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# SOLAR POWER IN WESTWOOD MUNICIPAL AND SCHOOL FACILITIES

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# OVERVIEW

- Background
- Phase 1 – Existing Projects
- Phase 2 – Planned Projects
- Shuttleworth Field – New Hanlon School
- Shuttleworth Benefits
- Questions and Discussion

# Phase I Existing Projects

- Ameresco\* retained and implemented Phase I in 2016/2017
- Ameresco invested \$1.7 million on the following rooftops in Westwood:
  - Westwood High School (186 kW)
  - Martha Jones Elementary (151 kW)
  - Downey Elementary (181 kW)
  - Thurston Middle (99 kW)
- Actual generation in 2019-20 in Westwood was 616,000 kWh
- New Massachusetts solar incentive program, “SMART”, offers opportunity to commence Phase II as originally intended



New Kiosk at the High School  
Donated to the Town by Ameresco



Project Ribbon Cutting



Westwood High School – Rooftop Solar PV Array (Phase I)

\*Ameresco – Framingham based energy Service Company selected by competitive bid process in 2017.

# Phase II Site Selection Summary

The economic benefit of Phase II summarized in the following table.

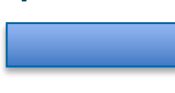
Name	Type	Size (estimated kW)	Year-1 Production (estimated kWh)
Thurston Middle School	Rooftop	85	102,000
Council of Aging	Carport	259	309,000
Shuttleworth Field	Groundmount	2000	2,460,000
Police Station	Carport	128	130,560
<b>TOTAL</b>		<b>2,472</b>	<b>3,001,560</b>

Name	Energy Discount	Year-1 Electricity Savings (estimated)	Year-1 PILOT Revenue* (estimated)	Total Value to Town (estimated)
Thurston Middle School	\$0.01 / kWh	\$ 1,020	\$ 425	\$ 1,445
Council of Aging	\$0.01 / kWh	\$ 3,090	\$ 1,295	\$ 4,385
Shuttleworth Field	\$0.0225 / kWh	\$ 55,350	\$ 10,000	\$ 65,350
Police Station	\$0.01 / kWh	\$ 1,306	\$ 640	\$ 1,946
<b>TOTAL</b>		<b>\$ 60,766</b>	<b>\$ 12,360</b>	<b>\$ 73,126</b>

\*assumes improvement to existing Pilot payments agreed to during Phase I, approximately \$5,000/MW.

**TOTAL ESTIMATED Y1 BENEFIT TO THE TOWN OF WESTWOOD = ~\$70,000**

# Benefits of Phase II

1. ZERO upfront cost to the Westwood
2. On-bill energy savings
3. Support for potential net-zero school development
4. Carbon offsets of the project equivalent to 
5. Help Town achieve 90% alternative energy target


2023 Estimated Town Total Annual Consumption Calculation (kWh)			
Town Total (estimated)	5,532,202 kWh	88%	FY18/19 Average
New Hanlon School (estimated increase)	749,019 kWh	12%	TT estimate less existing Hanlon and Deerfield loads
<b>Town Total (estimated)</b>	<b>6,281,221 kWh</b>	<b>100%</b>	<b>FY18/19 Average</b>
Town Target (Alternative Energy)	5,653,098 kWh	90%	
Solar Phase I	615,745 kWh	10.9%	9/18-10/19
Virtual Solar in Waltham	2,000,000 kWh	35.4%	Assumed
Remaining Town Need	3,037,354 kWh	53.7%	


 **283**

 homes' electricity use for one year

 **11.3**

 acres of U.S. forests preserved from conversion to cropland in one year

 **361**

 Passenger vehicles driven for one year

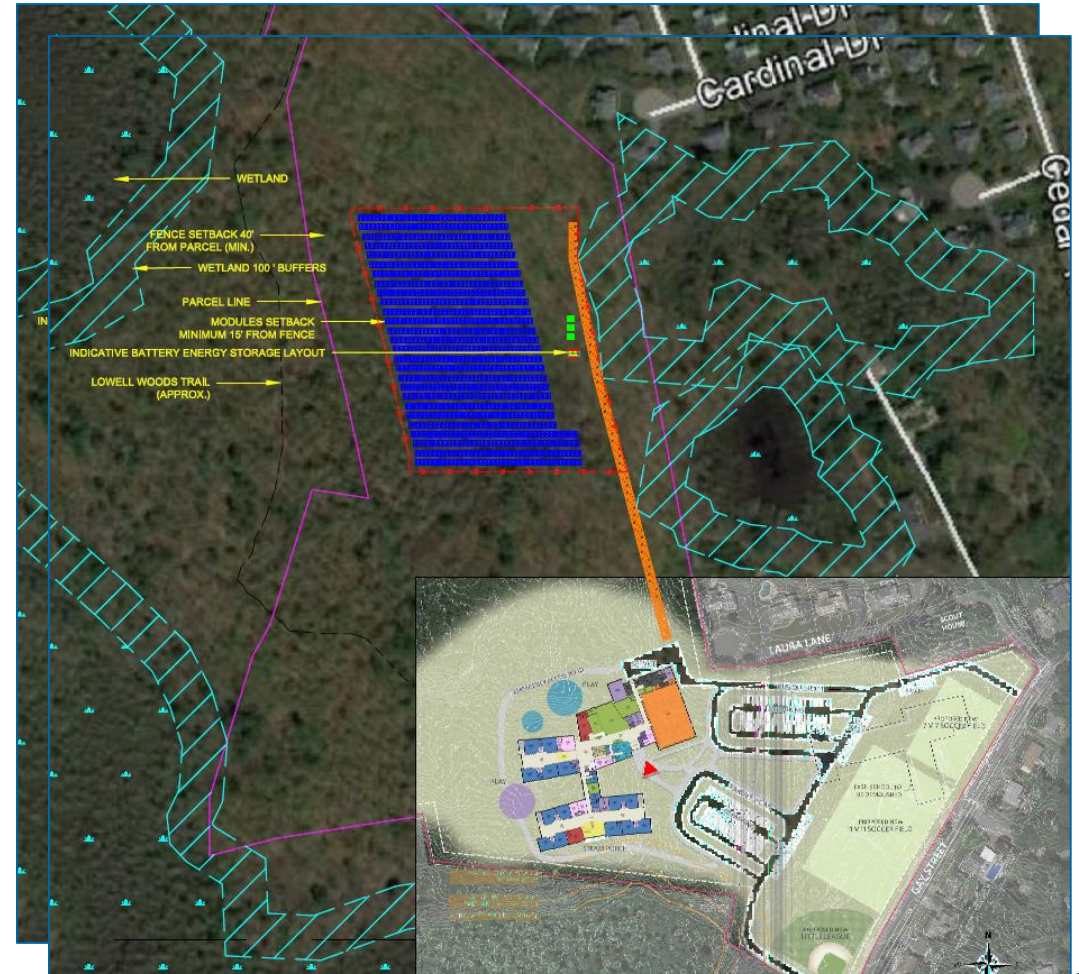


Shuttleworth Field /  
Hanlon School



# Shuttleworth Field / Hanlon School

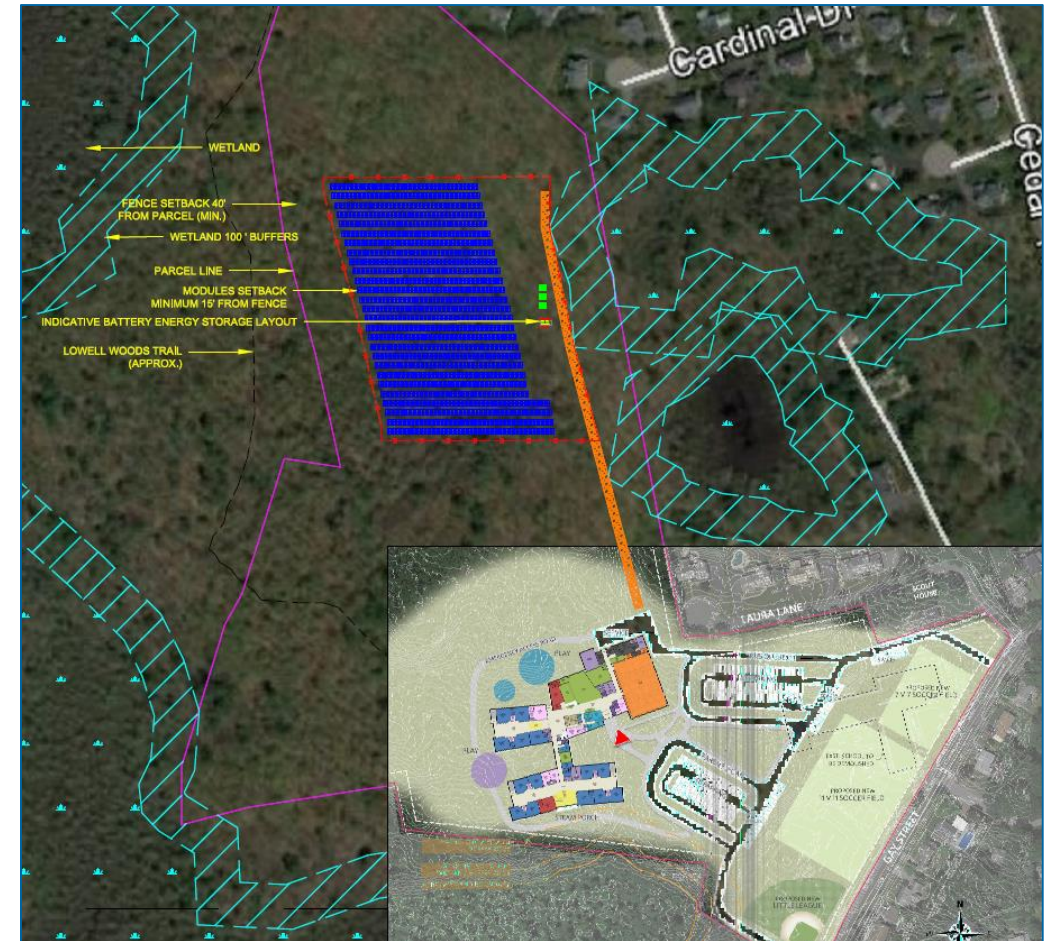
- Expected System Production: > 2,000,000 kWh annually
- Annual Savings to Town: \$0.0225/kWh  
Approximately \$60,000 savings annually for 20 years based on production
- Annual Pilot Payment to Town: \$10,000 /yr
- Solar Array will be coupled with a Battery Energy Storage System (BESS)
  - The solar system will be grid-connected to generate energy credits for the Town
  - The BESS will receive an added incentive which is passed through to the Town through the PPA to improve the annual savings.
  - The BESS will charge and discharge solar energy throughout the day to help regulate the local electric grid



# Shuttleworth Field / Hanlon School

## PROJECT CONSIDERATION TO MINIMIZE VISUAL IMPACTS

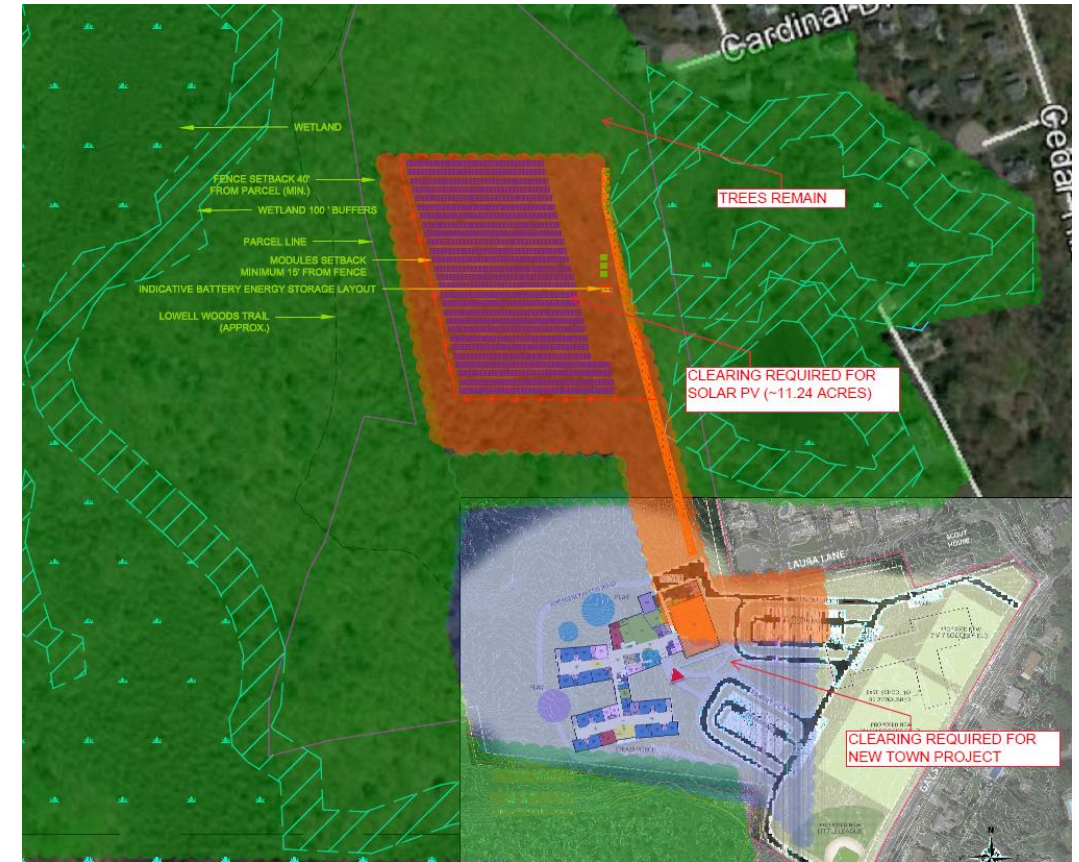
- The closet neighbor is to the Northeast of the parcel, at approximately 250' from the solar panels
- The basic screening requirements are covered in section 6.3.6.1 of the zoning by-law. It states that “planted shrubs and trees must form a year-round, continuous, substantially impervious visual screen within 3 years after planting.”
- Proposed Solution: hedge row of 350-400', including evergreens such as arborvitae, Colorado spruce, eastern hemlock, concolor, fir and Virginia red cedar. If necessary, these could be supplemented with shorter, understory evergreens like mountain laurel, inkberry or juniper.





# Shuttleworth Field / Hanlon School – Construction Synergies

- If the Town decides to move forward with a large School/fields/parking project at the Shuttleworth Field location, many construction synergies exist.
- The Proposed System will generate enough electricity on-site to support a Net-Zero designation for the new school. This system is a lower cost alternative to an on-site rooftop or parking canopy design. In addition to the annual energy savings, the Town saves in construction costs by not installing a rooftop solar array.
- Tree clearing from a Solar PV project is shown in the indicative image to the right.
  - Green locations indicate where existing tree and vegetation will not be disturbed.
  - Orange location indicates site impact of Solar PV.



2 MWdc Solar PV Design

# Next Steps

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1. Approval by Select Board to proceed with Power Purchase Agreement (PPA) and land lease that Ameresco can proceed with:
  - a. Design Approval by Eversource
  - b. Town of Westwood Planning Board site plan review
2. Eversource interconnection applications
3. Design approval by Department of Environmental Resources (SMART Incentive)
4. Final pricing incorporating any design changes
5. Begin construction – spring 2021
6. Construction completion – estimated December 2021. Ameresco will work with the Town to determine optimal project schedules for each site.

# Shuttleworth Field / Hanlon School

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## WHY IS SHUTTLEWORTH PREFERRED LOCATION

- Highest Incentive per kWh
- More than 10X potential output vs rooftop at new school
- Output exceeds combined potential of all Town municipal rooftops
- Output is >2X greater than Canopy potential on HS Parking lot
- Major contribution to Town goal of 90% renewable
- Potential for increased benefits after 20 years
- Educational potential for students
- Achieves a net carbon reduction
- Allows net-zero energy for new school

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# QUESTIONS AND DISCUSSION



# Supplemental Information

- “Landscapeing”

# “Lambscapers” – Solar Shepard LLC

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