



Posted 6.2.2022 at 3:15pm by JAD

**SELECT BOARD  
AGENDA  
Tuesday, June 7, 2022  
7:00pm**

*Rich Maiore, Erin McBee, Kara McGuire Minar, Don Ludwig, Charles Oliver*

**The Select Board Regular Meeting is being held virtually in accordance with legislation S. 2475, an act relative to extending certain COVID-19 measures adopted during the Covid Pandemic state of emergency. Interested individuals can listen in and participate by phone and/or online by following the link and phone # below.**

UpperTH ProWebinar is inviting you to a scheduled Zoom meeting.

Topic: Select Board

Time: Jun 7, 2022 07:00 PM Eastern Time (US and Canada)

Join Zoom Meeting

<https://us02web.zoom.us/j/88432637376?pwd=N0pmSEhnbUhxV1YvazAxb3doRnM5QT09>

Meeting ID: 884 3263 7376

Passcode: 172248

Find your local number: <https://us02web.zoom.us/u/kL155UcU0>

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+19294362866,,12390012# US (New York)

**AGENDA ITEMS**

- 1) Call meeting to order – Vice Chair Rich Maiore
- 2) Board reorganization (7:00)
- 3) Meet with Personnel Board to discuss their recommendation to recognize Juneteenth as a legal holiday, discuss changing Columbus Day to Indigenous Peoples Day & Determine Select Board/Fin Com Reps to Personnel Board (7:10)
- 4) Review Plan Summary prepared by the Harvard Devens Jurisdiction Committee and draft letter to the Executive Office of Housing and Economic Development at Commonwealth of MA (7:30)
- 5) Public Communication (7:45)
- 6) Approve minutes 5/17 (7:50)
- 7) Staff Report/Updates (7:55)
- 8) Harvard Climate Initiative Committee (HCIC) update (8:05)
- 9) Action/Discussion items: (8:25)
  - a) Recognize resignation of Didi Chadran from CPC & MAHT
  - b) Discuss Strategic Planning Session date, summer schedule/continuation of remote/zoom meetings, should the state allow them, past July

*Next Regular Select Board Meeting  
Tuesday, June 21, 2022  
7:00pm*

# Massachusetts Legal Holidays

Holiday	2021	2022	2023
<b>New Year's Day</b> January First	Jan. 1, Fri.	Jan. 1, Sat.	Jan. 1, Sun. (3)
<b>Martin Luther King, Jr. Day</b> Third Monday in January	Jan. 18, Mon.	Jan. 17, Mon.	Jan. 16, Mon.
<b>Washington's Birthday</b> Third Monday in February	Feb. 15, Mon.	Feb. 21, Mon.	Feb. 20, Mon.
<b>Patriots' Day</b> Third Monday in April	Apr. 19, Mon.	Apr. 18, Mon.	Apr. 17, Mon.
<b>Memorial Day</b> Last Monday in May** (1A)	May 31, Mon.** (1A)	May 30, Mon.** (1A)	May 29, Mon.** (1A)
<b>Juneteenth Independence Day</b> June 19th	June 19th, Sat. (3)	June 19th, Sun. (3)	June 19, Mon.
<b>Independence Day</b> July 4th**	July 4, Sun.** (3)	July 4, Mon.**	July 4, Tue. **
<b>Labor Day</b> First Monday in September**	Sept. 6, Mon.**	Sept. 5, Mon.**	Sept. 4, Mon.**
<b>Columbus Day</b> Second Monday in October* (Restrictions until 12 noon) (2)	Oct. 11, Mon.* (2)	Oct. 10, Mon.* (2)	Oct. 9, Mon.* (2)
<b>Veterans' Day</b> November 11th* (Restrictions until 1pm) (2)	Nov. 11, Thu.* (2)	Nov. 11, Fri.* (2)	Nov. 11, Sat.* (2)
<b>Thanksgiving Day</b> Customarily the fourth Thursday in November* (1)	Nov. 25, Thurs.* (1)	Nov. 24, Thurs.* (1)	Nov. 23, Thurs.* (1)
<b>Christmas Day</b> December 25th* (1)	Dec. 25, Sat.* (1)	Dec. 25, Sun.* (1)(3)	Dec. 25, Mon.* (1)

\* - Full restrictions apply for ALL commerce

\*\* - Restrictions apply except to retail

(1) Liquor Stores must be closed for Thanksgiving and Christmas Days.

(1A) Liquor stores may not open prior to 12:00 noon Memorial Day.

(2) Many companies operate all day on these holidays, pending obtaining a local permit.

(3) All holidays falling on Sunday must be observed on Monday, under state law. Saturday holidays are observed on Saturday.

Above is a list of all legal holidays observed in Massachusetts. State, county, and municipal offices are closed on the days listed above. Federal offices are only closed on holidays which the federal government recognizes (i.e. New Year's Day, Martin Luther King, Jr. Day, Washington's Birthday, Memorial Day, Juneteenth Independence Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving, and Christmas). The term "federal holiday" is not applicable to individual states and the private sector since each state has jurisdiction over its holidays.

In Massachusetts certain holidays are subject to laws which restrict the type of work that may be performed as well as the kind of business and commercial activities that may remain open. Only those holidays followed by asterisks (\*) have certain restrictions. On holidays not followed by asterisks, business and commercial activities may operate as usual.

**Please note: Only retail establishments may open during the summer holidays of Memorial Day, Independence Day, and Labor Day.** Some businesses may be required to pay premium pay on some holidays. Please contact the Attorney General's Fair Labor Division at 617-727-3465. The Department of Labor Standards (617-626-6975) oversees the approval of local permits allowing businesses to open on Columbus, Veteran's Days, Thanksgiving and Christmas when they otherwise could not open for some or all hours on those days.

For further information on holiday laws, contact Citizen Information Service:

Secretary of the Commonwealth	Telephone: 617-727-7030
Citizen Information Service	Toll-Free: 1-800-392-6090
One Ashburton Place, Room 1611	TTY: 617-878-3889
Boston, MA 02108-1512	Fax: 617-742-4528
	Email: <a href="mailto:cis@sec.state.ma.us">cis@sec.state.ma.us</a>

	OBSERVED	NOT OBSERVED	Total Holidays	COMMENTS
ACTON	X			
ATHOL	X			
AMHERST	X			
ASHLAND	X		13	for both union & non-union employees
ATTLEBORO	X			
<b>AYER</b>	<b>X</b>			
BARNSTABLE	X			
BLACKSTONE				Negotiations Requested
BEDFORD	X			
BELCHERTOWN	X			
BERNADSTON	X			
BEVERLY	X			
<b>BOLTON</b>	<b>X</b>		13 and 1 half-day floater	
<b>BOXBOROUGH</b>	<b>X</b>			
BRAINTREE				In negotiating year, added as a proposal
BREWSTER	X			
BURLINGTON	X		13	
CAMBRIDGE	X			
CANTON	X			
CHARLTON	X			Floating holiday to be used within 30-days
CHATHAM	X			
CHELMSFORD	X			
CHELSEA	X			
CHICKOPEE	X			
CHILMARK	X			
COHASSET	X			
CONCORD	X			
CONWAY	X			
DALTON	X			
DANVERS	X			
DEERFIELD	X			
DIGHTON	X			
DOVER	X			
DRACUT	X			
DUNSTABLE	X			In addition tio existing holidays
DUXBURY	X			
EAST BRIDGEWATER				It's on the radar and working on options (3/29/2022)
EASTHAMPTON	X			
EAST LONGMEADO	X			
EASTON	X		13	
EGREMONT	X			
FAIRHAVEN	X		13	Also receive a 1/2 day on New Year & Christmas Eve and Good Friday.
FALL RIVER	X			
FOXBOROUGH	X			
FRANKLIN	X			
GARDENER	X			
GREAT BARRINGTO	X			
GREENFIELD	X			

	OBSERVED	NOT OBSERVED	Total Holidays	COMMENTS
GLOUCESTER	X			
HADLEY	X			
HALIFAX	X			
HAMILTON	X			
HANSON	X			
HINGHAM	X			
HOLDEN	X			
HOLYOKE	X			
HOPKINTON	X		13	union and non-union employees
HUDSON				With labor counsel
IPSWICH	X			
KINGSTON	X			
LAKEVILLE	X			
LEICESTER	X			
LEXINGTON	X			
LINCOLN	X		13	
<b>LITTLETON</b>	<b>X</b>		12	
LONGMEADOW		X		
LUDLOW	X			
LYNN	X			
MARION	X			
MANSFIELD	X			
MARSHFIELD	X			
MAYNARD	X			
MEDFIELD	X			Currently bargaining
MEDWAY	X			
METHUEN	X			
MIDDLETON	X			
MILFORD	X			If passes at town meeting in May
MONTEREY	X			
NANTUCKET	X			
NEW BEDFORD	X		15.5	Good Friday, Christmas Eve, and NYE are half days
NEWTON	X			
NORTH ADAMS	X			Only if on a weekday
N ATTLEBORO	X			
NORTHAMPTON	X			
NORTH ANDOVER	X			
NORTHBRIDGE	X			
NORTHFIELD	X			
NORTON	X			
NORWELL	X			
NORWOOD	X		13	
ORANGE	X			
ORLEANS	X			
PAXTON	X			
PERMBROKE	X			
PEPPERELL	X			
PITTSFIELD	X			
PLYMPTON	X			

	OBSERVED	NOT OBSERVED	Total Holidays	COMMENTS
PROVINCETOWN	X			
RANDOLPH	X			
RAYNHAM	X			
READING	X			
REVERE	X			
ROCKWELL	X			
ROWLEY	X			
SALEM	X			
SANDWICH	X			
SEEKONK	X			
SHERBORN	X			
SHREWSBURY	X			
<b>SHIRLEY</b>	<b>X</b>			
SOMERSET	X			
SOUTHBRIDGE	X		13½	Christmas Eve is a ½ day
SOUTH HADLEY	X			
STERLING	X			
STONEHAM	X			
STOUGHTON	X			
STOW	<b>X</b>		12	by local tradition the day after Thanksgiving, and a little extra time at Christmas depending on where the holiday falls.
SUDBURY	X		13	
SWANSEA	X			
TAUNTON	X			
TISBURY	X			
TYNGSBOROUGH	X			
WALPOLE	X			
WARE	X			
WAREHAM	X			
WATERTOWN	X		15	
WELLESLEY	X			
WELLFLEET	X			
W BRIDGEWATER	X			
WESTFORD	X			
WESTMINISTER	X			
WEST NEWBURY	X			
WEST TISBURY	X			
WILBRAHAM	X			
WILLIAMSTOWN	X			
WILMINGTON	X			
YARMOUTH	X			

<b>Community</b>	<b>How are you handling Juneteenth?</b>	Action Taken	Action Not Taken
Abington			
Acton	Observing Juneteenth on June 19th. If Saturday, the previous Friday, if Sunday, the following Monday. Just negotiated in all union contracts.	x	
Acushnet			
Adams			
Agawam			
Alford			
Amesbury			
Amherst	Observing the holiday; this year the Friday before	X	
Andover			
Aquinnah			
Ashburnham			
Ashby			
Ashfield			
Ashland	We are currently planning to recognize this as a state holiday. Need to bargain with unions.	X	
Athol			
Attleboro	Observing the holiday.		
Auburn	Will be bargained in upcoming sessions next year.		X
Avon			
Ayer	Select Board voted to add this holiday and to recognize it as other holidays are recognized.	X	
Barnstable			
Barre			
Becket			
Bedford			
Bellingham			
Belmont			
Berkley			
Berlin			
Beverly	We negotiated it into our contracts	X	
Billerica			
Blackstone	Not offering, but requested in negotiations		X
Boston			
Bourne			
<b>Boxborough</b>	<b>Our Personnel Board is updating our Personnel Plan to include Juneteenth as a holiday. The updates to the plan will be voted at our upcoming Annual Town Meeting. The Personnel Board is also planning on changing the title of Columbus Day to Indigenous Peoples Day.</b>	<b>X</b>	
Boxford			
Boylston			

Braintree	We are in a negotiating year, so we are adding it as a proposal		
<b>Brewster</b>	<b>We were in a negotiating year, so we added it to our paid holidays</b>	<b>X</b>	
Bridgwater			
Brimfield			
Bristol County			
Brockton			
Brookfield			
Brookline			
Buckland			
<b>Burlington</b>	<b>We negotiated it into contracts that didn't include it automatically.</b>	<b>X</b>	
<b>Cambridge</b>	<b>We announced it will be a holiday for non union employees in 2021 (celebrated on Friday 6/18), and as each CBA expires we expect it will be bargained in (already have agreements with 2)</b>	<b>X</b>	
Canton			
Carlisle			
Carver	Negotiated into contracts		
Charlton			
Chatham		X	
Chelmsford	Chelmsford is closing the Library on Saturday. All employees scheduled to work at the Library this day will be paid. All other office buildings are closed anyway. Non-Union employees are given a floating holiday this year to be used by Labor Day. Bargaining group are excluded. As it is a State holiday, next year the holiday will be celebrated on Monday. Chelmsford Town Office Buildings will close.	X	
Chelsea Public Schools			
Chicopee Public Schools	Currently in negotiations, waiting to see if Unions will request it.		X
Chilmark	Observing the holiday; this year the Friday before for 2022. Future TBD		
Cohasset	Since the first two will be on weekends, we are planning activities to highlight diversity, equity and inclusion but no "time off."		X
Conway	Observing the holiday; this year the Friday before. Only for 2021. Future TBD	X	
Dalton	Observing the holiday since last year.	X	
Danvers	Negotiated into all contracts will be begin observing the holiday this year. If the holiday falls on a Saturday or Sunday, we will recognize on a Friday or Monday respectively		
Dartmouth			
Dedham			
Deerfield			
Dennis			
Dighton			X
Douglas			
Dover			

Dracut	We have added Juneteenth to the list of Holidays and will observe this year on Friday 6/18	X	
<b>Duxbury</b>	<b>Board of Selectmen voted to include “Juneteenth Independence Day” as a paid annual holiday for eligible Town employees, beginning this year, subject to the related holiday terms, eligibility and language in our current Personnel Policies and Collective Bargaining Agreements. Expect to have executed Memorandum of Agreements from collective bargaining units by June 4.)</b>	<b>X</b>	
Dracut Water Supply District	Voted at annual meeting to add to our list of paid holidays for employees. Given that it is a Saturday we will observe on Friday.	X	
Dudley			
Dunstable	Observing the holiday. We updated our Personnel Policy to include it last year after it became a state holiday. As it falls on the weekend we'll observe on Monday.		
Duxbury			
East Bridgewater	It's on the radar and working on options. (3/29/2022)		X
East Brookfield			
Eastham			
Easthampton	We will recognize it as a paid holiday June 2022 for non-union employees. We are not doing it this year. Unions have to negotiate it into their contracts.	X	
<b>Easton</b>	<b>Haven't announced anything to employees. Plan to treat as any other state holiday starting this year.</b>	<b>X</b>	
<b>Egremont</b>	<b>Treat as any other Holiday. Union's agreed.</b>	<b>X</b>	
Essex			
Fairhaven			
Fall River	In Fall River we want to possibly do holiday on Friday or Monday.	X	
Falmouth			
Fitchburg			
<b>Foxborough</b>	<b>Library closed Saturday; floating holiday for public safety scheduled on Saturday; Town Hall, COA, Rec are normally open 4 hours Friday and will be closed.</b>		<b>X</b>
Framingham			
Franklin	Will be adding it as a holiday in FY22. We did not bargain this and are drafting a MOU for FY20-FY22 CBA. We are hoping to organize a ceremony or event to celebrate this year, but will not have the actual holiday.	x	
Freetown			
Gardner			
Georgetown			
Gill			
<b>Gloucester</b>	<b>Will be observed on Friday June 18 this year - holiday</b>	<b>X</b>	
Goshen			
Grafton			



Granby	Not in Acton or future plans as of this date.		X
Great Barrington			
Greenfield	We bargained this. Added as a holiday in 2021 for union and non-union	X	
Groton			
Groveland			
<b>Hadley</b>	<b>Unions can propose at the next negotiations. For non-union, Policy Manual says Saturday holidays are observed on Friday. The Town offers one floating holiday for non-union, and it could designate Juneteenth as that floater.</b>		<b>X</b>
<b>Halifax</b>	<b>Halifax has agreed to make it a paid holiday for all union and non union employees</b>		<b>X</b>
Hamilton			
Hanover			
Hanson			
Hardwich			
Hardwick			
Harvard	This is being discussed with the Personnel Board for non-union. Not broached by Police (new contract starts 7/1/22), nor DPW, as of 3/28/22		X
Hingham			
Hinsdale			
Holbrook			
Holden	We are planning to recognize as a state holiday,will need to settle with unions.		x
Holliston			
Holyoke	We negotiated it in the beginning. Now we are giving it to all.		
Hopedale			
<b>Hopkinton</b>	<b>We are adding it to our list of paid holidays for town employees. Given that it is a Saturday we will observe on Friday. Currently working with CBAs.</b>	<b>X</b>	
Hubbardston			
Hudson	With Labor Counsel		X
Human Resources Services, Inc.			
Huntington			
Ipswich	observing it the Friday before, but going forward will be negotiated	X	
Kingston			
Lancaster			
Lakeville	Observed on the Friday before.		
Lee			
Leicester	The Select Board will be discussing adding this as a holiday at their April 19th, meeting		
Leverett			

Lexington	We have negotiated Juneteenth into one contract so far and anticipate that this will be requested by all unions over the next few months.	X	
Lincoln	Recognized retroactively in 2021 once it became federal, on calendar in 2022	X	
Littleton			
Longmeadow	No plans in Longmeadow, will most likely come up in negotiations.		X
Lowell			
Ludlow	As of April 20th the town has not yet decided how it will handle. Will update at a later date.		X
Lunenburg			
<b>Lynn</b>	<b>We are extending the Juneteenth holiday to all of our employees. Most of our unions have generic language honoring federal and state holidays while a couple of others have them specified. We'll formally address the inclusion with those bargaining units during negotiations later this year.</b>	<b>X</b>	
Lynnfield			
Malden			
Manchester-by-the-Sea			
<b>Mansfield</b>	<b>This is a state holiday and we are currently bargaining.</b>	<b>X</b>	
Marblborough			
Marblehead			
Marshfield	<b>Paid holiday will be observed Monday 6/20</b>		
Mashpee			
MassDevelopment-Devens			
Mattapoisett			
Maynard			
Medford			
<b>Medway</b>	<b>It is being treated as a state holiday and observed as such (day off)</b>	<b>X</b>	
Melrose			
Mendon			
Merrimac			
Methuen	We gave everyone Juneteenth even before we finalized our CBAs.		
<b>Middleton</b>	<b>Town Counsel has advised us that buildings will need to be closed and that we are responsible for paying employees for the holiday. We will enter into negotiations with unions as we are not legally required to pay double time or time and a half for those people working the holiday, so we will not just automatically add this to the holiday list for public safety.</b>	<b>X</b>	

Milford	<b>This request is showing up in all of our negotiations; we have agreed to the holiday being incorporated into the calendar if it passes Town Meeting in May!</b>		X
Millbury			
Millis			
Monson			
Montague			
Monterey	Accepted as a holiday	x	
Nahant			
Nantucket	We have received union proposals to recognize holiday. We also have some CBA's that automatically recognize a new State holiday. Our opinion is that it is an across the board acceptance of the holiday, but the details of how that is communicated and rolled out are not yet finalized. We are also measuring budget impact for FY21 for departments with employees who work holidays.	X	
Natick			
Needham			
New Bedford	We have added the holiday to the contracts and honor it equitably across all groups.	x	
New Marlborough			
Newbury			
<b>Newton</b>	<b>We have updated our City ordinances to include this holiday. If it falls on a Saturday, we will recognize it on a Friday, if it falls on a Sunday, we will recognize it on a Monday. Our non public safety staff will receive the paid day off and we will close city buildings. Our public safety staff (police, fire, dispatch) will receive an additional paid holiday. We did not bargain, we felt the holiday was too important to ask for something in return. We just granted it and asked our unions to acknowledge. They all did of course.</b>	X	
Norfolk			
Norfolk	Will close transfer station and library on June 19th. In negotiations for the future practice.		
North Adams	Since signing by governor- we will observe the Saturday Holiday on Friday in 2021		X
North Andover	We are currently negotiating with several groups. We expect that all will be given the holiday to be equitable across the Town.	X	
North Attleborough			
North Reading	The only Union that has asked for it to be a paid holiday (as of 3/8/21) has been the firefighters and we are still in negotiations regarding a number of other issues. NOTE: While the Sec State website has it as a holiday (and a Mon. holiday in 2023), the Law itself states, in part, that the Juneteenth Independence Day is, "to be observed on the Sunday that is closest to June 19th of each year".		X

Northampton	We are currently negotiating this as a new paid Holiday and planning to add it to our Holiday list this year, observed on Mon 6/20	X	
Northborough			
Northbridge	All union contracts say that if the State adopts a new Holiday then they get it. We added the Holiday to our non-union schedule as well		X
Northfield	Selectboard added it to list of Holidays. We have Personnel Policy on how to handle Saturday or Sunday Holiday observance. If it falls on a weekend day they work (i.e. Library) they will take it another day.	X	
Norton			
Norwell			
Norwood	4 of our contracts include language that says "and any other holiday declared by the governor." We will give Juneenth to those 4 groups and most likely non-unit employees	X	
Oak Bluffs			
<b>Orange</b>	<b>We did not negotiate it in this years CBA, we are paying everyone for this year and open negotiations next year.</b>		<b>X</b>
Orleans	2 of our union contracts get it automatically. We plan to bargain with the rest. The SB is going to take an official vote to close this year.	X	
Otis			
Oxford			
Palmer			
Paxton			
Peabody			
Pelham			
Pembroke			
<b>Pepperell</b>	<b>We have added it to our list of paid holidays for town employees. Given that it is a Saturday next year we will observe on Friday. Will work with CBAs in 2021.</b>	<b>X</b>	
Petersham			
Phillipston	Library Trustees may decide to close Saturday. No other office closures.		X
<b>Pittsfield</b>	We intend to treat this as the other holidays currently accepted under our personnel ordinance and CBAs. If the holiday falls on a weekend, it will be recognized on a friday or a monday. <b>Update 3.29.2022: will be incorporating the holiday in CBAs and was incorporated into City ordinance last year.</b>	<b>X</b>	
Plainville			
Plymouth			
Plympton	We observe it as all other paid holidays. If it's on a weekend, recognized Friday or Monday.		
Princeton			
Provincetown	In Union Negotiations now, have proposed to add it to the holiday schedule. If it falls on a weekend, it will be recognized on a Friday or Monday.	X	
Quincy			

<b>Randolph</b>	Has been negotiated into SEIU, Patrol, & Police Supervisors. Have not reached agreement with Fire at this time.		
<b>Raynham</b>	Union Contract now states if a holiday falls on a weekend, it will be recognized on a Friday or Monday. Labor Counsel gave opinion that it should be recognized this year (June 2021) because it falls on a Saturday and it is a state holiday.	X	
Reading	Reading Town Hall is already closed on Fridays - plan to address for the future		
Revere	We are negotiating this with the unions right now.		X
Richmond			
Rochester			
Rockland			
Rockport			
Rowley			
Rutland			
Salem			
Salisbury			
Sandisfield			
Sandwich	Sandwich will be giving June 18th off as a holiday to all employees. We will negotiate next time CBA's expire.	X	
Saugus			
Scituate			
Seekonk	Two unions have negotiated it, two have an automatic adoption clause, and we have three individual contract employees that have added it. We're just working in the language as negotiations come up.	X	
Sharon	Not in Sharon or future plans as of this date.		X
Sherborn			
Shirley			
<b>Shrewsbury</b>	<b>In 2021 Town Meeting voted to observe Juneteenth on June 19th yearly as a paid holiday. In accordance with all holiday observances, because it falls on a Sunday in 2022 it will be observed Monday.</b>	X	
Shutesbury			
Somerset			
<b>South Hadley</b>	<b>We have added it to our list of paid holidays for town employees. Given that it is a Saturday next year we will observe on Friday.</b>	X	
Southborough			
<b>Southbridge</b>	<b>We have added it to our annual holiday schedule. As per our Personnel regs, if it falls on a Saturday, we will observe it on Friday and will observe it on Monday if it falls on a Sunday.</b>	X	
Southwick			
Spencer			
Springfield			
Sterling			
Stockbridge			

Stoneham	It has been added to our list of paid holidays for Town Employees in 2021 and is being added to contracts as they come up in negotiations.	X'	
<b>Stow</b>	<b>It has been added to our list of paid holidays for town employees beginning in 2021. Given that it is a Saturday, we will observe on Friday.</b>	<b>X</b>	
Sturbridge			
Sudbury	We have recognized this as a state holiday for non-union employees. Our CBA's expire this year and we expect the unions to ask for it.	X	
Sunderland			
Sutton			
Swampscott			
Swansea	The Town of Halifax has now agreed to make it a paid holiday for all employees	X	
Taunton	we have verbage in our contracts so will be accepting it since state holiday	x	
Templeton			
Tewksbury			
Tisbury	we have verbage in our contracts so will be accepting it since state holiday	X	
Topsfield			
Towson			
Truro			
Tyngsborough			
Upton			
Uxbridge			
Wakefield			
Wales			
Waltham			
Walpole	Adding to Personnel Bylaw for non-union employees; some bargaining groups have language indicating recognizing holidays when new state holidays are added; negotiating with others	X	
Ware	negotiating now with the unions		X
Wareham	All our union contracts have language recognizing all State holidays as paid time off. No need to bargain.	X	
Washington			
<b>Watertown</b>	<b>Negotiated with the unions for paid holiday. did an MOA last year with the unions for paid Juneteenth. The regular non union employees get the same holidays as the Town Hall Associates/SEIU888.</b>	<b>X</b>	
Wayland	We are seeing a request for the holiday. So far we are not adding it to our list.		X
Webster			
Wellesley			
Wenham			
West Boylston			

<b>West Bridgewater</b>	<b>Providing June 19 as a paid holiday to all employees (union or non-union), in alignment with HRD's Red Book, which now recognized June 19th as a holiday for state employees.</b>	<b>X</b>	
West Brookfield			
West Newbury	Juneteenth was added to the Personnel Policy as an official holiday starting in calendar year 2022		
West Springfield	Only one union has made a request to add it to their list of paid holidays in bargaining. We may not make a decision until next year on whether we will do that. For 2021, we will observe by closing the public buildings but since it is on a Saturday it should only affect the library.		X
West Stockbridge			
West Tisbury	Its an official Massachusetts holidays on the Sec of States list of official holidays. We have a warrant article on the annual town meeting warrant to add it to the list.	X	
Westborough	At this point we have not adopted the holiday		X
Westfield			
Westford	Looking into		X
Westminister			
Weston			
Westport			
Westwood	We did not adopt this in FY21. Currently negotiating this for FY22 and beyond		X
Weymouth			
Wilbraham	Negotiating with our unions with contracts that spell out individual holidays. We will change personnel policy for non-union employees after we are done negotiating with our unions.		
Williamstown			
Wilmington			
Winchendon			
Winchester	we have all of our contracts up in June so it worked that we incorporated Juneteenth into our negotiations		X
Winchester Public Schools			
Winthrop			
Woburn	We have included it in our negotiations.		x
<b>Worcester</b>	<b>We are waiting for additional guidance. Juneteenth is a holiday but is it just on Sunday as the law states or is it supposed to be granted to non represented unions on Monday? Also, if it is determined to be recognized Sunday or Monday, the unions will need to negotiate.</b>		<b>X</b>
Worthington			
Wrentham			
Yarmouth			

# Harvard-Devens Jurisdiction Committee

## Plan Summary

Version: 04/07/2022

### Background

Passage of Ballot Question #4 at the 2017 Town Elections directed the Select Board to “begin planning for and initiate discussions with appropriate parties with the goal of presenting a plan to the Town of Harvard voters to resume jurisdiction over the land presently part of Devens formerly under the jurisdiction of the Town of Harvard...”

The Harvard-Devens Jurisdiction Committee (HDJC) was subsequently formed by the Select Board in February 2018 and charged with developing the plan. This “Plan Summary” is intended to provide an *overview* of the major elements to be addressed in a comprehensive plan for Harvard’s resumption of jurisdiction of its historical lands within Devens.

In 2019, MassDevelopment, the quasi-public state agency that manages Devens, aided in the formation of the Devens Jurisdiction Framework Committee (DJFC) which is composed of representatives from Ayer, Harvard, and Shirley, MassDevelopment, the Devens Enterprise Commission, and Devens residents and businesses. The task of the DJFC is to coordinate the efforts of the Devens stakeholders in determining local municipal governance of Devens and to submit a recommendation to the Governor and Legislature, as required by Chapter 498 of the Acts of 1993.

The DJFC’s task is similar to that of the HDJC but is broader in scope. It can consider a range of options for the future governance of Devens, such as the creation of Devens as a standalone town, for example.

### Consultant Services

The HDJC has taken the position that MassDevelopment should fund the cost of the consultant services required to develop a complete plan for Devens future governance. Funding for consultant services is seen as an appropriate and required expense of the Devens redevelopment project.

### HDJC Plan Summary

The essence of the HDJC plan is that Devens will be returned to Harvard and by extension to each of the other two towns from which it was assembled by the Army in 1917. This plan is explained below.

Residential Community – Devens residents have previously requested that their residential community be kept together and not be split up among separate towns. An element of Harvard’s “resumption of its historical lands” plan is that the entire residential community of Devens will become part of Harvard. This will add all 282 homes authorized under the Reuse Plan to Harvard.



# Harvard-Devens Jurisdiction Committee

## Plan Summary

Version: 04/07/2022

Boundary Changes – The historical boundary will be changed to include the approximately 40 housing units on Bates and Autumn Streets, now part of the Town of Ayer, thus keeping the Devens residential community together.

Municipal Services – Harvard will be responsible for providing all municipal services, including education (which Harvard now provides by contract with MassDevelopment). This can be accomplished by a variety of means:

- Expanding existing staff, facilities and equipment where needed within existing Harvard departments;
- Contracting with third parties for services; or
- Regionalizing specific services with other communities.

Utilities - Obtain legislative approval for the creation of a Devens “super” municipal utility which will be managed by an independent commission for the benefit of ratepayers. This retains the present organization and operation of Devens utilities for providing electric, gas, water, and for servicing wastewater, and additionally, storm water services.

A local utility commission, appointed for staggered long terms would replace the MassDevelopment Board. This proposal changes the management structure but would not change the geographic area currently served by Devens utilities. Legislation must include provision for adequate initial capital for infrastructure maintenance and rate stabilization.

Unified Permitting – There will be no change except that members of the Devens Enterprise Commission will be locally appointed as terms of current commissioners expire, rather than being appointed by the Governor.

Zoning/Reuse Plan - No changes are contemplated at this time, although the rezoning of Vicksburg Square for residential development may be sought by MassDevelopment. The HDJC advocates agreement on future governance before Vicksburg Square is rezoned to allow up to 300 additional housing units.

Public Lands – MassDevelopment should transfer ownership and operation of Mirror Lake as a public facility to the state Department of Conservation and Recreation. Future ownership and management of other open space areas now owned by MassDevelopment must be resolved. Entities holding conservation restrictions or other interests in open space must be consulted.

# Harvard-Devens Jurisdiction Committee

## Plan Summary

Version: 04/07/2022

Connectivity, Traffic and Transportation – Consider a limited re-opening of Old Mill Road to Patton Road. This access would be gated and available only for pedestrians, bikes, and emergency vehicles. Also, consider adding another access road (perhaps reconnecting Depot Rd with Salerno Circle) which would exclude trucks by design.

Environmental – Maintain existing agreements with US Army, EPA and the Massachusetts Department of Environmental Protection to ensure the high-level protections are maintained. Harvard must have status as a party of interest in these agreements.

Taxation and Municipal Finance – The HDJC believes that a thorough understanding of the impact on local taxes and municipal finance is critical to any discussion of Harvard resuming jurisdiction over its former lands at Devens. This applies equally to both Harvard and Devens.

Tasks to be considered include:

- Develop combined operating and capital budgets, including potential long term debt schedules.
- Merge Harvard and Devens property assessments.
- Develop projected tax rates assuming residential/commercial-industrial split rates.
- Analyze impact of split tax rate (residential vs. commercial/industrial) on Harvard's existing tax base.
- Review projected life of major capital investments (utilities, roads and equipment).
- Develop potential future capital obligations.

In short, a thorough analysis by consultants with municipal finance experience is required.

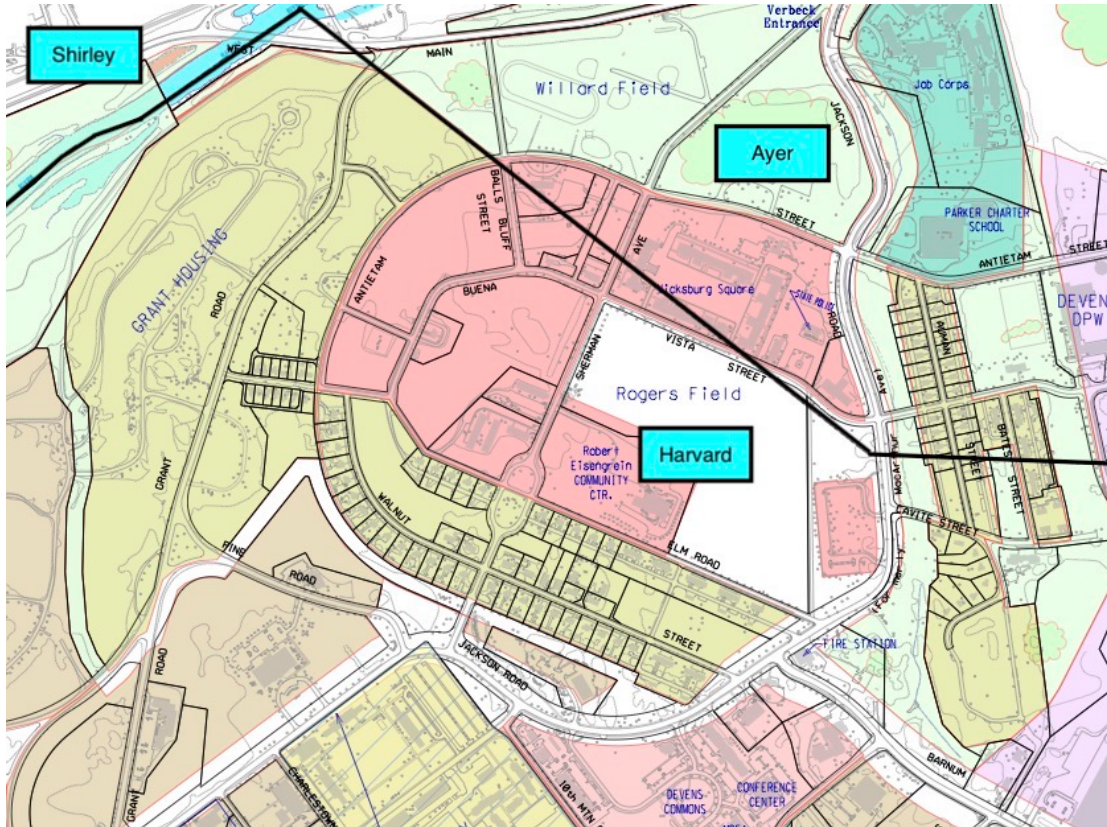
### In Conclusion

While this summary plan represents a future vision for a combined Devens-Harvard community, many details still need to be addressed; there will be questions raised, and various options presented. The current efforts of the larger Devens Jurisdiction Framework Committee (DJFC) are progressing slowly and it will likely take years for the DJFC to reach a consensus. This summary provides a basis for citizen engagement within Harvard as well as the larger Devens community.



# Harvard-Devens Jurisdiction Committee Plan Summary Version: 04/07/2022

## Appendix B. Devens Housing Areas



Devens housing areas, shown in yellow, are along Grant Road, Walnut Street, Elm Road, Cavite Street, Bates Street, and Auman Street. Bates and Auman Street straddle the Harvard-Ayer town boundary.

The yellow area at the bottom of the image is a portion of the U.S. Army Fort Devens compound and is not used for civilian purposes.

Dear Chairman Kennealy:

It is with surprise and regret that the Select Board in Harvard was informed that MassDevelopment was withdrawing its participation from the Devens Jurisdiction Framework Committee (DJFC). For more than two years the members of this committee have invested a great deal of time and effort planning for the future of permanent government at Devens.

I am writing to you because senior management at MassDevelopment has been unresponsive to the Harvard Select Board on matters relating to Devens. A letter to Mr. Rivera sent in May of last year has gone unanswered and other requests by the Town of Harvard from its staff and appointed volunteers on the matter of funding for the DJFC have been ignored, as have requests for engagement over the future of Vicksburg Square in the heart of Devens.

Despite the legislative requirement that MassDevelopment engage with all parties to the Devens Reuse Plan in planning for permanent government at Devens, your senior staff has now concluded on its own that such engagement should not begin until 2030, mistakenly interpreting the “not later than” language as a starting point rather than a deadline.

I have been informed that MassDevelopment will not provide any funding for this planning effort in its next Devens operating budget. Previously, MassDevelopment had made it a requirement that the three host communities of Ayer, Harvard and Shirley participate in this cost. These funding decisions appear to be a clear affront to the Towns. The Devens project presently holds over \$100 million in net assets, more than half of that in cash, on its balance sheet. Those funds belong to the Devens project which by many measures is coming to an end.

MassDevelopment has done a superior job implementing the Devens Reuse Plan as it was envisioned by the three towns and the Commonwealth. As the designated redevelopment authority for Devens it has coordinated the successful environmental cleanup efforts of the Army, MassDEP, and the EPA; replaced the neglected utility infrastructure completely, redesigned and built new roadways, demolished or repurposed abandoned buildings, and most importantly replaced all of the jobs lost when the military realigned away from Devens with a broad spectrum of mostly higher skilled jobs. It would be unfortunate to have its accomplishments diminished as it begins to exit the stage.

In addition to its role as a redevelopment authority, MassDevelopment was given the role as the interim government at Devens. As its redevelopment tasks diminish, its function as the local government has increased. As the residential portion of the Reuse Plan has been carried out and more residents arrive, the need to know what permanent government will look like and when the residents will become fully enfranchised, takes on greater importance. While MassDevelopment’s stewardship of Devens has been noteworthy, nonetheless, Devens residents have a right to fully participate in self government.



Finally, it needs to be made clear that bringing about the end of MassDevelopment's role as the interim government does not mean that its responsibilities to complete the work of the Reuse Plan has also ended. Once its role as the interim government ends, MassDevelopment will continue to operate at Devens just as it does in every other community where it has projects.

By participating in the Devens Jurisdiction Framework Committee, MassDevelopment brings almost 30 years of experience and important professional expertise to the effort. By fully funding the same level of outside consultant services in community development and municipal finance as was committed to the crafting of the Devens Reuse Plan in 1991, the complete success of the project can be assured.

Your action to bring about the full engagement both professionally and financially will be greatly appreciated.

Sincerely,

# Presentation to Select Board – May 17, 2022



Harvard Climate Initiative Committee and Harvard Energy Advisory Committee

# Presentation to Select Board, May 17, 2022

- ❖ HCIC Climate Action Plan Development
- ❖ HEAC Municipal Decarbonization Plan
- ❖ HCIC Education and Outreach
- ❖ Next Steps/Select Board Support



# **HCIC Climate Action Plan: Development Status**

# Climate Action Plan (CAP) History and Goals

## ❖ Plan Development under CRWG

- Agricultural Climate Action Plan
- Apple Country Report
- Draft Outline of CAP, materials from other towns

## ❖ HCIC

- Focus on implementable, achievable, measurable thus managing number of goals and actions
- In synch with Master Plan

# Guiding Principles for Plan Development

## ❖ 6 Focus Areas will have:

- A lead board or committee
- A liaison from HCIC
- Additional committees in partnership

## ❖ Approach

- For each focus area:
  - Develop 1<sup>st</sup> draft of goals and actions with lead committee
  - Meet with additional stakeholder committees to review and collect feedback
  - Based on feedback, develop 2<sup>nd</sup> draft of goals and actions
  - Potential future (but unprioritized) actions should be documented for later consideration
- Share with Select Board for feedback and guidance
- Socialize 2<sup>nd</sup> draft of CAP with town community for citizen feedback
- Build out rest of CAP: initial metrics, background, comprehensive problem statement (climate is not just about decarbonization)

## Collaboration Partners for each Focus Area

	HCIC Liaisons	Lead Committees	Stakeholder Committees	
Energy	Ellen Brian	HEAC	Permanent Bldg Bldg Commissioner Finance	
Buildings	Ellen Brian	HEAC Schools	Planning Board Permanent Bldg Bldg Commissioner Finance	
Transportation	Jefferson	Transportation	HEAC Planning Agriculture School	DPW Public Safety Town Admin CoA
Natural Resources	Jefferson Lucy Jaye Adam	ConCom Planning Board	HCT Pond Open Space DPW	Agriculture CPC Park and Rec Elm
Agriculture	Christiane	Agriculture	HCT ConCom	
Preparedness	Sharon Lucy	Public Safety	BoH Emergency CoA	Schools HEAC

## CAP Development Status

	1 <sup>st</sup> Draft	2 <sup>nd</sup> Partner Mtg	2 <sup>nd</sup> Draft
Energy	Done	Done	Done
Buildings	Done	Done	Done
Transportation	In progress, pending work by consultant on Transportation Plan	TBD	TBD
Natural Resources	Done	Prep underway To be scheduled after town mtg	TBD
Agriculture	Done	To be scheduled in May	TBD
Preparedness	In Progress, first draft may be ready by June.	TBD	TBD

## **Buildings – Example Goals/Actions**

### **Municipal Goal: Convert Harvard's municipal buildings from carbon-based fuel combustion to high efficiency electric heating**

- Develop a detailed electrification, upgrade and financial analysis plan of municipal heating systems.
- Adopt the updated Massachusetts Stretch Energy code
- Reduce municipal town waste by reusing and recycling construction, office and school supplies and materials by 10% per year.
- Expand purchasing of recycled office supplies through joint purchasing across all municipal departments.

### **Residential Goal: Replace residential building's fossil fuel consumption with high efficiency electric heating**

- Evaluate and adopt ways to encourage conversions of fossil fuel to efficient electric heating systems, which may include incentives and bylaw changes.
- Educate and assist homeowners to evaluate the costs and benefits of efficient electric heating and cooling systems including available financial incentives.

# HEAC Decarbonization Plan

# Town of Harvard Decarbonization

## ❖ Why Decarbonization?

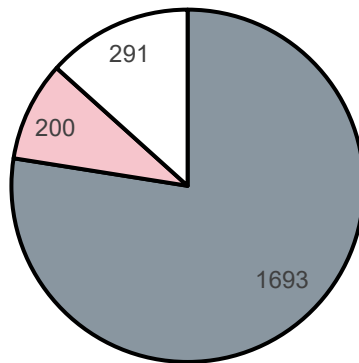
- Align with MA Goals, emissions reductions < 1990 levels: 50% by 2030; 85% by 2050
- Reduce emissions to mitigate the long-term environmental, financial and sustainability impacts

## ❖ Funding

- Awarded DOER grant funds through MRPC in July 2021
- MRPC → John Snell - Town of Harvard Municipal Decarbonization plan by Sep 2022

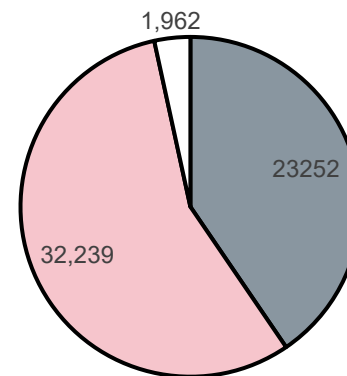
## ❖ Emission Sources (2018 KLA GHG Inventory)

Municipal Emissions MtCO<sub>2</sub>e



■ Buildings ■ Transportation ■ Other

Community Emissions MtCO<sub>2</sub>e



■ Buildings ■ Transportation ■ Other



# Municipal Decarbonization Plan

## ❖ Framework to achieve decarbonization

Reduce emissions 30% by 2030 and 89% by 2050; aligns with MA goals.

- Energy Reduction/Efficiency – Continue long term efforts
- Building Electrification – converting heating systems to electric
- Vehicles – converting to electric; focus on light duty short term
- Vehicles - charging stations
- Energy Source – Add PV Solar Installations
- Energy Source – Renewable Supply

## ❖ Next Steps

1. Finalize Decarbonization plan with stakeholder feedback.
2. Share plan with MRPC, DOER, NGRID
3. Technical and financial analysis/plan – grants to review buildings, vehicles, solar PV
4. Community Outreach

# HCIC Education and Outreach

# HCIC Education and Outreach

❖ Website: [harvardsclimateinitiative.org](https://harvardsclimateinitiative.org)

❖ Harvard Energize

❖ Sendpulse

❖ Events:

- Zoom Presentations – EV, Net Zero Home, Heating and Cooling Systems, Trash
- Earth Day Show and Tell around Town

❖ Grants

- Apple Country
- Application: MVP for Culvert Assessment and Design
- Future MVP Application: Bylaw research

# Request of Select Board

# How to get started with an Environmental Assessment Process?

**The scope of a municipal environmental assessment process might include:**

- ❖ Guidelines and requirements of Boards/Committees/Administration
  - New Construction and Renovation (energy, efficiency, natural environment impacts, lifecycle costs)
  - Purchasing/Procurement (reuse, recycle, useful life)
  - Land Use (e.g. biodiversity, tree and soil protection)
  - Policy (e.g. Bylaw changes)
  - Integrated with town budgeting
  - Included in initial town processes
  
- ❖ Required by Town Charter or Select Board

## Select Board Considerations

- ❖ HCIC and HEAC request assistance from the Select Board and relevant committees to design and implement an environmental assessment process
- ❖ Commitment of staff to support the above work and grant proposals and management
  - Lost funding opportunities if we don't make progress



By Emily Cotter - CBT architects, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=73747292>

**85% Decarbonization by 2050 Plan  
for  
The Town of Harvard's  
Municipal Facilities and Operations – 4<sup>th</sup> Draft  
April 11, 2022**

**Town of Harvard  
Municipal Facilities and Operations Decarbonization Plan  
4th Draft – JS/BS  
April 11, 2022**

Town of Harvard,

Thank you for the opportunity to help develop a path for Harvard to decarbonize its municipal facilities and operations. With financial assistance from the MA Department of Energy Resources (MA DOER), the Montachusett Regional Planning Commission (MRPC) has prepared the following municipal decarbonization plan for the Town of Harvard’s facilities and operations.

The plan was developed by MRPC and its consultant John Snell LLC who are solely responsible for the accuracy of this report. We have worked closely with the Energy Advisory Committee to confirm the information in this report and to shape the timing and scale of potential activities designed to meet the state’s 2030 and 2050 decarbonization goals.

The process that we followed to produce this report included:

1. Prepared a preliminary carbon emission assessment
2. Developed a preliminary set of recommendations and timeline to meet the State’s decarbonization goals
3. Reviewed the draft recommendations and timeline with town staff, management, and committees
4. Prepared a final draft report and providing Harvard with the supporting analysis files for future reference

Contact information:

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(617) 510-4198

Karen Chapman  
[kchapman@mrpc.org](mailto:kchapman@mrpc.org)  
(978) 798-6168



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## Decarbonization Road Map

Harvard's municipal facilities and operations emit about 1,493 mTonsCO<sub>2</sub>e<sup>1</sup> greenhouse gas emissions per year. The three primary sources of carbon emissions that we identified for Harvard's municipal facilities and operations were fuel combustion for heating and domestic hot water (DHW), the town's vehicles, and utility provided non-renewable energy electricity generation. Recommendations to reduce carbon emissions from these sources include:

1. Convert heating and domestic hot water (DHW) systems from fuel to high efficiency electricity
2. Convert town vehicles from internal combustion engines to electric motors
3. Convert all electricity generation from fuel to renewable energy

This approach focusses on fossil fuel replacement with electric equipment. However, converting heavy equipment to electric is not realistic in the near term. Unknown technologies like hydrogen or biodiesel might be better solutions longer term for heavy equipment.

The following sections detail our findings and specific recommendations for these three areas.

Appendices A-G include detailed facility-by-facility and vehicle-by-vehicle carbon emissions, potential energy savings, fuel reductions, conversion costs, electricity use increases, local renewable energy, and carbon offset opportunities.

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<sup>1</sup> Metric tons of carbon dioxide equivalent

<sup>2</sup> We selected FY2019 utility data for the baseline energy conditions because FY2019 was the last full year pre-COVID19.

## Heating and Domestic Hot Water

Harvard has 12 facilities with about 337,648 square feet that burn natural gas, oil, and propane for heat and domestic hot water (DHW). Total energy use for these facilities in fiscal year 2019<sup>2</sup> included:

- Natural Gas – 133,878 therms
- Oil – 3,606 gallons
- Propane – 1,246 gallons

This energy use is equivalent to 14,002 MMBtu<sup>3</sup>. In addition, these facilities consumed about 1,667,351 kWh of electricity which is equivalent to about 5,689 MMBtu<sup>4</sup>.

### *Energy Efficiency Projects*

Energy efficiency investments are the most cost-effective solution to reduce total energy use in Harvard's facilities. Energy efficient buildings are often more comfortable, durable, and healthier to work in than less efficient buildings. In addition, energy efficient buildings use smaller heating systems, require less electricity, and are less susceptible to high energy use and cost spikes caused by extreme weather conditions than less efficient buildings.

A reasonable energy performance target for new construction is about 25 kBtu<sup>5</sup> per square foot for all energy use including electricity. This metric is termed energy use intensity (EUI) standard. We used this value to identify potential energy efficiency opportunities for buildings with heating and DHW

<sup>3</sup> Million British Thermal Units

<sup>4</sup> All utility and facility data is from MassEnergyInsight

<sup>5</sup> Thousand British Thermal Units

EUIs higher than 25 kBtu/SF. These measures can be implemented as part of scheduled building maintenance and/or major renovation and rehabilitation investments.

Table 1 includes the energy savings assumptions and target implementation dates for the potential energy efficiency opportunities that we identified. Please refer to Appendix C for additional detail.

Facility name	Gross Floor Area (SF)	FY 2019 Heat/DHW (MMBtu)	FY 2019 Heat/DHW (kBtu/SF)	Target Heat/DHW (kBtu/SF)	Heat/DHW Reduction (%)	Target Efficiency Project Date (Year)
bromfield school	180,921	6,631	37	25	32%	2045
hildreth school	68,732	3,942	57	35	39%	2025
new library	22,199	1,394	63	50	20%	2040
highway department	10,180	447	44	25	43%	2030
police/ambulance station	9,345	97	10	10	0%	2035
center fire station	5,712	384	67	35	48%	2035
town hall	11,686	297	25	25	2%	2040
old library	9,881	251	25	25	2%	2045
hildreth house	8,778	204	23	23	1%	2035
bromfield house	6,134	188	31	25	18%	2040
still river fire station	1,792	150	84	40	52%	2035
old ambulance building	2,288	17	7	7	0%	2030
<b>Total</b>	<b>337,648</b>	<b>14,002</b>				

**Table 1. Energy efficiency project assumptions and savings**

Energy efficiency investments require close coordination with related building renovations and upgrades. Harvard will need to request and review more detailed energy engineering assessments to identify specific energy efficiency recommendations as part of these projects. The incremental

<sup>6</sup> The replacement cost for existing equipment assumes \$100,000 per MMBTU heating output.

<sup>7</sup> Actual equipment costs will vary significantly depending on site specific conditions. The emphasis here is that ductless heat pumps are significantly

cost for high performance building best practices should be about 10% or less of total project costs.

*Fuel to Electricity Conversions*

Converting Harvard’s buildings from fuel combustion to high efficiency electric heating and domestic hot water equipment is key to the town’s decarbonization efforts. Carbon emission rates will remain high until this equipment is replaced. Table 2 lists very preliminary estimated replacement costs<sup>6</sup> for the existing equipment and the estimated cost to install three alternative types of high efficiency electric heat pump equipment<sup>7</sup>. Please refer to Appendix D for additional detail.

Facility name	Gross Floor Area (SF)	Estimated Replacement			
		Standard Ductless Cost (\$)	\$10,000 VRF Cost (\$)	\$16,000 VRF Cost (\$)	\$26,000 Ground Cost (\$)
bromfield school	180,921	633,224	3,517,908	5,628,653	9,146,562
hildreth school	68,732	240,562	1,336,456	2,138,329	3,474,784
new library	22,199	77,697	431,647	690,636	1,122,283
highway department	10,180	35,630	197,944	316,711	514,656
police/ambulance station	9,345	32,708	181,708	290,733	472,442
center fire station	5,712	19,992	111,067	177,707	288,773
town hall	11,686	40,901	227,228	363,564	590,792
old library	9,881	34,584	192,131	307,409	499,539
hildreth house	8,778	30,723	170,683	273,093	443,777
bromfield house	6,134	21,469	119,272	190,836	310,108
still river fire station	1,792	6,272	34,844	55,751	90,596
old ambulance building	2,288	8,008	44,489	71,182	115,671
<b>Total</b>	<b>337,648</b>	<b>\$1,181,768</b>	<b>\$6,565,378</b>	<b>\$10,504,604</b>	<b>\$17,069,982</b>

**Table 2. Estimated fuel conversion equipment costs**

less expense to install than VRF and ground source heat pumps. Estimated costs per ton are from an oil-fired steam retrofit to high efficiency electric conversion engineering analysis in 2018 for Newburyport City Hall.

The first two heat pump technologies are air-source. Ductless heat pumps are used both in residential and commercial applications and are the most cost-effective fuel conversion option. Variable refrigerant flow (VRF) heat pumps are primarily used in commercial applications.

The third heat pump option is ground-source heat pumps (Ground) sometimes referred to as geothermal. Ground source heat pumps require a large water source in the form of a pond, stream, or well. Ground source heat pumps are used both in residential and commercial applications.

Ductless heat pumps serve one or two rooms and require multiple systems to serve a large room. VRF and ground source heat pumps serve multiple rooms. The cost for VRF and ground source heat pump systems is higher than ductless heat pump systems because they include the cost to install custom heating and cooling distribution components and advanced control systems. Ductless heat pumps are essentially “plug and play”.

As another ground source heat pump alternative, Harvard has discussed the possibility of installing a ground source heat pump system that serves multiple buildings. Harvard should assume that all existing HVAC equipment should be removed or abandoned in place when new heat pump technology is installed. All three heat pump technologies will provide better occupant comfort in buildings with adequate insulation and airsealing. In addition, temperature recovery from night or vacation temperature setbacks or power outages will take longer with heat pump systems than fossil fuel-fired systems.

Domestic hot water conversion options include solar, heat pump, and electric resistance water heating systems. Solar and hybrid heat pump domestic hot water systems are better for high-use municipal systems such as school kitchens. Small well insulated electric resistance or heat pump domestic hot water systems are better for low-use municipal settings such as rest rooms.

### Vehicles

Harvard has 48 vehicles and other equipment that have gasoline or diesel-powered internal combustion engines. Please refer to the Appendix E for a complete list of these vehicles and equipment<sup>8</sup>. Total energy use for these vehicles in fiscal year 2019 was:

- Gasoline – 14,995 gallons
- Diesel – 12,002 gallons

This fuel use is equivalent to about 3,753 MMBtu. Individual vehicle fuel use was unavailable for this report. For the purposes of this report, we estimated the average gasoline and diesel fuel use per vehicle.

#### *Light-Duty Vehicles*

Light-duty vehicles are the primary source of gasoline fuel consumption. Affordable electric motor vehicles exist right now that can replace the town’s light-duty vehicles that are scheduled for retirement in the next few years. The replacement cost for electric-powered light-duty vehicles has dropped significantly and is close to or on par with internal combustion engine vehicle costs.

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<sup>8</sup> Data source: 2019 Town vehicle insurance records

### *Heavy-Duty Vehicles*

Heavy-duty vehicles are the primary source of diesel fuel consumption. Few affordable electric-powered vehicles exist to replace the town's heavy-duty vehicles. In addition, heavy-duty vehicles provide services such as around-the-clock snowplowing that may be challenging for electric-powered vehicles to provide.

Heavy-duty vehicle conversions will most likely need to wait until the electric-powered heavy-duty vehicle market develops further. Interim retrofit options exist for heavy-duty vehicles including brake-assist and engine idling management systems.

Harvard outsources school bus services and does not own its school buses. Fuel consumption for the school buses does not have to be and is not included in Harvard's Green Community energy use. Harvard could include school bus fuel consumption as part of the town's municipal facility and operations or the town's community-wide decarbonization efforts.

Future school bus transportation contract negotiations could include discussions with school bus vendors regarding school bus fuel to electric conversions. The negotiations could include a discussion about parking the buses near the schools and purchasing Bi-directional charging stations. The large batteries in school buses may offer Harvard important load management and/or emergency power supply opportunities. Bi-directional charging stations allow vehicle batteries to both charge from and discharge to the electrical distribution system.

Bi-directional charging stations combined with an intelligent charging system will allow Harvard to use school bus and other vehicles to reduce peak electrical load conditions, charge the vehicles during periods of low demand, supplement electrical loads at night, and support emergency electrical power when the electrical system is down. Electric school bus batteries are particularly important because the batteries are very large.

### *Charging Stations and Load Management*

Part and parcel with converting vehicles from fuel to electricity, Harvard needs to anticipate how to pay for, locate, and manage associated electric charging stations. Harvard will need to purchase and place electric charging stations in convenient locations and get approval to connect them to the utility grid. Vehicles that Harvard should consider with its electric charging station deployment include town-owned vehicles, town staff-owned vehicles, and town resident-owned vehicles.

We recommend that Harvard develop a charging station plan for 100% community-wide electric-vehicle market penetration for the town. Harvard can then work backwards to determine the location for Harvard's first wave of electric charging stations. Rapid changes in EV vehicle technology combined with the investment in EV charging stations included in the recently approved Infrastructure bill will undoubtedly create a long-term need for more electric charging stations. On the flip side, most homes might install their own EV chargers and public charging stations may be less important than they are now.

Harvard will need to develop a load management plan with National Grid with this information and coordinate a phased installation plan with the utility company. Charging multiple vehicles rapidly and concurrently will add significant electrical load to the existing utility distribution infrastructure. On a more positive note, connecting multiple electric vehicles with large batteries to the utility distribution system will also offer significant load management opportunities.

### Electricity

Harvard uses electricity for its buildings, other structures, streetlights, and other services. Total municipal facility and operations electricity used in fiscal year 2019 was 1,936,032 kWh or about 6,606 MMBtu.

Electricity that Harvard purchased from National Grid in fiscal year 2019 included electricity generated from fossil-fuel and multiple grades of renewable energy electrical generation plants. National Grid’s electricity generation sources in 2019 were 80% fossil fuel (mostly natural gas) and 20% renewable energy.

Table 3 summarizes the projected increase in the default percent (%) renewable electricity supply that utility companies must provide customers. State legislation requires National Grid to increase the percent of renewable energy generation 2% each year until 2029 when the increase is reduced to 1% each year. In addition, the state added a 20% existing clean energy generation requirement in 2021.

Year	Total	Class I	Class II	Class II Biomass	Estimated CES-E
2019	20.2%	14.0%	2.7%	3.5%	
2025	54.1%	26.0%	3.6%	3.5%	21.0%
2030	63.1%	35.0%	3.6%	3.5%	21.0%
2035	68.1%	40.0%	3.6%	3.5%	21.0%
2040	73.1%	45.0%	3.6%	3.5%	21.0%
2045	78.1%	50.0%	3.6%	3.5%	21.0%
2050	83.1%	55.0%	3.6%	3.5%	21.0%

**Table 3. Renewable Energy Portfolio Standard and Clean Existing Generation<sup>9</sup>**

Variables to consider regarding grid-level renewable energy procurement include class, source (local, regional, or national), and renewable energy credit (REC) status. Class I local renewable energy that have not sold the renewable energy credits are the highest quality. Harvard can consider transitioning from “lower quality” to “high quality” renewable energy over time to keep grid-level renewable energy procurement more cost-effective.

According to US EPA<sup>10</sup>, “on-site power generation provides local governments with the most direct access to renewable energy. In addition to the overall benefits, on-site projects also provide a hedge against financial risks and improve power quality and supply reliability.” Overall benefits from local and regional renewable energy include:

- Reduced demand on our regional electricity and gas utility infrastructure to generate and supply electricity from large fossil-fuel power plants

<sup>9</sup> Per H3708. See <https://www.cityofbostonce.com/ma-renewable-energy-requirement/> for more detail

<sup>10</sup> <https://www.epa.gov/statelocalenergy/local-renewable-energy-benefits-and-resources>



- Direct public health benefits from reduced fossil fuel power plant operation
- Direct economic benefits from local jobs created to install local and regional renewable energy systems

In addition to grid-purchased electricity, Harvard purchased supply electricity through a solar photovoltaic (PV) power purchase agreement from a solar farm in Athol and produced electricity from a small PV installation located on the Hildreth Elementary School. A much larger PV PPA is installed on the new Hildreth Elementary School. Harvard has a renewable energy procurement option for residential and commercial electric customers. However, Harvard does not have a municipal facility renewable energy electricity supply contract.

We project that the total electricity use by Harvard’s facilities and operations will increase by about 75% by 2050. This includes additional electricity use for proposed electric heating and DHW fuel to electric conversions and proposed vehicle fuel to electricity conversions. It also takes into consideration proposed energy efficiency projects. Other variables that will affect future electricity use include the economy and the electricity industry’s historic 3% per year increase. Recent events and technologies have disrupted and will most likely continue to disrupt small, predictable annual electricity use increases.

### Grid Electricity

We project that the source of Harvard’s electricity will shift away from grid-provided electric generation sources to about 90% local and regional renewable generation by 2050.

Harvard will continue to connect to the local and regional ISO NE<sup>11</sup> electric grid but the source of electricity will increasingly shift to local sources.

Figure 1 summarizes our projected transition for Harvard’s electricity use and mix of electricity generation through 2050.

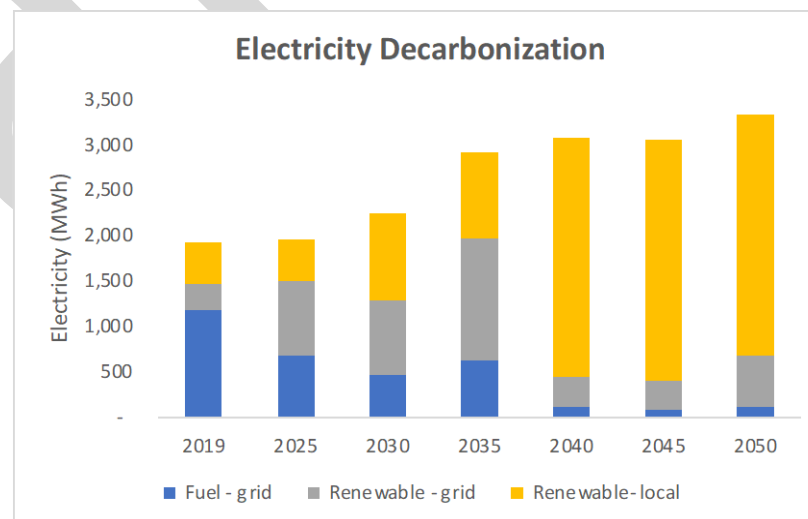


Figure 1. Projected electricity load and fuel mix

<sup>11</sup> **ISO New England Inc.** (ISO-NE) is an independent, non-profit organization that oversees the operation of New England's bulk electric power system and transmission lines.

Figure 1 on the previous page demonstrates a steady decline in fossil fuel grid electricity. State law requires investor-owned utility companies to increase the amount of renewable energy that they provide as part of their standard offer by 2% per year. In addition, we recommend that the town increase the amount of local renewable energy that it produces or procures. The chart highlights the impact of two proposed local renewable energy solar PV initiatives. One suggested initiative would be in 2030 for town facilities and parking lot installations. The second suggested initiative would be in 2040 for a large ground-mounted installation(s).

*Local Renewable Electricity*

Table 3 identifies current and potential solar PV installation locations on town facilities, town-owned land, and independent power purchase agreements. Please refer to Appendix F for additional detail.

Facility name	Available Roof Area (SF)	Available Land Area (Acres)	Estimated Solar PV Peak Output (kW)	\$3,496	\$5,000	\$1,500	\$1,200	Solar Electric kWh	Target Installation Date (Year)
				< 250 kW Roof (\$)	< 1 MW Parking (\$)	<1 MW Ground (\$)	>1 MW Ground (\$)		
bromfield school	36,184		109.3	382,103				139,357	2030
hildreth school	13,746		41.5	145,161				52,942	2030
new library	4,440		13.4	46,884				17,099	2030
highway department	2,036		6.2	21,500				7,841	2030
police/ambulance station	1,869		5.6	19,737				7,198	2030
center fire station	1,142		3.5	12,064				4,400	2030
town hall	2,337		7.1	24,681				9,001	2030
old library	1,976		6.0	20,869				7,611	2030
hildreth house	1,756		5.3	18,539				6,761	2030
bromfield house	1,227		3.7	12,955				4,725	2030
still river fire station	358		1.1	3,785				1,380	2030
old ambulance building	458		1.4	4,832				1,762	2030
school parking lots		2.0	263.2		1,315,789			335,526	2030
DPW parking lot		0.2	26.3		131,579			33,553	2030
Police parking lot		0.2	26.3		131,579			33,553	2030
Fire parking lot		0.2	26.3		131,579			33,553	2030
Library parking lot		0.2	26.3		131,579			33,553	2030
Athol PPA		2.2	289.5			434,211		369,079	2040
Other PPA		10.0	1,315.8				1,578,947	1,677,632	2040
	67,530	15.0	2,007.3	\$713,109	\$1,842,105	\$434,211	\$1,578,947	2,776,525	

**Table 3. Solar PV costs, output, and target installation dates**

We recommend that Harvard prepare or hire a consultant to assess all potential solar PV sites on municipally owned or controlled land for public review. Sites to review include the rooftop, parking lot, and potential open land sites listed in Table 3. The assessment should include aerial surveys of the sites, potential electricity peak output and annual electricity generation, estimated costs, and solar site ratings.

Depending on the solar PV site assessment findings, we envision Harvard signing a power purchase agreement in 2040 to supply about 1.5 MWh of local or regionally located solar PV electricity. This will require about 10 acres of ground-mounted solar PV panels.

Harvard will need to stay attuned to potential grant opportunities, rapidly changing Federal and State incentive programs, and the price of large-scale renewable energy installations. Current municipal sector best practice is to negotiate a solar PV power purchase agreement.

**Net Carbon Emissions Reduction**

The actions recommended in this decarbonization plan will reduce overall carbon emissions from Harvard’s municipal facilities and operations by about 30% in 2030 and about 89% by 2050<sup>12</sup>. These fall short of the State’s 50% carbon reduction target by 2030 and exceed the State’s 85% by 2050 carbon reduction target.

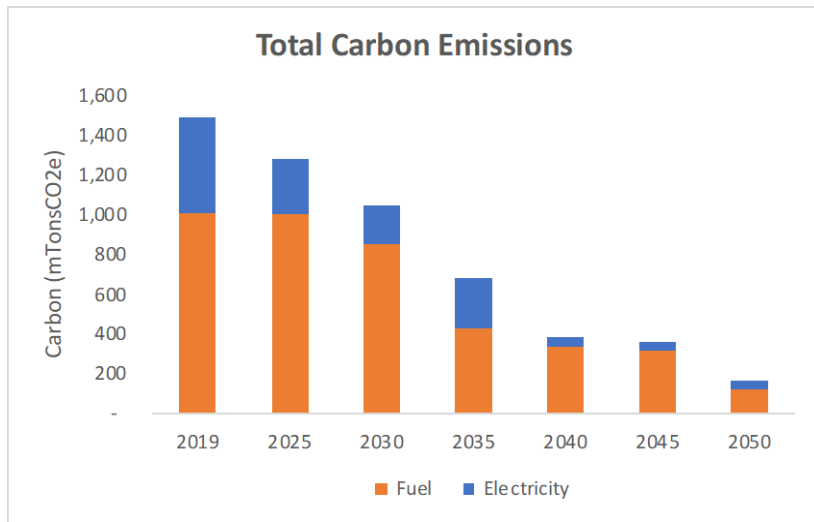
decarbonization by 2050 if the town purchased 100% renewable energy supply electricity.

<sup>12</sup> These percent reductions do not include potential carbon offset program benefits discussed later in this report. Harvard could reach 100%



### Carbon Emissions Reduction

Figure 2 represents the projected transition for Harvard’s carbon emissions reduction through 2050.



**Figure 2. Total carbon emissions reduction**

As figure 2 indicates, the primary source of municipal facility and operations carbon emissions is fuel combustion. In 2019, about 75% of Harvard’s carbon emissions were from building and vehicle-related fuel combustion and about 25% of the carbon emissions are from electricity generation fuel consumption.

Fuel-related carbon emissions will drop in close correlation with the speed and scale that Harvard can convert fuel-based combustion equipment to electric-powered equipment. At the same time, Harvard needs to transition to local and grid renewable energy electricity generation.

### Carbon Offsets

Table 4 includes preliminary information for potential local carbon offset opportunities with town-owned or town-controlled land.

Type	Owner	Total Land Area (Acres)	Net Carbon Offset Land Area (Acres)	Carbon Offset Land Area (%)	Forest Management (Carbon Credits)	Voluntary Carbon Market (\$)	Carbon Project Developer Fee (\$)
Forest		3,000	2,400	100%	4,800	24,000	9,600
Forest		2,000		0%			
Forest		500		0%			
Forest		400		0%			
Field		100		0%			
Field		100		0%			
Total		6,100	2,400	49%	4,800	\$24,000	\$9,600

Note 1: 1 carbon credit = 1 metric ton of CO2 (mTonCO@e)  
 Note 2: The total project size must be 3,000 acres or more

**Table 4. Forest management carbon offset program details**

Massachusetts is working on a plan (unreleased) to incorporate carbon sequestration opportunities in forests and fields to offset carbon emissions with the state’s decarbonization initiatives. In addition, MA DER and MA Audubon have developed supporting material for municipal carbon offset initiatives.

Based on these efforts, we recommend that Harvard investigate opportunities to enroll town-owned or controlled land into carbon sequestration-focused forest management programs. The minimum recommended size for a formal carbon offset project is about 3,000 acres. A carbon offset project of this scale would allow Harvard to prepare a sequestration forest management plan.

Harvard could either sell the carbon credits to offset the cost of the forest management plan and sequestration forest management tasks or not. Selling the carbon credits would

allow a buyer the opportunity to continue emitting carbon but offset the emissions with Harvard’s carbon sequestration efforts. MA Audubon is the best resource to contact for more information and regional examples of successful projects.

### Net Carbon Emissions

The proposed fuel conversions, renewable energy generation, energy efficiency, and carbon offset recommendations in this report, offer Harvard the resources necessary to meet Massachusetts 2030 and 2050 decarbonization goals. Figure 3 provides the forecast net carbon emissions glide path through 2050.

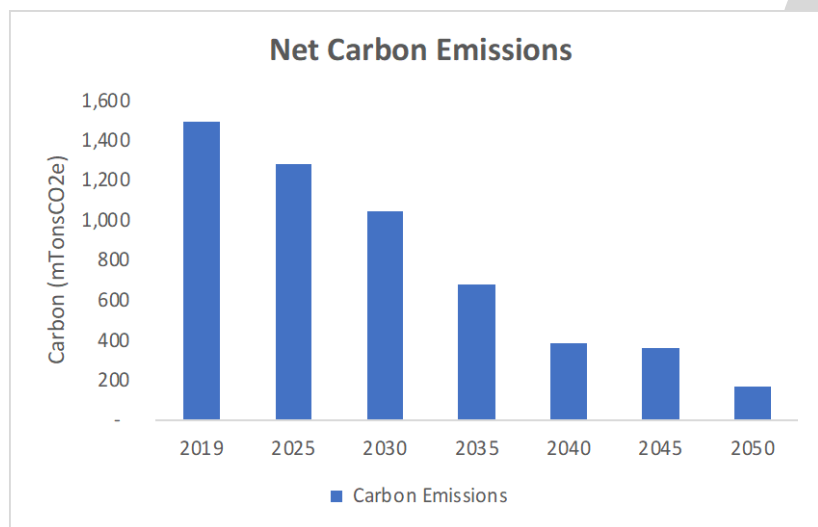


Figure 3. Net carbon emissions with no carbon offset

### Next Steps

1. Share the roadmap with Harvard’s technical and financial partners at MA DOER and MRPC

The Green Communities program run by MA DOER is the primary conduit between municipalities and the State’s decarbonization efforts. Sharing this roadmap with Harvard’s Green Community Regional Coordinator is an opportunity to help inform the State how Harvard and other community’s decarbonization efforts align with the State’s 2050 plan. MRPC can assist with this communication.

In addition, Harvard will need additional technical and financial support to plan for and implement the building, vehicle, and renewable energy actions recommended in the roadmap. MRPC can continue to help Harvard submit grant requests for technical and financial planning resources from MA DOER as they become available. Specific planning needs for building, vehicle, and renewable energy actions recommended in the roadmap include:

#### a. Buildings

Each building should receive a more detailed technical and financial analysis for one of two options. The first option is to focus exclusively on replacing the existing fossil fuel mechanical equipment with high efficiency electric mechanical equipment. The second option is to integrate the high efficiency electric mechanical equipment installation and comprehensive building envelope upgrades with a major building renovation.

The reports should document each buildings current energy performance, utility bill rates and cost, existing equipment, and provide budget level cost estimates for the proposed equipment and building energy performance upgrades. The report should include examples of comparable upgrades to similar buildings in Massachusetts and lessons learned.

In addition, on a building portfolio wide basis, the town would benefit from town facility management staff agreement on preferred approaches and associated preferred technology for high efficiency electricity and energy performance upgrades. Managing buildings with different technologies and equipment is very challenging. Building controls will play an increasingly important role as the primary tool to connect multiple pieces of equipment and every changing electrical loads and manage associated electric costs. Harvard should anticipate deploying a portfolio-wide building (and vehicle charging/solar PV/battery) control system. The town's budget should include regular (every 2-3 years) software and hardware updates.

#### *b. Vehicles*

Harvard will need to align the implementation of its vehicle conversions with the state's EV infrastructure upgrades, vehicle procurement, and vehicle incentive programs. The state's EV deployment plan is available at <https://www.mass.gov/doc/transportation-sector-technical-report/download>

Vehicle procurement will continue through the state's COMMBUYS program. Additional procurement

opportunities may arise that are part of the Green Communities program. MRPC can alert the town about these opportunities. EV incentive programs are available for light, medium, and heavy-duty vehicles at <https://www.mass.gov/service-details/mor-ev-rebate-program>

#### *c. Renewable Electricity*

Harvard should request technical and financial support to develop a solar PV blueprint for the town. The blueprint would identify potential local solar PV sites on rooftops, parking lots, and open space and rank them based on community-developed criteria. Criteria can include but not be limited to potential electricity generation, ease of construction, competing land use values, and visual impact.

### **2. Work closely with National Grid and Mass Save to shape, manage, and fund Harvard's transition to high efficiency electric equipment and vehicles.**

National Grid and Mass Save are the primary conduits for the state's renewable energy and energy efficiency project implementation support.

National Grid serves two roles in the implementation process. The first role is facilitatory. National Grid can help identify and coordinate technical and financial support that's available through Mass Save and National Grid. The second role is to help coordinate the nuts-and-bolts details of connecting proposed projects to the local electric grid.

The proposed actions in this roadmap will have a significant impact on the local electrical grid. Advanced discussions with

National Grid about the proposed scale and timing of these actions will assist National Grid with their local grid upgrade plans. Local and regional electrical grid upgrades often require 2-5 years to implement. The state and National Grid will need to anticipate and plan for similar actions by Harvard's citizens and businesses as well.

Mass Save is the primary source for high efficiency project funding support. The town and all vendors will need to apply for and comply with Mass Save's programs. Harvard should be aware that Mass Save's programs are reviewed and updated every three years. Financial incentives and program requirements may change from one triennial program term to another. Harvard should at a minimum be aware of the incentive programs that are approved every three years. Vendors that Harvard hires are responsible for requesting financial assistance and managing the documentation required for specific energy-related projects.

### 3. Develop a financial model to implement the roadmap

Financing and procuring the projects and equipment recommended in this roadmap will be a major challenge and test Harvard's financial resiliency. The town will need to weave funding for these projects with ongoing funding requirements and financial limitations imposed on municipal governments.

Harvard should charge a task force with representatives from the Business Manager's office and the Finance and Capital

Planning Committees to investigate and report back on financial alternatives to support these projects. Financial alternatives should include but not be limited to municipal ownership, private ownership, and lease-to-own and related power purchase agreement options. The financial framework should be flexible enough to integrate more detailed reports as they are developed for the proposed building, vehicle, and renewable energy projects.

### 4. Communicate the findings and recommendations

The scale of the proposed projects in this roadmap are significant. The scale of effort proposed in this roadmap reflects the urgent call for rapid change in the State's 2050 Decarbonization Roadmap<sup>13</sup>. Effective, transparent communication with the town's citizens, businesses, and industry will be critical to the success of these projects.

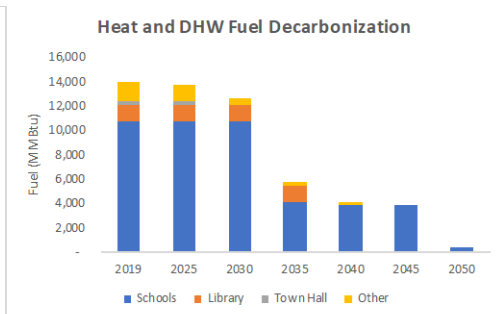
## Conclusion

Harvard's municipal facilities and operations emit about 1,493 mTonsCO<sub>2</sub>e of greenhouse gas emissions per year. Methodical replacement of fuel-powered equipment with electric-powered equipment and fuel-generated electricity with local renewable energy-generated electricity provides a framework to help the town reduce carbon emissions 30% by 2030 and 89% by 2050. Our report's recommendations and proposed implementation timeline balance the town's need for rapid deployment and prudent fiscal town management.

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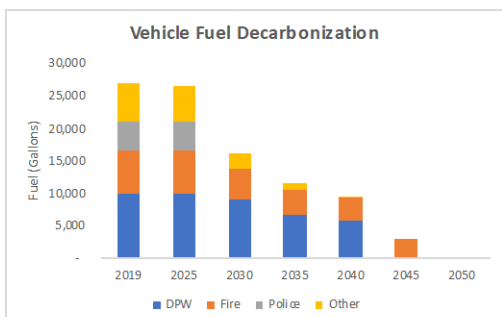
<sup>13</sup> <https://www.mass.gov/info-details/ma-decarbonization-roadmap>

## Appendix A: Decarbonization Summary



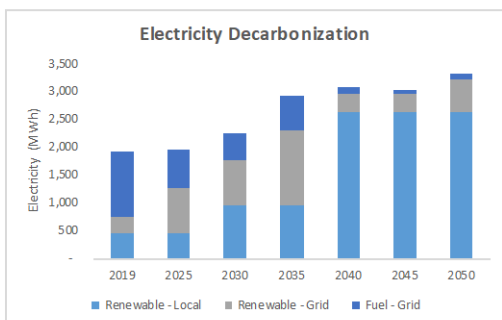
Heating and Domestic Hot Water (DHW) Fuel Decarbonization

Year (Fiscal)	Schools Fuel (MMBtu)	Library Fuel (MMBtu)	Town Hall Fuel (MMBtu)	Other Fuel (MMBtu)	Total Fuel (MMBtu)
2019	10,761	1,394	297	1,550	14,002
2025	10,761	1,394	297	1,383	13,835
<b>2030</b>	<b>10,761</b>	<b>1,394</b>	<b>-</b>	<b>552</b>	<b>12,707</b>
2035	4,130	1,394	-	251	5,775
2040	3,942	-	-	251	4,193
2045	3,942	-	-	-	3,942
<b>2050</b>	<b>461</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>461</b>



Vehicle Fuel Decarbonization

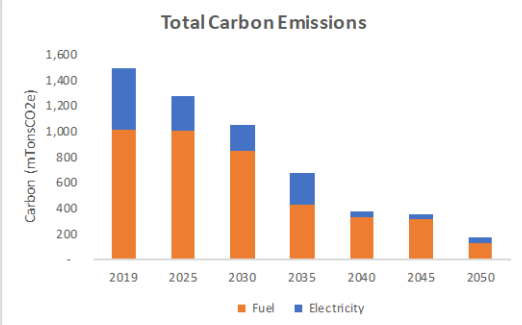
Year (Fiscal)	DPW Fuel (Gallons)	Fire Fuel (Gallons)	Police Fuel (Gallons)	Other Fuel (Gallons)	Total Fuel (Gallons)
2019	10,108	6,519	4,410	5,959	26,997
2025	10,108	6,519	4,410	5,572	26,610
<b>2030</b>	<b>9,226</b>	<b>4,755</b>	<b>-</b>	<b>2,044</b>	<b>16,025</b>
2035	6,579	3,873	-	1,162	11,615
2040	5,805	3,486	-	388	9,679
2045	-	3,099	-	-	3,099
<b>2050</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>



Grid Electricity Decarbonization

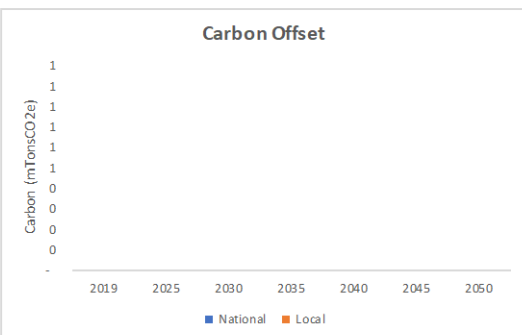
Year (Fiscal)	Fuel - Grid Electricity (MWh)	Renewable - Grid Electricity (MWh)	Total - Grid Electricity (MWh)	Renewable - Local Electricity (MWh)	Total Electricity (MWh)
2019	1,180	299	1,479	456	1,935
2025	689	812	1,500	457	1,957
<b>2030</b>	<b>477</b>	<b>816</b>	<b>1,293</b>	<b>962</b>	<b>2,255</b>
2035	628	1,340	1,968	963	2,931
2040	119	322	441	2,640	3,081
2045	90	322	412	2,641	3,054
<b>2050</b>	<b>116</b>	<b>570</b>	<b>686</b>	<b>2,643</b>	<b>3,330</b>

## Appendix B: Carbon Emissions Summary



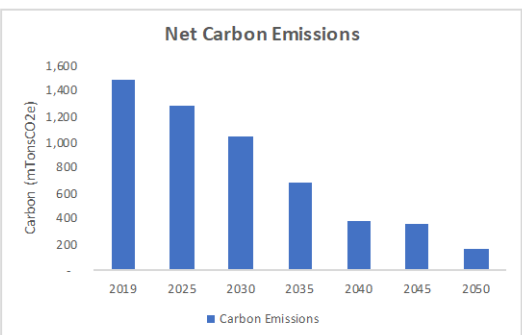
**Total Carbon Emissions**

Year (Fiscal)	Fuel Carbon (mTonsCO2e)	Electricity Carbon (mTonsCO2e)	Fuel (MMBTU)	Electricity Fuel (MWh)
2019	1,012	482	17,755	1,180
2025	1,002	282	17,588	690
<b>2030</b>	<b>854</b>	<b>195</b>	<b>14,988</b>	<b>478</b>
2035	424	257	7,443	630
2040	334	49	5,861	121
2045	320	38	5,610	93
<b>2050</b>	<b>121</b>	<b>49</b>	<b>2,129</b>	<b>121</b>



**Carbon Offset**

Year (Fiscal)	Total Carbon Offset (mTonsCO2e)	National Carbon Offset (mTonsCO2e)	Local Carbon Offset (mTonsCO2e)
2019	-	-	-
2025	-	-	-
<b>2030</b>	<b>-</b>	<b>-</b>	<b>-</b>
2035	-	-	-
2040	-	-	-
2045	-	-	-
<b>2050</b>	<b>-</b>	<b>-</b>	<b>-</b>



**Net Carbon Emissions**

Year (Fiscal)	Net Carbon Emissions (mTonsCO2e)	Total Carbon Emissions (mTonsCO2e)	Total Carbon Capture (mTonsCO2e)
2019	1,493	1,493	-
2025	1,284	1,284	-
<b>2030</b>	<b>1,049</b>	<b>1,049</b>	<b>-</b>
2035	681	681	-
2040	383	383	-
2045	358	358	-
<b>2050</b>	<b>171</b>	<b>171</b>	<b>-</b>

## Appendix C: Potential Energy Efficiency Impacts

**Building floor area, energy use (MMBtu), current and target energy use (kBtu/SF), proposed project dates, and estimated building heat loss and DHW energy (MMBtu) documentation.**

Facility name	Gross Floor Area (SF)	FY 2019 Diesel (MMBtu)	FY 2019 Electric (MMBtu)	FY 2019 Gas (MMBtu)	FY 2019 Gasoline (MMBtu)	FY 2019 Oil (MMBtu)	FY 2019 Propane (MMBtu)	FY 2019 Total (MMBtu)	FY 2019 Heat/DHW (MMBtu)	FY 2019 Heat/DHW (kBtu/SF)	Target Heat/DHW (kBtu/SF)	Heat/DHW Reduction (%)	Target Efficiency Project Date (Year)	Estimated Baseline Fuel Efficiency (%)	Estimated Building Heat/DHW (MMBtu)
bromfield school	180,921		3,106	6,631				9,738	6,631	37	25	32%	2045	75%	4,973
hildreth school	68,732		1,001	3,941				4,942	3,942	57	35	39%	2025	75%	2,957
new library	22,199		698	1,394				2,092	1,394	63	50	20%	2040	75%	1,046
highway department	10,180		107			351	96	555	447	44	25	43%	2030	75%	335
police/ambulance station	9,345		397	97				494	97	10	10	0%	2035	75%	73
center fire station	5,712		64	384				448	384	67	35	48%	2035	75%	288
town hall	11,686		125	297				422	297	25	25	2%	2040	75%	223
old library	9,881		51	251				302	251	25	25	2%	2045	75%	188
hildreth house	8,778		48	204				252	204	23	23	1%	2035	75%	153
bromfield house	6,134		40	188				228	188	31	25	18%	2040	75%	141
still river fire station	1,792		8			150		158	150	84	40	52%	2035	75%	113
old ambulance building	2,288		44				17	61	17	7	7	0%	2030	75%	13
<b>Total</b>	<b>337,648</b>	<b>0</b>	<b>5,689</b>	<b>13,387</b>		<b>501</b>	<b>113</b>	<b>19,692</b>	<b>14,002</b>						<b>10,502</b>

Note: The “Estimated building heat/DHW” MMBtu is the current (FY 2019) fuel consumption in MMBtu times the estimated baseline heating and DHW system fuel efficiency. Shaded areas represent entries and assumptions that can be changed or adjusted.

### Estimated efficiency savings potential (MMBtu)

Facility name	Gross Floor Area (SF)	2025 Efficiency Savings (MMBtu)	2030 Efficiency Savings (MMBtu)	2035 Efficiency Savings (MMBtu)	2040 Efficiency Savings (MMBtu)	2045 Efficiency Savings (MMBtu)	2050 Efficiency Savings (MMBtu)	Total Efficiency Savings (MMBtu)
bromfield school	180,921					632		632
hildreth school	68,732	461						461
new library	22,199				85			85
highway department	10,180		58					58
police/ambulance station	9,345							-
center fire station	5,712			55				55
town hall	11,686				1			1
old library	9,881					1		1
hildreth house	8,778			1				1
bromfield house	6,134				10			10
still river fire station	1,792			23				23
old ambulance building	2,288							-
<b>Total</b>	<b>337,648</b>	<b>461</b>	<b>58</b>	<b>79</b>	<b>97</b>	<b>634</b>	<b>-</b>	<b>1,329</b>

Note: The efficiency savings assume a post fuel conversion 250% heat pump efficiency

## Appendix D: Facility Fuel to Electricity Conversions

### Estimated standard efficiency and high efficiency costs and post conversion electricity (MMBtu) and (MWh) energy use

Facility name	Gross Floor Area (SF)	Estimated Fuel Equipment Output (MMBtu)	Estimated Standard Replacement Cost (\$)	Estimated Electric Equipment Output (Tons)	Estimated Electric Efficiency (%)	10%	\$10,000	\$16,000	\$26,000	Electric MMBtu	Electric MWh
						Incremental Cost (\$)	Ductless Cost (\$)	VRF Cost (\$)	Ground Cost (\$)		
bromfield school	180,921	6.3	633,224	352	250%	63,322	3,517,908	5,628,653	9,146,562	1,989	583
hildreth school	68,732	2.4	240,562	134	250%	24,056	1,336,456	2,138,329	3,474,784	1,183	347
new library	22,199	0.8	77,697	43	250%	7,770	431,647	690,636	1,122,283	418	123
highway department	10,180	0.4	35,630	20	250%	3,563	197,944	316,711	514,656	134	39
police/ambulance station	9,345	0.3	32,708	18	250%	3,271	181,708	290,733	472,442	29	8
center fire station	5,712	0.2	19,992	11	250%	1,999	111,067	177,707	288,773	115	34
town hall	11,686	0.4	40,901	23	250%	4,090	227,228	363,564	590,792	89	26
old library	9,881	0.3	34,584	19	250%	3,458	192,131	307,409	499,539	75	22
hildreth house	8,778	0.3	30,723	17	250%	3,072	170,683	273,093	443,777	61	18
bromfield house	6,134	0.2	21,469	12	250%	2,147	119,272	190,836	310,108	56	16
still river fire station	1,792	0.1	6,272	3	250%	627	34,844	55,751	90,596	45	13
old ambulance building	2,288	0.1	8,008	4	250%	801	44,489	71,182	115,671	5	1
<b>Total</b>	<b>337,648</b>		<b>\$1,181,768</b>			<b>\$118,177</b>	<b>\$6,565,378</b>	<b>\$10,504,604</b>	<b>\$17,069,982</b>	<b>4,199</b>	<b>1,230</b>

### Projected fuel use reduction (MMBtu)

Facility name	Gross Floor Area (SF)	Target Conversion Date (Year)	2025	2030	2035	2040	2045	2050	Total
			Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)	Heat DHW Conversion (MMBtu)
bromfield school	180,921	2035			6,631				6,631
hildreth school	68,732	2050					3,481		3,481
new library	22,199	2040				1,394			1,394
highway department	10,180	2030		447					447
police/ambulance station	9,345	2035			97				97
center fire station	5,712	2030		384					384
town hall	11,686	2030		297					297
old library	9,881	2045				251			251
hildreth house	8,778	2035			204				204
bromfield house	6,134	2040				188			188
still river fire station	1,792	2025	150						150
old ambulance building	2,288	2025	17						17
<b>Total</b>	<b>337,648</b>		<b>167</b>	<b>1,128</b>	<b>6,932</b>	<b>1,582</b>	<b>251</b>	<b>3,481</b>	<b>13,541</b>

Note: The Hildreth School conversion savings are adjusted lower to account for the new school construction post 2019.



## Appendix E: Vehicle Fuel to Electricity Conversions

### Diesel fuel vehicle age, replacement cost, estimated fuel use (gallons), and target electric conversion dates

Department name	Vehicle name	Insurance Year	Insurance Cost New (\$)	Estimated Diesel (Gallons)	Target Conversion Date (Year)	2025 Vehicle Conversion (Gallons)	2030 Vehicle Conversion (Gallons)	2035 Vehicle Conversion (Gallons)	2040 Vehicle Conversion (Gallons)	2045 Vehicle Conversion (Gallons)	2050 Vehicle Conversion (Gallons)	Total Vehicle Conversion (Gallons)
department of public works	International dump truck	1990	40,000	387	2045					387		387
department of public works	Elgin pelican sweeper	1999	88,476	387	2045					387		387
department of public works	Caterpillar wheel loader	2000	99,968	387	2045					387		387
department of public works	Mack dump truck	2002	86,568	387	2045					387		387
department of public works	Mack truck	2003	93,885	387	2045					387		387
department of public works	F550 dump truck	2011	50,036	387	2045					387		387
department of public works	F550 dump truck	2012	66,140	387	2045					387		387
department of public works	International dump truck	2012	180,000	387	2045					387		387
department of public works	John Deere loader	2014	162,837	387	2045					387		387
department of public works	F350 pickup	2014	34,250	387	2040				387			387
department of public works	John Deere loader/backhoe	2014	85,400	387	2045					387		387
department of public works	Dump Truck	2015	65,985	387	2045					387		387
department of public works	Mack dump truck	2016	174,990	387	2045					387		387
department of public works	Mack GU712	2018	181,417	387	2045					387		387
department of public works	F550	2019	78,340	387	2045					387		387
department of public works	Mack Granite	2020	194,000	387	2045					387		387
department of public works	F350	2021	63,116	387	2040				387			387
fire department	F450 Ambulance	2018	260,000	387	2040				387			387
fire department	Seagraves Pumper	1930	13,778	387	2050						387	387
fire department	Mack Pumper	1965	28,500	387	2050						387	387
fire department	Mack/Baker Aerialscope	1980	25,000	387	2050						387	387
fire department	International/KME Fire truck	2002	221,068	387	2050						387	387
fire department	Seagrave fire truck	2005	450,000	387	2050						387	387
fire department	F550	2011	140,000	387	2045					387		387
fire department	KME Pumper	2012	525,000	387	2050						387	387
fire department	Seagrave TB40CO	2015	517,002	388	2050						388	388
fire department	KW CONSTR	2018	329,000	388	2050						388	388
school department	F550 super duty	2006	45,000	388	2045					388		388
town administrator	E350 Super Duty	2011	25,705	387	2040				387			387
town administrator	E350 Super Duty	2014	50,000	387	2040				387			387
town administrator	Transit 350	2017	45,000	387	2025	387						387
Total			\$4,420,461	12,002		387			1,935	6,580	3,099	12,002

**Diesel fuel vehicle projected electric conversion cost (\$) and projected electricity use (MWh)**

Department name	Vehicle name	2025	2030	2035	2040	2045	2050	Total	2025	2030	2035	2040	2045	2050	Total
		Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (\$)	Vehicle Conversion (MWh)	Vehicle Conversion (MWh)	Vehicle Conversion (MWh)	Vehicle Conversion (MWh)	Vehicle Conversion (MWh)	Vehicle Conversion (MWh)
department of public works	International dump truck					60,000		60,000					8		8
department of public works	Elgin pelican sweeper					132,714		132,714					8		8
department of public works	Caterpillar wheel loader					149,952		149,952					8		16
department of public works	Mack dump truck					129,852		129,852					8		8
department of public works	Mack truck					140,828		140,828					8		8
department of public works	F550 dump truck					75,054		75,054					8		16
department of public works	F550 dump truck					99,210		99,210					8		8
department of public works	International dump truck					270,000		270,000					8		8
department of public works	John Deere loader					244,256		244,256					8		16
department of public works	F350 pickup				59,938			59,938				8			8
department of public works	John Deere loader/backhoe					128,100		128,100					8		8
department of public works	Dump Truck					98,978		98,978					8		16
department of public works	Mack dump truck					262,485		262,485					8		8
department of public works	Mack GU712					272,126		272,126					8		8
department of public works	F550					117,510		117,510					8		16
department of public works	Mack Granite					291,000		291,000					8		8
department of public works	F350				110,453			110,453				8			8
fire department	F450 Ambulance				455,000			455,000				8			16
fire department	Seagraves Pumper						17,223	17,223						8	8
fire department	Mack Pumper						35,625	35,625						8	8
fire department	Mack/Baker Aerialscope						31,250	31,250						8	16
fire department	International/KME Fire truck						276,335	276,335						8	8
fire department	Seagrave fire truck						562,500	562,500						8	8
fire department	F550					210,000		210,000					8		16
fire department	KME Pumper						656,250	656,250						8	8
fire department	Seagrave TB40CO						646,253	646,253						8	8
fire department	KW CONSTR						411,250	411,250						8	16
school department	F550 super duty					67,500		67,500					8		8
town administrator	E350 Super Duty				44,984			44,984				8			8
town administrator	E350 Super Duty				87,500			87,500				8			16
town administrator	Transit 350	90,000						90,000	8						8
<b>Total</b>		<b>\$90,000</b>			<b>\$757,874</b>	<b>\$2,749,563</b>	<b>\$2,636,685</b>	<b>\$6,234,122</b>	<b>8</b>			<b>40</b>	<b>136</b>	<b>64</b>	<b>240</b>

**Gasoline fuel vehicle age, insurance replacement cost, estimated current fuel use (gallons), and target electric conversion dates**

Department name	Vehicle name	Insurance Year	Insurance Cost New (\$)	Estimated Gasoline (Gallons)	Target Conversion Date (Year)	2025 Vehicle Conversion (Gallons)	2030 Vehicle Conversion (Gallons)	2035 Vehicle Conversion (Gallons)	2040 Vehicle Conversion (Gallons)	2045 Vehicle Conversion (Gallons)	2050 Vehicle Conversion (Gallons)	Total Vehicle Conversion (Gallons)
department of public works	Ford tractor	1994	35,182	882	2035			882				882
department of public works	Ford Explorer	2009	28,000	882	2030		882					882
department of public works	Kubota tractor	2010	96,894	882	2035			882				882
department of public works	F250	2015	38,027	882	2035			882				882
fire department	Tractor	1989	146,500	882	2035			882				882
fire department	Ford Explorer	2014	27,868	882	2030		882					882
fire department	Ford Explorer	2018	35,487	882	2030		882					882
police department	Ford Explorer	2015	29,952	882	2030			882				882
police department	Dodge Charger	2016	41,569	882	2030			882				882
police department	Dodge Charger	2018	34,213	882	2030			882				882
police department	F150	2018	35,086	882	2030			882				882
police department	Ford Explorer	2020	50,353	882	2030			882				882
school department	E350 van	2008	20,260	882	2030			882				882
school department	E150	2008	23,940	882	2030			882				882
school department	F350 pickup	2011	33,454	882	2030			882				882
school department	Econovan	2014	1,000	882	2030			882				882
school department	John Deere tractor	2016	31,000	882	2035			882				882
<b>Total</b>			<b>\$708,785</b>	<b>14,995</b>		<b>-</b>	<b>10,585</b>	<b>4,410</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>14,995</b>

**Gasoline fuel vehicle projected electric conversion cost (\$) and projected electricity use (MWh)**

Department name	Vehicle name	2025 Vehicle Conversion (\$)	2030 Vehicle Conversion (\$)	2035 Vehicle Conversion (\$)	2040 Vehicle Conversion (\$)	2045 Vehicle Conversion (\$)	2050 Vehicle Conversion (\$)	Total Vehicle Conversion (\$)	2025 Vehicle Conversion (MWh)	2030 Vehicle Conversion (MWh)	2035 Vehicle Conversion (MWh)	2040 Vehicle Conversion (MWh)	2045 Vehicle Conversion (MWh)	2050 Vehicle Conversion (MWh)	Total Vehicle Conversion (MWh)
department of public works	Ford tractor			38,700				38,700			18				18
department of public works	Ford Explorer		33,600					33,600		18					18
department of public works	Kubota tractor			106,583				106,583			18				18
department of public works	F250			41,830				41,830			18				18
fire department	Tractor			161,150				161,150			18				18
fire department	Ford Explorer		33,442					33,442		18					18
fire department	Ford Explorer		42,584					42,584		18					18
police department	Ford Explorer		35,942					35,942		18					18
police department	Dodge Charger		49,883					49,883		18					18
police department	Dodge Charger		41,056					41,056		18					18
police department	F150		42,103					42,103		18					18
police department	Ford Explorer		60,424					60,424		18					18
school department	E350 van		24,312					24,312		18					18
school department	E150		28,728					28,728		18					18
school department	F350 pickup		40,145					40,145		18					18
school department	Econovan		1,200					1,200		18					18
school department	John Deere tractor			34,100				34,100			18				18
<b>Total</b>		<b>\$0</b>	<b>\$433,418</b>	<b>\$382,363</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$815,782</b>	<b>-</b>	<b>216</b>	<b>90</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>306</b>

## Appendix F: Solar Photovoltaic Installations

### Preliminary potential Solar PV installation area, output, cost, and estimated electricity generation (kWh and MMBtu)

Solar Array Type	Department name	Facility name	Available Roof Area (SF)	Available Land Area (Acres)	Estimated Solar PV Peak Output (kW)	\$3,496	\$5,000	\$1,500	\$1,200	Total Solar PV (\$)	Solar Electric kWh	Solar Electric MMBtu
						< 250 kW Roof (\$)	< 1 MW Parking (\$)	<1 MW Ground (\$)	>1 MW Ground (\$)			
Building	school department	bromfield school	36,184		109.3	382,103				382,103	139,357	475
Building	school department	hildreth school			-	-				-	-	-
Building	library	new library			-	-				-	-	-
Building	department of public works	highway department	2,036		6.2	21,500				21,500	7,841	27
Building	police department	police/ambulance station	1,869		5.6	19,737				19,737	7,198	25
Building	fire department	center fire station	1,142		3.5	12,064				12,064	4,400	15
Building	town administrator	town hall	2,337		7.1	24,681				24,681	9,001	31
Building	town administrator	old library	1,976		6.0	20,869				20,869	7,611	26
Building	town administrator	hildreth house	1,756		5.3	18,539				18,539	6,761	23
Building	school department	bromfield house	1,227		3.7	12,955				12,955	4,725	16
Building	fire department	still river fire station	358		1.1	3,785				3,785	1,380	5
Building	town administrator	old ambulance building	458		1.4	4,832				4,832	1,762	6
Parking	school department	school parking lots		2.0	263.2		1,315,789			1,315,789	335,526	1,145
Parking	department of public works	DPW parking lot			-		-			-	-	-
Parking	police department	Police parking lot			-		-			-	-	-
Parking	fire department	Fire parking lot			-		-			-	-	-
Parking	library	Library parking lot			-		-			-	-	-
Ground Fixed	town administrator	Athol PPA		2.2	289.5			434,211		434,211	369,079	1,259
Ground Fixed	town administrator	Other PPA		10.0	1,315.8				1,578,947	1,578,947	1,677,632	5,724
			49,343	14.2	1,902.0	\$521,064	\$1,315,789	\$434,211	\$1,578,947	\$3,850,011	2,572,274	8,777

### Preliminary potential Solar PV installation or procurement dates and electricity use (kWh)

Solar Array Type	Department name	Facility name	Target	2025	2030	2035	2040	2045	2050	Total
			Installation Date (Year)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)	Solar PV Electricity (kWh)
Building	school department	bromfield school	2030		139,357					139,357
Building	school department	hildreth school	2030		-					-
Building	library	new library	2030		-					-
Building	department of public works	highway department	2030		7,841					7,841
Building	police department	police/ambulance station	2030		7,198					7,198
Building	fire department	center fire station	2030		4,400					4,400
Building	town administrator	town hall	2030		9,001					9,001
Building	town administrator	old library			-					-
Building	town administrator	hildreth house			-					-
Building	school department	bromfield house			-					-
Building	fire department	still river fire station	2030		1,380					1,380
Building	town administrator	old ambulance building			-					-
Parking	school department	school parking lots	2030		335,526					335,526
Parking	department of public works	DPW parking lot	2030		-					-
Parking	police department	Police parking lot	2030		-					-
Parking	fire department	Fire parking lot	2030		-					-
Parking	library	Library parking lot			-					-
Ground Fixed	town administrator	Athol PPA			-					-
Ground Fixed	town administrator	Other PPA	2040				1,677,632			1,677,632
					504,704		1,677,632			2,182,335

## Appendix G: Carbon Offsets

### Potential Carbon Offset projects and carbon credits

Local Carbon Offset							Carbon Credits/Acre	Carbon Credits/Acre	Carbon Credits/Acre	Carbon Credits/Acre			
					Low		2	0.4	1	3			
					High		7	0.6	1	7			
				20%	Selected		2	0.4	1	5			
Type	Owner	Parcel	Total Land Area (Acres)	Carbon Offset Land Area (Acres)	Carbon Risk Buffer Land Area (Acres)	Net Carbon Offset Land Area (Acres)	Carbon Offset Land Area (%)	Start Date (Fiscal Year)	Forest Management (Carbon Credits)	No Till/Low Till (Carbon Credits)	Perrenial Grass Planting (Carbon Credits)	Tree Planting (Carbon Credits)	Total (Carbon Credits)
Forest		1	3,000	3,000	600	2,400	100%		4,800				4,800
Forest		2	2,000				0%						
Forest		3	500				0%						
Forest		4	400				0%						
Field		5	100				0%						
Field		6	100				0%						
Total			6,100	3,000	600	2,400	49%		4,800				4,800

Note 1: 1 carbon credit = 1 metric ton of CO2 (mTonCO@e)

Note 2: The total project size must be 3,000 acres or more

### Projected carbon credit value, developer fees, and monitoring and verification costs

Local Carbon Offset							Carbon Revenue/ Credit	Carbon Revenue/ Credit					
							\$13	\$3	\$30,000	\$40,000	10%	8%	8%
							\$14	\$8	\$100,000	\$65,000	40%	10%	10%
							\$14	\$5	\$60,000	\$50,000	40%	10%	10%
Type	Owner	Parcel	Total Land Area (Acres)	Compliance Carbon Market (\$)	Voluntary Carbon Market (\$)	Total Carbon Credit Revenue (\$)	Small Project Carbon Inventory (\$)	Verification of Carbon Stocks (\$)	Carbon Project Developer Fee (\$)	Measurement & Monitoring (\$)	Verification (\$)		
Forest		1	3,000		24,000	24,000			9,600	2,400	2,400		
Forest		2	2,000										
Forest		3	500										
Forest		4	400										
Field		5	100										
Field		6	100										
Total			6,100	\$0	\$24,000	\$24,000			\$9,600	\$2,400	\$2,400		

Didi Chadran <amc01451@gmail.com>

Mon 5/16/2022 2:09 PM

To:

- Julie Doucet

Cc:

- Stu Sklar <ssklar01451@gmail.com>

Julie,

It kills me to have to do this, but I need to tender my resignation from the Community Preservation Committee & MAHT.

I've notified my committee colleagues of this news, and advised them that actions resulting from my stepping down will be on the agenda for our 5/25 CPC meeting.

What else am I obliged to do to ensure an orderly transition?

Thank you.

Didi