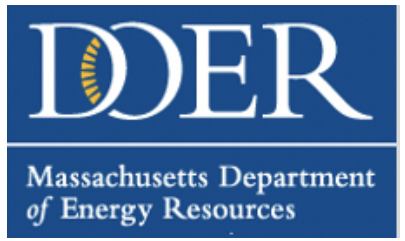
MA Leading by Example Council Meeting

March 9, 2021



Agenda

Welcome

News and Updates

To Energy and Beyond!

Water Conservation

Sustainable Landscaping

Waste Diversion

Q&A and Closing

Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

DOER
Massachusetts Department of Energy Resources

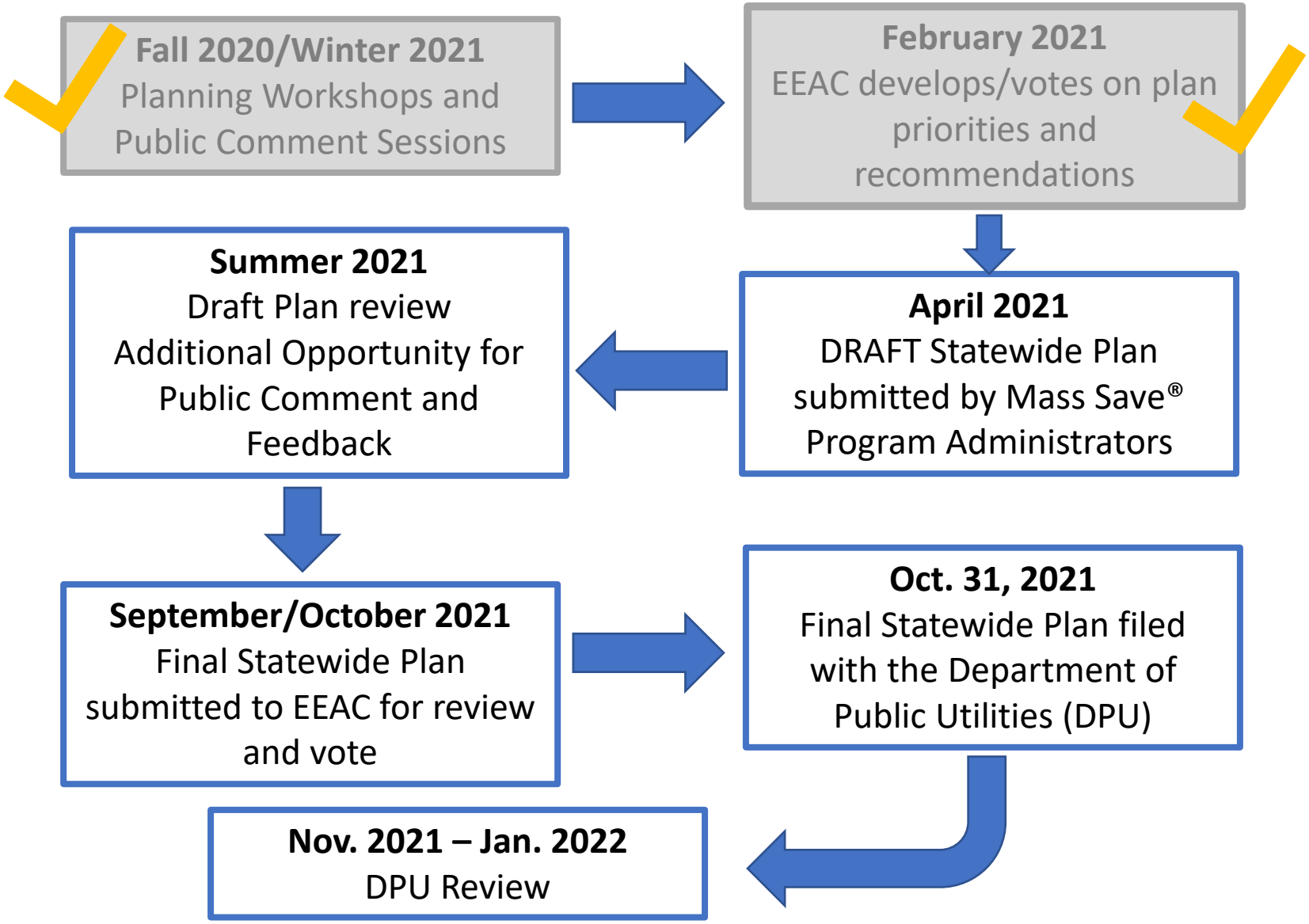
Clean Energy News and Updates

MA Clean Energy and Climate Plan for 2030

- Interim CECP sets 45% emission reduction target for 2030
- Public Comment period extended through March 22nd
  - Comments can be submitted via online form, or emailed to gwsa@mass.gov
  - Oral comments can be submitted as a voicemail to (617) 506-9630
- Upcoming webinars will provide an overview of the CECP and provide an opportunity for public comments
  - **Tuesday, March 9th, 3-4:30pm. Click here to register**
  - **Monday, March 15th, 6:30-8pm. Click here to register**

For more information, visit: www.mass.gov/2030CECP

2022-2024 Planning Status Update



Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

DOER
Massachusetts Department of Energy Resources

MA Offshore Wind News

Vineyard Wind (800 MW): BOEM completed final environmental impact statement in early March 2021

- Early 2021: Decision from BOEM, permits from EPA, approval from ACOR and NMFS
- Second half of 2021: On-shore work begins
- 2022: Offshore construction
- 2023: Begin turbine installations
- Late 2023: Begin exporting power to grid

Mayflower Wind (804 MW): Power purchase contracts between Mayflower Wind and utilities approved by DPU in November

- Federal tax credit passed in January expected to lower electricity costs
- Contracts on hold, pending motion from AG concerning compensation levels for utilities
- December 2025: Project fully operational

Draft RFP released for "at least 400 MW and up to 1600 MW of offshore wind energy generation“

- Considering bids as low as 200 MW
- Tentative goal to have contracts submitted to DPU in 2022

Sources: Statehouse News 1, 2; WWLP, WBUR

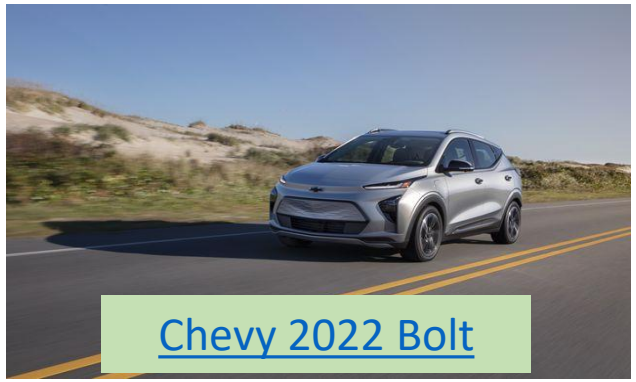
USCA LBE Working Group

- U.S. Climate Alliance consists of 25 states that commit to:
  - Implementing policies that advance the goals of the Paris Agreement
  - Tracking and report progress to the global community
  - Accelerating policies to reduce GHGs and advance clean energy at the state and federal level
- USCA includes several working groups for specific topics (e.g., power, resilience, transportation, etc.)
- LBE working group is new initiative launched in 2021 to help states establish and/or expand LBE programs, and share best practices
  - Regular calls between states
  - Recurring email communications
  - Sub-working groups

All-Electric Commitments by Automakers

- GM → 30 new EVs by 2025, no gas-powered light-duty vehicles by 2035
- Volvo → Fully electric by 2030, 50% of global sales fully-electric by 2025
- Ford → Lineup in Europe fully electric by 2030
- Tata Motors → Jaguar entirely electric by 2025, all electric models by 2030
- Volkswagen → 70+ electric models planned across portfolio through 2029


All-electric Volvo XC40


Chevy 2022 Bolt


Jaguar All-electric I-PACE


Ford Mach-E


VW E-Golf

Source: Car and Drive, Reuters, Autoweek

EVs Coming to a Road Near You in 2021

VW ID.4
Early 2021

Audi Q4 e-tron
Mid 2021

Rivian R1S
Mid 2021

Rivian R1T
Late 2021

Mazda MX-30
Early 2021

Lordstown Endurance
Mid 2021

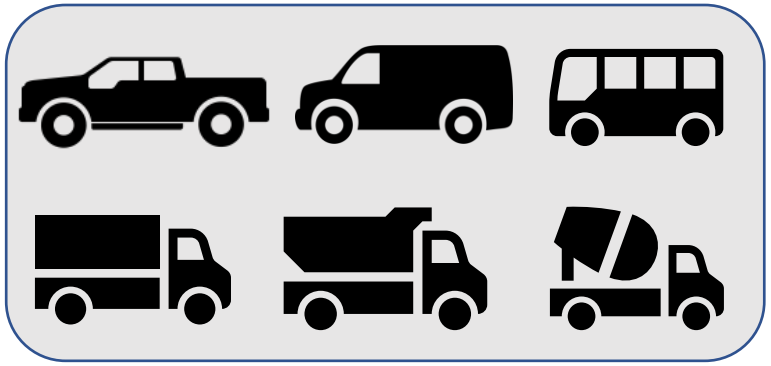
Nissan Ariya
Mid 2021

Hyundai Ioniq
Late 2021

New MOR-EV Program Incentives

Public fleets are eligible for MOR-EV rebates for medium- and heavy-duty EVs

- Applies to battery electric and fuel-cell electric vehicle purchases + leases
  - Sales price must be >$50,000
- Gross vehicle weight rating (GVWR) of more than 8,500 pounds
- Potential 10% incentive adder for EVs operating in Environmental Justice Communities



Rebates determined by GVWR and applicable block; larger vehicle classes able to 'reserve' incentives

BEV/FCEV Gross Vehicle Weight Rating (lbs.)	Incentive Reservation Type	Block Size (# vehicles)	Block 1 Incentive Value (subsequent blocks decline by 15% per block)
8,501 – 10,000	Rebate	200	$7,500
10,001 – 14,000	Rebate		$15,000
14,001 – 16,000	Voucher	100	$30,000
16,001 – 19,500	Voucher		$45,000
19,501 – 26,000	Voucher		$60,000
26,001 – 33,000	Voucher	50	$75,000
33,001 +	Voucher		$90,000

https://www.mass.gov/service-details/mor-ev-rebate-program

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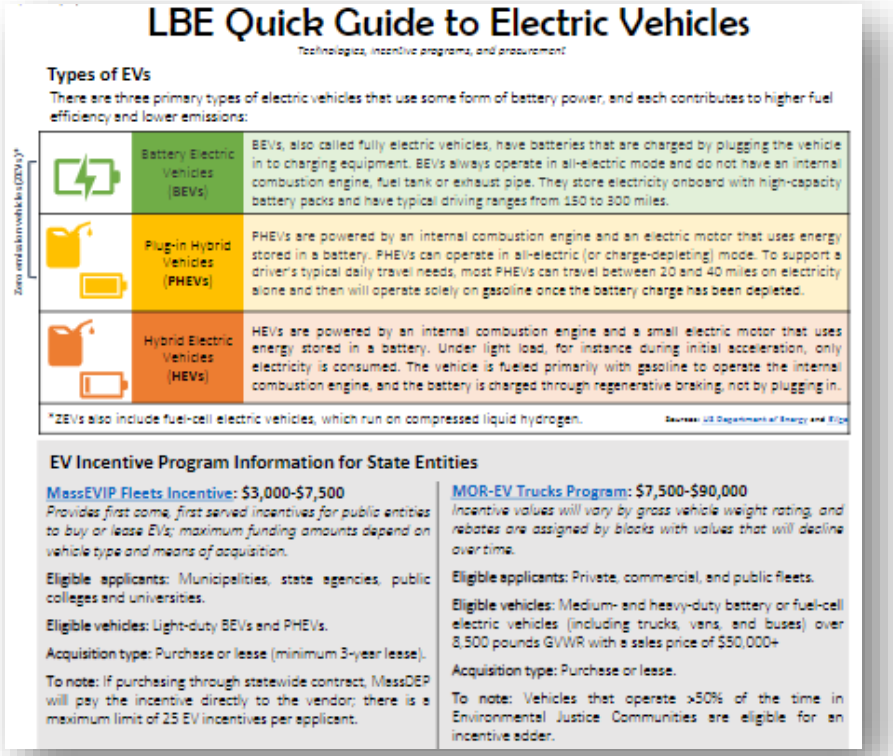
Massachusetts Department of Energy Resources

EV and EVSE Quick Guides

Coming soon!

- High-level overview of various EV and EV charging technologies, applicable incentive programs, and procurement information



LBE Quick Guide to Electric Vehicles

Technologies, incentive programs, and procurement

Types of EVs

There are three primary types of electric vehicles that use some form of battery power, and each contributes to higher fuel efficiency and lower emissions:

Battery Electric Vehicles (BEVs)	BEVs, also called fully electric vehicles, have batteries that are charged by plugging the vehicle in to charging equipment. BEVs always operate in all-electric mode and do not have an internal combustion engine, fuel tank or exhaust pipe. They store electricity onboard with high-capacity battery packs and have typical driving ranges from 150 to 300 miles.
Plug-in Hybrid Vehicles (PHEVs)	PHEVs are powered by an internal combustion engine and an electric motor that uses energy stored in a battery. PHEVs can operate in all-electric (or charge-depleting) mode. To support a driver's typical daily travel needs, most PHEVs can travel between 20 and 40 miles on electricity alone and then will operate solely on gasoline once the battery charge has been depleted.
Hybrid Electric Vehicles (HEVs)	HEVs are powered by an internal combustion engine and a small electric motor that uses energy stored in a battery. Under light load, for instance during initial acceleration, only electricity is consumed. The vehicle is fueled primarily with gasoline to operate the internal combustion engine, and the battery is charged through regenerative braking, not by plugging in.

*ZEVs also include fuel-cell electric vehicles, which run on compressed liquid hydrogen.

EV Incentive Program Information for State Entities

MassEVIP Fleets Incentive: $3,000-$7,500

Provides first come, first served incentives for public entities to buy or lease EVs; maximum funding amounts depend on vehicle type and means of acquisition.

Eligible applicants: Municipalities, state agencies, public colleges and universities.

Eligible vehicles: Light-duty BEVs and PHEVs.

Acquisition type: Purchase or lease (minimum 3-year lease).

To note: If purchasing through statewide contract, MassDEP will pay the incentive directly to the vendor; there is a maximum limit of 25 EV incentives per applicant.

MOR-EV Trucks Program: $7,500-$90,000

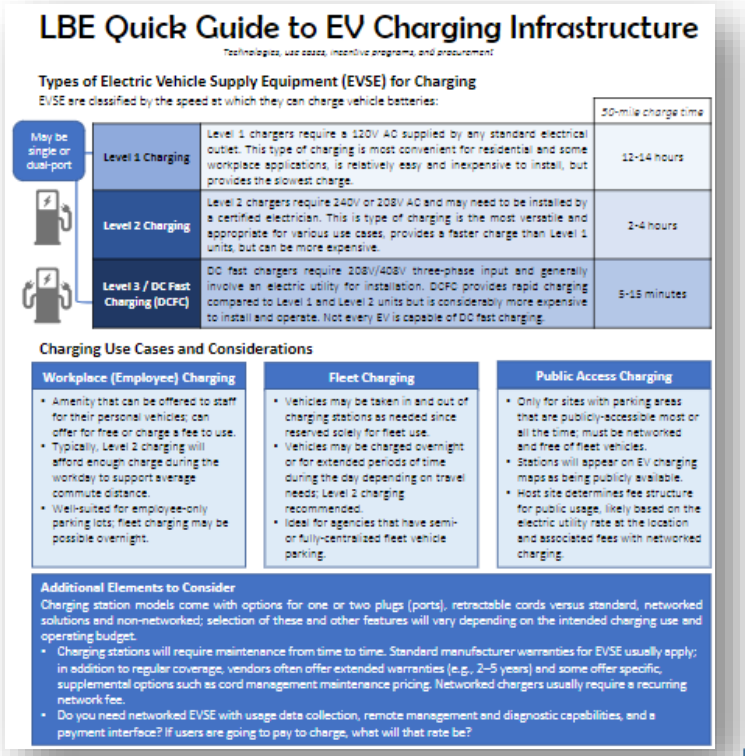
Incentive values will vary by gross vehicle weight rating, and rebates are assigned by blocks with values that will decline over time.

Eligible applicants: Private, commercial, and public fleets.

Eligible vehicles: Medium- and heavy-duty battery or fuel-cell electric vehicles (including trucks, vans, and buses) over 8,500 pounds GVWR with a sales price of $50,000+

Acquisition type: Purchase or lease.

To note: Vehicles that operate >50% of the time in Environmental Justice Communities are eligible for an incentive adder.



LBE Quick Guide to EV Charging Infrastructure

Technologies, use cases, incentive programs, and procurement

Types of Electric Vehicle Supply Equipment (EVSE) for Charging

EVSE are classified by the speed at which they can charge vehicle batteries:

		50-mile charge time
May be single or dual-port	**Level 1 Charging**	Level 1 chargers require a 120V AC supplied by any standard electrical outlet. This type of charging is most convenient for residential and some workplace applications, is relatively easy and inexpensive to install, but provides the slowest charge.	12-14 hours
	Level 2 Charging	Level 2 chargers require 240V or 208V AC and may need to be installed by a certified electrician. This is type of charging is the most versatile and appropriate for various use cases, provides a faster charge than Level 1 units, but can be more expensive.	2-4 hours
	Level 3 / DC Fast Charging (DCFC)	DC fast chargers require 208V/408V three-phase input and generally involve an electric utility for installation. DCFC provides rapid charging compared to Level 1 and Level 2 units but is considerably more expensive to install and operate. Not every EV is capable of DC fast charging.	5-15 minutes

Charging Use Cases and Considerations

Workplace (Employee) Charging

- Amenity that can be offered to staff for their personal vehicles; can offer for free or charge a fee to use.
- Typically, Level 2 charging will afford enough charge during the workday to support average commute distance.
- Well-suited for employee-only parking lots; fleet charging may be possible overnight.

Fleet Charging

- Vehicles may be taken in and out of charging stations as needed since reserved solely for fleet use.
- Vehicles may be charged overnight or for extended periods of time during the day depending on travel needs; Level 2 charging recommended.
- Ideal for agencies that have semi- or fully-centralized fleet vehicle parking.

Public Access Charging

- Only for sites with parking areas that are publicly-accessible most or all the time; must be networked and free of fleet vehicles.
- Stations will appear on EV charging maps as being publicly available.
- Host site determines fee structure for public usage, likely based on the electric utility rate at the location and associated fees with networked charging.

Additional Elements to Consider

Charging station models come with options for one or two plugs (ports), retractable cords versus standard, networked solutions and non-networked; selection of these and other features will vary depending on the intended charging use and operating budget.

- Charging stations will require maintenance from time to time. Standard manufacturer warranties for EVSE usually apply; in addition to regular coverage, vendors often offer extended warranties (e.g., 2–5 years) and some offer specific, supplemental options such as cord management maintenance pricing. Networked chargers usually require a recurring network fee.
- Do you need networked EVSE with usage data collection, remote management and diagnostic capabilities, and a payment interface? If users are going to pay to charge, what will that rate be?

2021 EV Purchase Challenge

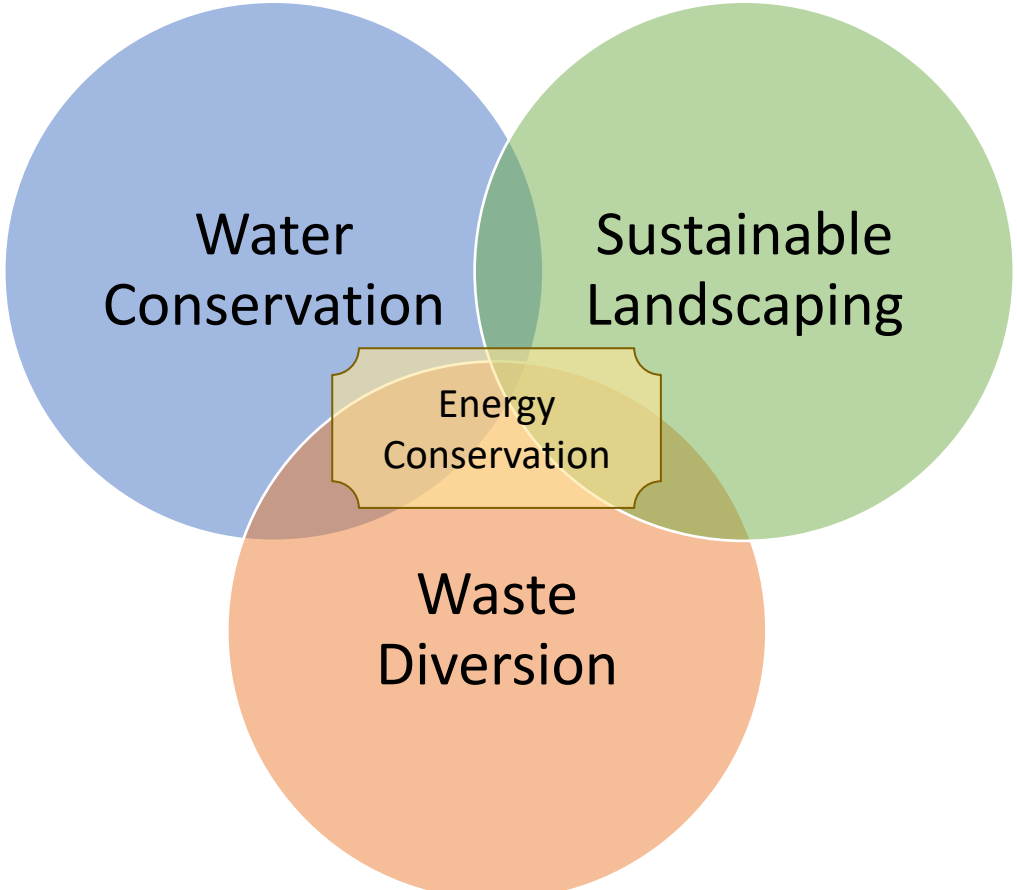
Mass*EVolves* +

- Voluntary **challenge to advance progress toward the adoption of electric vehicles in state fleets** in support of emissions reduction targets
- Opportunity for **peer-to-peer learning**, to **demonstrate leadership**, and to **gain additional recognition** for on-the-ground efforts to reduce environmental impacts
  - Criteria for the 2021 Challenge includes **the acquisition of at least one fleet EV**
- Interested state entities **first submit a Mass*EVolves* pledge** and can then elect to participate in the EV Purchase Challenge

Congrats to MassPort and UMass Lowell for recently pledging!

DOER
Massachusetts Department of Energy Resources

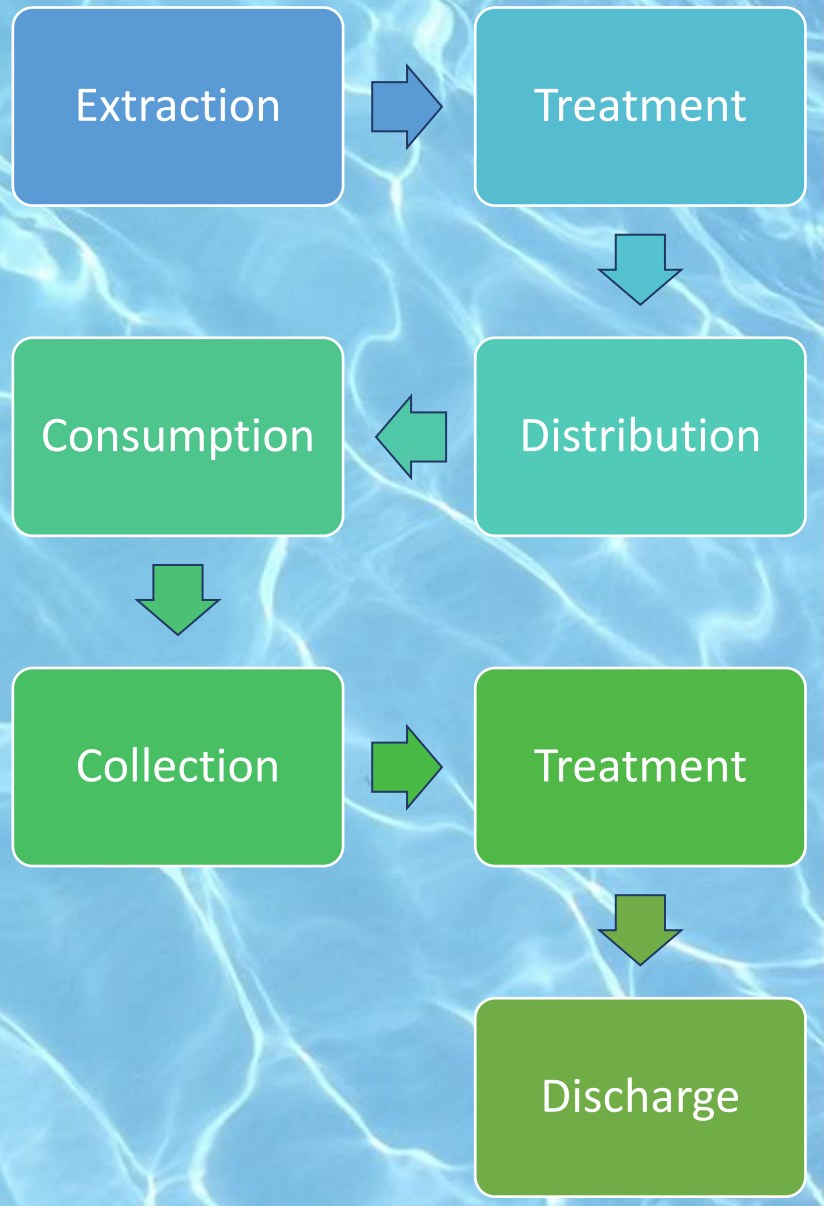
To Energy, and BEYOND!



Water-Energy Nexus

- Every gallon of water has an energy footprint needed to move, heat, and treat water
- In U.S., 8% of commercial buildings' energy use is to heat water – about the same as energy used for cooling and ventilation
- At least 3-4% of the nation's electricity is used to treat drinking and wastewater *(though this varies by location, and may be an underestimate) (GAO 2011)*

The Urban Water Lifecycle (GAO, 2011)



Sources: MA Decarbonization Roadmap Technical Report , EPA WaterSense: Quick Water Wins

Landscaping-Energy Nexus

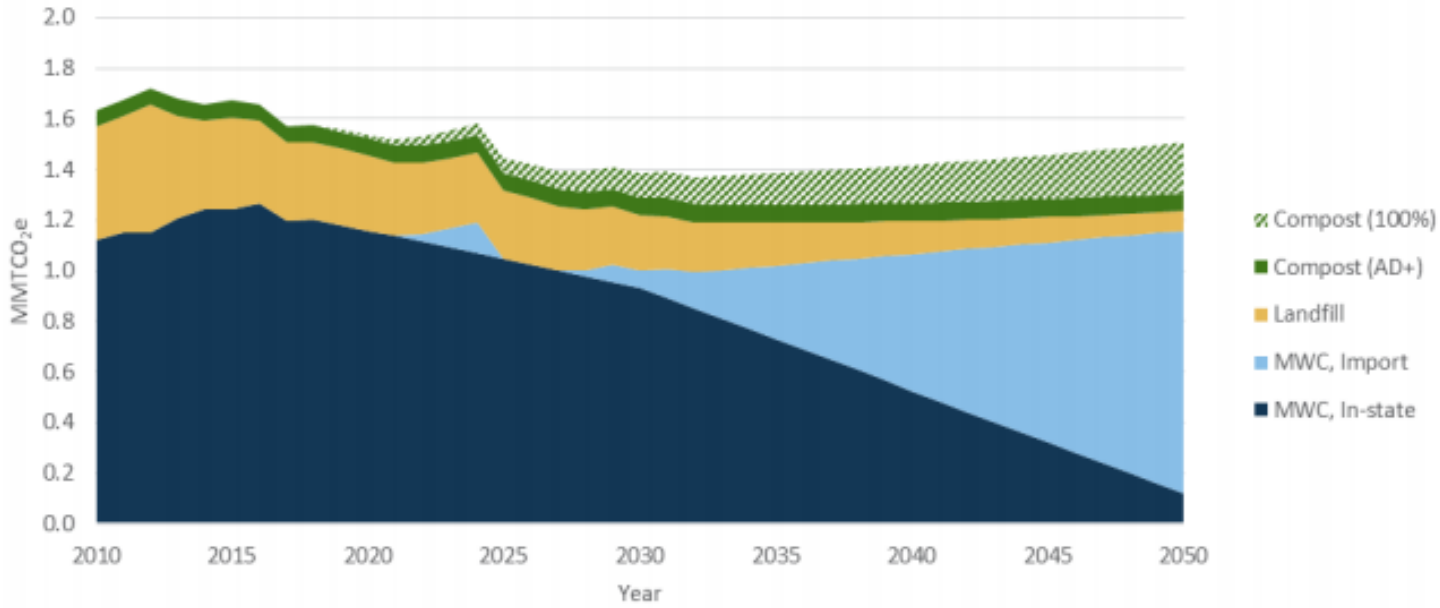
- Every acre of managed lawn has an energy footprint from mowing, watering, trimming, mulching, and more
- Mowers in the U.S. consume about 800 million gallons of gasoline per year
- One study estimated that in 2011, 121 million pieces of landscaping equipment emitted 20.4 million tons of CO2 (EPA 2015)

Sources: Utah DEQ, EPA 2015, Black and Decker

Waste-Energy Nexus

- Every pound of waste has an energy footprint from hauling, management, processing, and disposal
- 1-2% of MA GHG emissions come from solid waste management, primarily from:
  - Decomposition of organic waste in landfills
  - Incineration of fossil-fuel derived materials in waste combustion
- Emissions also from imported waste combustion, compost, and anaerobic digestion

Figure 21. GHG Emissions from the solid waste sector under the Draft 2030 SWMP, 2010-2050, two organic waste scenarios



Source: MA Decarbonization Roadmap Technical Report

Water Conservation

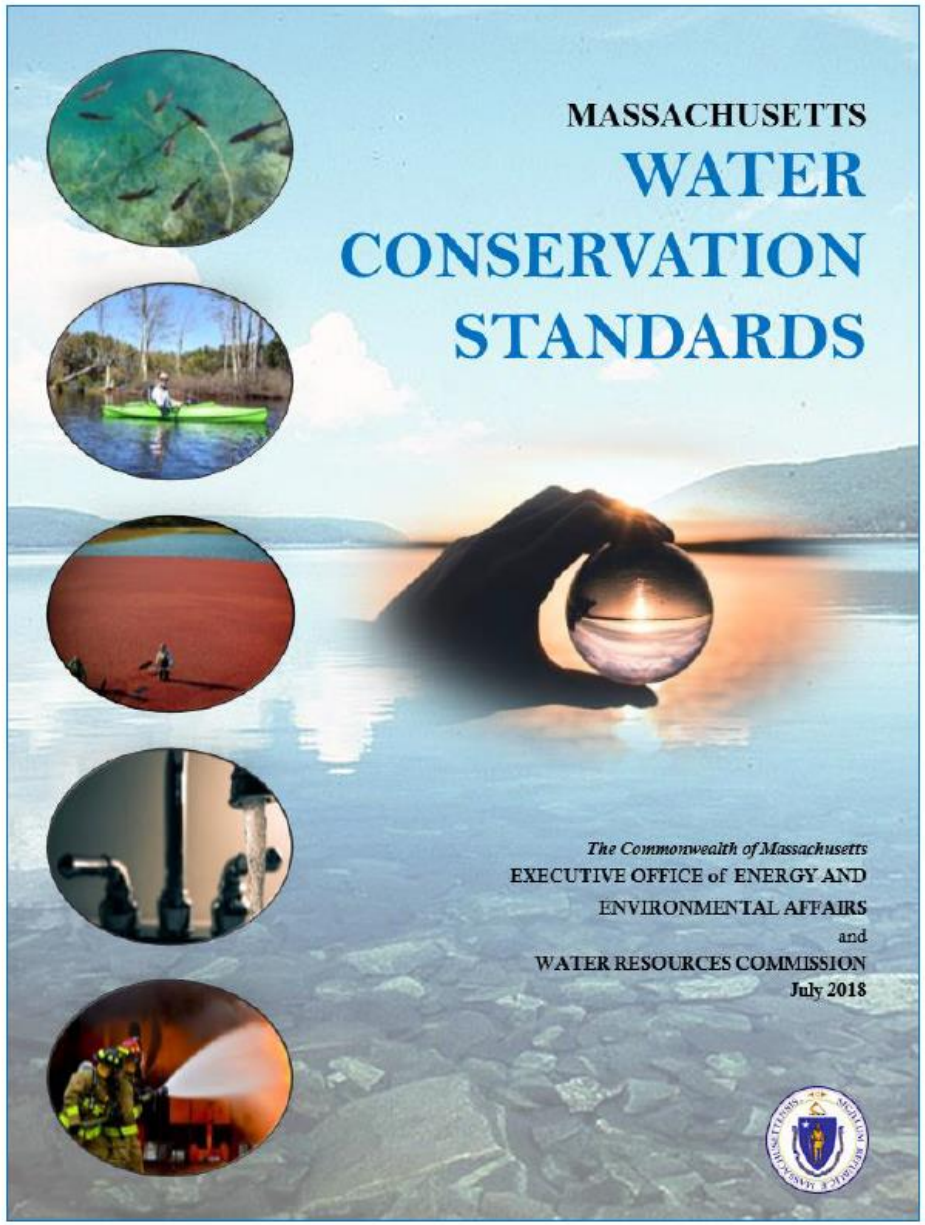
- Vandana Rao, Director of Water Policy, EEA
- Julia Wolfe, Director of Environmental Purchasing, OSD
- Krista Lillis, Program Manager, DCAMM
- Steve Bandarra, Sustainability Coordinator, Worcester State
- Ezra Small, Sustainability Manager, UMass Amherst

VANDANA RAO
Director of Water Policy

Executive Office of Energy and Environmental Affairs

Industrial-Commercial-Institutional WATER CONSERVATION

Indoor & Outdoor Use



SECTORS

Residential

Public Sector

Industrial Commercial
Institutional

Agricultural

Public Education

www.mass.gov/conservemawater

In Addition……

Water Loss Control

Metering

Pricing

Outdoor Water

Comprehensive Planning & Drought Management

www.mass.gov/conservemawater

ICI Sector Applies to…

www.mass.gov/conservemawater

The STANDARDS

6

GOLF & COMMERCIAL Entities enhance Water Efficiency

5

Practice WATER-SAVING LAWN & LANDSCAPING Techniques

- Do a WATER AUDIT & use findings to help:
  - Reuse and recycle cooling waters,
  - Reuse process waters
  - Use non-potable water
  - Replace water cooling with air cooling
  - Install efficient sanitary water devices
  - Water efficient landscaping

1

4

Use best available WATER SAVINGS TECHNOLOGY in Buildings

4

REUSE Treated WASTEWATER

2

Install SEPARATE METERS for Process Water

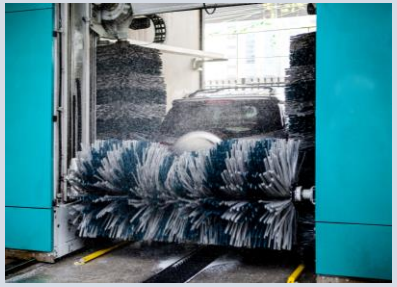
3

Implement a WATER SAVINGS STRATEGY

www.mass.gov/conservemawater

RECOMMENDATIONS

- Office of Technical Assistance inform and assist companies and large users
- Install and retrofit water-saving sanitary devices
- Work with code officials, state programs, manufacturers, legislators to promote water conservation
- Increase amount of pervious areas on property



www.mass.gov/conservemawater

RESOURCES

- State Water Conservation Website: www.mass.gov/conservemawater
- WaterSense Water Efficiency Standards: www.epa.gov/watersense
- Institutional facilities managers should consult “WaterSense at Work” which describes BMPs on water & energy efficiency
- For facilities with automatic irrigation systems, WaterSense labels professional certification programs for irrigation auditors, irrigation designers, and irrigation installation and maintenance professionals.
- New state law (MGL c. 21 s. 67) requires system interruption devices be installed “for newly installed or renovated irrigation systems”
- Water Resources Commission staff in DCR’s Office of Water Resources available to provide guidance

Vandana M. Rao, Ph.D.
Director of Water Policy
Executive Director, Water Resources Commission
Executive Office of Energy and Environmental Affairs
Vandana.Rao@mass.gov
(617) 626-1248
http://www.mass.gov/green

Water Conservation

Various statewide contracts

OPERATIONAL SERVICES DIVISION

Green Awareness for Facility Managers Flyer

Maintenance, Repair and Operations:

- FAC100 - Building Maintenance Repair and Operations Statewide Contract
- FAC101 - Facilities Maintenance, Repair & Operations (MRO) Industrial Supplies
- FAC105 - Maintenance Repair and Operations Industrial and Building Retail Products

Grocer:

- GRO35 - Foodservice Supplies and Equipment, Institutional Commercial Grade Large and Small

Alternative water treatment technologies

- FAC106 - Water Treatment Chemicals and Alternative Treatment Systems

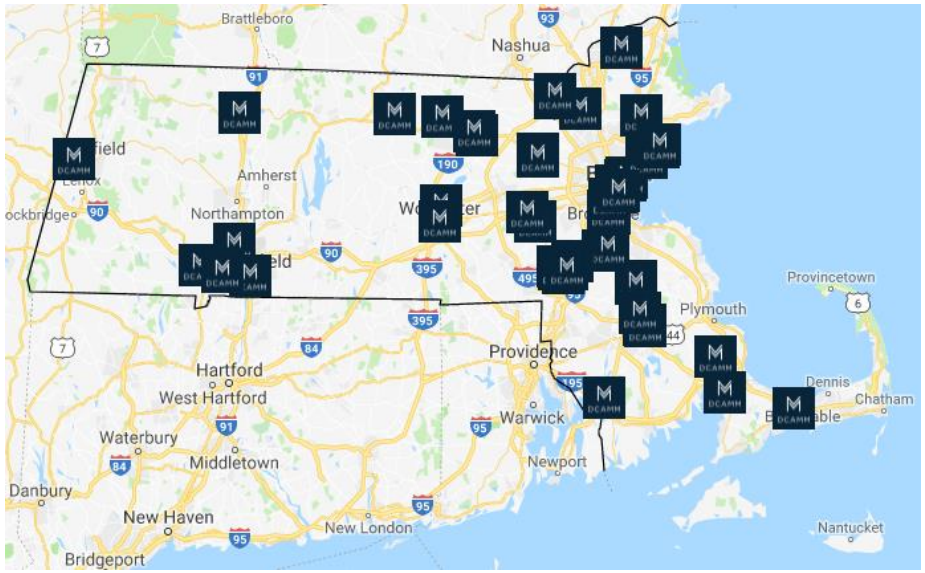
DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

CEI: Commonwealth Energy Intelligence
LBE

COMMONWEALTH ENERGY INTELLIGENCE

Background

- In 2016, contract with Enel (formerly Enernoc, now Hatch) for entire portfolio.
- All information is brought into 1 platform, 1,147 meters and ~500 utility accounts tracking and recording data for:
  - electricity
  - natural gas
  - steam
  - hot and chilled water
  - oil
  - water
- Over 60 sites
- ~32 million square feet
- Major Commonwealth Buildings Including:
  - state hospitals
  - prisons
  - colleges and universities
  - trial courts
  - office buildings
- Managed by DCAMM



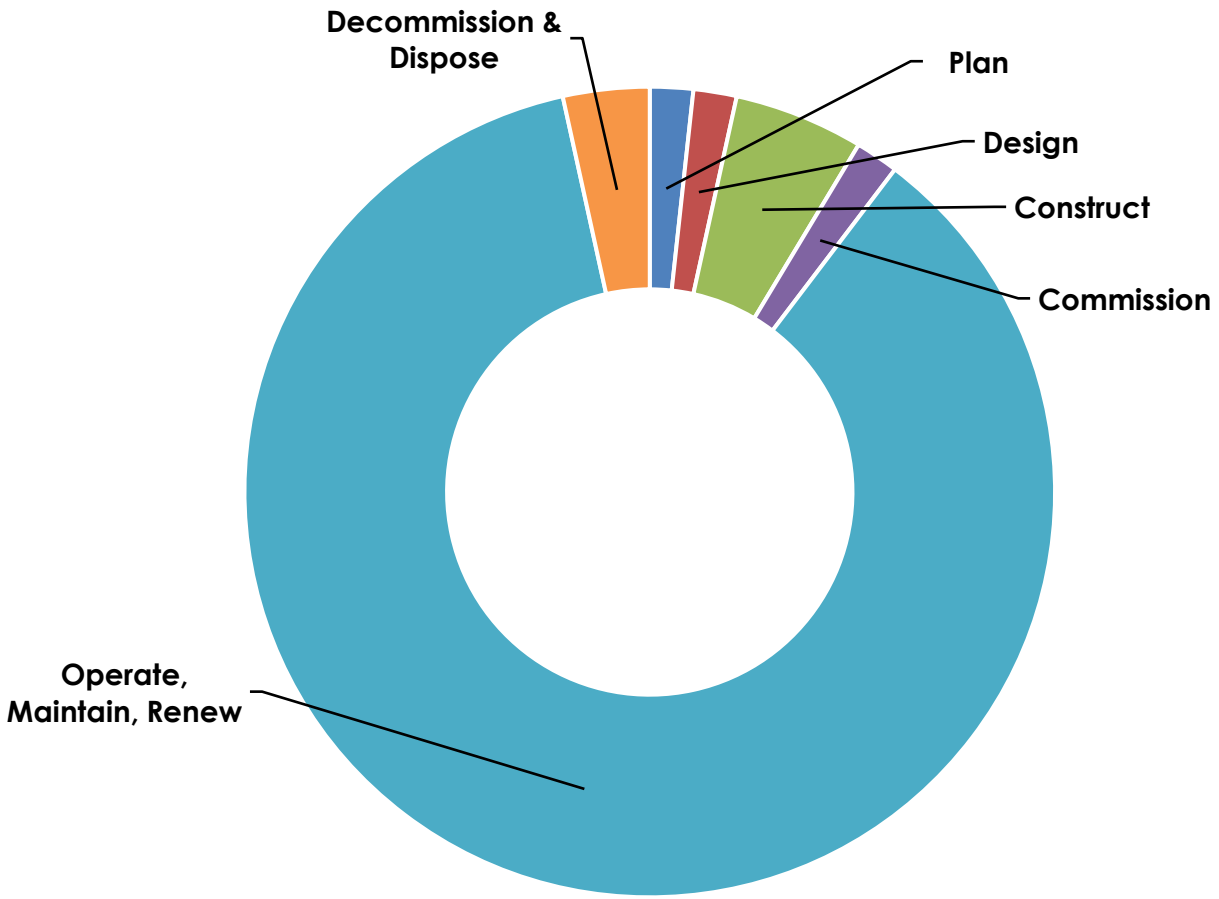
Sites in the CEI program

Installation of meter

ENERGY INTELLIGENCE IMPORTANCE AT DCAMM

We use data throughout the building life cycle for:

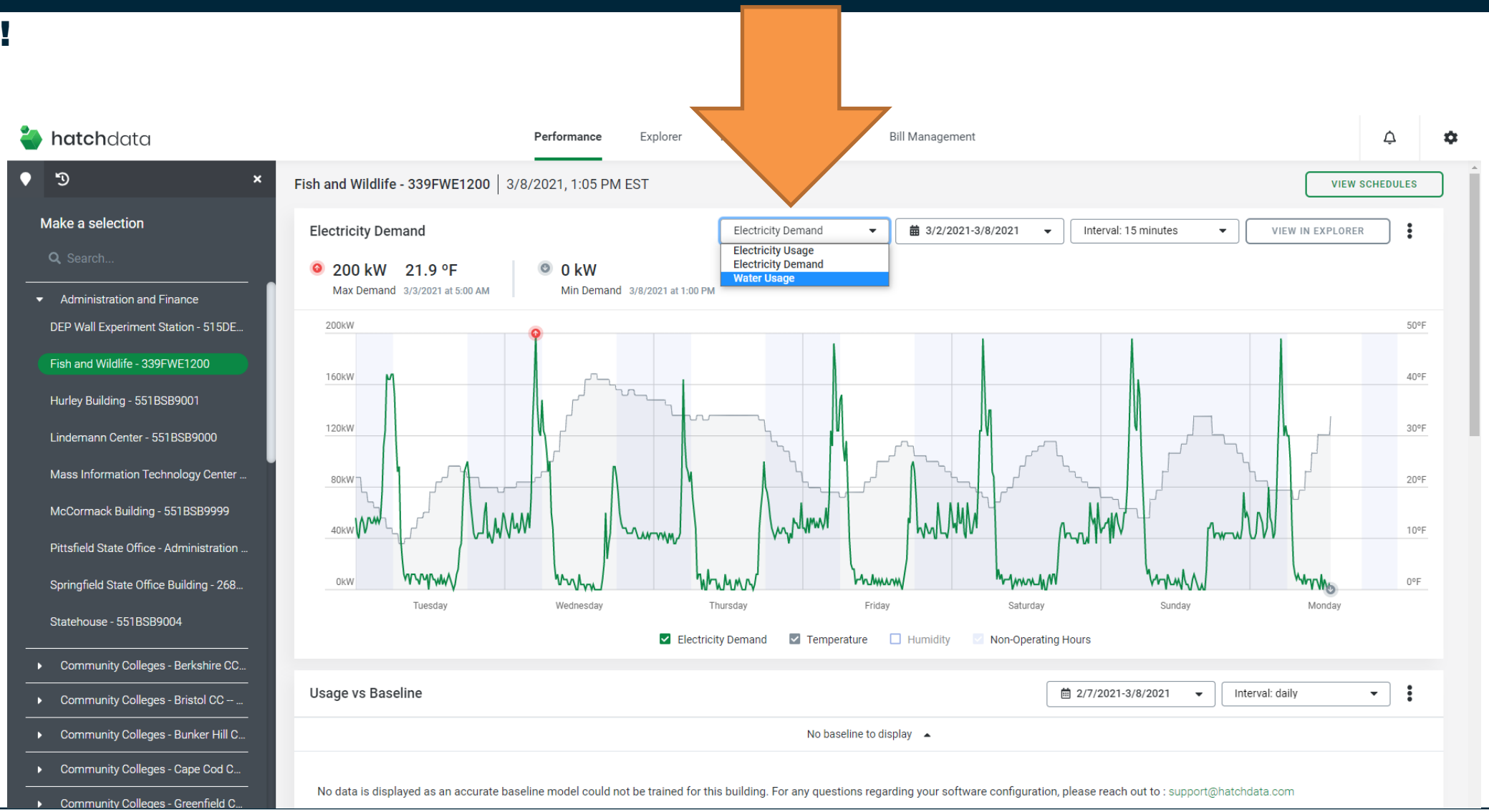
- Program planning
- Project Planning
- Ongoing building operations
- Measurement & Verification



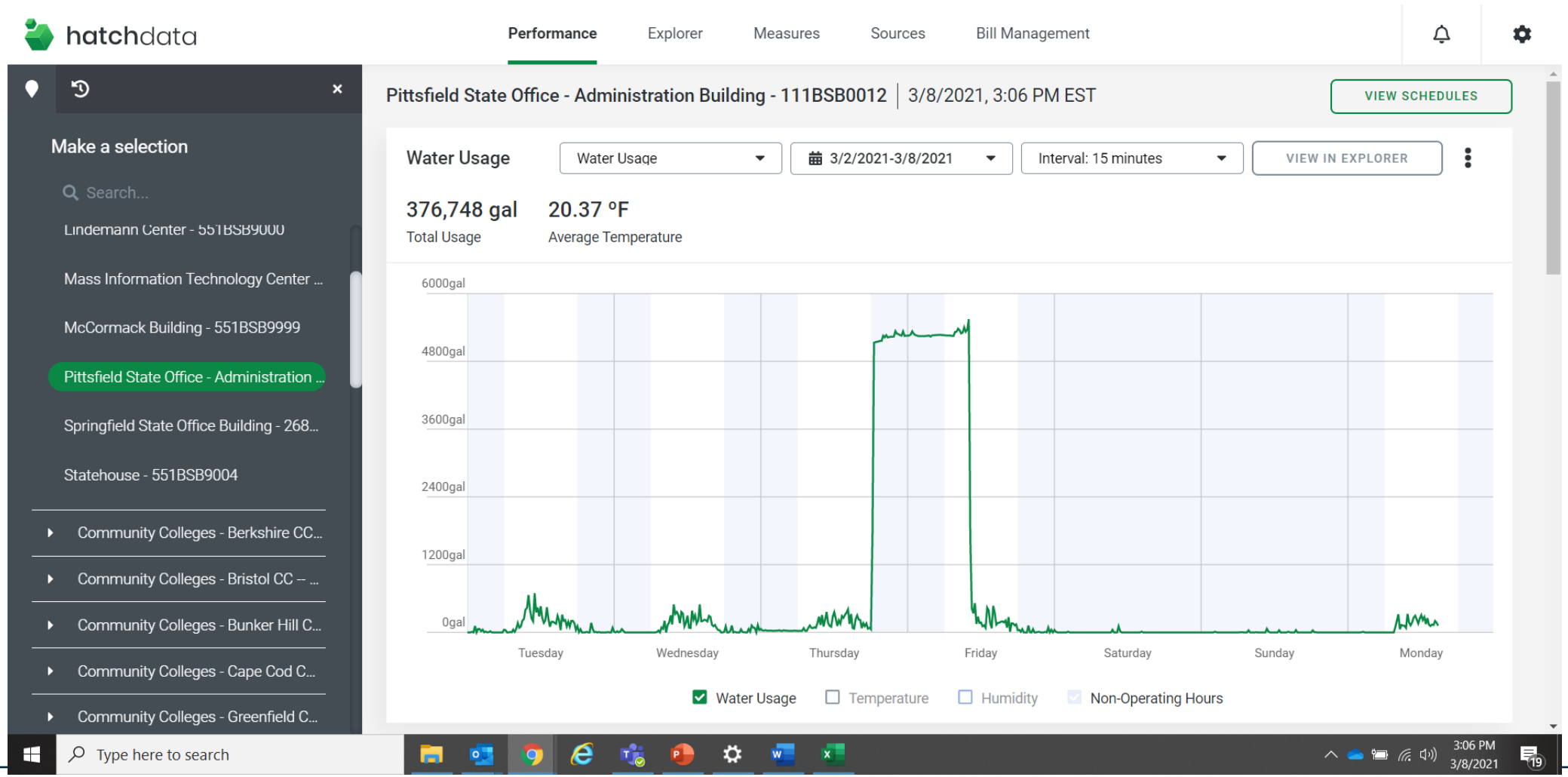
Additional Benefits:

- Save staff time
- Save taxpayer dollars
- Make smarter investments
- Improve existing building performance

NEW!


hatchdata
Performance
Explorer
Bill Management
Make a selection
Search...
Administration and Finance
DEP Wall Experiment Station - 515DE...
Fish and Wildlife - 339FWE1200
Hurley Building - 551BSB9001
Lindemann Center - 551BSB9000
Mass Information Technology Center ...
McCormack Building - 551BSB9999
Pittsfield State Office - Administration ...
Springfield State Office Building - 268...
Statehouse - 551BSB9004
Community Colleges - Berkshire CC...
Community Colleges - Bristol CC -- ...
Community Colleges - Bunker Hill C...
Community Colleges - Cape Cod C...
Community Colleges - Greenfield C...
Fish and Wildlife - 339FWE1200 | 3/8/2021, 1:05 PM EST
VIEW SCHEDULES
Electricity Demand
Electricity Demand
Electricity Usage
Electricity Demand
Water Usage
3/2/2021-3/8/2021
Interval: 15 minutes
VIEW IN EXPLORER
200 kW 21.9 °F
Max Demand 3/3/2021 at 5:00 AM
0 kW
Min Demand 3/8/2021 at 1:00 PM
200kW
160kW
120kW
80kW
40kW
0kW
50°F
40°F
30°F
20°F
10°F
0°F
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Monday
Electricity Demand
Temperature
Humidity
Non-Operating Hours
Usage vs Baseline
2/7/2021-3/8/2021
Interval: daily
No baseline to display
No data is displayed as an accurate baseline model could not be trained for this building. For any questions regarding your software configuration, please reach out to : support@hatchdata.com

WATER USAGE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Performance
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Make a selection
Search...
Lindemann Center - 551BSB9000
Mass Information Technology Center ...
McCormack Building - 551BSB9999
Pittsfield State Office - Administration ...
Springfield State Office Building - 268...
Statehouse - 551BSB9004
Community Colleges - Berkshire CC...
Community Colleges - Bristol CC – ...
Community Colleges - Bunker Hill C...
Community Colleges - Cape Cod C...
Community Colleges - Greenfield C...
Pittsfield State Office - Administration Building - 111BSB0012 | 3/8/2021, 3:06 PM EST
VIEW SCHEDULES
Water Usage
Water Usage
3/2/2021-3/8/2021
Interval: 15 minutes
VIEW IN EXPLORER
376,748 gal
Total Usage
20.37 °F
Average Temperature
6000gal
4800gal
3600gal
2400gal
1200gal
0gal
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Monday
Water Usage
Temperature
Humidity
Non-Operating Hours
Type here to search
3:06 PM
3/8/2021

QUESTIONS?

Krista Lillis, Program Manager: Krista.lillis@mass.gov
Timothy Spencer, Project Manager
Jackie Gomes, Assistant Project Manager

WORCESTER STATE UNIVERSITY

Sustainability at Worcester State University

LBE Meeting

Steve Bandarra

Sustainability Coordinator

March 9, 2021

Campus Water Conservation Efforts – The Basics

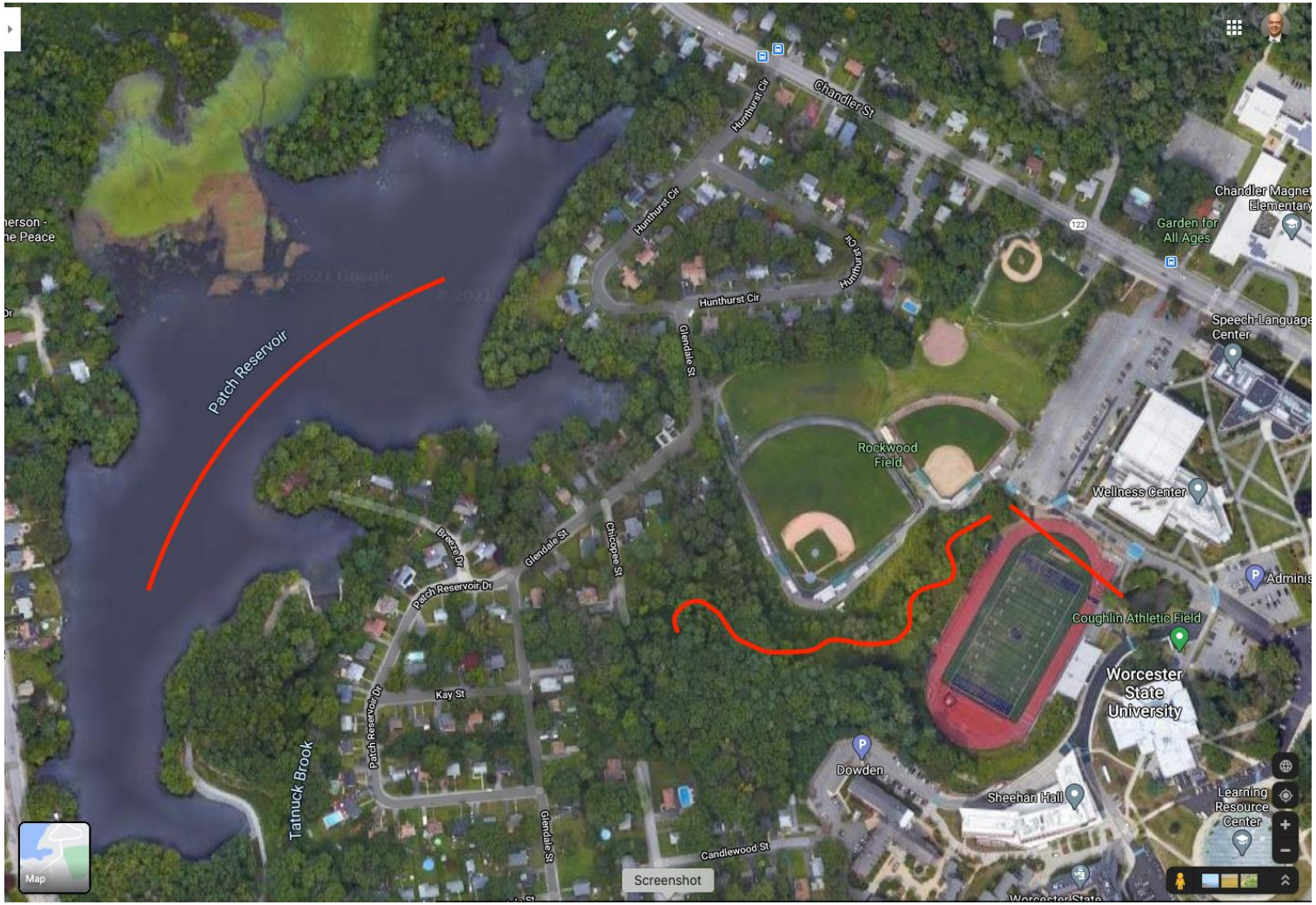
- Low flow faucets and shower heads
- Low flow sprayers for food service
- Dual flush toilets
- Ultra low flow urinals
  - 8 for 1
  - 500 vs 62.5
  - 87.5%

Stormwater Management

- “Lake Ellie”

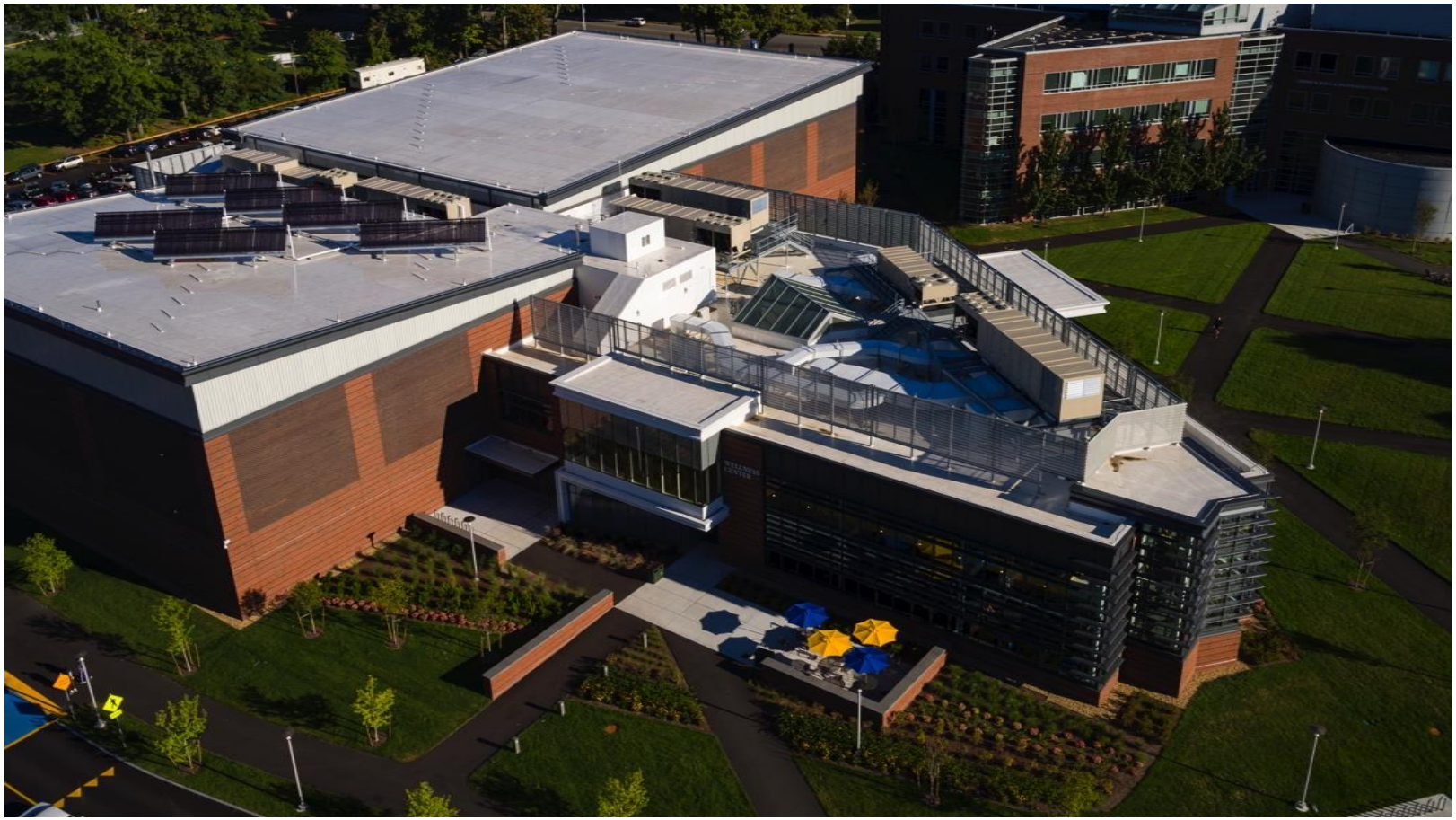
Stormwater Management

Stormwater Management



Wellness Center

- Rain water harvesting for irrigation from roof and stored in a 20,000 gallon underground tank



Thank You!

Steven Bandarra

Sustainability Coordinator

sbandarra@worcester.edu

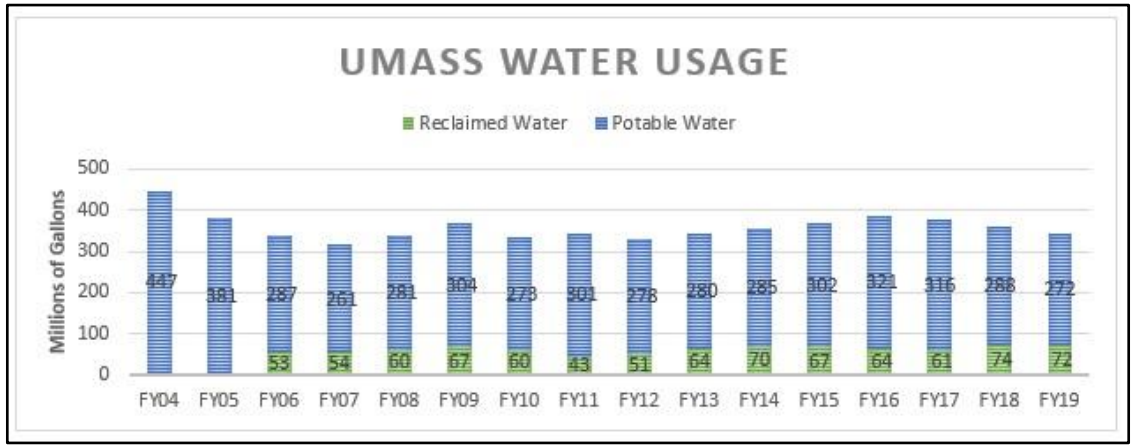
Web:
worcester.edu/green

Instagram and Twitter:
@WSUgreen

Use of Reclaimed Water on UMass Amherst Campus

UMass Reclaimed Water Treatment Facility (RWTF)

- Permitted for Boiler Water Makeup, Cooling Towers, Irrigation and Street Sweeping
- Current system can manufacture maximum of 172,800 gallons per day



Cooling Tower Usage

- Reclaimed Water is used on one (Honors College) of the 24 comfort cooling towers on campus. Saves 1.2 million gallons per year (MGPY) of potable water
- The Central Heating Plant operates two process cooling towers requiring 11 MGPY of water. During Class A water production, 7 million gallons of that is reclaimed water.

Use of Reclaimed Water on UMass Amherst Campus

Positives:

- Cost savings – we currently do not pay for the Wastewater effluent (RWTF influent). The oversight, testing and maintenance costs are less than the cost of potable water
- Sustainability and resiliency, especially during times of drought
- Current successes make reclaimed water attractive for possible use at other campus cooling towers, and other possible applications such as athletic field irrigation, ice rink filling, toilet flushing, and vehicle washing.
- Should a problem arise, the RWTF can be quickly isolated with equipment going onto potable water until the problem has been resolved. (occasionally turbidity levels)
- Infrastructure already existed for the RWTF. UMass already treated potable water via reverse osmosis for the purity required for boiler water make up.

Challenges:

- Getting through the regulatory process (Massachusetts DEP Permits and plumbing board approvals)
- Expansion: costs and required equipment for further use. Is it necessary to utilize RO for cooling towers and irrigation?
- End user perceptions (e.g. landscapers, Athletic Department Heads). A lack of comfort levels with the use of what they perceive to be “sewer water”.

Water Conservation Q&A

Sustainable Landscaping

- Dave Paulson, Endangered Species Review Biologist, MassWildlife
- Julia Wolfe, Director of Environmental Purchasing, OSD
- Ruairi O'Mahony, Director of Sustainability, UMass Lowell
- Rick Navarro, Maintenance Supervisor, Taunton State Hospital
- Chris Hoffman, Forest and Park Supervisor, DCR

Partnering for Pollinators

Progress to Date

Massachusetts Leading by Example

Pollinator Habitats on State Lands

277

Total Acres of Pollinator Habitats at MA State Sites

148

Acres of Limited Mow Zones

120

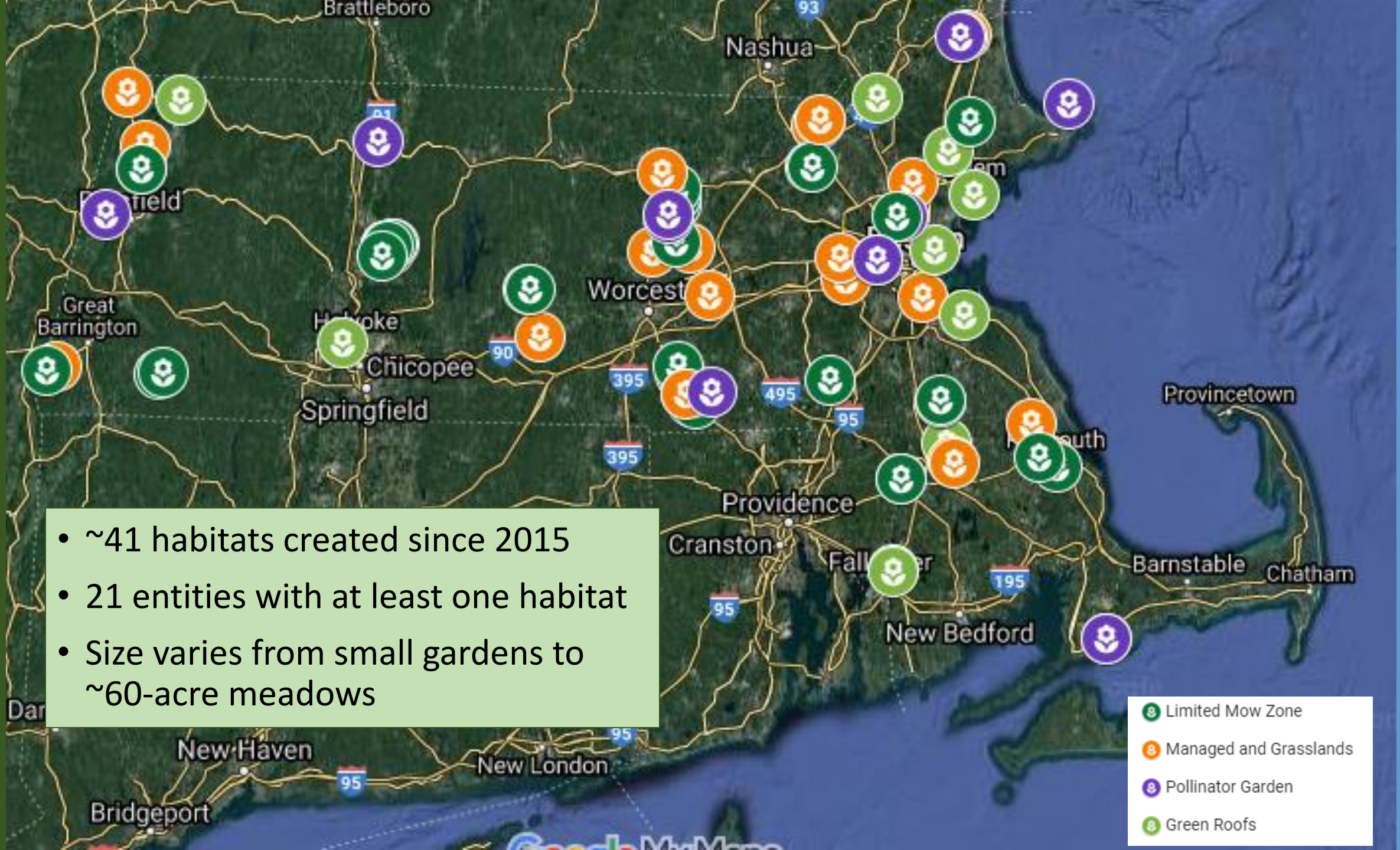
Acres of Managed Wildflower Meadows and Pollinator Gardens

81

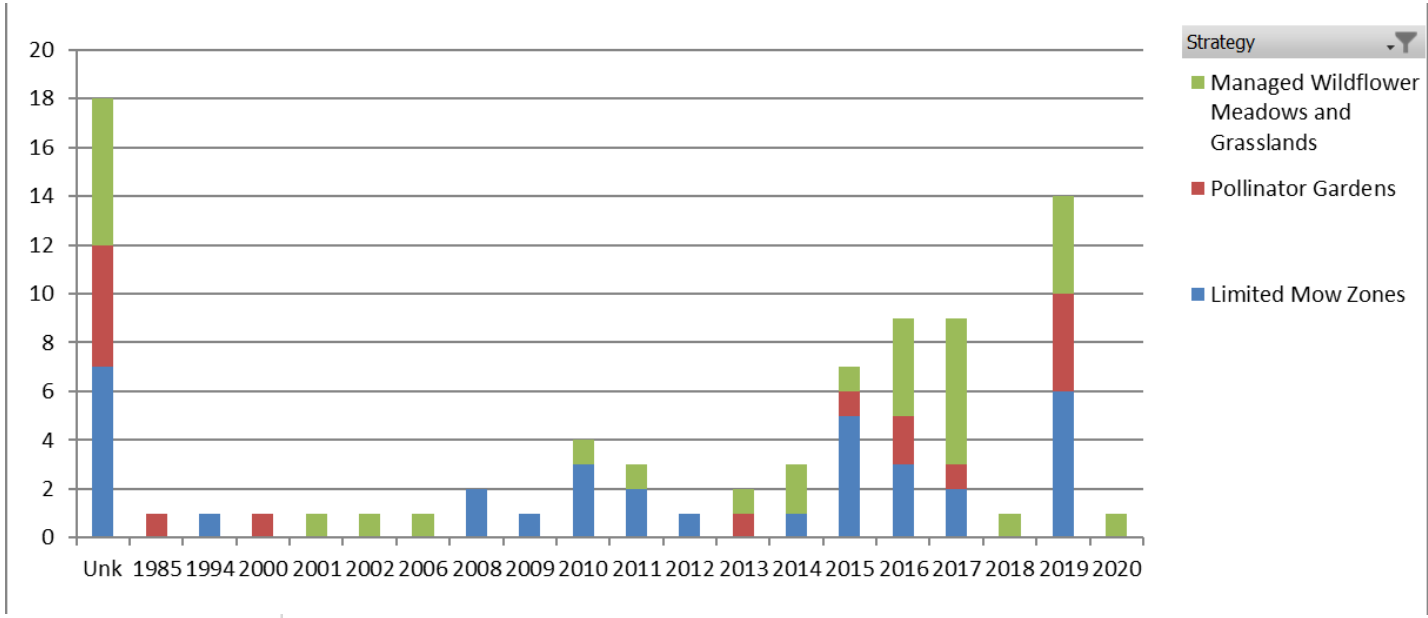
Number of Pollinator Habitats

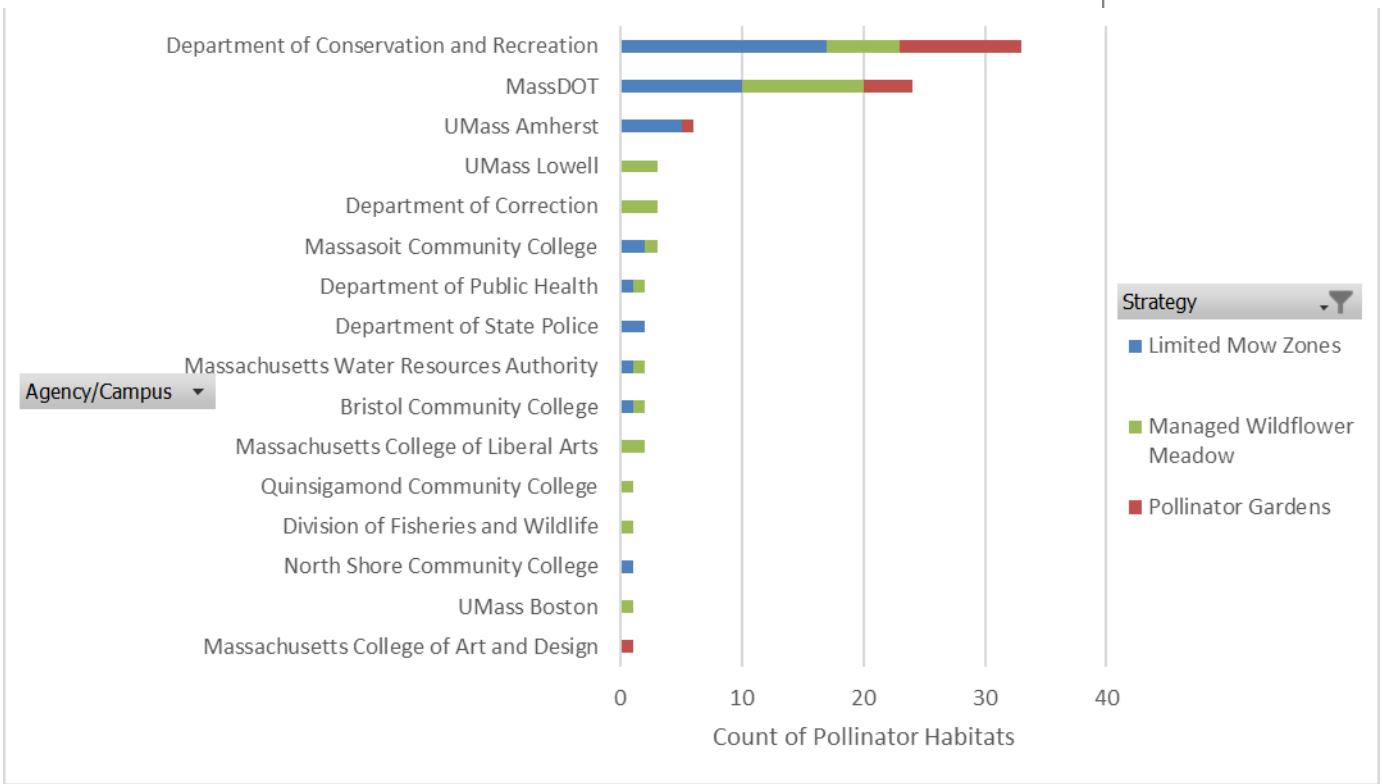
DMH Taunton – Wildflower Meadow

DCR Quabbin – Rain Garden



- ~41 habitats created since 2015
- 21 entities with at least one habitat
- Size varies from small gardens to ~60-acre meadows


20
18
16
14
12
10
8
6
4
2
0
Unk 1985 1994 2000 2001 2002 2006 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Strategy
Managed Wildflower Meadows and Grasslands
Pollinator Gardens
Limited Mow Zones


Department of Conservation and Recreation
MassDOT
UMass Amherst
UMass Lowell
Department of Correction
Massasoit Community College
Department of Public Health
Department of State Police
Massachusetts Water Resources Authority
Bristol Community College
Massachusetts College of Liberal Arts
Quinsigamond Community College
Division of Fisheries and Wildlife
North Shore Community College
UMass Boston
Massachusetts College of Art and Design
Agency/Campus
0
10
20
30
40
Count of Pollinator Habitats
Strategy
Limited Mow Zones
Managed Wildflower Meadow
Pollinator Gardens

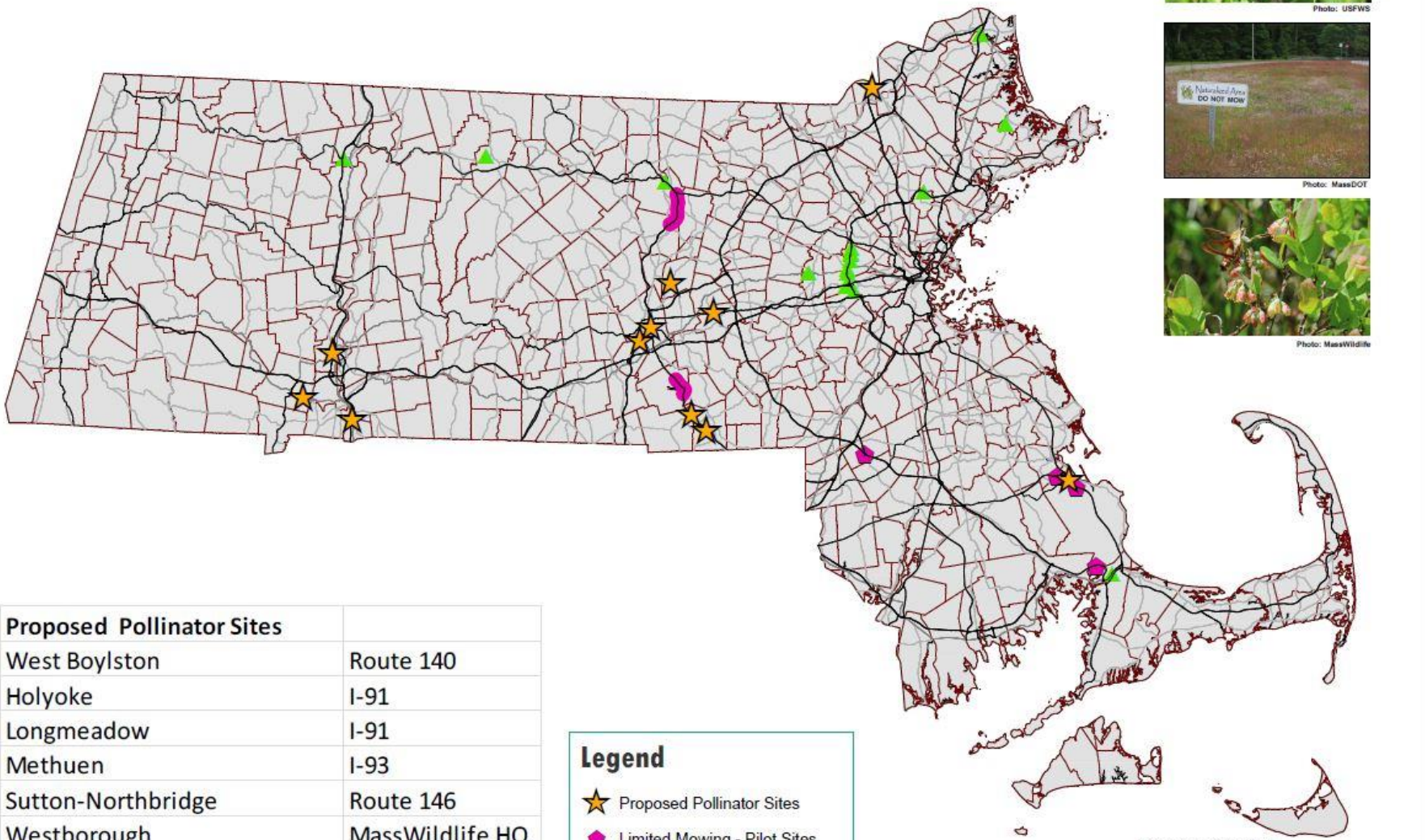
Partnering for Pollinators

massDOT
Massachusetts Department of Transportation
Highway Division


Photo: USFWS

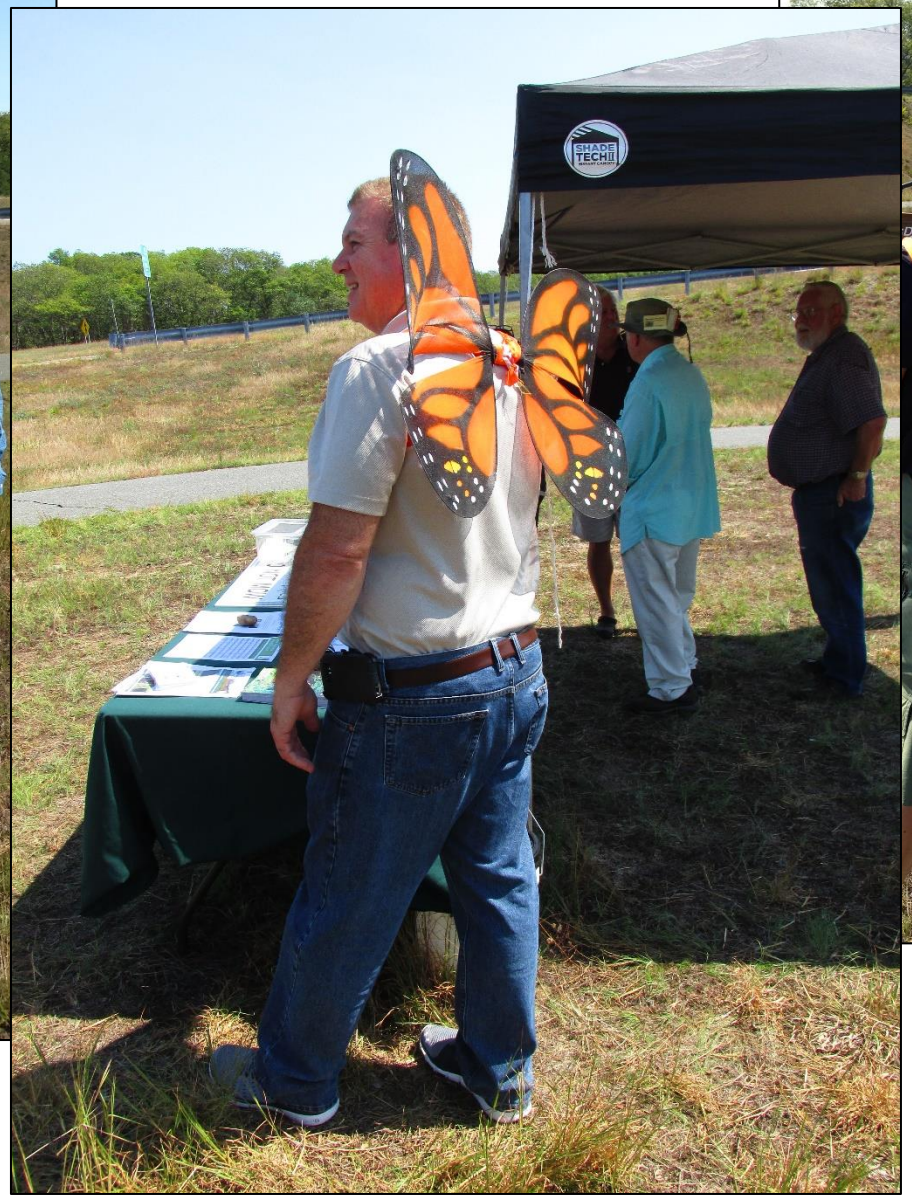
Photo: MassDOT

Photo: MassWildlife



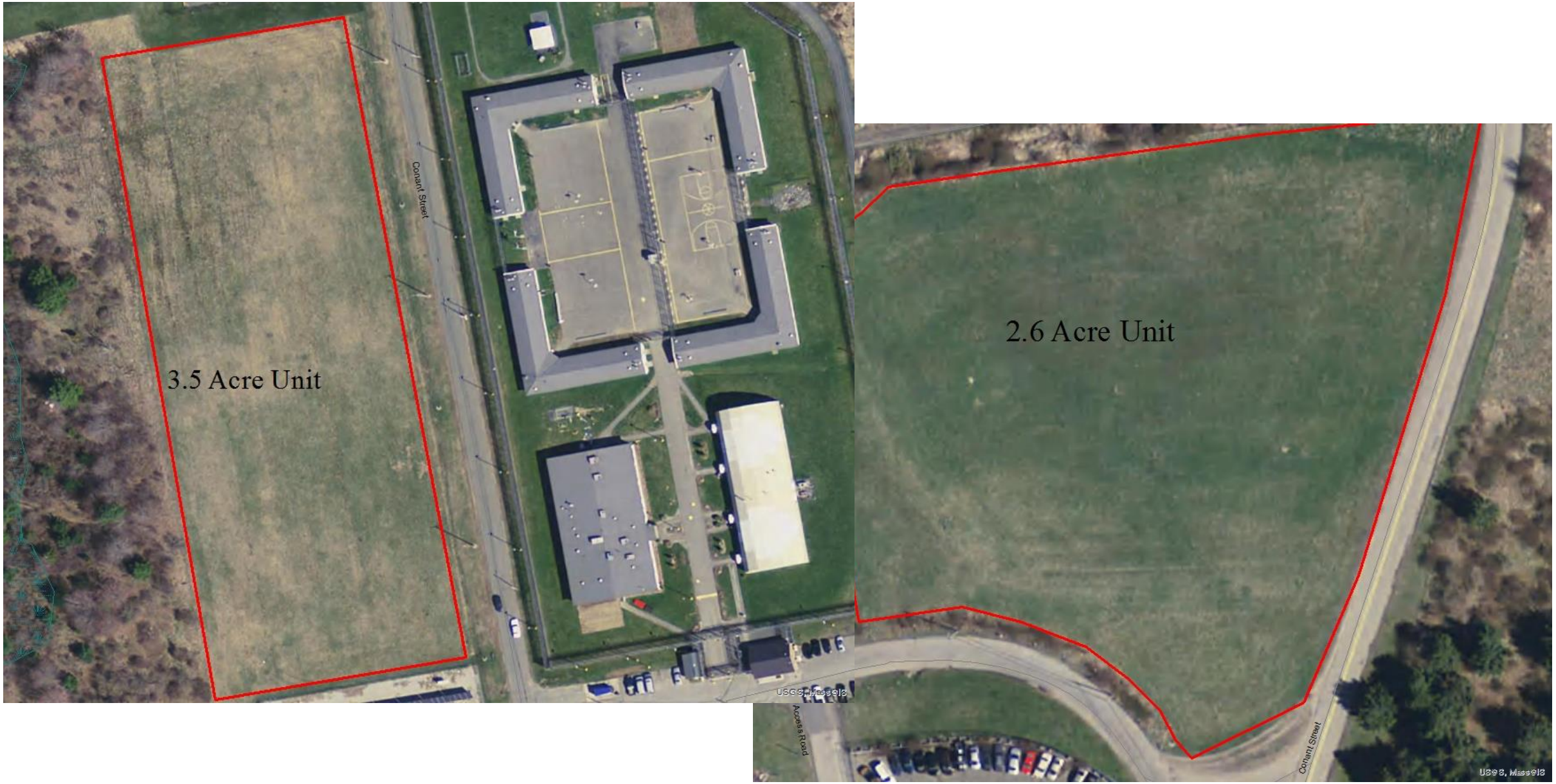
Proposed Pollinator Sites	
West Boylston	Route 140
Holyoke	I-91
Longmeadow	I-91
Methuen	I-93
Sutton-Northbridge	Route 146
Westborough	MassWildlife HQ
Westfield	I-91


massDOT
Naturalized Area
DO NOT MOW


SHADE
TECH


MassDOT


Old Colony
Correctional Center
Bedford St
Taunton River
Taunton River
Google


3.5 Acre Unit
2.6 Acre Unit
Conant Street
Access Road
Conant Street
USGS, Maxar


2.7 Acre Unit
Digital Globe, MassGIS


Mann Pond
Norfolk Auto
R & D AUTOMOTIVE
Main St
Main St
Clark St
Clark St
Clark St
Clark St
Stop River
Mozart Dr
Beethoven Ave
Haydn
MCI Norfolk
Bay State
Correctional Center
Winter St
Beethoven Ave
Winter St

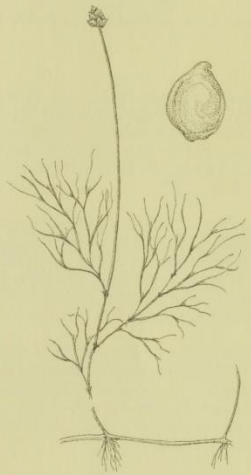
Orange Sallow Moth Habitat Management

The Vascular Plants of Massachusetts:

A County Checklist

First Revision

Melissa Dow Cullina, Bryan Connolly,
Bruce Sorrie and Paul Somers



Massachusetts Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife

	Status	S-Rank	BE	FR	HS	HD	WO	MI	ES	SU	NO	BR	PL	BA	DU	NA
ASTERACEAE COMPOSITE FAMILY																
Ageratina																
altissima (L.) King & H.E. Robinson (Eupatorium rugosum Houtt.) White Snakeroot		S4S5	N	N	N	N	N	N	N	N	N	N	I	I	I	*
aromatica (L.) Spach (Eupatorium aromaticum L.) Lesser Snakeroot	E	S1	*	*	*	*	*	N	*	N	N	N	N	N	N	N
Ageratum																
houstonianum P. Miller Houston's Ageratum		SNA	*	*	*	*	*	*	W	*	*	*	*	*	*	*
Ambrosia																
artemisiifolia L. (Ambrosia artemisiifolia L. var. elatior (L.) Descourtils) (Ambrosia artemisiifolia L. var. paniculata (Michaux) Blankinship) Ragweed		S5	N	N	N	N	N	N	N	N	N	N	N	N	N	N
psilostachya DC. (Ambrosia coronopifolia Torrey & A. Gray) (Ambrosia psilostachya DC. var. coronopifolia (Torrey & A. Gray)		SNA	*	*	I	*	*	*	*	I	*	*	*	I	I	I

Sustainable Landscaping

FAC88: Lawns & Grounds, Equipment, Parts, and Services Statewide

OPERATIONAL SERVICES DIVISION

[FAC88 Contract User Guide]

- Zero toxic emissions
- 50% less noise
- No fuel spillage
- No fuel cost
- Less maintenance
- No soil and water pollution
- Zero GHGs

- Commercial grade battery powered landscape equipment: Push mowers, walk-behind mowers, ride-on mowers, zero-turn mowers, blowers and string trimmers
- Public facilities using: DCR, Mass Aeronautics, Massasoit Community College, UMass Amherst & Lowell

[LBE Battery-powered landscaping equipment for state facilities flyer]

[FAC116 Lawns & Grounds Equipment, Parts and Services Bid]

Sustainable Landscaping

FAC103: Landscaping Services, Snow Removal, Tree Care and Related Services

OPERATIONAL SERVICES DIVISION

Request the following environmentally preferable products and services in the Statement of Work:

Landscaping and Grounds Keeping	Snow Removal	Tree Services	Invasive Plant Control	Outdoor Integrated Pest Management (IPM)	Irrigation systems installation, service and repair:
•Create pollinator protection habitats •Use IPM •Compost and organic fertilizers, native and drought tolerant plants, integration of xeriscape and permaculture practices •Compost all yard waste •Use zero-emission battery electric landscape equipment or, at the least, equipment powered with a four-stroke engine.	•Request deicing and snowmelt products certified by the **EPA's Safer Choice** program.	•Certain regions have a requirement that vendors be **certified by Massachusetts Department of Agricultural Resources to identify Asian long-horned beetles.** •Request non-contaminated trimmings be separated and composted.	•Request plan to target and remove non-native plant species without pesticides/herbicides	•Use IPM for pest management •**NOTE:** Executive Order 403 requires all state agencies to use an Integrated Pest Management (IPM) approach to pest control 	•Request drip irrigation or efficient irrigation equipment certified by **EPA's WaterSense** Program.

FAC103 Contract User Guide

Sustainable Landscaping

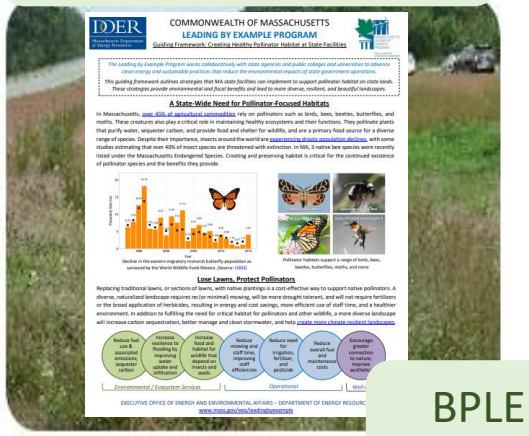
FAC104: Landscaping Products, Parks and Recreation Equipment and Related Products, Supplies and Service

Nursery Products	• Native and low water plants
Turf and Landscape Products	• Native seeds and those that support pollinator protection, water conservation supplies, LED lighting supplies
Compost and Mulch	• Compost is a soil amendment that assists with soil structure, water retention, and erosion control. Meets state testing requirements. Mulch used to retain moisture in soil, suppress weeds, and keep soil cool.
Soil Aggregate Products	• Recycled or reused aggregate products
Fertilizer	• Certified liquid organic fertilizers, organic plant stimulants, and organic soil amendments (certified by Organic Materials Review Institute (OMRI), National Organic Program (NOP), other nationally recognized program. Some vendors provide soil testing and take-back and recycling services for packaging.
Playground Equipment	• Made from plastic with at least 90% PCRC, plastic composite at least 50% PCRC
Playground Surfaces	• Made from rubber or plastic with at least 90% PCRC
Site Furnishing/Amenities	• Benches and picnic tables contain at least: plastic 90% PCRC, plastic composite 50% PCRC, aluminum 25% PCRC, concrete 15% PCRC. Bike racks made from HDPE to contain 100% PCRC, and steel at least 25% PCRC
Sports and Fitness Equipment	• Running tracks contain at least 90% PCRC
Outdoor Shelter/Shade Structures	• Recycled content composites
Fencing, Railing, Decking , Partitions and Lockers	• Plastic fencing to contain at least 60% PCRC, plastic shower partitions to contain at least 20% PCRC
Related Specialty EPP Products	• Products must be made with recycled materials and be less toxic or provide one or more additional environmental benefits compared to competing products and materials serving the same purpose. E.g., timbers or other products made with recycled plastic, erosion control bales made with recycled materials, less toxic athletic marking paint….

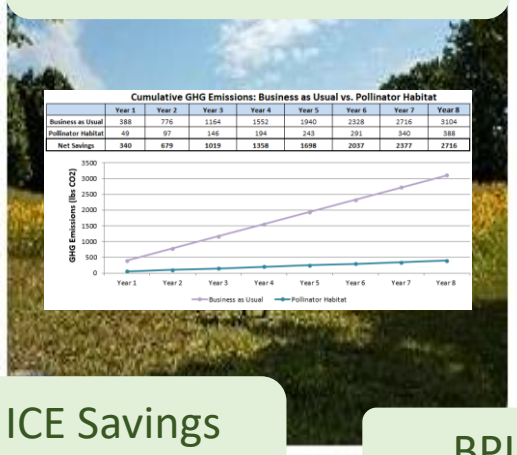
[FAC104 Contract User Guide]

Sustainable Landscaping Resources

Pollinator Habitat Guiding Framework

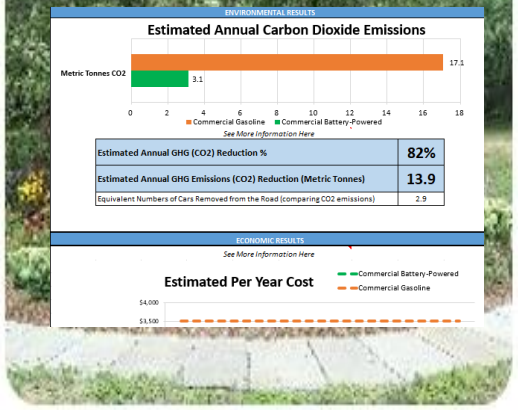


Lawn-to-Habitat Savings Calculator



Sample Signage

BPLE vs ICE Savings Calculator



BPLE Infographic

Seed Guidance – Under Development

Introduction		Grasslands and wildflower meadows can offer a numbe local wildlife. This guide is intended to provide exampl converted from lawns. Note that these mixes may not b contact Ryan.Kingston@mass.gov if consulation might b
Considerations before getting started	**Costs**	**Upfront and ongoing costs v** costs are provided as estima establishment, native plant landscaping costs. The Lawn to Pollinator Habi estimation of long-term sav
	"Pollinator Meadow" vs "Grassland Habitat"	The seed mixes included he **grassland meadows.** "Pollin more colorful than grass-do mixes contain more grasses **habitat restoration is a prim**
	Ongoing Care	**Facilities should be prepare** every site is different, ongo example, and in some cases experts if needed.

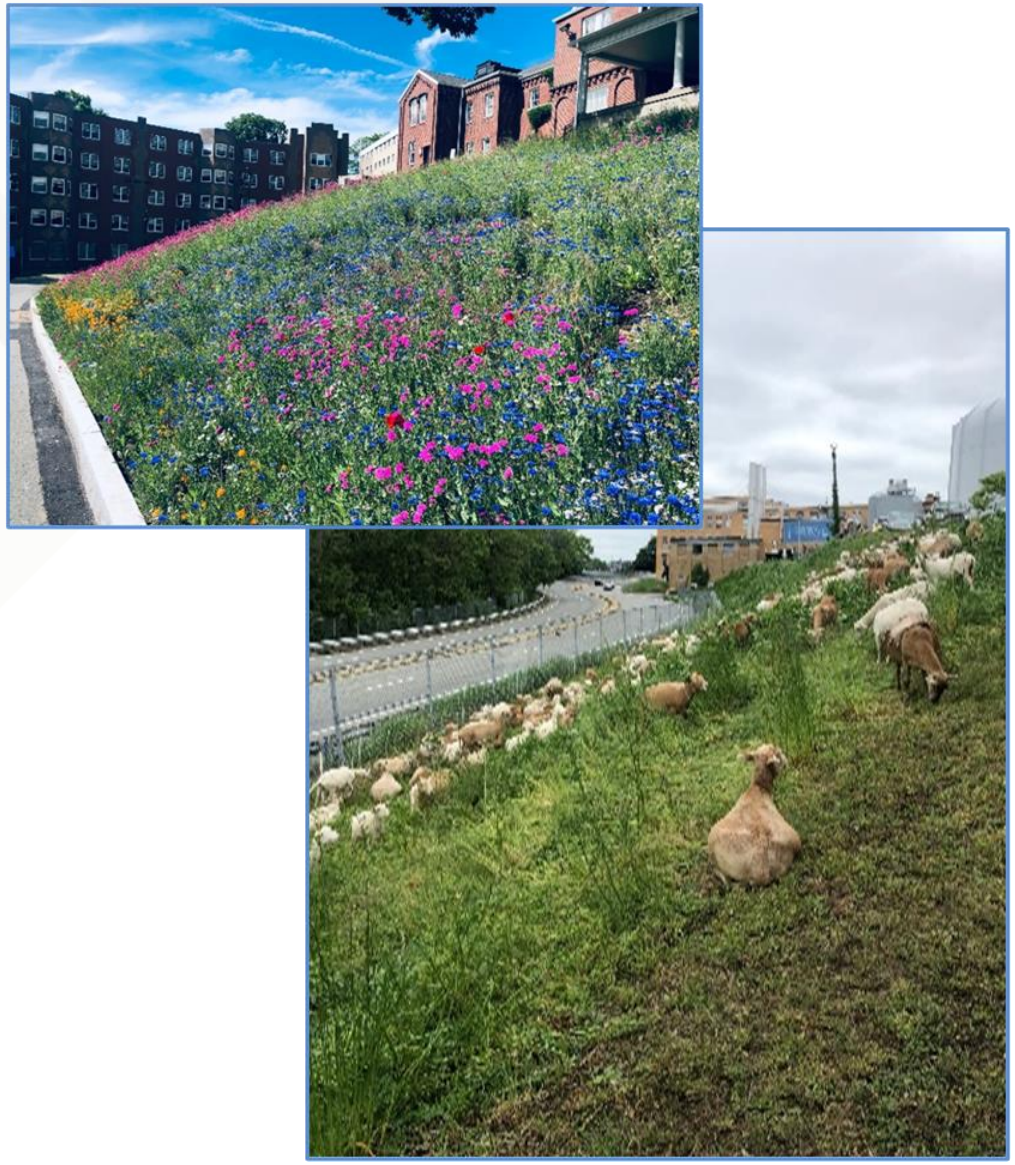
Visit: www.mass.gov/info-details/sustainable-landscaping-at-state-facilities

DOER
Massachusetts Department of Energy Resources

UMASS LOWELL – SUSTAINABLE GROUNDS MANAGEMENT

- Replaced three gas-powered lawn mowers with electric, solar assisted mowers
- Zero-emissions with improved power, torque & efficiency
- Tires or “Tweels” airless
- Reduced operator stress from lower noise, engine heat/vibration, and exhaust fumes
- 23,000lbs in GHG reductions per year

UMASS LOWELL – SUSTAINABLE GROUNDS MANAGEMENT



- Four separate pollinator habitats.
- Received waiver on latest LEED project to include pollinator habitat in place of no-mow designation.
- Campus beautification in addition to significant fiscal savings.
- Goats2Go. Very effective service, third of the cost versus traditional landscaping. Great PR!

Taunton State Hospital Wildflower Meadow

June 2017
1st growing season

August 2019
3rd growing season

June 2018
2nd growing season

June 2020
4th growing season

Battery Powered Landscaping Equipment

Walden Pond State Reservation

MA Dept of Conservation and Recreation

Christopher Hoffman, Park Supervisor

3/9/21


OREGON


OREGON
STIHL
BX650
OREGON
BX975
Blower
OREGON
OREGON


OREGON

Thank You

The MeanGrean SK48: Comfortable, quiet, & stands up to any gas-powered rival.

My staff love using the equipment!

Sustainable Landscaping Q&A

Waste Diversion

- Heather Billings, RecyclingWorks
- Julia Wolfe, Director of Environmental Purchasing, OSD
- Sean Foley, Construction Coordinator, Department of Correction
- Suzanne Wood, Associate Director, Sustainability and Campus Services, UMass Medical School

WASTE REDUCTION RESOURCES

Leading By Example | March 9, 2021

RECYCLINGWORKS
MASSACHUSETTS

RECYCLINGWORKS
MASSACHUSETTS

FREE ASSISTANCE FOR STATE AGENCIES & INSTITUTIONS

RecyclingWorks MA is funded by MassDEP, delivered under contract by the Center for EcoTechnology

recyclingworksma.com

What Is Technical Assistance?

Evaluate existing waste streams

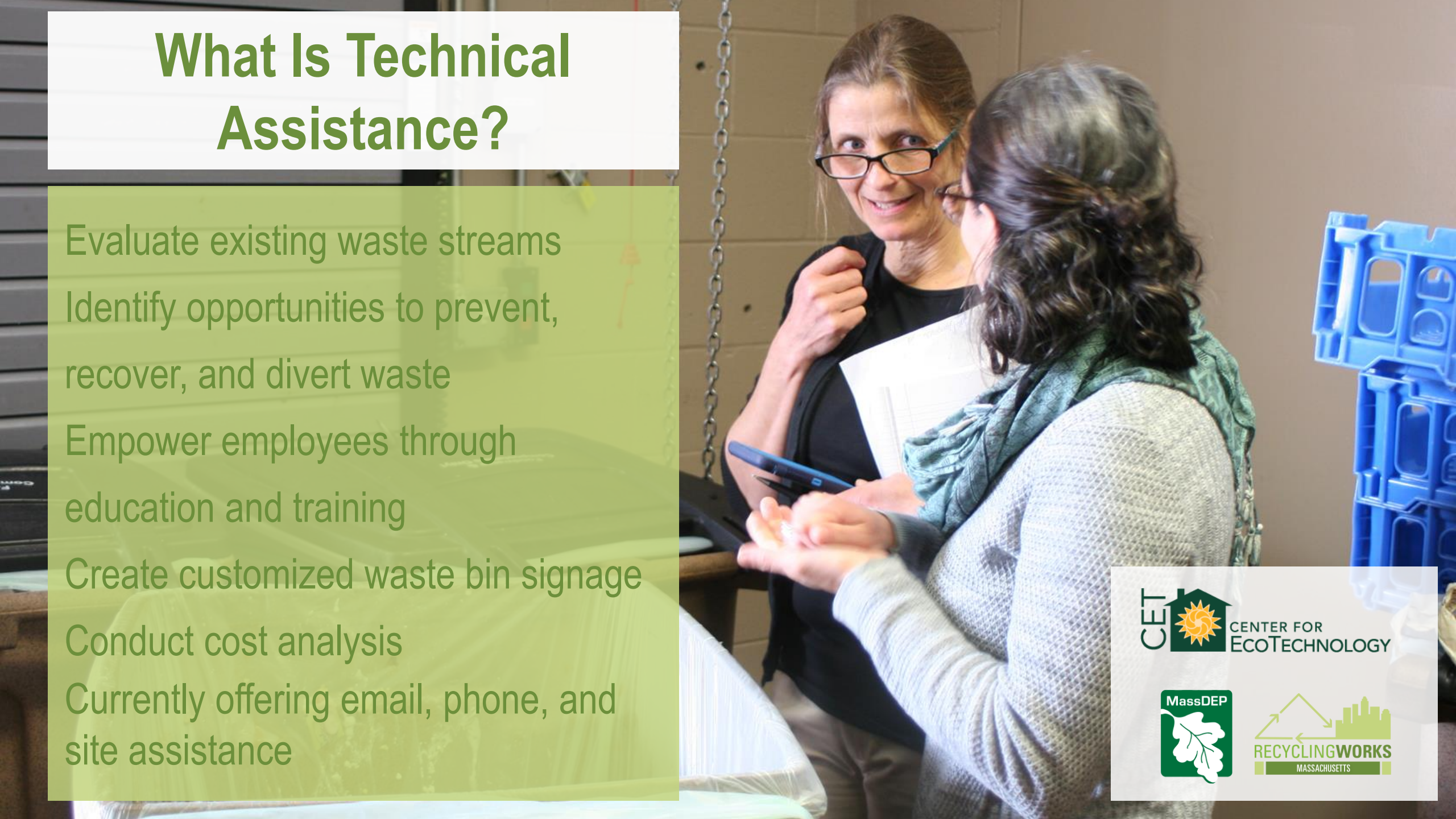
Identify opportunities to prevent, recover, and divert waste

Empower employees through education and training

Create customized waste bin signage

Conduct cost analysis

Currently offering email, phone, and site assistance



CET CENTER FOR ECOTECHNOLOGY

MassDEP

RECYCLINGWORKS MASSACHUSETTS


Remote Assistance
Available

Massachusetts Waste Bans

- Cardboard & paper
- Metal, glass, and plastic containers
- Commercial food waste (1 ton/week threshold, proposed reduction to .5/ton)
- Construction & demolition materials
- Yard waste
- Cathode Ray Tubes
- White goods

Massachusetts Waste Bans

recyclingworksma.com/waste-bans-and-compliance/

Visit the RecyclingWorks website for the complete list of banned materials

Estimate Your Food Waste

Correctional Facilities

	Average Measurement		Material
Inmates	1	lbs/inmate/day	Food Waste
Disposed Waste[1]	30	% of total generated waste by weight	Food Waste

Colleges & Universities

	Average Measurement		Material
Meals Served	0.35	lbs/meal	Food Waste
Students[1] **[Residential]**	141.75	lbs/student/year	Food Waste
Students[2] **[Non-Residential]**	37.8	lbs/student/year	Food Waste

recyclingworksma.com/food-waste-estimation-guide

Hauler Contracting Guidance

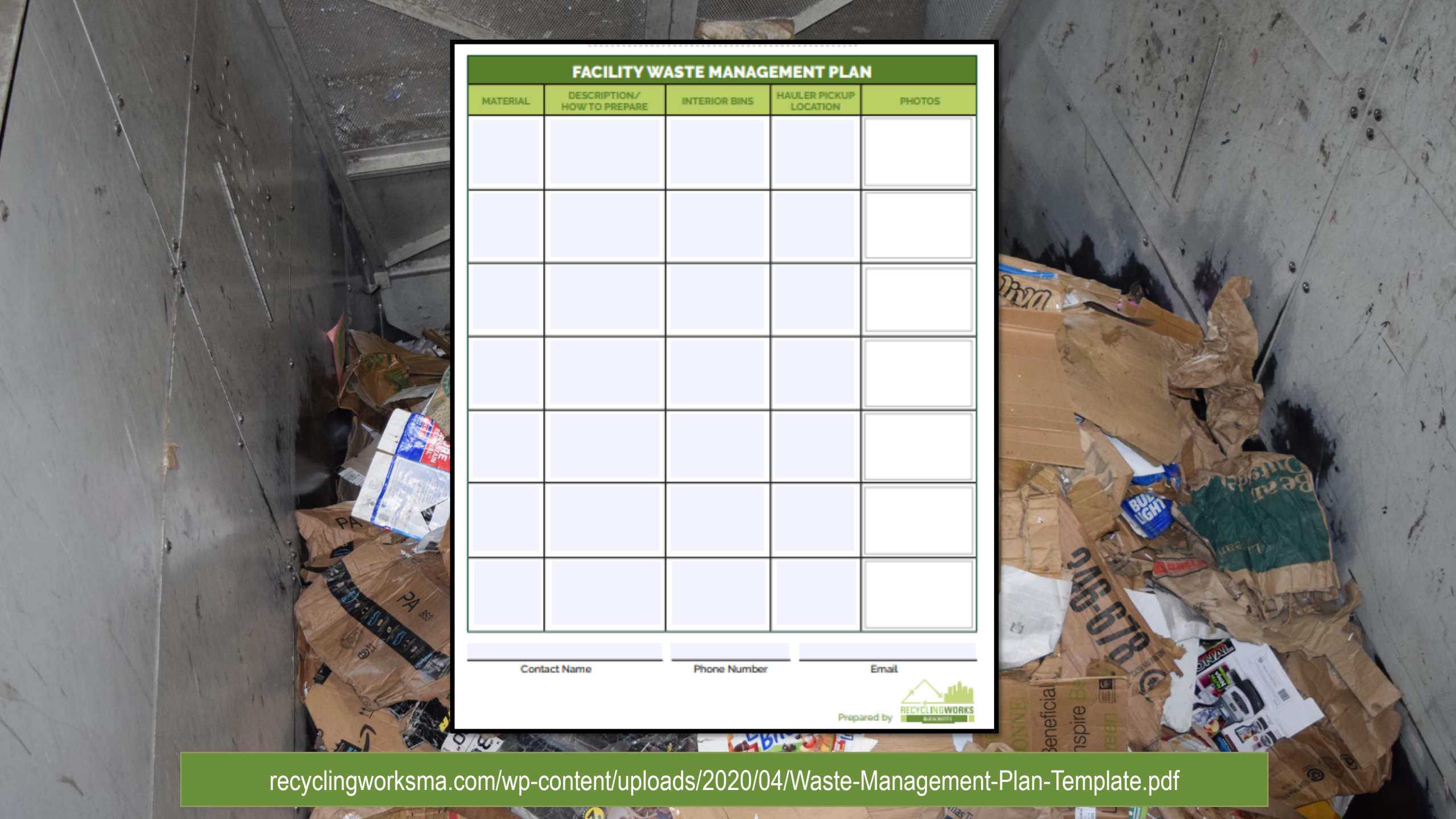
Know Your Waste

Create and Adjust Contracts

Comply with Waste Disposal Bans and Other Regulations

Communicate Effectively

recyclingworksma.com/hauler-contracting-bmp/



FACILITY WASTE MANAGEMENT PLAN

MATERIAL	DESCRIPTION/ HOW TO PREPARE	INTERIOR BINS	HAULER PICKUP LOCATION	PHOTOS

Contact Name | Phone Number | Email

Prepared by RECYCLINGWORKS MASSACHUSETTS

recyclingworksma.com/wp-content/uploads/2020/04/Waste-Management-Plan-Template.pdf

Resource Management Contracting for Waste Services

- Establish baseline cost, performance, and service levels
- Align all services to support resource efficiency
- Rethink hauler role and relationship
- Establish transparent pricing for services
- Provide direct financial incentives for resource efficiency

recyclingworksma.com/resource-management-contracting-for-waste-services/

Furniture and Office Equipment Reuse Guidance

Furniture and Office Equipment Reuse Guidance

State Surplus Property Program

Declare surplus property

Statewide Contract

Uniform Procurement Act

Donation and Recycling Resources

recyclingworksma.com/furniture-and-equipment-reuse-guidance/

Tips for Managing Trash and Recycling As You Reopen

- Contact your waste hauler
- Re-evaluate your waste needs
- Communicate with your employees
- Follow Recycle Smart MA guidance

Additional Resources for Reopening

Reopening Massachusetts

Comprehensive information from the Baker-Polito Administration regarding the plan to safely reopen the Massachusetts economy, get people back to work, and ease social restrictions while minimizing the health impacts of COVID-19

COVID-19 Information for the Solid Waste Management Industry

MassDEP has identified several resources related to the management of solid waste during the evolving COVID-19 outbreak

Contact Info

RecyclingWorks Hotline
(888) 254-5525
info@RecyclingWorksMA.com
www.recyclingworksma.com

Heather.Billings@cetonline.org

Questions?

RECYCLINGWORKS
MASSACHUSETTS

Waste Diversion

Various statewide contracts

OPERATIONAL SERVICES DIVISION

EPP Recycling Flyer

The Commonwealth of Massachusetts'

Environmentally Preferable Products Procurement Program

Manage Your Organization's Waste Stream in a More Sustainable Manner...

Recycling Possibilities on Statewide Contract

- The ability to recycle a vast array of items; and
- Tools and products to develop a recycling program in your facility, including on-site visits by awarded contract vendors who will assess your organization's needs, make cost-effective recommendations, and provide employee training.

Recycling 101:
Important Statewide Contracts to Know

FAC110 - Hazardous/Universal, Medical, and Electronic Waste Disposal and emergency response, offering comprehensive recycling solutions for hazardous waste

FAC85 - Environmentally Preferable Cleaning Products, Programs, Equipment, and Supplies, including recycling containers under Category 6 and recycled content/ compostable liners under Category 9

FAC86 - Solid Waste and Recycling Services, providing full waste and cost-effective recycling services for non-hazardous materials

FAC113 - Recycling Containers, Compost Bins, and Rain Barrels, providing a wide range of waste and recycling containers, including Big Belly compactors

FAC90 - Carpet and Mattress recycling services

Environmental Impact

In FY20, Commonwealth buyers diverted an estimated 55,710 tons of waste from disposal to recycling using resources on Statewide Contract. This reduction is equivalent to conserving the annual energy consumption of 10,169 households.[1]

mass.gov/epp

Recycling Possibilities on Statewide Contract

Antifreeze - FAC110
Asphalt, Brick, Concrete - FAC86
Batteries - FAC110, OFF47
Construction & Demo, including Clean Gypsum Wallboard & Corrugated Cardboard - FAC86
Electronic Waste - FAC86, FAC110
Fire Extinguishers - FAC110
Glass Containers - FAC86
Lamps and Ballasts - FAC110
Mattresses - FAC86, FAC90
Mercury - FAC110
Metal Cans and Containers - FAC86
Motor Oil - FAC110
Oil Filters - FAC110
Organic- Food Waste - FAC86
Organic - Leaves, Yard Waste and Floating Vegetation - FAC86, FAC103
Organic Solvents - FAC110
Paints - FAC110
Paper - FAC86
Paper Shredding/Secure Document and Media Destruction - FAC86, FAC96
Plastic Bottles and Containers - FAC86
Recyclable Fuels - FAC110
Redeemable Bottles and Cans - FAC86
Scrap Metal - FAC86
Sharps - FAC110
Street Sweepings - FAC86
Tanks - FAC110
Textiles - FAC86
Tires - FAC86
Toner Cartridges - ITC86
Vehicle Windshields - VEH103
White Goods (Large Appliances) - FAC86
Wood - FAC86

Did you know?

Better for the Environment and Cost Effective!

Remanufactured toner cartridges (remans) are produced from recycled empty toner cartridges that are inspected, cleaned, refilled, and quality tested to ensure optimal performance.

Comparing the average cost of remans with similar Original Equipment Manufacturer (OEM) cartridge costs, Executive Agencies saved $262,819 by using remans in FY20.[1]

Contact Us!

Julia Wolfe, Director of Environmental Purchasing, Operational Services Division
julia.wolfe@mass.gov
617-502-8836

[1] *2020 Annual Report for MA EPP Program: mass.gov/epp > EPP Annual Reports and Other Publications*

Refer to the Contract User Guides for details: mass.gov/osd > Find a Statewide Contract User Guide.

mass.gov/epp

© 2021 Operational Services Division

- Recycling services for hazardous and universal wastes
- Recycling services for solid waste
- Compostable liners, plastic bags with PCR plastic
- Recycling containers, compost bins, rain barrels, and other
- Professional services available through the PRF contracts (consultants, coordinators, planners, advertising, marketing)

Department of Correction: Waste Diversion and Recycling

Success with common materials

- Cardboard – baled and stored for recycling
- Scrap metals – cabinets, bedframes, Industries materials
- Plastic wrap – compressed and baled. No real after market.
  - **Need to identify better packaging**
- Canned food goods – flattened and baled
- Plastic bottles and various plastics – crushed and baled
- Shredded paper from daily operations
- Mattresses and construction debris.

Materials that can't be easily recycled

- Wood pallets – reuse, repurposed, return to supplier. Donate (orgs and schools)
- Waste food – Handling issues, need to refrigerate (odors and insects), farmer payments

Making it all Work

- 50% recycling rate for last ~10 years, up from 30%
- Need to get buy in and cooperation to ensure maximum recycling effort
- Each facility is ranked and compared - recycling rates and wastes discarded
- Ownership and responsibilities at the facility level
- Reduce incoming materials that are hard to recycle. Periodic review needed

Managing Untraditional Waste Streams

Surplus Office, Lab, and Medical Supplies

UMASS MEDICAL SCHOOL

SWAP Shop (Surplus with a Purpose)

- A “store” where any student, faculty or staff member encouraged to bring useful work-related items for reuse/exchange
- Not “formally designated” space
- The SWAP Shop accepts office and lab equipment and supplies
  - NO: chemicals, biologicals, isotopes, or needles.
  - Any lab equipment must be appropriately decontaminated
  - All computer peripherals that store information must be wiped of all data
  - No large pieces of furniture or equipment

UMASS MEDICAL SCHOOL

SWAP Shop: Successes & Challenges

- Exchanged over 15,000 lbs since opening in 2015
- Location: acquiring space is challenging – we had to be okay with “squatting” and changing locations if the room was needed by other departments
- Space can become dumping ground
  - Does require some oversight and organization
    - Sustainability Staff (1hour every 2 week-ish)
    - Support through partnerships: Grafton Job Corps
  - “rules” are not always followed – large equipment, not decontaminated, broken items
    - Larger clean-outs
    - Decontamination

UMASS MEDICAL SCHOOL

Looking beyond the campus

- Not all surplus items (even in “good” condition) have a useful life on campus
  - Medical supplies – no longer considered sterile if opened in patient room or fall on the floor
  - Medical equipment – technology changes and may become outdated
- Develop partnership to outside the organization to reuse items which are no longer useful on campus
  - Partners for World Health – affiliated hospital donates medical supplies that can no longer be used to medical mission trips
    - Donated over 20,000lbs since 2019 (pre-COVID)

▲ Example of medical supplies often used in developing countries compared to donated items

UMASS MEDICAL SCHOOL

Waste Diversion Q&A

Open Discussion and Q&A

Next LBE Council Meeting

Save the Date!

Tentative:

Tuesday, May 11th

10:00 am–12:00 pm

Upcoming Tentative Meeting Dates:
July 13th
September 7th
November 9th

Source video