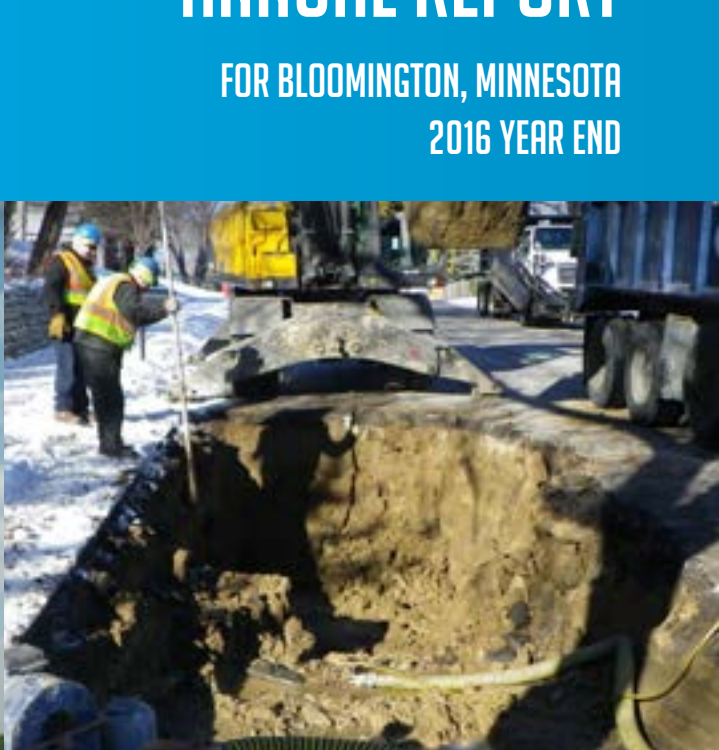


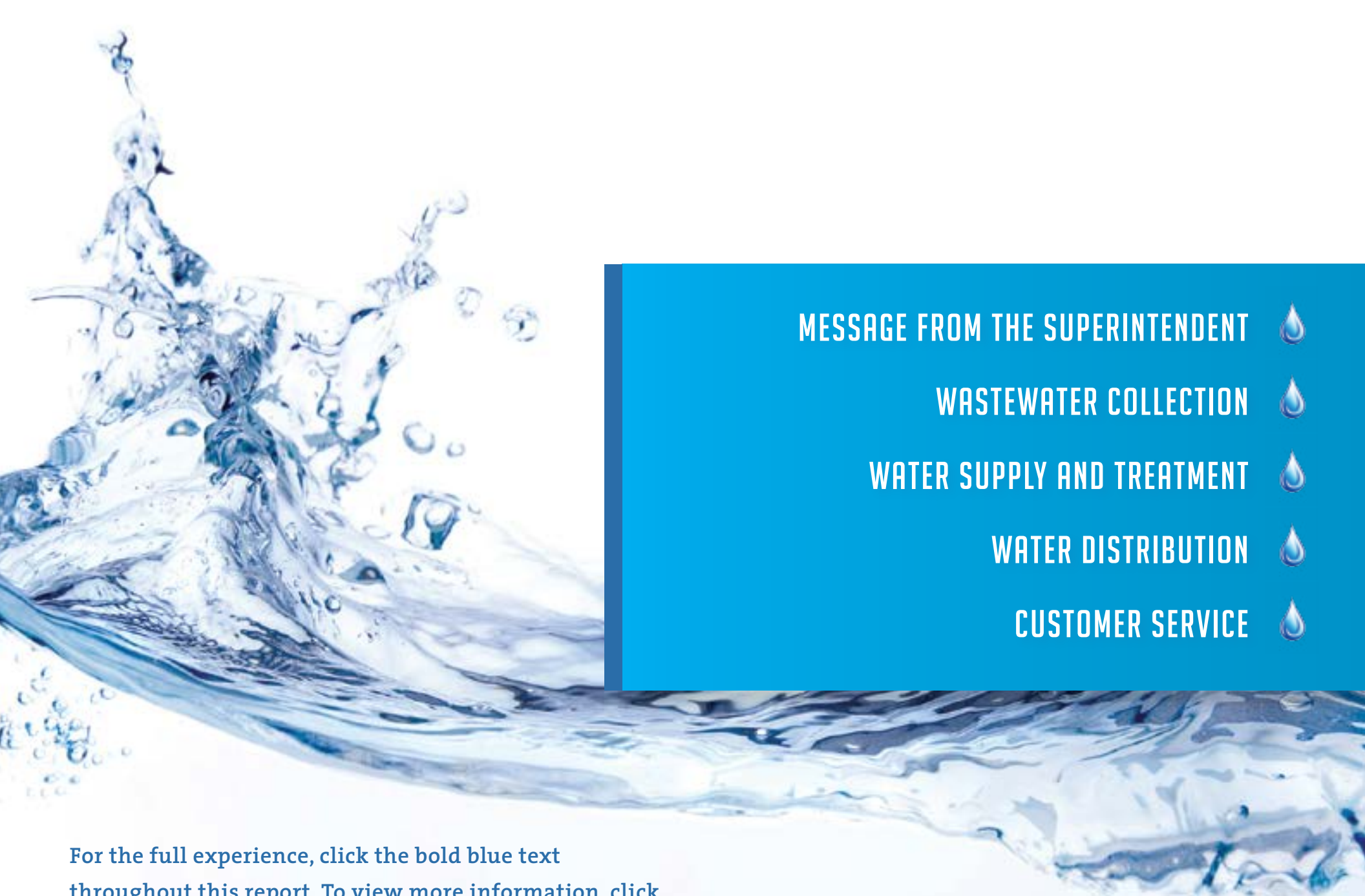
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BLOOMINGTON

CITY OF  
**BLOOMINGTON**  
MINNESOTA

# UTILITIES ANNUAL REPORT

FOR BLOOMINGTON, MINNESOTA  
2016 YEAR END





**MESSAGE FROM THE SUPERINTENDENT**



**WASTEWATER COLLECTION**



**WATER SUPPLY AND TREATMENT**



**WATER DISTRIBUTION**



**CUSTOMER SERVICE**



For the full experience, click the bold blue text throughout this report. To view more information, click the “i” at right for details.

# MESSAGE FROM THE SUPERINTENDENT



For many of us, 2016 marks a memorable year, as we celebrate the recognitions awarded to the City for winning the national drinking water taste test's "Best of the Best" in the country. Also, two of our Utility crew members competed in the Minnesota Section of the American Water Works Association's Hydrant Hysteria competition, and won it. They will be competing in the national competition, summer 2017 in Philadelphia, PA.

In 2016, we also said goodbye to several of our coworkers – our good friend and long-time Computer Specialist Poly Mel, as well as another "techie," Public Works Analyst Dave Johnson, who moved on to greener pastures. Most impactful for many was the unexpected loss of Senior Operator Jerry Neagbour, who died suddenly this past summer. Jerry came to work for the City in 1989, and grew into an excellent operator, trouble-shooter, mentor and friend to many of his coworkers. He is missed by all of us every passing day.



In this year's report, we have highlighted some of the things we do behind the scenes each day that keep the drinking water flowing and the sewage efficiently transported to the Metropolitan Council's treatment facility in Eagan. The City continues to work diligently each year to investigate and remove as much clear-water inflow and infiltration as reasonably possible. To that end, the Utility has been systematically investigating the current

condition of our sanitary sewer pipes, manholes and castings, and repairing or replacing those that do not meet our standards. Details of this work can be found at UAR2.

Our water treatment plant produces approximately 3 billion gallons of water each year. To do so, we must draw raw water from the six

high-capacity wells we are permitted to use. In order to ensure that we are providing safe drinking water to the community, we are required to constantly monitor the entire water distribution system, as well as all of the components associated with it, including the water treatment plant itself. For this issue of the Annual Report, we have provided an article entitled "The Dangers That Lurk Underground" that discusses the ongoing efforts of Utilities staff to monitor and test the water we produce daily. For more information on this story, please turn to UAR3. Also of interest was staff-initiated maintenance of the water plant's upflow basin weirs – an effort that required quite a bit of upfront research and coordination to pull it all together. A very informative article detailing this activity can be found at UAR3.

On a smaller scale, but still very important to the overall operation of the City's water distribution system, our operations and maintenance staff were able to accomplish the repair of a number of water isolation valves that were determined to be non-operational when they were recently inspected as part of the Utilities preventative maintenance inspections. Based on some industry literature research and networking, our staff selected a vendor/contractor to perform almost a dozen non-excavation



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## CONTINUED FROM MESSAGE FROM THE SUPERINTENDENT

repairs of corroded operating nuts, with great success. For additional information regarding this activity, please note the story on UAR4.

With the hundreds of miles of watermains and sanitary sewer mains, along with the thousands of hydrants, gatevalves, service connections and manholes, the City must be on constant alert whenever we are made aware of anyone wanting to excavate in the City's right-of-way. To gain a feel for the complexities of this locating activity, as well as the sheer volume of locates our staff is required to perform each year, I would invite you to read the article on Gopher State One Call locates. More on this can be seen at UAR5.

The articles mentioned above are just a sample of the continued excellent work accomplished by the dedicated and professional Utilities staff, who take great pride in providing excellent service to the community. We are all looking forward to another great year in 2017!

### ALSO IN 2016

- The **UTILITIES DIVISION** employed more than 50 people. Professionalism is a highly touted value within the Division. All operations staff are encouraged to continue to ascend their **STATE LICENSES**.
- Utilities continued its **TOTAL ASSET MANAGEMENT** plan with the global goal of institutionalizing the program.

The Administrative Section of Utilities is committed to providing a comprehensive water and wastewater utility services package at a rate that is less than the average cost of other cities providing a similar level of service. Each year, the Utilities Division is benchmarked in our

### **ANNUAL RATE SURVEY**

against similar utilities. Rates are ultimately driven by the

### **WATER AND WASTEWATER FUNDS' EXPENSES.**

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## CONTINUING THE WAR AGAINST I&I: REDUCING BLOOMINGTON'S INFILTRATION AND INFLOW IN THE WASTEWATER COLLECTION SYSTEM

In recent years, the State Legislature has approved bonding bills for the purpose of providing grant programs to municipalities for capital improvements to public wastewater systems in a war against Infiltration and Inflow (I&I). Since 2005, efforts by communities, property owners, and MCES have helped to reduce the regional annual wastewater volume by roughly nine billion gallons. The flow decrease has occurred even as

precipitation volumes, rainfall intensities, and population have increased. A recent study by the Met Council showed an 11% to 75% reduction in I&I flows for three communities that had participated in I&I reduction programs. In 2016, Bloomington submitted final documentation

Each day, the City's 28 pumping stations move more than 10.5 million gallons of wastewater out of the city.

to the MCES for inclusion in the 2014 Municipal Infiltration/Inflow Grant Program. The grant allowed the City to receive \$47,110 as a partial reimbursement for the costs to perform wastewater manhole and mainline rehabilitation in conjunction with City pavement projects. To date, Bloomington has participated in three I&I grant programs and received just under a half a million dollars for this war against I&I. It's estimated that Bloomington's I&I reduction efforts have removed roughly 63 million gallons of annual flow. At the current rate for wastewater treatment paid to the Met Council, the City realizes an annual savings of \$157,000. Historic records show a reduction of over one billion gallons, or a 27% decline in annual sewer flow between 1993 and the present. While

much of the reduction can be attributed to system wide conversion to low flow plumbing fixtures, a comparison of Bloomington's annual water use and sewer flow historic trends shows a more pronounced reduction in sewer flows. The extra reduction in sewer flow rates is thought to be a result of the I&I reduction work. One additional benefit of the I&I improvements is that it adds 40 to 70 years of additional life to the affected infrastructure items. Bloomington Utilities will continue to wage war on I&I as the work shows significant benefits.

Wastewater Collection strives to provide the continuous conveyance of wastewater into the regional treatment system. One benchmark used to evaluate Utilities' performance is the number of **POSITIVE SEWER STOPPAGES** in 2016 – our goal continues to be zero stoppages. The Division used routine operational and maintenance activities, such as **SEWER JETTING AND RODDING**, and **CLOSED CIRCUIT TELEVISIONING** to keep the sewage flowing in 2016.

### CITY OF BLOOMINGTON SANITARY SEWER SYSTEM – 2016

The Utility Division of Public Works maintains more than 359 miles of sewer pipes ranging from 6 to 46 inches.

In 2016, Utility crews performed maintenance and cleaning to almost 1.5 million linear feet of sewer pipes. That equals more than 280 miles!

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## CONTINUED FROM CITY OF BLOOMINGTON SANITARY SEWER SYSTEM - 2016



Vitrified clay pipe (VCP) is pipe made from a blend of clay and shale that has been subjected to high temperatures to achieve vitrification, a process which results in a hard, inert ceramic.

Utility Operations uses two high-pressure water cleaning machines called “jet trucks” for normal cleaning and another truck called a “rodder” that cuts tree roots in pipes mechanically.

Large areas of Bloomington’s sanitary sewer system were installed in the 1960’s. The most common type of pipe used back then was 8 inch diameter vitrified clay pipe (VCP) and it came in 4 foot lengths. The joints where they connect did not have gaskets; now 50-60 years later, tree roots have infiltrated the joints.

Residential services can also be affected by tree root growth.

Homeowners are responsible for the service from the house to the center of the street where the pipe meets the city sewer main. If a plumber is needed, homeowners should remember to also call the city Utilities Division at 952.563.8777 (952.563.4905 after business hours) to have the city main checked for problems. Plumbers should be instructed to clean the line all the way to the center of the street.

Other problems we fight in sanitary sewers are plastics, paper products, flushable wipes and by-products from cooking such as fats, oils, and grease (FOG). Utilities has found almost anything you can think of that should not be flushed down the drain.

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## THE DANGERS THAT LURK UNDERGROUND...

Did you know that the leading cause of death in the world is diarrhea? This may sound silly, however, while the U.S. has one of the safest water supplies in the world, it would be remiss not to mention the wake of events that led to the disaster in Flint, MI and the chemical spill in Charleston, WV. Events like these can quickly shatter the trust that most Americans place in their drinking water.

We must be vigilant and rigorous testers of water to protect the public health. We need to be constant learners about new and emerging

pathogens that cause disease. Microbes evolve and, in time, can overcome the defense mechanisms in our water treatment systems. Access to clean water is a stabilizing force, while lack of access destabilizes societies.

Learning from mistakes creates hope and progression. The key is education, knowing all the facts and specifically

developing the next generation of problem solvers. By looking into new technology and grasping analytical concepts makes prevention a clear goal. The Tri-City/William Lloyd Analytical Lab does just this. The lab is continuously sampling, analyzing and documenting water quality parameters throughout the distribution system and in its raw water supply. We can assure all staff and residents that the Bloomington water treatment process has been tailored and designed to achieve the highest quality and safest water possible.

The lab strives to connect people to each other in order to create positive strides. Scientists, engineers, water quality managers, operators, political decision-makers and nonprofits need to clearly understand the issues and how to solve them before they impact us. Accumulated knowledge is clearly a benefit to all of us. The objective is to promote collaboration among all of us that work in the water industry. The cost of inaction is far greater than being proactive.

The old adage “an ounce of prevention is worth a pound of cure” holds true as it’s easier to stop something from happening in the first place than to repair the damage after it has occurred.

Water Supply and Treatment strives to provide a sustainable supply of water that meets or exceeds all federal and state standards. A benchmark of this endeavor is the results reported in the federally mandated **WATER QUALITY REPORT**. In 2016, water usage fell short of the **PROJECTED DEMAND**.

## WATER TREATMENT PLANT OPERATIONS

This year has brought several important projects to the water treatment plant staff. Every winter, staff clean, maintain, and rebuild important equipment within the water treatment process. This year, there were several other projects that are not on the usual annual maintenance schedule. The first project is the upflow clarifier weir tab project and it was essential to extend the life of an important function within the treatment process.

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## CONTINUED FROM WTP OPERATIONS



Weirs are large steel troughs that carry water from one process to the next. There are a total of 15 weirs in each of our two clarifier basins. Because the weirs are in a harsh environment under water, rust is a major issue. The tabs were starting to rust to the point that our annual maintenance was not sufficient. This was a preventative maintenance project that was necessary to keep the infrastructure of the weirs from collapsing due to corrosion. Water treatment plant staff came up with a new design to ensure the weirs would continue to perform their critical function. A local company fabricated the parts and

water treatment plant staff installed the brackets this winter.

The second project was the replacement of our lime blower motor.

The replaced lime blower was original to the treatment plant from the 1970's. The old blower had some bad seals and was leaking oil. Because we receive lime two times a week in the winter and up to five days a week in the peak summer months, the cost to fix the old blower and get it back up to optimum running performance would have been unjustifiable. The plant staff researched a new blower motor and



found a local company to replace the old blower. The new motor is dramatically quieter and more maintenance friendly.

These two projects will ensure that our water treatment plant continues to be a world class facility. Overseeing all of the assets at the water treatment plant is an important responsibility for utility administration. The asset management process of deploying, operating, maintaining and upgrading facilities cost-effectively, and at the same time providing the best possible service to customers, is taken seriously. Employees at the water treatment plant and, utilities, as a whole, take pride in the service we provide to our residents.

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## TRENCHLESS GATE VALVE OPERATING NUT REPLACEMENT



Each year, Utility Operators inspect and exercise more than 2,600 six - twelve-inch gate valves as part of our ongoing asset management efforts. The reliability of gate valves in these sizes is crucial for isolating sections of the system for repair of leaks and scheduled construction activity. Gate valves have a two-inch square operating nut that operators access with a long t-handle wrench for opening and closing. Often, it is found that the operating nut is badly corroded, rounded off, or in some cases missing altogether from corrosion. Until recently, the only method of repair was

a full-scale excavation to replace this small component, at considerable cost to the City for labor, materials, and restoration.

The list of valves needing operating nut replacement kept growing, and in 2016 we found a solution in a local, one man contracting operation that completes the replacement from

street level in about one hour, with no excavation or restoration. With assistance from our Operators for temporary traffic control, the contractor successfully replaced 16 gate valve operating nuts at one eighth to one tenth of the cost of an open excavation. In addition, the operating nuts

supplied are made of high quality stainless steel, while the operating nuts originally supplied on gate valves are made of corrosion-prone cast iron.

Water Distribution strives to provide an uninterrupted flow of high quality potable water for both domestic and firefighting purposes. The largest potential disruption to service occurs as a result of main breaks. There were 29 **MAIN BREAKS REPAIRED** in 2016. The **10-YEAR AVERAGE** for main breaks is 21 per year.



The water distribution system's 4,600 hydrants and 6,900 valves require constant vigilance.

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## GOPHER STATE ONE CALL

Technology ensures the accurate marking of the City infrastructure.

Customer Service processes more than 170,000 meter readings per year and manages approximately 27,000 accounts

lines. These markings are required by State law and managed by the Gopher State One Call system.

### COLOR CODE FOR MARKING UNDERGROUND UTILITIES

WHITE	Area of Proposed Excavation
PINK	Temporary Survey Markings
RED	Electric
YELLOW	Gas, Oil, Steam, Propane
ORANGE	Communication, CATV, Fiber
BLUE	Water
PURPLE	Reclaimed Water, Irrigation
GREEN	Sewer

### Standard Marking Code Colors

Whether you are a professional excavator or homeowner, the State of Minnesota law (Minnesota Statute Chapter 216D) requires anyone who engages in digging, to contact Gopher State One Call, at least 48 hours before beginning.

Contacting Gopher State One Call will allow you to not only follow the law, but also help to ensure costly and potentially dangerous underground utility

damages are minimized or avoided. The service is free.

A variety of technology tools and applications have helped the Utilities Division become more productive and efficient.

In 2016, the Utilities Division implemented an updated Gopher State One Call ticket management software system. This update provided a useful integration between the ticket request and the visual placement of the ticket onto the electronic map.

Wireless cellular technology allows City staff to receive and delegate ticket requests, perform marking location duties and provide infrastructure information to field contractors. The benefits the Utilities have realized include less down time, reduced travel time to/from the office and improved customer service.

Additionally, the integration with the electronic map provides staff with readily available structure data in the field. There is no longer any need to bring paper tickets back to the office at the end of the day to complete them in the office computer.

In 2016, the City received, evaluated and managed approximately 12,500 ticket requests.

Customer Service continually strives to meet or exceed our customers' expectations. In addition to the permitting duties, staff is charged with mandated **ONE-CALL UTILITY LOCATING**. Customer Service also oversees the water meter maintenance program, and has read more than 135,000 residential readings and 41,000 commercial/multi-family readings in 2016

