

MUNICIPAL LIGHT PLANT AND PUBLIC WORKS

CONCORD MUNICIPAL LIGHT PLANT

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Concord Light is a community-owned electric utility, created for and by the citizens of Concord 110 years ago. The goal then, as it is now, was to provide reliable electric service with responsive, thoughtful service, all at a fair rate. 2008 has been a worthy addition to this history.

2008 was a challenging and productive year. We finalized gas purchases for the three-year power supply contract we signed last year. The contract will cover roughly half of the Town's power supply needs. Additional power resources have been reviewed and brought onboard. Light Plant Engineers and Line Crew dealt with harsh weather and the near washout of the primary line that feeds all of Concord. We pushed forward on our Automatic Meter Reading (AMR) system, crossed the two megawatt threshold for off-peak electric thermal storage load, and created a Conservation and Renewable Energy Services fund. Please read on to learn more about your electric utility!

POWER SUPPLY

Our existing power supply contract with Constellation Energy, negotiated in 2001, is set to expire at the end of September, 2009. Unfortunately this contract, which supplies all of Concord's electricity requirements at a low fixed price, cannot be extended due to higher energy prices and other market changes.

In 2007, we requested proposals from six suppliers and selected Morgan Stanley's offer because it had the lowest price, best credit support and acceptable contract terms. The new contract does not include fixed prices for the electricity provided. Instead, it has both fixed

and flexible pricing elements in order to mitigate risk in today's volatile energy markets. The agreement will go into effect in October, 2009.

The Morgan Stanley agreement will cover about half of our projected electricity needs. The remainder will come from a mix of sources still in development, including individual power plants and spot market energy purchases. For example, we have signed a contract for a 10 mW share of a new gas-fired plant scheduled to come online in early 2009 in Braintree. Other options include gas-fired units in Taunton and Brockton, a wind facility in Savoy and a wood burning generator in Russell.

To help manage this and all aspects of our power supply in an increasingly complicated environment, Concord Light is in the final process of approving a service contract with Energy New England, a leading provider of both supply and demand-side services to the public power community.

Power Supply Costs

The largest single expense for the Light Plant, by far, is the cost for purchasing electricity and transmitting it to Concord. For 2008 this came to approximately \$11,400,000, more than two-thirds of our total expenditures. The balance funds everything else, i.e., line repairs and maintenance, construction of new facilities,

PEAK DEMAND	
2007	2008
40,399 kW	44,021 kW
August	June

ENERGY SALES – kWh

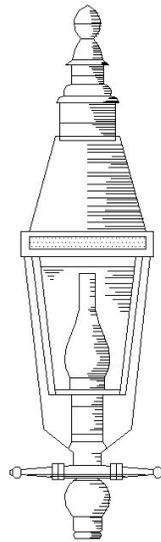
	2007	2008
Residential	70,517,651	70,176,556
General Service		
Small	13,088,754	12,984,126
Medium	25,774,935	23,808,955
Large	61,180,269	61,064,373
Municipal	11,128,009	11,544,525
TOTAL	181,689,618	179,578,535

employee salaries, equipment, debt, payment-in-lieu-of-taxes, insurance, conservation programs and billing operations.

Community

In addition to the \$354,000 given to the Town in-lieu-of taxes, Concord Light is involved in a number of community projects. For example:

- Since 1991 developmentally disabled workers from the Minuteman ARC have stuffed and mailed our electric and water bills. And for the past nine years they have shared our office, teaching all of us the value of community partnerships.
- The Light Plant is purchasing air sealing and energy efficiency supplies to help a coordinated Town effort to weatherize homes for those in need and are qualified.
- With bill inserts and a newsletter article, we encouraged people to donate directly to the Salvation Army's Good Neighbor program, which helps people in need pay their utility bills.
- This year the Light Plant increased by 25%, to \$20,000, our contribution to the Hugh Cargill Energy Fund, which helps Town residents with their electric bills.
- The Light Plant has worked closely with the Comprehensive Sustainable Energy Committee. We share their long-term goals and support their endeavors. The Chair of the Light Board is on the Committee and Light Plant staff has coordinated survey efforts and data requests with Committee members to help aid their efforts.
- Public school electric safety and energy efficiency programs and our tenth annual calendar contest, with artwork provided by selected public school 3rd and 4th graders, were the result of an ongoing collaborative effort with the public schools.
- Once again thousands of lights lit up the night in Concord Center and West Concord this Christmas season, thanks to a partnership between Concord Light and the Town of Concord. We upgraded all the bulbs to environmentally friendly LED—light emitting diode—lights. The change will save the Town more than \$1,100 in electricity costs this year alone. LED lights are initially more expensive than standard bulbs, but save over time since they consume far less energy. They also require much less energy to manufacture than other light sources, which further reduces their environmental impact. The new LEDs are rated to last more than 10 times longer than the standard incandescent bulbs they are replacing, cutting both maintenance and replacement costs. They are also more resistant to breakage, and give off less heat than standard bulbs.



- Line crews installed outdoor electric outlet panels and the Light Plant provided free electricity for the annual Picnic in the Park celebration.
- In 2006 we began a program to help those in financial need. Customers eligible for our Residential Rate Assistance program are able to lower their bills by as much as 30%. In 2008 we expanded the program such that eligible customers will be able to lower their bills by as much as 50%. As of December, 89 customers were taking advantage of the program. Qualifications and an application form can be found on our web pages: www.concordma.gov/cmlp.

Telecommunications

CMLP's evaluation of broadband over powerline (BPL) technology continued with a 3-month Smart Grid Pilot project installed in West Concord. Citizen volunteers were enlisted to help us in evaluating the broadband internet and the telephone service capabilities of the technology during the Pilot. At the end of the Pilot, we found that the Smart Grid technology worked well but the BPL equipment suffered from high equipment failure rates and inconsistent performance. These results led us to begin the planning for Phase 2 of a Smart Grid Pilot which involves the installation of Smart Grid using an all fiber optic backhaul network. The Phase 2 Pilot project will begin in early 2009.

In early 2008, the fiber optic equipment at six sites, which helps provide Ethernet and telephone connectivity to all the major Town buildings, was upgraded with new equipment to increase reliability and functionality. In addition, a separate "out-of-band management" fiber network was created to provide remote access and network management capabilities for the diverse types of fiber optic equipment that have been installed over the last few years. CMLP staff now has a great deal more diagnostic and network management flexibility under severe network disruptions such as "data storms" or other similar network failures.

Another fiber optic project was completed that provides connectivity of the new Deaconess Well Site on ORNAC to the Town fiber ring. This new addition to the Town fiber network allows the Water Department to monitor and manage the equipment at the site from 135 Keyes Road. Two other sites at White's Pond and Second Division wells are being evaluated for either broadband

wireless or fiber optic connectivity projects in 2009.

AUTOMATED METER READING

Installation of a new Automatic Meter Reading (AMR) system began in the fall of 2005 and continued through 2008. Approximately 95% of the Town's electric meters have now been upgraded. This new technology allows us to read electric and water meters from a vehicle while driving down the street. The new system increases meter reading accuracy, eliminates the need for meter readers to enter upon private property, avoids special meter reading appointments for meters located inside, improves the operating efficiency of the Light Plant and reduces our cost. Final installations will be completed in early 2009.

CUSTOMER SERVICE

School Safety and Conservation programs

Again this past fall, with the help of safety and conservation consultant Ray Gouley, 3rd grade students in the public schools learned about electric safety and ways to reduce electric use. The program focuses on the potential dangers of electricity indoors and outdoors, and a variety of methods to save electricity. The program was very well received – by both students and teachers alike.

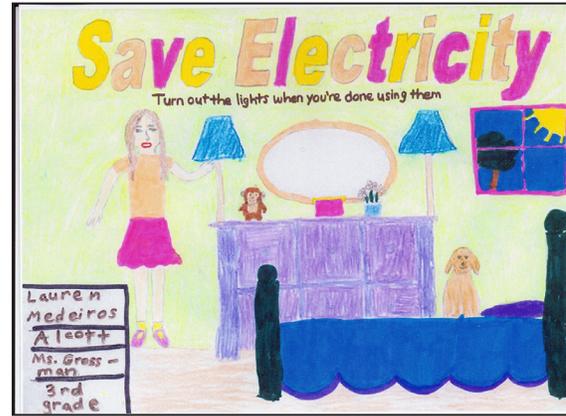
Calendar Contest

Over 225 3rd and 4th grade children from Concord public schools submitted artwork in our annual contest for inclusion in the 2009 calendar. As usual the judging was very difficult. The winning artists received a T-shirt with their art piece emblazoned on the front and a collage of all the chosen pictures on the back. Totebags with a collage were given to the teachers of winning students as well.

It should also be noted that the Calendar Contest would not have been possible without the able help of Diane Kabic, the K-5 Science Curriculum Specialist who was invaluable in helping to coordinate this fun and educational event.

Direct Payment

This service provides customers with an automated alternative for paying their electric and water bills. With over 1,100 customers participating, this program, operated in partnership with the Water Division of CPW



2008 Calendar cover.

and the Finance Department, has been a resounding success. Each customer's bill due amount is directly deducted from their bank account, saving them both time and postage.

Online Billing

This service begun in 2006 has been very successful.

Customers can now pay their bills through an encryption secured online bill payment center. They can also view their bills online and track their past electricity consumption. This approach also saves time and postage and lets the customer decide when to pay their bill.

ENERGY CONSERVATION PROGRAMS

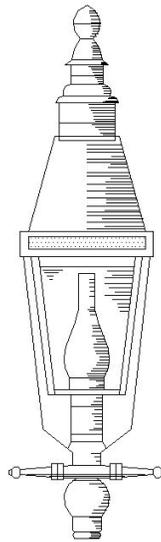
Appliance Rebate Program

This very popular program encourages customers to purchase efficient Energy Star rated appliances that typically save between 15-50% in energy costs, which saves customers money and helps the environment.

Eligibility is based on the Energy Star program established by the Department of Energy. Appliances that qualify for the rebate include refrigerators, clothes washers, dishwashers, central air-conditioners, room air conditioners and dehumidifiers. Rebates range from \$50-\$150. In 2008 rebates totaling over \$31,000 were provided to customers.

Light Bulb Rebate Program

This very popular program allows customers to receive up to a \$5.00 credit on their electric bill for every compact fluorescent or LED exit sign kit they purchase.



These bulbs use as much as two-thirds less electricity as compared to standard incandescent bulbs, which in turn reduces the emission of carbon dioxide into the air from fossil fuel electricity generating power plants. Last year nearly \$10,000 was credited to participating customers.

Residential Conservation Service

This complimentary service, contracted through Energy New England, helps Concord Light customers answer their energy related questions. If required, an energy advisor may be sent to the home to do a complete home energy evaluation. In addition, our Appliance Calculator, located at www.concordma.gov/cmlp, allows customers to determine how much each appliance in their home costs to run.

Municipal Building Audit Program

The Light Plant in conjunction with the Town and the CSEP Committee is funding a series of Level II audits for selected Town buildings. These audits will provide in-depth analyses on the energy usage patterns for each building as well as recommend a variety of options to help reduce usage in each. The audits are expected to be done by the spring of 2009 and the Light Plant's estimated share for the audits will be \$15,000.

Green Power

Towards the end of 2003, the Light Plant began signing up customers interested in "green" power produced at the Acton Hydro Co., Inc. Powder Mill dam on the Assabet River near the intersection of Concord, Acton, Maynard and Sudbury. Unfortunately, due to a cave-in along the spillway that runs adjacent to the dam, the startup of the project has been delayed. Permits for the project have now been issued and construction work has been begun. It is hoped that with luck and plenty of water flow in the Assabet River, Acton Hydro could be sending green power to Concord by late 2009. When the plant does become operational, this non-polluting power will be sold at a small premium, \$3.00 per 100 kWh block (the average customer uses about 925 kWhs each month).

ETS/WATER HEATER PROGRAM

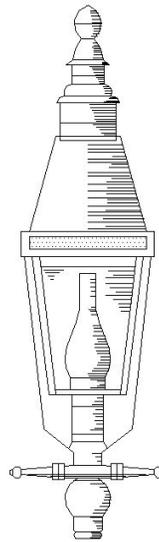
Our Electric Thermal Storage (ETS) heater program continues to be marketed. Currently we control a bit more than 2,000 kW of load in the winter, including over eighty residences, saving Concord ratepayers tens of thousands of dollars each year in avoided transmission and demand charges. In the future, this program will favorably affect our power supply decisions and help keep rates low.

ETS heaters come in a variety of styles - forced-hot-air, forced-hot-water and room units - and are charged off peak, when electricity costs are low. The stored heat is then used during on-peak periods. Off-peak charging saves the Light Plant on-peak premium costs. These savings are passed on to the customer, which currently make ETS operating costs significantly lower than oil and gas for home heating.

We also continue to offer our residential off-peak domestic hot water (DHW) program. Participating customers have their DHW tank's charging time "shifted" to avoid expensive peak electricity charges. Currently, the water heaters of approximately 400 customers are controlled. In exchange, these customers receive a reduced rate for water heating, saving each over \$200 per year, all while not causing a noticeable difference in their hot water supply.

Concord Light C.A.R.E.S.

Five new programs aimed at reducing the amount of electric capacity Concord must purchase were approved in 2008. The programs are all part of a new initiative called Concord Light CARES—Conservation And Renewable Energy Services. The idea behind Concord Light CARES is that it makes sense to invest in measures that focus on electric capacity reduction and electricity conservation. Holding down Concord's peak demand for electricity cuts the Town's power supply costs, and also reduces the region's need for expensive and often environmentally unfriendly peaking power plants. The first year of Concord Light CARES will focus on air conditioning load management, summer pool pumps, weatherization for those with electric heat, small commercial lighting, and rebates for solar photovoltaic installations.



ADMINISTRATION

The Concord Municipal Light Plant operates as a completely self-sustaining, non-profit, Enterprise Fund within the Town. No property tax money is required or used. All operating expenses, capital investments, and debt service are paid from electric revenues. In addition, the Light Plant contributes to the Town via a Payment-in-Lieu-of Taxes (PILOT). For 2008 this formula-based payment was \$354,000 and is the equivalent of the property taxes that would be paid by a non-municipal utility.

EMERGENCY REPAIR

In August, the critical 115kV feeder that connects our primary substation to the regional electric grid was nearly washed away. Water began to erode the side of the hill, which rests next to and above the 115kV feeder. A large sinkhole formed that if left untouched would have expanded and taken the feeder with it. The site of the slope failure is owned by FTN Limited Partnership, which is adjacent to our substation.

The Concord Light Engineering Department and Line Crew, with assistance from CPW, Fire, Police and Town Manager's office quickly prepared an action plan to stabilize the area, set up a berm to divert any new rainwater



Heavy rains caused significant erosion down a steep slope above the Assabet River on the Essco property, washing a dozen or more trees and hundreds of cubic yards of soil down the steep slope. The erosion came within several feet of exposing the main duct bank carrying all of the Town's electric power from the NStar sub-station underground to Forest Ridge.

from further eroding the hill, and then partially fill the sinkhole with trap rock. Within 24 hours a berm was set up, the drain pipe cleared and more than 100 tons of trap rock were installed. Even with these measures there was much concern that the rest of the hill would give way.

Over the next three days the berm was built up and expanded and another 200 tons of trap rock were installed. Subsequent rains have not noticeably degraded the hill. However, FTN Limited Partnership consultants intend to implement a permanent repair in 2009.

CONSTRUCTION ACTIVITY FOR 2008

As in years past, 2008 proved to be very busy on the construction front. A partial list of completed projects follows:

Main Street Utility Improvement Project

- Completed installation of underground electric facilities on Main Street between River Street and Sudbury Road and converted the overhead system to the underground system

Emerson Field Underground Project

- Designed and installed new underground conduit system for approximately 2.5 miles of road
- Installed house service conduits on Belknap Street between Main Street and Thoreau Street

Circuit 223-H8

- Built a new 13.8 kV distribution circuit to provide an additional feed to West Concord and to back up Emerson Hospital

Fiber Optic Project

- Installed new fiber cable from Station 223 to Deaconess Water Treatment Facility

Residential Street Light Upgrades

- Replaced 100 residential street lights with decorative energy efficient lights

PERSONNEL AND TRAINING

The line division continued to receive safety training on a variety of topics including electrical procedures, manhole gas dangers and work practices. The meter division also took part in safety training and the entire department received fire safety training. OSHA Rules and Regulations were also reviewed for any updates.

There were four new hires this year: Tom Christensen is a Civil Engineer and will be helping to design our electric construction projects. Jack Tombeno transferred from Public Works and recently switched to study as apprentice Lineman. Mike Hoogendoorn joined the Line Crew as an apprentice after completing the Energy Utility Technician program at Middlesex Community College. Linda Sevene joined the office staff as a Senior Department Clerk and is responsible for a variety of billing and customer service responsibilities.

***COMPREHENSIVE SUSTAINABLE
ENERGY COMMITTEE***

- Pamela Hathaway, Chair
- Brian Crouse
- Sally Hughes
- Sean Detweiler
- Tyke Crowley
- Arthur S. Fulman
- Paul Mahoney
- Eric Gamage

The Comprehensive Sustainable Energy Committee advanced efforts to conserve energy in Town buildings, refined our understanding of the Town’s overall energy use patterns, and participated in discussions with other committees and task forces regarding Concord’s energy use.

Pursuant to its responsibilities to administer the Sawyer Trust Fund, the Committee reviewed five applications; three were approved, for a total distribution of \$72,400 with savings to the Town of approximately \$23,000/year (see Table). In an effort to ensure that Trust funds are used in the most effective manner possible, the Committee scoped a request for a comprehensive audit of Town-administered buildings; the audit will be completed in the first quarter of 2009 and will guide subsequent funding allocation decisions.

The Committee proposed a Town Energy Use Policy for all Town employees; the policy is currently under review by the Town Manager and the Board of Selectmen. Committee members also began developing a Town-wide carbon footprint for use as a baseline in measuring the impact of energy- and carbon-reduction measures. As we move toward a more carbon-conscious world, this effort will ensure that Concord is fully informed in decisions regarding participation in State and regional carbon-reduction efforts.

Committee members also met with staff of the Concord Municipal Light Plant to discuss energy use as it relates to electricity policy and management, and provided comments on CMLP’s policies on net metering and on the ongoing rate study and community survey. Finally, Committee members participated in the ConcordCares initiative, promoting energy conservation and weatherization programs as part of this program to assist at-risk Concord residents.

CONCORD PUBLIC WORKS

PUBLIC WORKS COMMISSION

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 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 responsible for setting policy and rate schedules for water, sewer and solid waste services; for acting as an appeals board for water and sewer bills and for approving minimum standards for the final layout of Town roads.

Summary of Sawyer Trust Fund Allocation - 2008

Applicant	Work Proposed	Estimated Payback	Approved Funds
Emerson Umbrella	Insulation and Air Sealing	3+/- years	\$9,400
Beede Center	Variable speed drives and new pumps.	2+/- years	\$40,000
Town House	Storm windows	NA	\$23,000



From left: Nick Pappas, Philip Swain, James A. Smith, Chair; Cynthia W. Wood, Vice-Chair; Paul A. Mahoney

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

Activities of the Commission can be found throughout the year on the web at www.concordma.gov

Highlights for 2008 include:

- Review of the proposed crosswalk design at Main and Academy Lane, incorporating traffic calming elements.
- A public hearing and Commission approval to revise curbside collection and disposal rates.
- Updates to water conservation rebate programs related to replacement of toilets and clothes washers were approved.
- A public hearing and approval of the sewer improvement fee rate change.
- Approval of the deferral of betterment assessments as recommended by the Assessors Office.
- A public hearing and presentation of the 2008 Roads and Sidewalk Plan. A public safety concern raised at the hearing regarding traffic patterns on Crest Street was referred to the Concord Police Department's Public Safety Officer and resulted in modifications to the design for the street.
- A public hearing and approval of the revisions to the Right of Way fee schedule and permit application changes for multiple or looped driveways that also provided updates to other sections of the Right of Way permit.
- Approval of a wastewater "one connection per parcel" regulation waiver request for 405 Old Bedford Road.
- A public hearing and approval of the new water/sewer rates.

- Approval of a sewer service appeal related to increased flow and multiple connections at 335 Walden Street (Concord Housing Trust affordable housing development).
- A public meeting reviewing water quality and a health risk assessment performed by Cambridge Environmental Inc, focusing on testing protocols and findings related to Methyl Tertiary Butyl Ether contamination found in water supplies.
- Denial of a sewer service appeal of the "one connection per parcel" regulation at 20 Prairie Street.
- Approval of drainage easement relocation at 2194 Main Street related to the Route 62 Main Street Reconstruction Transportation Improvement Program (TIP) project.
- Approval of a sewer increase appeal for property located at 195 Sudbury Road.
- A public hearing and the approval of a Right of Way Trench Safety permit Regulation and related Fee adjustment to be implemented upon requirement by the State.
- A vote of support for the Community Preservation Act application for funding for the repair of the Monument Street retaining wall at Hutchins Farm.
- A tour of the Wastewater Treatment Plant.
- In addition to individual meeting topics referred to above, the Commission spent a great deal of time and effort reviewing the Wastewater Task Force efforts, including participating directly in the Task Force through representation on the Task Force by the Commission.
- The Commission continued to review the activities of Concord Public Works through monthly Director's reports and set aside time for public comment during each meeting.



Melvin Memorial in Sleepy Hollow

CEMETERY COMMITTEE



From left: Deborah B. Stoessel, Frederick E. MacDonald, Vice Chair; Carole A. Cushing, Richard W. Monaghan, Chair; Ruth E. Armknecht

The Concord Cemetery Committee consists of five members appointed by the Town Manager. The Committee is responsible for oversight of the operation and maintenance of all Town cemeteries and burial grounds and for establishing policies and procedures for these facilities.

Committee meetings provide a forum for the review and adjustment of fee structures; the conveyance of burial plots to owners; review of the annual budget and capital improvement program for the cemeteries; and for the review and disposition of specific requests from plot owners. The Committee provides guidance for the activities of the Friends of Sleepy Hollow that directly impact the cemeteries.

Concord cemeteries are an important asset to the Town. Visitors, historians and residents use them as a window to the past, as a pleasant place for solitude and contemplation, as well as a final resting place for many.

Concord cemeteries total about 55 acres. Maintaining these grounds in top condition requires the continued efforts of the Cemetery Division staff as well as other Public Works employees. The efforts of all are greatly appreciated.

Sleepy Hollow

Memorial Day and Veterans Day ceremonies were held at Sleepy Hollow. These events were well attended.

On-going maintenance/upgrade programs continued to be carried out at Sleepy Hollow. Roads were re-paved;

the tree management program continued to insure the health, safety and aesthetics of the hundreds of trees within the grounds; new plantings were made.

The family of the late George T. Barrett, Sr., generously underwrote the cost of erecting a new, illuminated flagpole to replace one originally erected by the family in the 1960's.

The gray, ante-bellum building, located opposite the New Hill Gate, which had served as Cemetery Division headquarters for many years, was vacated during the year so as to address the structural problems that had weakened the building's roof; to upgrade its electrical and mechanical systems; and to lay the groundwork for further renovations. This work will be part of a larger building program designed to insure that the Cemetery Division's administrative and operational needs are well met for the foreseeable future.

A commercial landscape architect was retained to explore alternatives and to develop plans for upgrading the border between Bedford Street and Sleepy Hollow. The goal is to provide a consistent, attractive border that also provides increased screening between the road and cemetery.

Most sales of burial plots now take place in The Knoll section of Sleepy Hollow. Surveys laying out new burial plots were completed so as to insure that lot sales would continue uninterrupted. New plots in the rear half of the ellipse were laid out. The Jewish section also was enlarged. Work continued to finalize water and sewer connections to the garage building.

Statistics

During 2008, there were 94 interments at Sleepy Hollow. 43 were full burials and 51 were cremations. Of the 94 interments, 39 were Concord residents. Lot sales for the year totaled 53, with 19 of these being sold to eligible former Town residents.

Friends of Sleepy Hollow

The Friends of Sleepy Hollow is a private, non-profit organization whose purpose is promoting the preservation, beautification and appreciation of the historic burial grounds in Concord. Additional information can be found at www.friendsofsleepyhollow.org.

The Friends' map of Sleepy Hollow, now in its second

printing, highlights areas of historical interest and continues to be a valuable asset to the hundreds of visitors who tour the grounds each year.

In addition to receiving individual donations, the Friends continued their fund raising efforts with a second Saturday Breakfast Series. Three meetings provided insights into the renovation of cemetery markers; a history of Concord's retail industry; and Concord history presented through video.

CONCORD PUBLIC WORKS ADMINISTRATION

Richard Reine,
Director

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, and through sound management, innovation, teamwork and vision provide dependable, high quality, responsive public works and utility services, consistent with community values and at reasonable costs to Concord's stakeholders.

Protecting the Town's Infrastructure/Providing Essential Services

Concord Public Works (CPW) is comprised of four divisions. There are two staff divisions --Administration (including Recycling and Solid Waste Management) and Engineering, and two line divisions--Highway & Grounds (including Cemetery) and the Water & Sewer. 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, playgrounds, ball fields, and recreation equipment; Town cemeteries; the Town's former 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 mission continues to focus on six keys—customer service, vision, innovation and creativity, teamwork, learning and growth, and energy!

CPW Team, Programs & Organization

Concord Public Works is made up of 56 individuals collectively representing over 460 years of experience. It is a team that is passionate about Concord, which takes great pride in its work, and fully understands its 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 while 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 2008. Notable accomplishments include:

- The roadway and sidewalk maintenance and management program resulted in the completion of approximately 3.54 miles of roadway and 1.5 miles of sidewalk improvements along with substantial drainage related improvements throughout Concord.
- The Warner's Pond Dam rehabilitation continued with substantial completion.
- The Mill Brook Culvert project began and will be completed in the summer of 2009.
- MassHighway completed all remaining contract items including drainage, sidewalk/granite curbing and guardrail as well as the sandblasting and painting of the superstructure structural steel components for Heath's Bridge.
- A number of catch basins were replaced and/or repaired at various locations including Nashawtuc Road and Baker Ave.
- The Highway Division made major drainage improvements on Cambridge Turnpike at Crosby's dam until a permanent solution can be developed.
- A major project was completed on Monument Street



A portion of the Public Works Team made up of Administration, Engineering, Highway, Grounds (Parks and Trees), Cemetery, Recycling and Waste Management, Water, and Sewer

which included the installation of a concrete buttressing wall to prevent a potential wall and roadway failure.

- All seven Town water pumping stations received water treatment improvements in addition to hardware and software upgrades to the Supervisory Control and Data Acquisition technology.
- An extensive water main and extension program was completed.

ENGINEERING DIVISION

William J. Renault P.E.
Acting Town Engineer

The Concord Public Works Engineering Division is responsible for the planning, design, engineering and construction of Town roads, sidewalks, drainage, bridges and stormwater infrastructure assets. The 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.

The Division provides Geographic Information System (GIS) services and maintains Town-wide inventories, database, mapping and document control for Concord's public right-of-ways, easements, infrastructure and natural resources.

ROADS AND SIDEWALKS 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 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. In addition, Concord has 55 miles of public sidewalks.

Concord's pavement management strategy and 20-year Roads and Sidewalks Program Plan emphasizes adequate investment in road and sidewalk/handicap ramp rehabilitation combined with preventive and routine maintenance. This program is based on an annual condition survey of 25% of roads and the evaluation of contiguous sidewalks. The program utilizes pavement management software, in-house engineering/operations knowledge and Town-wide utility planning to select pavement treatment and maintenance options.

A key element used to enhance road pavement maintenance is the extensive use of crack sealing. The use of this material enables CPW to maintain the integrity

of existing road structures while improving selected roads by means of reclamation and cold plane/overlay pavement treatments.

3.54 Miles of Roads Improved

Roads Program improvements completed include reclamation of Keyes Road, Rolling Wood Lane, Longfellow Road, Peter Bulkeley Road, Paul Revere Road, Nut Meadow Crossing, West Street, Crest Street, and Munroe Place.

ORNAC was selected to receive a combination mill/overlay and reclamation treatment while Main Street (from Monument Street to Sudbury Road) was selected to receive a mill and overlay treatment.

The reclamation and base course pavement portions of ORNAC were completed during the construction season. The remaining ORNAC work and Main Street mill and overlay will be completed in the 2009 construction season, prior to commencement of the 2009 Roads Program.

1.5 Miles of Sidewalks Improved

The Lexington Road sidewalk from Old Bedford Road to Monument Square was improved as part of the Roads and Sidewalks Program. Additionally Laws Brook Road (from Sorrell Road to Hill Street) and Main Street/Sudbury Road (from the Walden Street parking lot to Stow Street) are planned to be completed within 2008 Roads and Sidewalk contract, but the work has been pushed off until the spring of 2009.

Roads and Sidewalks in Sound Condition

The accompanying tables show that the condition of Town roads remain within the target range of 80-85

ROAD CONDITION SUMMARY

	2006	2007	2008
Pavement Condition Index (PCI) Network Average	83	84	83
Recommended Repair(s)			
Rehabilitation	13%	14%	12%
Routine Maintenance	46%	42%	52%
No Maintenance Required	41%	44%	32%

Note: The above referenced table is based on an infinite budget.

- Using the \$1M FY2008 budget, the *recommended* repairs breakdown is: (Rehabilitation 3%, Maintenance 12%, No Work Performed 85%)
- Using the \$1M FY2008 budget, the *performed* repairs breakdown is: (Rehabilitation 3%, Maintenance 4%, No Work Performed 93%)

PCI (Pavement Condition Index). A sustained investment in the Town’s sidewalks has provided continued progress in maintaining this Town asset. The slight degradation exhibited in the SCI (Sidewalk Condition Index) is more indicative of survey updates during the most recent inventory. Preliminary

calculations show that maintaining the current maintenance investment will allow the Sidewalk Program to meet its recommended range by 2011. 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.

Other Roads & Sidewalks Projects

CPW Engineering continues to manage all consulting engineering services for the design, survey, permitting and construction administration of the 1.2 mile Main Street (Route 62) “Footprint

SIDEWALK CONDITION SUMMARY

Sidewalk Condition Index (SCI)	SCI		
	Range	Miles	Percent
Replace	0-50	2.8	5%
Localized Repair - resurfacing	50-70	10.0	18%
Shows Wear – routine maintenance	70-90	31.2	56%
No Distresses	90-100	11.6	21%
Total Miles		55.6	100%

Roads” Reconstruction Project. Based on bids opened in November, the projected project cost is \$2.8 M. Project funding is through the FY 2008 TIP Program with construction scheduled to begin in the spring of 2009.

Stormwater/Drainage

Concord is a “rivers community” with a stormwater/drainage infrastructure consisting of 124 culverts, 183 drainage outfalls, 2,800 catch basins; 751 manholes; and 50+/- miles of drain lines. The Town is also responsible for six dams. CPW plans, coordinates and performs drainage improvements in conjunction with the Roads

and Sidewalks Program to minimize disruptions and to eliminate expensive emergency repairs. Drainage maintenance activities are coordinated with the Division of Natural Resources and are performed under the general maintenance permit issued by the Natural Resources Commission.

In the past, CPW Engineering staff developed a Drainage System Inventory and integrated the data into the Town's Geographical Information System (GIS). This work provided the basis for developing a 20-year Storm water/Drainage Management Plan. The Plan's goal is to improve, protect and maintain Concord's public storm water/drainage infrastructure through scheduled maintenance and planned replacements and enhancements. The Plan is also a key component of the Town's National Pollution Discharge Elimination System (NPDES) Phase II General Permit.

The sum of \$160,000 was appropriated in FY09 to continue the multi-year effort to improve the condition of the Town's storm water system. A major purpose of the Storm water/Drainage Management Plan is to prevent expensive emergencies from occurring in the future through a planned and scheduled maintenance and replacement program.

Multiple improvements to the Town's drainage system were constructed this year in coordination with the Roads Program. Drainage extensions were installed on Upland Road as well as two locations on ORNAC, to correct habitual flooding of the travel way on both streets. Additionally, an infiltration system was installed on Nut Meadow Crossing to improve the operation of the existing drainage system. All drainage work was designed and permitted in-house by the CPW Engineering Division.

The CPW Highway Division reconstructed a portion of the Baker Avenue tri-culverts to repair a crumbling headwall and collapsed pipe. The culvert rehabilitation and dewatering plan were designed and permitted in-

house by the CPW Engineering Division.

Other Stormwater/Drainage Projects

Other drainage improvement projects constructed during the construction season included the Warner's Pond Dam Rehabilitation and Mill Brook Culvert Rehabilitation. The Warner's Pond Dam was phased over the 2007 and 2008 construction seasons and is currently at substantial completion. The Mill Brook Culvert Project began within the 2008 construction season and will be completed in the summer of 2009. CPW Engineering facilitated public hearings during the planning phases and managed all consulting engineering services for the design, permitting and construction administration for the projects.



Warner Pond Dam rehabilitation reached substantial completion after exciting weather related incidents.

An engineering feasibility study is being performed for the proposed reconstruction of Cambridge Turnpike. The project proposes a comprehensive phased approach to construction that may include the removal of the privately owned Crosby Pond Dam as mitigation for the wetland impacts related to the improvements.

The project will include roadway reconstruction, culvert improvements to alleviate flooding and sidewalk improvements. The study is being completed using drainage program and roads program funds and the project is proposed to be funded through the TIP process.

Bridges

Engineering staff continued to monitor the wearing conditions and structural integrity of the five Town-owned bridges— Flint's Bridge, Heath's Bridge, Nashawtuc Bridge, Pail Factory Bridge and the Pine Street Bridge. Staff coordinated inspections/repairs/construction planning with the Massachusetts Highway Department (MHD). In an effort to expedite the rehabilitation of several of these bridges, staff continued its advocacy efforts with both MHD District No. 4 and State bridge officials as follows:

- Heath's Bridge – Mass Highway completed all remaining contract items including drainage, sidewalk/granite

curbing, guardrail, finish asphalt wearing course paving and pavement marking work. Mass Highway also amended their existing contract to include sandblasting and painting of the superstructure structural steel components. All work was completed within the 2008 construction season.

- Pine Street Bridge – Bridge reconstruction commenced during the 2008 construction season and is expected to be completed during the 2009 construction season. Funding for the \$1.2M project is through the FY 2006 TIP. CPW Engineering and Water/Sewer Divisions used this opportunity to coordinate needed Upland Road and Pine Street drainage improvements as well as water system improvements with Mass Highway to have portions completed by the bridge contractor.
- Flint's Bridge – Mass Highway is currently reviewing a revised sequencing plan for the bridge work to ensure proper loading of the bridge during construction. The project construction is expected to last through April 2010. Funding for the \$3.7M project is through the FY 2008 TIP.
- Nashawtuc Bridge – The project was bid in the fall. The low bidder was contacted regarding a change of project scope which will change the stone dowelling spacing, remove the structural parapet wall and eliminate the cutting of stone for the veneer. A change order could not be agreed upon; therefore the project will be rebid in the winter/spring of 2009. Community Preservation Committee funding in the amount of \$250,000 was obtained by CPW for the project. The remaining project funding is through the Roads Program.

Geographic Information System (GIS)



Concord's GIS Program continues to make significant progress and remains a "pace setter" for web-based GIS communities. The integration of the Roads, Sidewalks, Stormwater/Drainage, Water and Sewer Programs via GIS continues to pay dividends. This year's project included the development of multiple applications in PeopleForms with our GIS consultant, People GIS, including:

- Street Tree database and photo upload tool for data entry
- Street signs application and photo upload tool for data entry
- A master address table edit tool
- A document management and upload tool
- A public works customer service request and work order tracking tool
- Council on Aging database tool

Technical Support

Engineering staff provides engineering and construction management support services for CPW and various Town departments, boards and commissions.

The Town Engineer continued to represent and assist the Town as a participant on the Route 2 Corridor Advisory Committee (CAC) to address several projects:

- Crosby's Corner – Mass Highway is in the process of reviewing the 75% Design Plans and the construction schedule was revised from FY 2009 TIP to FY 2011 – 2014 TIP. Final Design 100% Plans are tentatively scheduled to be completed by the winter of 2009 with permitting expected to continue for the remainder of the 2009 calendar year. Early takings are expected to begin within the spring of 2009.
- Route 2/Concord Rotary – Mass Highway's design consultant, Earth Tech, Inc. is in the process of preparing the filing of the Environmental Impact Report (EIR) with the Massachusetts Environmental Policy Act office as the 25% design plan set. Earth Tech has conducted open house information sessions and meetings with Town staff over the 2008 calendar year to gain feedback on the potential alternatives. Alternatives #3 and #5 are being pursued within the EIR. The conceptual construction timeline remains between 2012 and 2014.

HIGHWAY & GROUNDS DIVISION

Dickinson Fowler,
Highway & Grounds Superintendent

The Highway and Grounds Division maintains approximately 107 miles of public streets along with the associated drainage systems consisting of almost 50 miles of drain lines, over 2,800 catch basins, 124 culverts and 751 drainage manholes. In addition, the division maintains 55 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 39 acres of active recreation areas (10 athletic fields). The new multi-use

fields at Concord Carlisle Regional High School which came on line in the spring add 10 acres of recreation area, a lavatory/storage building, as well as a parking lot for over one hundred cars. The Division maintains all public shade and park trees, under the direction of the Park and Tree Supervisor who is also the Town's Tree Warden.

Snow Removal Program

The 2008 season saw significant activity for the Department's winter maintenance personnel, including the record use of salt and sand. The winter snow levels were relatively normal with three storm events requiring full mobilization of forces, and three events that required snow removal. However, sanding and salting operations were extensive throughout the season due to the persistent cycle of freezing and thawing. The first reportable snow fall took place on 12/12/07 and required snow removal before the Christmas holiday while the entire snow season showed almost forty events requiring a response for snow and ice.

Roads and Sidewalk Maintenance

The Highway Division manages the contracts for several major maintenance programs including Catch Basin Cleaning as well as pavement preservation strategies such as crack sealing and infra-red patching. These programs were completed in the spring during cooler temperatures. Highway crews reclaimed several sections of roadway with full-depth patches of distressed pavement in preparation for certain 2008-09 road projects as well as those roads scheduled for crack sealing. Roads worked on included Conant, Walden, Main, Staffordshire, Old Bedford, MacArthur, Nashawtuc, Powdermill, Domino, Ridge, Walnut, and Crest. To control drainage, berms were installed on Monument, Old Marlboro, Bedford, and Central. Route 62 in West Concord continued to receive limited road improvement measures while waiting for the "foot print" State funded TIP rebuilding project, which is scheduled to begin in the spring of 2009 to commence. A major project was completed on Monument St. that included installing a concrete buttressing wall on the east side of the existing wall at Hutchins Farm in order to prevent a potential wall and roadway failure.

In addition to road repair and regular road maintenance, sign repair and replacement, brush cutting and



Park and Trees Crew remove a tree on Hubbard Street.

sweeping, the Division accomplished major sidewalk work which included overlaying and reconstruction of the sidewalk on Old Marlboro Road adjacent to the Peabody School. A number of other smaller repair projects were completed in cooperation with CMLP. A major paving project was also completed with Concord Public Works personnel, allowing substantial savings, at Sleepy Hollow Cemetery in the Pines section.

Drainage

Substantial work on Nashawtuc Road was completed involving rebuilding numerous catch basins and cleaning outfalls. Another large culvert replacement and repair project was partially completed on Baker Avenue. which involved the replacement of one of the three existing culverts to prevent further sidewalk and road collapse. In addition several sunken/collapsed catch basins were repaired at various locations. These repairs and replacements were on Minot, Lexington, Minuteman, Silver Hill, Keyes, Indian Pipe, Domino, Elm, Hubbard, Shag Bark, Partridge, Southfield, Nimrod, and Fairyland parking lot. Highway Division crews continued monitoring beaver/flooding areas of concern at Mill Brook, Spencer Brook, Cambridge, and Williams Road. Major drainage improvements were also completed on Cambridge Turnpike at Crosby's dam as a temporary measure in an attempt to mitigate roadway flooding until this road can be rebuilt permanently.

Parks and Playgrounds

The Park & Tree crews maintain over 39 acres of athletic fields for use by the baseball, softball, soccer, lacrosse

and other programs. With the addition of the multi-use fields at the Regional High School this total is now almost 50 acres. Emerson, Rideout, Ripley, Concord Carlisle Regional High School new fields and Sanborn playgrounds are heavily used from spring through the fall and receive the most attention with regard to mowing, raking, line painting, cleaning, fertilizing etc. Irrigation systems are frequently maintained, and an additional system was put on line at the Sanborn School following contractor work with electrical systems installed by CMLP. The crews also supported maintenance in various conservation areas, as well as the Community Gardens, the Visitor's Center, the hanging plant program in West Concord and all Town properties, numerous gateway traffic islands and areas of public access in the business districts. A planting project was completed at the Alcott School at the fence line on Laurel Street utilizing Alcott School Building Project Funds.

Trees

Concord Public Works planted a total of 90+ public shade and park trees. All shade trees were planted in accordance with the Division policy of "the right tree in the right place", and included many trees planted on private property as public shade trees, in accordance with the shade tree setback planting policy. Along with the new plantings, the Park & Tree crews pruned 25+ trees and took down another 150+ trees that had been damaged or were in hazardous condition jeopardizing public safety and Town infrastructure. Numerous trees continue to be removed in the Sleepy Hollow Cemetery by Concord Tree Crews in accordance with the adopted hazardous tree study, adopted by the Concord Cemetery Committee.

2008 saw the continued integration of Tree Warden activities within the Park and Tree Division. The move of the Tree Warden from the Planning Department to the Park and Tree Division occurred in 2005 and brought the administrative function as well as the operational function under one umbrella with Highway and Grounds. The "public shade tree protection policy" adopted in 2005, continues to be shared with the public, contractors and Town departments. The Division's goal remains to replace at least one public shade tree for every public shade tree that is removed or dies, although in recent years the needed take-downs have exceeded the

planting options. This comparison should be brought closer together in future years pending any major tree damage.

Cemetery

In addition to routine maintenance, mowing and burial activities, the cemetery staff worked on numerous projects and provided contractor oversight. The major project was the planning layout and survey work for approximately 1,000 burial lots at the Knoll. Survey work is complete with corner marker installation to be completed in early spring 2009. Project plans for historical restoration and improved functionality of the Sleepy Hollow Administration building were started with work to be done by Town employees utilizing local architects and contractors. Work is scheduled to be completed during 2009 with office space available for multiple department use. Cemetery operations continue to be located at the 133 Keyes Road Public Works facility while additional space options are evaluated. The Melvin Memorial continued to be monitored daily and covered during winter. Maintenance included annual review and treatment of the slate tablets and rifle inserts as well as continued brush clearing.

In the seventh year of a multi-phase monument restoration program in the older cemeteries, the Concord firm of Fannin Lehner Preservation Consultants completed their assessment at "Old Hill", and continued their physical conservation efforts.

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 3,305 households in FY08 (July 07-June 08). Subscribers to the municipal curbside collection program set out 1,469 tons of mixed paper, 556 tons of commingled containers, and 2,467 tons of trash for collection. The average household that subscribes to the Town program recycled .61 tons of materials and threw away .75 tons of trash.

Curbside Recycling Rate Remains in the Commonwealth's Top Ten Percent

Curbside Collections

	FY98	FY06	FY07	FY08
Total number of subscribers	2,518	3,224	3,184	3,305
Recyclables collected (tons)	1,264	1,986	1,982	2,025
Trash collected (tons)	2,351	2,552	2,559	2,467
Recycling rate	35%	44%	44%	45%

(FY = July 1 through June 30)

Residents in Concord's municipal curbside collection program recycled 45% of the materials they set at the curb. Concord's recycling rate ranks in the State's top ten percent. This figure does not include yard waste, which residents manage at home or drop off at the Composting Site on Saturdays, April through November. It also does not include information on the more than 1,000 households that contract with private haulers for the collection of their trash and recyclable materials.

PAPER REVENUES

	FY98	FY06	FY07	FY08
Trash disposal cost	\$110,564	\$187,549	\$195,783	\$194,254
Paper revenue	(\$8,061)	\$31,889	\$35,302	\$58,188
Avoided disposal costs (not including revenue above)	\$38,798	\$113,107	\$119,898	\$116,818

(FY = July 1 through June 30)

Recycling Savings Exceed \$1.4 M

The recycling program received revenue of \$58,188 for paper in FY08 and avoided \$116,818 in disposal costs by not disposing of paper as trash. Since 1998, when the Town began receiving revenue for recycled paper, recycled paper revenue has totaled \$374,549 and avoided disposal costs have totaled \$1,028,004, for an overall savings of \$1,402,553. The municipal collection program received an average of \$39.60 per ton for recycled paper collected at the curb, an increase of almost 65% from last year due to an increase in the value of paper. Curbside subscribers received a paper rebate of \$7.00 in October 2007 and another \$7.00 paper rebate in May 2008.

Reuse and Recycling DropOff & SwapOff Events Achieved Record Attendance

The Spring DropOff & SwapOff event attracted 974 households. This was the largest event ever held. The Fall

Dropoff / Swapoff Day

Participants	1999	2006	2007	2008
May	521	960	908	974
Oct	430	728	840	918

DropOff & SwapOff event was also a great success with 918 households participating (this was the largest fall event to date). The weather was cooperative and both events went smoothly, thanks to the volunteers that make these events possible.

Visits to the Compost Site

Year	Leaves/ grass	Brush	Paint Drop-off	Paint Pickup
2008	8,093	508	222	138
2007	7,880	697	296	171
2006	6,651	615	298	158
2002	4,931	253	400	86

Composting Site Turns Yard Waste into Garden Gold

From April through December, residents made nearly 8,100 visits to the Compost Site, dropping off leaves, grass clippings and brush, while 222 residents dropped off paint at the paint shed and 138 residents picked up paint. The reduced volume in paint is largely a result of educating residents about disposal of unusable latex paint in the trash. At the Compost Site, 1,025 Christmas trees were recycled and 98 large bags of Styrofoam were collected for recycling.

Keeping Mercury out of the Environment

Concord Public Works collected 22,411 linear feet of fluorescent light bulbs, 45 lbs. of mercury-containing thermostats and devices, and 204 lbs. of nickel cadmium & lithium batteries, from residents and municipal facilities, for recycling and proper disposal. This is in addition



Paul Reinhardt, Nancey Carroll, Kathi Tew, and Rod Robison prepare for a recycling exercise with Concord Middle School students on Public Works Week.

to 65,558 lbs. of computers, TV's, and other electronics that were collected at the two DropOff events. Another 6,136 linear feet of fluorescent bulbs and 6,300 lbs of computers and electronics were collected from businesses at business recycling events.

WATER AND SEWER DIVISION

Alan Cathcart,
Superintendent

In 1974 and 1976, Annual Town Meeting established separate Water and Sewer Funds to ensure that the operation, maintenance and capital improvement of the water and sewer systems would be financially viable enterprises. Expenses and expenditures incurred for each system are covered entirely by user fees. The Water and Sewer Division of Concord Public Works is responsible for managing the day-to-day operations of the water and sewer infrastructure and as of 2007, the total assets for each system are 19 million and 28.6 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 an early network of water mains to Concord Center. Today, the water system has grown to include both groundwater and surface water sources, a total of seven pumping stations, two major treatment facilities, and a high pressure water main network consisting of over 130 miles of pipe. Two covered storage reservoirs, one located at Annursnac Hill and the other located at Pine Hill in Lincoln provide total reserve capacity of 7.5 million gallons. There are presently 5,436 customers 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.

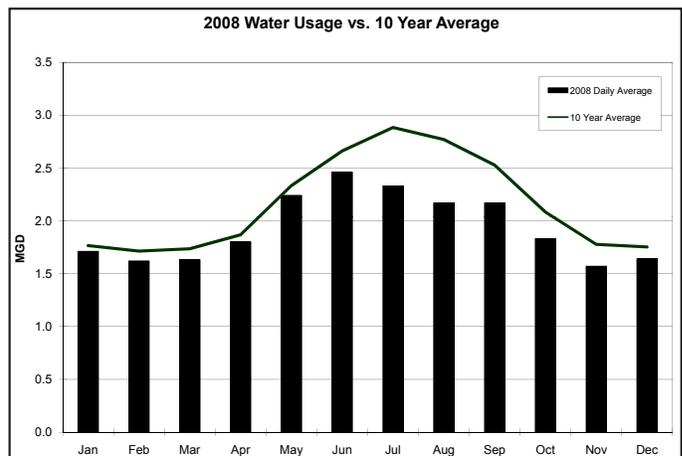
Water Use and Demand Management

Water use measured within Concord, like most residential communities, correlates directly with seasonal weather trends. The total water production measured during 2008 was 707 million gallons with an average daily demand of 1.93 million gallons. The highest water use in 2008 occurred in the summer months. This year,

the water demand was relatively low, with an average daily demand of 2.2 million gallons between May and October. In comparison to this same period of record in 2007, water use was lower by 60.3 million gallons. When compared to the 5 and 10 year averages, 2008 was below both these benchmarks. The peak daily usage registered in 2008 was 3.47 million gallons as recorded on June 11.

The summer began with decreased rainfall in May, normal rainfall in June, and almost twice the normal amount for July. The July rainfall mostly occurred in a few large volume events which is not beneficial to curbing water use. August and September saw above normal levels of precipitation while October was relatively dry. The precipitation was above normal for both the winter and summer months preventing the drought conditions experienced during 2007. Temperatures during the summer period were at or below normal except for June which was 2.3 degrees warmer than normal. This corresponds with our highest water demand month of 2008. All water sources were utilized to meet demand this year including Nagog Pond which supplied water during portions of the month of June.

In January, Concord appealed the terms and conditions included in the Massachusetts Department of Environmental Protection (MA DEP) issued "Water Management Act Registration Statement." While Concord's appeal remains open, the State Superior Court has issued a declaratory judgment that the Water Management Act does not authorize the MA DEP to condition withdrawal registration renewals. Regardless of the legal and regulatory findings, our customers are provided with one of the most comprehensive conservation programs in the



Commonwealth because of our commitment for long-term sustainable and environmentally responsible water resource management.

Water Conservation Program Highlights

Concord continues to lead in the promotion and practice of water conservation in New England. These efforts include Concord representing the northeastern water suppliers on the Smart Water Application Technology Promotional Working Group and participation in New England Water Works' Conservation Committee. Concord's conservation successes were recognized by MA DEP at the May Drinking Water Week ceremony, which awarded the Town with a certificate of outstanding performance in 2007; and by the SuAsCo River Stewardship Council, which jointly with the Concord-Carlisle League of Women Voters presented the conservation coordinator with a River Steward Award. Notable activities recorded over the past year include:

- **Community Conservation Challenge** – The second year of an outreach project partially funded by a grant from the Massachusetts Environmental Trust that linked fundraising for community groups with water conservation. The Challenge recruited 39 households to try to save water during the summer. Overall, participating households reduced their water use by 26%, saving over 500,000 gallons of water. Funds were earned on behalf of the Hugh Cargill Trust Committee, Concord Scout House, Concord-Carlisle League of Women Voters, and the Alcott School Green Monsters.
- **Water Conservation Grant** -- Concord received a \$34,000 grant from MA DEP to fund sixty \$100 rebates for the installation of high-efficiency clothes washers, to double the existing toilet rebate amounts, and to pay for retrofitting bathroom fixtures in municipal buildings in early 2009.



Marc Reardon and Tim Porter repair a catch basin.



From left: Matthew Mostoller, Joanne Bissetta, Rep. Cory Atkins, and Alan Cathcart. Concord Water Division was recognized at the State House for exemplary water conservation efforts.

- **Toilet Replacement Rebate Program** – Ninety-four older model toilets were replaced with water-efficient models, bringing the total replaced since 2004 to 337. On average, households that replaced their toilets have reduced their water use by more than 5,000 gallons a year and save \$44 annually on their water bills.
- **Outdoor Water Use** – Water-efficient landscape templates and water-wise lawn watering tips were shared in The Water Connection newsletter, the Concord Journal, the Annual Water Quality Report, fliers and the Town's website. In addition, workshops on sustainable landscaping, organic lawn care, water-efficient lawn care, and irrigation system maintenance were conducted.
- **Water Education** - Division staff continue to work with elementary school teachers, integrating a lesson on water resource protection and conservation into the fourth grade science curriculum at all Concord

Public Schools. Numerous educational materials are sent home annually to 200+ fourth grade students.

- **Residential Aids and Services** – 107 rain barrels were sold and 11 households received in-depth irrigation system audits. In addition, low-flow showerheads, faucet aerators, rain gauges, and toilet leak detection tablets, provided in part by a grant from the Massachusetts Department of Environmental Protection, were distributed to interested water customers.
- **Commercial Aids and Services** – Three local restaurants are testing low-flow pre-rinse spray nozzles, which can reduce hot water use by tens of thousands of gallons annually and net over \$1,000 a year in savings in energy, water and sewer bills.

Water Quality

In accordance with Massachusetts Department of Environmental Protection regulations, Concord was required to conduct lead and copper testing at 30 residential locations and two school locations. This sampling program helps ensure our corrosion control program is adequate to reduce leaching of lead and copper from older plumbing and fixtures. The monitoring continues to demonstrate that levels of lead or copper in the drinking

water remain well below State and Federal standards. Concord continues to be allowed to perform compliance monitoring on a three year cycle due to its historic compliance with limiting lead and copper exposure in drinking water.

In addition to these specific requirements, all other routine and non-routine testing activities continue to be conducted in accordance with State and Federal requirements at our sources of supply and within our distribution system. A summary of this information will continue to be made available on the Town website and sent directly to each customer in our Annual Water Quality Report.

The Water Division continues to be vigilant in identifying and preparing for future changes in drinking water regulations. For instance, regulations promulgated by the United States Environmental Protection Agency, effective in 2013, will require the Town to provide additional protection against microbial contamination due largely to Cryptosporidium and E. coli in surface water supplies. In anticipation of this mandate, staff has already begun to evaluate treatment and infrastructure needs relative to Nagog Pond. Working with consultants, a thorough review of water quality, infrastructure, regulations, and short and long term goals was completed. This effort will result in a recommendation for water treatment alternatives and work plans for up-

grading the dam and conveyance systems. Nagog Pond continues to be operated under a filtration waiver due to a comprehensive watershed protection program and the high quality of the water.

Pumping Station Rehabilitation and Upgrades

Physical improvements involving water treatment, chemical containment and dosing configurations were implemented at all seven water production facilities. Hardware and software upgrades were also made to strengthen our supervisory, control, and data acquisition technology, specifically with respect to improved alarm handling capabilities and to provide greater operational flexibility and redundancy of critical system components.

Water Main Rehabilitation and Extension Programs

This year's water main rehabilitation project focused on four streets in Concord Center: Walden Terrace, Laurel Street between Stow and Walden Streets, and the northern loop at the end of Belknap and Elsinore Streets. All water mains on these streets were replaced with 8-inch ductile iron pipe on Walden Terrace, 6-inch cast iron pipe on Laurel Street, and 8-inch transite pipe on Belknap and Elsinore Streets. To avoid unnecessary handling costs, the older transite main was abandoned in place and newer main was installed along the same general route. The Town's contractor completed replacement of the water mains and valves on all four streets and

ANNUAL WATER REPORT SUMMARY TABLE

Water Statistics	2008	2007	2006
Miles of Main	129.75	129.55	122.88
Hydrants	1,250	1,248	1,227
Main Pipe - New (linear feet)	1,080	12,354	2,325
Main Pipe –Feet Replaced or Rehabilitated	3,600	2,648	1,609
Number of Service Accounts	5,436	5,436	5,430
Total Water Demand (million gallons)	707	753	713
Daily Average Demand (million gallons)	1.93	2.06	1.95
Peak Day Demand (million gallons)	3.47	3.81	3.32
Annual Precipitation (inches)	63.74	38.57	52.30
Mean Annual Precipitation (inches)	41.61	41	41.45
Residential Rate per Unit of 748 gallons			
Base Rate- Step 1	\$3.72	\$3.61	\$3.44
Conservation Rate – Step 2 (May – Oct.)	\$7.06	\$6.71	\$6.28
Conservation Rate – Step 3 (May – Oct.)	\$9.28	\$8.83	\$8.24
General Service Rate per Unit of 748 gallons			
Step 1 - (<50 Units)	\$3.72	\$3.61	\$3.44
Step 2 - (>50 Units)	\$4.62	\$4.46	\$4.22

the water services and hydrants on Walden Terrace and Laurel Street. They will return in the spring to complete service installation on Belknap and Elsinore Streets before bringing the new mains in that area online. The work was coordinated with the Concord Municipal Light Plant's underground electrical work as well as Concord Public Works Roads Program.

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 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, service needs and treatment goals have evolved resulting in a series of collection system expansion initiatives and treatment system improvements. The present sewer system serves over 1,780 customers (35% of the community) and consists of 33 miles of collector mains (gravity and low pressure), two pumping stations and six neighborhood lift stations.

Pumping Station Rehabilitation and Removal

The Assabet Pumping Station (in West Concord) and the Lowell Road Pumping Station (near Lowell Road and Keyes Road) have been in continuous operation since they were completely overhauled in the mid-1980's. Both pumping stations are beginning to exhibit signs of normal wear and tear and have effectively served their designed life-cycles. Pump #3 at the Lowell Road Pump Station was replaced following a pump failure that rendered the old pump inoperable. The new pump was selected based on energy and water consumption efficiencies.

Four smaller neighborhood lift stations on Park Lane, Gifford Lane, Pilgrim Road, and Walden Street have

also been in continual operation since the mid-1980's. While all of these stations continue to operate reliably, plans are in progress to address long-term needs which will result in replacement or upgrades to each of these facilities.

Two smaller underground pumping stations were also recently added to the system to serve the Phase I sewer extension project, located at Cousin's Park in West Concord and at the intersection of Bedford Street and Old Bedford Road.

Sewer Main Extension and Rehabilitation Programs

The Water and Sewer Division continued normal day-to-day activities in the sewer system in 2008. No new sewer mains were installed and no major sewer rehabilitation was undertaken. Notable activities included

thorough cleaning and television inspection of 6,340 feet of sewer mains on Lexington Road, Conant Street, Main Street, Walden Terrace, Lowell Road, and Thoreau Street.

Infiltration and Inflow Inspection and Rehabilitation

The Town has an ongoing program to investigate and eliminate infiltration and inflow (I/I) from the Town's sewer system. The goal of this program is to increase capacity and

decrease the amount of clear water unnecessarily treated at the municipal wastewater treatment plant.

Inflow refers to rainwater that enters the sewer system via connections to storm drainage systems (e.g., catch basins, roof gutters, or sump pumps tied into sanitary sewer pipes). The Water and Sewer Division is increasing its outreach efforts to educate property owners about connections that should not be made to sanitary sewer. As part of this effort, the Division developed and mailed a brochure to all sewer customers in the summer about ways to avoid I/I on private property.

Wastewater Treatment Plant Operations and Facilities Improvements

Woodard & Curran, Inc. continues to operate the Town's Wastewater Treatment Plant (WWTP), located



Drainage Installation on Old Road to Nine Acre Corner.

off of Bedford Street, under the supervision of the Water and Sewer Division. The plant maintains excellent compliance with its regulatory requirements, in accordance with State and Federally issued permits. The recently completed treatment system upgrade, which included the installation of the first of its kind “CoMag” phosphorus reduction technology, has now been fully operational for one full year. The new system is performing better than anticipated based on earlier pilot testing and is meeting the new, more stringent phosphorus limits with reasonable operational cost and effort. The new technology is also receiving worldwide attention, with visitors from many states and several countries touring the facility.

Other improvements made at the plant are also fully operational, most notably a new ultraviolet disinfection system, sludge handling equipment, and a new odor control biofilter. A contractor has lined the plant’s effluent channel with a cement and epoxy grout, to enhance its structural integrity following the upgrade construction. As the plant progresses into the future with further regulatory requirements, the Town continues to explore ways to enhance wastewater treatment and environmental protection through innovative and sustainable technologies.

Wastewater Planning

The Public Works Director, Water and Sewer Superintendent and Operations Engineer and Planning

Director, working along side Weston & Sampson Engineers, Inc. and Taintor Associates, participated in the Wastewater Planning Task Force (WWPTF) comprised of representatives from the Board of Selectmen, Public Works Commission, Town Manager, Planning Board, and citizen representatives with the mission of providing guidance on the “Integrated Planning Initiative,” and to further coordinate planning goals with wastewater management in Concord. Driven by limited municipal wastewater capacity, the Task Force was called upon to better define potential development and land use changes in Concord in order to quantify how much additional municipal wastewater capacity might be needed in the future. The work confirmed that inadequate municipal wastewater capacity exists to implement the recommendations of the Comprehensive Long Range Plan and the Planned (Housing) Production Plan while still meeting the goals of the 2004 Comprehensive Wastewater Management Plan. The task force provided a recommendation to the Town through a warrant article scheduled to be presented at the 2009 Annual Town Meeting which proposes that wastewater treatment and capacity management alternatives should be investigated, including continued conservation measures, should the Town wish to accommodate wastewater flows above and beyond those flows necessary to meet existing requirements and obligations resulting from development and re-development under current zoning in a range between 320,000 to 600,000 gallons per day.

ANNUAL SEWER REPORT SUMMARY TABLE

Sewer Statistics	2008	2007	2006
Assabet Pumping Station			
Total Pumped (million gallons)	98.44	84.06	93.1
Monthly Average (million gallons)	8.2	7.01	7.8
Daily Average (million gallons)	0.27	0.23	0.25
Lowell Road Pumping Station			
Total Pumped (million gallons)	387.80	311.44	378.6
Monthly Average (million gallons)	32.32	25.95	31.6
Daily Average (million gallons)	1.06	0.85	1.04
Collection System			
Number of Service Accounts	1,780	1,772	1,731
Miles of Sewer Main	33.36	33.36	33.4
Main Pipe Inspected (lf.)	6,340	5,487	17,981
Main Pipe Rehabilitated (lf.)	0	2,720	5,344
Rate per Unit (unit = 748 gallons)	\$7.95	\$7.57	\$7.21