GREEN+ 2026
Session 6 - Renovation & Reuse

GREEN+ INITIATIVE

tacdc
Texas Association of Community Development Corporations

GREEN+ 2026

SUSTAINABLE DEVELOPMENT
10 TRAINING SESSIONS

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TEXAS ASSOCIATION OF COMMUNITY DEVELOPMENT CORPORATIONS

Why Do We Need a Green CDC Training in Texas?

- Nearly one-third of Texans face high energy burdens, with low-income, minority, and rural communities disproportionately affected due to aging homes and inefficient infrastructure.
- Rising utility costs, grid upgrades, and new industrial demands like data centers threaten to worsen affordability and reliability across the state.
- While conservation and clean energy is a potential solution, public understanding is low and opinions are deeply divided along partisan lines, highlighting a need for broader education and policy focus on both supply and demand.
- Nearly 45% of households pay over $200 a month on average for summer electricity. About one-third of Texans spend 7% or more of their income on energy — surpassing the high energy burden threshold of 6%.

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Masters in HCD, SMU

Co-Founder of
GREEN+

Human Systems & Strategies Design
Sustainable Development Advocate

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Board Member of
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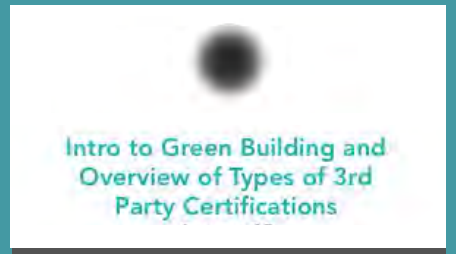
DSGN - Architect / Director of Sustainability/ Principal



Session 1
Today - January 13

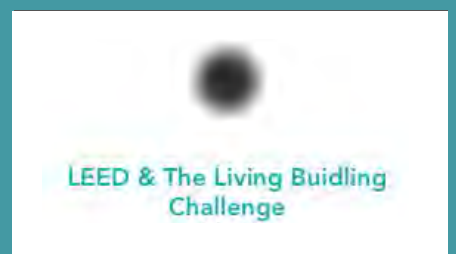
Session 2
February 10th

March 29 - 31
TACDC Conference

Session 4
April 14

Session 5
May 12

Session 6
June 9



Session 7
July 14

Session 8
August 11

Session 9
September 8

Session 10
October 13

Renovation & Reuse: The Hidden Power of Existing Buildings

June 9

Reusing and retrofitting existing buildings is one of the most impactful strategies for both sustainability and affordability. This session will highlight how owners and nonprofits can extend the life of their building stock, saving on development costs while dramatically reducing embodied carbon. We'll discuss approaches to renovation and adaptive reuse that improve efficiency, comfort, and long-term performance.

Participants will also be introduced to tools such as CARE, which can help evaluate whether reuse or replacement is the best path forward.

Attendees will leave with a clearer understanding of how reusing buildings supports climate goals while strengthening communities.

Presenters

Beth Brant, AIA,
LEED AP BD+C, LFA

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DSGN

Agenda - The Hidden Power of Existing Buildings

1. Embodied Carbon
2. Potential Cost Savings
3. Passive Design often built in! (before 1950s with invention of AC)
4. How to evaluate on whether to tear down or re-use (& things to be aware of)
5. The CARE tool
6. Case Study #1 - Vickery Meadow Community Courthouse
7. Case Study #2 - Trinity Dallas Church
8. Tips! Ways to adapt and make more efficient
9. Q&A / Discussion

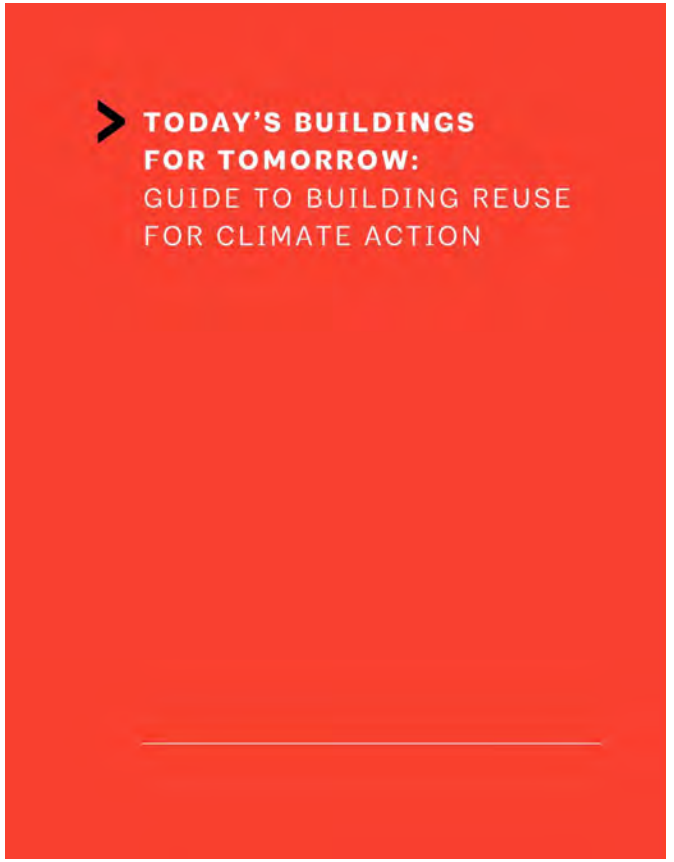
Why?

*"..**building reuse can help improve both public health and social equity.** In both urban and rural communities, low-income residents and communities of color **often live in substandard older buildings that may have inadequate ventilation and high utility bills.** High energy burdens—the percentage of income that goes to energy bills—plays a significant role in housing insecurity, where a few unexpectedly high bills in a row can lead to low-income residents losing their homes. According to the Department of Energy's Low-Income Energy Affordability Data (LEAD) Tool, households across the U.S. with **incomes below 30% of their state's median income pay 18% of that income for electricity and gas."***

"Former AIA President Carl Elefante observed, "There is no pathway to a zero-emissions building sector without zeroing out emissions from America's 325 billion square feet of existing buildings.""

A building's structure typically represents 50–75% of the embodied energy and carbon** emissions in that building, largely due to the weight and quantity of the materials that comprise the structure. **For that reason, building reuse that maintains all of the existing structure can meet today's needs** with **significantly lower carbon emissions than new construction.

*"**Reused** and renovated buildings **can be transformed into low- and zero-emissions buildings**, achieving energy performance comparable to that of new construction - **at a fraction of the embodied carbon."***



https://www.aia.org/resource-center/guide-building-reuse-climate-action

What is Embodied Carbon?

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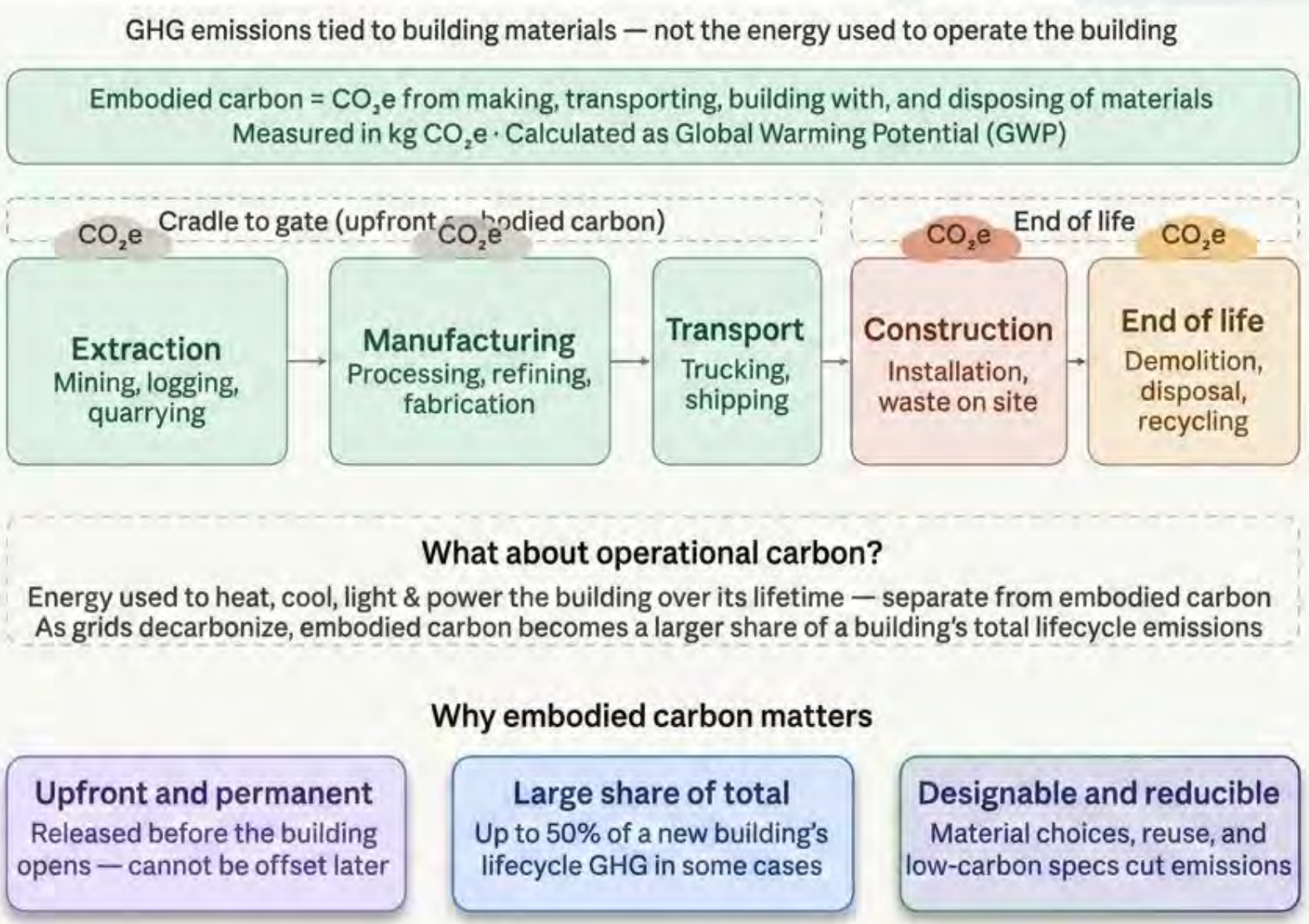
"Embodied carbon refers to the greenhouse gas (GHG) emissions associated with the manufacturing, transportation, installation, maintenance, and disposal of construction materials."

Add the embodied carbon of each piece of structure, brick, window, concrete, insulation, everything within and that creates the total existing embodied carbon for the building.



https://www.gsa.gov/blog/2021/07/23/embodied-carbon-next-steps-for-gsa

How much is 1 tonne of

Carbon Dioxide?

CO_2 gas

CARBON DIOXIDE

Height 8.2 m (26.9 ft)
Volume 556 m^3 (19,635 ft^3)
Weight 1 tonne (1,102 tons)

AVG. PERSON (AFRICA)

Height 1.64 m (5.38 ft)
Weight 65.82 kg (0.065 tonnes; 0.072 tons)

WEIGHT EQUIVALENTS

2 grand pianos

Walrus

Baby humpback whale

80 bars of gold

EMBODIED CARBON (A1-A3) EQUIVALENTS

2,203 clay bricks (0.454 $KgCO_2e$ /brick)

Only 4.12 pallets of bricks *

3.77 m^3 ready mix concrete (265$KgCO_2e/m^3$)

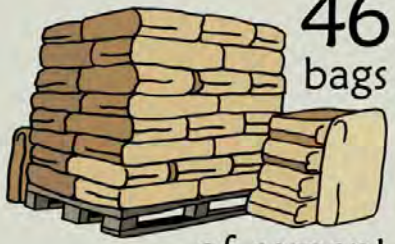
Only 2.4 concrete walls **

* 60 bricks per pallet

** height 2m; length 4m; width 20cm

... emits 1 tonne of CO2 !!

manufacturing 46 bags of cement



a year's trash from 1 household

raising a cow for 6 months

extracting 15 barrels of oil

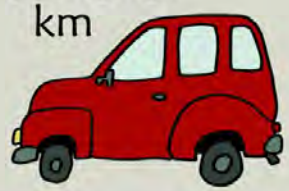
in Canada,

1 TONNE of Greenhouse Gases

comes from:

7 months powering a home

driving 4500 km



heating a home 4 months

CITIZENS FOR PUBLIC JUSTICE **WWW.CPJ.CA**

Potential Cost Savings

1. Existing Structure

for many commercial buildings, the structure can represent 20–30% of total construction costs.

- eliminate demolition and hauling costs associated with removing an existing structure.
- avoid or reduce costs of new foundation and structural steel and reinforcing steel quantities.
- lower labor costs associated with structural construction.

2. Existing Building Envelope

if the exterior walls, roof structure, or portions of the façade can remain, substantial savings may be realized.

- reduced masonry, curtain wall, or exterior cladding costs.
- no or reduced scaffolding during renovation

3. Existing Site Infrastructure

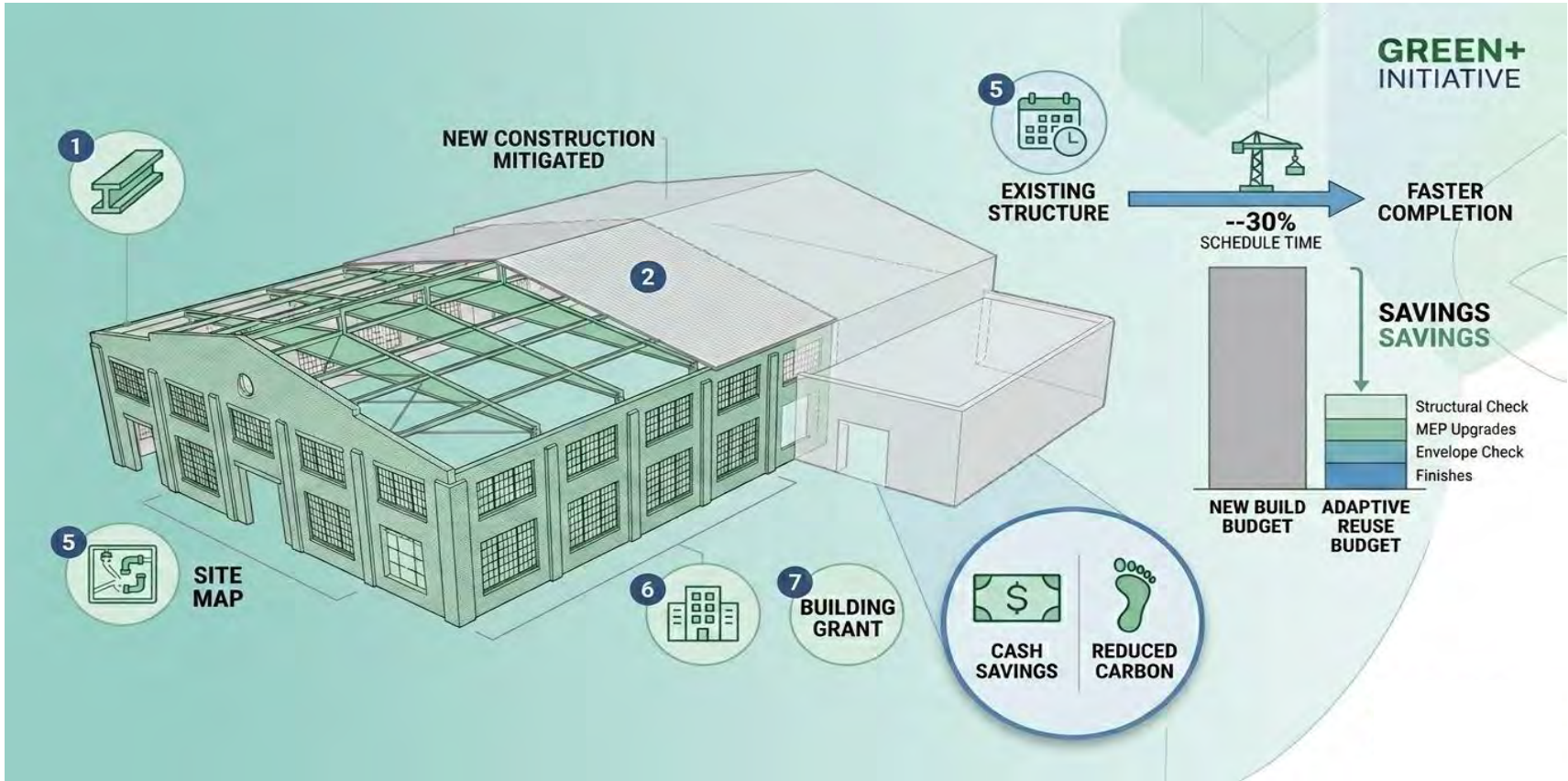
site development can easily account for 10–20% of a project budget on new construction.

- existing utility connections (water, sewer, electric, gas, telecom).
- existing parking lots and drives.
- existing stormwater infrastructure.
- existing site lighting and landscaping.

4. Reduced Land Development Costs

urban infill projects can see large savings here

- less grading and excavation & fewer retaining walls.
- reduced erosion control measures.
- less utility extension work.



Potential Cost Savings

5. Shorter Construction Duration

every month removed from a schedule can generate meaningful savings for owners carrying financing costs

- reduced general conditions.
- reduced temporary facilities costs.
- earlier occupancy and revenue generation.

6. Existing MEP Infrastructure

while major upgrades are often required, portions of existing systems may be retained. Even partial reuse can significantly reduce project costs.

- existing electrical service and transformers
- existing fire sprinkler protection or FDC mains.
- existing plumbing infrastructure.
- existing elevator shafts and equipment rooms.

7. Reduced Embodied Carbon & Sustainability Costs

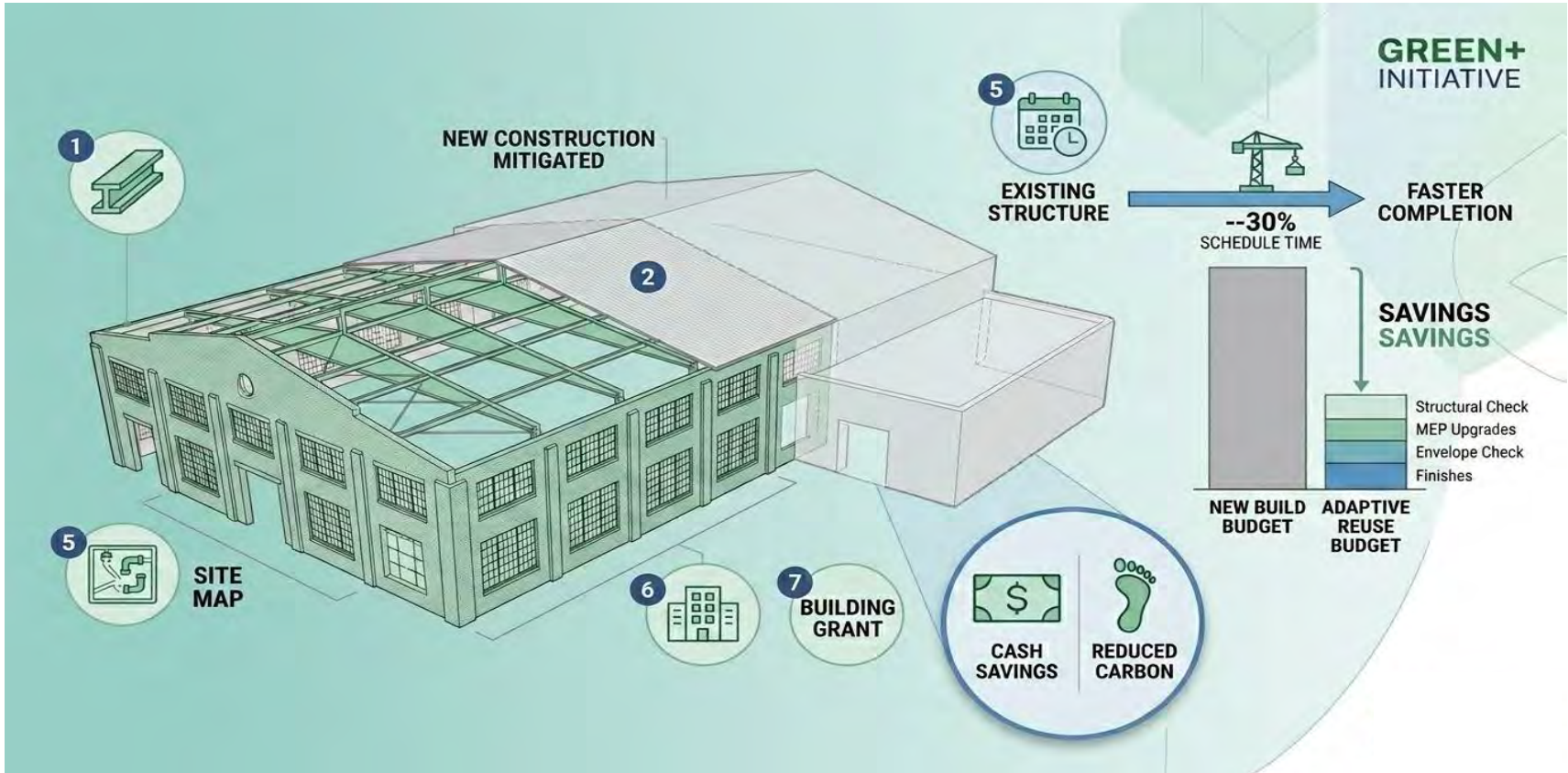
retaining existing materials avoids the cost and environmental impact of producing new construction materials.

- potential contribution toward green building certifications.
- reduced material transportation costs.
- lower construction waste disposal fees.

8. Tax Incentives and Grants

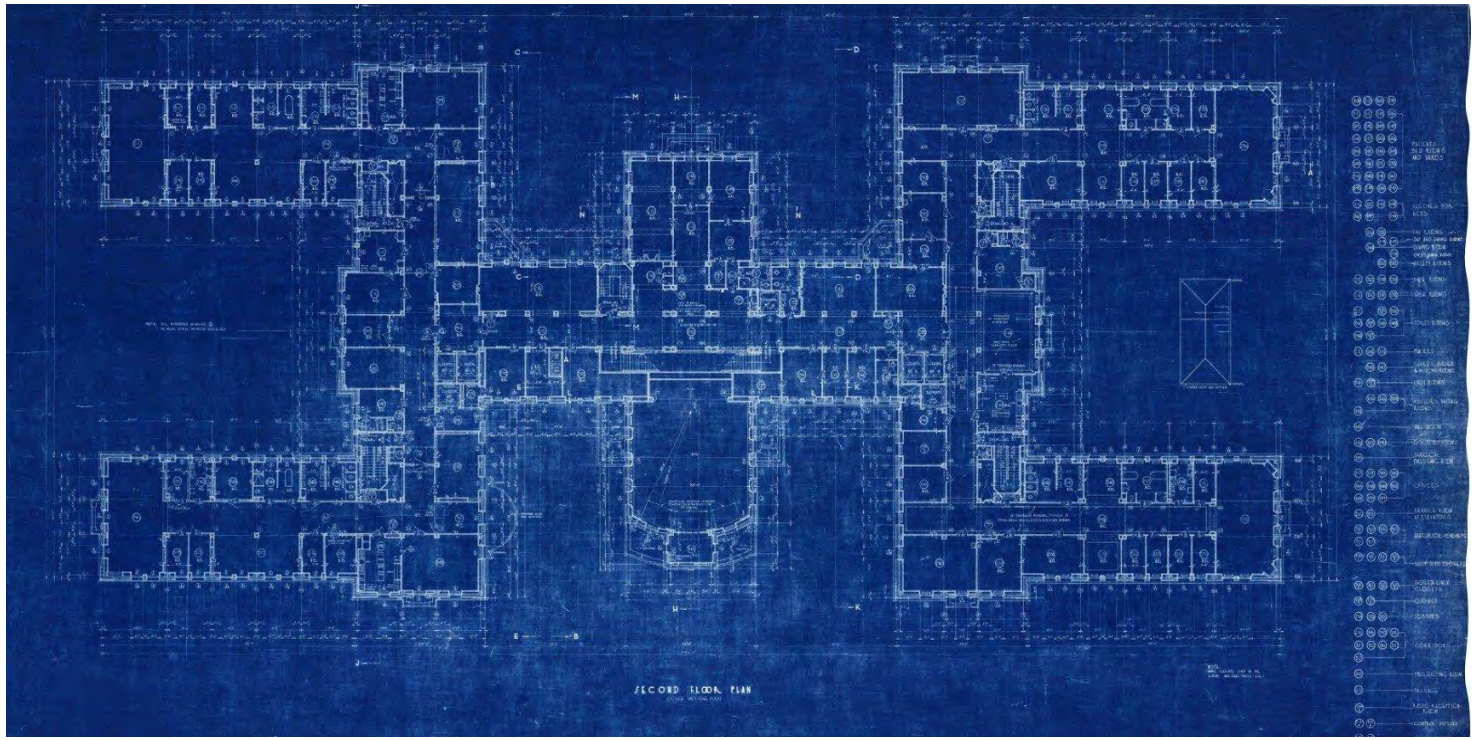
many adaptive reuse projects qualify for financial incentives - these incentives can sometimes offset millions of dollars in project costs.

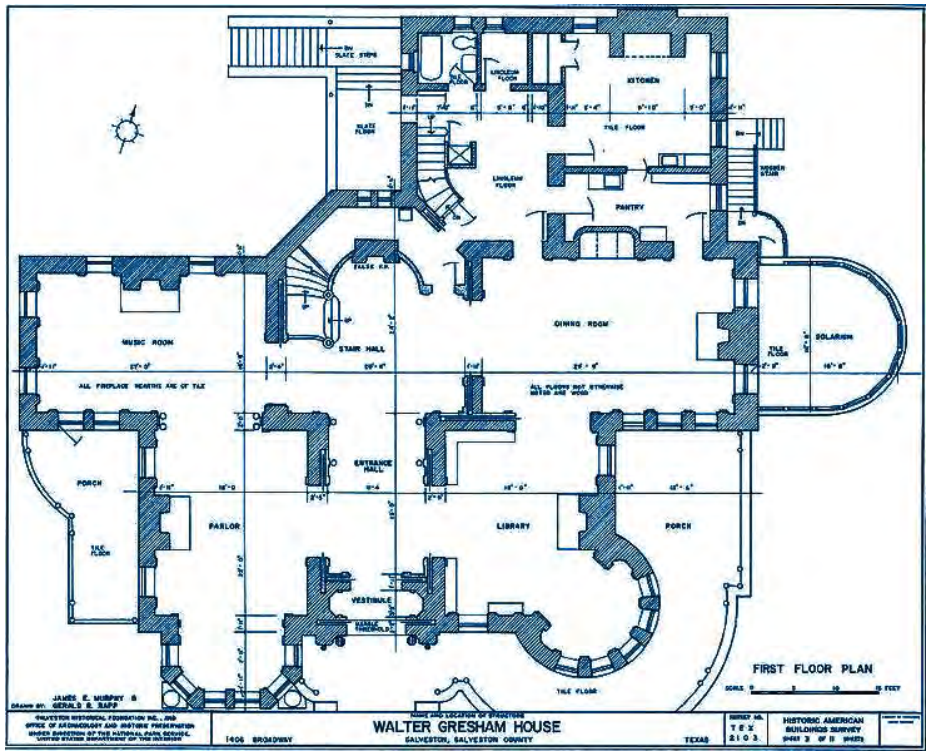
- Historic tax credits.
- State preservation incentives.
- Downtown redevelopment grants.
- Energy efficiency rebates.
- Brownfield redevelopment incentives.

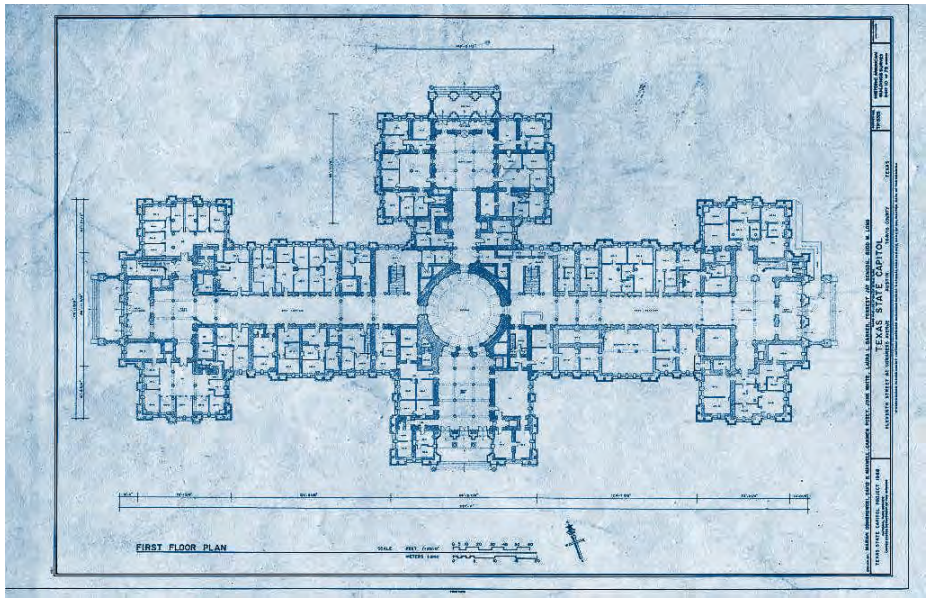


Passive Design - Often Built In!

- **orientation** of building to capitalize on **path of the sun**
- thought about **mitigating heat gain in the summer and trapping heat in in the winter**
- understood **existing wind paths** and careful **window placement and natural ventilation**
- designed for **shading** and existing or new creating **microclimates**
- used **transoms** and the **chimney or stack effect** to pull hot air out of the building
- used **fireplaces** and **trome walls** to absorb, store, and slowly release heat

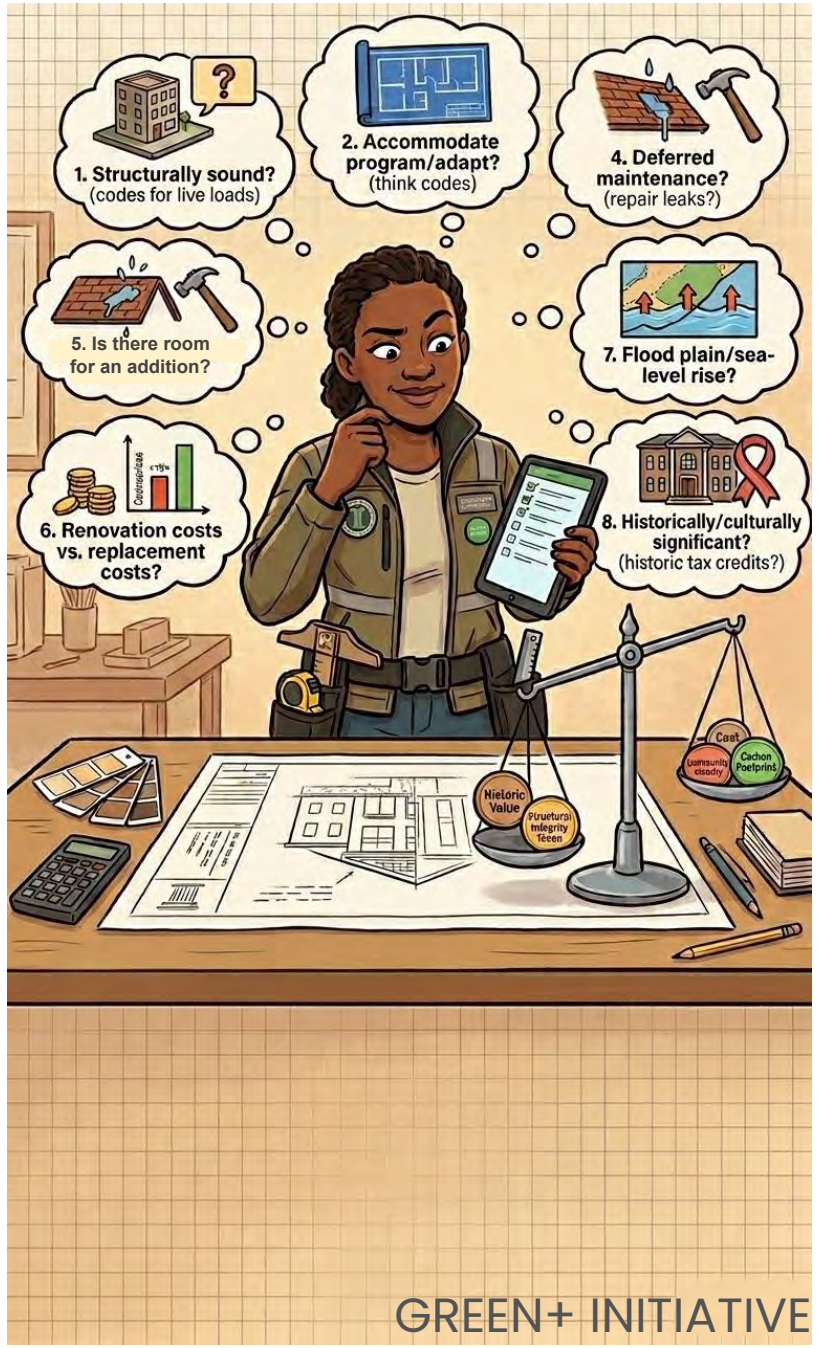






Tear Down? or ReUse?

1. Is the building structurally sound? Can the existing structure withstand load capacity?
2. Can the existing building accommodate the desired program, services, and user experience? or be simply adapted to do so?
3. Does the property support current and future needs for access, parking, expansion, security, and outdoor spaces? aka - is there room on the site?
4. What conditions or deferred maintenance may affect a renovation? i.e. does the building leak? if so, can it be easily repaired (in most cases, yes)
5. What in the current envelope is working well? Which elements have caused problems with, for example, air infiltration or water entry?
6. Can accessibility, egress, safety, technology, and operational goals be adapted / re-worked?
7. How do renovation costs compare to replacement or new construction costs?
8. Confirm the site is not in the flood plain or subject to possible flash flooding, storm surges or sea-level rise
9. Is it historically, culturally, or architecturally significant? If so, are historic tax credits feasible?
10. Does preserving it strengthen community identity and sense of place?
11. What passive strategies can be kept or incorporated?
12. How much embodied carbon can be preserved through reuse?



Tear Down? or ReUse?

More items for your architect to consider:

- *Spaces near an operable window can take advantage of natural ventilation when outdoor air conditions are appropriate. Typical guidance states that spaces within 20–25 feet of an operable window can be naturally ventilated if the open area is at least 5% of the floor area being served.*
- *Airtightness: It has long been understood that reducing unintended infiltration and air leakage through the building envelope is important… Measurements on a broad range of commercial buildings have demonstrated that infiltration has a significant impact on HVAC energy in these buildings as well.*
- *In buildings with low-slope ("flat") roofs where insulation is typically above the roof deck: Inspect for ponding that may indicate compression of roof insulation or settling of structural members.*
    - *If the roof still appears to have a substantial service life ahead, consider application of high-reflectance "cool roof" coatings.*
    - *If the roof is close to the end of its service life, consider replacing the roofing along with*
- *In buildings with high-sloped roofs or attics:*
    - *If ductwork for the HVAC system is currently run within the unconditioned attic, it may be worth considering moving the point of insulation to the underside of the roof decking. This "conditioned attic" or "unvented attic" approach means that ducts are not sitting in a hot attic in summer and leaking conditioned air into the great outdoors.*

The CARE Tool

www.caretool.org

The CARE Tool allows users to compare the total carbon impacts of renovating an existing building vs. replacing it with a new one.

"For everyone who has been interested in connecting building reuse with climate action but unsure where to start, the answer has arrived —start with CARE."

Jack Rusk

INSTRUCTIONS

Enter general project information in the first tab and information about the existing building in the second tab. In the third tab enter information about renovating the existing building including any planned additions, and in the fourth tab enter information about the new building to replace the existing building. Click an information for more details.

Compare each option using the charts and table to the right. The results will automatically populate once enough information is entered and automatically update as inputs are adjusted.

Case Study #1 - Vickery Meadow Community Courthouse

Case Study #1 - Vickery Meadow Community Courthouse

LIVING BUILDING CHALLENGE
TARGETED PETAL CERTIFICATION

Case Study #1 - Vickery Meadow Community Courthouse

CARE TOOL Carbon Avoided: Retrofit Estimator

Vickery Meadow Community Courthouse

General Information

PROJECT LOCATION

Country	USA
State/Province	TX
Postal Code	75231

CLIMATE INFORMATION

Heating Degree Days	N/A
Cooling Degree Days	N/A

MODEL INFORMATION

Modeled Timeframe

ELECTRICITY GRID EMISSIONS

Default

Existing Building

BUILDING CHARACTERISTICS

Total Floor Area	6300 ft²
Floors Above Grade	1
Floors Below Grade	0
Type of Structure	Steel-Concrete
Window-to-Wall Ratio	0.33

BUILDING USE

Primary Use	FireStation
Floor Area	6300 ft²
Secondary Use	
Floor Area	

OPERATIONAL ENERGY AND EMISSIONS

Existing Building EUI	63.7 kBtu
Existing Building Emissions Intensity	9.1 kgC

Existing Operational Emissions Intensity 9.1 $kgCO_2e/ft$

Building Reuse

BUILDING CHARACTERISTICS

Does the Reuse include an addition?	No
Total Floor Area Reused	6300 ft²
Reused Floors Above Grade	1
Reused Floors Below Grade	0
Total Floor Area of Addition	N/A
Addition Floors Above Grade	N/A
Addition Floors Below Grade	N/A

BUILDING USE

Will there be a change of use in the Existing Reused Building?	Yes

REUSED FLOOR AREA

Primary Use	Courthouse
Floor Area	6300 ft²
Secondary Use	N/A
Floor Area	N/A

ADDITION

Primary Use	N/A
Floor Area	N/A
Secondary Use	N/A
Floor Area	N/A

OPERATIONAL ENERGY AND EMISSIONS

Establish Baseline

Reuse Baseline EUI	70.1 kBtu/ft²-yr
Reuse Baseline Emissions Intensity	10 $kgCO_2e/ft^2$

Set Target - Reuse

Reuse: Target reduction in energy use	70%
Reuse EUI Target	21 kBtu/ft²-yr
Reuse Emissions Intensity	10 $kgCO_2e/ft^2$
Installing all electric systems and equipment?	Yes

Set Target - Addition

Does addition have a d
Addition: Target reduct
Addition EUI Target
Installing all electric sy
equipment?

Set Target - Renewab

Percentage of electrici
/off-site renewables

Reuse Operational Emissions Intensity

EMBODIED EMISSIO

Structural System Re

Extent of Structural
Replacement
Lateral Upgrade

Envelope Reuse

Exterior Walls
Windows/Glazing
Roofing
Insulate Walls

Interior Reuse

Minor: repair or resto
Medium: add new fi
structure
Major: total interior r
new partitions and fi

Mechanical, Electrica
Plumbing Systems R
Major

Addition
N/A

Modifiers
High Performance Mec

Reuse Embodied Emi
Intensity

New Building

BUILDING CHARACTERISTICS

Total Floor Area	6300 ft²
Floors Above Grade	1
Floors Below Grade	0

BUILDING USE

Primary Use	Courthouse
Floor Area	6300 ft²
Secondary Use	N/A
Floor Area	N/A

OPERATIONAL ENERGY AND EMISSIONS

Establish Baseline

New Building EUI Baseline	70.1 kBtu/ft²-yr
New Building Baseline Emissions Intensity	10 $kgCO_2e/ft^2$

Set Target

New Building: Target reduction in energy use	70%
New Building EUI Target	21 kBtu/ft²-yr
New Building Emissions Intensity	10 $kgCO_2e/ft^2$
Installing all electric systems and equipment?	No
Percentage of electricity produced by on-/off-site renewables	50%

New Building Operational Emissions Intensity 1.7 $kgCO_2e/ft^2$-yr

EMBODIED EMISSIONS

Steel-Concrete

Modifiers

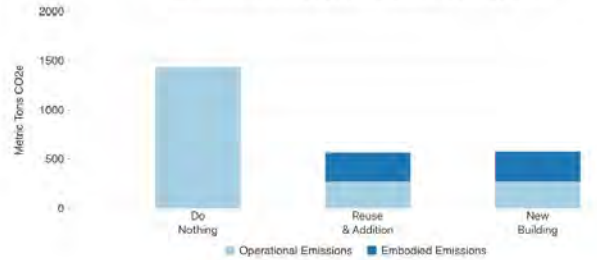
High Performance Mechanical, Electrical, Plumbing System

New Building Embodied Emissions Intensity 48.3 $kgCO_2e/ft^2$-yr

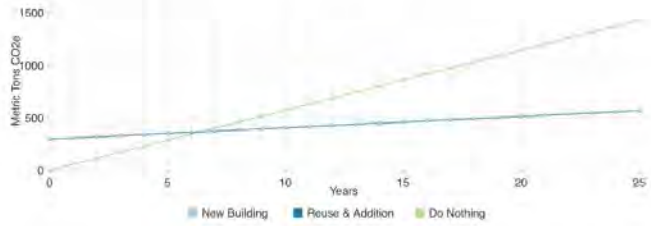
A 6,300 sq ft, 1950s fire station with 3-wythe load-bearing brick walls and a steel-joist roof contains an estimated 150 to 300 metric tonnes of CO2e

Results

Total Added Embodied & Operational Emissions over 25 Years



Cumulative Emissions Over Time



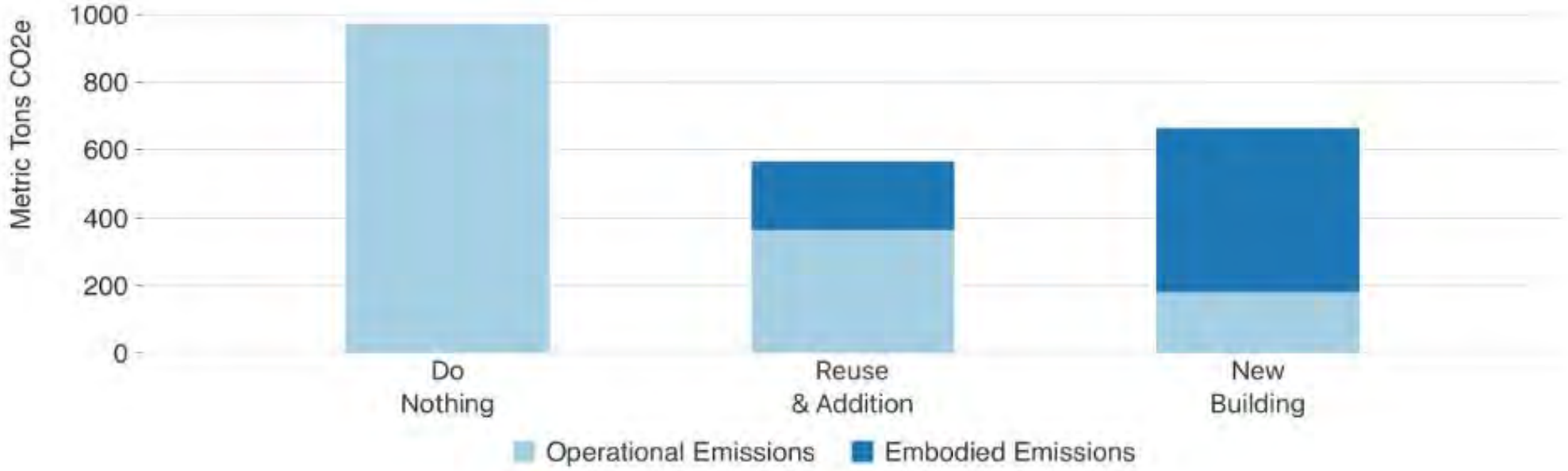
	DO NOTHING	REUSE & ADDITION	NEW BUILDING
Embodied Emissions (Metric Tons CO2e, cradle to gate)	N/A	295	304
Operational Emissions (Metric Tons CO2e / 25 years)	1435	271	270
Total Emissions (Metric Tons CO2e / 25 years)	1435	566	575
Total Emissions Intensity ($kgCO_2e/ft^2$ / 25 years)	228	90	91

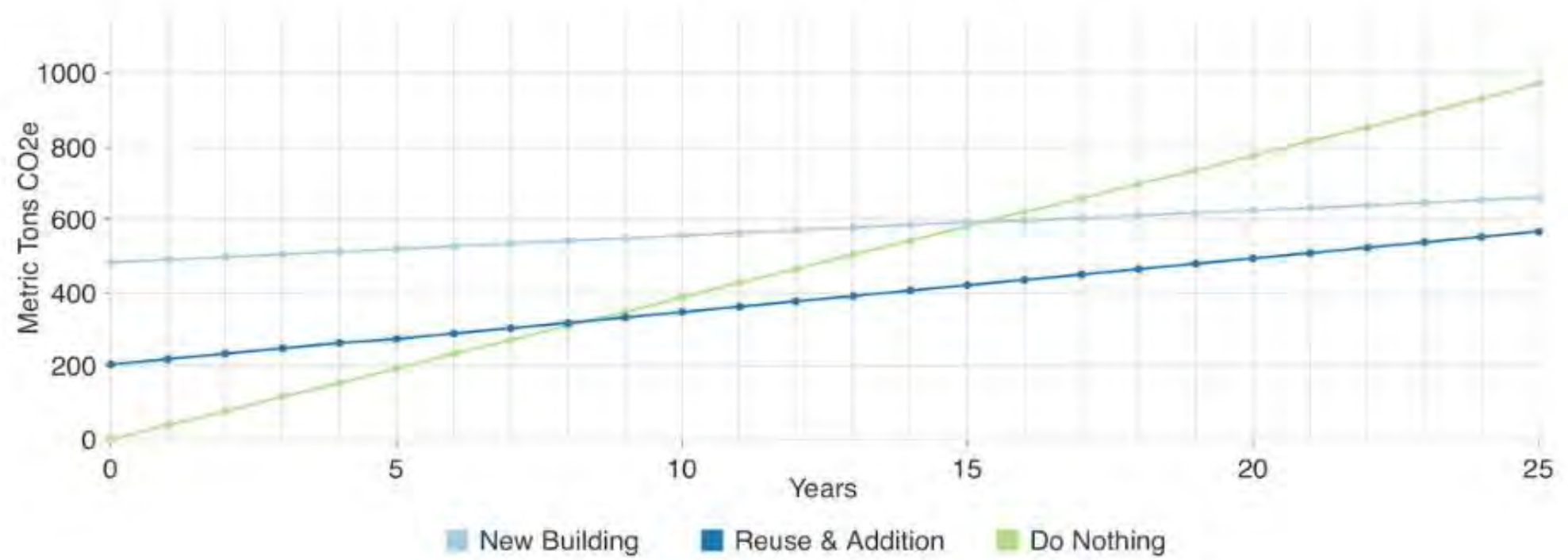
Case Study #2 - Trinity Dallas

Case Study #2 - Trinity Dallas

The embodied carbon of a 10,000 sq ft church is approximately 200 to 280 metric tons of CO_2e

Case Study #2 - Trinity Dallas


Metric Tons CO2e
1000
800
600
400
200
0
Do Nothing
Reuse & Addition
New Building
Operational Emissions
Embodied Emissions


Metric Tons CO2e
1000
800
600
400
200
0
0
5
10
15
20
25
Years
New Building
Reuse & Addition
Do Nothing

Tips! Ways to adapt, make it more efficient, and save a couple headaches

ONCE the team has decided to re-use the building:

- **Use energy modeling to determine best use of added insulation.** Usually start with roof, then windows (walls may not be needed or maybe just west or south walls)
- **Consider having an building envelope specialist.** The thermal barrier, insulation, vented vs non-vented attics all need to be considered carefully so as not to create moisture in walls, mold or mildew.
- **Consider doing a full LCA:** Enables Life Cycle Cost Analysis (LCCA) to compare the upfront construction costs with long-term operational energy savings.
- **Know your Tax Credit Opportunities!**
  - https://thc.texas.gov/preserve/grants-tax-credits
  - https://www.tdhca.texas.gov/apply-funds
- **Plan for a full building assessment and put it in the budget. This will save a lot of headaches down the road..**
  - i.e. does the Fire Alarm system still work? will it still be acceptable by code or to the new fire marshal?
  - i.e. is the roof really perfectly flat?! where are roof drains and gutters, Plan to add tapered insulation and new roof coating..
- **Do NOT Expect Perfection!** Old buildings have quirks, the floors are not uniform, the metals have patina.. embrace the history of the place.
- **You WILL Find Something Unexpected!** So hold a 10%+ owner's contingency in your back pocket and do not tell anyone about it.

LEED & The Living Building Challenge

Session 7
July 14

LINK IN THE CHAT!
https://tinyurl.com/2fjtv5cp

WELL, Fitwel & Healthy Materials

Session 8
August 11

Questions and Discussion