

House of Hope Presbyterian Church

UTILITY INFRASTRUCTURE IMPROVEMENT PROJECT

Congregational Presentation
January 19, 2025



PROJECT ACCOMPLISHMENTS

- Replaced the building heating and air conditioning systems including the conversion from steam to hot water heating
 - Improved energy efficiency
 - Reduced carbon footprint
- Installed a new computerized building automation system to control the heating, cooling and ventilation system
- Upgraded the building electrical service from Xcel Energy and replaced the primary electric gear
- Upgraded the building natural gas service including a new gas meter
- Replaced the previous two fire alarm systems with one addressable smoke/fire notification system
- Replaced most of the lights throughout the church with LED fixtures

HEATING SYSTEM REPLACEMENT

- The original steam boilers and pneumatic control system were installed in 1958
- Those original steam boilers had limitations resulting in inefficient operation
 - Radiant heat loss
 - Temperature control challenges
- The new boilers are a Hydronic Heating System
 - High efficiency, condensing hot water boilers
 - Central pumping system operated by VFD's
 - New hot water piping throughout the building and new hydronic accessories
 - New digital building controls system



AIR CONDITIONING EQUIPMENT REPLACEMENT

- The original equipment was an air-cooled chiller mounted on the roof with 55-ton capacity and 87-ton connected load (35% diversity). It served the Sanctuary, Parlour, East Wing Education and West Wing Offices/Conference Rooms. The original equipment had no expansion capacity.
- The new equipment has 95 tons of capacity with 123 tons of connected load (25% diversity) with the additional areas of the Great Hall, Rooms A & B, the Youth Center and the Skylight Room now being served.



AIR HANDLERS

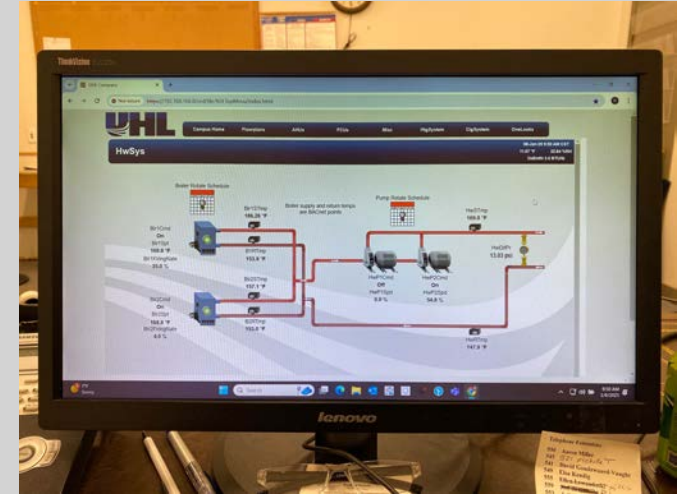
- Previous air handlers were all 1958 vintage with issues such as:
 - Lack of or limited return air to units
 - Improper or inadequate insulation
 - Some ductwork was undersized
 - There were some spaces without any ventilation
 - Building pressurization issues
 - Some equipment was difficult to access for maintenance
- All air handlers have been replaced with the proper type and size of unit for the area they serve
- Existing ductwork has been modified and new ductwork installed to properly serve the areas as air return via corridors is no longer allowed by code
- Air quality is better due to improvements in make-up air, return air, filtration and humidification
- Ceilings and lights in many rooms were removed to complete the work



HEATING, VENTILATION AND AIR CONDITIONING (HVAC) MECHANICAL SYSTEM CHANGES

The new mechanical system includes:

- 2 Boilers
- 1 Chiller (air conditioner)
- 8 Air Handlers
- 11 Variable Air Volume Terminal Boxes
- 21 Fan Coil Units
- 3 Humidifiers
- 8 Pumps
- 2 Expansion Tanks
- 2 Air Separators
- 14 Exhaust Fans
- 59 Induction Units
- 8 Cabinet Unit Heaters
- 1 Kitchen Make-Up Air Unit
- 1 Chemical Feed system
- Direct Digital Controls System



MAIN ELECTRICAL & GAS SERVICE

- The Xcel Energy service enters the building on the west side via overhead power lines and pole mounted transformers
- The original 800-amp service was insufficient to carry the new mechanical loads
- A new 1200-amp service has been installed by Xcel Energy and the project connected new feeders from the public utility service to the new main switchboard
- A new natural gas service connection was completed to the building including a new gas meter.



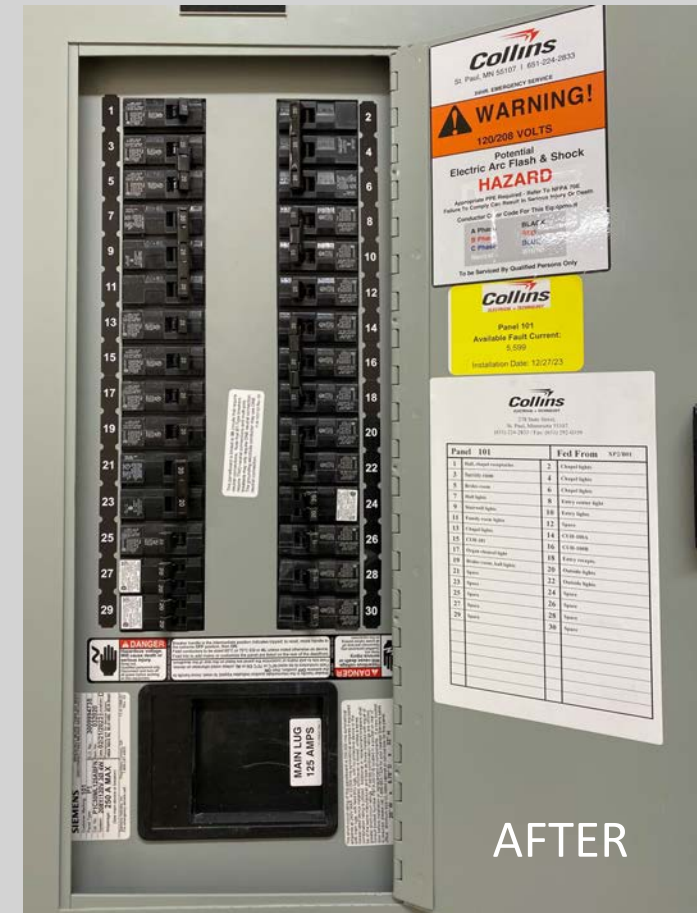
ELECTRICAL EQUIPMENT

- The original (1958) main switch and the adjacent distribution panelboard have been replaced
- The new equipment is not in the same location, but adjacent to it which allowed the electrical team to minimize the time that the church was without power during the switch of service to the new electrical gear.



ELECTRICAL CIRCUIT BREAKER BOXES

- 21 circuit breaker boxes exist throughout the building
- The circuit breaker boxes are generally full
- Circuit breaker equipment has a typical life of 40 years. Most panels have exceeded their expected service life.
- 15 of the 21 circuit breaker boxes have been replaced – the existing enclosure and all connected conduits were kept. The panel interior and front covers have been replaced.
- The electrical feeder from the new main electrical distribution panel board to each circuit breaker box has been replaced.
- The wiring from the circuit breaker boxes to lights, outlets, etc. has not been replaced and will need to be addressed as different areas of the church are renovated over time.



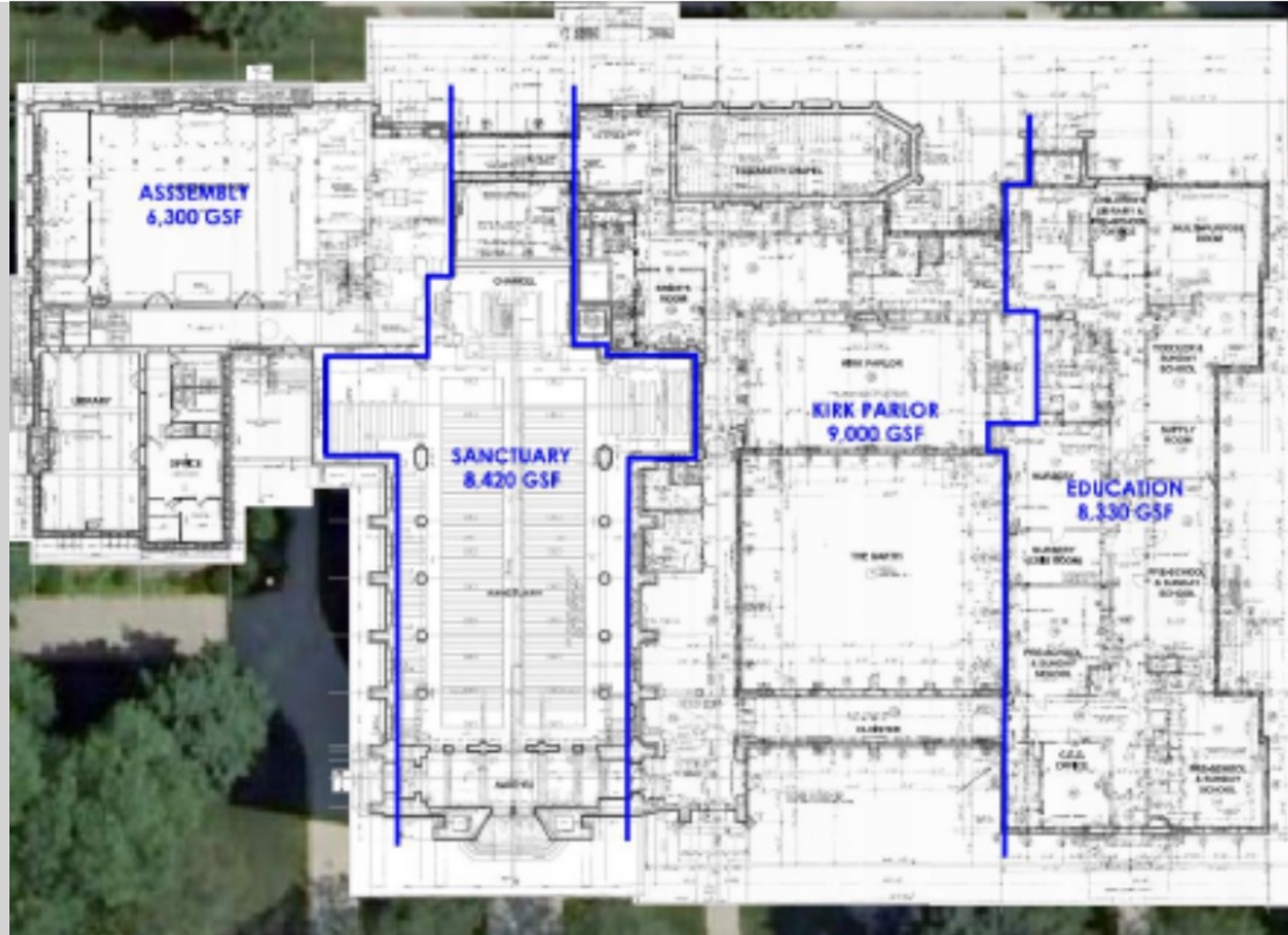
FIRE ALARM SYSTEM

- Previously the church had two separate fire alarm systems monitor the building. The two systems were networked together so an event on either system initiated a general alarm to the entire building
- The City required replacement of the previous systems with a single addressable smoke/fire notification system



FIRE SEPERATION ZONES

- The building does not have a fire suppression system.
- The completed project was a replacement of existing utility infrastructure elements. Since it was not a “renovation”, the City did not require the installation of a fire suppression system at this time so long as the building was separated into four rated assembly areas and there is no “change of use” of the facility.
- The current private school operation in the Education Wing is considered a “change of use” but due to the small size of the operation and the specific area being used, the City has not required a fire suppression system to be installed yet.
- Future renovations will require a fire suppression system be installed including a fire pump sized to serve the entire facility



LIGHTING REPLACEMENT

- Throughout the course of the project nearly all lights throughout the facility were replaced or re-lamped with LED style fixtures or bulbs.
- Areas where the existing ceiling and lights were removed for construction purposes, the lights were replaced with new LED fixtures.
- Almost all other lights throughout the church were re-built or re-lamped to LED fixtures and bulbs. House of Hope worked with the firm LightSwitch who partners with Xcel Energy on such projects for public sector and non-profit/tax-exempt entities. After all rebates the lighting upgrades only cost the church \$2,900.
- Lighting control systems were installed in some areas of the church to meet energy code and aid with energy efficiency.



HAZARDOUS MATERIALS ABATEMENT

- Prior to the start of the project, a Hazardous Material Survey was completed of the entire church
 - Asbestos containing material was found in the existing pipe insulation, floor tile and mastic, and plaster in 1958 addition
 - Lead based paint in various rooms throughout the building
- \$437K was spent removing what needed to be abated for this work to be completed, including other regulated materials such as:
 - Mercury containing thermostats
 - Smoke/Heat Sensors
 - Oil containing hydraulic door closures
 - Emergency Exit Light Batteries
 - Florescent Light Bulbs
- The remaining hazardous materials in the building is contained and safe for daily activities but must be managed properly when encountered
- Additional abatement will be required with future renovation work

PROJECT BUDGET

- Project Total Budget: \$11,324,000
- Projected Final Cost: \$11,230,000
- \$94,000 Under Budget

PROJECT FUNDING

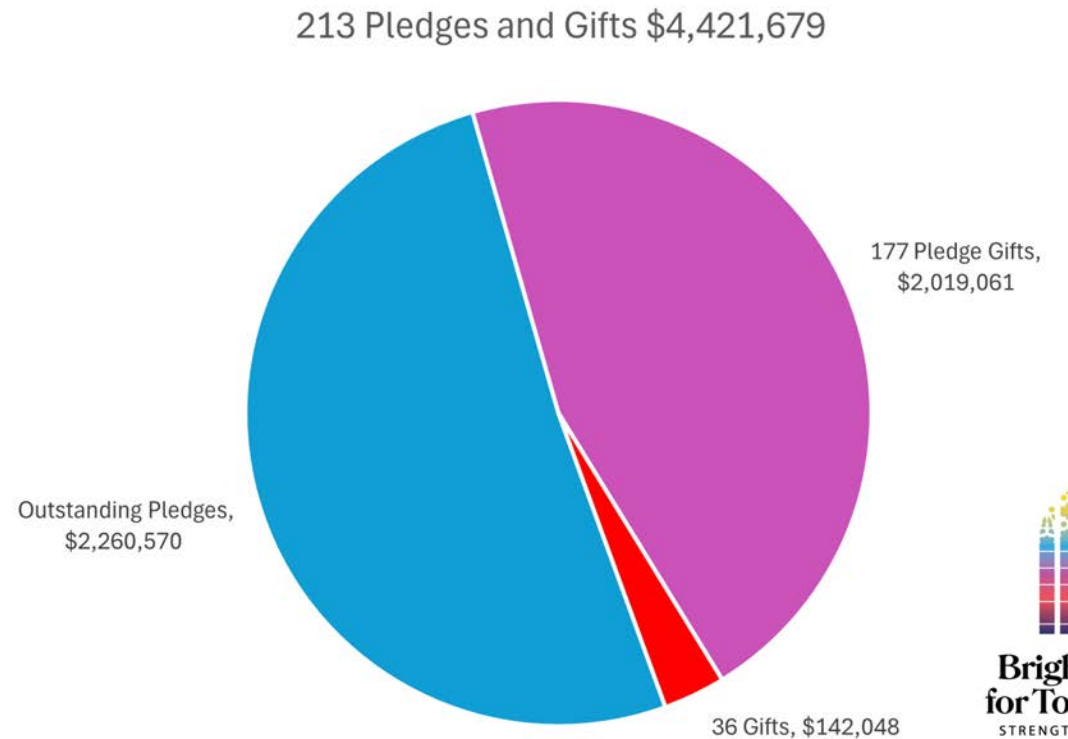
Legacy Building Fund Endowment

- Weyerhaeuser Funds \$750,000
- Meyers Funds \$773,203
- Contingency Funds \$1,684,924
- Unrestricted Endowment \$2,850,000

Endowment Funding \$6,058,127

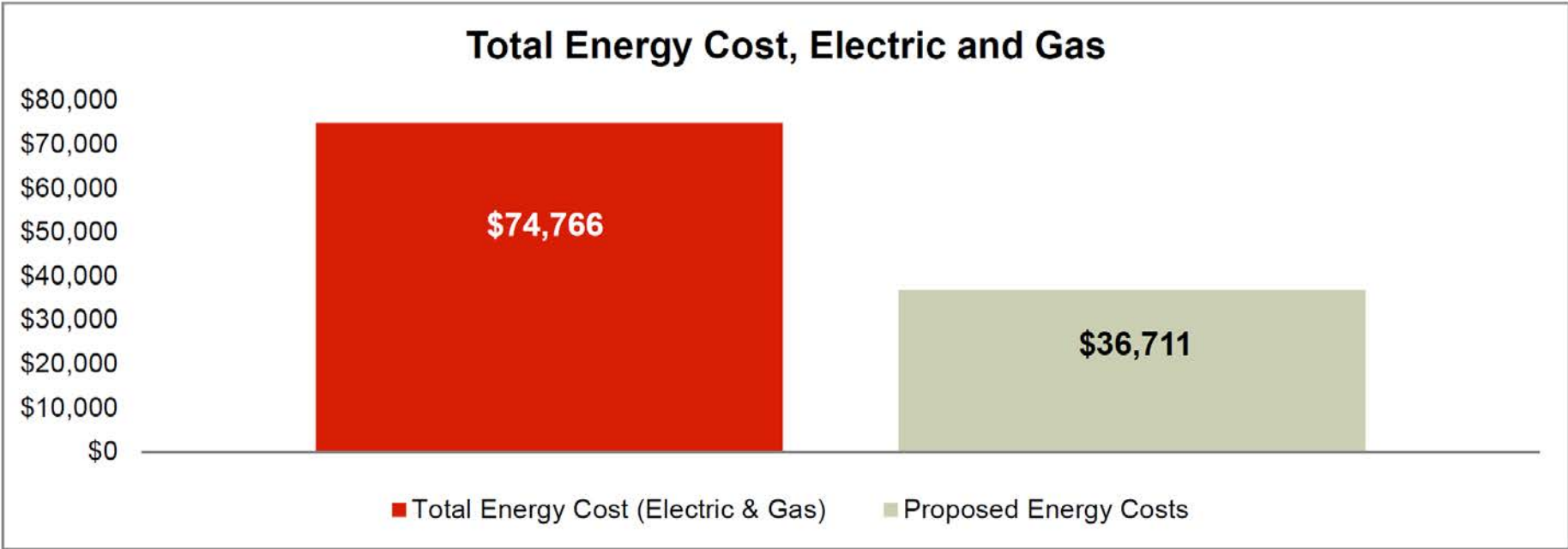
PILP Loan \$5,450,000

Bright Hope Capital Campaign Pledges and Gifts: \$4,421,679



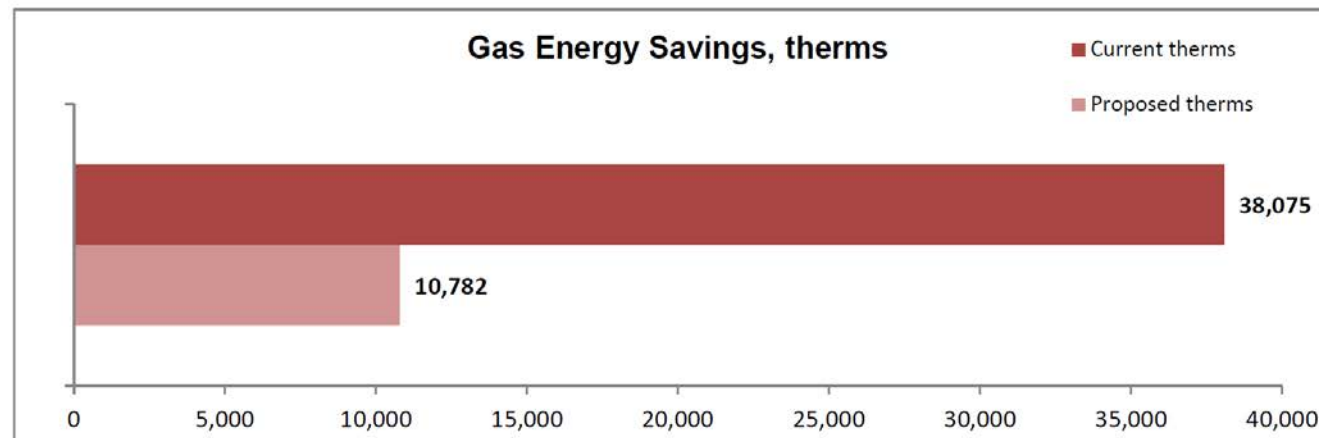
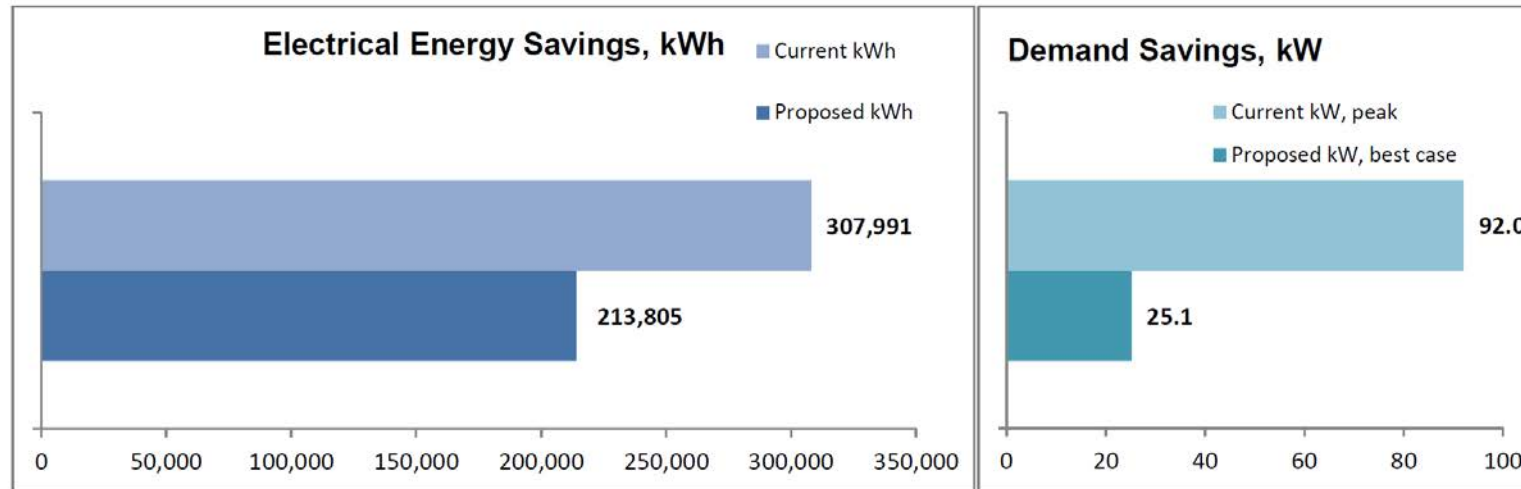
ENERGY SAVINGS PROFILE (source: Xcel Energy)

Total Energy Savings



Estimated Cost Savings, \$	50.9%
Demand Savings (kW), estimated	72.7%
Electric Usage Savings, estimated	30.6%
Gas Usage Savings, estimated	71.7%

ENERGY SAVINGS PROFILE (source: Xcel Energy)



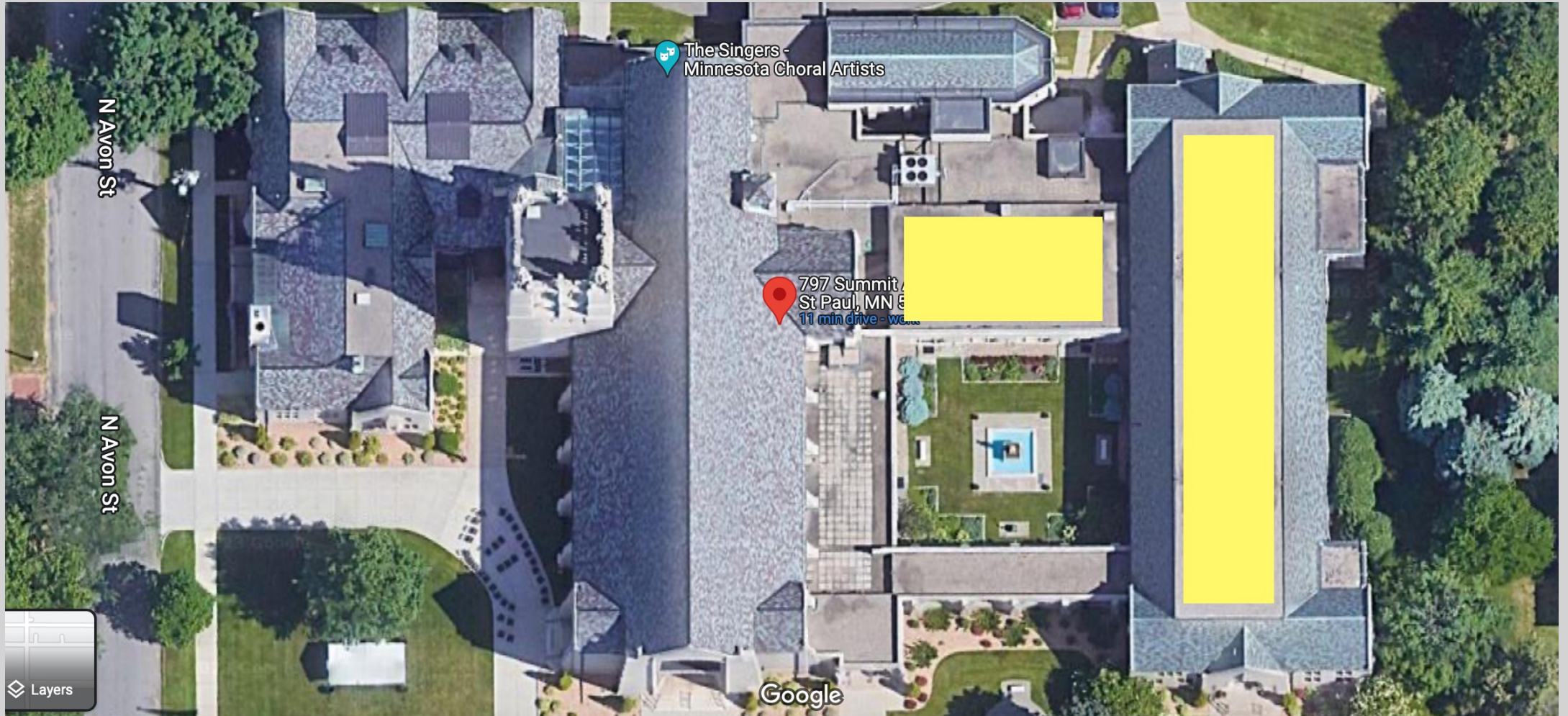
WHAT'S NEXT – ROOF REPAIR/REPLACEMENT

- Inspec has completed a roof and exterior wall survey with the goal of eliminating water infiltration.
 - Flat roofs have zero to a few years of service life remaining, even with annual maintenance and repairs.
 - Sloped (slate) roofs have decades of useful life remaining with proper annual maintenance and repairs
 - Exterior walls and windows have areas where tuckpointing and caulking replacement are needed.
- Inspec is developing plans to be bid in late January or early February to replace the flat roofing system, repair the slope roofs and the exterior walls as well as replace the caulk around all the windows.
- The goal is to make the building watertight above the ground.

WHAT'S NEXT - PHOTOVOLTAICS

- House of Hope is working through the possible installation of a system with Blue Sky Electric
- Preliminary design is a 99-panel system, with estimated electrical production the first year of 50,352kWh. The estimated electrical cost savings is over \$7,000 the first year and grows to over \$14,000 a year in year 25.
- The system will produce about 25% of the church's annual electrical usage and may further increase the demand savings.
- The system has about a 9-year payback period
- The current roof structure appears to have sufficient structural capacity to support the ballasted solar panel system.
- Next steps
 - Finalize the photovoltaic system design and verify that the final design of the system does not exceed the structural capacity of the roofs

PROPOSED PHOTOVOLTAIC LOCATIONS



WHAT'S NEXT – FACILITIES MANAGEMENT PLAN DEVELOPMENT

- A facilities management plan provides a framework for an organization's strategy to manage its building and equipment assets.
- A goal is to develop a comprehensive plan for the ongoing daily facility operations and scheduled preventative maintenance of the church facilities to provide an environment that meets the daily needs of the congregation and limits the risks of the physical assets
- A goal is to develop a long-term plan and budget to address deferred maintenance with scheduled replacement of items such as – flooring, painting, landscaping, security systems, building envelope, furniture, etc. This needs to be done in consideration of the Master Plan.

WHAT'S NEXT – IMPLEMENTATION OF THE MASTER PLAN

- What was just completed was an **“Enabling Project”** for House of Hope
 - Could not have been phased – needed to be done all at the same time
- The Master Plan provides the vision to make programmatic improvements to the building to create an environment resulting in a greater level of service and convenience to your communities.
- The Master Plan can be phased, but the City of St. Paul will require that future renovations bring the church into compliance with the Accessibility Code and will need to include a fire suppression system.
- Implementing the Master Plan requires careful planning, understanding of requirements, opportunities and options of how to design the vision and phase the work within an available budget.
- Implementation of the Master Plan, builds the church out of the deferred maintenance that currently exists
- The next steps are up to you.



QUESTIONS