

Utilities Operations Overview



FY20

The Charlottesville Department of Utilities provides the Charlottesville community with safe and reliable natural gas, drinking water, wastewater and stormwater services at a reasonable cost in an environmentally responsible manner.

Water Distribution



The City's water distribution system serving over 15,000 customers contains over 1,100 fire hydrants, 3,400 water valves and 183 miles of water main line ranging in size from 2 inch to 18 inch in diameter.

Water Distribution System Improvements

A Water Prioritization Study was completed in 2009, which identified 48 projects to be completed. Since 2009, additional projects were identified and added to the list and work has been completed on 73 water projects.

These projects aim to improve fire protection, reduce main breaks, improve overall water quality and address the undersized lines. Total length of pipe replaced to date for water projects is approximately 14.8 miles (78,313 linear feet) averaging about two miles per year. To date, \$16 million has been spent. This work is continuing in FY2020.

Additional supplemental water main projects include the following:

1. Rugby Road Water Meter Replacements/ Gentry Lane Water Main Installation
2. Emmet Street/ Ivy Road Water Main Replacement
3. High Street Water Main Replacement
4. West Main Street Water Main Replacement

Backflow / Cross-Connection Prevention

Cross-contamination presents a serious hazard to our water supply. The situation in which water flows in a direction that is opposite from the intended flow is called backflow, and can potentially put the drinking water supply in danger by allowing the undesirable reversal of flow, such that non-potable water moves into the potable water system. The location at which this backflow occurs, where a customer's water line and the main supply line are joined, is called a point of cross-connection. As part of the City's strategy, certain businesses, such as medical facilities, laboratories, food processing plants, chemical plants, high-rise buildings, or other facilities where a potential for backflow or cross-connection hazard may exist, are required to install and maintain cross-connection or backflow prevention devices. The City's Department of Utilities currently inspects over 1,200 backflow devices in an effort to maintain and provide the highest quality water to the City residents.



System Improvements to Prevent Water Loss

Replacing water distribution mains and service lines is an important component in water loss prevention and conservation. Aging pipes are a primary cause of lost water in a system. Since FY2009, the City has been replacing aged water lines and service lines, which reduces leaks and supports improving infrastructure. The City has also performed annual system-wide leak detection surveys. With over 238 miles of water lines (mains

and services), 10 leaks were detected and repaired during the 2018 testing, resulting in an estimated loss of 68,000 gallons per day. The City aims to respond and repair leaks expeditiously to minimize water loss and service impacts. Leak audit surveys were completed in 13 of the past 15 years and will continue annually. The next survey is scheduled for Fall 2019 and will be consistent with past years covering 100% of the distribution system.



The American Water Works Association (AWWA) recommends that all utilities perform a water audit every year. This audit is intended to identify sources of non-revenue water and to focus efforts in reducing those water losses. Based on the water audit recommendations, the City continues to minimize water loss by outreach, system repair and replacement, and improved leak detection technologies.

The water audit also recommended a water meter calibration and replacement program be implemented starting in FY2014. The meter replacement program replaced 84 large water meters in 2018 and over 231 since the program's inception. The success of the program has led to increased momentum with approximately 80 meters projected to be replaced in FY2020. Because conventional water meters less accurately measure low flow rates, starting in 2017 highly-sensitive "low-flow" ultrasonic meters are being installed in all applications.

Wastewater Collection



Charlottesville's sanitary sewer system extends to most areas of the City and consists of about 171 miles of pipe and 5,700 manholes.

Wastewater Collection Improvements

In 2009, Utilities awarded a multi-year, multi-million dollar contract utilizing a "find-and-fix" approach for sewer repair and rehabilitation. The work encompasses the rehabilitation of sewer manholes and sewer lines. In addition, crews have been performing CCTV (closed-circuit televising) and smoke testing throughout the City system. Any deficient pipes or structures found are immediately added to the list for rehabilitation/replacement under the same contract.

"Find-and-Fix" rehabilitation projects are unique construction projects. The exact work is not known at the time of bidding, so all potential work items must be included in the bid form (bid form includes over 200 bid items). The Contractor performs the evaluation work during construction, primarily TV inspections, submits the evaluation to the Engineer for review, and the Engineer then decides on the final rehab work within seven days. The work is fast-paced and allows for emergency situations to be addressed within 48 hours. The City estimates savings of over \$2 million following this find-and-fix approach. To date, 44.1 miles or 232,915 linear feet of sewer lines have been replaced or rehabilitated and \$19 million has been spent.



Staffing Needs

Due to the increase of development throughout the City, and the demand for increased infrastructure capacity, the Department is creating a new position and will hire an additional Utilities Construction Inspector. This position will be responsible for overseeing all aspects of the installation of public utility lines by private contractors to ensure that they are installed in compliance with local, state, and federal standards. This position will also assist in the inspection of capital improvement projects.



Fats Oils and Grease

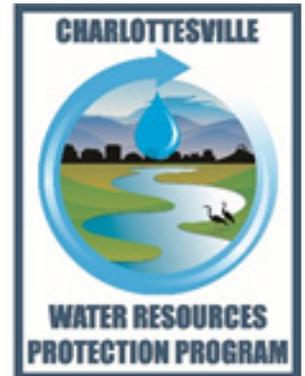
The City of Charlottesville prohibits the discharge of fats, oils, and grease (FOG) down the drain. In excessive amounts, these contaminants will cause or contribute to a blockage in the sanitary sewer collection system. FOG accumulates in sewer pipes, and over time, can build up and restrict the flow in the pipe, causing untreated wastewater to back up into businesses or homes, or cause manholes to overflow in the street (commonly referred to as sanitary sewer overflow or SSO). This SSO can potentially enter a storm drain and contaminate local waters. In an effort to prevent these events, the City of Charlottesville maintains an active FOG program that routinely inspects and advises best management practices to over 300 city restaurants on an annual basis on how to properly dispose of FOG.

Stormwater



Charlottesville's stormwater conveyance system is integrated throughout the City's municipal boundary and consists of approximately 130 miles of pipe and 8,250 structures.

The City owns roughly 54% of the stormwater pipes and 28% of the stormwater structures within the municipal boundary. Approximately 13 miles of the stormwater conveyance system carry streams that have been piped. The Stormwater Utility is the dedicated funding source for the City's Water Resources Protection Program (WRPP). The WRPP is designed to rehabilitate the City's aging stormwater conveyance system, comply with federal and state stormwater regulations, address drainage problems, and pursue environmental stewardship. The proposed stormwater utility rate for FY2020 remains unchanged at \$1.20/month per 500 square feet of impervious surface on a property. Stormwater utility fees are billed twice a year to property owners and are received with real estate tax bills due in June and December.



Stormwater Improvements

Utilities have had an active Stormwater Conveyance System Rehabilitation Program since 2010. The City has integrated the sanitary and storm sewer rehab into a single "find-and-fix" construction project with the same contractor completing the work. The work encompasses the rehabilitation, replacement, and repair of pipes and associated structures. In addition, non-routine repairs are completed in a timely manner as they arise, often in response to subsidence in City streets and sidewalks. Approximately 10 miles of pipe and 250 structures have been rehabilitated. To date, \$7 million has been spent.

The City-wide Water Resources Master Plan, published in 2017, includes both a drainage improvement and water quality capital improvement plan (CIP). Each individual plan ranks and prioritizes projects in reference to available funding. Projects included in the drainage improvement CIP address a combination of both historic and more recently identified drainage issues. Projects in the water quality CIP focus on stormwater management retrofits to achieve water quality improvement and nutrient runoff reduction.

Staffing Needs

In order to continue proper maintenance of the stormwater conveyance system and keep up with the increased workload of the Stormwater Utility, three (3) new positions will be created in FY2020. These positions will provide an additional maintenance crew which will be responsible for the day-to-day routine maintenance of the stormwater conveyance system. In FY2020, the Utilities Department will be able to move all operating expenses, including an additional four (4) positions currently paid from the General Fund, to the Stormwater Utility Enterprise Fund. This move is accomplished by reducing cash funding to the capital improvements budget to a level that is more in line with actual annual expenditures. This move ensures that adequate staffing is available to meet regulatory requirements under the City's MS4 permit while maintaining a high level of service to the system.



Gas System



Charlottesville Gas has provided residents of Charlottesville and urban areas of Albemarle County with safe, efficient, reliable, and economical service for over 150 years. Charlottesville Gas has over 20,200 customers and maintains 333 miles of gas lines and 275 miles of gas service lines.

Charlottesville Gas is required by the Pipeline & Hazardous Materials Safety Administration (PHMSA) to maintain an Operator Qualification Plan that adheres to federal regulations. These regulations require Charlottesville Gas employees to demonstrate their competence in regards to a variety of different tasks that are performed on any Charlottesville Gas pipeline. The typical Charlottesville Gas employee must satisfactorily pass over 40 Operator Qualification (OQ) tests. Charlottesville Gas is required, by code, to retain these training and test records for a minimum of five years. In December 2018, the State Corporation Commission (SCC) on behalf of PHMSA audited the Charlottesville Gas Operator Qualification Plan and testing records. The Commission found no probable violations or recommendations in regards to the Plan or the associated OQ records. The Charlottesville Gas Utility takes pride in staffing a trained and informed workforce, and the State Corporation Commission's inspection only validated the City's efforts.

Charlottesville Gas is required by PHMSA to monitor and address any potential leak threats to the natural gas system through a Distribution Integrity Management Program (D.I.M.P.). Examples of potential threats include excavator damages, corrosion and material defects. Included in the City's D.I.M.P. Plan are procedures that have been put in place to mitigate potential threats to the gas system. Not only must this plan be in place, but operators must demonstrate that the procedures are being implemented and that potential threats are being reduced. As part of the Program, Utilities have been working with the City's IT Department to develop an application to track and survey risks and threats to the natural gas system. Using the Utility GIS Viewer and tablets, Gas employees are able to track and document the location, cause, severity and response time associated with each leak. In March 2019, the State Corporation Commission on behalf of PHMSA performed a thorough audit of the City's D.I.M.P. The Commission found no pipeline safety violations in regards to the documentation or implementation of the City's D.I.M.P.

The Gas Utility works closely with the Local Energy Alliance Program (LEAP), a local community-based nonprofit that offers a variety of energy efficiency resources. Since 2014, a Home Energy Check-Up (HECU) is available to residential gas customers. This program is funded through a combination of a Charlottesville Gas contribution and a small fee of \$45 from the residents. During the HECU, a LEAP Energy Coach performs direct installs of energy saving measures. For 2019, the Gas Utility and LEAP have developed a new pilot program offering energy efficiency upgrades at no cost to income-qualified households. This program has the primary goal of reducing greenhouse gas emissions by saving energy. These improvements will also enhance low-income household conditions while reducing living expenses for residents.

There has been a 53% reduction in gas line damage caused by third party excavators in the last six years (from 2.83/100 Miss Utility tickets in 2013 to 1.32/1000 Miss Utility tickets in 2018). This is due to the implementation of the outreach program "Dig with Care" and outsourcing the natural gas location operation to improve its accuracy. The program includes a series of "Marty's Minute" radio spots, annual VA811 Day celebrations, excavation safety training workshops, and distributing VA811 kits to local contractors. In association with the Charlottesville Gas mascot, Flicker the Flame, a Flicker Sing-a-long Jingle Contest was held in conjunction with CBS19. Utilities asked the participants to help us promote gas safety in our community by submitting a video singing Flicker's jingle for a chance to win a \$1000 prize. This user-generated campaign had over 213,000 views on Flicker the Flame Facebook page and 4,258 engagements. 2,378 people voted for their favorite video which is more participation than CBS19 has received before for a single contest.

