

City of Cudahy, Wisconsin



ANNUAL REPORT OF THE DEPARTMENT OF PUBLIC WORKS FOR 2018

Compiled by the
Director of Public Works
March 2019

Annual Report of the City of Cudahy

Department of Public Works

For 2018

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:



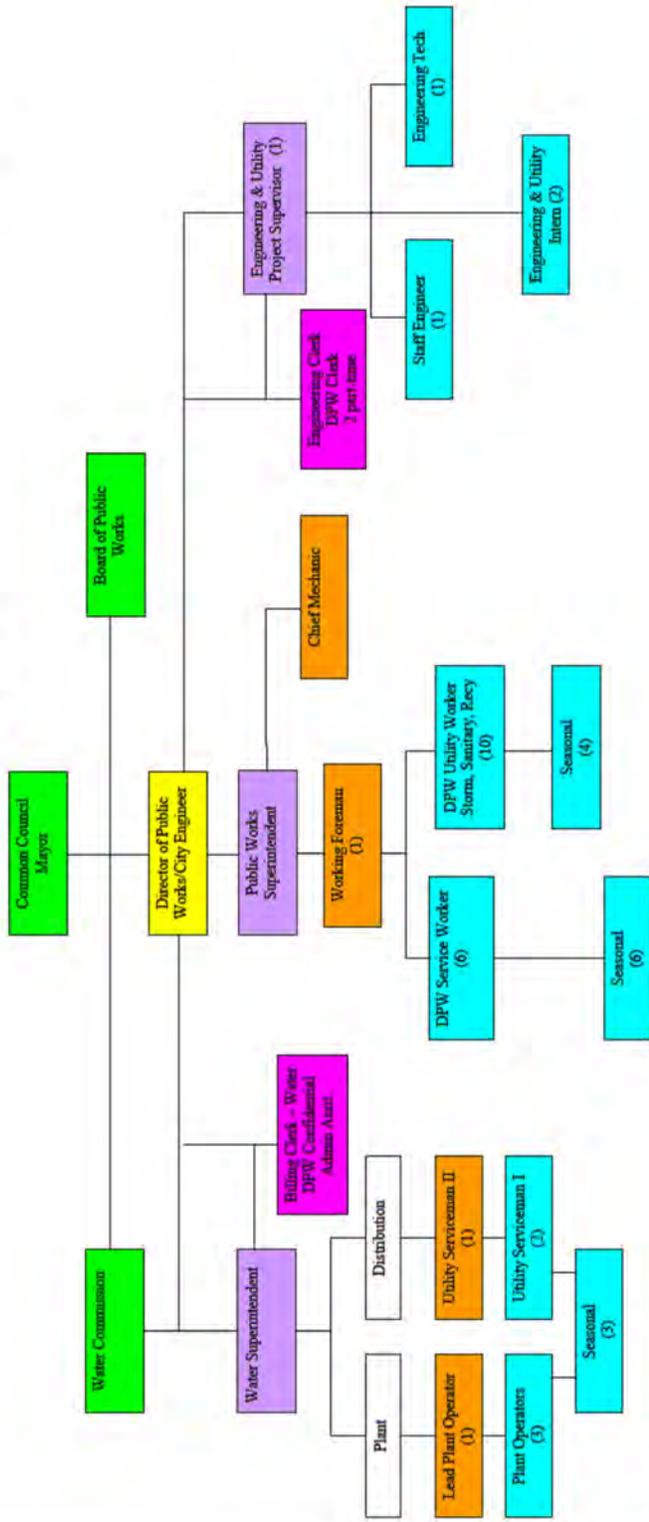
The main functions of the department include an Engineering Department that prepares long range & short term infrastructure improvements, prepares preliminary and final engineering for a variety of infrastructure improvements, administers and oversees construction management of those infrastructure improvements 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 2008 department had 24 full time positions)
Water	8 full time, (1 Superintendent, 4 plant operators, 3 distribution)
Administration	2 full time, 2 part time (in 2007 had 4 full time & 1 part-time)

Cudahy 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. The engineering department assists the DPW and Water Utility on field solutions, design and plan preparation and construction oversight. Sometimes they even have to plow snow.

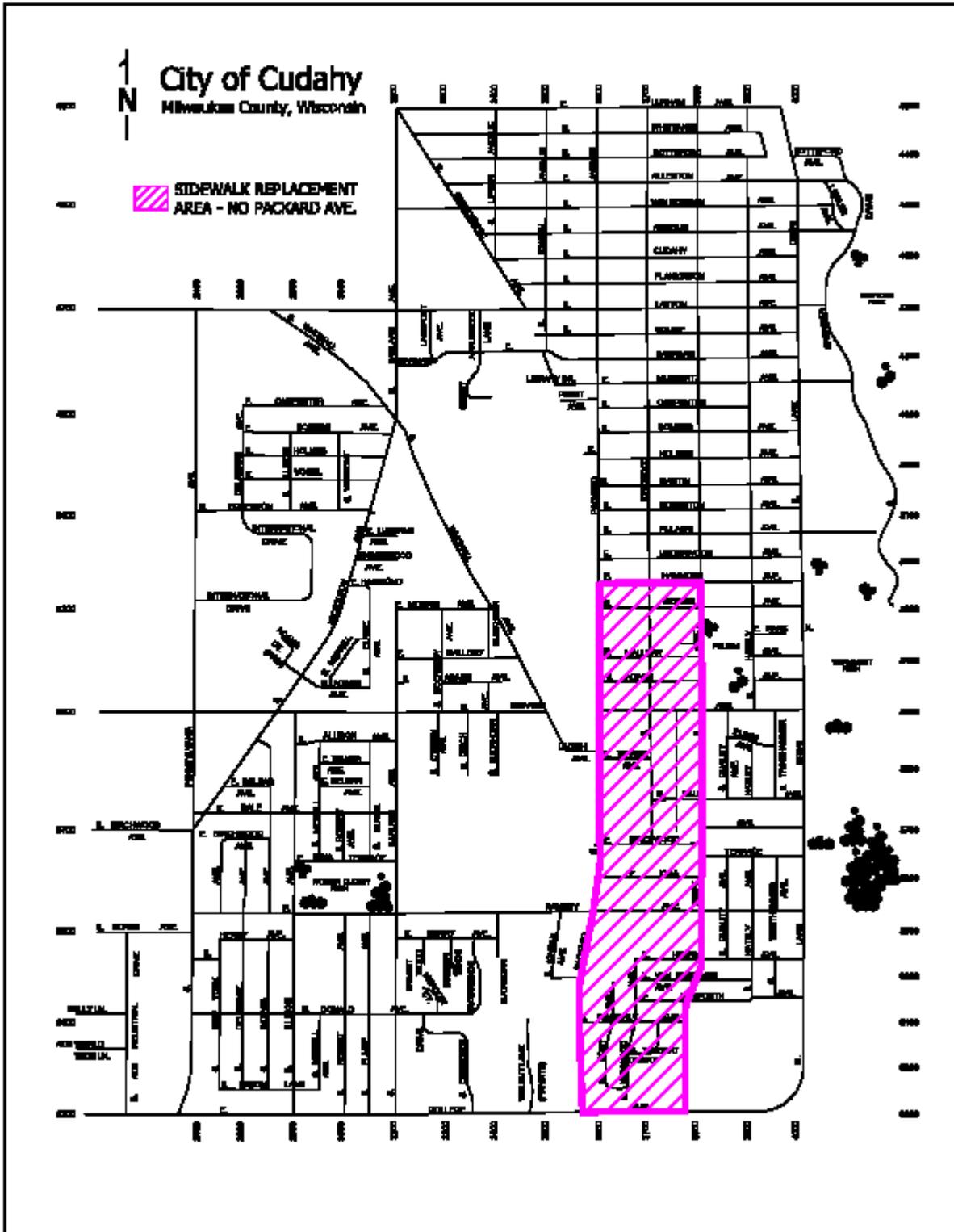
Significant projects for 2018

2018 was a year of data collection and plan preparation. It was also a year that the engineering office was remodeled that limited staff to small projects. Due to the volume of projects and the size of the staff there are years that result in all construction and no plan preparation, and then there are some years that little construction occurs but a lot of design and plan preparation is done. Although 2018 was a plan preparation year the following construction projects were performed in 2018.

Construction

- CDBG Bus Stops – HUD project that included the construction of bus stops pads, sidewalks and access ramps on Lake Drive at Pulaski Avenue. Staff prepared plans and construction oversight.
- Grading DPW Site on Whitnall - The staff prepared plans and construction oversight for the grading of the Whitnall site in preparation for the salt storage facility. The plans included a storm water pond and bio-basin.
- Hazardous Sidewalk Replacement- The staff continued the hazardous sidewalk replacement program in 2018 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 again was problematic because of the coordination that was needed between the We-Energies Gas Project and the sidewalk project.

Hazardous Sidewalk Replacement Area for 2018



- Squire/Layton Alley Reconstruction & City Hall front Parking lot Reconstruction** – This was a first of its kind for Cudahy and a first of its kind for Wisconsin. Although the “green alley” concept has been constructed in many Wisconsin Cities, it has not been attempted here in Cudahy. With a green alley the 4’ wide center area of the alley is constructed of 8” concrete pervious paver blocks. The area under the paver blocks is filled with “clear” stone as to wick the water away. The water drains down through the stone media and is collected by a 6” drain tile along the bottom of the trench. The green alley gets its name because it takes dirty storm water and filtrates out the bad stuff before it gets into the storm sewer system. The City is under a strict mandate to reduce its pollutant loads from organics. These systems work well to filter out the dirt but they don’t necessarily take out dissolved elements such as phosphorous. So Cudahy worked with an engineering firm to construct a media under the pavers out of blast furnace slag that would react with the phosphorous to eliminate it. Never before in Wisconsin has this been done and the City is on a three year testing period.

Cudahy’s Green Infrastructure Helps Reduce Pollutants and Protects Lake Michigan.



Blast Furnace Slag

Underneath the paver blocks is a 10’ wide section of a crushed stone-like material called **Blast Furnace Slag**. This material is a sustainable industrial byproduct of the steel/iron ore manufacturing process. Specifically, for this project, it provides a base for paving and also is used as filter material to aid in pollutant removal. The slag has small holes and pockets that absorb pollutants, like phosphorus, that are mixed in stormwater runoff. When used in conjunction with **PaveDrain**, a permeable pavement system, this form of construction helps remove phosphorus from stormwater quickly and protect our local waters like Lake Michigan.



In lab tests, systems like this have been able to remove more than 90% of dissolved phosphorus from stormwater within 1 hour of its contact with the system. ©HAM HILL/CS&P



PaveDrain

Blast Furnace Slag

Geotextile Wrapped Trench





PaveDrain

The pavers seen here are a type of concrete block that allows for the infiltration of storm water between its joints. The center blocks have an arch shape that maximizes on-site stormwater capacity/storage. **PaveDrain** has an infiltration rate that exceeds 1,000 inches per hour which allows for the capture of heavy rainfall events and the reduction of pollutants that come with the “first flush” of stormwater via the stone holding layer below. Combining the City Hall and the Squire Alley projects, the city now has over 4,500 square feet of **PaveDrain** that was installed through grants.



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MMSD

Department of Public Works Activities & Facts

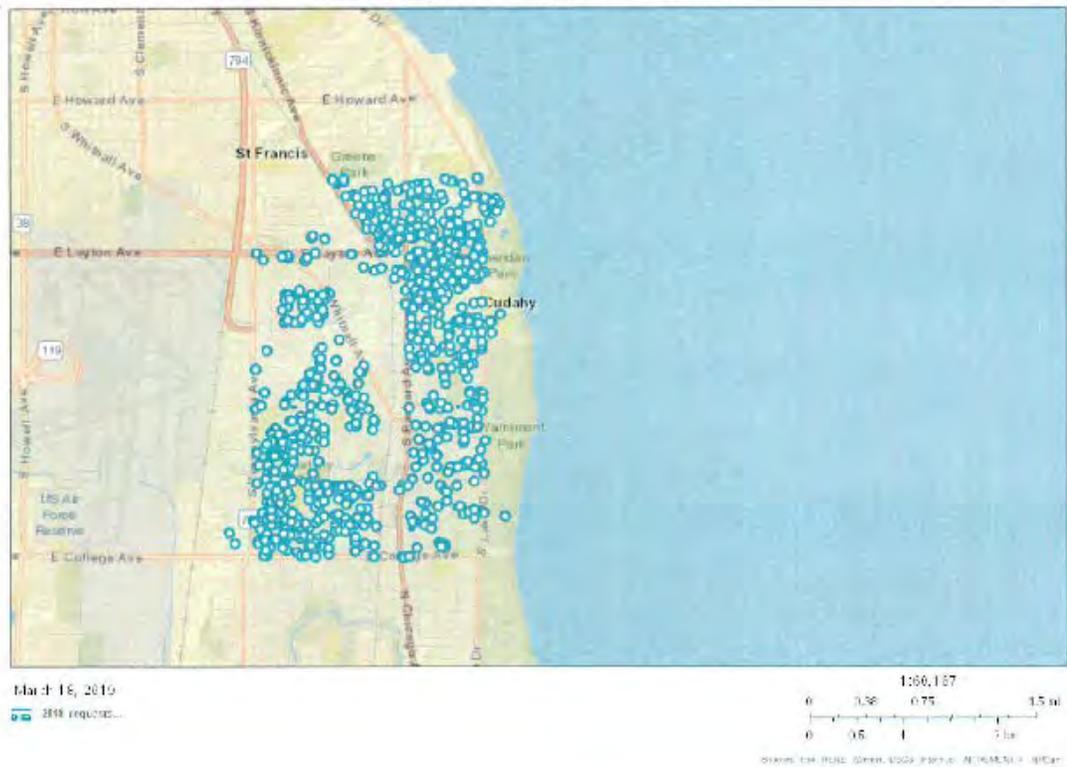
Work Requests

There were a total of **955 work requests** for DPW service in 2018 from the general public. That equates to **18 work requests per work week or nearly 4 a day**. Of those work requests, 54 requests were not closed out because they were related to other services or it was some service outside of what DPW can handle. There were 4507 tasks completed by DPW in 2018. Tasks make up a combination of general maintenance work and work requests from the public. That equates to an average of **17 tasks completed by DPW in a given work day**.

3/18/2019

2018 requests completed - 955 total

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Activities in 2018

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. However the money appropriated in 2017 funded roughly 422 tree removals leaving about 1178 compromised trees. In 2018 the City again appropriated funds to the tree removal program. The costs are not only associated with the cutting of the tree but the removal of the waste, stumping and restoration. In 2018 the City had an issue with property owners who did not water newly restored areas after stumping and the DPW had to go out nearly three times to restore many of the areas.

Tree Removal

Some trees were removed by City forces and some by the contractor. Total # of trees removed in 2018 was 633.

	<u># of Trees</u>		<u>Cost</u>
DPW	180 trees		\$ 104,196
Contractor	453 trees	17481 dia inches stumped	<u>\$ 241,433</u>
		Total Tree Cutting	\$ 345,629
Cost of Tree Restoration by DPW			
	1 st time		\$ 88,096
	2 nd time		<u>\$ 9,059</u>
		Total Restoration	\$ 97,155
		Total Cost of Tree Removal	\$442,784

Tree Planting

The Department did manage to plant 168 trees in 2018. 88 trees were planted in Spring & 80 trees were planted in Fall. Of the trees planted 18 property owners donated money to have 27 trees planted.

The Following make up the approved tree species:

- Apollo Sugar Maple
- Hackberry Prairie Sentinel
- Frontier Elm
- Ivory silk Lilac
- American Hophornbeam
- Spring Flurry Serviceberry
- Sterling Silver Linden
- Greenspire Little Leaf Linden
- Shawnee Brave Cypress
- Crimson English Oak
- Ivory Pillar Lilac
- Amelancher Spring Flurry
- State Street Maple
- Hackberry
- Eyestopper Cork Tree
- Columnar Black Sugar Maple
- Bald Cypress
- Exclamation Plane Tree
- Ginko
- Emerald Spire Crabapple
- Tatarian Maple
- Kentucky Coffee

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. The winter of 2017-2018 made trimming difficult but the crew did get the projected 2017-2018 area completed. The Department trimmed 1777 trees at a cost of \$ 144,855.

3/18/2019

2018 Tree Trimming

2018 Tree Trimming



<https://ogech07.cartocdn.com/Cesium/WMMap1?input?file=2018%2018%20Tree%20Trimming×tamp=1532933358&orientation=landscape&onload=5655757-52e1-44ce-8aff-23d91130e984>

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 continues to replace 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. The City is up to date but it is an on-going process to meet & replace signs due to reflectivity requirements.

Parkway & Building Grounds Maintenance

The Department maintains over 13 miles of street parkways, medians and municipal building grounds or roughly 32 acres. 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.

Special Events

The Department of Public Works is often the silent worker behind many special events. In 2018 the Department spent nearly 273 labor hours on the July 4th Celebration. Whether it’s for a parade or just setting up barricades for block parties the Department logged over 424 labor hours to special events in 2018.

Leaf Collection

Leaf collection is part of a recycling function and a storm water function. It typically begins around October 15th and the crew is usually finishing up around the second week in December. Due to the warming effects of Lake Michigan, the leaves tend to drop later in Cudahy then in the western part of Milwaukee County. This can be problematic during December snow events. Leaves are collected curbside **weekly**. The 2018 cost of leaf collection was \$ 91,745.



When leaf collection get heavy (lots of large piles) the crews pick up the leaves by pushing them into a loader bucket. The loader bucket then puts them in a rea packer where they are compacted and then taken to a compost facility. The crew then follows up with the street sweeper.

Leaves are collected on the main roadways with a vacuum trailer. The trailer is also used when leaf fall is light.



Drop-off Site

The Department manages a Drop-Off Site for yard residential yard waste, recycling and rubbish. Each year the cost of disposing of rubbish becomes more of a challenge as the cost is rising but the revenue (tax money) is not appropriated. In 2018, 529 labor hours were appropriated for the Drop-Off site. 251.6 tons of trash was dropped off and 121, 20-30 yard dumpsters were utilized.

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.

In 2018 the City replace 41 catch basins which involves breaking up the roadway, excavation, catch basin removal & replacement, backfilling, curb repair and roadway replacement. So it can be very time consuming. In 2018 the department cost for catch basin replacement was \$76,716 funded through the Storm Water Utility. That amounts to about \$1871 per catch basin.

The City sweeps its streets **nearly weekly** between March 15th & December 15th. The City also tries to get out and sweep street during the winter months at least once a month. In 2018 the City collected 181 tons of material in the street sweeper. The City also cleans storm water catch basins through the use of a vacuum truck. In 2018 the City collected 253 tons of material out of catch basins. The sweepings and the catch basin debris are required to be landfilled at an approved facility.

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. In 2018 the Common Council authorized the Department to construct the salt storage facility. Although too late in the season to get anything constructed the Department did get the site graded and prepared so that a larger salt storage facility could be built in 2019.

Salt Application

2017-2018 Winter Season In the 2017-2018 the Department Used 517.23 tons of salt for 27 events averaging about 19.15 tons per event or about 257 pounds per lane mile. Some of this salt however is used for fires, water main breaks and sump discharges so it difficult to get an accurate pounds per lane mile application rate.

The Department uses several different methods of removing snow & ice and it doesn't involve putting more salt down. The mission is to provide safe streets at the same time as being environmentally conscious. Chlorides are bad for the environmental and much of the City's storm water discharges directly to Lake Michigan. The way the Department does this is through understanding each storm, taking into account pavement temperatures, applying brine on the streets and public sidewalks ahead of the event when practical, plowing when the snow is ½" or more, using belly plows for snow pack and making sure that salt is used at the best time.

Anti-Icing





Benefits of Anti-Icing



Difficulties of Winter in a City like Cudahy

Parked Cars



Snow removal downtown



Plowing

What does the Department do to reduce the use of salt and remove hard pack snow & ice? Four of the City's trucks have a "belly plow" which now are ordered on every new truck. A belly plow uses the chassis to remove ice & hard packed snow which minimized the use of road salt.



Belly plow

Budget Balance													
Department of Public Works													
2018													
Account	2018 Budget Revenue	2018 Actual Revenue	2018 Budget Expenses	2018 Actual Expenses	Surplus/shortfall			Reserve for Capital Expense	What Equipment				
101 DPW Operating	\$ 176,400	\$ 85,528	\$ 2,635,950	\$ 2,485,301	\$ 59,777	This account is supported by taxes. Revenues fell short because the Finance Director was double charging utilities for engineering costs at end of year. So budget # for revenues was set higher. This December we did not double charge so it shows that revenues were less than budget. Revenue values adjusted for 2019 to reflect this.							
104 Special Collections	\$ 256,605	\$ 288,139	\$ 232,184	\$ 187,154	\$ 70,985	Not supported by taxes - this account is supported by garbage fee & balances carry over to be used to purchase garbage carts, equipment & improve Drop-Off		\$ 50,000	Garbage Carts				
901 Recycling Fund	\$ 507,881	\$ 678,622	\$ 663,659	\$ 538,620	\$ 140,002	Not supported by taxes - this account is supported by recycling fee & is self supporting. Must have a surplus at the end of the year to put money away in a capital expense account to purchase equipment for leaf collection, etc		\$ 120,000	Recycling Carts, Loader - transfer Site				
201 Sanitary Fund	\$ 1,227,253	\$ 1,156,024	\$ 1,369,141	\$ 942,231	\$ 213,793	Not supported by taxes - this account is supported by sewer rate & is self supporting. Must have a surplus at the end of the year to put money away in a capital expense account to purchase equipment & replace sanitary sewer mains. Ordinance passed that 25% of surplus goes into capital account.		Minimum = \$53,250, Recommended = \$200,000	Replace sanitary mains				
302 Storm Water Utility	\$ 1,364,600	\$ 1,343,357	\$ 606,535	\$ 539,107	\$ 67,428	Not supported by taxes - this account is supported by storm water fee & is self supporting. Must have a surplus at the end of the year to put money away in a capital expense account to purchase equipment & replace storm water facilities. Ordinance passed that 25% of surplus goes into capital account.		Minimum = \$16857, Recommended = \$60000	Replace storm water facilities				

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.

2018 Summary list of Activities Completed

ADA bus stops constructed	2
Hazardous sidewalk replaced	2.3 miles
Handicap ramps constructed	52
Tasks Completed	4507
Public Request for Services	955
Trees removed	633
Trees Trimmed	1777
Sanitary sewer cleaned	16 miles
Street Swept –	181 tons debris collected
Catch basins cleaned	253 tons collected
Catch basins repaired	41
20 yd Dumpsters Emptied at Drop-off	121
Tons Trashed collected at Drop-Off	251.6 tons

Summary – Financial

	<u>Revenues – Expenses</u>	<u>Restricted 2019</u>
DPW 101 Overall balance	\$ 59,777	
Special Collections 104	\$ 70,985	\$ 50,000
Recycling 901	\$ 140,002	\$ 120,000
Sanitary Fund 201	\$ 213,790	\$ 200,000
Storm Water Fund	\$ 67,428	\$ 60,000