

Timber Trends



Photo credit: Ben Benschneider, Michael Green Architecture
Spokane, WA

TIMBER TRENDS BY THINK WOOD

Five Trends on Track to Change Architecture in 2021

2021 Forecast

As the AEC industry embarks on a new year, we look to gain insight into emerging and enduring themes that will influence the future of the built environment. How has the pandemic affected your outlook? What factors will shape your designs?

Think Wood surveyed 775 U.S. developers, architects, contractors and industry experts to hear their predictions for the top trends in timber construction this year and to understand how the market has shifted in response to the COVID-19 pandemic.

COVID-19 Pandemic Impact ‘Remains to be Seen’

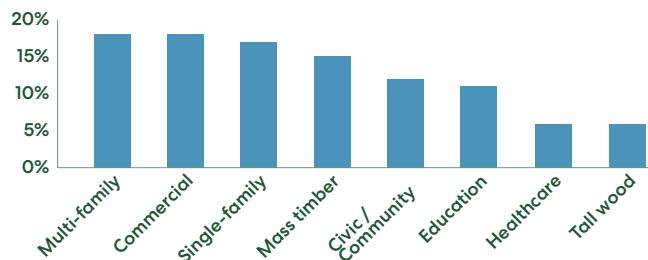
Beyond the construction delays, labor challenges and related economic impacts of 2020, survey participants predict the repercussions of the global pandemic will persist in 2021, primarily impacting projects already in progress. The effects span construction schedules, budgets and emerging post-pandemic design principles. Ramifications for planned projects remain to be seen. Continue reading to see the top five trends to watch in 2021.

“Projections for upcoming projects have been changed due to uncertainty. The use of space, circulation and ventilation have become more prominent considerations in architectural design.”

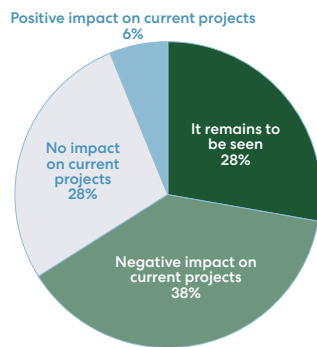
-- Timber Trends Survey Respondent

2021 Survey Results

What types of projects do you anticipate working on in 2021?



How has the COVID-19 pandemic affected your current projects in 2021?



40%

of survey respondents said the pandemic's impact on planned projects remains to be seen.

Addressing Climate Change

Trend Forecast

Survey respondents predicted low or zero carbon, and green building as the top trending topic of 2021, driven in large part by industry, government and individual firm energy and carbon reduction targets. Despite the COVID-19 pandemic, the non-residential green buildings market reached approx. \$80 billion in 2020 and is expected to reach \$103 billion by 2023.¹ Because up to 80 percent of a building's embodied carbon comes from structural materials, designers can incorporate sustainability by choosing less carbon intensive options.² Wood products are one important climate solution because they require less energy to manufacture than other materials, and store carbon through the useful life of the product.

Emphasis on green building certification programs also will increase,³ including LEED, Green Globes, Living Building Challenge, and others. Wood products are recognized by each certification system, with LEED and Green Globes granting 8-10 percent in potential credits through substantial use of wood in construction.⁴ Tools like Life Cycle Assessments (LCAs) also are emerging as one of the most functional assessment devices for understanding energy use⁵ and other environmental metrics, like potential to impact climate.

Catalyst

Anchoring the new South Landing Eco-District neighborhood in Spokane, Wash., the Catalyst building designed by [Michael Green Architecture](#) and the adjacent Scott Morris Center for Energy Innovation demonstrate new building techniques, materials and a sustainable shared energy model that makes Catalyst one of the largest zero energy buildings in North America and one of the first zero carbon buildings to be certified by the International Living Future Institute. Catalyst's design uses roughly 4,000 cubic meters of mass timber in both structural and design elements, enabling Catalyst to achieve near-passive house levels of thermal performance, and helping to collectively offset 5,000 metric tons of carbon, equating to 1,100 cars off the road for a year.⁶ See [project fact sheet](#).

“We believe mass timber is much more than a structural building material; it is an opportunity to guide building design and construction towards a future of sustainable building on an entirely new scale.” -- Craig Curtis, Kattera's Chief Architect

[Building Platforms Architecture](#)

Read WoodWorks' [Catalyst case study](#) and learn how wood acts as a carbon sink in the [Timber City Initiative](#) from Gray Organschi Architecture.



Photo credit: Ben Benschneider, Michael Green Architecture
Spokane, WA

Trend Forecast

Mass timber has gained major momentum in recent years. As of December 2020, WoodWorks⁷ reported 1,060 mass timber projects had been constructed or were in design in all 50 United States, and a new report projects that the number of mass timber buildings could double every two years.⁸ Vox Magazine further credited wood/mass timber as “the hottest thing in architecture this century.”⁹

Changes passed for the 2021 code cycle allow mass timber buildings to be constructed 8 to 18 stories tall, signaling potential increases in overall mass timber construction in new market sectors as well as in higher-density projects. A number of tall timber buildings are under construction in the US,¹⁰ and 18 percent of Timber Trends survey respondents anticipate working on a tall wood project this year.

“Mass timber isn’t simply a green building fad, it’s a resurgence of one of the oldest building materials used by man. The desire to use wood in commercial buildings will increase not only because it’s the more sustainable choice, but because building occupants and tenants will prefer it.” -- Andrew Tsay Jacobs, Director of Building Technology Lab, AIA, EIT | Perkins&Will

Learn more in Perkins&Will’s case study about [1 De Haro](#), San Francisco’s first cross-laminated timber (CLT) structure and California’s first multi-story mass timber building.

Timber Lofts

A direct reflection of its historic, yet trendsetting locale, Milwaukee’s first mass timber building, [Timber Lofts](#), is an adaptive reuse project that combines a 130-year-old warehouse renovation with new CLT construction in an adjacent parcel. Architects [Engberg Anderson’s](#) aimed to define a contemporary architectural character for the building’s new addition without distracting from the timeless aesthetic of the existing artifact. They struck a balance with mass timber, noting sustainability and aesthetics as important design factors. Mass timber also reduced their construction schedule by 20%



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Mass Timber

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Prefabrication and Modular

Trend Forecast

Prefabricated and modular buildings are at the forefront of innovative construction techniques, coming in as the third most anticipated 2021 trend from survey respondents. The building industry is now embracing digital tools like 3D modeling, building information modeling (BIM) and computer numeric control (CNC) machines, making prefabrication and modular construction more common.¹¹

According to Dodge Data & Analytics, prefabrication and modular construction are providing significant improvements to costs, schedule, quality and safety performance, productivity, client satisfaction and waste reduction. Modular construction can speed up construction by as much as 50 percent and cut costs by 20 percent, according to a 2019 report by McKinsey & Company.¹² It also has the added benefit of being a low-carbon alternative.¹³ Design firms and contractors are forecasting expanded use of both approaches as benefits are more widely measured and the industry develops more resources to support innovative applications.¹⁴

“I am now focusing exclusively on prefabricated hybrid residential design and construction solutions that prioritize energy efficiency, low carbon footprints and occupant health and well-being.” -- Timber Trends

Survey Respondent

Model-C

The “Model-C” building system is a kit-of-parts multi-family housing assembly constructed from prefabricated CLT panels. Through demonstration projects like Model-C, MIT start-up [Generate](#) and Boston-based design-build firm [Placetaylor](#) are showcasing how wood construction can address multi-family housing shortages in dense, urban environments while meeting ambitious sustainable development goals. While Model-C was originally developed as an optimal system for mid-rise residential construction, its modular assembly process is designed to easily adapt to diverse site parameters and taller building applications. The Model-C building system will be delivered in prefabricated modules, reducing both construction schedules and waste. Wood construction also will maximize Model-C’s irregular urban lot, optimize solar panel orientation, and offer unique aesthetics for the building interior.¹⁵

Image credit: Generate, Placetaylor
Boston, MA



Trend Forecast

Building on the advantages of wood in the built environment, survey respondents predict that hybrid construction will be a major trend in 2021, both in terms of materials and construction techniques. Hybrid building, using structures that incorporate several types of structural materials, may boost digitalisation, enhance sustainability and help control budgets.¹⁶ Hybrid-timber construction combines wood with materials such as steel and concrete to deliver a wide range of structural solutions. (Mass timber products often used in hybrid structures include CLT, Glulam and Laminated Veneer Lumber.)¹⁷ Hybrid construction also allows architects and engineering teams to explore different materials that complement the vision of the project, while meeting many objectives that a scheme is trying to achieve, including aesthetics, thermal and sustainability.¹⁸

“Mass timber plays well with other structural materials. Often the right structural solution for a project is not a pure mass timber structure, but a hybrid solution.” -- [Structure Magazine](#)

See the latest [hybrid research](#) from the MIT-backed startup Generate Technologies.

Lubber Run Community Center

The two-story Lubber Run Community Center structure interweaves building and landscape by literally burrowing into the surroundings of its namesake park. The 50,000 square-foot hybrid structure includes concrete, structural steel, heavy timber glulam columns, beams and double purlins, as well as tongue & groove wood decking. Site layout, building massing, envelope design, and systems design were driven by the zero-energy goal of maximizing the on-site solar array while optimizing the building's efficiency. Highly efficient MEP systems and a unique Thermawall system increases the project's energy performance while decreasing the number of building materials.¹⁹ Additionally, area trees felled during construction were milled to construct biophilic elements, like bench seating, for the building interior.



Hybrid Construction



Photo credit: Tom Holsworth, VMDO
Arlington, VA

Trend Forecast

According to Harvard University's *State of the Nation's Housing 2020 report*,²⁰ affordable housing conditions worsened for many in 2020. Even before the pandemic-induced downturn, 37.1 million households (30.2 percent) spent more than 30 percent of their incomes on housing in 2019.²¹ Timber plays²² an important role in affordable housing by improving access to economical,²³ comfortable, and sustainable living spaces. Building techniques such as urban infills, adaptive reuse and overbuilds are increasingly becoming a popular development approach to address densification. Adding stories to existing buildings is more feasible with timber because of its lighter weight.²⁴ Multi-family housing starts increased in 2020, reaching a 30-year high of 426,000 units in the first quarter,²⁵ and wood framing is used in more than 80% of multi-family buildings.²⁶

Learn more about reducing affordable housing development costs in [this Harvard study](#).

Richardson Apartments

Designed to provide permanent residences for low-income, formerly homeless adults, this five-story project consists of 120 studio apartments. Architect [David Baker + Partners](#) used wood as the primary structural material because of its relative cost savings compared with concrete and steel. Wood was left exposed in the common areas for warmth, to reinforce the sustainable philosophy of the building, and to provide a quality, welcoming ambiance. The spacious, secure lobby leads to a lushly landscaped central courtyard that provides a healing space for residents to gather. The facility also features wood patio furniture in the courtyard, providing additional connection with nature. The award-winning project was designed to embody the philosophy that a well-conceived building can add dignity to the lives of the people who live within its walls.²⁷

“We want to make sure that people have quality homes and feel good about where they live. While we’re doing that, we also want to make sure the buildings are energy-efficient and help us better address climate change.” -- [Greg Payne](#),
Development Officer | Avesta Housing



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Affordable Housing

Sources

1. [https://www.globenewswire.com/news-release/2020/08/19/2080474/0/en/Non-residential-Green-Buildings-Industry-2020-2030-Market-Expected-to-Recover-from-the-COVID-19-Pandemic-and-Reach-103-Billion-in-2023.html#:~:text=The%20global%20nonresidential%20green%20buildings.CAGR\)%20of%20%2D7.1%25.&text=Increased%20need%20for%20sustainable%20and,the%20Nonresidential%20green%20building%20market](https://www.globenewswire.com/news-release/2020/08/19/2080474/0/en/Non-residential-Green-Buildings-Industry-2020-2030-Market-Expected-to-Recover-from-the-COVID-19-Pandemic-and-Reach-103-Billion-in-2023.html#:~:text=The%20global%20nonresidential%20green%20buildings.CAGR)%20of%20%2D7.1%25.&text=Increased%20need%20for%20sustainable%20and,the%20Nonresidential%20green%20building%20market)
2. https://americas.uli.org/wp-content/uploads/ULI-Documents/Greenprint-Embodied-Carbon-Report_FINAL.pdf
3. <https://greenbuildinginsider.com/950/major-green-construction-trends-that-are-emerging-this-year>
4. <https://lr4scx402tmr26fqa93wk6an-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/HW-Role-of-Wood-in-Green-Building-CEU-92020.pdf>
5. <https://www.aia.org/resources/7961-building-life-cycle-assessment-in-practice>
6. <https://drive.google.com/file/d/1uau0aIRTDk9tYf3zGpAiRW3YWdGWc04S/view>
7. <https://www.woodworks.org/publications-media/building-trends-mass-timber/>
8. <https://www.bdcnetwork.com/new-report-predicts-significant-demand-growth-mass-timber-components>
9. <https://www.vox.com/energy-and-environment/2020/1/15/21058051/climate-change-building-materials-mass-timber-cross-laminated-clt>
10. <https://www.woodworks.org/publications-media/building-trends-mass-timber/>
11. https://lr4scx402tmr26fqa93wk6an-wpengine.netdna-ssl.com/wp-content/uploads/2020/08/Designing-Sustainable-Prefabricated-Wood-Buildings_Think-Wood-CEU-1.pdf
12. <https://www.mckinsey.com/business-functions/operations/our-insights/modular-construction-from-projects-to-products#>
13. <https://www.thinkwood.com/light-frame-and-prefab>
14. https://proddrupalcontent.construction.com/s3fs-public/SMR1219_Prefab_2020_small-compressed.pdf
15. <https://www.thinkwood.com/projects/clt-passive-house-demonstration-project>
16. <https://heal.fi/news/what-are-the-benefits-of-using-hybrid-structures-in-building/>
17. <https://woodforgood.com/why-choose-wood/hybrid-solutions>
18. <https://www.hybridstructures.com/core-solutions/why-hybrid/#:~:text=This%20type%20of%20construction%20is.in%20the%20most%20appropriate%20manner.>
19. <https://www.vmdo.com/lubber-run-community-center.html>
20. <https://www.jchs.harvard.edu/state-nations-housing-2020>
21. <https://www.jchs.harvard.edu/state-nations-housing-2020>
22. <https://www.bchousing.org/research-centre/library/housing-affordability/modular-prefabricated-housing-literature-scan&sortType=sortByDate>
23. <https://www.passivehousecanada.com/passive-house-resources/passive-approaches-to-low-energy-%20affordable-housing/>
24. <https://www.thinkwood.com/sustainability>
25. <https://www.jchs.harvard.edu/state-nations-housing-2020>
26. <https://www.thinkwood.com/blog/affordable-housing>
27. <https://www.architectmagazine.com/project-gallery/drs-julian-and-raye-richardson-apartments>