



The graphic features two overlapping circular logos. The left logo is green with the text "suez environnement" in white. The right logo is blue with a white icon of a person swimming and the text "United Water" in white. Below these logos, the words "NEW YORK" are written in large, bold, blue capital letters. The entire graphic is set against a background of yellow, green, and blue rectangular blocks.

# Rapid Assessment Report

Benchmarking and Management Audit

Task 2 - Benchmarking

*West Nyack, NY*

April 21, 2015

Submitted by:  
HDR Architecture &  
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# 1 Executive Summary

The New York State Public Service Commission (PSC) requested that United Water New York (UWNY) review its management and oversight system with a view towards ensuring performance, customer service, and cost containment.<sup>1</sup> UWNY, in turn, retained HDR to conduct a review of its operations from a management perspective, including management strategies, operations and maintenance (O&M), and operational cost controls.<sup>2</sup> Following a strategic direction workshop with UWNY leadership, HDR initiated the second task under its contract, which is to undertake a Rapid Assessment review of UWNY's operational management, including existing management systems related to the use of metrics, trends in UWNY's operational performance metrics, and a comparison of UWNY's operations against certain industry benchmarks in its provision of water services, including both supply and distribution, to customers in Rockland County, New York. This report also includes suggestions for how UWNY may further leverage its already extensive use of metrics to operate its water system.

The assessment is composed of three analyses intended to offer a complete picture of operational performance and identify opportunities for improvements in service, operations, and related costs. The three analyses are: (1) Current Performance Review Process and Trends, consisting of a review of the performance management review process used by management and supervisors of various functions at UWNY, and trends in performance of selected metrics; (2) Benchmark Against Industry Standards, consisting of a comparison of UWNY to water utilities nationally as well as regionally and by population size served across established industry performance indicators; and (3) Performance Management System Review, consisting of a review of the performance management system, its metrics, the report itself and a gap analysis of existing indicators.

1. **Current Performance Review Process and Trends.** UWNY has implemented a continuous improvement process and uses a robust framework for the review of each Key Performance Indicator (KPI) it currently uses to track operations, including weekly reviews and course correction plans to close performance gaps over time. The continuous improvement process and information provided in support of it are adequate to meet the needs of managers and supervisors on a daily basis and their engagement as “owners” of performance is evident. The analysis of trends in performance uncovered certain limited areas that warrant new or continued attention.

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<sup>1</sup> PSC, Case No. 13-UWNY, the local company that operates in Rockland County, and its operational performance metrics and related management (June 26, 2014), at p. 72.

<sup>2</sup> HDR understands that a separate, PSC-directed review of intercompany accounting – including central functions provided by United Water such as capital planning, procurement, and construction management – is underway by Deloitte Touche LLP. This Rapid Assessment focused on operations at UWNY, the operating company in Rockland County.

*Opportunities for Improvement.* Beginning in the early 2000s UWNY began to develop its processes to support continuous improvement. This should be continued more specifically as described in Section 4, *Metrics Review*. Furthermore, based on historical performance data, continued or additional focus on the following areas may serve to halt or reverse negative trends or improve instances of past poor performance:

- Non-revenue water (this is currently a focus of a number of UWNY internal assessments and improvement initiatives and should be continued);
- Use of labor hours for predictive maintenance activities; and
- Backlog of outstanding distribution work orders.

2. **Benchmark Against Industry Standards.** UWNY's performance is better than its peers in approximately one-third of KPIs assessed, and generally comparable to its peers in approximately half of the reviewed indicators. For the remaining one-quarter to one-fifth of KPIs in which it lags its peers (i.e., performance is in the bottom quartile as compared to aggregate utility data), these areas should be viewed as representing opportunities for further assessment, specific strategic objectives, and improvement initiatives.

*Opportunities for Improvement.* Based on benchmarking, gaps between UWNY's performance and that of its peer utilities in the following areas could be examined for improvements to reduce costs or improve effectiveness or both:

- Identifying non-operating costs<sup>3</sup> as a component of water rates, including communication to rate payers of those costs on their utility bills;
- More efficient handling of customer complaints and a more precise method of generating work orders;
- Reducing service disruptions, ensuring infrastructure integrity, and striking the right balance between total maintenance hours and renewal and replacement rates; and
- Improving energy efficiency and reduced chemical consumption in the treatment of drinking water.

3. **Metric Review.** The Rapid Assessment also focused on the measurements and tools used to assess and improve performance.

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<sup>3</sup> Many if not all of these non-operating costs may be outside of UWNY's control; therefore an examination into these costs only is suggested in this Assessment.

*Opportunities for Improvement.* As described above, the framework used by UWNY is robust and ahead of many utilities. Nevertheless, UWNY might review its performance management system according to the following principles and suggestions:

- Consider adjusting the KPI dashboard and presentation so that metrics roll up and are retained in a manner that allows for longer term trend analysis, as the fine granularity of the existing KPI report may have the unintended consequence of limited visibility into annual and year-over-year trends.
- Consider a company-wide business case evaluation for KPI dashboard alternatives to the current Excel-based format that requires significant manual entry and re-formatting as indicators change over time.
- The current KPI report represents performance tracking for individual functions and work groups within UWNY, which roll up to targets in the five-year medium term plan submitted to the PSC in connection with rate cases. This regulatory context may have the unintended consequences of making strategic planning options more limited for private utilities than public utilities. Within this structure, UWNY could explore opportunities to developing a more organic and flexible strategic plan that involves more customer-facing service levels and greater awareness at the field level of the underlying rationale and strategic goals behind PSC-ordered performance targets.
- UWNY currently supports a continuous improvement process through its existing performance management system. The above-described opportunities will serve to focus attention, streamline data collection and management, and enhance decision-making toward a greater strategy that positively impacts internal operations and customer services.

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## 2 Current Performance Review System and Trends

This section specifically evaluates regularly scheduled performance review meetings, ownership of KPIs and target-setting. It also includes a trend analysis of existing performance indicators. A more detailed review of UWNY's performance management system, including types and completeness of indicators and the reporting tool itself is included in Section 4, *Metrics Review*.

### 2.1 Management System

UWNY has a well-established record of developing, improving, and using metrics or KPIs to continuously improve business performance. From 2001 to 2002, UWNY undertook a self-assessment and developed metrics with the help of PerformMAX software and systems. Since then, UWNY has reviewed and updated its KPIs on a periodic basis. UWNY has used KPI reports on a daily, weekly, monthly, and annual basis to organize, plan, and optimize operations and maintenance, and has a dedicated staff to track metrics and produce reports. Based on conversations with UWNY leadership and observations of a weekly KPI review meeting on March 10, 2015, it is clear that both management and operational staff understand the importance of KPIs and use them in daily operations and maintenance activities to drive performance. Department managers, superintendents, and supervisors are required to know their group's KPI results and be prepared to discuss where they are in regards to plan. On a daily basis, managers, superintendents, field supervisors, and staff have discussions on performance under each KPI. Daily metrics including targets versus actuals are examined with individual work groups every morning and get rolled into summary tables and charts which are reviewed in the weekly meetings. This demonstrates that the use of metrics to drive performance improvements occurs at multiple levels of the organization.

On a regular schedule, UWNY executives, managers and representatives from each Department review weekly KPI reports. UWNY leadership and Department managers discuss related operations issues such as regulatory requirements, service levels, preventive maintenance, and capital project coordination. UWNY staff discusses any underperforming metrics and makes appropriate adjustments to improve results. Individual units are expected to report on irregularities between plan and actual values and propose a plan or action items to trend towards plan. Using KPI results in this manner represents a continual improvement process with long-term utility and customer benefits.

UWNY also completes monthly and annual reviews of KPI results. KPI targets and plan values are reviewed and adjusted yearly for continual improvement of the utility

performance. In some cases, KPIs and their plan values are adjusted, added or removed from the report on an as-needed basis. For example, valve maintenance is based on a five-year schedule; if a previous year's target was not met, the current year goal will change in order to get back on the five-year schedule.

Most of the target or plan values are set by UWNY. A few of the KPI targets, however, are established by the PSC or other state regulators such as the Department of Health. For example, replacement rates of meters are regulated by the PSC. KPIs are integrated with UWNY's capital and operations budget and asset management plan; annual budgets and rate plan approvals are used to establish select operations and maintenance targets to take into consideration what can and should be accomplished with available funds.

## **2.2 Trend Analysis**

To supplement UWNY's existing and detailed review of performance metrics on a daily, weekly, and monthly basis, HDR analyzed year-over-year performance for KPIs and reporting metrics with available historical performance information. The purpose of this assessment is to determine general trends in performance and to provide a longer-term perspective.

### **2.2.1 Background & Methodology**

HDR reviewed historical Water Audit Results, Employee Surveys and year-end Executive Operation Weekly Summary Reports. Each report is discussed in further detail below.

#### **Water Audit (2009-2014)**

UWNY provided a reporting worksheet for the last six years of self-reporting using free water audit software published by the American Water Works Association (AWWA).<sup>4</sup> This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and to identify areas for improving efficiency and reducing costs. Inputs include the volume of water supplied, the volume of authorized consumption (metered and unmetered), water system data (e.g., length of water mains, number of service connections), and various costs. Using these inputs the program provides financial and operational efficiency indicators, including the annual cost and volume of losses per service connection per day. The worksheet also calculates an annual Infrastructure Leakage Index (ILI), which is a useful indicator for benchmarking management of real losses. In addition, HDR conducted a Non-revenue Water Management Study for UWNY in 2013. The findings section below provides a summary of UWNY's progress over time in managing water losses and associated performance indicators.

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<sup>4</sup> <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>

### **Employee Survey (2008, 2011, 2013)**

UWNY conducts employee engagement surveys separately from its operational KPIs. This information is used to improve employee satisfaction over time. For this Rapid Assessment, UWNY provided summary results of employee surveys for 2008, 2011 and 2013. The surveys cover a broad range of company concerns including communication, employee engagement and satisfaction, supervisory consideration, diversity in the workplace, training and development, and employees' perception of managers' concern for their careers and well being. The summaries provide the total number of responses received, questions asked and associated dimension(s) and percent of favorable and unfavorable responses, but do not include the same questions and dimensions across the three years. Therefore the discussion provided in the findings section below is limited to those dimensions that could be evaluated consistently over the three years of data.

### **Executive Operation Weekly Summary (Year-End, 2011-2014)**

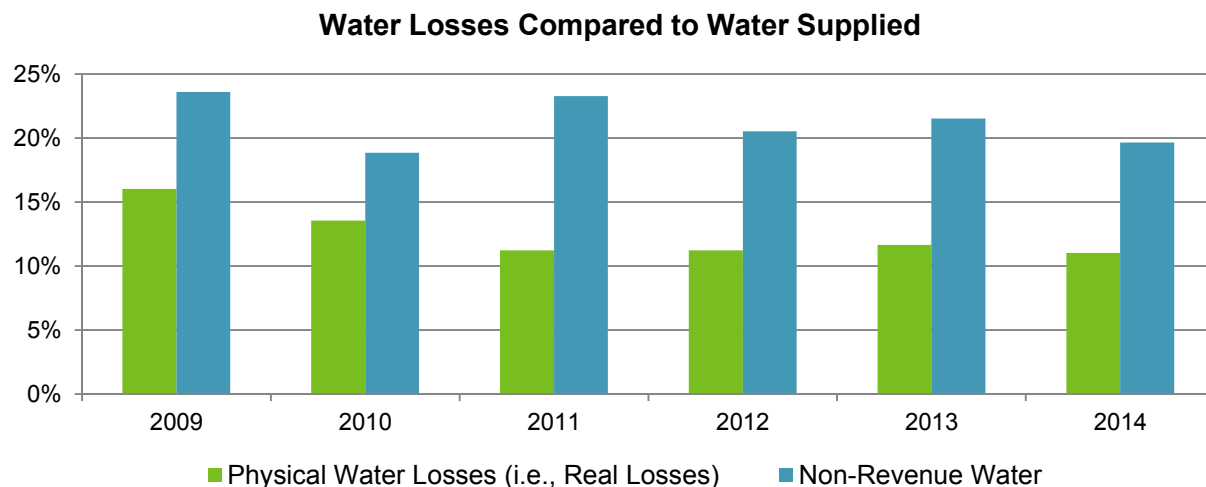
As discussed above, UWNY has in place a detailed system for internally tracking operations-related performance metrics, many of which are established by the PSC in connection with rate proceedings. UWNY tracks performance across five departments (customer service, meters, construction, distribution and production) on a weekly basis. The reports overwrite the previous week's metrics with a total update for the year to date. While this means there is no running account of week-over-week, month-over-month, or year-over-year performance, the last report of each year can be used to derive yearly totals. HDR reviewed the year-end reports for 2011 to 2014, covering December 26 to January 1, 2011, December 24 to December 30, 2012, December 23 to December 29, 2013, and December 22 to December 28, 2014. The findings section below provides a summary of metrics assessed and discusses notable outliers.

## 2.2.2 Findings

The following sections analyze UWNY's three separate performance reports for trends over time.

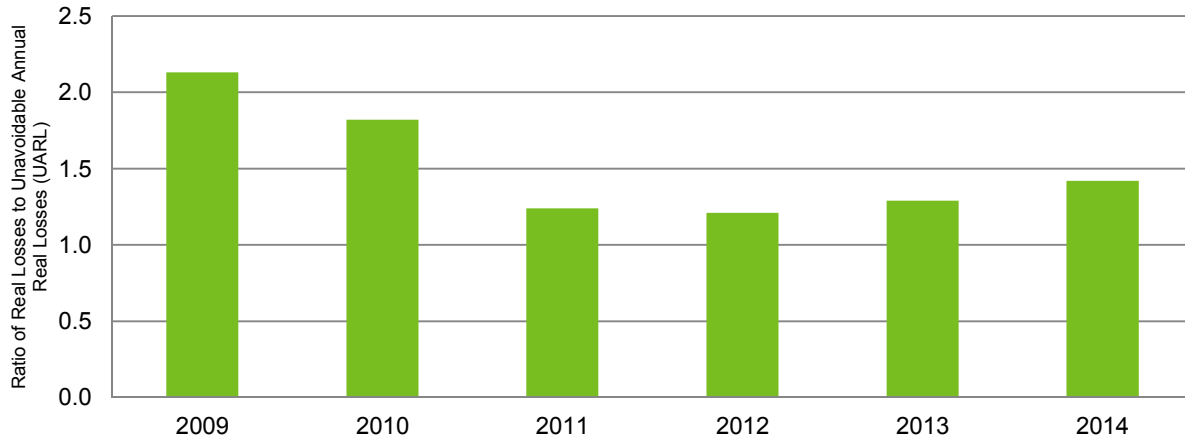
### Water Audit (2009-2014)

AWWA's Water Audit Software quantifies losses and identifies areas for improved efficiency. Throughout all six years reviewed, Real Losses have steadily declined approximately 5% while all non-revenue water has declined approximately 4%, but with greater year-to-year variation.



Management of water losses can be measured by the ILI, which is calculated by dividing the current annual real losses by the unavoidable annual real losses. An ILI equal to two means that real losses are twice as high as the minimum expected amount of leakage and measures should be evaluated for reducing it. As shown below, UWNY's ILI peaked at 2.1 in 2009 and declined to a low of 1.2 in 2012, with a small rise to 1.4 in the past two years.

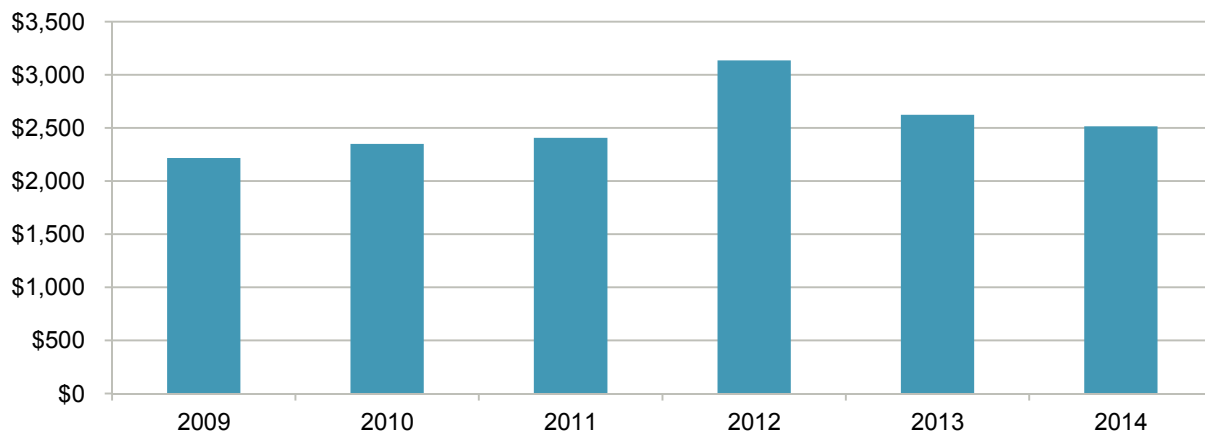
### Infrastructure Leakage Index



### Notable Outliers

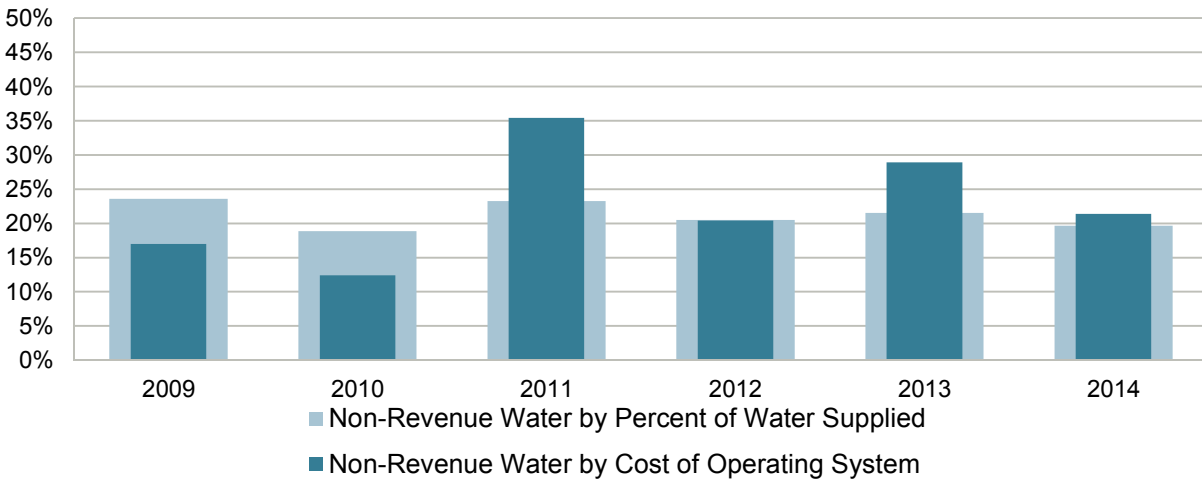
The annual cost of operating the water system that has been input into the Water Audit Software includes costs for operations, maintenance, and incurred costs for long-term upkeep of the system. Normalizing these costs to water supplied, over the past six years costs have been stable within a narrow range, with the exception of higher costs in 2012.

### O&M Cost of Water Services (\$/Million Gallons of Water Supplied)



Non-revenue water, while a focus of ongoing UWNY reduction efforts, appears to not be the major driver of the total costs of operating the system, representing on average less than 25% of the costs over the past six years.

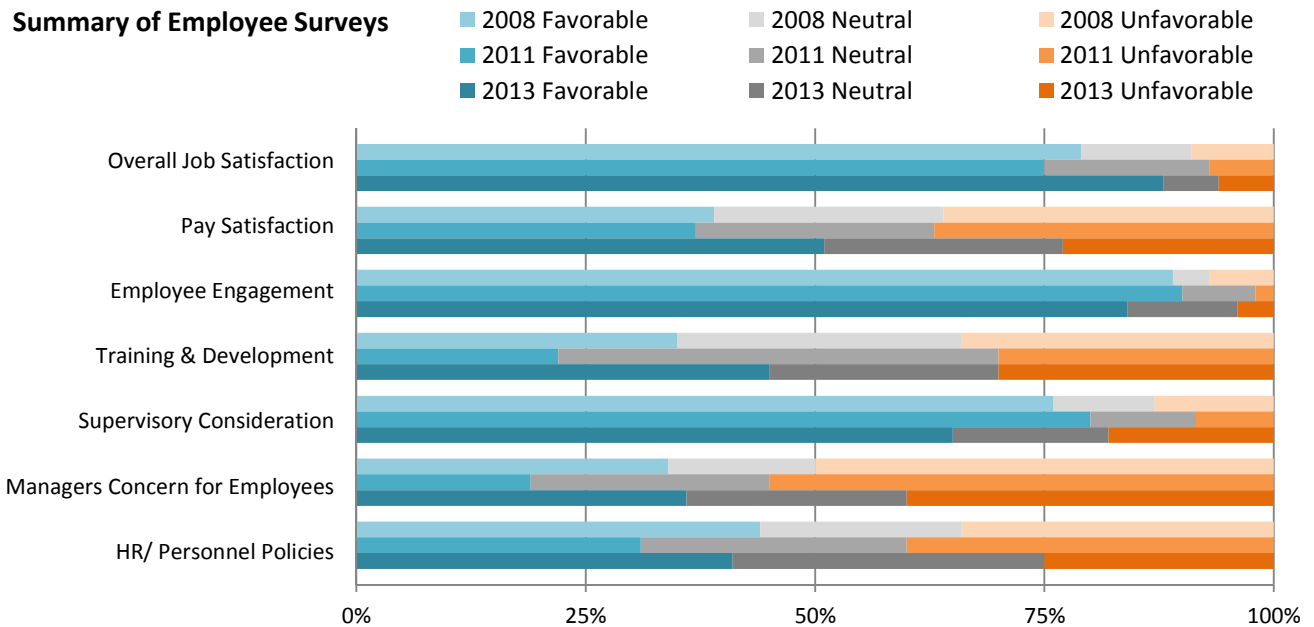
### Non-Revenue Water



Nevertheless, for a variety of reasons UWNY is seeking to put in place systems to reduce non-revenue water and also to provide other benefits. UWNY will install an Advanced Metering Infrastructure / Automatic Meter Reading system over the next several years to improve accuracy of metering within the system. District Metering Areas are being evaluated as a method to further locate non-revenue water. If water audit results in non-revenue water above 18 percent of water supplied, UWNY must report to PSC. Moreover, UWNY has adopted a policy of soundings for leaks whenever an asset is “touched” in the field during routine or emergency maintenance activities (e.g., main breaks, leaks).

### Employee Survey (2008, 2011, 2013)

HDR reviewed responses to 20 questions for each year of employee surveys provided. For the purposes of this assessment, responses not corresponding to either favorable or unfavorable were classified as neutral. Overall, job satisfaction has improved over the years measured. The distribution of responses is shown below.



### Notable Outliers

UWNY employees have high employee engagement (average 88% favorable over the three years of data), overall job satisfaction (average 81% favorable), and feel their supervisors are fair, friendly and helpful (average 74% percent favorable). The largest unfavorable responses were in the category of survey questions related to employee satisfaction with management (i.e., Managers' Concern for Employees). We note that no employee survey has been submitted following recent management changes at UWNY.

## Executive Operation Weekly Summary (Year-End, 2011-2014)

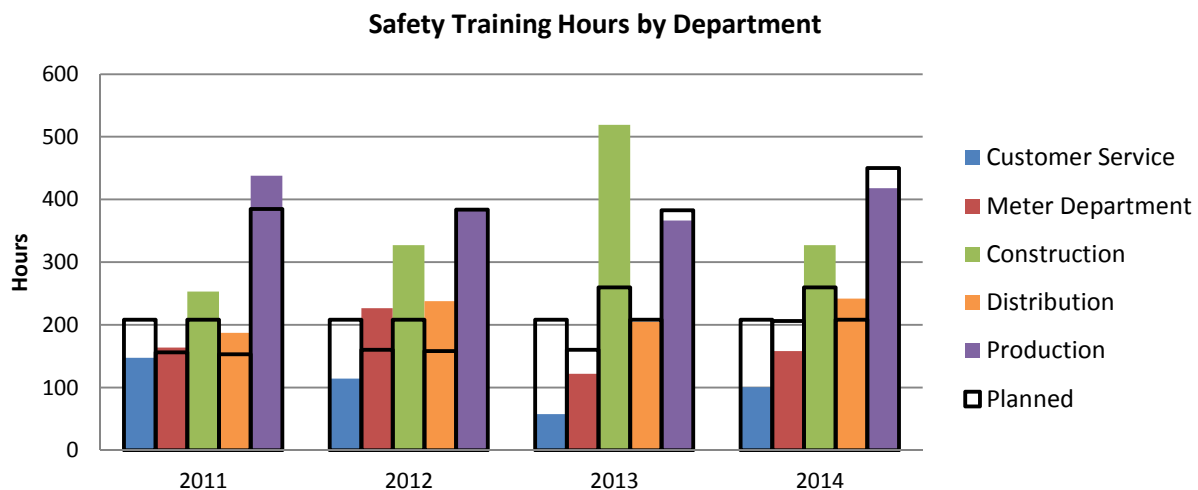
HDR reviewed the following yearly metrics to identify trends:

- Total hours of safety training by department compared to plan;
- Number of meters replaced by the Meter Department compared to requirements set by PSC;
- Main breaks and service leaks repaired by the Construction Department compared to 10-year historic averages, and associated actual labor costs to repair compared to plan;
- Number of hydrants and valves that received maintenance, flushing points or stops, and hydrants winter inspections compared to plan;
- Miles of main surveyed compared to plan; and
- Number of outstanding (i.e., open) work orders in the Construction and Distribution Departments.

UWNY tracks a number of metrics in the Production Department, including the volume of water produced, electrical and chemical costs and outstanding work orders. However, this data is only available on a daily and weekly basis, not on a cumulative basis, and is not indicative of long-term KPI performance and is not included in this assessment.

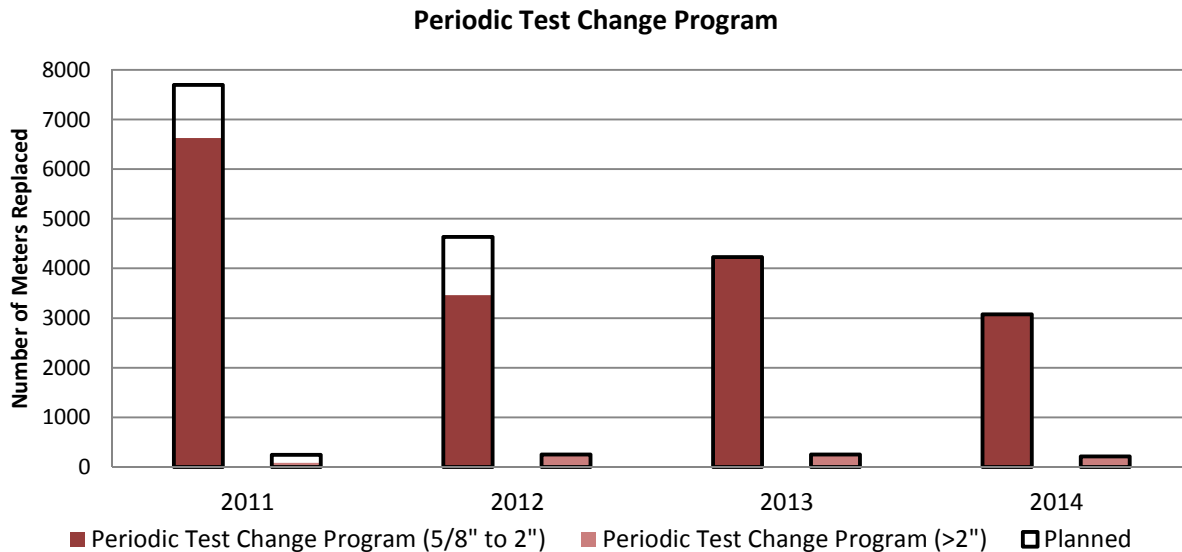
### Summary and Notable Outliers

Overall, UWNY staff has surpassed the annual safety training goals with the Construction Department leading the way. However, within the Customer Service Department actual hours are approximately 50% of the goal averaged over four years of data.

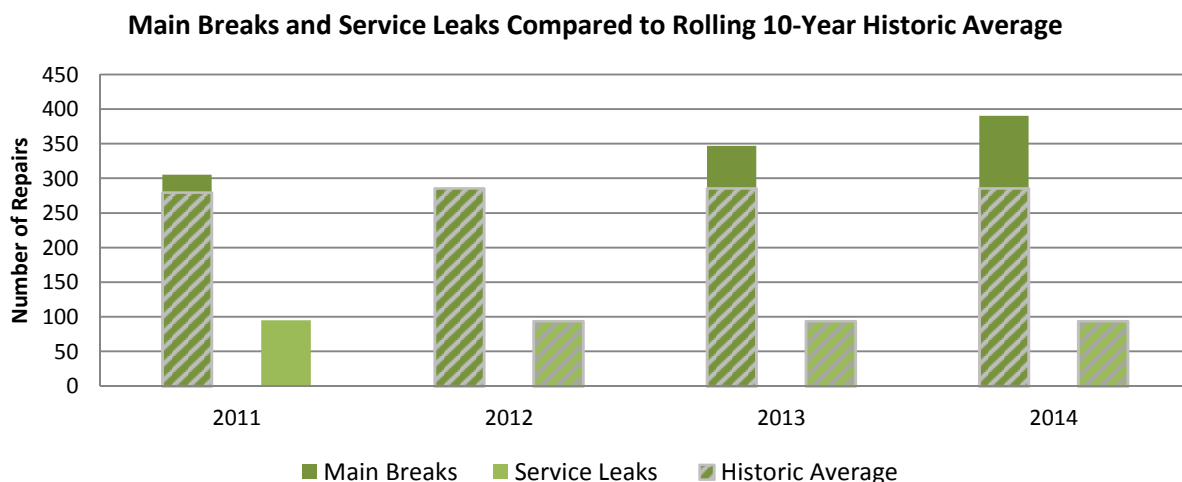




On average, actual meter replacements compared to plan have improved over the four years reviewed and on average have met over 80% of the targets based on PSC requirements, which have declined in absolute terms from 2011 to 2014.

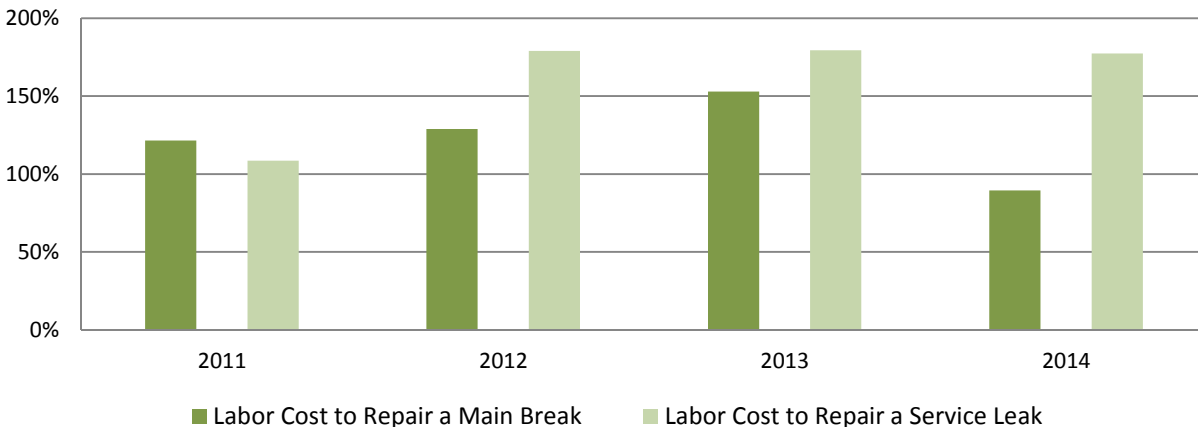


The number of main break and service leak repairs are comparable to a rolling 10-year historic average tracked by UWNY. However, labor costs have exceeded plan based on the average labor cost to repair a main break or service leak during regular and after hours, and the necessary incurrence of overtime hours.<sup>5</sup> The affect of weather on variability is shown by the spike in breaks in early 2014, corresponding to historic cold weather.



<sup>5</sup> Historically, the labor cost to repair main breaks and service leaks has been planned with straight time labor rates. In actuality, however, most breaks have the potential to generate overtime given mark-out requirements, an eight-hour work day, and the goal of repairing service immediately, without waiting for the next regular work day. Accordingly, UWNY has revised its plan labor costs in 2015, going forward, to align with operational realities.

**Labor Costs for Repairs Compared to Planned**



On average, the number of hydrants and valves that receive maintenance, flushing points or stops, and hydrant winter inspections, as well as miles of mains surveyed have exceeded plan, which is set every year to comply with state regulations. All hydrants are winter inspected each year, starting September 1, and can extend into the following calendar year depending on conditions such as the number of main breaks and weather conditions. Accordingly, variation in calendar-year metrics does not necessarily indicate issues with performance of inspections. For example, the number of hydrants that received winter inspections in 2013 appears low, but that is the consequence of a higher number of inspections in fall 2012, during the same winter season. Similarly, winter inspections and miles of mains surveyed shown below target in 2014 may simply reflect that inspections were completed in fall 2013.<sup>6</sup>

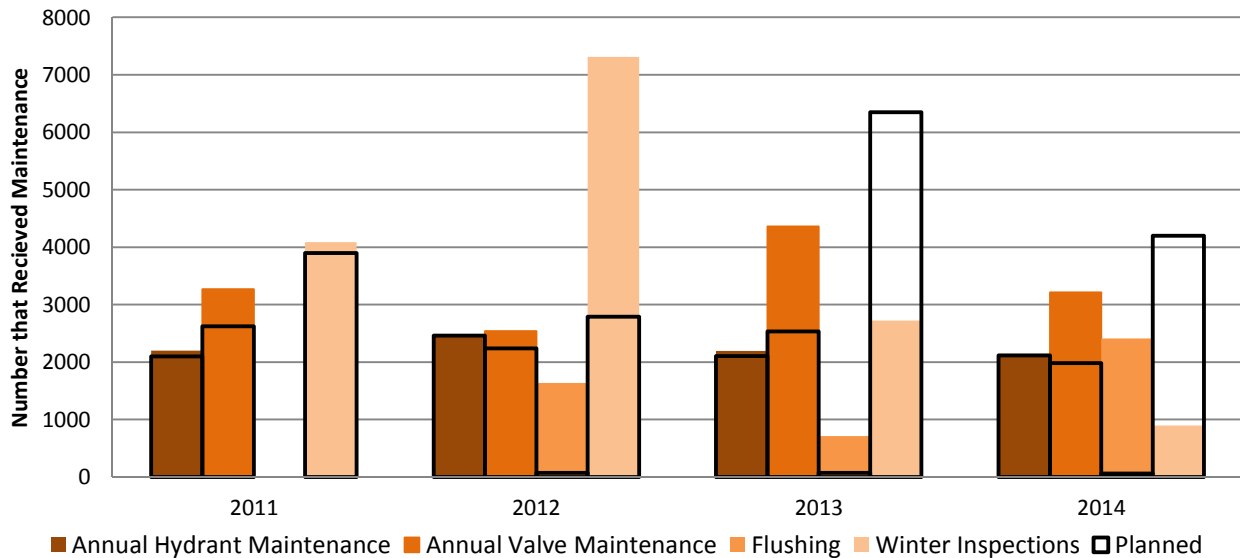
One third of all hydrants are targeted to be exercised and maintained annually per PSC requirement. A filing is provided to the PSC each year. Winter inspections are completed on dry-barrel hydrants to make sure they are properly drained and have not frozen. An average of six hydrants are out of service at any one time during routine flushing and maintenance. When issues are found with hydrants during routine exercising and maintenance, they are immediately entered as work orders to be addressed. Annual hydrant maintenance is trending at plan while flushing is trending well above plan. Hydrant flushing is completed after main breaks as well as when there are water quality complaints. Hydrant maintenance including flushing should be balanced with non-revenue water volumes. Hydrants should be flushed over shorter durations. Unidirectional flushing has only historically been used in special cases and hydraulic modeling is completed to establish. Unidirectional flushing can reduce the time needed to flush hydrants as well as the overall water used since this process increases

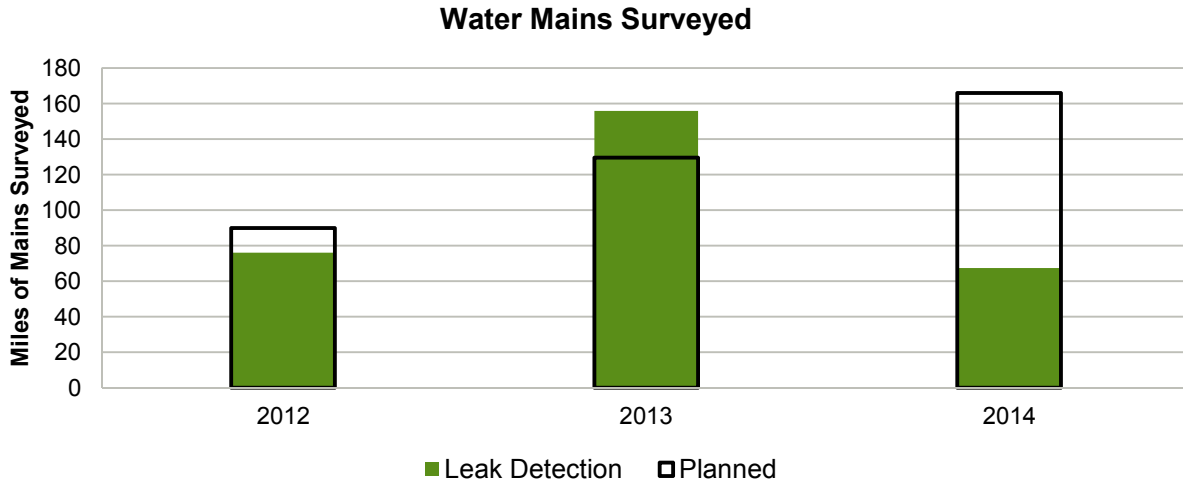
<sup>6</sup> Flushing data for 2011 is not available. However, HDR understands that the minimum number of hydrants flushed each year is one-third of the hydrants during the hydrant maintenance program. This does not include flushing after main breaks, for water quality issues, or for other purposes.

flushing velocity. However, the labor requirement for unidirectional flushing is substantially greater than conventional flushing due to the time required to set up each flushing routine including valve operation required to isolate the system. Therefore, reducing the duration of conventional flushing and continuing to use unidirectional flushing in special cases may result in an ideal balance between non-revenue water and labor requirements.

Valves are targeted to be exercised and maintained on a five-year cycle under PSC requirements, averaging to approximately one-fifth of valves in any given year. UWNV is maintaining valves at a rate higher than plan so the annual valve maintenance rate varies from the target year to year. Many valves are exercised as part of main break response or other non-planned distribution system activities, which typically results in above plan results. These exercised valves can be rescheduled out to the next exercise cycle instead exercised again on the normal program schedule. UWNV is currently working to re-balance the annual exercising program so that closer to one-fifth of the valves are exercised per year but will remain with the plan as required to exercise all valves every five years.

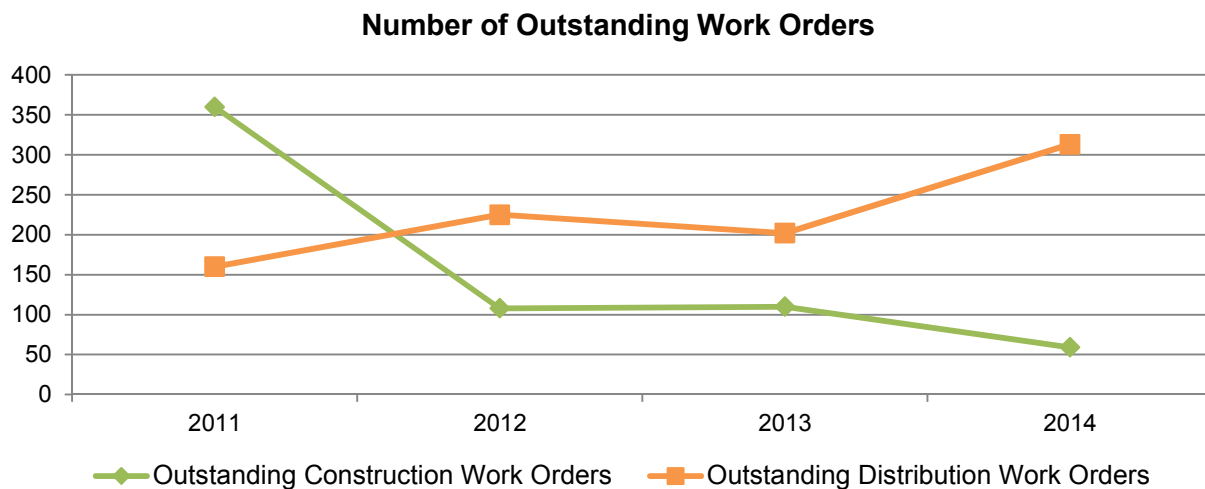
**Annual Hydrant and Valve Maintenance**





The decline in survey performance in 2014 is due to the increased use of soundings, coupled with turnover, injuries, and other absences in distribution department in 2014.

UWNY also tracks number of outstanding work orders in its different operational departments. As shown below, the number of outstanding work orders for the Construction Department has seen a downward trend, while the Distribution Department has experienced an upward trend over the four years of data reviewed. These trends should be further assessed to insure manageable levels for the company as a whole.



## 3 Benchmarking Against Industry Standards

In order to assess how UWNY ranks in comparison to other utilities, HDR compared UWNY to the best available industry benchmarks, which are maintained by AWWA<sup>7</sup>. This comparison consisted of 68 performance indicators. The AWWA dataset is developed from an annual survey and includes aggregated performance data from 33 water utilities and select performance data from utilities that provide both water and wastewater services.

### 3.1 Methodology

UWNY staff completed a survey of performance and cost indicators for comparison against aggregated performance data collected by AWWA in its annual utilities benchmark survey from 2013, which is the latest year available. The results of the survey were then compared to aggregated information from three sources:

- *National* – all participating water utilities (33 total);
- *Regional* – all participating water and combined (water and wastewater) utilities from Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont (seven total); and
- *High Population* -- Water and combined utilities serving a comparable population of 100,001-500,000 people (53 total).

The aggregated data is further broken down by:

- *Top Quartile* – representing the top 25 percent of respondent information;
- *Median* – representing the average of the middle 50 percent; and
- *Bottom Quartile* – representing the bottom 25 percent of respondent information.

HDR reviewed the quality of the data provided by UWNY by identifying any responses that were an order of magnitude greater than the Top Quartile of national respondents or less than the Bottom Quartile of national respondents. These were flagged for potential data quality issues and were subsequently reviewed and corrected by UWNY.<sup>8</sup> HDR did not provide any further assessment of data quality or integrity. HDR did leave out of the comparison those AWWA indicators that are irrelevant (for example, those

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<sup>7</sup> American Water Works Association, *Benchmarking Performance Indicators for Water and Wastewater: 2013 Survey Data and Analyses Report*.

<sup>8</sup> This review uncovered certain errors in AWWA's calculation of indicators regarding service disruptions. The errors were confirmed by AWWA and a manual correction to the data was made.

pertaining to wastewater operations only) and indicators that are secondary to performance from a customer point of view (for example, percent of full-time employees dedicated to different work functions (management, planning, O&M)).

UWNY's performance was then assessed in a first-level analysis and determined to be in the Top Quartile (equal to or above the Top Quartile value of a given indicator), Above Average (below the Top Quartile and equal to or above the Median), Below Average (below the Median and equal to or above the Bottom Quartile value of a given indicator) or in the Bottom Quartile (below the Bottom Quartile value of a given indicator). The results of this analysis are presented in Section 3.3 *Detailed Comparative Benchmarking Results*.

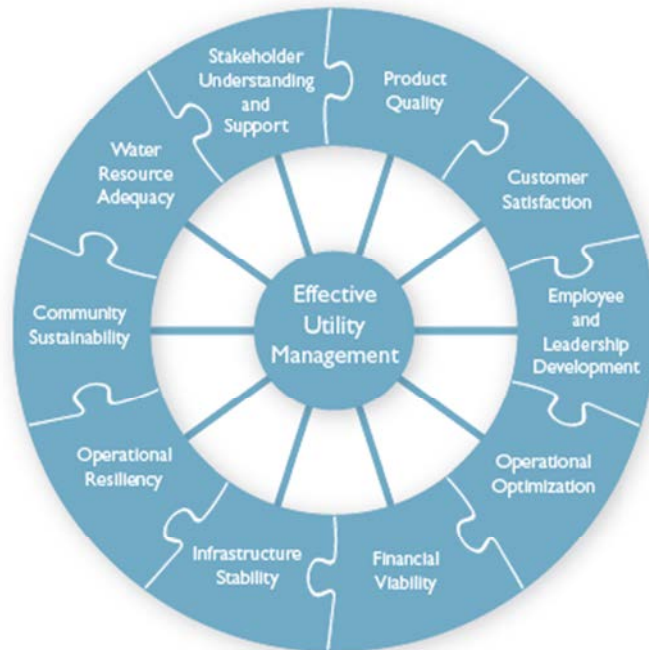
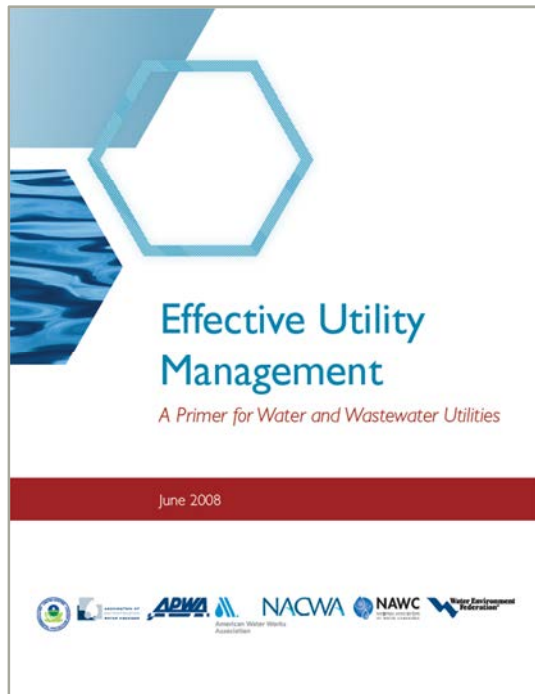
In order to organize the assessment UWNY's performance within an accepted framework, each of the indicators was assigned to one of the ten attributes<sup>9</sup> of Effective Utility Management (EUM) found in the EUM Primer that was jointly developed by the U.S. Environmental Protection Agency, AWWA, Association of Metropolitan Water Agencies, National Association of Water Companies, National Association of Clean Water Agencies, and the American Public Works Association. These major water and wastewater utility associations developed principles and strategies to identify, encourage, and recognize excellence in water and wastewater utility management. Utility advisors also served to support the development of the EUM.<sup>10</sup> The EUM Attributes serve as framework for process improvements, performance management, and strategy. This framework is recognized by the industry as representing best practices and UWNY management is familiar with it as a tool. The framework is multi-faceted in its uses, and is also used to assess UWNY's performance management system.

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<sup>9</sup> Where possible, the indicators were included in the Attribute categories as assigned by AWWA and the Water Research Foundation *Enhancement of QualServe Tools to Improve Utility Operations* (AWWA, Water Research Foundation, Project #4110, 2009). In some instances, however, indicators were moved to a different Attribute if it aided in facilitating the assessment or provided for a more thorough assessment. In these instances, the discrepancy is noted.

<sup>10</sup> For more information, please see the Effective Utility Management Primer, [http://water.epa.gov/scitech/wastetech/upload/tools\\_si\\_watereum\\_primerforeffectiveutilities.pdf](http://water.epa.gov/scitech/wastetech/upload/tools_si_watereum_primerforeffectiveutilities.pdf)

## EUM Primer and 10 Attributes of Effective Utility Management



Performance across each Attribute category as a whole is summarized in *Section 3.2 Findings*. For each Attribute those indicators with the biggest performance differences from the median and those with the largest potential opportunity for improvement or impact on the customer are presented graphically. Where relevant discrepancies in regional performance or performance by utilities by population size served exist as compared to national performance data, those results are also presented graphically.

### 3.2 Findings

The following sections document UWNY's performance under the EUM Attributes as compared to general industry trends reflected in AWWA's survey results. Because utility performance can be affected by both the geographic area of operation and the size of the population served, HDR compared the statistics to three benchmarks:

- Water utilities nationally (33 total);
- Water utilities in the Northeast, which encompasses Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont (seven total, with information supplemented by combined utility respondent aggregate data); and
- Water utilities serving populations of 100,001 to 500,000 people (53 total, with information supplemented by combined utility respondent aggregate data).

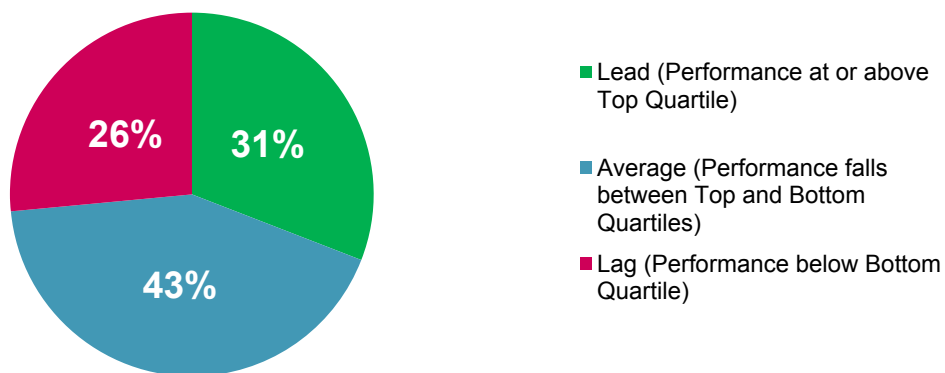
These comparisons are provided in the aggregate and also broken down by Top Quartile, Median, and Bottom Quartile.

### 3.2.1 Overall Health

#### Summary

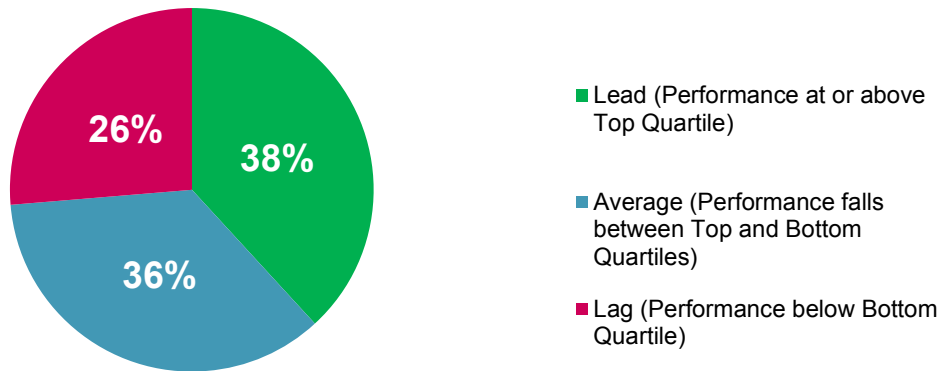
Overall Health is not one of the ten Attributes described in the Effective Utility Management Primer. However, for the purposes of this Rapid Assessment, certain indicators are included under this heading to provide a snapshot of UWNY overall. The summary charts show UWNY in comparison to aggregated data across all 68 indicators, where “Lead” represents a UWNY response at or above the top quartile figure, “Average” represents a UWNY response between the bottom and top quartile, and “Lag” represents a UWNY response at or below the bottom quartile figure. In all three comparisons, UWNY indicators lead more than lag its peers, and the majority of its indicators are within the middle range of responses, indicating that UWNY is generally performing in line with or better than its peers nationally, in the Northeast, and within the same population size served. These charts do not, however, assign a weight or relative importance to any of the 68 indicators, nor do they assess relative proximity to each quartile figure. As such each Attribute section provides further granularity in performance.

**UWNY Performance Compared to National Performance**

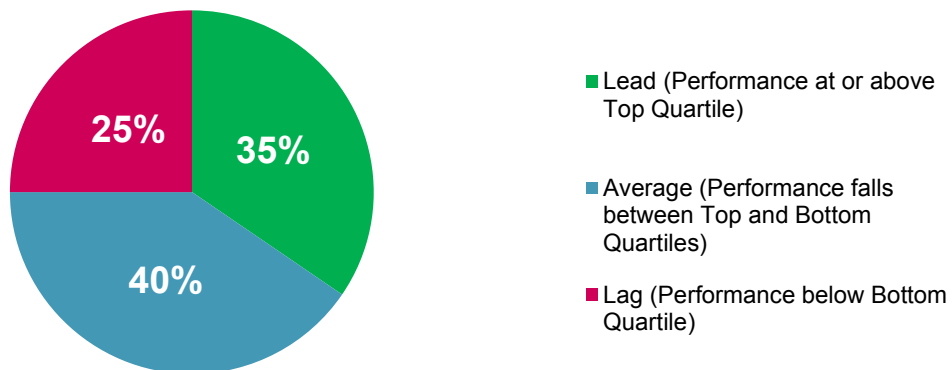




### UWNY Performance Compared to Regional Performance



### UWNY Performance Compared to Large System Performance



In addition the indicator Organizational Best Practices Index<sup>11</sup> provides a self-assessment across several functions that relate to the different EUM Attribute categories. The functions are: strategic planning, long-term financial planning, risk management planning, performance management system, optimized asset management program, customer involvement program, governing body transparency and accountability, drought response/water shortage contingency plan, source water protection plan, succession planning, and continuous improvement program. In most functions, UWNY is performing at or above average, particularly in performance measurement and continuous improvement, with two notable exceptions.

#### Notable Outliers

In both accountability and transparency and source water protection UWNY assessed each activity as “implemented, but room for significant improvement” as compared to all industry peers, who ranked themselves as “fully to largely implemented”. It should be

<sup>11</sup> AWWA and the Water Research Foundation *Enhancement of QualServe Tools to Improve Utility Operations* Attribute Employee and Leadership Development.

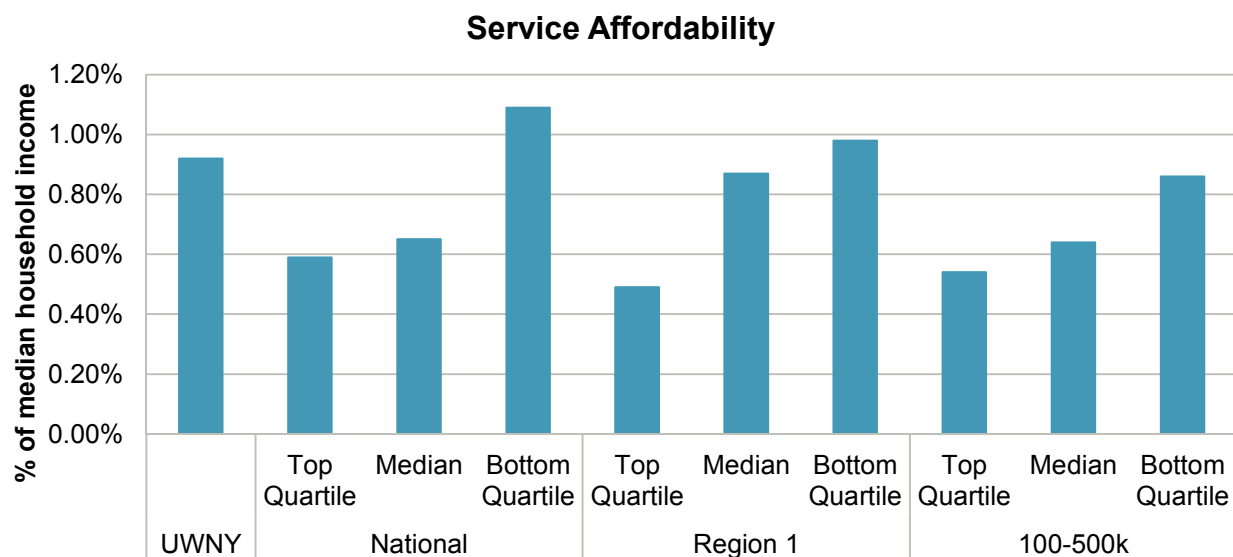
noted that most peers participating in the survey are public entities with different disclosure and transparency requirements than UWNY.

### 3.2.2 Attribute: Community Sustainability

#### Summary

Sustainability typically encompasses a wide variety of topics. This assessment utilizes an index based off of self-reported performance in various categories contributing to Triple-Bottom-Line (TBL) decision-making. Performance is rated from little to no compliance to some evidence of compliance to full compliance. Categories include commitment to environmental, social, and economic goals and communication of such goals and targets, use of policies, management systems, and processes to achieve TBL goals and objectives, consideration for the environment and natural resources in utility planning and operations, and measurements of greenhouse gas emissions or carbon footprint and energy consumption efficiency. UWNY’s self-reported performance is at or above average nationally and in comparison to regional and population peers.

This attribute also assesses service affordability as measured by the average annual water bill as a percent of median annual household income for the population served. Across all peer comparisons, UWNY is performing below average, indicating a higher than average annual bill as a percent of median income. However, we note that income is not related to overall cost of living, which may be higher in the region for both utilities and customers. Normalizing by cost of living would require a comparison of average rental income, monthly electric bills, and like measures for each service area. Additionally, as is described in Section 3.2.10 *Attribute: Stakeholder Understanding and Support*, property taxes represent approximately 40% of the average UWNY bill. A comparison of rates with non-utility costs removed was not possible in this assessment.



### 3.2.3 Attribute: Customer Satisfaction

#### Summary

Customer Service includes customer complaints, customer service delivery (billing, call center indicators), and customer satisfaction. UWNY ranks above average on call center performance, indicating that interactions with customers on the phone are efficient. They perform below average on complaints and customer service spending efficiency.

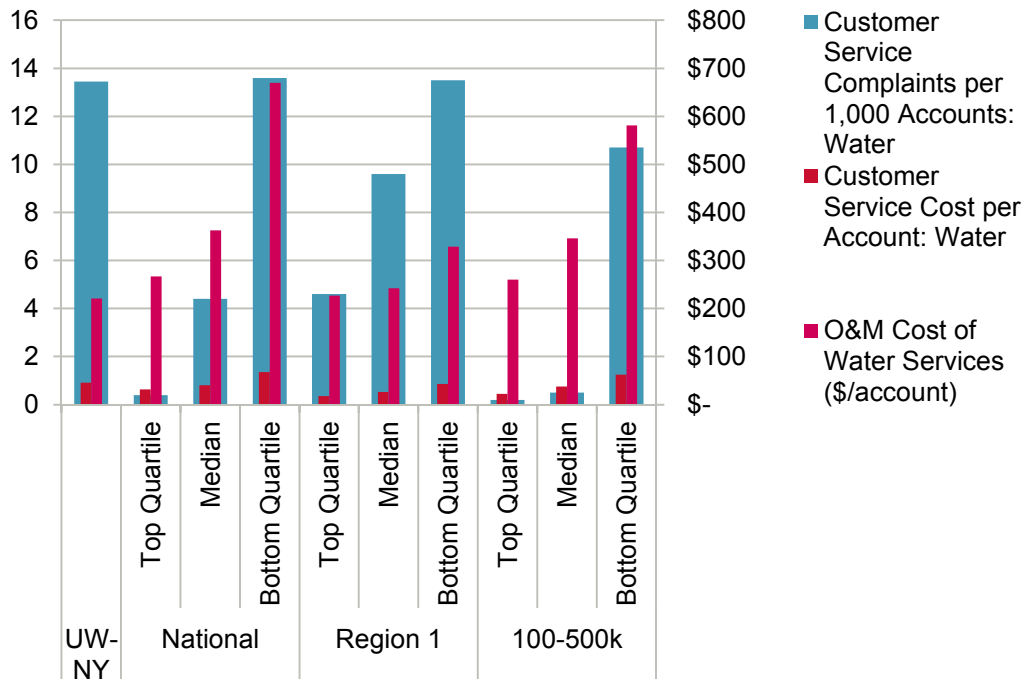
#### Notable Outliers

UWNY ranks in the bottom quartile for customer service complaints suggesting that while it is efficient in service delivery, in some cases it may not be as effective as its peers. Further, UWNY's cost spent on customer service<sup>12</sup> specifically is slightly higher than average. Customer service costs include new account activation, meter activities, billing and payments, collections and bankruptcy, complaint management, and outreach and education. Because the nature of customer complaints is not captured in this analysis (e.g. water quality, service interruptions, billing errors, etc.) a direct comparison of spending rates and complaints cannot be made. O&M spending per customer account is lower than average, and is described further in *Section 3.2.7 Attribute: Operational Optimization*; it is graphed here to show the possibility of the impact of O&M activities and spending rates on service and complaints. Further assessment into specific customer services functions may yield opportunities to drive down costs and/or rates of customer complaints.

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<sup>12</sup> AWWA and the Water Research Foundation, *Enhancement of QualServe Tools to Improve Utility Operations*, Attribute: Operational Optimization.

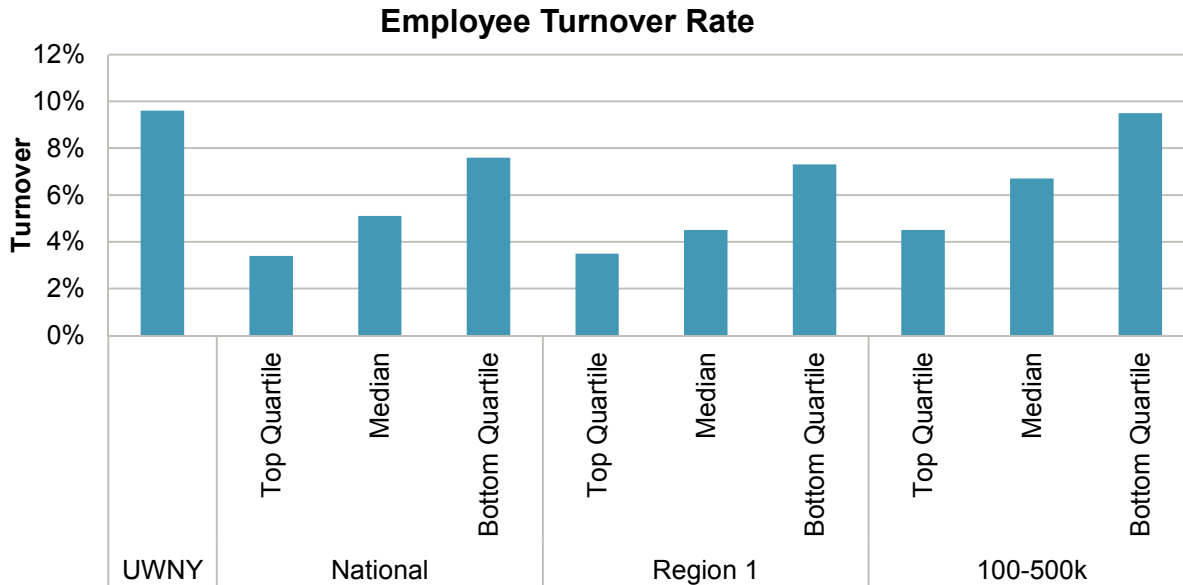
### Complaints Compared Spending



### 3.2.4 Attribute: Employee and Leadership Development

#### Summary

There are three empirical measurements to gauge this attribute: retirement eligibility, employee turnover, and training hours per employee. Additionally, succession planning, included under Overall Health, is a related self-assessed indicator. UWN-Y training rates are in line with or slightly higher than its peers. Retirement eligibility and succession planning are above average. Turnover rates are approximately 20 to 30 percent higher than average.



### 3.2.5 Attribute: Financial Viability

#### Summary

Indicators of financial viability include measurements to assess both short- and long-term financial health and include such measures as return on assets, debt service coverage, cash reserves, and operating ratio. An accurate comparison of financial viability is difficult because UWNY is a private utility, while many of the participants that represent the aggregated comparison data are public and so adhere to different financial requirements. However, in most instances UWNY has comparable debt and operating ratios, rates of return on assets, and debt service coverage. See *Section 3.3 Detailed Comparative Benchmarking Results* for additional details. A comparison of another common indicator of Financial Viabilities, available cash reserves, was omitted due to the existing financial structure between UWNY and its corporate parent, which did not allow for an accurate comparison of UWNY cash reserves with aggregate utility data using the available information.

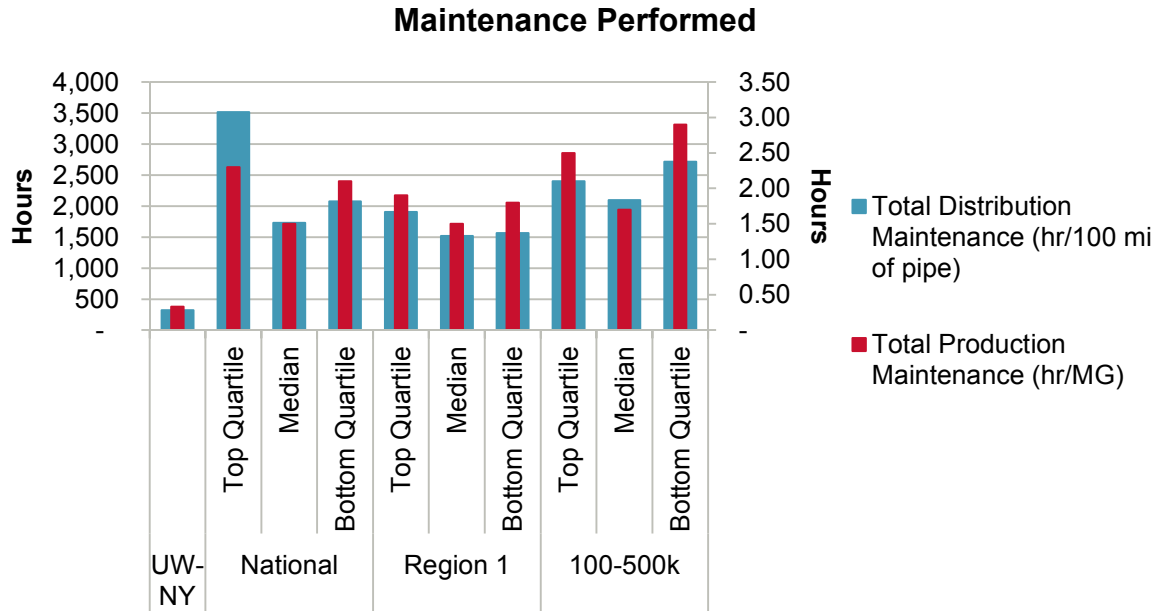
HDR understands that UWNY is undertaking a separate audit of inter-company, parent-sub charges, so this Rapid Assessment primarily focuses on operations activities.

### 3.2.6 Attribute: Infrastructure Stability

#### Summary

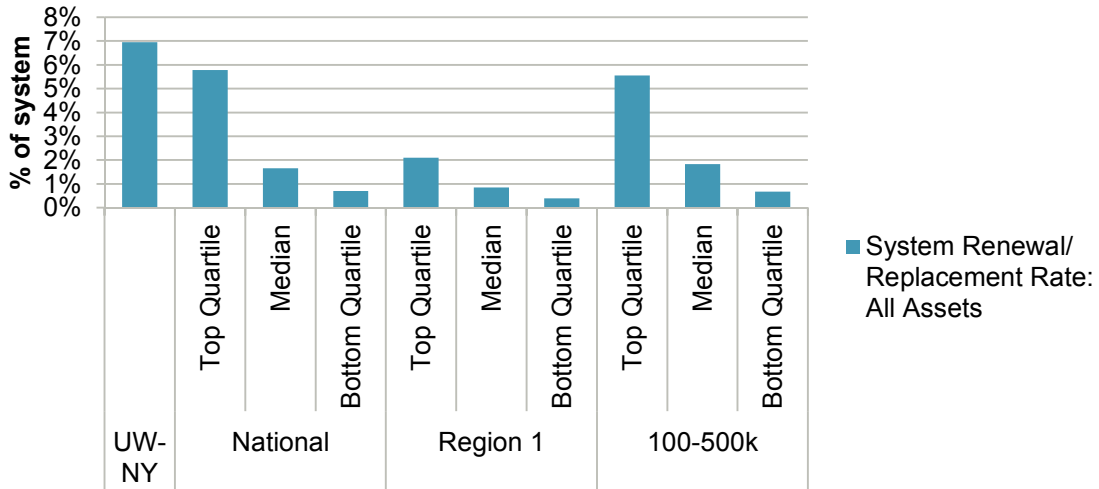
Infrastructure stability can be measured by rates of system renewal and replacement, distribution system integrity (leaks and breaks), and maintenance activities. Generally, UWNY is performing well ahead of other utilities in renewal and replacement rates for water supply, treatment, pump station, and transmission and distribution assets.

Generally, the total hours of maintenance performed by UWNY to its assets is low; given its replacement rates, this suggests that UWNY is efficient in performing renewal and replacement activities when looking at labor hours, and that much of its infrastructure maintenance costs are capitalized as renewal and replacement.<sup>13</sup> Planned (preventative and predictive) maintenance (PM) as a percent of total maintenance is above average, which suggests that asset management planning is an integral part of maintenance activities.

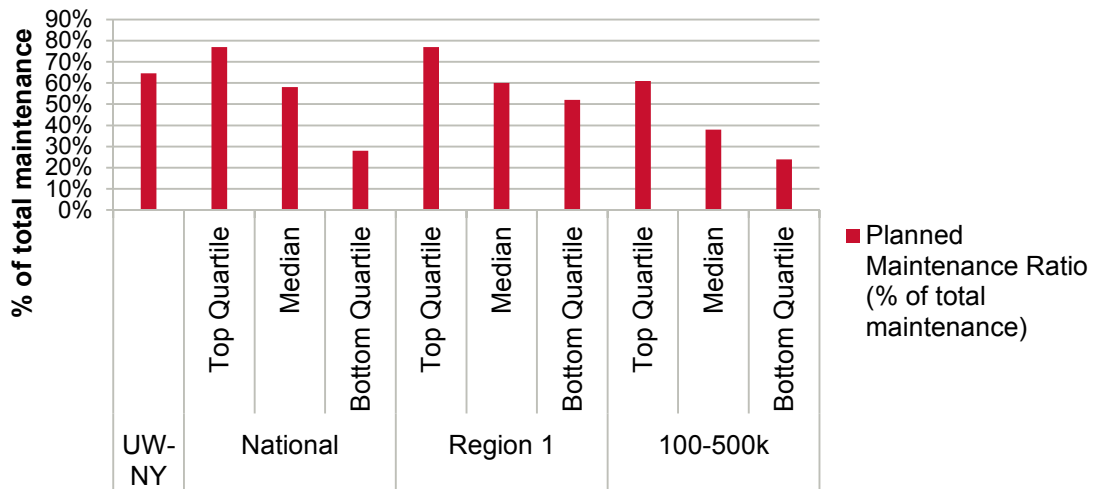


<sup>13</sup> Total Maintenance (hr/100 mi of pipe) is not an indicator included in the AWWA *Benchmarking Performance Indicators for Water and Wastewater: 2013 Survey Data and Analyses Report*. It was derived by summing the hours of Corrective Maintenance (hr/100 mi of pipe) and Planned Maintenance (hr/100 mi of pipe) aggregated data. Performance is inversely rated for Corrective Maintenance (lower hours results in higher performance) and positively rated for Planned Maintenance (higher hours result in high performance). Therefore, a positive or negative rating using top, median, and bottom quartiles is not applicable. However, for the purpose of this graph, the sum of maintenance hours is shown as such to more easily compare to related indicators.

### System Renewal/ Replacement Rate



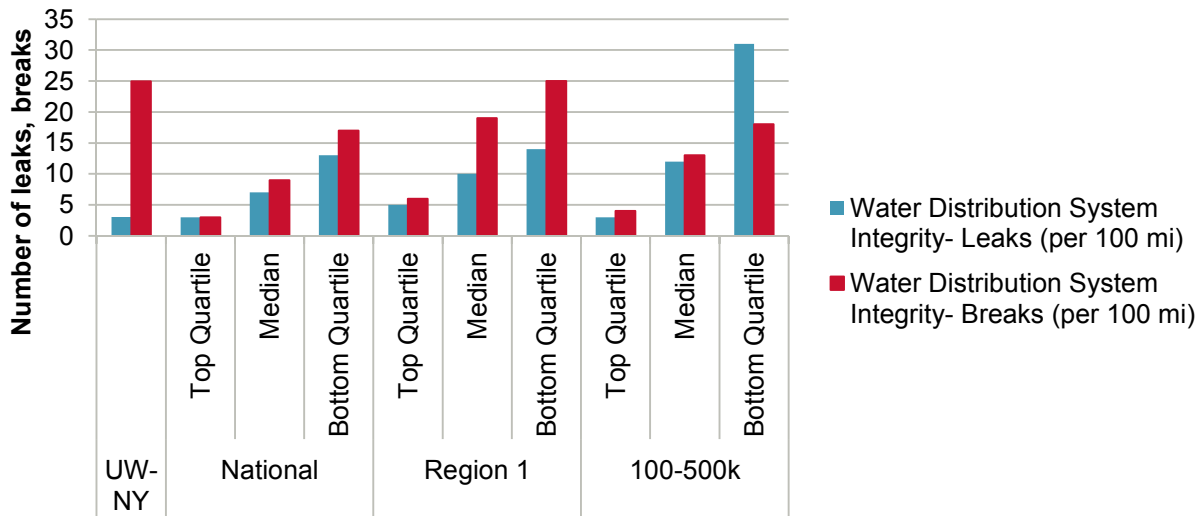
### Planned Maintenance Ratio (% of total maintenance)



### Regional or Population Differences

Although UWNYS rate of breaks per 100 miles of pipe is high when compared to national and population averages, when compared to its peers in the Northeast, UWNYS is performing only slightly below average. Its leak rate is below average across national, regional, and population comparisons. This is consistent with climate impacts on infrastructure. Further assessment into the relationship between amount of planned maintenance performed and breaks may lead to opportunities for improvements in this area. A comparison of infrastructure age and material type was not included in this assessment.

### Infrastructure Integrity

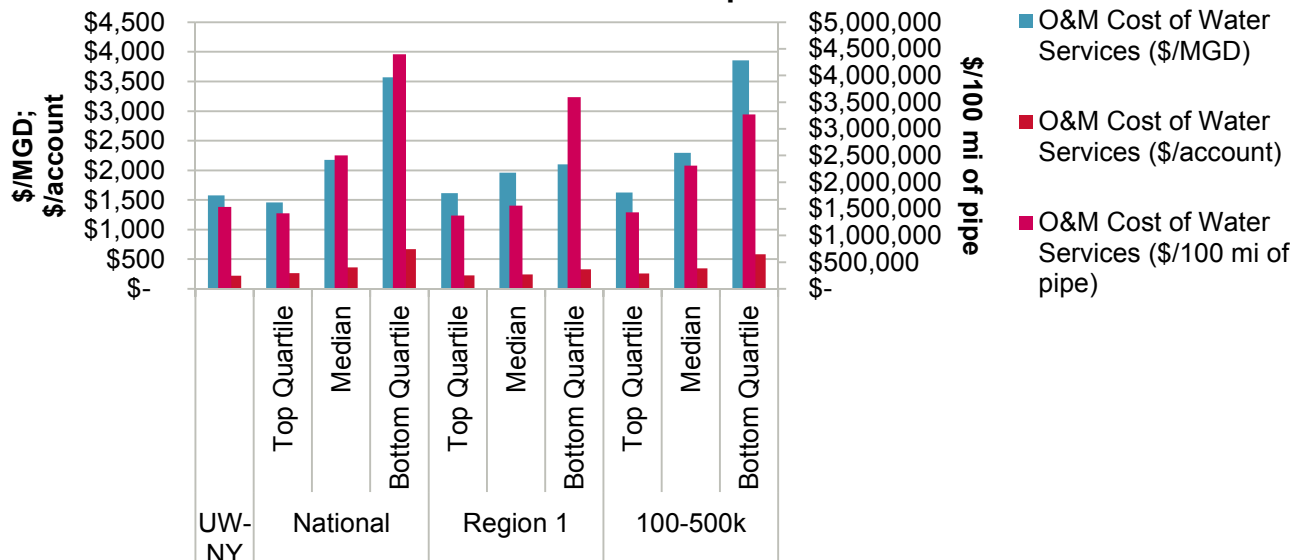


### 3.2.7 Attribute: Operational Optimization

#### Summary

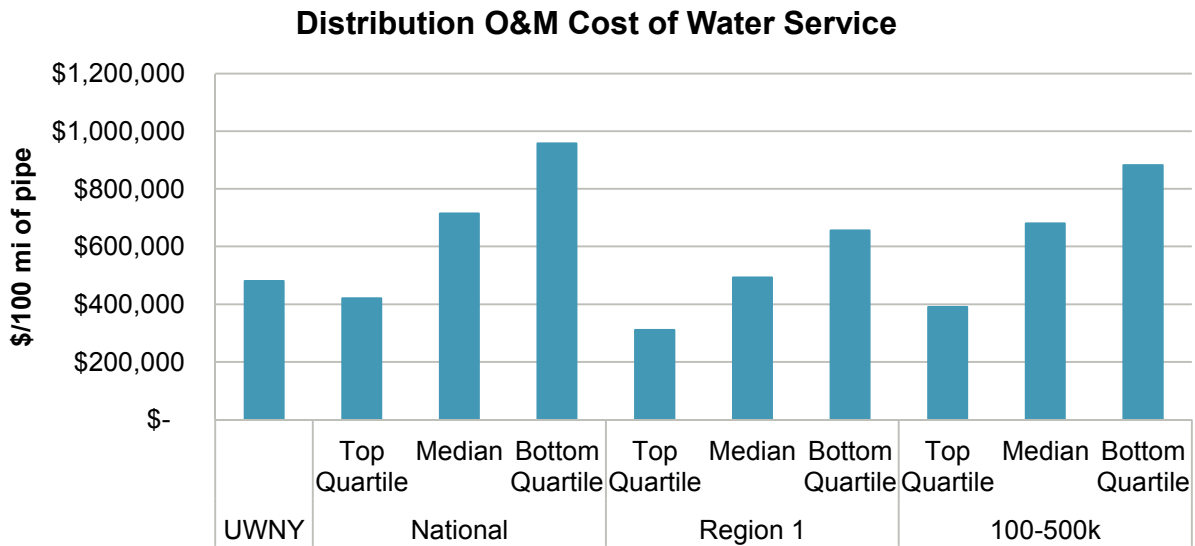
Operational optimization consists of effective and efficient use of labor and materials. Water management efficiency such as water loss and meter function is sometimes considered; this is addressed in Section 2.2 *Trend Analysis* as an assessment of UWNY’s performance over time. Overall operations and maintenance (O&M) expenditures are at or below average for all indicators, which have been normalized using several factors including cost per account, cost per millions of gallons per day (MGD), and cost per 100 miles of pipe.

### Normalized O&M Expenditures

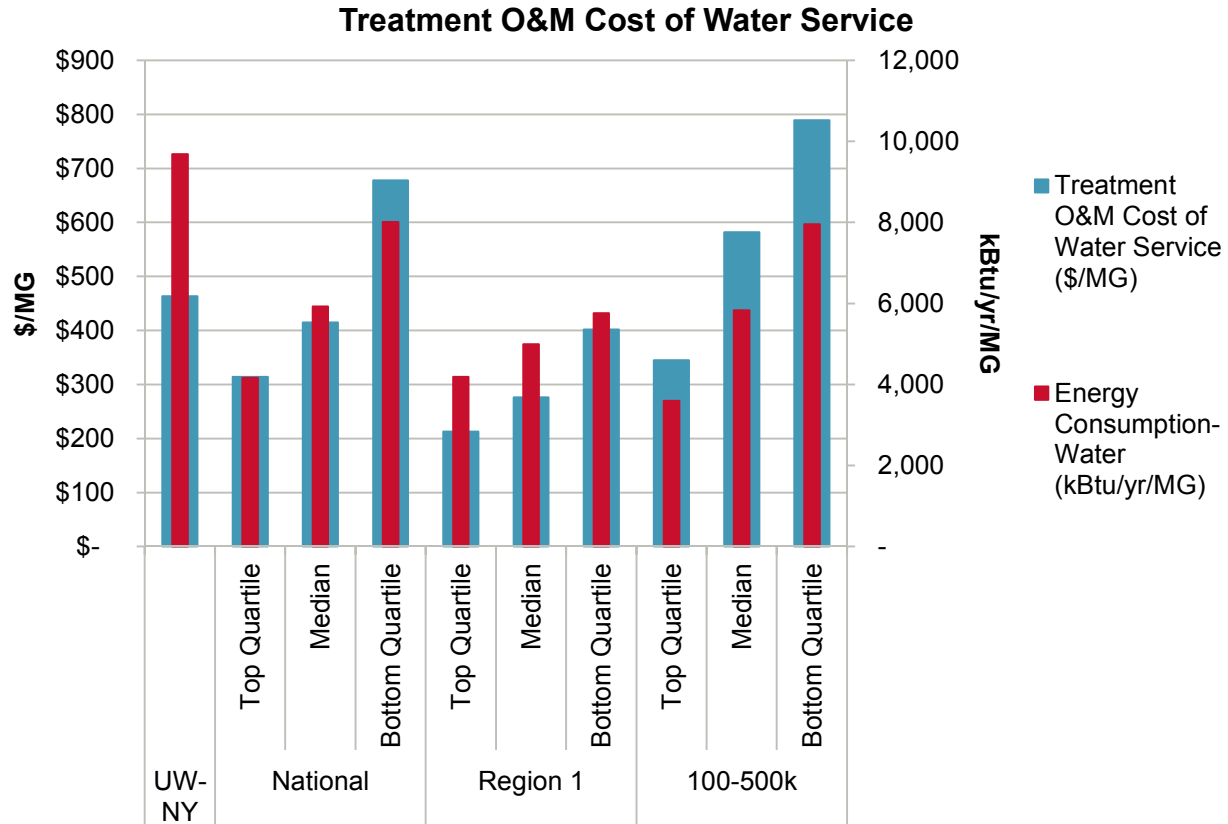




By function, UWNY’s costs for distribution are below average while treatment costs are slightly higher than average. Energy consumption rates<sup>14</sup> are also higher, which is notable as they may be a driver of higher overall treatment costs. Because this holds true for comparisons to utilities in UWNY’s region and serving a similar population size, it is unlikely that disparate power prices are a primary factor. Further assessment is required to determine the exact cause of higher than average treatment costs (including whether energy consumption rates are the driver) and reasons for the higher than average energy consumption rates; such an assessment may identify operational improvements in treatment to reduce cost.



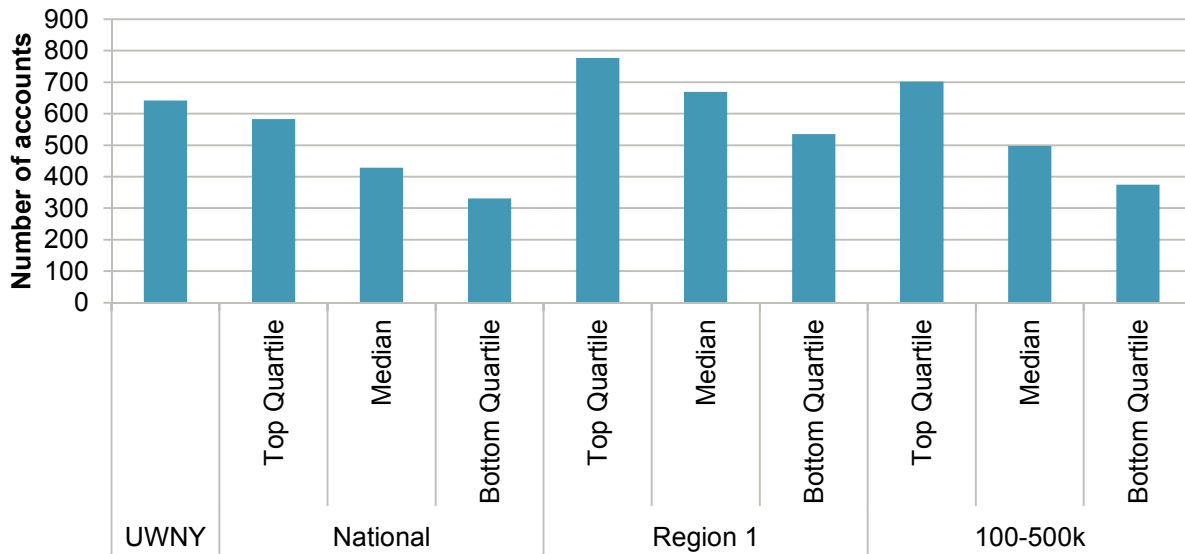
<sup>14</sup> AWWA and the Water Research Foundation *Enhancement of QualServe Tools to Improve Utility Operations* Attribute Community Sustainability.



#### Notable Outliers

UWNY has a very high ratio of customer accounts per employee. This suggests that across all functions, UWNY is operating efficiently as compared to its peers. However, because this is a measure of efficiency and does not speak to the effectiveness or quality of service delivery, other indicators should be considered, including customer complaints rates, compliance, and service interruptions. These are described further in Sections 3.2.3 *Attribute: Customer Service* and 3.2.9 *Attribute: Product Quality*.

### Customer Accounts per Employee



### 3.2.8 Attribute: Operational Resiliency

#### Summary

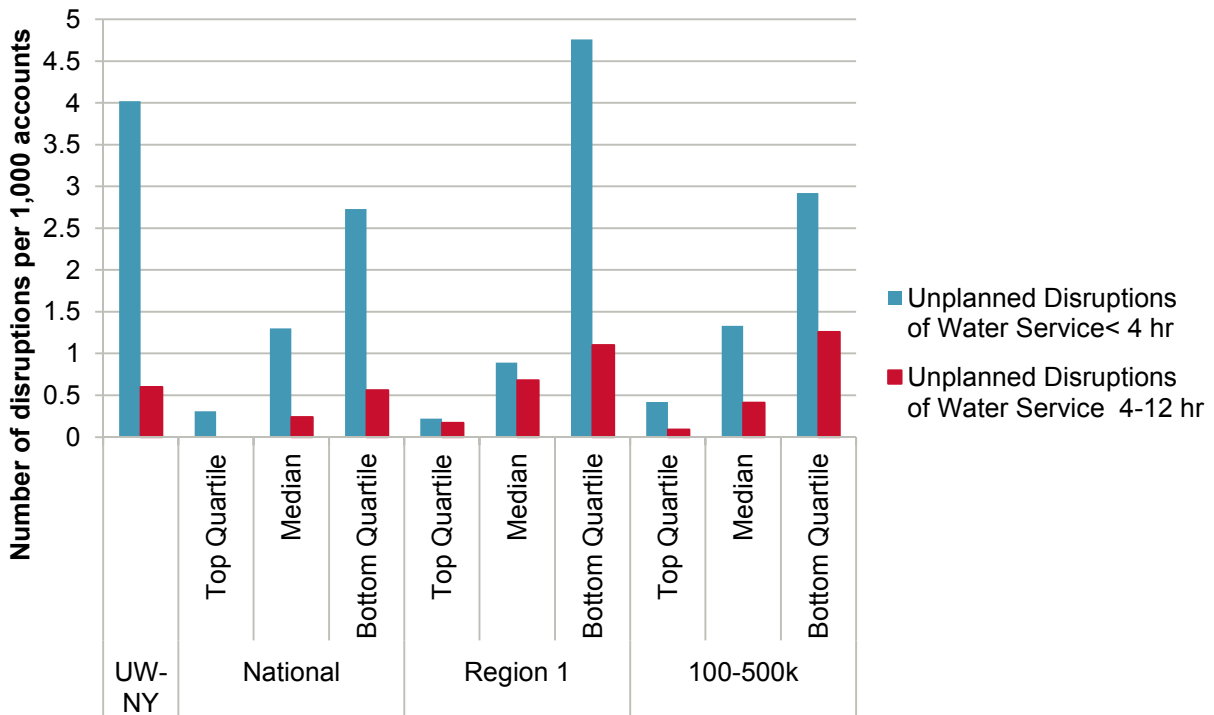
For the purposes of this assessment, this attribute is measured by formal hours of training per employee in emergency response readiness. It is supported by measures of Overall Health, including risk management planning, drought response/water shortage contingency planning, and source water protection, which are self-assessed. In all measures, UWNY is at or above the median except in source water protection planning, for which UWNY ranked itself as “implementing with room for substantial improvement.” Utilities nationally, regionally, and by population self-assessed as largely “implementing with room for improvement” or better.

### 3.2.9 Attribute: Product Quality

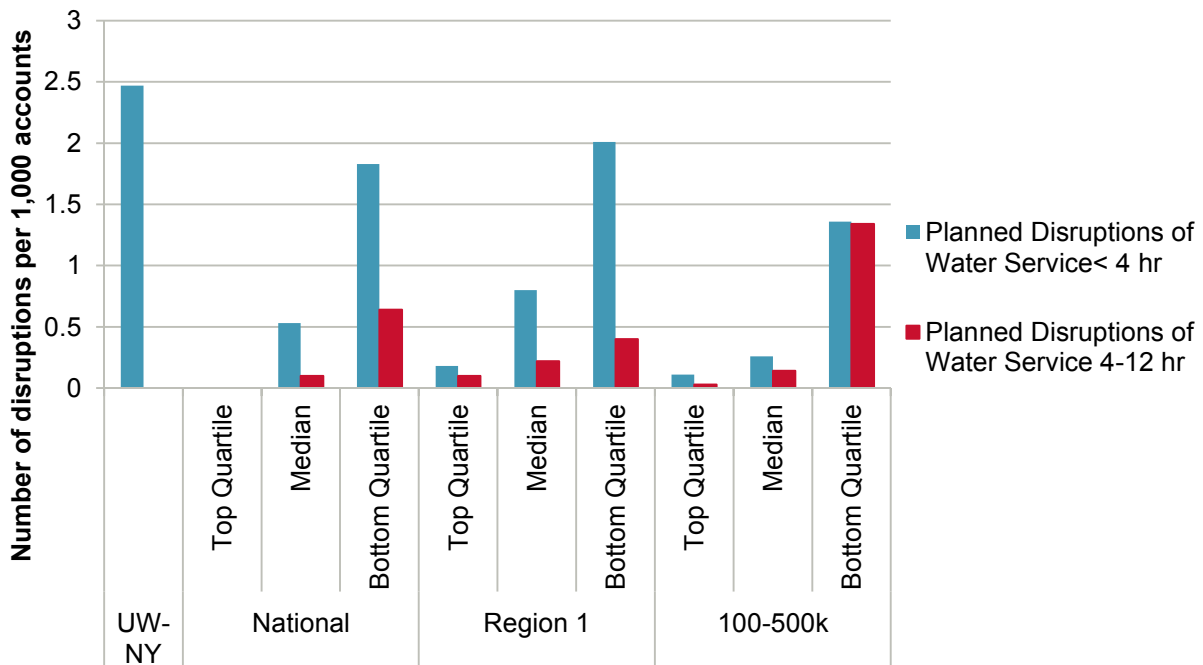
#### Summary

The “product” in this assessment is both water as a physical good, and its distribution (delivery). This is measured by rate of compliance with all health-related drinking water standards required by the utility’s primary regulator (because of this, regional comparisons are of primary relevance). Service delivery is measured by instances (number) of disruptions (planned and unplanned) as well as time to address unplanned disruptions. UWNY has higher than average rates of unplanned disruptions, although its time to address such disruptions is faster than average. This may be affected by climate and location, and is described further below. Its rates of planned disruptions lasting less than four hours are within the bottom quartile, however it performs comparable to other utilities for planned disruptions lasting from four to 12 hours, indicating that when disruptions to service are required, they are performed as efficiently as industry average. Unplanned and planned disruptions lasting more than 12 hours are measured as an indicator, but very few utilities report a measurable number of disruptions of such a long duration (UWNY has none), so it has been excluded.

**Unplanned Service Disruption Frequency Index**



### Planned Service Disruption Frequency Index



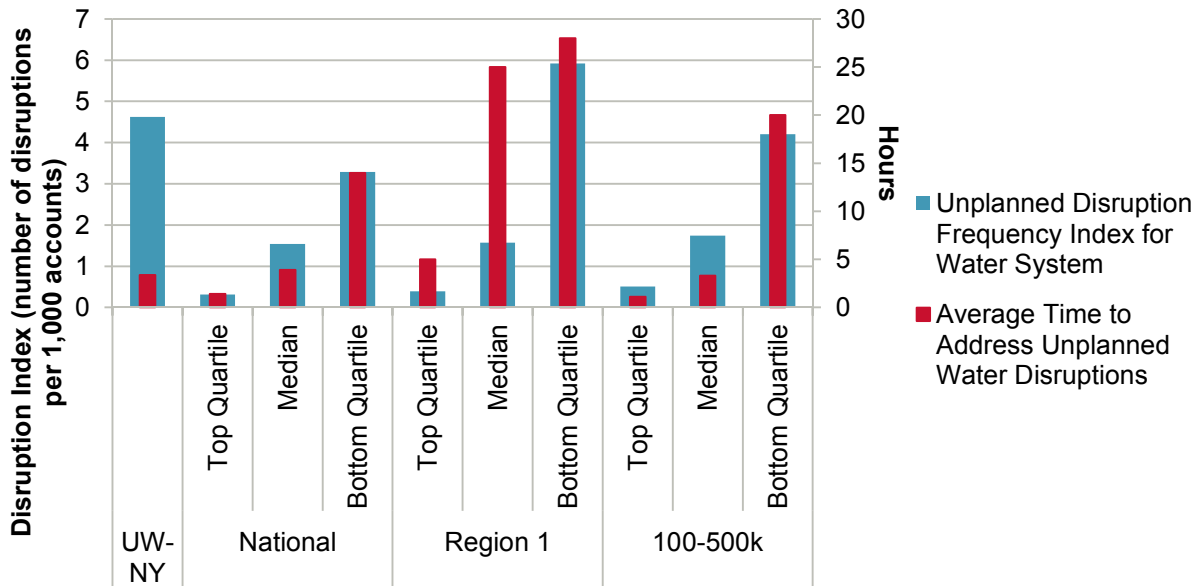
UWNY’s high rates of service disruption are in line with their high rates of renewal and replacement, as well as main breaks as described under Infrastructure Stability. Again, further analysis of maintenance rates and practices together with asset management planning may yield opportunities for improvement.

UWNY reported a regulatory compliance rate of 99.73%, while aggregate data for all utilities across all regions and population sizes report at 100% compliance. This discrepancy is considered statistically insignificant due to the aggregation of information and rounding disparities.

#### Notable Regional or Population Differences

As described above, UWNY performs in the bottom quartile for average unplanned service disruptions when compared to utilities nationally and of a similar population size. However, when compared to utilities operating in the Northeast, it is performing only slightly below average, likely reflecting the affect of cold winters on line breaks. UWNY is performing better than average in its time to address such disruptions.

### Unplanned Disruption Frequency and Resolution



### 3.2.10 Attribute: Stakeholder Understanding and Support

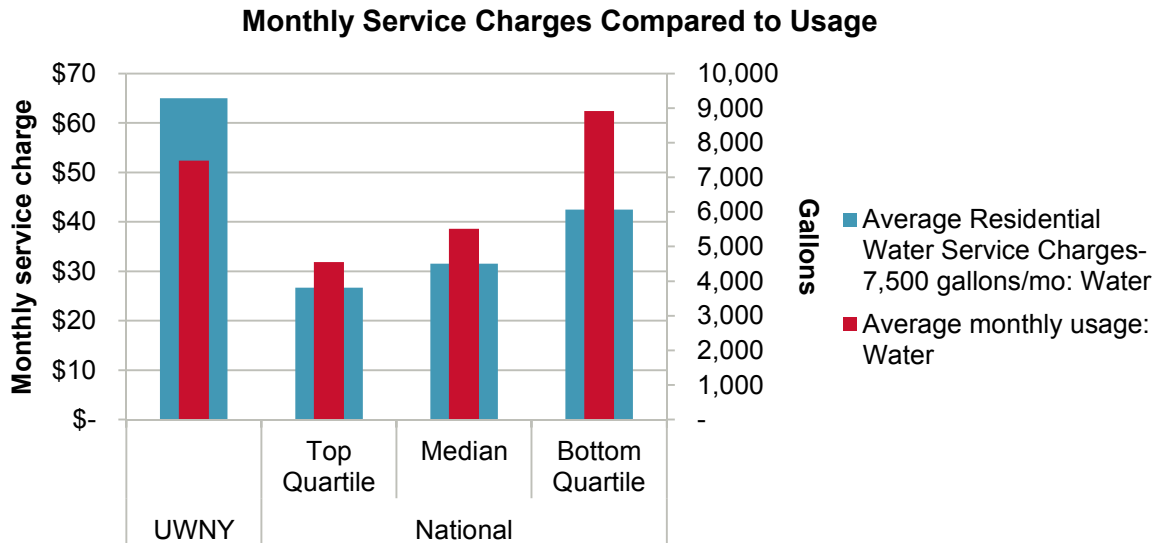
#### Summary

For the purposes of this comparison, this attribute is measured by two types of indicators. A self-assessment indicator gauges stakeholder outreach. This index is based on topics including customer satisfaction surveys, engagement with key stakeholders such as public officials, regulators, special interest groups, and developers and contractors, diversity of communication channels and outreach programs/products, and review and use of stakeholder feedback. Additionally as part of the Overall Health assessment, each utility self-assesses its Customer Involvement Program. In both, UWNY is performing above average. The residential water service charge is also included here; UWNY falls well in the bottom quartile for this indicator, however this does not account for non-utility costs that are included in the water service charge. It is highly probable that property and other taxes included in the water service charge are driving down UWNY’s performance on this indicator, which is further described below.

#### Notable Outliers

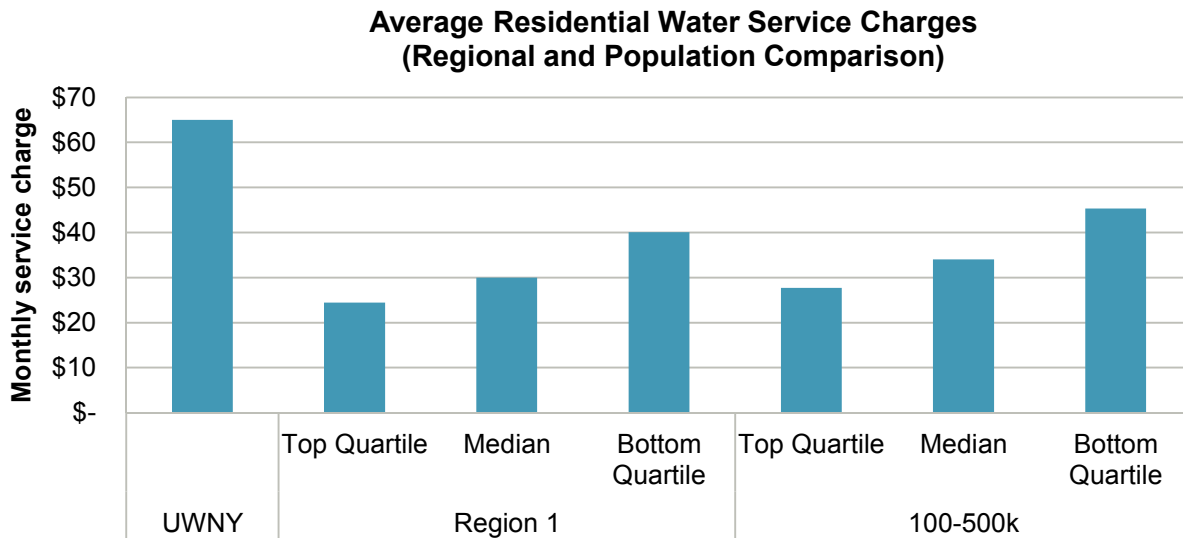
As described, an assessment of rates charged to residential customers shows UWNY rates as being much higher than its peers. Results have been normalized based on actual water consumed. While UWNY’s monthly consumption rates fall above the bottom quartile and below the median (where higher consumption is inversely related to performance), monthly service charges by volume are higher than those in the bottom quartile by 53%. Recently, utilities have faced declining revenues as customers consume less water, which has resulted in escalating rates to cover the costs of

maintaining infrastructure (fixed costs). Still, nationally, those utilities with the lowest consumption rates have the lowest monthly bills.



### Regional or Population Differences

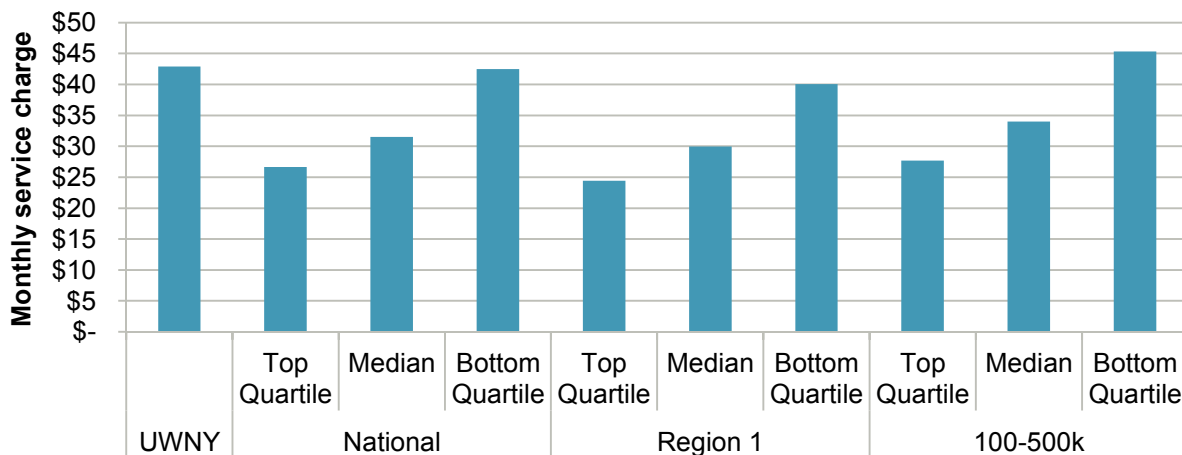
UWNY also has higher monthly service charges (normalized by volume of 7,500 gallons per month) when compared to utilities regionally and with a comparable population size, by 62% and 43% respectively.



Certain of UWNY's costs – including normalized customer service costs (3.2.2 *Attribute: Customer* and O&M costs (Section 3.2.7 *Attribute: Operational Optimization*) – are below average on a normalized per account basis, leaving little room for likely improvements. However, components of UWNY's current water service charge cover

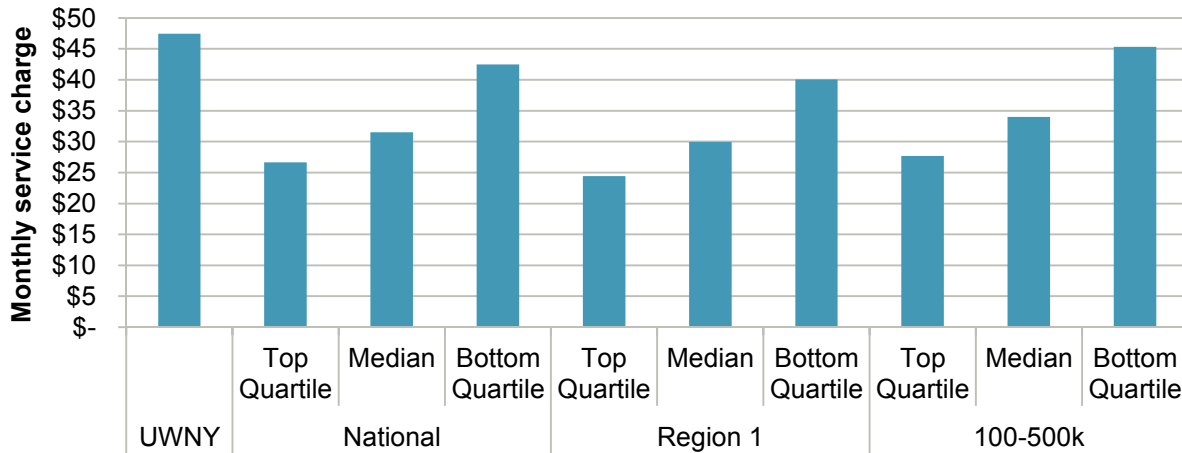
costs that are not a direct result of utility operating expenditures, and are therefore beyond UWNYS control. Specifically, approximately 40% of the current water service charge covers income and other taxes. Because the data used in the comparison is submitted by utilities confidentially and is subsequently aggregated, it is not possible to compare rates across utilities with all taxes removed. The following comparison shows UWNYS water service charges compared to aggregate data with (1) all taxes removed, and (2) all taxes other than income taxes removed for UWNYS rates only. In this comparison, UWNYS rates are one percent higher than the bottom quartile value nationally, seven percent higher than the bottom quartile value regionally, and within the bottom quartile by population served. A more thorough review of all financial data, including capital costs, taxes, and other expenses, would be necessary to target areas for further investigation and improvement. Those topics are beyond the scope of this Rapid Assessment.

**Average Residential Water Service Charges - all taxes excluded from UWNYS rates**





### Average Residential Water Service Charges - all non-income taxes excluded from UWNY rates

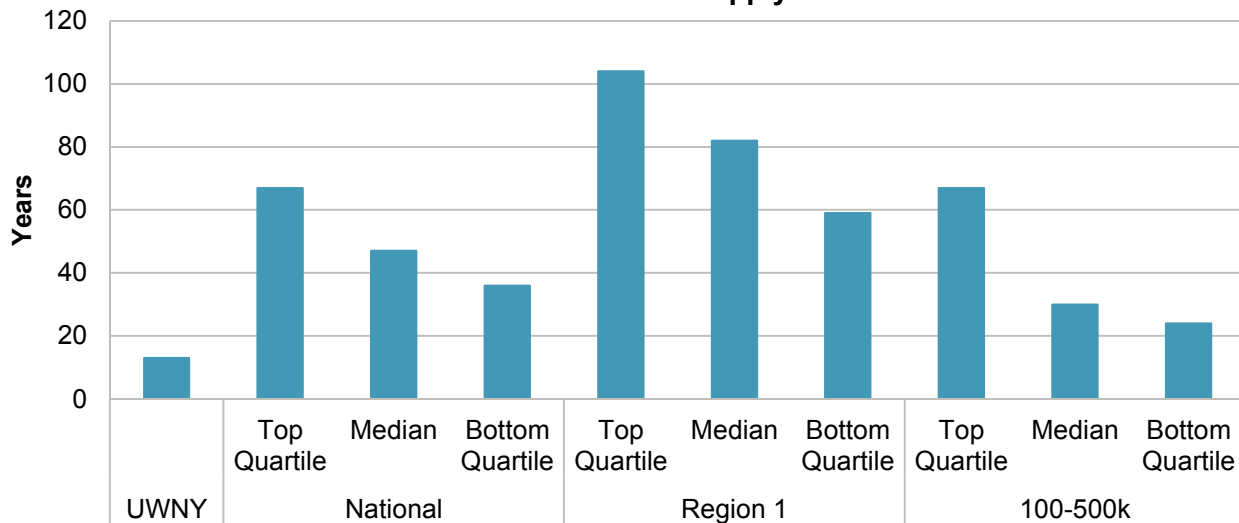


### 3.2.11 Attribute: Water Resource Adequacy

#### Summary

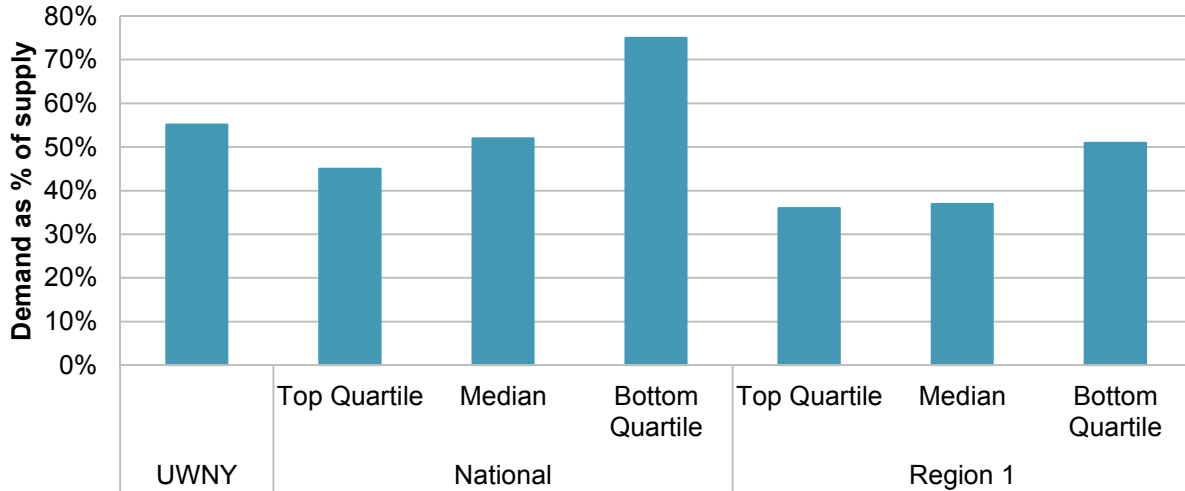
Water Resource Adequacy can be indicated by adequacy of supply and supply-demand management. Available water supply is measured by the estimated years until demand exceeds supply. UWNY's supply adequacy is currently ranked in the bottom quartile across all peer comparisons, indicating that this should be a planning priority.

### Available Water Supply



Successful supply-demand management can be indicated by annual water demand (five-year average) as a percent of average annual available water supplies (current yields). UWNY is performing near the average for this indicator when compared nationally and below the average when compared regionally.

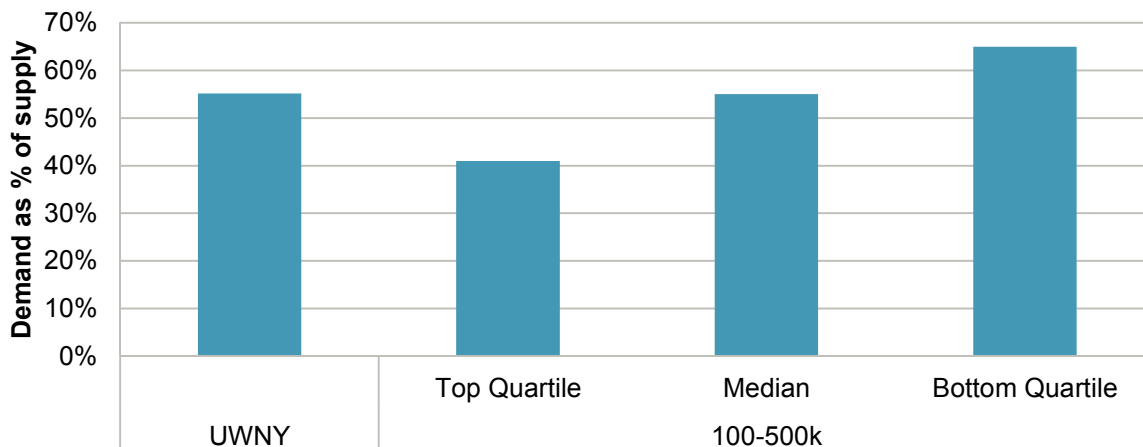
### Supply / Demand Balance



### Notable Regional or Population Differences

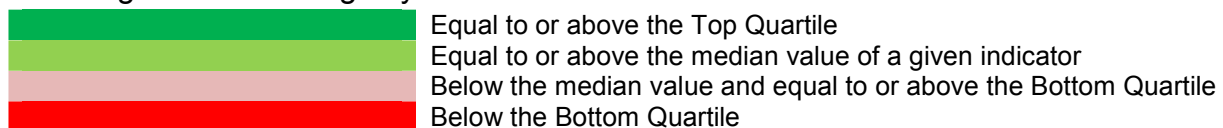
Compared to similarly sized utilities, UWNY supply-demand management is above average, which may indicate that the ability to manage supply is affected by population size, due to increased storage capacity needs.

### Current Water Demand by Population Served



## 3.3 Detailed Comparative Benchmarking Results

The following table presents the results of the analysis for UWNY performance across all 68 indicators. The analysis is a heat map, used to illustrate the range of performance according to the following key:



EUM Attribute	Performance Indicator	UWNY	Comparison - National	Comparison - Northeast	Comparison - Population Size
Overall Health	Organizational Best Practices Index <sup>15</sup>	76%			
	Strategic Planning	4			
	Long-term Financial Planning	4			
	Risk Management Planning	4			
	Performance Measurement System	5			
	Optimized Asset Management Program	3			
	Customer Involvement Program	3			
	Governing Body Transparency and Accountability	3			
	Drought Response/Water Shortage Contingency Plan	4			
	Source Water Protection Plan	3			
	Succession Planning	4			
	Continuous Improvement Program	4			
Community Sustainability	Triple-Bottom-Line Index <sup>16</sup>	80%			
	Total per Capita Consumption: Water (gpcd) <sup>17</sup>	93.67			
	Service Affordability (%): Water	0.92%			
Customer Satisfaction	Customer Service Complaints per 1,000 Accounts: Water	13.45			
	Technical Service Complaints per 1,000 Accounts: Water	0.81			
	Call Center Indicators- Average call time (minutes): Water	4			
	Call Center Indicators - Average wait time (minutes): Water	1			
	Call Center Indicators- Abandoned call ratio: Water	8%			
	Customer Service Cost per Account: Water	\$45.36			
	Billing Accuracy: Water	17.38			
Employee Leadership and Development	Training Hours per Employee: Water	21.23			
	Employee Turnover Rate: Water	10%			
	Retirement Eligibility: Water	12%			
Financial Viability	Debt Ratio: Water ( <i>total liabilities divided by total assets</i> )	52%			
	Return on Assets: Water ( <i>net income divided by total assets</i> )	3%			
	Debt Service Coverage Ratio: Water ( <i>total operating revenue – total O&amp;M costs divided by total debt service</i> )	3.2			
	Operating Ratio: Water ( <i>total O&amp;M costs divided by total operating revenue</i> )	21%			
Infrastructure Stability	System Renewal/Replacement Rate: Water Supply	6%			
	System Renewal/Replacement Rate: Water Treatment	12%			
	System Renewal/Replacement Rate: Water Pump Stations	4%			
	System Renewal/Replacement Rate: Water T&D	6%			

<sup>15</sup> The Organizational Best Practice Index is based on a self-assessment of performance in the specific elements listed. The following point scale is used: 1 – Activity is not currently practiced; 2 – Activity is implemented but only occasionally or without uniformity; 3- Activity is implemented, but there is room for substantial improvement; 4 – Activity is largely implemented but there is room for improvement; 5 – Activity is fully implemented. The Index is found by taking the respondents total score when each element is added, divided by a perfect score of 5 for each element.

<sup>16</sup> The Triple-Bottom-Line Index is based on a self-assessment of performance in a variety of categories provided to the respondent. The respondent is asked to rate the evidence of each category using the following point scale: 0 – None or little; 1 – Some evidence; 2 – Full compliance. The Index is found by taking the respondents total score when each response is added, divided by a perfect score of 2 for each element.

<sup>17</sup> Includes wholesale consumption. Per capita consumption for residential customers is 54.73 gpcd, which is a very low consumption rate.

<b>EUM Attribute</b>	<b>Performance Indicator</b>	<b>UWNY</b>	<b>Comparison - National</b>	<b>Comparison - Northeast</b>	<b>Comparison - Population Size</b>
Infrastructure Stability	Water Distribution System Integrity- Leaks (per 100 mi)	3.05			
	Water Distribution System Integrity- Breaks (per 100 mi)	24.94			
	Planned Maintenance Ratio (% of total maintenance)	65%			
	Corrective Maintenance to Production (hr/MG)	0.12			
	Planned Maintenance to Production (hr/MG)	0.21			
	Corrective Maintenance to Distribution (hr/100 mi pipe)	114.32			
	Planned Maintenance to Distribution (hr/100 mi pipe)	208.09			
Operational Optimization	Customer Accounts per Employee: Water	641.7			
	Domestic per Capita Production (gcpd)	54.73			
	O&M Cost of Water Services (\$/account)	\$221.02			
	O&M Cost of Water Services (\$/MGD)	\$1,577.47			
	O&M Cost of Water Services (\$/100 mi of pipe)	\$1,539,032.76			
	Treatment O&M Cost of Water Service (\$/MG)	\$463.68			
	Distribution O&M Cost of Water Service (\$/100 mi of pipe)	\$480,119.94			
	MGD of Water Delivered per Employee	0.25			
	Energy Consumption- Water (kBtu/yr/MG)	9684.7			
Operational Resiliency	Emergency Response Readiness: Water	2.55			
Product Quality	Planned Disruptions of Water Service < 4 hr	2.47			
	Planned Disruptions of Water Service 4-12 hr	0			
	Planned Disruptions of Water Service > 12 hours	0			
	Unplanned Disruptions of Water Service < 4 hr	4.02			
	Unplanned Disruptions of Water Service 4-12 hr	0.6			
	Unplanned Disruptions of Water Service > 12 hr	0			
	Average Time to Address Unplanned Water Disruptions	3.36			
	System Average Disruption Frequency Index - Water	7.09			
	Planned Disruption Frequency Index for Water System	2.47			
	Unplanned Disruption Frequency Index for Water System	4.62			
Stakeholder Understanding and Support	Regulatory Compliance - Water (%)	99.73%			
	Stakeholder Outreach Index <sup>18</sup>	100%			
	Average Residential Water Service Charges-7,500 gallons/mo: Water	\$65.00			
	Average Residential Water Service Charges-average one month service: Water	\$64.93			
Water Resource Adequacy	Average monthly usage: Water	7,480			
	Current Water Demand (%)	55%			
	Available Water Supply (years)	13			

<sup>18</sup> The Stakeholder Outreach Index is based on a self-assessment of performance in a variety of categories provided to the respondent. The respondent is asked to rate the evidence of each category using a point scale tailored to each category. The Index is found by taking the respondents total score when each response is added, divided by a perfect score for each element.

## 4 Metrics Review

In addition to reviewing the trends of existing metrics and benchmarking against the AWWA survey, HDR undertook a high-level review of UWNY's business performance management system to determine:

- Whether there were any gaps under the EUM framework and in comparison to typical industry metrics;
- Whether the effectiveness in driving performance improvements and strategic direction might be improved; and
- Where there may be opportunities to increase the visualization, accessibility, and application of the key performance indicators via the reporting tool.

### 4.1 Existing Performance Metric Observations

The existing metrics were reviewed and the following observations were made in general and regarding certain metrics:

- In general, many of the KPI metrics in the report do not have year to date (YTD) values to effectively track long-term performance.
- In general, several of the KPI metrics in the report are missing corresponding charts to visualize the YTD trends versus plan.
- In general, planned overtime could be used to catch up on work order backlogs or training. For example, the meter department was experiencing some backlog and training deficiencies but was under their planned overtime allowance YTD. By using some more of the overtime allowance, the backlog and training plans could be achieved throughout the year.
- Customer service KPIs only contain items related to billing and do not currently track water service or maintenance issues including customer complaints.
- Water (product) quality, water audit, safety incident, and overall utility financial KPIs appear to be absent from the current report format. These are tracked separately by UWNY and are not included in the weekly KPI report.
- To-do items are auto-generated by the customer service system when there is a billing exception detected. It is unclear whether this process can be adjusted with auto scripting to improve the anomaly detection to fix false positives in the To-do items generation process. From time to time, the To-dos are cleared from the system so this KPI is not currently serving as a truly actionable management metric.

- In general, the KPI reports are not archived daily, weekly or monthly and are instead overwritten weekly with the updated reports. Availability of archives would allow for UWNY to go back and see a snapshot of utility performance at any time and trend performance over smaller time periods than year-to-year.
- UWNY currently prepares weekly operation reports using KPIs. The current KPI report is built in Microsoft Excel and is either actively linked to various data sources or includes manually entered data. From time to time, changes in spreadsheets (data formats, location references, formulas, etc.), either with the KPIs or their data sources, can break links and values in the summary sheets used to generate the KPI report.

## 4.2 Metric Gap Analysis

A review and gap analysis of metrics pertaining to all of the EUM attribute areas was completed and is summarized in the following sections. The goal of any performance metrics should be to provide useful information to drive key performance improvement decisions on a daily basis at the operational level and/or the long-term strategic direction of the utility. While UWNY's current list of KPIs is extensive and its review and improvement process highly involved, requiring the engagement of staff at many levels of the organization as described in Section 2.1 *Management System*, the majority of the included metrics pertain only to day-to-day operational decision-making, without any insight into higher-level performance that is tied into the strategic direction of the organization, or that allows for a comparison of industry indicators over time. Further, attention should be paid to external or "customer-facing" metrics that primarily track issues of customer concern. The following sections provide examples of sets of indicators that would represent a blend of indicators for the purposes of short-term operational and long-term strategic and customer-specific improvements.

Potential future metrics should not be added if they do not address either or both of these improvement areas. In the same way, existing metrics that do not provide value should be removed. This results in an efficient collection and summarization of only the key data necessary to operate the utility most efficiently. KPIs that are not useful for improving performance and are only for information purposes should be either removed completely from the report or moved to a separate report of general utility metrics. This would reduce the workload necessary to generate and track these less important metrics.

Two industry resources were utilized during the gap analysis of performance metrics: (1) Key Asset Data for Water and Wastewater Utilities<sup>19</sup> which includes a list of typical industry performance indicators for drinking water assets and (2) Enhancement of

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<sup>19</sup> AWWA, Water Research Foundation, Project #4187, 2012

QualServe Tools to Improve Utility Operations<sup>20</sup> which aligns typical industry performance indicators with EUM attribute areas. Priorities for specific EUM attribute areas were identified by UWNY during the project kickoff meeting using the EUM Self-Assessment process. These priority attribute areas are identified as such in the below sections. Example KPIs representing a blended selection of metrics organized by Attribute are also included at the end of this section.

#### **4.2.1 Community Sustainability (EUM Self-Assessment Priority)**

A demand response program at water treatment plants is in place for transitioning to off-grid power supply as requested by the power utility. UWNY receives payment for participation in the program.

Current annual average residential water use is low (approximately 55 gallons per capita daily). This is primarily due to new construction with low indoor use fixtures. The public is interested in driving water use lower if possible. Additional water conservation measures could be evaluated for implementation including rebate programs for older fixtures and limiting irrigation schedules. Significant population growth is occurring and is driving the need for additional water supplies.

Sustainability is an interest for local groups. UWNY is completing power use evaluations at the treatment plants and is implementing time-of-use improvements to lower overall power use. Vehicle fuel efficiencies with idle time clocks are being implemented in the utility fleet. These and other related energy, green and environment initiatives should be established as metrics and made more visible to the public to address their sustainability interests.

#### **4.2.2 Customer Satisfaction**

Customer service metrics are currently limited to billing issues. Metrics for customer complaints and resolution should be tracked both for customer service-related complaints as well as product quality and delivery-related complaints. Relevant customer surveys should continue to be conducted annually to determine what customers are looking for regarding their water service and what issues they are experiencing.

An improved UWNY customer website is currently being developed. This will help route routine customer service calls regarding typical billing inquiries to the website which will boost customer service metrics (calls received, average answer speed, and abandon call rate). A call center on-hold as well as IVR recording should be implemented to direct customers to the website for typical customer service request (bill payment, account information, service stop-start requests, etc.). UWNY's goal is to route 80 percent of customer contacts to the website to resolve their customer service needs instead of calling into the call center. Additional KPIs involving website usage and routed calls to

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<sup>20</sup> AWWA, Water Research Foundation, Project #4110, 2009

website should be established to determine effectiveness of customer service redirection. In addition, with AMI/AMR reporting integrated with the website, customers will be able to discover more about their water usage patterns and related concerns they may have about their bill.

#### **4.2.3 Employee and Leadership Development**

UWNY has a leadership development program for employee skill development and succession planning. This program helps backfill critical positions, promotes knowledge transfer, and encourages employee development. Additionally UWNY performs employee surveys every few years to obtain feedback from staff. Annual employee surveys are recommended to receive relevant and timely feedback. Employee survey results should continue to be evaluated for potential internal changes that could help retention and satisfaction rates.

#### **4.2.4 Financial Viability (EUM Self-Assessment Priority)**

Unit costs for infrastructure are being developed by UWNY for typical capital improvement projects such as main replacement, meter replacement, service leaks, and break repairs. Street paving, permits, utility relocation and miscellaneous non-utility infrastructure unit costs should also be developed. Schedule impacts due to permits and outside agency coordination should be considered as well. This information will allow UWNY to better estimate capital project costs and plan their overall capital improvement plan.

#### **4.2.5 Infrastructure Stability (EUM Self-Assessment Priority)**

Communication between Planning and Operations groups at UWNY is used to identify and vet infrastructure needs and priorities. This way the overall utility funding can be used in the most needed locations to assist in maintaining UWNY's infrastructure.

Water main breaks are being tracked in the KPI reports; however, to benchmark UWNY's water main break rate against other utilities, a water main break rate should be calculated on a main breaks per 100 miles basis (based on the total existing pipe length in UWNY's distributions system).

#### **4.2.6 Operational Optimization (EUM Self-Assessment Priority)**

According to UWNY staff, over 80 percent of costs are in supply, treatment, and distribution including pumping energy so operations optimization should be a priority for performance metrics. There are many existing operations optimization metrics related to energy and chemical use at treatment plants and wells as well as distribution system maintenance labor and costs.

The following observations and gaps have been identified in the KPI report from a strategic level:



- Review and negotiations of procurement contracts for chemicals and supplies are completed annually. In addition to the on-going chemical use costs, contract prices and parameters could be tracked with metrics. This would allow month-to-month tracking of chemical use in respect to contracts to assist with annual chemical procurement negotiations and planning.
- The Engineering Support KPI is used for workload and resource balancing. The Manager of Planning completes weekly planning of staff resources. Regulatory requirements are first priority in planning staff resources followed by preventative maintenance and capital improvement engineering support.
- Sizing and types should be optimized for all new meters per AWWA Manual M22. Advanced Metering Infrastructure (AMI)/Automatic Meter Reading (AMR) implementation metrics should be implemented.
- KW-h meters should be installed for real-time energy management data to track energy usage and efficiency. The meters should be first installed on equipment using the most energy. An energy management system and dashboard should be implemented for evaluating and optimizing real-time usage.
- In conjunction with energy optimization, chemical use in treatment processes should be optimized to save on overall treatment costs.
- Water loss indicators including Infrastructure Leakage Index (ILI) and Unaccounted for Water (UFW) should be added to the KPI report in addition to Non-Revenue Water (NRW). The water loss metrics should eventually be tracked by district meter area (DMA) when they are implemented for real-time water loss detection.

#### **4.2.7 Operational Resiliency**

Continuity of operations has been a major focus for UNWY. As proof of this resiliency attention, there was no loss of service during Hurricanes Irene and Sandy. As part of the Drive to Zero program, health and safety related incidents are tracked but are not currently included in the KPI report. Safety training and activities are tracked in the KPIs but not the safety incidents such as injuries and near-miss reports. They should be included to increase the visibility and importance of these issues. Target values should be set to zero to match the goals of the program. Safety and incident review is performed at a number of meetings, including a weekly committee meeting and compliance meetings. By including the health and safety data in the KPI report, it will be reviewed and tracked by a wider range of staff including those working in the field where safety awareness is vital.

#### **4.2.8 Product Quality (EUM Self-Assessment Priority)**

There are very few metrics that address product quality. UWNWY does have a Drive to Zero program related to compliance issues such as water quality and health and safety.

The goal of this program is to reduce and eliminate these types of issues. Additional metrics should be considered to determine the impact of the program and recommended improvements that are implemented. Target values should be set to zero to match the goals of the program.

#### **4.2.9 Stakeholder Understanding and Support (EUM Self-Assessment Priority)**

A Stakeholder Outreach Improvement Plan developed by UWNY is in place and improvements are planned. Additional metrics should be considered to determine the impact of the plan and its recommended improvements that are implemented. Customer service surveys every several years are conducted; however, no real-time service satisfaction information is collected and summarized in the KPI reports. Web-based and mobile applications that gather publicly sourced system information could be developed for UWNY to collect real-time observations from all stakeholders including their customers. These web-based or mobile apps provide a mechanism for a utility to communicate bi-directionally with their stakeholders. UWNY would be able to communicate service outages, main break locations, and any other relevant news while the public is able to use the app to report back any observed issues such as main breaks, leaks or product quality concerns.

#### **4.2.10 Water Resource Adequacy (EUM Self-Assessment Priority)**

UWNY tracks several metrics related to water resource adequacy including production availability (percentage of sources available for production), actual production per plant and wells, Lake Deforest Reservoir raw water diversion, and Hackensack River flow (used to manage the passing flow requirement). Population growth, demographic changes, unit demand, service classification, and climate change annual metrics should be considered for long-term strategic monitoring and benchmarking in relation to water supply for use during the master planning process.

#### **4.2.11 Example Metrics**

Several new metrics should be considered for strategic trending and benchmarking. The following table presents example KPIs for each EUM Attribute. This list is not exhaustive; it is meant to demonstrate the types of metrics that should be represented in a performance management system to drive business performance at one or both of a daily operations level and long-term strategic level, while allowing for benchmarking against common industry metrics over time. Some of the included metrics are currently being tracked by UWNY and further assessment is required to verify the addition of some metrics, removal of others, and any adjustments to the calculations and frequency of tracking and reporting. As described previously, only those KPIs that demonstrably guide decision-making at an operational or strategic level should be included in a reporting tool, while those metrics that are infrequently used or for informational purposes only should be moved to a separate report. Further, KPIs should continue to be evaluated for usefulness, and those that are temporarily in place to measure the impact of a particular

change initiative should be removed when appropriate (for which UWNY currently has an evaluation process in place). This allows for continued streamlined reporting of only timely and relevant data to daily operational efficiencies and long-term continual performance improvement.

The table presents the following descriptive information for each example KPI:

- Indicator: the title of the indicator that describes what is being measured
- Calculation: denotes the units of measure and how the indicator is determined
- Day-to-Day Operations Metric: an “X” in this column denotes the use of the indicator to guide decision-making on an immediate level such as daily operations in the call center, treatment facilities, and operations and maintenance activities in the distribution system
- Long-Term Strategic and/or Benchmarking Metric: an “X” in this column denotes the use of the indicator to check performance against strategic objectives or goals and progress on change initiatives, and/or provide a performance benchmark against indicators that are formally tracked on an industry-wide level
- Orientation: describes whether indicator is either internally- or externally (customer)-facing
- Type: describes whether the indicator is a measure of quality, efficiency, or effectiveness

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<u>EUM Attribute</u>	<u>Indicator</u>	<u>Calculation</u>	<u>Day-to-Day Operations Metric</u>	<u>Long-Term Strategic and / or Benchmarking Metric</u>	<u>Orientation</u>	<u>Type</u>
<b>Customer Satisfaction</b>	Customer Service Complaints Rate (number per 1,000 customers)	1,000 times number of customer service complaints divided by total number of customers	X	X	External	Quality
	Customer Service Compliant Resolution Rate	Number of resolved customer service complaints divided by total number of complaints	X	X	External	Effectiveness
	Water Quality or Delivery Complaints Rate (number per 1,000 customers)	1,000 times number of water quality complaints divided by total number of customers	X	X	External	Quality
	Water Quality or Delivery Complaint Resolution Rate	Number of resolved water quality complaints divided by total number of complaints	X	X	External	Effectiveness
	Billing Accuracy (% per 10,000 bills)	10,000 times number of error-drive billing adjustments divided by total number of bills generated		X	Internal	Quality
	Response Time to Customer Problems (hours)	Average number of hours before a customer problem is resolved	X		Internal	Efficiency
<b>Employee Leadership and Development</b>	Human Resource Efficiency (MG per year per FTE)	Annual water produced (MG) per year divided by number of full time equivalent (FTE) employees		X	Internal	Efficiency
	Training Hours Per Employee (per year per FTE)	Total annual training hours for employees divided by number of FTE employees	X	X	Internal	Quality / Effectiveness
	Employee Turnover Rate (%)	Number of regular employee departures divided by number of FTE employees		X	Internal	Effectiveness
	Internal Employee Promotions (%)	Number of internal promotions divided by total number of positions filled		X	Internal	Effectiveness
	Retirement Eligibility (%)	Number of regular employees eligible for retirement within the next five years divided by number of FTE employees		X	Internal	Effectiveness
	Organizational Best Practices Index (%)	Index based on the organizational best practices checklist found in the QualServe performance indicators list		X	Internal	Efficiency / Effectiveness
	Customer Account Ratio (%)	Number of customer accounts divided by number of FTE employees		X	Internal / External	Efficiency
<b>Financial Viability</b>	Cash Reserve (Days)	Undesignated cash reserve dollars divided by cost of on-going operations (average dollars per day)	X	X	Internal / External	Quality
	Debt Ratio (%)	Total liabilities divided by total assets		X	Internal / External	Quality
	Return on Assets (%)	Net income divided by total assets		X	Internal / External	Efficiency
	Customer Service Cost per Account (\$ per customer)	Total customer service cost divided by total number of active accounts		X	Internal / External	Efficiency

<u>EUM Attribute</u>	<u>Indicator</u>	<u>Calculation</u>	<u>Day-to-Day Operations Metric</u>	<u>Long-Term Strategic and / or Benchmarking Metric</u>	<u>Orientation</u>	<u>Type</u>
<b>Infrastructure Stability</b>	Emergency Service Line Repairs and Replacements per Service Connection (repairs/replacements per service connection)	Number of emergency connection repairs and replacements divided by total number of service connections	X	X	Internal	Quality
	Effective Hydrants (%)	Total number of effective (fully functional) hydrants divided by total number of hydrants	X		Internal	Effectiveness
	Effective Valves (%)	Total number of effective (fully functional) valves divided by total number of valves	X		Internal	Effectiveness
	System Renewal/Replacement Rate (%)	Actual expenditure and reserve on renewal and replacement divided by total present worth of renewal and replacement needs		X	Internal / External	Quality / Efficiency
	Water Distribution System Integrity (breaks per 100 miles)	100 times total number of main breaks plus leaks divided by total miles of distribution pipes	X	X	Internal / External	Quality / Effectiveness
<b>Operational Optimization</b>	Operations and Maintenance (O&M) Cost Ratio (\$ per MG)	Total O&M cost divided by total MG produced	X	X	Internal	Efficiency
	Unit Cost of Treatment (\$ per MG)	Total treatment cost divided by total MG produced	X	X	Internal	Efficiency
	Infrastructure Leakage Index (volume per connection)	Real and apparent loss volume divided by number of service connections		X	Internal / External	Quality / Effectiveness
<b>Operational Resiliency</b>	Emergency Response Readiness (training hours per FTE)	Total training hours for all employees on emergency response readiness divided by number of FTE employees		X	Internal	Quality / Effectiveness
	Employee Health and Safety Severity Rate (days)	200,000 times total days away from work divided by total hours worked by all employees	X	X	Internal / External	Quality / Effectiveness
	Water Storage Adequacy (%)	Volume of treated water storage (MG) divided by water pumpage per day (MG)	X	X	Internal	Efficiency / Effectiveness
<b>Product Quality</b>	Regulatory Compliance Rate (%)	Total number of in compliance measurements per year divided by total number of measurements per year	X	X	Internal / External	Quality / Effectiveness
	Customer Water Quality Complaints (complaints per year per 1,000 customers)	Total number of water quality complaints per year divided by 1,000 customers served	X	X	External	Quality
	Outages/Interruptions in Service (rate per 1,000 customers)	1,000 times number of customers experiencing disruption divided by number of active customer accounts	X	X	External	Quality
	Pressure Adequacy (number and hours)	1,000 times number of customers experiencing pressures either higher or lower than established maximum and minimum limits divided by number of active customer accounts	X	X	External	Quality

<u>EUM Attribute</u>	<u>Indicator</u>	<u>Calculation</u>	<u>Day-to-Day Operations Metric</u>	<u>Long-Term Strategic and / or Benchmarking Metric</u>	<u>Orientation</u>	<u>Type</u>
	Disinfectant Residual Concentration Violations (number)	Total number of occurrences where the measured sample disinfectant residual concentration is less than the regulatory minimum concentration	X	X	Internal / External	Quality / Effectiveness
	Coliform Violations (number)	Total number of occurrences of positive total coliform samples	X	X	Internal / External	Quality / Effectiveness
<b>Stakeholder Understanding and Support</b>	Stakeholder Outreach Index (%)	Index based on the stakeholder outreach checklist found in Appendix D of the “Enhancement of QualServe Tools to Improve Utility Operations” by AWWA (2009)	X	X	External	Effectiveness
	Residential Cost of Water Service	Average water bill per month		X	External	Efficiency / Effectiveness
<b>Community Sustainability</b>	Service Affordability (%)	Average annual residential water bill divided by real median household income		X	External	Efficiency / Effectiveness
	Energy Consumption Efficiency (KWh per MG)	Total energy use (kWh) per year divided by total MG produced per year for treatment and raw and potable water transmission	X	X	Internal / External	Efficiency / Effectiveness
<b>Water Resource Adequacy</b>	Safe Yield Adequacy	Sum of available supply (MGD) divided by peak day demand for water (MGD)		X	External / Internal	Quality / Effectiveness
	Unit Cost of Source Supply	Cost of available supply divided by total volume (MG) produced on an annual basis per supply	X	X	Internal	Efficiency
	Current Water Demand (%)	Five-year average water demand (MG) divided by average available water supply based on current yield (MG)		X	External / Internal	Quality / Effectiveness
	Available Future Water Supply (Years)	Future year when demand (MG) exceeds supply (MG) – current year		X	External / Internal	Quality / Effectiveness
	Raw and Potable Water Transmission Adequacy (%)	Raw and potable transmission capacity (MGD) divided by peak demand for raw and potable water (MGD)		X	Internal	Efficiency / Effectiveness
	Water Treatment Adequacy (%)	Treatment capacity (MGD) divided by peak production demand for potable water (MGD)		X	Internal	Quality / Effectiveness

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## 5 Recommendations

The following recommendations are based off of the review of UWNY's existing performance management review process, historical data for indicators provided by UWNY, a comparison of self-reported UWNY performance against national benchmark indicators, and a review of the current KPIs used by UWNY. The recommendations are organized into two groupings: 1) specific opportunities for further evaluation or improvement in operational functions and 2) strategic actions to improve business performance management.

### 5.1 Operational Functions

Findings from the trend analysis performed for UWNY's current KPIs and the comparison to industry performance through benchmarking revealed opportunities that may result in reduced costs and/or increased levels of service delivered to UWNY's customers. Further assessment may be required. In addition, observations made during time with UWNY resulted in further recommendations.

1. Evaluate customer services
  - a. Map customer service business processes and identify cost centers. At the same time perform an assessment of the types and causes of customer complaints. Identify areas where functions may be streamline and/or resources reallocated to better meet customer needs and/or reduce expenditures.
  - b. Continue website expansion initiative as described in *Section 4.2.2 Customer Satisfaction*. Identify gaps in customer services based on recommendation 1a that may be filled via the website.
  - c. Conduct annual customer and employee surveys to receive consistent and timely feedback for improving service. For example, responses on changes that affect the customer like the recent change from monthly versus quarterly billing are important to know for the utility. Electronic web-based surveys broadcasted via social media or email is preferred and could lead to a higher response rate.
2. Perform a root cause analysis of unplanned service interruptions including main breaks. Assess preventative and planned maintenance activities against causational and locational data and update maintenance frequency intervals and asset management plans as appropriate. Assess allocation of labor to maintenance activities and adjust as necessary. Include failure information in work order management system by asset.

3. Implement an Asset Management based approach to performing condition assessment for existing mains and appurtenances in response to high volume of water main breaks.
4. Continue exploring alternative and backup plans to increase water supply availability. Develop a formal initiative to identify water supply planning solutions for a 20-50 year planning window.
5. Continue on-going measures to reduce non-revenue water.
6. Seek to connect strategic planning and master planning process more directly with KPI development and execution, to the extent allowable under the PSC's medium term plan and rate approval process. Explore opportunities to develop a formal UWNY strategic plan with employee and stakeholder input.
7. Develop web-based or mobile apps to collect vital information from the public such as report of main breaks, leaks, water quality complaints, etc.
8. Combine a knowledge management plan and information (documents, data and records) management best practices into strategic and business planning at UWNY. Consider implementing an EMS approach to document SOPs and support a Continuous Improvement process.

## **5.2 Strategic Actions and Business Performance Management**

Aligning current performance management indicators with higher-level goals and initiatives will stream-line decision-making and allow UWNY to continue to improve performance on the day-to-day operational level while adding a strategic approach and outlook. The following general recommendations are made considering a review of UWNY's current performance indicator tracking and reporting process and to enhance the use of existing metrics:

1. Align complete performance measurement program with UWNY's strategic planning process to include KPIs in strategic plan so that the metrics can be used to drive utility forward while tracking progress towards customer service and business goals.
2. Establish several key customer-facing, defined levels of service for improved customer communication and satisfaction that operations are being tracked and improved over time.
3. Develop long-term action plans based on real-time to historical performance results for driving strategic improvement and tracking operations, maintenance, and capital efficiency and improvement opportunities.
4. Review existing performance indicators:

- Consider adding performance indicators as summarized in Section 4.2 *Metric Gap Analysis* that fill gaps in measurement and align with the EUM framework and a continual improvement direction.
  - Remove indicators in existing summary report that are not providing value or decision-making intelligence.
  - Update KPI calculations or units to better normalize data to industry for improved interpretation and benchmarking.
5. Review the existing KPI reporting excel spreadsheet:
- Add YTD values and charts for all KPIs for those with only weekly/monthly values in the current format which are not indicative of long-term performance.
  - Archive weekly/monthly/annual KPI reports for benchmarking and historical comparison purposes
  - Increase automated data entry and compilation of performance data to reduce the workload required to develop the KPI report and the potential for errors in manual data entry.
  - Consider conducting a company-wide business case evaluation to adopt consistent KPI dashboard software for increased visualizing, access, use, archiving, management and strategic long-term use of performance metrics. Adopting a different KPI management system could also limit the occurrence of unintentional disruptions such as those in the Excel summary sheets due to changes to source data.



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