

# TOWN OF ACTON PUBLIC WORKS FACILITY

DPW Building Committee Meeting

January 29, 2025



# AGENDA

- 01 Building System Comparison
- 02 Fleet Inventory Verification
- 03 General Project Update
- 04 Next Steps

# Building System Comparison

# 1. BUILDING SYSTEM COMPARISON

## Life Cycle Cost Analysis (LCCA)

The design team has been working toward a facility using renewable energy per Acton's bylaw "Regulating Fossil Fuel Infrastructure in Buildings".

A comparison of fossil fuels vs renewables was requested.

An LCCA was conducted to compare the following building systems:

1. Natural Gas (fossil fuel)
2. Air Source Heat Pumps
3. Ground Source Heat Pumps (current basis of design)

An LCCA looks at energy consumption & demand, capital costs, operating costs, maintenance and replacement costs, and incentives.

The analysis results in estimated payback periods within a 30 year timeframe.

The exercise also looks at carbon emissions associated with the systems.

Option	System	Gross Capital Investment	Annual Elec. Cons. (kWh)	Annual Gas Cons. (Therms)	Combined Utility Cost	Annual Utility \$/ft <sup>2</sup>	Annual kBtu/s.f. (EUI)	Annual Maint. Cost	Annual Expense	GHG Emissions (lb CO <sub>2</sub> )
1	Base	\$3,276,000	226,000	10,600	\$76,640	\$ 1.67	39.8	\$ 10,000	\$86,640	<b>227,300</b>

### Assumptions

- Natural Gas Condensing Boilers and Water Heater
- Utility costs \$0.25/kWh and \$1.90/Therm
- Replacement of DX cooling system at 15 years

### The Numbers

- Lower life cycle costs than other options, highest GHG emissions
- GHG emissions based on EPA emissions factors for NPCC New England Region
- Costs amortized over 30 years

Option	System	Gross Capital Investment	MassSave Heat Pump Adder Incentive	Net Investment	Annual Elec. Cons. (kWh)	Utility Cost	Annual Utility \$/s.f.	EUI	Annual Maint. Cost	Annual Expense	Annual Cost Impact	Total Life-Cycle Savings	ROI	GHG Emissions (lb CO2)
2	ASHP	\$ 3,970,000	\$ 100,000	\$3,870,000	323,000	\$ 80,750	\$1.76	24.0	\$ 15,000	\$ 95,750	\$ 9,110	- \$ 3,205,151	-83%	183,984

## Assumptions

- System includes Air to Water Heat Pump
- Replacement of ATW system at 20 years

## The Numbers

- Highest life cycle cost impact
- Highest annual energy costs
- Worst ROI
- Middle-ground GHG emissions

Option	System	Gross Capital Investment	MassSave Heat Pump Adder Incentive	30% IRA Geothermal Federal Tax Credit	Net Investment
3a	GSHP	\$ 5,580,000	\$ 810,000		\$ 4,770,000
3b	GSHP	\$ 5,580,000	\$ 810,000	\$ 1,431,000	\$ 3,339,000

Annual Elec. Cons. (kWh)	Annual Electric Cost	Combined Utility Cost	Annual Utility \$/s.f.	Annual kBTU/s.f. (EUI)	Annual Maint. Cost	Combined Annual Expense	Combined Annual Cost Impact	Total Life-Cycle Savings	ROI	GHG Emissions (lb CO2)
293,200	\$ 73,300	\$ 73,300	\$ 1.59	21.7	\$ 18,000	\$ 91,300	\$ 4,660	-\$2,463,632	-52%	167,129
293,200	\$ 73,300	\$ 73,300	\$ 1.59	21.7	\$ 18,000	\$ 91,300	\$ 4,660	-\$237,503	-7%	167,129

## Assumptions

- System includes Geothermal/ Ground Source Heat Pump, est. 40 wells
- Geothermal system lifespan same as length of loan
- MassSave incentive based on 2024 prescriptive heat pump incentive
- Federal tax credit based on existing IRA direct pay tax credit

## The Numbers

- Option 3a does not include the 30% IRA Geothermal Federal Tax Credit in the Net Investment cost, while option 3b does

**Acton DPW - Payback Summary**  
**Including Mass Save Incentives & Federal Tax Credit**

Option	System	Gross Capital Investment	Net Investment after Incentives	Annual kBTU/s.f. (EUI)	Annual Expense	Annual Cost Impact	Total Life-Cycle Savings	ROI	GHG Emissions (lb CO2)
1	Base	\$ 3,276,000		39.8	\$ 86,640				227,300

Option	System	Gross Capital Investment	Net Investment after Incentives	Annual kBTU/s.f. (EUI)	Annual Expense	Annual Cost Impact	Total Life-Cycle Savings	ROI	GHG Emissions (lb CO2)
2	ASHP	\$ 3,970,000	\$ 3,870,000	24.0	\$ 95,750	\$ 9,110	\$ (3,205,151)	-83%	183,984
3a	GSHP	\$ 5,580,000	\$ 4,770,000	21.7	\$ 91,300	\$ 4,660	\$ (2,463,632)	-52%	167,129
3b	GSHP	\$ 5,580,000	\$ 3,339,000	21.7	\$ 91,300	\$ 4,660	\$ (237,504)	-7%	167,129

**Notes:**

Cost estimates based on similar project costs.

Incentives based on 2024 prescriptive heat pump incentives for GSHP. For ASHP used estimated based on prior custom projects.

Federal tax credit based on existing IRA direct pay tax credit.

Estimated utility costs based on \$0.25/kWh and \$1.90/Therm.

Values based on energy model performed for HVAC System Life Cycle Cost Analysis purposes. A 30% safety factor should be applied for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations.





# Questions?

# Fleet Inventory Verification

# 2. FLEET INVENTORY VERIFICATION

## Quantities, Sizes & Storage Provisions

	INDOOR PARKING STALL	INDOOR FLOOR SPACE	OUTSIDE CANOPY
HIGHWAY	(20) LG VEH (5) LG EQUIP (3) SM VEH	(12) SM & M EQUIP (2) T	(8) T
TREES & GROUNDS	(1) LG VEH (2) M VEH (2) SM VEH	(5) M EQUIP (1) T	(3) T
TRANSFER STATION	STORAGE PROVISIONS TBD: (3) LARGE VEHICLES, LOADER, AND SCREENER		

ADDITIONAL ITEMS: 6 MESSAGE BOARDS, 4 LIGHT TOWERS, 2 LARGE SCREENERS PLUS: +/- 100 CONES, 50+ A-FRAME CAUTION SIGNS, CONSTRUCTION SIGNS, GENERATORS, PUMPS, DEMO SAWS, CHAIN SAWS, ETC. USED DAILY

#	SIZE / TYPE	STORAGE REQ.	DIVISION	DESCRIPTION	TYPE
42	SM VEH	parking lot	Highway	FORD LIGHTNING	TRUCK
43	LG EQUIP	STALL	Highway	CAT 958M	LOADER
44	LG EQUIP	STALL	Highway	CAT 960G	LOADER
45	LG EQUIP	STALL	Highway	JD 710K	BACKHOE
46	LG EQUIP	STALL	Highway	CAT M313D	EXCAVATOR
47	LG EQUIP	STALL	Highway	CAT 960H	LOADER
48	LG EQUIP	STALL	Highway	ROAD KING	SCRAPER
49	LG EQUIP	STALL	Highway	MCCLOSKEY 513R	SCRAPER
43	LG VEH	STALL	Highway	MACK GU712	DUMP
44	LG VEH	STALL	Highway	MACK GU712	DUMP
45	LG VEH	STALL	Highway	FORD F550	TRUCK
46	LG VEH	STALL	Highway	FORD F550	TRUCK
47	LG VEH	STALL	Highway	FORD F550	TRUCK
48	LG VEH	STALL	Highway	FORD F550	TRUCK
49	LG VEH	STALL	Highway	MACK RD600P	FLAT BED
50	LG VEH	STALL	Highway	MACK GR47P (Curb Basin Truck)	DUMP
51	LG VEH	STALL	Highway	MACK GU713	DUMP
52	LG VEH	STALL	Highway	MACK CHL613	TRACTOR
53	LG VEH	STALL	Highway	MACK RD600P	DUMP
54	LG VEH	STALL	Highway	MACK RD600P	DUMP
55	LG VEH	STALL	Highway	MACK RD600P	DUMP
56	LG VEH	STALL	Highway	MACK RD600P	DUMP
57	LG VEH	STALL	Highway	MACK RD600P	DUMP
58	LG VEH	STALL	Highway	MACK GR42P	DUMP
59	LG VEH	STALL	Highway	MACK RD600P	DUMP
60	LG VEH	STALL	Highway	MACK GU713	DUMP
61	LG VEH	STALL	Highway	MACK GU700	DUMP
62	LG VEH	STALL	Highway	MACK RD600P	DUMP
63	LG VEH	1/2 STALL	Highway	ELGIN PELICAN	SWEEPER
69	LG VEH	1/2 STALL	Highway	ELGIN PELICAN	SWEEPER
72	MEQUIP	FLOOR	Highway	CAT DP98S CASCADE	FORKLIFT
73	M EQUIP	FLOOR	Highway	BOBCAT 750	SKID STEER
76	M EQUIP	FLOOR	Highway	WACKER NEUSON WL-32	MINI LOADER
82	M EQUIP	FLOOR	Highway	MOPOWER DCA 2550H GENERATOR	GENERATOR
83	M EQUIP	FLOOR	Highway	BOBCAT 840	COMPACTOR
89	M EQUIP	FLOOR	Highway	BOBCAT MODEL E35	EXCAVATOR
90	M EQUIP	FLOOR	Highway	WACKER NEUSON WL-32	MINI LOADER
127	M EQUIP	FLOOR	Highway	WACKER NEUSON TOWABLE GEN.	GENERATOR
136	M EQUIP	FLOOR	Highway	WACKER NEUSON WL-20	MINI LOADER
78	SM EQUIP	FLOOR	Highway	BOBCAT S160	SKID STEER
113	SM EQUIP	FLOOR	Highway	BOBCAT T170	SKID STEER
138	SM EQUIP	FLOOR	Highway	SKID STEER M10024	SKID STEER
1	SM VEH	take home	Highway	FORD F250	TRUCK
10	SM VEH	STALL	Highway	FORD F350	TRUCK
11	SM VEH	take home	Highway	FORD F250	TRUCK
14	SM VEH	take home	Highway	FORD RANGER	TRUCK
17	SM VEH	STALL	Highway	FORD F350	TRUCK
131	SM VEH	STALL	Highway	FORD F250	TRUCK
71	T	INSIDE	Highway	PAINT TRAILER	TRAILER
84	T	?	Highway	CONTRAIL C-10 (Bobcat Trailer)	TRAILER
91	T	?	Highway	SURE TRAC UTILITY TRAILER	TRAILER
92	T	?	Highway	HUSON TOL PSH-100 (TB Trailer)	TRAILER
93	T	?	Highway	STECO TRAILER (T4)	TRAILER
94	T	?	Highway	BOGERS TRAILER	TRAILER
96	T	?	Highway	44 TRIM TRAILER	TRAILER
99	T	?	Highway	SOMMERSET TR ALFON (T7)	TRAILER
128	T	?	Highway	CROSS COUNTRY TRAILER	TRAILER
116	T	INSIDE	Highway	HEAT UTILITY TRAILER	HOT BOX
	T	floor	Highway	ALLMANT LIGHT TOWER	Light
	T	floor	Highway	ALLMANT NIGHT LIGHT PRO	Light
	T	floor	Highway	ALLMANT NIGHT LIGHT PRO	Light
1	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
2	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
3	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
4	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
5	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
6	T	floor	Highway	FULL MATRIX MESSAGE BOARD	msg bd
107	LG VEH	STALL	T & G	PERIGHTLINER BUCKET TRUCK	TRUCK
79	MEQUIP	FLOOR	T & G	JD 5420 TRACTOR	TRACTOR
101	M EQUIP	FLOOR	T & G	CARLTON MOORE 2001	CHIPPERS
102	MEQUIP	FLOOR	T & G	JD 3750 TRACTOR	TRACTOR
106	MEQUIP	FLOOR	T & G	GIANT VAC	LEAF VACUUM
108	M EQUIP	STALL	T & G	WARRANT INDICATOR	TRUCK
110	M VEH	STALL	T & G	FORD F-550 (Gross)	TRUCK
115	M VEH	STALL	T & G	FORD F-550	CHIP TRUCK
116	SM VEH	STALL	T & G	FORD F550	TRUCK
118	SM VEH	STALL	T & G	FORD F-550	TRUCK
111	T	?	T & G	WATER TANK TRAILER	TRAILER
	T	INSIDE	T & G	BO TEX TRAILER (BIG GREEN)	TRAILER
	T	INSIDE	T & G	BO TEX TRAILER (BIG GREEN)	TRAILER
	T	?	T & G	BO TEX TRAILER (BIG GREEN)	TRAILER
76	LG EQUIP	TBD	Transfer Station	90K CAT	LOADER
87	LG EQUIP	TBD	Transfer Station	RAMMONT 480S 750 IMPACTOR	IMPACTOR
46	LG VEH	TBD	Transfer Station	MACK GR40P	ROLL OFF
51	LG VEH	TBD	Transfer Station	MACK P94T	TRACTOR
56	LG VEH	TBD	Transfer Station	KAM OTTAC	YARD TRACTOR

## 2. FLEET INVENTORY VERIFICATION

### Quantities, Sizes & Storage Provisions

STORAGE GARAGE = 24,900 SF



# General Project Updates

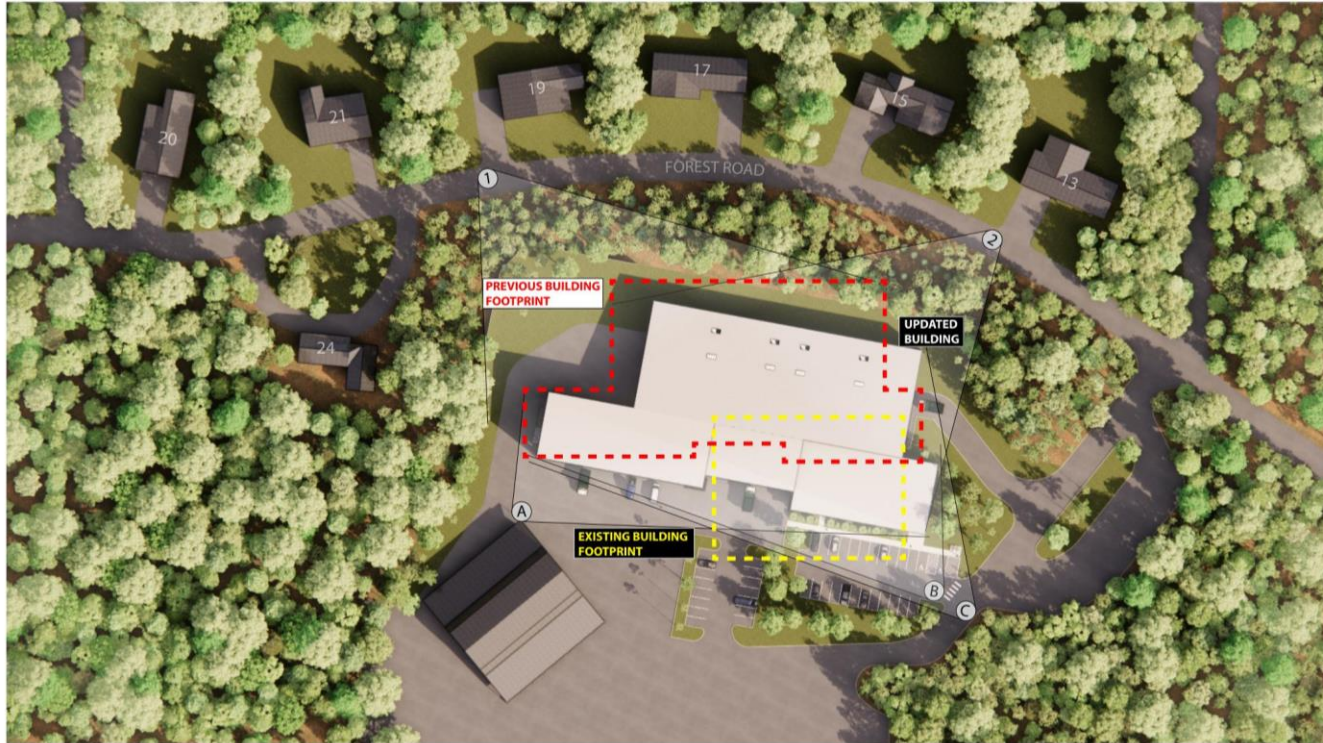
# 3. GENERAL PROJECT UPDATES

## Recent Activities

- Internal Kick-Off for Design Development
- DPW Open House; Last Saturday 1/25
- Site/Civil Plan Update
- 100% Draft SD Energy Model
  - Per Mass Save Incentives Program
- Industrial Equipment Meeting #2; Wednesday 1/29
  - Follow up #3 meeting to be schedule next week
- Hazardous Building Material Inventory; Friday 1/31
- Upcoming meeting with Fire Marshal & Building Inspector; TBD

# 3. GENERAL PROJECT UPDATES

## Updated Site/Civil Plan





# 3. GENERAL PROJECT UPDATES

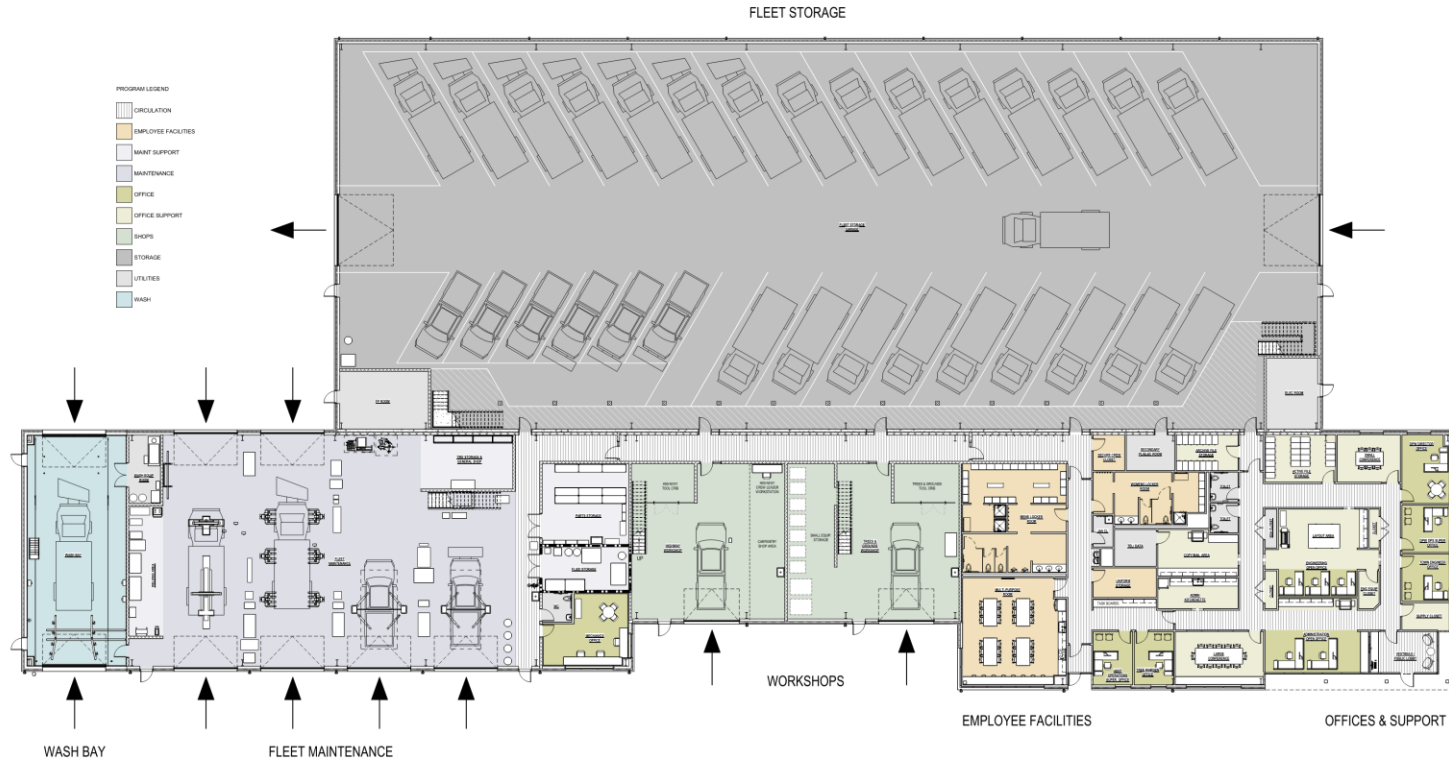
## Updated Renderings





# 3. GENERAL PROJECT UPDATES

## Updated Floor Plan



<b>Administration</b>	<b>4,967 gsf</b>
Offices	1,360 nsf
Support	1,750 nsf
Utilities	100 nsf
Circulation	1,000 nsf
<b>Employee Facilities</b>	<b>3,348 gsf</b>
Emp Fac	1,880 nsf
Utilities	280 nsf
Circulation	470 nsf
<b>Workshops</b>	<b>4,045 gsf</b>
Shops	3,270 nsf
Circulation	800 nsf
<b>Fleet Maintenance</b>	<b>7,740 gsf</b>
Maintenance Bays	5,560 nsf
Maintenance Support	1,340 nsf
Office	300 nsf
Utilities	60 nsf
<b>Fleet Storage</b>	<b>24,900 gsf</b>
Fleet Storage	23,890 nsf
Utilities	620 nsf
<b>Wash Bay</b>	<b>1,786 gsf</b>
Wash Bay	1,450 nsf
Utilities	140 nsf

**TOTAL GSF = 46,786**

# Next Steps

## 4. NEXT STEPS

### Future Milestones

- |   |                       |
|---|-----------------------|
| ❑ Pricing Set to Cost Estimator                                     | April 11, 2025        |
| ❑ Annual Town Meeting for Final Design<br>and Construction Funding: | May 5, 2025           |
| ❑ Final Design/Bidding:   | Summer-Fall 2025      |
| ❑ Construction (1-1/2 Years):                                       | Early 2026 – Mid 2027 |



**Thank you!**  
**Questions?**

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