Westwood Public Schools

Hanlon Elementary School Building Project

Sustainability Subcommittee

04.23.2020

Agenda

- Outline Identified Goals
- Review Assumptions Being Studied
- Identify Sustainability Order of Priorities
- Define Decision Points
- Schedule Next Steps

Our Focus

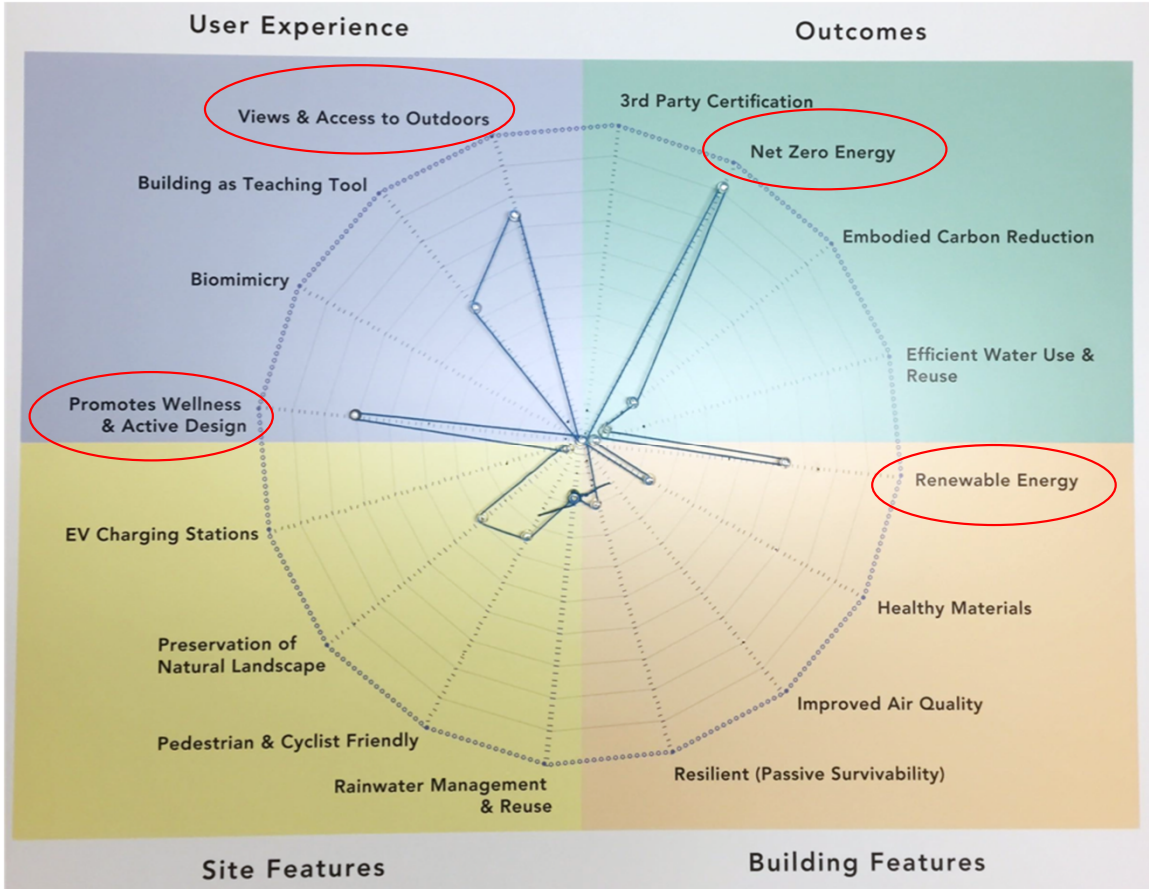
1. **Show what we are doing and where we are headed**
2. **Are you in agreement on our approach and options being studied?**
3. **Obtain feedback on priorities of sustainability features**

Identified Goals and Direction - Westwood

Jan 2, 2020 Handout - Goals Sustainability

1. Passive House Design Standard as goal
2. Orientation of building
3. Orientation of roof / eliminating penetrations to maximize PV
4. Minimize thermal bridging between exterior wall and inside to passive house standard
5. Super Insulation – closed cell foam topped off with open cell foam to achieve R60 roof and R43 walls
6. Slab design insulated from building
7. Triple pane argon filled windows
8. Daylighting
9. HQ Air Exchange System
10. Ground Source Heat Pump heating
11. Integration of existing on-site solar into project

Jan 30, 2020 Sustainability Charette



Identified Goals and Direction

1. Provide a Sustainably Designed Building that achieves a minimum of:

- 20% beyond current Energy Code
- LEED Certification and receive 2% points from MSBA funding

2. Explore the capital cost and return on investment (ROI) of achieving:

- Net Zero Energy (NZE or ZNE)

3. Leverage assistance from Eversource/Thornton Tomasetti:

- Explore energy efficiency measures to achieve a goal of EUI of 25

Other Considerations

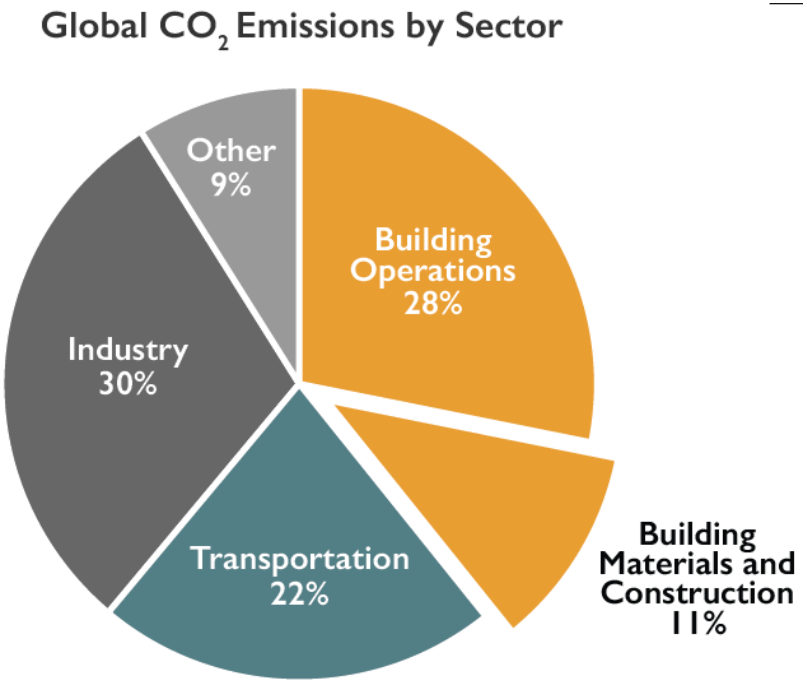
4. Reduce Embodied Carbon footprint by exploring the use of Engineered Cross Laminated Timber (CLT) vs. Steel Frame

Carbon Management

Carbon: Why is Carbon Management Important?

- **Operational** Carbon: released through fossil fuels
- **Embodied** Carbon: amount of carbon used to create a material

i.e. steel has high amount of embodied carbon, meanwhile wood has a very low amount)



Other Considerations

5. Explore the Use of Rainwater Capture for Reuse: irrigation/greywater

Less potable water used = water conservation

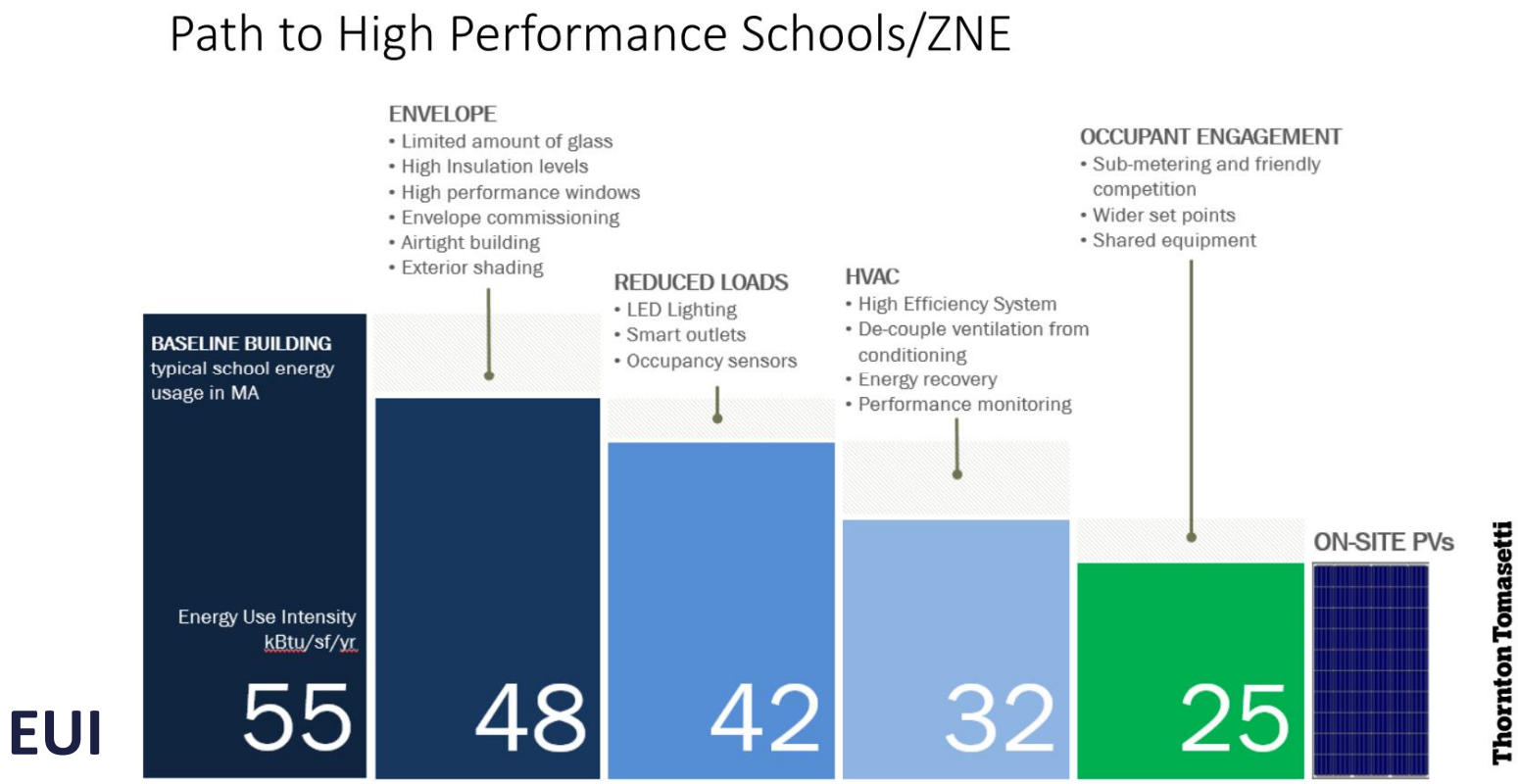
Identified Goals and Direction

Net Zero Energy: What does it take to achieve this – target areas:

- Exterior Envelope
- Heating: Nat Gas vs. Air/Water Heat Pump vs. Geothermal
- Electricity Reductions – Daylighting Opportunities, Submetering, Controls
- Renewable Energy: PV Panels and battery storage on-site

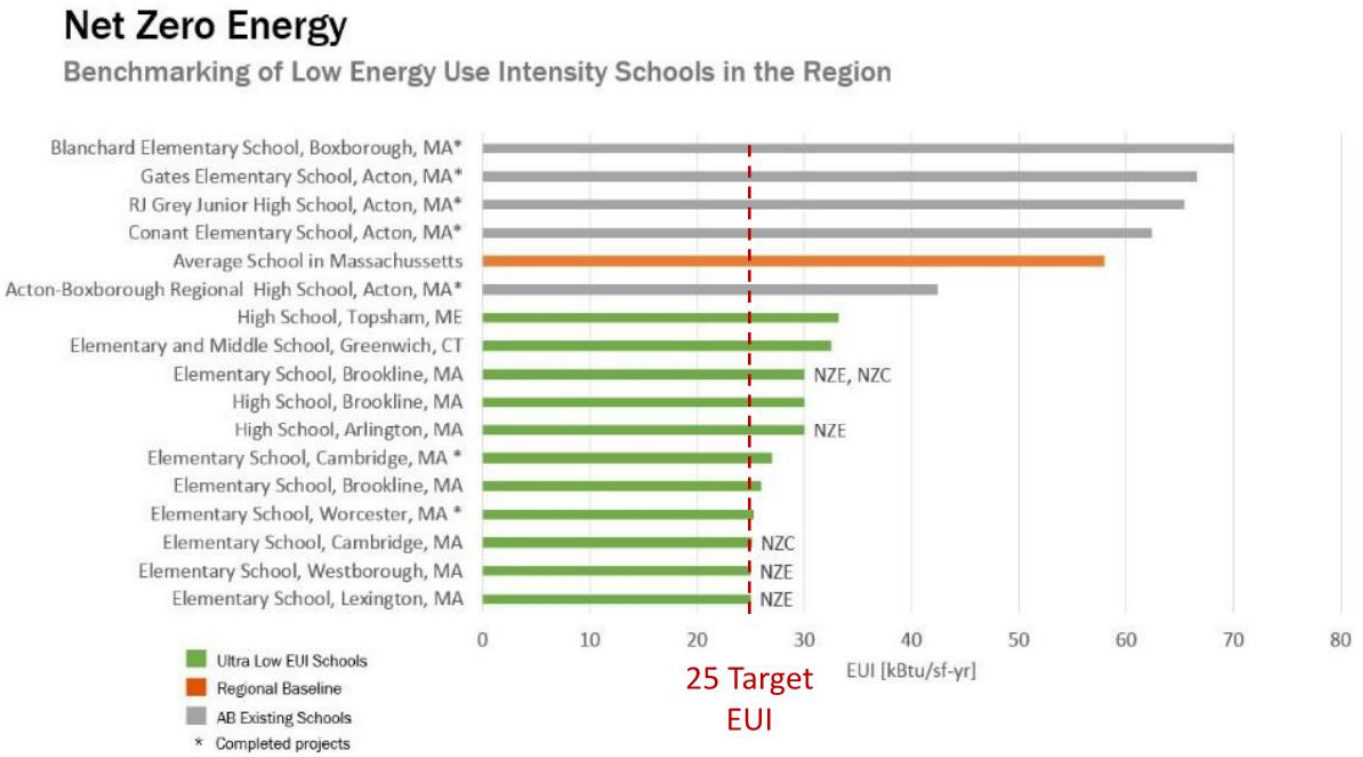
Identified Goals and Direction

Energy Use Intensity (EUI): energy consumed per square ft / year



Identified Goals and Direction

EUI – Frame of Reference / Benchmarking



Thornton Tomasetti

Outline of Assumptions – Do You Agree?

Baseline Project:

a. Green Schools Program: Achieve LEED-S v4 “Certified” and exceed MA Energy base code by 10%.

b. Additional 2% reimbursement: Achieve above but exceed MA Energy base code by 20%.

Study in Progress (review attachment)

- **Baseline:** Natural Gas heating system
- **Tier-1:** Fossil Fuel Free: Use Centralized Air/Water Heat Pump
- **Tier-2:** Fossil Fuel Free: Use Geothermal Heating System
- **Alternate Structural Frame Analysis**: Use Timber Frame Construction in lieu of Steel Frame (Carbon)

GOAL: Determine best approach for Return on Investment (ROI) over the life of the building

Rainwater Harvesting: Should this be considered?

Sustainability – Order of Priorities

Define order of priorities for recommendation to School Building Committee (SBC):

- **High Efficiency Natural Gas heating VS. Fossil Fuel Free (Heat Pump)**
  Sub-question: Air/Water Heat Pump vs. Ground Source (Geothermal)
- **Net Zero Energy (NZE): Annual operating savings as low as possible VS. achieving NZE**
- **Embodied Carbon reduction: Timber framing VS. Steel**
- **Reduction in Water Use for irrigation/greywater: municipal/potable water VS. rain-water cistern**

Define Decision Points – Panel Discussion

What decisions need to be made during current phase and which can be made during Schematic Design (SD)?

- Items that have a potential impact on the construction budget being carried into SD phase

What information is needed to make decisions?

- What level of Return on Investment (ROI) is worthwhile pursuing (i.e. # years threshold for payback)?
- How does Town of Westwood Comprehensive Sustainability Plan shape/guide SBC decision?
- Are there sustainability features that should be considered even if the ROI does not meet the identified threshold? If so, what are they and why?
- Other?

Next Steps

- ❑ **Determine additional dates/meetings for Sustainability Subcommittee**
- ❑ **May 1st : Submit options for cost estimating**
- ❑ May 29th: School Building Committee – Review Options with Cost
- ❑ June 2nd: Community Presentation: Review Options with Cost
- ❑ June 12: School Building Committee: Sustainability Decisions
- ❑ June 19: School Building Committee: Preferred Option and PSR Vote