU leadership structure over the last two years suggests frequent structural changes, including loss of the Deputy Director Position, the addition of Commissioner of Special Projects, and changes of positions from Manager to Commissioner. In the last 18 months, it appears that every senior position has changed at least once, some twice, and a few three times (although all of this is difficult to even track).

The reasons for these changes are many and largely outside the scope of this study. That said, the political appointments and better career opportunities elsewhere are major causal factors. The effects of this instability are not quantifiable, but common sense suggests they are severely detrimental to the organization. Schumaker & Company is especially concerned that the DPU has been unable to plan and initiate performance improvement initiatives.

The shortcomings cited in this report are many. There are no quick fixes to most of what we have identified. It takes time for a Director (Chief Executive Officer) to set priorities and mobilize resources to affect major changes in an organization. The DPU Directors typically have less than a year in the position and his or her direct reports change frequently as well. Hence the lower levels of management are focused on keeping things running day-to-day, as they should be, but no one is able to focus on the future and on strengthening the business enterprise.

Finding VII-8 DPU Commissioners have few direct reports and inconsistent reporting structures.

Schumaker & Company finds the DPU senior management organization structure to be, frankly, incomprehensible. This was compounded by the frequent changes discussed in the prior finding. It was difficult to even know which version of the organization charts were current.

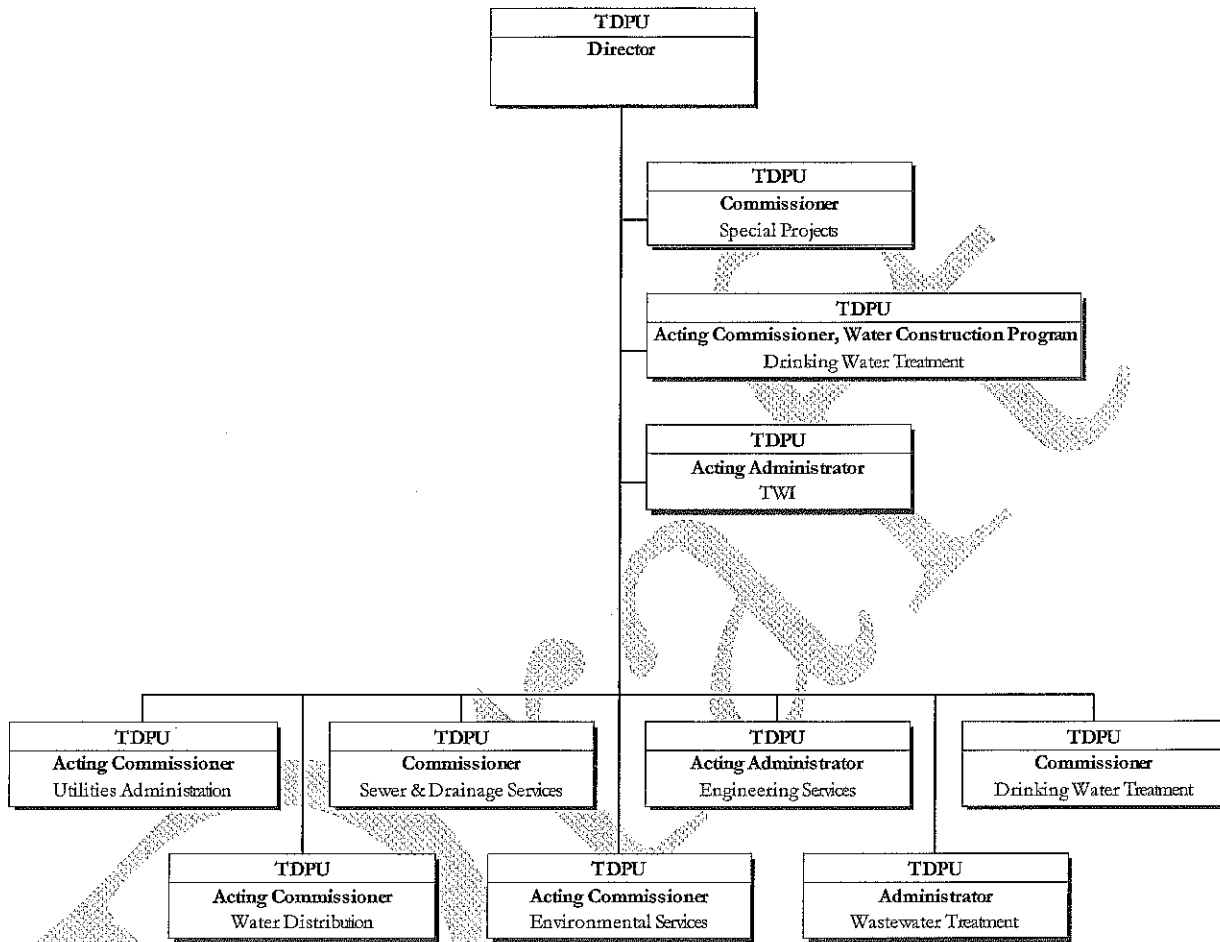
We note that the Water Treatment Plant is headed by a Commissioner with a single direct report of an Administrator who appears to act as the Plant Operations Manager. This Administrator appears to have three Administrators reporting to him. The Water Reclamation Division, on the other hand, operates without a Commissioner. This division is headed by the Plant Administrator and he has several Administrators and a Senior Engineer reporting to him.

Similarly, Water Distribution is headed by a Commissioner (acting) with two Managers reporting to him. One manager is responsible for the largely unrelated function of Call City Hall. The other is a single Manager responsible for Water Distribution operations. Similarly, the Commissioner of Sewer and Drainage Services division has a single Manager reporting directly to him.

The Engineering Division is currently headed by an acting Administrator, replacing a Commissioner of Engineering Services. Four Administrators and a Senior Engineer report to the acting Administrator of this division.

There is also a Commissioners for Special Projects with no direct reports and an acting Commissioner for Water Treatment/Water Construction Program as well as an acting Administrator for TWI. *Exhibit VII-8* provides a graphic depiction of the current senior management positions at the DPU.

**Exhibit VII-8
Senior Management Structure
as of November, 2014**



Schumaker & Company is unable to make a clear distinction between the roles of Commissioner, Administrator, and Manager with respect to responsibility and authority. Nor are we able to understand how these roles are applied relative to the divisional structure. We are also concerned that in a few cases, a division is headed by a Commissioner with a single direct report who appears to have full responsibility for the division. The difference between the two treatment divisions are perhaps the most glaring and incomprehensible.

Finding VII-9 The DPU use of supervisory titles and associated levels of authority are inconsistent.

Schumaker & Company found the DPU management structure to complex and difficult to understand. (see *Finding VII-8*). This complexity and confusion is evident at the supervisory level of the organization. For example, in Water Treatment, eight Operators are supervised by five Senior

Operators (Supervisors represented by Local 2058) who reports to the Operator of Record. At the pump stations, in the same division, eight Operators report to a single Superintendent, who reports to the Operator of Record. In distribution, Senior Watermain & Service Repair Workers are represented by Local 7 and report to Foreman who report to General Foreman. In Water Distribution, the foreman-to-worker ratio is about one-to-twelve.

Schumaker & Company reviewed job descriptions to try to better understand these distinctions. The job descriptions provide little clarity. For example, the Senior Water Control Room Operator (a supervisor represented by AFSCME Local 2058) “supervises and reviews the work of assigned operators and Chemist/Bacteriologist” (although on the organization charts, the Senior Chemists report to the Chief Chemist and there is no mention of a Bacteriologist). In the Distribution Division, the Senior Watermain and Service Repair Worker (a non-supervisory position represented by AFSCME Local 7) is responsible for “overseeing a crew performing a variety of semi-skilled and unskilled manual tasks.”

Schumaker & Company understands that a distinction can be made between “overseeing” work (providing work direction absent supervisory authority) and “supervising” (having authority in hiring, transfer, suspension, promotion, discharge, assignment, reward, or discipline of other employees, direction of the work of other employees, or responding to employee grievances on behalf of the employer). We are not sure that this distinction is evident in the day-to-day work of the senior-level positions and see the use of a common title as a further source of confusion.

Other examples of this kind of title and responsibility confusion, as well as vastly different reporting rations, exist in the DPU. In any organization, clarity of roles and responsibilities, as well as an efficient management structure is essential to effective performance. In a Civil Service/collective bargaining environment it is even more so as roles and boundaries are more narrowly defined by policy and contract. Employees should not be supervised by someone in the same collective bargaining unit. Titles should be consistent and denote a standardized level of authority and reasonability. Outdated titles and classifications should be phased out or revised for clarity and consistency.

Finding VII-10 **DPU’s aging workforce, lack of workforce and succession plans, high turnover, and below market management compensation present a continuity risk for the utility.**

In the prior findings, we have made the point that the DPU has not planned for the replacement of its aging workforce, has not developed internal leaders, suffers from frequent turnover at the senior level, and offers uncompetitive compensation for managers. Taken together, Schumaker & Company believes it rises to a level of risk to the continuity of operations of the utility. Accelerated retirement activity and significantly better career opportunities elsewhere (especially in an improving economy) along with the risk of any number of unforeseen events could lead to a sudden loss of significant number of key personnel. Low compensation and organizational turmoil can hamper the DPU’s ability to attract and retain talent. At the risk of sounding alarmist, this does have the potential to have serious consequences to the safe and efficient operation of the system.



Finding VII-11 DPU does little employee training.

Schumaker & Company requested documentation on employee training and hours of training provided (to compare to industry benchmarks). This information was largely not available. The Customer Service and Safety areas appear to have the most formal training efforts, while nearly all other employee training is on-the-job training (OJT).

Training responsibilities appear to be shared by supervisors and senior employees. While we do not wish to discredit the training that is done, we are aware that the OJT typically suffers from significant inconsistencies in content and effectiveness. Some employees are naturally effective trainers. Others are not. Some employees teach good habits, some teach bad ones.

In the absence of clear standards, documented activities, and demonstration of trainee competency (through testing or work demonstration), there is a significant risk that the training fails to meet its objectives. In an age of increasing technology, heightened regulatory compliance requirements, and increased customer expectations, the old way of training employees is not sufficient. Training must have clear objectives based on rigorous job/task analysis, effective instructional design, documentation of proficiency, and delivered by competent trainers delivering to a known standard.

Finding VII-12 DPU has no formal training and certification records system.

If nothing else, regulatory compliance requires extensive documentation of training and certifications. In the case of system events, the DPU needs to be able to prove that employees were properly trained, credentialed, and equipped. We discussed above the fact that the DPU cannot produce training records. Licensing and recertification requirements are divisional responsibilities and there is no standard for record keeping.

Finding VII-13 DPU utilizes job classifications that limit employee development and deployment flexibility.

On a positive note, the DPU does not appear to have many of the narrow, outdated, and inefficient job definitions seen in some utilities – especially municipal utilities. Broadly defined jobs, where employees can perform a range of tasks as the work demands provide significant deployment flexibility and operational efficiency.

While there are not a lot of obsolete jobs at the DPU, jobs do appear to be defined at a low level and do not encompass advanced licensing, skill development, and broad technical skills. In addition, movement from some jobs to the senior classification is promotional rather developmental (see *Finding VII-14*). We note that a Water Treatment Maintenance Worker requires a tenth grade reading proficiency and one year of experience. A Senior Water Treatment Maintenance Worker requires a general educational development (GED) and three years of experience. Neither requires certifications or special training.

We understand the value of general labor, but emphasize the growing technical requirements of utility work and would look for jobs designed to perform higher level work as well as lower skilled tasks. More

importantly, increasing the skill variety and task significance of a job has positive effects on the motivating potential of the work. In addition, a vast array of unskilled tasks can be assigned to the Utility Worker classification adding task variety to this classification and improving the overall motivational potential of the work.

Our concern is that the existing job descriptions and the job designs they reflect reduce the qualifications to a simple standard that conforms well to Civil Service requirements, but does not necessarily produce the most capable employees, with the broadest skills, able to perform the greatest variety of work. Advancing technology, regulation, and demands for quality and efficiency require modern job designs.

Finding VII-14 The DPU provides limited incentive for operators to get advanced licensing.

Advanced licensing is one way to achieve higher employee skill levels. It also fits well within a civil service environment that values objective testing over selective performance judgment. Unfortunately, the City of Toledo offers a small incentive of about 25 cents an hour for additional licensing. This is a relatively small incentive for achieving the difficult goal of preparing for and passing these difficult tests.

Schumaker & Company understands the complexities of pay modification within a collective bargaining and civil service environment. But considering new compensation structures in conjunction with more robust job design offers opportunity for improved organizational performance and employee rewards.

Finding VII-15 The AFSCME Local 7 contract presents a significant opportunity to redesign jobs to encourage professional development and deployment flexibility.

The recently ratified AFSCME Local 7 contract continues a joint union/management committeemen to eliminating narrow, redundant, and obsolete job classifications through a cooperative process. Schumaker & Company was impressed with the positive management/union relationship in general, and this commitment as reflected in contract language. We believe this offers a significant opportunity to address the concerns raised in the prior two findings. These will be discussed further in our related recommendations.

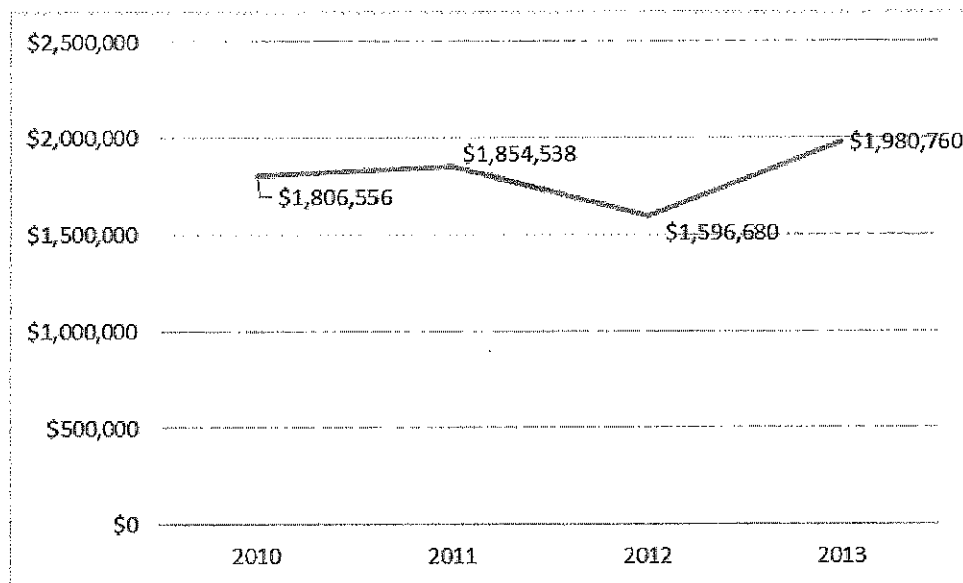
Finding VII-16 DPU uses significant amounts of overtime to address chronic vacancies.

Overtime is an essential tool for managing variable work demands. Appropriate use of overtime is far more efficient than overstaffing and is, within limits, generally welcomed by employees. On the other hand, excessive overtime is expensive and takes a toll on worker morale and may lead to worker fatigue. Fatigue has been shown to be a contributing, and sometimes causal, factor in employee operational errors and accidents.

Overtime costs increased by almost 25% between 2012 and 2013. The overtime cost trend is graphically displayed in *Exhibit VII-9*.



**Exhibit VII-9
DPU Overtime Costs
2010 to 2013**



Our concern about excessive overtime was raised during interviews where plant employees expressed concern about repeated double shifts. For example, in the first six months of this year, seven Control Room Operators at the Water Treatment plant worked 217 overtime shifts, of which 72 were double shifts. Four Senior Control Room Operators worked 183 overtime shifts, of which 72 were double shifts.

As of September 15, 2014, eight High-Service (HS)/Low-Service (LS) Operators have been required to work overtime 359 times for 2014. Of these occurrences, 220 occurrences were for 12 hours or more.

The extensive occurrences of double shifts seems to be related to the difficulty filling of Operator positions. Certainly the slow City of Toledo hiring process is a contributing factor, but the requirement that Operators be licensed prior to being hired adds to the challenge.

Finding VII-17 DPU divides customer service between Utilities Administration and Water Distribution.

Customer with water billing and general service issues call the DPU customer service call center or visit the customer service office. Water emergencies and system service issues are handled by the agents at Call City Hall (CCH), which is currently housed within the Water Distribution division. The placement of this function in Water Distribution apparently reflects a desire to expand the role of the dispatchers to take citizen calls about a variety of city services.

Schumaker & Company believes strongly that the water utility is a distinct municipal enterprise requiring its own customer service function. Dispatchers should be field-facing and support communication and coordination of field efforts. Well trained customer service agents should be customer-facing and fully capable of addressing customer needs and relaying information internally.

Splitting the customer contact between the Call City Hall and Customer Service organizations is confusing to the customer and potentially inefficient. In addition, the system knowledge required to give effective customer service and the complexity of tasks associated with water billing and customer service needs is beyond what can reasonably be combined with other municipal services. Water Distribution is not a customer-facing function and not in a position to give CCH the support it needs.

As we have stated elsewhere, the water utility is an enterprise function. Its customer service needs are complex and time sensitive. Combining these function with other City services seems ill advised. Schumaker & Company heard talk of combining the water utility customer service into a larger city-wide 311 function. Every 311 operation we have seen struggles to relay accurate information and take simple service requests for the vast array of city services and functions. It is well beyond the capability of any 311 operation we have seen to take on the complex billing and service requests that a water utility must handle.

C. Recommendations

Recommendation VII-1 Develop a comprehensive workforce plan that addresses future needs, including staffing and associated skill levels. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)

Utilities, of all types, are dealing with an aging workforce. Today, most utilities have a comprehensive workforce plan, which forecasts attrition, especially retirements, in key operational positions and identifies goals and strategies to assure that qualified people will be available to operate the system. Among the key elements of these plans is clear definition of the workforce of the future defining skills and attributes of the next generation of workers. Changing technology and increased regulatory requirements demand higher skilled workers with technical knowledge. The push toward higher levels of licensing in water utilities is evidence of this trend.

Workforce plans often identify strategies such as partnerships with community colleges and trade schools to promote utility careers, support licensure, and identify high potential candidates. This coupled with robust internal internship and career development programs help assure the availability of qualified workers to operate the system. The DPU needs to do attrition assessments by job classification, define the emerging skills and attributes, and develop a plan to assure qualified workers are available.



Recommendation VII-2 **Develop a comprehensive management succession plan that that addresses future needs and defines recruitment and retention strategies, including compensation. (Refer to Finding VII-2, Finding VII-5, Finding VII-6, Finding VII-7, Finding VII-8, Finding VII-9, and Finding VII-10.)**

Succession planning is one of eleven organizational best practices identified by the American Water Works Association.^{cxviii} Succession planning increases the availability of experienced and capable employees that are prepared to assume leadership roles, as required by promotions and attrition. At minimum, these plans include:

- ◆ Identification of key roles for succession or replacement
- ◆ Analysis of job requirements and development of an associated competency model
- ◆ Identification of development career paths and individuals on these paths
- ◆ Identification of key roles without an identifiable internal successor
- ◆ Assessment of these individuals and estimation of readiness for promotion
- ◆ A formal development process for potential successors

Below market compensation for DPU management was discussed in *Finding VII-6*. We expect that the succession plan will identify roles for which the utility will likely look outside for someone to fill. The low salaries at the DPU will certainly present a challenge to attracting and retaining talented leadership. We understand that these roles are paid consistent with other comparable City of Toledo management positions. We have not assessed the market rates for other municipal managers, but believe strongly that the benchmark is other municipal water utilities. As such, we believe the Toledo water utility should be operated as a municipal enterprise and allowed to implement a market-based compensation strategy.

Given all the factors we have identified, relatively low pay available to DPU managers, the high turnover, and high retirement eligibility, a succession plan seems especially critical for the ongoing success of the DPU.

Recommendation VII-3 **Combine jobs, where possible, and implement a competency/certification based job-progression system to encourage professional development, employee retention, deployment flexibility and productivity. (Refer to Finding VII-1, Finding VII-2, Finding VII-4, Finding VII-9, Finding VII-11, Finding VII-13, Finding VII-14, Finding VII-15, and Finding VII-16.)**

Given DPU's staffing shortages in key Operator positions, the pressure it is under to not fill vacant positions, and the difficulty it has filling positions in a timely fashion, it is essential that the utility develop strategies to assure workforce availability. Rather than aggressively filling open positions, Schumaker & Company believes that the DPU should invest in redesigning jobs to create more flexible deployment and improve staffing efficiency.

The joint-effort between City of Toledo and Local 7 to consolidate positions and eliminate obsolete job classifications is consistent with what we are proposing here, but has largely been limited to consolidating work into an existing classification. This is an efficient, and largely effective, strategy within the context of Civil Service rules and processes. We recommend that the work within the DPU go further in two important ways. First, we recommend that the consolidation of classifications be done in a manner that creates career progressions based on the acquisition of licenses, certifications or the demonstration of specific competencies. The jobs are designed with a clear progression path and associated increases in compensation. This creates an incentive for employees to develop additional skills and attain higher levels of licensure. At the same time, more skilled employees, able to perform a broader range of tasks, allows the DPU more flexibility in deployment and generate significant staffing efficiencies.

Second, another key difference from the city-wide effort is that these jobs must be specific to the DPU. Again we emphasize the importance of managing the DPU as an enterprise. A well-functioning job progression system has associated training costs. The benefit of this investment should return to the utility. The investment in employee development should create career development paths inside the organization, not paths that lead outside the organization.

Advancement within the progression is based on individual attainment of the competency or certification. Well-designed progression systems have no instructional barrier to progression. This means there is no need for a vacancy at a higher level to be able to progress. As such, it is theoretically possible to have all employees paid at the highest level, although normal attrition and individual limitations make this practically impossible. It is important to note that anyone within the progression can perform all work associated with his/her level and all levels below. This means that senior employees may sometimes be assigned lower level work. It is this deployment flexibility that produces staffing efficiencies, as one person may be assigned a range of tasks that were divided into two jobs. (This should not be read as one person doing the work volume of two people. It simply means that the range of tasks is combined.)

Many job progressions also have mandatory progression levels (usually the first three of five) and higher, voluntary levels. These additional job requirements are, of course, subject to collective bargaining

Schumaker & Company sees opportunity for job progressions in Water Treatment, Water Reclamation, and Customer Service. With deeper analysis, others may be identified. *Exhibit VII-10* provides a sample job progression for Water Treatment Plant Operators.

**Exhibit VII-10
Sample Job Progression for Water Treatment Plant Operator**

Level	Designation	Requirements (to enter the level)	Key Functions
5	Lead Operator	Class 3 License	Process control, training
4	Operator 2	Class 2 License	System operations and routine maintenance
3	Operator 1	Class 1 License	
2	Operator in Training		Working under the direction of a Lead Operator to develop knowledge and skills, and gain experience necessary for licensing
1	Operator Assistant	High School Diploma/GED	Utility worker and minor maintenance

At the same time, the DPU should redefine the Senior Water Control Room Operator as a Supervisor position, distinguishing it from the Lead Operator. The Supervisor performs work restricted to supervisory/management classifications, including hiring, evaluating, disciplining, and terminating employees. In addition, Supervisors manage the progression process and play a key role in employee development.

A key feature of such a system is that employees advance based on acquisition of required certifications and not based on seniority, subjective qualifications, or the availability of a promotional opportunity. While it is theoretically possible for all employees to be at the top of the pay scale, it is unlikely given turnover, varying levels of desire to progress, and the time it takes to do so. In general, the progression should be built so that it takes a minimum of five to seven years to reach the top level.

Such a system does have the potential to increase payroll and training costs. These expenses are typically recouped in greater deployment flexibility and associated staffing level optimization.

Recommendation VII-4 Implement a formal employee training system and a learning management system to deliver and document training. (Refer to Finding VII-11, Finding VII-12, and Finding VII-14.)

We recommended in our chapter on occupational health and safety the adoption of a training content management, delivery, and documentation system. We indicated in that chapter that we are impressed with Target Solutions (<http://www.targetsolutions.com/home>).³ This product offers content developed specifically for water and wastewater utilities. It also allows for the uploading and sharing of practically any content developed in-house or purchased elsewhere.

A system such as this would be particularly useful for the call centers. It could support initial training and provide a convenient and efficient method for training on new policies and procedures—including testing and electronic signatures to document that an agent has read policy changes. Testing can be used

³ Schumaker & Company has no relationship with Target Solutions and we are not recommending purchase of this specific system without appropriate needs assessment and review of multiple vendors.

in many ways to assure comprehension of standardized procedures. The system will record employee training completion and scores. Perhaps most importantly, it has a comprehensive training records system. It also allows for easy documentation of training and testing for advancement, it tracks expirations of mandated training, and it notifies employees and supervisors of pending certification expirations or training refresher requirements.

In the call center, the instructional designer can push out new content quickly, with employees able to access such content at their work stations. This capability reduces the need for classroom training and provides a way to easily document employee participation and comprehension (when testing is used).

This system would be equally useful in supporting employee development in operations. Wherever career progressions are implemented, there is a significantly heightened need for formal employee development. Encouraging employees to achieve higher licensing levels requires formal training and practice testing, all of which is best managed through a centralized training delivery and learning management system.

Using a system such as this across the enterprise makes for a *very* low-cost solution with wide applicability. It offers efficient delivery of standardized content and documentation for training completion, testing, and policy compliance.

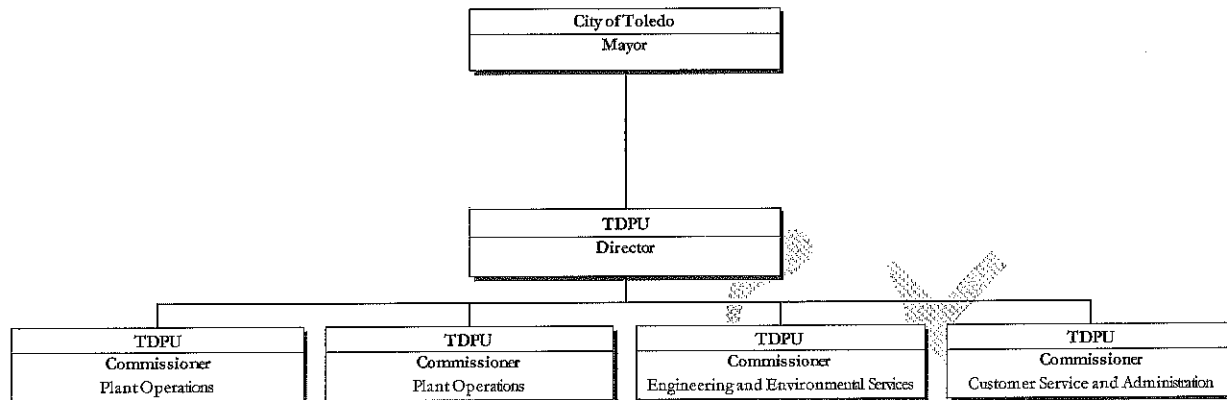
Recommendation VII-5 Consider reducing the number of Commissioners and streamlining the management and supervisory structure. (Refer to Finding VII-1, Finding VII-5, Finding VII-6, Finding VII-7, Finding VII-8, and Finding VII-9)

It is beyond the scope of this project to provide a comprehensive reorganization of the DPU. Such an undertaking requires more extensive knowledge of present and future operational demands, as well as well-structured process to respond to political, union, and Civil Service interests and requirements. Schumaker & Company is comfortable in recommending that the number of Commissioners be reduced. We believe this would be the appropriate starting point for a reconsideration of the entire management structure down through first-line supervision. We believe that the DPU could function effectively with four Commissioners all reporting to the Director.

A Commissioner of Plant Operations would be responsible for both Water Treatment and Water Reclamation. Both plants would be under the authority of a highly qualified plant manager (exempt, Civil Service position). A Commissioner of Field Operations would be responsible for Water Distribution and Sewers and Drainage. A Commissioner of Engineering and Environmental Services would, as the title suggests, be responsible for what is now two separate divisions bringing together the technical/professional functions with a clear focus on regulatory compliance and system performance. A Commissioner of Customer Service and Administration would be responsible for the combined divisions of these names. Central to this role is improving customer service while effectively managing utility revenue and expenses. This structure is graphically described in *Exhibit VII-11*.



**Exhibit VII-11
Streamlined Commissioner Organizational Structure**



Although we offer limited definition here, Schumaker & Company strongly believes that such a restructuring is far more than streamlining management and reducing costs. The key here is to stabilize and bring together parts of the organization that can achieve some synergies leading to major operational improvements. It is also a necessary step to clarify roles and redefine them to meet the present and future needs of the organization. Schumaker & Company believe the greatest opportunities for streamlining management are in Plant Operations and Field Operations where there are, obviously, the greatest number of employees, but where there is also greater confusion and more outdated job descriptions from Commissioners to Senior Operators.

**Recommendation VII-6 Integrate customer service functions under Utilities Administration.
(Refer to Finding VII-17.)**

Customers calling about their water service should be able to call a single number and speak with a trained agent who can address their needs. The work of utility call center agents is complex and should not be integrated with other City of Toledo customer service functions.

Citizens would benefit from a single phone number or even a single 311, but the interactive voice response (IVR) system should direct that call to an agent that specializes in water utility customer service.

Trying to train a 311 agent to handle utility issues will just make both 311 and utility customer service ineffective and inefficient. The 311 systems can effectively handle requests for information and simple transactions and request for service (such as reserving a picnic shelter or reporting a pothole). The water utility customer service agents must know the system, be able to respond to emergencies, and be able to handle complex billing issues and payment arrangements. These calls tend to be longer and involve far more interaction than typical 311 calls.

The DPU needs a highly trained, full service customer service function not distracted by other citizen requests for service.

¹ / Discussion in large part taken from 2012 American Water Works Association Benchmarking Study – Performance Indicators of Water and Wastewater Utilities: Survey Data and Analyses Report (2012 AWWA Benchmarking Report).

- ² / Information Response 3
- ³ / Information Response 3
- ⁴ / Information Response 2
- ⁵ / Information Response 3
- ⁶ / Information Response 3
- ⁷ / Interview 7 and DPU comments
- ⁸ / Interview 7 and DPU comments
- ⁹ / Interview 7
- ¹⁰ / Interview 7 and DPU comments
- ¹¹ / Interview 7
- ¹² / Interview 7
- ¹³ / Interview 7
- ¹⁴ / Information Response 52
- ¹⁵ / Interview 8 and TDU comments
- ¹⁶ / DPU comments
- ¹⁷ / Information Response 52
- ¹⁸ / Information Response 8
- ¹⁹ / Interviews 8 and 11D
- ²⁰ / Interview 11C
- ²¹ / Interview 11C
- ²² / Interview 11C
- ²³ / Interview 11C
- ²⁴ / Interview 8
- ²⁵ / Interviews 8 and 11B
- ²⁶ / Interviews 8 and 11B
- ²⁷ / Interview 8
- ²⁸ / Interview 8
- ²⁹ / Interviews 8 and 14
- ³⁰ / Interviews 8 and 15
- ³¹ / Interviews 8 and 16
- ³² / Interviews 8 and 18
- ³³ / Information Response 5
- ³⁴ / Information Response 61
- ³⁵ / Information Response 53
- ³⁶ / Information Response 2
- ³⁷ / Information Response 23
- ³⁸ / Information Response 21
- ³⁹ / Information Response 21
- ⁴⁰ / Information Response 21
- ⁴¹ / Information Response 21
- ⁴² / Information Response 17



⁴³ / Information Response 17
⁴⁴ / Information Response 17
⁴⁵ / Information Response 17
⁴⁶ / Information Response 17
⁴⁷ / Kickoff Meeting and Interviews 7 and 11A
⁴⁸ / Information Response 17
⁴⁹ / Interviews 7 and 11A
⁵⁰ / Information Response 17
⁵¹ / Interview 7
⁵² / Interviews 7 and 11A
⁵³ / Interview 7
⁵⁴ / Interview 7
⁵⁵ / Interview 7
⁵⁶ / Interview 7
⁵⁷ / Information Response 21
⁵⁸ / Information Response 113
⁵⁹ / Information Response 113
⁶⁰ / Information Response 113
⁶¹ / Information Response 111
⁶² / Interviews 8
⁶³ / Interviews 8
⁶⁴ / Interviews 8
⁶⁵ / Interviews 8
⁶⁶ / Interviews 8
⁶⁷ / Interviews 8
⁶⁸ / Interviews 8
⁶⁹ / Interviews 8 and 19
⁷⁰ / Information Response 52
⁷¹ / Interview 8
⁷² / Information Response 52
⁷³ / Information Response 52 and Interview 8
⁷⁴ / Information Response 128
⁷⁵ / Interview 11
⁷⁶ / Interviews 8 and 11
⁷⁷ / Information Response 57
⁷⁸ / Information Response 57
⁷⁹ / Information Response 57
⁸⁰ / Information Response 57 and Interview 20
⁸¹ / Information Response 57
⁸² / Information Response 57
⁸³ / Interview 20 and July 25, 2014 Presentation to DPU Management
⁸⁴ / Information Response 62
⁸⁵ / Information Response 62
⁸⁶ / Information Response 62
⁸⁷ / Information Response 63
⁸⁸ / Discussions with UA Management
⁸⁹ / Discussions with UA Management

- ⁹⁰ / Information Response 60
- ⁹¹ / Interviews 8, 11, and 19
- ⁹² / Interviews 8, 11, and 19
- ⁹³ / Interviews 8, 11, and 19
- ⁹⁴ / Interviews 7, 8, and 13
- ⁹⁵ / Interviews 8, 14, 16, 17, and 18
- ⁹⁶ / Borowski, J. and Adams, P. Water Utility Safety and Health: Review of Best Practices. Water Research Foundation. 2010, Page 21.
- ⁹⁷ / Borowski, J. and Adams, P. Water Utility Safety and Health: Review of Best Practices. Water Research Foundation. 2010, Page 43.
- ⁹⁸ / Borowski, J. and Adams, P. Water Utility Safety and Health: Review of Best Practices. Water Research Foundation. 2010, Page 6.
- ⁹⁹ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁰ / Information Response 2
- ¹⁰¹ / 2013 Department of Public Utilities Annual Report
- ¹⁰² / 2013 Department of Public Utilities Annual Report
- ¹⁰³ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁴ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁵ / Information Response 2
- ¹⁰⁶ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁷ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁸ / 2013 Department of Public Utilities Annual Report
- ¹⁰⁹ / 2013 Department of Public Utilities Annual Report
- ¹¹⁰ / 2013 Department of Public Utilities Annual Report
- ¹¹¹ / 2013 Department of Public Utilities Annual Report
- ¹¹² / Information Response 2
- ¹¹³ / 2013 Department of Public Utilities Annual Report
- ¹¹⁴ / 2013 Department of Public Utilities Annual Report
- ¹¹⁵ / 2013 Department of Public Utilities Annual Report
- ¹¹⁶ / 2013 Department of Public Utilities Annual Report
- ¹¹⁷ / 2013 Department of Public Utilities Annual Report
- ¹¹⁸ / 2013 Department of Public Utilities Annual Report
- ¹¹⁹ / 2013 Department of Public Utilities Annual Report
- ¹²⁰ / 2013 Department of Public Utilities Annual Report
- ¹²¹ / 2013 Department of Public Utilities Annual Report
- ¹²² / 2013 Department of Public Utilities Annual Report
- ¹²³ / Information Response 2
- ¹²⁴ / Interviews 2, 3, 4, and 5
- ¹²⁵ / Interviews 2, 3, 4, and 5
- ¹²⁶ / Interviews 2, 3, 4, and 5
- ¹²⁷ / Interviews 2, 3, 4, and 5
- ¹²⁸ / Interviews 2, 3, 4, and 5
- ¹²⁹ / Interviews 2, 3, 4, and 5
- ¹³⁰ / Schumaker & Company consultant experience
- ¹³¹ / Interviews 2, 3, 4, and 5
- ¹³² / Schumaker & Company consultant experience
- ¹³³ / Interviews 2, 3, 4, and 5
- ¹³⁴ / Interviews 2, 3, 4, and 5
- ¹³⁵ / Interviews 2, 3, 4, and 5
- ¹³⁶ / Interviews 2, 3, 4, and 5

¹³⁷ / Interviews 2, 3, 4, and 5

¹³⁸ / Interviews 2, 3, 4, and 5

¹³⁹ / Interviews 2, 3, 4, and 5

¹⁴⁰ / Interviews 2, 3, 4, and 5

¹⁴¹ / Interviews 2, 3, 4, and 5

¹⁴² / Interviews 2, 3, 4, and 5

¹⁴³ / Information Request 34

¹⁴⁴ / Information Response 47

¹⁴⁵ / Information Request 35

¹⁴⁶ / Information Request 35

¹⁴⁷ / Information Request 35

^{cxlviii} /2012 Benchmarking, Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses Report, American Water Works Association, 2014. Page 19.

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