



For the next 90 years

Health & Wellness Campus

An Electric, Biophilic, & Resilient Hospital

INTRODUCTION

SPEAKERS



Aaron Anderson, AIA, LEED AP
Principal | Market Design Leader



David Neff
Director of Facilities | Plant Operations



Douglas Hundley, PE, CxA, CGD, LEED AP
Vice President



Tiffany Broyles Yost, AIA, LEED AP BD+C, Fitwel Ambassador
Associate Principal | Director of Sustainability & Resilience

1. Introduction: A Health & Wellness Campus
2. Design Approach
3. Pivotal Strategies, Practical Application
4. Open Discussion

AGENDA



**MARGARET MARY
HEALTH**

INTRODUCTION



90
+
YEARS

COMMITTED TO DELIVERING QUALITY

- Est. In 1932 As Margaret Mary Community Hospital
 - Transitioned To Community Ownership In 1967
 - Supported By The John A. Hillenbrand Foundation
- Expansion Of Services To Neighboring Communities:
 - Brookville, Osgood, & Milan
- Six Pine Ranch Road Campus Property Growth & Evolution To Meet Community Healthcare Needs:
 - Outpatient & Cancer Center Est. In 2005
 - Physician Center Opened In 2012
 - <20 Acres Identified For Developing A Health & Wellness Campus Masterplan

INTRODUCTION



MARGARET MARY
HEALTH

MISSION

To improve the health of our communities.

VISION

To be the BEST health care provider for our communities where people choose to come for services; where physicians choose to practice; and where team members choose to work.



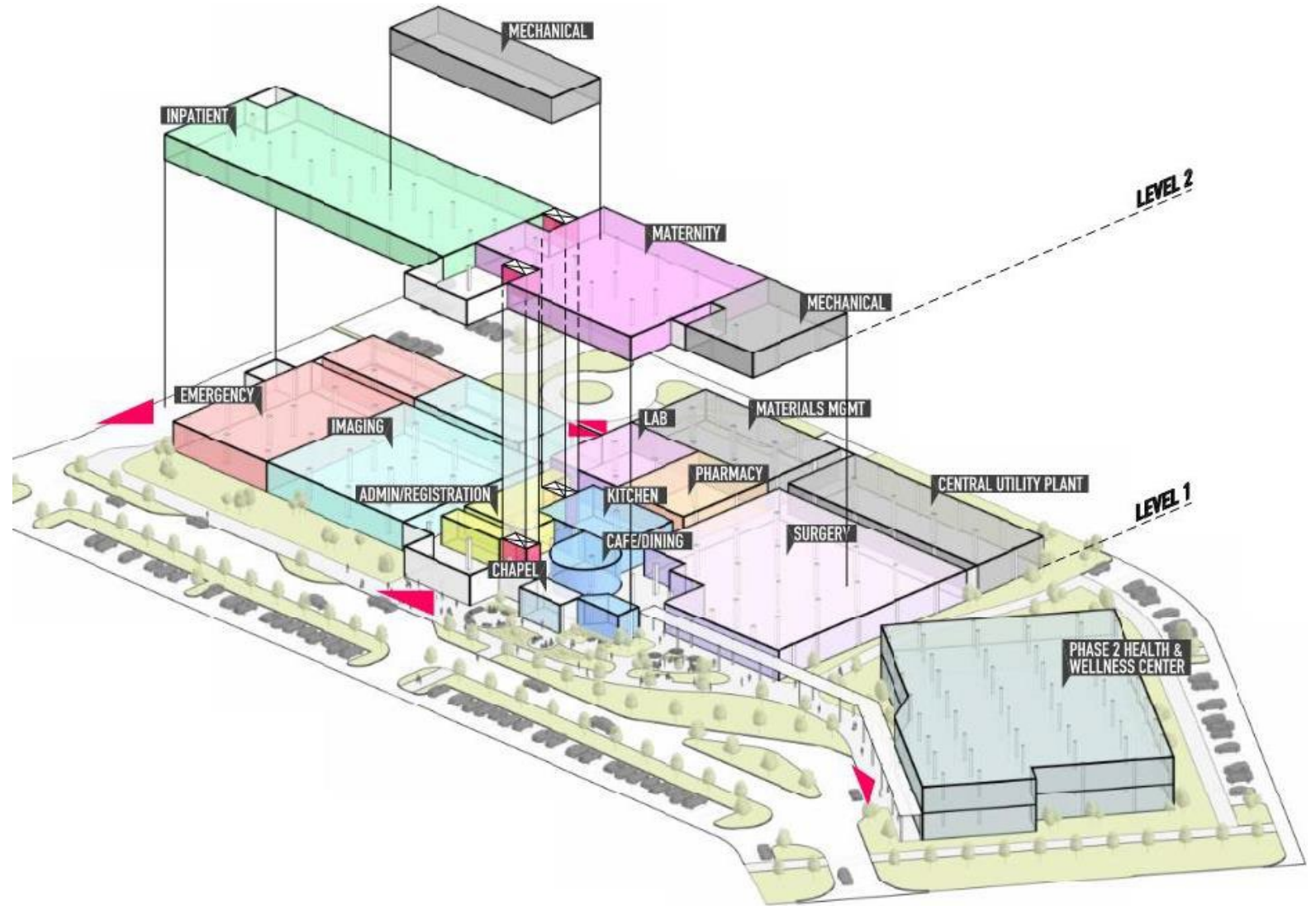
INTRODUCTION



THE NEXT 90 YEARS

New Critical Access Hospital:

- Expanded Surgery Services
- Imaging, Lab, & Pharmacy
- Emergency Department
- 25 Inpatient Beds
- Labor & Delivery Unit
- Central Utility Plan
- Proximate To A Future Health & Wellness Center



INTRODUCTION



DRIVEN BY GOALS

Community is central to success. From high level site analysis to critical planning adjacencies, every decision pays service to Margaret Mary Health's goals:



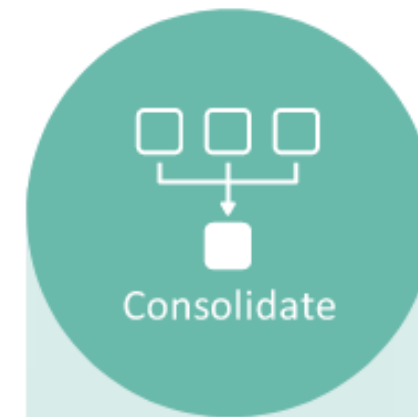
Service

To be Southeastern Indiana's Regional Healthcare **PROVIDER OF CHOICE**



Innovative

To Represent a **NEW MODEL** of Rural Healthcare Delivery in the U.S.



Consolidate

To have all Services Located in a Single Location **MAXIMIZING EFFICIENCY** and High Levels of Patient and Staff Satisfaction



Flexible

The Ability to Flex From an **OUTPATIENT MODEL TO AN INPATIENT MODEL** at the 'Flip of a Switch'



Independent

Remain **INDEPENDENT BUT OPEN** to Ventures that will Strengthen the MMH Mission, Vision and Values



Safe

To be the **SAFEST** Healthcare Facility for our Patients, Their Families and Our Team

An architectural rendering of a modern building with a waterfront park area. The building is a long, low-profile structure with large windows and a flat roof. In the foreground, there is a paved walkway, a grassy area, and a body of water. A person is sitting on a large stone block, and another person is standing nearby. A red balloon is visible in the background. The scene is set during the day with soft lighting.

DESIGN APPROACH

Wrapping patients and staff in wellness.

Purpose • Program • Performance



INTRODUCTION

DESIGN ASPIRATIONS

WRAP PEOPLE IN WELLNESS

Foster belonging with spaces that nurture the physical, emotional and social aspects of health.

CULTURAL ANCHORING

Celebrate the land and the hands that have shaped MMH by integrating the built and natural environments.

HONE A LASTING LEGACY

Principles of time, heritage, space and material; Layering, light and texture combine to express MMH's identity through architecture.

DESIGN APPROACH

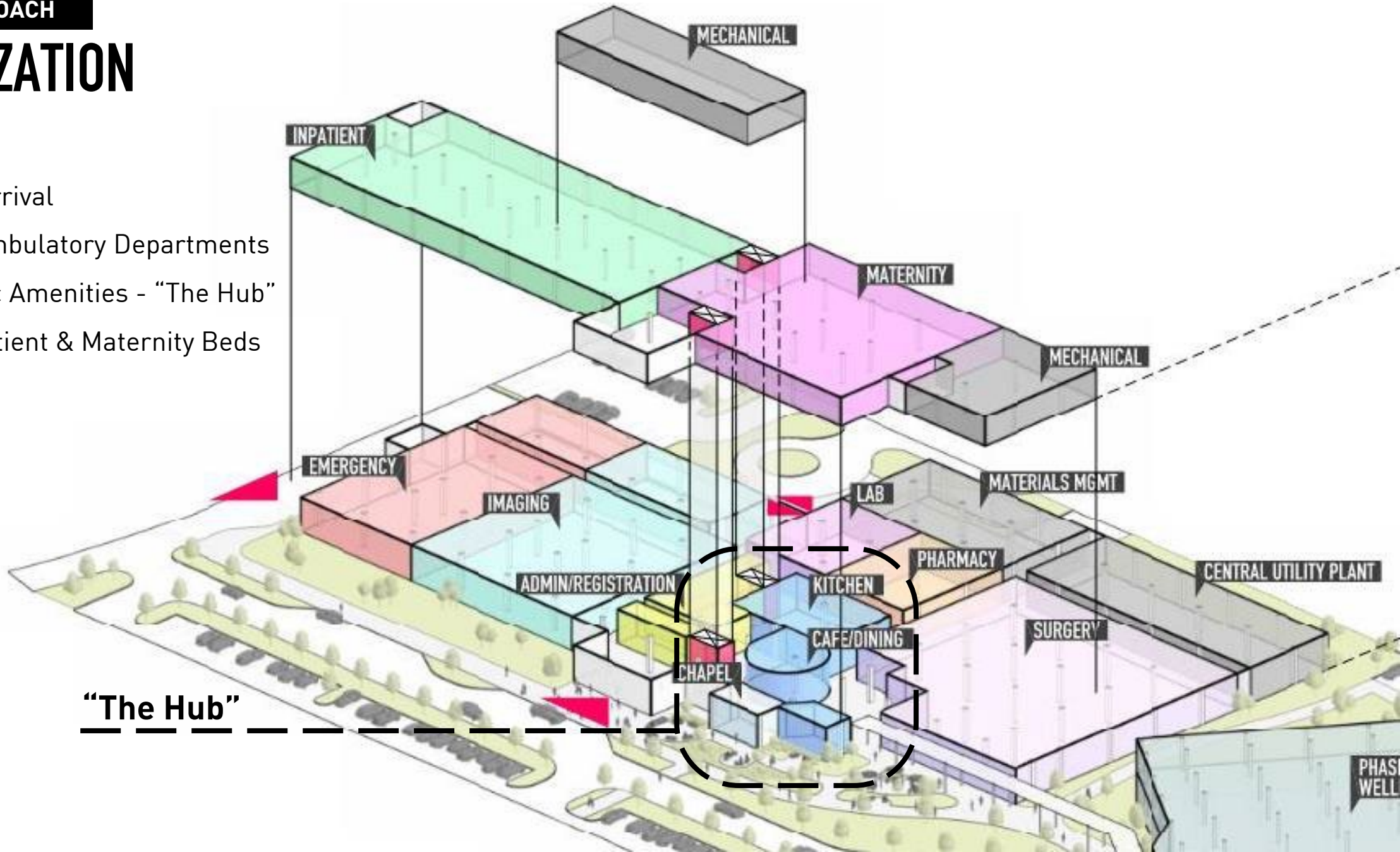
ORGANIZATION

Welcoming Arrival

Accessible Ambulatory Departments

Inviting Public Amenities - "The Hub"

Elevated Inpatient & Maternity Beds

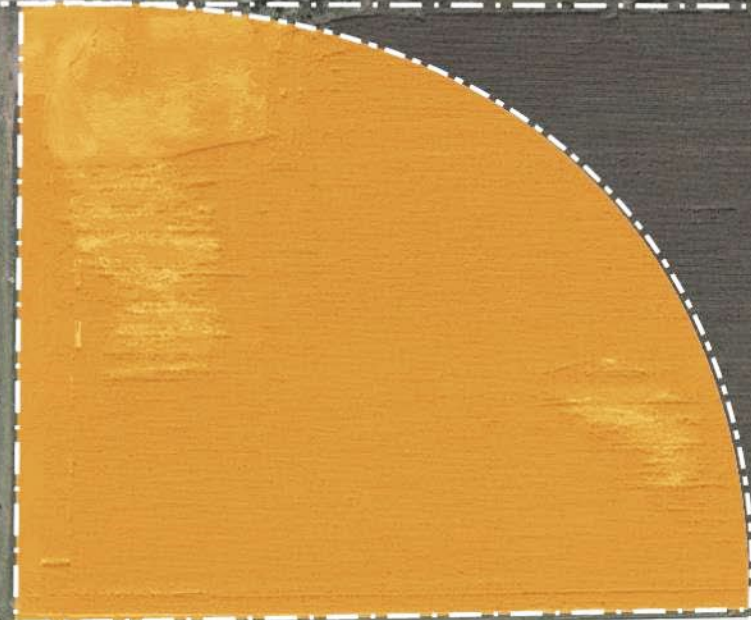


"The Hub"

PHASE WELL

DESIGN APPROACH

MINIMIZE THE FOOTPRINT



**EXISTING CANCER &
OUTPATIENT CAMPUS**

DESIGN APPROACH

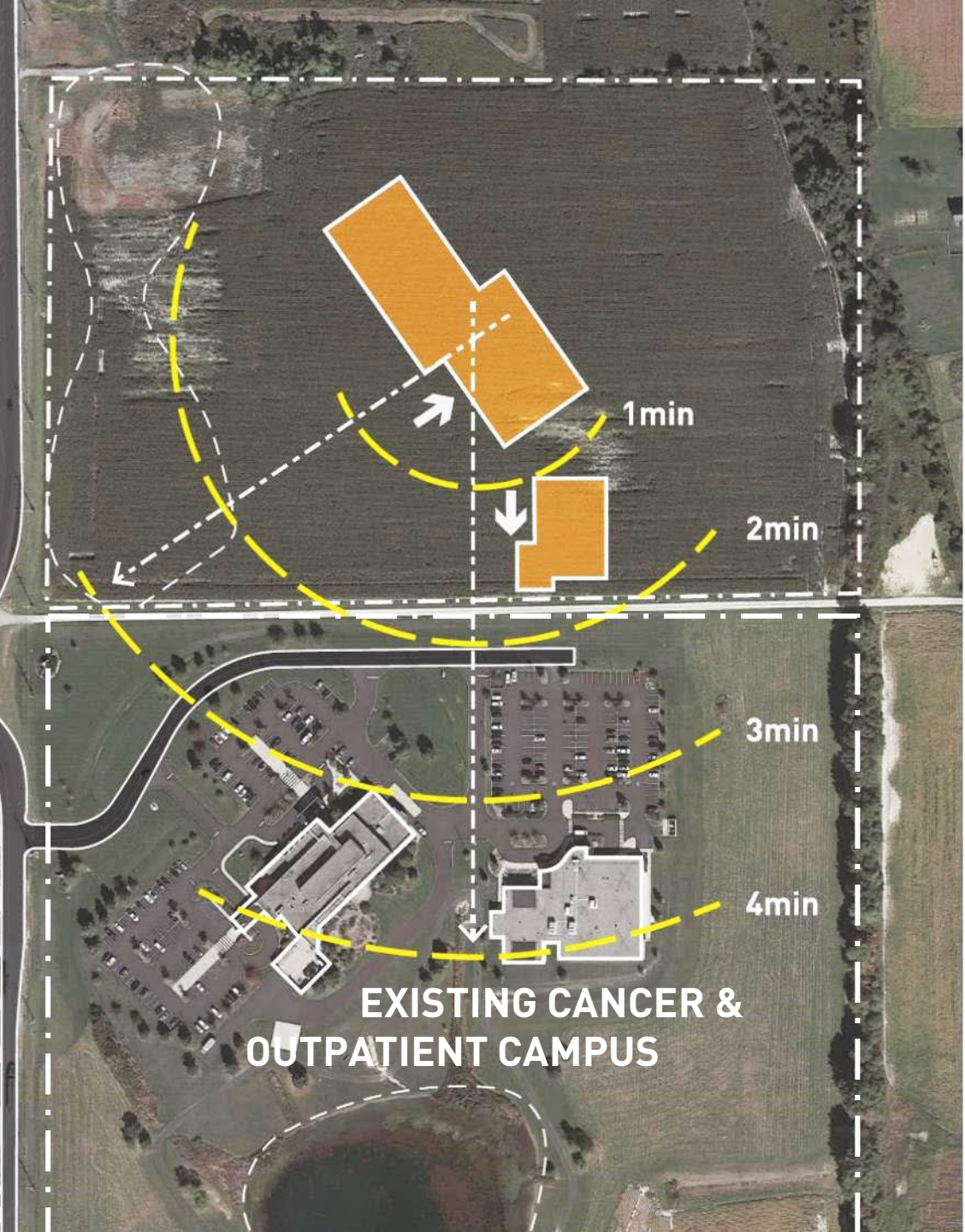
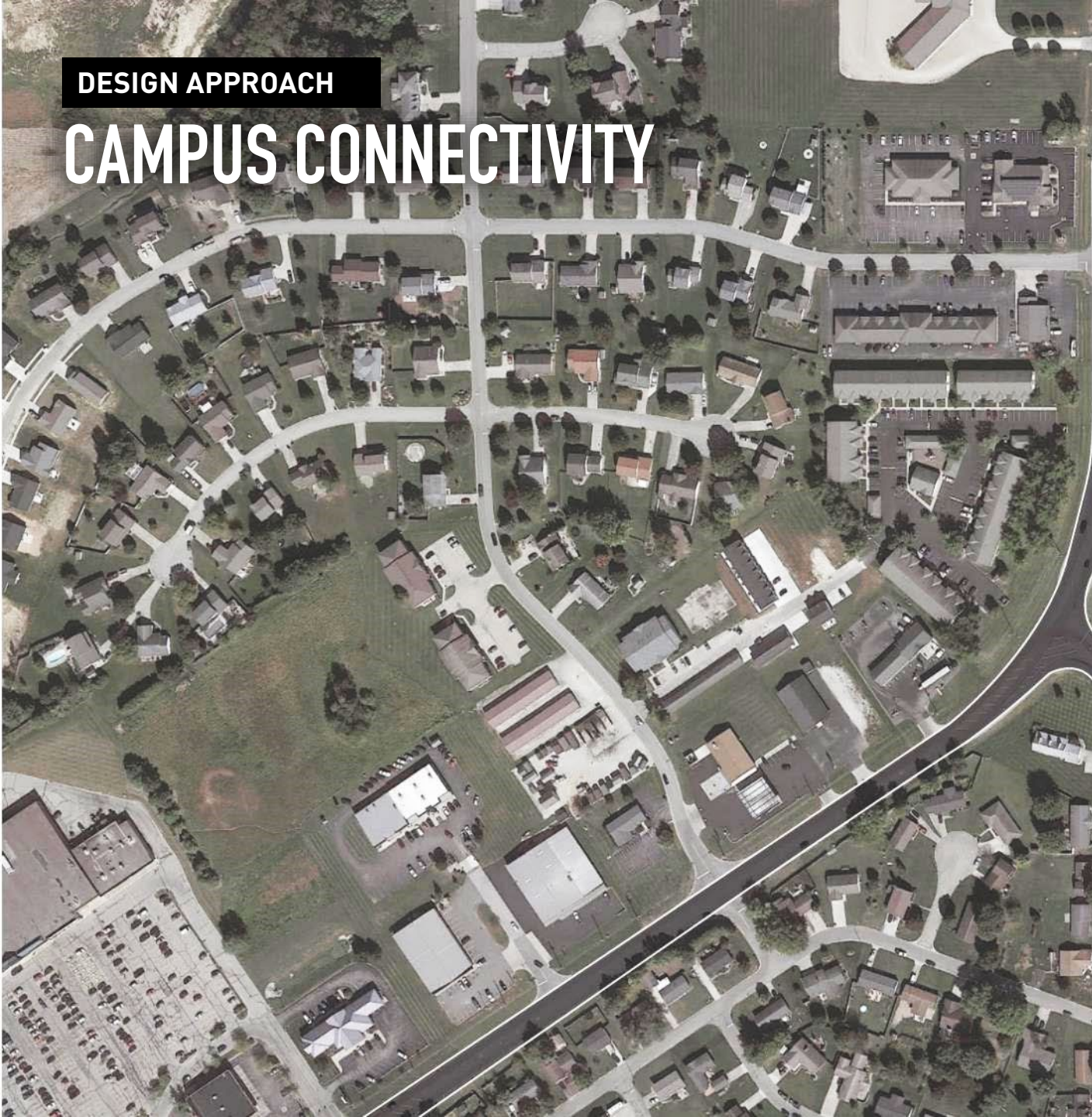
GREENSPACE AS FRONT DOOR



EXISTING CANCER &
OUTPATIENT CAMPUS

DESIGN APPROACH

CAMPUS CONNECTIVITY



DESIGN APPROACH

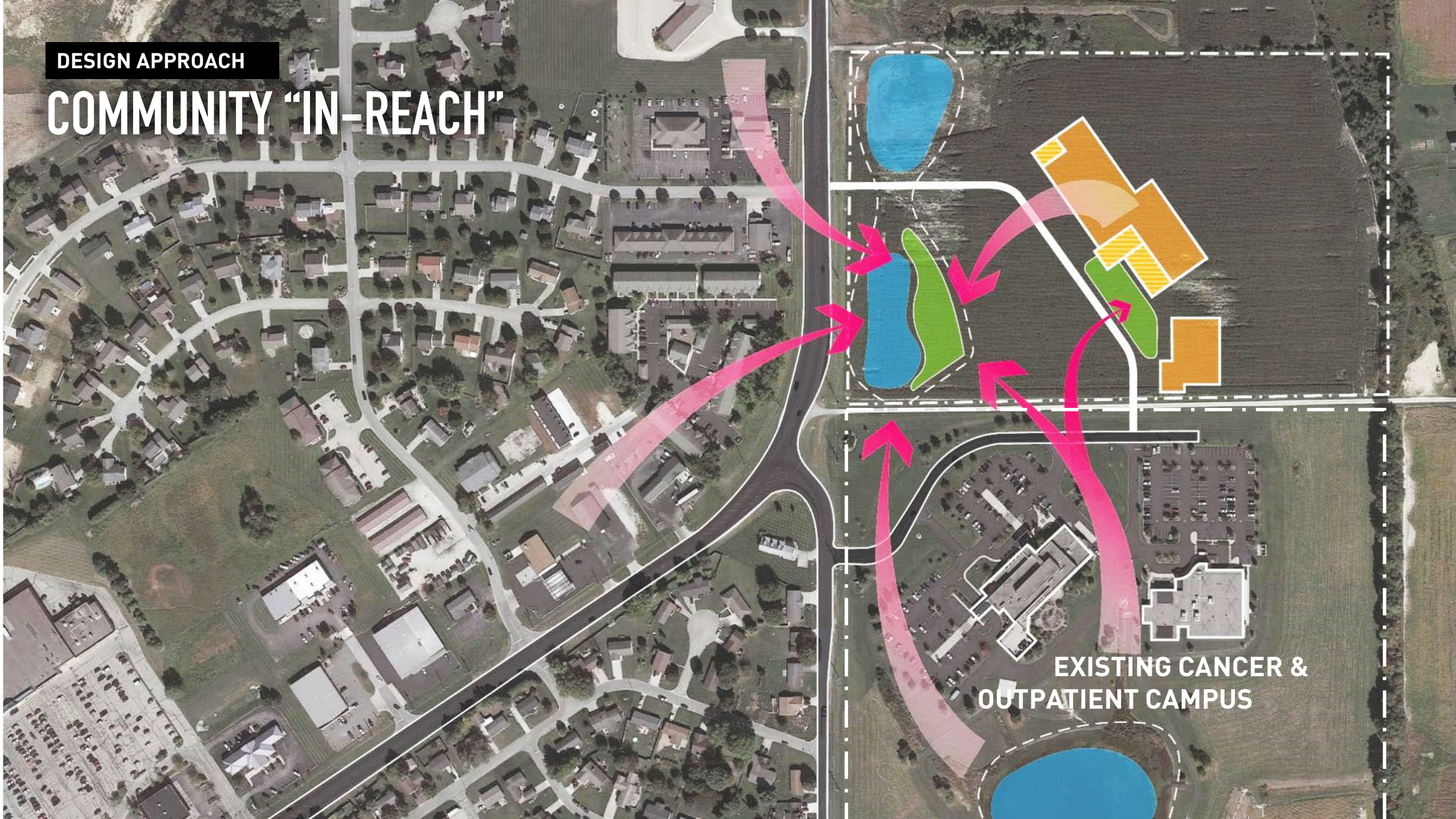
INTUITIVE ACCESS



EXISTING CANCER &
OUTPATIENT CAMPUS

DESIGN APPROACH

COMMUNITY "IN-REACH"



EXISTING CANCER &
OUTPATIENT CAMPUS

DESIGN APPROACH

AN INVITATION...



DESIGN APPROACH

FOR COMMUNITY WELL-BEING



New Hospital

Future Health & Wellness Center

The "HUB"

Physician's Center

To Freedom Park >

Outpatient & Cancer Center

Community Park Landscape

Future Roundabout

< To Oldenburg

State Road - 229

Six Pine Ranch Rd.

DESIGN APPROACH

FOR COMMUNITY WELL-BEING



EMERGENCY

Meditation Garden

The "HUB"

Amphitheater

Micro-Forest

Walking, Running,
& Biking Pathways

Farmer's
Market

Outdoor
Meeting
Space

Waters Edge
Respite Element

Social
Connectivity

DESIGN APPROACH

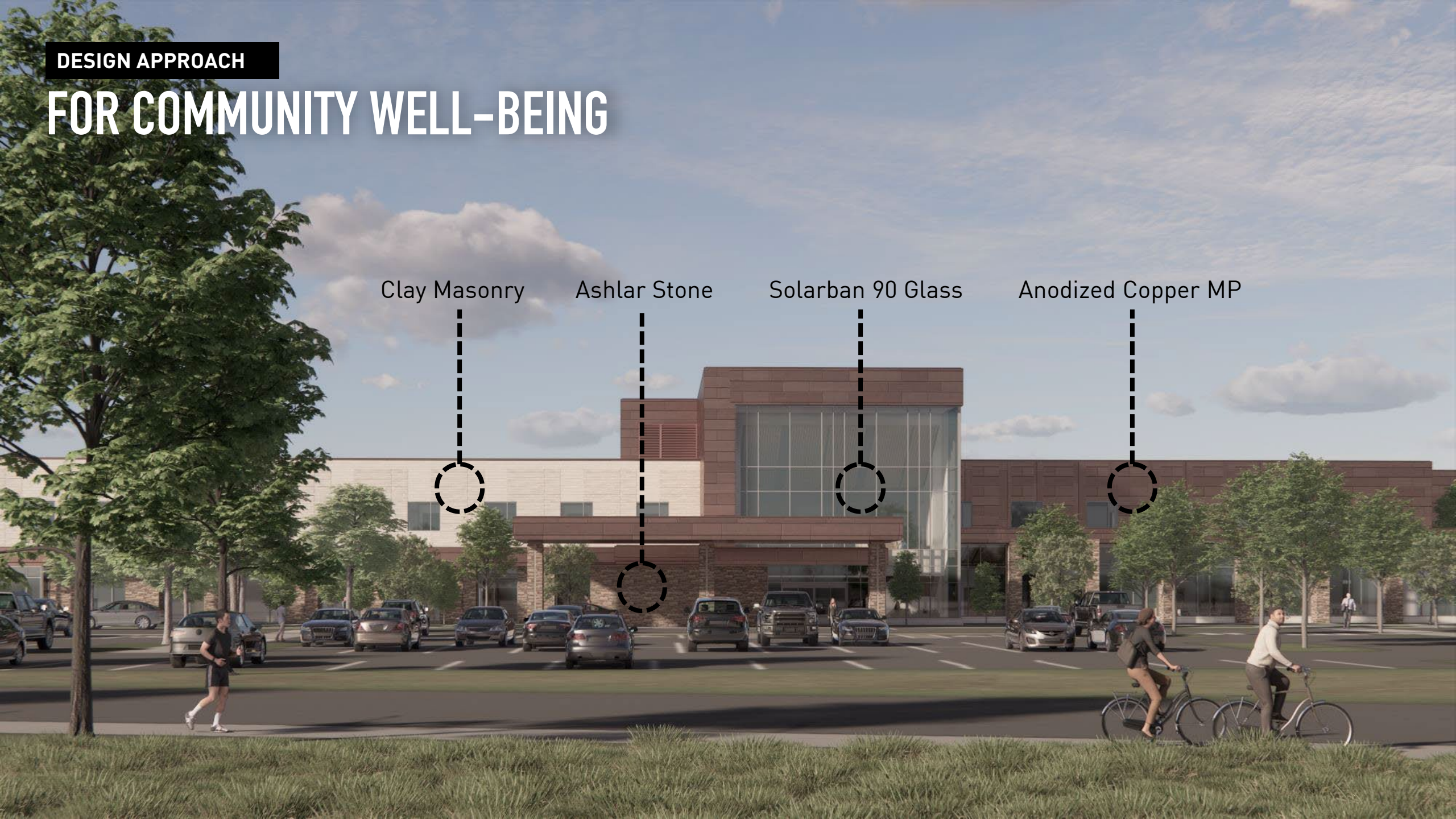
FOR COMMUNITY WELL-BEING

Clay Masonry

Ashlar Stone

Solarban 90 Glass

Anodized Copper MP



DESIGN APPROACH

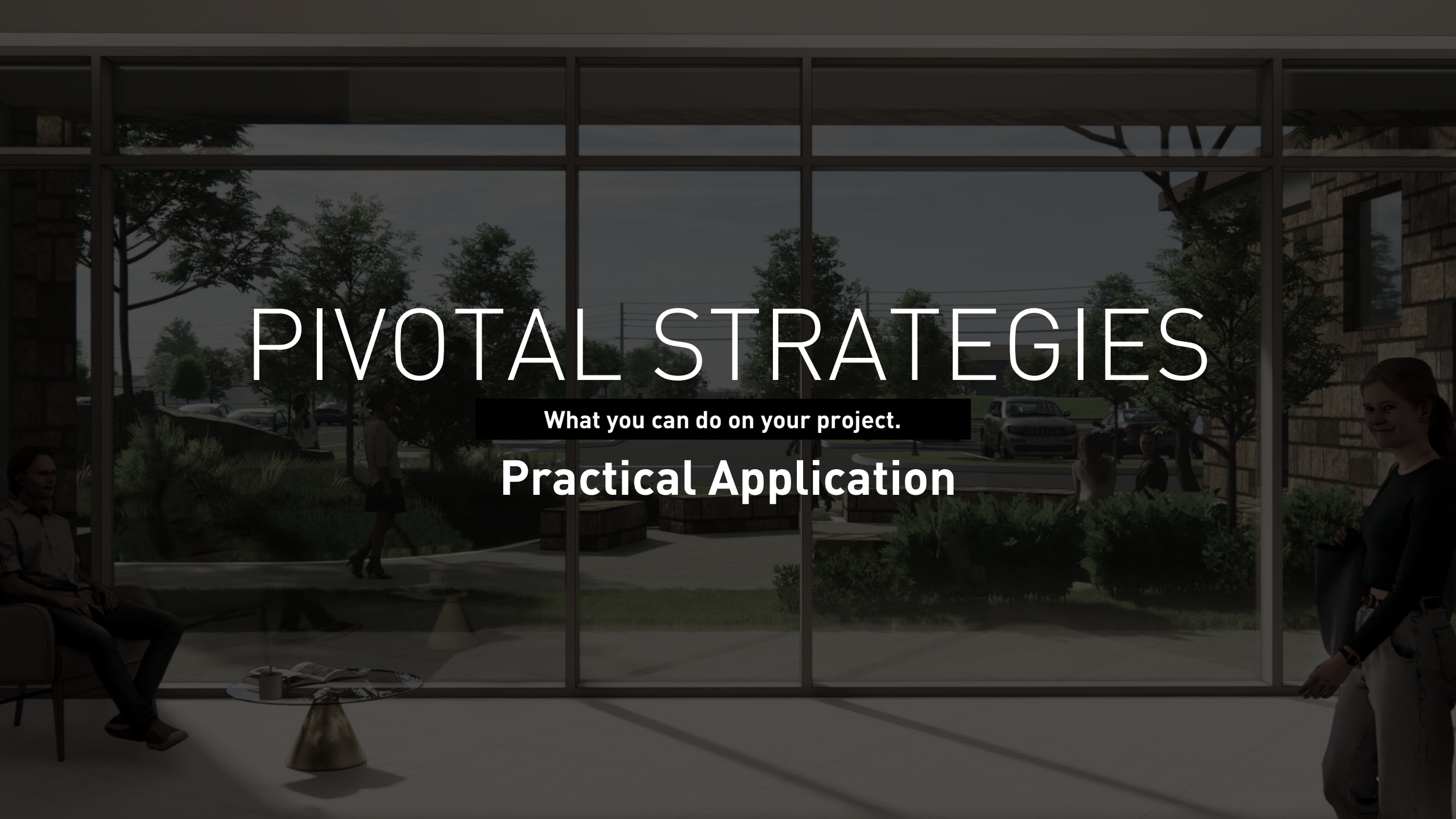
FOR COMMUNITY WELL-BEING



PIVOTAL STRATEGIES

What you can do on your project.

Practical Application

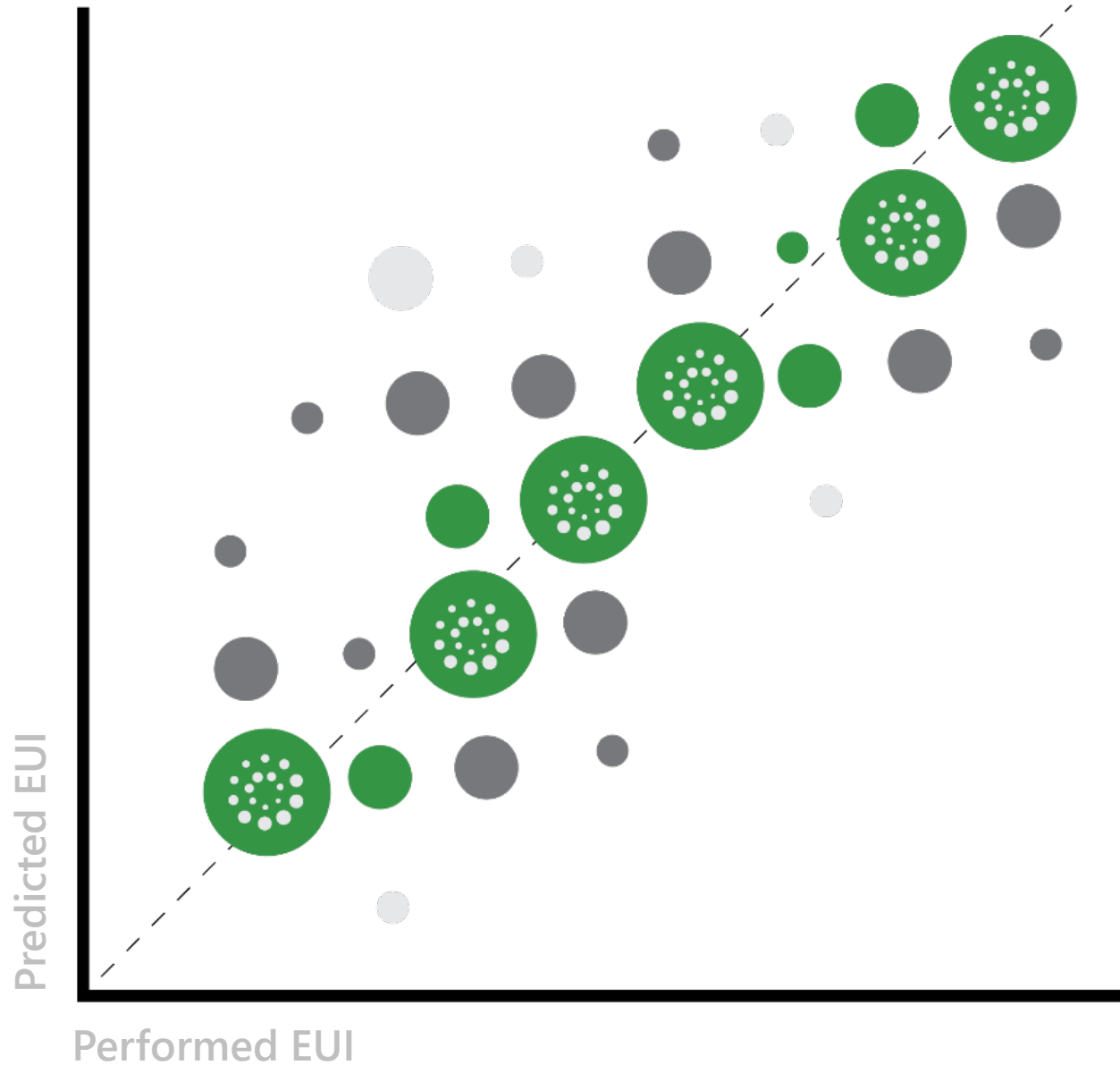


PIVOTAL STRATEGIES

WE ARE DATA DRIVEN

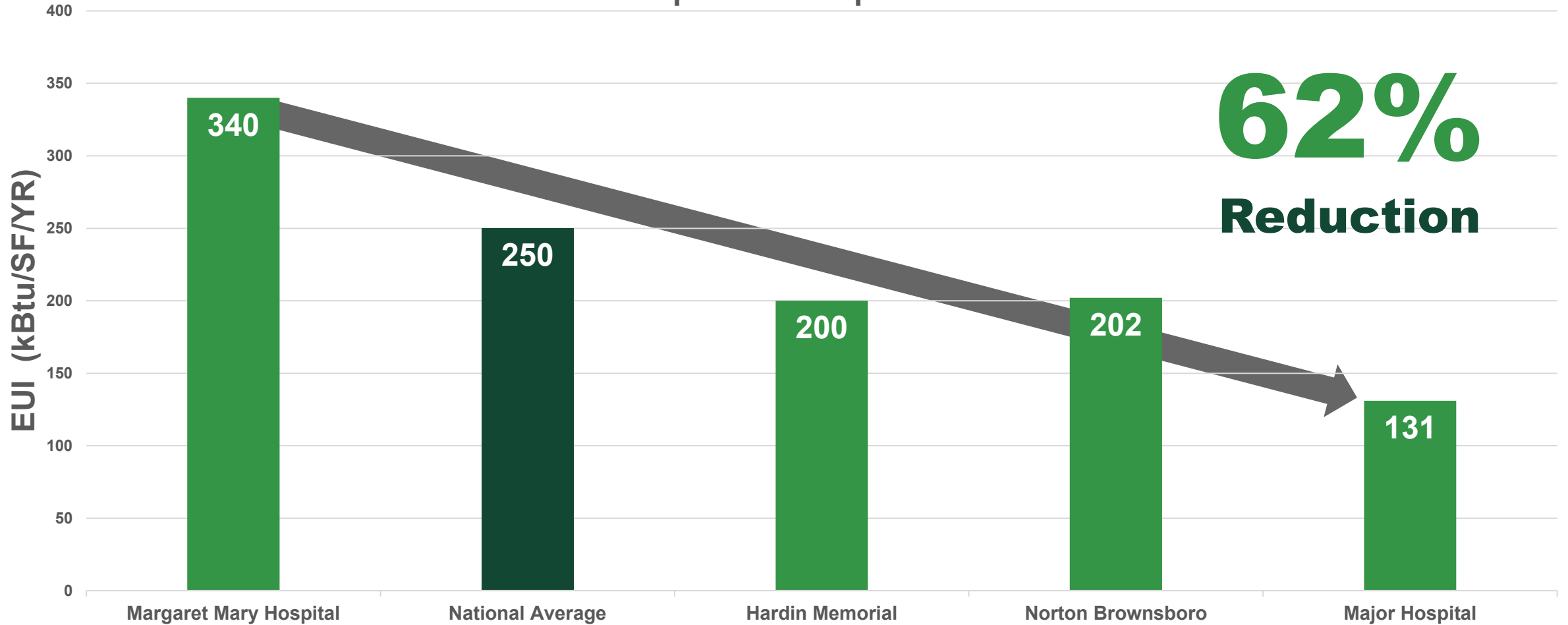
“
You cannot manage
what you do not
measure.

”
- W. Edwards Deming

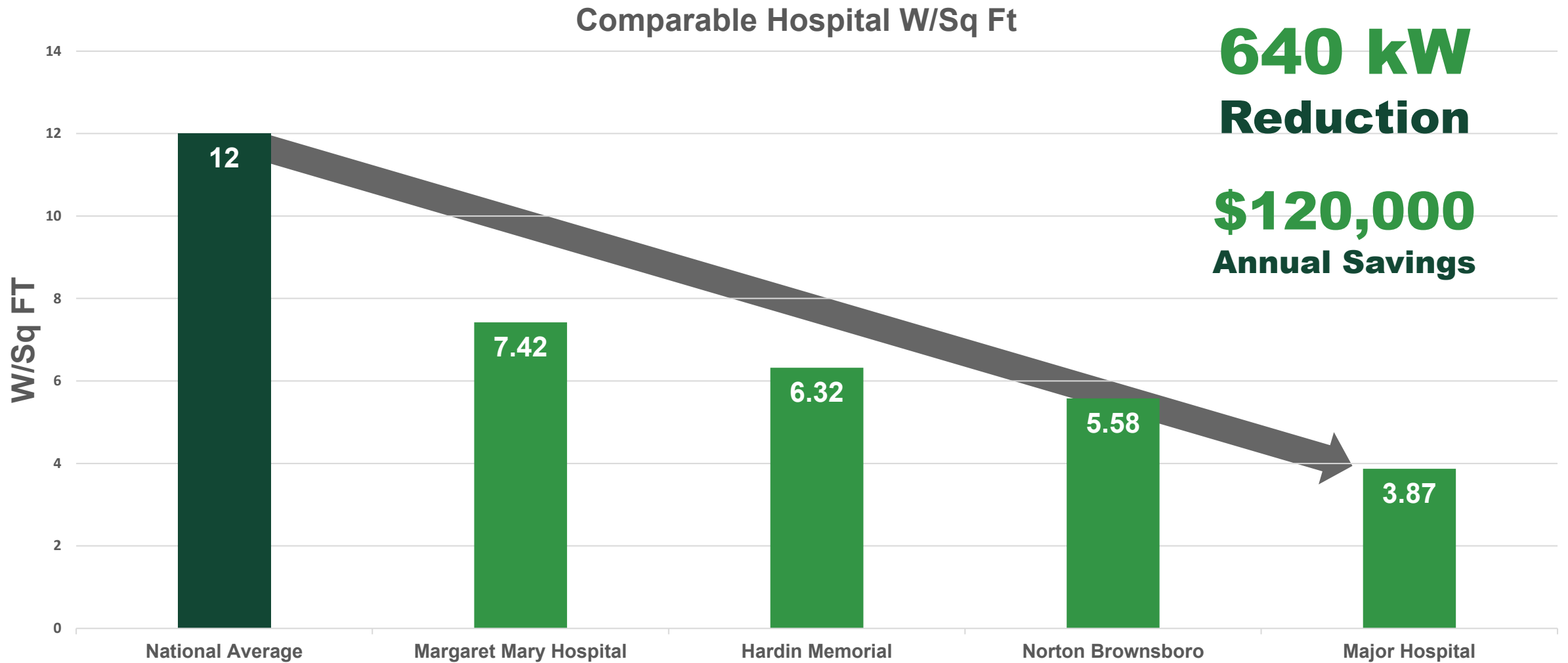


Energy Benchmarking

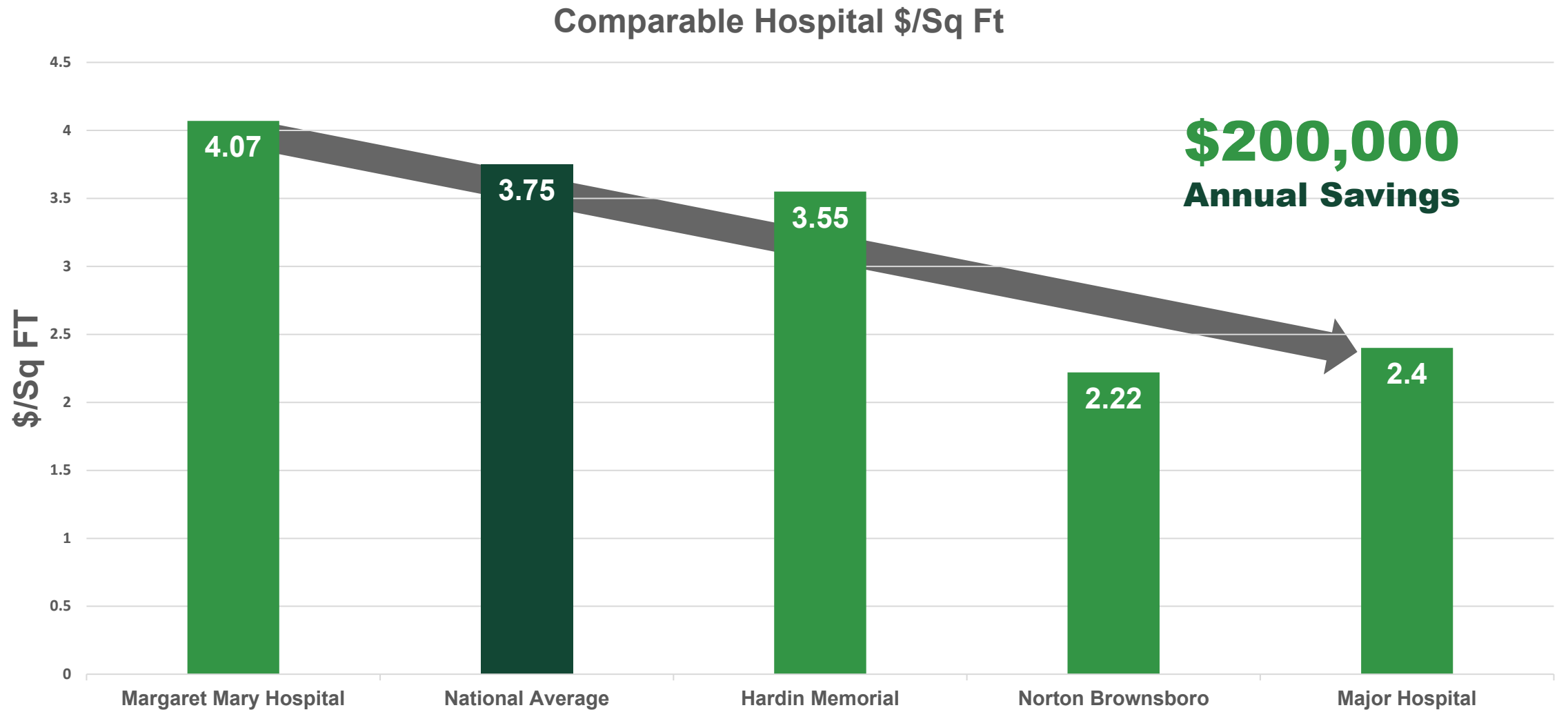
Comparable Hospital EUI



Energy Benchmarking - Demand



Energy Benchmarking - Cost



Pre-Design Energy Goals

- Consumption – EUI 130
- Energy Cost - \$200,000
- Energy Star Score – 95



Traditional Healthcare Design

- Natural Gas Steam Boilers for Humidification & Sterilization
- Natural Gas Condensing Boilers for Heating
- Gas Fired Kitchen Fryers and Char broilers



Incentives

- IRA Funding
- Energy Rebates



Inflation Reduction Act (IRA)



ITC Increases

Green systems / technologies

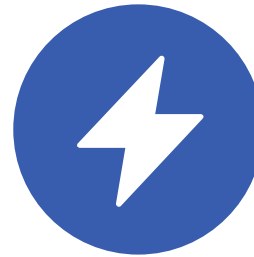


30% Base Tax Credit

Installed efficiency / generation



Direct-Payment to Not-for-Profit Owners



Energy Community

Bonus 10% incentive



179d Increases

Up to \$5/SF



Domestic Manufacturing

Bonus 10% incentive

IRA CALCULATOR:

Crunching the Numbers,
Finding the Opportunities



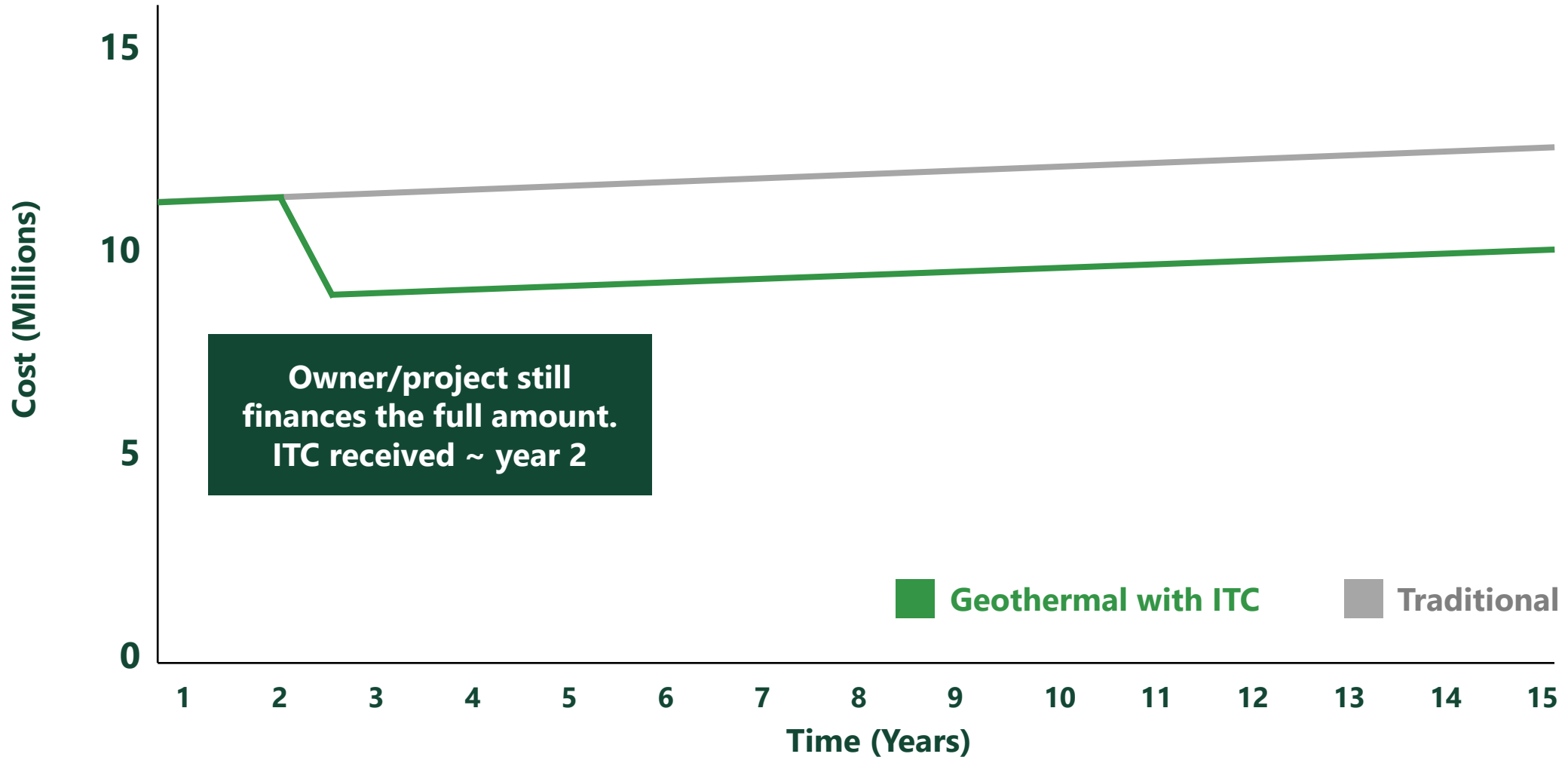
<https://www.gbbn.com/ira/>

Client Case Study

Margaret Mary Health	~125,000 ft²
Construction Budget/ft²	\$720/ft²
Construction Budget	\$90,000,000
HVAC Budget/ft²	\$95/ft²
HVAC Budget	\$11,875,000
IRA Impact	\$2,500,000+

Life Cycle Cost Analysis

Traditional vs. Geothermal

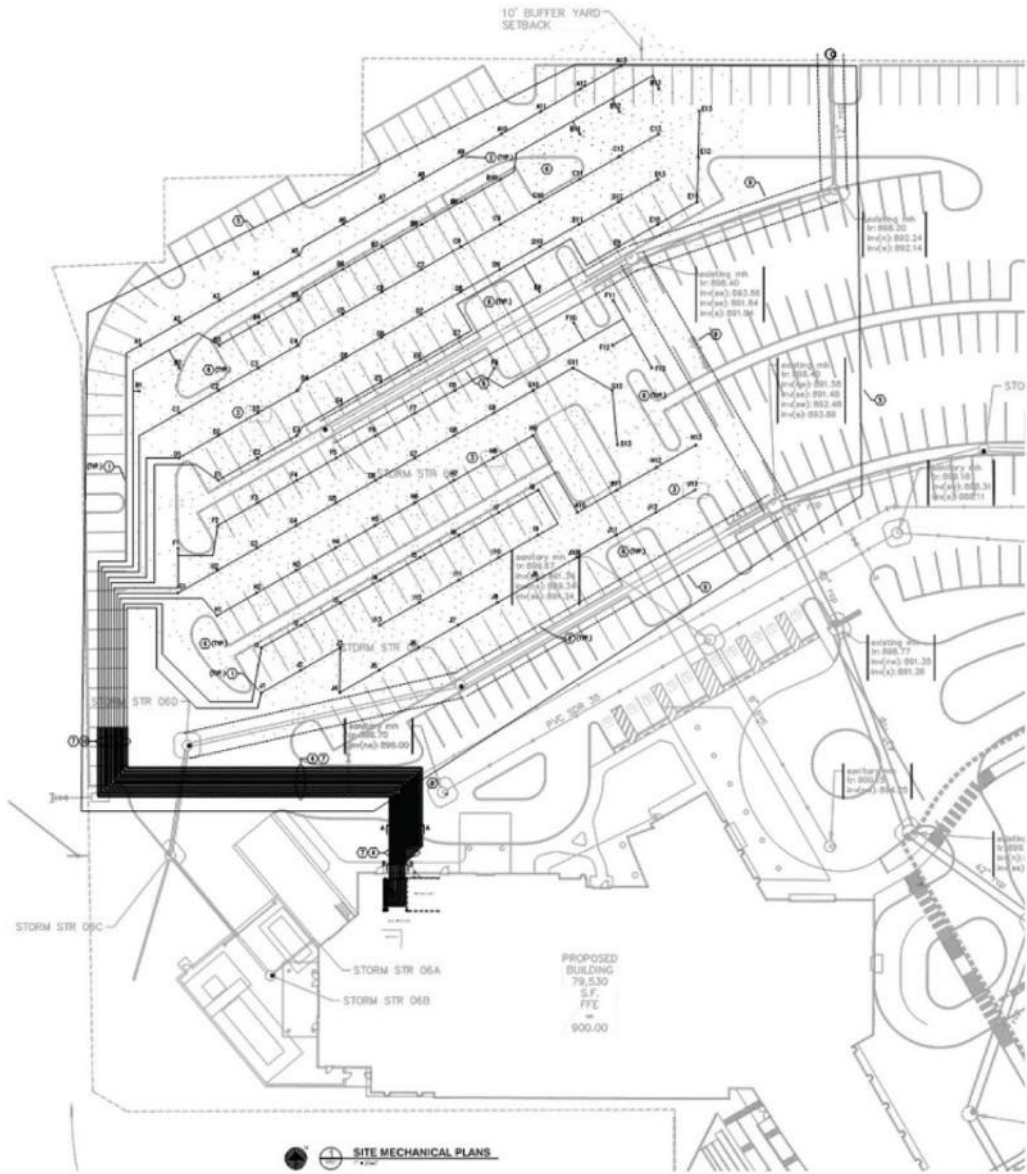


Strategies

- Geothermal Central Plant
- Heat Recovery Chillers
- Air Side Energy Recovery
- Adiabatic Humidification

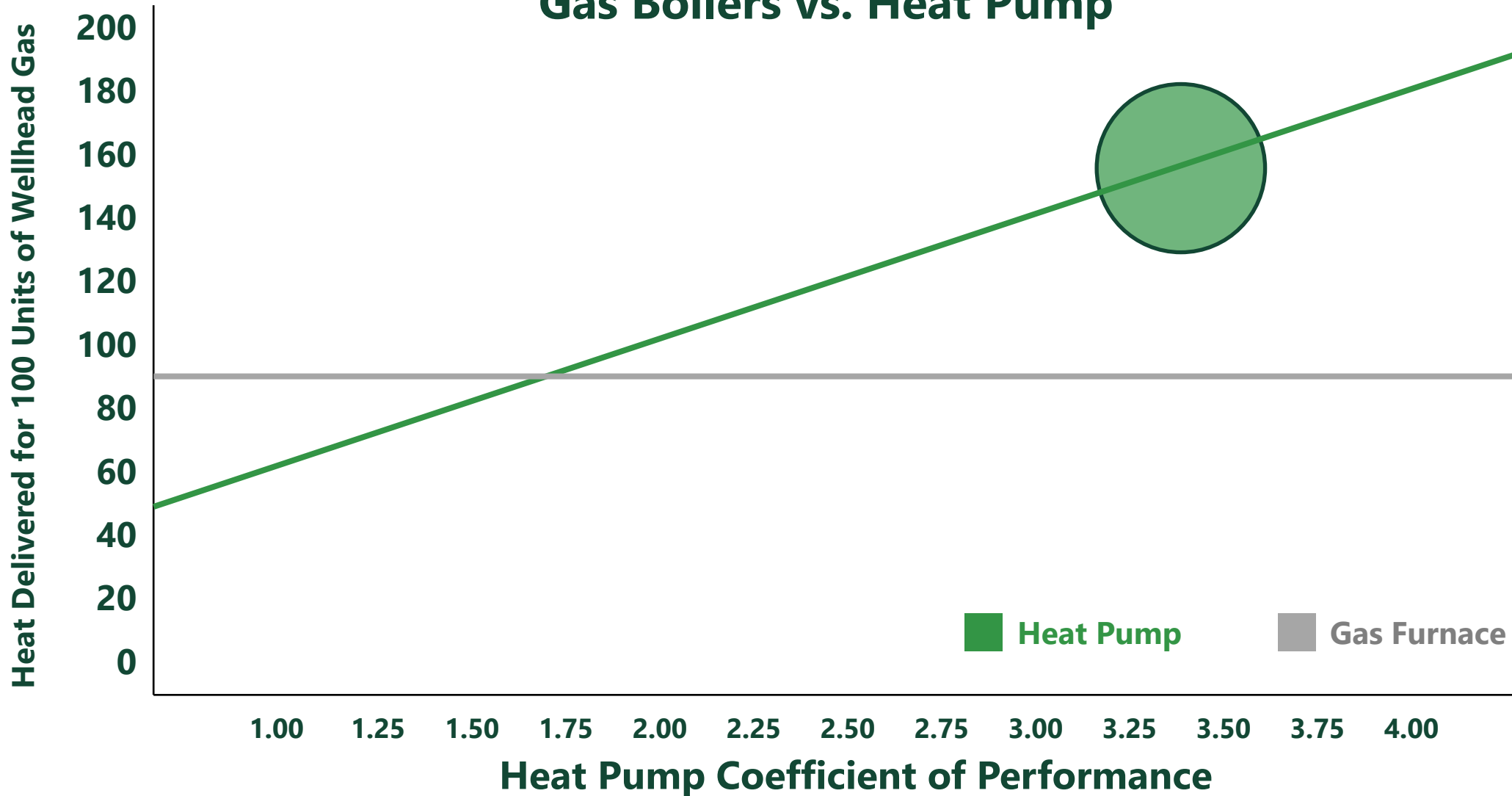


Geothermal



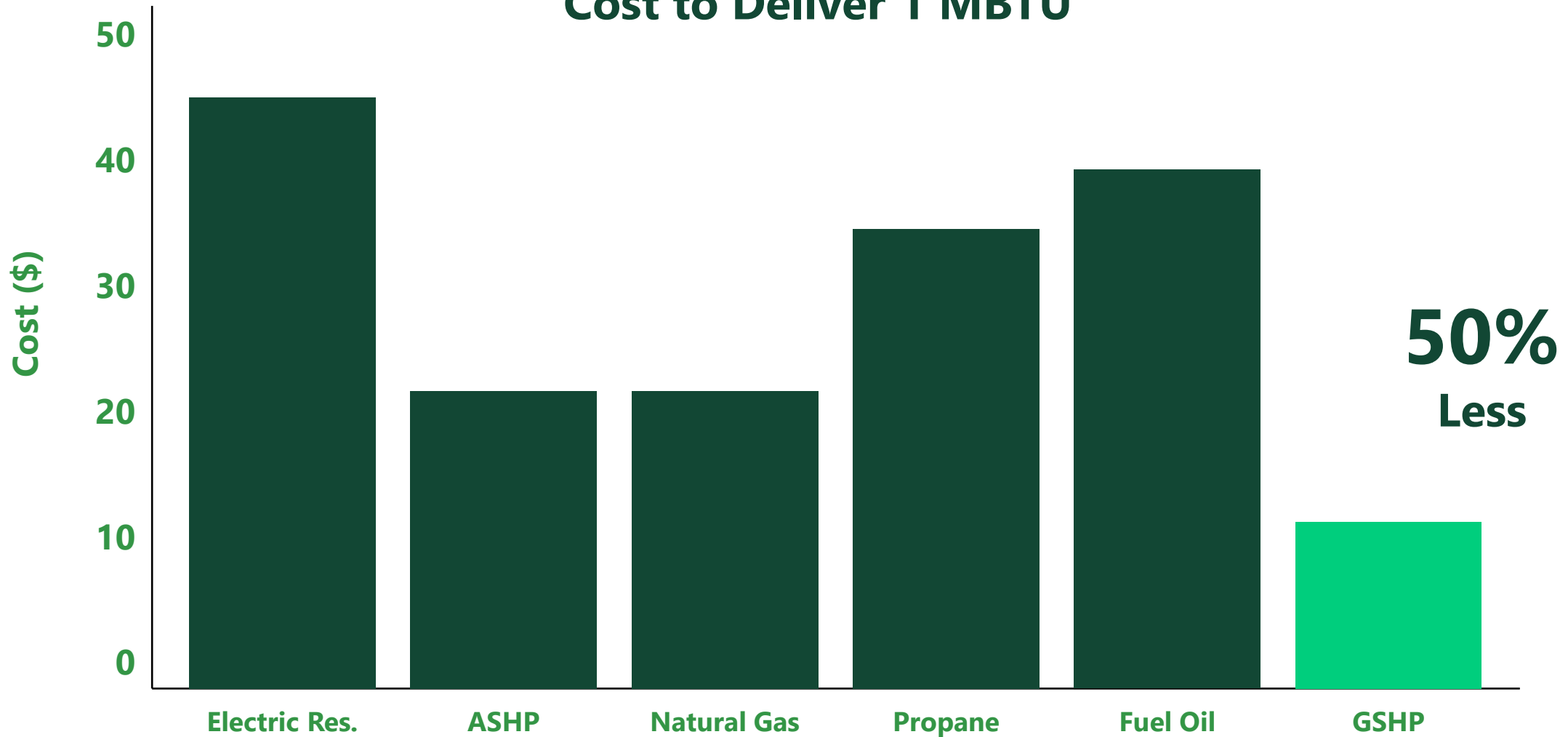
System Comparison – Efficiency

Gas Boilers vs. Heat Pump

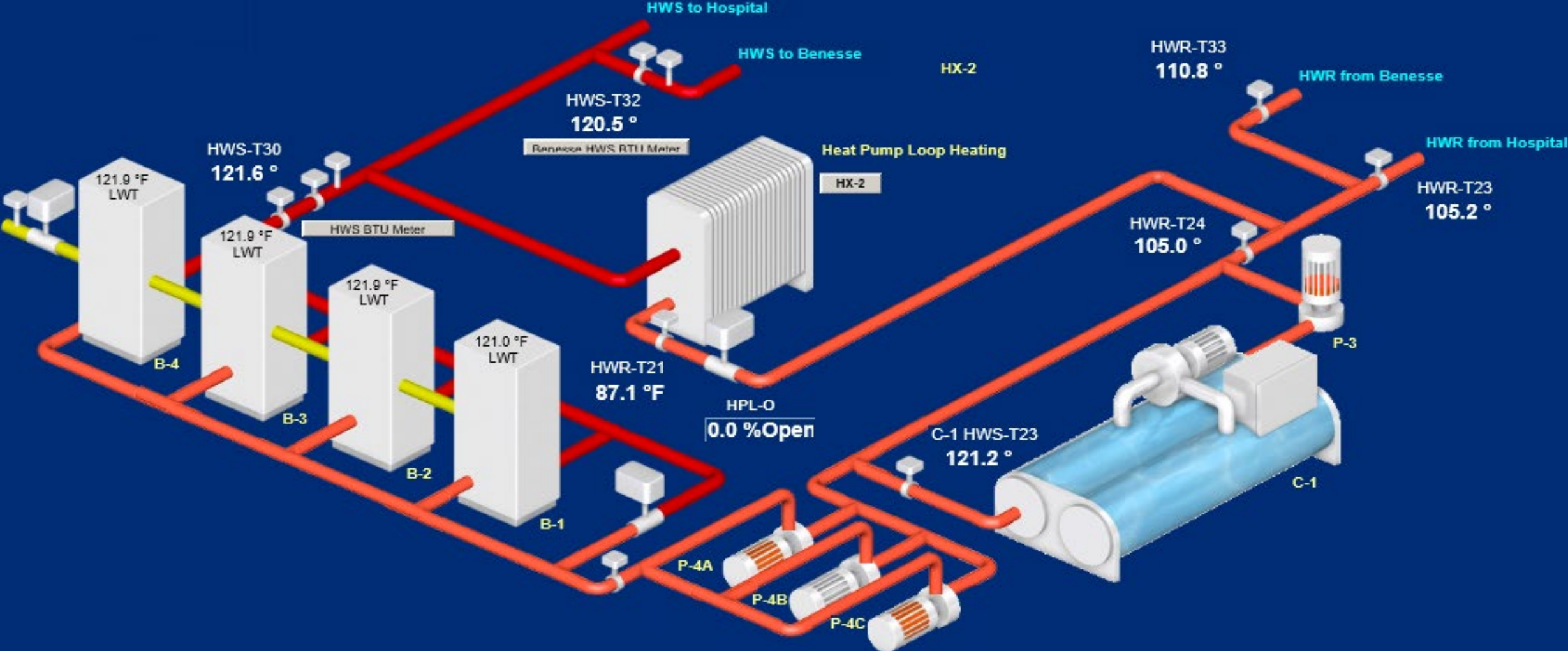


System Comparison – Efficiency

Cost to Deliver 1 MBTU



Heat Recovery



Hospital X

AVERAGE MONTHLY USAGE: 28,123

TOTAL USAGE: 337,470 CCF

Major Health Partners

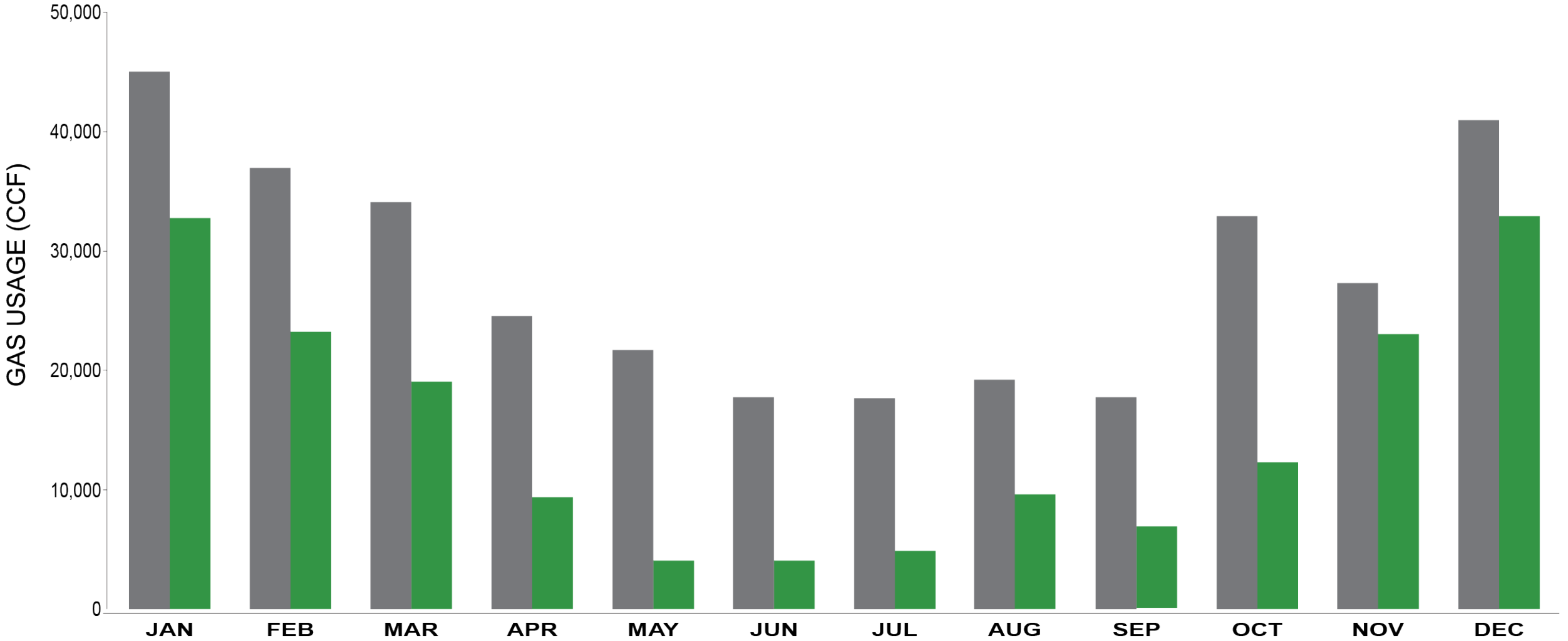
AVERAGE MONTHLY USAGE: 15,359

TOTAL USAGE: 184,304 CCF

SAVINGS

*AVERAGE MONTHLY USAGE SAVINGS: **12,764 CCF***

*TOTAL ANNUAL SAVINGS: **153,166 CCF***



Energy Recovery

System Settings

Occupied Occupied Command

Outside Air

OA Temp 1: 47.0 °F
OA Humidity 1: 94.2 %RH

Filter

OA Bypass Damper Output: 100.0 % Closed

OA Temp 2: 54.1 °F
OA Humidity 2: 73.1 %RH

Supply Air Pressure: 0.99 in w.c.

Smoke Detector: Normal

AFD-O3
AFD-O4A
AFD-O5
AFD-O6

Exhaust Air

OAD Status: Damper Open
EAD Status: Damper Open

Filter

EA Temp 1: 66.9 °F
EA Temp 2: 66.9 °F

EA Bypass Damper Output: 0.0 % Closed

EA Humidity: 40.8 %RH

Return Air Pressure: -1.01 in

Smoke Detector: Normal

Normal High Static Alarm

Normal Low Static Alarm

AFD-E3A
AFD-E3B
AFD-E3C
AFD-E4
AFD-E6A
AFD-E6B

OA Fan Controls

VFD-1 Lead VFD

Manual Rotation

Supply Fan

Command

On Run Status

Normal Alarm

43,703 hrs Runtime

Speed

Exhaust Fan

Command

On Run Status

Normal Alarm

43,681 hrs Runtime

Speed

Air Pressure Control

SA-P Setpoint

RA-P Setpoint

Energy Recovery Wheel

0.41 in w.c. ERW-DP

Command

On Run Status

Normal Alarm

32,666 hrs Runtime

Cooling Mode Enable OA Setpoint

Inactive Cooling Mode

Inactive Economizer Mode

Economizer Mode Enabled When OA Temp is Between Heat/Cool Setpoints

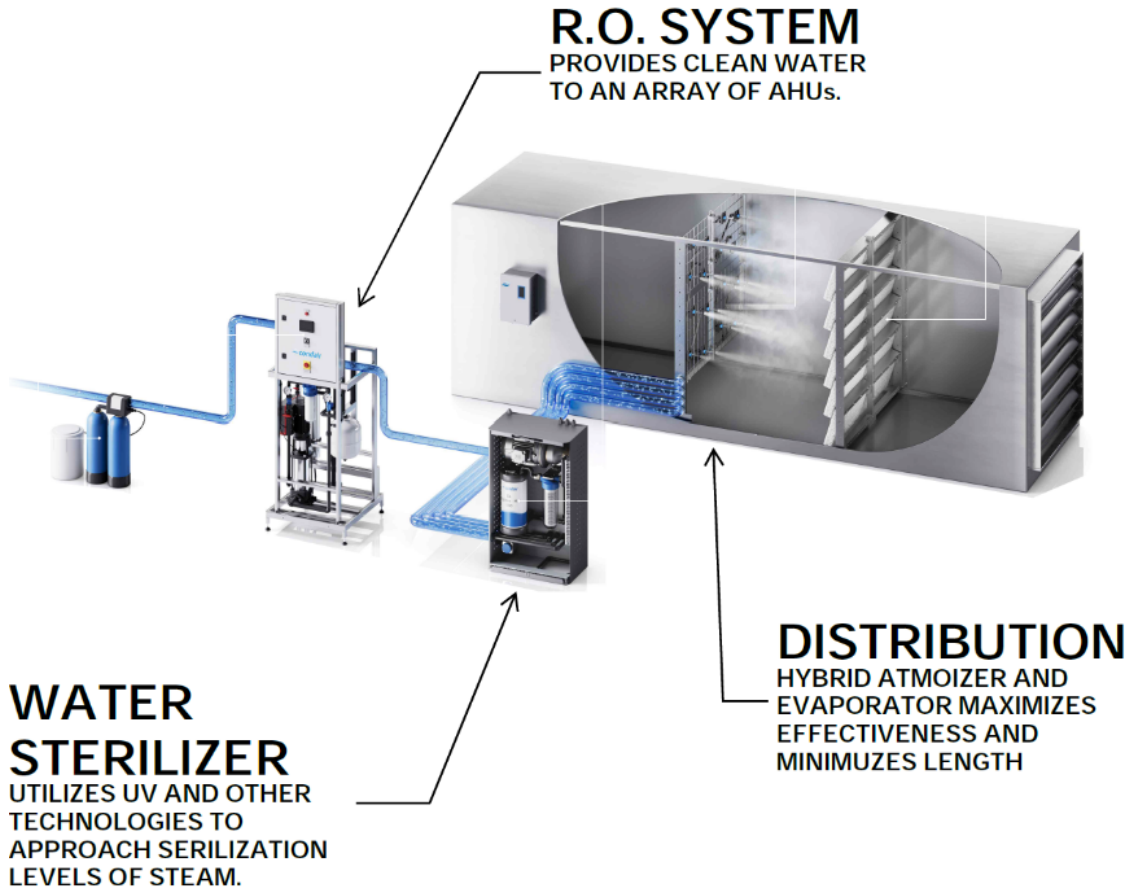
Heating Mode Enable OA

Active Heating Mode

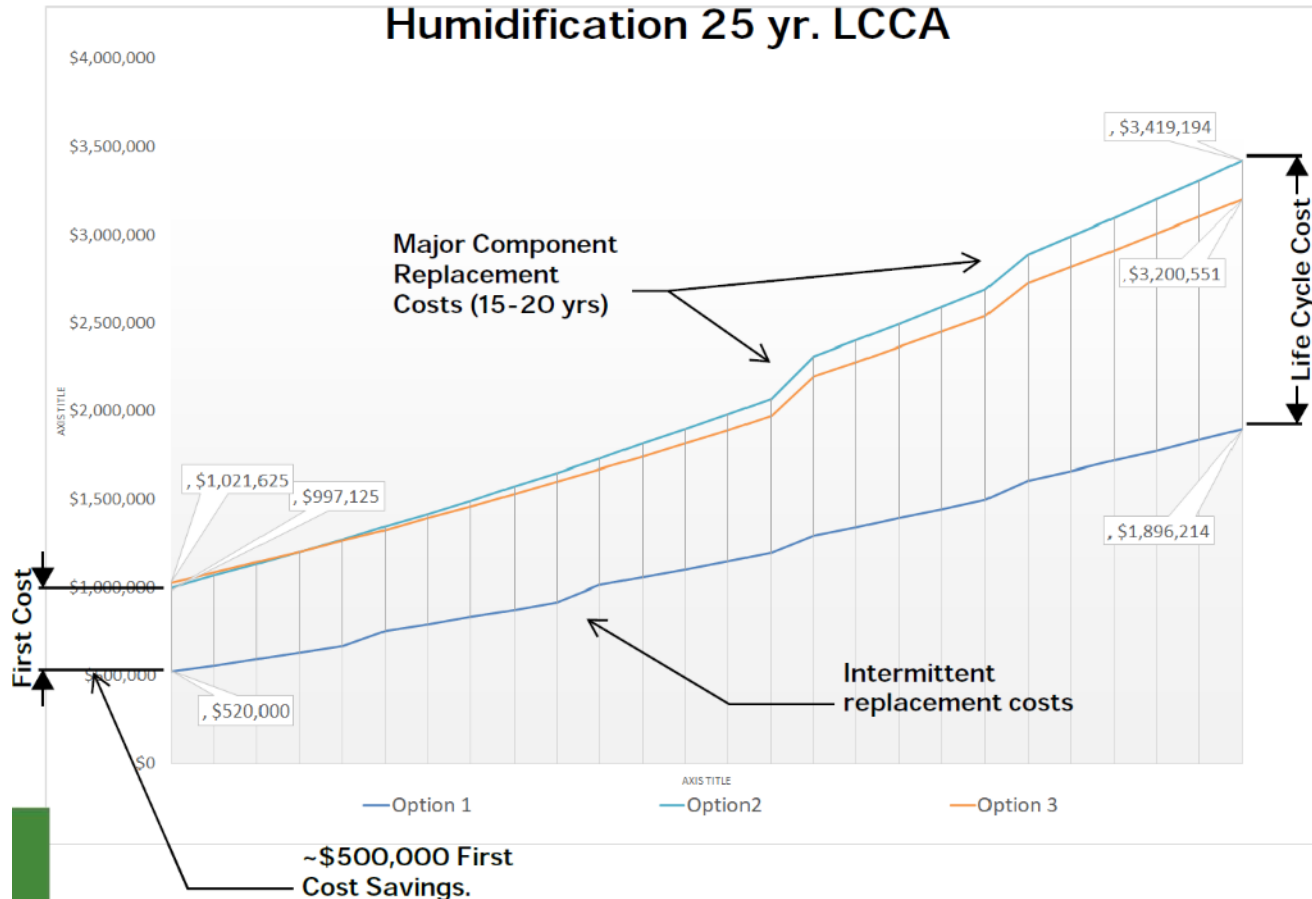
Heating Mode Supply Air Temp

Freeze Protection Enable OA

Humidification Options



Adiabatic Humidification



Cost Assumptions/Clarifications:

- Electric sterilizer maintenance premium ~\$15,000/year
- Utility costs based on historical billing data.
- Study doesn't account for costs of sterilization energy.

Adiabatic	Steam
- Pumps + UV + Heat = <u>~45w/gal</u>	- @ 65% Eff = <u>~3600w/gal</u>
- EUJ: <u>~3.4</u>	- EUJ: <u>~10.2</u>
- Energy Cost/Year = <u>~\$5750</u>	- Energy Cost/Year = <u>~\$11,500</u>
- Maintenance Cost/Year = <u>~\$10,000</u>	- Maintenance Cost/Year = <u>~\$55,000*</u>
<u>~\$50,000 savings / year.</u>	<u>*ASHRAE O&O cost database</u>

Sterilization

- Integral Electric Steam Generators
- Increased Resiliency



Kitchen

- Healthier Cooking
- Less Heat
- Less Exhaust and Make-up Air



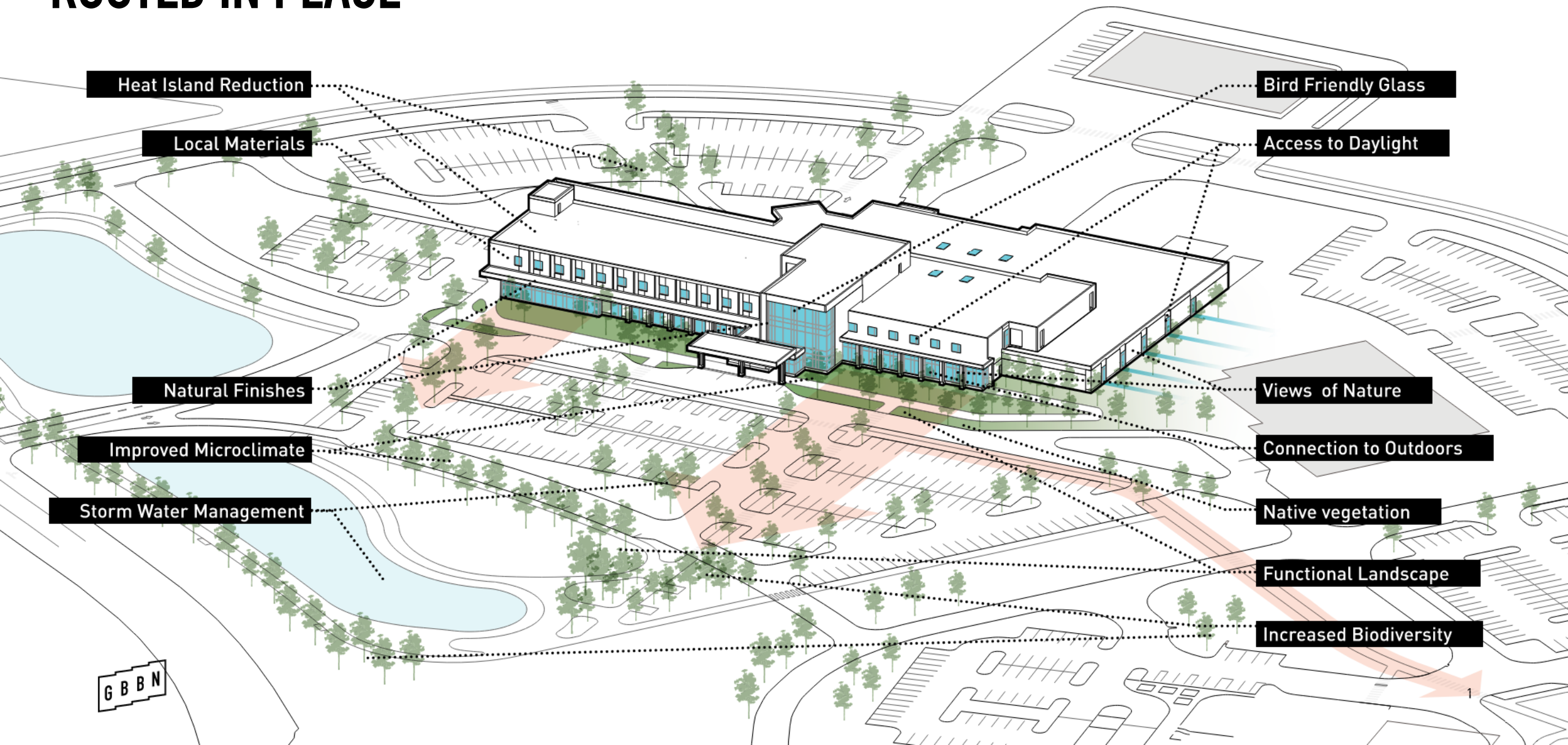
Current Energy Goals

- Consumption – EUI 115
- Energy Cost - \$250,000
- Energy Star Score – 100



DESIGN APPROACH

ROOTED IN PLACE



DESIGN APPROACH

ROOTED IN PLACE

Connection to Nature

Biophilic Design, using natural materials, organic patterns in finishes, and direct views or access to vegetation and the outdoors, provides a beneficial connection to nature and its daily and seasonal changes.

Access to Daylight & Views

Staff access to daylight and views supports cognitive capacity and has been shown to increase job satisfaction resulting in improved patient care and better health outcomes for patients. Corridor windows and skylights connect staff to daily variation in sunlight.

Expansive Views while Waiting

Glazed atrium, Hub space, and intake spaces are welcoming, provide transparency and ease the transition between exterior- or interior.

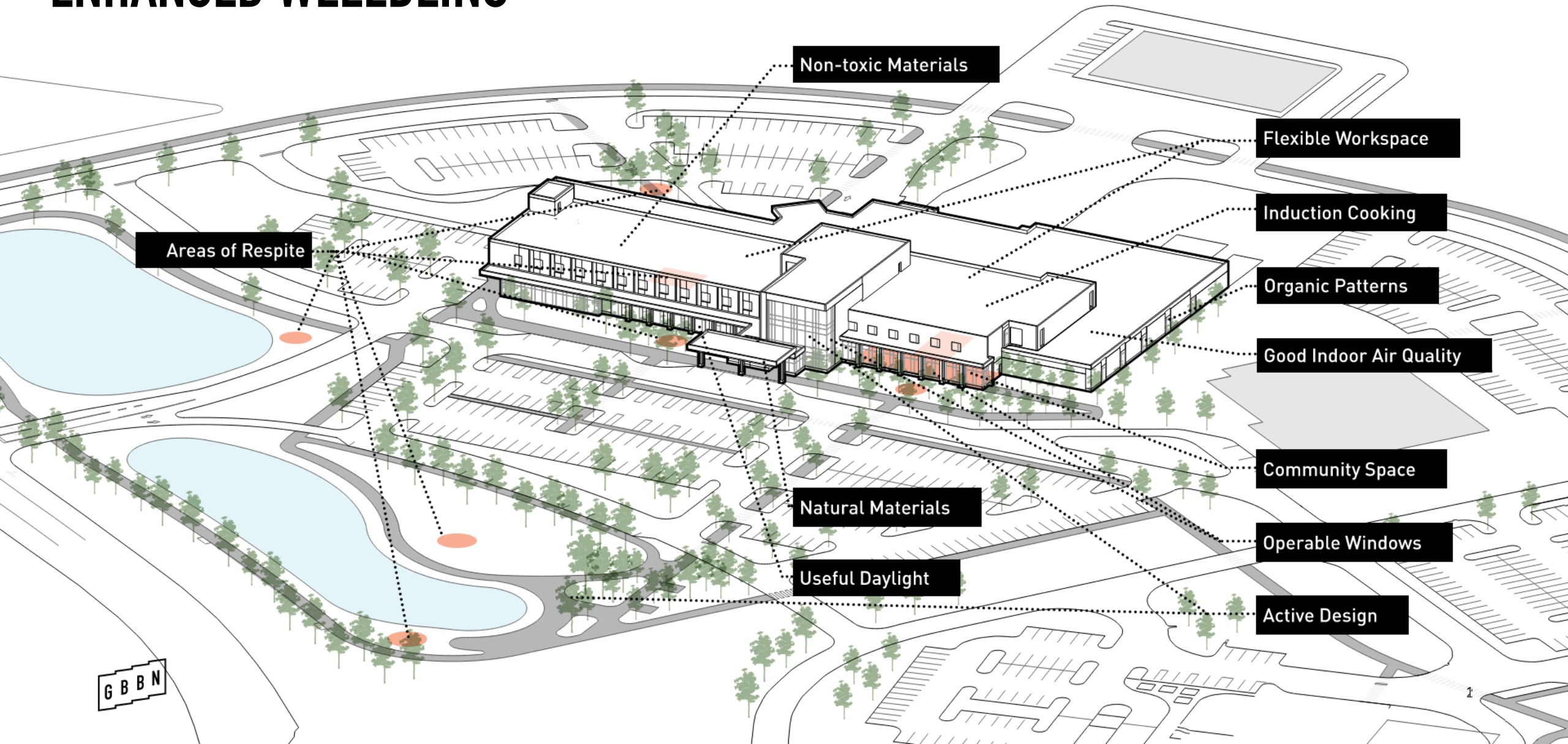
Functional Landscape

Tapping into the local history of putting the land to work, native trees and vegetation provide shade, improve the local



DESIGN APPROACH

ENHANCED WELLBEING



DESIGN APPROACH

ENHANCED WELLBEING

Active Design

Visually enticing and prominent stairs encourage physical activity, while the centrally located kitchen and dining area offer healthy food, both contributing to improved health of staff and visitors.

Healthy Materials

Regionally available, non-toxic building materials and finishes are prioritized to reduce the overall embodied carbon of the building and maintain high quality indoor air.

Enhanced Lighting

Consideration of daylighting, glare, and solar heat gain led to a combination of strategic daylighting and high efficiency LED lighting and controls that minimize energy use while improving occupant experience. Key skylights and Solatubes offer additional daylight in precise locations.

Areas of Respite

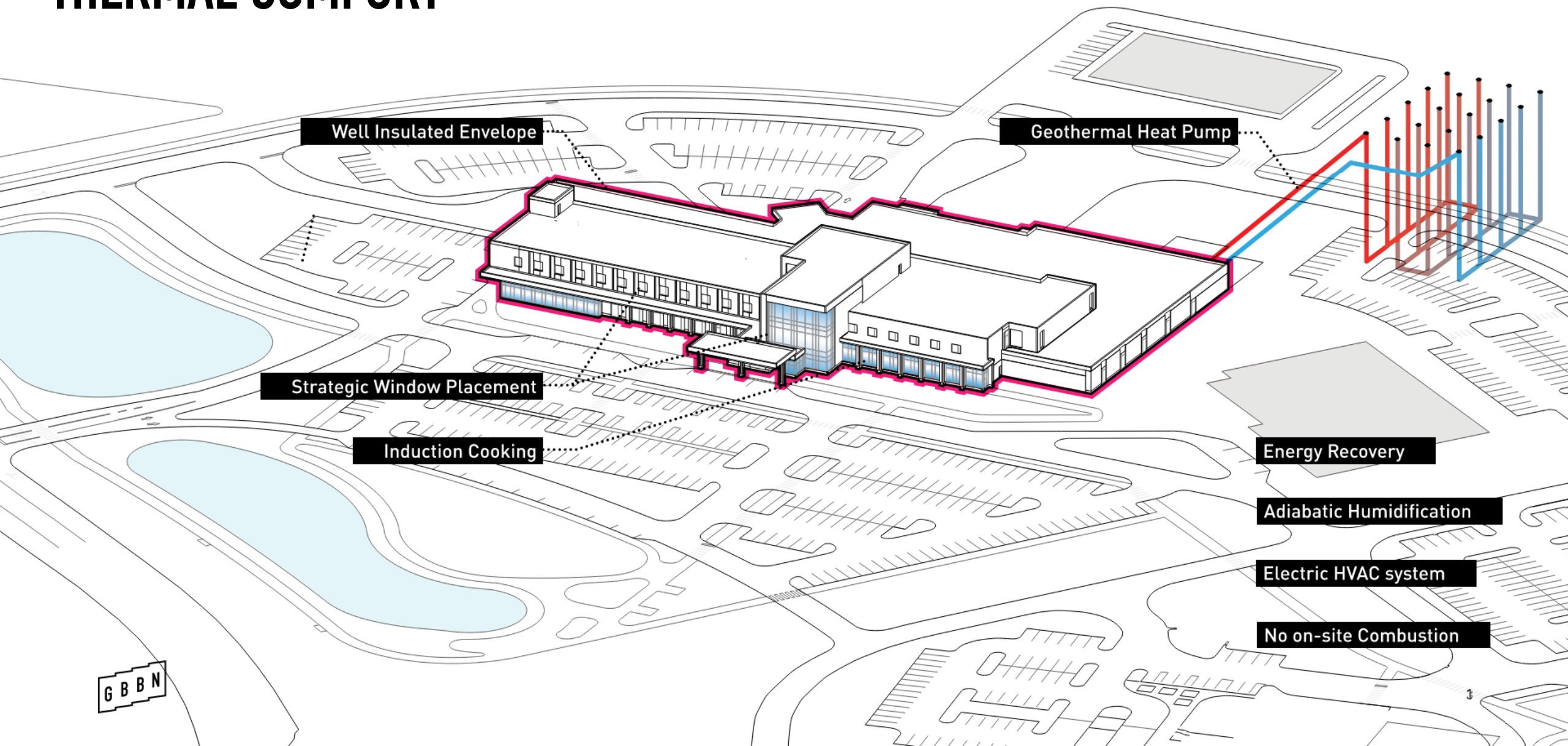
Varied and flexible spaces offer a choice of quiet, private spaces for calm or communal spaces to gather and connect with others.

Community Space

Multi-use space for visitors to the Health and Wellness Campus and the local community.



THERMAL COMFORT



DESIGN APPROACH

THERMAL COMFORT

High Performance Building Envelope

Strategic placement of windows, proper insulation, and smart detailing combine to create a building envelope that minimizes unwanted heat gain or loss, increasing comforts for patients and staff and lowering operational energy use.

Geothermal Heat Pump System

High efficiency geothermal heat pumps provide renewable energy and complement “best practice” mechanical systems that reduce energy use and cost, reserving more money for patient care.

Adiabatic Humidification

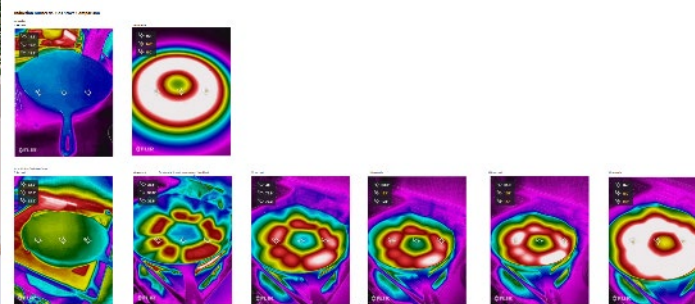
This proven technology humidifies air without adding heat offering significant energy saving, precise humidity control, and ease of maintenance.

Electric HVAC Systems

Electric building systems eliminate the need for on-site fuel combustion and reduce direct carbon emissions and operational costs over time.

Induction Cooking

Electric induction cooking provides several benefits: better indoor air quality, lower indoor temperature, less energy use, cooks food more quickly and evenly, improved safety.



THANK YOU!



Aaron Anderson, AIA, LEED AP
Principal | Market Design Leader



David Neff
Director of Facilities | Plant Operations



Douglas Hundley, PE, CxA, CGD, LEED AP
Vice President



Tiffany Broyles Yost, AIA, LEED AP BD+C, Fitwel Ambassador
Associate Principal | Director of Sustainability & Resilience