

City of Cudahy, Wisconsin

**ANNUAL REPORT
OF THE
DEPARTMENT OF PUBLIC WORKS
FOR 2017**

Compiled by the
Director of Public Works
March 2018

Annual Report of the City of Cudahy

Department of Public Works

For 2017

Mission: The mission of the Cudahy Department of Public Works is to efficiently provide & maintain sustainable, safe and reliable infrastructure for all they serve, 24 hours a day, 7 days a week.

Structure: The Department is divided into three major divisions:



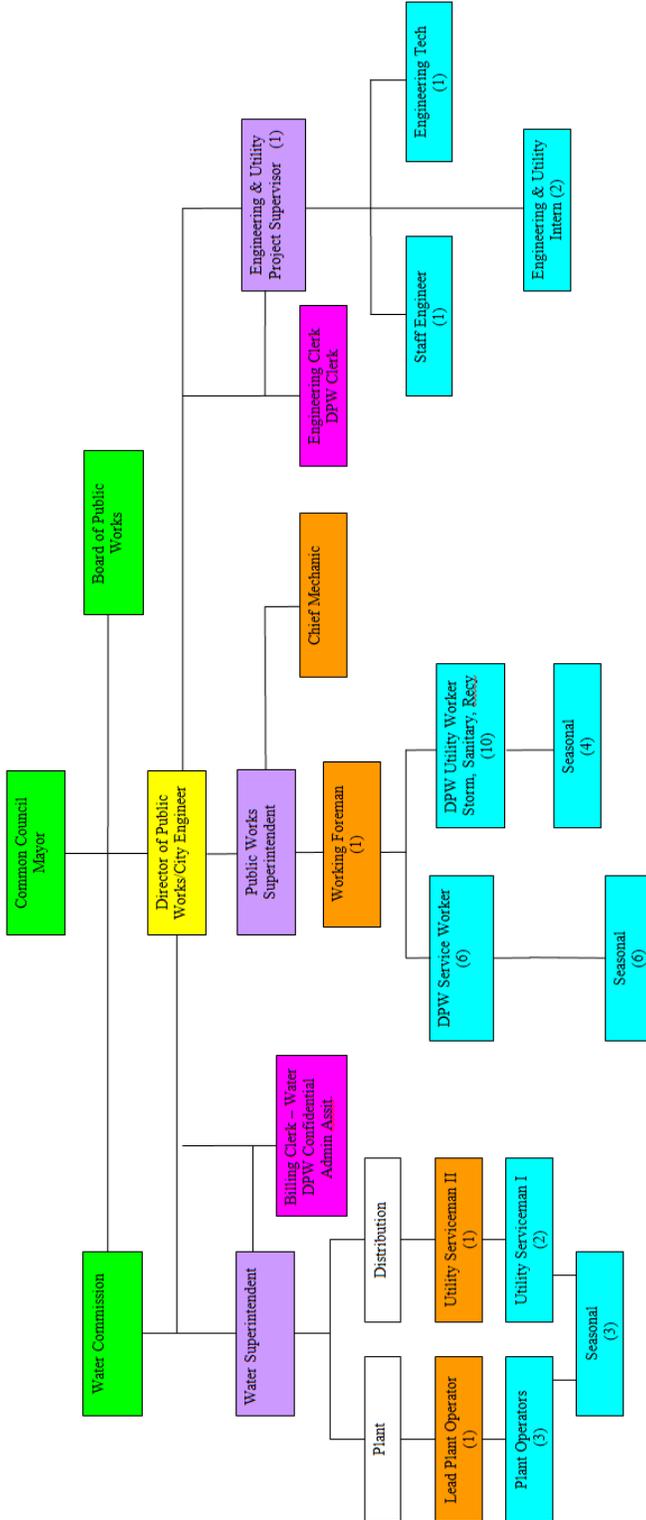
The main functions of the department include an Engineering Department that prepares long range & short term infrastructure improvements, prepares preliminary and final engineering for a variety of infrastructure improvements, administers and oversees construction management of those infrastructure improvements and maintains the City's Geographical Information system. The DPW maintains the sanitary sewer system, storm water system, street lighting system, streets, alleys, urban forest, municipal buildings, fleet and manages a refuse & recycling program. The Water Utility operates and maintains a surface water treatment plant, a potable water distribution system and a non-potable water system serving two very large industrial complexes. The City of Cudahy's Department of Public Works is unique because all aspects of municipal infrastructure, Engineering, DPW and Utilities are under one department. The Department is managed by a Director of Public Works who is the licensed City Engineer. This is an extremely efficient way of operating because it allows resources, technology and skills to be shared. It also allows for a coordinated effort when major infrastructure is rebuilt.

The Board of Public Works has oversight of the Engineering and the DPW divisions whereas the Water Commission has oversight of the Water Division. Although all divisions work integral with each other on the mission of the department, this report will concentrate on the Engineering & DPW Divisions under the requirements of Section 62.14 of the Wisconsin State Statutes. The Water Utility is governed under different statutes regulated by the Public Service Commission and is required to prepare an annual Consumer Confidence Report.

Number of Employees in the Department of Public Works

Engineering	3 full time, 2 interns (in 2016 it was 4 full time, 2 interns)
DPW	19 Full time, 10 Seasonal (11 full time positions paid out of the Utilities) (in 1999 department had 26 full time positions)
Water	8 full time, (1 Superintendent, 4 plant operators, 3 distribution)
Administration	2 full time, 1 part time (in 2007 had 4 full time & 1 part-time)

**Department of Public Works
Proposed Organizational Chart**



The next page of this document outlines a number of major construction projects the Engineering staff undertook this year. The Engineering Department is comprised of an engineering supervisor, staff engineer, engineering technician and two college interns. Although the Director of Public Works assists with plan review, construction management and long range capital planning this small department handles an impressive amount of work annually. Projects included survey and data collection, design & plan preparation, utility coordination/relocation, community outreach, special assessment preparation & final billing, construction oversight and data management. In addition, the engineering staff reviews development plans, private utility replacement work, and engineering studies for the sanitary system and Storm Water Utility. The Department continues to update and get data into the City's Cartegraph asset system. This system is used to register public inquiries, produce work orders, manage history on the entire City's infrastructure and update the information on the City's Geographical digit map system.

Significant projects for 2017

- Packard Avenue Reconstruction – This project started in late 2016 with the replacement of sanitary sewer, water main, and storm water upgrades between Lunham & Cudahy Avenues. Completion of the roadway reconstruction plans took place in early 2017. City staff did the entire design including the street lighting. Construction began in late May and was completed before the opening of school in late August. The Department handled the entire project management including public meetings, special assessments, communication, layout, inspection and construction coordination with utilities/agencies. The roadway was open to traffic before school began in fall and the project completed under budget.
- Lead Service Line Replacement – The Engineering staff worked with the Water Utility to identify lead water services. This took a lot of field coordination. The project is expected to continue for the next couple of years.
- Grange Avenue Sewer & Water – This project was not on the schedule for 2017 but the 128th Refueling Wing requested the City of Cudahy to extend sanitary sewer & water main down Grange Avenue from Pennsylvania to the City's west city limits line. The project was a federally funded project and the 128th had a deadline to get the utilities installed by the end of 2017. The engineering staff did the design & construction management. The difficulty on this project was the unfamiliarity of coordinating work under a federal contract. The work was completed on-time and under estimate.
- Hazardous Sidewalk Replacement- The staff continued the hazardous sidewalk replacement program in 2017 which included re-evaluation of the sidewalk, property owner notification and communication, inspection & project management and special assessments. The sidewalk project is always a difficult one as it takes a lot more staff time than most projects. This is a result of the amount of hours spent inspecting the walk and then dealing with the public. This year it was especially problematic because of the coordination that was needed between the We-Energies Gas Project and the sidewalk project.
- CDBG Bus Stops – HUD project that included the construction of bus stops on Pennsylvania Ave.

Engineering Projects for 2017 (Non Construction Related)

- Replacement of We-Energies Gas piping throughout the City: We-Energies began replacing several miles of gas main & services in the City in 2016 and continued with a larger project in 2017. This consumed about 10% of the engineering department's time with plan review, permitting, construction coordination, resident complaints and permit compliance.
- Installation of new fiber-optic cable & equipment within the City right of way by Crown Castle: The new trend by companies is to install a robust fiber-optic communication cable in City rights of way to provide data storage and internet services to customers. Crown Castle, a firm out of the Chicagoland area was the first company to embark on such installation in the Milwaukee Metropolitan area. This large cable network system required the Engineering Department to review over 72 pages of plans, process permits, coordinate construction with City construction, handle resident complaints and review restoration. This consumed about 12% of the Engineering staff time this year.
- Sanitary Sewer Lift Station Replacement – the engineering staff continues to work with R.A. Smith National on the replacement of the College Avenue lift station. The project is closer to final design. Additional flow data was needed for the sanitary sewer as MMSD will require the City to install a much smaller system. This concerns the department because the lift station was designed & has much larger flows than MMSD will allow. Some of the flow is during peak wet weather conditions resulting from illegal sump-pump connections. The engineering staff continues to work on projects to find the sources of the inflow and ways to reduce it. Because it will take years and lots of money to provide the much needed inflow elimination, the staff will need to provide a plan in order to facilitate some of the discussion with MMSD on the sizing of the station.
- Storm Water Management - Staff is work on the preliminary design of the Grange Avenue relief line that will reduce flooding of intersections and roadways during peak rain events in the middle section of the City. The relief line is also intended to provide storm sewer for Grange between Whitnall and Barland so that it can be improved along with other roadways in that area. On the northern end of the City, the staff continues to work on a storm water project to relieve flooding on Van Norman near Lippmann Manufacturing/FMP. The Department has been working with St. Francis on the design as St. Francis is the downstream recipient. One project that the engineering department has had little success in is the relief of storm water in the Ace Industrial area. This will take cooperation from the Union Pacific Railroad . There is a defective culvert under the rail road tracks at College Avenue which the Rail Road is slow to fix.
- Inflow & Infiltration of clear water into the sanitary sewer system: The Department has determined that a good majority of the clear water that migrates into the sanitary sewer system is from illegally connected sump pumps that discharge into floor drains or are tied into the sanitary lateral. The staff has been working on obtaining money through MMSD grants to provide storm laterals & connections to property owners in areas with active sump pumps.
- Cartegraph System – The cartegraph system is an asset management and a work order system mainly used by the Department of Public Works and the Utilities. The engineering staff has played a critical role in 2017 with getting this system more functional.



Project of the Year:

The American Public Works Associations awarded the City of Cudahy the 2017 Project of the Year award for the State of Wisconsin. This project was a group effort between the City owned utilities, DPW and the engineering staff. The project required all the infrastructure above and below the ground to be replaced. The design, permitting, environmental control, project management and coordination of the construction required all departments within the Department of Public Works to work together. The design was done by the engineering department but the engineering staff worked with the City Arborist and other DPW staff members on the selection of the planting material. The City electrician was also involved in the selection and design of the street lighting system. During construction all divisions of the Department of Public Works played a part. This was a great achievement and beat out several Wisconsin Department of Transportation projects.



The DPW performs operational and maintenance functions over the City’s infrastructure. Although the duties are preventive, the essential responsibilities of the department are responsive in nature.

- EMERGENCY FUNCTIONS**
- Snow plowing & salting of streets
 - Snow plowing alleys
 - Flood control – barricades & clearing of debris
 - Sanitary sewer blockage
 - Sanitary sewer by-passing
 - Roadway collapse-barricading & temporary repair
 - Signal knockdown or malfunction
 - Street Light knockdown
 - Spilled load or accident clean-up
 - Trees/limbs removal after wind storm
 - City hall HVAC malfunctions
 - Provide back-up generators for emergencies
 - Assist Water Utility with water main breaks

- ROUTINE FUNCTIONS**
- Snow plowing – parking lots
 - Snow clean-up/removal
 - Preventive storm water flood control
 - Street Light maintenance & repair
 - Signal light maintenance & repair
 - Streets & Alleys – Pothole patching
 - Streets – Permanent patching
 - Parkways – turf maintenance
 - Downtown Packard –planting & maintenance of flowers/parkways, garbage cans, seasonal banners
 - Tree removal
 - Tree Planting
 - Tree Trimming
 - Street Sweeping
 - Catch Basin Cleaning
 - Leaf Collection
 - Sanitary & storm sewer cleaning
 - Manhole & inlet repair
 - Storm water facility maintenance
 - Sanitary Lift station maintenance
 - City Hall building maintenance, grounds & HVAC
 - City elections
 - Civic celebration – set-up & assistance
 - Recycling Yard (Drop-off site)
 - Refuse – municipal buildings, bus-stops
 - Refuse & Recycling – Cart repair & assembly, contractor oversight of collection
 - Street & regulatory sign installation & maintenance
 - Pavement Marking
 - Fleet Maintenance

Infrastructure Responsibilities

<u>Streets</u>	
59.3 Centerline miles of streets (149 lane miles)	
<u>Sanitary Sewer</u>	
54.7 miles of Sanitary Sewer Main (8” to 48” size)	
<u>Storm Sewer</u>	
29 miles of Storm Sewer Main (12” to 72”)	
# of Catch Basins/Inlets	1643
<u>Alleys</u>	13.1 miles
<u>Signalized Intersections</u>	9
<u>Street Lights City owned</u>	
29.6 miles (520 street light poles)	
<u>Street Trees</u>	4200

Department of Public Works Activities & Facts

Is the Public Works Department the same as it was a decade ago? **No**

Over the past decade the Department has seen a lot of changes in personnel, technology and operations. These changes were necessary to balance the overall budget of the City and to adapt to changing requirements at the State level. The Department suffered greatly in 2011 after the City lost a severe amount of State shared revenue and grants. Because the Department of Public Works is one of the largest Departments and because (Police & Fire) were protected under State law, Public Works took on much of the burden. To offset cuts in State shared revenue, the Department was forced to reduced staff levels. Reduction in staff and funds also impacted how services were provided to the public. In response, the Department implemented technology/equipment that provided efficiencies lost by labor reduction. Some service that required a significant amount of capital or could be done cheaper by contracting were outsourced. However some services that were outsourced that provided efficiencies or were critical to emergency operations were assimilated back into the department. To get a better picture of the funding reduction one has to look at the amount of funding budgeted from 2008 to 2017.

<u>Year</u>	<u>Budget Public Works</u>	<u>DPW impact on \$5000 tax bill</u>
2008	\$ 2,400,462	\$300.00
2017	\$ 2,685,875	\$306.75

With labor cuts and funding cuts, how were City services impacted?

The budget cuts to the Department caused the Department to rethink how it was providing services. From road salt application to garbage collection, sewer cleaning to tree trimming, all services were reviewed for inefficiencies and modified to reduce cost and provide equitable service to all. Contracted garbage service reduced the significant capital cost for the replacement of garbage trucks. Curbside spring clean-up was changed to a "Drop-Off" program. Other DPW programs such as sanitary sewer cleaning, tree trimming and asphalt resurfacing needed to be restructured to provide cost savings. The City had contracted out sewer cleaning for decades but this was very costly and impacted emergency response time during severe weather events or sewer back-ups. So the department purchased a sewer jetter and trained its staff. The sewer jetter has not only saved the City 32% annually in sewer maintenance costs but has been proven to serve a multitude of functions for the Storm Water and Water Utilities. The tree trimming and tree removal programs that were done on a complaint basis were changed to a planned and annually scheduled program. Tree trimming was divided up into 5 sections with one section being done each year. Similarly asphalt resurfacing projects were broken up into areas to save on contractor mobilization charges. Although the Department tries to stay on target with daily services, this goal is continually challenged by weather related emergencies and the over 1200 customer service work requests received annually.

Work Requests

There were a total of **1253 work requests** for DPW service in 2017. That equates to **24 work requests per work week or nearly 5 a day**. Of those work requests, 43 requests were not closed out because they were related to trees that were scheduled to be trimmed during the 2018 trimming schedule or were trees that were on the schedule to be removed.

Activities in 2017

At the beginning of 2017 the City Arborist estimated that roughly 1600 urban street trees were compromised and required removal. Factors such as decades of heavy salt use, trimming at the wrong time of the year, vandalism and disease are all to blame, however, the largest culprits in the past couple of years has been the infliction of the emerald ash borer beetle and maple decline due to parkway pollution. The City began mass removals in 2016 using its own forces however this was difficult because of the small labor force and the other competing need of the department. In 2017 the Department contracted out tree removal with an allocation of about \$250,000 taken from the road fund approved by the Council. This was necessary because the dead trees pose a significant safety hazard and liability to the City – more so than a pothole. Outsourcing also allowed the Department to catch-up on decades of tree trimming.

Tree Removal

Some trees were removed by City forces and some by the contractor. The amounts per district are outlined below however these are the amounts as of November 1, 2017. As of the end of December 2017, the total amount is around 422.

Total # of Trees Removed in 2017 (November 1, 2017)

Aldermanic District # 1	64
Aldermanic District #2	60
Aldermanic District #3	7
Aldermanic District #4	46
Aldermanic District # 5	185

Tree Planting

Unfortunately with the strain on the budget for tree removal and tree trimming, the purchase and cost of re-plantings of street trees has been severely cut. In 2017 the department replanted trees on Packard Avenue from Cudahy to Lunham Avenues using unspent funds allocated for the reconstruction project. The remainder of trees planted in 2017 came from donations and from trees pre-purchased in the fall of 2016.

Tree Trimming

The Public Works Department does all the tree trimming. The City is broken up into 5 trimming areas. Trimming is done between the months of December through March to minimize disease and bug infestation. All individuals in the department that trim the trees are either certified arborist or are trained by the arborist. Many of the trees that are now diseased or dying were trimmed at the wrong time of year or by someone other than City trained personnel. In 2017 the Department trimmed 1168 trees at a cost of \$200,000.



Areas where trees were trimmed in 2017

Street Lights

About half the City street lights are owned and maintained by the City of Cudahy. The other half of the system and those in alleys are “leased” through We-Energies. Due to the expense of leasing street lights through We-Energies, the City’s goal is to replace the We-Energies system on roadways with a City owned LED system. The Department does this when a street is being reconstructed. On the City’s currently owned system, the department is replacing the old in-efficient bulb with an LED fixture when the bulb or fixture needs replacing.

Street signs

The Department is required to meet federal standards set for all street signs whether they are regulatory of way-finding. In 2017 the Department was volunteered to install flashing school crossing signs and beacons at significant school crossings for the school district. The signs were purchased by the school district however, the project was not well thought out as the parts supplied did not fit the conditions. As a result, the department used up a significant amount of resources. It should be noted that the Department of Public Works does not maintain these flashing signs. The responsibility of the signs and the programming of when these signs flash are the responsibility of the School district.

Parkway & Building Grounds Maintenance

The Department maintains over 13 miles of street parkways, medians and municipal building grounds. This includes grass cutting, trimming, planting and maintaining flower beds, pots, & bio basins. It also includes installing banners and seasonal decorations. The City reduces the cost by utilizing 10 seasonal employees for about 80% of these tasks. Flowers pots & baskets are designed and planted by a gifted Department of Public Works employee. She also is responsible for the seasonal decorations at City Hall.

Storm Water Maintenance

A large part of the Department’s funding is through the Storm & Sanitary Utilities. Without these utilities the department could not provide the necessary labor required during a snow plowing event. Eleven of the nineteen positions are funded through non-tax funds. That means that 8 positions are funded through taxes. The City needs a minimum of 12 employees (not including the mechanic & Superintendent) for a typical snow event for plowing. That means that 4 of the employees are actually utility employees. If an event is prolonged for 16 hours or more, the labor required increases to a minimum of 22 not including the mechanic and Superintendent. At that point all employees including those from the Water Utility (if there are no water main breaks) and the engineering staff are utilized.

The work required for storm water maintenance includes plant & bed maintenance on the bio-basins & swales, brush and tree removal in City maintained storm water detention basins and ditches, dredging of silted detention basins, catch basin cleaning & rebuilding, storm sewer cleaning and street sweeping.

How often are the streets swept a year?

Street sweeping is done all year round. Even during the winter months. Much of the City's storm sewer system has a direct connection to Lake Michigan so it is very important that any salt residue, organics, oils or road debris is picked up before a rain event.

2017 61 times 191 tons debris

Sweeping during the leaf season increases to daily to remove any residual material that can cause water quality issues.

How often are leaves picked up?

Leaves piled in the curb create a significant amount of pollutant run-off. Although leaves are a natural material, the leaf compost generates phosphorous. Although plants love it, phosphorous in water-ways especially Lake Michigan increases algae growth which is very detrimental to fishing, swimming, boating and water quality. Algae plumes can create significant issues for Water surface plants as it clogs piping, creates taste & odor problems and increases the cost to produce potable water. (The City operates a water surface plant) Typically the City will begin leaf collection with a vacuum truck toward the end of September. From about October 15th to Thanksgiving the City picks up large piles of leaves weekly starting on the north side of the City on Monday. There is no set day or time. Once the City is through the neighborhood for that given week, the Department will not be back until the following week. This is necessary because the Department's labor is required to do other things.

Catch Basin Cleaning & Repair

The Department removes debris from its more than 1600 catch basins. This typically begins after leaf collection ends, stops during the winter months and resumes during spring. Debris removal is done with the City's vacuum or sewer jetter/vactor truck. During the cleaning process the department inspects the catch basin for any repairs. Repairs range from rebuilding the top 12" to the entire basin. Normally the department can rebuild about 3 basins a day. At the beginning of 2017, the City had nearly 200 basins that needed some form of repair. The Department repaired 53 of those in 2017.

Sanitary Sewer Cleaning

In 2013 the Department purchased a sewer jetter/vactor truck to clean its 54 miles of sanitary sewer pipe. The cleaning of sewers was outsourced prior to that point. Not only was it a cost savings to have the City clean the sewers but the Department no longer had to wait several hours during a sewer back-up for a contractor to respond. The purchase was made to decrease cost and ensure responsiveness, however, the equipment has become very versatile for trench excavation during water main breaks and sewer collapses. Outside of emergencies it is used routinely for excavations for utilities, street lights and even street tree planting.

Sanitary sewer cleaning is typically done during the winter. The City is broken up into three districts, with one district cleaned every third year. There are some sewer sections that are done annually because they have been problematic. In 2017 the area bounded by Lunham on the north, Morris on the south, Packard on the west and the Lake on the east had routine cleaning or root cutting done. That equates to 19.5 miles of sewer cleaned.

Preparedness

Sewer cleaning, tree removal, flood mitigation, anti-icing, exercises, pre-planning storm events, snow removal, catch basin cleaning are pre-emergency preparedness to lessen the impact of an emergency event. Equipment, generators, emergency management plans and barricades is indicative of having the right tools in the tool box when that emergency event arrives. Construction of preparedness facilities, material storage, lift station by-pass, sanitary by-passes and storm water detention facilities are all facilities constructed to address preparedness. All these actions the Department undertakes to be prepared when an emergency event may occur. Being prepared protects the safety & welfare of the public. Although the Department cannot prevent a storm from occurring, being prepared ahead of it reduces the economic loss and may save a life. Factors such as having the right operating equipment, having the material, having and training the labor, having the right sized facility to store the equipment, material and labor are all very important. Just as important is having an educated and seasoned management staff in the operations of public works and utilities who can determine what is needed. In 2015 one of the goals of the department was to construct a salt storage facility by the end of 2017. The facility would have the capacity of storing salt not only for a normal winter but for some of the worst seasons recorded in the past 15 years. Currently the City can store about half of what's needed annually during normal conditions and a fourth of what is needed during an aggressive winter season. It should be understood that the Department did prepare a needs analysis and plans for construction in 2017 and followed all necessary approvals. However, in July 2017 the Department was unable to progress to the construction phase as a result of public opposition to the construction of the facility.

2017 Budget Results

Although the revenues were down approximately \$3200, the Department of Public Works ended up with an overall surplus of \$256,400 this year. A portion of it was due to the milder winter but a larger contribution resulted from continued operational changes, technology and the employees.

Summary

General: The Department of Public Works provides two vital functions – preventative and responsive. The Department’s daily responsibilities are to rebuild, repair, clean and maintain the public infrastructure in order to prevent infrastructure failure, economic loss and ultimately provide a safe and healthy environment for all to thrive in. The second role is to be responsive to things that just happen such as weather, flooding, sewer collapses, water main breaks, signal malfunctions, outages, traffic crashes, road failures and heating or cooling issues at City Hall.

2017 Summary list of Activities Completed

Street reconstructed	.5 miles	
ADA bus stops constructed	4	
Hazardous sidewalk replaced	1.78 miles	
Handicap ramps constructed	27	
Sanitary sewer main replaced	.4 miles	
Water main replaced	.51 miles	
Water services & sewer laterals replaced	59	
New sanitary main installed	.15 miles	
New water main installed	.22 miles	
Work orders closed	1210	
Trees removed	362 (November 2017)	422 (December 31, 2017)
Trees Trimmed	1168	
Sanitary sewer cleaned	19.5 miles	
Street Swept –	61 times	191 tons debris collected
Catch basins Cleaned	779	
Catch basins repaired	43	
Leaves Collected	168 tons	
20 yd Dumpsters Emptied at Drop-off	96	
Streets Pothole patched	191 tons of cold patch	
Alleys Pothole patched	55 tons of cold patch	
Street lights replaced	19	

Summary – Financial

Budget - Expenses (year-end balance)	\$ 259,663
-Revenue (year-end)	\$ 3,165
Overall balance	\$ 256,498