

Timber Trends



TIMBER TRENDS BY THINK WOOD

The Year Ahead:
Integrated Design
Solutions for Decarbonizing
the Built Environment

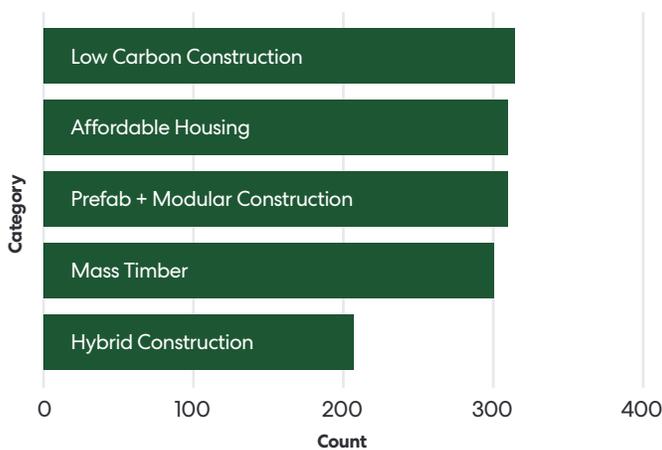
THINK
WOOD®

2022 Forecast

If 2021 was a year of labor, supply chain, and pandemic-related disruptions, 2022 will be a year to gain new traction on the pressing issues shaping our approach to the built environment.¹

In January 2022, Think Wood surveyed 500 architects, engineers, developers, and contractors to get their take on the emerging trends in design and construction this year. The top three trends—low carbon construction, affordable housing, and prefabrication/modular construction—were ranked in popularity within >1% of each other, suggesting the importance of employing multiple strategies to address design challenges.² This intersectionality, exhibited in a rising number of timber projects, is a bright spot for the year ahead.

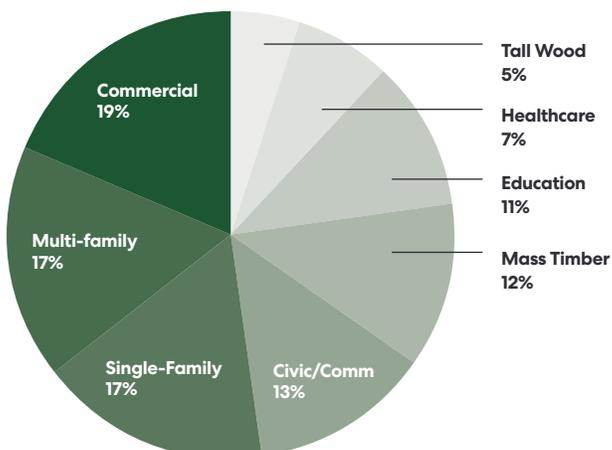
TOP 5 TRENDS RANKED



TIMBER TRENDS SURVEY RESPONDENT

“Mass timber will help institutional investors work closer to their ESG goals and modular construction will allow developers to try to mitigate labor issues in construction.”

ANTICIPATED PROJECTS BY MARKET SECTOR



TIMBER TRENDS SURVEY RESPONDENT

“Major needs for housing will drive materiality and construction types. I think finding a way to use prefab, mass timber, low income housing that is competitive to traditional house construction will be an interesting endeavor.”



Beyond ranking top trends, Think Wood delved further to understand how practitioners are approaching the number one trend of low carbon construction:

77% of respondents report considering embodied carbon impact when specifying structural materials at least some of the time.

32% weigh the impacts all or most of the time, pointing to the carbon footprint of building materials as increasingly important in building design.

The use of formal whole building life cycle assessment (LCA) or carbon accounting tools is not yet widespread.

Only 8% of respondents are using LCA/carbon accounting tools all or most of the time, while 29% report using these tools 'some of the time'. Given the interest in embodied carbon, we will likely see an expansion in the use of these tools in the years to come.

41% of respondents report that their firms either already have or are currently establishing ESG goals and/or carbon targets. 31% of respondents report that their firms are planning to establish ESG goals within the next five years, for a total of

72% investing time and resources on ESG and carbon targets.

While the industry is advancing towards a low carbon future, specifiers are uniquely positioned to help close the gap between ambition and action to meet growing environmental expectations of the AEC sector. If you're new to carbon accounting, check out these [helpful resources](#).

1 Low Carbon Construction

Without decisive action, building materials used in new construction in cities across the globe will generate 100 gigatons of embodied carbon by 2050. One gigaton is equal to 2.2 trillion pounds or 10,000 fully-loaded U.S. aircraft carriers.³ Embodied carbon is a priority for many environmental, architecture, and urban planning organizations including C40 Cities, Architecture 2030, Urban Land Institute, Carbon Leadership Forum, and the World Green Building Council.

Cutting Carbon with Mass Timber and Passive House Design

To lower a building's carbon footprint, an increasing number of design teams are turning to timber because it is less carbon-intensive than other structural materials.⁴ Such is the case with Terra at 11 E Lenox Street, a 7-story, 34-unit multifamily project in Boston, MA, that combines the thermal benefits of mass timber construction and Passive House design to create an incredibly energy-efficient and low carbon building.⁵

“Mass timber is the ideal structural system choice in reducing a building’s overall embodied carbon, and with its excellent thermal properties, it also contributes to creating a robust passive building envelope that reduces thermal bridging and heat loss.”

Monte French Design Studio⁶

According to project architect [Monte French Design Studio \(MFDS\)](#), this winning combo helps cut operational energy consumption with a mix of passive and active systems and the use of eco-friendly materials—including mass timber. As a result, the project team curbed energy use by more than 80%, earning PHIUS+ PreCertification.⁷ The building’s wood structural system will store 844 tons of CO₂ throughout the building lifecycle and offset 327 tons of CO₂ when compared to conventional steel or concrete alternatives.⁸ 11 E Lenox Street is expected to be completed later this year.





Affordable housing is top of mind for Timber Trends survey respondents, jumping up the list from the #5 trend in 2021, to the #2 trend this year. With the increasing urgency to build more affordable housing comes the need to find more efficient, and replicable construction methods that can meet the demand for density while reducing carbon emissions.⁹

Design teams are looking to prefabricated light-frame and modularized wood construction, and just-in-time delivery to streamline fabrication and reduce construction schedules— which in turn can help reduce overall project costs.¹⁰

Boosting Affordability with Factory-Built Wood Construction

In the Greater Seattle area, design firm [Mithun](#) has been working with non-profit [Forterra](#) on the development of a Modular CLT Prototype for multifamily construction with planned deployment on sites across Western Washington and nationally. The project achieves its cost-cutting, time-saving volumetric factory production by leveraging integrated and multidisciplinary design for its architectural, structural, MEP, fire and acoustic solutions. The prototype is comprised of three prefabricated modules to create a two-bedroom, one-bathroom unit measuring approximately 1,165 square feet. The design allows for units to be stacked up to seven stories. Four all-CLT large-scale multifamily modular projects using this prototype are currently underway.

The modules will be fabricated at the Darrington Wood Innovation Center (DWIC), a 94-acre campus that will house the next generation of high-tech wood product companies. Designed by Mithun, the first phase of DWIC includes a small high-efficiency sawmill and kiln facility; a CLT and glulam manufacturing plant; and the modular fabrication and assembly facility.

2 Affordable Housing

“Prefabricated construction technology innovation is pivotal in addressing the compounding crisis of climate change and housing shortages. Now more than ever, clients are asking, ‘What does it take to go modular?’

[Mithun](#)¹²

Prefabrication and modular construction, combined with building information modeling (BIM) and computer numeric control (CNC) machines, continues to gain ground in the AEC sector.¹³ It can help boost efficiencies, reduce costs, and cut waste¹⁴ and conceiving of buildings as a prefab kit of parts enables easier disassembly and re-use at the end of their service life.¹⁵ The benefits of prefabrication and modular construction are particularly relevant to scalable building types like hotels and hospitality facilities, student and remote housing, multifamily development, and commercial office buildings.¹⁶

Merits of Modular: Increase Efficiency While Reducing Impact

Brooklyn-based firm [Garrison Architects](#) turned to factory-built timber construction for their recently completed boutique hotel and spa, The Piaule Landscape Retreat, located on a remote 50-acre site in the Catskill Mountains in southeastern New York State.¹⁷

Twenty-four prefabricated wooden units are perched on stilts surrounding a sleek, modern central timber lodge. The units' floor-to-ceiling windows slide open to reveal the sights, sounds, and sensations of the natural surroundings. The elevated standalone modules vary in size from 375 to 975 square feet.¹⁸

Prefabricated modules can not only reduce onsite construction but also limit environmental impact on remote locations like the Catskills. Accessed via a quiet, tree-lined road, the lodge features cedar cladding, a butterfly wooden roof, and floor-to-ceiling windows that provide vistas of the surrounding mountains. Interiors are constructed from locally-sourced materials to enhance the feeling of bringing the outdoors in; walls and ceilings are paneled with cedar and white oak.

3

Prefab + Modular Construction

“The units were prefabricated and placed by crane onto foundational stilts that elevate them four feet above ground level, allowing water and critters to pass underneath.”

[Garrison Architects](#)



Photo credit: Sean Davidson | The Piaule Landscape Retreat



As both a construction material and building system, mass timber is gaining significant and sustained momentum — increasingly, it is viewed as a viable option to energy-intensive structural alternatives by a broad section of the AEC sector.¹⁹ Along with its carbon-storing advantages, exposed timber’s aesthetic and biophilic benefits are market differentiators that can boost a project’s value and contribute to occupant well-being.²⁰

4 Mass Timber

“The use of regionally sourced mass timber reflects one of the design goals of our new Home Office, which is to connect associates with nature and the beauty of Arkansas.

Dan Bartlett, EVP, Corporate Affairs, Walmart²¹

Mass Timber Moves Mainstream

One sign that mass timber is becoming mainstream is its wider adoption by an increasing number of influential Fortune 500 companies. From [Google](#) and [Microsoft](#), to [Adidas](#) and [McDonald's](#), big brands are using mass timber to construct a growing number of corporate facilities. This includes retail giant [Walmart](#) whose [new corporate campus](#) is currently the largest mass timber corporate campus project under construction worldwide by square footage²², and is set to use 1.7 million cubic feet of regionally-sourced lumber for the structures.²³

Dispersed over 350 acres of native seeded greenery and 10 acres of lakes, Walmart’s new Home Office will be comprised of more than 2 million square feet of mass timber construction spread over 11 office buildings.²⁴ To supply the project, Canadian-based Structurlam opened a manufacturing facility in Conway, Arkansas in 2021. The new home office campus is anticipated to open in phases through 2025.²⁵



Photo credit: Courtesy of the University of Idaho |
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Advanced hybrid construction is increasingly combining wood with steel and concrete to deliver a wide range of efficient structural solutions from innovative and graceful geometries to long-spanning roof designs. Project teams are thinking outside the box to achieve gravity-defying engineering feats, historically reserved for conventional steel and concrete construction.²⁷

Game Changer for Stadium Design

The recently completed Idaho Central Credit Union Arena at the University of Idaho is one example of creative ingenuity with hybrid timber construction. The stadium's undulating roof, engineered and built by [StructureCraft](#), is constructed from a doubly curved plywood diaphragm supported by hybrid glulam timber/steel trusses, carefully proportioned for both aesthetics and structural efficiency.²⁸ The king post trusses span over 150 feet across the main arena and the timber/steel portal frame spans 120 feet to allow for viewing from the secondary seating.²⁹

Prefabrication and preassembly on-site streamlined construction and enhanced safety by reducing the amount of work required at extreme heights. Complex timber engineering was required to design the thrust connection between beam and column, effectively transferring over 450,000 pounds of compression.³⁰ With the use of new wood and connector systems technology, clear-span mass timber construction for sports and recreational facilities like this is becoming a competitive alternative to conventional concrete and steel techniques.³¹ The overall result is a warm yet awe-inspiring experience for both spectators and athletes.

5 Hybrid Construction

“A structural 3D model produced all the geometry and shop drawings required to produce the curved glulam shapes, each of which had a unique curvature. Our skilled shop team used in-house CNC capabilities along with layout optimization to cut the desired shapes out of the curved timber billets.”

[StructureCraft](#)³²

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