SEWER COLLECTION SYSTEM ANNUAL REPORT

2016/2017

City of Lancaster

lancaster ca
it's positively clear

A report of the history, current assessment, budget, activities, and the achievements of the Lancaster, California Sewer Collection System in Fiscal Year 2016/2017.

Sewer Collection System Annual Report

LANCASTER, CALIFORNIA 2016/2017

System Overview

A Sanitary Sewer Collection System is a series of pipes, manholes, and lift stations that convey wastewater from homes and businesses to a treatment plant. The City of Lancaster's (City) sanitary sewer collection system consists of a network of 429 miles of sewer lines, 8,970 sewer manholes, and one sewer lift station. This information is obtained from data input into the City's Geographic Information System. The oldest sewer pipes in the City were installed in 1947 with a resultant average age of 30 years old. The estimated value of the sewer collection system is in excess of 300 million dollars.

City of Lancaster Sanitary Sewer System Collection History

The City assumed responsibility for the operation and maintenance of its sanitary sewer system from the County of Los Angeles Consolidated Sewer Maintenance District on July 1, 2008. At that time the City formed Utility Services, a Section of the Public Works Division with the primary goal of properly managing, operating, and planning for the system to ensure it is a valuable asset for many years to come. With the goal of reducing the number of sewer overflows and to develop a program for the sustainability of the system, the City worked with the State and County Sanitation District to develop a maintenance program which would systematically clean and inspect the sewer pipes, visually and with cameras. Additionally, a program was developed to reduce the amount of harmful materials being discharged into the system. With these efforts, the number of overflows have been greatly reduced and staff believes there is a reliable plan in place to prolong the life of and manage the orderly growth of the sewer system.

DID YOU KNOW?

SANITARY SEWER MANHOLES IN THE CITY OF LANCASTER VARY IN DEPTH FROM 8 FEET TO UP TO 23 FEET. THAT'S OVER TWO STORIES DEEP!

Sanitary Sewer Overflow

A collection system's greatest concern is a sanitary sewer overflow (SSO); this is when a pipe becomes clogged and raw sewage wastewater flows up and out of a manhole. SSOs are typically caused by roots growing into the pipes or a buildup of grease. Before the City maintained the system, the City suffered 20 or more SSOs every year.
Currently, the City averages three per year.

Maintenance Program

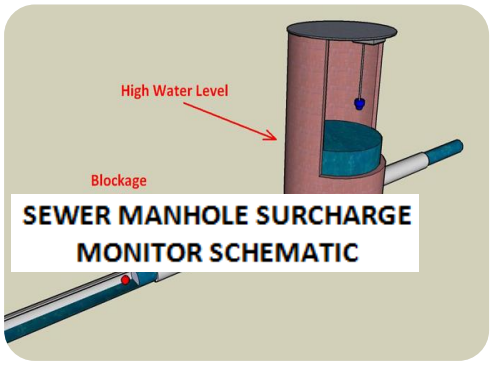
Cleaning

Cleaning consists of pipe flushing and root removal. Field staff cleans system pipes regularly using a hydrojet, a high-pressure jetting system which utilizes water and an optional vacuum to remove debris. This removes grease buildup as well as minor roots and debris to enable the wastewater to flow freely through the pipes. Blocked wastewater causes odors, SSOs, and damage to pipes. The objective of sewer pipe cleaning is to prevent future blockages of the sewer system. Roots are also removed by a mechanical cutting rodder or treated with environmentally safe foam. The majority of the maintenance budget is spent on these procedures.

Inspections

Waiting for damage or blockages to present themselves is an expensive maintenance strategy. Therefore, staff follows a strict inspection schedule to identify problems before they result in SSOs or expensive repairs. The City owns a closed circuit television (CCTV) truck from which an operator sends a camera on a small-wheeled vehicle through the sewer lines. It is controlled remotely from the truck and the video is stored for further analysis. Blockages, roots, cracks, and damaged pipes are located and cleaning or repair is scheduled. CCTV provides staff an additional resource which enhances the planning of maintenance and repair programs.

When a system pipe is blocked, wastewater will slowly rise and fill a manhole. Locations have been identified where blockages are common and field staff visually inspect these manholes on a regular basis to proactively monitor for impending overflows. Additionally, surcharge monitors have been installed in selected manholes; these monitors contain sensors on the underside of the manhole cover to measure water levels and will issue alerts of elevated flow levels so that corrective action can be taken before an overflow occurs. This prevents costly and messy sewer overflows. Surcharge monitors are currently installed at ten locations throughout the City which had previously experienced sewer overflows.

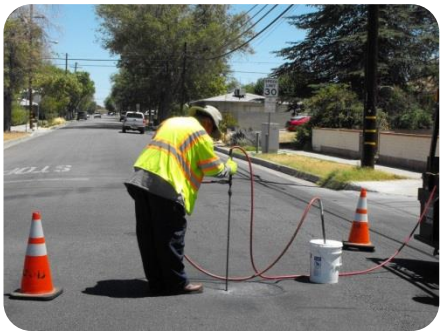


WOULD YOU BELIEVE?

SOME CITY SANITARY SEWER LINES ARE UP TO 30 INCHES IN DIAMETER; ENOUGH TO ACCOMMODATE 52 MILLION TOILET FLUSHES PER DAY!

Vermin Abatement

The City maintains a vermin abatement program within sewer manholes. The product used to treat manholes for roaches is called Zone Defense (boric acid). Boric acid, or Boron, is used in many household products and is safe for humans, unless ingested in large quantities. The product is applied by trained professionals using compressed air with a high pressure hose to spread the product inside of the manhole. The product is pulled from the container and blown through the vent hole in the manhole lid to produce a dusting of powder throughout the manhole. A six-month follow-up inspection of the manhole is performed to evaluate the treatment. If necessary, the manhole is re-treated to eliminate vermin.



Prevention Program

Fats, Oils, and Grease (FOG)

Keeping harmful substances from entering the sewer is much easier than trying to get them out. Fats, Oils, and Grease are harmful to sewers and feed the bacteria that create hydrogen sulfide gas. Hydrogen sulfide causes a “rotten egg” smell, is a health risk, and deteriorates sewer pipes. FOG build up in pipes creates blockages and leads to blockages and SSOs.

Food service establishments (restaurants, cafeterias, etc.) produce a significant amount of FOG. Lancaster is one of many cities that work with restaurants to reduce the amount of FOG sent down the drain. All food service establishments are required to apply for a FATS, OILS, AND GREASE (FOG) WASTEWATER DISCHARGE PERMIT prior to commencing operation and to submit to no less than an annual inspection by a FOG inspector. Under the regulations of the FOG discharge permit, a business must maintain best management practices to prevent FOG discharge, including scraping and dry wiping of pans and dishes into the trash before being washed, and maintain a grease removal device, such as a grease interceptor or trap. Staff regularly engages with the community to educate residents and business owners on how to best reduce their FOG impact on the sewer system.

Industrial Waste Water Discharge

Some businesses in the community manufacture or generate harmful chemicals that pose a health risk and damage sewer pipes, if not properly disposed of or treated. Utility Service staff is evaluating the creation of a program to help businesses identify their hazards and ensure they are mitigated.

Capital Improvements

A capital improvement program is employed to plan for affordable improvements instead of expensive emergency repairs. With an investment as large as the City's sewer system, financial reserves and good planning are crucial.

As sewer pipes age or are exposed to chemicals, they can wear, crack, or collapse resulting in wastewater flowing out, and ground water seeping into the pipe. Once the sites in need of repair or replacement have been identified, staff develops a plan to fix them in the most cost effective manner. New methods such as cured in place lining using trenchless technology to rehabilitate pipes, are proving to be an economical alternative to digging up streets and installing new pipe. The City is utilizing these and other cutting-edge techniques to stretch the capital budget. Trucks, equipment, and pumps require regular overhauls or replacement in order to remain efficient and effective; staff has developed, and is constantly enhancing, the long-term capital improvement program to ensure that major expenses are identified early and financial reserves are established.

Staffing

The Utility Services Section currently consists of a staff of 26, including the Assistant Utility Services Manager, Management Analyst, Industrial Waste Technician II, Industrial Waste Technician I, Environmental Compliance Officer, Environmental Compliance Specialist II, Environmental Compliance Technician, two Environmental Aides, Electrician, two Lead Maintenance Workers, five Maintenance Worker IIs and nine Maintenance Worker Is.

Training

Staff holds memberships in the following organizations -

- National Association of Sewer Service Companies, Inc. (NASSCO),
- Water Environment Federation (WEF),
- American Water Works Association (AWWA),
- California Water & Environment Association (CWEA),
- American Public Works Association (APWA),

YOU CAN HELP:

NEVER POUR GREASE DOWN THE DRAIN. PUT IT IN A CAN OR SOAK IT UP IN A PAPER TOWEL AND PUT IT INTO THE TRASH OR SAVE YOUR GREASE & DELIVER TO CITY MAINTENANCE YARD AT
615 W. AVENUE H, FOR RECYCLING.

- California Land Surveyor's Association (CLSA), and
- Association for GIS Professionals (URISA).

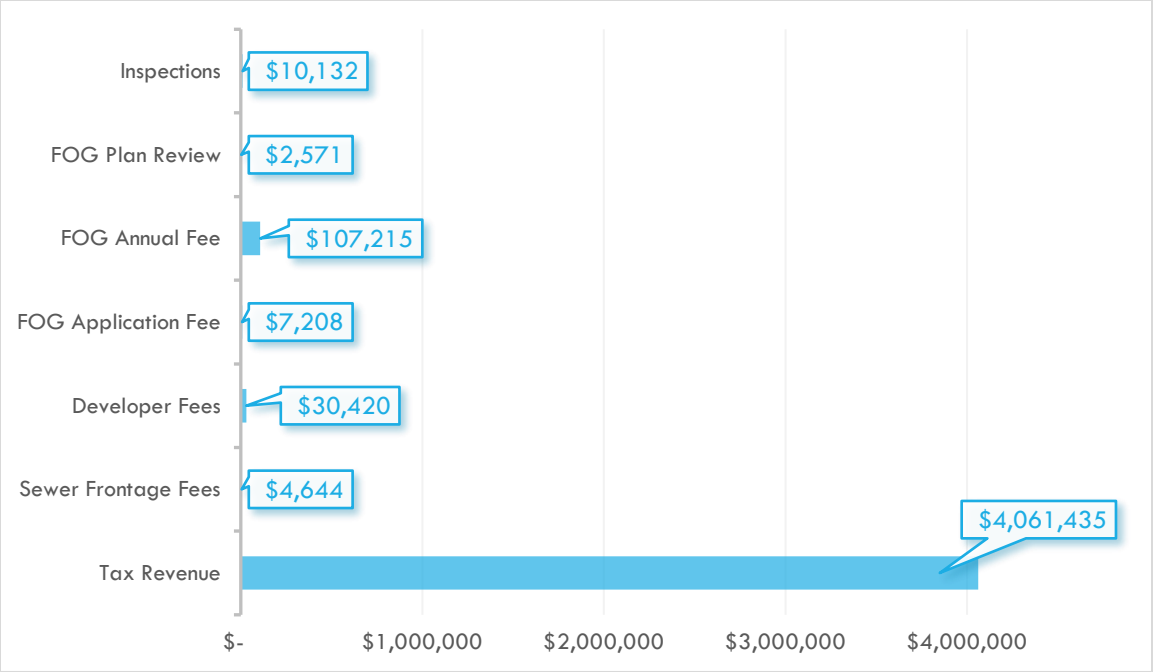
These organizations provide training and certification to ensure staff is able to safely and proficiently maintain the system. In fiscal year 2016/2017, staff members received 3 new certifications and 14 re-certifications.

Conclusion

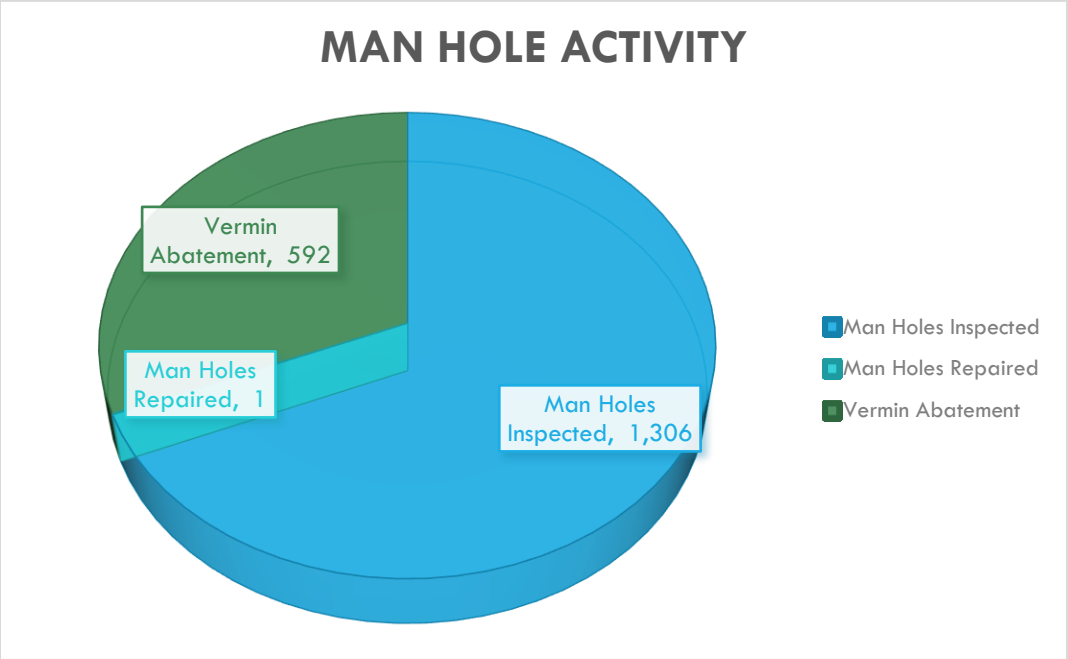
As staff reviews the past year's performance of the sewer system, the maintenance, investigation, and prevention programs are proving to continue to be successful. Expansion of preventive programs, specifically community outreach and the FOG program, are continuing to be evaluated and will be implemented as they are developed. Additionally, new asset management software systems are beginning to roll out and will aid in the scheduling and tracking of maintenance in order to ensure a complete, system-wide approach. The capital improvement program provides assurance that our system will be successful for future generations and is constantly being evaluated and updated with the most current and urgent needs. The staff of the Utility Services Section is proud to provide such a vital service to the residents and businesses of the community and will continue to remain proactive in order to safeguard one of the City's major assets.

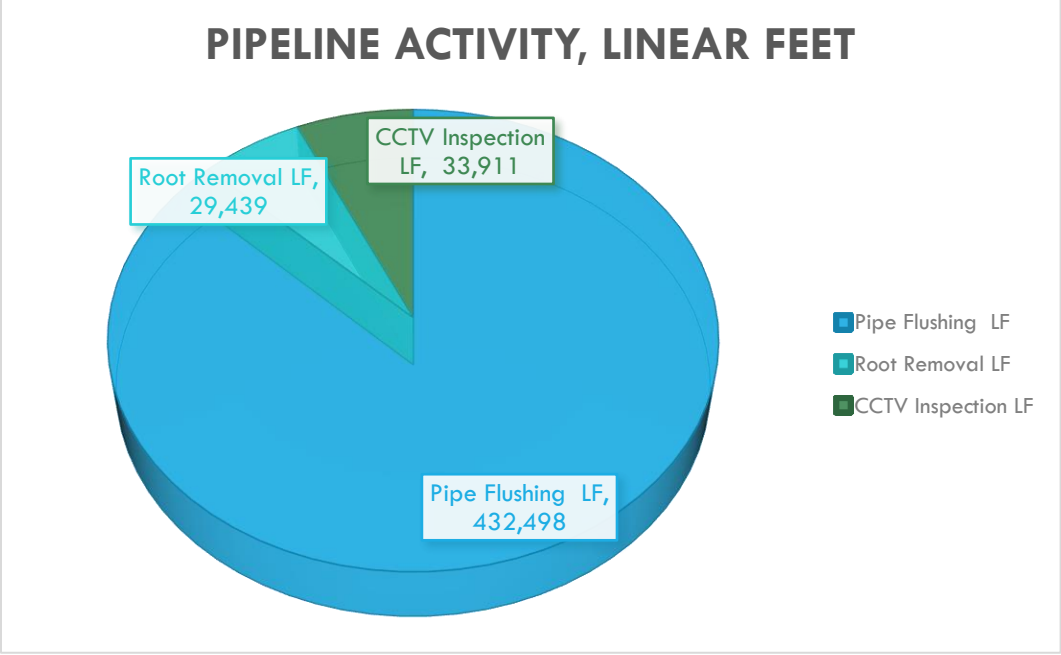
2016/2017 Annual Sewer District Revenue Sources

The City collects sewer fees from a variety of sources; however, the overwhelming majority of revenue comes from property owners whose properties are connected to the sewer system. As shown in the exhibit below, the City collects over $4,000,000 in sewer charges; these funds are used for the care of the system and the specialized equipment required to properly clean and inspect the asset.



2016/2017 Annual Sewer Maintenance Activity at a Glance





Sewer System Performance Review

Sewer System Performance	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017
Pipe Cleaning:						
Pipe Flushing	179,977 LF or 34.1 Miles	209,616 LF or 39.7 Miles	176,880 LF or 33.5 Miles	257,242 LF or 48.7 Miles	313,117 LF or 59.3 Miles	432,498 LF or 81.9 Miles
Root Removal	172,194 LF or 32.6 Miles	155,967 LF or 29.5 Miles	111,408 LF or 21.1 Miles	117,296 LF or 22.2 Miles	39,380 LF or 7.46 Miles	29,439 LF or 5.56 Miles
Closed-Circuit TV Inspection:	146,203 LF or 27.7 Miles	167,851 LF or 31.8 Miles	68,640 LF or 13 Miles	85,834 LF or 16.3 Miles	55,095 LF or 10.43 Miles	33,911 LF or 6.42 Miles
Manholes:						
Inspected	2,268	1,507	96	2,127	2,318	1,306
Repaired	5	9	3	30	10	1
Vermin Abatement	n/a	n/a	848	233	352	592
Sewer Overflow (SSOs):	4	3	5	4	4	3
Annual SSO Rate (SSO/100 miles of pipe)	0.93	0.69	1.16	0.93	0.93	0.69
Portion of SSO Runoff Contained	97%	95%	100%	32%[1]	98%	100%
Main SSO Causes						
Grease	95%	100%	80%	75%	80%	15%
Roots	5%	0%	20%	0%	10%	15%
Other (Vandalism, etc.)				25%	10%	70%

[1] The percentage of run-off contained for fiscal year 2014-2015 is lower, compared to the previous year, due to the fact that two of the four spills occurred in dirt fields where the liquid soaked into the ground and could not be recovered.