

FIRST PARISH BEDFORD

CAPITAL CAMPAIGN STUDY FINDINGS

January 12, 2026

GREENER 



MEETING GOALS AND AGENDA

Meeting goals:

- First Parish Bedford to understand cost impact of capital projects included in GreenerU study
- GreenerU to present survey results
- GreenerU to receive additional feedback to incorporate into final recommendations/report to First Parish Bedford

Meeting agenda:

1. Introduce ourselves (GreenerU)
2. Review goals, agenda, and project scope
3. Present on capital campaign project findings
4. Q&A on capital projects
5. Review HVAC options
6. Q&A on HVAC options
7. Present survey results
8. Q&A on survey results
9. Next steps

SCOPE OF PROJECT

Scope of GU campaign study includes:

- HVAC for Common Room/modern portion of church
- Energy efficiency
- Fire protection
- Backup power
- Electric cooktop

Scope of GU planning effort includes:

- Two workshops (December and today)
- Survey of all campaign projects
- Ranking of capital priorities (workshop one and survey)
- Review of feedback

ABOUT GREENERU

GreenerU helps institutions navigate the pathways to decarbonization through planning, engineering, and construction.



goals and values
development



stakeholder
buy-in

engineering
and design



construction project
management



REVIEW OF CAPITAL PROJECTS

ENERGY CONSERVATION MEASURES

LED lighting upgrade

- Approximately 55% of the building has non-LED lighting

Solution	Cost
Replacements – <ul style="list-style-type: none">• includes full replacement of some fixtures for improved aesthetics and additional motion sensor control functionality• 10,900 kWh in annual energy savings	\$100,540 (~\$104,280 gross cost and \$3,740 in incentives)
Retrofits – <ul style="list-style-type: none">• uses existing fixtures and replaces the bulbs/ballasts only• 9,100 kWh in annual energy savings	\$59,800 (no incentives)

Envelope improvements – part of architectural study

- Includes improved insulation in some parts of the building and replacing windows that have lost their seal and are quite drafty

GENERATOR

Problem: Existing battery does not have long enough charge to evacuate using elevator for more than one person

Recommendation:

- Generac 60 kW generator
- Equipment + installation and startup
- Enough to power elevator
- Location: vault

Estimated cost to install generator:
\$95,000



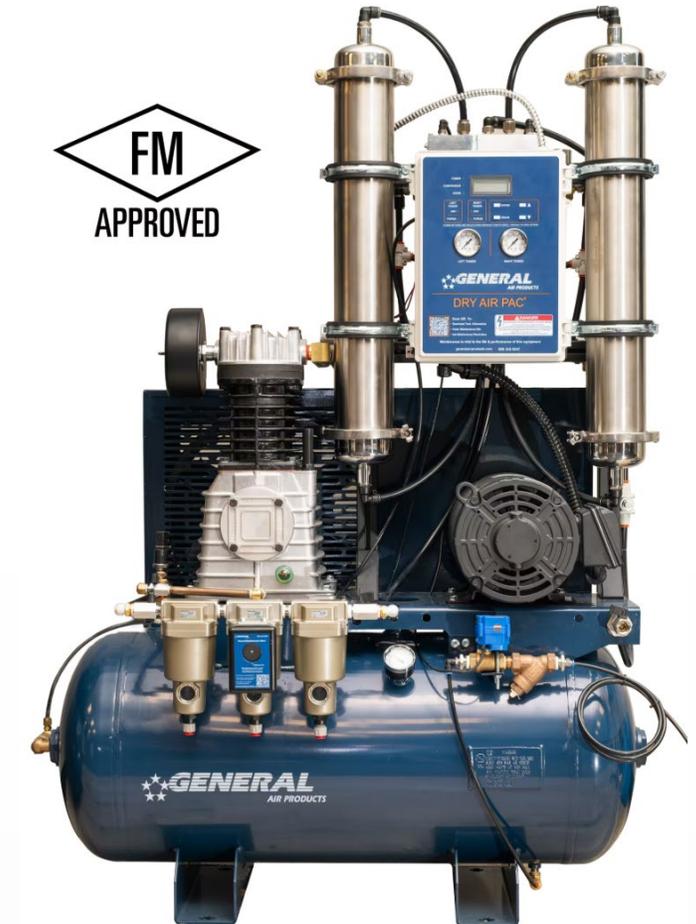
FIRE SUPPRESSION SYSTEM

Problem: Existing dry fire suppression system is 40–50 years old and has issues with leaks.

Recommendation:

- Install DAPV500A Dry Air Pac (dryer + compressor)
- This will prevent future problems by removing moisture from compressed air but will not fix existing rust damage done by moisture in pipe system
- Hold additional budget (\$90k–\$100k) to investigate if major piping replacements are required

Estimated cost to install dryer:
\$35,000



ELECTRIC COOKTOP

Problem: Induction vs electric resistance as alternative to gas range

	Induction cooktop	Electric resistance cooktop
Efficiency/ environmental consideration	<ul style="list-style-type: none">• Higher efficiency option• Removes reliance on natural gas	<ul style="list-style-type: none">• Not as efficient as induction• Removes reliance on natural gas
Safety	<ul style="list-style-type: none">• Concerns with pacemakers – this should not be an issue if people with pacemakers leave a distances of 12–24 inches between pacemaker and cooktop• Recommendation: Have those with pacemaker consult with their doctor before using or getting close to the cooktop to understand the limitations of their specific pacemaker	<ul style="list-style-type: none">• Concerns with hot cooktop and small children• Recommendation: consider a stove guard or burner covers for placing over when not in use
Relative cost	<ul style="list-style-type: none">• Higher upfront cost• Higher efficiency = lower operating cost• Requires specific cookware (magnetic stainless steel, cast iron, etc)	<ul style="list-style-type: none">• Lower upfront cost• Lower efficiency = higher operating cost



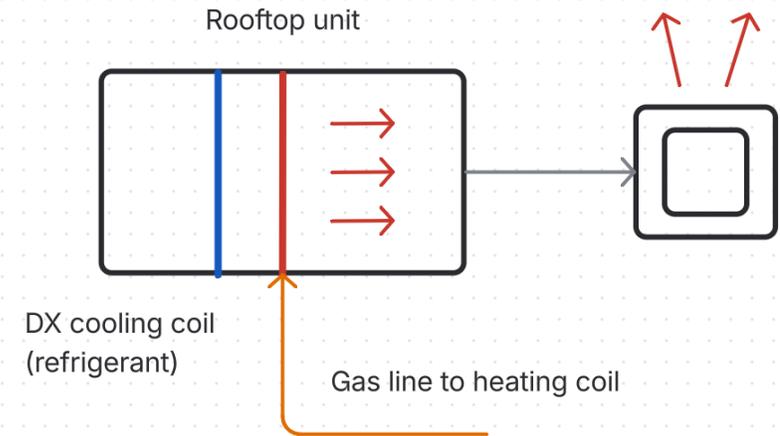
Q&A FOR CAPITAL PROJECTS



REVIEW OF HVAC CAPITAL PROJECT

EXISTING SYSTEM ON COMMON ROOM SIDE

- Four gas-powered rooftop units (RTUs) that produce hot air delivered through ductwork and diffusers
- Located on the roof above common room



WHAT ARE HEAT PUMPS?



Ground source heat pumps

- Pulls energy from the ground into useful heating or cooling
- Rejects hot/cold energy from building into the ground
- Most efficient way to heat and cool a building with current heat pump technology
- COP – 4.0 to 5.0 and may slowly decrease over many years as the ground temperature becomes less warm
- The wells have a very long lifespan of 50+ years
- Pumps and terminal equipment will last 20–30 years, some equipment may need to be replaced sooner

Air source heat pumps

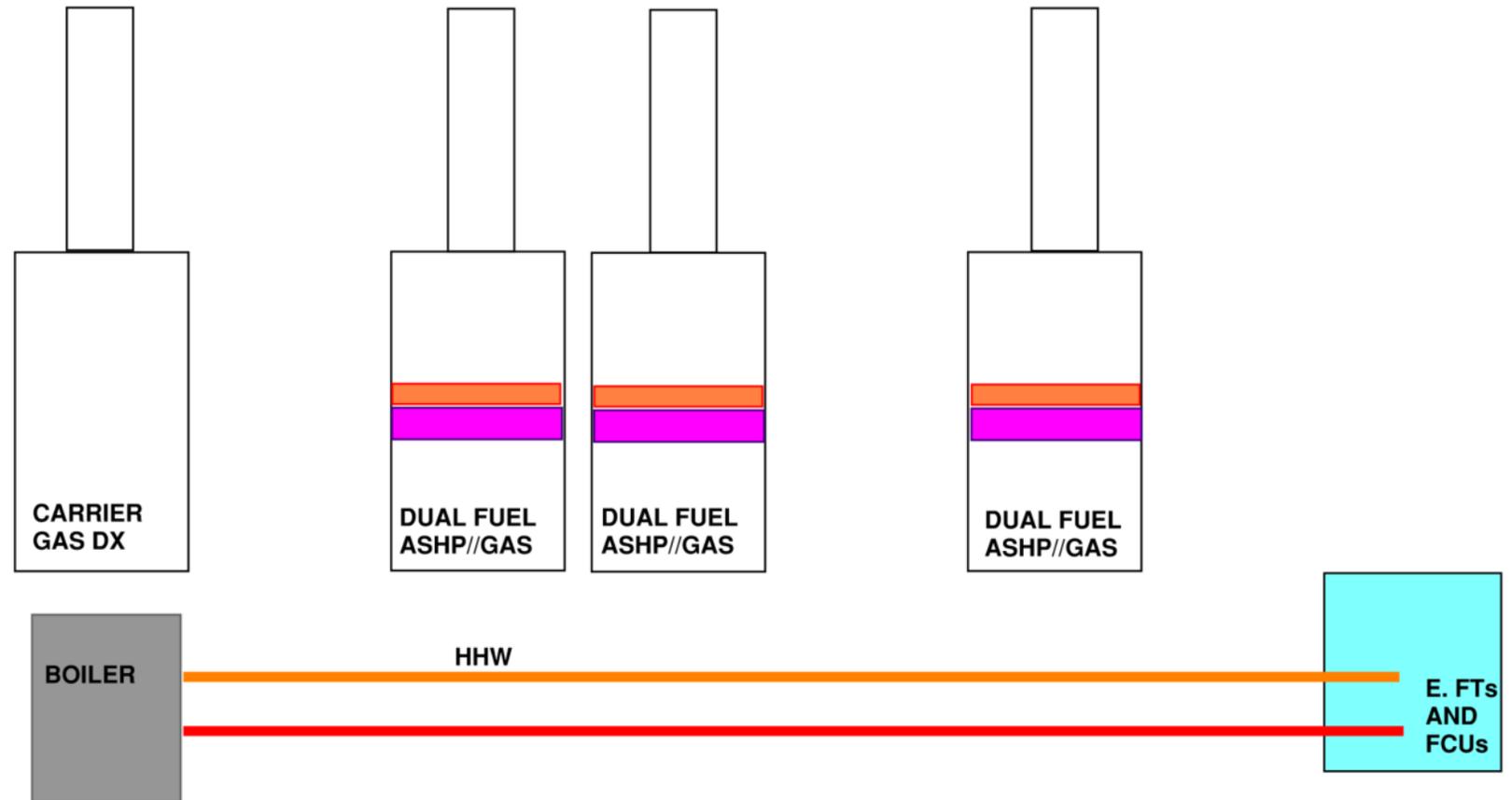
- Pulls energy from outside air into useful heating or cooling
- Reject hot/cold air from inside to outside
- More efficient than traditional heating systems, but less efficient than geothermal
- COP – 2.5 to 3.5 and varies depending on outside air temps, losing efficiency in colder temperatures
- In colder climates, may require some form of backup heating for the coldest days of winter
- Equipment will last between 20–30 years, some equipment may need to be replaced sooner

ADDRESSING SOME SURVEY QUESTIONS

- Financial aspects
 - Cannot compare commercial to residential; code compliance for ventilation, more complex systems and installation required
 - The range presented for ASHP in the survey has been split into 2 options (more on that in following slides)
- Geothermal
 - Unless funded through a third-party that you can pay back over time, costs will be upfront
 - Collaboration with Town – are there nearby properties that could benefit?
 - Cost feasibility relies on federal money, which may not be of interest of the church
- Carbon savings
 - Varies for different options, generally geothermal being the highest

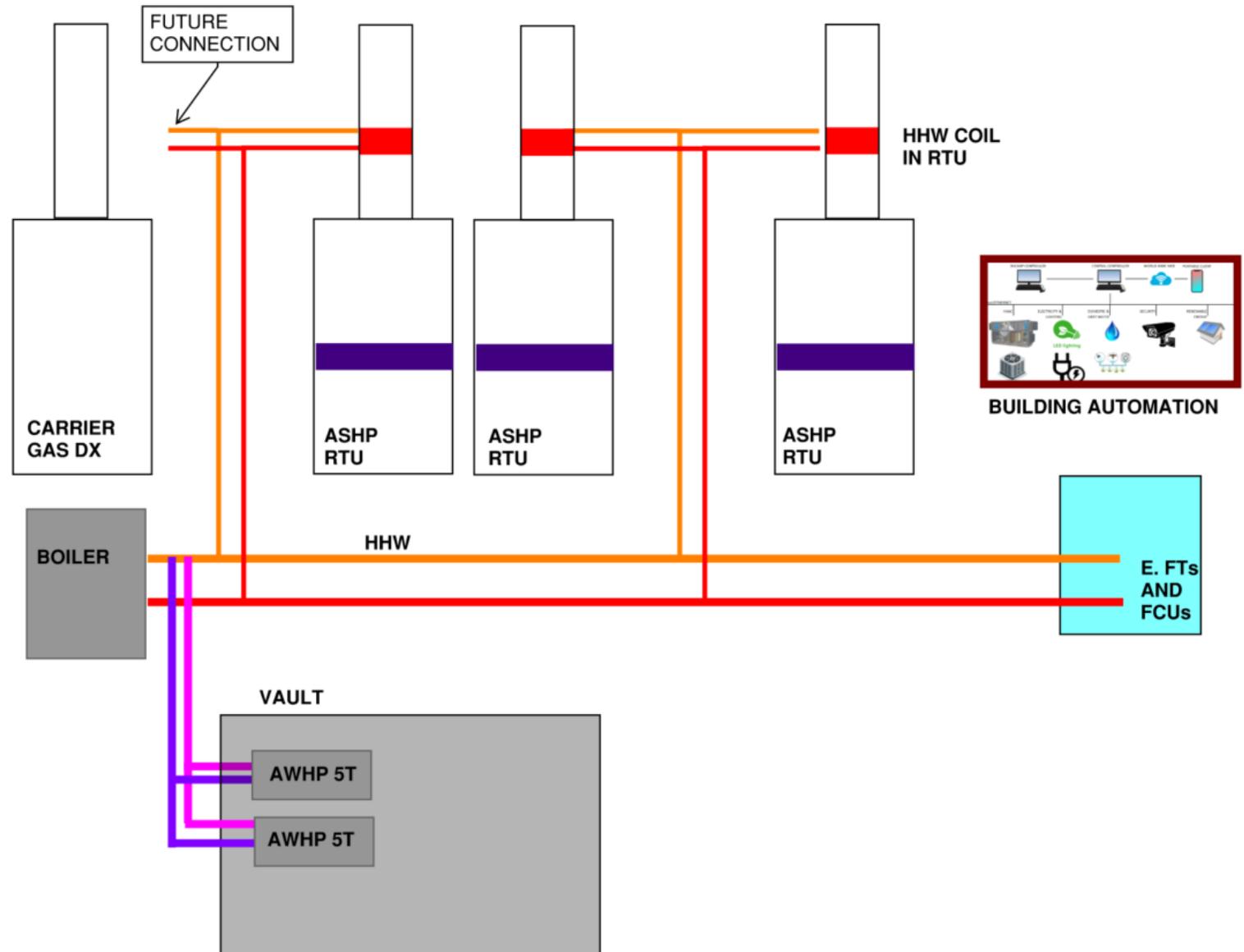
DUAL FUEL AIR-SOURCE HEAT PUMP (ASHP) AND GAS

- Similar to existing gas-fired RTUs
- Carbon savings by using ASHP technology for majority of year
- Relies on gas on coldest days of winter



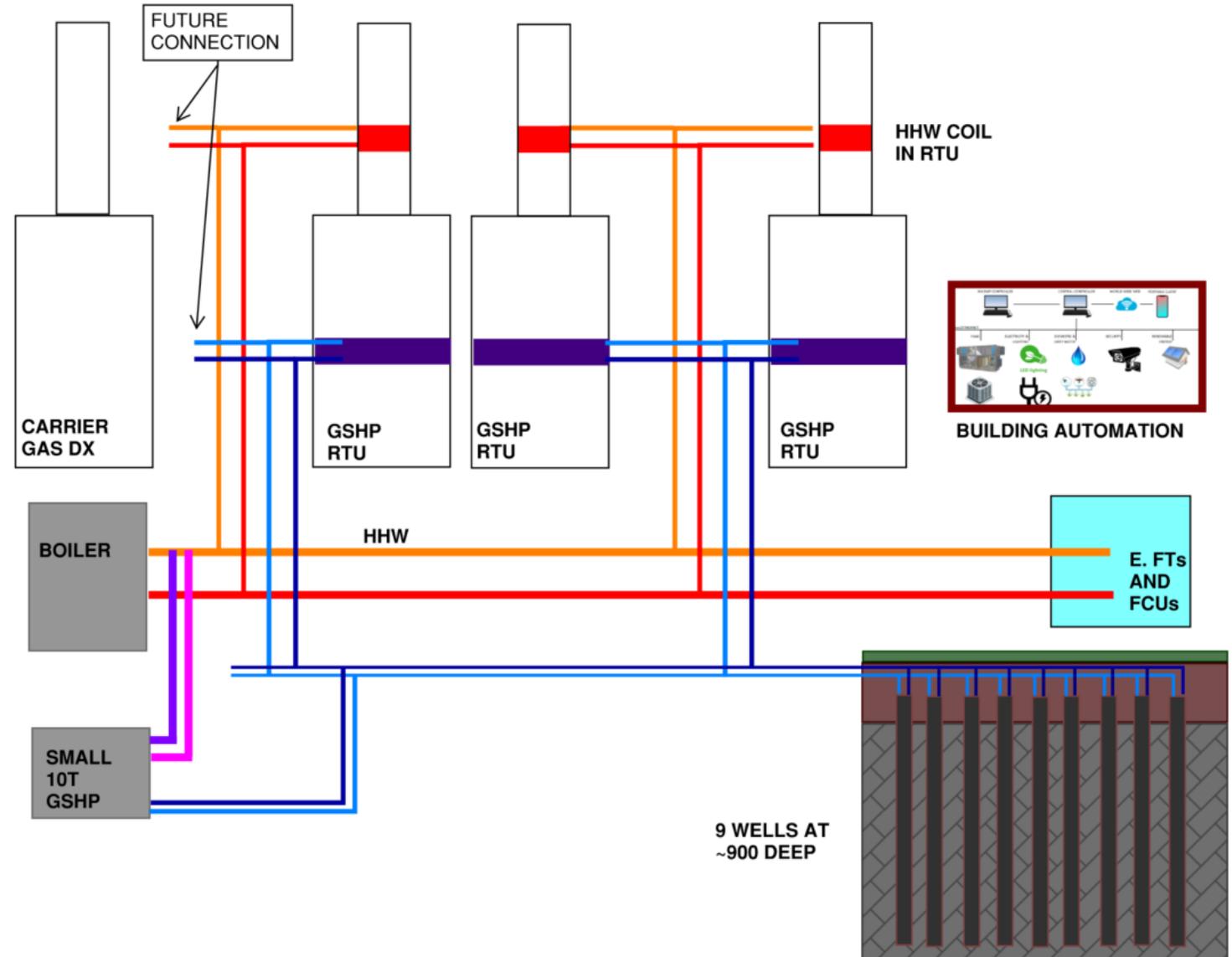
AIR-TO-WATER HEAT PUMP (AWHP) OPTION

- Connection to boiler system for support in winter months
- AWHP can reduce boiler load in shoulder seasons



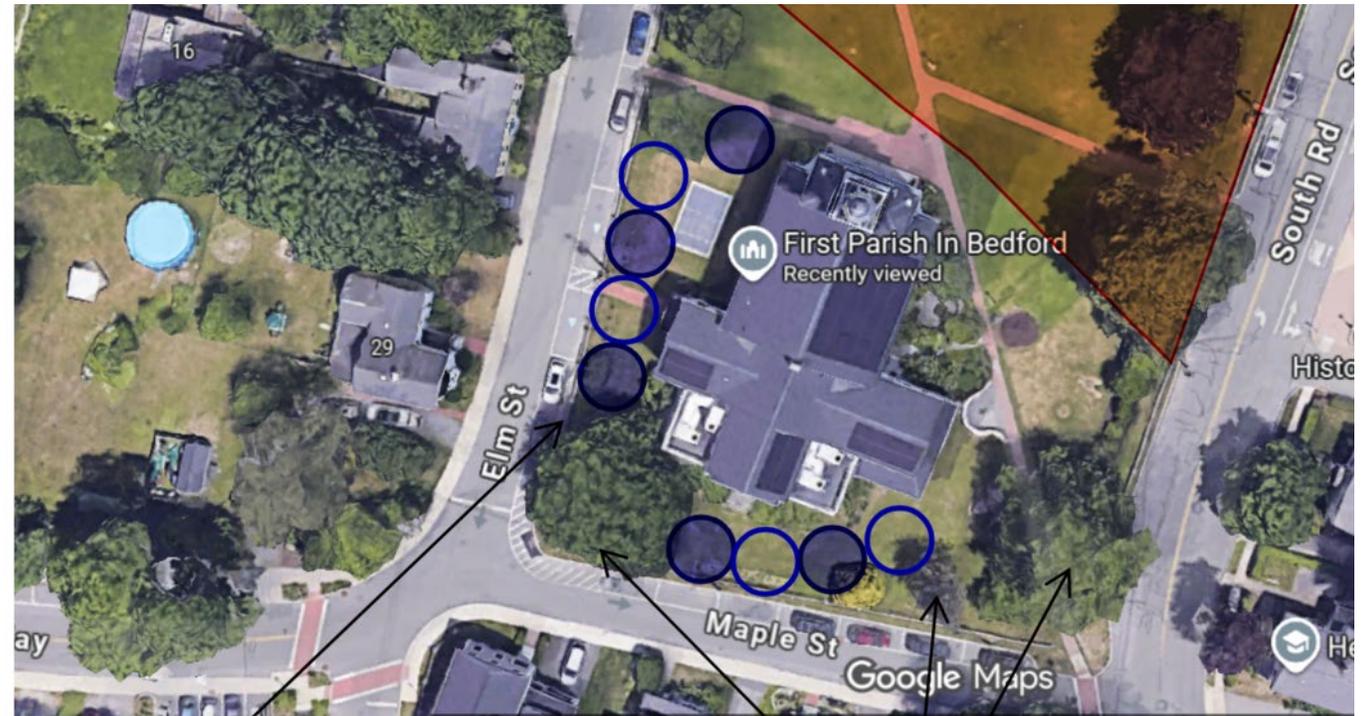
GROUND SOURCE HEAT PUMP (GSHP) OPTION

- Connection to boiler system for support if required
- GSHP can reduce boiler load in shoulder seasons



GEOHERMAL WELL FIELD

- Can fit on the south and west sides of the building
- 9 wells are required

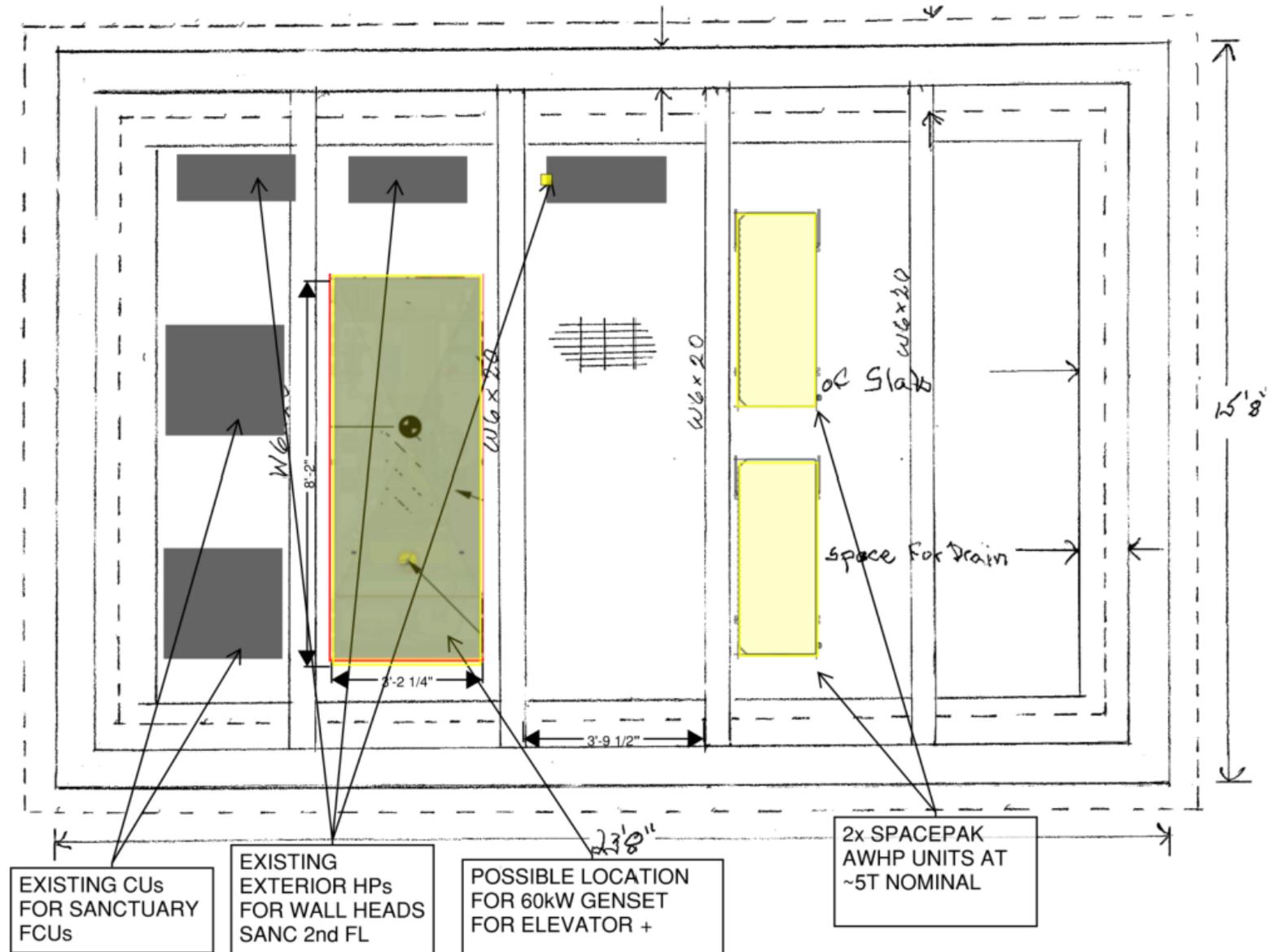


9 POSSIBLE WELLS
(5 MIN SHOWN IN BLUE)
20' MIN SPACING
6" OR 8" DRILL AT
CENTER OF CIRCLE

AVOIDING TREES

VAULT LAYOUT WITH POSSIBLE NEW EQUIPMENT

- Generator and air-to-water heat pump equipment can fit in the vault



PROS AND CONS

GEO / GSHP

ASHP RTU/ AWHP

DUAL FUEL ASHP/GAS RTU

PRO

- No outdoor equipment required
- Highest efficiencies using ground as heat exchange
- Connects to existing hydronic pipe network, reducing some of the load on sanctuary boiler
- Modern BAS to optimize and monitor performance
- Removes almost all fossil fuel from modern/Common Room side of building (except for recently replaced gas RTU)

- High efficiency using outside air as heat exchange (not as good as ground)
- Connects to existing hydronic pipe network, reducing some of the load on sanctuary boiler
- Modern BAS to optimize and monitor performance
- Removes almost all fossil fuel from modern/Common Room side of building (except for recently replaced gas RTU)

- Higher efficiency than gas-only RTU option
- Reduces fossil fuel reliance but not completely
- Lowest upfront cost to FPB

CON

- Larger upfront investment cost, however made comparable by MassSave incentive and Federal Investment Tax Credit (ITC) via "Direct Pay."
- Completely new BAS will be required for all new equipment

- AWHPs are located outside; but can be placed in the vault
- Lower efficiency than ground
- Completely new BAS will be required for all new equipment
- No ITC and lower MassSave incentives.

- Does not remove fossil fuel from common room side of building
- Lower efficiency than ground or AWHP
- No ITC and lower MassSave incentives.

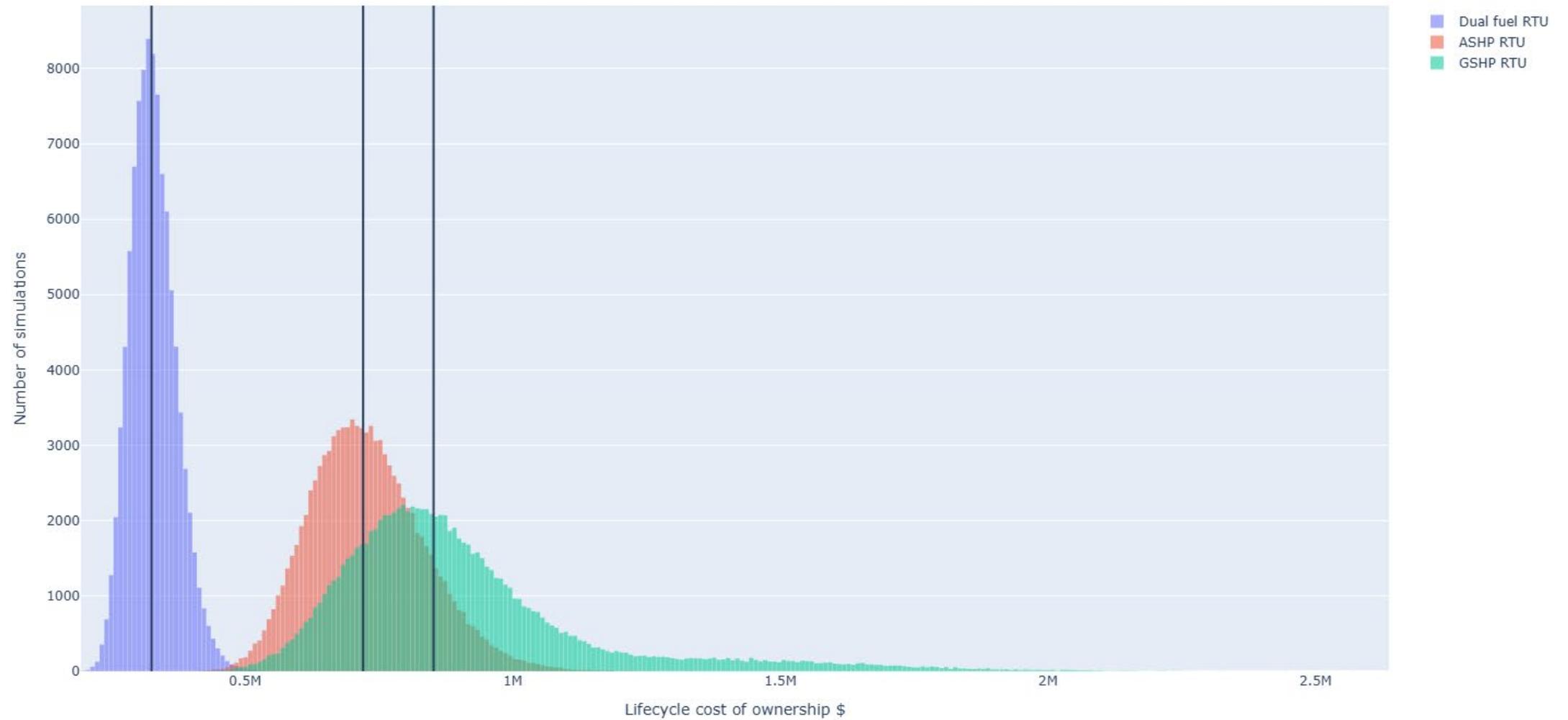
COST COMPARISON OF OPTIONS

	GEO / GSHP	ASHP RTU/ AWHP	DUAL FUEL ASHP/GAS RTU
GROSS COST	\$1.45 M–\$1.6 M	\$600,000–\$700,000	\$250,000–\$300,000
AVAILABLE INCENTIVES	MassSave (\$3,600/ton): \$165,600 IRA Federal Investment Tax Credit (40%): \$560,000–\$640,000	MassSave (\$2,000/ton): \$65,000	MassSave (\$2,000/ton): \$45,000
NET COST TO FPB	\$644,000–\$874,000	\$535,000–\$635,000	\$205,000–\$255,000

**compared to approximately \$40k–\$45k per unit (equipment and installation) for gas-only RTU; \$120–\$135k total cost for three units*

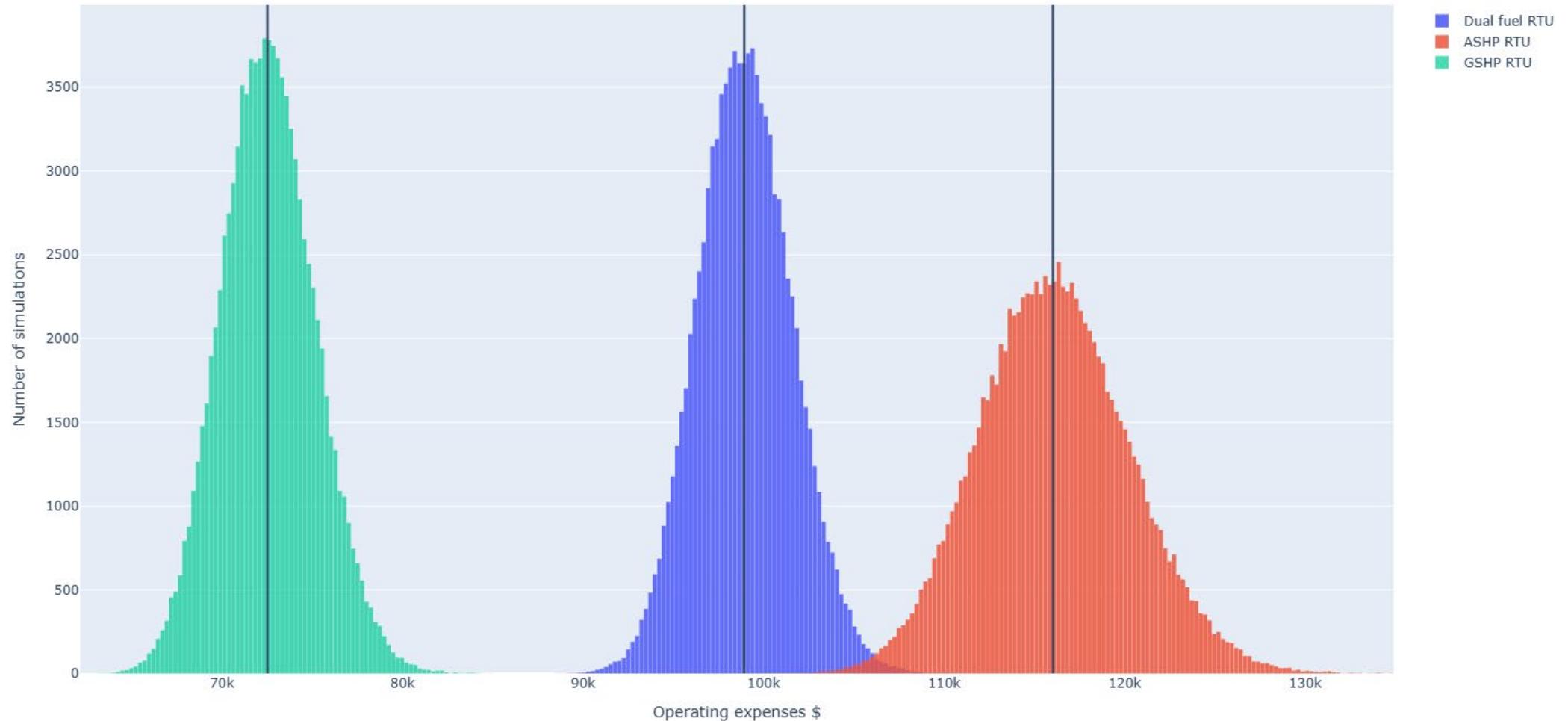
MONTE CARLO ANALYSIS | LIFECYCLE COST

Proposed solutions lifecycle cost of ownership comparison.



MONTE CARLO ANALYSIS | LIFECYCLE OPERATING COSTS

Proposed solutions lifecycle operating expenses comparison.



RELATIVE CARBON REDUCTION OF OPTIONS

GEO / GSHP

ASHP RTU/ AWHP

DUAL FUEL ASHP/GAS RTU



- Complete elimination of natural gas on modern side of building
- Some reduction of boiler usage on sanctuary side of building and uses boiler as backup on the coldest days
- Highest efficiency solution, lowest amount of electricity use



- Complete elimination of natural gas on modern side of building
- Some reduction of boiler usage on sanctuary side of building and uses boiler as backup on colder days/weeks
- High efficiency solution, most electrical usage of all three options



- Reduction of natural gas on modern side of building
- Still relies on gas on coldest days/weeks of winter
- ASHP is same efficiency as ASHP/AWHP option, but will be running less often and using less electricity



Q&A ON HVAC CAPITAL PROJECT



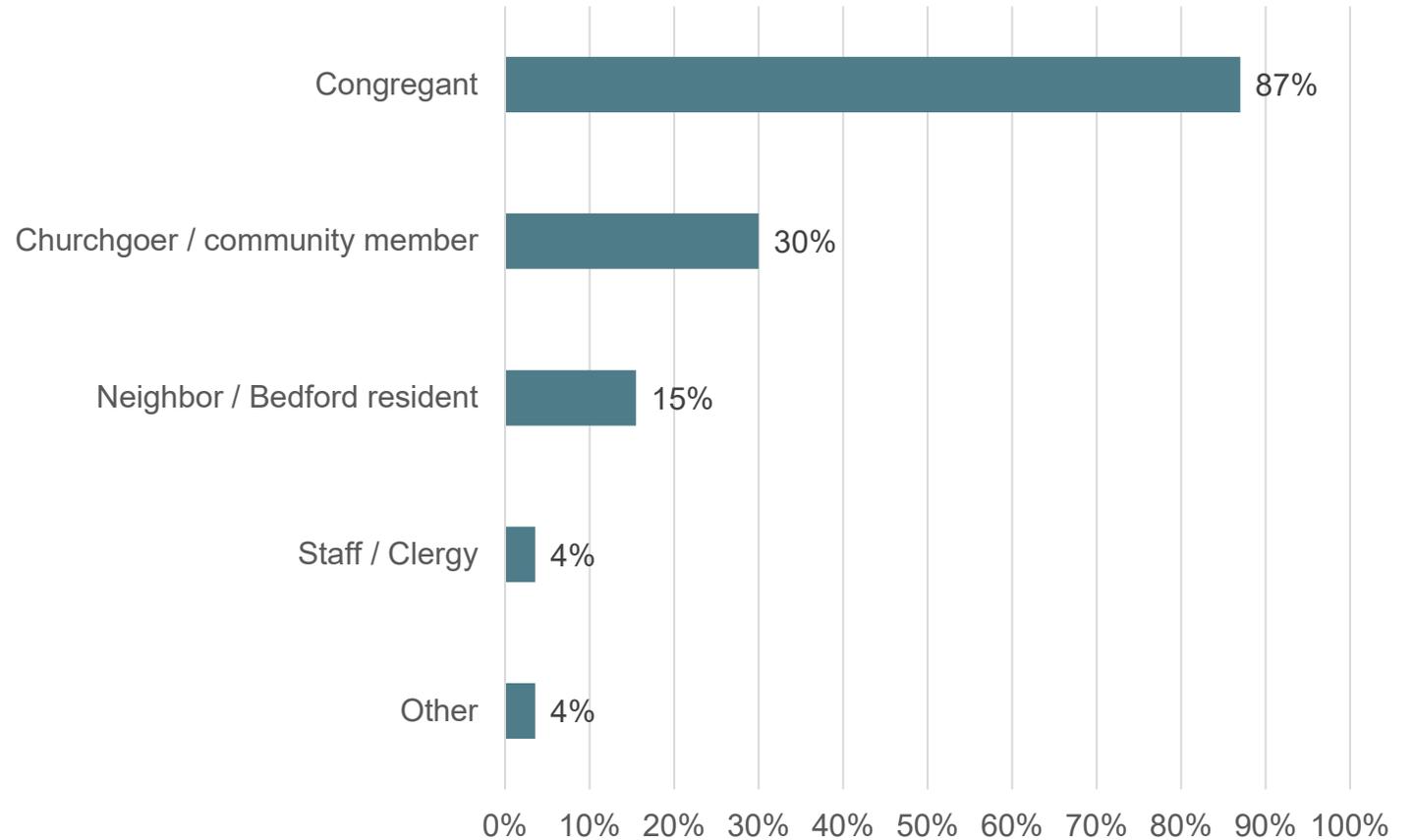
SURVEY RESULTS

SURVEY: FPB COMMUNITY PRIORITIES

Survey overview

- 88 individuals participated in the survey
- The survey was open from December 12, 2025 to January 5, 2026

Breakdown of respondents (select all that apply)



OVERALL PRIORITIZATION

Top priorities:

1. Heating the rear addition
2. Updating the fire suppression system
3. Installing backup power
4. Providing an ADA accessible common room

Overall thoughts:

- The community values safety and sustainability
- The number of choices and high costs are overwhelming
- There's a need for better cost-benefit data before decisions can be made

HEATING FOR THE REAR ADDITION

Top priorities:

1. Minimizing energy use overall
2. Taking advantage of utility / tax incentives
3. Reducing fossil fuel use

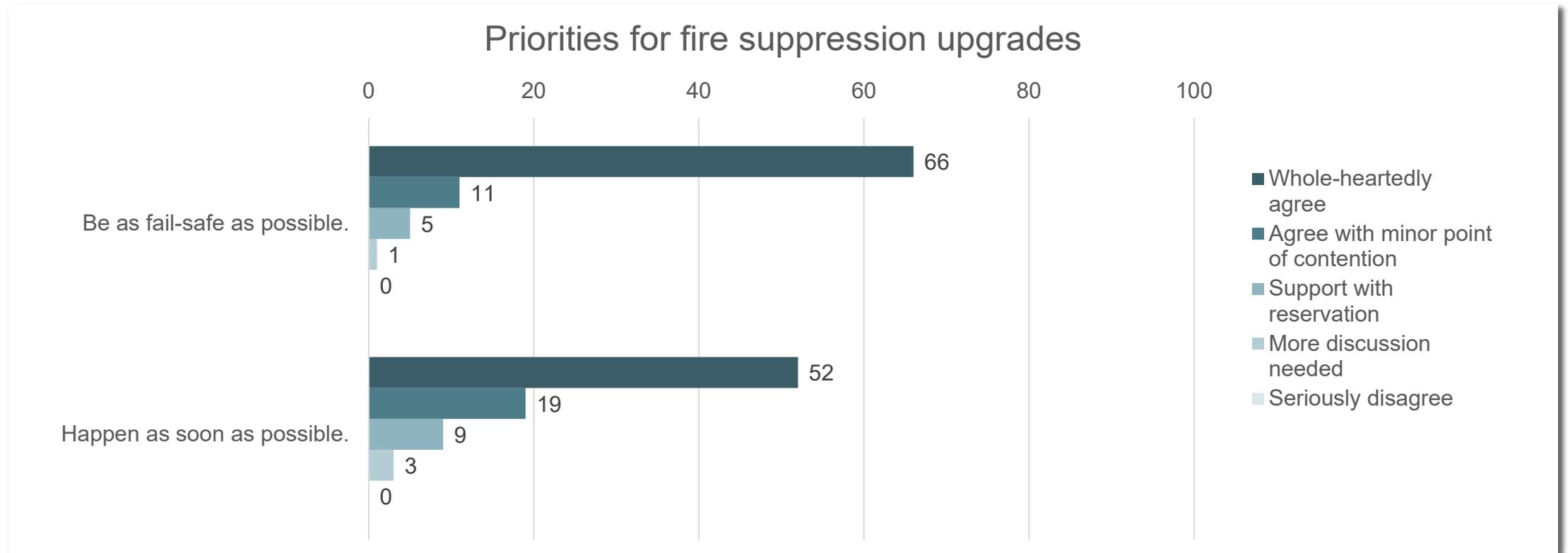
Comments:

- The dual fuel approach is a good compromise

Questions:

- Why are the heat pump cost estimates so high?
- Can costs be spread over several years or shared with other buildings?
- Is decarbonizing the building the most impactful way to spend this money?
- Will new tech soon render these suggestions obsolete?
- Do air-source heat pumps perform well in cold weather?

FIRE SUPPRESSION AND SAFETY

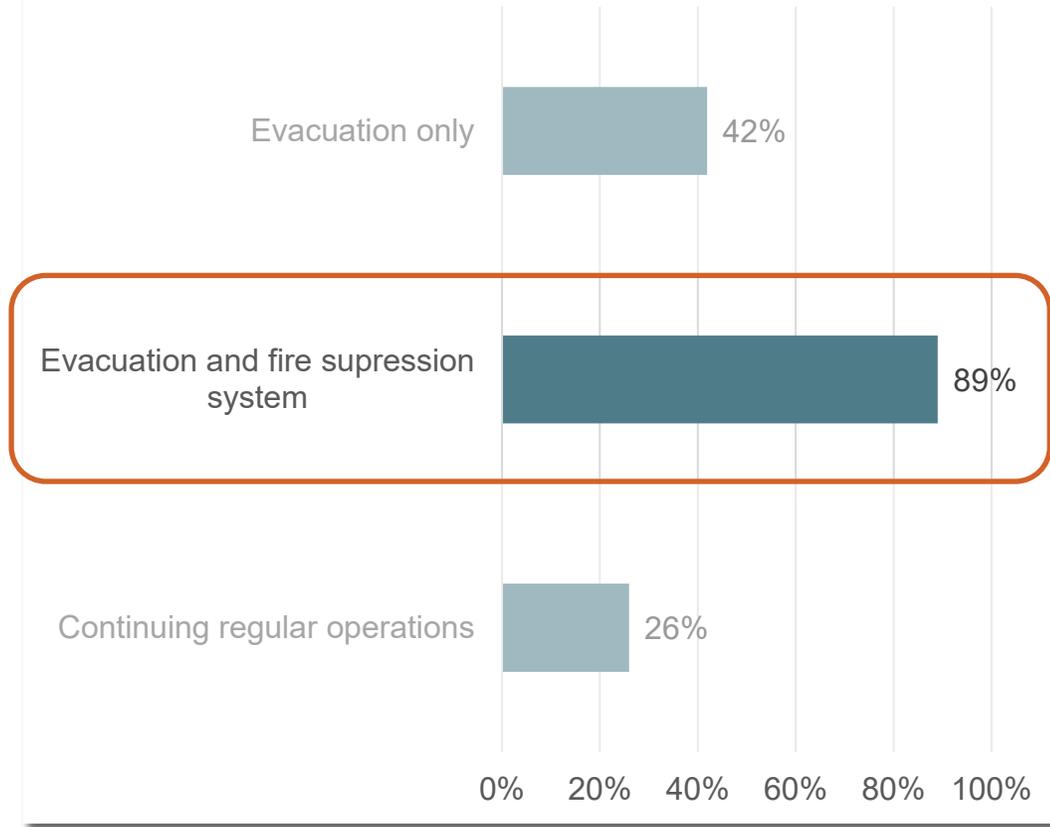


Comments:

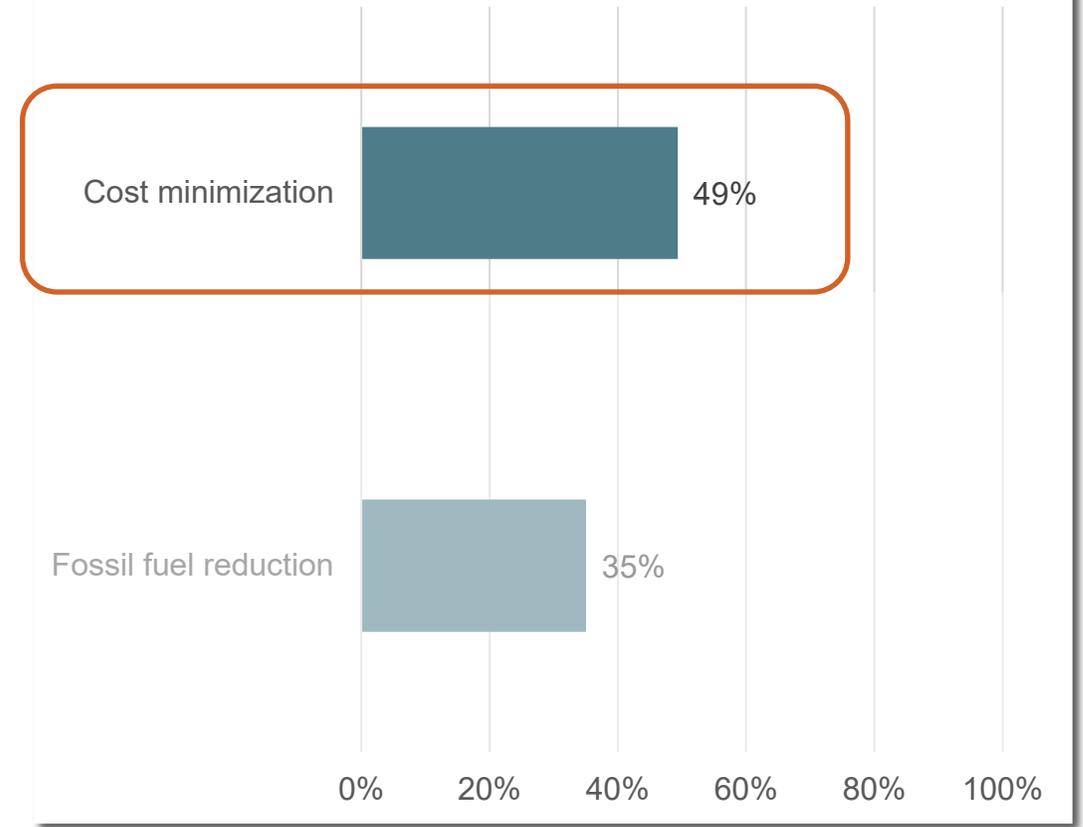
- Most see this as a “no-brainer” and top priority
- There are concerns that the cost estimates are too low for a whole-building project

BACKUP POWER

Backup power should have the capacity to support...



In a direct comparison, backup power decisions should prioritize...



COMMON ROOM ACCESSIBILITY

Top priorities:

1. Safety for all users
2. Installing a ramp for exiting the building
3. Solutions fitting in architecturally

Lowest priority:

- Solutions being as inexpensive as possible

Concerns:

- Electric lifts may be too slow in emergencies
- \$225,000 is a high cost for a ramp
- Back patio renovation needs more conversation / detail.

REPLACING THE COMMON ROOM RANGE

Top priorities:

1. Consider safety for individuals with pacemakers
2. Prioritize fossil fuel reduction over cost minimization
3. Prioritize long-term costs over first costs

Lowest priority:

1. Include an additional oven

Questions:

- Why is the cost of a stove so high?
- Are the current ovens sufficient?

OVERHAULING THE ORGAN

78%

of respondents feel solutions should support the parish's cultural legacy and services

35%

of respondents feel other needs should be prioritized over preserving the organ

Suggestions:

- Explore “fake” organ options
- Delay working on the organ in favor of other high-cost needs

SOUNDPROOFING AND PARSONAGE

Soundproofing Room 201

- **77%** of respondents want to start with simple solutions (carpeting and curtains) before professional assessments
- Many doubt the necessity of this project compared to others

Parsonage improvements

- **69%** of respondents support expanding the ability to accommodate disabilities
- **56%** believe accessibility should be prioritized over cost
- **Questions:**
 - Is the parsonage still a private residence or a program space?
 - Why is the bathroom renovation estimate so high?



Q&A ON SURVEY RESULTS

NEXT STEPS