

PUBLIC WORKS

PUBLIC WORKS COMMISSION

Andrew Boardman, Chair
K.C. Winslow, Vice Chair
Arthur Fulman
Toby Kramer
Peter W. Wallis

The Public Works Commission acts as the Town's Road, Water and Sewer Commissioners, and advises the Public Works Director in the Department's efforts to maintain and protect the Town's public works, utility and solid waste/recycling services. The Commission also advises Town Meeting, the Town Manager, Planning Board and other Town officials and boards on matters that concern Town water and sewer service, drainage and roads. The Commission is also responsible for setting policy and rate schedules for water, sewer and solid waste services; for acting as an appeals board for right of way permits and water and sewer bills; and for approving minimum standards for the final layout of Town roads.

The Public Works Commission also provides a forum for review of water, sewer and solid waste rates, the annual roads and sidewalk program, public street layout, and water and sewer extensions.

The ongoing activities of the Commission can be found throughout the year on the web at www.concordma.gov

Highlights of the Commission's activities for 2017 included (in chronological order):

- Voted to approve a request to install private water utility for agricultural irrigation in a public way (Liberty Street).
- Voted to approve an increase in Title 5 wastewater flow of 1,260 gallons per day to accommodate 36 additional seats at the Karma Restaurant located at 105 Thoreau Street.
- Conducted a public hearing and approved revised curbside collection and disposal rates.
- Voted to approve the grant of a sewer easement and a drainage easement by Brookside Square at 50 Behar-

rell Street to the Town of Concord.

- Conducted executive sessions to discuss litigation strategy relative to the Nagog Pond Water Treatment Facility Upgrade.
- Conducted a public meeting to discuss parking lot design/reconstruction of the Church Street Lot in West Concord, the Walden/Hubbard Lot and the Keyes Road Parking Lot.
- Conducted a public meeting to discuss the Public Shade Tree Inventory and Management Program. Conducted a Public Shade Tree Inventory Project Presentation and voted to accept the findings completed by Davey Resource Group and support the Public Works Director/Town Tree Warden in CPW's efforts to implement the recommendations contained in the Management Plan as budgets and resources allow.
- Conducted a Roads Program Briefing followed by a formal public hearing discussing the 2017/2018 Roads Program.
- Discussed various Town Articles to be presented at the Annual Town Meeting.
- Voted to reduce the "Outdoor Water Use Emergency" to a "Seasonal Water Conservation Advisory".
- Voted to approve the Pilot Lead Water Service Line Outreach and Replacement Program.
- Conducted the Water and Sewer Rate public hearing and approved the 2017 rate schedule.
- Voted to approve the confirmatory deed and accept the approximate 11 acre gift of land relative to the Brewster Well Site.
- Voted to approve a waiver of the Sewer Regulations Article III Section 2 in order to approve a separate sewer connection for both structures at 17 Laws Brook Road.
- Participated in discussion of the Comprehensive Long Range Plan.
- Participated in a winter maintenance presentation which included a report from Hometown Forecast Services relative to the upcoming winter season.
- Voted to approve a letter from the Public Works Commission providing comments to the Zoning Board of Appeals relative to 462 Thoreau Street - Groundwater Conservancy District.
- Voted the PWC's intention to layout the way (Monsen Road) and refer the petition to the Planning Board to report a recommendation.
- Participated in budget review meetings.

- Voted to indicate support for the proposed Emerson Field Improvement Plan and urged the Community Preservation Committee to provide the Concord Public Works funding request in the amount of \$600,000 in their recommendation at the 2018 Annual Town Meeting. The PWC also approved a letter of support to be submitted to the Community Preservation Committee.
- Reviewed the design of the Cambridge Turnpike Improvement Project which included reconstruction of the roadway from Lexington Road to Route 2.
- Reviewed the infrastructure improvement project for Sleepy Hollow Phase 1 and Phase 2 and voted their support on the Phase 2 CPA grant application.

The Public Works Commission and Concord Public Works continue to focus on their joint goal of promoting greater community involvement in Concord Public Works projects and programs. This deliberate strategy has resulted in greater responsiveness to all stakeholders and positive project outcomes. Examples of these efforts include neighborhood on-site meetings for large infrastructure improvement projects, and outreach meetings for the Roads Program. In addition the Director continues to review the activities of Concord Public Works through the monthly Director's report and the Public Works Commission sets aside time for public comment during each meeting.

CONCORD CEMETERY COMMITTEE

Paul Cooke, Chair
Gina Nasson, Vice-Chair
Carol Harney
Whitney Kocher
Andrea Solomon

2017 was a busy, productive year for the Concord Cemeteries! The Committee was pleased that so much was accomplished in the burying grounds entrusted to the Committee's care—these 55 acres constituting one of Concord's great treasures. Much credit for this fruitfulness goes to its diligent and careful supervisor, Highway and Grounds Superintendent, Mr. Dan Rowley, and to the equally hardworking Cemetery Supervisor, Ms. Tish Hopkins. Below are highlights of 2017.

Road, Stone Wall and Drainage System Improvement Project, Phase One, Completed

Phase One, funded in 2016 with \$225,000 in Community Preservation Act funds, a debt authorization of \$157,000 voted for unanimously at Town Meeting, and with monies from the Concord Cemetery Fund, was completed in the fall of 2017. Now, in the "amphitheater" below Authors' Ridge, cemetery roadways have all been rebuilt and thoroughly restored, drainage completely updated, selected stone walls fully renewed and granite posts carefully repositioned. Mr. Rowley and Ms. Hopkins oversaw the placement of a sign acknowledging the very generous financial support for this project given by Concord's Community Preservation Act Committee. The sign is just inside the Prichard Gate. The CPA Committee has overseen the award of \$525,000 for this project in the past two years, an award without which it could not have been done.

Road, Stone Wall and Drainage System Improvement Project, Phase Two

Mr. Rowley presented Article 46, a \$150,000 debt authorization request at the Concord Finance Committee's Public Hearing on February 27, 2017. In April, the Cemetery Committee Chair successfully presented the request for this debt authorization to the Town Meeting, along with a request for \$300,000 of Community Preservation Act funding. The engineering survey for Phase Two of the Improvement Project and the project's design phase were completed this year. Bids will be solicited for the project early in 2018 and it is hoped the work will be completed by the end of summer 2018.

Tree Inventory and Management Plan Project

A plan to conduct the tree inventory was presented at the Public Works Commission meeting on March 8, 2017; field work for the tree inventory was completed in August. The project created an electronic inventory that assessed the species and condition of public shade trees in Concord, including in the three Concord public cemeteries. The inventory is accessible through TreeKeeper, the tree inventory management program software used for the project. With this program the cemetery administration can view the condition of every tree in the cemeteries, including its location on a map and a photograph of each tree. This provides information that will guide the cemetery concerning which species to plant in fulfilling an original aim of cemetery planners: that every native tree in Massachusetts should be represented in Sleepy Hollow. The software will help guide all future tree plantings in the

town's cemeteries, indicating which species populations are in short supply and where resources to support the health of the cemetery tree population should be most helpfully directed.

Surveyors Historical Society

In honor of Henry David Thoreau's career as a surveyor between 1846 and 1860, the Surveyors Historical Society applied for and received permission from the Committee to place a small GPS disk behind the Thoreau family headstone in Sleepy Hollow Cemetery. The ceremony to place the marker, held on September 14, 2017, was attended by over a hundred people and reported in the Concord Journal. Ms. Gina Nasson, Vice Chair of the Cemetery Committee, offered public words of welcome to the gathered Society, along with Highway and Grounds Superintendent Dan Rowley. The Society's chairman, Mr. Richard Leu, in his remarks said the Society wished to celebrate Thoreau with a "Final Point" marker, which is a small medalion with the precise geodetic coordinates of the grave inscribed on it—Latitude 42:27:2.945, Longitude 71:20:32:691. Ms. Lorna Hainesworth of Randallstown, MD, was the sponsor of the ceremony, providing the funds to pay for the marker.

Cemetery Rates

A public rate hearing was held this year after the



Thoreau "Final Point" marker provided by the Surveyors Historical Society

Committee reviewed a rate chart assembled by Cemetery Supervisor Tish Hopkins that showed our rates in comparison to rates in surrounding towns. The last time our rates were raised was six years ago. At the hearing the Committee agreed to raise the rate gradually over two years. In 2017 the full interment fee was

raised \$100 to \$900 for weekday burials and to \$1,300 for weekend and holiday burials. These additional funds will be placed in the Cemetery Fund to help finance cemetery maintenance.

Master Plan Update Project

The Committee examined the most recent edition of the Cemetery Master Plan, which dates from 2001, along with its 2004 update. After reviewing and discussing the supply of burying sites, cemetery operations, infrastructure, monument restoration, the Melvin Memorial restoration, and the status of The Knoll—the newest part of Sleepy Hollow Cemetery on Bedford Street east of the main section—we agreed an update was needed. To accomplish this a subcommittee was formed constituted by Committee members Whitney Kocher and Andrea Solomon. Subsequently in spring, 2017, Andrea Solomon and Tish Hopkins visited two other cemeteries to learn more about mausoleums, cemetery improvement and beautification possibilities. They observed in their visits that there was a wide spread of affordability choices for burial ranging from columbaria to mausoleums. Ms. Kocher and Ms. Solomon have edited the old master plan and now are to lead the Committee in discussing instituting some of these new options in 2018. The Committee was reminded that the interest expressed by one citizen in 2016 regarding purchase of a plot and building a mausoleum on it in the old part of Sleepy Hollow near the present Pope tomb was the original impetus to revisit the now twelve-year old Master Plan. The Committee expects to complete the update early in 2018 and put it on its website. We hope to come to an agreement regarding such possible new features as mausoleums and columbaria through this process.

Trail Survey Behind Sleepy Hollow Cemetery

The full Cemetery Committee along with Highway and Grounds Superintendent Dan Rowley and Cemetery Supervisor Tish Hopkins met at 5 pm on Wednesday, October 4, 2017, with Mr. Bob White, Chair of the Trails Committee, with Trails Committee member Mr. Jonathan Keyes and with Ms. Lori Capone of Concord's Natural Resources Department for a joint walk along a trail that traverses woods and swampy areas connecting the older part of Sleepy Hollow and the new area known as The Knoll. We discussed the possibility of improving the path and possibly even installing an American Disabilities Act-compliant boardwalk over the swampy section of the trail. Ms. Capone

agreed to determine costs associated with installing such a boardwalk.

Cemetery Mowing and Spring and Fall cleanups

The contract with Einstein's Landscaping to maintain Sleepy Hollow Cemetery, Concord's only active ceme-



On the trail in October behind Sleepy Hollow Cemetery. Pictured L to R, front, are Jonathan Keyes (Trails Committee), Lori Capone (Concord Natural Resources Dept.) and Bob White (Chair, Trails Committee). L to R, standing, are Paul Cooke (Chair, Cemetery Committee), Andrea Solomon (Cemetery Committee), Carol Harney (Cemetery Committee), Dan Rowley (Highway and Grounds Superintendent), Gina Nasson (Vice-Chair, Cemetery Committee), Whitney Kocher (Cemetery Committee), and Tish Hopkins (Cemetery Supervisor).

tery, expired at the end of July. At present, the contract is valued at approximately \$89,000 a year. Bids for a new one-year contract—with the option of extending annually twice for a total of three years—were solicited and a new contract was awarded over the summer to Einstein's, who have done a good job over the past three years. Meanwhile, Cemetery Supervisor Hopkins assisted by Concord Public Works staff and crew from MCI Concord have continued to provide mowing and spring and fall cleanups at Concord's two older cemeteries, Old Hill Burying Ground, established in 1635, and the South Burying Ground, inaugurated in 1697. This year the Committee decided to initiate an email notification network through which interested citizens who sign up for it can receive early notification of dates for Sleepy Hollow's fall clean-up so that if they wish to, they can do additional preparations of the gravesites of loved ones before this last clean-up of the year. The Cemetery Committee and administration will publicize this service so that concerned members of the public can sign up.

Concord Cemeteries in the News

Three notable articles featuring Sleepy Hollow Cemetery appeared in the Concord Journal in 2017. On September 21 "Thoreau, the surveyor, is honored" by Henry Schwan appeared with four large color photos and 20 column-inches of reportage. On October 19, "The Melvin' is getting a makeover" by Henry Schwan appeared on the front page of the Concord Journal with a handsome color picture of the site. The 23 column-inch story continued on the front page of Section D featuring a color photo of Dan Rowley, Highway and Grounds Superintendent, and Tish Hopkins, Cemetery Supervisor, standing in front of the memorial. The story appeared with an accompanying video which was posted on the Concord Journal's website. A third article, "Finding a forgotten Alcott photo" by Jim Callahan, appeared on December 28 on page B3. Filling almost an entire page with 24 column-inches of reporting and seven black and white photos, the story focuses on the discovery of Mr. Ray Angelo, a researcher into the life of one of Henry Thoreau's friends, Minot Pratt. Angelo found that Pratt was buried in Sleepy Hollow but that there was no marker at all for him there. With permission from the Pratt family he purchased a new marker for the site and had it installed in the cemetery—a photo of which is part of the article.

The Friends of Sleepy Hollow

In April of 2016 a new project in the ongoing cooperation between the Cemetery Committee and the private, non-profit organization, The Friends of Sleepy Hollow, began when a delegation from the Friends, including Ms. Susan Dee, Ms. Barbara Ewen and Ms. Pricilla Sturges, working with Committee Vice-Chair Gina Nasson, chose the planting of some 60 trees and shrubs in Sleepy Hollow to the east of Prichard Gate. Advised by Ms. Martha Lyon, a landscape architect, along with Concord's Tree Warden, Peter Flynn, the project, delayed by the 2016 summer drought, was completed in September, 2017 at a cost of approximately \$5,400. This was funded entirely by the generosity of the Friends (www.friendsofsleepyhollow.org). Highway and Grounds Superintendent Rowley and Cemetery Supervisor Hopkins ensured that the plantings would be watered. Also during the year the Cemetery Committee, responding to concerns of Friends President Kevin Plodzick and the Board of Directors of the Friends about the adhesion of one of the rifles decorating the Melvin Memorial, worked with Highway and Grounds

Superintendent Rowley and Cemetery Supervisor Hopkins to ensure a temporary repair. This was all that was deemed necessary because of the greater preservation effort for the entire Melvin Memorial planned for 2018. Committee member Carol Harney, serving as the Cemetery Committee's unofficial liaison with the Friends, continued in that important work, attending the monthly meetings of the Friends' Board of Directors in 2017 and keeping both groups informed about each other's efforts.



In the fall with some of the new plantings in the cemetery along Bedford Road provided by The Friends of Sleepy Hollow. Pictured, L to R, are Tish Hopkins (Cemetery Supervisor), Dan Rowley (Highway and Grounds Superintendent), and Mallory Price (Administrative Assistant for the Cemetery Committee and Highway and Grounds).

Melvin Memorial Preservation Project

Dedicated on June 16, 1909, the Melvin Memorial in Sleepy Hollow Cemetery, designed and created by Daniel Chester French—who also created the great sculpture of Abraham Lincoln in the memorial on the National Mall in Washington, D.C.—has for some time been showing cracks and other wear due to exposure to the elements. One of Concord's great treasures, the statue known as "Mourning Victory" that is the central feature of the memorial, stands over slate plaques celebrating the sacrifices of three brothers who fell in the Civil War. The memorial was commissioned by their surviving brother. Knowing the statue and its setting would need preservation work, a special Melvin Memorial Restoration Committee spent roughly twenty

years raising funds for the project. Bids for the work were received at the end of this year and a contract will be awarded early in 2018. The preservation work is to be completed during the coming year.

Honoring Veterans

The Maynard Elks put out American flags on the veterans' graves in Sleepy Hollow Cemetery for Memorial Day. Ms. Hopkins has faithfully overseen these memorial activities for many years, removing the flags at the end of the year and preparing them for the retired-flag burning ceremony during the Veterans' Day Observance.

Statistics

In 2017 there were 90 interments at Sleepy Hollow Cemetery; of these, 46 were Concord residents at the time of their deaths. Of the interments 26 were full burials and 64 were cremations. Lot sales for the year totaled 63, with 9 of these being sold to eligible former residents.

ADMINISTRATION

Richard K. Reine, M.S.C.E., PWLF
Director and Tree Warden

The Concord Public Works Team continues to focus on its principal mission to enhance the quality of life for those living, working or visiting the Town of Concord. Through sound management, communication, leadership, innovation, teamwork and vision Concord Public Works provides dependable, high quality, responsive public works and utility services. This is consistent with our community values and at reasonable cost to Concord's citizens, businesses, institutions and visitors today and into the future.

Protecting the Town's Infrastructure/Providing Essential Services

Concord Public Works (CPW) is comprised of four Divisions. These include two staff divisions: Administration (including Recycling and Solid Waste Management) and Engineering. CPW also has two line Divisions: Highway & Grounds (which includes Cemetery Operations) and the Water & Sewer Division. The Department is responsible for planning and managing a large segment of the Town's infrastructure. These assets include Concord's roads and roadsides;

curbs and sidewalks; catch basins, storm drains, culverts and outfalls; traffic islands; guardrails; street signs and traffic signals; public shade trees and park trees; Town parks, common areas, playgrounds, ball fields, and recreation equipment; Town cemeteries; the Town's compost site and closed landfill, including the earth products and snow storage facility; the public water supply including its storage, pumping, and distribution systems; the Town's sewer collection, pumping, and treatment systems; and CPW buildings and equipment.

Delivering key services including water service; sewer service; recycling, curbside trash collection and disposal service; yard waste disposal; and winter snow and ice management along with other storm and safety services is also a core responsibility of Concord Public Works.

Keys to Organizational Excellence

CPW's strategy for success in meeting its goals relies on the principles of ingenuity, fact based problem solving, accountability, safety and environmental stewardship, context sensitivity, respect and integrity, diversity, customer satisfaction, empowerment, communication and continuous improvement. These key principles along with the experience and dedication of the CPW team leads to organizational excellence.

CPW Team, Programs & Organization

Concord Public Works is made up of 55 dedicated individuals with a wealth of experience. It is a team that is passionate about Concord, which takes great pride in their work, and fully understands their stewardship responsibilities.

The Four CPW divisions manage eight programs — Administration, Engineering, Highway, Grounds (Parks and Trees), Cemetery, Recycling and Waste Management, Water, and Sewer. Two of the programs, Water and Sewer are totally supported by user fees. Two other programs, Recycling and Waste Management and Cemetery are primarily funded from fees.

Infrastructure Improvements and Initiatives

The Divisional Reports that follow summarize a series of initiatives and accomplishments in 2017. Notable accomplishments include:

- The continued targeted roadway and sidewalk

maintenance and management program resulted in the internal design and scheduled construction of approximately 3.19 miles of roadway and .24 miles of sidewalk improvements. This work also included the improvement of 34 curb ramps.

- Multiple improvements to the Town's drainage system were constructed. This included the installation of 28 drainage structures and 1,800 feet of drain pipe on ORNAC (from Main Street to Rte. 2), Sudbury Road (from Fitchburg Turnpike to the Town Line), Monument Street and Assabet Avenue.
- Significant improvements were also made to the Town's culvert network. The Lowell Road Culvert Replacement Project included the replacement of an undersized stone culvert with a new 8'x2' concrete box culvert and also included improvements to the stormwater collection system with the replacement of 2,200 feet of drain pipe and installation of 21 drainage structures.
- EPA/NPDES MS4 Permit –The Permit Year 14 annual reporting to the Environmental Protection Agency was completed.
- Park and Tree Staff under the direction of the Tree Warden planted over 14 public shade and park trees as well as street/scape trees. 147 potentially hazardous trees were removed.
- Expert maintenance continued by CPW Highway and Grounds Division staff of almost 50 acres of athletic fields for use by baseball, softball, soccer, lacrosse and other programs.
- The winter of 2016-17 included 53 inches of snow with a total of 42 responses for winter maintenance.
- DropOff SwapOff events held in May and October which also included unwanted medication and Sharps collection were well attended.
- Continuation of the water conservation rebate program for high efficiency clothes washers and toilets occurred.
- The unanticipated and contentious permitting process for the Nagog Pond Filtration Plant had adversely impacted Concord's design and construction schedule.
- Numerous water main extension and replacement projects were undertaken including the Bruce Freeman Rail Trail, Whit's End Road and Sweet Birch.
- Completion of the School Bus Transportation and Maintenance Center located at 214Y Main Street which provides a permanent solution for the storage and maintenance of Concord's school bus fleet.

CPW Leadership and Innovation

The Centers for Disease Control and Prevention and the American Dental Association presented Concord Public Works with its Water Fluoridation Quality Award. This was in recognition of maintaining effective dosing and documentation of ongoing drinking water fluoridation efforts.

Learning and Growth

With the ever increasing complexity of public works operations, the need for professional development of CPW employees continues to play an important role in the organization. Concord Public Works is committed to providing its employees with opportunities to increase skills while endeavoring to make certain our team is comprised of motivated, informed and inspired team members who can utilize this knowledge for the benefit of Concord.

Safety

CPW's Safety Committee continued its meetings and received input from the CPW Team. All employees continue to utilize the Pure Safety online training system customized for specific public works job risks to accomplish their monthly training goals. The following additional training was presented for CPW Employees: A simulator based emergency driver training class was conducted by MIIA. A Tick Awareness program was conducted in conjunction with the Board of Health. A Lock-Out, Tag-Out training program was conducted by MIIA. Adult CPR and AED along with Standard First Aid training was conducted for all interested employees.

Public Works Week – Middle School Event

Concord Public Works celebrated National Public Works Week on May 24 with the 8th grade class from Concord's Middle School for the eleventh consecutive year; the theme was "Public Works Connects Us". The entire public works team worked with CPW's Administrative and Special Projects Coordinator, Anna Trout and Applied Technology Teacher, Doug Shattuck to showcase the importance of public works. Events included stormwater system maintenance, stormwater and water quality, recycling/reuse opportunities, a tour of the Wastewater Treatment Plant, best management practice for turf grass and presentations of stormwater pollution prevention videos created by the students.

Personnel

Concord Public Works appreciates the contributions

made by the following employees who moved on from their positions within the department. These include Peter Flynn (Public Works Supervisor) and John Wilson (Public Works Supervisor). We were happy to welcome Keith Baldinger (Assistant Highway & Grounds Superintendent), Robert Hill (Management Analyst – Water/Sewer), Benjamin Pileeki (Water/Sewer System Maintainer) and Timothy Wilson (Associate Engineer-Engineering).

ENGINEERING DIVISION

William, J. Renault, P.E. – Town Engineer

The Concord Public Works (CPW) Engineering Division is responsible for the planning, design, engineering and construction of the Town road, sidewalk, bridge, and stormwater/drainage infrastructure assets. CPW's Engineering Division provides a wide range of professional engineering and construction management services for Concord Public Works (Administration, Water, Sewer and Highway/Grounds/Cemetery) and other Town departments and boards. Roads Program

There are approximately one hundred and seven miles of public roads, classified as arterial roads, collector roads and local streets. Arterial roads provide movement between collector roads, other arterial roads and major highways and make-up approximately 34% of Concord's public roads. Collector roads, used primarily



CPW's Engineering Division at Junction Park for Public Works Week Event

to connect local streets to other collector and arterial roads, make-up approximately 7% of Concord's public roads, and the remaining 59% of public roads consist of local streets.

Concord's pavement management strategy and 20-year Roads Program emphasize adequate capital investment in the roadway network combined with preventive and routine maintenance activities to prolong the pavement life cycle. Capital roadway improvements typically include the reclamation, mill and overlay and overlay pavement treatments. The reclamation treatment pulverizes the roadway's pavement, re-grades the new subgrade material and installs two new layers of hot mix asphalt pavement. A mill and overlay treatment cold planes off the top wearing course of pavement and a new pavement layer is installed over the grooved pavement. An overlay treatment is a thin asphalt layer installed over an existing roadway.

A condition survey of the Town's roadway network is performed every four years and inputted into the Town's roads program software. This survey was most recently completed within the 2014 calendar year. The software utilizes the pavement condition data, estimated traffic volumes and treatment cost to recommend pavement improvement projects. CPW's Engineering Division then utilizes this software output, engineering judgment and planned utility improvements to finalize the year's roads program.

Maintenance activities are also used to preserve the integrity of the existing road structures while reducing the need for the more costly rehabilitation treatments. Crack sealing is utilized as the primary preventative maintenance activity, while full depth patching and infrared spot repair are used as the primary routine maintenance activities by CPW.

3.19 Miles of Roads Improved

CPW's Engineering Division completed the internal design and bidding for the FY18 Roads Program in 2017. In total the project bid included 3.19 miles of Concord's roadways including the reclaim of Whit's End Road as well as mill and overlay of ORNAC (from Main Street to Rte. 2), Lowell Road from (Barrett's Mill Road to Westford Road), Sudbury Road (from Fitchburg Turnpike to the Town Line), Laurel Street (from Thoreau Street to Stow Street) and a portion of Assabet Avenue. Pavement reclaim of Whit's End Road along

with associated drainage work highlighted below was completed prior to the close of the 2017 construction season. Remaining pavement improvements will be completed in spring 2018.

6.80 Miles of Roads Maintained

CPW continued with a significant roadway maintenance program within calendar year 2017, maintaining a total of 6.80 miles of Concord's roadways. A total of 1.7 miles of roadway patching were bid within the 2017 patching contract. The contract included portions of Walden Street, Pine Street, Barrett's Mill Road and Kenny Dunn Square. CPW also completed its annual crack sealing bid in 2017, selecting 5.1 miles of roadway to be treated with a hot-poured asphalt fiber compound, specifically designed to improve the strength and performance of asphalt pavements and extend the life expectancy of the road. The roads selected for crack seal treatment included: Sudbury Road, Old Bedford Road, Old Marlboro Road, Westford Road and Harrington Ave.

Cambridge Turnpike Improvement Project

The Cambridge Turnpike Improvement Project (CTIP) proposes to construct roadway improvements to address a major flooding issue which causes frequent closure of the roadway in heavier rain events. The Town also views this as an important opportunity to design and construct improvements to the roadway and other public infrastructure to enhance the experience of the people who use the area. To the extent that is feasible, a project objective will be to integrate several modes of transportation in an aesthetically pleasing manner that complements the community's character and is sensitive to the nearby environmental and historical resources that Concord residents value and enjoy. CPW initiated a significant public outreach program for the project to provide residents with multiple input opportunities as the project's design is advanced.

In 2017 CPW's Engineering Division continued consultant management and technical engineering guidance through the permitting phase of the project development. An Environmental Notification Form (ENF) was filed with the Massachusetts Environmental Policy Act office (MEPA) in August. The project team received the MEPA certificate in October. Additionally, the Notice of Intent was filed in December and presented at the Concord Natural Resources Commission and is expected to be approved in January 2018. The

project is scheduled to be bid in two phases in the 2018 calendar year.

Monsen Road

CPW's Engineering Division initiated the acceptance process for a 500' extension of Monsen Road as part of the 2013 Monsen Farm Definitive Subdivision. The Public Works Commission voted their intention to layout the way at their November meeting. The PWC will layout the way at their January 2018 meeting and the road will be moved for acceptance by the Town at the 2018 Annual Town Meeting.

Sidewalk/ADA Compliance Program

Concord's sidewalk management strategy emphasizes adequate capital investment to the existing sidewalk network to maintain and/or improve the pedestrian experience for all sidewalk users. The sidewalk budget also funds ADA compliance maintenance activities and upgrades to the sidewalk network including pedestrian access routes and curb ramps. The sidewalk network contains approximately 58 miles of public sidewalks and approximately 809 curb ramps. A condition survey of the sidewalks is performed every four years in conjunction with the roadway condition survey. A Townwide curb ramp inventory and condition assessment was initially completed in 2011. Also an assessment of physical mobility barriers along pedestrian access routes (sidewalks and curb ramps)

was completed as part of an update to the Town's ADA Right of Way Transition Plan in 2016.

Sidewalks and curb ramp projects are prioritized for repair based on their proximity to high pedestrian generators, overall condition and compliance with current ADA accessibility standards. Sidewalk and curb ramp reconstructions are bid as standalone projects, included within the roads program bid or completed as internal projects by CPW's Highway Division.

0.24 Miles of Sidewalk and 34 Curb Ramps Improved
CPW's Engineering Division incorporated 34 new curb ramps in bids for the 2017/18 Road Program, West Concord Streetscape Improvement Project, Cambridge Turnpike Improvement Project and Parking Lot Rehabilitation bids. Additionally 0.24 miles of sidewalk were replaced within the West Concord Streetscape Improvement Project and Rideout Park Rehabilitation project.

ADA Public Right of Way Transition Plan

CPW's Engineering Division completed the installation of 16 new on-street handicapped parking spaces with associated signage and pavement markings within the three center areas: Downtown Concord, Thoreau Depot and West Concord Center.

Roads and Sidewalks in Sound Condition

The accompanying tables show the condition of Town

SIDEWALK CONDITION SUMMARY			
Sidewalk Condition Index (SCI)	SCI Range	Miles*	Percent
Replace	0-50	0.8	1%
Localized Repair	51-70	15	26%
Shows Wear	71-90	32	55%
No Distresses	91-100	10.2	18%
Total Miles		58	100%
*Approximate Miles			
Network Average	Year		SCI
	2009		76
	2010		75
	2011		81
	2012		81
	2013		78
	2014		82
	2015		81
	2016		79
	2017		77

ROAD CONDITION SUMMARY									
	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pavement Condition Index (PCI) Network Average	81	82	80	80	81	82	82	80	78
(PCI) Arterial/Collector Average	88	86	84	82	87	85	84	82	82
(PCI) Local Road Average	75	75	79	78	77	77	79	78	77
Recommended Repairs									
Rehabilitation	9%	8%	8%	10%	6%	7%	6%	12%	12%
Maintenance	51%	48%	52%	51%	40%	29%	36%	38%	53%
No Maintenance Required	40%	44%	40%	39%	54%	64%	58%	50%	35%
Note: The above referenced table is based on an infinite budget.									
o Using the FY2018 budget, the actual performed repairs breakdown was:									
(Rehabilitation 1%, Maintenance 16%, No Work Performed 83%)									

roads and sidewalks. The road and sidewalk PCI (Pavement Condition Index) ratings are slightly outside of the target 80-85 PCI and 80-85 SCI (Sidewalk Condition Index), respectively, based on the pavement management deterioration curve and algorithms. Following the 2018 Town-wide roadway condition survey we anticipate the PCI rating to increase to within the target index. The Town's overall investment in its road and sidewalk assets have resulted in cost effectively protecting and improving Concord's public way infrastructure for pedestrians and drivers while avoiding a multi-million dollar backlog to be paid by future residents of Concord.

Stormwater/Drainage Program

Concord's stormwater infrastructure consists of approximately 216 culverts, 431 outfalls, 1,208 drainage manholes, 2,771 catch basins, 157 leaching structures, 61.1 miles of drain lines, 15 detention basins, 2 infiltration basins, 5 bioretention areas, 8 treatment chambers and 3 dams. Concord Public Works plans, designs, coordinates and performs construction of drainage improvements in conjunction with the Roads and Sidewalks Programs

to minimize disruptions and to eliminate expensive emergency repairs. Drainage maintenance activities are also coordinated with the Division of Natural Resources and are typically performed under a general maintenance permit previously issued by the Natural Resources Commission and last renewed in 2017. In 2002 and 2003 the Town performed a closed drainage system inventory and in 2011 completed a culvert inventory. Within these inventory projects, condition assessments and rating systems were developed and integrated into the Town's geographical information system (GIS) to provide the basis for the development of the Town's 20-year Stormwater/Drainage Management Plan. This plan is intended to provide a cost-effective framework for the upgrade and repair of the Town's stormwater/drainage system and to prevent expensive emergency repairs from occurring in the future through a planned and scheduled maintenance and replacement program.

Staff continues to update the location and condition data of Concord's Stormwater/Drainage infrastructure

within the GIS system. CPW's Highway Division staff verifies and supplements GIS drainage data during annual catch basin system cleaning operations. CPW's Engineering Division provides updated drainage data obtained through ground survey for various capital improvement projects. All updated inventory data is used to prioritize drainage rehabilitation/replacement projects and to meet Federal NPDES MS4 permit requirements.

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II General Permit issued by the EPA is also a major component of the Town's Drainage Program. The permit, issued in August 2003, requires towns to meet multiple objectives or "minimum control measures" to improve water quality within the Commonwealth including: public education and outreach, public involvement and participation, illicit discharge detection and elimination, construction-site stormwater runoff control, post-construction stormwater management in new development and redevelopment, pollution prevention and good housekeeping in municipal operations. An updated permit was finalized by the EPA in 2016 with increased requirements for the six minimum control measures.

Stormwater/Drainage Projects

CPW's Engineering Division incorporated significant improvements to the Town's drainage collection system within 2017. CPW's Engineering Division completed the bidding, construction oversight and contract administration for the 2017/18 Roads Program bid which included the installation of 28 drainage structures and 1,800 feet of drain pipe on ORNAC (from Main Street to Rte. 2), Sudbury Road (from Fitchburg Turnpike to the Town Line), Monument Street and Assabet Avenue.

CPW's Engineering Division also completed improvements to the Town's culvert network in 2017 with the completion of design, permitting and bidding of the Lowell Road Culvert Replacement Project. The project replaced an undersized stone culvert with a new 8'x2' concrete box culvert and also included improvements to the stormwater collection system with the replacement of 2,200 feet of drain pipe and installation of 21 drainage structures. The Town obtained over \$500,000 in Federal FEMA Hazard Mitigation Grant Program funds to supplement Town capital drainage funding.

Lastly, CPW's Engineering Division completed in-house bidding, construction inspection and contract administration for the West Concord streetscape enhancement project. The project incorporated sustainable stormwater infrastructure retrofits into the design with the installation of new porous pavers in Mandrioli Park and Tea Cakes public plaza and also included the installation of a new bioretention area within Church Street.

EPA - NPDES MS4 Permit

CPW's Engineering Division completed the National Pollutant Discharge Elimination System (NPDES) MS4 Permit Year 14 annual reporting to the Environmental Protection Agency. Major permit accomplishments within Year 14 included environmental monitoring review and administration for 11 projects meeting NPDES permit thresholds. Additionally, CPW Engineering and GIS staff continued efforts to update the accuracy of the Townwide drainage system layer within the GIS to meet current and upcoming NPDES MS4 permit requirements.

The Massachusetts Coalition for Water Resources Stewardship (MCWRS), of which Concord is a member, as well as other entities filed a petition for review of the final Massachusetts MS4 permit with First Circuit of the United States Court of Appeals. The expectation is that the Court's interpretation of the municipal stormwater provisions of the Federal Clean Water Act will be consistent with that of Massachusetts municipalities. In June 2017 the EPA granted municipalities a stay of the 2016 permit while the Court hears the appeal.

Bridges

CPW's Engineering Division is responsible for the management and monitoring of the (5) Town owned bridges: Heath's Bridge (Sudbury Road), Pine Street Bridge (Pine Street), Flint's Bridge (Monument Street), Hurd's/Nashawtuc Bridge (Nashawtuc Road) and Pail Factory Bridge (Commonwealth Avenue). Bridge inspections are completed every two years by MassDOT bridge staff and forwarded to CPW's Engineering Division office for inclusion within Town records and to prioritize any needed repairs. Inspections are completed to evaluate the structural condition of bridge components as well as underwater stability/erosion issues to meet National Bridge Inspection Standards. When required bridge rehabilitation project scopes are

developed and managed by CPW's Engineering Division. Bridge repair funding comes from a variety of sources including: Chapter 90 state aid, local funding, state accelerated bridge program, etc.

Cemetery Infrastructure

CPW's Engineering Division finalized construction inspection and contract administration for the first phase of the infrastructure rehabilitation of historic Sleepy Hollow Cemetery. In total the project included the rehabilitation of 3,700 linear feet of roadways, installation of 30 new drainage structures, 1,350 feet of new drainage pipe, 400 feet of new stone waterways and 200 of retaining wall improvements in the cemetery. Additionally the Division began design for the second phase of improvements in the cemetery. Phase II is expected to rehabilitate 5,400 linear feet of cemetery roadway, install 17 drainage structures, install 900 feet of new drain pipe and 470 feet of drainage swales.

Parking Lots

CPW's Engineering Division completed in-house design and permitting for the rehabilitation of the Keyes Road, Walden Street and Church Street parking lots. The design incorporated several stormwater collection system improvements, including replacement of 360 feet of drainage pipe, and installation of 18 new drainage structures. Additionally the stormwater design incorporated sustainable stormwater infrastructure retrofits through the installation of 2 new tree box filters and 3 bioretention areas. The project will be bid and constructed in 2018.

School Bus Transportation and Maintenance Facility Project Management

CPW continued project management of the building construction project which began in fall of 2016. Work through the winter included site grading, utility installation as well as mechanical systems installation. The non-potable water system install, interior finishes installation and balancing of the building's mechanical systems continued into the summer and the building work reached substantial completion by July 2017. CPW's Engineering Division provided construction administration and oversight for the parking lot construction through the Roads Program contract in July 2017. The parking lot construction was initially included as an additive alternative with the building construction bid, but CPW negotiated a change order with the Roads Program contractor to save over \$100,000

in project cost. Similarly, CPW provided construction management for a separate contract for the installation of the fuel island to provide savings of another \$75,000 to the project. The fuel island installation was also completed in July 2017.

The project received its certificate of occupancy from the Concord Building Department in early August and the School Department moved into the building in Mid-August. CPW continued the management of the project post-occupancy with the coordination of the design for the new electric bus charging system, keying of the building and coordination of staff training for the building's mechanical equipment.

Technical Support

Parking Management Plan

CPW's Engineering Division continued to provide technical support to the Department of Planning and Land Management in their implementation of the Townwide Parking Management Plan. The Division coordinated the layout/locations for new pay by phone signage and regulatory parking signs based on the plan recommendations. Sign installation was completed by late August.

Punkatasset Parking

CPW's Engineering Division continued to provide technical support to the Select Board in the analysis of parking alternatives for the Estabrook and Punkatasset Woods Conservation Areas in 2017. Building on a previous conceptual parking review of the conservation area's four access points Estabrook Road, Lowell Road (trailhead to Chamberlain Woods), Monument Street (trailhead to Punkatasset Woods) and Monument Farm (private way abutted to public conservation lands), CPW's Engineering Division prepared an analysis of the shoulder parking on Monument Street. The analysis explored the area's stopping sight distance, vehicular speed data, tree and stone wall impacts, and cost/benefit analysis.

HIGHWAY, GROUNDS & CEMETERY DIVISION 2017

Daniel Rowley, Highway & Grounds Superintendent and Assistant Tree Warden

The Concord Public Works, Highway and Grounds Division maintains approximately 107 miles of public streets along with the associated drainage systems consisting of approximately 61.1 miles of drain lines, 2,771 catch basins, 216 culverts, 1,208 drainage manholes, 431 outfalls, 157 leaching structures, 15 detention basins, 5 bioretention areas, and 3 dams. In addition, CPW's Highway and Grounds Division maintains 59 miles of sidewalks, 2,793 signs, over 90 pieces of CPW vehicles and equipment, and manages the compost facility. It is responsible for 82 acres of public parks and grounds including 50 acres of active recreation areas which includes ten (10) athletic fields. CPW's Grounds Division maintains all public shade and park trees, under the direction of the Town's Tree Warden.

Snow Removal Program

While the total snow accumulation of 53.25 inches for the 2016 - 2017 winter season is considered close to average, it still required significant effort by CPW's Snow Fighting Team. In the end there were a total of 42 responses for winter maintenance which included applying salt brine before forecasted storms, deicing roads, plowing, and snow removal. The start of the season was on December 5, 2016, with a 1 inch snowstorm, and the end was on April 1, 2017, with a 2 inch snowstorm. The most significant storm of the season was on March 14, 2017, when 9.5 inches of snow fell. The snow during this storm had high moisture content so it was very heavy and wet which caused a few downed trees and multiple branches to fall.

Roads and Sidewalk Maintenance

CPW's Highway Division completed ongoing maintenance and improvement to Concord's roads and sidewalks throughout the year. One program that continued to be a priority was replacing street signs. Significant effort was invested in replacing regulatory, advisory, and street name signs throughout Town. A total of 276 signs were replaced this year; 177 of which were street name signs and the other 99 were regulatory and advisory. Town-wide street sweeping and sweeping of the designated sidewalk route was

completed by the end of May with weekly sweeping of the downtown areas completed throughout the season. Other roadway improvements included 635 square yards of infrared repairs completed by a contractor. These repairs were completed at various locations on Elm Street, Harrington Avenue, Main Street, Monument Street, Lexington Road, Nimrod Drive, Old Marlboro Road, Old Pickard Road, and Old Road to Nine Acre Corner. Over 715 feet of weathering steel guardrail was removed and replaced by a contractor on Sudbury Road and repairs were completed on 75 feet of damaged guardrail on College Road.



Road work being completed by CPW

Compost Site Management

The Compost Site and Walden Street landfill continues to be a critical asset to CPW's operation and a valuable resource for the community. CPW's Highway Division provided weekly hours from April to December for residents to visit the site and dispose of brush, leaves, grass clippings, invasive species, and paint. Crews process the leaves and grass clippings collected throughout the year and transform this yard waste into valuable compost which is available to residents. The Compost Site also provides storage for CPW equipment as well as a staging area for wood chips and logs that are a result of CPW's Grounds Division tree maintenance efforts. It is also critical to CPW's winter maintenance operations by providing significant storage for snow. Snow removed in the downtown area is hauled to this location. Again this year, a contractor disposed of the wood chips and processed the brush and logs and disposed of them at no cost to the Town.

Drainage

Drainage system maintenance and improvement efforts continued to be another priority of CPW's Highway Division. This year, 648 catch basins were cleaned by CPW Highway Division crews utilizing Town-owned equipment. The elimination of sand from regular roadway deicing efforts, which began in the winter of 2013-2014, has greatly reduced the amount of debris collected during the catch basin cleaning process. This also reduces the amount of debris which must be disposed of in accordance with DEP standards and also aids in keeping waterways clean. Catch basin repairs and manhole cover adjustments required ongoing attention from CPW Highway Division crews. Many of these needed repairs were identified as part of the inspection that was completed during the catch basin cleaning process.

Ongoing monitoring and maintenance of other drainage structures such as bioretention areas, detention areas, drain swales, and culvert headwalls and outfalls continued to be a priority this year. The drain swale on Annursnac Hill Road received ongoing cleaning and maintenance to ensure its proper function. Bio-retention areas were weeded, mowed, and new mulch installed to maintain their functionality and aesthetic properties. Detention areas were mowed and cleaned during the season.

Fleet Maintenance

Proper fleet maintenance is essential for CPW's operations. One fleet maintenance supervisor and one mechanic oversee the maintenance and repair of over 90 pieces of equipment. This was an exciting year for equipment procurement which is necessary to keep our fleet up to date and to minimize repairs. The Town made significant investments in replacement equipment this year which included: two heavy duty six-wheel dump trucks, a Prinoth sidewalk machine, two mobile message boards, and a Toro infield grooming machine. These trucks and equipment were purchased to replace similar units that had reached the end of their useful life. The mechanic's area in the 133 Keyes Road garage had the outdated stationary truck lift replaced with a set of state-of-the-art Stertil-Koni mobile column truck lifts. In addition, the two remaining salt spreading trucks in the fleet were retrofitted with closed loop computerized spreader control units. Now the entire salt spreading fleet has the capability of being as efficient as possible which reduces salt usage.

Other ongoing efforts included updating several existing plows and other associated winter maintenance equipment to further improve the efficiency of CPW's winter operations.

Parks and Playgrounds

CPW's Grounds Division continued to provide exceptional care to the Town's grounds and trees throughout the year. Fortunately, the drought we faced in 2016 did not persist in 2017. This was very helpful in aiding in the beautification and maintenance of Concord's grounds. Efforts this year included spring and fall cleanups, regular mowing of all turf areas, grooming infields, fertilizing and liming based on the results of soil testing, and supporting Concord's many youth sports programs. CPW's Grounds Division also continued to support several other programs including the hanging basket program in West Concord and the community gardens.

CPW's Grounds Division celebrated the retirement of Peter Flynn, Grounds Division Supervisor and Town Tree Warden in January 2017, with a special ceremony. Peter is commended for over 35 years of dedicated service to the Town of Concord. Peter was an excellent leader and very knowledgeable about plant and tree care. In 2007, Peter was honored by the Massachusetts Tree Wardens and Foresters Association as their Tree Warden of the Year. This prestigious award is a testament to Peter's knowledge which recognizes him as a leader in his field. CPW wishes Peter a happy and healthy retirement.

The work completed by CPW's Grounds Division is done in an environmentally sensitive and sustainable manner to care for almost 50 acres of athletic fields, playgrounds, traffic islands, and other Town owned properties. Improving upon the efficiency of operations, reducing environmental impact, and sustainability remained a priority for CPW's Grounds Division in 2017. One area that particular attention was given is the irrigation systems that provide water to Town athletic fields. Recognizing that irrigation is important to properly maintaining turf surfaces, CPW continues to focus efforts on monitoring the use of and improving the efficiency of all irrigation systems. Irrigation controller upgrades were completed at Ripley Field, Emerson Field, Upper Sanborn Field, and Cushing Field. The replacement controllers installed at each location have the same water saving features as the irrigation

controller that was installed at Rideout Field in 2016. These controllers can be monitored and adjusted from any web-based device which allows for changes to be made to zone run times based on the weather. This is particularly helpful if significant rain is forecasted. The irrigation systems will typically be shut off a day or more in advance of the rain to conserve water and the energy needed to power the well pumps. Flow meters will be installed in the future to better understand the amount of water used and to identify leaks.

Maintenance of the Doug White Fields remained a priority of CPW's Grounds Division. The use of a snow pusher allowed the fields to be opened for use on March 25, 2017, but a two inch snow storm on April 1, 2017 required the fields to be closed for a few days. Once the snow melted, the fields were opened for the season on April 3, 2017. The Doug White Fields are utilized extensively by the community and CPW's Grounds Division provides daily maintenance so they remain in optimal playing condition. The annual G-max testing was completed in September to ensure players' safety. Again this year, a contractor was utilized for deep cleaning and de-compaction work for both fields. The fields were closed for the season in late November.

An application for Community Preservation Act Funding was submitted in September for improvements at Emerson Field. The aging infrastructure at this location is in need of renovation or replacement. The proposed improvements include irrigation system upgrades, on-site water supply well redevelopment or replacement, infield and outfield renovations for the two baseball fields and one softball field, sustainability and operational improvements to the spray fountain. CPW is hopeful to obtain funding over the next few years to implement these upgrades.

Trees

For the first time in Concord's history, a town-wide public shade tree assessment and inventory was completed. CPW contracted with Davey Resource Group, A Division of The Davey Tree Expert Company of Kent, Ohio to complete the project which also included a comprehensive management plan to allow the Town to utilize the collected data. The project was a significant investment for the Town, which was partially offset by a \$30,000 challenge grant from the Massachusetts Department of Conservation and Recreation. The

project included the inventory and assessment all trees within the Town's 107 miles of public street right-of-way (ROW), the three cemeteries, and selected public parks and facilities. Field work for the project began in late May 2017 and concluded at the end of August. During the data collection process, a team of five or six certified arborists from Davey Resource Group visually inspected each tree and recorded information such as size, species, location, condition, and took a photo of each tree. In the end, 23,871 trees were inventoried, 846 stumps located, and 2,135 planting locations identified. All of the collected data was entered into a web-based management program which allows the data to be easily accessed and updated. A draft of the management plan was finished in October and was presented at the regularly scheduled Public Works Commission meeting in October.

Managing the tree inventory and management plan project required significant time and resources from CPW's Highway and Grounds Division managers which limited the public shade tree planting program. Public Works planted a total of 14 public shade and park trees. These trees were planted throughout the year on Town property and through the Public Shade Tree Planting Program. Each tree was carefully selected after reviewing the planting location to ensure it is planted within the established policy of planting "the right tree in the right place". Watering and monitoring of the newly planted trees was ongoing throughout the year to ensure they were well established and thrived.

Arbor Day was once again celebrated with the planting of a tree and a commemorative ceremony. Continuing a long standing tradition, the Garden Club of Concord once again gifted a tree to be planted in celebration of Arbor Day. A 'Wild Fire' black tupelo tree was planted near the tennis courts at Rideout Field in a location where several hazardous black locust trees were removed. A nice celebration was held the morning of Arbor Day, April 28, 2017, at that location with members of CPW and the Garden Club of Concord present.

Under the direction of the Town Tree Warden, CPW's Grounds Division removed 147 trees that were determined to be in declining health and potentially hazardous. Significant effort was invested in pruning trees on Laws Brook Road and Old Pickard Road during the summer. Support for tree maintenance needs at Sleepy Hollow Cemetery was also provided, which included

tree pruning to address limited access to graves and the removal of hazardous trees. Assistance was also provided to CMLP for tree issues that could potentially impact their infrastructure.

Recognizing the potential for irreversible damage that can be caused during the construction process, Concord Public Works continued to actively promote the "public shade tree protection policy" as much as possible through interactions with the public, contractors, and Town Departments.

Cemetery

CPW's Cemetery Operating Unit provided burials year round and properly maintained the Town's three cemeteries. A great deal of pride is taken in the professional and compassionate service that is provided to residents. This year 90 interments were completed; of which 26 were full burials and 64 were cremation burials. The use of contracted landscaping services continued for the mowing and spring/fall cleanup needs of Sleepy Hollow Cemetery. CPW's Cemetery Operating Unit crews provided mowing and spring/fall cleanups for the Old Hill Burying Ground and South Burying Place. All other maintenance for the cemeteries was completed by Concord Public Works crews including pothole patching, tree and stump removal, and ongoing turf improvements.

Improving the condition of the infrastructure of Sleepy Hollow Cemetery remains a priority for CPW. Phase one of infrastructure improvements was completed this year which included selected roadways, stone walls, and the drainage system. The Authors' Ridge area of Sleepy Hollow Cemetery was targeted for the first phase of improvements. The construction improvements included removing all asphalt in the roads, installing drainage upgrades, removing and rebuilding the stone wall on Upland Avenue and repaving with base course and top course bituminous asphalt. This project was funded by Community Preservation Act funds, a debt authorization, and funds from the Cemetery Fund. Recognizing the need for additional improvements, \$450,000 in funding was secured at the Annual Town Meeting in April 2017, for a second phase of improvements. The Community Preservation Act provided \$300,000 of this funding and \$150,000 was committed from a debt authorization. Engineering survey was completed during the summer and design work started at the beginning of winter. The project is

expected to be bid during the winter with construction taking place in the late spring and summer of 2018.

Providing ongoing monitoring and care for the Melvin Memorial continued throughout the year. Daedalus, Inc. was contracted during the summer to complete repairs to the three bronze rifles on the Memorial. These repairs were necessary to secure the rifles to the slate tablets so they will not be damaged during the winter or stolen. Using technical specifications developed in 2015, bids were solicited in the fall for restoration and preservation services for the memorial. The restoration and preservation efforts detailed in the specifications include cleaning the memorial, repointing, repairing cracks and spalls, and resetting or replacing the slate panels on the memorial. The project is expected to be completed in 2018.

During their 21st annual "Rendezvous" event, the Surveyors Historical Society included a visit to Sleepy Hollow Cemetery to honor Henry David Thoreau and to recognize his surveying work. On the afternoon of September 14, 2017, a group of approximately 100 people attending the three day "Rendezvous" event gathered in the Authors' Ridge area of Sleepy Hollow Cemetery to honor Thoreau and to dedicate a "final point" marker that was installed near his grave. The 4" round bronze marker includes the latitude and longitude of Thoreau's grave. The design and installation of this marker was approved by the Cemetery Committee.

A significant planting project was completed this year between the third and fourth gate in Sleepy Hollow Cemetery. Approximately 100 plants were installed by CPW crews with help from a MCI crew in just under two days. The plants and design for the project were a gift from The Friends of Sleepy Hollow Cemetery. The design was completed by landscape architect, Martha Lyon, and the plants came from Sylvan Nursery, Inc., in Westport, MA. The plants include lowbush blueberry, drooping leucothoe, mountain andromeda, northern bayberry, serviceberry and dogwood trees. The Cemetery Supervisor is going to provide ongoing watering and care.

RECYCLING AND WASTE MANAGEMENT PROGRAM

Rod Robison
Environmental Services Program Administrator

Curbside Collection, Disposal, and Processing

The municipal curbside collection program provided trash and recycling services to 3,639 house-holds. Subscribers to the municipal curbside collection program set out 1,111 tons of mixed paper, 605 tons of commingled containers, and 2,548 tons of trash for collection. The average subscriber on the Town's curbside program recycled .47 tons of materials and disposed of .70 tons of trash.

Curbside Recycling Rate

Residents using Concord's municipal curbside collection program recycled 40% of the materials they set at the curb. This figure does not include yard waste, which residents manage at home or drop off at the Composting Site on Saturdays, April through mid-December. It also does not include the tons of materials collected for recycling at the semi-annual DropOff-SwapOff days, nor does it include information on the more than 1,000 households that contract with private haulers for the collection of their trash and recyclable materials.

Recycling Savings Exceed \$2.3M

The curbside program received revenue of \$19,524 for paper and avoided \$87,785 in disposal costs by not

Curbside Collection Subscribers (as of June 30)

Year	Number of Subscribers	Recyclables collected(tons)	Trash collected (tons)	Recycling Rate
FY98	2,518	1,264	2,351	35%
FY08	3,305	2,025	2,467	45%
FY09	3,323	1,864	2,387	44%
FY10	3,407	1,810	2,426	43%
FY11	3,468	1,780	2,483	42%
FY12	3,488	1,794	2,484	42%
FY13	3,514	1,734	2,513	41%
FY14	3,517	1,760	2,544	40%
FY15	3,539	1,767	2,574	40%
FY16	3,608	1,761	2,581	40%
FY17	3,639	1,716	2,548	40%

(FY = July 1 through June 30)

Curbside Recycling

Year	Disposal Cost	Paper Revenue	Avoided Disposal Cost
FY98	\$110,564	(\$8,061)	\$38,798
FY08	\$194,254	\$58,188	\$116,818
FY09	\$194,254	\$25,833	\$93,282
FY10	\$186,786	\$20,220	\$93,247
FY11	\$191,191	\$30,325	\$91,915
FY12	\$191,815	\$32,200	\$92,352
FY13	\$196,067	\$4,981	\$86,868
FY14	\$193,318	\$5,904	\$89,756
FY15	\$199,925	\$1,567	\$90,946
FY16	\$204,424	\$480	\$88,723
FY17	\$201,261	\$19,524	\$87,785

(FY = July 1 through June 30)

DropOff SwapOff Participants

Year	May	October
1999	521	430
2009	889	981
2010	931	989
2011	979	891
2012	890	852
2013	893	851
2014	931	893
2015	929	928
2016	918	749
2017	894	947

disposing of paper as trash. Since July 1998, when the Town began receiving revenue for recycled paper, recycled paper revenue has totaled \$515,583 and avoided disposal costs have totaled \$1,842,913 for an overall savings of \$2,358,496.

Reuse and Recycling DropOff & SwapOff Events

The Spring DropOff & SwapOff event on May 6th attracted 894 households. The Fall DropOff & SwapOff event on October 14th was also a great success with 947 households participating. Both events ran smoothly, thanks to the volunteers who make these events possible.

Unwanted Medication & Sharps Collection

Unwanted medication & sharps were collected at the May 6th and October 14th DropOff events. Seven boxes of unwanted medication and seven boxes of sharps were collected between the two events.

Hazardous Products Collection

Subscribers to the curbside collection program receive one free pass per year to the Minuteman Hazardous Products Regional Facility in Lexington (for up to 25 lbs. or 25 gallons of hazardous waste). The facility is open one weekend day a month from April – November. Ninety-five curbside subscribers visited the site in 2017, along with ten non-curbside subscribers who paid the vendor directly.

Concord Public Works will be hosting a hazardous waste collection for residents and businesses in September 2018. Curbside program subscribers will be able to obtain a free pass for this event; businesses and non-curbside subscribers pay the vendor directly.

Composting Site Turns Yard Waste into Garden Gold From April through mid-December 2017, residents made more than 8,000 visits to the 755 Walden Street Compost Site, dropping off leaves, grass clippings and brush, while 437 residents dropped off paint at the paint shed and 178 residents picked up paint for reuse. At the Compost Site, 1,225 Christmas trees and 175 bags of Styrofoam™ were collected for recycling from the 2017 holiday season.

Visits to the Composting Site

Year	Leaves & grass	Brush	Paint Drop-off	Paint Pickup
2004	5,963	329	204	148
2005	6,078	418	230	118
2006	6,651	615	298	158
2007	7,880	697	296	171
2008	8,093	508	222	138
2009	6,723	667	210	145
2010	6,470	587	252	156
2011	5,106	650	279	156
2012	5,376	667	200	190
2013	6,547	675	341	183
2014	6,484	371	351	182
2015	7,556	489	432	196
2016	6,558	590	267	183
2017	9,968	684	437	178

Landfill Inspection & Reporting

MassDEP requires an annual landfill inspection by a third-party MassDEP-approved inspector for closed landfills in the Commonwealth. Concord Public Works coordinated the annual landfill inspection with Weston & Sampson. The inspection was conducted on November 8, 2017. The annual landfill inspection report included a summary of the 2017 monitoring results at the landfill.

The Town's closed landfill post closure monitoring and maintenance requirements in accordance with 310 CMR 19.132, mandate groundwater and landfill gas monitoring. There are nine groundwater wells and twenty-three soil gas probes associated with the 755 Walden Street closed landfill. The former landfill, which has now been put back into productive beneficial reuse with the construction of a utility scale solar facility, received formal closure certification from MassDEP on 10/16/13.

Keeping Mercury Out Of the Environment

Concord Public Works collected 8,394 linear feet of fluorescent light bulbs and 246 lbs. of nickel cadmium, lithium, and lead acid batteries from residents and municipal facilities for recycling. This is in addition to 13.38 tons of computers, TV's, and other electronics that were collected for recycling at the two DropOff events. Another 10,368 linear feet of fluorescent bulbs and 2.35 tons of computers and electronics were collected from businesses at the April and September business recycling events.

Annual Right-To-Know, Hazardous Waste Management, & SPCC Training

Annual Right-To-Know (RTK), Hazardous Waste Management, and SPCC (Spill Control & Countermeasure) training was conducted for Concord Public Works employees on June 29th and July 12th. RTK training is required by the Mass. Division of Occupational Safety (DOS), while Hazardous Waste Management and SPCC training are mandated by the EPA and MassDEP.

Grants

Concord Public Works obtained a Recycling Dividends Program (RDP) grant from MassDEP in the amount of \$6,000. This is a points-based grant. The Town earned ten points for its recycling programs. The grant can be utilized to purchase recycling-related equipment

including but not limited to curbside recycling bins, compost bins, public space recycling bins, etc.

Polystyrene Bylaw

Residents voted to enact a Polystyrene Bylaw (Article 45) at the 2016 Town Meeting. The Town Manager designated CPW to coordinate outreach and enforce the bylaw. The bylaw went into effect January 1, 2017 and became enforceable on July 1, 2017.

A part time outreach and enforcement officer reached out to all businesses, schools, institutions, and organizations affected by the bylaw, prior to July 1, 2017. Enforcement site visits commenced in July and concluded in September. Fourteen businesses received a one-year waiver.

Bike Giveaway

Concord Public Works hosted a bike giveaway on June 21, 2017. The bike giveaway included bikes collected at the DropOff portion of the October 15, 2016 and May 6, 2017 DropOff-SwapOff events. The bike giveaway was very popular with residents. Leftover bikes were donated to Emerson Umbrella (non-working bikes for art projects), the Boys and Girls Club of Worcester, and Worcester Earn-a-Bike, a nonprofit organization. The next Concord Bike Giveaway will be held in June 2018.

Concord Electric Lawnmower Swap

Concord Public Works partnered with CESC (Concord Comprehensive Sustainable Energy Committee) and Quiet Communities at the September 23, 2017 Concord Electric Lawnmower Swap event. This was the first lawnmower exchange event in New England. The event was held at Concord Public Works. Ninety-one residents traded in old gasoline-powered lawnmowers and received a \$100 rebate on a new EGO electric lawnmower.

WATER AND SEWER DIVISION

Alan H. Cathcart, Superintendent

In 1974 and 1976, Annual Town Meeting established separate Water and Sewer Enterprise Funds, to ensure that the operation, maintenance and capital improvement of Concord's water and sewer systems would be financially viable. Expenses incurred for each system are covered by revenues generated by each respective enterprise. The Water and Sewer Division of Concord Public Works (CPW) is responsible for managing the day-to-day operations of drinking water and sewer infrastructure. As of 2017, the total assets for each system are 21.9 million and 17.8 million dollars, respectively.

Water System

Concord was provided with legislative authority to establish a public water system in 1872. In 1874, water from Sandy Pond, Lincoln, began flowing through the original network of water mains to Concord Center. Today, the water system has evolved to include six groundwater wells and one surface water source, seven water pumping stations, two water treatment facilities, and a high-pressure water main network consisting of over 134 miles of pipe. Two covered storage reservoirs, one located on Annurnac Hill and the other located on Pine Hill in Lincoln provide total reserve capacity of 7.5 million gallons. There are presently 5,605 accounts receiving potable water service and fire protection from this supply. This represents approximately 95% of Concord residents and businesses, together with a small number of Acton properties along Route 2A.

Regulatory/Policy Updates

Concord's 20 Year Water Management Act (WMA) Permit Renewal Update: The Massachusetts Department of Environmental Protection (MassDEP) affirmed that Concord's permit and registration right, originally scheduled to be renewed prior to June 30, 2017, has been administratively deferred until December 31, 2021, in accordance with the State imposed Permit Extension Act. In a related matter, MassDEP also re-affirmed the position that they would not impose water conservation and use restriction "conditions" on registered systems, in response to a petition which was received from the Massachusetts Rivers Alliance.

On May 1st, Concord's Seasonal Water Demand Management Plan went into effect. At no time during the peak summer demand period did operational or environmental triggers require the Public Works Commission to elevate the seasonal "advisory" to an enforceable outdoor water use restriction. CPW's Water Division continued to provide targeted outreach to customers interested in installing in-ground irrigation systems, particularly with respect to registration, design, and connection fee requirements as specified in the Town Bylaws.

Water Use and Demand Management

Concord's WMA registration and permit presently provides a cap on "authorized" water withdrawals of up to 2.51 million gallons per day (MGD) on average or 916 million gallons per year to meet all residential, commercial, institutional and municipal needs. Conservation limits included in this permit are an allowance of 65 gallons per day per capita (RGPDC) for residences and a 10% allowance for system losses (primarily attributed to leaks). In 2017, the total water production required to meet our system demands was 1.80 million gallons per day or 673 million gallons per year. A peak day demand of 3.04 million gallons was recorded on July 21, 2017. The RGPDC and total system losses (or "unaccounted" for water use) was calculated to be 65 gal/day and 9%, respectively.

Water Conservation Program Highlights

CPW's Water Division continues to maintain its commitment to its comprehensive water conservation program that encourages efficient water use via seasonal increasing block rates. The provision of complimentary residential water saving devices including, showerheads, aerators, garden nozzles, rain gages, and toilet fill cycle diverters as well as customized outreach and assistance to customers who are interested in learning more about indoor and outdoor water savings opportunities was also continued. As funds allowed, CPW's Water Division also continued to offer rebates on water saving toilets and high-efficiency clothes washing machines.

New England Water Distribution Services LLC performed a water main leak detection survey on approximately 50% of the water distribution system beginning the second week of November. The acoustic survey targeted water mains, hydrants, select gate valves, and select service lines located in the northern half of

the system. In areas where non-metal mains existed, NEWDS traced the main using acoustic monitoring every 10 feet using a ground microphone. Five hydrant leaks were identified (no main or service leaks) with an estimated value of lost water at 14.5 gallons per minute (or 20,880 gallons per day). All identified leaks were repaired.

Water Quality and Drinking Water Compliance

Routine and non-routine water quality testing activities continue to demonstrate that Concord's drinking water satisfied all applicable State and Federal requirements. A summary of water quality test results is available on the Town website and the Annual Water Quality Report – updated each spring (www.concord-ma.gov/wqreport). Customers who prefer to receive a hard copy of this information can contact CPW's Water/Sewer Division office directly to make such a request.

In accordance with the Federal Lead and Copper Rule (commonly referred to as the LCR), Concord performed lead and copper testing at 30 designated sample sites located throughout the water distribution system. Two schools were also included in this sampling effort. Findings confirmed that source water quality treatment efforts continue to reduce risks of lead and copper leaching from private service lines and plumbing fixtures. The actual compliance limit based upon the 90th percentile value (concentration) for lead and copper were calculated as 0.0033 ppm and 0.278 ppm – well below the action levels of 0.015 ppm and 1.3 ppm, respectively, established by EPA.

CPW's Water Division once again received an annual Water Fluoridation Quality Award from the Centers for Disease Control and Prevention (CDC) and the American Dental Association (ASTDD) in recognition that CPW's Water Division has maintained effective dosing and documentation of ongoing drinking water fluoridation efforts.

A cross connection is any physical connection which is created between a drinking water supply line and a piece of equipment or piping containing water that does not meet drinking water quality standards or contains other substances that could make the water unsafe to drink. For example, cross connections may exist between pipes containing drinking water and boilers, lawn irrigation systems, solar heating systems,

photography equipment or fire protection systems. Water Safety Services (Woburn, MA) continued to perform inspections of new commercial operations to ensure appropriate protection controls are in place as well as testing of existing devices that are located within commercial properties throughout town.

Water Supply Protection

In 1991, a Nagog Pond Watershed Resource Protection Plan (WRPP) was developed as a companion document to a drinking water filtration waiver issued by the EPA. The plan identified all existing land-uses within the watershed with associated contamination threats that could impact the quality of this unfiltered water supply. As a condition of this long-standing waiver, and to ensure land-use changes within the watershed are both characterized and mitigated effectively, the plan is required to be updated every three years. In accordance with this obligation, CPW's Water Division submitted an update to this plan that was developed in accordance with MassDEP's guidance.

In early summer, operations personnel responded to several attempted security breaches in the vicinity of the Nagog Pond dam and gatehouse. While Nagog Pond was not in operation, MassDEP drinking water program was notified, and a battery of water quality tests were conducted to ensure the public water supply had not been compromised. Immediately following these activities, new security systems were employed at this remote site, including enhanced surveillance.

Nagog Pond Filtration Plant Update

In early 2017, the Acton Board of Selectmen issued Concord a Special Use Permit and Site Plan Special Permit for a proposed drinking water filtration facility to be constructed at Nagog Pond. The final permit included conditions that were determined to be detrimental to Concord's short and long-term interests. Concord appealed this decision to the Commonwealth of Massachusetts Land Court. Despite having been placed on a "fast" track review schedule and despite engaging in exhaustive negotiations and settlements with Acton, Concord's concerns and interests remain unresolved. This unanticipated and contentious permitting process has significantly and adversely impacted Concord's design and construction schedule.

Water Pumping Station Rehabilitation and Upgrades
CPW Water Division crews continued to perform

routine operation and maintenance of the seven water production facilities and related treatment systems which make up our total water supply. In addition to these routine inspection and service activities, capital upgrades are also planned and performed on the millions of dollars of assets including associated mechanical, electrical, plumbing and instrumentation and control systems housed within these facilities. Notable improvements performed within the past year include: the rehabilitation of a groundwater well (03G) located at the Deaconess well site, the installation of a modified "temporary" ozone generation system at the existing ozone facility at Nagog Pond; the re-alignment of the high lift booster pump located inside Rt 2A pumpstation; and external building improvements performed at the Hugh Cargill pumping station including painting/replacement of deteriorating trim, cupola and doors.

A request for qualifications was issued for professional engineering services to evaluate existing conditions of the Annursnac Hill and Pine Hill Water Storage Tanks. The design firm will provide 100% design for each project identified, and perform construction administrative services for same. In addition to this work, the design firm will also be asked to design a small chemical storage addition to the Second Division well; and perform misc. engineering support services. Weston & Sampson submitted the most favorable proposal and is in the process of finalizing the scope of work and contract.

Special Water Service Programs

CPW's Water Division staff collaborated with Concord on Tap to increase the availability of public drinking water fountains throughout Town. Once volunteers from Concord on Tap were able to successfully obtain funding for these new fountains via the Town's Community Preservation Act program, units were procured and installed by CPW's Water Division operations staff. The new fountains can be found at the following recreation areas: the Ripley School, Thoreau School, Sanborn School, Alcott School, Peabody School, and South Meadow Field

Staff began implementation of a Public Works Commission approved lead service line awareness and pilot replacement program. This program was designed to educate and provide targeted support services to customers with known or suspected lead water service lines. Based on the potential number of services impacted and the quality and availability of service records

maintained within CPW's Water Division, the program will take several years to fully implement. To date, approximately 80 customers have received a direct mailing informing them that Town service records would indicate their private water service may be at least partially made of lead. In addition to this notification, they have been eligible to receive water quality confirmation testing services, received guidance materials detailing potential health risks and service management recommendations, and have been informed that they may qualify for a very unique lead service line replacement assistance program. The service line replacement program has been specially tailored to include the offering of CPW Water Division personnel to replace these service lines at a very competitive rate (well below market rate) with the added benefit of a payment plan that allows payments to be apportioned over a one year period. As the replacement program is new and could potentially impose on broader public interests, it has been offered as a pilot initiative.

Water Main Rehabilitation and Extension Activities

The water distribution system consists of approximately 134 miles of water main ranging in size from 6-inch to 16-inch. A replacement/rehabilitation program has been developed to maintain and improve upon system service reliability. New projects are prioritized based on age, condition, and material of pipe. Plans are further refined with consideration to other public works initiatives such as drainage improvements, annual Roads Program or CMLP underground initiatives. Each year, new mains may also be added to the system to allow for service to new or existing properties where frontage to the municipal water distribution system had not otherwise existed.

Notable water main replacement or extension project activities performed within the past year include:

- Bruce Freeman Rail Trail - D.W. White (Acushnet, MA), serving as a subcontractor to MA DOT performed the relay of approximately 180 LF of 12-inch cement-lined ductile iron (CLDI) main along Powder Mill Road in conjunction with overpass/tunnel work associated with the new Bruce Freeman Rail Trail project.
- Whit's End Road - Fenton and Son (Acton MA), sub-contractor to Lazaro Paving Corp (responsible for 2018 Roads Program), performed water main replacement activities along Whit's End. Their scope of work

Annual Water Report Summary Table

Water Statistics	2017	2016	2015	2014	2013
Miles of Main	133.5	133.3	132.8	132.5	131.6
Hydrants	1,328	1,327	1,321	1,318	1,306
Main Pipe - New (linear feet)	1,073	2,510	1,660	2,557	3,476
Main Pipe - Replaced or Rehabilitated (lf)	626	1,568	4,800	7,328	98
Number of Service Accounts	5,605	5,601	5,554	5,518	5,497
Total Water Demand (million gal.)	673	728	767	722	755
Daily Average Demand (million gal.)	1.80	1.99	2.10	1.98	2.05
Peak Day Demand (million gal.)	3.04	4.15	3.79	3.82	3.91
Unaccounted for Water (percent)	8.7	11	73	65	68
Residential per Capital per day (gal.)	65	70	73	65	68
Annual Precipitation (inches)	45.49	35.59	35.51	48.29	41.73
Mean Annual Precipitation (inches)	41.98	41.95	41.92	41.97	42
Residential Rate per Unit (unit = 7.48 gal.)					
Base Rate- Step 1	\$.0516	\$.0496	\$.0477	\$.0459	\$.0441
Conservation Rate – Step 2 (May 1 – Oct. 31)	\$.1084	\$.0992	\$.0954	\$.0918	\$.0882
Conservation Rate – Step 3 (May 1 – Oct. 31)	\$.1367	\$.1240	\$.1193	\$.1148	\$.1103
General Service Rate per Unit of 7.48 gallons					
Step 1 - (<50 Units)	\$.0516	\$.0496	\$.0477	\$.0459	\$.0441
Step 2 - (>50 Units)	\$.1367	\$.0630	\$.0606	\$.0583	\$.0561

included the replacement of approximately 800 LF of 8-inch transite main with new 8-inch CLDI water main, the replacement of 7 active service connections (within the right-of-way up to the private property line) and the replacement of 2 hydrants.

- Sweet Birch (PRD) – Water Main Extension: Patriot Excavating (Acton, MA) installed a new 8-inch CLDI water main approximately 1,073 feet into a new a 12-lot residential development. Their plan of work involved the installation of new water service laterals, one new hydrant, and two in-line gate valves to connect to an existing 12-inch water main located in Forest Ridge Road.

Based on the age and condition of water main located throughout the water distribution system, it is not uncommon for sections to fail. When they do, they can cause sudden pressure drops or water discoloration that can affect a few customers or larger neighborhoods. Depending on the nature and location of each break, individual water service interruptions can also occur and last from several hours to over 8 hours. This past year, CPW’s Water Division performed emergen-

cy repairs at the following locations: Bedford Street (February 21, 2017) and Arrow Head Road (February 24, 2017).

Sewer System

Concord was provided with legislative authority to create a municipal sewer system in 1894. By early 1900 a small centralized collection system was designed and constructed, carrying wastewater from Concord center via a network of gravity mains to a collection chamber located at 141 Keyes Road where it was then pumped to a cluster of filter beds located approximately one mile away on fields located adjacent to Great Meadows. Over the years, the service area has expanded, and treatment systems improved resulting in a system that consists of over 34 miles of collector mains (gravity and low pressure), two pumping stations, six neighborhood lift stations and a 1.2 MGD treatment plant. The present sewer system serves over 1,869 customers or 35% of the community.

Regulatory/Policy Updates

National Pollutant Discharge Elimination System (NPDES) – State Primacy: Governor Baker re-filed legislation that would delegate authority of the National Pollutant Discharge Elimination System (NPDES) to the Massachusetts Department of Environmental Protection (MassDEP). The legislation sets aside \$4.7 million annually to help fund the program, in addition to the \$1.4 million in the FY2018 annual budget proposal for initial staffing. Many water and wastewater organizations have long advocated for this transition from EPA with the belief that MassDEP has a deeper and more balanced understanding of local needs and interest and will be more reasonable in its permitting program.

Sewer Pumping Stations

Sewer pumping stations collect wastewater from a local network of pipes and then pump this wastewater to a central wastewater treatment facility located off of Bedford Road. The size and complexity of each pumping station depend upon local land elevations, topography, and the actual volume of wastewater handled. The Lowell Road and Assabet Sewer Stations are the two largest facilities in Concord, designed to handle flows from the most densely populated and commercialized neighborhoods of West Concord and Concord Center. There are six smaller neighborhood lift stations that serve less populated areas of Town with much more modest physical footprints.

The Lowell Road and Assabet Sewer pumping stations were last upgraded in the mid 1980’s. As most of the mechanical, electrical, plumbing and instrumentation and control systems associated with these two facilities have served well beyond their useful life, planning efforts were initiated towards the replacement or reconditioning of these facilities. Kleinfelder, a qualified water and wastewater engineering firm, was retained to perform an evaluation of the existing conditions of each facility. This assessment will lead to the development of a 25% (preliminary) design for each respective facility. CPW’s Water/Sewer Division will review the 25% design along with the quality of service rendered before authorizing final design, bidding and construction phases. In addition to these design efforts, Kleinfelder will also develop specifications for the replacement of an intermediate pump located at the Wastewater Treatment Facility.

Collection System

The sewer collection system is composed of over 34

miles of gravity and low-pressure collection main (ranging in size 2-inch to 27-inch diameter) with manholes. While there has been no recent public effort made to expand the sewer service area, smaller private extensions are reviewed and approved so long as they serve areas consistent with the Town’s Comprehensive Wastewater Master Plan (CWMP).

Approximately 50% (15.4 miles) of Concord’s sewer collection system is made up of clay pipes – much of it dating back to the original sewer system installed over 100 years ago. Concord continues to investigate the condition of this infrastructure and repair or replace it as needed to reduce preventable inflow and infiltration (I/I). Inflow and infiltration refers to stormwater and groundwater that flows into the sanitary wastewater collection system through illicit connections or leaking pipes. Unlike many cities and towns across the country, Concord is fortunate that the stormwater and sanitary wastewater drainage systems were originally designed and constructed as completely separate systems. As such, Concord is spared the costly burden of managing combined sewer overflows (CSO’s) that is more common when stormwater is directed to the sanitary sewer system. While routine collection system inspections and maintenance efforts continued throughout the year, no major capital improvement projects or system expansion initiatives were realized.

Infiltration and Inflow Program

A successful I/I program is developed to reduce risks and frequency of sanitary sewer overflows, reduces the operating cost required to treat what is essentially clean water, and increases the likelihood of maintaining water quality standards that are included in a strictly enforced discharge permit. This past year, there were no reportable sanitary sewer overflows identified within Concord’s system. Furthermore, the 12-month (rolling average) of wastewater flow processed through Concord’s wastewater treatment plant was 1.0 MGD, below the 1.2 MGD permitted capacity assigned to this facility. The infiltration rate (of groundwater) into the collection system was calculated at 38.82% and the inflow rate (stormwater) was estimated at approximately 0.3%. Both rates fall within acceptable industry limits and well below “excessive” rates as defined by the MassDEP.

In accordance with 314 CMR 12.04(2) (c) 1 as detailed in the Operation, Maintenance and Pretreatment

Standards for Wastewater Treatment Works and Indirect Dischargers Regulations, Concord is required to submit a formal Infiltration/Inflow (III) Control Plan to MassDEP's Division of Water Pollution Control. While Concord has a plan dating back to 2006 and performs many of the work outlined within such a plan, the plan had not been updated to comport with MassDEP's new format. As this plan is being reviewed and revised as part of broader and more comprehensive NPDES renewal process, Concord requested an extension for this administrative procedure.

Wastewater Treatment Plant Operations
Woodard & Curran, Inc. (Portland, ME) continues to operate the Concord Wastewater Treatment Plant (WWTP), located off of Bedford Street. They are in the 4th year of a 10-year service contract. CPW's Water and Sewer Division continues to work closely with Woodard & Curran to ensure day to day operations and maintenance is performed in a quality manner. Within the past year, the facilities and associated equipment ran reliably

with and in accordance with state and federally issued permits.

Nanae, Japan

Alan Cathcart, Water/Sewer Superintendent, was honored to serve in a Concord delegation that traveled to Nanae, Japan, to celebrate the 20th anniversary of the Concord/Nanae Network (CNN). Over the past twenty years, this special sister city program has helped foster meaningful connections between hundreds of individuals from both communities - in a way that has been both professionally and personally enriching. Following this very special celebration, the delegation traveled to Sapporo, Japan, following in the footsteps of a fellow Concordian, one William Wheeler. Shortly after establishing Concord's first public water system (in 1874), William Wheeler ventured to the sparsely populated Japanese island of Hokkaido, at the request of the new Meiji Government, to help train the Japanese in industrialized agricultural principles that he had learned while attending the Massachusetts Agricultural College (what is now UMASS Amherst).

COMMUNITY DEVELOPMENT

DEPARTMENT OF PLANNING AND LAND MANAGEMENT

Marcia Rasmussen, Director of Planning and Land Management

Mission

To guide the development and use of private and public lands within the Town of Concord in a manner that preserves and celebrates the unique character that is Concord.

Organization and Staffing

The Department is comprised of sixteen full-time and 8-10 part-time individuals within four distinct Divisions – Building Inspections, Health, Natural Resources and Planning. The range and extent of authority exercised by these Divisions is found in State Law and in the Town's bylaws.

The four Planning & Land Management Divisions provide staff support to the Town's regulatory boards and committees that address land use and development activities in the Town: the Board of Appeals, Board of Health, Natural Resources Commission, Planning Board and Historic Districts Commission. DPLM staff also provides support to the Comprehensive Long Range Plan Committee, Community Preservation Committee and Historical Commission, in addition to many other sub-committees and task forces that may be appointed to address specific issues from time to time, such as the Conservation Restriction Stewardship Committee, Bruce Freeman Rail Trail Advisory Committee and West Concord Advisory Committee. Staff also participates in regional groups such as the 13 communities that make up the MAPC-Minuteman Area Group on Inter-local Coordination (MAGIC), the Battle Road Scenic Byway Committee, the seven towns that participate in the Regional Housing Services Office and participation in the CHNA15 Partnership.

Building Inspector Laurie Livoli was promoted to Building Commissioner in January 2017. This past year, we also welcomed Senior Planner Heather Lamplough to the Planning Division and Assistant Local Inspector Ed Mullen as well as the return of Brian

Smith (as back-up Electrical Inspector) to the Building Inspections Division. Two part-time summer conservation crew members, Joseph Guerin and Justin Livoli, were hired in the Natural Resources Division to work on trails maintenance, signage improvements, and invasive species control of Town open space and conservation lands, and, with funding through the Town Manager's budget, Rangers Adam D'Agostino and Mark McCullough were hired for a third year to advise visitors and residents about restricted swimming in White Pond and undertake measures to address erosion at the Pond, in addition to monitoring land usage by dogs and other trail users at several conservation properties. The Planning Division hired Planning Intern Alec Wade in late spring, to assist with events for the Envision Concord: Bridge to 2030 planning effort and implementation of the parking management program. We also worked with Community Services staff to hire summer intern, Erica Chin whose position was funded through Massport's Community Summer Jobs Program.

This year marks the fourth year with Concord as the lead community in administering the Regional Housing Services Office (RHSO). RHSO offices relocated from 141 Keyes Road to 37 Knox Trail in the fall. The RHSO is staffed by four people: Elizabeth Rust is Program Manager, Dan Gaulin is Senior Housing Specialist, and Lara Plaskon and Elizabeth Valente are the two part-time Housing Specialists. The Regional Housing Services Office supports affordable housing activity (such as rental housing monitoring, assisting in re-sales, project development, WestMetro HOME activities, etc.) in seven communities including: Acton, Bedford, Burlington, Concord, Lexington, Sudbury and Weston.

Detailed reports on the regulatory activities of the various boards staffed by DPLM and additional information specific to the four Divisions are included elsewhere in this Annual Report.

Annual Sewer Report Summary

Sewer Statistics	2017	2016	2015	2014	2013
Assabet Pumping Station					
Total Pumped (million gallons)	88.09	74.47	73.85	78.67	78.31
Monthly Average (million gallons)	7.34	6.21	6.15	6.55	6.53
Daily Average (million gallons)	0.24	0.20	0.20	0.22	0.21
Lowell Road Pumping Station					
Total Pumped (million gallons)	312.64	258.44	272.02	341.13	322.92
Monthly Average (million gallons)	26.05	21.54	22.67	28.43	26.91
Daily Average (million gallons)	0.86	0.71	0.75	0.93	0.88
Bedford Street					
Total Pumped (million gallons)	6.18	5.80	5.48	5.23	
Monthly Average (million gallons)	0.51	0.48	0.46	0.44	
Daily Average (million gallons)	0.02	0.02	0.02	0.01	
Collection System					
Number of Service Accounts	1,869	1,866	1,851	1,834	1,832
Miles of Sewer Main	34.03	34.03	34.03	34.03	34.00
Main Pipe Inspected (lf.)	11,350	1,500	3,500	3,700	2,062
Main Pipe Replaced/Rehabilitated (lf.)	0	0	0	705	0
Rate per Unit (unit = 7.48 gallons)	\$.1141	\$.1119	\$.1086	\$.1055	\$.1014