



**WATERBURY**



# ENGINEERING DEPARTMENT



**ANNUAL REPORT 2022-2023**

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### Introduction

The Department of Engineering provides technical expertise and management for City Capital Improvement projects. The Department oversees construction in the public rights of way by Utility Companies and private contractors, provides information to the general public and advises all other City agencies, Boards and Commissions requiring its services and information. Traffic provides engineering and technical support on traffic and safety related issues.

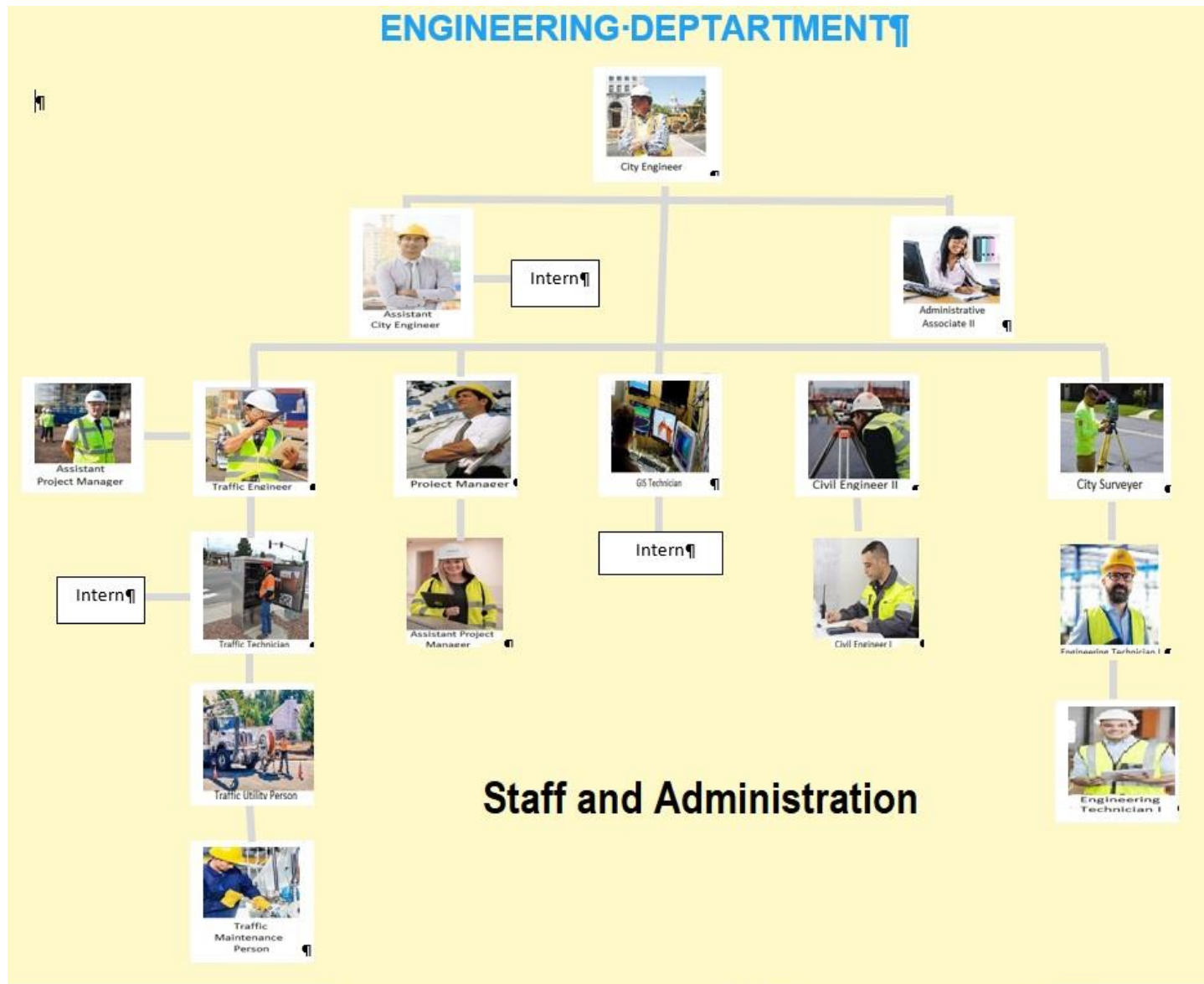
In addition, the Department manages and coordinates the City's utility Geographic Information System (GIS) and assures compliance with environmental permits and regulations.

### Engineering Department Primary Duties



- Provides technical expertise and management for City Capital Improvement projects.
- Oversees construction in the public rights of way by Utility Companies and private contractors.
- Provides information to the general public.
- Advises City agencies, Boards and Commissions requiring its services and information.
- Traffic provides engineering and technical support on traffic and safety related issues.
- Develop long range capital improvement plans and budgets.
- Design, manage and inspect Public Works construction projects.
- Administer the City's Municipal Separate Storm Sewer System (MS4) General Permit.
- Maintain State and Federal Storm Water Permits for numerous City properties and infrastructure.

- Coordinate with Connecticut Department of Transportation (DOT) and Naugatuck Valley Council of Governments (NVCOG), Waterbury Development Corporation (WDC) and other state and regional agencies on capital projects impacting City infrastructure.
- Review, approve and inspect public infrastructure improvements for land development projects.
- Operate and maintain the City traffic signal system.
- Maintain traffic and street name signs and pavement markings.
- Issue street and sidewalk use permits required for street closings, detours or blockages for parades, utility work, processions, running or walking events, and other activities.
- Provide logistical support for festivals, processions, block parties and other activities.
- Maintain maps and records of the City's infrastructure.
- Conduct land-surveying duties.
- Issue street opening permits for private and utility company work within the City Rights-of-Way.
- Issue dumpster permits for placement within the City Rights of Way.
- Assign house numbers.
- Approve and inspect building permits in regard to impacts on City's infrastructure
- Address citizen concerns with regard to engineering and/or infrastructure issues.
- Mark out City storm sewers and traffic signal loop detector locations for "Call Before You Dig" requests.
- Assist with Snow Removal operations and management.
- Attend Board of Alderman and other City Commission meetings and advise on status of City Capital projects.
- Perform annual and biannual dam inspection, permitting, and reports for the Connecticut Department of Energy and Environmental Protection (DEEP).
- Provide services to other City departments and the public as requested.
- Advise Corporate Counsel on FOIA requests and Releases of Certificates of Assessments, as well as property boundary and easement issues.
- Prepare or assist with grant applications for traffic, infrastructure, environmental, and recreational projects.
- Maintain bridge and culvert inspections and inventories.



The Department of Engineering is currently comprised of six management positions:

City Engineer	Roy Cavanaugh, P.E.
Assistant City Engineer	Vincent Caterino, P. E.
Acting Traffic Engineer	Jose Duverge, P. E.
Assistant Traffic Project Manager	Ryan Bushka
Project Manager	Sal Porzio
Assistant Engineering Project Manager	Noreen Brady

Engineering also has one GIS technician, two Civil Engineer II, one Civil Engineer I, one CT Licensed City Surveyor, a part time licensed engineer for project design, administration and one technical personnel whose primary roles are inspection and permitting of private sector construction and maintaining the inventory of existing infrastructure. Currently there is a vacant Civil Engineer II position and one vacant Civil Engineer I position. The Department of Public Works provides Administrative support to the Engineering Department.

Traffic Engineering staff presently consists of one part time Traffic Signal Technician, one full time Traffic Signal Technician, one full time Traffic Utility Person and one full-time Traffic Maintenance person. In addition, there may be up to three (3) interns working in various offices.

### **Capital Improvements**

During the past fiscal year, the Department of Engineering has been providing expertise in a total of 21 Capital Improvement projects. This expertise includes the planning, design and inspection of capital projects, and providing engineering review and consulting for other City Departments. A major drainage rehabilitation program on over 23 miles of roadway was completed this year. Drainage improvement, installations or reconstruction were conducted on the following streets:

#### Drainage

Alder Street	Englewood Street	Grove Street
		Linden Street
Municipal Stadium Emergency Repair		Shirley Street
Oakville Condo Emergency Repair		St. Jean Street
South Leonard Street	Walnut Street Emergency Repair	
Woodruff and Adelaide Streets		

The Downtown Signalization Project Congestion Mitigation Air Quality (CMAQ) design is near completion with the RFP in the works and a 2024 start construction date. Local Road Accident Reduction projects are finishing design completion for East Main Street at Brass Mill Street and North Walnut Street at East Farms Street. Construction of the Naugatuck River greenway from Platts Mill Road to Eagle Street is complete. Recent grant awards were submitted and approved for an extension of the Naugatuck River Greenway from Eagle Street to downtown and for a greenway along Mad River Road from South Main Street to East Liberty Street. The Department also received a notification of an award from the Climate Resiliency Program at the CT DEEP for the Clough Brook watershed improvements and will be working with the NVCOG on the North Walnut Street Drainage Improvements from the same program. Work has not yet begun on these projects.

### **Traffic/Transportation**

New commercial and residential developments contribute to an increase in traffic throughout City streets. It is for this reason that traffic signal design projects include upgrading traffic signals with new equipment and implementing pre-emption equipment for emergency vehicles.

As development continues to occur in the City, it is important that our roadways be well maintained with proper traffic control devices. Emphasis is on keeping traffic signals, roads and highways maintained according to State and Federal regulations. This effort is accomplished by repairing traffic equipment, replacing faded signs, repainting faded pavement markings, replacing broken or missing signs and installing new signs. The goal is to expedite and mitigate problems or requests as quickly as possible.

In conjunction with the City Planning Office and the Development Team, various plans were reviewed for new developments, road design, traffic signal design and

utilities design projects from the State, utility companies, developers and consultants. During the construction phase, technical support was provided and detour plans were examined to recommend alternative routes for improving the traffic flow around construction sites.

### **Newly Accepted City Streets**

There were no new City streets accepted this year. The City currently maintains 295 miles of paved roadways and 0.22 miles of unpaved roadways.

### **Land Development**

The Department reviews and inspects all development in the City that affects the City's infrastructure from single-family homes to large commercial and residential developments. The Department is currently reviewing and/or overseeing the construction of 22 new Major Land Development projects in conjunction with Planning and Zoning.

In addition to these major projects, the Department reviewed 17 building permits for compliance with City regulations. These reviews include but are not limited to single family houses, building additions, and structure demolition, which do not require approval by the City of Waterbury Land Use Boards.

### **Street Opening Permits**

There were **739** permits issued for the construction and repair of gas mains, sanitary sewers, sidewalks, driveways, and/or other underground utilities. Engineering Staff are responsible for follow up inspections as required.

### **Dumpster Permits**

There were **49** dumpster permits processed in FY 22 – 23. Engineering is now coordinating these with the Building Department to ensure Building Permits are obtained.

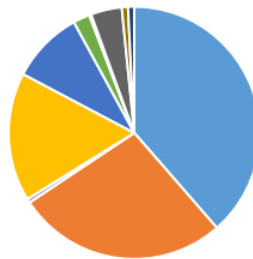
### **Call Before You Dig (CBYD) Requests**

Approximately **818** requests were processed in FY22 – 23, an average of approximately **3** requests per workday.

### **Citizens' Concerns**

Citizens' Concern recorded **203** Engineering Requests, Citizen Concerns (QAlert) were addressed by the Department of Engineering directly and an additional **1031** for Traffic. Typically, depending on the nature of the concern, a member of Engineering visits the site, makes a recommendation and implements the recommendation. Each concern is unique and requires a different level of action. These actions include any one or all of the following: Meet with the citizen at the site; research records; contact a department or PWD bureau for further investigation and/or immediate repair; develop preliminary plan and estimate for consideration as a project; or no action to be taken. The one traffic utility person, the one traffic signal technician, the Assistant Project Manager or the one traffic maintainer, handles traffic requests.

QAlert Annual Activity



- Traffic Control Sign
- Signal Repair
- Sidewalk Repair
- Utility/contractor Cut
- Guardrail Repair
- Sneakers on Wires
- Underground Utility Work
- Missing/Damaged Street Name Sign
- Paving
- Engineering Inspection
- Sidewalk Inspection
- Guardrail Request
- Street Opening Permit

Request Type	Open	In Progress	Closed	Total
Traffic Control Sign	145	13	367	527
Missing/Damaged Street Name Sign	102	5	162	295
Signal Repair	2	2	166	170
Paving	62	14	41	117
Sidewalk Repair	35	13	34	82
Engineering Inspection	8	1	25	44
Utility/contractor Cut	1	8	31	40
Sidewalk Inspection	0	0	27	27
Guardrail Repair	15	1	2	18
Guardrail Request	3	0	0	3
Sneakers on Wires	3	0	0	3
Street Opening Permit			1	1
Underground Utility Work			1	1

### **Street and Sidewalk Use Permits**

**01** permit for road closures and/or detours, parades, processions and special events were reviewed and approved by the Department this fiscal year. Many of these events required Traffic assistance with signs, barricades, cones and other support.

### **Miles of Sidewalks**

The City maintains **223** miles of sidewalks:

60 miles of Asphalt    0.5 miles of Brick    158 miles of Concrete    4.5 miles of Mixed

### **Record Searches**

Record Research requests are received by email, telephone calls and from walk-in customers, approximately **12** were processed this Fiscal Year. During the course of a business day when personnel are available, the Department of Engineering routinely Traffic requests and the four Engineering Technicians search records for maps, permits

and other data to fulfill Engineering research requests.

### **Traffic Signals**

A total of **161** responses were performed to replace light bulbs, LED's, load switches, detector amplifiers, conflict monitors, controllers, cabinets, pedestrian signals, pedestals and to reset traffic signals from conflict flash. A traffic "interrupter" program has been initiated. Pre-emption equipment has been replaced to restore the function that allows emergency vehicles priority at intersections. This replacement program is on-going. The department is supervising a major signal upgrade in the down town area to be installed next fiscal year and working with the CT DOT on the signal upgrades to be performed as a result of the I-84 Exit 21 closure. The city has 101 traffic light locations.

### **Traffic Control Signs**

A total of **04** new traffic control signs were installed.  
A total of **119** existing traffic control signs were repaired.  
A total of **371** existing traffic control signs were replaced.

### **Street Name Signs**

During the year **113** Street Name Signs were repaired or replaced by staff.  
A total of **619** Street and Traffic sign work orders were serviced this fiscal year.

### **Pavement Markings**

During this fiscal year, pavement marking work was performed separately and in conjunction with the milling and paving program, totaling **23.4** miles.

### **Accomplishments**

#### **Dams**

The city has dams registered with the CT DEEP. Recent property acquisitions include the Risdon and Bray's Buckle dams. Both of these were inspected and registered with the state. Emergency Action Plans and stability analyses are under development.

#### **Sidewalks**

In FY 2022-2023, the following sidewalks were installed or rehabilitated:

Aurora Street	Boyden Street	Chase Parkway
Euclid Street	Hamilton Avenue	North Main Street
Pearl Street	Ray Street	

Lakewood Road sidewalk design is underway using LOTCIP funds and the Chase Parkway sidewalk is also being extended using Community Connectivity Program grant funds.

#### **ADA Compliance**

Sidewalks throughout the city are being inspected and upgraded to meet Americans with Disabilities Act (ADA) compliance. Ongoing efforts are underway to meet Department of Justice (DOT) requirements with the Registrar of Voters for polling place access.

### **Roadway Program**

In FY 2020-2023 the following roads were milled, paved or rehabilitated:  
Niagara Street      Robbins Street

### **I84 Mixmaster**

Engineering has been working closely with the CT DOT on the I-84 Mixmaster Renovations including upgrades to Riverside Street, closing exit 21 east bound, relocation of exit 34 on Rte. 8. Southbound, redesign of South Main Street, improvements to West Main Street from Highland Avenue to I-84, traffic signal upgrades affected by Exit 21 closure and relocation of I-84 westbound Exit 18.

### **Sanitary Sewer Separation Program**

Engineering is designing, inspecting, and administering projects to comply with the EPA mandate to separate storm and sanitary sewers systems.

### **Underground Storage Tank (UST) Upgrades**

Engineering is assisting the Board of Education in their UST Program and is completing the design of the UST removal and replacement with an above ground storage tank and new dispenser at the Waterbury Police Department

### **Sanitary Sewer Separation Program**

Parking garage improvement projects include the Buckingham/Field Street garage structural rehabilitation and elevator replacements. Public Building project assistance provided includes the Chase Building rehabilitation, elevator upgrades, various projects to Jefferson Square, Firehouses on East Main Street, Bunker Hill Street, and other miscellaneous projects as required.

### **Parks**

Park projects include electrical upgrades to Chase Park House, new roofing at Baldwin Recreation Center, and design of new basketball court at Waterville Park, along with design of the bathroom at Scofield Park, permitting and design of pond rehabilitation at Fulton Park, assisting with 3 city pool replacements, the Washington Park Wall and sidewalk replacement design, as well as the water fountain replacement and sidewalk rehabilitation at East Mountain Park.

The following table summarizes the Department of Engineering's accomplishments during the past five fiscal years.

Description	Fiscal Year				
	17-18	18-19	19 - 20	20-21	21-22
<b>Capital Improvement Projects</b>					
Capital Project Expenditures (Millions of dollars)	\$8.33	\$15.2	\$7.7	\$16.7	\$16.8
Infra Structure and Miscellaneous Projects	4	12	16	22	25
Traffic Projects	0	3	4	5	9
Park	6	8	16	18	12
<b>Land Use and Private Development</b>					
Major Land Development	10	11	20	7	34
Minor Land Development (Building Permits)	16	24	32	37	14
<b>Permits/Citizens Requests</b>					
Street Opening	881	777	646	761	642
Call Before You Dig requests	5392	4885	4858	4858	667
Citizen Concerns (Q Alerts)	950	1040	917	974	880
Street and Sidewalk Use (Special Events)	95	79	84	76	38
Record Research	30	32	32	64	60
Dumpster Permits				66	48
<b>Street and Traffic Control Maintenance</b>					
Repair of Traffic Signals	213	196	199	194	150
New Traffic Control (TC) Signs	73	133	126	35	4
Replacement/Repair of Existing TC Signs	232	265	292	315	17
Remove or Relocate Existing TC Signs	43	45	17	13	1
Replacement/Repair of Street Name Signs	79	107	79	27	17
Milling and Paving (miles)	4.9	9.5	7.2	0	23.4
Centerline /Lane Line Striping (miles)	2.4	3.6	0	0	0
Stop Bars, Cross Walks, Turn Arrows, (S.F.)	17,615	3,910	0	0	0

## **Bridges**

The City of Waterbury maintains 22 bridges listed in the National Bridge Inventory, with a span of at least 20 feet. In the most recent Connecticut Department of Transportation (DOT) biennial bridge inspection report, released in 2019, the DOT listed all City structures in fair or better condition except:

- Bridge No. 05534, Washington Avenue over Mad River – Rated: Poor
- Bridge No. 05039, Eagle Street over Naugatuck River – Rated: Poor

Emergency repairs were conducted on the Washington Avenue Bridge to address the scour issues identified during the bi-annual inspection performed by the Connecticut Department of Transportation. Applications to the DOT Local Bridge program for the replacement or rehabilitation of the Eagle Street and Washington Avenue bridges were submitted. The CT DOT approved funding for the replacement of the Eagle Street bridge. Design to be performed by the CT DOT has not yet begun. The Department engaged the services of SLR Consulting to inspect four other bridge identified by the CT DOT as needing some repairs which will generate future projects.

### **Drainage Facilities**

The City maintains the following drainage facilities:

14,310 Catch Basins   243 miles of Storm Sewer Pipes   81 Culverts

### **Operations**

In order to increase the efficiency of the day-to-day operation of the Bureau and to clarify the policies and requirements for work within the public streets and right of ways, the Bureau will continue to develop "Public Works Construction Regulations." These regulations will update and consolidate into one document the current policies and construction requirements presently in force by the City. The regulations will address privately owned utilities servicing individual properties, extension of City utilities by private developers and subdivision construction. This work is ongoing as staffing and time permits.

The permitting process is being reviewed and updated, standardized drawing details and technical specifications continue to be developed and promulgated, the utility trench repair inspection program is being vigorously enforced and staff training and professional development programs being implemented. Engineering is working in conjunction with other departments to implement an online permit application process.

Project Management capability is being enhanced with the addition of the Assistant Project Manager positions and filling vacant Civil Engineer and Traffic Engineer positions.

The standard city construction details were developed, have been distributed to city agencies and published to the city website.

### **Department of Engineering Modernization**

- There have been multiple GIS Web applications introduced to streamline data access. These applications are available via the internet and help to promote open government practices.
- The Department continues to build and grow its digital map vault; internet access is available to this data.
- Digital map vault now contains in excess of 90,000 documents.
- Several new CADD capable computers have been acquired, iPad issues to field personnel and software programs and licenses have been acquired for additional

workstations.

The long-term goal is to increase the staff level with Civil Engineers to recover from downsizing due to prior budget cutbacks, resignations and retirements. Filling the vacant positions presents a major challenge. The department has implemented an aggressive staff training program through the UCONN Public Works Academy and the Technology Transfer Program Certificate programs.

**Intern Program**

The Department has three authorized intern positions, one each in Engineering, Traffic and Geographic Information Systems. In addition, it is participating the City-Wide High School Intern Program

**GEOGRAPHIC INFORMATION SYSTEMS**

**I. GIS Website Usage Statistics (Fiscal Year 2022-2023):**

<b>GIS Internet Traffic Information 2022-2023 FY</b>				
<b>Fiscal Year</b>	<b>GIS Web Search (Visits)</b>	<b>Percent Increase</b>	<b>GIS Interactive (Visits)</b>	<b>Percent Increase</b>
<b>2022 - 2023</b>	67,816	Down 3%	17,286	Down 5%
<b>2021 - 2022</b>	70,105	Up 27%	18,313	Up 12%
<b>2020 - 2021</b>	55,058	Up 21%	16,390	Up 16%
<b>2019 - 2020</b>	45,478	Up 1%	14,106	Up 6.5%
<b>2018 – 2019</b>	45,025	Up 8.5%	13,240	Up 9%
<b>2017 – 2018</b>	41,457	Up 6%	12,146	Up 17%

**II. GIS General Map Requests (Fiscal Year 2022-2023):**

The Engineering Department has made GIS services available to all departments within the City of Waterbury. During the course of the year, several map projects of varying detail are requested of the GIS Technician. The following table is a summary of how many maps have been requested:

297 Mapping Projects requested 2022-2023 FY					
Department	Map Projects	Department	Map Projects	Department	Map Projects
Engineering	56	WDC	19	WPC	10
Planning Dept	48	Data Requests	15	Mayor	9
Water Dept	43	Police Dept	14	Fire Dept	3
Voters	35	Senior Center	12	Refuse	1
States Atty	20	Health Dept	11	Building	1

**III. GIS Projects of Significance (Fiscal Year 2022-2023):**

**Committees:**

- **Waterbury Land Bank:** The Waterbury Land Bank helps determine which properties the City should purchase or accept via donation.

**Public Safety Updates:**

- **NEXGEN – 911 Dispatch:** The City of Waterbury uses NEXGEN's dispatch software for its E911 services. The software is based on centerline and address point data. The centerline, and address points were updated, as well as, a couple thousand business and government building names entered into the database.
- **Fire Department – First Due:** The Fire Department installed a new GIS based software called First Due. This software is based off the GIS address point layer hosted on the City GIS server and has been updated for Fire Department needs. Additionally, the Fire Department complex maps have been digitized to GIS format.
- **Fire Department – Truck Deployment:** Mapping was created to compare the Fire Truck deployment coverage areas. This was done for multiple scenarios.

**GIS Website Updates:**

- **Waterbury Land Bank Website:** This privatized website displays the Waterbury Land Bank acquisitions, donations, summary foreclosures, USPS properties, City owned and Land Bank Target areas. All layers were created in house for the purpose of this website.
- **Waterbury Health Department Website:** This privatized website displays drug activity, high crime areas, illegal dumping, homeless encampments, transactional sex workers, grocery stores, lead levels, social vulnerability index, age of housing and Vape sale locations. All layers were created in house for the purpose of this website.
- **Main Street Waterbury Website:** The website is used to track and inventory the sponsored banners in the downtown area. Field work was done to collect locations and mapped out in comparison to the provided list.

**GIS Conversion and update of Assessor Tax Maps:**

- **Parcel R.O.Ws:** Conversion of ROWs is complete for maps 1-204 and 440-569 (333 Maps total). This is a work in progress.
- **CAMA Link:** A strong link between the CAMA database and GIS Parcels has been created. There is a 99.9% match rate of CAMA records linking to GIS parcels with 2 out 33,909 unmatched.
- **Parcel Updates:** Working with the Assessor’s office: 61 property updates have been performed this fiscal year to keep the tax maps current. 16 resurveys, 10 lot line revisions, 21 lots combined, 5 lot subdivisions, 7 GIS updates, and 2 easements have been completed.

**I. GIS Website Usage Statistics (Fiscal Year 2022-2023):**

GIS Internet Traffic Information 2021-2022 FY				
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2017 – 2018	41,457	Up 6%	12,146	Up 17%
2016 – 2017	39,181	UP 5%	10,407	Up 100%

**II. GIS General Map Requests (Fiscal Year 2022-2023):**

The Engineering Department has made GIS services available to all departments within the City of Waterbury. During the course of the year several map projects of varying detail are requested of the GIS Technician. The following table is a summary of how many maps have been requested:

245 Mapping Projects requested 2022-2023 FY					
Department	Map Projects	Department	Map Projects	Department	Map Projects
Engineering	60	Senior Center	12	Police Dept.	5
Voters	53	Data	12	Education	5

		Request			
WDC	23	Public Works	10	State's Atty.	5
Water Dept.	19	Planning Dept.	10	Assessor	4
Mayor's Office	17	WPC	10	Fire Dept.	0

### **III. GIS Projects of Significance (Fiscal Year 2022-2023):**

#### **Committees:**

- **Land Advisory Committee:** The Land Advisory Committee helps determine which properties the City should purchase or accept via donation. The Department are in the process of creating a GIS based Land Bank to store City owned properties.

#### **House Assembly Voting Districts:**

- **Map Update:** The State of CT provided the City of Waterbury with a map of the new House Assembly voting districts to be integrated into the GIS system.
- **Street List:** With each House Assembly district, and subdistrict, we provided an updated listing of addresses and voting poll locations. These street listings were used to update the Registrar of Voters system.
- **Subdistricts:** In addition to the State provided House districts, the City and Registrar's office created subdistricts per each district and created corresponding maps with voting locations. This data was used to send out mailers to the public notifying them of their new polling place location.

#### **Water Pollution Control Projects:**

- **Smoke Test:** Utilizing inspection data gathered by an outside contractor and input into WPC's Sedaru system, a map of all smoke test results. This map was converted into a GIS website for easier navigation and link to maps. These results identified crisis connections between the storm and sanitary systems which must be eliminated.
- **Sedaru Update:** Sedaru was updated, and the GIS data customized, to update manhole and pipe inspections to include NWMCC inspections, building inspections and other outside contractor inspections.
- **Interceptor Map Length:** With help from the Engineering tech at Jacobs, and an intern in the Engineering Department, all as-builts were reviewed for the interceptor pipes and map length information as entered.

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