

June 19<sup>th</sup>, 2023



# Innovative Engineering for a Sustainable Future

*Extrapolating the U.S. Experience to a Global*

Outcome

Jennifer Cover, PE — President and CEO







**SCIENCE**

**+**

**STRUCTURAL  
ENGINEERING**

**GRAVITY**



**WIND**



**SEISMIC**



# Designing a more sustainable future



Ascent  
Architect: Korb & Associates Architects  
Engineer: Thornton Tomasetti



# GLOBAL CO<sub>2</sub> EMISSIONS

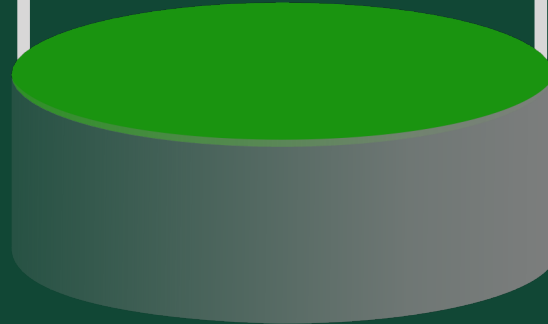
## Buildings

40% of annual global  
greenhouse gas  
emissions



## Building Materials and Construction

13%





**2 billion persons**

30 years

7.7 billion

**9.7 billion**







**26%** increase in  
global population by 2050

+ urbanization  
**68%**  
in urban areas







We need a  
**cleaner**  
way to build



Building: Carbon12  
Developer: Kaiser Group  
Architect: Path Architecture  
Photo: Andrew Pogue







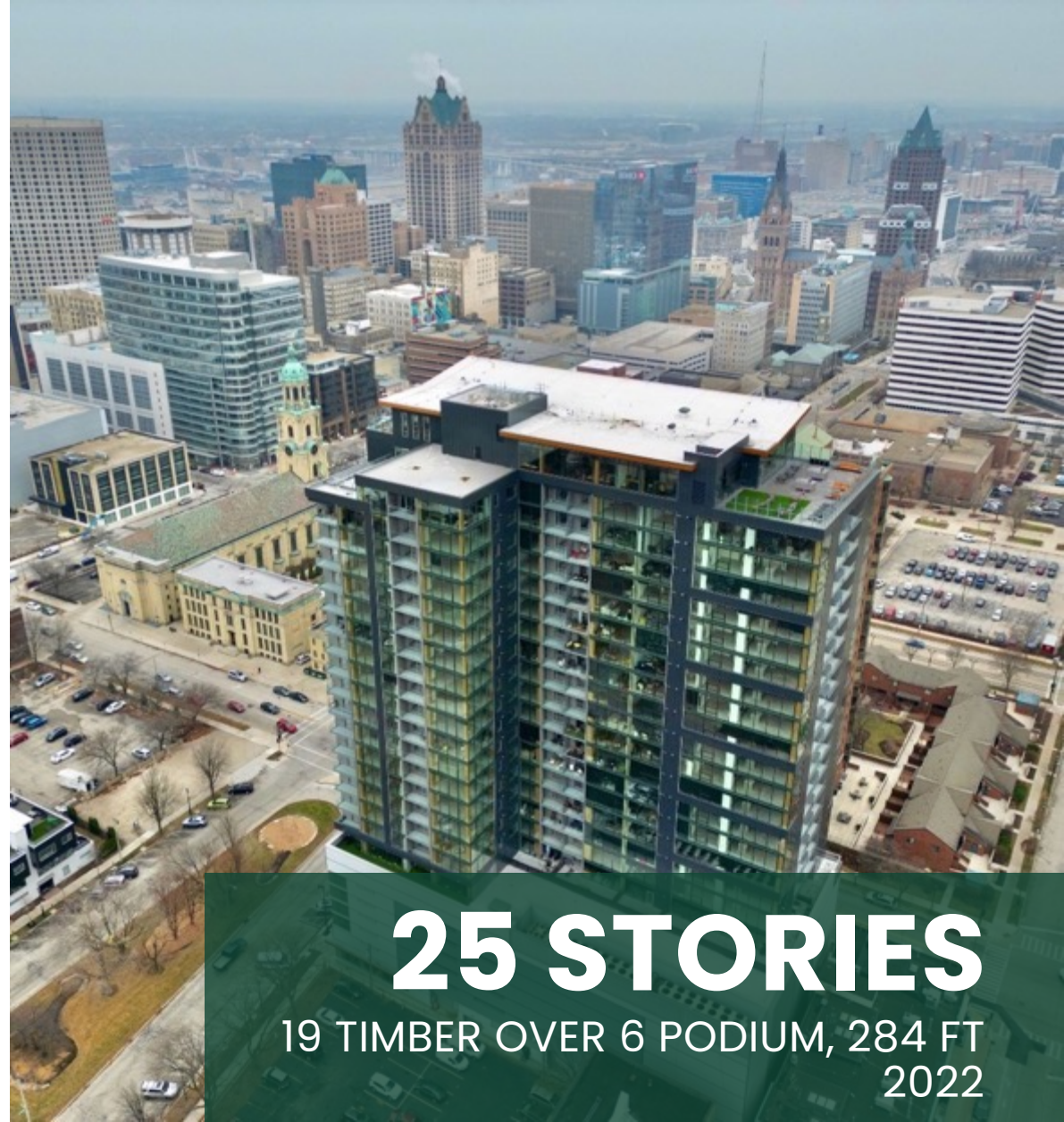
A wonderful serenity

WOODWORKS



# Ascent, Milwaukee

Tallest Mass Timber Building in the World



## 25 STORIES

19 TIMBER OVER 6 PODIUM, 284 FT  
2022

Architect: Korb & Associates Architects  
Engineer: Thornton Tomasetti  
Photo: CD Smith Construction



# Advancements Across the Globe

Stadthaus  
Architect: Waugh Thistleton Architects  
Engineer: Techniker LTD

Brock Commons Tallwood House  
Architects: Acton Ostry Architects  
Engineer: Fast & Epp  
Photo: Michael Elkan



A photograph of the London skyline, featuring the Gherkin (30 St Mary Axe) and the Tower of London, with the River Thames in the foreground. The image is overlaid with a dark green semi-transparent rectangle on the left side, which contains the text.

How do you **break**  
**into the norm...**

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The image shows the interior of the Prescott Regional Airport Terminal. The ceiling is a prominent feature, made of light-colored wood planks arranged in a grid pattern. Several modern, black, dome-shaped pendant lights hang from the ceiling. The walls are primarily white with large glass windows that offer a view of the outdoors. In the foreground, there are several metal stanchions with retractable belts, likely for a security or baggage screening area. The floor is a polished, light-colored material that reflects the overhead lights and the ceiling structure.

# and **change** how people build

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Prescott Regional Airport Terminal  
Architect: DWL Architects + Planners  
Engineer: LSW Engineers  
Photo: Kyle Zirkus

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U.S. –  
**17,000**  
**Annually**

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U.S. –  
**17,000**  
**Annually**

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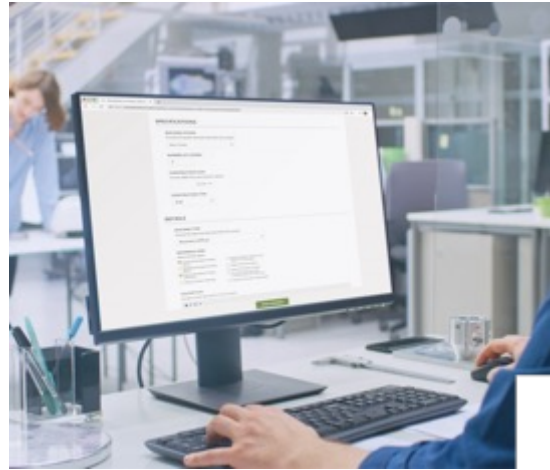
47 A Day!

# Market Drivers for Mass Timber



Adidas North American Headquarters  
Architect: LEVER Architecture  
Engineer: KPFF Consulting Engineers  
Photo: Garrett Rowland





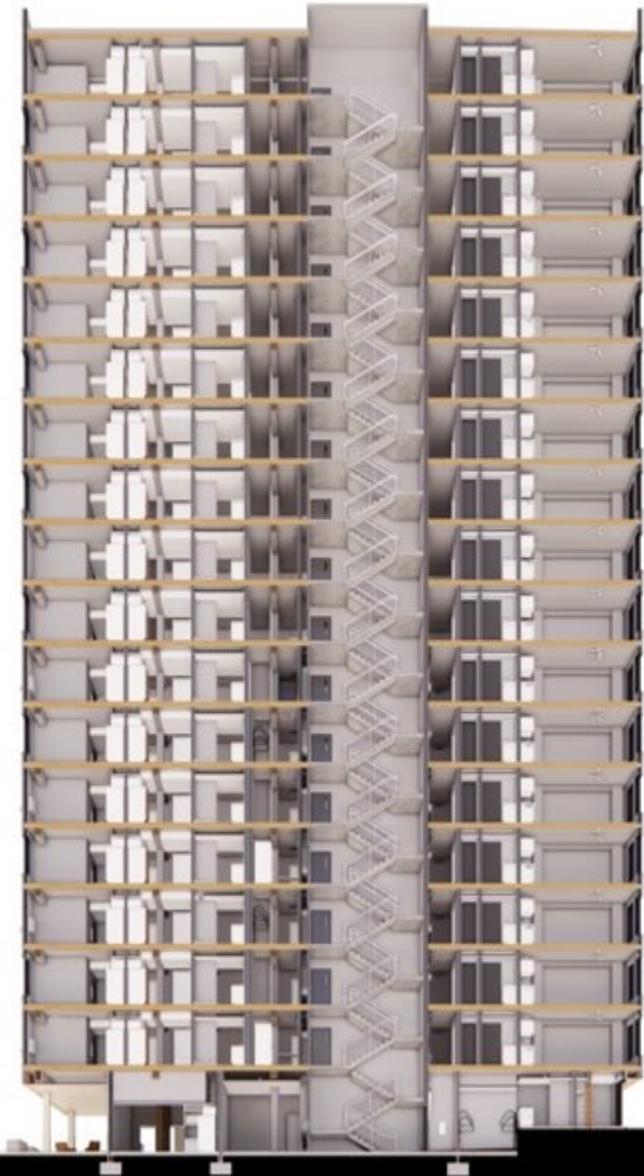


# 2021 IBC NEW CONSTRUCTION TYPES

18 stories IV-A

12 stories IV-B

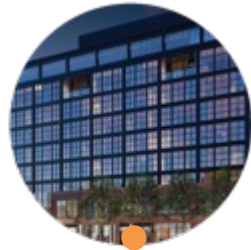
9 stories IV-C





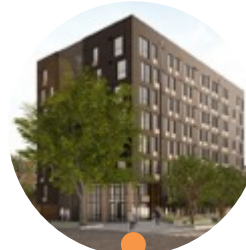
**Timberview**

Portland, OR  
9 stories –  
8 stories mass timber



**Heartwood**

Seattle, WA  
8 stories mass timber



**INTRO  
Cleveland**

Cleveland, OH  
9 stories –  
8 mass timber



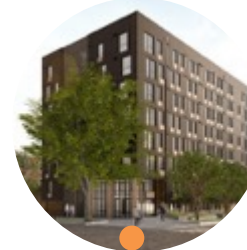
**Carbon 12**

Portland, OR  
8 stories  
mass timber



**Baker's Place**

Madison, WI  
15 stories  
12 mass timber



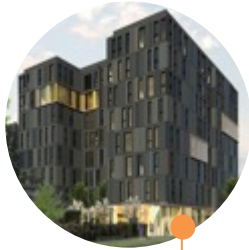
**11 E Lenox**

Boston, MA  
7 stories  
mass timber



**Minnesota Places**

Portland, OR  
8 stories –  
7 mass timber



**Ascent**

Milwaukee, WI  
25 stories –  
19 mass timber



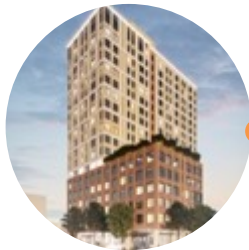
**80 M Street**

Washington DC  
10 stories – 3-story  
mass timber  
vertical addition



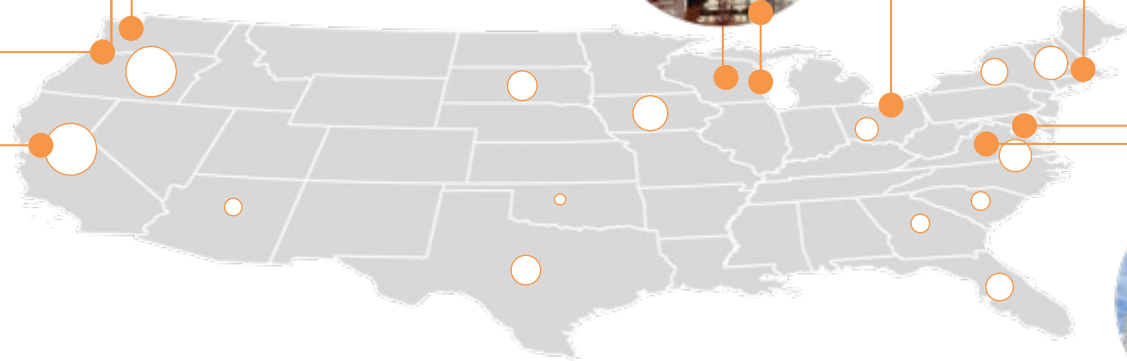
**1510 Webster**

Oakland, CA  
18 stories –  
16 mass timber



**Apex Plaza**

Charlottesville, VA  
8 stories –  
6 mass timber



**11 TALL WOOD STRUCTURES BUILT**



**208 MORE IN DESIGN**





# CLEARING HURDLES

USDA Forest Service  
U.S. DEPARTMENT OF AGRICULTURE  
Forest Products Laboratory | Research Paper FPL-GTR-297 | March 2023

## Research Needs Assessment for the Mass Timber Industry

### Proceedings of the 3rd North American Mass Timber Research Needs Workshop

Marco T. Lo Ricco  
Richard D. Bergman  
Samuel L. Zelinka  
Iain Macdonald  
Bill Parsons  
Jennifer S. Cover  
William A. Martin



WoodWorks  
WOOD PRODUCTS COUNCIL

## Obstacles Preventing the Increased Adoption of Sustainable Mass Timber

A study of projects that could not clear the hurdles

Report created for ClimateWorks  
By WoodWorks – Wood Products Council

Credits (clockwise from top left): Canby, Oregon - W&A | Michael Green Architecture © Ben Bruchman; TS, WA | Michael Green Architecture, SLF Group, photo Eric Peter, Woodhouse; photo Sam Goff; photo www.researchwood.com

The cover features a large photograph of a modern interior space with a high ceiling of exposed wooden beams and columns. A dark brown banner with white text is overlaid on the top half. The right side has a green vertical bar with white text. The bottom right has a white box with black text. The bottom of the cover is a collage of three images: a lumber yard, a forest, and a modern building.





Brentwood Public Library  
Architect: Fog Studio  
Engineer: Holmes Structures  
Photo: Blake Marvin Photography



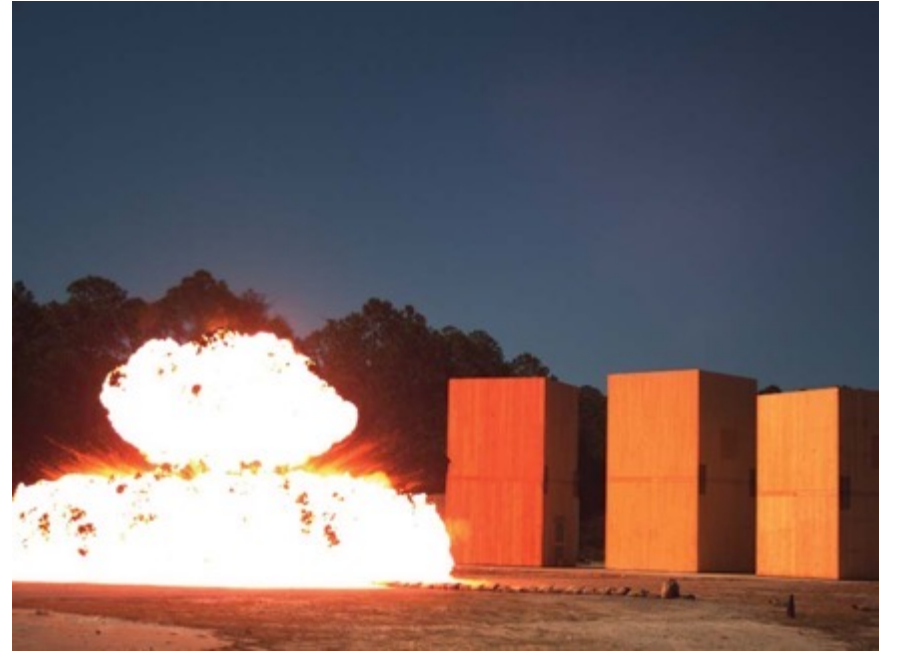
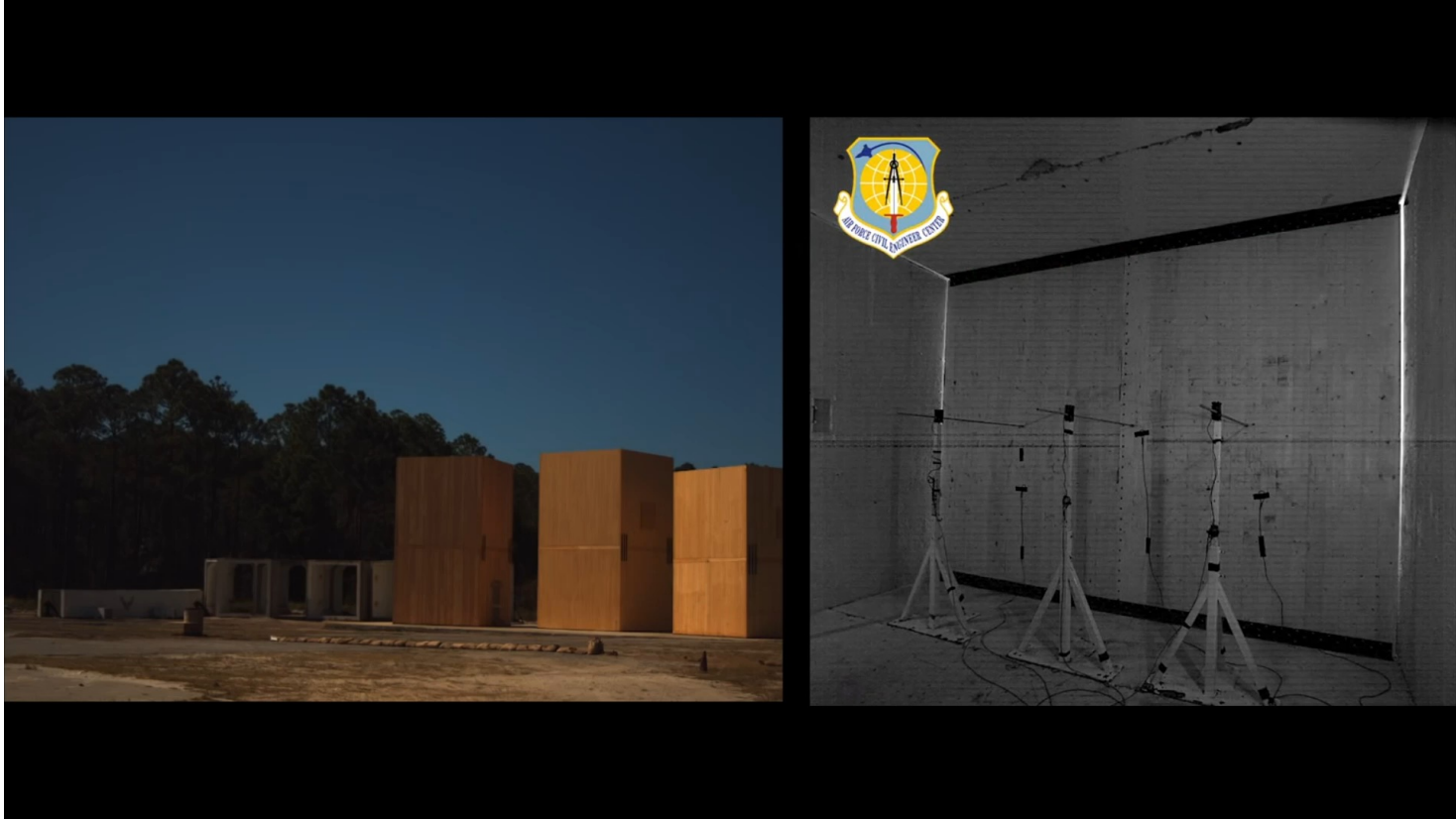


Southfield Park 35 Warehouse  
Architect: PDMS Group Engineer: Hunt-Joiner  
Contractor: Clayco Support: Timberlab  
Photo: Erika Brown Edwards





# BLAST RESISTANCE TEST





# SHAKE TEST







Sacred Heart School  
Architect: aedis Architecture  
Engineer: Daedalus Structural Engineering  
Contractor: XL Construction  
Photo: Marco Zecchin



# FIRE TESTING



# REFINING THE CODE ROADMAP



100% Timber Ceiling Exposure Up to 12 Stories





# Research & Engineering

Installation Process

Training  
General  
Construction  
Contractors  
Managers &  
Installers

# FIELD TRAINING



**NORTH ATLANTIC STATES**  
Regional Council of Carpenters



**SOUTHWEST  
CARPENTERS  
TRAINING FUND**





Photo: Structurlam | Seagate Structures

# CARBON ACCOUNTING

The image features a light-colored wooden table top in the foreground, showing a clear wood grain pattern. The background is a soft-focus view of green trees and foliage, with bright sunlight filtering through, creating a bokeh effect of light spots. The overall scene is bright and natural, suggesting an eco-friendly or sustainable theme.





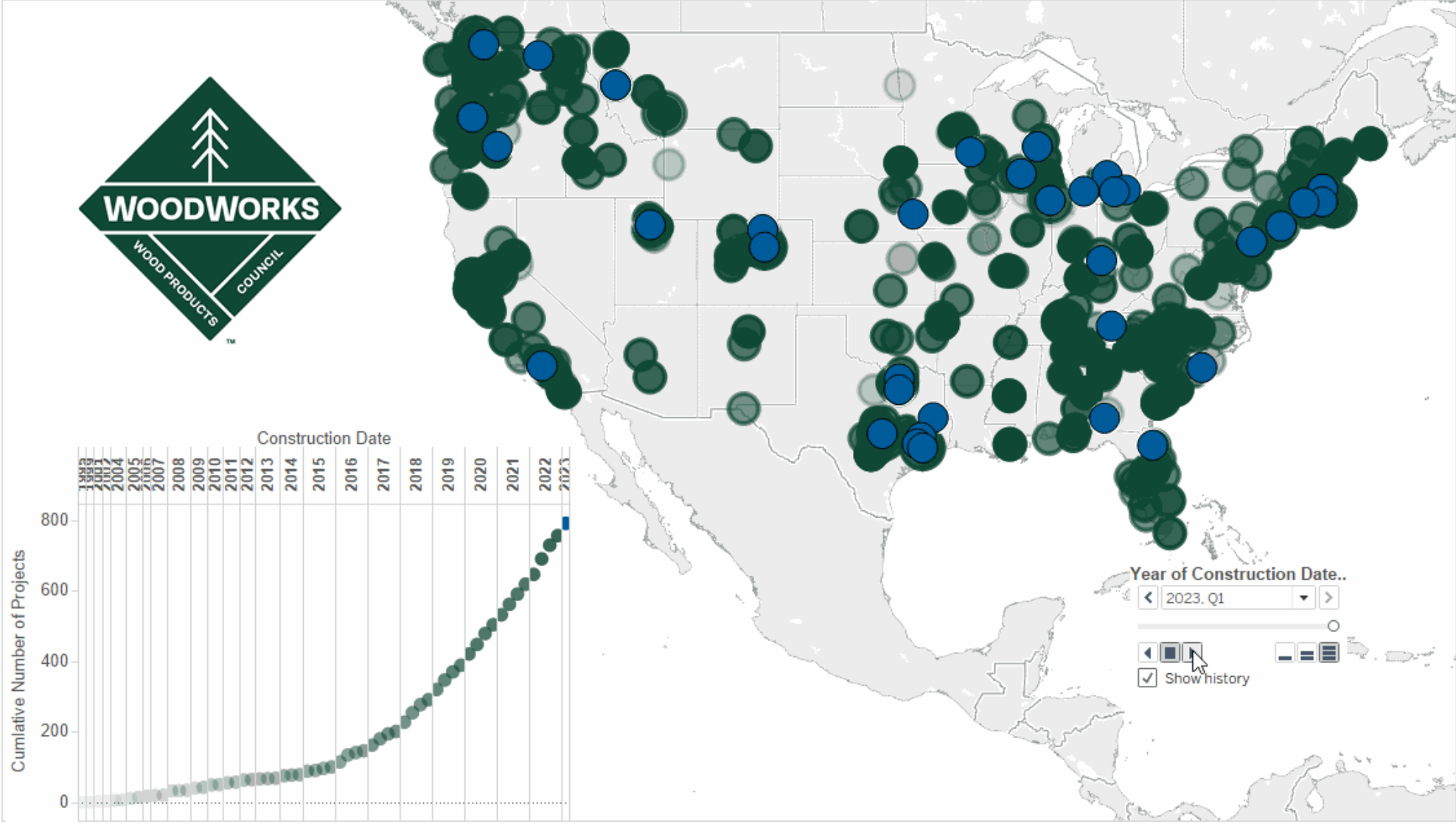
# Choose building materials based on their true sustainability.

Learn about whole building life cycle assessment, biogenic carbon and EPDs at [woodworks.org](http://woodworks.org)



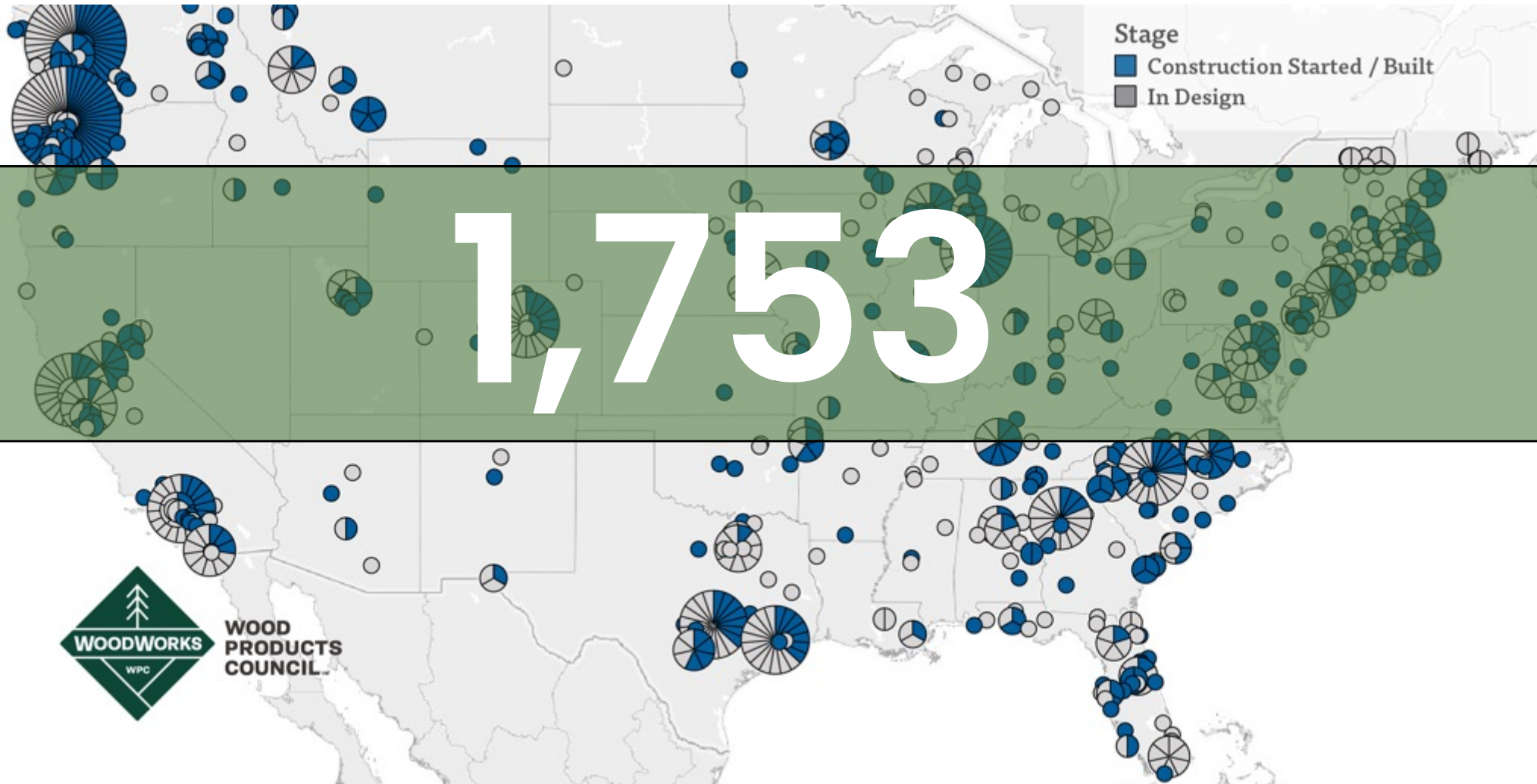
Catalyst  
Architect: MGA | Michael Green Architecture  
Photo: Ben Benschneider

# Current State of Mass Timber Projects





# Current State of Mass Timber Projects



*\* This total includes modern mass timber and post-and-beam structures built since 2013*



**WOODWORKS  
INNOVATION  
NETWORK.ORG**





## INTRO

📍 Cleveland, OH  
Project



### COMPANIES INVOLVED:

**Hartshorne Plunkard  
Architecture**  
Architect

**Fast + Epp**  
Structural Engineer

**Forefront Structural  
Engineers, Inc.**  
Structural Engineer

**Panzica Construction**  
General Contractor

**WJE**  
Fire/Building Code Consultant

**Seagate Mass Timber Inc.**  
Timber Procurement and  
Installation



**WOODWORKS  
INNOVATION  
NETWORK.ORG**



## Platte Fifteen

📍 Denver, CO  
Project



**Greg Kingsley**  
CEO , KL&A Engineers and Builders  
📍 Golden, CO



No Cost  
Project Design Support

+

Continuing Education





5000



**35,000**





**Thank You – Enjoy the Conference**