Medford High School

Medford Comprehensive High School
Eco-Charrette Community Meeting
09/17/2026



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LeftField
Agency
Landscape + Planning

Agenda

1. Introduction & Project Overview (10 mins)
2. Sustainability Givens Overview (5 mins)
3. Healthfulness & Environmental Literacy (5 mins)
4. LCCA Overview & Preliminary PV Analysis (10 mins)
5. Breakout Sessions (40 mins)
    - Climate, Energy & Atmosphere
    - Water Efficiency & Sustainable Sites
    - Healthy Materials & Indoor Environmental Quality
6. Wrap-up & Next Steps (10 mins)

Meet the Team



Martine Dion, FAIA,
LEED AP BD+C
Director of Sustainability



Matt Rice, AIA
LEED AP BD+C
Principal In Charge



Michael Reid, AIA
Architect



Melissa Russell,
CPHC, LFA, SHP,
WELL AP
Sustainable Design Analyst



Brenda Lam,
LEED AP BD+C,
Fitwel Amb.
Sustainable Design Project Coordinator



Laura Swan
Civil Engineer



Emily Ehlers, PE
Mechanical Engineer

What is an Eco-Charrette ?

A collaborative workshop focused on **sustainable, environmentally responsible solutions**, bringing together diverse stakeholders and community voices contributing to a consensus-based discussion of a project's sustainable design goals and objectives.

The 3 main objectives:

1. *To familiarize and educate stakeholders on general sustainable design principles and the LEEDv4 for Schools certification.*
2. *Identify current and potential sustainable design opportunities.*
3. *Develop sustainable design goals that specifically align with the School District and the City's goals and mission.*



INTEGRATIVE PROCESS



LOCATION & TRANSPORTATION



SUSTAINABLE SITES



WATER EFFICIENCY



ENERGY & ATMOSPHERE



MATERIALS & RESOURCES



INDOOR ENVIRONMENTAL QUALITY

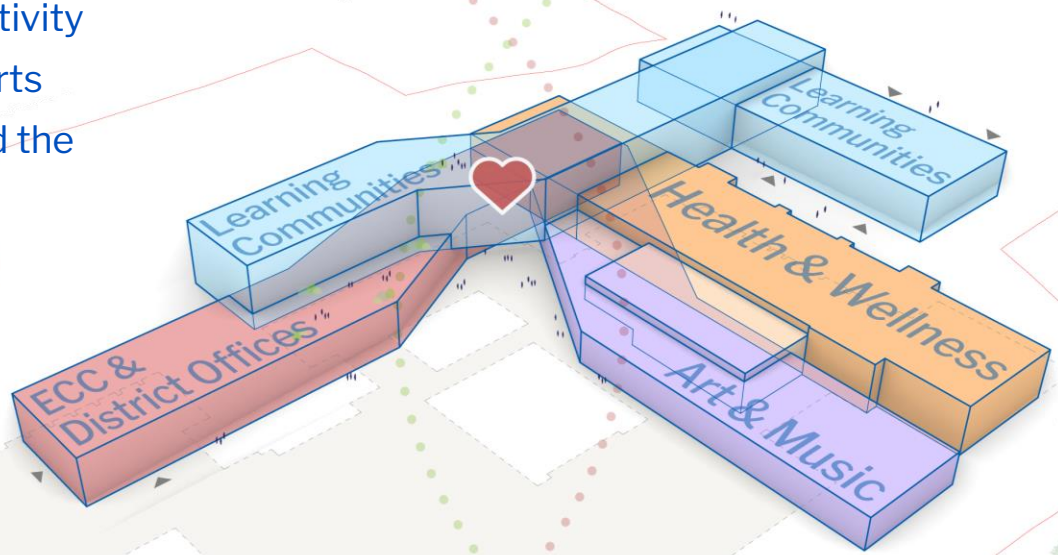
Project Overview



Medford High School Eco-Charrette – Project Design Vision

Educational Program Integration

- Academic Neighborhoods
- Interdisciplinary Adjacencies
- Transparency and Connectivity
- Integrated Student Supports
- Connections to Nature and the Outdoors
- A School with a Vibrant Heart at its Center





Addition/Renovation Axonometric Diagram

New Addition Mass

Renovated Mass

Site Goals:

- Pedestrian-friendly Campus
- Improved Vehicular and Pedestrian Flows
- Enhanced Public Safety
- Improved Stormwater Management
- Mitigate Impacts to Neighbors

Facility Goals:

- Universal Accessibility
- Safe and Easily Secured for Multiple Uses
- Easy to Maintain
- Healthy, Energy Efficient and Resilient

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Medford High School Eco-Charrette – Building and Site Relationship



Sustainability Givens Overview

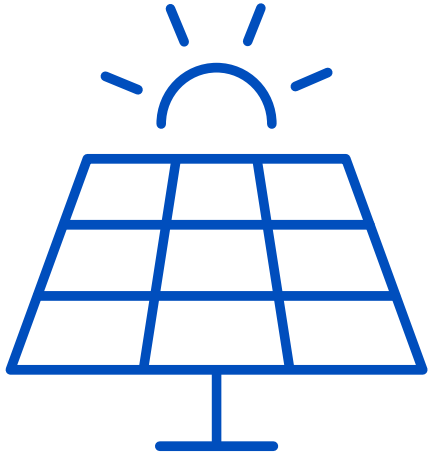
Medford High School Eco-Charrette – Sustainability Givens

MSBA Green School Policy:

- LEEDv4 Silver (minimum)
- Standard Stretch Energy Code
- MEP/BE/Ongoing LEED Commissioning
- 3 LEED MR/IEQ points

MSBA 4% Additional Reimbursement:

- Specialized Stretch Energy Code (3%)
- 5 LEED MR/IEQ points (1%)



Specialized [Opt-in] Stretch Energy Code

1. **Full Compliance with the Standard Stretch Energy Code**
2. **Specialized Stretch Energy Code Pathways**
   - All-Electric HVAC & DHW
   - Fossil Fuel Heating:
     - Electrification of Heating Readiness
     - Solar PV installation



Medford School Committee Motion

- LEEDv4 (Silver minimum)
- Net Zero Energy
- Healthy Materials (1% MSBA)
- Water Stewardship (30% reduction)
- Cost of Ownership (LCCA)

Medford High School – School Committee Motion
[voted and approved by SC 7.20.26, reviewed with Sustainability Advisory Team 7.21.26]

The Comprehensive Medford High School project shall achieve a **minimum of LEED v4 Silver** certification to meet MSBA requirements; however, the project shall prioritize building performance, occupant health, and lifecycle cost over point accumulation. To that end, the project shall:

- **Strive to achieve net-zero energy** (as technically feasible) through integrated passive design strategies, all-electric high-efficiency systems, and on-site renewable energy generation;
- **Specify red list- free, healthy materials** for all materials except MEP/FP and prioritize LEED healthy materials credits necessary to obtain the maximum IAQ MSBA reimbursement to ensure superior indoor air quality for students and staff.
- **Prioritize water efficiency and stewardship** to reduce indoor potable water consumption by a minimum of 30%; while trying to eliminate potable water for irrigation use;
- **Minimize the total cost of ownership**, designing operational systems, controls and monitoring to substantially reduce energy, water, and maintenance costs over the life of the building.

The long-term cost of operating and maintaining the building shall remain at the forefront of every design decision.

Medford High School Eco-Charrette – Sustainability Overview

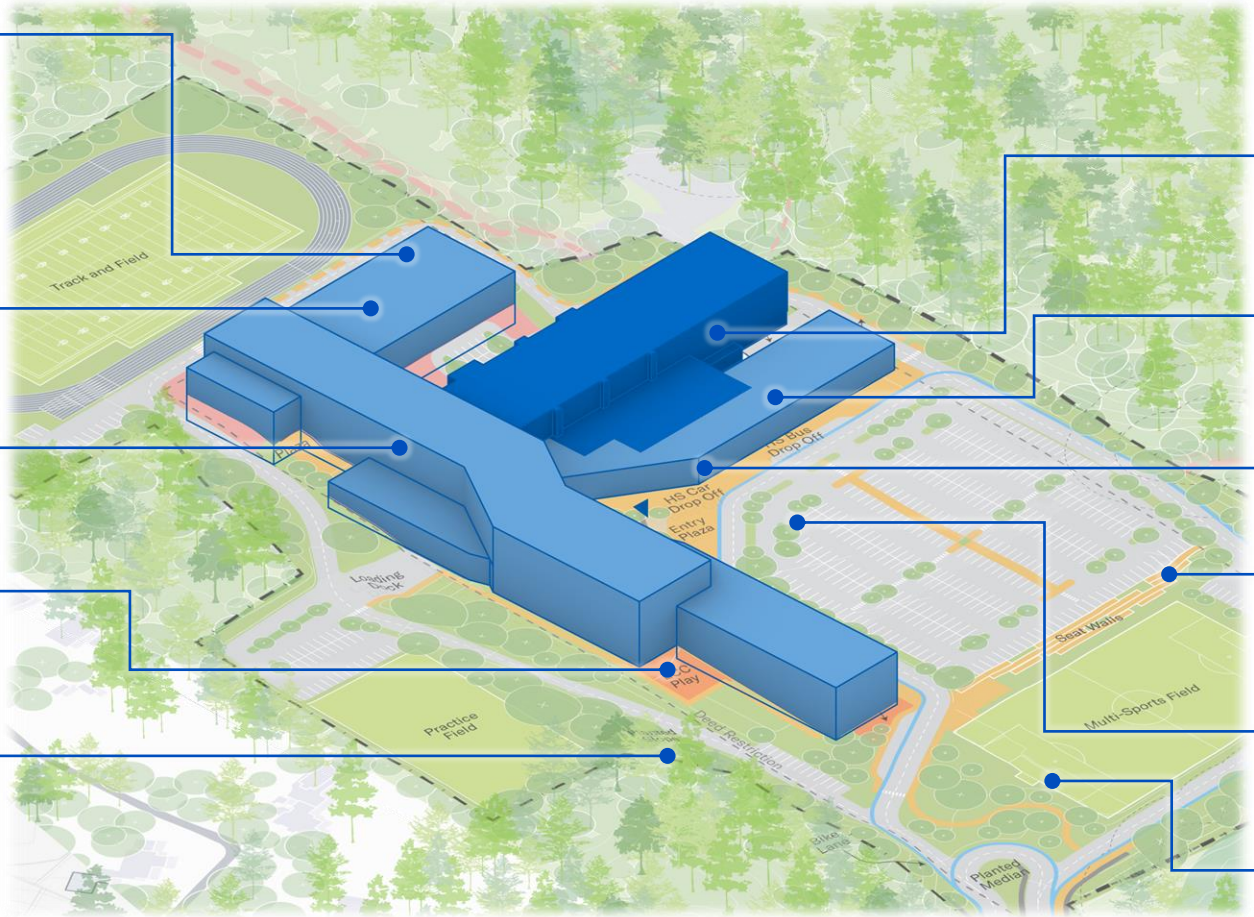
High-Performance Envelope with Triple-Glazed Windows (Optimize Energy Performance)

Renewable Energy (Solar PV)

High-Efficient All-Electric HVAC Systems

Low-Emitting and Healthy/Sustainable Materials

Urban Heat Island Reduction



Building Life-Cycle Impact (Embodied Carbon) Reduction

Indoor Water Use Reduction

Daylight and Quality Views

Stormwater Management

Green Vehicles (Electric Vehicle Charging Stations)

Open Space

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Medford High School Eco-Charrette – LEEDv4 Scorecard

LEED v4 for BD+C: Schools

Project Checklist

DRAFT

Project Name: **Medford High School**

Date: 27-Aug-26

Y	?	N			
1			Credit	Integrative Process	1

2	4	24	**Location and Transportation**		**15**
		15	Credit	LEED for Neighborhood Development Location	15
	1		Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
1	1	3	Credit	Surrounding Density and Diverse Uses	5
	1	3	Credit	Access to Quality Transit	4
	1		Credit	Bicycle Facilities	1
		1	Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles (v4.1) - 5% EVs	1

4	7	1	**Sustainable Sites**		**12**
Y			Prereq	Construction Activity Pollution Prevention	Required
Y			Prereq	Environmental Site Assessment	Required
1			Credit	Site Assessment	1
	1	1	Credit	Site Development - Protect or Restore Habitat	2
	1		Credit	Open Space	1
1	2		Credit	Rainwater Management (v4.1)	3
1	1		Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1
	1		Credit	Site Master Plan	1
1			Credit	Joint Use of Facilities	1

3	2	7	**Water Efficiency**		**12**
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
	1	1	Credit	Outdoor Water Use Reduction	2
2	1	4	Credit	Indoor Water Use Reduction - 30% goal	7
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

22	9	2	**Energy and Atmosphere**		**31**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
14	2		Credit	Optimize Energy Performance	16
1			Credit	Advanced Energy Metering	1
1	1		Credit	Demand Response	2
	5		Credit	Renewable Energy (v4.1) Pending PV install-Green Energy cr. (up to 5 pts)	3
	1		Credit	Enhanced Refrigerant Management	1
		2	Credit	Green Power and Carbon Offsets - (see Renewable Energy)	2

7	4	2	**Materials and Resources**		**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
2	1	2	Credit	Building Life-Cycle Impact Reduction - v4.1	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1	1		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

9	4	3	**Indoor Environmental Quality**		**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
Y			Prereq	Minimum Acoustic Performance	Required
2			Credit	Enhanced Indoor Air Quality Strategies - C02 Sensors at all required spaces	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort - all applicable spaces	1
1	1		Credit	Interior Lighting (v4.1)	2
	1	2	Credit	Daylight (v4.1)	3
	1		Credit	Quality Views (v4.1)	1
		1	Credit	Acoustic Performance	1

6	0	0	**Innovation**		**6**
5			Credit	Innovation: 95% CWMP, Low Merc. Lamps, Exempl. HPDs & EPDs,MRpc103 pilot cr.	5
1			Credit	LEED Accredited Professional	1

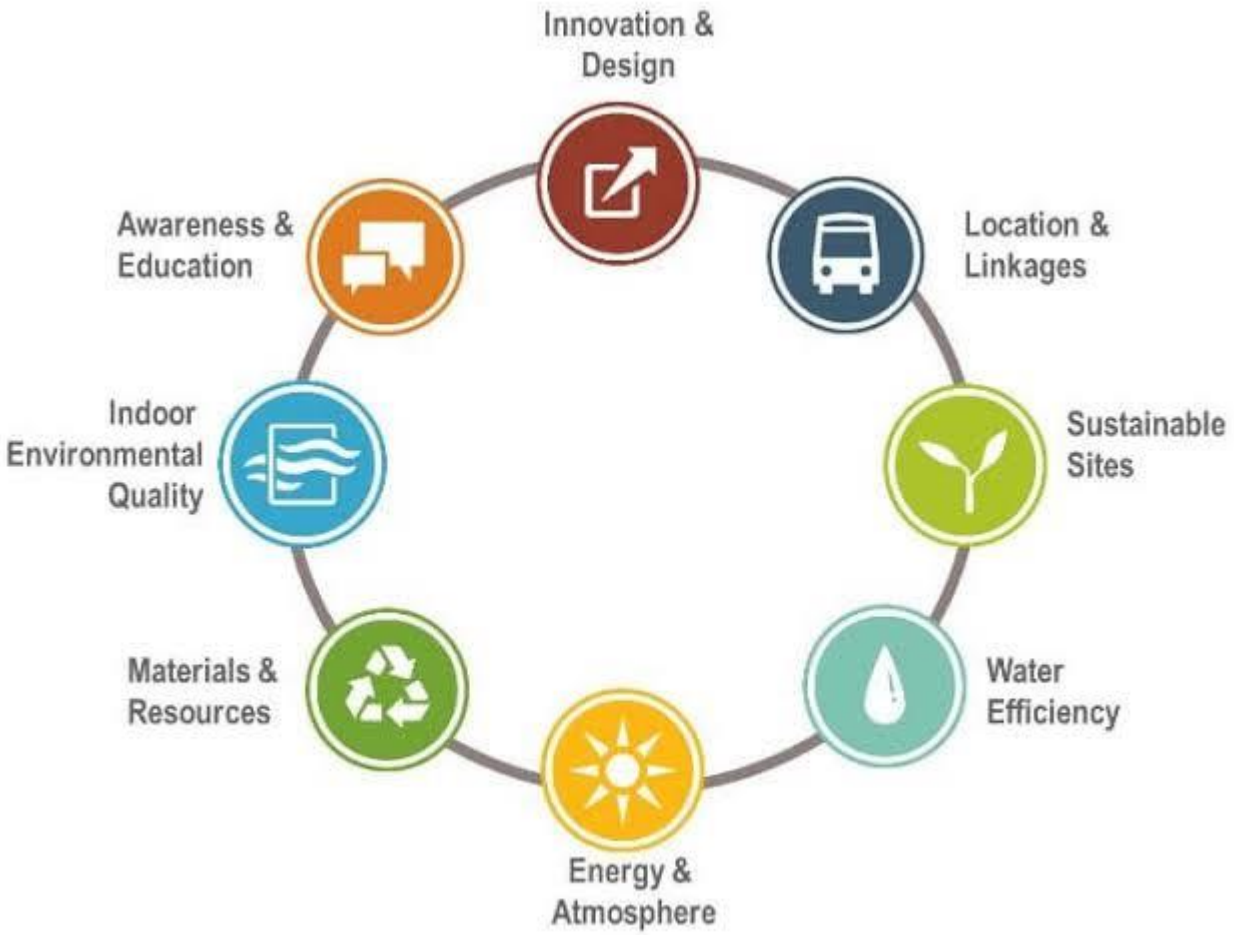
2	2	0	**Regional Priority**		**4**
1			Credit	Regional Priority: Building LCA - MR credit (Tally)	1
1			Credit	Regional Priority: Optimize energy performance (8 points min)	1
	1		Credit	Regional Priority: Rainwater Management (2 pts min)	1
	1		Credit	Regional Priority:Renewable energy (2 points min)	1

56	32	39	**TOTALS**	Possible Points:	**110**

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

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Name your top priority relative to Sustainability for the Medford High School Project



Healthfulness & Environmental Literacy

HEALTHFULNESS



1

Optimize comfort & wellbeing



2

Minimize exposure to hazards



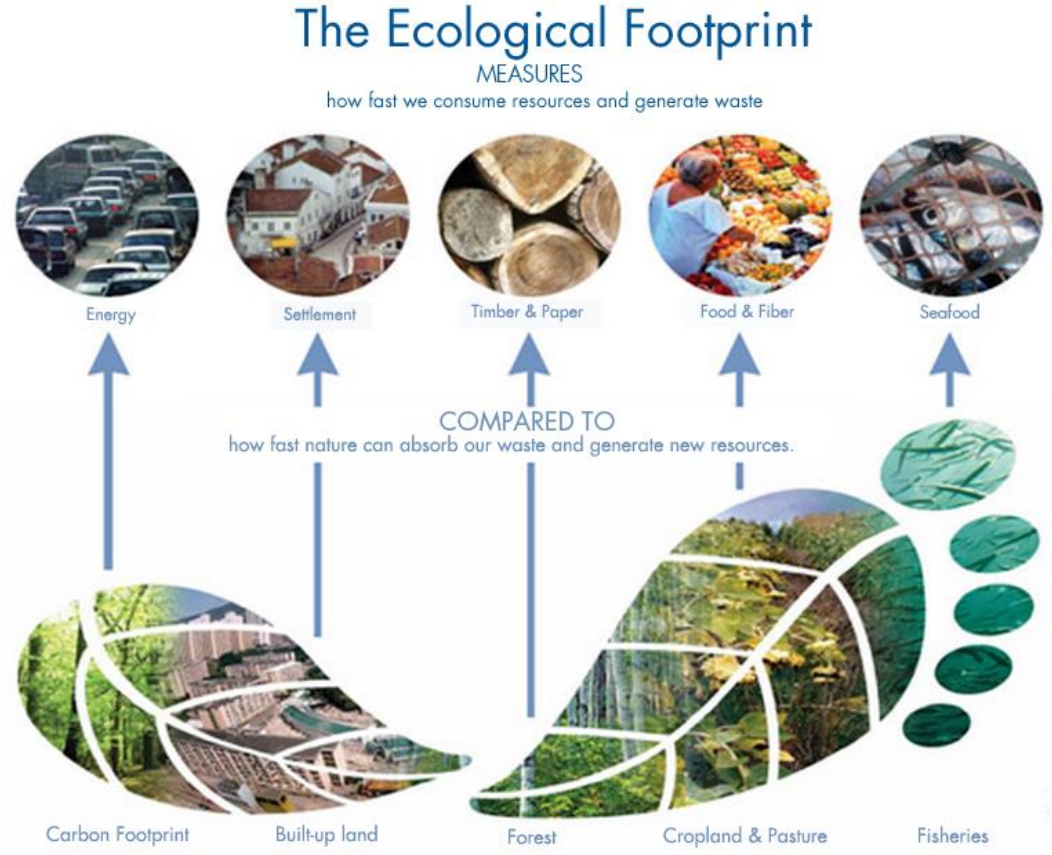
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Create equitable & inclusive spaces

Medford High School Eco-Charrette – Healthy and Sustainable Materials

Design Strategies

- Optimization of materials reuse
- Low-Carbon Materials
- Low-Emitting Materials
- Recycled Content
  - FSC Wood
- Local/Regional Materials (as feasible)
- Life-Cycle Cost including durability, maintenance



Source: Global Footprint Network









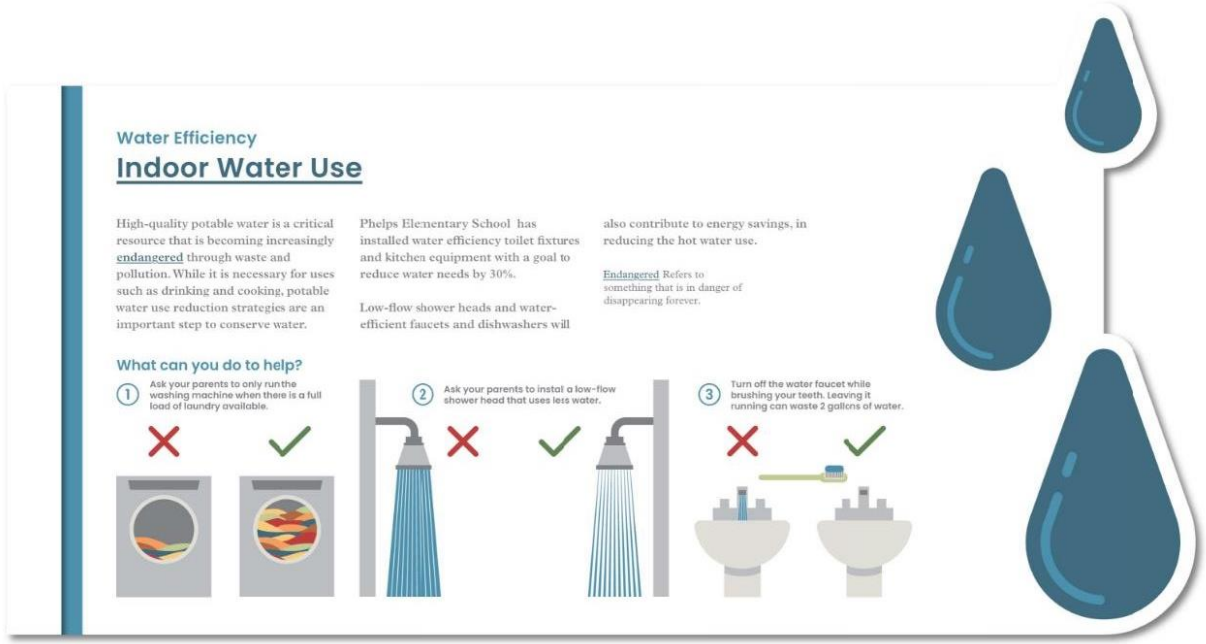


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Medford High School Eco-Charrette – Environmental Literacy

The Building as a Teacher

- Real World
- Environmental Awareness
- Participatory Recycling/Composting
- Community Gardens
- Connect to nature
- Measurable/Quantifiable
- Make Visible, expose what's hidden
- Connect to consumption
- Habit forming





SMMA Project: Wellesley High School

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Medford High School Eco-Charrette – Embodied Carbon

Wood & Mass Timber Feasibility Considerations

- Code regulation impacts
- Cost
- Early coordination with manufacturer needed
- Fire resistance
- Acoustics
- Tighter column spacing and/or deeper beams



SMMA Project: Smith Vocational and Agricultural High School



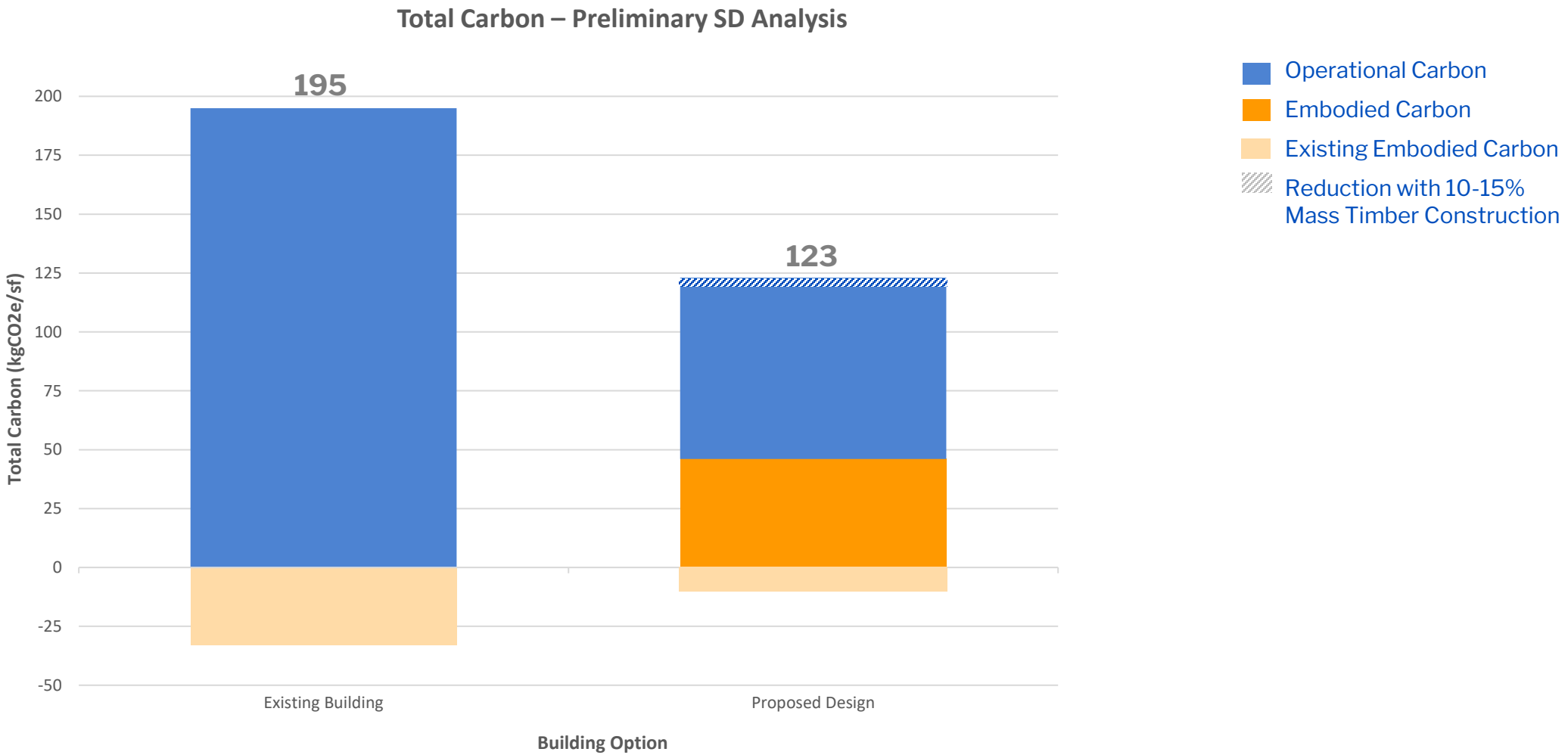
Innoventum Solar Carport Project

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Total Carbon = Operational Carbon (Energy) + Embodied Carbon (Materials)

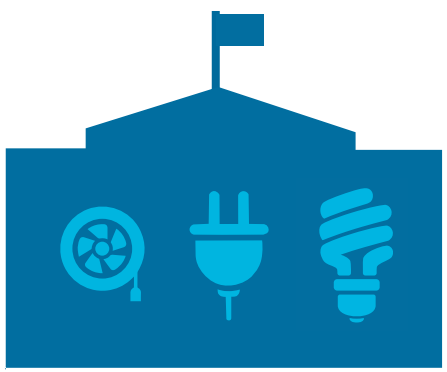
Operational Carbon is the greenhouse gas (GHG) emissions associated with the annual energy consumption of the building.

Embodied Carbon is the greenhouse gas emissions associated with the life cycle of the building materials, including manufacturing, transportation, installation, maintenance, and disposal.



Life Cycle Cost Analysis (LCCA) & Solar PV Assessment

Medford High School Eco-Charrette – Net Zero Energy Goal



Energy Consumption (KBTU/yr)

35 pEUI

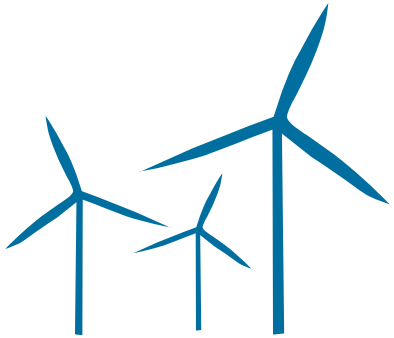
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People

20% Energy Use Contingency

−



Renewables

Solar PV [Sizing]

=

0

Net Zero Energy

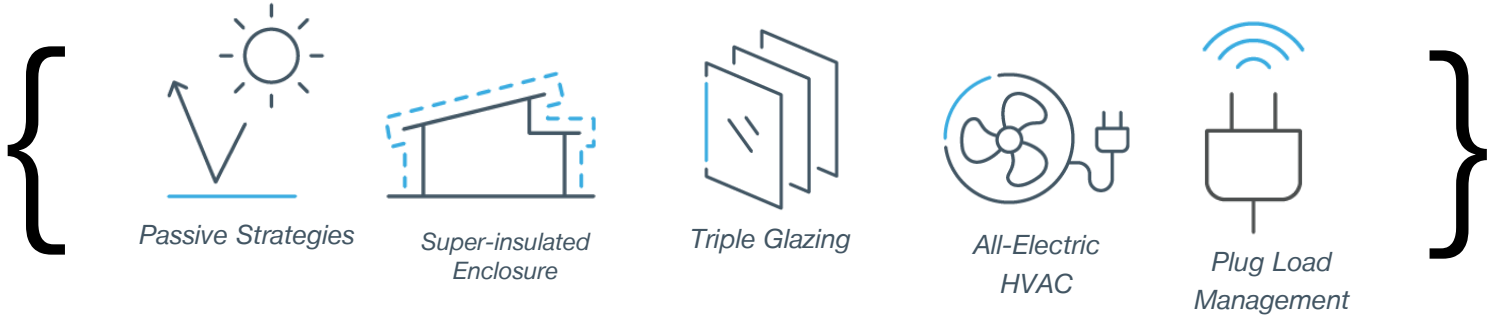
Predicted EUI Goal

35

kBtu/SF/Yr. [Goal]

Realistic impact of vocational trade programs consideration

Specialized Stretch Energy Code Strategies



Medford High School Eco-Charrette – SD Life Cycle Cost Analysis (LCCA)

Life Cycle Cost Analysis (LCCA) is used to assess and compare the associated initial and operating costs of building systems (HVAC) over the life cycle of the building (50 years)

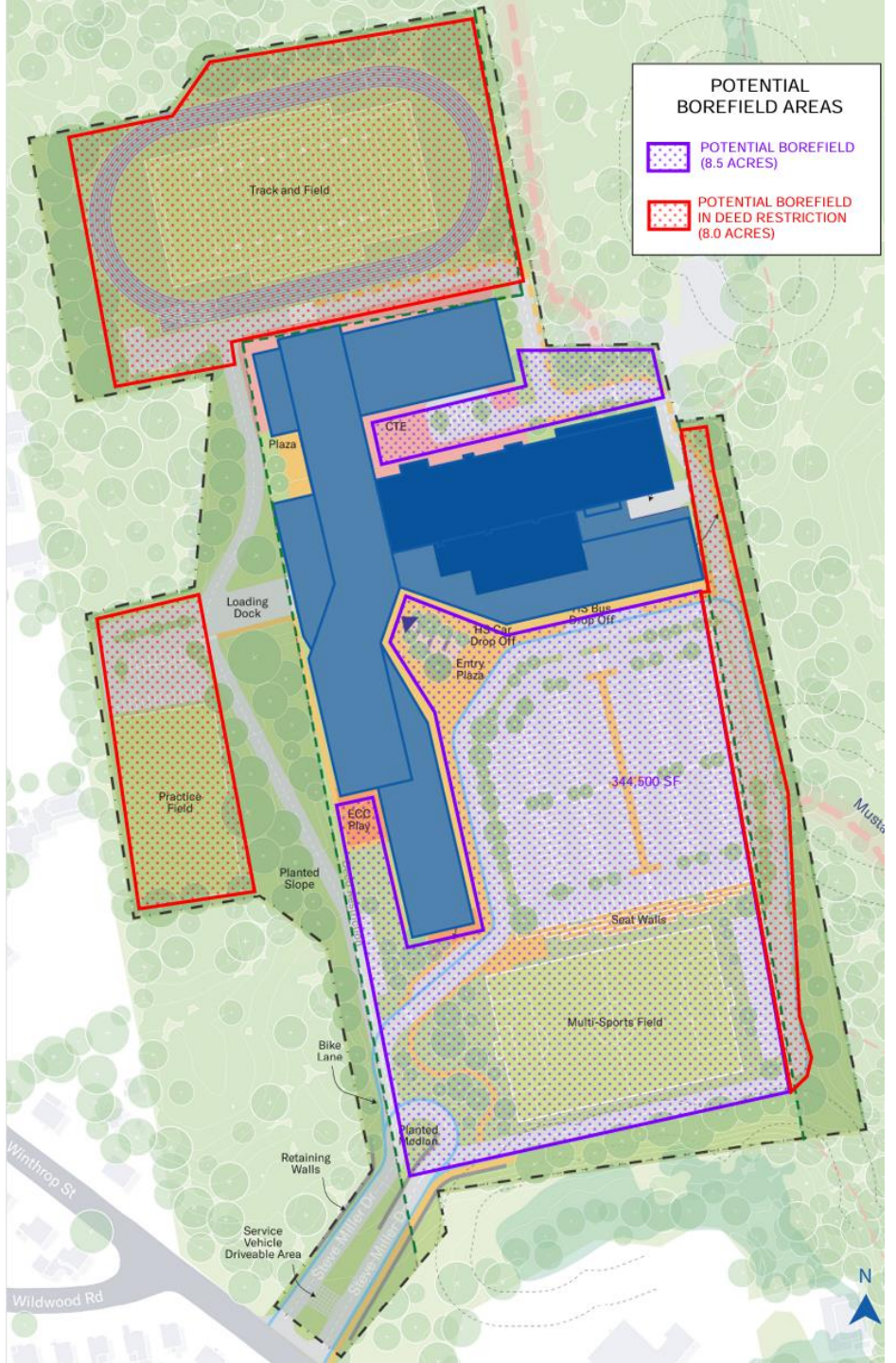
LCCA includes:

- Initial costs
- Replacement Costs
- Maintenance Costs
- Energy savings from Utility Costs
- 50-yr. life cycle
- 3% cost escalation
- Incremental Costs, Payback and Incentives

HVAC Systems Studied
GSHP (Ground Source Heat Pump – Geothermal)
Hybrid -GSHP (50%) and AtWHP (50%)
AtWHP (Air-to-Water Heat Pump)
Fossil Fuel Heating & Cooling (Baseline)

Medford High School Eco-Charrette – Site Overview & Constraints

	Bore (Wells) Area	
Depth	**800 ft**	**500 ft**
Ground Source Heat Pump – GSHP [100%]	~9 Acres	~12 Acres+
Hybrid – GSHP [50%] / **AtWHP** [50%]	~4.5 Acres	~8+ Acres
Site Available Area	~8.6 Acres	



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Medford High School Eco-Charrette – SD Preliminary Solar PV Assessment

Roof Solar Photovoltaic (PV) System

Low Ballasted System



SMMA Project: North Middlesex Regional High School

High Canopy System



Solar Design Associates Project: Clark University

Parking Solar Photovoltaic (PV) System

Long Span Canopy System



Solar Design Associates Project: Oberlin

Parking Space Cover System



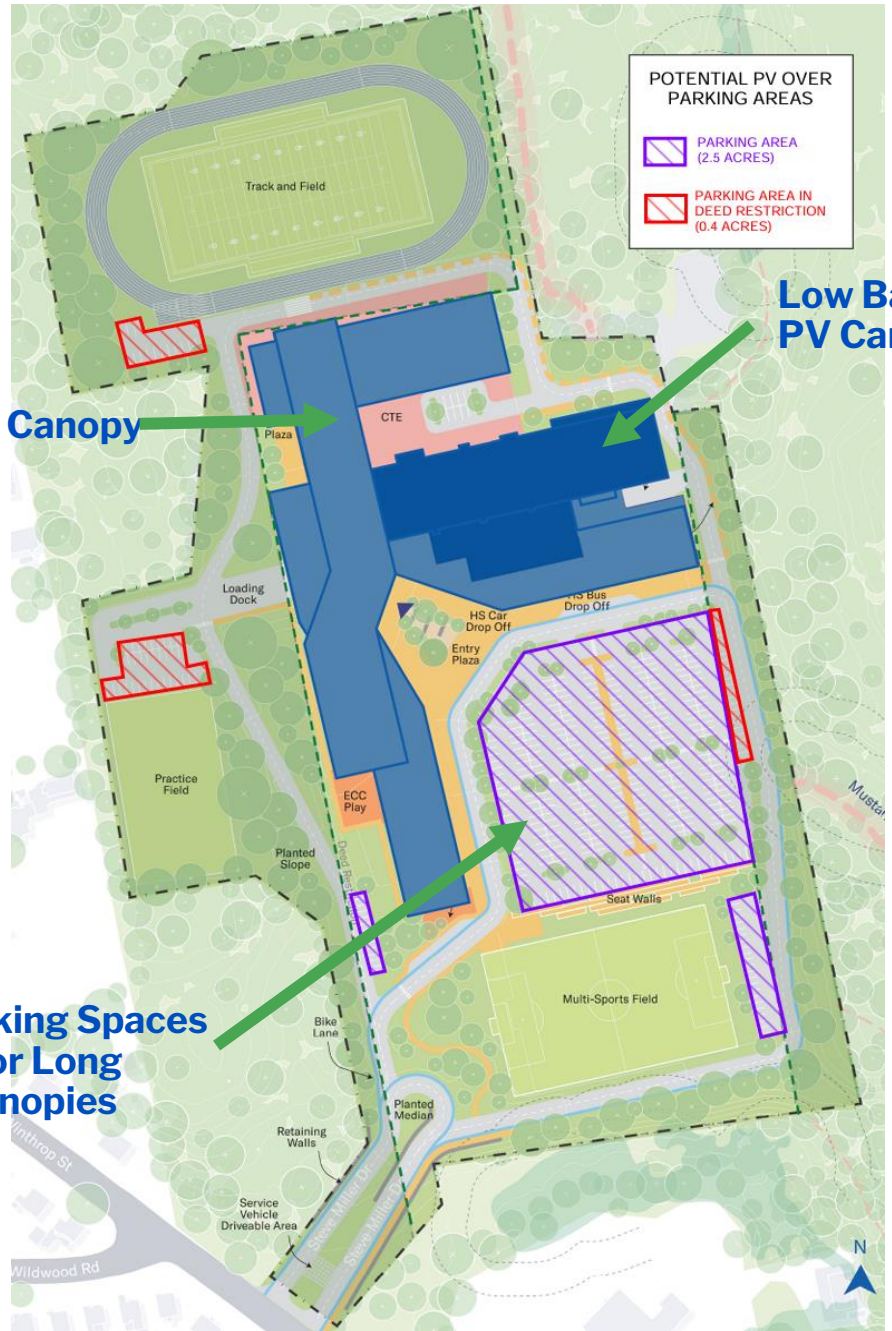
SMMA Project: The Lincoln School

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Medford High School Eco-Charrette – SD Preliminary Solar PV Assessment

Solar PV System	Estimated NZE contribution
	(%)
ROOF Hybrid Solar PV High Canopy /Low ballasted systems	~50%
PARKING Hybrid Solar PV Long span/parking space canopies	~50%
Total	~100%

100% Net Zero Energy (NZE) Site Capacity Assessment



Low Ballasted Roof PV Canopy

High Roof PV Canopy

Hybrid: Parking Spaces Cover and/or Long Span PV Canopies

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Medford High School Eco-Charrette – Utility Incentives

Goal

Path 2: EUI Reduction Incentive Tiers						
		% Reduction Required to Participate				
	Incentive Rate	Office	Lab/office	K-12	Lodging	All other building types
Tier 1	$0.50/sf	5%-15%	20%-35%	20%-25%	20%-30%	15%-25%
Tier 2	$0.75/sf	N/A	N/A	25%-30%	30%-40%	25%-35%
Tier 3	$1.00/sf	15% and above	35% and above	30% and above	40% and above	35% and above

*Total incentives, including construction incentives and adders, are capped at $3,000,000 per project.

Mass Save Utility Incentive Coordination

- SMMA has engaged with National Grid to review incentive pathways.
- MOU signed and executed.
- Optimizing qualifying incentives – capped at $3,000,000:
  - Commercial C&I Program – Path 2, Tier 3**
  - Heat Pump Equipment Incentives
  - Post-Occupancy Verification Incentives

***MHS CTE programs' higher energy use [EUI 35 goal] does not qualify for the Path 1 NZE [requiring EUI 25] per National Grid and Mass Save. Smaller, less energy intense High Schools with no CTE programs may target EUI 25, however Mass Save does not allow exemptions on Path 1 for high school with CTE programs and higher energy use.*

Breakout Sessions

Climate, Energy and Atmosphere
Water Efficiency and Sustainable Sites
Healthy Materials and Indoor Environmental Quality

<u>Two</u> Breakout Group Sessions (20 mins each)

- Allows attendees to rotate and attend 2 separate group (topic) sessions

For each group:

- Facilitator
- Note Taker
- Speaker (Summary Reporting)
- Respect comment time limits
- Allow everyone to speak

Climate, Energy & Atmosphere

- Energy Performance, LCCA (Net Zero Energy)
- Renewable Energy
- Climate Resiliency
- HVAC
- Electrical Systems
- Operational Carbon
- Embodied Carbon

Water Efficiency & Sustainable Sites

- Indoor & Outdoor Water Use Reduction
- Stormwater Management
- Outdoor Classrooms
- Resilient Landscaping
- Green Vehicles
- Urban Heat Island Reduction

Healthy Materials & Indoor Environmental Quality

- Thermal Comfort
- Daylight
- Access to Views
- Enhanced Indoor Air Quality
- Healthy Materials

Next Steps

Medford High School Eco-Charrette – Next Steps

Next Meetings:

- **Sustainability & MEP Systems Advisory Team Meetings**
  - Wednesday September 23rd, 6:30 – 8:30pm
  - Thursday October 1st, 5:30 – 7:00pm

- **School Building Committee (SBC) Meeting**
  - Tuesday October 6th, 6:00pm



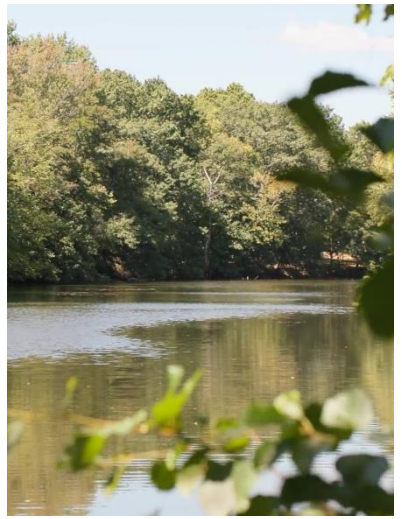








It’s all about the Community











Thank you