



THE NEW DESIGN EXCELLENCE

AN EQUITABLE, REGENERATIVE, & WELLBEING-FOCUSED APPROACH
New York City Architecture Biennial | October 18, 2022
Tiffany Broyles Yost | Director of Sustainability & Resilience

1. Introduction & Context
2. The Role of Architecture
3. Process & Goals
4. Project Examples
5. Impact

AGENDA

A close-up photograph of a person's hand with a dark skin tone touching a surface with a raised, orange honeycomb pattern. The hand is positioned in the upper right quadrant, with fingers slightly spread. The background is a blurred, bright orange and white pattern, suggesting a larger wall or structure made of similar cells. The overall lighting is warm and soft.

**POSITIVELY
AFFECTING
PEOPLE IS THE
MOST IMPORTANT
THING WE DO.**

BEIJING • CINCINNATI • LOUISVILLE • MINNEAPOLIS • PITTSBURGH



ACHE
HEAPY

REHAB, RENOVATE, OR REPLACE

Building the hospital of tomorrow.

2022
SYMPOSIUM

SUSTAINABILITY
IN HEALTHCARE

NYC
Ab New York City
Architecture
Biennial

2022 LOUISVILLE
SUSTAINABILITY
SUMMIT
OCTOBER
06
2022

LOUISVILLE 2030

A BETTER TOMORROW
BEGINS TODAY

1-4pm
Virtual Event



THE BUSINESS CASE FOR A SUSTAINABLE FUTURE

CARRIE BUTLER, TARC
NATHAN CRUYER, EDELEN RENEWABLES
NICKIE CASHDOLLAR, APPHARVEST
BOB LOCKE, HABITAT FOR HUMANITY
TIFFANY BROYLES YOST, GBBN

WHEELER LEWIS
SUSTAINABILITY
SUMMIT + NeoCon

BUILDINGS AS MEDICINE:

How Better Design Removes
Environmental Stressors

ANGELA
MAZZI

FAIA, FACHA, EDAC



WEST REGIONAL
SUSTAINABILITY
SUMMIT

BETTER HOUSING:

Equitable Decarbonization
through Collaboration

AMANDA
MARKOVIC

TIFFANY
BROYLES YOST

AIA, LEED AP BD+C,
FITWEL AMB



edra

HEALTH IN ALL DESIGN CONFERENCE 2022

Get More from your Corridors:
Balancing Patient Care & Staff Respite in the MICU



By Sayati Wazalwar



IF YOU BUILD IT,
WILL THEY COME?

Increasingly, students are asking,
"HOW SUSTAINABLE
IS YOUR INSTITUTION?"



Nick Sillies



Greenbuild | International
Conference + Expo

NOVEMBER 1-3, 2022 | MOSCONE CENTER | SAN FRANCISCO

Tree Pittsburgh: Modular & Zero Energy on a Non-profit Budget

Danielle Crumrine | Tree Pittsburgh

Matt Plecity | GBBN

Tiffany Broyles Yost | GBBN



TREE | PITTSBURGH



GBBN



Repurposing
older buildings
can position arts
organizations
as catalysts
for growth...



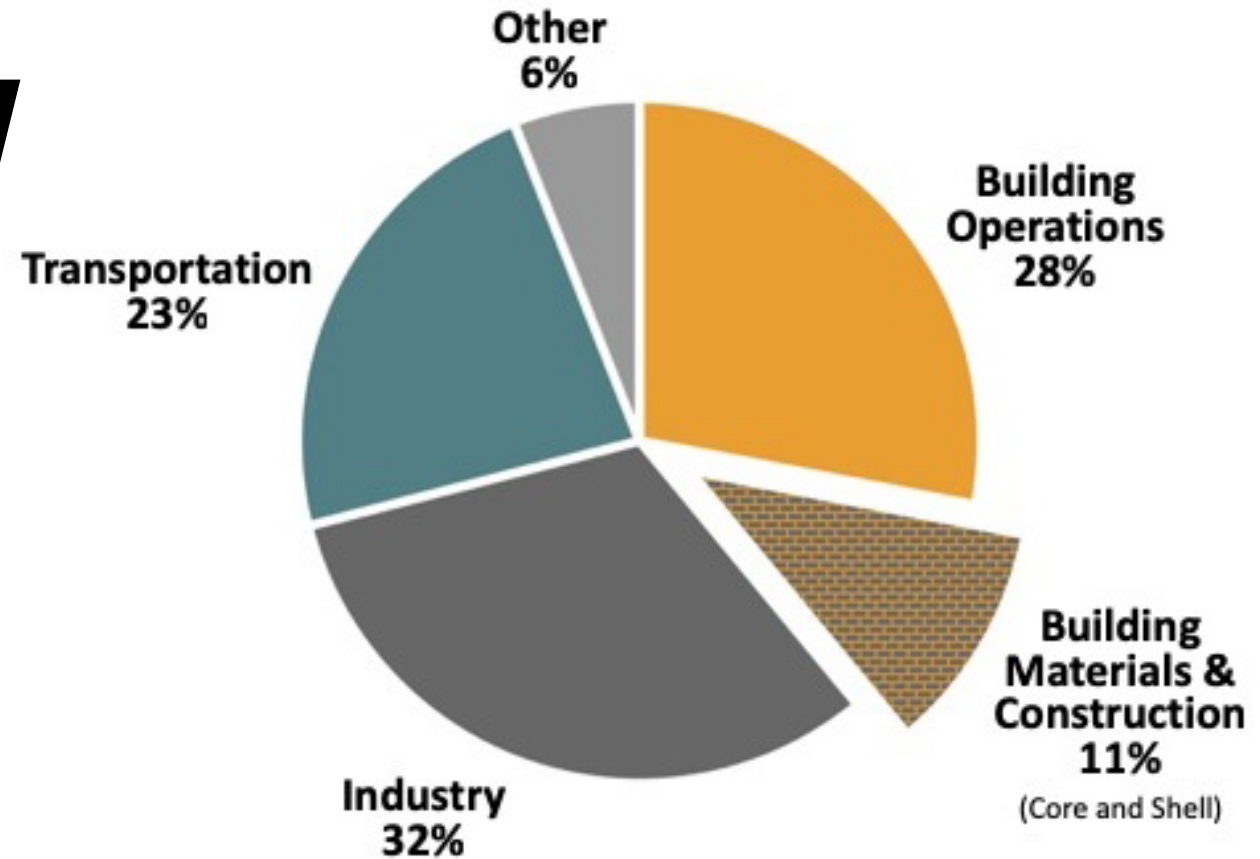
OCTOBER 6, 2022

BROYLES YOST, CONI, & MAZZI TO PRESENT, "IMPROVING HEALTHCARE
RESILIENCE THROUGH AN EQUITY FOCUSED FRAMEWORK" AT THE AIA/ACSA
INTERSECTIONS RESEARCH CONFERENCE: RESILIENT FUTURES

THE ROLE OF ARCHITECTURE

Buildings generate nearly 40% of annual global GHG emissions.

Global CO₂ Emissions by Sector



Source:
Global Alliance for Buildings and Construction.
2018 GLOBAL STATUS REPORT.



What determines health?



- Social & Physical Environment
- Medical Care
- Lifestyle & Behaviors
- Genes & Biology

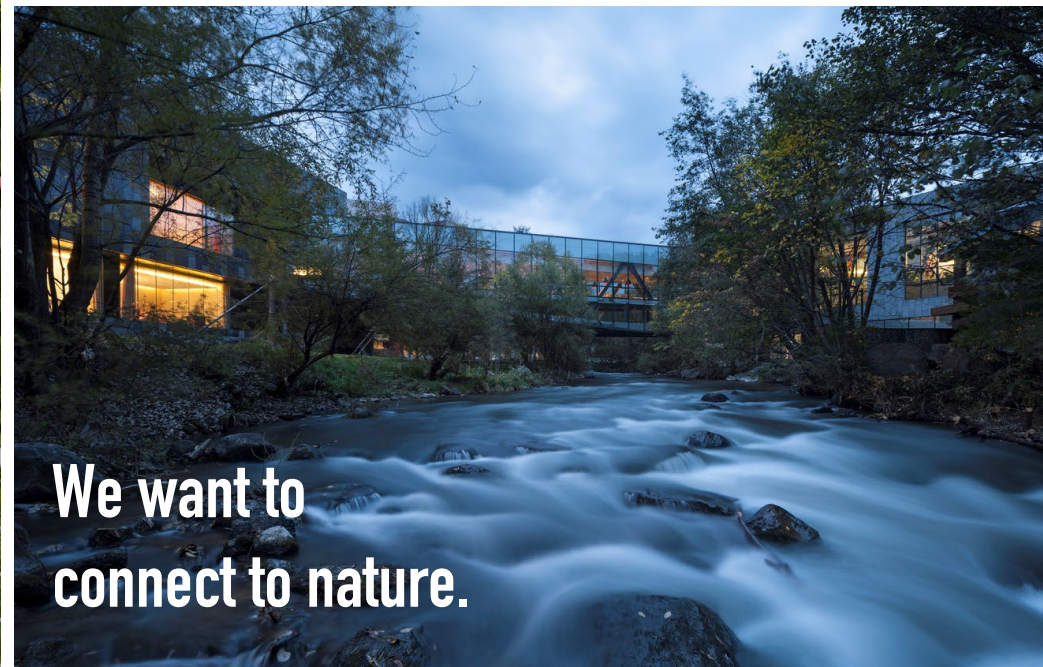
www.cdc.gov/nchhstp/socialdeterminants/faq.html





**WHY DO WE CARE?
WHAT ARE THE RISKS?**

**We want to
improve well-being.**



**We want to
connect to nature.**



**We want to minimize
energy/water use.**



**We want to
enhance communities.**





**We want to
improve well-being.**



**We want to
connect to nature.**




**We want to minimize
energy/water use.**



**We want to
enhance communities.**



PROCESS & GOALS

A close-up photograph of a person's hand with a dark skin tone touching a surface with a raised, orange honeycomb pattern. The hand is positioned in the upper right quadrant, with fingers spread across the pattern. The background is softly blurred, showing more of the honeycomb pattern and a bright, out-of-focus area on the right side.

**POSITIVELY
AFFECTING
PEOPLE IS THE
MOST IMPORTANT
THING WE DO.**

BEIJING • CINCINNATI • LOUISVILLE • MINNEAPOLIS • PITTSBURGH



Improve
individual
well-being.

**Design net
zero carbon
buildings.**



AIA 2030 COMMITMENT

Design all Net Zero Energy buildings by 2030 and Net Zero Carbon by 2050.

CINCINNATI
2030
DISTRICT®

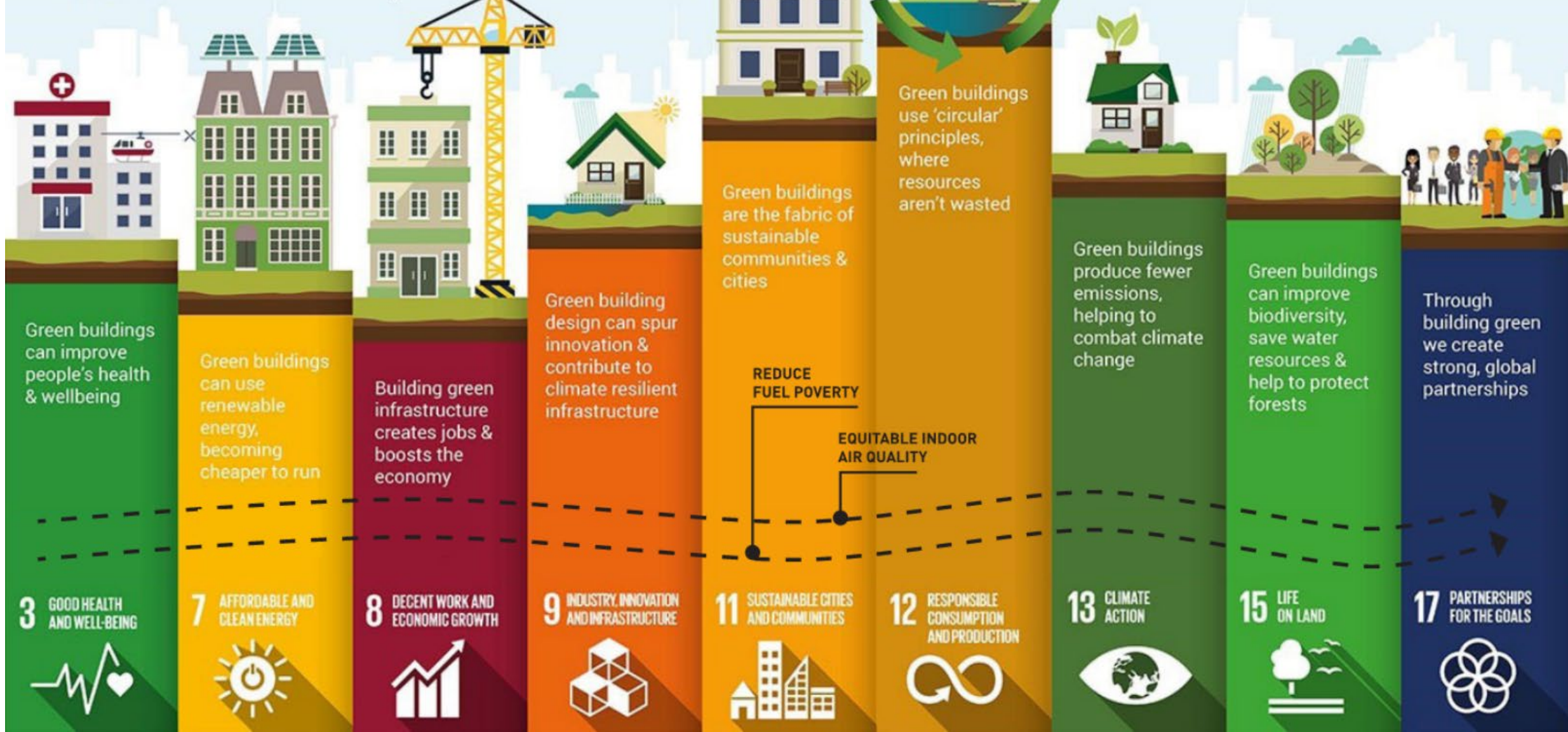
Reduce our office building energy use, water consumption, and transportation commuting emissions 50% by 2030.



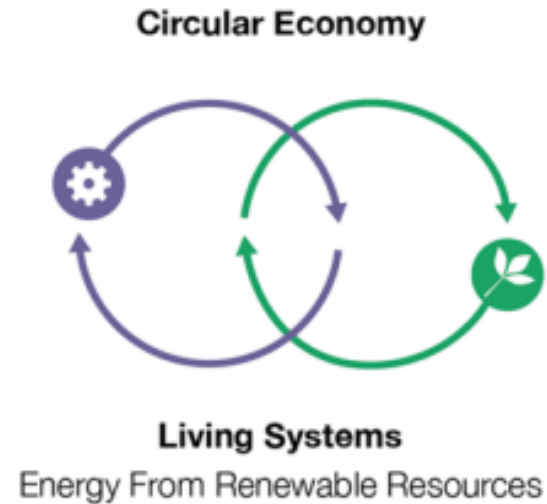
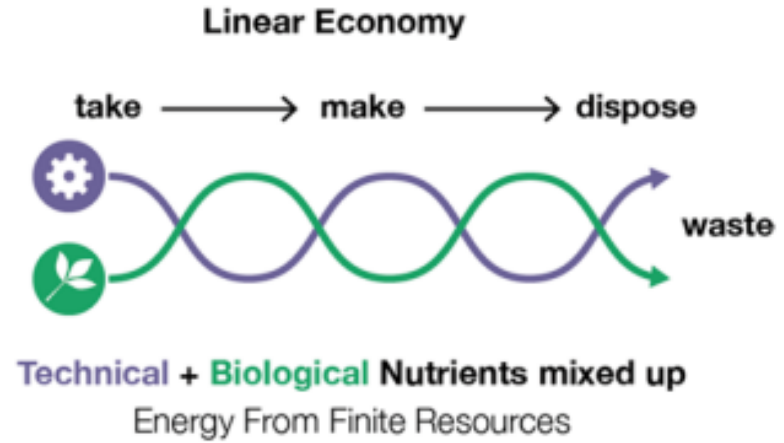


WORLD GREEN BUILDING COUNCIL

SUSTAINABLE DEVELOPMENT GOALS



We need to shift from a linear to a circular economy.



HOW TO GET STARTED

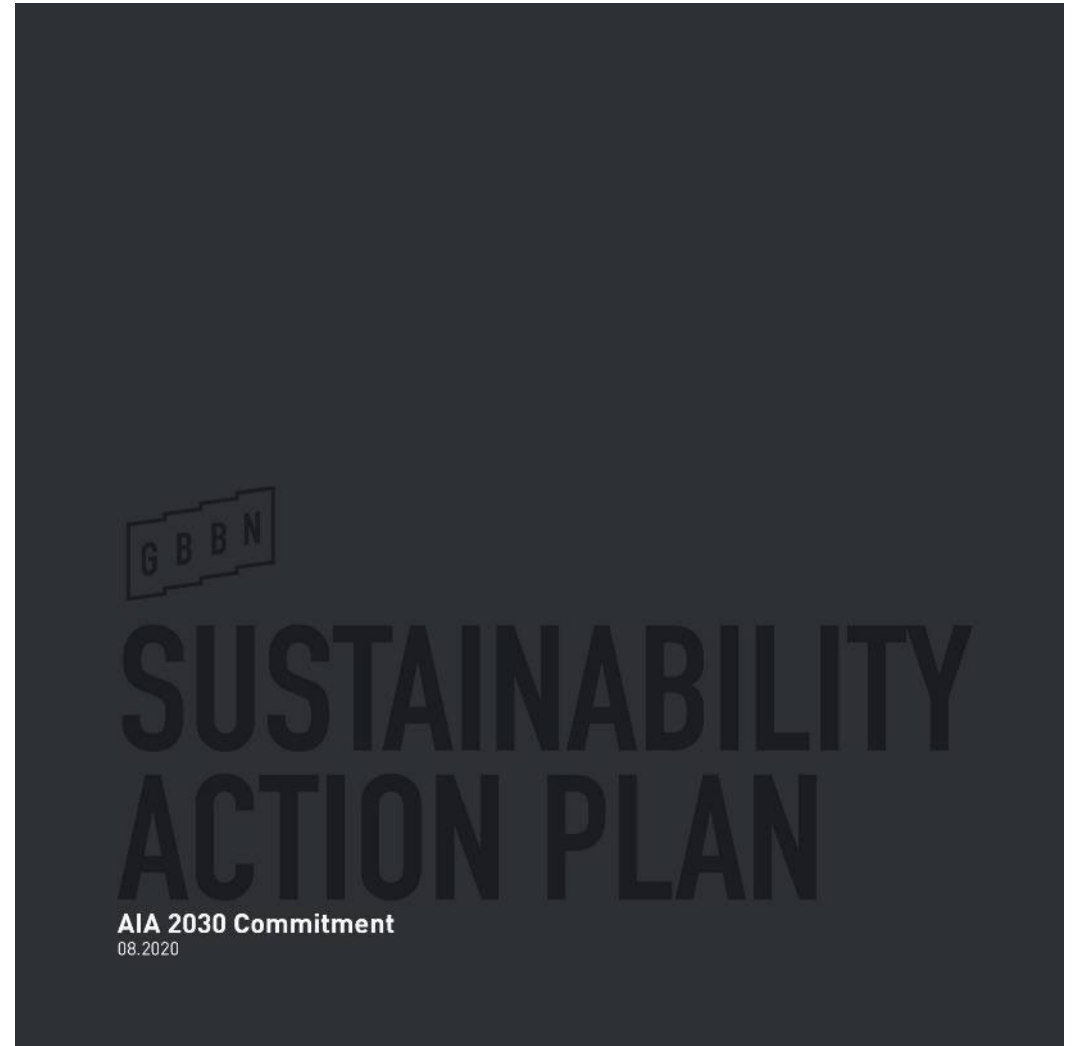
Held focus group meetings in every office

Capitalized on existing tools

Wrote a Sustainability Action Plan

Formed a Sustainability Action Network

Started gathering data



SUSTAINABILITY ACTION NETWORK





GOALS

A Design Process that connects environmental metrics and design at a project's earliest stages through all phases of development.

Metrics that help us evaluate design strategies and inform decision making by revealing the impact design has on building performance, focused primarily on carbon emissions and occupant wellbeing.

Community Engagement through an active voice for sustainability, resilience, and inclusion.

Training and Education to further expertise, support professional development, and share lessons learned.

Firm Operations that reflect our commitment to sustainable design and resilience through environmental stewardship, staff wellbeing, and social justice.

DESIGN PROCESS

Integrate Principles

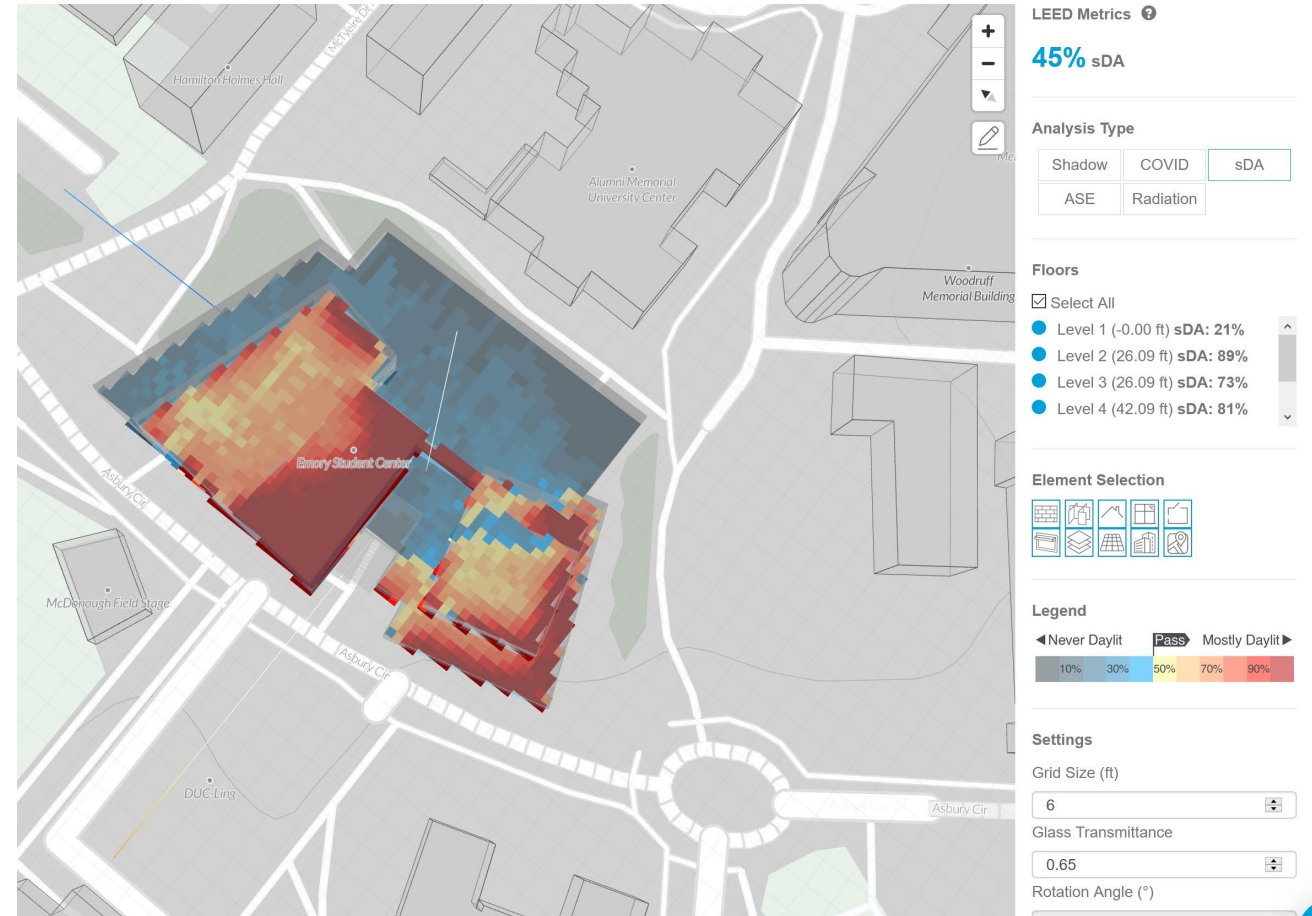
“How does this project contribute to creating a walkable, human-scaled community inside and outside the property lines?”

Establish Goals

- Reduce pEUI by 50%
- Capture 75% of stormwater runoff
- Provide daylight to 90% of occupied spaces
- LEED Platinum

Model Performance

Use Cove.tool to for climate analysis, daylight and glare simulations, and energy modeling during Concept, Schematic Design, and Design Development



FRAMEWORK FOR DESIGN EXCELLENCE

INSPIRING SUSTAINABLE, RESILIENT, AND INCLUSIVE DESIGN



Design for Integration



Design for Equitable Communities



Design for Ecosystems



Design for Water



Design for Economy



Design for Energy



Design for Well-being



Design for Resources



Design for Change



Design for Discovery



METRICS

Inventory Projects

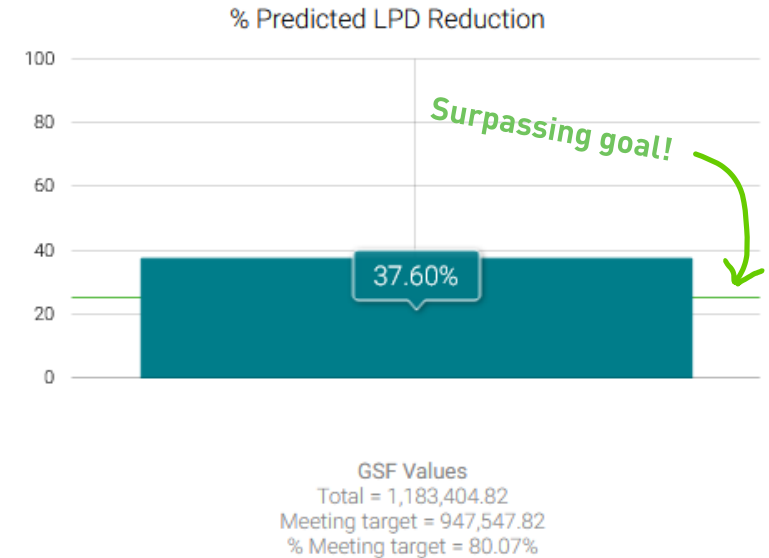
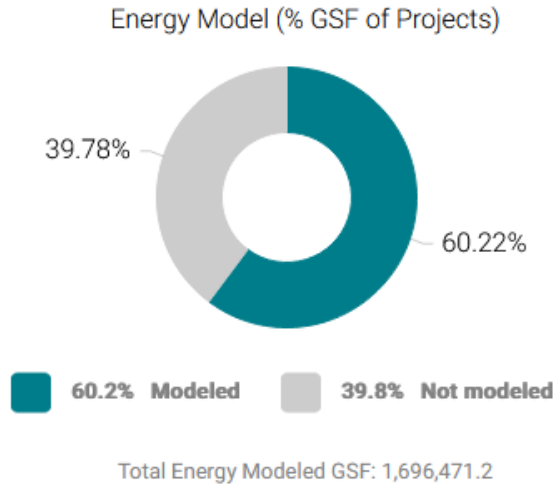
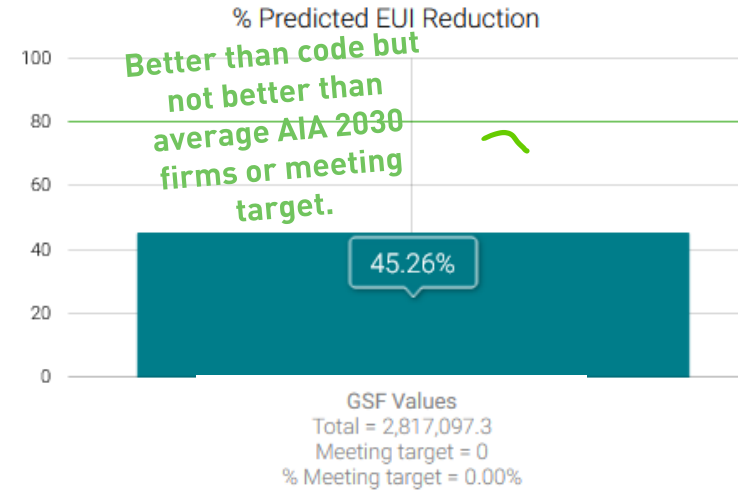
Know your predicted Energy Use Intensity (pEUI)/Lighting Power Density (LPD)

Establish Road Map

Use AIA Design Data Exchange (DDx) and Cove.tool to develop incremental pEUI targets

54 projects and 4,000,502.12 GSF included in analysis. **Up from 11 in 2020!**

Interior-only projects: 15 projects and 1,183,404.82 GSF included in analysis.
Whole-Building projects: 39 projects and 2,817,097.3 GSF included in analysis.



COMMUNITY ENGAGEMENT

Broadcast Commitment

Use Design Expedition and DIS to demonstrate our approach to sustainability, resilience, and inclusion

Collaborate for Innovation

Partner with like-minded consultants or non-profits to address local sustainability issue

Engage Organizations

Encourage staff to volunteer for sustainability organizations and civic task forces that advance high-performance buildings



TRAINING & EDUCATION

Advocate Internally

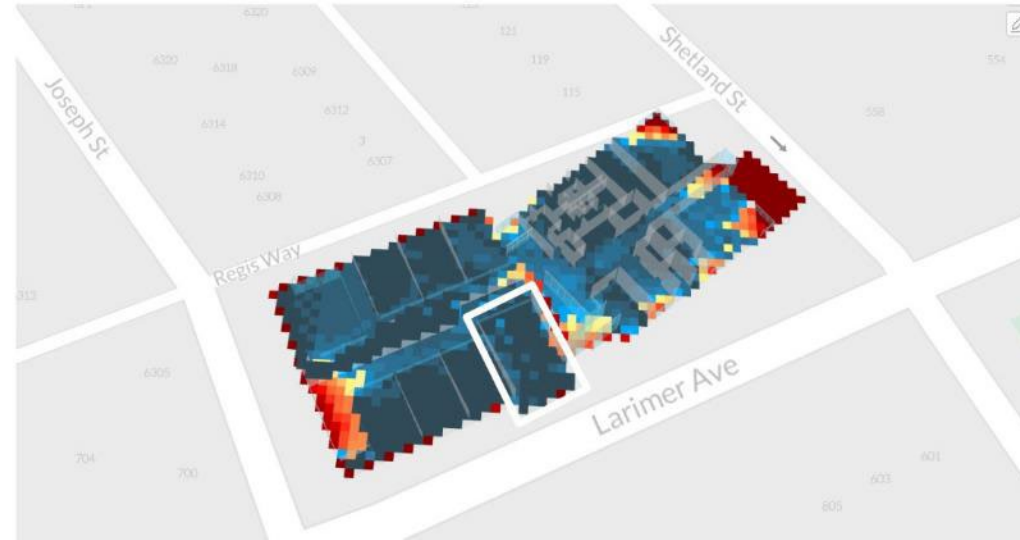
Host regular training and educational workshops.

Connect Teams

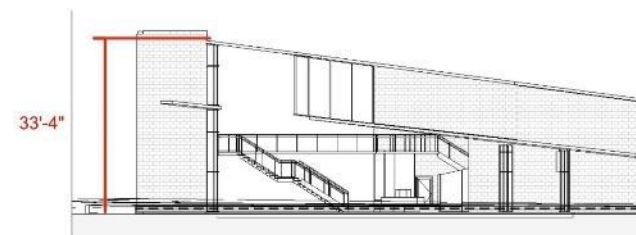
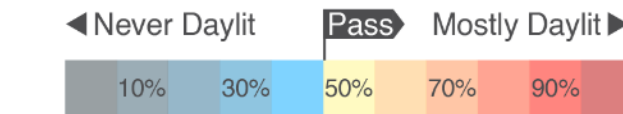
Create a sustainable materials library

Support Accreditations

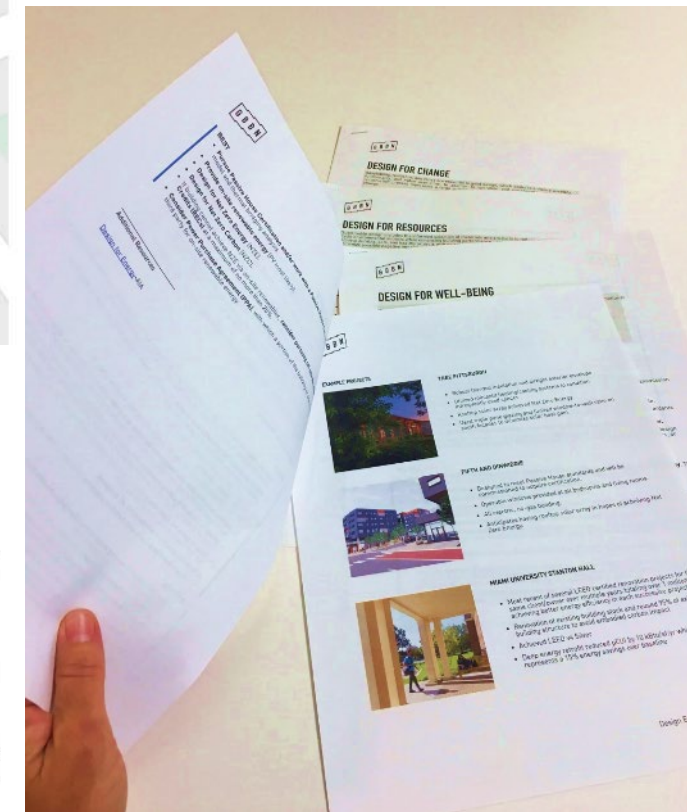
Encourage staff to obtain green building accreditations (LEED GA/AP, Fitwel Ambassador, WELL AP, Certified Passive House Designer, etc.)



SPACIAL DAYLIGHT AUTONOMY



TO ROOF



FIRM OPERATIONS

Minimize Waste

Perform a waste audit

Reduce Carbon Emissions

Track carbon footprint for 2021

Focus on Staff Wellbeing

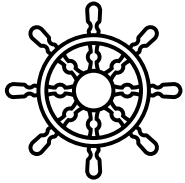
Integrate and improve health and wellness initiatives

Support Social Equity

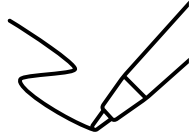
Input via sustainability lens



SAN INITIATIVES



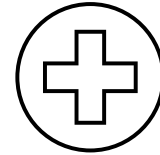
SAN
STRATEGIC
LEADERSHIP



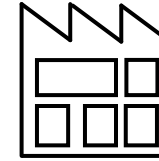
DESIGN
EXCELLENCE



PROJECT
MANAGER
TOOLKIT



HEALTH
CARE
APPROACH



PASSIVE
HOUSE
INITIATIVE



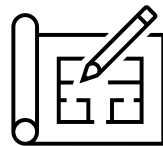
CARBON
EMISSIONS
FOOTPRINT



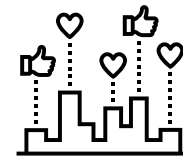
DISCUSSION
FORUMS



EMBODIED
CARBON
PLAN



INTERIOR
DESIGN FOR
CLIMATE
CHANGE



BUILDING
PERFORMANCE
ANALYSIS &
VISUALIZATION

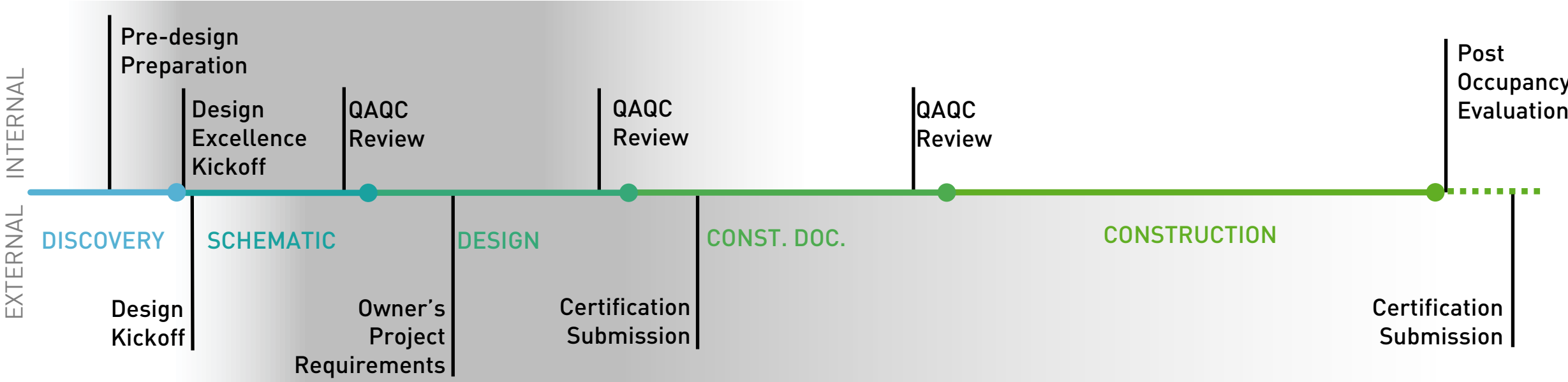


GBBN
BUILDING
WELL-BEING



GREEN FOR
GREEN

PROJECT ROADMAP



INTERNAL
EXTERNAL

Building Performance Analysis

TREE

PITTSBURGH





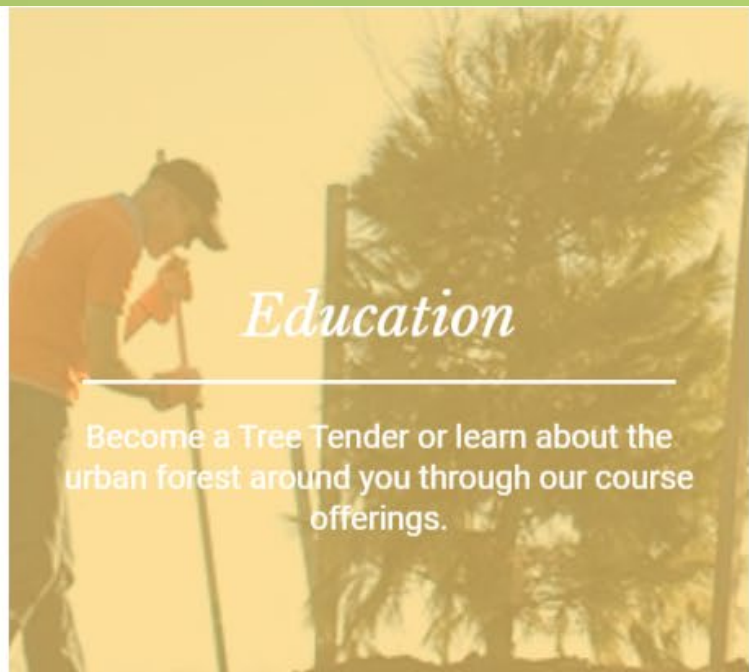


Mission

Tree Pittsburgh is an environmental non-profit organization dedicated to enhancing community vitality by restoring and protecting the urban forest through tree planting and care, education, and advocacy.

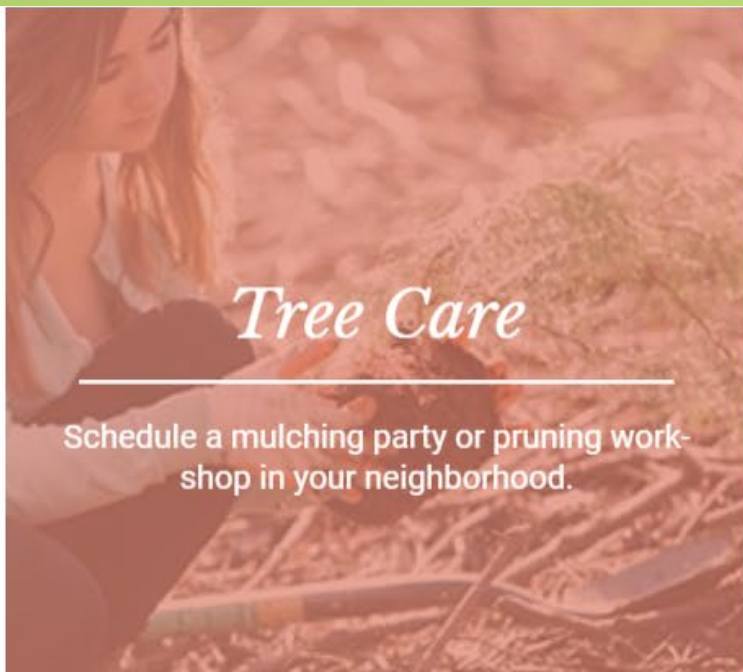
Vision

Our vision is to create a healthy urban forest for all by inspiring and engaging people to maintain, plant, and protect trees. We believe that all people have the right to benefit from the many health, environmental, and social benefits that trees provide. A greener city will create more vital communities for generations to come.



Education

Become a Tree Tender or learn about the urban forest around you through our course offerings.



Tree Care

Schedule a mulching party or pruning workshop in your neighborhood.



Neighborhoods

Learn more about Tree Pittsburgh's neighborhood-level planning.



EDUCATION & ADVOCACY



ON SITE OPERATIONS



NEIGHBORHOOD PLANTING



SITE CONDITIONS



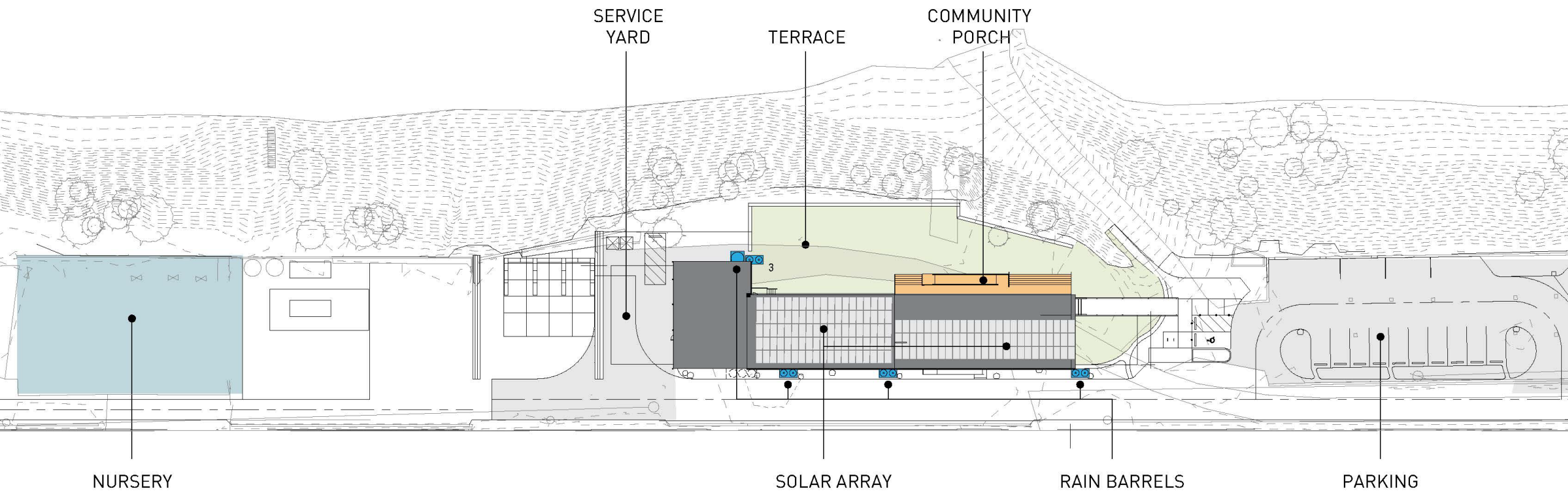
DESIGN DRIVERS: COST & PERFORMANCE





DESIGN DRIVERS: PROGRAM

ALLEGHENY RIVER



NURSERY

SERVICE
YARD

TERRACE

COMMUNITY
PORCH

SOLAR ARRAY

RAIN BARRELS

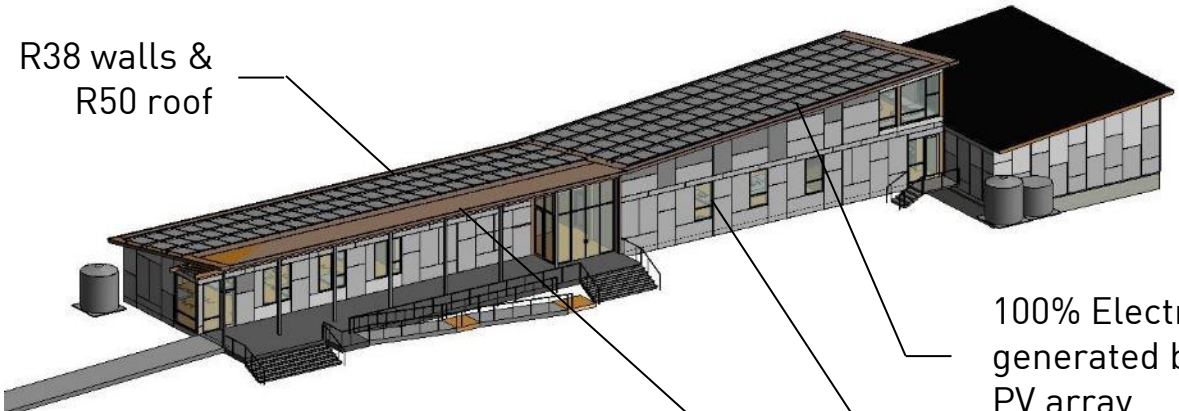
PARKING

**DESIGN DRIVER:
SOLAR ENERGY**



DESIGN DRIVER: SOLAR ENERGY

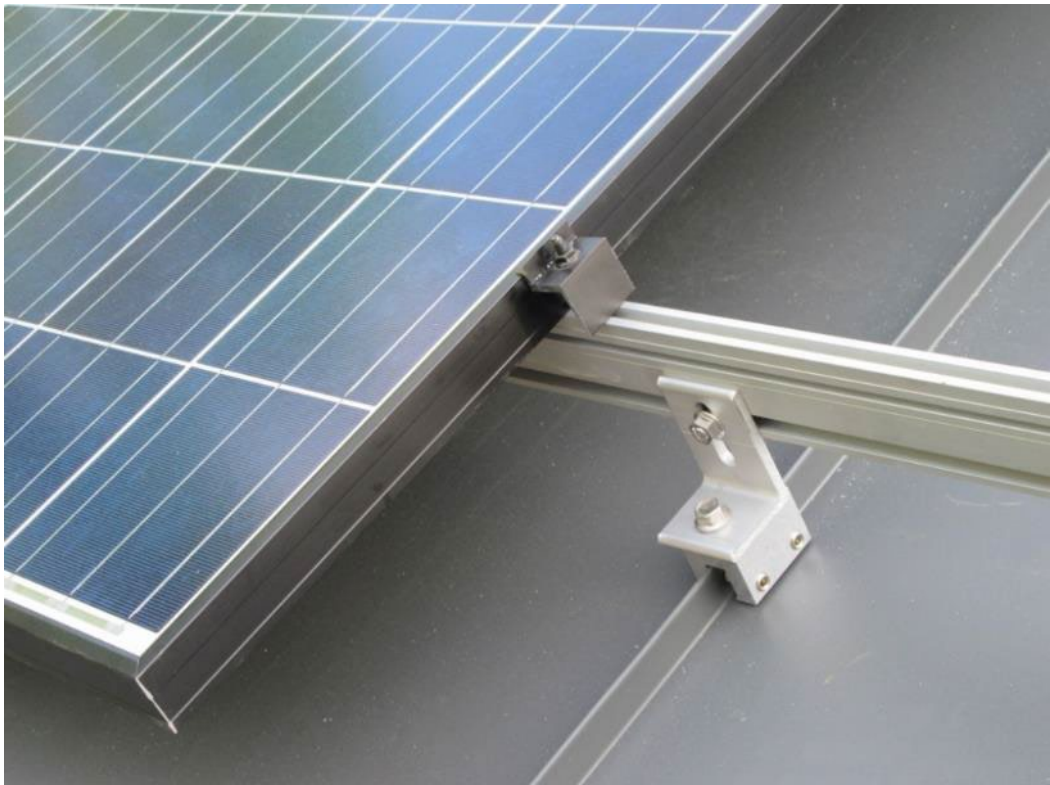
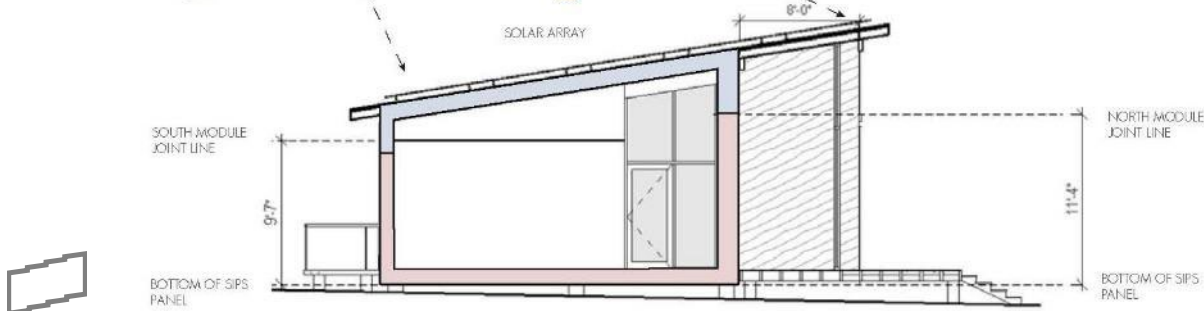
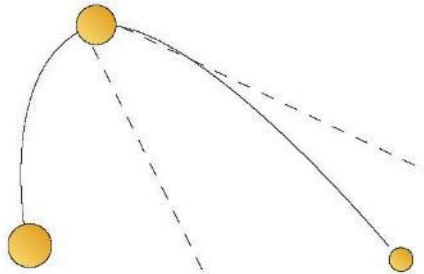
R38 walls & R50 roof



100% Electricity generated by 60kw PV array

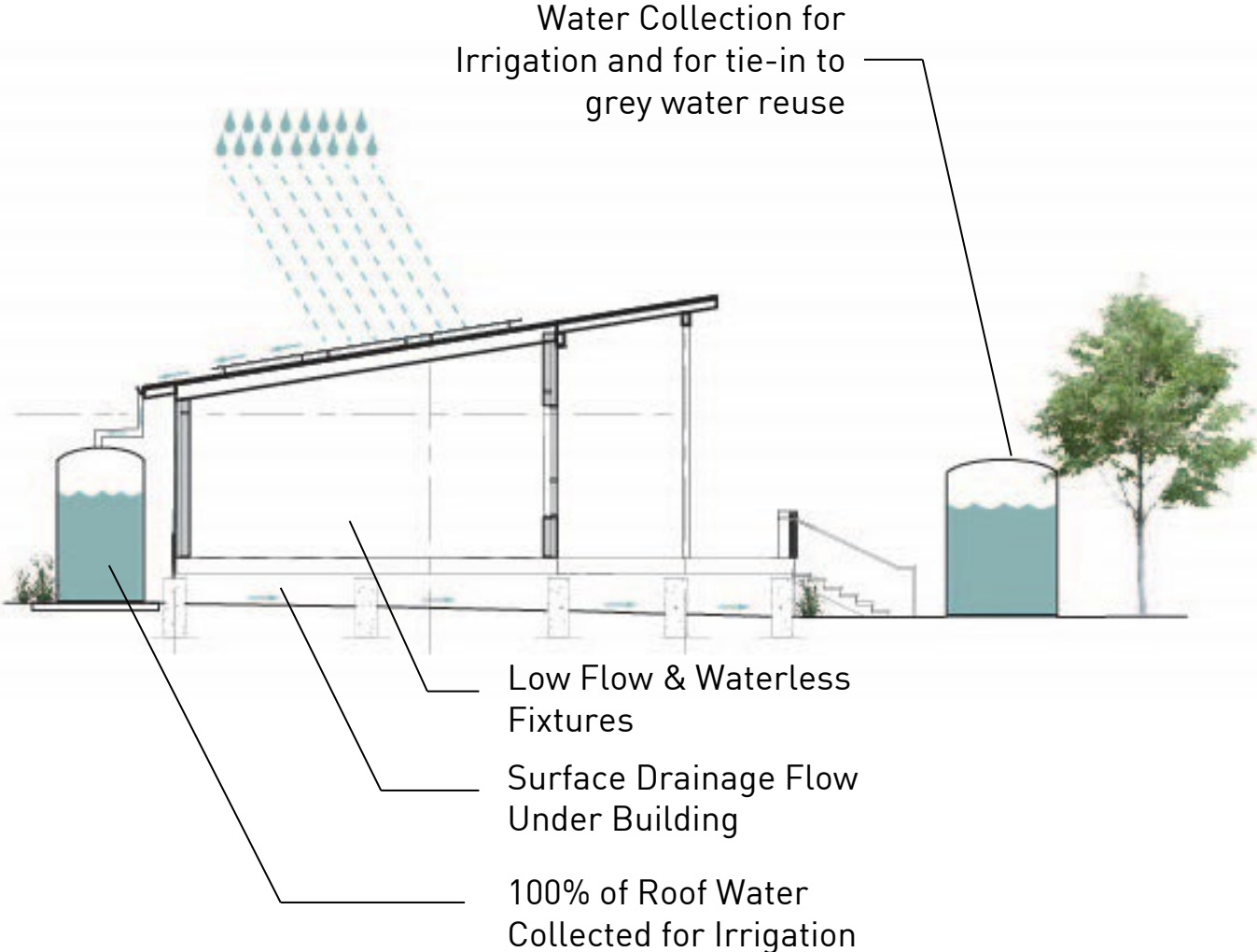
Triple glazed windows

Optimized solar orientation & shading

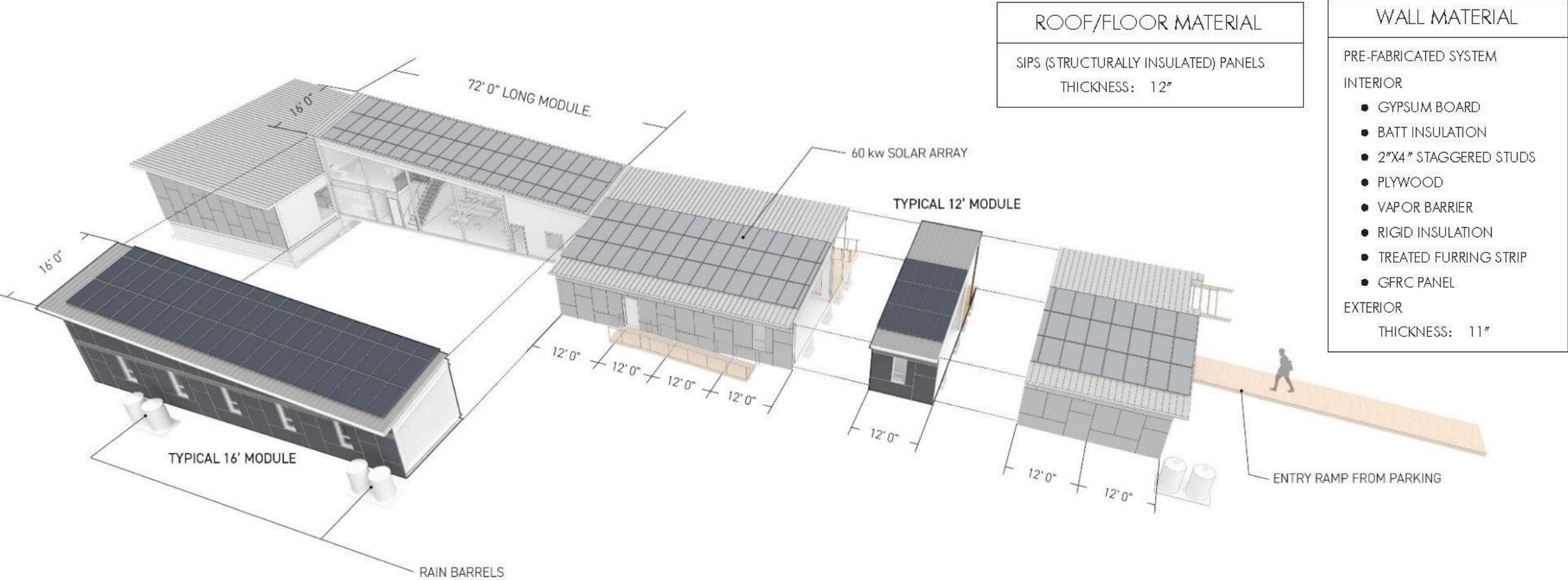




DESIGN DRIVER: WATER MANAGEMENT

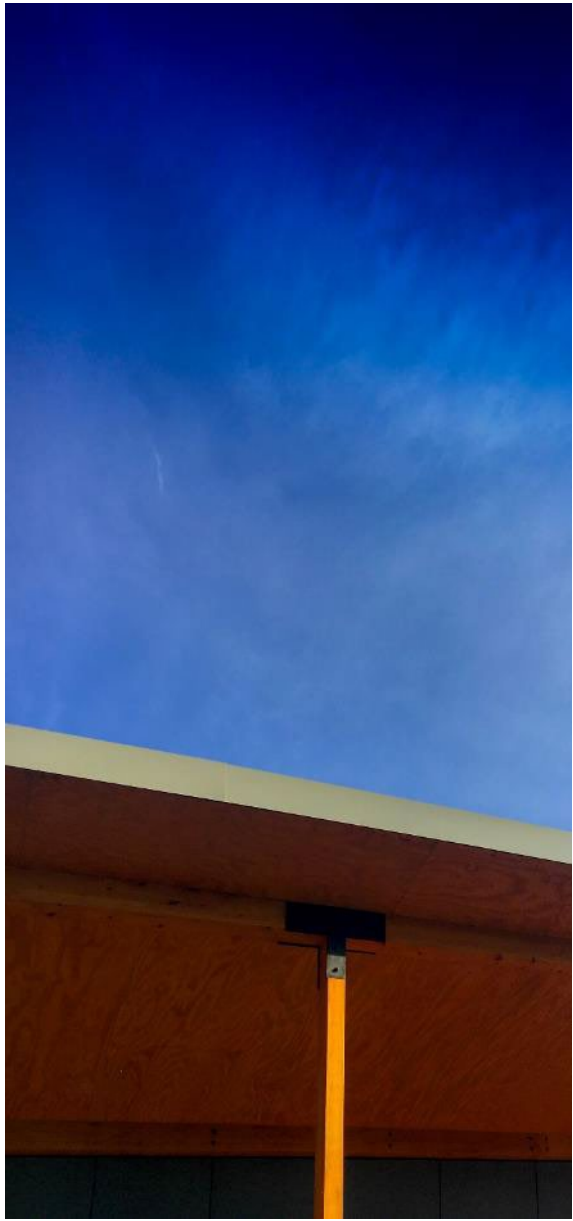
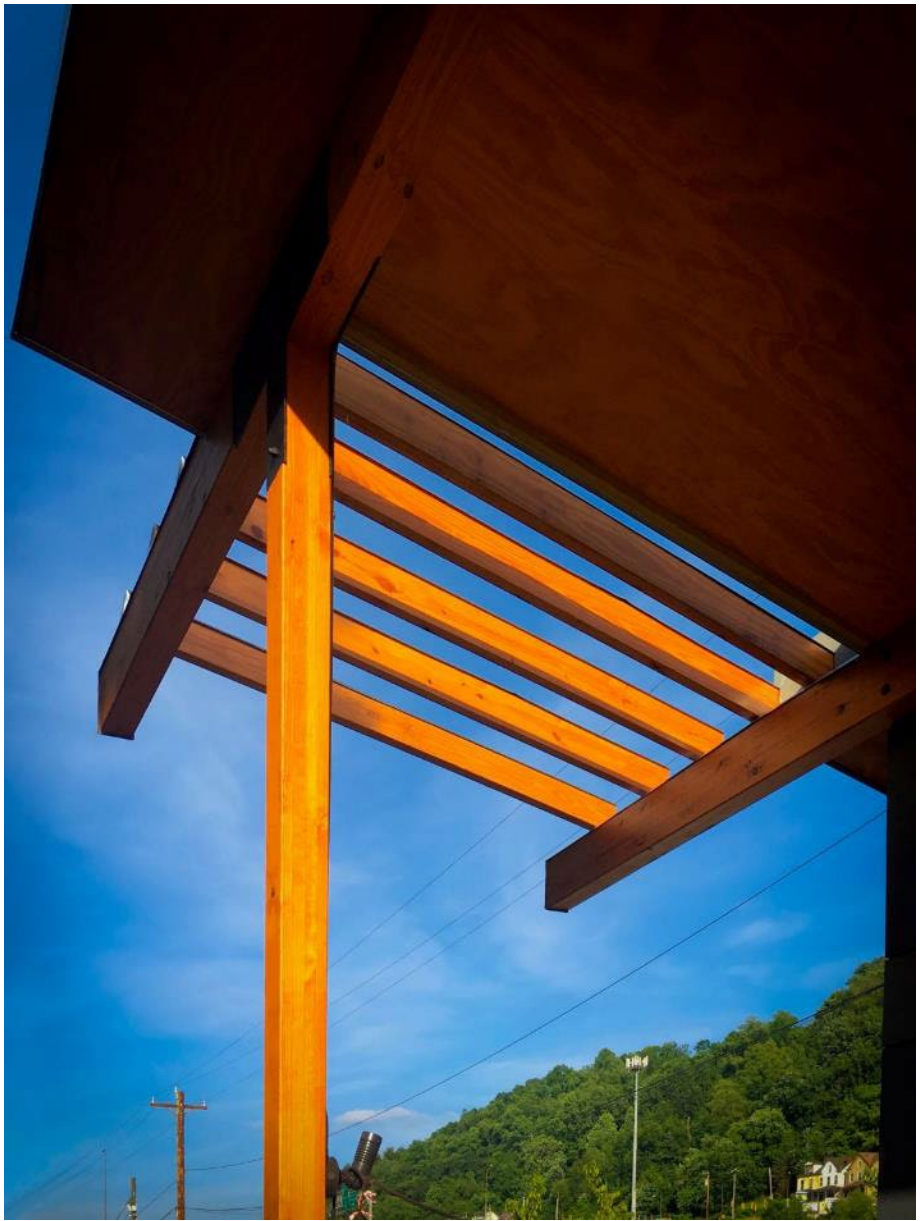


DESIGN DRIVER: PRE-FABRICATED & MODULAR



DESIGN DRIVERS: WASTE REDUCTION & QAULTY









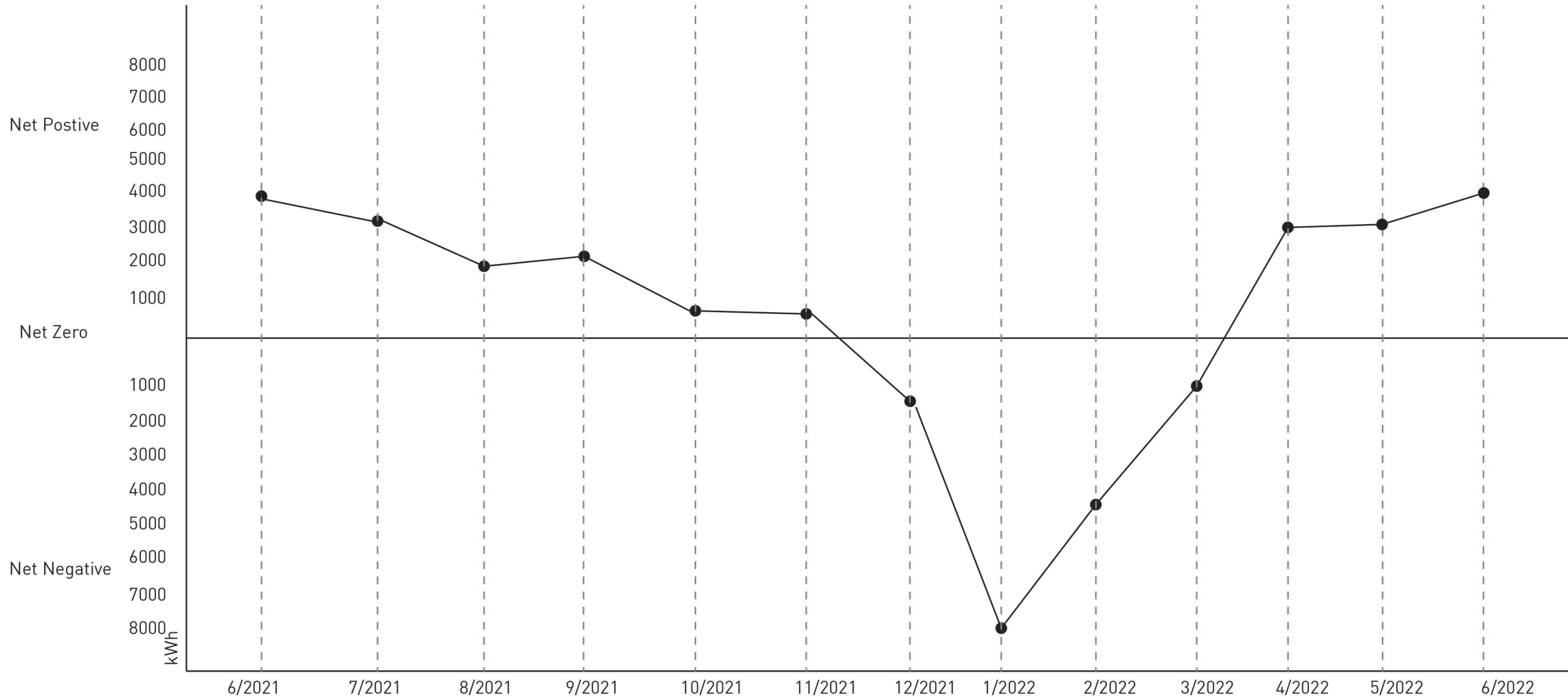






PERFORMANCE: NET ZERO ENERGY

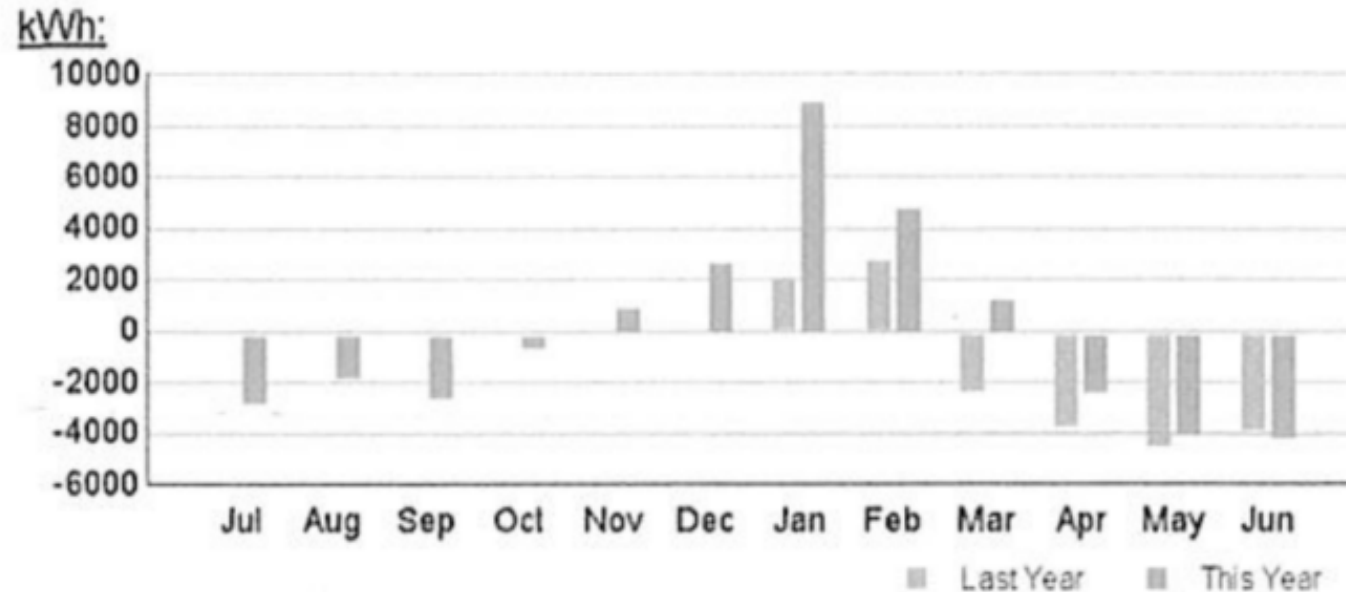
Actual Net Usage



PERFORMANCE: NET ZERO ENERGY

Usage and Demand

Period	Total kWh Usage	Avg Daily kWh Usage	# of Days	Avg Daily Temp (F)
Current Month	-4253	0	30	61
Last Month	-4018	0	32	66
Same Month Last Year	-3947	0	30	74





5TH & DINWIDDIE
EAST & WEST

GOOD DESIGN

=

SUSTAINABLE DESIGN



GOOD DEVELOPMENT

=

EQUITABLE DEVELOPMENT



DESIGN DRIVER: CITY & COMMUNITY PLANS



GOALS

THE ECONOMIC DISTRICT PLAN REINFORCES PITTSBURGH'S INITIATIVE AND IS BUILT AROUND THE FOLLOWING GOALS:

PEOPLE	PLANET	PLACE	PERFORMANCE
<p>Equity Promote a vibrant, diverse community where the residents of Uptown West Oakland are an active and vital part of the community's future. Foster diversity, build opportunities and don't just build the bricks of systems that target some other communities.</p> <p>Opportunity Maximize local businesses and vibrant production, attract leading opportunities and create a clear pathway for residents to obtain job opportunities.</p>	<p>Health Ensure a vibrant, sustainable and environmentally healthy in the planning, design and development of Uptown West Oakland.</p> <p>Choice Before, during and after the development process that air and water quality, noise and other environmental impacts are minimized and that the community is actively engaged in the process.</p>	<p>Identity Reinforce Uptown West Oakland's unique character by promoting and creating vibrant, healthy, vibrant, productive, and sustainable communities and expanding local art and community events.</p> <p>Connectivity Create stronger connections in the Uptown West Oakland, Downtown, the Strip District, and the University City areas, including transit, pedestrian, and bicycle.</p>	<p>Leadership Promote solutions for water, building systems and energy usage that will reduce Uptown West Oakland's carbon footprint and improve its performance and efficiency.</p> <p>Leadership Create policies, programs and a model for sustainable development that are innovative to other districts and effectively use resources in the community.</p> <p>The residents of the district are responsible for the vision, plan and development.</p>

PITTSBURGH 2030 DISTRICTS DOWNTOWN - OAKLAND




START WITH THE DESIRED OUTCOME

Owner's Project requirements

- community
- energy
- indoor air quality
- indoor environmental quality
- landscaping
- materials
- operations & maintenance
- waste
- water
- transportation

January 25, 2021



AUROS GROUP
OWNER'S PROJECT REQUIREMENTS
FIFTH AND DINWIDDIE, WEST SITE

Targets & Goals		Responsibility	Notes	
<u>SUSTAINABILITY PROGRAM GOALS</u>	Building Owner: Fifth and Dinwiddie Development, LLC Building Address: Fifth and Dinwiddie West, Pittsburgh, Pennsylvania Building Size: 192,000 Square Feet Building Type: Multi-Family, Retail Project Budget: \$38 million Project Type: 55 kBtu/sf/yr Owner Sustainability Director: Derrick Tillman AUROS360™ Advisor: Craig Stevenson			
	Passive House (PH) Classic Standard (certification) RESET Air (certification) Fiwel (certification)	AUROS Group AUROS Group AUROS Group		
	C-PACE (compliance) p4 Performance Measures (narrative only) The 2030 Challenge (compliance)	Derrick Tillman GBBN AUROS Group		
<u>MEASUREMENT AND VERIFICATION</u>	Integrated Solutions includes: - AIA 2030 District Whole-Building Analytics - RESET Air Accredited Data Provider - Interrogation-based Commissioning - Monitoring-based Commissioning - Single-Pane of Glass for all Operational Networks Converged Network, Open-Integration Data Platform and DDC System Optimal Solar Integration	MBI AUROS Group Newcomb & Boyd		
<u>COMMUNITY</u>	Affordable Living Units Community Events Space MWDBE Subcontracting Participation MWDBE Tradesperson Participation	Derrick Tillman Derrick Tillman Derrick Tillman Derrick Tillman		
Qualitative Health and Development	Occupant Survey for Wi-Fi Access and Tenant Exit Interview Satisfaction Survey for Regular Occupants (Fiwel) Provide Regular Occupants Access to Lactation Room (Fiwel) Universally Accessible Water Supply with Water Bottle Refilling Stations (Fiwel)	Derrick Tillman/NDC Asset Management AUROS Group AUROS Group		
Social Equity and Inclusion Workforce Training and Education	Outdoor Space Amenities (Fiwel) Supportive Services Program Passive House Tradesperson and Renewables Technologies	AUROS Group Derrick Tillman Derrick Tillman		
<u>ENERGY</u>	Site EUI Renewables (Photovoltaic Panels)	14-20 kBtu/sf/yr Optimal Solar	AUROS Group MBI	
<u>INDOOR AIR QUALITY</u>	Carbon Dioxide (CO2) Humidity Ozone (O3) Particulate Matter 2.5 (PM2.5) Radon Temperature Total Volatile Organic Compound (TVOC) Ceiling Mounted Paddle Fans Kitchen Exhaust Fans	< 600 ppm Monitored < 51 ppb < 12 µg/m3 < 0.148 Bq/L [4 pCi/L] in the lowest occupied level Monitored < 0.4 mg/m3 (< 400 µg/m3) Included in Bedrooms and Living Room Recirculation without Makeup Air	AE Team AE Team AE Team AE Team MBI AE Team AE Team AE Team AE Team	Preconstruction

THEN DETERMINE METRICS

Certifications



Compliance



FIFTH & DINWIDDIE



Downtownburgh

Hill District

Oakland

Uptown



DINWIDDIE STREET

FIFTH AVE

BUILDING PROGRAM

Residential:
190,000 total sf
171 total units

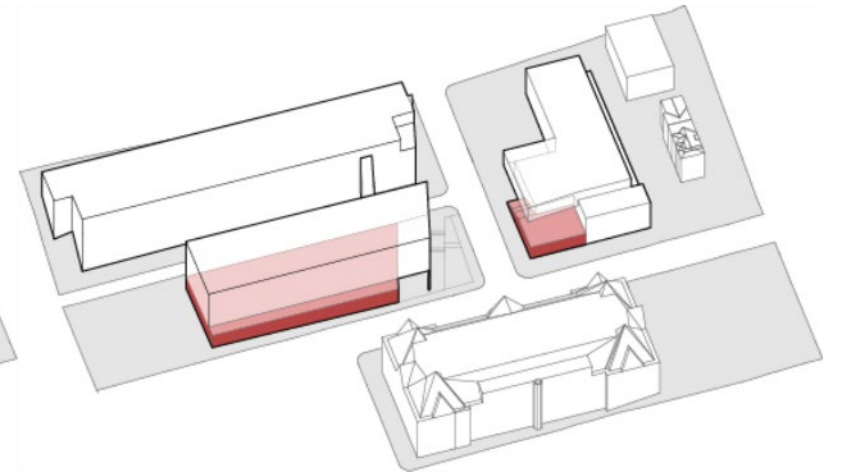
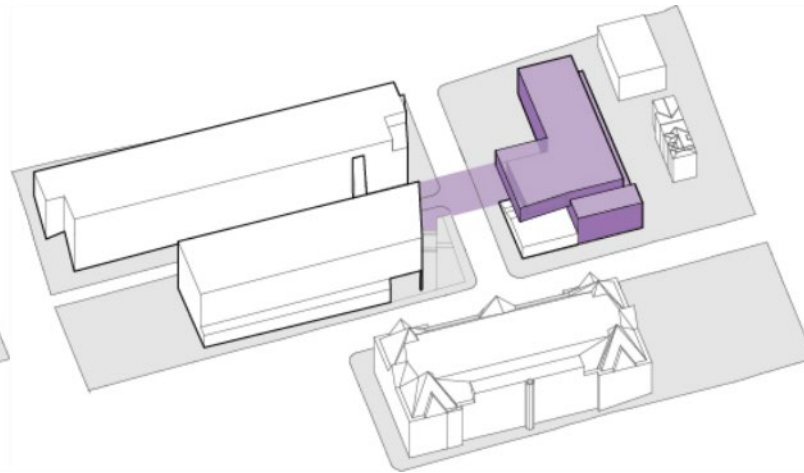
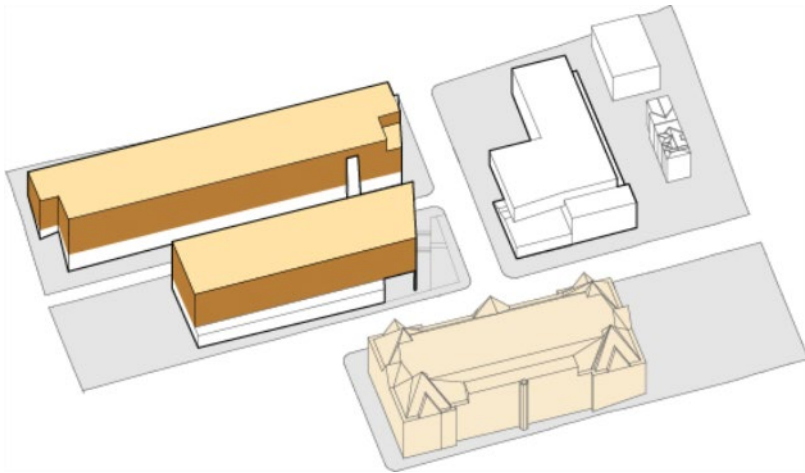
29 Studio Units (~400sf)
123 One Bedroom (~650sf)
19 Two Bedroom (~900sf)

137 units market rate
34 units affordable (20%)

Commercial Office:
34,000sf

Workforce training
Flex Use
Co-Working

Retail:
12,000sf West
2,300sf East



FIFTH & DINWIDDIE EAST (pEUI 18)



FIFTH & DINWIDDIE WEST (pEUI 16)



EQUITABLE UNIT DISTRIBUTION

-  RESIDENTIAL ACCESSORY
-  RESIDENTIAL CIRCULATION
-  RESIDENTIAL UNITS (NOT IN CONDO)
-  RESIDENTIAL UNITS (CONDO)

Efficiency: 4
 1 Bedroom: 8
 2 Bedroom: 3

Total Level 4: 15

LIHTC DESIGNATED AFFORDABLE UNITS

Total Level 4: 11



MOBILITY IMPAIRED UNIT
 Total in Level 4 Condo: 2



SENSORY IMPAIRED UNIT
 Total in Level 4 Condo: 1



FIFTH & DINWIDDIE WEST









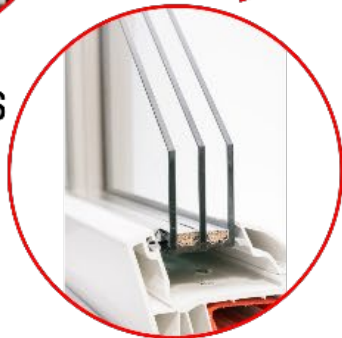
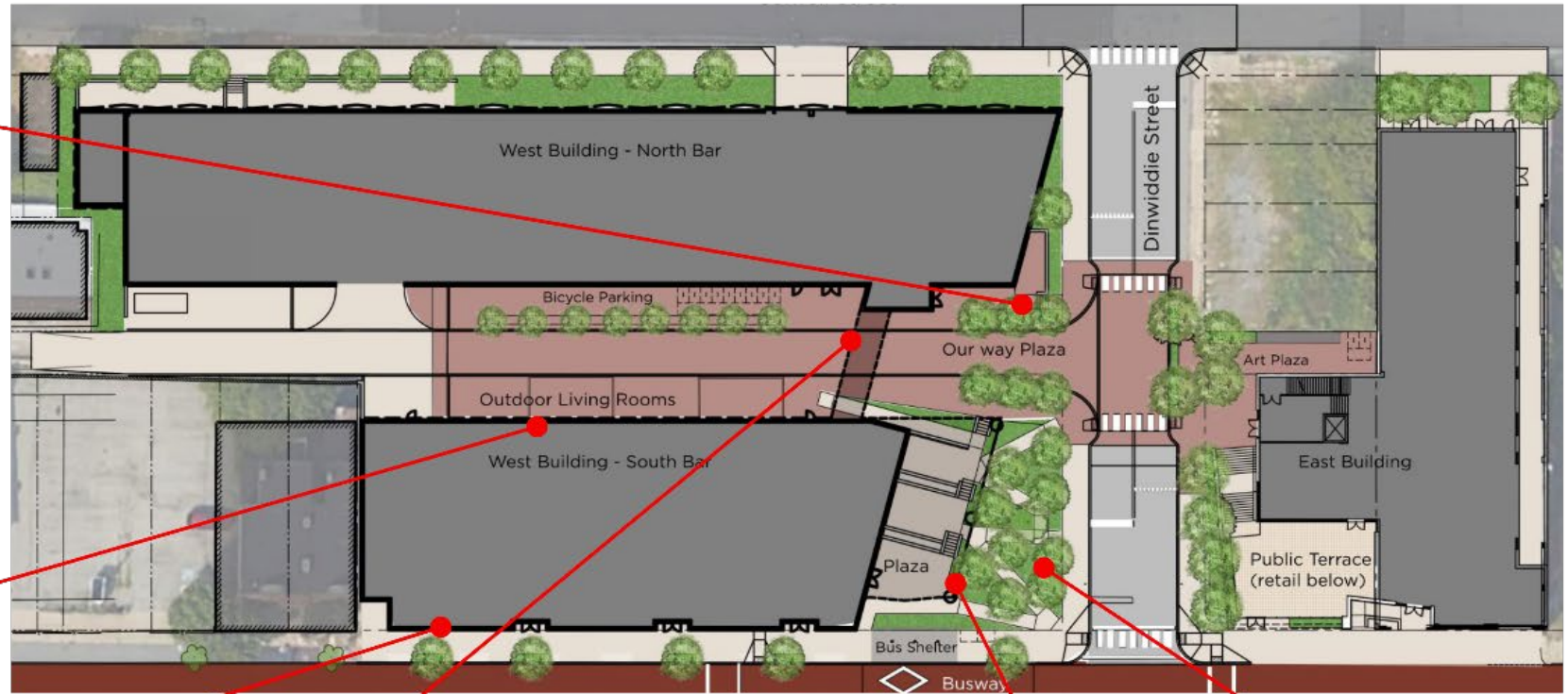
PUBLIC
ART



ROOF TERRACE



OUTDOOR LIVING ROOMS



HIGH PERFORMANCE WINDOWS



SCOOTER/ BIKE SHARE



BRT SHELTER



STADIUM SEATING



MULTI-STEM TREES



PROGRESS
& **IMPACT**

AIA 2030 COMMITMENT

Design all Net Zero Energy buildings by 2030 and Net Zero Carbon by 2050.

CINCINNATI
2030
DISTRICT®

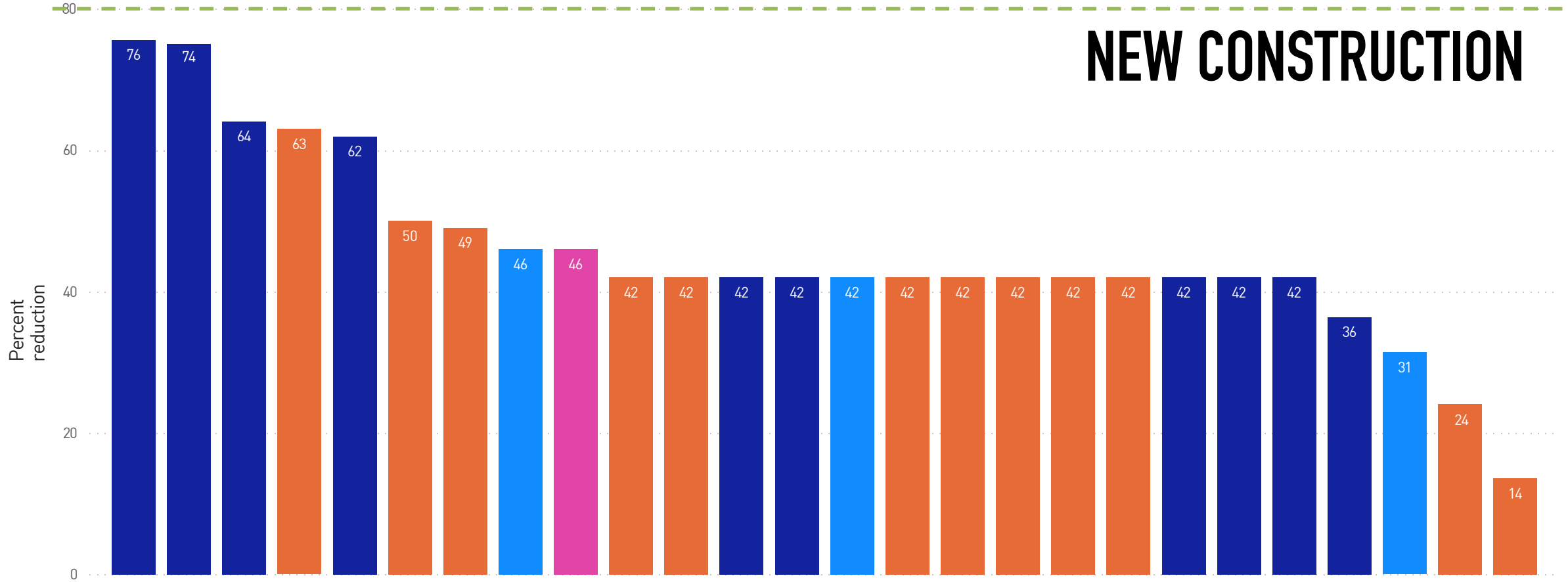
Reduce our office building energy use, water consumption, and transportation commuting emissions 50% by 2030.



Percent reduction of pEUI by Project name and Market

Market ● Arts ● Community Development ● Healthcare ● Higher Education ● Workplace — 80% Reduction Target

NEW CONSTRUCTION

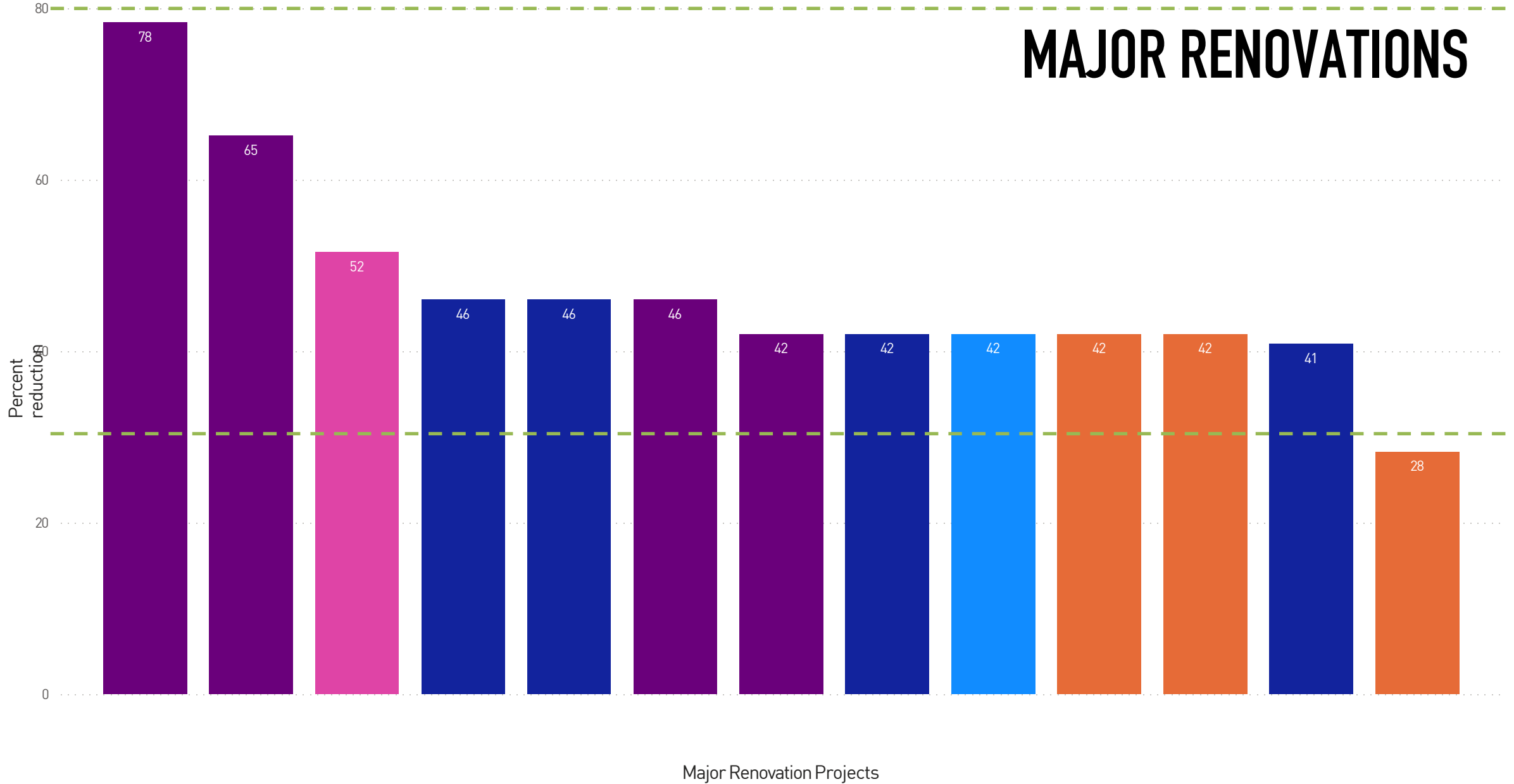


New Construction Projects

Percent reduction of pEUI by Project name and Market

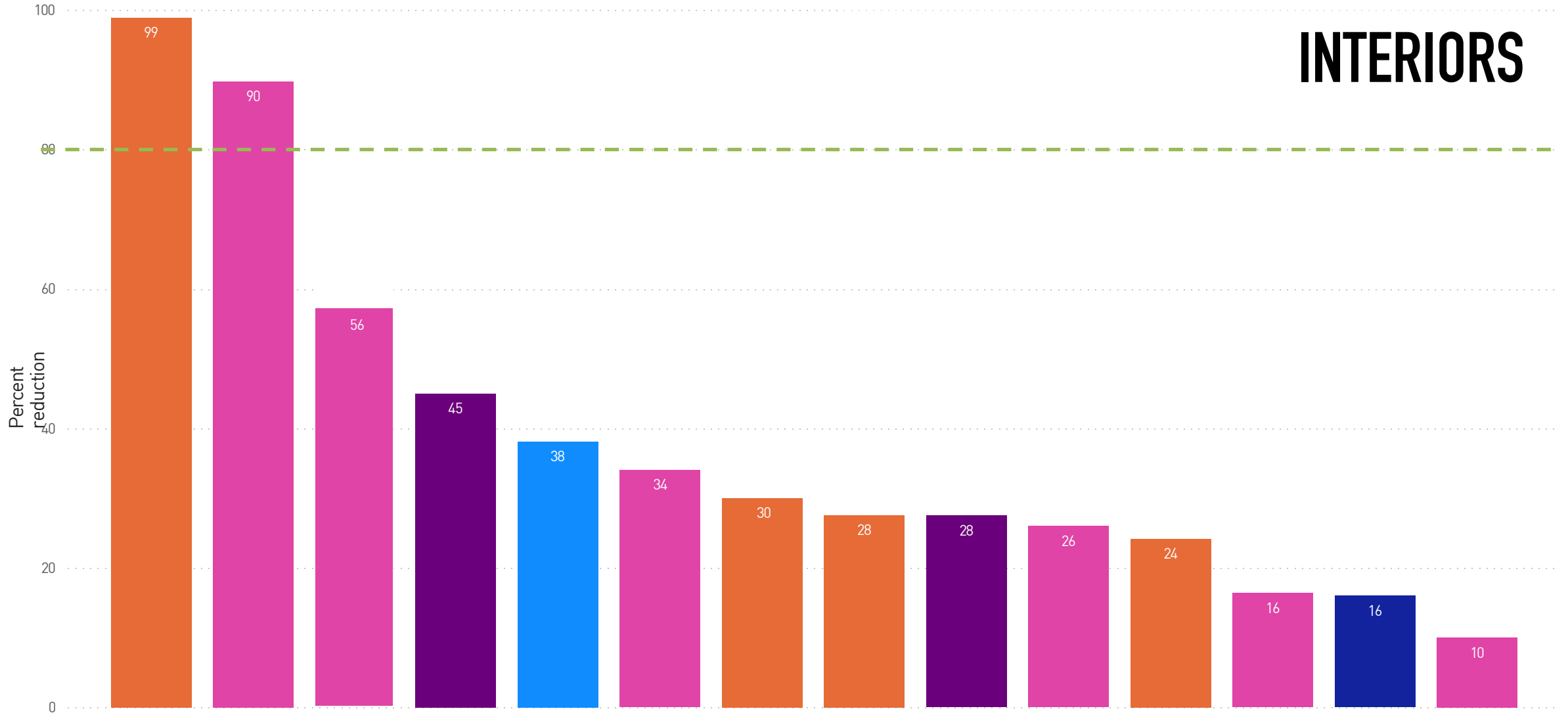
Market ● Arts ● Community Development ● Healthcare ● Higher Education ● Workplace ● 30% to 80% Reduction Target depending on SOW

MAJOR RENOVATIONS



Percent reduction of pLPD by Project name and Market

Market ● Arts ● Community Development ● Healthcare ● Higher Education ● Workplace — 80% Reduction Target

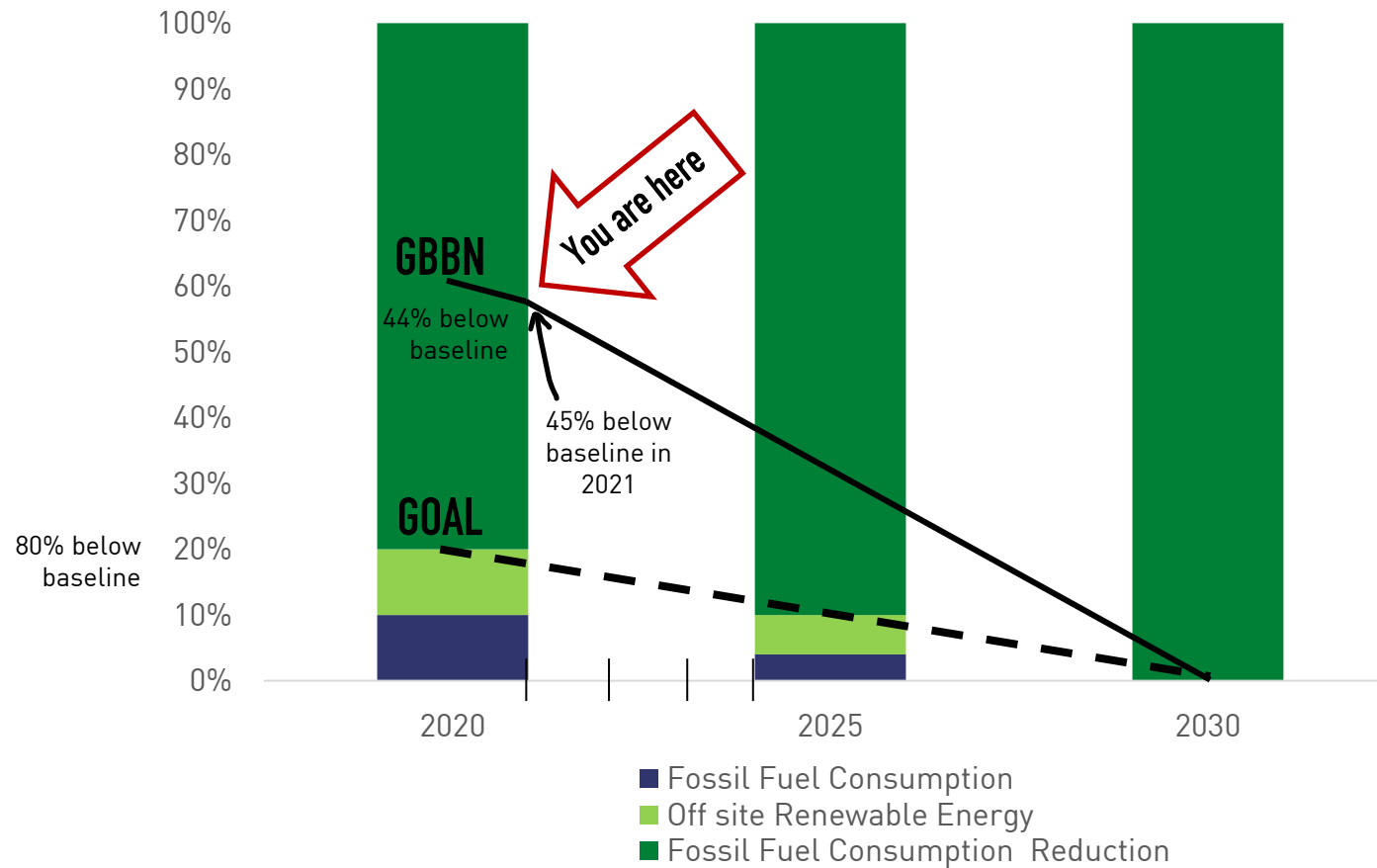


INTERIORS



Interiors
Projects

AIA 2030 COMMITMENT PROGRESS



OPERATIONS: CARBON EMISSIONS



2021 Business travel mileage:
36,401 miles
12,413kg of CO2 emissions

2022 Business travel mileage:
Jan-Mar
8,335.6 miles
2,842kg of CO2 emissions



2021 Airline Business Travel:
58 trips
6,996kg of CO2 emissions

2022 Airline Business Travel:
Jan-Mar
31 trips
4,615kg of CO2 emissions

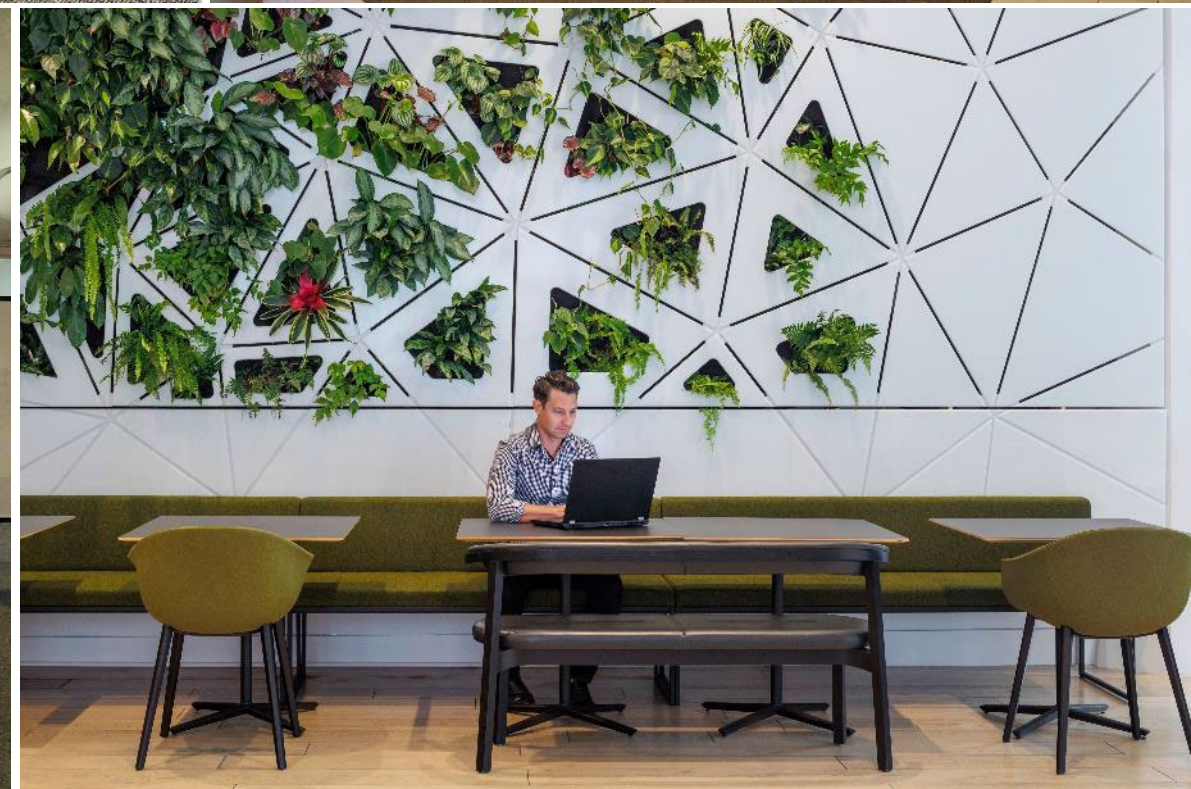
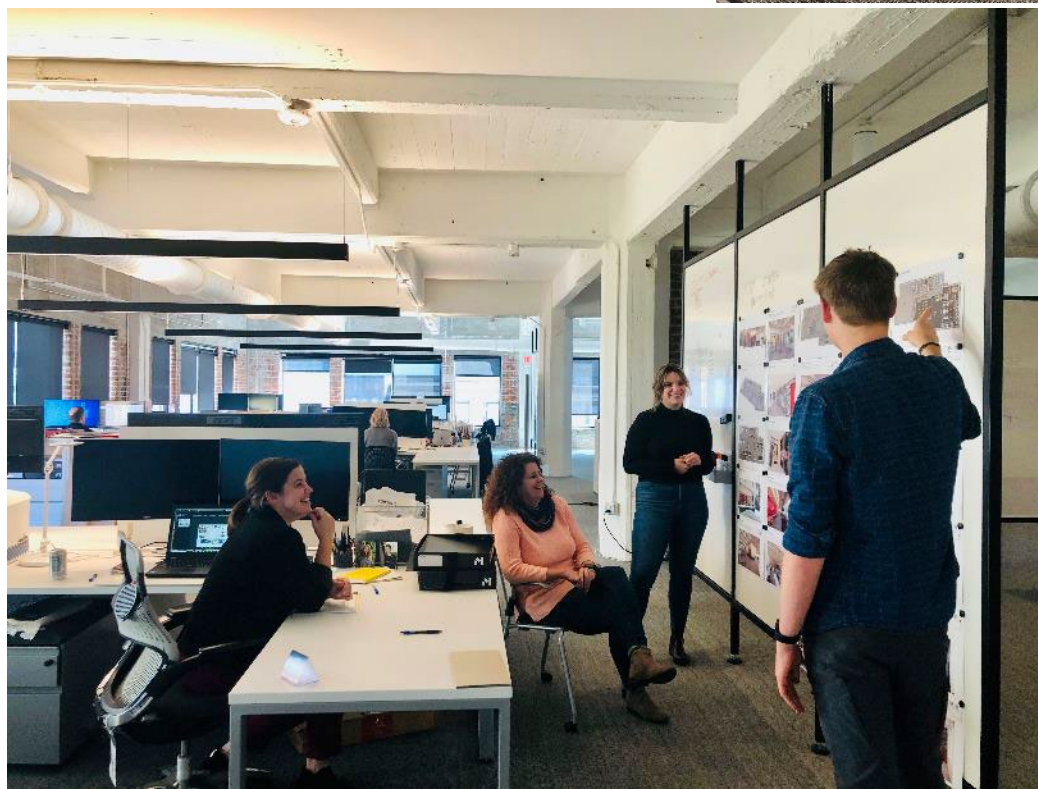
Total CO₂ Emissions by Travel Type

Transport Type	CO ₂ (kg)	CH ₄ (g)	N ₂ O (g)
Passenger Car	12,413	328	291
Light-Duty Truck	0	0	0
Motorcycle	0	0	0
Intercity Rail - Northeast Corridor	0	0	0
Intercity Rail - Other Routes	0	0	0
Intercity Rail - National Average	0	0	0
Commuter Rail	0	0	0
Transit Rail (i.e. Subway, Tram)	0	0	0
Bus	0	0	0
Short Haul (< 300 miles)	92	3	3
Medium Haul (>= 300 miles, < 2300 miles)	5,680	26	182
Long Haul (>= 2300 miles)	1,224	5	39

Total CO₂ Equivalent Emissions (metric tons) - Employee Business Travel **19.6**



OPERATIONS: WELLBEING





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