Select Board Meeting and Goal Workshop – Amended 7.14.2023
Monday, July 17, 2023 7:00 PM
School Committee Room, School Administration Building
30 Whittier Court, Andover, MA 01810

I. Call to Order – 7:00 P.M.

II. Opening Ceremonies

A. Moment of Silence/Pledge of Allegiance

III. Communications/Announcements/Liaison Reports

IV. Citizens Petitions and Presentations

V. Public Hearings

A. Eversource Gas – Essex Street
Board to review and consider voting to approve an application from Eversource Gas of Massachusetts requesting permission to excavate for the purpose of installing approximately 900 feet of 8" plastic gas main in Andover on Essex Street from Central Street to School Street, according to blueprints made as part of this petition, and the make the necessary connections along said extensions.

VI. Regular Business

A. Matchplay Golf and Sports Lounge License Issuance Extension
Board to consider voting to approve a two-month extension of the Board's November 7, 2022 approval of a new All Alcoholic Beverages Pouring License for MP GOLF LLC, d/b/a Matchplay Golf & Sports Lounge, 209 North Main Street, Andover, MA, so that the new license can be issued at any time before October 1, 2023.

B. Right of First Refusal - 2 Francis Drive Unit # 404
Board to consider voting to not exercise their right of first refusal for the affordable unit at 2 Francis Drive Unit # 404.

C. One Day Liquor License on Town Property
Board to consider voting to approve an application from the Recreation Division of the Town of Andover for a One-Day Liquor License for use on Town property under Section XI.2.N "Special One-Day Alcohol License Policy & Application for Outdoor Events on Town-owned Property."

D. Orders of Taking for Greenwood Road Easements
Board to consider voting to approve Orders of Taking for temporary and permanent easements located at 168 Greenwood Road, 170 Greenwood Road, and 172 Greenwood Road in connection with the capping of the Ledge Road landfill.

VII. Consent Agenda

A. Appointments by the Select Board

Board to vote that the following appointments by the Select Board be approved.

Department	Name	Position	Rate	Date of Hire
Town Clerk	Abigail Harris	Inspector	$10.25/hr	7/17/2023
Town Clerk	Adam Isbitsky	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Alexander Iannicelli	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Alexandra Driscoll	Inspector	$10.25/hr	7/17/2023
Town Clerk	Alice E. Friedenson	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Alicia Wang	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Amanda Gasse	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Amanda Lutsch	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Ameera Mazraany	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Amy Belscher	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Amy Holland	Inspector	$10.25/hr	7/17/2023
Town Clerk	Amy Janovsky	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Amy Jaromin	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Andrew Smith	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Ann Grecoe	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Anne Feeney	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Anthony Sofia	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Art Rousmaniere	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Barbara Ann Bourgeois	Inspector	$10.25/hr	7/17/2023
Town Clerk	Betsey Couture	Inspector	$10.25/hr	7/17/2023
Town Clerk	Betsy Streeter	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Bill Kettinger	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Bobbie Brodie	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Bonita Zahorik	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Brewster LaMacchia	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Buzz Stapczynski	Election Worker	$10.25/hr	7/17/2023
Town Clerk	C. William Kettinger, Jr.	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Calvin G. Perry	Deputy Warden	$11.25/hr	7/17/2023
Town Clerk	Carol Hopkinson	Clerk	$11.25/hr	7/17/2023
Town Clerk	Carolyn Page	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Catherine A. Robie	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Cathleen Conroy	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Champa Bilwakesh	Inspector	$10.25/hr	7/17/2023
Town Clerk	Charlotte Taylor	Clerk p.m.	$11.25/hr	7/17/2023
Town Clerk	Christina Banta	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Christine E. Curran	Inspector	$10.25/hr	7/17/2023

Town Clerk	Christine Hayward	Warden	$12.25/hr	7/17/2023
Town Clerk	Claire Enos	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Clinton Reiser	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Constantine Bassilakis	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Cynthia Barakatt	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Cynthia Cohen	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Cynthia D. Campbell	Inspector	$10.25/hr	7/17/2023
Town Clerk	Cynthia Stoltz	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Daniela Roubicek	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Danielle Crompton	Inspector	$10.25/hr	7/17/2023
Town Clerk	David Berman	Inspector	$10.25/hr	7/17/2023
Town Clerk	David C. Tomlinson	Election Worker	$10.25/hr	7/17/2023
Town Clerk	David Cleary	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	David Lewis	Election Worker	$10.25/hr	7/17/2023
Town Clerk	David W. Brown	Warden	$12.25/hr	7/17/2023
Town Clerk	Deb Hartman	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Debbie Lowry	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Deborah K. Moskal	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Delores J. Cleland	Inspector	$10.25/hr	7/17/2023
Town Clerk	Denise Gentile	Inspector	$10.25/hr	7/17/2023
Town Clerk	Denise S. Doherty	Warden	$10.25/hr	7/17/2023
Town Clerk	Dennis Bell	Inspector	$10.25/hr	7/17/2023
Town Clerk	Diane Riemer	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Dianne E. DeLucia	Inspector	$10.25/hr	7/17/2023
Town Clerk	Donna Cooper	Deputy Warden	$11.25/hr	7/17/2023
Town Clerk	Donnabeth Dooley	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Dora Volpe	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Dorothy Hollenbeck	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Dorothy S. Morrissey	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Edna Allen	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Eleanor Everett	Warden	$12.25/hr	7/17/2023
Town Clerk	Elizabeth Anderson	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Elizabeth Kochakian	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Ellen T. Marcus	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Emily O'Hara	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Erin Staudt	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Eugenia Moffitt	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Evelyn A. Retelle	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Evelyn Curley	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Frank Lastrina	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Gail A. Demaso	Inspector	$10.25/hr	7/17/2023
Town Clerk	Gail Ralston	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Gal Kramer	Inspector	$10.25/hr	7/17/2023

Town Clerk	Genee Morrissey	Election Worker	$10.25/hr	7/17/2023
Town Clerk	George Fulginiti	Inspector	$10.25/hr	7/17/2023
Town Clerk	George Kakridas	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	George Thomson	Election Worker	$10.25/hr	7/17/2023
Town Clerk	George Woodward	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Geraldine Jacobson	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Gerda Mosca	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Gisela Spreizer	Clerk	$11.25/hr	7/17/2023
Town Clerk	Gloria Wager	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Greg Bird	Election Worker	$10.25/hr	7/17/2023
Town Clerk	H. Francis Rittershaus	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Helen Waldruff	Clerk a.m.	$11.25/hr	7/17/2023
Town Clerk	Howard A. Zetlan	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Howard J. Rabinowitz	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Iris Roskell	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jack Hall	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	James Blatchford	Election Worker	$10.25/hr	7/17/2023
Town Clerk	James J. Redmond	Clerk	$11.25/hr	7/17/2023
Town Clerk	James Sellers	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jane Gifun	Inspector	$10.25/hr	7/17/2023
Town Clerk	Janet Arnold	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jason Stellakis	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jeanne S. Paskowsky	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jennifer B. Hickman	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Jennifer O'Neill	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Jennifer Smith	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Joan Fox	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Joanne Lepine	Election Worker	$10.25/hr	7/17/2023
Town Clerk	John Doherty	Inspector	$10.25/hr	7/17/2023
Town Clerk	John Gardner	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	John Joseph Sudol	Election Worker	$10.25/hr	7/17/2023
Town Clerk	John McCarthy	Election Worker	$10.25/hr	7/17/2023
Town Clerk	John Saba	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Joseph F. Gifun	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Joy A. Sapienza	Clerk	$10.25/hr	7/17/2023
Town Clerk	Judith F. Birtles	Clerk	$11.25/hr	7/17/2023
Town Clerk	Judith T. Norton	Election Worker	$12.25/hr	7/17/2023
Town Clerk	Judith T. Reghitto	Warden	$12.25/hr	7/17/2023
Town Clerk	Julianne Stein	Election Worker	$10.25/hr	7/17/2023
Town Clerk	June Qiao	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Karen Dobbelaar	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Kathleen Dolan	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Kathleen Salvi	Election Worker	$10.25/hr	7/17/2023

Town Clerk	Kathy Vieira	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Kenneth Gasse	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Kenneth Ozoonian	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Kevin J. Twohig	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Kirsten Ahearn	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Kitty Craig Comin	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Lenard Zohn	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Leo Greene	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Linda D'Andrea	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Linda Kosinski	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Linda O'Connell	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Linda Salzman	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Lisa L. Reid	Deputy Warden	$10.25/hr	7/17/2023
Town Clerk	Lisa Lapp	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Lisa Rigoli	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Lois Kelly	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Lora Bates	Deputy Warden	$10.25/hr	7/17/2023
Town Clerk	Luan M. Giannone	Inspector	$10.25/hr	7/17/2023
Town Clerk	Lynn M.R. Landry	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Marcia S. O'Donnell	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Margaret Tenczar	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Marian Bicking	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Marie Holbrook	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Marilyn Blumsack	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Marilyn Fulginiti	Inspector	$10.25/hr	7/17/2023
Town Clerk	Martha B. Mahoney	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Mary D. Barry	Deputy Warden	$10.25/hr	7/17/2023
Town Clerk	Mary Jane Bausemer	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Mary Kate Allard	Deputy Warden	$10.25/hr	7/17/2023
Town Clerk	Mary Long	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Mary Mcgettrick	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	MaryRuth Luther	Clerk	$11.25/hr	7/17/2023
Town Clerk	Matt Murphy	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Matthew Gosselin	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Maureen A. Finneran	Inspector	$10.25/hr	7/17/2023
Town Clerk	Michael Wartman	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Micheline M. Pelletier	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Mildred M. Raymond	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Molly C. Bicking	Deputy Warden	$10.25/hr	7/17/2023
Town Clerk	Myrna L. Zetlan	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Nancy Buckley	Inspector	$10.25/hr	7/17/2023
Town Clerk	Nancy Donahue	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Nancy Earnley	Deputy Clerk	$10.25/hr	7/17/2023

Town Clerk	Nancy Husted	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Nancy Mulvey	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Nancy Simili	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Nancy Vogel	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Norm Rice	Clerk	$11.25/hr	7/17/2023
Town Clerk	Norma A. Gammon	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Pam Newman	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Patricia Boutin-Skene	Deputy Clerk	$10.25/hr	7/17/2023
Town Clerk	Patricia Dell-Ross	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Patricia Fleming	Warden	$12.25/hr	7/17/2023
Town Clerk	Patricia J. Simpson	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Patricia M. Donahue	Inspector	$10.25/hr	7/17/2023
Town Clerk	Patrick Donahue	Election Worker	$10.25/hr	7/17/2023
Town Clerk	Paul G. Ordman	Warden	$12.25/hr	7/17/2023
Town Clerk	Paul Hickman	Deputy Inspector	$10.25/hr	7/17/2023
Town Clerk	Paula DelDotto	Election Worker	$10.25/hr	7/17/2023

B. Appointments by the Town Manager

Board to vote that the following appointments by the Town Manager be approved.

Department	Name	Position	Rate/Term	Date of Hire
Andover Police Department	Michael Egitto *(Colin Radford)*	Police Officer	$59,198.19/yr	7/17/2023
Andover Police Department	Hector Perez *(Daniel Vining)*	Police Officer	$59,198.19/yr	7/17/2023
Andover Police Department	David Rodriguez *(Michael Anderson)*	Police Officer	$59,198.19/yr	7/17/2023
Andover Police Department	Drew Searfoss *(Barry Dubois)*	Police Officer	$59,198.19/yr	7/17/2023
Andover Police Department	Joseph Nunez-Roman	Police Officer	$59,198.19/yr	7/17/2023
Memorial Hall Library	Heather Maganzini *(Molly McIntyre)*	Library Assistant II	$31.73/hr	8/1/2023
Commission on Disability	Elizabeth Maldari	Member	Term Expires 6/30/2026	7/1/2023
Commission on Disability	Hannah Wilen	Member	Term Expires 6/30/2026	7/1/2023

VIII. Goal Setting Workshop

A. Town Manager to update the Board on 2022-2023 Goals and Objectives

1. Comprehensive Plan and Climate Action Plan – Director of Sustainability and Assistant Town Planner to update the Board on the alignment of the Comprehensive Plan and Climate Action Plan.

2. Community Health Improvement Plan – Director of Public Health to present preliminary recommendations and overview of next steps.

3. Select Board and Town Manager to discuss 2023-2024 Goals and Objectives.

4. Board to discuss and consider voting to approve Town Manager Review Process.

X. Adjourn

If any member of the public wishing to attend this meeting seeks special accommodations in accordance with the Americans with Disabilities Act, please contact Kathryn Forina in the Town Manager's Office at 978-623-8215 or by email at kathryn.forina@andoverma.us

MEETINGS ARE TELEVISED ON
COMCAST CHANNEL 22 AND VERIZON CHANNEL 45

TOWN OF ANDOVER
Town Clerk's Office

36 Bartlet Street
Andover, MA 01810
978-623-8230
townclerk@andoverma.gov

NOTICE

You are hereby notified that a Public Hearing will be held by the Andover Select Board, on July, 17, 2023 in the School Committee Room, 30 Whittier Court, at 7 PM.

This hearing is on the petition of Eversource Gas of Massachusetts requesting permission to excavate for the purpose of replacing and or extending its gas mains, according to blueprints made a part of this petition, and to make the necessary house connections along said extensions, as follows:

This project is to install approximately 980 feet of 8" plastic gas main in Andover on Essex St. from Central St. to School St.

WO#: 12735996

Plan(s) of the proposed work can be found in the Meeting Packet on the Select Board's page on the Town of Andover website, www.andoverma.gov.

In addition to the hearing itself, representatives from the utility company will be available at 6:45 P.M. on the above date to answer any other questions residents may have relating to the proposed work.

By order of the
Select Board

Austin Simko
Assistant Town Manager/Town Clerk

Plan No.: WO#: 12735996
Date: July 17, 2023

TOWN OF ANDOVER, MASSACHUSETTS

PRIVATE UTILITY PETITION CHECKLIST

TO BE FILLED OUT BY PETITIONER

COMPANY: Eversource Gas of Massachusetts WO# 127-35996

PROJECT MANAGER NAME: Louie DeRoxas

PROJECT MANAGER CONTACT NUMBER: 978-701-3625

LIST OF ADDRESSES IMPACTED BY PROPOSED WORK:

6-53 Essex Street (see attached map). No service work, only main installation.

PETITIONER IS REQUIRED TO ATTACH PICTURES SHOWING AREA OF PROPOSAL

PICTURES HAVE BEEN ATTACHED YES

TO BE FILLED OUT BY TOWN OF ANDOVER STAFF

DPW

SUPPORT PROJECT (YES / NO)

SIGNATURE: _____

TITLE: Town Engineer

COMMENTS:

POLICE DEPARTMENT

SUPPORT PROJECT (YES / NO)

SIGNATURE: _____

TITLE: _____

COMMENTS:

FIRE DEPARTMENT

SUPPORT PROJECT (YES / NO)

SIGNATURE: _____

TITLE: _____

COMMENTS:

TOWN OF ANDOVER, MASSACHUSETTS

PRIVATE UTILITY PETITION CHECKLIST

TO BE FILLED OUT BY PETITIONER

COMPANY: Eversource Gas of Massachusetts WO# 127-35996

PROJECT MANAGER NAME: Louie DeRoxas

PROJECT MANAGER CONTACT NUMBER: 978-701-3625

LIST OF ADDRESSES IMPACTED BY PROPOSED WORK:

6-53 Essex Street (see attached map). No service work, only main installation.

PETITIONER IS REQUIRED TO ATTACH PICTURES SHOWING AREA OF PROPOSAL

PICTURES HAVE BEEN ATTACHED YES

TO BE FILLED OUT BY TOWN OF ANDOVER STAFF

DPW

SUPPORT PROJECT (YES / NO) SIGNATURE: _____

TITLE: _____

COMMENTS:

POLICE DEPARTMENT

SUPPORT PROJECT (YES / NO) SIGNATURE: _____

TITLE: Executive Officer

COMMENTS:

FIRE DEPARTMENT

SUPPORT PROJECT (YES / NO) SIGNATURE: _____

TITLE: _____

COMMENTS:

ANDOVER TOWN CLERK
RCUD 2023 MAY 23 AM10:19

TOWN OF ANDOVER, MASSACHUSETTS

PRIVATE UTILITY PETITION CHECKLIST

TO BE FILLED OUT BY PETITIONER

COMPANY: Eversource Gas of Massachusetts WO# 127-35996

PROJECT MANAGER NAME: Louie DeRoxas

PROJECT MANAGER CONTACT NUMBER: 978-701-3625

LIST OF ADDRESSES IMPACTED BY PROPOSED WORK:

6-53 Essex Street (see attached map). No service work, only main installation.

PETITIONER IS REQUIRED TO ATTACH PICTURES SHOWING AREA OF PROPOSAL

PICTURES HAVE BEEN ATTACHED YES

TO BE FILLED OUT BY TOWN OF ANDOVER STAFF

DPW

SUPPORT PROJECT (YES / NO) SIGNATURE: _____

TITLE: _____

COMMENTS:

POLICE DEPARTMENT

SUPPORT PROJECT (YES / NO) SIGNATURE: _____

TITLE: _____

COMMENTS:

FIRE DEPARTMENT

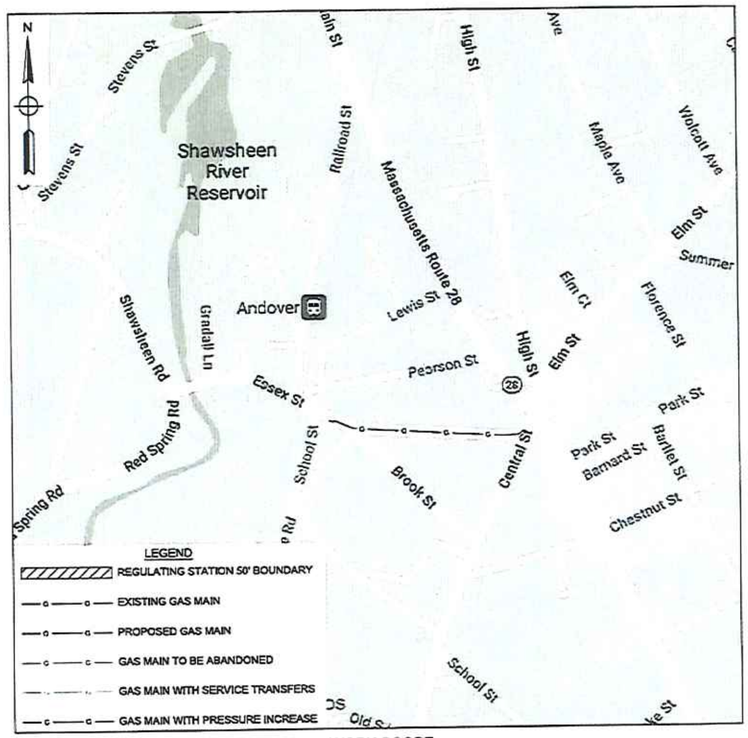
SUPPORT PROJECT (YES / NO) SIGNATURE: MB Manning

TITLE: Fire Chief

COMMENTS:

TABLE OF CONTENTS

EVERSOURCE ENERGY



WORK SCOPE
NOT TO SCALE

ESSEX ST, ANDOVER, MA
PROJECT #23EG164R
WORK ORDER #12735996

PROJECT SUMMARY TABLE
INSTALLATION INFORMATION

Work Type	LENGTH (FT)	SIZE (IN)	MAOP	MATERIAL
INSTALL	3'	8"	98 PSIG	CS
INSTALL	965'	8"	98 PSIG	HDPE
INSTALL	6'	6"	98 PSIG	HDPE
			INSTALLATION TOTAL	974'
			UPRATE/RETEST TOTAL	0'

PROJECT SUMMARY TABLE
ABANDONMENT INFORMATION

LENGTH (FT)	SIZE (IN)	MAOP	ABANDONMENT CLASS
10'	6"	98 PSIG	Plastic (Non-GSEP)
		GSEP ABANDONMENT SUBTOTAL	0'
		NON-GSEP ABANDONMENT SUBTOTAL	10'
		ABANDONMENT TOTAL	10'

ISSUED FOR CONSTRUCTION

DANIEL J WORNALI MECHANICAL

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
COVER SHEET

SCALE: NTS		SHEET 01 OF 10	
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-01	0

GENERAL NOTES:

A. IF ANY OF THE FOLLOWING OCCUR A DRAWING REVISION IS REQUIRED AND MUST BE APPROVED AND/OR STAMPED BY THE ENGINEER OF RECORD. CHANGES CAN BE APPROVED AND/OR STAMPED BY A PROJECT ENGINEER, BUT THE ENGINEER OF RECORD MUST BE INFORMED.

1. IF THE TIE IN POINT MOVES TO A DIFFERENT SEGMENT OF PIPE THAN SHOWN.
2. IF A CHANGE IN THE LOCATION OF VALVES IS REQUIRED.
3. IF THERE IS ANY CHANGE TO WHAT IS SHOWN ON THE DRAWING WITHIN 50 FT OF A PRESSURE REGULATING STATION, DISTRICT REGULATOR, OR GATE STATION.
4. IF A CHANGE IN PIPE SIZE, MATERIAL, OR WALL THICKNESS IS REQUIRED.
5. ALTERNATE FITTINGS THAT ARE ACCEPTABLE FOR ANY TIE-IN DETAIL WILL BE CALLED OUT IN THE DRAWING. FITTING CHANGES NOT SHOWN AS ALTERNATIVES ON THE DRAWING WILL NEED TO FOLLOW THE DRAWING CHANGE PROCESS CONTAINED IN SECTION V.D.

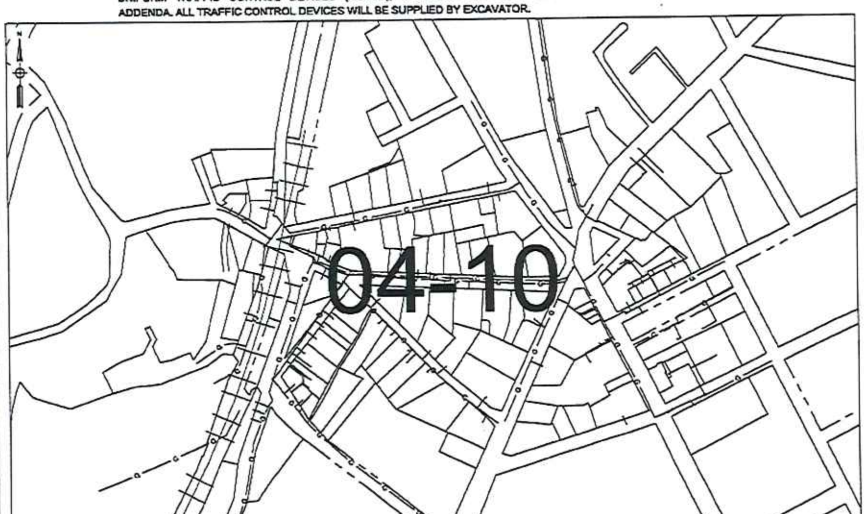
B. CONSTRUCTION DRAWINGS, LOCATIONS OF EXISTING UTILITIES, UNDERGROUND STRUCTURES AND WORK LOCATIONS ARE BASED ON BEST AVAILABLE INFORMATION BUT HAVE NOT BEEN FIELD VERIFIED.

C. ALL WORK, MATERIAL AND CONSTRUCTION SHALL BE PERFORMED AND COMPLETED IN COMPLIANCE WITH ALL PERMITS AND APPROVALS PER EVERSOURCE, LOCAL, STATE, OSHA AND FEDERAL REGULATIONS AND STANDARDS.

D. ALL LIVE GAS WORK EXCEPT SERVICE SIZE TAPS, INCLUDING BUT NOT LIMITED TO TAPPING OF FITTINGS ON LIVE MAINS, STOPPING, MANIPULATING VALVE, ABANDONMENT, SHALL BE PERFORMED BY, OR AT THE DIRECTION AND UNDER THE DIRECT SUPERVISION OF EVERSOURCE GAS PERSONNEL AND IN ACCORDANCE WITH THE WRITTEN PROCEDURE. DRAWING CHANGES MAY ALSO REQUIRE A CHANGE TO THE PROCEDURE.

E. EXCAVATOR IS REQUIRED TO PROTECT EXISTING UTILITIES, STRUCTURES, LANDSCAPES FEATURES, SIGNAGE, CURBS, ETC. CARE SHOULD BE TAKEN NOT TO DISTURB OR DAMAGE SUCH ITEMS. ROADWAY, SIDEWALKS, AND GRASS DISTURBED SHALL BE RESTORED TO THE SATISFACTION OF THE CITY OR TOWN. PLANT BEDS WILL BE RELOCATED TO THEIR EXISTING REGULAR LOCATION.

F. ALL TRAFFIC CONTROL SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), INCLUDING ALL REVISIONS AND ADDENDA. ALL TRAFFIC CONTROL DEVICES WILL BE SUPPLIED BY EXCAVATOR.



OVERVIEW KEY MAP
NOT TO SCALE

ESSEX ST, ANDOVER — COMPLETE BOM

REQUIRED BILL OF MATERIALS

Item Number	Maximo Part Number	Description	Quantity	Units
38	500705	VALVE,BALL, 8 IN IPS, POLYETHYLENE, SDR11, BUTT WELD, W/ FULL PORT OPENING, BLACK FINISH	2	
17	500856	COUPLING,PIPE, 6 IN IPS, ELECTROFUSION, PLASTIC, P100	7	EA
18	500857	COUPLING,PIPE, 8 IN IPS, ELECTROFUSION, PLASTIC, P100	25	EA
55	500869	TEE,PIPE, NON-BLOWING, 6 X 1/2 IN CTS X 0.090 IN THK WALL SDR 7, ELECTROFUSION X COMPRESSION ENDS, LIGHT WALL, POLYETHYLENE, PE3408/PE100	2	EA
375	503674	TAPE,WAX, 9 FT LG X 4 IN W, BROWN, 24 ROLLS/CS, BELOW GROUND USE ONLY, TR-1WAX	5	EA
377	505818	ANODE,BAG, 2.5 X 2.5 X 4.5 IN, 10 FT LG, 3 LB, MAGNESIUM, Alternate IN 577776	2	EA
370	513679	CABLE, INSULATED, MDP, #12 AWG, 7 STR, YELLOW, POLYETHYLENE-30, SOFT DRAWN CU, 500 FT/RL, FOR USED AS PIPE LOCATOR	1000	FT
10	542539	CAP,PIPE, 6 IN IPS SDR 11, BUTT END, POLYETHYLENE, P100	3	EA
11	542540	CAP,PIPE, 8 IN IPS SDR 11, BUTT END, POLYETHYLENE, P100	2	EA
24	545339	ELBOW,PIPE, 45 DEG, 6 IN SDR 11, BUTT WELD ENDS, POLYETHYLENE, P100	1	EA
25	545340	ELBOW,PIPE, 45 DEG, 8 IN SDR 11, BUTT WELD ENDS, POLYETHYLENE, P100	6	EA
22	545343	ELBOW,PIPE, 90 DEG, 8 IN SDR 11, BUTT WELD ENDS, POLYETHYLENE, P100	6	EA
212	545358	ELBOW,PIPE, 90 DEG, 8 IN X 0.322 IN THK WALL, BUTT WELD ENDS, CS, ASTM A234 GR B, ANSI B16.9 , LONG RADIUS	1	EA
270	546243	FITTING,LINE STOPPER, BOTTOM OPENING, 8 IN , WELDED ENDS, W/ 150 LB FLANGE, FOR BEVELED 8.625 IN OD THIN WALL STEEL PIPE	1	EA
75	546255	FITTING,TRANSITION, 8 IN IPS CS X 8 IN IPS PE4710, SDR 11, STEEL WELD X PLASITC, BUTT ENDS	1	EA
6	554009	PIPE, 6 IN IPS X 0.602 IN THK WALL SDR 11, 6.625 IN OD, 40 FT LG, POLYETHYLENE, PE3408/PE100	40	FT
7	554010	PIPE, 8 IN IPS X 8-3/8 IN X 0.784 IN THK WALL SDR 11, 40 FT LG, POLYETHYLENE, PE3408/PE100	1000	FT
28	555590	REDUCER,PIPE, 8 IN X 6 IN IPS SDR 11, BUTT ENDS, POLYETHYLENE, P100	1	EA
368	565814	TAPE,WARNING, MARKED BURIED GAS LINE, 4 MIL, 1000 FT ROLL, 6 IN W, YELLOW, ISSUE EACH ROLL AS 1, T-01-A00,	1	RL
379	577776	ANODE,BAG, 17 LB NET, HIGH POTENTIAL MAGNESIUM, W/ 10 FT #10 AWG TW ORANGE LEAD WIRE, PACKED IN CARDBOARD BOX 42 LB TOTAL WEIGHT	4	EA
58	584713	FITTING,TEE, 8 IN IPS X 1/2 IN CTS, ELECTROFUSION TAPPING TEE WITH PERMASERT STAB OUTLET, HDPE, BLACK, NSTAR M-140	1	EA
44	604132	BOX,VALVE, W/ 5-1/4 IN SQ NON-LOCKING LID, FOR 8 IN FULL PORT VALVES, PAVEMENT RISER IN 583488. 6/BOX	1	EA
106	610005	PIPE, ERW, 8 IN X 0.250 IN THK WALL, DOUBLE RANDOM LG, BEVELED ENDS, CS, X42, PRITEC COATED, API 5L, CMA 726818	20	FT
488	610264	NIPPLE,PIPE, NON-BLOWING, DRILL, 1-1/4 IN X 3 IN, WELDED, 1440 PSIG, CMA 2485855	1	EA
54	610738	FITTING,TEE, BOLT-ON, 6 IN IPS X 1-1/4 IN CTS, ELECTROFUSION, HDPE, ASTM D2513 / F1055-GAS / D3261, GFCP, CMA 4315816	2	EA
90	610757	FITTING,CAP, END, LYCOFIT, 1/2 IN CTS X 0.090 IN THK WALL, PLASTIC, CMA 750823	2	EA
89	610761	FITTING,CAP, END, LYCOFIT, 1-1/4 IN CTS X 0.121 IN THK WALL, PLASTIC, CMA 750822	1	EA
98	610764	FITTING,COUPLING, PIPE, LYCOFIT, 1/2 IN CTS X 0.090 IN WALL THK, PLASTIC, CMA 21658100	3	EA
94	610767	FITTING,COUPLING, PIPE, LYCOFIT, 1-1/4 IN CTS X 0.121 IN WALL THK, PLASTIC, CMA 21658094	2	EA

ISSUED FOR CONSTRUCTION

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
NOTES

SCALE: NTS		SHEET 02 OF 10	
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-02	0

ay 16, 2023 - 11:46am

DRAWING LEGEND

Gas Main Symbology

- REGULATING STATION 50' BOUNDARY
- EXISTING GAS MAIN
- EXISTING ABANDONED GAS MAIN
- PROPOSED GAS MAIN
- GAS MAIN TO BE ABANDONED
- GAS MAIN WITH SERVICE TRANSFERS
- GAS MAIN WITH PRESSURE INCREASE
- GAS SERVICE
- RIGHT-OF-WAY / PARCELS
- EASEMENT
- PAVEMENT
- ELECTRIC
- WATER LINE
- SEWER LINE
- TELEPHONE
- DRAIN LINE
- FENCE LINE

Gas Main Material/Pressure Label References

MATERIAL CODES

UCS*	Unprotected Coated Steel Gas Main
PCS*	Protected Coated Steel Gas Main
CI*	Cast Iron Gas Main
BS*	Bare Steel Gas Main
WI*	Wrought Iron Gas Main
PH*	High Density Polyethylene Gas Main
PM*	Medium Density Polyethylene Gas Main

PRESSURE CODES

*LP	Low Pressure (<0.5 PSIG or 14" W.C.)
*IP	Intermediate Pressure (>2 PSIG ≤ 10 PSIG)
*MP	Medium Pressure (>10 PSIG ≤ 60 PSIG)
*HP	High Pressure (>60 PSIG)

MISCELLANEOUS CODES

*-SER	Service
*-R	Riser
(TC)	Transmission Class

Gas Main Installation Method Label References

AT	Attached
BH	Bridge Hanger
BLGH	Building Hanger
DB	Directional Bore
IS	Inserted
OC	Open Cut
PB	Pneumatic Bore
PL	Plowed
RT	Roof Top
(E)	Existing
(P)	Proposed

Gas Facility Symbology

x"GV	Gas Valve
x"PV	Critical Gas Valve (Gate - GV, Plug - PV, PE Ball - BP, ST Ball - BV)
x"HVTT	High Volume Tapping Tee
x"SST	Pressure Control Fitting - ShortStopp Tee
x"SPH	Pressure Control Fitting - Spherical Tee
x"MF-BO	Pressure Control Fitting - Mueller Bottom-out
x"MF-SO	Pressure Control Fitting - Mueller Side-out
x"MF-FT	Pressure Control Fitting - Mueller Flange Tee
x"SS	Pressure Control Fitting - ShortStopp
x"MF	Pressure Control Fitting - Mueller Stopper
x"x x" POLYTAP	Polytapp Side Saddle Fitting
	Transition
	End Cap
	Riser
	Reducer
	Electronic Marker
TWS	Flush-mounted Tracer Wire Station
	Post Pipeline Marker with Tracer Wire
	Gas Main Marker without Tracer Wire
	Test Well
	Regulator Station
	Single Customer Regulator
	Meter
	Meter with Regulator
	Test Point (Station)
	Gas Service Tie-over
	Gas Service Replacement
MMO	Meter Move Out

Swing Tie Symbology

- Telephone Manhole
- Drain Manhole
- Electric Manhole
- Catch Basis
- Sewer Manhole
- Fire Hydrant
- Utility Pole
- Property Marker
- Telephone Pedestal
- Television Pedestal
- Unknown Manhole
- Water Box
- Water Gate
- Electric Pedestal
- Iron Pin
- Light Pole
- INSIDE METER
- OUTSIDE METER

ISSUED FOR CONSTRUCTION

DANIEL J. WORNAU MECHANICAL
Daniel J Wornau, PE 2023.05.16 14:11:09-04'00'

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
LEGEND

SCALE: NTS		SHEET 03 OF 10	
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-03	0

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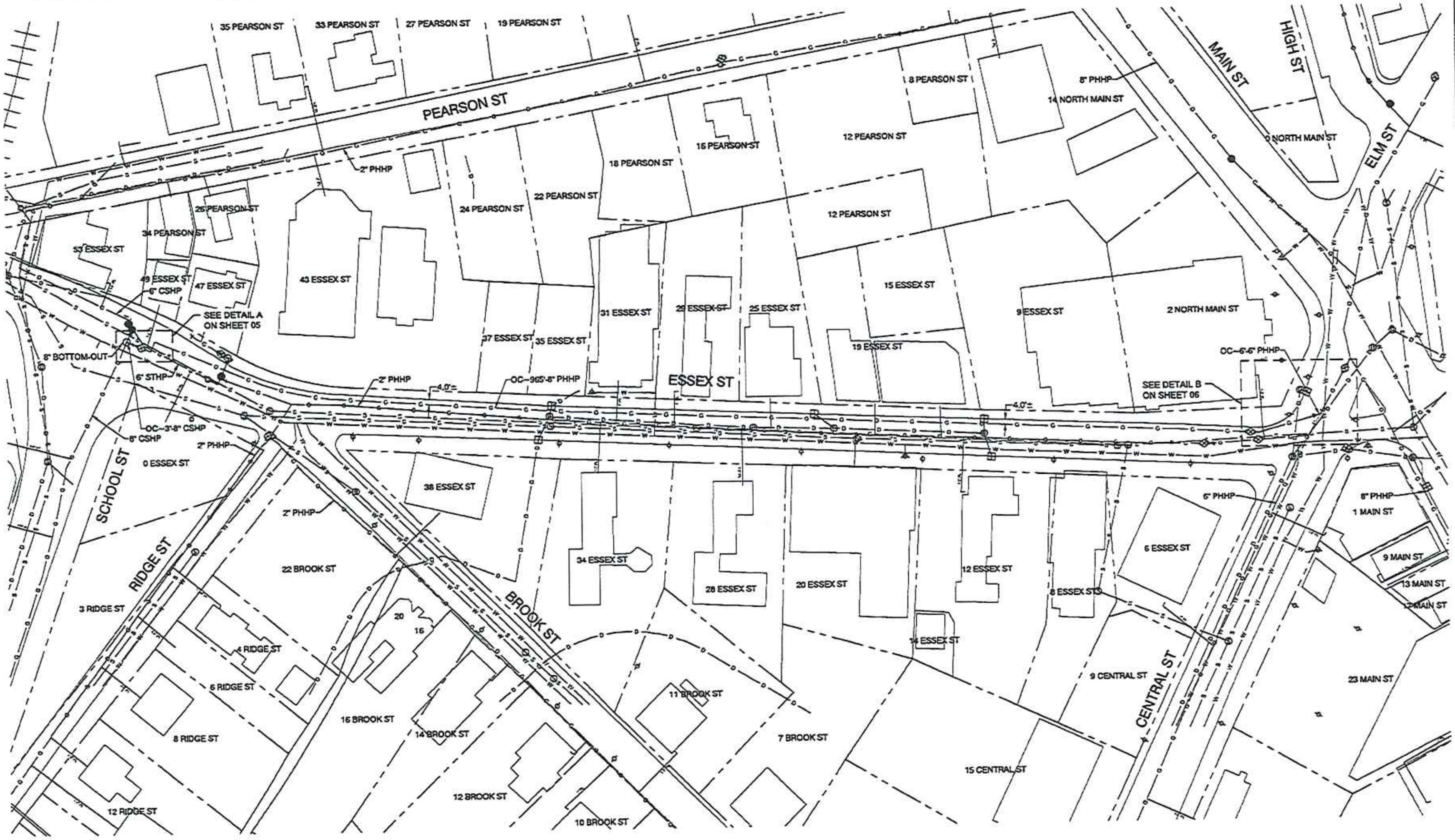
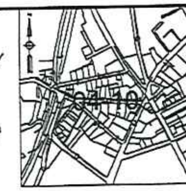




No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

ISSUED FOR CONSTRUCTION

COMMONWEALTH OF MASSACHUSETTS
DANIEL J MCNALL
MECHANICAL

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

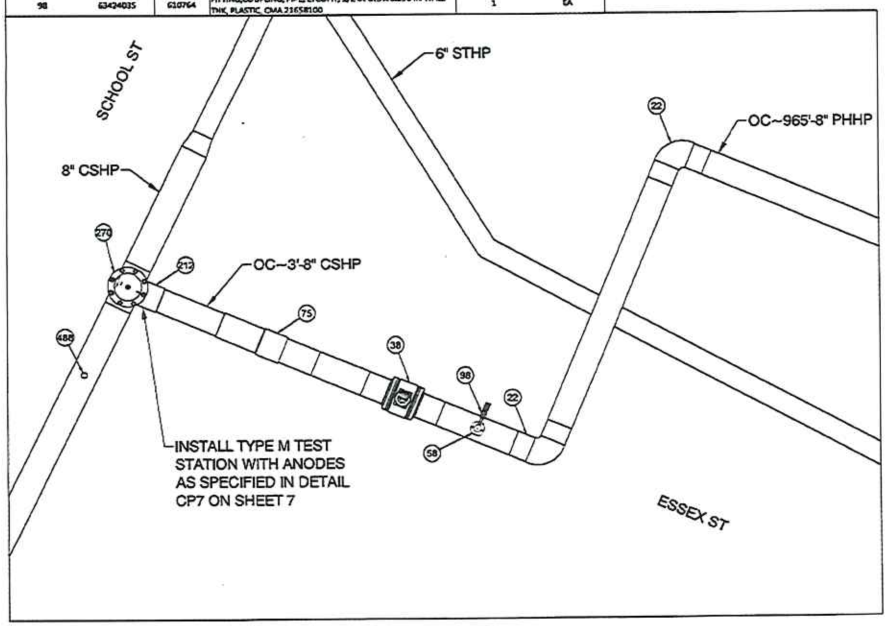
FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
PROJECT LOCATION PLAN

SCALE: 1" = 40'		SHEET 04 OF 10	
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-04	0

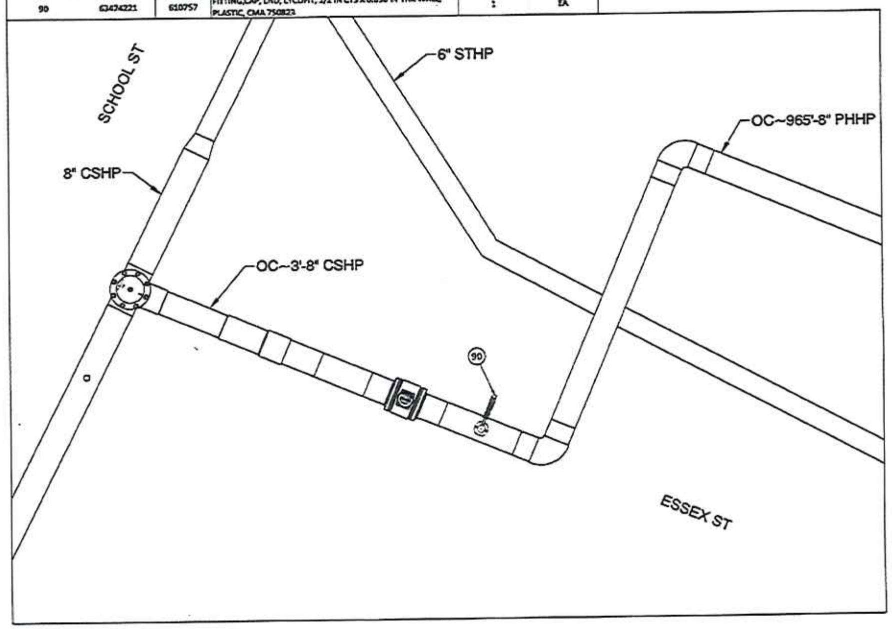
ay 16, 2023 - 11:46am

ESSEX ST, ANDOVER				DETAIL "A" PREPARATORY	
REQUIRED BILL OF MATERIALS					
Item Number	MRC Stock Number	Maximo Part Number	Description	Quantity	Units
212	16000167	545358	ELBOW,PIPE, 90 DEG, 8 IN X 0.322 IN THK WALL, BUTT WELD ENDS, CS, ASTM A234 GR B, ANSI B16.9 , LONG RADIUS	1	EA
22	63078169	545343	ELBOW,PIPE, 90 DEG, 8 IN SDR 11, BUTT WELD ENDS, POLYETHYLENE, P100	2	EA
270	63550307	546243	FITTING,LINE STOPPER, BOTTOM OPENING, 8 IN , WELDED ENDS, W/ 150 LB FLANGE, FOR BEVELED 8.625 IN OD THIN WALL STEEL PIPE	1	EA
38	14712516	500705	VALVE,BALL, 8 IN IPS, POLYETHYLENE, SDR11, BUTT WELD, W/ FULL PORT OPENING, BLACK FINISH	1	
488	63420117	610264	NIPPLE,PIPE, NON-BLOWING, DRILL, 1-1/4 IN X 3 IN, WELDED, 1440 PSIG, CMA 2485855	1	EA
58	63051591	584713	FITTING,TEE, 8 IN IPS X 1/2 IN CTS, ELECTROFUSION TAPPING TEE WITH PERMASERT STAB OUTLET, HDPE, BLACK, NSTAR M-140	1	EA
75	63150132	546255	FITTING,TRANSITION, 8 IN IPS CS X 8 IN IPS PE4710, SDR 11, STEEL WELD X PLASITC, BUTT ENDS	1	EA
98	63424035	610764	FITTING,COUPLING, PIPE, LYCOFIT, 1/2 IN CTS X 0.090 IN WALL THK, PLASTIC, CMA 21658100	1	EA



PREPARATORY TIE-IN DETAIL A
NOT TO SCALE

ESSEX ST, ANDOVER				DETAIL "A" FINAL	
REQUIRED BILL OF MATERIALS					
Item Number	MRC Stock Number	Maximo Part Number	Description	Quantity	Units
90	63474221	610757	FITTING,CAP, END, LYCOFIT, 1/2 IN CTS X 0.090 IN THK WALL, PLASTIC, CMA 750823	1	EA



FINAL TIE-IN DETAIL A
NOT TO SCALE

ISSUED FOR CONSTRUCTION

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

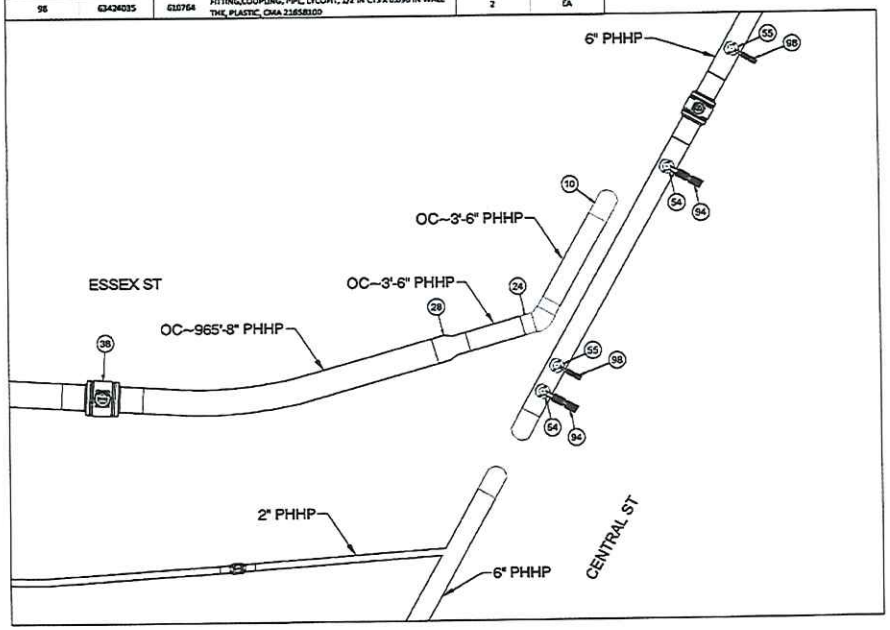
Revision/Status

EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
PREPARATORY AND FINAL TIE-IN DETAILS

SCALE: NTS		SHEET 05 OF 10	
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-05	0

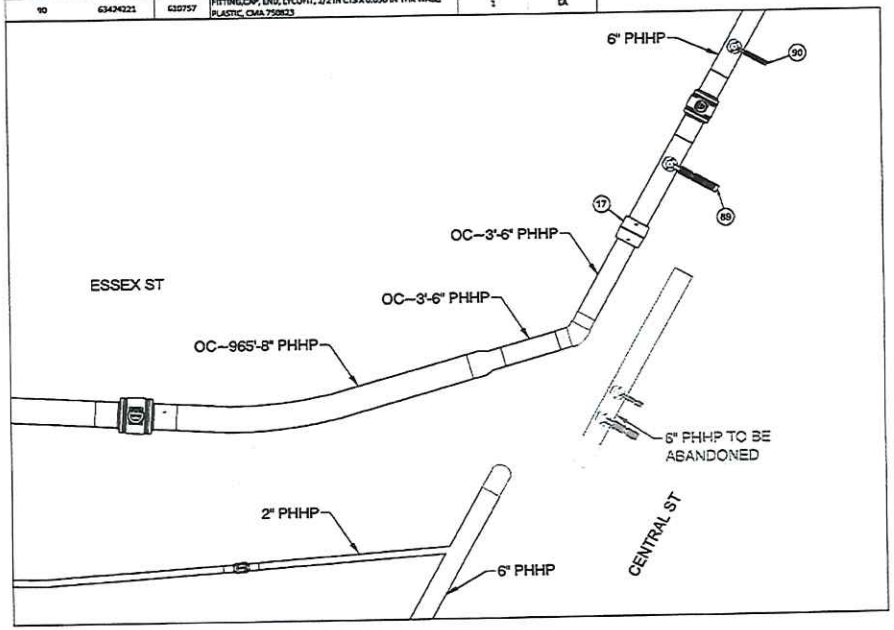
ay 16, 2023 - 11:46am

ESSEX ST, ANDOVER				DETAIL "B" PREPARATORY	
REQUIRED BILL OF MATERIALS					
Item Number	**MRC Stock Number**	**Maximo Part Number**	**Description**	**Quantity**	**Units**
10	63078054	542539	CAP,PIPE, 6 IN IPS SDR 11, BUTT END, POLYETHYLENE, PI00	1	EA
24	63078246	545339	ELBOW,PIPE, 45 DEG, 6 IN SDR 11, BUTT WELD ENDS, POLYETHYLENE, P100	1	EA
28	63078404	555596	REDUCER,PIPE, 8 IN X 6 IN IPS SDR 11, BUTT ENDS, POLYETHYLENE, P100	1	EA
38	14712516	500705	VALVE,BALL, 8 IN IPS, POLYETHYLENE, SDR11, BUTT WELD, W/ FULL PORT OPENING, BLACK FINISH	1	
54	63051740	610738	FITTING,TEE, BOLT-ON, 6 IN IPS X 1-1/4 IN CTS, ELECTROFUSION, HDPE, ASTM D2513 / F1055-GAS / D2261, GPCP, CMA 4315816	2	EA
55	63051277	500869	TEE,PIPE, NON-BLOWING, 6 X 1/2 IN CTS X 0.090 IN THK WALL SDR 7, ELECTROFUSION X COMPRESSION ENDS, LIGHT WALL, POLYETHYLENE, PE3408/PE100	2	EA
94	63424224	610767	FITTING,COUPLING, PIPE, LYCOFIT, 1-1/4 IN CTS X 0.121 IN WALL THK, PLASTIC, CMA 21658094	2	EA
98	63424035	610764	FITTING,COUPLING, PIPE, LYCOFIT, 1/2 IN CTS X 0.090 IN WALL THK, PLASTIC, CMA 21658100	2	EA



PREPARATORY TIE-IN DETAIL B
NOT TO SCALE

ESSEX ST, ANDOVER				DETAIL "B" FINAL	
REQUIRED BILL OF MATERIALS					
Item Number	**MRC Stock Number**	**Maximo Part Number**	**Description**	**Quantity**	**Units**
17	63051039	500856	COUPLING,PIPE, 6 IN IPS, ELECTROFUSION, PLASTIC, P100	1	EA
88	63424222	610761	FITTING,CAP, END, LYCOFIT, 1-1/4 IN CTS X 0.121 IN THK WALL, PLASTIC, CMA 750822	1	EA
90	63424221	610757	FITTING,CAP, END, LYCOFIT, 1/2 IN CTS X 0.090 IN THK WALL, PLASTIC, CMA 750823	1	EA



FINAL TIE-IN DETAIL B
NOT TO SCALE

ISSUED FOR CONSTRUCTION

DANIEL J. MCINNIS MECHANICAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
2023.05.16 14:11:01-04'00'

CAMPOS EPC
6 Columbia Drive, Amherst, NH 03031
(603) 457-7160

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dwr/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

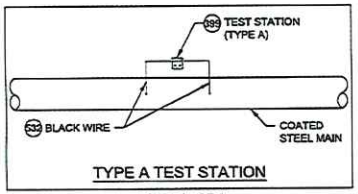
EVERSOURCE ENERGY

ESSEX ST, ANDOVER, MA
PROJECT # 23EG164R
PREPARATORY AND FINAL TIE-IN DETAILS

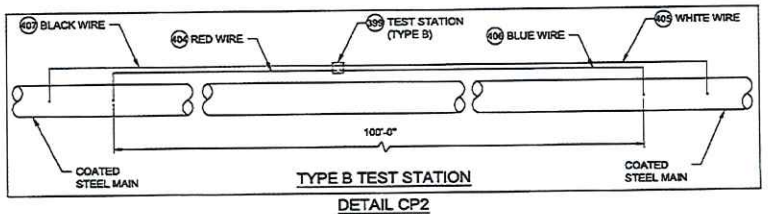
SCALE: NTS | SHEET 06 OF 10

Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-06	0

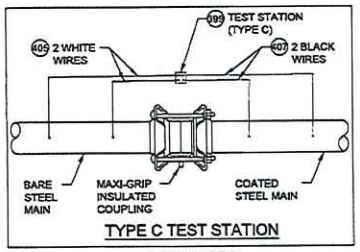
ay 16, 2023 - 11:47am



DETAIL CP1
SCALE: 1/2" = 1'-0"



DETAIL CP2
SCALE: 1/2" = 1'-0"



DETAIL CP3
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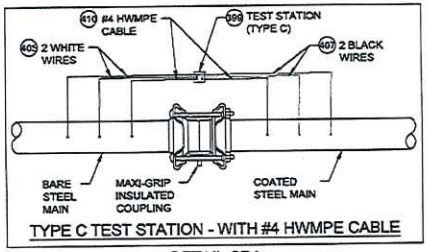
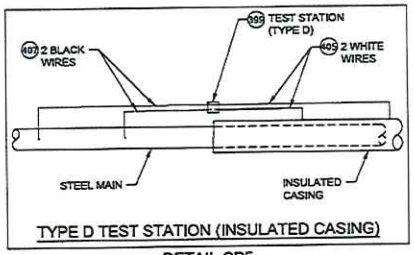


DETAIL CP4
SCALE: 1/2" = 1'-0"



DETAIL CP5
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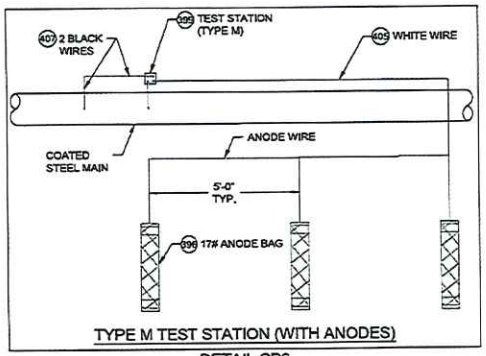
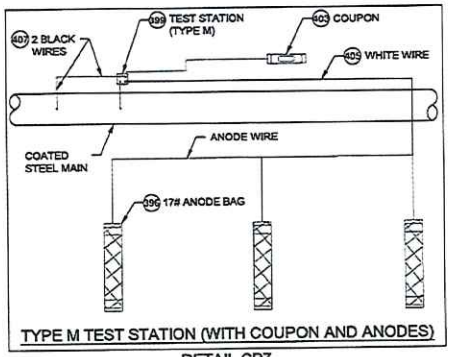


DETAIL CP6
SCALE: 1/2" = 1'-0"



DETAIL CP7
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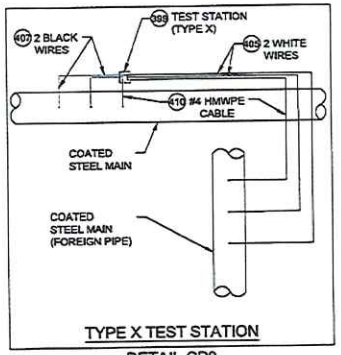

DETAIL CP8
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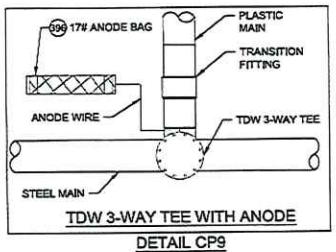

DETAIL CP9
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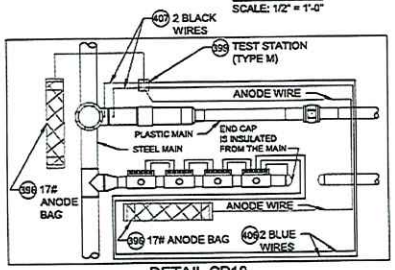

DETAIL CP10
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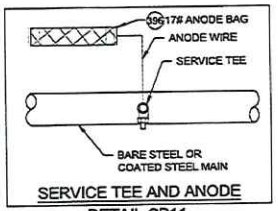


DETAIL CP11
SCALE: 1/2" = 1'-0"

CATHODIC PROTECTION BILL OF MATERIALS

ITEM	MAXIMO NO.	DESCRIPTION	UNITS
396	577775	ANODE,BAG, 17 LB NET, HIGH POTENTIAL MAGNESIUM, W/ 10 FT #10 AWG TW ORANGE LEAD WIRE, PACKED IN CARDBOARD BOX 42 LB TOTAL WEIGHT	EA
397	409626	CONNECTOR, SPLIT BOLT, 12 SOLID - 10 STRANDED, CU TO CU, HOUSING (COVER) MATE IN 390389	EA
398	390389	HOUSING, 20 V MAX, 10 AWG MAX, FOR PROTECTING THACUM WIRE SPLICES, USED WITH CONNECTOR IN 409626, 10/BAG	EA
399	590871	BOX,VALVE, TEST STATION, CP TEST #176, 10-1/4 IN DIA. LID, 6-3/8 IN LD, 16 IN H., ASTM A48 CL 25 CAST IRON, FOR OFF-ROAD USE ONLY	EA
400	400367	POWDER, CARTRIDGE, TYPE S-T-30, ALLOY , CAP COLOR CLEAR, 15 GM CHARGE, 20/PAC, FOR STEEL PIPE	BOX
401	559168	SLEEVE,ELECTRICAL, #14 TO 10 AWG, W/ THERMITE WELDER, FOR CATHODIC PROTECTION	EA
402	584045	CDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-ZIN-LW010, 10 FT OF CABLE	ES
403	603126	CDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-ZIN-LW025, 25 FT OF CABLE	ES
404	603140	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, RED, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
405	576415	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, WHITE, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
406	603141	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLUE INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
407	603139	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLACK, INSULATED, CU, 500 FT SPOOL,WIRE	ROLL
408	300804	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE,HORIZONTAL STEEL PIPE 4 IN AND LARGER DIAMETER	EA
409	300805	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE,HORIZONTAL STEEL PIPE 3/4 - 3-1/2 IN DIAMETER	EA
410	405850	CABLE, INSULATED, CATHODIC PROTECTION, 1/C, #4 AWG, 7 STR, 600 V, BLACK, HMWPE, CU, 1000 FT ROLLS	FT
411	397918	ANODE,BAG, 2.5 X 2.5 X 4.5 IN, 10 FT LG, 3 LB, MAGNESIUM, Alternate IN 577775	EA
577	603769	TRENTONFILL FOR PIN-GF, 140 PA, FOR FILLING VOIDS & IRREGULAR SPACES PRIOR TO WRAPPING W/MAX TAPE., OF TO 110F APPLICATION TEMPERATURE, 6 BLOCKS/CASE,	CASE
575	400572	PRIMER, 4 GAL/CASE, BROWN, FOR WAX TAPE, APPLICATION TEMP 0 TO 230 F, TEMCOAT 3000	EA
576	603673	TAPE,WAX, 9 FT LG X 4 IN W, 24 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-62A WAX, ALUMINUM	ROLL
697	603423	TAPE,WAX, 9 FT LG X 6 IN W X 70-80 MIL THK, 10 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-62A WAX, ALUMINUM	ROLL

NOTES:

1. ALL TEST STATION BOXES SHOULD BE INSTALLED IN A SAFE LOCATION WHERE ONE INDIVIDUAL CAN SAFELY OPEN AND ACCESS THE TEST WIRES. ALL TEST WIRES INSIDE THE BOX SHOULD HAVE ENOUGH SLACK ON THE WIRES SO THEY CAN EXTEND A MINIMUM OF 12" ABOVE GRADE.
2. FOR TYPE A TEST STATIONS, THE TWO WIRES SHOULD BE THERMITE WELDED TO THE COATED STEEL MAIN AND BE THE SAME COLOR. (COUPONS COULD BE ADDED TO THE TEST STATION TYPE).
3. FOR TYPE B TEST STATIONS, EACH OF THE FOUR WIRES SHOULD BE A DIFFERENT COLOR AND DOCUMENTED
4. FOR TYPE C TEST STATIONS, THE WIRES SHOULD BE THE SAME COLOR ON EACH SIDE OF THE INSULATED COUPLING. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
5. FOR TYPE D TEST STATIONS WHICH ARE AT A CASING, WHITE WIRES ARE NORMALLY INSTALLED ON THE STEEL CASING AND BLACK WIRES ARE INSTALLED ON THE CARRIER PIPE. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
6. FOR TYPE M TEST STATIONS, THE TWO WIRES THERMITE WELDED TO THE CARRIER PIPE SHOULD BE THE SAME COLOR WIRE. THERE IS ALSO MAGNESIUM ANODE(S) WIRE(S) LOCATED INSIDE THE TEST STATION BOX.THE WIRE COLOR (TYPICALLY ORANGE) FOR THE ANODES. IF THE ANODE WIRES ARE SPLICED TO A COMMON ANODE HEADER CABLE, THE ANODE HEADER CABLE SHOULD BE A (WHITE OR RED) DIFFERENT COLOR WIRE THAN THE WIRE THAT WAS THERMITE WELDED TO THE CARRIER PIPE. AT A TYPE M TEST STATION, NO MAGNESIUM ANODES SHOULD BE DIRECTLY THERMITE WELDED TO THE CARRIER PIPE OR IN CONTACT WITH THE CARRIER PIPE. THE ANODE HEADER WIRE OR INDIVIDUAL ANODE WIRES SHOULD TERMINATE INSIDE THE TEST STATION BOX. ANODES SHOULD BE SPACED A MINIMUM OF 5' ON CENTER FROM EACH OTHER AND A MINIMUM OF 12" AWAY AND BELOW THE BOTTOM OF THE STEEL MAIN.
7. IF COUPONS ARE TO BE INSTALLED , FIRST REMOVE THE PROTECTIVE LABEL COVERING THE STEEL COUPON AND THE RED STICKERS COVERING EACH SENSING PORT. CLEAN THE ENTIRE STEEL COUPON SURFACE WITH ALCOHOL TO REMOVE THE CORROSION INHIBITOR .PLACE THE COUPON ASSEMBLY APPROXIMATELY 12" FROM THE GAS MAIN BEING MONITORED WITH THE SENSING PORTS FACING THE GAS MAIN. THE COUPON ASSEMBLY SHOULD BE LOCATED ADJACENT TO THE BOTTOM PORTION OF THE GAS MAIN. ANYWHERE BETWEEN 3 O'CLOCK AND 9 O'CLOCK. THE SOIL BETWEEN THE COUPON AND THE MAIN SHOULD BE WELL COMPACTED AND CONTAIN NO ROCKS LARGER THAN A CENTIMETER IN DIAMETER OR FOREIGN MATERIAL.
8. ONE (1) 3# ANODE (MINIMUM) SHALL BE INSTALLED TO PROTECT THE CLAMPS ON EACH 10-FOOT SPAN OF PIPE. EACH 10-FOOT SPAN OF PIPE MUST BE A CONTINUOUS SECTION OF STEEL. CLAMPS ON NON-CONTINUOUS SECTIONS OF STEEL EVEN IF THEY ARE WITHIN 10 FEET OF EACH CANNOT BE PROTECTED BY THE SAME ANODE.
9. REFER TO CONSTRUCTION STANDARD CS-600 SECTION IV.G WHICH PROVIDES GENERAL GUIDANCE REGARDING "WRAPPING" FOR CORROSION PROTECTION. CS-600 SECTION IV.G.5. DESCRIBES THE BASIC STEPS REQUIRED TO WRAP LEAK REPAIR CLAMPS.

NOTE: DETAILS CP-9 AND CP-11 ARE FOR NEW STEEL FITTINGS THAT ARE NOT ELECTRICALLY ISOLATED FROM EXISTING UNPROTECTED STEEL. THESE ANODES ARE DIRECTLY CONNECTED TO THE NEW STEEL FITTING AND THE ANODE MUST BE A MINIMUM OF 2 FEET FROM ANY NEW ISOLATED FITTINGS OR ASSOCIATED ANODES.

No.	Revision/Status	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

EVERSOURCE ENERGY

ESSEX ST, ANDOVER, MA

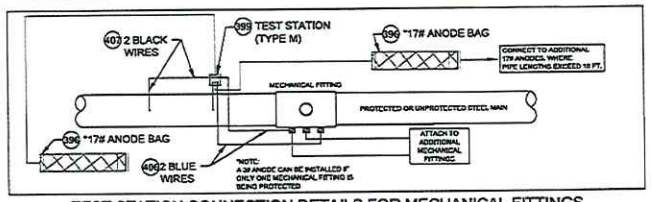
PROJECT # 23EG164R

MA CORROSION DETAILS

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

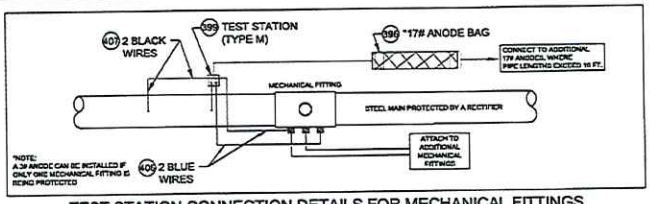
SCALE:1/2" = 1'-0" SHEET 07 OF 10

Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-07	0



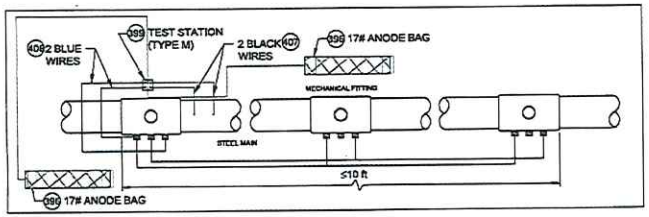
TEST STATION CONNECTION DETAILS FOR MECHANICAL FITTINGS
INSTALLED ON A STEEL MAIN

DETAIL CP12
SCALE: 1/2" = 1'-0"



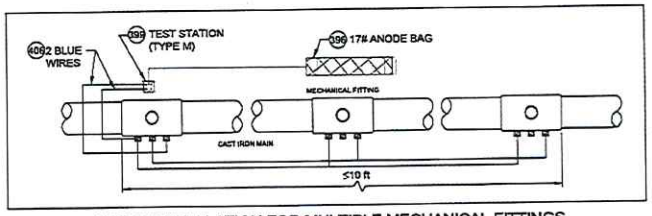
TEST STATION CONNECTION DETAILS FOR MECHANICAL FITTINGS
INSTALLED ON STEEL MAIN PROTECTED BY A RECTIFIER

DETAIL CP13
SCALE: 1/2" = 1'-0"



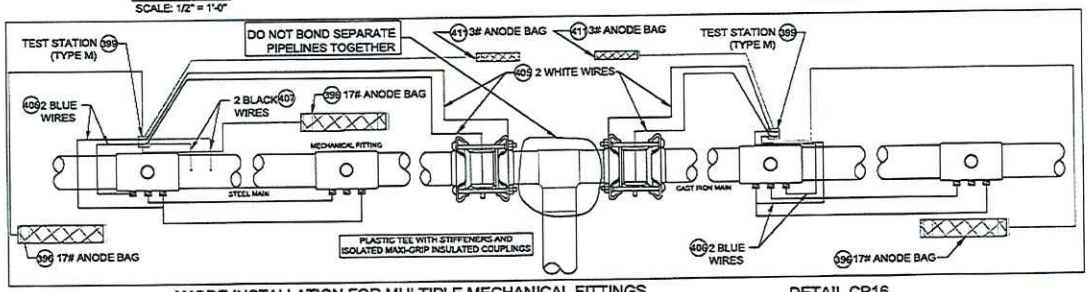
ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON A ELECTRICALLY CONTINUOUS SECTION OF STEEL MAIN

DETAIL CP14
SCALE: 1/2" = 1'-0"



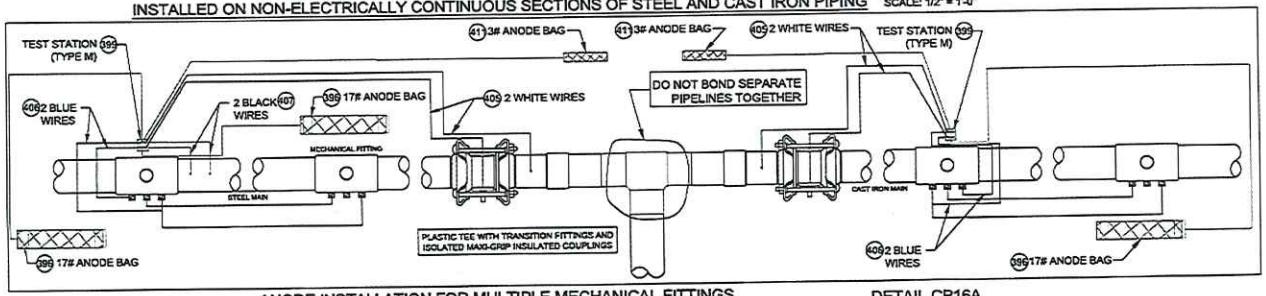
ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON A CAST IRON MAIN

DETAIL CP15
SCALE: 1/2" = 1'-0"



ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON NON-ELECTRICALLY CONTINUOUS SECTIONS OF STEEL AND CAST IRON PIPING

DETAIL CP16
SCALE: 1/2" = 1'-0"



ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON NON-ELECTRICALLY CONTINUOUS SECTIONS OF STEEL AND CAST IRON PIPING

DETAIL CP16A
SCALE: 1/2" = 1'-0"

CATHODIC PROTECTION BILL OF MATERIALS

ITEM	MAXIMO NO.	DESCRIPTION	UNITS
396	577776	ANODE,BAG, 17 LB MGT, HIGH POTENTIAL MAGNESIUM, W/ 10 FT #10 AWG Tw GRANDE, LEAD WIRE, PACKED IN CARDBOARD BOX 42 LB TOTAL WEIGHT	EA
397	406626	CONNECTOR, SPLIT BOLT, 12 SOLID - 10 STRANDED, CU TO CU, HOUSING (COVER) MATE IN 590389.	EA
398	590389	HOUSING, 30 V MAX, 10 AWG MAX, FOR PROTECTING TRACER WIRE SPLICES, USED WITH CONNECTOR IN 406626, 10/BAG	EA
399	590571	BOX VALVE, TEST STATION, CP TEST #17#, 10-1/4 IN DIA. LID, 8-3/8 IN LD, 16 IN H., ASTM A48 CL 35 CAST IRON, FOR OFF-ROAD USE ONLY	EA
400	400567	POWDER, CARTRIDGE, TYPE IS F-03, ALLOY , CAP COLOR CLEAR, 15 GM CHARGE, 20/PAC, FOR STEEL PIPE	BOX
401	559168	SLEEVE,ELECTRICAL, #14 TO 10 AWG, W/ THERMITE WELDER, FOR CATHODIC PROTECTION	EA
402	584845	EDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-ZIN-LW010, 10 FT OF CABLE	ES
403	603126	EDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-ZIN-LW035, 35 FT OF CABLE	ES
404	603140	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, RED, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
405	579415	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, WHITE, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
406	603141	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLUE INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
407	603139	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLACK, INSULATED, CU, 500 FT SPOOL,WIRE	ROLL
408	580894	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE,HORIZONTAL STEEL PIPE 4 IN AND LARGER DIAMETER	EA
409	580805	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE, HORIZONTAL STEEL PIPE 3/4 - 2-1/2 IN DIAMETER	EA
410	403859	CABLE, INSULATED, CATHODIC PROTECTION, 1/C, #4 AWG, 7 STR, 600 V, BLACK, HMWPE, CU, 1000 FT ROLLS	FT
411	397818	ANODE,BAG, 2.5 X 2.5 X 4.5 IN, 10 FT LG, 3 LB, MAGNESIUM, Alternate IN 577776	EA
577	603769	TRENTON=FILL FOR PM-GP, 140 YA, FOR FILLING VOIDS & IRREGULAR SPACES PRIOR TO WRAPPING WINAX TAPE, 0F TO 110F APPLICATION TEMPERATURE, 6 BLOCKS/CASE.	CASE
575	400572	PRIMER, 4 GAL/CASE, BROWN, FOR WAX TAPE, APPLICATION TEMP 0 TO 230 F, TEMCOAT 3000	EA
576	603673	TAPE,WAX, 9 FT LG X 4 IN W, 24 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-42A WAX, ALUMINUM	ROLL
597	603423	TAPE,WAX, 9 FT LG X 8 IN W X 70-80 MIL THK, 16 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-42A WAX, ALUMINUM	ROLL

NOTES:

1. ALL TEST STATION BOXES SHOULD BE INSTALLED IN A SAFE LOCATION WHERE ONE INDIVIDUAL CAN SAFELY OPEN AND ACCESS THE TEST WIRES. ALL TEST WIRES INSIDE THE BOX SHOULD HAVE ENOUGH SLACK ON THE WIRES SO THEY CAN EXTEND A MINIMUM OF 12" ABOVE GRADE.
2. FOR TYPE A TEST STATIONS, THE TWO WIRES SHOULD BE THERMITE WELDED TO THE COATED STEEL MAIN AND BE THE SAME COLOR. (COUPONS COULD BE ADDED TO THE TEST STATION TYPE).
3. FOR TYPE B TEST STATIONS, EACH OF THE FOUR WIRES SHOULD BE A DIFFERENT COLOR AND DOCUMENTED
4. FOR TYPE C TEST STATIONS, THE WIRES SHOULD BE THE SAME COLOR ON EACH SIDE OF THE INSULATED COUPLING. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
5. FOR TYPE D TEST STATIONS WHICH ARE AT A CASING, WHITE WIRES ARE NORMALLY INSTALLED ON THE STEEL CASING AND BLACK WIRES ARE INSTALLED ON THE CARRIER PIPE. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
6. FOR TYPE M TEST STATIONS, THE TWO WIRES THERMITE WELDED TO THE CARRIER PIPE SHOULD BE THE SAME COLOR WIRE. THERE IS ALSO MAGNESIUM ANODE(S) WIRE(S) LOCATED INSIDE THE TEST STATION BOX.THE WIRE COLOR (TYPICALLY ORANGE) FOR THE ANODES. IF THE ANODE WIRES ARE SPLICED TO A COMMON ANODE HEADER CABLE, THE ANODE HEADER CABLE SHOULD BE A (WHITE OR RED) DIFFERENT COLOR WIRE THAN THE WIRE THAT WAS THERMITE WELDED TO THE CARRIER PIPE. AT A TYPE M TEST STATION, NO MAGNESIUM ANODES SHOULD BE DIRECTLY THERMITE WELDED TO THE CARRIER PIPE OR IN CONTACT WITH THE CARRIER PIPE. THE ANODE HEADER WIRE OR INDIVIDUAL ANODE WIRES SHOULD TERMINATE INSIDE THE TEST STATION BOX. ANODES SHOULD BE SPACED A MINIMUM OF 5' ON CENTER FROM EACH OTHER AND A MINIMUM OF 12" AWAY AND BELOW THE BOTTOM OF THE STEEL MAIN.
7. IF COUPONS ARE TO BE INSTALLED , FIRST REMOVE THE PROTECTIVE LABEL COVERING THE STEEL COUPON AND THE RED STICKERS COVERING EACH SENSING PORT. CLEAN THE ENTIRE STEEL COUPON SURFACE WITH ALCOHOL TO REMOVE THE CORROSION INHIBITOR. PLACE THE COUPON ASSEMBLY APPROXIMATELY 12" FROM THE GAS MAIN BEING MONITORED WITH THE SENSING PORTS FACING THE GAS MAIN. THE COUPON ASSEMBLY SHOULD BE LOCATED ADJACENT TO THE BOTTOM PORTION OF THE GAS MAIN, ANYWHERE BETWEEN 3 O'CLOCK AND 9 O'CLOCK. THE SOIL BETWEEN THE COUPON AND THE MAIN SHOULD BE WELL COMPACTED AND CONTAIN NO ROCKS LARGER THAN A CENTIMETER IN DIAMETER OR FOREIGN MATERIAL.
8. ONE (1) 3# ANODE (MINIMUM) SHALL BE INSTALLED TO PROTECT THE CLAMPS ON EACH 10-FOOT SPAN OF PIPE. EACH 10-FOOT SPAN OF PIPE MUST BE A CONTINUOUS SECTION OF STEEL. CLAMPS ON NON-CONTINUOUS SECTIONS OF STEEL EVEN IF THEY ARE WITHIN 10 FEET OF EACH CANNOT BE PROTECTED BY THE SAME ANODE.
9. REFER TO CONSTRUCTION STANDARD CS-503 SECTION IV.G WHICH PROVIDES GENERAL GUIDANCE REGARDING "WRAPPING" FOR CORROSION PROTECTION. CS-503 SECTION IV.C.5. DESCRIBES THE BASIC STEPS REQUIRED TO WRAP LEAK REPAIR CLAMPS.

NOTE: WHEN MULTIPLE WIRES FROM DIFFERENT PIPE SECTIONS ARE IN THE SAME TEST STATION, THE WIRES FROM THE SAME PIPE SECTION AND ASSOCIATED ANODE WILL BE TAPED TOGETHER INSIDE THE TEST STATION.

No.	Revision/Status	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

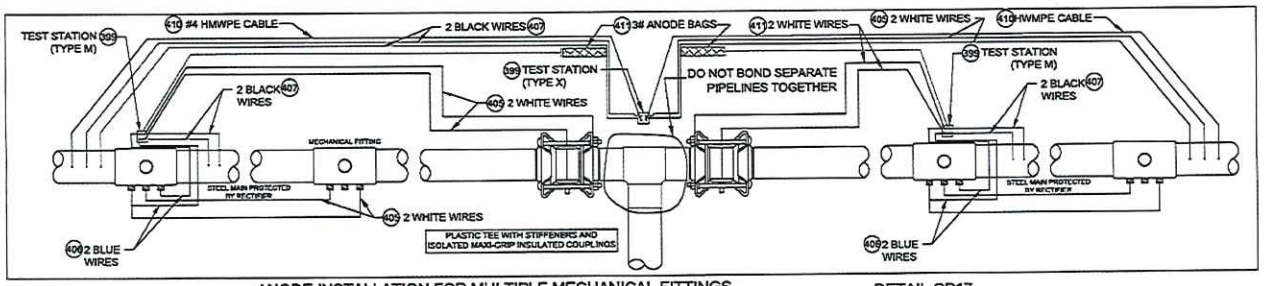
EVERSOURCE ENERGY
ESSEX ST, ANDOVER, MA
PROJECT # 23EG154R
MA CORROSION DETAILS

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

SCALE: 1/2" = 1'-0" | SHEET 08 OF 10

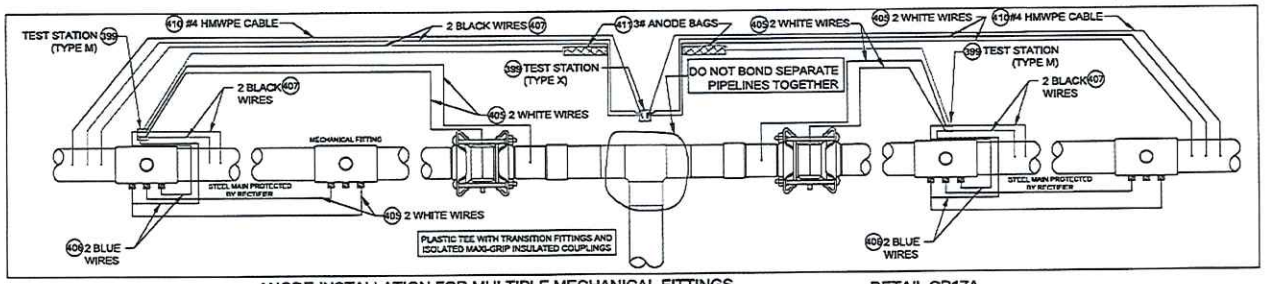
Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-08	0

ay 16, 2023 - 11:47am



ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON NON-ELECTRICALLY CONTINUOUS SECTIONS OF COATED STEEL PIPING

DETAIL CP17
SCALE: 1/2" = 1'-0"



ANODE INSTALLATION FOR MULTIPLE MECHANICAL FITTINGS
INSTALLED ON NON-ELECTRICALLY CONTINUOUS SECTIONS OF COATED STEEL PIPING

DETAIL CP17A
SCALE: 1/2" = 1'-0"

CATHODIC PROTECTION BILL OF MATERIALS

ITEM	MAXIMO NO.	DESCRIPTION	UNITS
396	577776	ANODE,BAG, 17 LB NET, HIGH POTENTIAL MAGNESIUM, W/ 10 FT #10 AWG TW ORANGE LEAD WIRE, PACKED IN CARDBOARD BOX 42 LB TOTAL WEIGHT	EA
397	406626	CONNECTOR, SPLIT BOLT, 12 SOLID - 10 STRANDED, CU TO CU, HOUSING (COVER) MATE IN 590389	EA
398	590389	HOUSING, 30 V MAX, 10 AWG MAX, FOR PROTECTING TRACER WIRE SPLICES, USED WITH CONNECTOR IN 406626, 10/BAG	EA
399	590871	BOX,VALVE, TEST STATION, D-TEST #1178, 10-1/4 IN DIA, LID, 6-3/8 IN LD, 18 IN H., ASTM A48 CL 25 CAST IRON, FOR OFF-ROAD USE ONLY	EA
400	400567	POWDER, CARTRIDGE, TYPE IS F-33, ALLOY , CAP COLOR CLEAR, 15 GM CHARGE, 250/PAC, FOR STEEL PIPE	BOX
401	559168	SLEEVE,ELECTRICAL, #14 TO 10 AWG, W/ THERMITE WELDER, FOR CATHODIC PROTECTION	EA
402	584045	EDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-2IN-LW010, 10 FT OF CABLE	ES
403	603125	EDI CONCENTRIC COUPON ASSEMBLY INCLUDING UCB-2IN-LW025, 25 FT OF CABLE	ES
404	603140	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, RED, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
405	578415	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, WHITE, INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
406	603141	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLUE INSULATED, CU, 500 FT SPOOL, WIRE	ROLL
407	603139	WIRE,ELECTRICAL, THHN, 1/C, #10 AWG, STRANDED, BLACK, INSULATED, CU, 500 FT SPOOL,WIRE	ROLL
408	508804	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE,HORIZONTAL STEEL PIPE 4 IN AND LARGER DIAMETER	EA
409	508805	WELDER,THERMITE, THERMITE, FOR GAS PIPE, #12 CABLE, HORIZONTAL STEEL PIPE 3/4 - 2-1/2 IN DIAMETER	EA
410	405850	CABLE, INSULATED, CATHODIC PROTECTION, 1/C, #4 AWG, 7 STR, 600 V, BLACK, HMWPE, CU, 1000 FT ROLLS	FT
411	397816	ANODE,BAG, 2.5 X 2.5 X 4.5 IN, 10 FT LG, 3 LB, MAGNESIUM, Alternate to 577776	EA
577	603768	TRENTON=FILL FOR PM-GP, 140 PA, FOR FILLING VOIDS & IRREGULAR SPACES PRIOR TO WRAPPING W/WAX TAPE, GP TO 110F APPLICATION TEMPERATURE, 6 BLOCKS/CASE.	CASE
575	400572	PRIMER, 4 GAL/CASE, BROWN, FOR WAX TAPE, APPLICATION TEMP 0 TO 230 F, TEMCOAT 3000	EA
576	503673	TAPE,WAX, 9 FT LG X 4 IN W, 24 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-42A WAX, ALUMINUM	ROLL
597	603423	TAPE,WAX, 9 FT LG X 2 IN W X 70-80 MIL THK, 16 ROLLS/CS, ABOVE AND BELOW GROUND APPLICATIONS, TR-42A WAX, ALUMINUM	ROLL

NOTES:

1. ALL TEST STATION BOXES SHOULD BE INSTALLED IN A SAFE LOCATION WHERE ONE INDIVIDUAL CAN SAFELY OPEN AND ACCESS THE TEST WIRES. ALL TEST WIRES INSIDE THE BOX SHOULD HAVE ENOUGH SLACK ON THE WIRES SO THEY CAN EXTEND A MINIMUM OF 12" ABOVE GRADE.
2. FOR TYPE A TEST STATIONS, THE TWO WIRES SHOULD BE THERMITE WELDED TO THE COATED STEEL MAIN AND BE THE SAME COLOR. (COUPONS COULD BE ADDED TO THE TEST STATION TYPE).
3. FOR TYPE B TEST STATIONS, EACH OF THE FOUR WIRES SHOULD BE A DIFFERENT COLOR AND DOCUMENTED
4. FOR TYPE C TEST STATIONS, THE WIRES SHOULD BE THE SAME COLOR ON EACH SIDE OF THE INSULATED COUPLING. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
5. FOR TYPE D TEST STATIONS WHICH ARE AT A CASING, WHITE WIRES ARE NORMALLY INSTALLED ON THE STEEL CASING AND BLACK WIRES ARE INSTALLED ON THE CARRIER PIPE. (ANODES AND/OR COUPONS COULD BE ADDED TO THIS TEST STATION TYPE).
6. FOR TYPE M TEST STATIONS, THE TWO WIRES THERMITE WELDED TO THE CARRIER PIPE SHOULD BE THE SAME COLOR WIRE. THERE IS ALSO MAGNESIUM ANODE(S) WIRE(S) LOCATED INSIDE THE TEST STATION BOX.THE WIRE COLOR (TYPICALLY ORANGE) FOR THE ANODES. IF THE ANODE WIRES ARE SPLICED TO A COMMON ANODE HEADER CABLE, THE ANODE HEADER CABLE SHOULD BE A (WHITE OR RED) DIFFERENT COLOR WIRE THAN THE WIRE THAT WAS THERMITE WELDED TO THE CARRIER PIPE. AT A TYPE M TEST STATION, NO MAGNESIUM ANODES SHOULD BE DIRECTLY THERMITE WELDED TO THE CARRIER PIPE OR IN CONTACT WITH THE CARRIER PIPE. THE ANODE HEADER WIRE OR INDIVIDUAL ANODE WIRES SHOULD TERMINATE INSIDE THE TEST STATION BOX. ANODES SHOULD BE SPACED A MINIMUM OF 5' ON CENTER FROM EACH OTHER AND A MINIMUM OF 12" AWAY AND BELOW THE BOTTOM OF THE STEEL MAIN.
7. IF COUPONS ARE TO BE INSTALLED , FIRST REMOVE THE PROTECTIVE LABEL COVERING THE STEEL COUPON AND THE RED STICKERS COVERING EACH SENSING PORT. CLEAN THE ENTIRE STEEL COUPON SURFACE WITH ALCOHOL TO REMOVE THE CORROSION INHIBITOR .PLACE THE COUPON ASSEMBLY APPROXIMATELY 12" FROM THE GAS MAIN BEING MONITORED WITH THE SENSING PORTS FACING THE GAS MAIN. THE COUPON ASSEMBLY SHOULD BE LOCATED ADJACENT TO THE BOTTOM PORTION OF THE GAS MAIN, ANYWHERE BETWEEN 3 O'CLOCK AND 9 O'CLOCK. THE SOIL BETWEEN THE COUPON AND THE MAIN SHOULD BE WELL COMPACTED AND CONTAIN NO ROCKS LARGER THAN A CENTIMETER IN DIAMETER OR FOREIGN MATERIAL.
8. ONE (1) 3# ANODE (MINIMUM) SHALL BE INSTALLED TO PROTECT THE CLAMPS ON EACH 10-FOOT SPAN OF PIPE. EACH 10-FOOT SPAN OF PIPE MUST BE A CONTINUOUS SECTION OF STEEL. CLAMPS ON NON-CONTINUOUS SECTIONS OF STEEL EVEN IF THEY ARE WITHIN 10 FEET OF EACH CANNOT BE PROTECTED BY THE SAME ANODE.
9. REFER TO CONSTRUCTION STANDARD CS-600 SECTION IV.G WHICH PROVIDES GENERAL GUIDANCE REGARDING "WRAPPING" FOR CORROSION PROTECTION. CS-600 SECTION IV.C.5. DESCRIBES THE BASIC STEPS REQUIRED TO WRAP LEAK REPAIR CLAMPS.

NOTE: WHEN MULTIPLE WIRES FROM DIFFERENT PIPE SECTIONS ARE IN THE SAME TEST STATION, THE WIRES FROM THE SAME PIPE SECTION AND ASSOCIATED ANODE WILL BE TAPED TOGETHER INSIDE THE TEST STATION.

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

EVERSOURCE ENERGY

ESSEX ST, ANDOVER, MA

PROJECT # 23EG164R

MA CORROSION DETAILS

SHEET 09 OF 10

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

SCALE: 1/2" = 1'-0"

Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-09	0

ay 16, 2023 - 11:47am

ISSUED FOR CONSTRUCTION

CAMPOS EPC

6 Columbia Drive, Amherst, NH 03031
(603) 457-7150

FIELD VERIFY DIMENSIONS PRIOR TO PIPE FABRICATION

No.	Description	Date	Dw/Ck
0	ISSUED FOR CONSTRUCTION	05/15/23	KMR/MCM

Revision/Status

EVERSOURCE ENERGY

ESSEX ST, ANDOVER, MA

PROJECT # 23EG164R

BLANK GRIDDED SHEET

SCALE: NTS

SHEET 10 OF 10

Drawn by / Date	Checked by / Date	Drawing Number	Rev. No.
KMR 05/15/23	JH 05/15/23	MA-LAW-PIP-23-401-10	0

ay 16, 2023 - 11:47am

MATCHPLAY
GOLF & SPORTS LOUNGE

209 N Main
Suite 60
Andover, MA 01810
978.771.4016
zappalatennis@gmail.com

June 9, 2023

Town of Andover
Town Clerk's Office
ATTN: Vanessa French
36 Bartlett St
Andover, MA 01810

Applicant: MP Golf, LLC(DBA: Matchplay Golf and Sports Lounge)

ABCC License Number: 07336-RS-0026

Premises Address: 209 N Main St Suite 60 Andover, MA 01810

1. On November 7th, 2022, the Andover Select Board approved Matchplay Golf and Sport's Lounge's Alcoholic Beverage License Application, which was thereafter sent along to the Massachusetts ABCC.
2. On February 1st, 2023, the ABCC issued its Commission Decision of Approval, per the attached Exhibit.
3. Due to unavoidable construction delays, the build out of the restaurant space at 209 N Main St Suite 60 Andover, MA 01810 will not be completed before August 1st, 2023, the six month anniversary of the ABCC's approval.
4. Matchplay Golf and Sports Lounge hereby petitions the Select Board to grant a 3 Month Extension of the Select Board's Aprroval of Matchplay's Alcoholic Beverage License.
5. This petition is based upon Matchplay facing several unexpected delays and construction difficulties in the space located in Suite 60 at 209 N Main St Andover, MA 01810. Construction is moving diligently, and construction is expected to be completed by September 15th, 2023.
6. Matchplay respectfully requests the Select Board deem this to be good cause for granting the 3 month extension.

Matchplay respectfully asks that this matter be placed on the Select Board Agenda at your earliest opportunity. Matchplay would be pleased to attend and provide any additional information requested by the Select Board.

Submitted this 9th day of June, 2023.

DocuSigned by:
Andrew Zappala
C0ECB4F9B08741C...

Andrew Zappala Owner/Manager

The Commonwealth of Massachusetts
Alcoholic Beverages Control Commission

Licensing Authority Certification

Municipality: Andover

ABCC Commission Decision

APPROVED

Ralph Sacramone

Ralph Sacramone
Executive Director

Date of Commission Decision: 02/01/2023

License Information:

Applicant Name/DBA:	MP GOLF LLC / MATCHPLAY GOLF AND SPORTS LOUNGE	License Number (if applicable):	07336-RS-0026
Premises Address:	209 North Main Street Andover MA 01810	Record Number:	2022-001106-RT-APP
Manager Name:	ANDREW ZAPPALA		
Class:	Annual	Granted Under Special Legislation?	Yes ○ No ⊙
Category:	All Alcoholic Beverages		
On / Off Premises:	On-Premises Consumption	Is there a pledge on this license?	Yes ○ No ⊙
Type:	Restaurant	Is this license under a management agreement?	Yes ○ No ⊙

Transaction Type:

New/Transfer License: New

Application Contact:

Name: ANDREW ZAPPALA	Title: Manager	Phone: (978) 771-4016	Email: ZAPPALATENNIS@GMAIL.COM

TOWN OF ANDOVER

Town Offices
Planning Division
36 Bartlet Street
Andover, MA 01810
(978) 623-8650

July 11, 2023

Re: Riverside Woods, Unit 404, Affordable Unit Right of First Refusal

Dear Select Board,

When an affordable unit becomes available for resale, in some circumstances, the Town of Andover has the Right of First Refusal. An affordable unit at Riverside Woods, will become available this month, at a calculated price (based on 80% area median income) and listed for sale for $182,500. It is a one-bedroom and one bathroom unit.

It is recommended that we try to find an eligible buyer for the unit instead of exercising the Town's Right of First Refusal. There are two reasons for this, one there are not sufficient funds in the Housing Trust Fund account and two, the Town has been successful working with Andover Community Trust (ACT) and the Department of Housing and Community Development (DHCD) to find an eligible buyer in all cases.

If the Select Board votes to <u>not</u> exercise it's Right of First Refusal, Andover Community Trust will begin marketing the unit to households that meet the following criteria:

- *Households with income less than 80% AMI*
  1 person - $66,300 2 people - $75,750
- *Maximum Household Liquid Asset Limit $275,000 (includes equity from home sale and other assets)*
- *At least 1 applicant must be over the age of 62 (and the remaining household member must be over the age of 18).*
- *The buyer does not have to be a first-time buyer.*

If you have any questions, feel free to reach out anytime.

Sincerely,

Lisa Schwarz

Lisa Schwarz, AICP

TOWN OF ANDOVER

TOWN CLERK'S OFFICE

36 Bartlet Street
Andover, MA 01810
978-623-8230
www.andoverma.gov

SPECIAL ONE DAY LIQUOR LICENSE FOR AN OUTDOOR EVENT ON TOWN PROPERTY

APPLICATION

BUSINESS/ORGANIZATION INFORMATION	
BUSINESS/ORGANIZATION NAME:	ANDOVER RECREATION
BUSINESS/ORGANIZATION ADDRESS:	36 BARTLET ST. ANDOVER, MA
IS THIS A BUSINESS OR NON PROFIT ORGANIZATION?	☐ BUSINESS ☑ NON PROFIT ORGANIZATION
SOCIAL SECUIRTY/FID #:	[redacted]
INDIVIDUAL APPLICANT INFORMATION *(THIS INFORMATION IS REQUIRED FOR ALL APPLICATIONS)*	
NAME:	KIERNAN HOPKINS
ADDRESS	36 BARTLET ST. ANDOVER (WORK)
PHONE:	978-623-8348
EMAIL:	KIERNAN.HOPKINS@ANDOVERMA.US
DRIVER'S LICENSE #/STATE OF ISSUE:	[redacted]
DATE OF BIRTH:	
EVENT INFORMATION	
DATE OF EVENT:	JULY 22, 2023
TIME:	Start Time 9 : 00 ☑ AM ☐ PM End Time 5 : 00 ☐ AM ☑ PM
PURPOSE OF EVENT:	FUNDRAISER
LOCATION OF LICENSED ACTIVITY:	147 ABBOT ST. ANDOVER, MA
DESCRIPTION OF OUTDOOR AREA:	PICKLEBALL COURTS BASEBALL/SOFTBALL DIAMOND

Oak & Iron Beer Garden @ Rec Park

Andover Unified Pickle Ball Classic

Security Plan

Controlling Access to Alcohol

- 1 ID station
- Proper ID, right hand stamp
- Server checks for stamp before serving
- "one stamp – one beer"

Controlling Unruly Customers

- Highly unlikely (audience, time of day, nature of event)
- Servers TIPS trained
- Julie and Jim @ serving station
- If needed, call police

Provisions for Crowd Control

- ID Checker manage inflow of people per Jim & Julie direction

Emergency Evacuation

- Alcohol perimeter easily pushed over
- Pop up tents easily removed
- Rear supply chain entrance easily expanded

TOWN OF ANDOVER
ORDER OF TAKING
TEMPORARY AND PERMANENT EASEMENTS
168 GREENWOOD ROAD

WHEREAS, THE INHABITANTS OF THE TOWN OF ANDOVER voted by a 2/3 vote declared by the Moderator, to approve a motion made under Article 26 at the Annual Town Meeting on May 2, 2023 to approve the Taking by Eminent Domain of Easements related to the Ledge Road Landfill:

NOW, THEREFORE, the Select Board of the Town of Andover, acting pursuant to the authority granted to it by the aforesaid vote of the Town Meeting, and in accordance with the provision of Massachusetts General Laws, Chapter 79 and all other power and authority to it granted or implied, **DOES HEREBY TAKE BY EMINENT DOMAIN IN FEE SIMPLE**, for the purposes set forth in said vote of the Town Meeting, a temporary construction easement and a permanent easement on the property known as 168 Greenwood Road, which easements are described as follows:.

PERPETUAL EASEMENT

In addition to, and not in limitation of, the rights granted in the Order of Taking by the Inhabitants of the Town of Andover dated April 24, 1972 and recorded with North Essex District Registry of Deeds in Book 1191, Page 656, the perpetual right and easement to locate, relocate, erect, construct, reconstruct, install, lay, dig up, operate, maintain, patrol, inspect, repair, replace, alter, change the location of, extend or remove one or more pipes for the drainage of surface water and all necessary and proper conduits, conductors, pipes, foundations, fittings, and fixtures and other apparatus, equipment and fixtures deemed necessary for the purposes specified above, as the Town of Andover may from time to time desire along, upon, under and across the land at 168 Greenwood Road located within the land shown as the area marked "50' Wide Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger, former Boston & Maine R.R. Layout, Map 148, Lot 13," on Plan of Land entitled: "Plan of Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger to Inhabitants of the Town of Andover, Massachusetts, Scale 1" = 40', March, 1972, John Avery, Jr., Town Engineer," recorded with North Essex District Registry of Deeds as Plan No. 6590 ("Easement Area"), and also shown on Land Court Plan No. 35854B as "Inhabitants of the Town of Andover Drain Easement."

This taking includes the perpetual right and easement at any time and from time to time and without any further payment therefor to cut and trim trees, brush, overhanging branches and other obstructions on said strip of land to the extent that the Town of Andover deems necessary to clear and keep clear and operate safely the said pipes; and the right to enter said Easement Area for access thereto for all the above purposes.

Such drainage pipe or pipes and each and every part thereof, whether fixed to the realty or not, shall be and remain the property of the Town of Andover.

TEMPORARY EASEMENT

The right and easement along, upon, above, under and across the Easement Area described above for the purpose of bringing and placing on said Easement Area all construction materials, personnel, tools, equipment, vehicles and appliances necessary to remove and dispose of waste located within the temporary construction easement area; without limitation, construct landfill features on Town of Andover property proximate to the Easement Area including but not limited to the landfill cap anchor trench, detention basins, berms, swales, landfill gas collector trench, landfill gas monitoring wells, and plantings; access other land of the Town of Andover property from the landfill property adjacent to the Easement area, transport arsenic-impacted and other wetland soils across the Easement Area from land of the Town of Andover west of the Easement Area to the landfill for disposal, and the right and easement to cut and trim trees, brush, overhanging branches and other obstructions to the extent that the Grantee deems necessary, and the right to enter said Easement Area for access thereto for all the above purposes.

This temporary construction easement shall automatically terminate and be of no further force or effect at such time as the Massachusetts Department of Environmental Protection accepts the Certification of the Landfill Closure, and the accepted Certification is recorded at the Registry of Deeds.

No damages are being paid for this taking. The Easement Area described in this Order of Taking is the same Easement Area shown on Plan No. 17559 recorded with the North Essex District Registry of Deeds and on Plan No. 6590 referenced herein which was the subject of the Order of Taking recorded with the North Essex District Registry of Deeds in Book 1191, Page 656.

Parties in Interest

Dipankar and Sonal Biswas
168 Greenwood Road
Andover, MA 01810, Owners
Book 15535, Page 78

Hanscom Federal Credit Union, Mortgagee
Book 16390, Page 295.

The Select Board of the Town of Andover, on behalf of the Inhabitants of the Town of Andover, having been duly authorized by vote of the Town of Andover Town Meeting and the Select Board, hereby execute this Taking on this day of , 2023.

THE INHABITANTS OF THE
TOWN OF ANDOVER
By its Select Board,
Having been duly authorized,

_____
Melissa Danisch, Select Board Chair

_____
Laura M. Gregory

_____
Christian C. Huntress

_____
Annie Gilbert

_____
Alexander J. Vispoli

COMMONWEALTH OF MASSACHUSETTS

Essex, SS. **, 2023**

On this day of , 2023, before me, the undersigned notary public, personally appeared Melissa Danisch, Laura M. Gregory, Christian C. Huntress, Annie Gilbert and Alexander J. Vispoli, members of the Town of Andover Select Board who are personally known to me and who are the persons whose names are signed on the preceding document, and acknowledged to me that they signed it voluntarily for its stated purpose, as duly authorized by vote of the Select Board of the Town of Andover.

_____
Notary Public
My Commission Expires:

TOWN OF ANDOVER
ORDER OF TAKING
TEMPORARY AND PERMANENT EASEMENTS
170 GREENWOOD ROAD

WHEREAS, THE INHABITANTS OF THE TOWN OF ANDOVER voted by a 2/3 vote declared by the Moderator, to approve a motion made under Article 26 at the Annual Town Meeting on May 2, 2023 to approve the Taking by Eminent Domain of Easements related to the Ledge Road Landfill:

NOW, THEREFORE, the Select Board of the Town of Andover, acting pursuant to the authority granted to it by the aforesaid vote of the Town Meeting, and in accordance with the provision of Massachusetts General Laws, Chapter 79 and all other power and authority to it granted or implied, **DOES HEREBY TAKE BY EMINENT DOMAIN IN FEE SIMPLE**, for the purposes set forth in said vote of the Town Meeting, a temporary construction easement and a permanent easement on the property known as 170 Greenwood Road, which easements are described as follows:.

PERPETUAL EASEMENT

In addition to, and not in limitation of, the rights granted in the Order of Taking by the Inhabitants of the Town of Andover dated April 24, 1972 and recorded with North Essex District Registry of Deeds in Book 1191, Page 656, the perpetual right and easement to locate, relocate, erect, construct, reconstruct, install, lay, dig up, operate, maintain, patrol, inspect, repair, replace, alter, change the location of, extend or remove one or more pipes for the drainage of surface water and all necessary and proper conduits, conductors, pipes, foundations, fittings, and fixtures and other apparatus, equipment and fixtures deemed necessary for the purposes specified above, as the Town of Andover may from time to time desire along, upon, under and across the land at 170 Greenwood Road located within the land shown as the area marked "50' Wide Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger, former Boston & Maine R.R. Layout, Map 148, Lot 13," on Plan of Land entitled: "Plan of Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger to Inhabitants of the Town of Andover, Massachusetts, Scale 1" = 40', March, 1972, John Avery, Jr., Town Engineer," recorded with North Essex District Registry of Deeds as Plan No. 6590 ("Easement Area"), and also shown on Land Court Plan No. 35854B as "Inhabitants of the Town of Andover Drain Easement."

This taking includes the perpetual right and easement at any time and from time to time and without any further payment therefor to cut and trim trees, brush, overhanging branches and other obstructions on said strip of land to the extent that the Town of Andover deems necessary to clear and keep clear and operate safely the said pipes; and the right to enter said Easement Area for access thereto for all the above purposes.

Such drainage pipe or pipes and each and every part thereof, whether fixed to the realty or not, shall be and remain the property of the Town of Andover.

TEMPORARY EASEMENT

The right and easement along, upon, above, under and across the Easement Area described above for the purpose of bringing and placing on said Easement Area all construction materials, personnel, tools, equipment, vehicles and appliances necessary to remove and dispose of waste located within the temporary construction easement area; without limitation, construct landfill features on Town of Andover property proximate to the Easement Area including but not limited to the landfill cap anchor trench, detention basins, berms, swales, landfill gas collector trench, landfill gas monitoring wells, and plantings; access other land of the Town of Andover property from the landfill property adjacent to the Easement area, transport arsenic-impacted and other wetland soils across the Easement Area from land of the Town of Andover west of the Easement Area to the landfill for disposal, and the right and easement to cut and trim trees, brush, overhanging branches and other obstructions to the extent that the Grantee deems necessary, and the right to enter said Easement Area for access thereto for all the above purposes.

This temporary construction easement shall automatically terminate and be of no further force and effect at such time as the Massachusetts Department of Environmental Protection accepts the Certification of the Landfill Closure, and the accepted Certification is recorded at the Registry of Deeds.

No damages are being paid for this taking. The Easement Area described in this Order of Taking is the same Easement Area shown on Plan No. 17559 recorded with the North Essex District Registry of Deeds and on Plan No. 6590 referenced herein which was the subject of the Order of Taking recorded with the North Essex District Registry of Deeds in Book 1191, Page 656.

Parties in Interest

Anastasia Driscoll and
Jessica A. Valkenburg
170 Greenwood Road
Andover, MA 01810, Owners
Book 15352, Page 240

Mortgage Electronic Registration Systems, Mortgagee
Book 15352, Page 242.

Bank of America, N.A., Mortgagee
Book 15862, Page 244.

The Select Board of the Town of Andover, on behalf of the Inhabitants of the Town of Andover, having been duly authorized by vote of the Town of Andover Town Meeting and the Select Board, hereby execute this Taking on this day of , 2023.

THE INHABITANTS OF THE
TOWN OF ANDOVER

By its Select Board,
Having been duly authorized,

_____
Melissa Danisch, Select Board Chair

_____
Laura M. Gregory

_____
Christian C. Huntress

_____
Annie Gilbert

_____
Alexander J. Vispoli

COMMONWEALTH OF MASSACHUSETTS

Essex, SS. **, 2023**

On this day of , 2023, before me, the undersigned notary public, personally appeared Melissa Danisch, Laura M. Gregory, Christian C. Huntress, Annie Gilbert and Alexander J. Vispoli, members of the Town of Andover Select Board who are personally known to me and who are the persons whose names are signed on the preceding document, and acknowledged to me that they signed it voluntarily for its stated purpose, as duly authorized by vote of the Select Board of the Town of Andover.

_____
Notary Public
My Commission Expires:

TOWN OF ANDOVER
ORDER OF TAKING
TEMPORARY AND PERMANENT EASEMENTS
172 GREENWOOD ROAD

WHEREAS, THE INHABITANTS OF THE TOWN OF ANDOVER voted by a 2/3 vote declared by the Moderator, to approve a motion made under Article 26 at the Annual Town Meeting on May 2, 2023 to approve the Taking by Eminent Domain of Easements related to the Ledge Road Landfill:

NOW, THEREFORE, the Select Board of the Town of Andover, acting pursuant to the authority granted to it by the aforesaid vote of the Town Meeting, and in accordance with the provision of Massachusetts General Laws, Chapter 79 and all other power and authority to it granted or implied, **DOES HEREBY TAKE BY EMINENT DOMAIN IN FEE SIMPLE**, for the purposes set forth in said vote of the Town Meeting, a temporary construction easement and a permanent easement on the property known as 172 Greenwood Road, which easements are described as follows:.

PERPETUAL EASEMENT

In addition to, and not in limitation of, the rights granted in the Order of Taking by the Inhabitants of the Town of Andover dated April 24, 1972 and recorded with North Essex District Registry of Deeds in Book 1191, Page 656, the perpetual right and easement to locate, relocate, erect, construct, reconstruct, install, lay, dig up, operate, maintain, patrol, inspect, repair, replace, alter, change the location of, extend or remove one or more pipes for the drainage of surface water and all necessary and proper conduits, conductors, pipes, foundations, fittings, and fixtures and other apparatus, equipment and fixtures deemed necessary for the purposes specified above, as the Town of Andover may from time to time desire along, upon, under and across the land at 172 Greenwood Road located within the land shown as the area marked "50' Wide Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger, former Boston & Maine R.R. Layout, Map 148, Lot 13," on Plan of Land entitled: "Plan of Drainage Easement, George H. Belanger, Jr. and Ida M. Belanger to Inhabitants of the Town of Andover, Massachusetts, Scale 1" = 40', March, 1972, John Avery, Jr., Town Engineer," recorded with North Essex District Registry of Deeds as Plan No. 6590 ("Easement Area"), and also shown on Land Court Plan No. 35854B as "Inhabitants of the Town of Andover Drain Easement."

This taking includes the perpetual right and easement at any time and from time to time and without any further payment therefor to cut and trim trees, brush, overhanging branches and other obstructions on said strip of land to the extent that the Town of Andover deems necessary to clear and keep clear and operate safely the said pipes; and the right to enter said Easement Area for access thereto for all the above purposes.

Such drainage pipe or pipes and each and every part thereof, whether fixed to the realty or not, shall be and remain the property of the Town of Andover.

TEMPORARY EASEMENT

The right and easement along, upon, above, under and across the Easement Area described above for the purpose of bringing and placing on said Easement Area all construction materials, personnel, tools, equipment, vehicles and appliances necessary to remove and dispose of waste located within the temporary construction easement area; without limitation, construct landfill features on Town of Andover property proximate to the Easement Area including but not limited to the landfill cap anchor trench, detention basins, berms, swales, landfill gas collector trench, landfill gas monitoring wells, and plantings; access other land of the Town of Andover property from the landfill property adjacent to the Easement area, transport arsenic-impacted and other wetland soils across the Easement Area from land of the Town of Andover west of the Easement Area to the landfill for disposal, and the right and easement to cut and trim trees, brush, overhanging branches and other obstructions to the extent that the Grantee deems necessary, and the right to enter said Easement Area for access thereto for all the above purposes.

This temporary construction easement shall automatically terminate and be of no further force and effect at such time as the Massachusetts Department of Environmental Protection accepts the Certification of the Landfill Closure, and the accepted Certification is recorded at the Registry of Deeds.

No damages are being paid for this taking. The Easement Area described in this Order of Taking is the same Easement Area shown on Plan No. 17559 recorded with the North Essex District Registry of Deeds and on Plan No. 6590 referenced herein which was the subject of the Order of Taking recorded with the North Essex District Registry of Deeds in Book 1191, Page 656.

Parties in Interest

Hung Noc Nguyen
172 Greenwood Road
Andover, MA 01810, Owner
Book 16285, Page 157

Mortgage Electronic Registration Systems, Mortgagee
Book 16945, Page 95.

The Select Board of the Town of Andover, on behalf of the Inhabitants of the Town of Andover, having been duly authorized by vote of the Town of Andover Town Meeting and the Select Board, hereby execute this Taking on this day of , 2023.

THE INHABITANTS OF THE
TOWN OF ANDOVER
By its Select Board,
Having been duly authorized,

_____
Melissa Danisch, Select Board Chair

_____
Laura M. Gregory

_____
Christian C. Huntress

_____
Annie Gilbert

_____
Alexander J. Vispoli

COMMONWEALTH OF MASSACHUSETTS

Essex, SS. **, 2023**

On this day of , 2023, before me, the undersigned notary public, personally appeared Melissa Danisch, Laura M. Gregory, Christian C. Huntress, Annie Gilbert and Alexander J. Vispoli, members of the Town of Andover Select Board who are personally known to me and who are the persons whose names are signed on the preceding document, and acknowledged to me that they signed it voluntarily for its stated purpose, as duly authorized by vote of the Select Board of the Town of Andover.

_____
Notary Public
My Commission Expires:

Town of Andover

Climate Action & Sustainability Plan

SUSTAINABLE ANDOVER

June 2023

Table of Contents

Cover page image: "Climate Change Vision," artwork by Sean Kim, Pike School

Land Acknowledgement

We open by respectfully acknowledging that we collectively gather on the territory of many Indigenous peoples, who have stewarded this land for hundreds of generations.

With gratitude to the Andover Center for History & Culture for their guidance, we acknowledge the harmful effect colonization and violent systemic and cultural inequities have had on our understanding of Indigenous identity and terminology.

Andover was home to the Pennacook people as early as 6000 BCE, and we honor their past, present, and emerging leaders.

Land Acknowledgments are a small, but essential, step towards building a culture of respect, truth, and accountability.

Acknowledgements

Steering Committee
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title

Town of Andover
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title

Weston & Sampson
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title
Name, Title

Town Hall in Snow. Photo by Kate Margolese

Foreword

Letter placeholder here. Will add actual text and headshot at left. Ur? Ipis eossunt laut doluptas minvellabo. Volut eum, nos que sum re, sitatia tempor aut elitinc illibus ciist, officimaio odi quos consequo qui nossunt invendelicia dolum faccuptasi ratibea quideli quidit ad et odiam, commole stiaturepro te quid maio dolorro omnit fugiam qui dolorepedi quat pos dolorae nus moluptas rectis mod ex es dolo molor sin consequi que nobis que re dolenim usanda consedi tatureseqUo ilitas eum, et mod et inihit ea sitam eatis aut arum quid quature odi odignat ioriorerae et estia nonsed maios qui beat estemquo ius, te pa cone seque nobis ipsusdam, non rat vit omnimin prest volorro et lis moloribus et officit debit faccae lacepro vitatium audio. Laborerum lab illuptatis eratur maio temporum et ressitatecti odipit, cus di volorerum quidi sit ilianti aditatur, odita vellece prepudam que eum esecat aribus resto vendios simagnatem hicae pe cus que necuptatur? Ad qui que veriberum doluptae. Itat.

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Our personal protective equipment for the long emergency ahead depends on recognizing our interconnection. Emotional intelligence, practices to stretch the window of tolerance, the ability to sit with uncertainty, the dexterity to balance hope and fear, a commitment to not narratively foreclose the future, the belief that our actions are meaningful, an embracing of ambivalence, and a connection to a strong community that acts together to care for itself—all of these skills appear in the tool kit for surviving and thriving in the years to come.

— Britt Wray, PhD, Generation Dread: Finding Purpose in an Age of Climate Crisis, Alfred A. Knopf, Canada, Kindle, 233. Provided by Committee Member, Dennis Richards

Letter from the Steering Group

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Introduction

Andover's first Climate Action and Sustainability Plan is informed by our residents and businesses, our shared values, and science. This plan builds upon significant climate work in town and shares how we as a community can equitably reduce our greenhouse gas emissions and live in a more sustainable community. Andover is home to **more than 36,000 residents** and a wide range of businesses from local shops and restaurants to multinational corporations. As a desirable place to live and work, we need to be prepared for the changing climate and actively work to reduce our greenhouse gas emissions. With Andover's unique attributes including the large commercial and industrial sectors, vast natural resources, and passionate residents, the community has both challenges and opportunities for climate adaptation and mitigation that differ from its neighbors.

This Climate Action and Sustainability Plan will serve as a comprehensive roadmap for taking climate action and building resilience, while aligning with regional and statewide efforts. Achieving net-zero emissions and preparing for the future will require a collaborative effort from the municipality, residents, businesses, and community groups.

Step it Up Andover. Photo by Kate Margolese

Mission Statement

The Town of Andover will meet the State's net-zero emissions mandate by 2050 along with the interim targets for 2030 and 2040. We envision a community that equitably supports economic, social and sustainable growth. We welcome new neighbors and businesses and embrace the cultural richness of Andover's history and its people.

By making transformative changes in reducing energy use, promoting renewable energy adoption, implementing sustainable and health-conscious construction practices for new and existing buildings, advocating for electrical vehicle adoption, as well as shaping a respectful relationship with our environment and natural resources, Andover will reduce greenhouse gas emissions while promoting sustainable growth. Through improved infrastructure, zoning, policies, education, and communication, the town will enjoy a more resilient future.

Guiding Principles

Andover's climate adaptation and mitigation actions will be guided by four key principles. These principles are resilience, equity, justice, and collaboration.

Resilience

Resilience is defined as the capacity of individuals, communities, businesses, institutions, and governments to adapt to changing conditions and to prepare for, withstand, and rapidly recover from disruptions to everyday life, such as hazard events.[1] Climate change remains shrouded in uncertainties, making climate resilience an exceptionally important concept to consider when developing a path forward for the Andover Community. Hazard events are likely to become more frequent and more severe (refer to XX Climate Impacts). The Town of Andover should aim to not only survive these events but thrive even in the face of uncertainty. Integrating resilience into climate action strategies can help the Town be better prepared for changing conditions.

Equity

As the Town of Andover considers climate adaptation and mitigation strategies, it must also consider equity. Equity is the consistent and systematic fair, just, and impartial treatment of all individuals.[1] Climate adaptation and mitigation strategies must serve and protect all members of the Andover community, especially those who have been historically underserved or underrepresented. Andover must strive to cultivate an atmosphere of inclusion and representation, and to implement practices that support equitable participation in local planning. Implementation of climate actions and resilience strategies should also be done in an equitable manner so that all Andover residents—regardless of their race, ethnicity, color, gender, age, sexuality, national origin, ability, or income—can experience the benefits and avoid additional burdens in the transition to a more sustainable Andover.

Justice

Justice, specifically environmental justice (EJ), is the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment. EJ is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits.[2] Environmental justice will be achieved when no group endures disproportionate impacts from climate change or environmental hazards when compared to other groups. Climate change is already having disproportionate impacts on those who have contributed to its causes the least. The Town of Andover aims to dismantle this injustice and prevent it from persisting within the community. Keeping environmental justice at the forefront of discussions surrounding climate adaptation and mitigation strategies will ensure that all needs of the community are met in an equitable way. Andover has one Environmental Justice Population designated by the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) in which the minority population is 49.3% of the neighborhood (by census block groups).[3]

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1 Definition from the Federal Emergency Management Agency

2 Definition from the Massachusetts Executive Office of Energy and Environmental Affairs

3 Massachusetts 2022 Environmental Justice Populations https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations

Ballardvale Dam on The Shawsheen River. June 23, 2023. Photo by Jon Unger

Collaboration

Achieving decarbonization, resilience, equity, and justice cannot be accomplished in isolation. Implementing resilient, equitable, and just climate adaptation and mitigation strategies will take the combined efforts of Town departments, community groups, businesses, non-profits, and individuals. Not only will it be important to collaborate within the Town of Andover, but it will also be important to coordinate efforts with neighboring towns and communities, and align with statewide efforts. Increased collaboration increases the chances of successful and effective implementation of climate adaptation and mitigation strategies.

The development of the Climate Action and Sustainability Plan coincided with the development of the Master Plan and the Community Health Plan, both of which support climate adaptation and mitigation efforts for a more sustainable Andover. The Master Plan includes an Environmental Sustainability section with goals regarding sustainable development, alternative and electric transportation, and residential and commercial climate action that are closely aligned with actions described in this plan. The Community Health Plan includes priorities and objectives related to building a sense of community and improving access to health resources, housing, and alternative transportation. The Town's Active Transportation Plan is also underway and will develop a long-term vision and plan for enhancing pedestrian/bicycling movement throughout town. This will include safety and infrastructure improvements, Complete Streets funding opportunities, reduced reliance on vehicles, and an improved sense of community.

Continued collaboration is needed to implement the actions and recommendations in all of these plans to make Andover a more sustainable community to live and work in.

Greenhouse Gas Emissions

Carbon dioxide, methane, nitrous oxide, and other fluorinated gases are considered greenhouse gases (GHGs). These gases are released naturally, however, human-caused activities, such as burning fossil fuels to power buildings and vehicles, trap heat and cause the planet to warm. The rate at which GHG emissions are being produced has accelerated and is leading to long-term shifts in temperatures and weather patterns.

To understand Andover's contributions to climate change, a baseline greenhouse gas emissions inventory was conducted. This is the first step in tracking progress toward emissions reductions and net-zero goals. By using science-based data we can make more informed decisions and better prioritize high impact actions to mitigate climate change.

The emissions baseline was developed for 2017, consistent with other communities including Arlington, Natick, and Melrose. This year was selected because it is fairly recent, but independent of the 2018 Columbia Gas incident and COVID-19. Additional inventories will be conducted in future years and compared with the baseline to assess progress toward reducing these emissions.

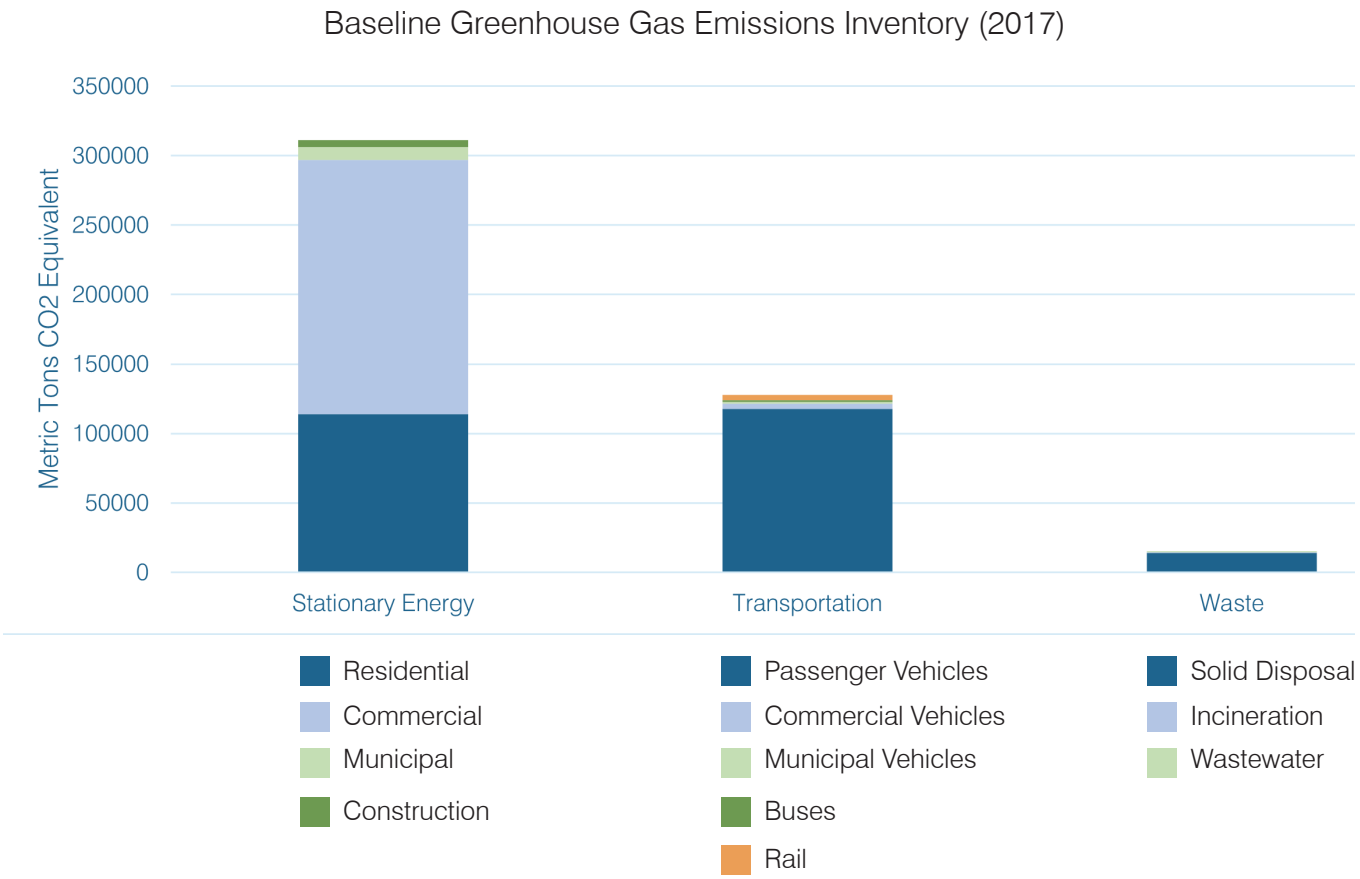
The inventory was conducted following the guidance provided with the Metropolitan Area Planning Council's (MAPC) GHG Inventory Tool and used a combination of municipal data and publicly available data from entities such as Mass Save, MAPC, U.S. Census, etc. The inventory includes:

Stationary:
Electricity and fossil fuel usage from all buildings in Andover plus off-road equipment fuel usage

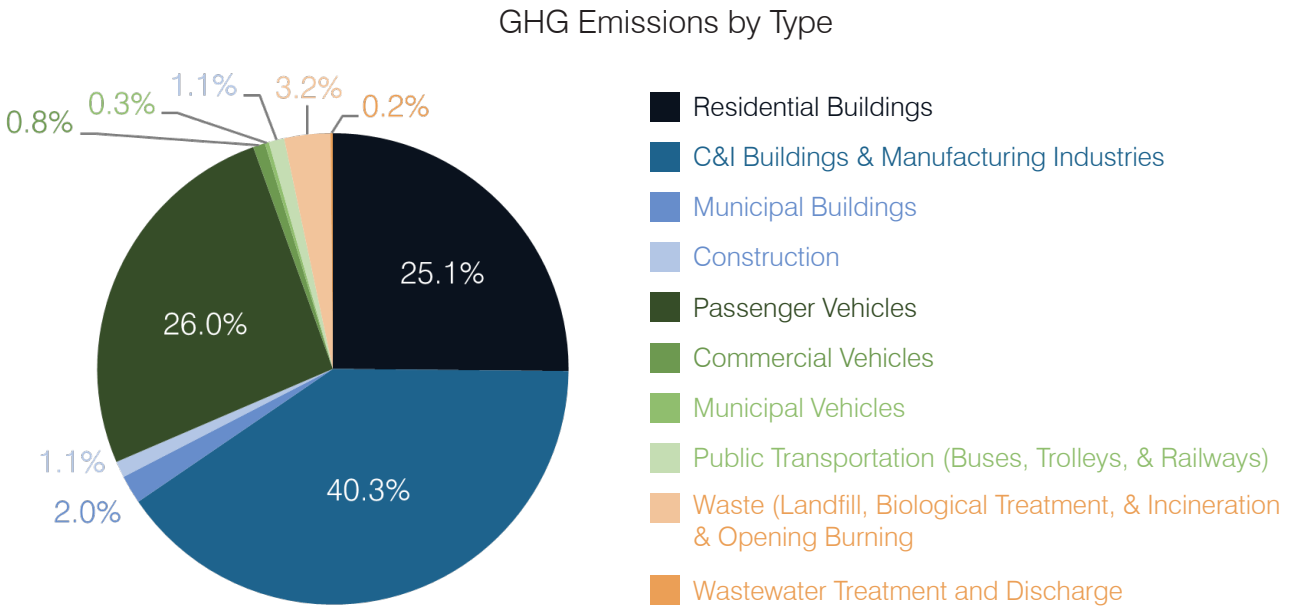
Transportation:
All vehicles registered in Andover plus the portion of Massachusetts Bay Transit Authority (MBTA) systems used in Andover

Waste:
All waste and wastewater disposed by Andover

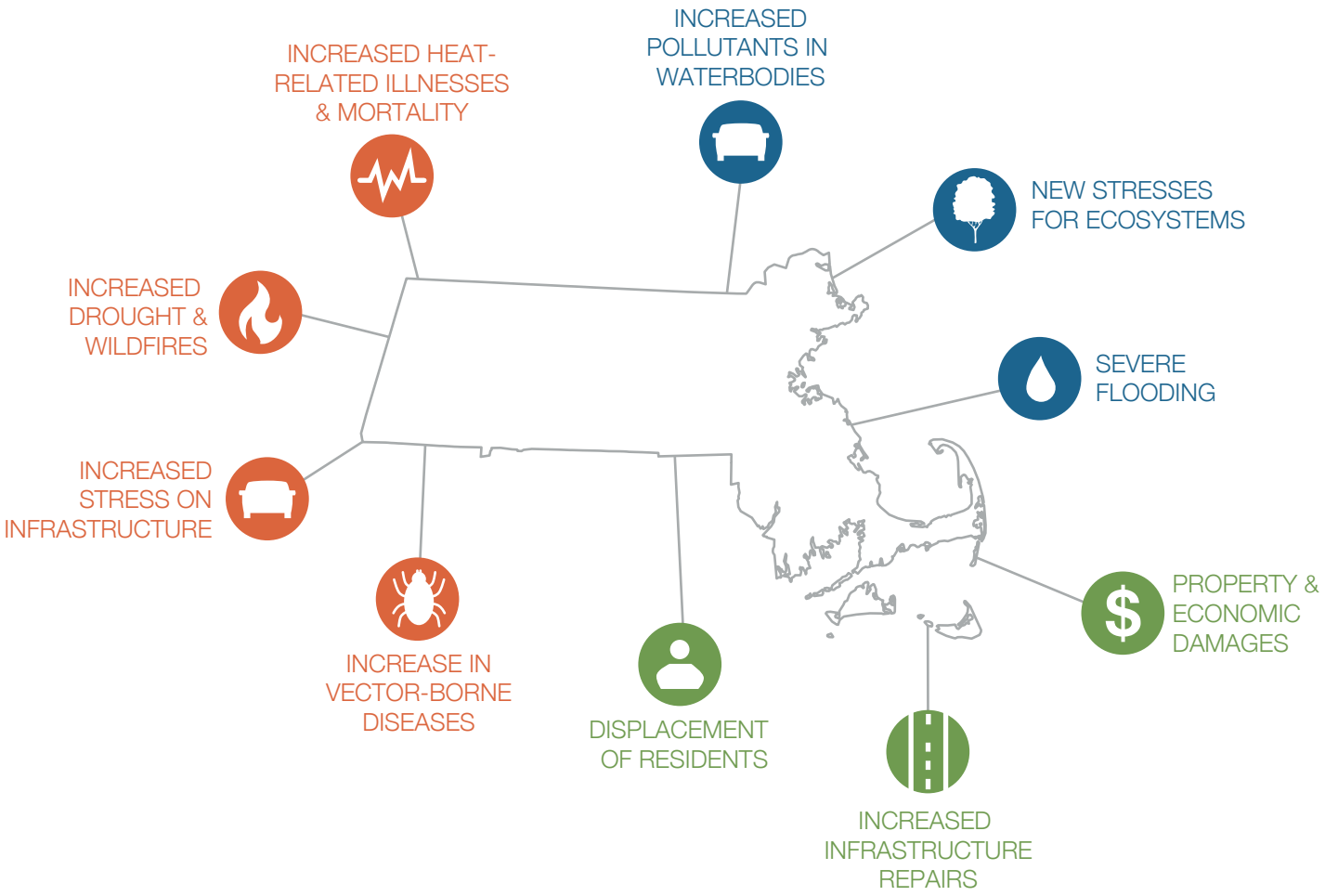
The community as a whole, including residents, businesses, and the municipality, were responsible for emitting **453,779 metric tons of carbon dioxide equivalent (MTCO2e) in 2017.** This is equivalent to **12 MTCO2e per resident.**



The three largest portions of Andover's emissions include commercial/industrial buildings (40.3%), residential buildings (25.1%), and passenger vehicles (26.0%). The emissions associated with municipal buildings and vehicles represent only a small fraction of the total emissions at 2.3%. Given this distribution, actions that help residents and businesses transition to more sustainable alternatives can have considerable emissions reductions, while the Town can lead by example in decarbonizing its own operations.



Climate Hazards & Impacts



By the end of the century, Andover and the surrounding region will experience between 28 and 46 days per year with temperatures over 90 degrees Fahrenheit. Compared to an average of only had 7 days between 1971 to 2000.

Total annual precipitation at century's end is projected to increase by as much as 18% above the 1971-2000 baseline of 45 inches.

Source: ResilientMA **https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/**

The Municipal Vulnerability Preparedness (MVP) Community Resilience Building process identified flooding, nor'easters, and extreme temperatures as the Town's top climate hazards of concern.

Impacts from Climate Hazards

Infrastructure:

Infrastructure including buildings, bridges, culverts, dams, sewer systems, water systems, storm drain lines, and power and communication networks are all vulnerable to extreme storm events, especially aging infrastructure. Additional maintenance and repair may be needed as normal climate conditions change.

Natural Resources:

The changing climate is expected to lead to increased growth of invasive species, reduction in biodiversity, and ecosystem disturbance.

Protecting existing natural resources continues to become more important as we rely on them for ecosystems services such as flood reduction, carbon sequestration, water and air purification, shade, etc.

Public Health and Safety:

Physical and behavioral health, including mental health, is likely to be impacted by climate change. Examples of the impacts include increased injuries and deaths including heat-related illnesses, increased health costs, increased vector- and water-borne diseases, reduced air quality, reduced recreation opportunities, limited access to emergency services and evacuation, respiratory diseases and asthma, increased allergens, reduced water and food quality, reduced air quality, etc.

Financial:

Cost of recovering from storm events, such as property damage and lost income, can be a burden to residents, businesses, and the Town. In addition to storm events, some sectors, such as agriculture and others that are highly dependent on natural resources, may be significantly impacted by the gradual change in climate, therefore leading to cascading impacts to consumers and communities.

Learn more about climate impacts in Andover from the **MVP Community Resilience Building Report**, Hazard Mitigation Plan (expected 2024) and from state resources such as **ResilientMA** and in the **Massachusetts Climate Change Assessment**.

Flooding

Andover residents and businesses have long been impacted by flooding. More recently, severe flooding was experienced in the spring of 2006 (Mother's Day Flood) and 2010. During the 2010 event, major roads were flooded, a sewer pump station failed, schools were closed, homes and businesses were damaged, and residents were evacuated including 115 older adults living at Atria Marland Place. Many locations were impacted by both the 2006 and 2010 events including the residents of Washington Park Condominiums.

Source: Hermes, Ann. March 17, 2020. Flooding Displaces Hundreds. Andover Townsman. **https://www.andovertownsman.com/news/flooding-displaces-hundreds/article_dbc18892-e2e4-5e38-b825-5f069abc9daa.html**

Extreme Heat

In the last several years, the Town has used municipal buildings as cooling centers during extreme heat events including the Memorial Hall Library in 2019 and the Robb Center in 2022.

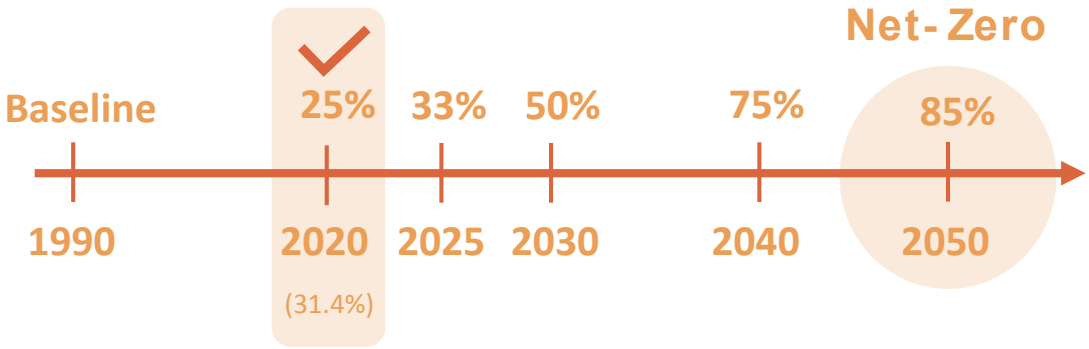
Flooding and damaged powerlines from Hurricane Edna in 1954 taken by Donald Look. Flooded area of Central Street looking toward Elm Street-Main Street Andover. Photo from the Andover Center for History & Culture

1936 Shawsheen flood. View of York Street with man in row boat. Photo from the Andover Center for History & Culture

Climate Action at the State Level

The Commonwealth of Massachusetts is taking action to address climate change impacts and contributions on numerous fronts, detailed in the **MA Decarbonization Roadmap** (2020) and the passing of the **Climate Act of 2021**, also known as An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy. The Climate Act of 2021 required the adoption of statewide goals to reduce greenhouse gas (GHG) emissions and sector-specific sublimits to progress toward interim emissions reduction goals, with the goal of achieving net-zero emissions by 2050.

The Commonwealth defines net-zero as "a level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level."[1]



The **Clean Energy and Climate Plan for 2025 and 2030**, published in June of 2022, built upon the modeling and analysis of the Decarbonization Roadmap with a greater focus on climate action through 2030. This plan outlines specific strategies, policies, and implementation goals and benchmarks for the Commonwealth to reduce emissions in a cost-effective and equitable manner, with a focus on efforts now through 2030 to achieve a 50% reduction of GHG emissions from the 1990 baseline.[2]

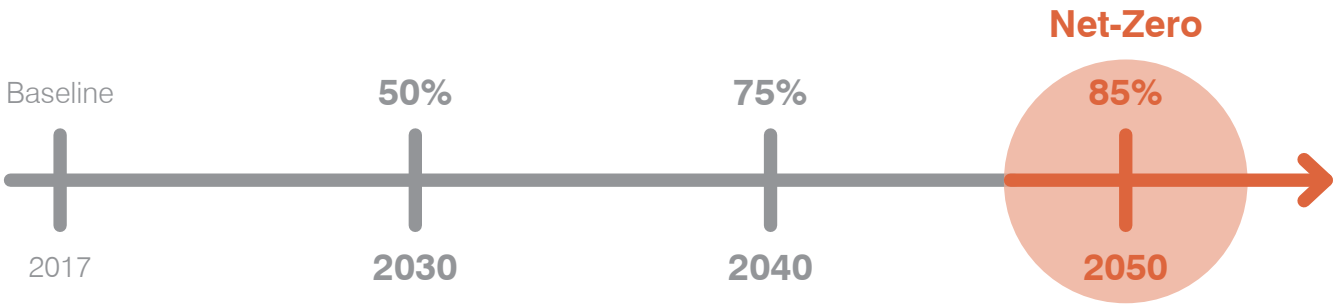
Given the commonwealth's ability to develop wide-reaching policy and facilitate the transition of larger scale infrastructure, this allows Andover to focus efforts locally while also experiencing benefits of state-wide action. One example of this relationship is the recent updates to the Stretch Energy Code, led by the Department of Energy Resources (DOER). As a stretch code community already, Andover's new buildings and qualified retrofits are subject to the new requirements for installation and/or prewiring of net-zero enabling technologies. This statewide action is helping communities decarbonize the building stock, therefore making progress on both statewide and Andover specific GHG emissions reduction goals.

1 **Determination of Statewide Emissions Limit for 2050**. April 22, 2020.
2 **Massachusetts Clean Energy and Climate Plan for 2025 and 2030**. June 30, 2022.

Andover's Climate Action Goals

In alignment with the goals adopted by the Commonwealth of Massachusetts to achieve net-zero by 2050, Andover has undertaken its own roadmap to incorporate the unique attributes of the town through this transition.

Andover aims to achieve net-zero emissions by 2050 which includes an 85% emissions reduction from the 2017 baseline. Interim goals include a 50% reduction and 75% reduction of emissions from the 2017 baseline by 2030 and 2040, respectively. The remaining 15% of emissions that may be unavoidable will be accounted for with natural carbon sequestration from lands such as forests and wetlands and additional carbon capture and storage with emerging technologies.



With an understanding of where Andover's emissions are coming from, 2030 and 2050 targets for measuring progress have been set to guide emissions reductions and resiliency improvements. These targets are action specific and summarized by sector in the Implementation Plan section.

Andover Community Garden on High Plain Road, June 2023. Photo by Jon Unger

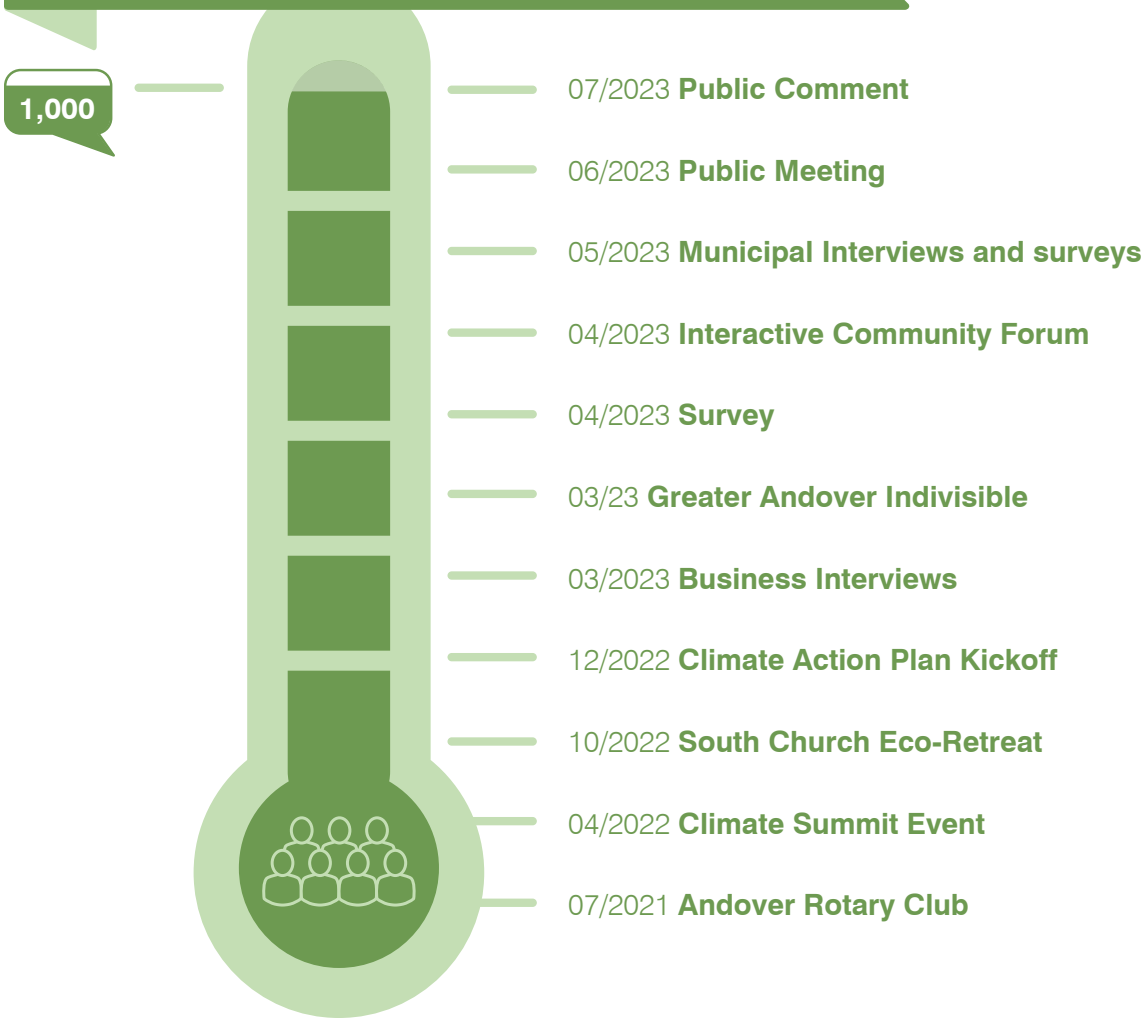
Andover staff and volunteers meet up at the Municipal Services Facility to make sure rain barrels are intact prior to distributing them to residents. Photographer: Amy Latva-Kokko

Plan Development

Andover has been taking action to reduce greenhouse gas emissions and improve sustainability and resilience in the last several years. By hiring a Sustainability Director in 2019, Andover improved its capacity to facilitate sustainable and resilient programs and policy initiatives. To further these efforts, the Climate Action and Sustainability Plan is designed to serve as a roadmap for meeting net-zero goals and better preparing the community for the future.

The development of this plan had nearly 1,000 touchpoints with community and municipal stakeholders. Over 450 residents, students, and businesses responded to the Climate Action and Sustainability Plan survey. This survey gathered information regarding concerns about climate change, current climate adaptation and mitigation strategies used, and barriers for further implementation.

Engagement with Stakeholders



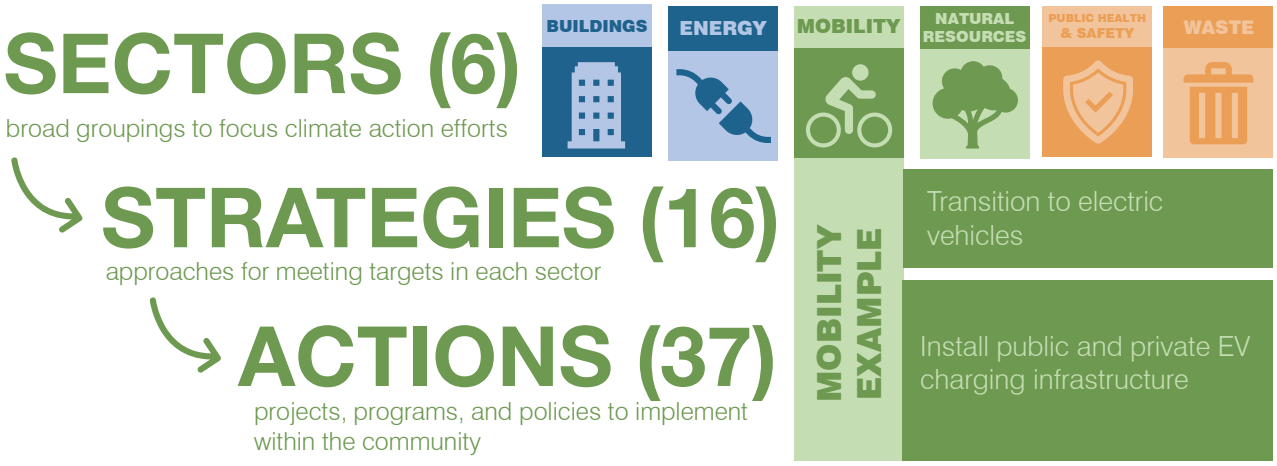
Four public meetings (two virtual, two in-person) were held during the course of the project to gather input on goal setting, engagement planning, action development, and implementation details. Municipal staff were also engaged virtually and during an in-person session to learn about the need for climate adaptation and mitigation, and how their department can be involved in facilitating action implementation.

The Climate Action Planning Steering Group, consisting of volunteer residents, regularly provided guidance throughout the project.

The actions proposed in this plan leverage existing efforts and identify new opportunities to improve resilience and reduce emissions within the Town government and the community. Actions were developed using a four-step approach which included:

1. Identification of past and on-going climate action and resilience efforts
2. Compilation of actions from community engagement (e.g., Climate Summit and Interactive Community Forum) and best practices used by other communities
3. Revision and prioritization of actions
4. Development of detailed plans for implementing actions

The plan is organized into sectors, strategies, and actions. Descriptions of each sector provide context as to why the strategies and actions within it are important for achieving net-zero emissions and building resilience.



Each of the 35 actions have a two-page implementation plan that details the action leader, supporting partners, key steps for implementation, ease of implementation, measures of success, timeframe, cost, possible funding sources, possible resilience or GHG emission reduction potential, co-benefits and equity considerations. This information provides a foundation for making progress toward each action.

See the next page for more information on how to read the plan.

Sector

Strategy

Action

Information on the sector, strategy, and action is listed at the top of the page

Action Description

Information about the action is described in narrative text

Key Steps for Implementation

Steps to achieve the action are listed chronologically

Action Lead

Supporting Partners

Information about department and organization involvement is listed in these rows

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

One of these boxes are checked, to indicate what is required

Measures of Success

Metrics that could be used to evaluate success are listed here

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

A legend is included to define key categories

Action Initiation Timeframe

Action initiation timeframe is shown on a sliding scale

Resilience Considerations

Co-Benefits & Equity Considerations

Resilience considerations, and co-benefits and equity considerations, are described in text

Cost

Cost is summarized in dollar signs

Possible Funding Sources

Possible funding sources are listed in text

Overview of the Plan

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Buildings

B-1 Construct Net-Zero, Low Embodied Carbon New Buildings

- B-1-1. Adopt the Specialized Stretch Energy Code
- B-1-2. Reduce embodied carbon in new buildings

B-2 Retrofit Existing Buildings to Use Less Energy & Renewable Energy

- B-2-1. Facilitate a residential electrification and energy efficiency program
- B-2-2. Facilitate a commercial and municipal electrification and energy efficiency program
- B-2-3. Develop a residential climate resilience strategy

Energy

E-1 Reduce Energy Use

- E-1-1. Educate commercial entities and municipal stakeholders on energy reduction
- E-1-2. Educate residents on energy reduction
- E-1-3. Partner with utilities to address gas leaks in supply infrastructure.

E-2 Transition to Renewable Energy

- E-2-1. Implement Municipal Aggregation (also known as Andover Community Power)
- E-2-1. Implement Municipal Aggregation (also known as Andover Community Power)
- E-2-3. Increase the amount of voluntary MA Class I Renewable Energy Certificates for municipal electricity procurement contracts.

E-3 Emphasize Energy Education from Kindergarten through the Trades

- E-3-1. Increase clean energy and climate change educational programming into K-12 school curriculum.
- E-3-2. Clean Energy Workforce and Apprenticeship Initiative

E-4 Enhance Energy Resilience

- E-4-1. Evaluate municipal facilities energy supplies and add power redundancy.

Mobility

M-1 Enable and Promote Alternative Transportation

- M-1-1. Implement Active Transportation Plan

M-2 Transition to Electric Vehicles

- M-2-1. Install EV charging infrastructure
- M-2-2. Transition public fleets to EVs

Public Health & Safety

PH-1 Protect residents, workers, and visitors in the event of natural disasters or public health crises

- PH-1-1. Explore meaningful ways to increase emergency communication with the community
- PH-1-2. Develop neighborhood resilience hubs to coordinate and maintain resident well-being

PH-2 Enhance municipal and community preparedness to respond to climate impacts

- PH-2-1. Develop public health approach to build mental wellness and resilience
- PH-2-2. Develop a vector-borne illnesses management and communications plan
- PH-2-3. Identify and assess hazardous material storage locations at risk from flooding

Natural Resources

NR-1 Enhance and protect the tree canopy

- NR-1-1. Develop a program to maintain and improve the municipal tree canopy.

NR-2 Advance the smart and efficient use of water

- NR-2-1. Identify and repair water distribution system leaks.
- NR-2-2. Promote residential water conservation practices

NR-3 Promote and Protect Andover's biodiversity and natural resources

- NR-3-1. Lead by example with municipal adoption of sustainable landscaping practices
- NR-3-2. Facilitate the use of sustainable landscaping practices in Andover
- NR-3-3. Provide education on the protection of biodiverse ecosystems in the community

NR-4 Minimize stormwater run-off

- NR-4-1. Minimize impervious surfaces throughout Andover
- NR-4-2. Install nature-based solutions pilot projects in areas vulnerable to flooding

NR-5 Prioritize wetlands in enhancing Andover's resilience to climate change

- NR-5-1. Make Andover's wetlands more resilient
- NR-5-2. Promote community awareness of wetlands importance

Mentor Susan Valenti and Intern Davena Halak with an Environmental Sustainability Internship Course (ESIC) poster. Photo provided by Melanie Cutler

Waste

W-1 Reduce and Divert Waste

- W-1-1. Enhance and update the trash and recycling collection program
- W-1-2. Develop an organics composting program
- W-1-3. Establish a Recycle and Reuse Drop-Off Site
- W-1-4. Ensure parallel trash and recycling collection service for multifamily residential

Composting area. Photo by Kate Margolese

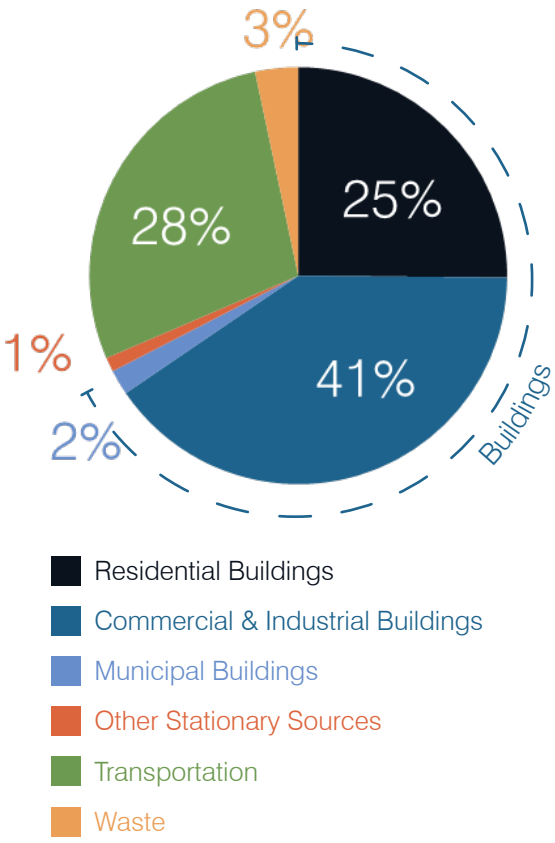
Recycling. Photo by Kate Margolese

Buildings

Climate resilient, net-zero buildings are essential for creating a more sustainable future. In Andover, buildings and the energy used to power operations occurring inside of them make up 67.4% of the total GHG emissions.

These GHG emissions can be reduced by combining energy efficiency with net-zero enabling technology. Energy efficiency improvements including weatherization, insulation, smart thermostats, lighting upgrades and controls, appliance upgrades, etc. can reduce energy consumption of buildings, therefore reducing greenhouse gas emissions. Incentives and rebates are available from a variety of organizations including Mass Save to help residents and businesses cost effectively implement energy retrofits. In 2021, Andover residents received $1,116,839 in electric incentives, and Andover's commercial and industrial entities received another $1,311,111 in electric incentives.[1] Emissions can also be reduced by transitioning heating, cooling, and other equipment that uses fossil fuels like natural gas or oil, to efficient, all-electric technologies such as air- and ground-source heat pumps. Electrification of building systems enables buildings to become net-zero as the electricity grid becomes more saturated with renewable energy sources.

Building Greenhouse Gas Emissions



The emissions included in the GHG inventory are also known as operational carbon emissions. Embodied carbon is defined by the Carbon Leadership Forum as, "the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials."[2] Andover does not yet measure its embodied carbon and aims to take initial steps to measure, bring awareness to, and reduce embodied carbon emissions. Material choices during the design process and improved building maintenance and repair or reuse are some examples of how embodied carbon emissions can be reduced.

Buildings of the future are being designed and constructed now so in order to meet net-zero goals in 2050, Andover's new buildings should be high performance, low embodied carbon, and net-zero ready to avoid the need to retrofit these buildings in the future.

1 Mass Save Data **https://www.masssavedata.com/Public/GeographicSavings?view=U**
2 Carbon Leadership Forum **https://carbonleadershipforum.org/embodied-carbon-101/**

Building strategies for Andover include:

B-1. Construct Net-Zero, Low Embodied Carbon New Buildings

B-2. Retrofit Existing Buildings to Use Less Energy and Renewable Energy

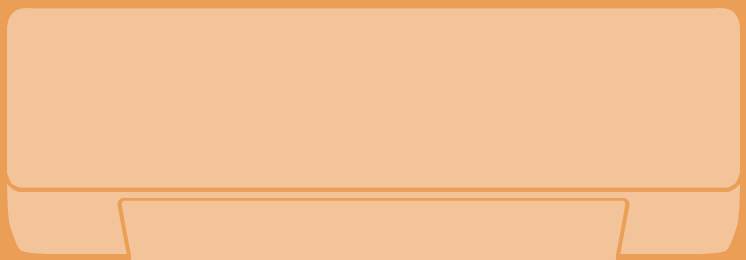
Building Targets

Action ID	Topic	Metric	2030 Target	2050 Target
B-1-1	New Buildings	% all electric new buildings	100%	100%
B-2-1	Existing Buildings	No. weatherizations installed/year	300	all homes insulated
B-2-1	Existing Buildings	No. heat pumps installed/year	200	all homes have heat pumps
B-2-1	Existing Buildings	% reduction in gas consumption	3%	80%
B-2-2	Existing Buildings	No. all-electric municipal buildings	2	8
B-2-2	Existing Buildings	% reduction in gas consumption	10%	50%

All homes will need to transition away from fossil fuel heating and cooling systems and improve energy efficiency. By engaging organizations that own or manage affordable housing, apartment complexes, and condominiums, the Town can advocate for deep energy retrofits and net-zero enabling technology to ensure everyone moves forward in the electrification transition. Additional resources and funding opportunities also exist for these types of housing and for low-income individuals and households, such as the **Mass Save Income Based Offers** like **Enhanced Residential Program** and **Income Eligible Program.**

Case Study

Buildings



All-Electric Efficient Air Source Heat Pumps

Environmental and health concerns over the continued use of fossil fuels, prompted us to choose to electrify as much of our home as we could. As our well maintained natural gas boilers began to age out, it was the perfect time to transition to **all-electric efficient air source heat pumps.**

Our first step was to increase the efficiency of our home through air sealing and insulating our building envelope. We installed ducts in our basement which service the HVAC needs of the first floor, and we installed floor mounted mini split units in the four main rooms of our second floor.

The first floor consists of one zone, and the second floor mini splits each act as its own individually controlled zone. There are times when we only need to cool or warm one or two rooms, and there are times when all units are working simultaneously. There is plenty of flexibility and the system has worked quite comfortably for us.

We decided to keep one of the two natural gas boilers as a "backup." We have not really needed it. On the night when it was -12° F in the winter of 2023, our system worked fine, although not as efficiently as it would at 0° F and above. We ran the hydronic boiler just that one night, more to make sure that it would work than because the heat pump couldn't keep up. We chose a heat pump system that is specifically designed for the climate that we live in.

Some considerations from our experience:

- Your home or building will have its own needs, and you and your contractor can best determine what kind of system would work most suitably for you.
- Try to receive estimates from multiple contractors who are geographically reasonably close by and ask lots of questions. Your contractor should be aware of any rebates or tax incentives that your HVAC system might be eligible for.

- Jonathan Unger, Andover Resident

Buildings

B-1. Construct Net-Zero, Low Embodied Carbon New Buildings

B-1-1. Adopt the Specialized Stretch Energy Code

Action Description

The Specialized Stretch Energy Code is a set of regulations in Massachusetts that requires buildings to meet specific energy efficiency standards. The code requires that buildings with fossil fuel systems be pre-wired for future electric systems, and for smaller buildings to accommodate solar photovoltaic systems. Additionally, multifamily buildings over 12,000 sq. ft. must meet Passive House standards or net-zero home performance scores. The code is an above-code appendix to the state's base building energy code and is designed to result in cost-effective construction that is energy-efficient. New commercial and residential buildings and qualified renovations are required to comply with the specialized stretch energy code. This code builds upon the current stretch code (in effect as of January 1, 2023, and July 1, 2023). While this action has limited potential to reduce emissions associated with existing buildings, it can establish a standard for any future buildings constructed in Andover to be net-zero or net-zero ready. This is important because it is more difficult to retrofit buildings than to build new ones with net-zero enabling technology and adequate electrical service, especially as we approach 2050.

Key Steps for Implementation

- Internal and external training for building inspectors and related departments.
- Public education and meetings with developers, architects, and tradespeople.
- Select Board and Town Manager approval.
- Town Meeting vote.

Action Lead

Sustainability Department

Supporting Partners

- Buildings (Inspectional Services) Division
- Facilities Department
- Community Development & Planning
- Andover WECAN
- Andover Green Advisory Board
- Memorial Public Library
- Developers, realtors, architects

Ease of Implementation

☒ Requires Town Meeting vote
☐ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Reduction in fossil fuel use in buildings with significant renovations.
2. Number of new net-zero buildings constructed as a percent of all new buildings.

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Short — Medium — Long

Resilience Considerations

Passive House design can increase resilience by creating eco-friendly and energy-efficient structures that maintain consistent indoor temperatures and excellent air quality.[1] Passive House buildings can withstand severe climate events and power outages, making them resilient structures. Net-zero buildings can generate their own energy from renewable sources, such as solar and wind power, which can increase their independence and reduce their vulnerability to power outages and disruptions when paired with energy storage devices.[2]

Co-Benefits & Equity Considerations

1. The Specialized Stretch Energy Code would apply equally to all residential construction including low- and moderate-income construction. There are funds to support all-electric low- and moderate-income construction from the state and federal governments. The cost of implementation may dissuade property owners from retrofitting existing buildings.
2. The Specialized code includes provisions for improved indoor air quality, which can have positive impacts on public health.
3. The Specialized code can result in lower energy bills for residents of new buildings constructed under the code.
4. Buildings constructed under the Specialized code may have higher property values due to their energy efficiency and reduced greenhouse gas emissions.

Cost

$

Possible Funding Sources

External municipal funding sources are not needed. Incentives, rebates, and technical assistance are available through Mass Save for residential and commercial net-zero enabling technology and energy efficiency measures.

1 https://www.buildings.com/resiliency-sustainability/article/33001322/how-passive-house-design-encourages-resilience
2 https://www.energy.gov/eere/buildings/zero-energy-buildings-resource-hub

Buildings

B-1. Construct Net-Zero, Low Embodied Carbon New Buildings

B-1-2. Reduce embodied carbon in new buildings

Action Description

Reducing embodied carbon in new buildings is an important step towards achieving a more sustainable future. Embodied carbon refers to the greenhouse gas emissions associated with the construction and end-of-life of a building, including the CO2 emitted from extraction and manufacturing processes to create construction materials, the transport of materials and equipment to a project site, installation and construction activities, building maintenance, demolition, and material disposal. Fortunately, there are several ways to reduce embodied carbon in new buildings. These include expanding adaptive reuse, repurposing existing assets or materials, using low carbon materials, and using electric construction equipment. Andover can begin this process of tracking and reducing embodied carbon by leading by example with municipal buildings and preparing educational materials for promoting awareness of the need to reduce embodied carbon in new buildings. Embodied carbon is not captured in Andover's GHG inventory and therefore this action does not directly reduce emissions from the baseline but is part of the larger climate change mitigation effort. Embodied carbon is a considerable source of emissions and this action is included to address this source.

Key Steps for Implementation

- Establish an embodied carbon baseline.
- Promote the use of low carbon materials in new buildings and renovations.
- Develop a checklist for permit applications or other educational materials.
- Possibly require lifecycle analysis for all new buildings over 20,000 ft2 and municipal buildings.
- Develop an educational series for local architects, builders, and developers.

Action Lead

Sustainability Department

Supporting Partners

- Buildings (Inspectional Services) Division
- Facilities Department
- Community Development & Planning
- WECAN
- Andover Green Advisory Board
- Memorial Public Library
- Developers, Realtors

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Quantification of embodied carbon.
2. Reduction of embodied carbon baseline over time.
3. Hosting educational series and good attendance.

Action Initiation Timeframe

Resilience Considerations

To reduce embodied carbon, take several steps upfront, such as reusing buildings instead of constructing new ones, specifying low-carbon concrete mixes, limiting carbon-intensive materials, choosing lower carbon alternatives, using high-recycled content materials, and maximizing structural efficiency. Use more resilient materials that will last longer and are often produced via a more efficient construction process, which will reduce capital expenditure as well as maintenance, repair, and replacement costs.

Co-Benefits & Equity Considerations

1. Reducing embodied carbon can also lead to cost savings. For example, one of the main methods to reduce embodied carbon is by using more resilient materials that will last longer and are often produced via a more efficient construction process.
2. By optimizing the design and construction processes to reduce waste, builders can minimize construction costs, reduce project timelines, and improve the overall quality of the building.

Cost

$$$: Assuming software or consulting services may be needed to calculate embodied carbon for municipal buildings

Possible Funding Sources

1. Massachusetts Clean Energy Center (MassCEC) **Embodied Carbon Reduction Challenge** is awarding $10,000 to $50,000 for new construction and major renovation projects that have innovative and impactful changes to reduce embodied carbon (applications due March 31st, 2024).

B-2. Retrofit Existing Buildings to Use Less Energy & Renewable Energy

B-2-1. Facilitate a residential electrification and energy efficiency program

Action Description

Facilitating a residential electrification and energy efficiency program involves a whole-home systems approach to optimize energy efficiency. This includes considering all the variables, details, and interactions that affect energy use in a home, such as appliances and home electronics, insulation, and air sealing. Upgrades to more energy-efficient appliances and retrofits to existing household equipment can further reduce residential energy demand. Appropriate policy interventions and programs can be designed to promote sustainable changes in behavior and encourage investments in structural improvements. Andover can support residents transitioning their home heating and cooling systems to efficient all-electric air-source heat pumps, ground-source/geothermal heat pumps, solar hot water, and/or heat pump water heaters and make deep energy efficiency retrofits through educational materials, training, and outreach regarding rebates and incentives.

Key Steps for Implementation

- Research past education and installation campaigns such as Massachusetts Clean Energy Center (MassCEC) HeatSmart program, which was a volunteer-led community-based outreach and group purchasing campaign. Refer to the Solarize-HeatSmart Toolkit for resources including training webinars. Note: The procurement laws that the Town is subject to may be a barrier for certain types of Town-sponsored bulk purchasing campaign.
- Collaborate with community groups such as Andover WECAN to further pursue the Heat Pump Coaching Program to train residents and conduct outreach.
- Compile existing resources related to costs and available rebates and incentives into an easily accessible format for distribution.
- Target homeowners that already expect to replace their heating and/or cooling equipment in the next five years to help them make informed decisions and target owners of apartment and condominium complexes where individuals have less control.
- Work with the Andover Housing Authority, Andover Community Trust, and Mass Save Community First Partnership to promote heat pumps and energy efficiency within affordable housing.

Action Lead

Sustainability Department

Supporting Partners

- Andover WECAN
- Heat Smart Alliance
- Mass Save Community First Partnership
- Andover Housing Authority
- Andover Community Trust

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Increased number of weatherization, insulation, and air sealing installed.
2. Increased number of heat pumps installed.
3. Reduced residential natural gas and oil usage

Action Initiation Timeframe

Resilience Considerations

Facilitating a residential electrification and energy efficiency program has several benefits for climate resilience. When new heating and cooling equipment is installed, it should be done so in a way that it is protected from climate hazards such as flooding, extreme heat, and wind. These modifications can increase the resilience and reliability of the electric grid, which is essential during extreme weather events.

Co-Benefits & Equity Considerations

1. Expands access to affordable clean energy and energy efficiency, which helps to reduce monthly energy bills for pollution-burdened communities.
2. Low-income households may not be able to afford the upfront costs of electrification and energy efficiency upgrades.
3. Renters and other groups may face barriers to participating in electrification and energy efficiency programs.
4. Electrification and energy efficiency upgrades can have health and safety benefits, such as reducing indoor air pollution and improving ventilation.

Cost

$$: Funds to develop a program and resources for supporting the community.

Possible Funding Sources

1. Mass Save Incentives and **Income Based Offers**
2. **Mass Save HEAT Loan**
3. **Mass Save Enhanced Barrier Mitigation Incentives** (to address knob and tube wiring and removal of vermiculite)

Buildings

B-2. Retrofit Existing Buildings to Use Less Energy & Renewable Energy

B-2-2. Facilitate a commercial and municipal electrification and energy efficiency program

Action Description

Facilitating a commercial and municipal electrification and energy efficiency program can have numerous benefits for communities. Implementing energy efficiency measures can reduce fuel import dependence, lower energy costs, and contribute to emissions reductions. Electrification can offer inherent advantages of controllability, precision, versatility, efficiency, and environmental benefits compared to other energy sources. Andover can help businesses and commercial property owners improve energy efficiency and electrify operations to transition away from fossil fuel usage and reduce energy demand by facilitating business-to-business learning and education through outreach and training.

Key Steps for Implementation

- Opt into the Property Assessed Clean Energy (PACE) programs. MassDevelopment staff can guide Andover through the process and provide a copy of the resolution model.
- Facilitate round table discussions by defining key stakeholders, identifying interest in topics, and identifying speakers or resources.
- Study geothermal opportunities and notify groups involved with current pilot projects of Andover's interest, for example, the Home Energy Efficiency Team (HEET) is creating a database of public interest in geothermal networks across the state to share with utilities, legislators and regulators. Notify them here: **Want geo service on your street? (arcgis.com)**
- Continue to seek state and federal funding for municipal energy efficiency and electrification projects, prioritizing projects that can occur during regular maintenance or upgrade schedules.

Action Lead

Sustainability Department

Supporting Partners

- Community Development and Planning Department
- Facilities Department
- Andover WECAN
- Rotary Club
- Chamber of Commerce

Ease of Implementation

☐ Requires Town Meeting vote
☐ Department has authority to carry out
☒ PACE requires Select Board approval

Measures of Success

1. Number of all-electric municipal buildings
2. Percent reduction in energy consumption

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Short | Medium | Long

Resilience Considerations

To facilitate a commercial and municipal electrification and energy efficiency program, climate resilience considerations should be taken into account. This includes employing climate resilience and carbon footprint considerations, building capacity to strengthen the foundation for low emission energy, and incorporating forward-looking climate change data in the design of capital projects. Energy efficiency retrofits can help mitigate increased peak electric demand.

Co-Benefits & Equity Considerations

1. Reduced utility bills from energy efficiency improvements.
2. Opportunities for marketing sustainable practices or retaining and recruiting employees that value sustainability.
3. By reducing greenhouse gas emissions, energy efficiency can also help improve air quality and reduce the negative health impacts associated with air pollution
4. Energy efficiency programs can support economic development by creating jobs and stimulating local economies.
5. Energy efficiency improvements can create a more comfortable and productive work environment, which can lead to increased worker productivity.
6. Energy efficiency improvements can also improve building comfort and health by reducing drafts, improving ventilation, and reducing the risk of mold and other indoor air quality issues.

Cost

$$$$$: Municipal energy efficiency and electrification

Possible Funding Sources

1. **PACE** offers financing with terms up to 20 years. Savings from the upgrades can be used to repay the betterment over time which can be collected quarterly, semi-annually or annually. Additionally, at property sale, the assessment and lien are transferred to future property owners, who also benefit from the installed upgrades and will realize energy savings.
2. **Mass Save** incentives, programs, and technical support for businesses.
3. **National Grid** rebates, incentives and programs.
4. Department of Energy Resources **Green Communities Grants** (Municipal).
5. **Massachusetts School Building Authority** grant programs (Municipal).

B-2. Retrofit Existing Buildings to Use Less Energy & Renewable Energy

B-2-3. Develop a residential climate resilience strategy

Action Description

Developing a residential climate resilience strategy is essential to ensure that homes and communities are prepared for the impacts of climate change. A residential climate resilience strategy should include a combination of 'grey' building solutions with 'green' nature-based solutions. The strategy should prioritize the integration of "soft" resiliency strategies, such as green infrastructure, and "hard" resiliency strategies, such as built or engineered solutions. The strategy should also support social cohesion, community ties, information flow, and the empowerment of individuals and communities.[1]

Key Steps for Implementation

- Develop a residential climate resilience educational campaign to provide information on the impacts of climate change, how it might affect residential properties, and strategies residents can implement to protect themselves.
- Develop zoning to protect buildings from loss and damage by researching resilient zoning used by other communities, collaborating with other departments, drafting the zoning language, and following the zoning bylaw process including a Town Meeting vote. Consider strengthening floodplain overlay district requirements as **recommended by MAPC.**
- Research the opportunity to reduce flood insurance payments for residents through the FEMA National Flood Insurance Program **Community Rating System** (CRS) and apply if deemed to be a good candidate. This program awards credit points for a variety of public information and floodplain management activities completed within the community, as described in the **guidance document.** Discounts on flood insurance premiums are based on the CRS class and credit points obtained.

Action Lead

Sustainability Department

Supporting Partners

- Community Planning and Development
- Buildings (Inspectional Services) Division
- WECAN
- Andover Green Advisory Board
- Conservation Commission

1 https://www.mdpi.com/2071-1050/11/10/2888

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☒ Zoning changes require Town Meeting vote
- ☐ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Number or dollar value of flood insurance claims after a significant storm event.
2. FEMA Community Rating System class and discount achieved.
3. Number of residents engaged with outreach and education.

Action Initiation Timeframe

Short — Medium — Long

Resilience Considerations

Resilient residential buildings are designed to withstand environmental stressors and disasters, ensuring longevity, innovation, and adaptability. To make buildings resilient to climate change, it is important to consider strategies such as building resilience to heatwaves, floods, and cold.

Co-Benefits & Equity Considerations

Developing and implementing a strategy to improve climate resilience has numerous co-benefits including possibly reduced property damage, costs, and injury or loss of life. Education and outreach should include vulnerable populations such as older adults or people with disabilities and the property owners where they reside to understand their needs for improving resilience and how that can be incorporated into the strategy.

Cost

$

Possible Funding Sources

1. **State Municipal Vulnerability Preparedness (MVP) program**
2. **Federal Emergency Management Agency Hazard Mitigation Assistance Grants**

Energy

To meet net-zero and resilience goals, Andover must reduce energy consumption, promote renewable energy adoption, and improve energy system resilience. Reducing energy is a critical first step. By reducing energy use, less energy needs to be created. New energy infrastructure creates greenhouse gases– whether that's building new wind turbines or building and running a power plant.

Transitioning from fossil-fuel based energy to electricity allows for the possibility of net-zero energy use. Over time the electricity grid is becoming more saturated with renewable energy and therefore the GHG emissions associated with using electricity are decreasing. Electricity can be less carbon- intensive than fossil fuels like coal, oil, and natural gas.

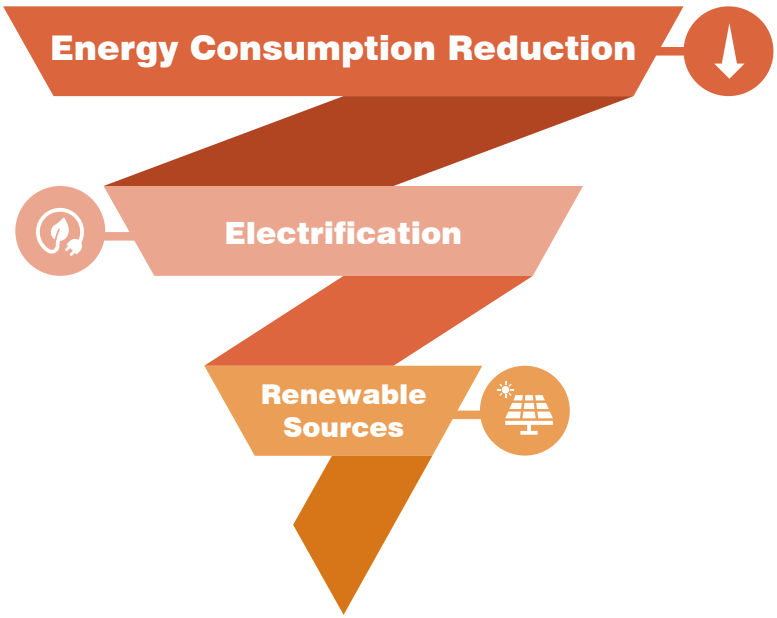
The Town, residents, and businesses have begun this energy transformation. The town is leading by example in both reducing its energy use and transitioning to electricity. All of Andover's streetlights use energy-saving LED lighting. In addition, the Town is prioritizing renewable electricity for all-electric school buildings and energy intensive processes such as water treatment.

The energy related actions detailed in this plan take an educational approach to motivate residents and businesses to take action. Past education and outreach campaigns have been successful, such as the Solarize MA program in which 78 solar systems, with a total capacity of 653.75 kW, were contracted and installed in Andover in 2014. Solar photovoltaic systems are just one of the energy strategies Andover can utilize.

The Town will build community support for energy projects by providing resources about cost savings and technologies, and also by bringing together people that have already implemented new energy solutions. With resident-to-resident and business-to-business opportunities for learning, we can move forward in the energy transition together.

The Town of Andover was awarded $15,000 through the Municipal Energy Technical Assistance Grant Program to conduct an energy resiliency assessment of the Town of Andover's Shawsheen Village Pump Station (SVPS). The scope includes:

- Existing conditions assessment and site visit
- Evaluation of flow monitoring data and energy usage
- Report development



Energy strategies for Andover include:

E-1. Reduce Energy Use

E-2. Transition to Renewable Energy

E-3. Emphasize Energy Education From K Through the Trades

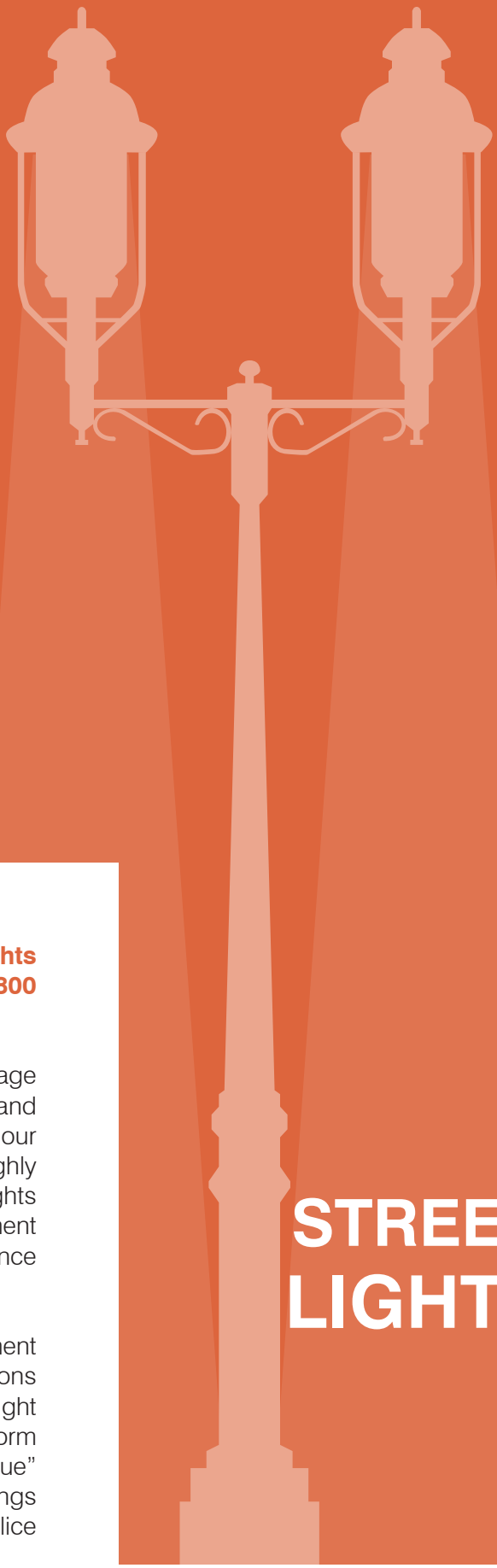
E-4. Enhance Energy Resilience

Energy Targets

Action ID	Topic	Metric	2030 Target	2050 Target
E-1-1	Reduce Energy	No. large business participants	3	6
E-1-1	Reduce Energy	No. business participants	3	6
E-2-1	Renewable Energy	% of eligible accounts enrolled	100%	100%
E-2-1	Renewable Energy	% opt-in for 100% renewable option	50%	100%
E-2-2	Renewable Energy	MW installed solar capacity (cumulative)	18 MW(DC)	40 MW(DC)
E-2-3	Renewable Energy	% MA Class I RECs in supplied energy	60%	100%
E-3-1	K-12 Climate Change	% student exposed to curriculum or programming	5%	75%
E-3-2	Clean Energy Workforce	No. apprentices participating in Andover projects (cumulative)	30	100
E-4-1	Municipal Building Resilience	No. accessible buildings serving as warming or cooling centers	4	6

Case Study

Energy



STREET LIGHTS

The Town has converted 100% of town-owned streetlights to light emitting diodes (LEDs) which include 1,800 streetlights.

This is expected to yield a 50-80% reduction in energy usage from the previous technology and significant utility and maintenance savings annually. Between the purchase of our lights and the retrofit to LED, the Town stands to save roughly $100,000 per year in maintenance and energy use. LED lights are more expensive, but can last 20 years, so the investment will be paid back by these savings and reduced maintenance costs in under 5 years.

In addition to the extended lifecycle and lower replacement costs, LEDs result in reduced greenhouse gas emissions because they use less energy. They also help reduce light pollution at night and provide improved and more uniform light quality. LEDs make colors look brighter and more “true” to natural color. Due to the improved color rendition, things appear brighter and sharper under LEDs which is why police and other safety personnel prefer LEDs.

E-1. Reduce Energy Use

E-1-1. Educate commercial entities and municipal stakeholders on energy reduction

Action Description

Energy efficiency can reduce GHG emissions, fuel import dependence, and lessen exposure to energy price volatility, while making systems and societies more resilient. As Andover electrifies, reducing peak energy demand will be critical to balance electricity supply and demand. This will help reduce the need for new infrastructure to support the transition away from fossil fuels. With Andover's businesses consuming a large quantity of energy, the Town aims to convene business roundtables so best practices on meaningful energy efficiency and demand reduction can be shared.

Key Steps for Implementation

- Facilitate business-to-business discussions regarding best practices on peak energy demand reduction and other energy related topics to enable sharing successful strategies, technologies, and resources such as National Grid's Connected Solutions program. Identify interested businesses, topics of interest, and possible speakers or resources.
- Connect businesses with National Grid and Eversource energy efficiency account representatives. Larger commercial and industrial businesses may already be in contact with their representatives. The Town can help connect businesses that do not have a representative or do not know who their representative is.
- Educate municipal employees on energy reduction strategies related to their operations to improve efficiency and reduce peak energy demand.
- Investigate technology that could support municipal staff and operations in energy reduction such as additional controls or energy storage.

Action Lead

Sustainability Department

Supporting Partners

- Utility energy efficiency account representative
- Facilities Department
- Public Works Department
- Andover WECAN
- Andover Green Advisory Board
- Chamber of Commerce
- Rotary Club

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Number of large businesses participating.
2. Demand reductions.
3. Number of projects initiated based on outreach.

Action Initiation Timeframe

Resilience Considerations

During peak demand periods, demand load reductions can alleviate energy supply and grid constraints, thereby decreasing the risk of power system failures.

Co-Benefits & Equity Considerations

1. By reducing energy usage during peak periods, consumers can earn revenue and reduce their electricity bills.
2. Businesses generating their own energy using alternative sources, such as solar panels, can help to reduce peak demand charges from the utility.
3. Demand response programs can help electricity providers save money through reductions in peak demand and the ability to defer construction of new infrastructure.
4. Small businesses may have limited financial resources to make energy efficiency improvements and reduce peak demand.

Cost

$

Possible Funding Sources

1. National Grid **Connected Solutions** programs for demand reduction
2. **Mass Save**

E-1. Reduce Energy Use

E-1-2. Educate residents on energy reduction

Action Description

Andover can take several steps to educate residents on energy reduction. One approach is by encouraging residents to adopt pledges to reduce energy use and providing financial and technical assistance for residential energy audits and retrofits. Simple, well-structured, and well-communicated energy-saving advice can motivate citizens to act.

Reducing energy consumption in residential buildings is an important step towards reducing stress on the grid and can have considerable cost savings. One way to achieve this is by investing in energy-efficient appliances and products, such as energy-saving bulbs and smart appliances. Another way is to optimize home energy efficiency through a whole-home systems approach, which considers all the variables, details, and interactions that affect energy use in a home. This includes passive design concepts.

By reducing energy consumption in residential buildings, we can save money, increase energy security, reduce pollution, and minimize the natural resources used to power our homes.

Key Steps for Implementation

- Develop a residential energy reduction campaign which provides examples of what energy reduction strategies and resources for financial and technical support, such as Mass Save.
- Connect residents with other residents that have already begun to implement energy efficiency strategies in their homes to enable information sharing. Some examples include lawn signs to inform neighbors, events with community groups and green teams, etc.

Action Lead

Sustainability Department

Supporting Partners

- Utility companies
- Andover WECAN
- Andover Green Advisory Board
- Mass Save

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Demand reductions.
2. Number of projects initiated based on outreach.
3. Increase in dollars saved through **Mass Save Electric Incentives**.

Action Initiation Timeframe

Resilience Considerations

During peak demand periods, demand load reductions can alleviate energy supply and grid constraints, thereby decreasing the risk of power system failures.

Co-Benefits & Equity Considerations

1. By reducing energy usage during peak periods and improving overall energy efficiency, residents can reduce their electricity bills.
2. Residents generating their own energy using alternative sources, such as solar panels, can reduce peak demand charges from the utility.
3. Demand response programs can help electricity providers save money through reductions in peak demand and the ability to defer construction of new infrastructure.
4. Peak demand reduction programs can have equity implications, as low-income households may be less likely to participate due to lack of awareness, access, or ability to pay for energy efficiency upgrades.
5. Renters have limited control over energy efficiency upgrades and the Town can work with property owners on their behalf.

Cost

$

Possible Funding Sources

1. **National Grid Income Eligible Services Program**
2. National Grid **Connected Solutions** programs for demand reduction
3. **Mass Save**

E-1. Reduce Energy Use

E-1-3. Partner with utilities to address gas leaks in supply infrastructure.

Action Description

Partnering with utilities to address gas leaks in supply infrastructure is a crucial step towards reducing methane emissions and ensuring safe and reliable natural gas storage. Transmission and distribution losses of natural gas contribute to Andover's GHG emissions. These emissions equate to 28,642 MTCO2e or 6.3% of the total baseline emissions. Andover can collaborate with other entities, including the utilities themselves, to motivate utilities to improve leak detection programs and address these more urgently, therefore reducing GHG emissions. Gas leaks are a safety and public health hazard to the community and an environmental justice issue. s. Gas leaks include the release of methane, which is a potent greenhouse gas with a global warming potential 27-30 times higher than that of carbon dioxide, over a period of 100 years. Over 20 years, the global warming potential of methane is 81-83 times that of carbon dioxide because it has a short lifespan.[1] Reducing methane emissions associated with gas leaks can have a considerable impact in mitigating climate change.

Key Steps for Implementation

- Collaborate with HEET, other groups, or other communities already advocating for gas leak detection and correction to identify methods of partnership with utilities that have been successful. An example of HEET's efforts through existing partnership was described in a **WGBH News article.**
- Research methods to further promote gas leak repairs such as the City of Boston **Ordinance Regarding Management and Elimination of Natural Gas Leaks.**

Action Lead

Sustainability Department

Supporting Partners

- Emergency Management Director
- Emergency Management Working Group
- Home Energy Efficiency Team (HEET)
- Gas Transition Allies
- MA Department of Public Utilities

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

1 EPA. Understanding Global Warming Potentials. https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Reduced number of gas leaks based on data reported annually to the Department of Public Utilities, summarized by the **Home Energy Efficiency Team.**
2. Percent of gas distribution pipes modernized.

Action Initiation Timeframe

Resilience Considerations

Designing a resilient gas supply infrastructure poses several challenges. Electrification and diverse clean fuels should be explicitly prioritized as part of these resilience strategies.

Co-Benefits & Equity Considerations

1. Addressing leaks can reduce pollution.
2. Improve local environmental quality.
3. Improve public health.

Cost

$

Possible Funding Sources

Utilities would be responsible for funding improvements to supply infrastructure

E-2. Transition to Renewable Energy

E-2-1. Implement Municipal Aggregation (also known as Andover Community Power)

Action Description

Municipal aggregation is a process by which towns and cities purchase electricity supply in bulk from an alternative supplier while still receiving transmission and distribution service from their existing utility provider. The main benefit of municipal aggregation is that it allows communities to have more local control over their electricity sources, more green power than is offered by the default utility, and/or lower electricity prices. It also encourages the development of renewable energy sources and supports green jobs. Andover Community Power (ACP) is a program that will be offered by the Town to provide residents and businesses more electricity supply options. The program is a Town-vetted alternative to National Grid's default supply and other third-party electricity suppliers. The program has been under review by the Department of Public Utilities since July 2021. Refer to the ACP website for more information: **https://acp.andoverma.gov/.**

Key Steps for Implementation

- Upon approval by the DPU, Andover will monitor the market and identify the appropriate time to run a competitive bid for electricity supply.
- Upon selection of an electricity supplier, Andover will implement an extensive education and outreach campaign to make residents and businesses aware of the upcoming program launch and their choice to participate in the program or leave before it starts (opt out).
- Residents and businesses will be strongly encouraged to choose the "Andover Ultimate" product with 100% renewable energy (MA Class I Renewable Energy Certificates (RECs).

Action Lead

Sustainability Department

Supporting Partners

- Andover WECAN
- Town Manager
- Rotary Club
- Realtors
- Community Groups
- Faith Groups
- Memorial Public Library

Ease of Implementation

☒ Already passed at Town Meeting
☐ Department has authority to carry out
☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Number of accounts enrolled.
2. Number of accounts enrolled in the 100% renewable option: goal 100% by 2050.

Action Initiation Timeframe

Resilience Considerations

It is important to create a program that meets the needs of the community, that the program is financially sustainable, and that the program is structured to provide reliable and resilient electricity supply.

Co-Benefits & Equity Considerations

1. Residents and businesses can benefit from reduced electricity costs and stable rates. While the program cannot guarantee savings to customers in the future, the Town of Andover is committed to working to provide stable and affordable electricity rates through the ACP program.
2. By using the bulk purchasing power of the community, renewable energy is more accessible to all, including low-income households and renters.
3. All of Andover's community members participating in the program will have access to the same benefits.

Cost

$

Possible Funding Sources

No funding sources should be needed

E-2. Transition to Renewable Energy

E-2-2. Offer training programs for residents on solar and energy storage options.

Action Description

Solar energy is a sustainable and clean source of energy that can benefit residential customers. However, one of the main challenges of solar energy is its intermittency, which means that it is not always available when needed. Energy storage can help address this issue by allowing solar energy to be stored when it is generated and used when it is needed. Storage can also help smooth out variations in how solar energy flows on the grid, which can be affected by season, time of day, clouds, dust, haze, or obstructions like shadows, rain, snow, and dirt. Andover can provide residents with the knowledge and tools to procure solar and energy storage technology for their homes through educational materials, training, and outreach building upon past efforts and learning from campaigns in other communities.

Key Steps for Implementation

- Research past education and installation campaigns and models from other cities and towns (e.g. **SolarizeMA Toolkit and past marketing plan for Andover, MetroWest Clean Energy**). The procurement laws that the Town is subject to may be a barrier for a Town-organized purchasing campaign.
- Collaborate with community groups such as Andover WECAN to pursue a resident-to-resident coaching program similar to what is in development for heat pumps.
- Compile existing resources related to costs and available rebates and incentives into an easily accessible format for distribution.
- Target homeowners that have previously expressed interest through prior engagement or programs and work with the Andover Housing Authority, Andover Community Trust, and other community groups to identify possibilities for solar or energy storage for affordable housing or other community solar options.

Action Lead

Sustainability Department

Supporting Partners

- Community Development and Planning
- local solar companies
- WECAN

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Increased megawatts of installed solar capacity in Andover.
2. Number of homes with solar.
3. Number of people engaged during outreach and education.

Resilience Considerations

Solar and energy storage can play an important role in increasing the resilience of the electricity grid and the communities served by the grid, while also mitigating climate risks and contributing to energy security and productivity.

Co-Benefits & Equity Considerations

4. 1. Solar and energy storage systems may be cost-prohibitive for some members of the community and the Town can work with community groups to identify funding sources or additional methods for providing access to renewable energy such as with community solar.
5. 2. Community solar projects provide an alternative to rooftop photovoltaic systems for people who are unable to install solar panels on their roofs because they don't own their homes, have insufficient solar resources or roof conditions to support a rooftop PV system due to shading, roof size, or other factors, or for financial/other reasons.

Cost

$: *education & outreach*

Possible Funding Sources

1. Department of Energy Resources **Solar Massachusetts Renewable Target** (SMART) program.
2. National Grid **Connected Solutions** for energy storage.

E-2. Transition to Renewable Energy

E-2-3. Increase the amount of voluntary MA Class I Renewable Energy Certificates for municipal electricity procurement contracts.

Action Description

MA Class I Renewable Energy Certificates are a type of certificate that serves as proof of purchase for the attributes of renewable energy generation. They are used to implement the Massachusetts Renewable Energy Portfolio Standard (RPS), which requires retail electricity suppliers to obtain a percentage of the electricity they serve to their customers from qualifying renewable energy facilities. Increasing the portion of Andover's electricity that comes from renewable energy sources can help reduce GHG emissions. Renewable Energy Certificates or Credits (RECs) are issued for every megawatt-hour of renewable electricity produced and can be purchased by entities, such as the Town of Andover, to claim this renewable electricity. This is a system used to account for the flow of renewable energy throughout the electricity grid. Starting in December 2023, Town and School electricity will contain 15% additional MA Class I RECs beyond the minimum required by the State, increasing Andover's use of renewable energy. The Town has committed to matching the additional MA Class I RECs in the Andover Community Power.

Key Steps for Implementation

- Assess current municipal electricity contracts.
- Revise future contracts to include an additional 15% MA Class I RECs beyond the minimum required by the State.
- Increase RECs as needed to achieve 100% renewable energy sources by 2050.

Action Lead

Sustainability Department

Supporting Partners

- Facilities Department
- Community Development & Planning

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

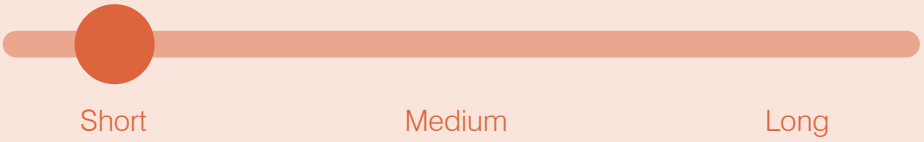
Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Percent of total electricity that comes from renewable sources via RECs.

Action Initiation Timeframe



Resilience Considerations

enewable energy generation plays a crucial role in building climate resilience. The use of renewable energy sources such as solar, wind, hydroelectric, biomass, and geothermal power can provide energy without the planet-warming effects of fossil fuels. Renewable energy produces far less carbon dioxide (CO2) and other harmful greenhouse gases and pollutants, making it widely viewed as playing a central role in climate change mitigation and a clean energy transition.

Co-Benefits & Equity Considerations

1. Renewable energy generation can have significant health co-benefits, including reducing premature mortalities due to air pollution.
2. Renewable energy generation can create economic development and jobs in manufacturing, installation, and more.

Cost

- Voluntary MA Class I RECs vary in costs depending on the market and the amount of energy consumed. In the most recent contract, the additional cost for 15% additional MA Class I RECs beyond the required state minimum of 24% for 2024 was $0.03/kWh, a roughly $77,000 cost increase in the year. This is roughly 3% of the town's electric costs of $2.9 million annually.
- Voluntary Class I RECs act to hasten the transition of the electricity grid to clean energy. Absent any voluntary Class I REC purchases beyond requirement, Massachusetts Clean Energy Standard is projected to result in a power grid that is serviced entirely by renewable energy by 2040. When the State reaches that point, the Town's voluntary Class I REC purchase will cease because there would be no additionality in the purchase of additional Class I RECs.

Possible Funding Sources

No funding sources are expected to be needed

E-3. Emphasize Energy Education from Kindergarten through the Trades

E-3-1. Increase clean energy and climate change educational programming into K-12 school curriculum.

Action Description

Climate change is one of the most pressing issues of our time, and it is essential that we educate our youth about its causes, effects, and potential solutions. Incorporating clean energy and climate change educational programming into K-12 school curricula is a crucial step in this direction. Including climate change education in K-12 curriculum has numerous benefits, including encouragement of behavior change and the adoption of sustainable practices, enhanced science literacy and understanding of ecological concepts, and improved ability to adapt to climate change by providing students with the tools to calculate risks, prepare for climate crises, and recover from their effects. By increasing clean energy and climate change educational programming in K-12 school curricula, we can help our youth understand the importance of taking action to mitigate climate change and create a more sustainable future.

Key Steps for Implementation

- Assess what is currently being taught in public schools with regard to climate change and what opportunities students have for hands-on learning outside the classroom (e.g., green teams, clubs, internships, etc.).
- Research the climate change education legislation that has been developed including three bills that were introduced in the Massachusetts House of Representatives in February 2023.[1]
- Educate Andover residents and demonstrate support of this legislation
- Collaborate with entities across Andover to expand hands-on learning opportunities and programs (e.g., field trips, internships, projects, etc.).

Action Lead

School Committee/School Administration

Supporting Partners

- PTA Groups
- Andover High School's ESIC Program
- Girls and Boys Scouts
- Sustainability Department
- Andover Youth Services

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☐ Department has authority to carry out
- ☐ Requires Select Board approval
- ☒ Requires state approval for formal curriculum changes

1 National Center for Science Education. March 17, 2023. Climate change education legislation in Massachusetts. **https://ncse.ngo/climate-change-education-legislation-massachusetts**

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Number of students engaged in sustainability related programming and education.
2. Number of field trips to relevant sites.

Action Initiation Timeframe

Resilience Considerations

Having knowledge of climate change can make individuals more aware of and prepared for its impacts. The more prepared a community is, the more resilient they are during or after a hazardous event.

Co-Benefits & Equity Considerations

1. Climate change education should be standardized across the public school system, providing all students with an equal opportunity to learn about climate change and solutions to mitigation its impacts.
2. The community will be more knowledgeable, prepared, and resilient.
3. Informed students can educate others including their families.

Cost

$$

Possible Funding Sources

1. **The Devonshire Foundation**
2. **Environmental Education Grant**

E-3. Emphasize Energy Education from Kindergarten through the Trades

E-3-2. Clean Energy Workforce and Apprenticeship Initiative

Action Description

The transition to clean energy and electrification requires a skilled workforce that can design, install, and maintain renewable energy systems. Workforce development programs can play a crucial role in providing education and training to prepare individuals for these jobs. The Town can support the development of clean energy careers through partnerships with local education institutions and hands-on learning opportunities.

Key Steps for Implementation

- Follow the workforce development efforts of the **Merrimack Valley Clean Energy & Energy Efficiency Programs**, established based on the settlement of the gas explosions. One of the **advisory committee's 2023 goals** includes evaluating possible workforce development programs. Research other clean energy workforce development programs and resources such as those available through **MassCEC.**
- Collaborate with local vocational schools such as the Greater Lawrence Technical School and the Essex North Shore Agricultural and Technical School.
- Identify opportunities for student projects at municipal facilities in Town.

Action Lead

Sustainability Department

Supporting Partners

- Facilities Department
- local vocational schools
- Andover Community Trust

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Number of students that express an interest in clean energy education.
2. Launch Clean Energy Apprenticeship Program for tradespeople. On-the-job training will be critical as new sustainable technology is available and installed.
3. Increase is tradespeople qualified to install heat pumps.
4. Number of apprentices hired.

Action Initiation Timeframe

Resilience Considerations

Workforce development programs promote high-quality careers and greater economic equity for underrepresented and disadvantaged workers leading to social resilience and community resilience. The Town of Andover is encouraging apprenticeship or direct-hire grant programs that pair renewable energy and ground-source heat pump project developers with workers that recently graduated from local technical schools who have shown interest in energy projects.

Co-Benefits & Equity Considerations

1. MassCEC is actively working to equitably expand workforce development efforts across the state. To fill the gaps in the workforce, underrepresented populations and youth can have opportunities in the many careers needed which have varying skills and education requirements. By promoting career pathways and making these accessible to more people, Andover can help bring security to this growing field.
2. Talent development plays a multifaceted role in sustainability. It has a unique opportunity to address societal challenges and grow the next generation of leaders through investment in skill development and intellectual capital.

Cost

$$$

Possible Funding Sources

MassCEC **Equity Workforce Training Implementation Grants** and **Equity Workforce Planning and Capacity Grants**

E-4. Enhance Energy Resilience

E-4-1. Evaluate municipal facilities energy supplies and add power redundancy.

Action Description

Municipal facilities, such as water and wastewater utilities, data centers, and critical facilities, require a continuous and reliable power supply to operate effectively. However, power outages can occur due to various reasons, including natural disasters, cyberattacks, and equipment failures. To ensure power resilience, it is essential to evaluate the energy supplies of these facilities and add power redundancy. Having backup generators, portable generators, and redundant electricity supply can prepare these facilities for power outages and emergency situations. By implementing these measures, municipal facilities can ensure a reliable and resilient power supply, even during emergencies.

Key Steps for Implementation

- Determine which buildings have backup power supply and which do not and assess the redundancy of the electric supply (i.e., electricity from one or multiple substation) for critical facilities.

  Identify buildings that must remain functional in times of emergency
- Secure funding to install emergency generators or portable generators at facilities that do not already have them.
- Install emergency generators and portable generator connections.

Action Lead

Facilities Department

Supporting Partners

- Public Works Department
- Sustainability Department

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Increase in the number of facilities with backup power.
2. No major disruptions to power at municipal facilities during times of emergency.

Action Initiation Timeframe

Resilience Considerations

Having redundant power sources at municipal buildings will help the community return to normalcy faster following a hazard event or crisis. Any redundant power sources should be protected from climate hazards and confirmed to have enough power for a multi-day power outage.

Co-Benefits & Equity Considerations

1. Municipal facilities can serve as warming, cooling, or emergency shelters. These locations should be accessible for people with disabilities.

Cost

$$$

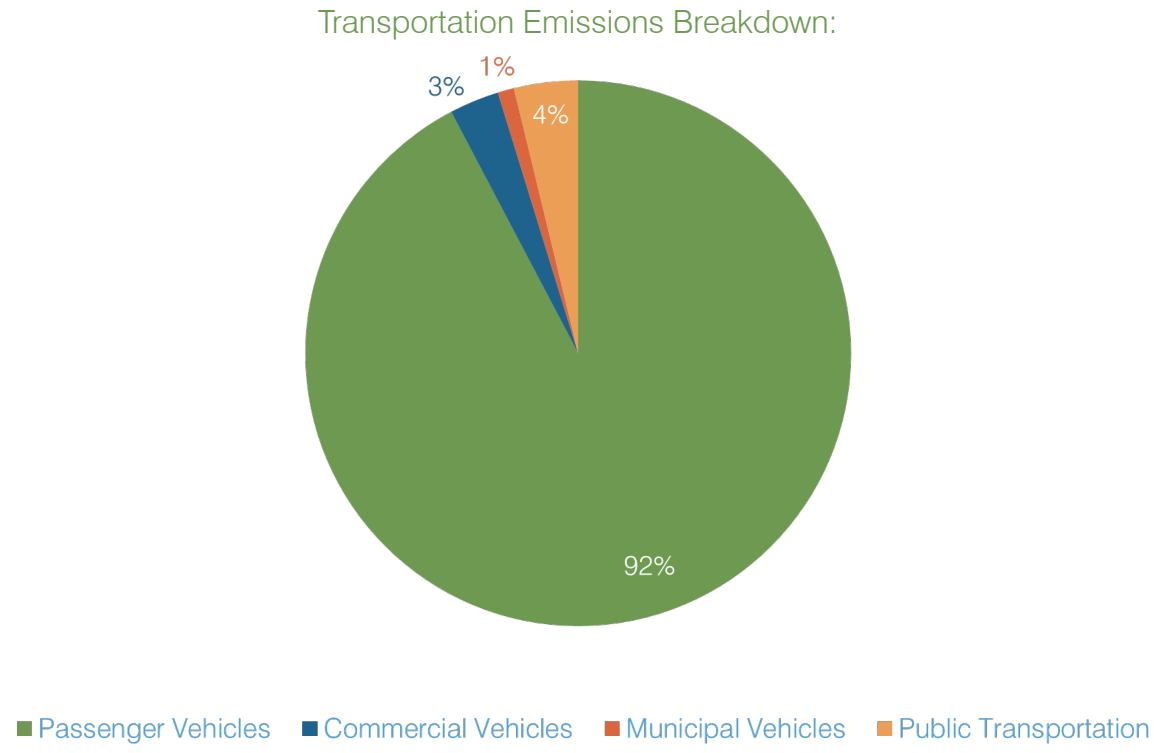
Possible Funding Sources

Municipal Energy Technical Assistance (META) Grant Program provides grants up to $15,000 to provide municipalities with aid in negotiation, development and/or management of clean energy projects.

Mobility

Climate resilient and sustainable mobility is a concept that aims to reduce the impact of transportation on the environment while ensuring that transportation remains accessible and efficient. It involves a shift towards zero-carbon and low-carbon modes of transportation, such as walking, cycling, and public transit, as well as the use of cleaner fuels and more efficient vehicles. The benefits include enhanced recreation opportunities, public health improvements, cost savings on fuel and vehicles, reduced carbon emissions and air pollution, and job creation with increased vehicle and battery manufacturing. Climate resilient and sustainable mobility also involves planning and designing transportation systems that are resilient to the impacts of climate change to get people where they need to be with reduced disruption.

Transportation is a major contributor to greenhouse gas emissions. Decreasing the number of miles driven and number of vehicles on the road while transitioning those vehicles to electric can have a large impact in reducing greenhouse gas emissions. GHG emissions associated with passenger vehicles account for 26% of Andover's total emissions and equate to 117,826 MTCO2e per year. This makes up 92% of the total transportation related emissions, with commercial vehicles, municipal vehicles, and public transportation making up the remaining 8% of the transportation sector. If all gasoline and diesel usage by vehicles was eliminated, Andover's total emissions could be reduced by 124,051 MTCO2e per year. This assumes there are no additional emissions associated with electricity usage because by 2050 ideally the electricity will be 100% renewably sourced (for more information on emissions reduction calculations refer to Appendix X). Included in this possible reduction is 1,236 MTCO2e associated with the transition of municipal vehicles to electric vehicles. The Town recognizes there are challenges for transitioning many vehicle types to electric, but the technology and available vehicle types are evolving and will continue to evolve by 2050.



Andover residents are actively transitioning to electric vehicles. The 2023 vehicle excise tax cycle identified 500 electric vehicles and 234 plug-in hybrid vehicles registered in Andover. However, this represents only 2.6% of vehicles registered in Andover. The survey conducted as part of the plan development revealed that of the 28 respondents that had an electric vehicle, 93% of them charge their vehicle at home. All 28 respondents were homeowners and no renters reported having an electric vehicle. While the Town can take meaningful action towards increasing EV charging infrastructure, there is still work to be done for multifamily housing complexes and private homes without the ability to install their own EV charging infrastructure. The Town is trying to bridge this gap with publicly available charging stations and education about shifting transportation modes. The Town recognizes that there are barriers to walking, biking, and taking public transportation, such as safety concerns, limited ability, time, and convenience, and is developing an Active Transportation Plan to devise a path forward.

Vehicle Type	Quantity
Battery Electric Vehicles (BEV)	500
Plug-In Hybrid Electric Vehicles (PHEV)	234
TOTAL BEV and PHEV	734
TOTAL REGISTERED VEHICLES	28,362
% BEV+PHEV	2.6%
Other Hybrid (Unspecified, Strong, or Mild)	1,024
%BEV+PHEV+ Other Hybrid	6.2%

Mobility strategies for Andover include:

M-1. Enable and Promote Alternative Transportation

M-2. Transition to Electric Vehicles

Mobility Targets:

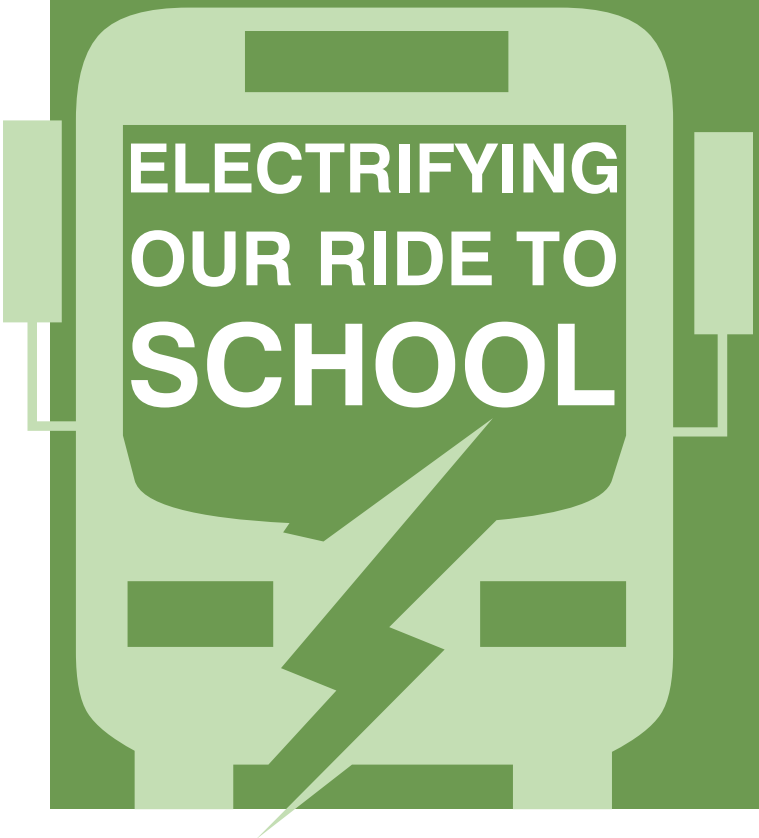
Action ID	Topic	Metric	2030 Target	2050 Target
M-1-1	Alternative Transportation	% trips on foot or by bike	3%	10%
M-1-1	Alternative Transportation	Reduced no. vehicles miles traveled per household		
M-2-1	Electric Vehicles	No. apartment and condo complexes with EV charging stations	5%	50%
M-2-1	Electric Vehicles	No. workplaces with EV charging stations	5%	50%
M-2-2	Electric Vehicles	% light-duty and medium-duty EVs in municipal fleet	10%	100%

More than 10% of all students in Andover Public Schools ride an electric school bus!

Trombly Motor Coach Services, based in Dracut, MA, provides transportation services to Andover Public Schools. Thanks to a grant from the federal government, Trombly's parent company introduced ten new electric school buses to its fleet, and five of those buses now carry Andover students to and from school. Each electric bus cost approximately $350,000 – more than three times a conventional diesel bus. Charging stations require an additional investment of about $60,0000 each. However, there is no incremental cost to Andover Public Schools for implementing its electric buses; the federal grant offset any increase in transportation cost due to the conversion which allowed Trombly to provide the new buses to Andover at the same rate as the older diesel buses. The electric buses have a range of 138 miles on a full charge.

In addition to eliminating carbon emissions, students and drivers love the new electric buses because they're quiet, there's no smell of diesel exhaust, they don't vibrate, and the regenerative braking makes the buses more responsive and easier to maneuver and stop.

Dr. Parvey, Superintendent of Andover Public Schools, praised the new buses, adding "We are very proud to lead the conversion to a safer, carbon-free transportation system which will benefit not only our students and families but also the Andover community and our partners at Trombly too. As we plan and work to create a zero-emission future, this is a significant step toward achieving our goal."



M-1. Enable and Promote Alternative Transportation

M-1-1. Implement Active Transportation Plan

Action Description

Implementing the Active Transportation Plan is crucial for lowering transportation emissions. The Active Transportation Plan provides a foundation for policies, procedures, investments, and improvements to the active transportation infrastructure. Implementing policies, programs, and facilities such as bikeways, trails, and sidewalks supports the use of active transportation to serve mobility needs in an efficient and sustainable manner. By adopting recommendations of the Active Transportation Plan, we can create a healthier, more active, and more sustainable future for ourselves and for generations to come. Wherever possible we want to shift miles driven in a car to alternative forms of transportation including public transportation, biking, walking, and rolling.

Key Steps for Implementation

Implementation steps will be determined during and following the development of the Active Transportation Plan. Collecting data on the number of cars, bikes, and pedestrians traversing the town will be helpful for measuring success.

Action Lead

Community Development and Planning

Supporting Partners

- Department of Public Works
- Sustainability Department
- Facilities
- Walk Bike Andover
- Andover Trails
- Open Space Task Force

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Number of additional miles of bike lanes or pedestrian walkways.
2. Percent of all trips on foot or bike
3. Decreased vehicle miles traveled

Action Initiation Timeframe

Short | Medium | Long

Legend

Action Initiation Timeframe

Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*

$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Resilience Considerations

The development of the Active Transportation Plan with a focus on climate resilience is an important step towards creating sustainable communities. As climate change continues to exacerbate natural disasters, it is crucial to invest in transportation infrastructure that can withstand these challenges. The plan should include smart and sustainable street design, transit-oriented development, parking management, and sustainable transportation planning.

Co-Benefits & Equity Considerations

1. The Active Transportation Plan should ensure that resources are distributed equitably across all communities.
2. Public transportation should be increased and made accessible to everyone.
3. Active transportation can increase physical activity levels, which can lead to improved health outcomes such as reduced risk of chronic diseases like obesity, diabetes, and heart disease.[1]
4. Opportunities to improve the safety and comfort of Andover's streets for all users will be incorporated into the Active Transportation Plan.

Cost

$$$$: *Depending on implementation actions.*

Possible Funding Sources

1. **Community Transit Grant Program**
2. **Complete Streets Funding Program**
3. **Community Connections Funding Program**

1 https://pubmed.ncbi.nlm.nih.gov/20637168/

M-2. Transition to Electric Vehicles

M-2-1. Install EV charging infrastructure

Action Description

The transition to electric vehicles is crucial for reducing emissions and combating climate change. Municipalities play an important role in the transition to electric vehicles (EVs) by installing public EV charging infrastructure and promoting the need for EV charging infrastructure at businesses, apartments, and condos. In order for everyone to be able to transition to electric vehicles, there needs to be a charging infrastructure for EV owners who do not have access to off-street parking, cannot afford to install their own charger or are limited as renters or shared-owners. In addition, providing reliable, convenient, and fast charging stations can attract visitors to businesses in Andover. Andover should install public EV charging infrastructure to accommodate the increase in visiting electric vehicles. Andover has already started adding EV charging infrastructure to municipal lots and is planning additional ways to expand the network.

Key Steps for Implementation

- Conduct a study to determine the areas where EV charging infrastructure would be highly utilized by drivers who don't have access to off-street parking near their home or cannot afford to install a charger. This study should also include an assessment of apartments, condominiums, and other home types that may have barriers to installing EV charging.
- Assess the need for additional EV charging infrastructure based on annually determining the rate of EV adoption by residents. Install additional EV chargers when demand outstrips availability based on charging infrastructure occupancy data.
- Develop and annually update an EV charging infrastructure development guide for multifamily housing in Andover, including but not limited to listing available rebates and incentives, upfront and ongoing cost breakdowns, and percentage of EVs registered in town.
- Encourage new commercial and industrial developers to install workplace charging infrastructure for their employees.

Action Lead

Facilities Department

Supporting Partners

- Apartment building owners, condo associations
- Department of Public Works
- Community Development and Planning
- Andover WECAN
- Andover Green Advisory Board
- Chamber of Commerce
- Economic Development Council

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Installation of EV charging stations at apartment and condo complexes in Andover.
2. Increased use of electric vehicles in Andover by residents living in apartments and condos in Andover.
3. Installation of EV charging stations at commercial and industrial workplaces in Andover.

Action Initiation Timeframe

Resilience Considerations

Electric vehicles can improve climate resilience in several ways. They emit fewer greenhouse gases and air pollutants than gasoline or diesel cars. This means that they can help reduce the amount of carbon emissions released into the atmosphere, which is a major contributor to climate change. Electric vehicles can help reduce the reliance on fossil fuels, which are a finite resource and contribute to climate change. Electric vehicles can help improve air quality, which can have a positive impact on public health.[1]

Co-Benefits & Equity Considerations

1. Electric vehicles can help reduce noise pollution and particulate matter from combustion engines, which can have a positive impact on the environment and human health.
2. Electric vehicles may not be accessible to everyone because of price, although they are becoming more affordable as technology changes and as more EVs enter the used car market.

Cost

$$$

Possible Funding Sources

1. **National Grid EV Charging Program**
2. **MassEVIP Workplace & Fleet Charging Incentives**
3. **MassEVIP Multi-Unit Dwelling & Educational Campus Charging Incentives**
4. **MassEVIP Direct Current Fast Charging Incentives**

1 https://www.eea.europa.eu/articles/electric-vehicles-a-smart

M-2. Transition to Electric Vehicles

M-2-2. Transition public fleets to EVs

Action Description

Transitioning municipal fleets to electric vehicles (EVs) requires a solid strategy. The first step is to analyze the utilization of all current vehicles by examining driving data. Local governments like Andover can directly impact the EV market by committing to electrification and investing in new fleet technology. Ongoing declines in battery costs, wider availability of electric car models, uptake of EVs by fleet operators, and enthusiasm of electric car buyers provide a favorable environment for transitioning the municipal fleet to EVs. As vehicles need to be replaced, they should be replaced with electric vehicles when possible.

Key Steps for Implementation

- Identify municipal fleet useful life and opportunities to replace fossil fuel vehicles with electric vehicles.
- Consult Town Staff to ensure that an electric vehicle will meet their needs.
- Identify where electric vehicles can be purchased for the best price.

Action Lead

Facilities Department

Supporting Partners

- Department of Public Works
- Police and Fire Departments

Ease of Implementation

☒ Approval at Town Meeting
☐ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Increase in number of electric vehicles in the Town of Andover's community fleet

Action Initiation Timeframe

Short — Medium — Long

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Resilience Considerations

Transitioning municipal fleets to electric vehicles (EVs) is a crucial step in building climate resilience and mitigating emissions. EVs are responsible for considerably lower emissions over their lifetime than conventional vehicles. This is especially true in regions with cleaner electricity generation. Using more energy-efficient vehicles like EVs can help improve fuel economy, lower fuel costs, and reduce emissions, which can contribute to our energy security.[1]

Co-Benefits & Equity Considerations

1. EVs can save money over their useful life, as they require less maintenance and have lower operating costs than traditional vehicles.
2. EVs produce zero tailpipe emissions, which can help reduce air pollution.
3. EVs produce less noise pollution than traditional vehicles, which can lead to quieter streets.
4. Municipal fleets transitioning to EVs can set an example for residents and encourage accelerated adoption of EVs.

Cost

$$$$

Possible Funding Sources

1. **National Grid EV Charging Program**
2. **MassEVIP Workplace & Fleet Charging Incentives**

1 https://afdc.energy.gov/fuels/electricity_benefits.html

Public Health & Safety

Public health, resilience, and sustainability are interconnected concepts that are critical for the well-being of individuals and communities. Climate change brings a suite of uncertainties. Preparing and protecting the public for different types of hazards or crises is an important task to mitigate the impacts of events caused by climate change.

Climate change has significant impacts on public health. Extreme weather events such as heatwaves, storms, and floods can lead to death and illness. Climate change also disrupts food systems, increases the spread of food-, water-, and vector-borne diseases, and affects mental health. In addition, climate change undermines many of the social determinants of good health, such as livelihoods, equality, and access to health care and social support structures. Climate change affects the social and environmental determinants of health, including clean air, safe drinking water, sufficient food, and secure shelter. Vulnerable populations, such as those with limited economic resources and those living in certain locations, are at higher risk. Climate change is also one of many compounding factors that can influence mental health. The public health community has an important perspective to share about climate change, which can make the problem more personally relevant, significant, and understandable to members of the public.

Community preparedness is an essential aspect of disaster management. It involves the collective efforts of community members to prepare for potential disasters and emergencies. The goal of community preparedness is to ensure that individuals and communities are equipped with the necessary training, education, and resources to prepare in advance against the threat of a possible local disaster. According to **Ready.gov,** studies have shown that individuals who believe they are prepared for disasters often are not as prepared as they think, while others admit they have not developed any type of personal preparedness plan. Therefore, community preparedness aims to maximize residents' awareness of the importance of proactive planning and encourage participation in disaster preparedness activities. This can be achieved by partnering with local resources, establishing effective community emergency response teams, and developing community disaster preparedness plans.

The Town of Andover is currently updating its Community Health Plan. The plan is expected to be released in Summer 2023. The Plan's priority topics are Mental Health, Affordable Housing, and Diversity, Equity, and Sense of Community. This plan echoes and amplifies those sentiments.

How does climate change effect mental health?

The Centers for Disease Control and Prevention (CDC) has identified the following effects to mental health related to climate change:

- Trauma, grief, or sleep disorders after extreme weather
- Stress or depression due to changes in food access and livelihoods
- Mood disorders or aggressive behavior in areas with rising surface temperatures
- Feelings of helplessness or anxiety about the future

Source: How Climate Change Can Affect Your Mental Health. May 10, 2022. **How Climate Change Can Affect Your Mental Health | Blogs | CDC**

Public Health and Safety strategies for Andover include:

PH-1: Protect residents, workers, and visitors in the event of natural disasters or public health crises

PH-2: Enhance municipal and community preparedness to respond to climate impacts

Public Health and Safety Targets:

Action ID	Topic	Metric	2030 Target	2050 Target
PH-1-1	Public Safety	Increased enrollment in communication pathways	10%	75%
PH-1-2	Resilience Hubs	Percent of population located within 2 miles of a hub	5%	50%
PH-2-1	Climate Impact	Instances of climate-related injuries and deaths		0
PH-2-2	Climate Impact	Instances of climate related vector-borne illnesses		0
PH-2-3	Climate impact	Incidents involving release of hazardous materials during floods		0

UMass Amherst's Industrial Assessment Center faculty and students visit Andover' Water Treatment Plan for a comprehensive tour and energy assessment of the Andover Water Treatment Plant. Photographer: Joyce Losick-Yang

March 2020 flood event. Photo by Kate Margolese

Case Study

Public Health & Safety

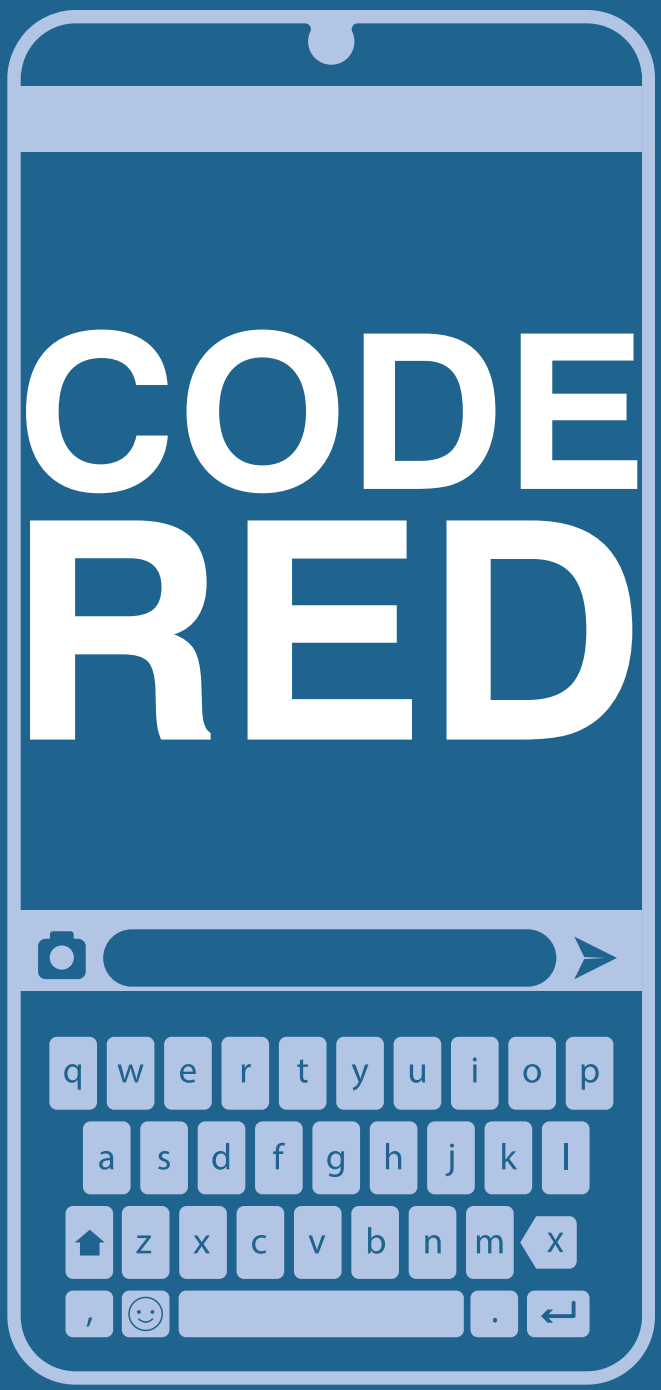
Have you heard the news?

Since 2014, the Town of Andover has been using the CodeRED Emergency Notification System to alert residents and businesses of emergency situations. It enables the Town to provide mass notification quickly and easily through phone calls, text messages, and emails.

As the Town experiences the impacts of climate change, access to information can help improve public health and safety. In 2019, mosquitos in Andover were positive for Eastern Equine Encephalitis (EEE) and the state designated the Town as a high risk for EEE. During this time, CodeRED was used to disseminate information about the risk and mitigation efforts. CodeRED is also used regularly to provide information about disruptions to municipal services from severe weather events. With more frequent and serve storms expected due to climate change, advanced notice of these events can help the community prepare.

CodeRED is a free program and participants can opt out at any time. If you are not already registered, you can do so here: **Register for CodeRED Online**

If you were previously being call through our old Reverse 911 system, you will need to re-register with the new CodeRED system. For those who are hearing impaired, the sign up form offers a TDD only option for tone delivery of emergency messages. Messages delivered to phone numbers marked TDD will only be delivered in a TDD/TTY format. Residents without internet access may visit town offices and fill out a CodeRED registration form in-person.



Public Health & Safety

PH-1: Protect residents, workers, and visitors in the event of natural disasters or public health crises

PH-1-1. Explore meaningful ways to increase emergency communication with the community

Action Description

Resilient communication is a crucial aspect of community resilience. There are several strategies Andover can use to communicate with the public effectively. Effective communications strategies for municipalities include the use of social media, reverse calling systems, digital billboards, and the Town's website. Social media platforms such as Facebook, Twitter, and Instagram can be used to disseminate information, respond to resident queries and concerns, and shape content that residents will want to engage with. It is important to determine which method is the most effective means of timely communication for the majority of citizens.

Key Steps for Implementation

- Compile available data on usage of current communication systems and develop a public survey, advertise, and distribute survey via multiple pathways, including social media, website, and print.
- Analyze survey result to determine if the survey captured a representative sample and identify the three most common methods and any gaps in communications.
- Expand the reach of the communication methods with an outreach campaign.
- Research and implement additional communication strategies to address gaps, if needed.

Action Lead

Emergency Management Director

Supporting Partners

- Department of Public Health
- Emergency Management Working Group
- Information Technology
- Faith Communities
- PTA Groups
- Adjacent Communities
- Library

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. High number of survey respondents.
2. Increased engagement numbers on the website and social media.
3. Increased enrollment in communication pathways (i.e., subscribed to CodeRED, emails, etc.).

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Resilience Considerations

Climate resilient communication is crucial for communities to prepare for and cope with the impacts of climate change. As we work to avert the worst potential impacts of climate change, we must also become more resilient to those impacts that are now unavoidable. Citizens are more prepared when they have easy access to the information they need during a hazard event or crisis. To achieve a climate resilient community, increasing climate information and technical capacity for flexible and dynamic systems are needed. This needs to be coupled with greater consideration of the socio-ecological resilience and context-specific values of marginalized communities and meaningful engagement with the most vulnerable in decision making.

Co-Benefits & Equity Considerations

1. These impacts often disproportionately affect low-income communities and communities of color, reinforcing the need for equitable and proactive resilience planning and resource allocation.
2. Not all citizens may have easy access to internet, television, or text messaging.
3. Building proactive resilience and engaging with the many aspects of climate change and future uncertainties involved requires working with traditionally marginalized groups, including women, youth, Indigenous Peoples, local communities, and ethnic minorities.
4. Make sure that youth, seniors, people with disabilities, and people who work in flood-prone areas are being reached in more than one way.

Cost

$

Possible Funding Sources

1. **Department of Homeland Security Regional Catastrophic Preparedness Grant Program (RCPGP),** refer to **Grants.gov** for currently available federal grants and to the **Massachusetts Emergency Management Agency** for additional guidance and funding on the topic of emergency management and communications

Public Health & Safety

PH-1: Protect residents, workers, and visitors in the event of natural disasters or public health crises

PH-1-2. Develop neighborhood resilience hubs to coordinate and maintain resident well-being

Action Description

Developing neighborhood resilience hubs is a strategy that can help coordinate and maintain resident well-being. Resilience hubs are community-serving facilities that are designed to enhance community resilience while reducing greenhouse gas emissions and improving local quality of life. These hubs are typically housed in trusted, community-managed facilities such as a church or civic center and are designed to coordinate culturally sensitive, multilingual services to better meet the needs of diverse groups of community members. They can provide a safe place for temporary shelter and relief during days of extreme heat or operate as centers for distributing necessities such as food and multilingual information after disaster events such as floods. By engaging residents in the process of designing community resilience hubs, communities can define their needs and priorities for their neighborhood, promoting equity and community and economic development.[1]

Key Steps for Implementation

- Increase public education and outreach efforts regarding emergency planning and preparedness.
- Connect the public with emergency services.
- Connect those with special needs to emergency services.
- Host public hazard expos or other community engagement events.
- Facilitate emergency drills via public schools.

Action Lead

Public Safety

Supporting Partners

- Facilities
- Emergency Services
- MEMA
- MA Dept. of Public Health
- Library
- Faith Communities
- Better Business Bureau
- Andover Youth Services

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

1 http://resilience-hub.org/

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Increased connectivity between emergency services and vulnerable populations.
2. Public survey to assess preparedness.

Action Initiation Timeframe

Resilience Considerations

Communities become more resilient to disasters when citizens are more prepared and informed. When citizens are prepared, it is less likely that there will be loss of life or damage to property. Resilience hubs are a promising approach to building local community power and leadership, strengthening relationships between governments and the people they serve, and addressing existing health inequities that disasters highlight and exacerbate.

Co-Benefits & Equity Considerations

1. Site considerations might include accessibility and physical safety.
2. Resilience hubs should be designed to coordinate culturally sensitive, multilingual services to better meet the needs of diverse groups of community members.

Cost

$

Possible Funding Sources

1. **FEMA BRIC funding for Capability & Capacity Building**
2. **Municipal Vulnerability Preparedness (MVP) program**

PH-2: Enhance municipal and community preparedness to respond to climate impacts

PH-2-1. Develop public health approach to build mental wellness and resilience

Action Description

Developing a public health approach to build mental wellness and resilience is crucial in promoting overall well-being. According to the World Health Organization, mental health is a state of well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. It is a basic human right and a crucial component of health and well-being. Building resilience and promoting mental wellness can prevent the onset of mental health problems and potentially lessen the severity of existing mental health problems.[1] The 118th Congress recently introduced the Community Mental Wellness and Resilience Act to provide funding to address this issue.[2] To prepare for climate impacts and help address climate related mental health, Andover can establish programs to facilitate community connectedness and communication of important information to all residents including youth, who are particularly concerned about climate change.

Key Steps for Implementation

- Develop a peer recovery support services programs to provide non-clinical services that include peer support services and engagement, recovery housing, recovery community centers, peer bridger programs, peer-run crisis respites, warm lines, and recovery programs in High Schools and colleges.
- Study how to engage citizens to use municipal resources such as the cooling and warming centers.
- Engage community members.
- Identify required staff and resources required.

Action Lead

Community Development & Planning – Health Department

Supporting Partners

- Andover Youth Services
- PTA Groups
- Andover Public Schools

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

1 https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response
2 https://www.markey.senate.gov/imo/media/doc/one-pager_cmwra_-_050423pdf.pdf

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

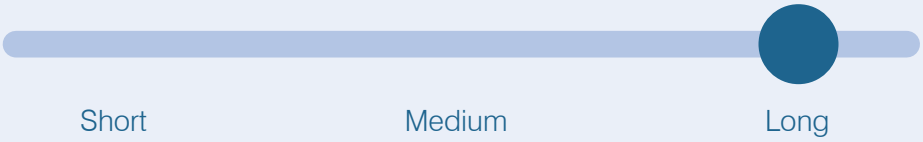
Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Fewer instances of heatstroke or heat-related death.
2. Fewer instances of hypothermia or cold-related death.
3. Decreased closures of businesses after a hazard event.

Action Initiation Timeframe



Resilience Considerations

To build community resilience, there is tremendous potential to work together in a coordinated and comprehensive manner. Developing age and culturally appropriate community strategies to engage all adults and youth in enhancing and sustaining mental wellness and resilience is a key step in promoting mental health.[1]

Co-Benefits & Equity Considerations

1. A public health approach can help address persistent health disparities rooted in systemic racism and improve individual and community health.
2. Social connections serve as important protection against poor health and well-being and aid in coping with toxic stress that damages health.
3. People of all ages will be able to access municipal programs and resources, including youth.

Cost

$$

Possible Funding Sources

1. **FEMA BRIC funding for Capability & Capacity Building**
2. **FEMA Small Business Program**
3. **Health and Public Safety Workforce Resiliency Training Grant**

1 https://psychnews.psychiatryonline.org/doi/10.1176/appi.pn.2023.02.2.23

PH-2: Enhance municipal and community preparedness to respond to climate impacts

PH-2-2. Develop a vector-borne illnesses management and communications plan.

Action Description

Climate change is expected to increase the incidence and spread of vector-borne diseases which are diseases caused by parasites, viruses, and bacteria and transmitted by vectors. Warmer temperatures can expand the geographic range of vectors such as mosquitoes and ticks, allowing them to survive and breed in areas where they previously could not. Increased rainfall can also create more breeding areas for many vectors by increasing the amount of standing water.[1] Developing a resilient vector-borne illnesses management and communications plan requires a multi-faceted approach. This includes strengthening communication with the community, preventive messaging, and resilient multidisciplinary local and cross borders collaboration in resource mobilization and allocation to scale-up integrated and sustainable vector control. By implementing these strategies, Andover can develop a comprehensive and effective plan to manage vector-borne illnesses and communicate with the communities.

Key Steps for Implementation

- Create a citizen science platform to create new channels of communication between mosquito control specialists and community members.
- Develop an early warning system for mosquito-borne diseases to be used to alert the community to potential outbreaks. This can help to mobilize the community to take preventive measures.
- Develop education on how to prevent vector-borne diseases from spreading to be shared at appropriate times of the year.
- Identify available staff resources to assign to the project.
- Identify existing plans and assessments that look at climate change.
- Develop a coordination plan across agencies and adjacent communities.

Action Lead

Community Development & Planning – Health Department

Supporting Partners

- Regional Mosquito Control District
- Emergency Management Working Group
- Information Technology
- Faith Communities
- PTA Groups
- Adjacent Communities
- Library

1 https://www.nature.com/articles/s41590-020-0648-y

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Fewer instances of vector-borne illnesses.
2. Decreased service calls for pest or mosquito management.

Action Initiation Timeframe

Resilience Considerations

Vector-borne illnesses management and communications plan can improve resilience by strengthening the health system, promoting prevention, and increasing awareness. The Centers for Disease Control and Prevention (CDC) has developed a Building Resilience Against Climate framework that can be used to implement and monitor vector-borne disease control strategies.[1]

Co-Benefits & Equity Considerations

1. Developing a plan to manage vector-borne illnesses can help identify vulnerable populations and areas that are at higher risk of exposure to these diseases.
2. Collaboration between different sectors, such as public health, agriculture, and environmental management, can help to ensure that vector-borne illnesses are managed in an equitable manner.
3. Vector-borne illnesses can affect different populations in different ways, and interventions should be tailored to meet the specific needs of each population.

Cost

$$

Possible Funding Sources

1. **Strengthening Training, Evaluation, and Partnerships in the Prevention and Control of Vector-Borne Diseases**

1 https://www.cdc.gov/climateandhealth/BRACE.htm

PH-2: Enhance municipal and community preparedness to respond to climate impacts

PH-2-3. Identify and assess hazardous material storage locations at risk from flooding

Action Description

Identifying and assessing hazardous material storage locations at risk from flooding is crucial to prevent environmental contamination and health risks. Storage facilities protect hazardous waste by storing them in tanks, but if these facilities are located in flood-prone areas, the risk of contamination increases. Floods can cause tanks to rupture, leading to the release of hazardous materials into the environment. The toxic waste threat is increasing with climate change as flood events become most substantive and frequent. It is essential to identify and assess hazardous material storage locations at risk from flooding to prevent environmental contamination and health risks.

Key Steps for Implementation

- Conduct a risk assessment to measure the potential loss of life, personal injury, and economic and property damage resulting from identified hazards.
- Develop mitigation strategies to reduce the risk of flooding at hazardous material storage locations. This can include relocating storage facilities, implementing flood protection measures, and developing emergency response plans.
- Establish a maintenance and training program.
- Create an education to inform the community on storing hazardous household products such as paints, solvents, pesticides, etc.

Action Lead

Department of Public Works

Supporting Partners

- Sustainability Department
- Facilities Department
- Community Development & Planning – Health Department
- Emergency Services
- Better Business Bureau

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Less or no incidents involving hazardous materials during flooding events.
2. Successful deployment of flood control measures during flooding events

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Resilience Considerations

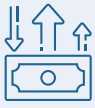
Flood control measures at hazardous material locations will increase resilience by decreasing the possibility of accidents or contamination.

Co-Benefits & Equity Considerations

1. Flood control measures may provide protection to the facilities in addition to the hazardous materials contained within them.

Cost

$$$



Possible Funding Sources

1. **Hazard Mitigation Assistance Grants**
2. MEMA's **Hazardous Materials Emergency Preparedness (HMEP) Grant**

Natural Resources

Protecting natural resources such as forests, water, and wetlands is a crucial part of climate adaptation and mitigation. Shade trees help to mitigate extreme heat and wetlands help to mitigate flooding from rainfall or storm events. Both have the ability to sequester carbon dioxide. Potable water should be conserved and used responsibly in order to ensure its continued supply in the future and to reduce the demand from the water treatment plant, which is one of the most energy intensive municipal operations. Preserving biodiversity helps to maintain healthy ecosystems and prevent further acceleration of climate change. Allowing resources and systems to function naturally and without human disturbance can help reduce GHG emissions and build resilience. When natural resources need to be managed, such as stormwater runoff, nature-based solutions that aim to protect and restore ecological systems should be used.

The community benefits from natural resources like the 2,200 acres of Conservation Commission protected land across the community.[1] Andover has approximately 5,921 acres of forests and 2,523 acres of wetlands that provide important ecosystem services including carbon sequestration.[2] The 11,521 street trees included in Andover's tree inventory sequester 885 MTCO2 each year.[3]

Nature-Based Solutions (NBS) are adaptation measures focused on the protection, restoration, and/or management of ecological systems to safeguard public health, provide clean air and water, increase natural hazard resilience, and sequester carbon. Incorporating NBS in local planning and design projects produces long-term solutions that benefit human and natural systems.

NBS offer numerous co-benefits that address challenges faced by communities:

- Climate Resilience
- Cost-Effective Alternatives
- Supporting Ecosystem Services
- Spurring Economic Activity
- Enriching Human Health And Well-Being

Source: **Nature-Based Solutions Toolkit https://resilientma.mass.gov/mvp/content.html?toolkit=nature_based**

1 As of 2021 from **https://andoverma.gov/156/Conservation**

2 Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, **doi:10.5066/P9KZCM54**. Land cover types included deciduous forest, evergreen forest, and mixed forest, woody wetlands and emergent herbaceous wetlands.

3 **https://andoverma.treekeepersoftware.com/index.cfm?deviceWidth=1920**

Natural Resource strategies for Andover include:

NR-1: Enhance and protect the tree canopy

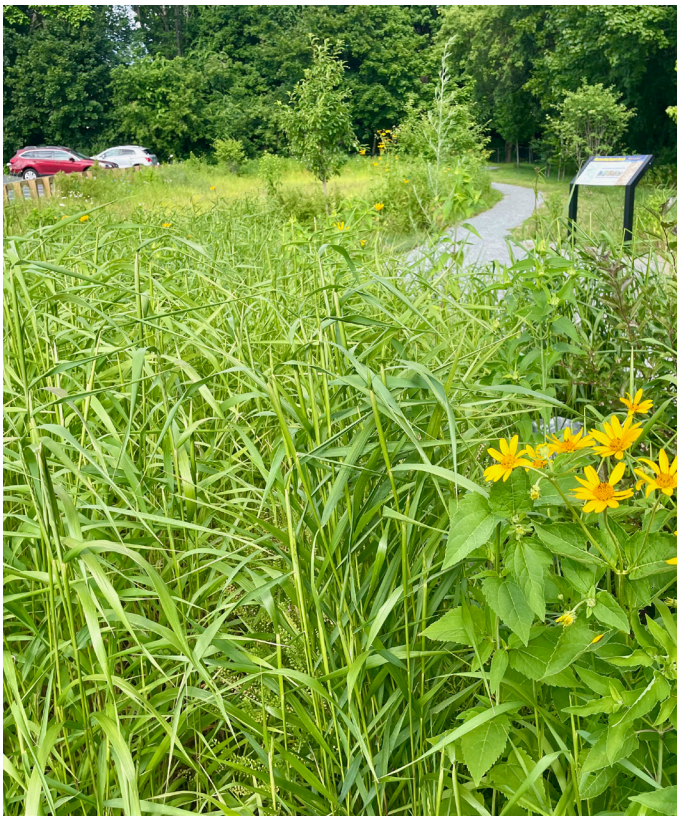
NR-2. Advance the smart and efficient use of water by all community members

NR-3. Promote and Protect Andover's biodiversity and natural resources

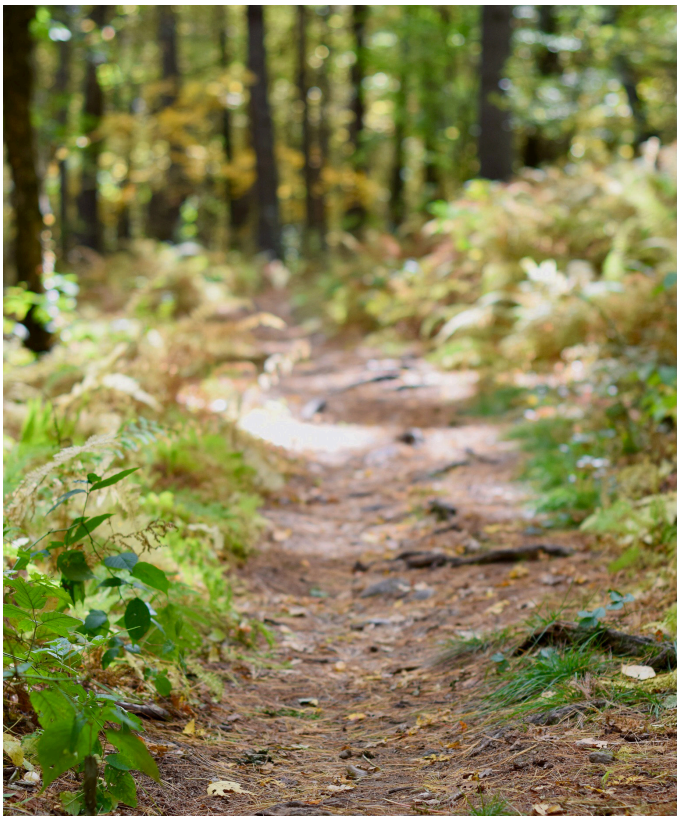
NR-4. Minimize stormwater run-off

NR-5. Prioritize the role of wetlands in enhancing Andover's resilience to climate change

The Environmental Sustainability Internship Course (ESIC) is a unique approach to experiential and project-based learning at Andover High School in Andover, MA. Each student is matched with a community mentor to work on a project to improve environmental sustainability in Andover. While all of the projects have a basis in sustainability, each internship is a unique experience based on the student's and mentor's connections, skills, and interests. All internships focus on job skills, leadership, project management, and environmental sustainability.



Playstead in Andover. Photo by Kate Margolese



Hiking Trail. Photo by Kate Margolese

Natural Resource Targets:

Action ID	Topic	Metric	2030 Target	2050 Target
NR-1-1	Tree Canopies	% tree cover in town	68%	70%
NR-1-2	Urban Heat	% impacted areas with newly planted trees	3%	15%
NR-2-1	Water Conservation	% reduction in leak volume	10%	50%
NR-2-2	Water Conservation	% reduction in residential water usage	18.75%	25%
NR-3-1	Nature Resource Protection	% electric landscaping equipment	30%	75%
NR-3-1	Nature Resource Protection	No. town properties practicing low impact landscaping	2	10
NR-3-2	Nature Resource Protection	% residential/commercial low impact landscapes	5%	50%
NR-3-3	Biodiversity Education	No. public events	4	12
NR-4-2	Stormwater Management	No. nature-based solutions implemented to reduce climate impacts	2	5
NR-5-1	Wetlands	% acreage increase in protected wetlands	5%	10%
NR-5-1	Wetlands	No. public events	2	4

Case Study

Natural Resources

In June 2022, a small group of dedicated volunteers came together to promote native plantings and healthy habitats for pollinators throughout our community. Andover Pollinator Pathway's mission is to foster connections between the many natural spaces in town and residential gardens to form a pathway for pollinators. The goal is to create a more robust, resilient ecosystem with a greater diversity of native species to support pollinators. Residents can join by following these five practices:

- Plant native plants, including trees, shrubs, grasses, and flowers.
- Reduce the use of chemical fertilizers, herbicides, and pesticides in favor of safer alternatives.
- Control invasive plants
- Reduce lawn size in favor of native plantings
- Leave leaves in the landscape in the fall

Andover Pollinator Pathway has dedicated gardeners who do yard visits to help residents get started on creating their own pollinator garden using the five practices listed. They provide residents with lists of native plants and local nurseries carrying these native pollinator plants. They have set up **a webpage on the national Pollinator Pathway site** and, to date, have over 30 yards on their interactive google map. In addition, they have over 110 names on the mailing list who receive newsletters.

Andover Pollinator Pathway also sponsors a Speaker Series with Memorial Hall Library to educate Andover residents about best practices including transitioning lawns into healthy ecosystems, soil health and organic land management, demonstrations on winter seed starting, and growing native plants for spring plant sales. They invite Andover residents to nurture backyard biodiversity by learning more about the benefits of native plants and pollinators.

NR-1: Enhance and protect the tree canopy

NR-1-1. Develop a program to maintain and improve the municipal tree canopy.

Action Description

Maintaining and improving the municipal tree canopy is essential for the health and well-being of Andover. Trees help reduce runoff, erosion, and stormwater, and they provide many other benefits such as reducing heat islands, increasing property values, and improving air quality. To achieve these benefits, Andover can develop a forestry program that preserves, plants, and manages local forests and trees for public benefits and quality of life. As global warming increases, extreme heat waves and invasive species can degrade the existing tree canopy. A municipal forestry program can provide technical, educational, and financial assistance to help town staff triage and prioritize needs and provide training to field staff on topics of pruning, planting, or identification of tree defects. The Town is currently developing a Tree Management Plan.

Key Steps for Implementation

- Assess the current status of the tree canopy in Andover
- Identify areas with needs for additional trees.
- Complete the Tree Management Plan.
- Determine available funding and seek additional funding if necessary.
- Work in conjunction with Public Works and the community to execute plantings.
- Calculate the total carbon sequestration potential of all trees.

Action Lead

Department of Public Works

Supporting Partners

- Community Development & Planning
- Conservation Commission
- Andover High School's environmental club
- Merrimack Valley Planning Commission
- Sustainability Department

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Sustained or increased percentage of tree cover in the town.

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Short | Medium | Long

0-2 years to start, maintenance and growth will be ongoing

Resilience Considerations

Improving the tree canopy of a community can contribute greatly to resilience. Tree canopies mitigate urban heat impacts and promote biodiversity. A thriving tree canopy can also contribute to better air quality.

Co-Benefits & Equity Considerations

1. Improved canopy and aesthetics in traditionally underserved neighborhoods.
2. Mitigate urban heat effect.
3. Improved air quality.
4. Lowered summer energy costs.

Cost

$

Possible Funding Sources

1. **Healthy Communities Grant Program for New England**
2. **Municipal Vulnerability Preparedness Grants from EEA**
3. **Urban and Community Forestry Challenge Grants**
4. **Urban & Community Forestry Inflation Reduction Act Grants**

NR-1: Enhance and protect the tree canopy

NR-1-2. Identify areas vulnerable to extreme heat impacts and coordinate tree planting efforts

Action Description

Trees can help reduce urban heat by shading building surfaces, deflecting radiation from the sun, and releasing moisture into the atmosphere. Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration.[1] The use of trees and vegetation in the urban environment brings benefits beyond mitigating urban heat islands including reducing electricity demand for air conditioning, not only sparing money and emissions, but helping avoid potentially catastrophic power failures during heat waves.

Key Steps for Implementation

- Identify areas that are vulnerable to extreme heat impacts. This could include citizen science projects similar to those **conducted in Boston.**
- Secure funding for additional shade tree cover.
- Enlist community support to execute plantings.

Action Lead

Department of Public Works

Supporting Partners

- Community Development & Planning
- Conservation Commission
- Andover High School's environmental club and ESIC course
- Merrimack Valley Planning Commission
- Sustainability Department
- Andover Green Advisory Board

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Increased tree coverage in identified areas.
2. Decreased instances of extreme heat impacts in newly planted areas.

Action Initiation Timeframe

Short — Medium — Long

1 https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Resilience Considerations

Reducing extreme urban heat effects will be important as the community continues to navigate climate change and its impacts. Trees provide shade and are effective at mitigating the impacts of urban heat. Areas that lack tree cover can be vulnerable to extreme heat impacts.

Co-Benefits & Equity Considerations

1. Improved aesthetics.
2. Planting trees in these areas can help reduce the health risks of a warming climate and make the effort more equitable.
3. Urban tree canopy has greater cooling effects in socially vulnerable neighborhoods, making it an effective strategy to combat extreme heat events that are becoming a significant climate-driven threat to public health.

Cost

$$$

Possible Funding Sources

1. **Healthy Communities Grant Program for New England**
2. **Municipal Vulnerability Preparedness Grants from EEA**
3. **Urban and Community Forestry Challenge Grants**
4. **Urban & Community Forestry Inflation Reduction Act Grants**
5. **Massachusetts Collaborative for Private Forestland – Regional Conservation Partnership Program**

NR-2. Advance the smart and efficient use of water

NR-2-1. Identify and repair water distribution system leaks.

Action Description

Identifying and repairing water distribution leaks can make a town more sustainable in several ways. First, it can help conserve water, which is becoming an increasingly scarce resource. Second, it can reduce the amount of energy required to pump and treat water, which can help lower greenhouse gas emissions. Third, it can save money for both the town and its residents by reducing water bills. By implementing leak detection programs, utilizing green energy systems, and repairing leaks as soon as they are detected, Andover can improve our water supply networks and become more sustainable. Andover currently responds to public property leaks to repair them immediately; however private property repairs are not addressed as quickly.

Key Steps for Implementation

- Develop a standard for strict deadlines for private property repairs and penalties for noncompliance.
- Revise future contracts for professional services for leak detection to also include immediate repair once found.
- Develop a program for the municipality to support repairs of private property leaks.

Action Lead

Department of Public Works

Supporting Partners

- Facilities Dept.
- Andover Green Advisory Board

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☐ Department has authority to carry out
- ☒ Will need to pass at Select Board Meeting

Measures of Success

1. Leak should not persist year over year. There should be a clear reduction in leak volume in ASR.

Action Initiation Timeframe

Short — Medium — Long

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Resilience Considerations

By reducing water distribution leaks, utilities can better manage water resources during extreme weather events, reduce water loss, save money, and improve infrastructure. These measures can help build a more resilient water supply system that can withstand the impacts of climate change.

Co-Benefits & Equity Considerations

1. Reduced wastewater discharges through indoor water savings, which can improve water quality and aquatic habitat.
2. Reduced need for water supply expansion.
3. Investments in water infrastructure can yield additional benefits for water security and resilience for surrounding communities.
4. Community access to safe, affordable, and reliable water services, regardless of income, race, or other factors.
5. Leakage reduction measures should be designed to ensure that the benefits are distributed equitably across the community.

Cost

$$$$

Possible Funding Sources

1. **MassDEP Water Resources Grants & Financial Assistance**
2. **HUD Community Development Block Grant (CDBG)**
3. **Water Infrastructure Finance and Innovation Act (WIFIA)**

NR-2. Advance the smart and efficient use of water

NR-2-2. Promote residential water conservation practices

Action Description

Promoting residential water conservation practices is crucial for ensuring the availability of clean water for future generations. Water conservation involves the efficient utilization of water while cutting down its wastage. There are several ways to conserve water at home, indoors and outdoors. Indoor ways include fixing leaks, using low-flow showerheads and faucets, and installing water-efficient appliances. Outdoor ways include planting native species, converting space to non-lawn alternatives, and watering outdoors only when needed. Schools can also actively contribute to the conservation of water with the help of pupils and staff. Additionally, water conservation can extend the life of septic systems, reduce soil saturation, and prevent water pollution in nearby lakes, rivers, and local watersheds. It is essential to change habits and start with simple steps to reduce water consumption gradually. By promoting residential water conservation practices, we can ensure that supplies of fresh water will be available for everyone, today and tomorrow.

Key Steps for Implementation

- Offer water efficiency classes to employees and residents so they can learn techniques to incorporate water-efficient practices into their daily lives.
- Update the website with helpful information regarding water conservation.
- Work with local home improvement stores to sell or advertise the use of rain barrels.
- Host a bi-annual water conservation workshop for the community.
- Provide clear communications about upcoming restrictions on water use.
- Designate or hire staff to monitor and enforce any new regulations.
- Fund the installation of advanced metering infrastructure (AMI) and automatic meter reading (AMR) metering technology.
- Pass by-law implementing water restrictions in accordance with terms set forth in WMA Registration and Permit issued to town, including enforcement mechanism and penalties for noncompliance. During drought emergencies, the town implements restrictions through the Water Use Restriction Bylaw which was adopted in 2002.

Action Lead

Department of Public Works

Supporting Partners

- Community Development and Planning
- Facilities Department
- Sustainability Department
- Andover Green Advisory Board
- Better Business Bureau
- Faith Communities
- PTA Groups
- Girls and Boys Scouts
- Greater Lawrence Technical School

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Increased use of rain gardens, rain barrels, and other methods of water storage.
2. Decline in the average residential water bill.
3. Reduction in water pumped from WTP during summer months.
4. If AMR system is implemented, there would be no peak usage during early morning/evening hours on restricted days, and/or no usage on irrigation meters during this period.

Action Initiation Timeframe

Resilience Considerations

Freshwater resources should be conserved as much as possible. There is uncertainty surrounding how climate change will impact freshwater resources, and therefore learning water conservation habits now will be beneficial in the long-term.

Co-Benefits & Equity Considerations

1. Ensuring all people have access to clean, safe, affordable water service is one of the three pillars for advancing water equity. Residential water surveys and evaluations targeted at high water users can benefit equity and fairness.
2. Residential water conservation practices can result in water use savings of 20% to 40%.[1]
3. Increased water efficiency, water reuse, and better integration of land use and water planning can help maintain a healthy environment, promote sustainable development, and reduce the need for costly water supply expansion projects.

Cost

$: *However, if an AMI/AMR system is implemented, the cost would be greater than $2M*

Possible Funding Sources

1. **Department of Housing and Urban Development Green and Resilient Retrofit Program (GRRP)**
2. **Mass Save Program**
3. **State Revolving Fund (for AMI/ARM, but very competitive)**

1 https://www.oas.org/dsd/publications/unit/oea59e/ch31.htm

NR-3. Promote and Protect Andover's biodiversity and natural resources

NR-3-1. Lead by example with municipal adoption of sustainable landscaping practices

Action Description

Andover can lead by example with sustainable landscaping practices by implementing eco-friendly landscaping practices, prioritizing the use of native species plans, and using electric equipment to reduce air pollution, conserve water, and manage waste. By implementing these practices, Andover can save money and resources while demonstrating for residents and businesses what best practices are for sustainable landscapes.

Key Steps for Implementation

- Review current town landscaping practices to identify which species use the most water and require the most maintenance and make more sustainable selections for future landscaping.
- Assess the inventory of Town owned landscape equipment to identify equipment near the end of its lifespan and develop a replacement plan tied to the capital budget for electric equipment.
- Create internal educational materials for hired landscaping staff and decision makers.
- Demonstrate transparent and participatory leadership on adoption to the community through local newspaper articles and on the Town's website.

Action Lead

Facilities Department
Department of Public Works

Supporting Partners

- Community Development & Planning Department, specifically the Conservation and Planning & Economic Development divisions
- Sustainability Department
- Merrimack Valley Planning Commission
- Andover High School's ESIC Program

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Increase in use of native plant species in landscaping.
2. Purchase and use of electric landscaping equipment.
3. Increase in use of low impact development techniques on municipal properties.

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Short | Medium | Long

3-6 years, ongoing

Resilience Considerations

Overall, sustainable landscape practices can help communities adapt and redevelop to reduce risks and improve ecological and human health, and offer a way forward for communities to become more resilient to climate change. The use of native plant species and low impact development techniques assist with stormwater runoff management and promote biodiversity. Additionally, the use of electric landscaping equipment can decrease reliance on fossil fuels and decrease GHG emissions.

Co-Benefits & Equity Considerations

1. Sustainable landscaping practices can promote the creation, maintenance, enhancement, and restoration of ecosystems, supporting biodiversity.
2. Sustainable landscaping practices can help improve air and water quality, which can have a positive impact on the health of low-income communities.
3. Sustainable landscaping practices can help build social capital by promoting social interactions and building relationships that increase resilience during crises.
4. Sustainable landscaping practices can address environmental justice considerations by focusing on the (un)equal distribution of ecosystem services and the associated green and blue infrastructure with regard to marginalized groups.

Cost

$$: *This should be incorporated in the budgeting process planned for the asset's end of useful life.*

Possible Funding Sources

1. Incorporate in annual Town budgeting process.

NR-3. Promote and Protect Andover's biodiversity and natural resources

NR-3-2. Facilitate the use of sustainable landscaping practices in Andover

Action Description

Sustainable landscaping practices aim to create an environmentally friendly and climate-appropriate landscape that requires minimal resource inputs such as fertilizer, pesticides, gasoline, time, and water. These practices include using native plants, reducing water usage, composting locally grown crops and kitchen waste, and limiting the amount of irrigated turf to areas of high use by the homeowner.[1] Andover can play an active role in supporting residents and businesses with more sustainable landscaping practices through the development of educational materials and ordinances. As an example, York County Pennsylvania has a Sustainable Landscaping Model Ordinance that encourages sustainable landscape practices in common areas of major residential developments. The ordinance provides guidelines for the use of native plants, soil amendments, and other sustainable landscaping practices.[2]

Key Steps for Implementation

- Host public meetings and workshops for residents and landscaping companies about the importance of sustainable landscaping.
- Develop take-home educational materials for residents and landscaping companies.
- Develop a model ordinance for sustainable landscaping for new development and parcels over 1 acre.

Action Lead

Community Development and Planning

Supporting Partners

- Local landscaping companies
- residents
- DPW
- **Massachusetts Horticulture Society**
- **American Society of Landscape Architects**
- **Grow Native Massachusetts**
- Shawsheen Watershed Group
- Conservation Commission
- Andover Green Advisory Board
- Andover Village Improvement Society
- Open Space Task Force
- Garden Clubs
- Pollinator Pathways

1 **https://www.mass.gov/doc/more-than-just-a-yard-ecological-landscaping-tools-1/download**
2 https://www.ycpc.org/DocumentCenter/View/303/Model-Sustainable-Landscaping-Ordinance-Final-01-27-2014-PDF

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☐ Department has authority to carry out
- ☒ Development of the ordinance will require Select Board vote. Education materials only require staff time.

Measures of Success

1. Higher percentage of residential and commercial properties utilizing sustainable landscaping techniques.
2. Increase in presence of native plant species.
3. Increase in use of electric landscaping equipment.
4. Passing of model ordinance.

Action Initiation Timeframe

Resilience Considerations

Sustainable landscaping practices promote the use of native plant species which help promote biodiversity in the area. Sustainable practices may also include limiting impervious coverage which is beneficial for stormwater runoff mitigation. Sustainable landscaping practices also conserve water, create habitat, sequester carbon, and control erosion.

Co-Benefits & Equity Considerations

1. Sustainable landscaping practices can reduce maintenance costs for homeowners, which can be especially beneficial for low-income communities.
2. Increase in native plant species helps local wildlife thrive.
3. Habitat generation.
4. Sustainable landscaping can reduce the costs for irrigation, fertilizer, and pesticides.
5. Water conservation.

Cost

$

Possible Funding Sources

1. **Healthy Communities Grant Program for New England**
2. **Urban and Community Forestry Challenge Grants**
3. Consider partnering with local organizations, businesses, and universities for support on pilot projects for low-income residents.

Natural Resources

NR-3. Promote and Protect Andover's biodiversity and natural resources

NR-3-3. Provide education on the protection of biodiverse ecosystems in the community

Action Description

Many residents and businesses may not know the importance of biodiverse ecosystems in their community. The benefits of biodiverse ecosystems include sustaining natural systems to improve resilience and carbon sequestration. Andover can provide educational programs on the protection of biodiversity through community-based conservation approaches. These approaches involve initiatives aimed at conserving biodiversity while also letting local people benefit from the resources. Educational materials can include examples for protection and conservation of natural areas and wildlife, as well as important cultural and indigenous knowledge and resources.

Key Steps for Implementation

- Develop and distribute educational materials for residents.
- Work with the school district to include the importance of biodiversity in the curriculum or other learning opportunities.
- Develop a biodiversity index benchmark for existing biodiversity in Andover to monitor over time.

Action Lead

Community Development and Planning; Conservation Division

Supporting Partners

- Andover Public Schools
- Pollinator Pathways
- Girls and Boys Scouts
- Open Space Task Force
- Andover High School's ESIC Program
- Senior Center
- Memorial Hall Library

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

Measures of Success

1. Development and continued monitoring of biodiversity to include species richness and evenness. Species richness is the total number of distinct species, while evenness is a measure of how evenly distributed the individuals are among the species.[1]

1 https://www.nrcs.usda.gov/publications/ceap-wildlife-2016-BiodiversityMetrics-MultiScaleAnalysis.pdf

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Action Initiation Timeframe

Short | Medium | Long

Resilience Considerations

All the great benefits from biodiversity depend on our nature being diverse. For any ecosystem to function, it needs a lot of components, and places with high ecosystem biodiversity create groups of communities that are better protected against drastic changes.

Co-Benefits & Equity Considerations

1. Biodiversity is fundamental for the provision of ecosystem services, which we depend on for food, air, and water security, and multiple other natural benefits.
2. Biodiversity provides numerous ecosystem services that are crucial to human well-being at present and in the future.
3. Equity-centered ecosystem restoration, which approaches restoration through an equity lens in addition to sound ecological principles, is more likely to improve ecological outcomes and promote environmental and social justice.

Cost

$

Possible Funding Sources

1. **Urban and Community Forestry Challenge Grants**
2. Consider partnering with local organizations, businesses, and universities for support on pilot projects for low-income residents.

NR-4. Minimize stormwater run-off

NR-4-1. Minimize impervious surfaces throughout Andover

Action Description

Impervious surfaces reduce infiltration, increase surface runoff, alter the pathways by which water reaches streams, and can lead to localized flooding, among other environmental consequences. Andover can develop bylaws and best practice education programs to minimize impervious surfaces and promote low-impact development. Targeted places to reduce the amount of impervious surfaces include buildings, roads, parking lots, and other structures for new construction and redevelopment projects, and municipal properties. Regulations regarding impervious coverage could be located in the zoning by-law or the Stormwater Management and Erosion Control by-law.

Key Steps for Implementation

- Creating education and information materials to be provided when new permits are requested.
- Educate the public and developers about the benefits of reducing impervious coverage.
- Develop revisions to the by-laws.
- Educate the Select Board about the benefits of reducing impervious coverage
- Adopt and implement new regulations.
- Create an incentive program at the municipal level that encourages property owners to reduce impervious surfaces and install low-impact development (LID)/green stormwater infrastructure (GSI) elements.
- Implement a community-based plan designed to summarize strategies for reducing. existing and future impervious surface coverage and increasing stormwater.

Action Lead

Community Development and Planning Department

Supporting Partners

- Department of Public Works
- Sustainability Department
- Facilities Department
- Andover Green Advisory Board
- Andover Village Improvement Society
- Open Space Task Force
- Shawsheen Watershed Group

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☐ Department has authority to carry out
- ☒ This action requires the adoption of new legislation by the Select Board

Measures of Success

1. Adoption of new regulations regarding impervious coverage.
2. Increased use of pervious surfaces by developers and homeowners.
3. Decrease in stormwater runoff.
4. Decrease in urban heat effect.

Action Initiation Timeframe

Resilience Considerations

Reducing impervious surfaces can provide several resilience benefits. By minimizing areas such as streets, parking lots, and driveways, stormwater runoff is reduced, which enhances flood control, reduces erosion, and increases infiltration. Impervious surface reduction can help improve urban heat island (UHI) by reducing the amount of heat absorbed by built surfaces during the daytime.

Co-Benefits & Equity Considerations

1. Increased greenspace can facilitate recreational and community activities that enhance the quality of life of residents/employees.
2. Reduced runoff volume translates into reduced pollutant loads to downstream waters, which can improve water quality.
3. People of color, families with children, and low-income communities are most likely to be impacted by impervious surfaces.
4. This program should raise awareness of green infrastructure benefits, include residents in the design and decision-making process, and lessen the burden of environmental hazards on low-income communities.

Cost

$$

Possible Funding Sources

1. **Section 319 Nonpoint Source Competitive Grants Program**
2. **604(b) Grant Program: Water Quality Management Planning from MassDEP**
3. **Healthy Communities Grant Program for New England**

NR-4. Minimize stormwater run-off

NR-4-2. Install nature-based solutions pilot projects in areas vulnerable to flooding

Action Description

Nature-based solutions (NBS) can be an effective way to mitigate flood risks in areas vulnerable to flooding. NBS are actions that protect, sustainably manage, and restore natural and modified ecosystems to address societal challenges. They can help to reduce flood risk, combat climate change, improve water quality, protect coastal property, restore and protect wetlands, stabilize shorelines, and reduce urban heat. Based on vegetated surfaces, NBS provide opportunities for water interception, evapotranspiration, infiltration, and filtration, and thus, can help to reduce the negative impacts of floods, such as erosion, sedimentation, and loss of vegetation cover. NBS can be an ideal solution for Andover which is both sustainable and resilient. Ideally, the Town will implement a series of NBS pilot projects. These projects can be performed by the Town, by community groups with support from the Town, or by local schools. The Town previously implemented a 0.5 acre green infrastructure project.

Key Steps for Implementation

- Identify areas of frequent flooding by developing a town or watershed wide flood model which includes future climate projections. Using this model, identify target areas for nature-based solutions and green infrastructure.
- Alternatively, the Town can crowdsource locations from the community through a campaign. It should be noted that this method does not include future climate changes.
- Select pilot projects locations and identify funding and partners.
- Obtain buy-in from community members.
- Design and construct NBS pilot projects.
- Maintain and study improvements of NBS.

Action Lead

Facilities Department
Department of Public Works

Supporting Partners

- Sustainability Department
- Community Development and Planning Department
- Conservation Division
- Andover Public Schools

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

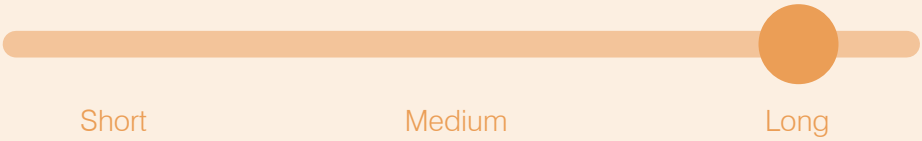
Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Installation of nature-based solutions.
2. Reduced flooding and/or heat in identified areas.
3. Increase in use or desire for nature-based solutions.

Action Initiation Timeframe



Resilience Considerations

Nature-based solutions contribute greatly to community resilience and flood mitigation. They often offer better long-term solutions for flood mitigation than gray infrastructure.

Co-Benefits & Equity Considerations

1. NBS can provide a wide range of co-benefits such as water and air quality improvements, wildlife habitat, carbon sequestration, and flood risk reduction.
2. Healthy natural and managed ecosystems produce a diverse range of services on which human well-being depends, such as food, fiber, clean water, and cultural and recreational opportunities.
3. NBS can help restore watershed and ecosystem health, increase biodiversity, and manage floods, droughts, and extreme weather events.
4. Equity considerations are important in assessing the co-benefits of NBS across elements of socio-cultural and environmental systems.
5. NBS can also provide opportunities for community engagement and empowerment, which can help build social capital and increase community resilience.

Cost

$$$

Possible Funding Sources

1. **Section 319 Nonpoint Source Competitive Grants Program**
2. **604(b) Grant Program: Water Quality Management Planning from MassDEP**
3. **Healthy Communities Grant Program for New England**
4. **Urban and Community Forestry Challenge Grants**
5. **Hazard Mitigation Grants**

NR-5. Prioritize wetlands in enhancing Andover's resilience to climate change

NR-5-1. Make Andover's wetlands more resilient

Action Description

Wetlands are biodiversity hotspots, providing important habitats for many species of plants and animals. They also play an integral role in shaping the ecology and function of the watershed by providing flooding and erosion protection and improving water quality, as well as offering opportunities for recreation. Last but not least, wetlands can provide carbon storage, slowing the progression of climate change.

We need to protect, create, expand, and connect wetlands by identifying strategic areas for expansion and migration, including the adoption of local regulations that prioritize the protection and restoration of wetlands.

Key Steps for Implementation

- Perform a study to identify areas for wetland migration and expansion through new nature-based solutions.
- Enlist the assistance of local non-profits, land trusts, and conservation organizations to increase community awareness and garner support for wetlands protection.
- Identify wetland areas that could be set aside as passive recreational areas, and others that need to be protected and restored to improve wildlife habitats and riverine health
- Characterize the destruction and risk of wetlands.
- Add resilience language to the **General Bylaw for Wetland Protection** and gain needed approvals.
- Create a program to incentivize landowners to identify new wetlands on private properties.
- Calculate the carbon sequestration potential of wetlands. The **MA Healthy Soils Action Plan** estimates wetlands have an average soil organic carbon stock of 321 metric tons/acre.

Action Lead

Community Development and Planning; Conservation Division

Supporting Partners

- Local non-profits/land trusts including but not limited to Andover Village Improvement Society (AVIS), Shawsheen River Watershed Association, Merrimack River Watershed Council, Essex Greenbelt Association
- state agencies
- federal agencies
- Sustainability Department

Ease of Implementation

☐ Requires Town Meeting vote
☐ Department has authority to carry out
☒ This action requires the adoption of new legislation by Planning Board and the Select Board

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. No net loss of wetlands.
2. Increased percentage of land set aside in land trusts.
3. Increase in protected wetlands.
4. Passing an amendment to add resilience to the Wetlands Protection Bylaw.

Action Initiation Timeframe

Resilience Considerations

Wetlands play an important role in community resilience. They mitigate flooding and stormwater runoff by storing and slowing floodwaters and allowing them to passively permeate into the groundwater table. Climate change may bring more frequent storms with higher rates of precipitation, making functioning wetlands a crucial part of community resilience.

Co-Benefits & Equity Considerations

1. Protecting watersheds and communities with nature-based solutions, including but not limited to increasing riparian buffers can help vulnerable communities that are disproportionately affected by climate change.
2. Wetlands provide several benefits for humans, including reducing flood damage, improving water quality, and providing habitat for wildlife.
3. Protecting and restoring wetlands can help mitigate climate change by sequestering carbon and reducing greenhouse gas emissions.
4. Wetlands can provide recreational opportunities and support local economies.
5. Land acquisitions to protect and conserve wetlands can occur through either the purchase or donation of land. It is important to consider the equity implications of these acquisitions, as they may displace low-income or minority communities.

Cost

$

Possible Funding Sources

1. **National Coastal Wetlands Conservation Grants**
2. **Wetland Program Development Grants**
3. **MassWildlife Habitat Management Grant Program**

NR-5. Prioritize wetlands in enhancing Andover's resilience to climate change

NR-5-2. Promote community awareness of wetlands importance

Action Description

Wetlands play a key role in community resilience that often goes unrecognized by members of the community. Building community awareness of the importance of wetlands is an important part of sustainable wetland planning and management. One way to promote community awareness is to educate people about the benefits of wetlands, such as their role in improving water quality, providing wildlife habitat, and reducing rainstorm damage. Another way is to encourage people to participate and volunteer in wetland conservation efforts. Additionally, providing important contact information for local bodies responsible for wildlife rescue, wetland rehabilitation and conservation work, and research organizations can be useful. Finally, learning about the wetlands and the ecosystem benefits they provide can be an effective way to encourage people to value and prioritize wetlands.

Key Steps for Implementation

- Develop public outreach and education materials promoting the importance of wetlands.
- Host a community wetlands workshop that explains the importance of wetlands.
- Develop educational signage to be displayed adjacent to wetlands and in other natural areas.

Action Lead

Community Development and Planning; Conservation Division

Supporting Partners

- Memorial Hall Library
- local non-profits and land trusts
- AVIS
- Andover Trails

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Measures of Success

1. Attendance at educational opportunities provided by the Town.
2. Increased community desire for wetlands protection.

Action Initiation Timeframe

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Resilience Considerations

The more educated the public, the more likely wetlands are to be protected, and the better they will function in terms of community resilience. If a community takes care and protects their wetlands, they will benefit from improved water quality, improved flood mitigation, more passive recreation space, and improved aesthetics of the community.

Co-Benefits & Equity Considerations

1. Nature tourism: Wetlands can provide opportunities for nature tourism, such as birdwatching and wildlife viewing.
2. Educational opportunities for youth.
3. It is important to consider the location of wetlands and transportation resources when designing educational programs to ensure that all communities have access to information, events and resources.
4. Land acquisitions to protect and conserve wetlands need to consider the equity implications of these acquisitions, as they may displace low-income or minority communities.

Cost

$

Possible Funding Sources

1. **National Coastal Wetlands Conservation Grants**
2. **Wetland Program Development Grants**
3. **MassWildlife Habitat Management Grant Program**

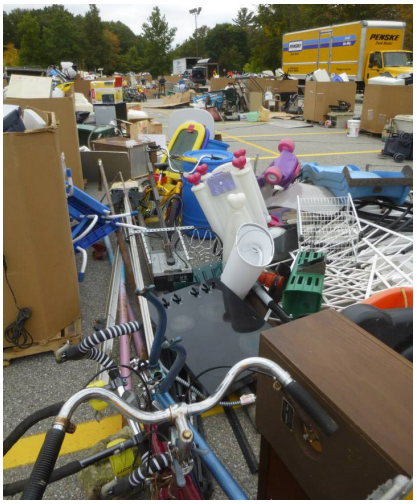
Waste

Most of Andover's solid waste goes to an incinerator but, at times, such as when the facility has reduced capacity due to maintenance, the waste is shipped to regional landfills. Solid waste contributes to greenhouse gas emissions during anaerobic decay of waste in landfills and during combustion at incineration facilities. According to the Massachusetts Department of Environmental Protection (MassDEP) Solid Waste Master Plan, Waste reduction can lead to significant greenhouse gas emission reductions, particularly when viewed from a lifecycle perspective. Based on the EPA Waste Reduction Model (WARM), if Massachusetts achieves the 2030 waste reduction goals, it could prevent over 1,700,000 metric tons of carbon dioxide (CO2) equivalent from entering the atmosphere. This reduction is equivalent to removing annual emissions from over 370,000 passenger vehicles or conserving nearly 200 million gallons of gasoline.[1]

Solid waste makes up 3.2%, or 14,354 MTCO2e, of Andover's total baseline GHG emissions. Waste prevention, reuse, recycling, and composting can divert waste and therefore reduce emissions associated with waste disposal. Composting can help to convert food waste into productive soils that can then be used for another cycle of growing plants. Composting allows organic material to be digested in a manner that avoids the production of methane, which is a potent greenhouse gas with a global warming potential 28 times higher than that of carbon dioxide.

The Town currently provides several methods for waste disposal in addition to the curbside trash, recycling, and seasonal leaf collection program. The Bald Hill Compost facility accepts grass clippings, leaves, green garden waste, and woody yard waste. It is open seasonally and requires a permit for residents. Residents can also pick up finished compost at the site for personal use. The Town also has historically held an annual drive-through donation, reuse, and recycling event known as Zero Waste Day, in addition to offering household hazardous waste and electronics recycling one-day collections.

Bald Hill Compost Site. June 23, 2023. Photo by Jon Unger



Zero Waste Day in April 2014. Photo from the Zero Waste Day Andover Facebook page

1 https://www.mass.gov/doc/2030-solid-waste-master-plan-working-together-toward-zero-waste, page 10

In 2023, Zero Waste Day was held on June 3rd and collected a variety of items including:

For Reuse:
- Toys and hobbies
- Camping and travel gear
- Clothing and shoes
- Books, CDs, DVDs
- Bicycles
- Furniture
- Home goods
- Household and building materials

For recycling:
- Tires
- Textiles
- Electronics and appliances
- Scrap metal
- Dehumidifiers

Mass Save offered $30 rebates for dehumidifiers.

By keeping these items out of landfills and incinerators, Andover is reducing GHG emissions associated with solid waste disposal.

By identifying opportunities for source reduction and developing infrastructure for improved collection of food wastes, recyclable materials, large or bulky items, and hazardous materials, Andover can reduce waste-related contributions to climate change. There are financial and resiliency reasons to reduce the Town's generation of solid waste in addition to the need to reduce GHG emissions. The resiliency concerns arise because the regional waste disposal capacity has significantly declined in the past decades and is at a point where a large storm event would cause a regional disruption in the solid waste disposal system throughout New England and would likely require shipping waste to landfills out-of-state. The critical shortage of disposal capacity also is likely to lead to significant cost increases at landfills and incinerators in the future.

Other municipalities have reduced their solid waste generation through a combination of effective measures such as convenient and comprehensive diversion programs (including curbside food waste collection, mattress collection, weekly recycling, scrap metal drop-off areas) and trash limits through the distribution of standardized trash containers and various types of fees to fund the enhanced programs. It is clear from the data collected by MassDEP, that those municipalities with enhanced diversion programs have succeeded in reducing their trash tonnage. MassDEP collects data on the tons of solid waste generated and paid for by a municipality and the number of households that are served by that program. By looking at the municipalities across the state with the lowest trash levels being considered the best, Andover is in the bottom 5% in terms of tons per household served. Andover should enhance its collection program, challenge residents to reduce the waste generation by 50% or more, and fund any additional cost with new fees such that the cost does not reduce funding for other critical town needs.

Waste strategies for Andover include:

W-1. Reduce and Divert Waste

Waste Targets

Action ID	Topic	Metric	2030 Target	2050 Target
W-1-1	Trash and Recycling Program	% Reduction in tonnage	50%	90%
W-1-2	Composting	% household participation	10%	50%
W-1-3	Dropoff Site	% Improperly disposed reusable or recyclable material		100%
W-1-4	Trash and Recycling Program	% households served		100%

Ballardvale Dam on The Shawsheen River, June 2023, Photo by Jon Unger

Case Study

Waste

DIVERTING FOOD WASTES FROM ANDOVER SCHOOLS

The U.S. Environmental Protection Agency (EPA) **reported in 2021** that the annual food loss and waste in the United States is equivalent to 170 million metric tons of greenhouse gas emissions. This amount does not include methane from decomposition of organic food matters in landfills. It is striking that 50% of the overall food loss and waste in the U.S. occurs during the consumption stage of the food chain, and the amount of food wasted by restaurants, cafeterias and households can feed all food insecure Americans.

Preventing food wastes can improve food security in communities, leading to a healthier population. That is why committed parents working with the Andover Public Schools implemented a food rescue program in 2017. Parent volunteers worked with school officials to set up share tables to recover uneaten school lunch items and transporting the collected food to local food pantries. The group was also instrumental in setting up in-school composting programs to process food wastes. Their work was **highlighted by the EPA** in 2018 as one of 13 winners in a national recognition program.

W-1. Reduce and Divert Waste

W-1-1. Enhance and update the trash and recycling collection program

Action Description

Andover must enhance and update the trash and recycling collection program to reduce waste sent to landfills and incinerators, conserve natural resources, prevent pollution, reduce greenhouse gases, and avoid future cost increases. The urgency to reduce waste across the state is due to the reduced disposal capacity at landfills and an aging set of solid waste incinerators. In contrast, there are increased opportunities for reuse, recycling, composting, and donating items. Reflecting these realities, the Massachusetts Solid Waste Master Plan has set a waste reduction goal for 2050 to reduce disposal by about 5.1 million tons by 2050, from a 2018 baseline of 5.7 million tons to 570,000 tons by 2050, a 90 percent reduction in tons disposed.[1] By updating the trash collection program, Andover can facilitate the collection of recyclable materials. This would reduce the amount of trash generated and minimize future cost increases.

Key Steps for Implementation

- Develop political support.
- Define a new collection program.
- Create a new bid document that includes new collection program features.
- Select contractor.
- Publicize and educate the community on the new program.
- Distribute barrels.

Action Lead

Department of Public Works

Supporting Partners

- Trash and Recycling Vendors
- Sustainability Department
- Andover Green Advisory Board

Ease of Implementation

☐ Requires Town Meeting vote
☒ Department has authority to carry out
☐ Requires Select Board approval

1 **https://www.mass.gov/doc/2030-solid-waste-master-plan-working-together-toward-zero-waste/download**, page 10.

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Reduced trash tonnage per household.
2. 50% reduction in tonnage by 2030.
3. 90% reduction in tonnage by 2050.

Action Initiation Timeframe

Resilience Considerations

By reducing Andover waste, the town would help enhance the resilience of the state to respond to large storm events that cause an increase in solid waste disposal.

Co-Benefits & Equity Considerations

1. Reducing waste protects the environment and reduces expenses for disposal.
2. Recycling and reusing waste lessens the need to extract resources and lowers the potential for contamination.[1]
3. Sustainable waste management practices can help businesses and communities create economic and social benefits.
4. Sustainable waste reduction efforts should aim to benefit all members of society, regardless of their socioeconomic status.
5. Sustainable waste reduction efforts should aim to educate and engage all members of society, not just those who are already environmentally conscious. This can help to ensure that everyone has the knowledge and tools they need to participate in sustainable waste reduction efforts.
6. Policies that require individuals to pay for waste disposal could disproportionately affect low-income households and programs to address that cost impact should be considered as part of the fee structure.

Cost

$: *Cost would likely increase for weekly collection. Savings would accrue from reduced waste generation and from solid waste fees.*

Possible Funding Sources

1. **Sustainable Materials Recovery Program (SMRP) Municipal Grant**
2. **Consumer Recycling Education and Outreach Grant Program**
3. **MassDEP Reduce, Reuse, Repair Micro-Grant**

1 https://www.epa.gov/recycle/reducing-and-reusing-basics

W-1. Reduce and Divert Waste

W-1-2. Develop an organics composting program

Action Description

Developing an organic composting program is a great way to recycle organic waste and create a nutrient-rich soil amendment or mulch. Composting is a controlled, aerobic process that involves microorganisms breaking down organic materials such as food scraps and yard trimmings. The end product is compost, which can be used to enrich soil and plants. Composting is a resourceful way to manage waste more sustainably, reduce the volume of materials that might otherwise be disposed of in landfills or trash incinerators, and prevent powerful greenhouse gases from being emitted into the atmosphere. To facilitate composting throughout Andover, the Town should provide multiple options including backyard compost bin distribution, an optional town-wide curbside collection of food waste (because an optional program is likely to have less contamination), and continuation of the Bald Hill drop-off site.

Key Steps for Implementation

- Before starting the initiative, it is important to get the buy-in from key stakeholders and provide educational materials to develop political support.
- Define new compost collection program options.
- Expand and promote the existing backyard compost bin program.
- Create new bid document for services and select contractor for curbside compost collection.
- Publicize widely.
- Distribute curbside compost collection barrels.

Action Lead

Department of Public Works

Supporting Partners

- MassDEP Municipal Assistance Coordinator
- Andover Public Schools
- Andover Green Advisory Board
- Girls and Boys Scouts
- Andover Youth Services

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. 50% participation rate.
2. Waste reduction of 15% within 2 years of implementation.

Action Initiation Timeframe

Resilience Considerations

Community composting can support local food production and food security, create and sustain local jobs, and build healthy soil.

Co-Benefits & Equity Considerations

3. Higher quality compost could be available at Bald Hill if the organic material collected are composted here. Must be accessible to everyone in the community who desires to participate.
4. Composting enriches the soil with nutrients, which reduces the need for fertilizers and pesticides. Fertilizers and pesticides require fossil fuels for their production and shipping, and some of them are potentially harmful to our health.
5. Composting can create green jobs and support local economies.

Cost

$: This cost assumes any additional costs for curbside collection are incorporated into an overall waste management fee.

Possible Funding Sources

1. **MassDEP Waste & Recycling Grants & Assistance**
2. **Climate Pollution Reduction Grants** through EPA

W-1. Reduce and Divert Waste

W-1-3. Establish a Recycle and Reuse Drop-Off Site

Action Description

Establishing a recycling and reuse drop-off site is an important step towards better waste management. When establishing a recycling and reuse drop-off site, there are several key considerations such as location, design, equipment, staffing, education and outreach, and regulations. The process of reusing starts with the assumption that the used materials that flow through our lives can be a resource rather than refuse.[1] Andover residents currently have no place to easily dispose of several categories of reusable or recyclable materials such as tires, scrap metal, paint, motor oil, and mercury-containing items. A recycle and reuse drop-off site would reduce waste disposed of as trash. Recycling and reuse limits the need to extract new resources, which reduces greenhouse gas emissions and helps to mitigate climate change.

Key Steps for Implementation

- Develop political support and educational materials.
- Define items to be collected.
- Identify site or negotiate site access.
- Layout site.
- Determine whether to be privately operated or town operated.
- Develop bid documents and select vendor.
- Publicize widely.
- An alternative to establishing a site in Andover is to negotiate with North Andover to utilize their drop off site.

Action Lead

Department of Public Works

Supporting Partners

- MassDEP Municipal Assistance Coordinator
- Andover Public Schools
- Andover Green Advisory Board
- Girls and Boys Scouts
- Andover Youth Services

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☒ Department has authority to carry out
- ☐ Requires Select Board approval

1 https://pubs.nmsu.edu/_g/G314/index.html

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Start of operations within 7 years.
2. Active use of the site by Andover residents.
3. Increase in number of users and amount of material collected.

Action Initiation Timeframe

Depending on the availability of a site

Co-Benefits & Equity Considerations

4. Recycling reduces the use of natural resources by reusing materials, which conserves natural resources such as timber, water, and minerals.
5. Recycling indirectly reduces stress and creates a positive environment.[1]
6. Increased donations to non-profits.
7. Must be easily accessible to the entire community.
8. This could offer drop-off access to those who are not currently served by the Town's trash collection program.

Cost

$$

Possible Funding Sources

1. **Sustainable Materials Recovery Program (SMRP) Municipal Grant**
2. **Consumer Recycling Education and Outreach Grant Program**
3. **MassDEP Reduce, Reuse, Repair Micro-Grant**

1 https://community.thriveglobal.com/recycling-is-good-for-the-environment-but-did-you-know-it-can-also-improve-your-mental-health/

W-1. Reduce and Divert Waste

W-1-4. Ensure parallel trash and recycling collection service for multifamily residential

Action Description

Andover residents living in apartments or condominiums with more than six units are not served by the Town's trash and recycling program. Only some of these residences currently have access to recycling. The MassDEP regulates disposal of materials across the Commonwealth. MassDEP has identified a list of items that should be recycled or reused rather than landfilled or incinerated, known as **Waste Disposal Bans.** The Town has the ability to increase access to recycling services for apartment and condominium residents and better comply with state regulations by revising the Board of Health (BOH) regulations. The BOH has authority to adopt private hauler regulations requiring that all private haulers seeking a permit to operate in Andover must offer recycling services at no additional cost and demonstrate their compliance with the Waste Disposal Bans.

Key Steps for Implementation

- Develop political support with BOH.
- Request assistance from MassDEP.
- Develop draft regulations based on MassDEP resources and submit to BOH.
- Publicize to private haulers.
- Enforce the following year by requiring data reporting on tonnages collected in Andover by each company and a list of any entities not complying with the waste sorting requirements.
- Educate residents served by private haulers, using the MassDEP Solid Waste Master Plan as a resource.

Action Lead

Community Development & Planning - Health Director

Supporting Partners

- MassDEP Municipal Assistance Coordinator
- Sustainability Department

Ease of Implementation

- ☐ Requires Town Meeting vote
- ☐ Department has authority to carry out
- ☐ Requires Select Board approval
- ☒ Would require new legislation and regulation from the Board of Health

Legend

Action Initiation Timeframe
Short: 0-2 years
Medium: 3-6 years
Long: 7+ years

Cost*
$: less than 10k
$$: 10-50k
$$$: 50-500k
$$$$: 500k-2mill
$$$$$: 2 mill+

**Cost associated with the actions refers to how much it is expected to cost the Town to implement. This does not include costs for individuals or businesses which may vary.*

Measures of Success

1. Number of complexes that begin to implement a recycling program (baseline currently unknown).
2. Tons of recyclable materials collected by private haulers.

Action Initiation Timeframe

Co-Benefits & Equity Considerations

1. Renters and condominium owners will have greater access to recycling services and may have an increased sense of belonging when given equal access to similar waste diversion as Town serviced residents.

Cost

$

Possible Funding Sources

1. **Consumer Recycling Education and Outreach Grant Program**

Implementation Roadmap

This is placeholder text. Photos will be added once content is added. Ovidus, occaeca boremquate imus am in con earum res escium quia il in ea aut ut prerspitae nis dolore sinus dolorio modis arum volenis mo ea arundanist ab ius. Accuptat vellaborum fugitat voluptata di volut quis dolo volore, eius sam accum fugia aut et lab inveria speribe rsperit, sim nulpa volore, vendite ctempos cume voluptatio voleste odigenimus maio omnisquam, odiat aut faccusantis endessitatem sim et ius et et explibus alistrum volorit pa nonem quundus mi, quiae volupti ditatem. Id quo dellabo. Orporum untium que voluptas quidi deliquae. Rit experch iliquas erum ea volorer ferferum qui doluptias eost int odipsamust reria ipitatem aut in nullo quo eium aut reprem ex ea ne si occat et velesto iur rem quisqui sum ventorecate eturerum sini optiber feruptatis adit eossita seque vel iundita con reritas nemquibus, cus, quam, ute perro ex et labo. Ti aut auta nobitasitem remo qui de pos arcim quae et harchilit vollendam, optium atis sum evelece stist, experes nobit eiciene sediassint.

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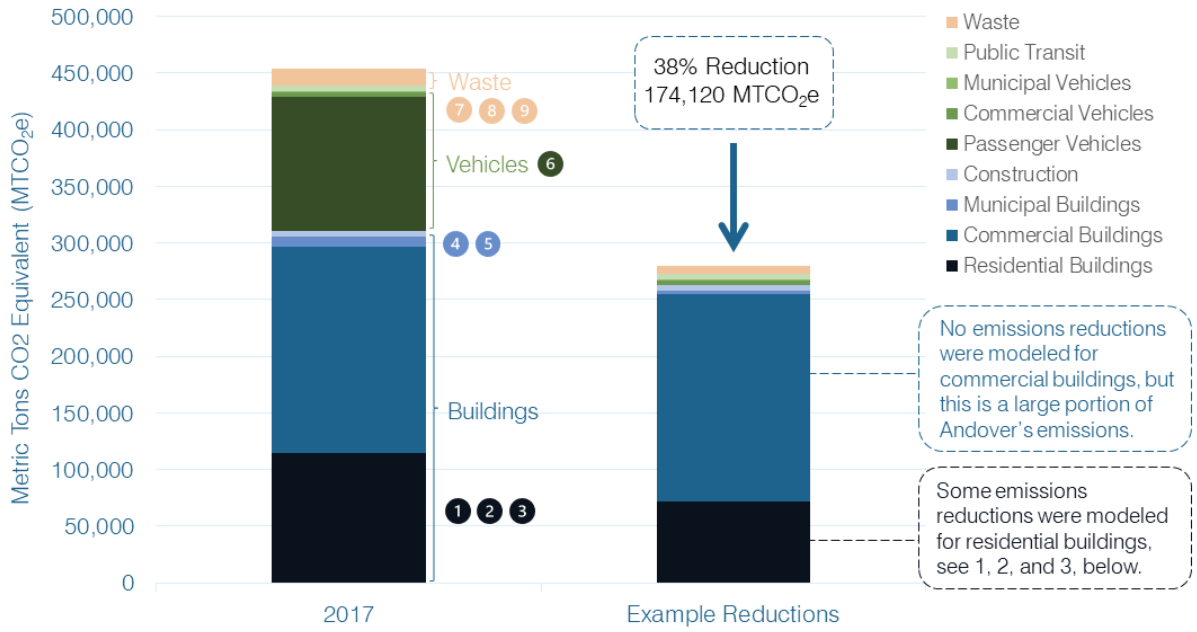
This graph shows example greenhouse gas emissions reductions from a sample of actions across sectors.



1

If residential energy efficiency improvements were made to reduce energy consumption by 10%, this would reduce Andover's emissions by 8,769 MTCO2e per year.

2

If 4,360 homes switched from a natural gas boiler to an air source heat pump, Andover's emissions would be reduced by an estimated 11,772 MTCO2e per year.

3

If all residential electricity was assumed to be 100% Class I RECs, Andover's emissions would reduce by 21,812 MTCO2 (excluding electricity reduced due to energy efficiency).

4

If all municipal natural gas usage was eliminated Andover's emissions would be reduced by 5,326 MTCO2e.

5

If the water treatment plant electricity usage was reduced by 10% with residential and commercial water conservation measures and energy efficiency upgrades, there would be a reduction of 105 MTCO2e.

6

If all gasoline and diesel usage from passenger vehicles was eliminated emissions would be reduced by 117,817 MTCO2e.

7

If Andover's tons of waste were reduced by 50%, emissions would be reduced by 6,924 MTCO2e

8

If an organics composting program was developed and all possible food waste was composted, 1,357 MTCO2e could be reduced.

9

If the Board of Health requires private waste haulers to provide the same level of recycling services to multifamily residential, 229 MTCO2e could be reduced.

Additional examples include:

10

If 4,360 homes in Andover had solar panels on their roofs, 6,785 MTCO2e would be avoided. See Appendix X for more information about the assumptions and calculations.

11

Specialized Stretch Code: If by 2050, there was an additional 14,551,117 square feet of residential and commercial space in Andover and 80% of this did not use natural gas, an estimated 35,630 MTCO2e would be avoided in one year.

Related Strategies & Actions:

1 2 B-2-1

3 E-1-1

4 B-2-2

5 NR-2

6 M-2

7 W-1-1

8 W-1-2

9 W-1-4

10 E-1-2

11 B-1-1

Additional information about the GHG emissions reduction calculations can be found In Appendix X.

Conclusion

The transition to net-zero is a necessary step in the fight against climate change, but also a difficult one.

The Town of Andover recognizes that bold action is needed to meet the goals and targets outlined in this plan. While the actions and details to get started on implementation pertain to the municipality, many of the 37 actions cannot be executed without residents and businesses doing their part. The Town can embark on projects, establish programs, and create policies to make headway toward net-zero, but lifestyle changes, building retrofits, and new business practices are necessary too.

While there is massive transformation needed, we can expect many positive outcomes including cleaner air and water, a healthier community, and new job opportunities in clean energy and other sustainable industries. By empowering residents and businesses with the knowledge, tools, and resources to make decisions with climate in mind, we can secure a more sustainable future.

Pushing the envelope

The Town's Capital Improvement Program plans and budgets several years out but in each iteration departmental requests typically far exceeded the resources available. While the Town has financial and staff constraints to execute climate actions on top of existing operations, climate action and sustainability have been deemed a priority, yet we need to be creative and resourceful to meet net-zero goals. This includes continuing to take advantage of state and federal funding opportunities and expanding staff capacity.

View from the bridge on Stevens Street over the Shawsheen River, June 2023, Photo by Jon Unger

How you can help in the transition

There are a range of things that residents and businesses can do to start or continue taking climate action. Some examples include:

Start with small changes

- Utilizing the free Mass Save energy audits to identify energy efficiency measures that can help you reduce your energy and save money on your utility bills.
- Walk, bike, or use public transportation once per week instead of driving when it's convenient, if you have the ability
- Water your lawn, or portions of it, less often

Make sustainable swaps when you're in need of a replacement or upgrade

- When in need of a new vehicle, opt for a plug-in hybrid or an electric vehicle
- When in need of a new heating or cooling system, opt for an all-electric efficient heat pump, rather than a direct replacement of fossil fuel systems
- When in need of a new appliance like a stove or water heater, opt for an electric version

Share your knowledge with others and stay informed

- Already have an EV, heat pump, solar, etc.? Share your experience with your friends and neighbors!
- Stay in the know! Subscribe to **2050, Andover's Sustainability e-newsletter.**

Advocate beyond Andover

- Make your voice heard by advocating for additional climate action at the state and federal levels by joining advocacy groups like Andover WECAN, contacting elected officials, participating in public events, and supporting upcoming legislation.

Induction cooking. Photo by Kate Margolese

Town Meeting. Photo by Kate Margolese

Glossary and Abbreviations

The following definitions are consistent with those in the Massachusetts Decarbonization Roadmap, unless otherwise noted.

Adaptation (to climate change): Actions taken at the individual, local, regional, and national levels to reduce risks from today's changed climate conditions and to prepare for impacts from additional changes projected for the future. *Definition from the US Global Climate Change Research Program and consistent with the Massachusetts Climate Assessment*

Anthropogenic: Made by people or resulting from human activities; usually used in the context of emissions that are produced as a result of human activities.

Building Envelope: The physical separator between the indoor and outdoor environments that limits heat transfer.

Capacity: The maximum amount of energy that can be produced at a given time. Often used to characterize the amount of electricity generation infrastructure (reported in Watts), but can also be used to describe the storage of a battery, the amount of transmission, or the output of a heat pump (Btu)

Carbon Capture and Storage (CCS): The process of capturing waste carbon dioxide (CO2), transporting it to a storage site, and depositing it where it will not enter the atmosphere.

Carbon Dioxide (CO2): A naturally occurring gas, and also a byproduct of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal human caused greenhouse gas that affects the Earth's radiative balance.

Carbon Dioxide Equivalent (CO2e): A unit of measurement that allows the effect of different greenhouse gases and other factors to be compared using carbon dioxide as a standard unit for reference. CO2e are commonly expressed as "metric tons of carbon dioxide equivalents (MT CO2 e)."

Carbon Sequestration: The process of removing carbon from the atmosphere and storing it in a reservoir. From the point of view of biology, it includes the direct sequestration through a change in land use like afforestation. From the point of view of physics, it includes the split and removal of carbon dioxide to store it underground for a long period of time in gas and oil reservoirs, coal mines, and depleted saline aquifers. *Definition from the Climate Reality Project*

Carbon Sink: A biological system or other natural environment, such as a forest or a body of water, that absorbs more carbon dioxide from the atmosphere than it releases.

Climate Change: A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period.

Climate Equity: Recognizing and addressing the unequal burdens made worse by climate change, while ensuring that all people share the benefits of climate protection efforts. Achieving equity means that all people—regardless of their race, color, gender, age, sexuality, national origin, ability, or income—live in safe, healthy, fair communities. *Definition from the Environmental Protection Agency (EPA)*

Co-Benefits: The positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare.

Decarbonization: The process by which countries or other entities aim to achieve a low-carbon economy, or by which individuals aim to reduce their consumption of carbon.

Distribution: The process and system of moving electricity from the transmission system to individual consumers.

Direct Emissions: Greenhouse gas emissions from sources that are attributed to the reporting entity.

Emissions: The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Embodied Carbon: In the building industry, embodied carbon refers to the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. In contrast, operational carbon refers to the greenhouse gas emissions due to building energy consumption. *Definition from the* ***Carbon Leadership Forum***

Energy Efficiency: Using less energy to provide the same service (lighting, mobility, cooling/heating, etc).

Environmental Justice (EJ): the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment. EJ is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits. *Definition from the Massachusetts Executive Office of Energy and Environmental Affairs*

Equity: See Definition for Climate Equity

Above the Ballardvale Dam on The Shawsheen River, June 2023, Photo by Jon Unger

The Shawsheen River near Balmoral, June 2023, Photo by Jon Unger

Flexible Loads: Energy using devices where their energy demands can be shifted according to user needs and/or requirement of power balance.

Fossil Fuel: A general term for organic materials formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years.

Generation: The production of electric power from a primary energy resource: natural gas, wind, solar. Typically reported in Watt-hours.

Global Warming Potential (GWP): A measure allowing comparisons of different gases across a common unit.

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere.
Indirect Emissions: GHG emissions that are a consequence of the activities of the reporting entity but occur at sources owned or controlled by another entity.

Inventory: A comprehensive, quantified list of an entity's or jurisdiction's GHG emissions and sources.

Load: The amount of energy demanded by a particular energy service or the aggregation of services such as electricity demand.

Methane (CH4): A colorless, odorless flammable gas that is the main constituent of natural gas. It is the simplest member of the alkane series of hydrocarbons.

Metric Ton: Common international measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs. or 1.1 short tons.

Mitigation (of climate change): A human intervention to reduce the sources or enhance the sinks of greenhouse gases.

Municipal Solid Waste (MSW): Residential solid waste and some non-hazardous commercial, institutional, and industrial wastes.

Natural Gas: A naturally occurring mixture of principally methane and small fractions of hydrocarbon and non-hydrocarbon gases found in porous geologic formations beneath the Earth's surface, often in association with petroleum (oil).

Natural Hazard: Sources of harm or difficulty created by meteorological, environmental, or geological events. *Definition from FEMA and consistent with the Massachusetts Climate Assessment*

Net-Zero Emissions: The balancing of gross emissions with removals of greenhouse gases from the atmosphere.

Net-Zero Enabling Technology: Technologies that either 1) significantly increase energy efficiency, 2) allow for a structure to avoid onsite combustion of fossil fuels or to source renewable energy, or 3) store energy generated from renewable sources onsite. *Definition from the Metropolitan Area Planning Council (MAPC)*

Nitrous Oxide (N2O): One of the six primary GHGs, typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

Reforestation: Planting of forests on lands that have previously contained forests but that have been converted to some other use.

Renewable Energy: Energy obtained from natural sources that are considered endless due to the immense amount of energy they contain, or due to their capacity to regenerate themselves in a natural way. Renewable energies are divided into: eolic (wind), geothermic, hydroelectric, tidal energy, solar, wave energy, biomass, and biofuels. *Definition from the Climate Reality Project*

Resilience: the capacity of individuals, communities, businesses, institutions, and governments to adapt to changing conditions and to prepare for, withstand, and rapidly recover from disruptions to everyday life, such as hazard events. *Definition from FEMA and consistent with the Massachusetts Climate Assessment*

Sequestration: The uptake of carbon containing substances, in particular carbon dioxide, in terrestrial or marine reservoirs.

Sink: Any process, activity or mechanism that removes a greenhouse gas from the atmosphere.
Transmission: The bulk movement of electrical energy from a generating source and site to a substation or intermediate location.

Vulnerability: Tendency or predisposition to be affected in a negative manner. The level of susceptibility of a system, or its inability to face the negative effects of climate change such as the volatility of weather and the extremes. Vulnerability is a function of a system's character, magnitude, and exposure to climatic variation rate, as well as its sensitivity and adaptation capacity. *Definition from the Climate Reality Project*

Andover Town Green in winter. Photo by Kate Margolese

A snowy road in Andover. Photo by Kate Margolese

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Appendix A. Example Greenhouse Gas Emissions Reductions Calculations

Table A-1. Example Greenhouse Gas Emissions Reductions Calculations

Estimated emissions reductions were calculated using emissions factors and other values consistent with Andover's 2017 baseline greenhouse gas (GHG) inventory conducted with the Metropolitan Area Planning Council (MAPC) GHG Inventory Tool, unless otherwise noted.

Inputs were modified to reflect the proposed strategies and actions on the "Inputs for 2017" sheet and results on the "All Emissions - Summary" sheet were compared with the results of the baseline inventory to determine possible emissions reductions. The assumptions made for each action are summarized in this table. Some calculations do not reflect the greatest emissions reductions possible to avoid double counting with other overlapping actions.

These calculations serve as estimates and examples of the types of emissions reductions the town may expect but are not guaranteed. The science behind emissions calculations, including emissions factors, is continually changing as better information becomes available.

Related Action	Calculations & Assumptions	Emissions Reduction (MTCO2e/ year)
B-2-1. Facilitate a residential electrification and energy efficiency program	Emissions reduction estimates account for the transition to air source heat pumps and energy efficiency improvements. An emissions reduction of 2.7 MTCO2e/year/house was determined using the Mass Save Heating Comparison Calculator with the following assumptions: • $171/month for natural gas Average natural gas bill in Massachusetts (wwlp.com) • 1,744 ft2 average home size Median Home Price by State 2023 (worldpopulationreview.com) • Transition from natural gas boiler system with central air conditioning to air source heat pump system. There were 8,720 single family parcels in Andover in 2022 according to the MA Department of Revenue Data Analytics and Resources Bureau Parcel Count and Valuations by Use. Assuming half (4,360) of the single family homes converted from natural gas boilers to air source heats pumps, the resulting emissions reduction is 11,772 MTCO2e/year. Emissions reductions associated with energy efficiency improvements were calculated by assuming a 10% energy savings from the 2017 baseline electricity and natural gas usage. A value of 10% was determined through	20,541

	conversations with Joyce Losick-Yang. The 2017 residential Mass Save data used in the 2017 inventory tool ("Inputs for 2017" Cell C32 and Cell D32) were reduced from 109,446 MWh/year to 98,501 MWh/year and 9,225,699 therms to 8,303,129 therms. This resulted in an emissions reduction of 8,769 MTCO2e/year ("All Emissions – Summary" Table 4).	
B-2-2. Facilitate a commercial and municipal electrification and energy efficiency program	Emissions associated with municipal natural gas usage	5,326
E-1-1. Implement Municipal Aggregation	Residential electricity assumed to be 100% Class I RECs. To avoid double counting emissions reductions with the 10% energy efficiency action, 90% of the residential energy consumption, or 98,501,400 kWh was entered. "All Emissions – Summary" Cell E98 shows a reduction from 24,236 to 2,424 MTCO2e.	21,812
M-2. Transition to Electric Vehicles	If all gasoline and diesel usage by vehicles was eliminated from passenger vehicles, Andover's total emissions could be reduced by 117,817 MTCO2e per year. This value is from "All Emissions – Summary" sheet Cell D131 minus the emissions associated with the 13 electric passenger vehicles which is about 9 MTCO2e. This calculation uses inputs from the "Inputs for 2017" sheet in which there were 23,225 passenger vehicles. The number of vehicles registered has increased since 2017. This calculation assumes there are no additional emissions associated with electricity usage because by 2050 ideally the electricity will be 100% renewably sourced. For electric vehicles that are not charged with 100% renewable energy, there are emissions associated with the electricity usage. If gasoline and diesel usage for municipal vehicles was eliminated, emissions would be reduced by 1,236 MTCO2e per year.	
NR-2. Advance the smart and	The water treatment plant used 4,536,800 kWh in 2017 according to Mass Energy Insight data. If the electricity was	105

efficient use of water	reduced by 10% through water conservation strategies and energy efficiency upgrades, the emissions reduction would be 105 MTCO2e ("All Emissions – Summary" Cell D129 8,855 MTCO2e – 8,750 MTCO2e). To avoid double counting with other actions eliminating natural gas usage, water treatment plant natural gas was not included.	
W-1-1. Enhance and update the trash and recycling collection program	The 2017 GHG inventory inputs of 9,772 tons municipally collected waste and 18,148 tons privately hauled waste were reduced by 25% and 50% to identify a possible range of reductions. Candy Dann identified a 25%-50% reduction in waste based on communities such as Dover, Natick, Needham, Hamilton, Newton, Marblehead, Ipswich. Reduced tonnages were entered into the 2017 GHG tool on sheet "Inputs for 2017" cells C302 and C303 and the resulting emissions were gathered from "All Emissions – Summary" sheet in Cell D136 and subtracted from the original values.	3,462 (25%) - 6,924 (50%)
W-1-2. Develop an organics composting program	The 2017 GHG inventory input of 9,772 tons municipally collected waste was used and revised. Municipally hauler waste is collected from residential properties with six or less units that have access to a public way and collected from all municipal buildings. The default waste characterization study recommended in the GHG Tool identified food waste as 28% of waste. Possible food waste is estimated to be 2,736 tons. The quantity was subtracted from the 9,772 tons of municipally collected waste ("Inputs for 2017" Cell C302) and added in the section for composting (Cell D302). Cell C284 was also set to equal 100%. The emissions reductions are estimated to be 1,357 MTCO2e per year. This estimation method assumes all possible food waste is composted. If only half, then 672 MTCO2e per year is expected (as implementation details specify as a goal). Municipally hauled waste includes schools and therefore the reductions from a school composting program are reflected in the calculations.	1,357
W-1-4. Ensure parallel trash and recycling collection service	Data reported to MassDEP for 2018 (used in the 2017 GHG Tool) indicates that the Town program serves 8,899 households out of the total of 10,654 households. Assuming the tons per household is approximately similar to other Andover households (roughly 2400lbs/hh), that would equate to nearly 2,106 tons of trash collected commercially. Some	229

for multifamily residential	of the apartments and condo complexes do offer recycling but not all. By requiring haulers to provide a recycling program, trash from these residences would be reduced by at least 50% of the recyclables in the trash (recyclable paper 21.8%, plastic 15%, metal 4.8% and glass 2.3% for a total of 43.9%) or 22% of 2,106 tons, which would amount to 463 tons per year.	

Table A-2. Additional Example Calculations

The actions included in this table have been excluded from the graph shown in the Example GHG Emissions Reductions section of the plan because they either double count emissions reductions or are avoided emissions from future activities that have not been included in the 2017 baseline.

Related Action	Calculations & Assumptions	Avoided Emissions
B-1-1. Adopt the Specialized Stretch Energy Code	Using the square footage totals from the assessor's data for 2015 and 2022 from column AH ("FinArea") for commercial and residential building types, the average growth was 1% per year for residential and 0.7% per year for commercial. This translates to an additional 10,428,720 square feet for residential and 4,122,397 square feet for commercial by 2050. Using the Mass Save Data natural gas usage for 2021 (most recent) and the 2022 square footage data, the average residential usage is 0.27 therms/square foot and commercial usage is 0.91 therm/square foot. Assuming 80% of the square footage does not use natural gas, this equates to 2,220,416 therms avoided and 2,996,997 therms avoided for residential and commercial, respectively. When entered into the 2017 GHG Tool, the resulting emissions avoided would be 12,229 MTCO2e, 15,898 MTCO2e, for residential and commercial, respectively. Emissions associated with natural gas transmission and distribution would also be avoided and equate to 3,193 MTCO2e and 4,310 MTCO2e for residential and commercial, respectively. The combined total avoided emissions are 35,630 MTCO2e in 2050.	35,630 MTCO2e in 2050

E-1-2. Offer training programs for residents on solar and energy storage options	Possible emissions avoided by using solar. Not included in reductions in table above to avoid double counting with other actions that aim to procure renewable energy. Assumptions: • Half of the 8,720 single family parcels is 4,360 homes from 2022 Parcel Count and Valuations by Use table https://dlsgateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=PropertyTaxInformation.LA4.Parcel_counts_vals • 1,744 ft^2 with 2 stories (50%) and 40% available roof space (likely an underestimate for Andover) average home size in MA https://worldpopulationreview.com/state-rankings/median-home-price-by-state • 24ft^2 per panel Solar Panel Size and Weight: How Big Are Solar Panels? | EnergySage • Therefore fit 14.5 panels per house • 325 watts per panel https://news.energysage.com/what-is-the-power-output-of-a-solar-panel/ • Therefore 4,733 watts per home or 5915 kWh per home • The emissions factor of 0.00026308336 MTCO2e/kWh used in the 2017 GHG Tool for electricity was used If this quantity of electricity was from the 2017 grid, it would have resulted in 6,785 MTCO2e. These emissions would have been avoided if the electricity had instead been from rooftop solar photovoltaic systems.	6,785 MTCO2e /year

Carbon Sequestration Calculations and Limitations:

Forests

Related Strategy: NR-1. Enhance and Protect Tree Canopy

According to the Davey Resource Group Tree Keeper tool, Andover's 11,521 street trees included in the tree inventory sequester 1,951,072.22 lbs CO_2 per year or 885 $MTCO_2$. This only represents a fraction of trees in Andover. The Tool can be viewed here: https://andoverma.treekeepersoftware.com/index.cfm?deviceWidth=1920

Other means for calculating the carbon sequestration of Andover's forest were investigated but methodology and sequestration estimates vary widely. Some climate action plans for other communities, including Weston and Acton, have used i-Tree, a tree canopy assessment tool to calculate benefits including carbon sequestration. This is similar to the Tree Keeper tool, but i-Tree has

greater functionality including the canopy tool which can calculate sequestration based on land cover types.

The Town of Amherst calculated carbon sequestration with land cover data (MassGIS) and the MA Healthy Soils Action Plan (2021) using an average forest sequestration rate of 0.72 MTCO2e per acre per year. However, the original source of this information could not be located. Amherst's Climate Action Adaptation and Resilience Plan can be viewed here: https://www.amherstma.gov/DocumentCenter/View/58981/Climate-Action-Adaptation-and-Resilience-Plan-Final-from-June-2021

The Massachusetts Healthy Soils Action Plan (2023) states that forests have an average soil organic carbon of 54 metric tons/acre and 1 metric ton of soil organic carbon is equal to 3.677 tons of carbon dioxide. Source: https://www.mass.gov/doc/healthy-soils-action-plan-2023/download (pages 22 and 23).

An average sequestration rate was not provided and the analysis focused mainly on soil carbon. The Action Plan states, "Protecting this soil carbon for the long term and increasing the capacity of forests to sequester more carbon each year is essential for climate change mitigation and habitat preservation" (page 35).

Using the MA Healthy Soils Action Plan (2023) data and land cover data, forest soil carbon storage was calculated. According to the National Land Cover Database 2019 land cover data Andover has 5921.1 acres of forest (29% of the total 20,578.0 acres). These include deciduous forests, evergreen forests, and mixed forests, further described here: National Land Cover Database Class Legend and Description | Multi-Resolution Land Characteristics (MRLC) Consortium.

Land cover data source: Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, doi:10.5066/P9KZCM54

Calculation:

5921.1 acres x 54 metric tons soil organic carbon/acre = 319,739 metric tons soil organic carbon.
319,739 metric tons soil organic carbon x 3.677 metric tons CO_2 = 1,175,682 metric tons of CO_2

Forests in Andover store 319,739 metric tons soil organic carbon, which is equivalent to 1,175,682 metric tons of carbon dioxide. Further analysis is needed to determine the annual sequestration of forest soils and the trees themselves using the methodology described here or with another methodology. Action NR-1-1. includes calculating possible carbon sequestration as a key step to better understanding the value of Andover's forests.

Wetlands

Related Strategy: NR-5. Prioritize wetlands in enhancing Andover's resilience to climate change

The Town of Amherst calculated carbon sequestration with land cover data (MassGIS) and the MA Healthy Soils Action Plan (2021) using an average wetland sequestration rate of 2 MTCO2e per acre

per year. However, the original source of this information could not be located. Amherst's Climate Action Adaptation and Resilience Plan can be viewed here: https://www.amherstma.gov/DocumentCenter/View/58981/Climate-Action-Adaptation-and-Resilience-Plan-Final-from-June-2021

The Massachusetts Healthy Soils Action Plan states that wetlands have an average soil organic carbon of 321 metric tons/acre and 1 metric ton of soil organic carbon is equal to 3.677 tons of carbon dioxide https://www.mass.gov/doc/healthy-soils-action-plan-2023/download (pages 22 and 23).

According to the National Land Cover Database 2019 land cover data Andover has 2,523.2 acres of wetlands (12% of the total 20,578.0 acres).

Land cover data source: Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, doi:10.5066/P9KZCM54

Calculation:
2,523.2 acres x 321 metric tons soil organic carbon/acre = 809,947 metric tons soil organic carbon.
809,947 metric tons soil organic carbon x 3.677 metric tons CO_2 = 2,978,176 metric tons of CO_2

Wetlands in Andover store 809,947.2 metric tons soil organic carbon, which is equivalent to 2,978,176 metric tons of carbon dioxide. Further analysis is needed to determine the annual sequestration of wetland soils. *Strategy NR-5. Prioritize wetlands in enhancing Andover's resilience to climate change* includes the recommendation to calculate possible carbon sequestration of wetlands.

TOWN OF ANDOVER *Finance & Budget*

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Andrew P. Flanagan
Town Manager

Michael Lindstrom
Deputy Town Manager

To: Select Board
Finance Committee
Superintendent of Schools
School Committee
Revenue and Expenditure Task Force

From: Hayley Green, Town Accountant/Assistant Finance Director

CC: Andrew Flanagan, Michael Lindstrom, Patrick Lawlor, Keith Taverna, Martha Sybert, Tara Bicknell, Town Website

Date: June 7, 2023

Re: ***FY 2023 Financials***

The attached reports summarize the Town's financial position through April 30, 2023. Included are the following:

- Executive Summary
- Budgeted versus Actual Revenues – General Fund and Enterprise Funds
- Revenue Comparison Graphs
- Personal Services and Other Expenditures by Department
- Reserve Account and Compensation Fund Analysis
- Chapter 44 § 53 E ½ Revolving Funds
- Capital Projects status – FY17 – FY23

Feel free to contact me, should you have any questions regarding the reports.

The attached reports of the Town Accountant summarize FY 2023 revenues and expenditures for the General Fund, Enterprise Funds, Compensation Fund, Reserve Fund, Revolving Funds and Capital Projects through April 30, 2023.

General Fund

The total general fund receipts of all sources collected through April 30, 2023 are exceeding the annual projections through ten months of the year. FY 2023 local receipts are $3,276,813 greater than FY 2022 collections through the same period of time. This is primarily due to the increase in investment income as interest rates have risen, the increase in building permits, as there was one very large permit in December, and the increase in hotel motel and meals tax revenue, as more people are dining out and traveling as compared to last year. Total off-set receipts collections are $320,715 greater than FY 2022 collections, primarily due to the increase in ambulance receipts as people have become comfortable riding in ambulances again after the pandemic. General fund personal services and other expenditures are in line with or less than FY 2023 projections through April 2023. The public works other expenditures budget is overspent by $493,062. This is due to the snow and ice deficit, which in May, Town Meeting voted to supplement with $965,000 of free cash.

Water Enterprise Fund

The total water enterprise fund collections are exceeding the annual projections through April 2023. The user charges receipts are $1,060,078 greater than FY22 through the same period of time because there were drier summer conditions, resulting in more consumption for FY23. Water personal services and other expenses are in line with FY 2023 projections through April 2023.

Sewer Enterprise Fund

The total sewer enterprise fund collections are lower than annual projections through April 2023. The user charges receipts are $139,010 more than prior year receipts through the same period. The greater collections are correlated with the larger water collections

through this period. Sewer personal services are lower than and other expenses are in line with projections through April 2023.

Reserve Fund

Town Meeting approved a reserve fund balance of $200,000. The Finance Committee authorized $34,800 to be spent on the replacement of three boiler sections at the West Elementary School.

Compensation Fund

Town Meeting approved a compensation fund balance of $848,339. This money has not been used through April 2023.

Revolving Accounts

Town Meeting voted to approve 16 revolving funds with a total spending limit of $2,490,000. The spending limit can be increased by vote of the Select Board and Finance Committee.

Capital Projects

These projects are part of the Town's capital improvement plan voted at Town Meeting from taxation. There is a balance of $2,956,453 available for the most recent seven years of approved projects.

Town of Andover

FY 2023 General Fund Year-To-Date Revenue Report

Budgeted vs. Actuals 4/30/2023 and 4/30/2022

Local Receipts	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Motor Vehicle Excise	5,651,834	5,305,218	93.9%	5,595,875	5,368,483	95.9%	55,959	(63,265)
Hotel/Motel/Meals	1,799,000	2,222,429	123.5%	1,475,000	1,701,618	115.4%	324,000	520,811
Penalties and Interest on Taxes and Excises	480,000	322,597	67.2%	480,000	479,153	99.8%	-	(156,556)
Fees	61,000	36,773	60.3%	61,000	140,409	230.2%	-	(103,636)
Payments in Lieu of Taxes	451,731	2,016	0.4%	440,713	2,016	0.5%	11,018	-
Other Departmental Revenues	213,000	343,681	161.4%	294,200	163,635	55.6%	(81,200)	180,045
Other Departmental Revenues - School Medicare	200,000	310,878	155.4%	200,000	522,801	261.4%	-	(211,922)
Non-Recurring Revenues	5,000	61,107	1222.1%	5,800	9,496	163.7%	(800)	51,611
Licenses and Permits	2,377,540	2,768,339	116.4%	2,354,000	2,655,788	112.8%	23,540	112,550
Fines & Forfeits	132,500	129,477	97.7%	227,000	113,138	49.8%	(94,500)	16,338
Investment Income	204,000	3,068,533	1504.2%	200,000	137,605	68.8%	4,000	2,930,929
Special Assessments	-	87	N/A	-	180	N/A	-	(93)
Total Estimated Receipts	11,575,605	14,571,134	125.9%	11,333,588	11,294,322	99.7%	242,017	3,276,813

Off-Set Receipts	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Recreation	531,531	479,060	90.1%	393,510	456,988	116.1%	138,021	22,072
Elder Services	106,000	93,861	88.5%	106,000	105,415	99.4%	-	(11,554)
Public Facilities - Rental Receipts	40,000	84,823	212.1%	20,000	80,791	404.0%	20,000	4,032
Cemetery - Interment Fees	60,000	54,900	91.5%	60,000	50,017	83.4%	-	4,883
Public Safety - Police Detail Fees	60,000	62,709	104.5%	60,000	74,689	124.5%	-	(11,981)
Public Safety / Fire - Ambulance Receipts	1,300,000	1,462,632	112.5%	1,250,000	1,149,370	91.9%	50,000	313,262
Total Off-Set Receipts	2,097,531	2,237,984	106.7%	1,889,510	1,917,269	101.5%	208,021	320,715

Other Revenues	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Property Taxes (inc. Tax Titles)	174,778,254	166,778,691	95.4%	165,459,877	158,533,938	95.8%	9,318,377	8,244,754
State Aid	14,794,019	12,224,300	82.6%	14,178,409	11,932,055	84.2%	615,610	292,245
Total Other Revenues	189,572,273	179,002,991	94.4%	179,638,286	170,465,993	94.9%	9,933,987	8,536,999
Total Revenues	203,245,409	195,812,110	96.3%	192,861,384	183,677,583.57	95.2%	10,384,025	12,134,526

Town of Andover

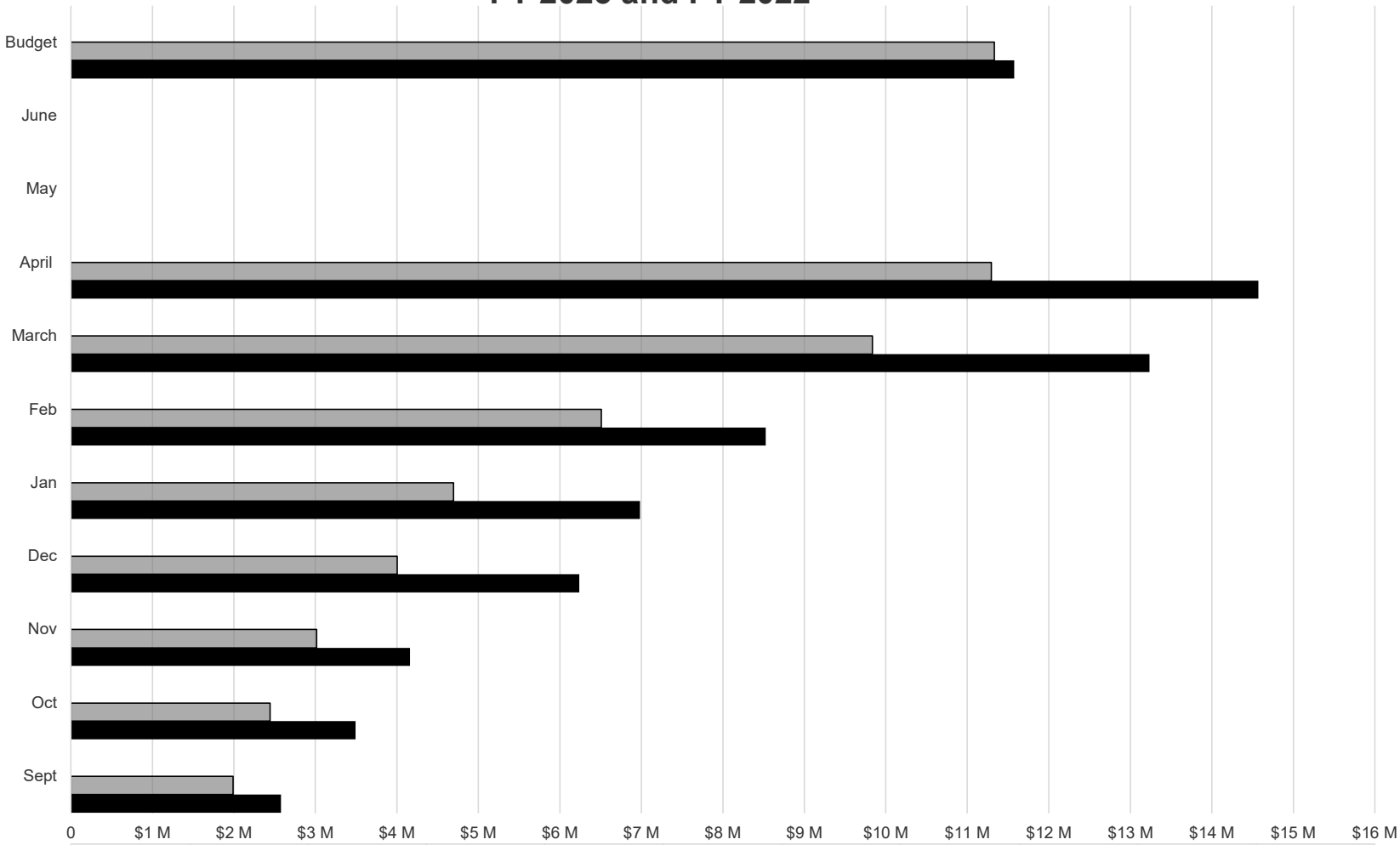
FY 2023 Enterprise Funds Year-To-Date Revenue Report

Budgeted vs. Actuals 4/30/2023 and 4/30/2022

Water Fund	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
User Charges	10,445,844	9,217,083	88.2%	9,996,766	8,157,006	81.6%	449,078	1,060,078
Water Connection	7,500	4,403	58.7%	41,000	5,661	13.8%	(33,500)	(1,258)
Water Testing Fees	12,000	5,075	42.3%	18,000	12,490	69.4%	(6,000)	(7,415)
Meter Installations	10,000	6,650	66.5%	9,000	6,525	72.5%	1,000	125
Fire Flow Test	5,000	7,500	150.0%	9,000	4,982	55.4%	(4,000)	2,518
Special/Final Reads	25,000	12,886	51.5%	25,000	17,866	71.5%	-	(4,980)
Backflow/Cross Connection Fees	87,500	62,899	71.9%	75,000	103,088	137.5%	12,500	(40,188)
Water Tap	-	1,425	N/A	1,000	600	60.0%	(1,000)	825
Liens	85,000	78,231	92.0%	80,000	88,656	110.8%	5,000	(10,426)
Fire Suppression	280,000	179,713	64.2%	220,000	247,876	112.7%	60,000	(68,163)
Interest /Misc Revenue	2,500	4,049	162.0%	-	1,640	N/A	2,500	2,409
Non-Revenue Interest	7,500	33,671	448.9%	19,000	3,475	18.3%	(11,500)	30,196
Total Water Receipts	10,967,844	9,613,585	87.7%	10,493,766	8,649,864	82.4%	474,078	963,721

Sewer Fund	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
User Charges	5,173,301	3,796,994	73.4%	5,086,120	3,657,984	71.9%	87,181	139,010
Committed Interest/Income	110,000	124,256	113.0%	165,000	151,725	92.0%	(55,000)	(27,469)
Liens	55,000	38,839	70.6%	55,000	58,398	106.2%	-	(19,559)
Apport Assmnts	340,000	401,438	118.1%	410,000	443,822	108.2%	(70,000)	(42,384)
Deferred Property Tax	-	10,800	N/A	-	-	N/A	-	10,800
State Reimb/Grants	-	5,630	N/A	-	7,218	N/A	-	(1,588)
Interest /Misc Revenue	3,500	1,194	34.1%	-	2,479	N/A	3,500	(1,285)
Non-Revenue Interest	6,500	36,468	561.0%	15,000	2,437	16.2%	(8,500)	34,031
Total Sewer Receipts	5,688,301	4,415,619.15	77.6%	5,731,120	4,324,062	75.4%	(42,819)	91,557
Total Enterprise Revenues	16,656,145	14,029,204	84.2%	16,224,886	12,973,927	79.96%	431,259	1,055,277

Town of Andover
Local Receipts
FY 2023 and FY 2022



	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Budget
FY 2022 % of Budget	17.6%	21.6%	26.6%	35.3%	41.4%	57.4%	86.8%	99.7%	0.0%	0.0%	100.0%
FY 2023 % of Budget	22.3%	30.2%	36.0%	53.9%	60.3%	73.6%	114.3%	125.9%	0.0%	0.0%	100.0%
FY 2022 Receipts	$1,989,405	$2,444,067	$3,015,542	$4,004,836	$4,695,288	$6,508,233	$9,835,835	$11,294,322			$11,333,588
FY 2023 Receipts	$2,577,784	$3,494,520	$4,161,602	$6,236,788	$6,982,570	$8,525,336	$13,235,643	$14,571,134			$11,575,605

Town of Andover

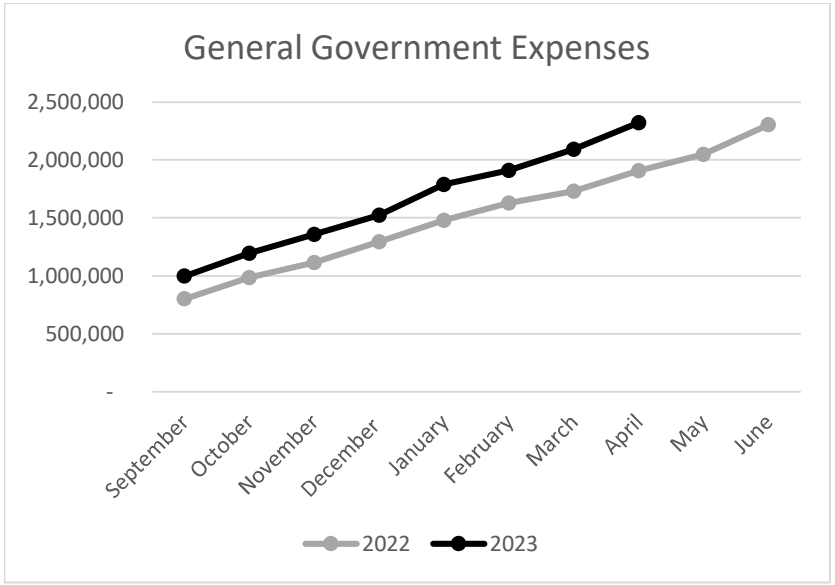
FY 2023 Year-To-Date Budget Report

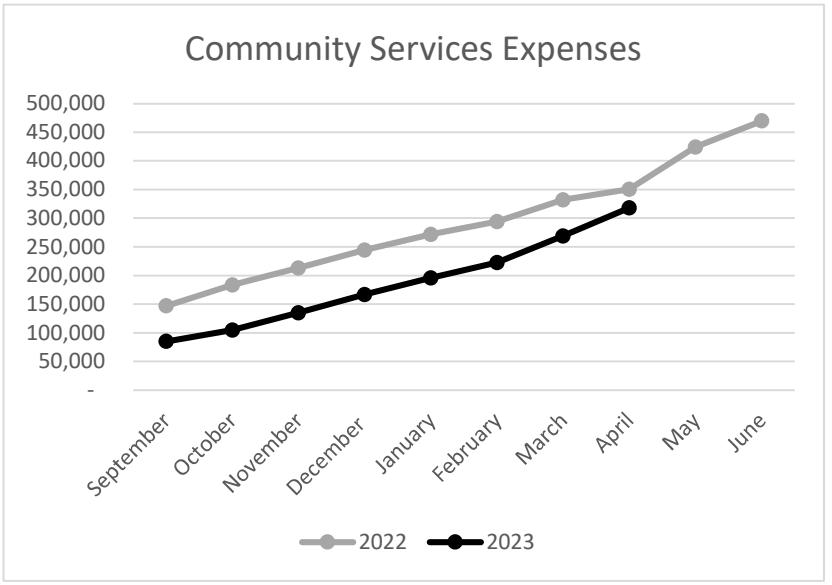
Personal Services and Other Expenditures thru 4/30/2023

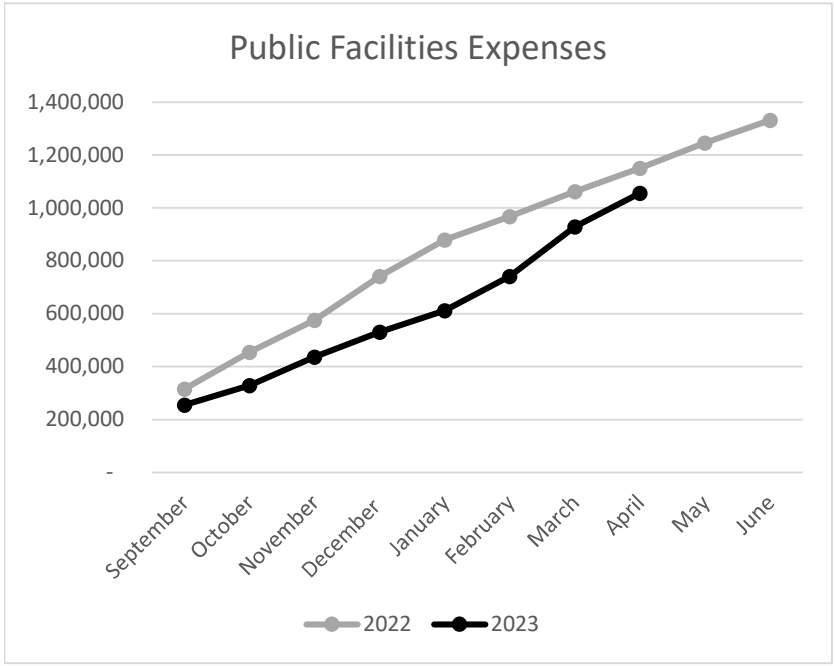
Personal Services	Original Appropriation	Transfers/ Adjustments	Revised Budget	YTD Expended	Encumbrances	Available Balance	% Expended & Encumbered	% Expended
General Government	7,511,444	27,661	7,539,105	5,769,447	-	1,769,658	76.5%	76.5%
Community Services	1,879,000	-	1,879,000	1,426,760	-	452,240	75.9%	75.9%
Public Facilities	2,592,091	-	2,592,091	2,054,281	-	537,810	79.3%	79.3%
Public Safety - Fire	8,611,698	14,621	8,626,319	7,167,368	14,621	1,444,330	83.3%	83.1%
Public Safety - Police	8,116,962	-	8,116,962	6,560,502	-	1,556,460	80.8%	80.8%
Public Works	3,834,283	-	3,834,283	3,204,700	-	629,583	83.6%	83.6%
Library	2,307,538	-	2,307,538	1,814,988	-	492,550	78.7%	78.7%
School	77,899,943	-	77,899,943	53,658,563	21,190,906	3,050,474	96.1%	68.9%
Compensation Fund	848,339	-	848,339	-	-	848,339	0.0%	0.0%
Total Personal Services - General Fund	113,601,298	42,282	113,643,580	81,656,609	21,205,526	10,781,444	90.5%	71.9%
Water Enterprise	2,343,272	-	2,343,272	1,866,987	-	476,285	79.7%	79.7%
Sewer Enterprise	357,873	1,794	359,667	198,820	-	160,847	55.3%	55.3%
Total Personal Services - Enterprise Funds	2,701,145	1,794	2,702,939	2,065,807	-	637,132	76.4%	76.4%

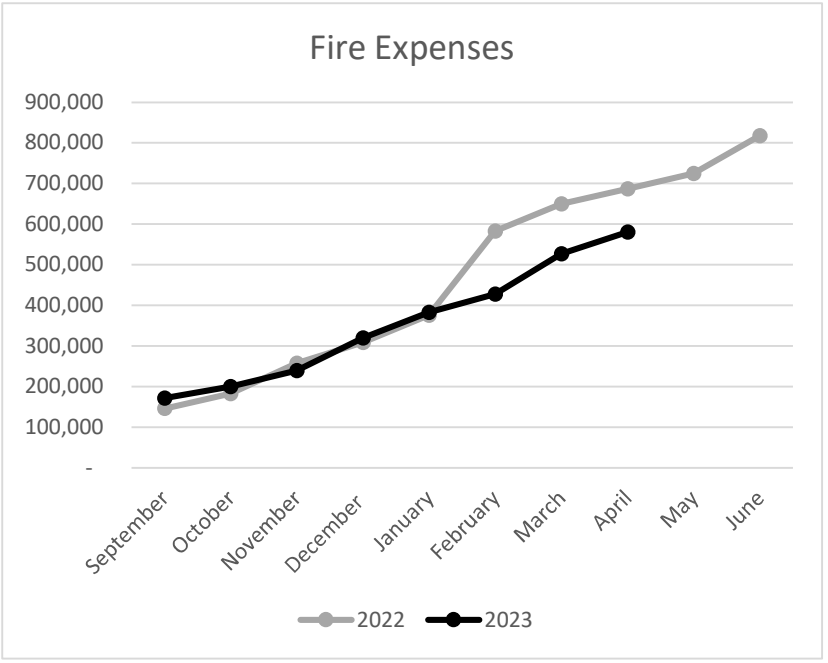
Other Expenses	Original Appropriation	Transfers/ Adjustments	Revised Budget	YTD Expended	Encumbrances	Available Balance	% Expended & Encumbered	% Expended
General Government	2,721,202	222,087	2,943,289	2,322,058	301,187	320,044	89.1%	78.9%
Community Services	610,024	65,776	675,800	318,218	118,743	238,838	64.7%	47.1%
Public Facilities	1,354,850	193,418	1,548,268	1,056,064	333,850	158,353	89.8%	68.2%
Public Safety - Fire	612,050	62,985	675,035	580,370	57,701	36,965	94.5%	86.0%
Public Safety - Police	1,018,318	79,609	1,097,927	741,225	247,856	108,846	90.1%	67.5%
Public Works	5,888,050	353,729	6,241,779	5,142,604	1,592,237	(493,062) *	107.9%	82.4%
Library	666,437	37,072	703,509	514,640	72,207	116,662	83.4%	73.2%
School	17,226,948	1,576,330	18,803,278	13,630,175	4,481,927	691,176	96.3%	72.5%
Technical Schools	1,274,000	-	1,274,000	931,186	267,899	74,915	94.1%	73.1%
Debt Service	23,333,890	-	23,333,890	20,344,900	-	2,988,990	87.2%	87.2%
Insurance	1,164,000	6,313	1,170,313	1,151,409	11,920	6,984	99.4%	98.4%
Health Insurance	23,034,797	-	23,034,797	12,914,114	-	10,120,683	56.1%	56.1%
Unemployment	164,000	-	164,000	88,508	46,460	29,031	82.3%	54.0%
Retirement	6,253,955	-	6,253,955	6,253,956	-	(1)	100.0%	100.0%
Reserve Fund	200,000	(34,800)	165,200	-	-	165,200	0.0%	0.0%
OPEB Appropriation	1,753,413	-	1,753,413	1,753,413	-	-	100.0%	100.0%
Total Other Expenses - General Fund	87,275,934	2,562,519	89,838,453	67,742,840	7,531,987	14,563,626	83.8%	75.4%
Water Enterprise	7,727,574	1,097,243	8,824,817	7,194,644	1,399,155	231,018	97.4%	81.5%
Sewer Enterprise	4,580,540	621,368	5,201,908	4,375,170	258,871	567,868	89.1%	84.1%
Total Other Expenses - Enterprise Funds	12,308,114	1,718,612	14,026,726	11,569,814	1,658,026	798,886	94.3%	82.5%
Total - General Fund	200,877,232	2,604,801	203,482,033	149,399,449	28,737,513	25,345,070	87.5%	73.4%
Total - Enterprise Funds	15,009,259	1,720,406	16,729,665	13,635,621	1,658,026	1,436,018	91.4%	81.5%

*Includes snow & ice deficit. Town Meeting approved $965,000 of free cash to suppliment this budget.

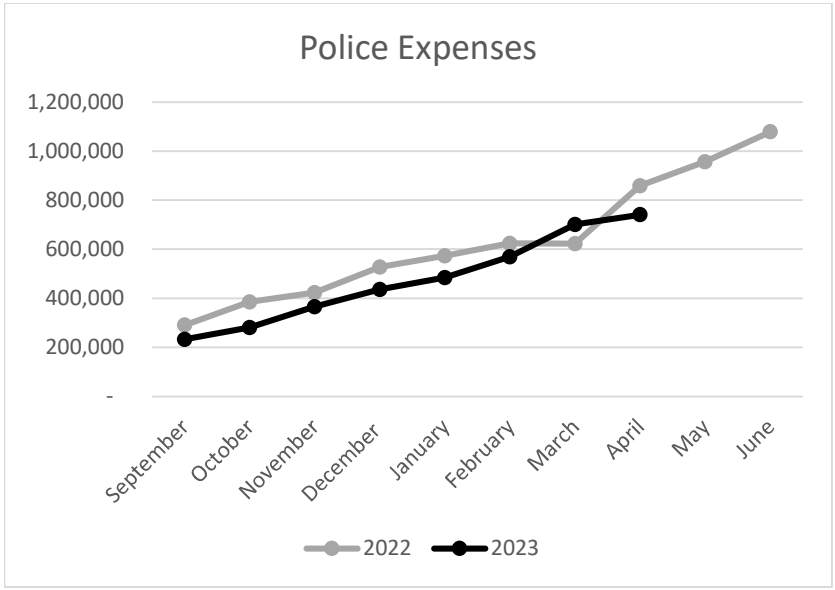


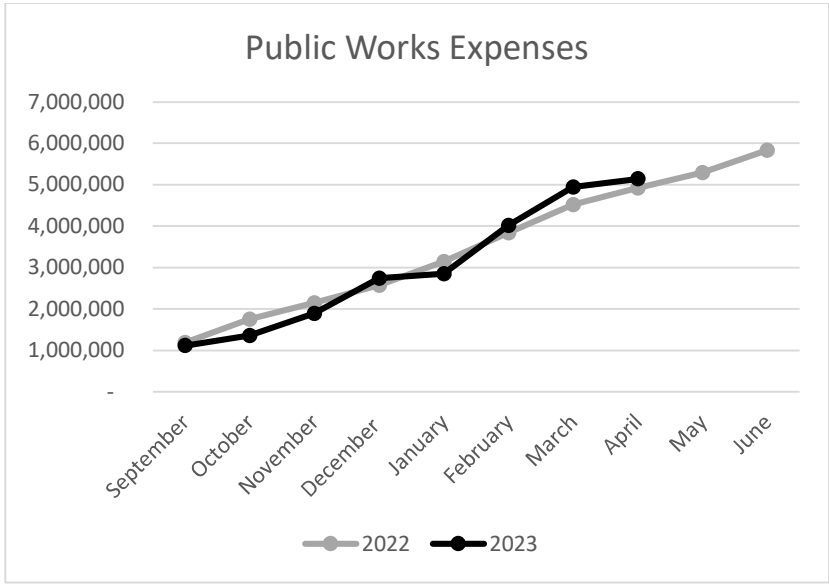


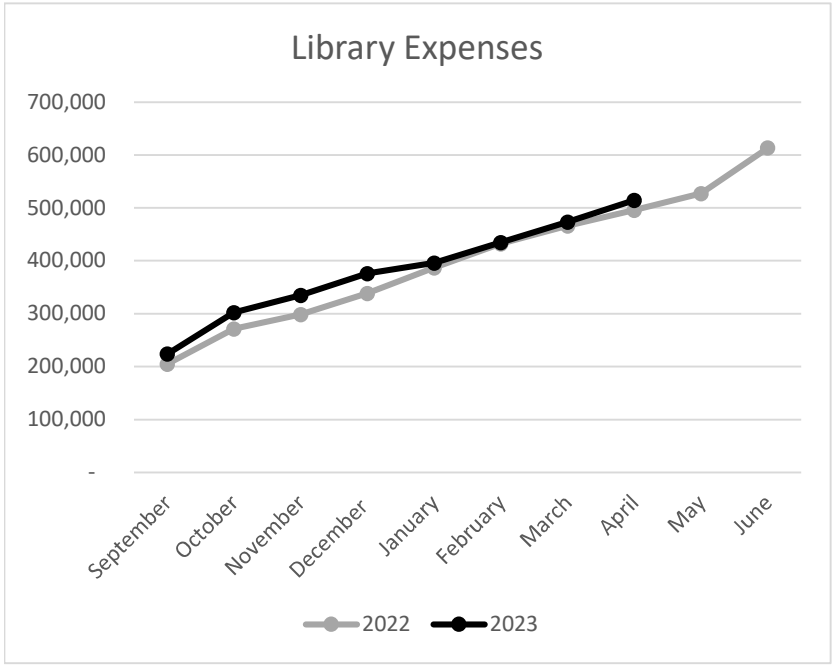


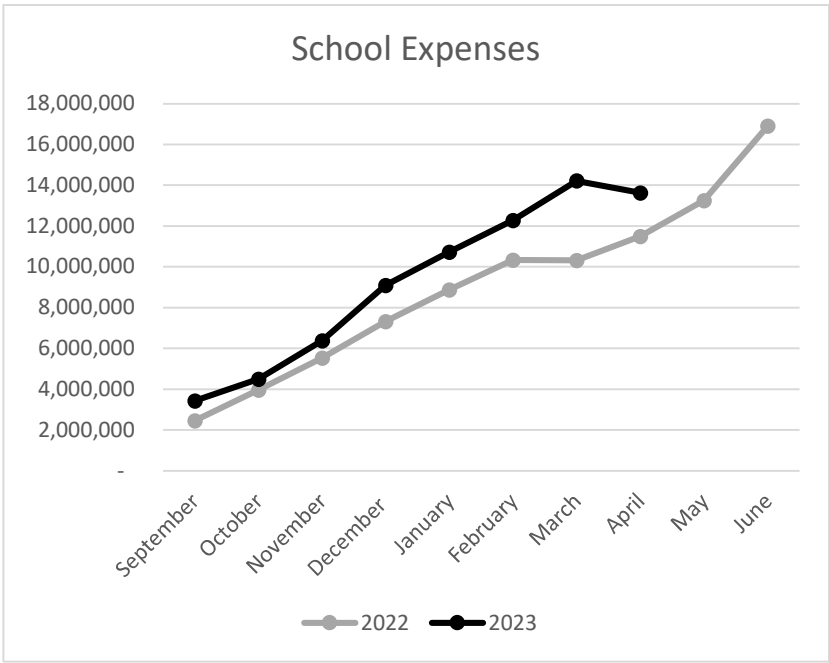


*Expenses vary from year to year due to timing and departmental needs, but can still be on budget.









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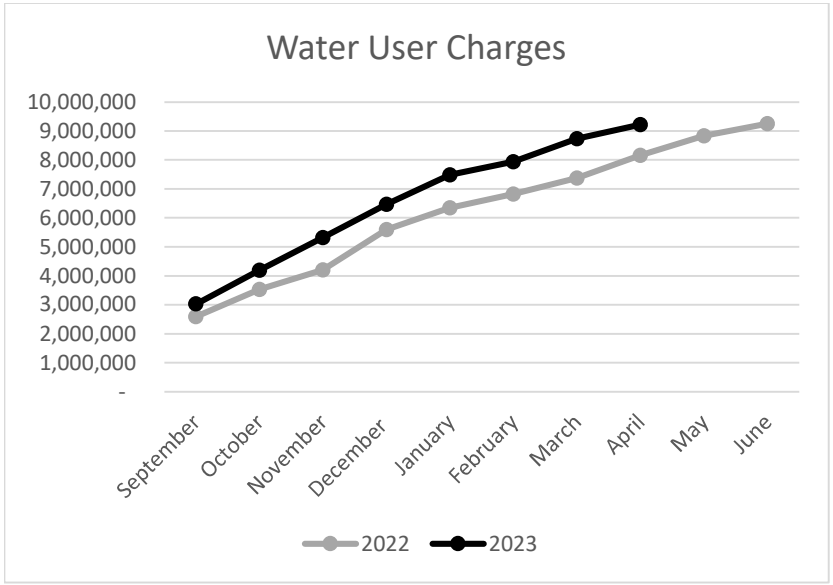

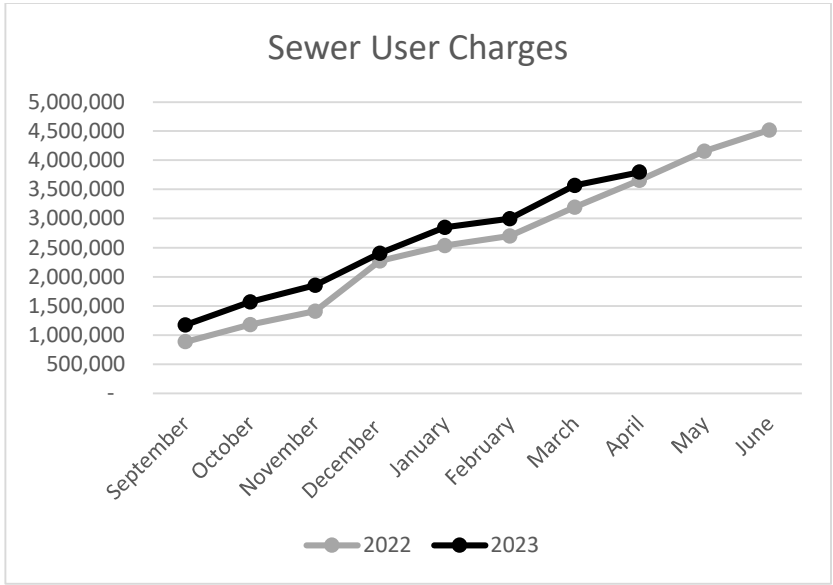

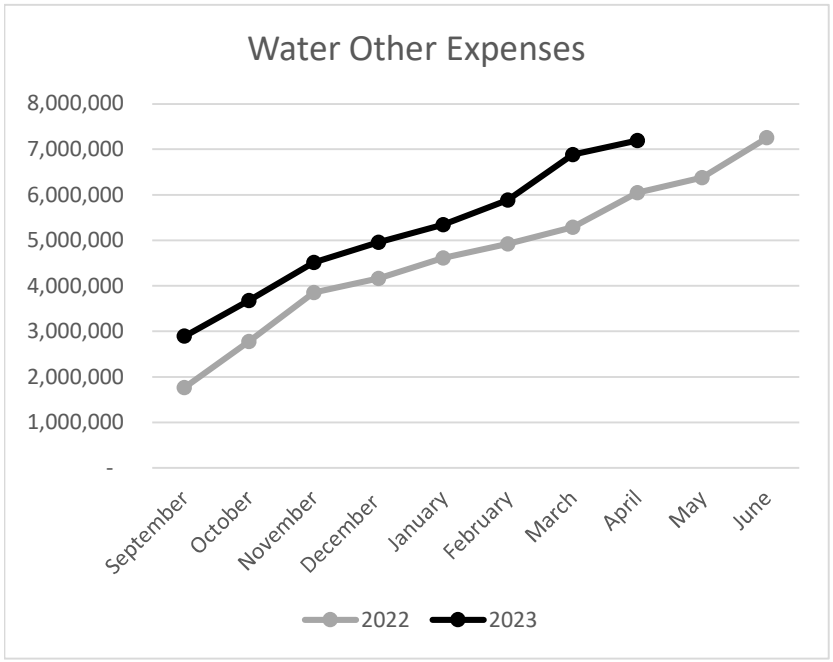

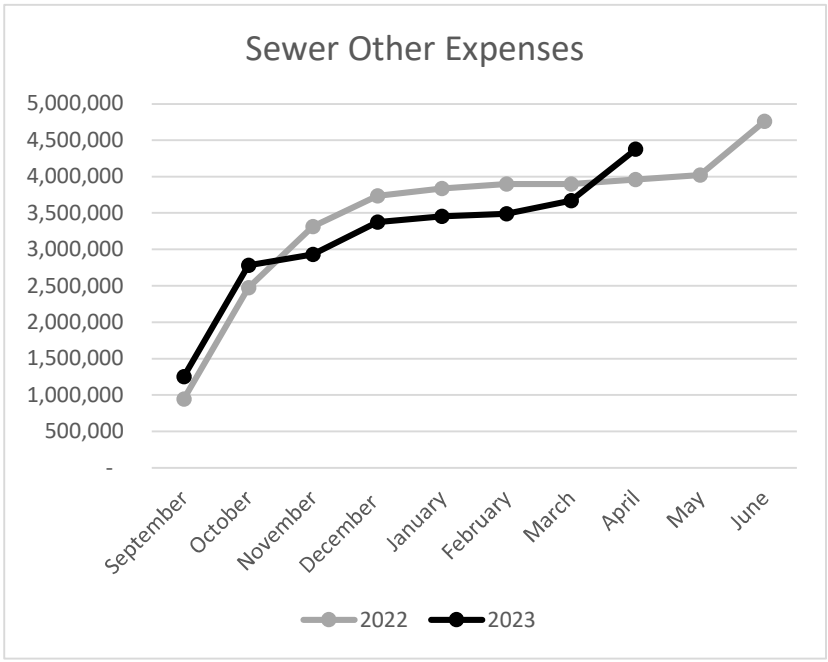

*Expenses vary from year to year due to timing and departmental needs, but can still be on budget.

Town of Andover

FY 2023 Reserve Account and Compensation Fund

As of 4/30/23

RESERVE FUND

Appropriation by Vote of Town Meeting June 2022	$	200,000.00
Transfers by Vote of Town Meeting		0.00
Transfers by Authority of the Finance Committee		
Replacement of three boiler sections at West Elementary		(34,800.00)
Available Balance	$	165,200.00

COMPENSATION FUND

Appropriation by Vote of Town Meeting June 2022	$	848,339.00
Transfers by Vote of Town Meeting		0.00
Transfer by Authority of the Select Board		0.00
Available Balance	$	848,339.00

Town of Andover

FY 2023 Revolving Accounts

(M.G.L. CH. 44, § 53 E1/2)

As of 4/30/23

	CD & P Legal Notices	Library Lost/Damaged Materials	CD & P Health Services Clinics	Recreation Special Services	Youth Services	Facilities Field Maintenance	Elder Services	Police Antenna Uses	School Photocopy Fees	Facilities Compost Program	DPW Solid Waste Fees	CD & P Stormwater Management	Fire Emergency Billing	Health Services Inspections	School Professional Development	Student Technology Rental
	Acct 5550	Acct 5631	Acct 5557	Acct 5552	Acct 5553	Acct 5622	Acct 5554	Acct 5653	Acct 4510	Acct 5666	Acct 5667	Acct 5668	Acct 5669	Acct 5670	Acct 4500	Acct 4260
Balance thru 6/30/2021	21,250	14,507	-688	397,353	329,733	108,905	133,721	46,715	29,218	14,497	76,288	0	681	119,994	3,279	13,176
Receipts thru 6/30/2022	29,730	4,119	44,490	1,866,865	156,582	77,050	83,795	6,930	12,638	26,010	29,665	0	0	57,435	0	53,950
Expenditures thru 6/30/2022	26,692	541	29,882	1,223,055	144,976	30,352	75,530	0	0	4,174	16,550	0	0	27,363	0	20,624
Balance thru 6/30/2022	24,288	18,086	13,920	1,041,162	341,339	155,602	141,987	53,645	41,855	36,333	89,403	0	681	150,066	3,279	46,503
Receipts thru 4/30/2023	25,285	3,359	58,321	1,709,384	260,993	53,804	93,874	5,247	6,271	18,884	14,151	0	0	59,685	0	1,695
Expenditures thru 4/30/2023	17,155	3,038	33,114	1,193,626	141,676	15,230	65,179	0	0	30,871	22,308	0	0	14,525	95	29,624
Balance thru 4/30/2023	32,417	18,406	39,127	1,556,920	460,657	194,176	170,682	58,892	48,126	24,347	81,247	0	681	195,226	3,184	18,574
Spending Authorization	$20,000	$20,000	$60,000	$1,750,000 *	$400,000	$150,000	$225,000	$50,000	$10,000	$60,000	$40,000	$5,000	$100,000	$100,000	$50,000	$200,000
Y-T-D % Spent	85.77%	15.19%	55.19%	68.21%	35.42%	10.15%	28.97%	0.00%	0.00%	51.45%	55.77%	0.00%	0.00%	14.53%	0.19%	14.81%

* Spending limit increased from $1,000,000 to $1,750,000 with Select Board and Finance Committee approval

Town of Andover
Capital Projects
4/30/2023

		FY17	FY18	FY19	FY20	FY21	FY22	FY23	Total Available
	Budget	1,120,000	1,495,643	1,040,000	1,011,600	1,150,000	1,185,000	1,271,500	
	Expended	1,120,000	1,495,643	1,040,000	993,163	1,042,952	1,048,582	653,445	
	Encumbered	-	-	-	8,688	36,810	54,433	123,930	
Total School CIP	Available	-	-	-	9,748	70,238	81,985	494,126	656,097
	Budget	222,000	579,018	487,000	1,044,098	902,108	137,000	150,000	
	Expended	192,000	555,672	406,836	810,878	802,108	86,040	6,061	
	Encumbered	-	9,300	34,429	22,317	-	17,436	5,810	
Total General Government CIP	Available	30,000	14,046	45,736	210,903	100,000	33,525	138,130	572,340
	Budget	-	32,214	-	-	-	-	-	
	Expended	-	32,214	-	-	-	-	-	
	Encumbered	-	-	-	-	-	-	-	
Total Youth Services CIP	Available	-	-	-	-	-	-	-	-
	Budget	50,000	-	-	-	-	-	-	
	Expended	50,000	-	-	-	-	-	-	
	Encumbered	-	-	-	-	-	-	-	
Total Recreation CIP	Available	-	-	-	-	-	-	-	-
	Budget	25,000	-	-	10,000	50,000	-	-	
	Expended	25,000	-	-	-	15,000	-	-	
	Encumbered	-	-	-	10,000	-	-	-	
Total Library CIP	Available	-	-	-	-	35,000	-	-	35,000
	Budget	623,000	800,000	946,000	1,303,000	468,000	1,180,000	1,165,000	
	Expended	623,000	781,647	942,264	1,298,765	367,280	653,304	92,871	
	Encumbered	-	18,348	259	460	20,778	204,708	89,417	
Total Facilities CIP	Available	-	5	3,477	3,775	79,942	321,989	982,712	1,391,900
	Budget	195,000	293,500	250,077	195,000.00	195,000.00	255,000	-	
	Expended	195,000	293,500	249,159	195,000.00	179,055.49	77,808	-	
	Encumbered	-	-	-	-	15,945	165,156	-	
Total Police CIP	Available	-	-	918	-	-	12,036	-	12,954
	Budget	20,000	63,500	214,000	-	96,000	88,000	-	
	Expended	20,000	61,352	201,715	-	96,000	77,383	-	
	Encumbered	-	-	-	-	-	-	-	
Total Fire CIP	Available	-	2,148	12,285	-	-	10,617	-	25,050
	Budget	285,000	415,000	328,000	400,000	-	165,000	170,000	
	Expended	275,370	366,154	323,147	399,026	-	20,277	-	
	Encumbered	431	2,713	4,853	973	-	106,944	-	
Total DPW CIP	Available	9,200	46,132	-	-	-	37,779	170,000	263,112
	Budget	1,420,000	2,183,232	2,225,077	2,952,098	1,711,108	1,825,000	1,485,000	
	Expended	1,380,370	2,090,539	2,123,121	2,703,668	1,459,443	914,811	98,932	
	Encumbered	431	30,362	39,540	33,750	36,723	494,243	95,227	
Total Town CIP	Available	39,200	62,331	62,416	214,679	214,942	415,946	1,290,842	2,300,355
	Budget	2,540,000	3,678,875	3,265,077	3,963,698	2,861,108	3,010,000	2,756,500	
	Expended	2,500,370	3,586,182	3,163,121	3,696,831	2,502,395	1,963,393	752,376	
	Encumbered	431	30,362	39,540	42,438	73,533	548,676	219,156	
Grand Total	Available	39,200	62,331	62,416	224,428	285,180	497,931	1,784,967	2,956,453

TOWN OF ANDOVER *Finance & Budget*
Hayley Green, CPA, Town Accountant/Assistant Finance Director
Accounting Department

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(978) 623-8920
hayley.green@andoverma.us
www.andoverma.gov

Andrew P. Flanagan
Town Manager

Michael Lindstrom
Deputy Town Manager

To: Select Board
Finance Committee
Superintendent of Schools
School Committee
Revenue and Expenditure Task Force

From: Hayley Green, Town Accountant/Assistant Finance Director

CC: Andrew Flanagan, Michael Lindstrom, Patrick Lawlor, Keith Taverna, Martha Sybert, Tara Bicknell, Town Website

Date: June 7, 2023

Re: ***FY 2023 Financials***

The attached reports summarize the Town's financial position through May 31, 2023. Included are the following:

- Executive Summary
- Budgeted versus Actual Revenues – General Fund and Enterprise Funds
- Revenue Comparison Graphs
- Personal Services and Other Expenditures by Department
- Reserve Account and Compensation Fund Analysis
- Chapter 44 § 53 E ½ Revolving Funds
- Capital Projects status – FY17 – FY23

Feel free to contact me, should you have any questions regarding the reports.

The attached reports of the Town Accountant summarize FY 2023 revenues and expenditures for the General Fund, Enterprise Funds, Compensation Fund, Reserve Fund, Revolving Funds and Capital Projects through May 31, 2023.

General Fund

The total general fund receipts of all sources collected through May 31, 2023 are exceeding the annual projections through eleven months of the year. FY 2023 local receipts are $3,815,068 greater than FY 2022 collections through the same period of time. This is primarily due to the increase in investment income as interest rates have risen, the increase in building permits, as there was one very large permit in December, and the increase in hotel motel and meals tax revenue, as more people are dining out and traveling as compared to last year. Total off-set receipts collections are $342,055 greater than FY 2022 collections, primarily due to the increase in ambulance receipts as people have become comfortable riding in ambulances again after the pandemic. General fund personal services and other expenditures are in line with FY 2023 projections through May 2023. The fire safety other expenditures budget was overspent by $10,581 due to increased medical expenses. This over expenditure was covered by year-end transfers voted in June.

Water Enterprise Fund

The total water enterprise fund collections are in line with the annual projections through May 2023. The user charges receipts are $746,816 greater than FY22 through the same period of time because there were drier summer conditions, resulting in more consumption for FY23. Water personal services and other expenses are in line with FY 2023 projections through May 2023.

Sewer Enterprise Fund

The total sewer enterprise fund collections are lower than annual projections through May 2023. The user charges receipts are $168,839 less than prior year receipts through

the same period. Sewer personal services are lower than and other expenses are in line with projections through May 2023.

Reserve Fund

Town Meeting approved a reserve fund balance of $200,000. The Finance Committee authorized $34,800 to be spent on the replacement of three boiler sections at the West Elementary School.

Compensation Fund

Town Meeting approved a compensation fund balance of $848,339. This money has not been used through May 2023.

Revolving Accounts

Town Meeting voted to approve 16 revolving funds with a total spending limit of $2,490,000. The spending limit can be increased by vote of the Select Board and Finance Committee.

Capital Projects

These projects are part of the Town's capital improvement plan voted at Town Meeting from taxation. There is a balance of $2,709,910 available for the most recent seven years of approved projects.

Town of Andover

FY 2023 General Fund Year-To-Date Revenue Report

Budgeted vs. Actuals 5/31/2023 and 5/31/2022

Local Receipts	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Motor Vehicle Excise	5,651,834	5,639,426	99.8%	5,595,875	5,605,418	100.2%	55,959	34,008
Hotel/Motel/Meals	1,799,000	2,222,429	123.5%	1,475,000	1,701,618	115.4%	324,000	520,811
Penalties and Interest on Taxes and Excises	480,000	372,163	77.5%	480,000	550,403	114.7%	-	(178,239)
Fees	61,000	40,249	66.0%	61,000	142,044	232.9%	-	(101,795)
Payments in Lieu of Taxes	451,731	2,016	0.4%	440,713	453,111	102.8%	11,018	(451,095)
Other Departmental Revenues	213,000	366,553	172.1%	294,200	185,018	62.9%	(81,200)	181,535
Other Departmental Revenues - School Medicare	200,000	310,878	155.4%	200,000	522,801	261.4%	-	(211,922)
Non-Recurring Revenues	5,000	61,107	1222.1%	5,800	9,496	163.7%	(800)	51,611
Licenses and Permits	2,377,540	3,384,702	142.4%	2,354,000	2,879,529	122.3%	23,540	505,173
Fines & Forfeits	132,500	145,709	110.0%	227,000	124,442	54.8%	(94,500)	21,267
Investment Income	204,000	3,603,707	1766.5%	200,000	159,899	79.9%	4,000	3,443,807
Special Assessments	-	87	N/A	-	180	N/A	-	(93)
Total Estimated Receipts	11,575,605	16,149,026	139.5%	11,333,588	12,333,958	108.8%	242,017	3,815,068

Off-Set Receipts	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Recreation	531,531	482,505	90.8%	393,510	451,314	114.7%	138,021	31,191
Elder Services	106,000	110,117	103.9%	106,000	115,635	109.1%	-	(5,518)
Public Facilities - Rental Receipts	40,000	93,265	233.2%	20,000	90,064	450.3%	20,000	3,201
Cemetery - Interment Fees	60,000	57,958	96.6%	60,000	57,583	96.0%	-	375
Public Safety - Police Detail Fees	60,000	65,584	109.3%	60,000	78,673	131.1%	-	(13,089)
Public Safety / Fire - Ambulance Receipts	1,300,000	1,595,277	122.7%	1,250,000	1,269,382	101.6%	50,000	325,895
Total Off-Set Receipts	2,097,531	2,404,706	114.6%	1,889,510	2,062,652	109.2%	208,021	342,055

Other Revenues	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
Property Taxes (inc. Tax Titles)	174,778,254	173,723,499	99.4%	165,459,877	164,723,335	99.6%	9,318,377	9,000,164
State Aid	14,794,019	13,441,891	90.9%	14,178,409	13,114,514	92.5%	615,610	327,377
Total Other Revenues	189,572,273	187,165,390	98.7%	179,638,286	177,837,849	99.0%	9,933,987	9,327,541
Total Revenues	203,245,409	205,719,122	101.2%	192,861,384	192,234,459.33	99.7%	10,384,025	13,484,663

Town of Andover

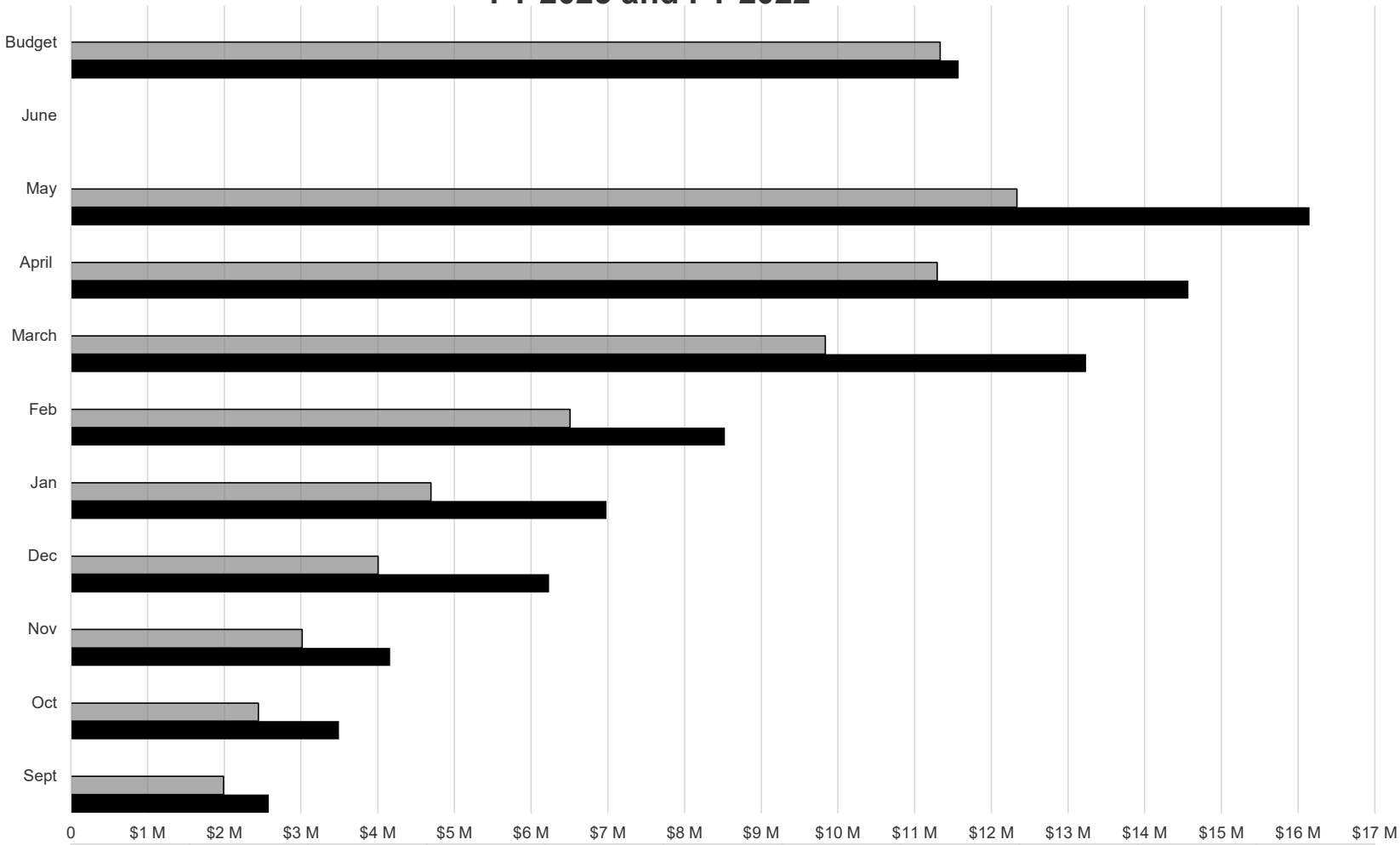
FY 2023 Enterprise Funds Year-To-Date Revenue Report

Budgeted vs. Actuals 5/31/2023 and 5/31/2022

Water Fund	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
User Charges	10,445,844	9,672,637	92.6%	9,996,766	8,829,596	88.3%	449,078	843,041
Water Connection	7,500	5,032	67.1%	41,000	5,661	13.8%	(33,500)	(629)
Water Testing Fees	12,000	5,075	42.3%	18,000	12,490	69.4%	(6,000)	(7,415)
Meter Installations	10,000	8,225	82.3%	9,000	6,525	72.5%	1,000	1,700
Fire Flow Test	5,000	9,773	195.5%	9,000	4,982	55.4%	(4,000)	4,791
Special/Final Reads	25,000	14,136	56.5%	25,000	19,413	77.7%	-	(5,277)
Backflow/Cross Connection Fees	87,500	75,910	86.8%	75,000	114,125	152.2%	12,500	(38,216)
Water Tap	-	1,575	N/A	1,000	600	60.0%	(1,000)	975
Liens	85,000	83,486	98.2%	80,000	94,951	118.7%	5,000	(11,465)
Fire Suppression	280,000	197,907	70.7%	220,000	271,198	123.3%	60,000	(73,291)
Interest /Misc Revenue	2,500	4,098	163.9%	-	1,693	N/A	2,500	2,405
Non-Revenue Interest	7,500	33,671	448.9%	19,000	3,475	18.3%	(11,500)	30,196
Total Water Receipts	10,967,844	10,111,524	92.2%	10,493,766	9,364,708	89.2%	474,078	746,816

Sewer Fund	FY 23 Budgeted Receipts	FY 23 YTD Revenues	% Collected	FY 22 Budgeted Receipts	FY 22 YTD Revenues	% Collected	Change in Budgets	Change in YTD Receipts
User Charges	5,173,301	3,988,385	77.1%	5,086,120	4,157,224	81.7%	87,181	(168,839)
Committed Interest/Income	110,000	136,662	124.2%	165,000	164,952	100.0%	(55,000)	(28,290)
Liens	55,000	42,956	78.1%	55,000	62,400	113.5%	-	(19,444)
Apport Assmnts	340,000	452,886	133.2%	410,000	494,521	120.6%	(70,000)	(41,634)
Deferred Property Tax	-	10,800	N/A	-	-	N/A	-	10,800
State Reimb/Grants	-	5,630	N/A	-	7,218	N/A	-	(1,588)
Interest /Misc Revenue	3,500	1,286	36.7%	-	2,580	N/A	3,500	(1,294)
Non-Revenue Interest	6,500	36,468	561.0%	15,000	2,437	16.2%	(8,500)	34,031
Total Sewer Receipts	5,688,301	4,675,073.97	82.2%	5,731,120	4,891,332	85.3%	(42,819)	(216,258)
Total Enterprise Revenues	16,656,145	14,786,598	88.8%	16,224,886	14,256,040	87.87%	431,259	530,557

Town of Andover
Local Receipts
FY 2023 and FY 2022

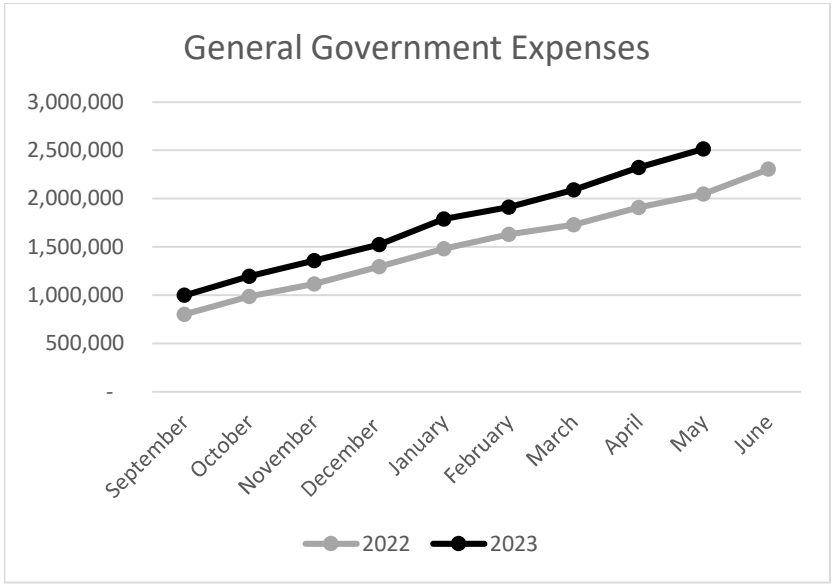


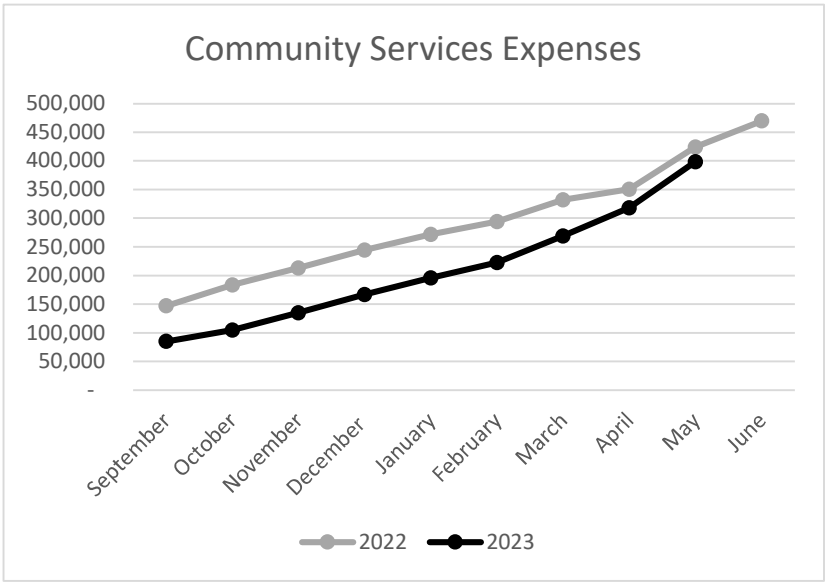
	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Budget
FY 2022 % of Budget	17.6%	21.6%	26.6%	35.3%	41.4%	57.4%	86.8%	99.7%	108.8%	0.0%	100.0%
FY 2023 % of Budget	22.3%	30.2%	36.0%	53.9%	60.3%	73.6%	114.3%	125.9%	139.5%	0.0%	100.0%
FY 2022 Receipts	$1,989,405	$2,444,067	$3,015,542	$4,004,836	$4,695,288	$6,508,233	$9,835,835	$11,294,322	$12,333,958		$11,333,588
FY 2023 Receipts	$2,577,784	$3,494,520	$4,161,602	$6,236,788	$6,982,570	$8,525,336	$13,235,643	$14,571,134	$16,149,026		$11,575,605

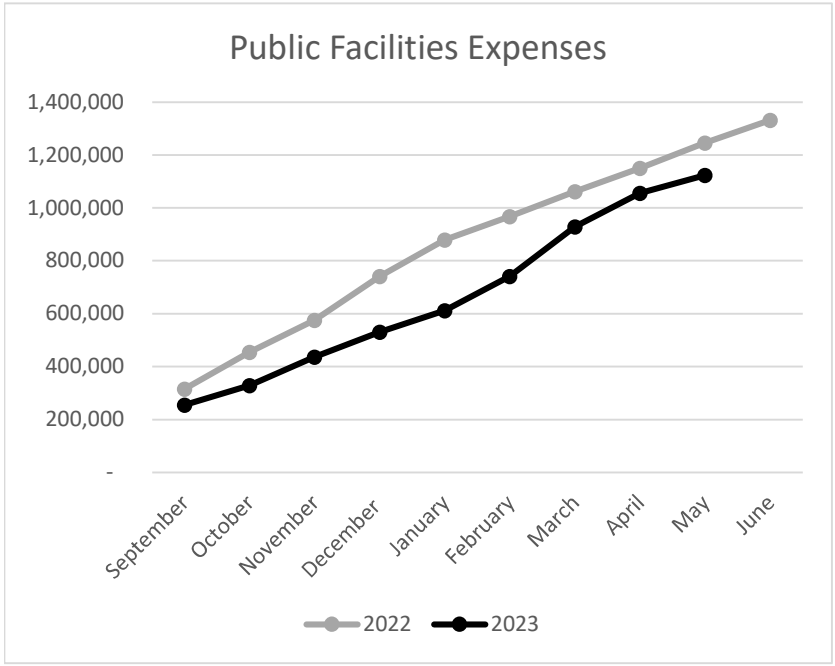
Town of Andover
FY 2023 Year-To-Date Budget Report
Personal Services and Other Expenditures thru 5/31/2023

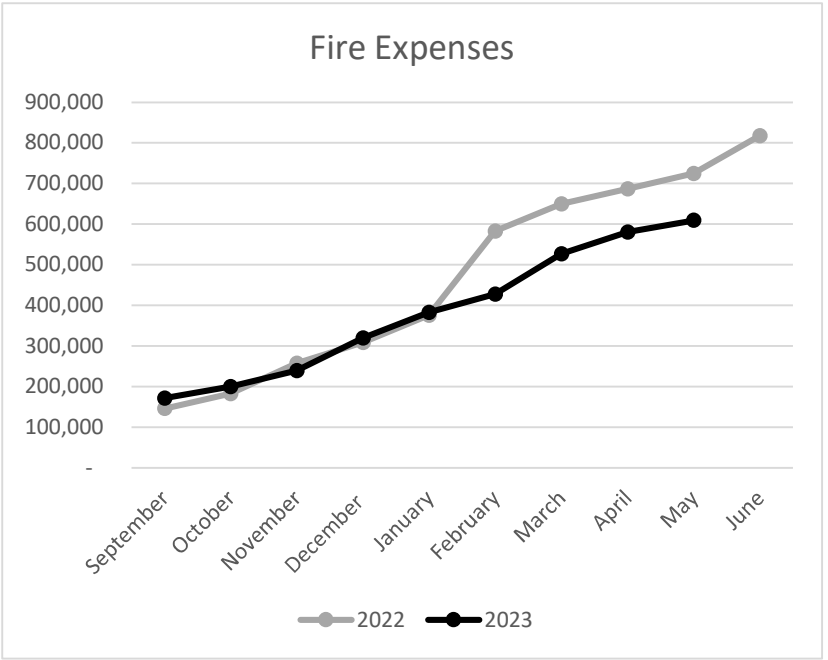
Personal Services	Original Appropriation	Transfers/ Adjustments	Revised Budget	YTD Expended	Encumbrances	Available Balance	% Expended & Encumbered	% Expended
General Government	7,511,444	27,661	7,539,105	6,295,487	-	1,243,618	83.5%	83.5%
Community Services	1,879,000	-	1,879,000	1,539,197	-	339,803	81.9%	81.9%
Public Facilities	2,592,091	-	2,592,091	2,239,582	-	352,510	86.4%	86.4%
Public Safety - Fire	8,611,698	14,621	8,626,319	7,791,177	14,621	820,521	90.5%	90.3%
Public Safety - Police	8,116,962	-	8,116,962	7,195,536	-	921,426	88.6%	88.6%
Public Works	3,834,283	159,069	3,993,352	3,433,161	-	560,191	86.0%	86.0%
Library	2,307,538	-	2,307,538	1,989,742	-	317,796	86.2%	86.2%
School	77,899,943	(1,300,000)	76,599,943	60,075,441	15,324,426	1,200,076	98.4%	78.4%
Compensation Fund	848,339	-	848,339	-	-	848,339	0.0%	0.0%
Total Personal Services - General Fund	113,601,298	(1,098,649)	112,502,649	90,559,322	15,339,047	6,604,281	94.1%	80.5%
Water Enterprise	2,343,272	-	2,343,272	2,052,246	-	291,027	87.6%	87.6%
Sewer Enterprise	357,873	1,794	359,667	292,062	-	67,605	81.2%	81.2%
Total Personal Services - Enterprise Funds	2,701,145	1,794	2,702,939	2,344,307	-	358,632	86.7%	86.7%

Other Expenses	Original Appropriation	Transfers/ Adjustments	Revised Budget	YTD Expended	Encumbrances	Available Balance	% Expended & Encumbered	% Expended
General Government	2,721,202	277,131	2,998,333	2,514,615	337,844	145,874	95.1%	83.9%
Community Services	610,024	65,776	675,800	398,594	101,090	176,116	73.9%	59.0%
Public Facilities	1,354,850	193,418	1,548,268	1,123,297	319,755	105,215	93.2%	72.6%
Public Safety - Fire	612,050	62,985	675,035	609,436	76,181	(10,581)	101.6%	90.3%
Public Safety - Police	1,018,318	79,609	1,097,927	879,118	175,519	43,289	96.1%	80.1%
Public Works	5,888,050	1,159,660	7,047,710	5,916,559	957,846	173,305	97.5%	84.0%
Library	666,437	37,072	703,509	538,566	60,313	104,630	85.1%	76.6%
School	17,226,948	2,876,330	20,103,278	14,927,396	3,307,612	1,868,270	90.7%	74.3%
Technical Schools	1,274,000	-	1,274,000	1,199,085	-	74,915	94.1%	94.1%
Debt Service	23,333,890	-	23,333,890	20,919,567	-	2,414,323	89.7%	89.7%
Insurance	1,164,000	6,313	1,170,313	1,154,432	8,897	6,984	99.4%	98.6%
Health Insurance	23,034,797	-	23,034,797	13,994,262	-	9,040,535	60.8%	60.8%
Unemployment	164,000	-	164,000	134,969	-	29,031	82.3%	82.3%
Retirement	6,253,955	-	6,253,955	6,253,956	-	(1)	100.0%	100.0%
Reserve Fund	200,000	(34,800)	165,200	-	-	165,200	0.0%	0.0%
OPEB Appropriation	1,753,413	-	1,753,413	1,753,413	-	-	100.0%	100.0%
Total Other Expenses - General Fund	87,275,934	4,723,494	91,999,428	72,317,265	5,345,056	14,337,106	84.4%	78.6%
Water Enterprise	7,727,574	1,097,243	8,824,817	7,551,202	1,243,621	29,994	99.7%	85.6%
Sewer Enterprise	4,580,540	621,368	5,201,908	4,465,399	234,505	502,004	90.3%	85.8%
Total Other Expenses - Enterprise Funds	12,308,114	1,718,612	14,026,726	12,016,601	1,478,127	531,998	96.2%	85.7%
Total - General Fund	200,877,232	3,624,845	204,502,077	162,876,586	20,684,103	20,941,387	89.8%	79.6%
Total - Enterprise Funds	15,009,259	1,720,406	16,729,665	14,360,908	1,478,127	890,630	94.7%	85.8%

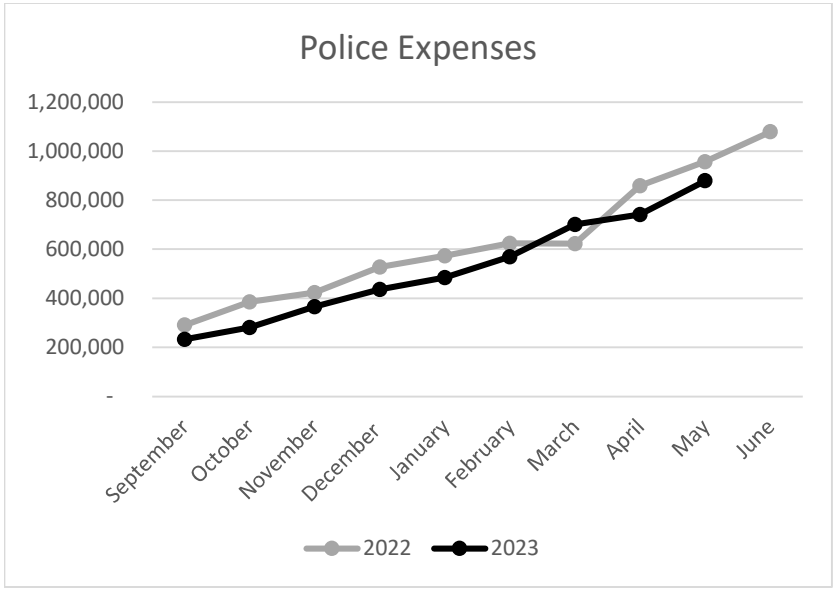


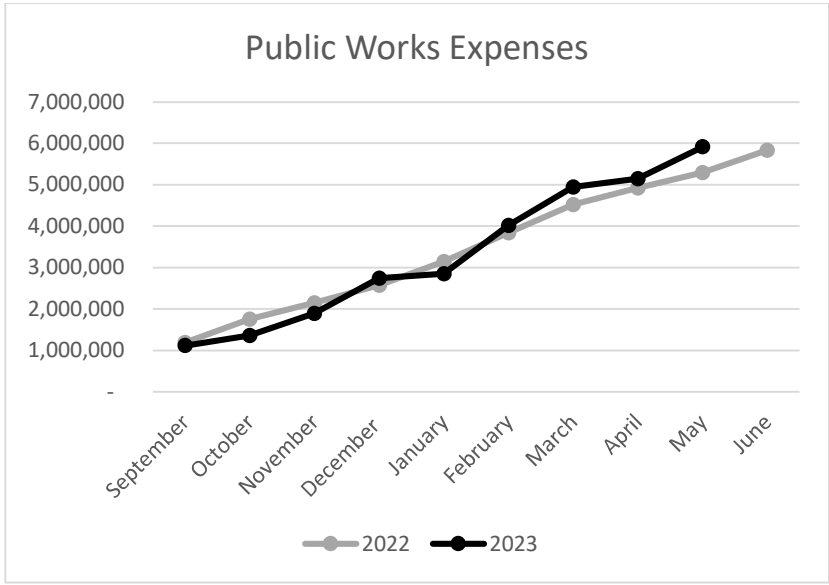


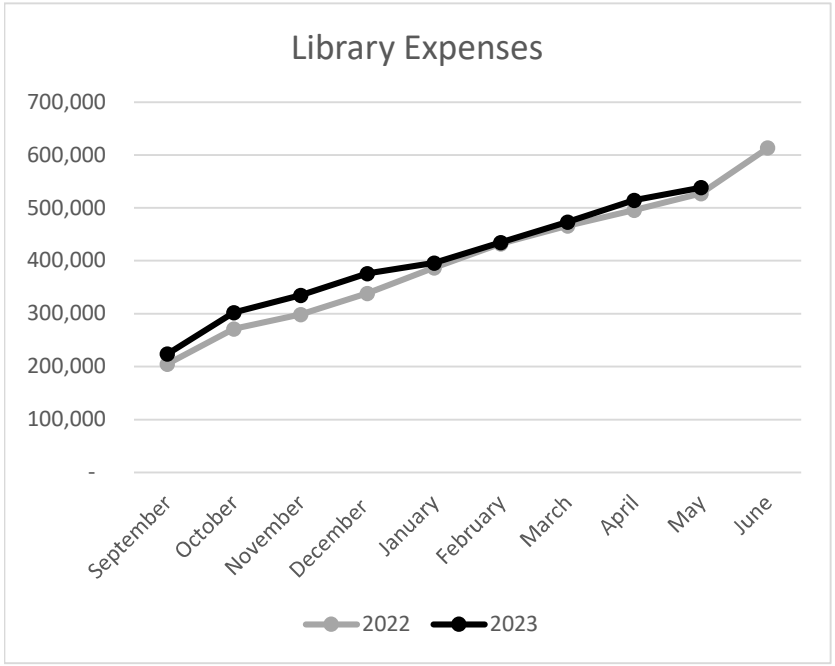


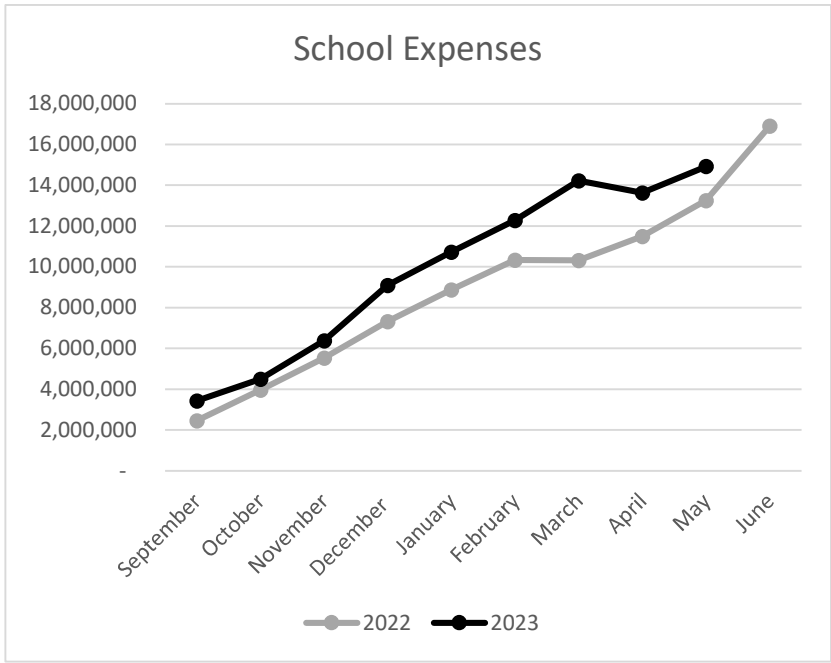


*Expenses vary from year to year due to timing and departmental needs, but can still be on budget.









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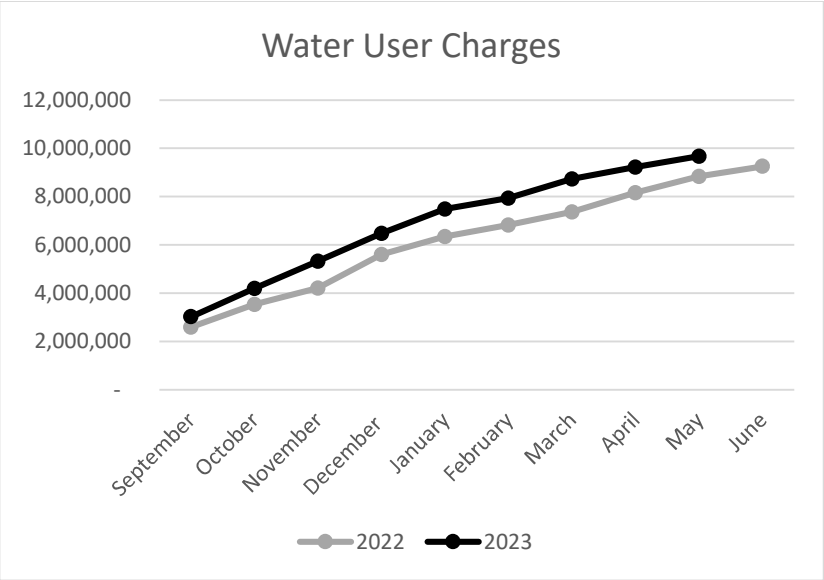

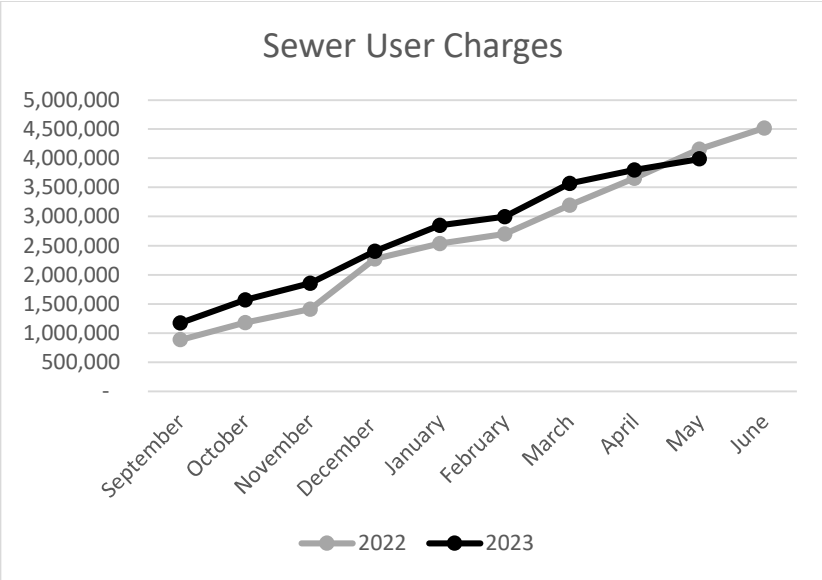

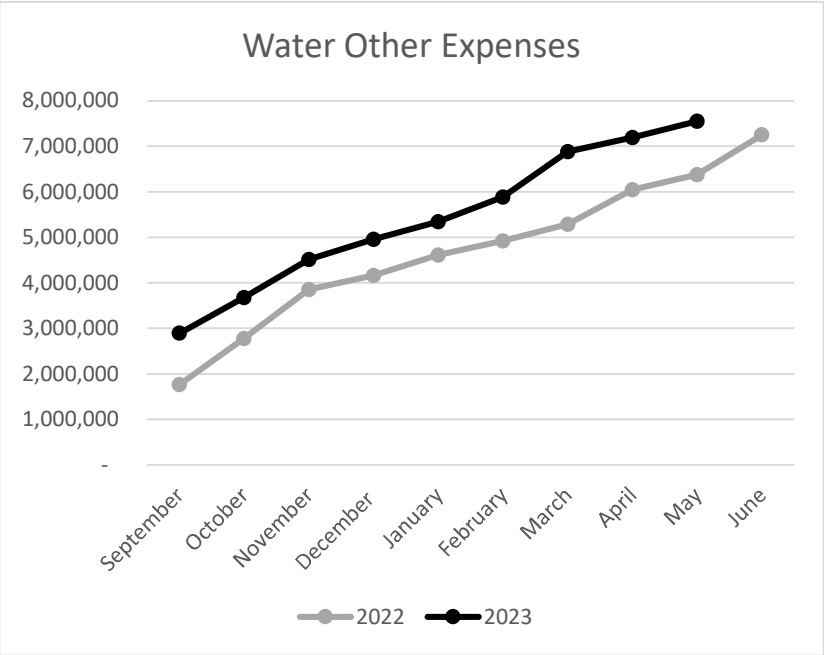

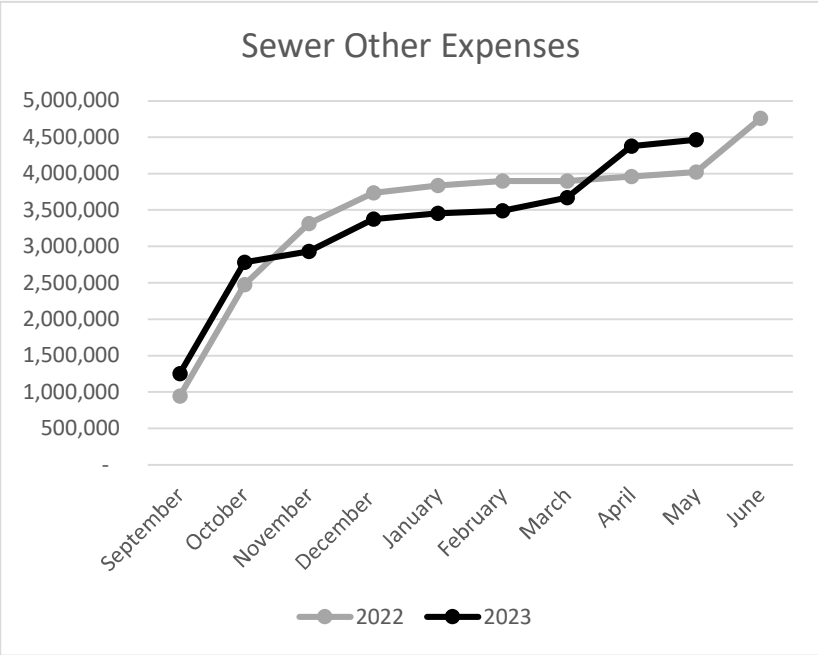

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Town of Andover

FY 2023 Reserve Account and Compensation Fund

As of 5/31/23

RESERVE FUND

Appropriation by Vote of Town Meeting June 2022	$	200,000.00
Transfers by Vote of Town Meeting		0.00
Transfers by Authority of the Finance Committee		
Replacement of three boiler sections at West Elementary		(34,800.00)
Available Balance	$	165,200.00

COMPENSATION FUND

Appropriation by Vote of Town Meeting June 2022	$	848,339.00
Transfers by Vote of Town Meeting		0.00
Transfer by Authority of the Select Board		0.00
Available Balance	$	848,339.00

Town of Andover

FY 2023 Revolving Accounts

(M.G.L. CH. 44, § 53 E1/2)

As of 5/31/23

	CD & P Legal Notices	Library Lost/Damaged Materials	CD & P Health Services Clinics	Recreation Special Services	Youth Services	Facilities Field Maintenance	Elder Services	Police Antenna Uses	School Photocopy Fees	Facilities Compost Program	DPW Solid Waste Fees	CD & P Stormwater Management	Fire Emergency Billing	Health Services Inspections	School Professional Development	Student Technology Rental
	Acct 5550	Acct 5631	Acct 5557	Acct 5552	Acct 5553	Acct 5622	Acct 5554	Acct 5653	Acct 4510	Acct 5666	Acct 5667	Acct 5668	Acct 5669	Acct 5670	Acct 4500	Acct 4260
Balance thru 6/30/2021	21,250	14,507	-688	397,353	329,733	108,905	133,721	46,715	29,218	14,497	76,288	0	681	119,994	3,279	13,176
Receipts thru 6/30/2022	29,730	4,119	44,490	1,866,865	156,582	77,050	83,795	6,930	12,638	26,010	29,665	0	0	57,435	0	53,950
Expenditures thru 6/30/2022	26,692	541	29,882	1,223,055	144,976	30,352	75,530	0	0	4,174	16,550	0	0	27,363	0	20,624
Balance thru 6/30/2022	24,288	18,086	13,920	1,041,162	341,339	155,602	141,987	53,645	41,855	36,333	89,403	0	681	150,066	3,279	46,503
Receipts thru 5/31/2023	27,405	3,498	68,095	1,724,147	266,123	74,129	116,576	5,247	6,836	24,486	22,162	0	0	61,090	0	3,775
Expenditures thru 5/31/2023	18,480	3,038	33,125	1,266,763	144,910	22,527	71,730	0	0	31,434	22,308	0	0	14,525	95	29,624
Balance thru 5/31/2023	33,212	18,545	48,890	1,498,547	462,553	207,204	186,832	58,892	48,692	29,386	89,257	0	681	196,631	3,184	20,654
Spending Authorization	$20,000	$20,000	$60,000	$1,750,000 *	$400,000	$150,000	$225,000	$50,000	$10,000	$60,000	$40,000	$5,000	$100,000	$100,000	$50,000	$200,000
Y-T-D % Spent	92.40%	15.19%	55.21%	72.39%	36.23%	15.02%	31.88%	0.00%	0.00%	52.39%	55.77%	0.00%	0.00%	14.53%	0.19%	14.81%

* Spending limit increased from $1,000,000 to $1,750,000 with Select Board and Finance Committee approval

Town of Andover
Capital Projects
5/31/2023

		FY17	FY18	FY19	FY20	FY21	FY22	FY23	Total Available
	Budget	1,120,000	1,495,643	1,040,000	1,011,600	1,150,000	1,185,000	1,271,500	
	Expended	1,120,000	1,495,643	1,040,000	993,163	1,056,189	1,048,582	675,875	
	Encumbered	-	-	-	8,733	19,899	54,433	122,685	
Total School CIP	Available	-	-	-	9,704	73,911	81,985	472,940	638,540
	Budget	222,000	579,018	487,000	1,044,098	902,108	137,000	150,000	
	Expended	192,000	555,672	406,836	814,495	802,108	95,275	6,920	
	Encumbered	-	9,300	34,429	23,106	-	8,201	5,810	
Total General Government CIP	Available	30,000	14,046	45,736	206,497	100,000	33,525	137,271	567,075
	Budget	-	32,214	-	-	-	-	-	
	Expended	-	32,214	-	-	-	-	-	
	Encumbered	-	-	-	-	-	-	-	
Total Youth Services CIP	Available	-	-	-	-	-	-	-	-
	Budget	50,000	-	-	-	-	-	-	
	Expended	50,000	-	-	-	-	-	-	
	Encumbered	-	-	-	-	-	-	-	
Total Recreation CIP	Available	-	-	-	-	-	-	-	-
	Budget	25,000	-	-	10,000	50,000	-	-	
	Expended	25,000	-	-	10,000	15,000	-	-	
	Encumbered	-	-	-	-	-	-	-	
Total Library CIP	Available	-	-	-	-	35,000	-	-	35,000
	Budget	623,000	800,000	946,000	1,303,000	468,000	1,180,000	1,165,000	
	Expended	623,000	781,647	942,523	1,298,765	367,280	686,495	126,359	
	Encumbered	-	18,348	-	460	48,248	249,278	161,631	
Total Facilities CIP	Available	-	5	3,477	3,775	52,472	244,227	877,010	1,180,966
	Budget	195,000	293,500	250,077	195,000.00	195,000.00	255,000	-	
	Expended	195,000	293,500	250,077	195,000.00	179,055.49	116,419	-	
	Encumbered	-	-	-	-	15,945	134,845	-	
Total Police CIP	Available	-	-	-	-	-	3,736	-	3,736
	Budget	20,000	63,500	214,000	-	96,000	88,000	-	
	Expended	20,000	61,353	205,282	-	96,000	77,383	-	
	Encumbered	-	-	-	-	-	-	-	
Total Fire CIP	Available	-	2,147	8,718	-	-	10,617	-	21,482
	Budget	285,000	415,000	328,000	400,000	-	165,000	170,000	
	Expended	275,370	366,154	327,190	399,026	-	20,277	-	
	Encumbered	431	2,713	810	973	-	106,944	-	
Total DPW CIP	Available	9,200	46,132	-	-	-	37,779	170,000	263,112
	Budget	1,420,000	2,183,232	2,225,077	2,952,098	1,711,108	1,825,000	1,485,000	
	Expended	1,380,370	2,090,540	2,131,907	2,717,286	1,459,443	995,848	133,279	
	Encumbered	431	30,362	35,239	24,539	64,193	499,268	167,441	
Total Town CIP	Available	39,200	62,330	57,931	210,273	187,472	329,884	1,184,280	2,071,370
	Budget	2,540,000	3,678,875	3,265,077	3,963,698	2,861,108	3,010,000	2,756,500	
	Expended	2,500,370	3,586,183	3,171,907	3,710,449	2,515,633	2,044,430	809,153	
	Encumbered	431	30,362	35,239	33,272	84,092	553,701	290,126	
Grand Total	Available	39,200	62,330	57,931	219,977	261,383	411,869	1,657,220	2,709,910