

SLB®
SOFTWOOD
LUMBER BOARD

2022 ANNUAL REPORT

EXPANDING DEMAND FOR SOFTWOOD LUMBER WITH EDUCATION, INSPIRATION, AND FACILITATION

REFLECTING ON A TERM OF GROWTH AND NEW PERSPECTIVES

Dear Fellow Investors and Industry Colleagues,

It is my pleasure to share with you the SLB's 2022 Annual Report. It was an exciting year of reconnection and opportunity, and the SLB, its funded programs, and its initiatives once again delivered on our mission to grow and protect markets for softwood lumber, resulting in the 11th consecutive year of growth in incremental lumber demand.

These successes are felt by everyone in our industry—from millworker and forester to manufacturer and landowner. Reflecting on these last two years, I am extremely proud of the efforts that we have made to educate the building industry about the incredible benefits—both environmental and economic—that we all know about building with wood. Our focus on education has led to a continued increase in building conversions in the multifamily and commercial sectors, and to code adoptions that allow wood to climb to never-before-seen heights. Our investment in programs like the Mass Timber Competition, with joint funding from the USDA Forest Service—that continues an alliance formally recognized by the memorandum of understanding signed in 2021—helps not only to showcase the power of mass timber as a building material, but also to effect timber adoption by funding the showcase projects that will inspire the projects of tomorrow.

I am also proud of the diverse voices we have brought to the table over the past two years. Expanding the perspectives on our Board Committees with the addition of non-Board members has been invaluable and has resulted in new Board Directors able to join with deep knowledge of our common goals and fresh ideas on how to achieve them. Expanding our leadership outreach is an important effort to make sure that all perspectives in our industry are heard.

As I close my tenure as Board Chair, I want to welcome our new Chair, Brian Luoma. Brian's thoughtful direction of our Programs Committee and involvement in multiple industry associations has prepared him well and has given him great insight into the new growth opportunities available for wood in the built environment. I wish him every success and look forward to working with him as a member of the Executive Committee in 2023.

Thank you for being a part of the SLB. I appreciate your support over these past two years and look forward to continuing to work with everyone in this community to unlock new market opportunities and to spread the word about the transformative possibilities that wood brings to the built environment.

Sincerely,

Caroline Dauzat
Board Chair

IN 2022, THE SLB:

GENERATED

2 BILLION BOARD FEET (BBF)

OF INCREMENTAL DEMAND.

BY FACILITATING WOOD USE.

PRODUCED A CARBON BENEFIT OF

5.3 MILLION METRIC TONS OF CO_2

the equivalent of not burning **29,270 rail cars of coal.**

AMERICAN WOOD COUNCIL

100%

of mass timber ceilings can be exposed in Type IV-B buildings up to 12 stories under the 2024 IBC as a direct result of AWC education and involvement.

WOODWORKS

WOODWORKS DIRECTLY CONVERTED

465 light-frame and mass timber buildings,
and influenced a total of
1,728 projects
to choose wood, resulting in
869 MM BF of incremental lumber in 2022.

Each $1 invested by the SLB in 2022 resulted in

113 BF OF INCREMENTAL DEMAND

(the average incremental demand is 84 BF/$1 over the lifetime of the SLB from 2012–2022).

Generated

11.8 BBF
of total new demand

with SLB investments.

THINK WOOD®

Think Wood sent

512 SALES QUALIFIED LEADS (SQLS)

to WoodWorks for project support or further nurturing in 2022, bringing the total number of leads transferred to **1,138** since 2019.

Delivered more than

105,000
hours of education

to architects, engineers, designers, developers, contractors, and code officials from SLB funded programs.

Think Wood and WoodWorks co-nurtured leads that led to

48
touchpoint projects

breaking ground in 2022, representing
106.6 MM BF.

74% of projects that WoodWorks supported in 2022 used light-frame construction. **26%** percent used mass timber, up from **21%** in 2021.

CHARTING CONTINUED GROWTH FOR SOFTWOOD LUMBER DEMAND IN THE CONSTRUCTION INDUSTRY

Dear Investors,

For the 11th consecutive year, we collectively delivered year-over-year growth in demand and impact for the softwood lumber industry, generating more than 2 BBF of incremental demand in 2022—a record in the SLB's history. While we are incredibly proud of that result, we are equally proud that the sustainable impacts of wood products continue to be felt in the construction industry. Project conversions in 2022 resulted in a total carbon benefit—stored and avoided—of 5.3 million metric tons of CO_2. That's the equivalent of 29,270 railcars of coal left unburned or the entire state of New Hampshire not driving gas-powered vehicles for a year.

These successes occurred against a backdrop of continued challenges for the industry. The domino effects of ongoing supply chain issues slowed construction on many projects, while efforts to curb inflation saw mortgage interest rates rise sharply, slowing home sales and creating headwinds for the single-family new construction and remodeling sectors that drive much lumber demand. Our progress reinforces and re-emphasizes the important role that the SLB plays to diversify and expand softwood lumber demand beyond traditional segments and end uses.

We've made considerable progress to date. Softwood lumber's market share in multifamily projects from five to eight stories has grown from 38% when the SLB was founded in 2012 to 47% in 2022. The continued urgent need for affordable housing is shining light on the multifamily sector, where wood structural systems (be they light-frame or mass timber) have proved themselves to be incredible tools for creating safe, healthy, affordable housing—and quickly. Finding ways to sustainably convert and expand existing nonresidential buildings (such as mass timber overbuilds) will breathe new life into cities without incurring the carbon debt of demolishing and rebuilding wholesale. And it's not just our industry highlighting these trends: Gensler, the largest global commercial and multifamily architecture firm, cites decarbonizing the built environment, pursuing more multifamily affordable housing, and converting existing buildings into housing as three of the most urgent market needs in 2023.

Market share is also beginning to grow in nontraditional markets such as office, education, industrial, and more. In fact, Forest Economic Advisors shows that wood market share in nonresidential buildings over four stories has risen from 2% in 2012 to 7% in 2021. This is due in large part to the SLB's investments in the work of the AWC and tall mass timber code changes as well as the funding to promote and facilitate the use of innovative light-frame and mass timber systems through the Wood Institute, Think Wood, and WoodWorks. These challenging new markets and opportunities outside of single-family will provide stability and smooth out the impact of the peaks and valleys in the residential construction market. They will also provide opportunities for measurable increases in market share and lumber consumption going forward—not to mention the positive environmental impact of these changes on communities.

This past year we re-organized how we execute the Think Wood program, Education initiative, and industry communications. We were fortunate to attract three talented people to our team. Katie, Reed, and Jeff bring diverse perspectives, talents, and experiences to the SLB, ensuring that we are well positioned to inform and educate the market on the economic and environmental benefits of building with softwood lumber, and to drive demand. But we would not be able to do so without the support of you, our investors, and the Board that represents you. In particular, I want to thank Board Chair Caroline Dauzat for her dedicated leadership during the challenging times we have faced as a Board and as a society over the past two years. Her steady hand and support have put the organization in a strong position as we enter the second decade of the SLB's mission. And I want to welcome our new Board Chair, Brian Luoma, whose focus on collaboration as Programs Chair has driven home the fact that we can achieve more together than we can as individual entities. We are excited to see where his leadership takes us.

On behalf of the SLB Board, our team, and partners, I thank you for your continued commitment and engagement with the SLB, and I look forward to working with you as we continue to advance our common goals. I invite you to provide your comments, perspectives, and ideas with us as we work to build a stronger market for softwood lumber products in the United States.

Sincerely,

Cees de Jager
President & CEO

SLB STAFF



Cees de Jager
President & CEO



Ryan Flom
Chief Marketing Officer



Maureen Pello
SVP, Operations



Simon Hyoun
VP, Marketing and Communications



Katie Gerfen
Director, Communications



Reed Kelterborn
Director, Education



Jeffrey Lee
Manager, Communications

EDUCATION DRIVES SUCCESS AT EVERY LEVEL

Dear Colleagues,

In 2022, the SLB and its funded programs operated efficiently and effectively on behalf of our industry, carefully stewarding our investments toward increasing the demand for our products, and it is with high confidence that I report our collective hard work is paying dividends. The heightened and growing interest in building with wood continues to shine in media spotlights—receiving interest from not just the construction industry, but the general public, as well—and decarbonization became a more urgent and earnest discussion. By expanding our focus on education, we reached more critical voices than ever before. That includes code officials and fire marshals who pave the way for wood buildings, architects and engineers who design them today, architecture students who will design them tomorrow, and developers and clients who make them a reality.

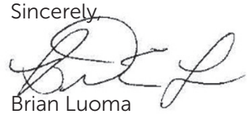
We helped to achieve inspirational, real-world projects through our funding, with the USDA Forest Service, of the 2022 Mass Timber Competition. That's a great accomplishment, but the competition is about so much more than the six winning buildings: The mandate that the teams share learnings from their development process creates dynamic living showcases that will help others understand how to navigate building with mass timber and encourage future adoption.

Our commitment to educating the architects, engineers, and developers on the benefits of building with wood can be seen in the maturation of the Wood Institute into a scalable program. But architects design with what they know, and architecture school curricula have a disproportionate focus on teaching students how to design with concrete and steel. This is why 2022 saw the beginning of our efforts to engage with architecture school faculty in a series of workshops that support them in bringing wood education to their studios—and why it is important to continue direct student engagement with programs like the mass timber student design competition we co-sponsor with the Association for Collegiate Schools of Architecture.

This focus on education is also central to the Think Wood campaign, where we continued to raise awareness about opportunities for wood in construction, and then nurture engaged professional leads with repeated contact through newsletters and other communications. In 2022, we continued to have success raising awareness and fostering interest with high-value content such as project case studies, a new Sustainable Building Resources Library, and a new Mass Timber Design Manual, among others. Leads who are engaged and ask a question about building with wood on a specific project continue to be forwarded to WoodWorks, which nurtures those leads with project assistance until they become building conversions. That relationship strengthened in 2022, with the result being a record number of projects directly influenced by our campaigns, amounting to 869 MM BF of incremental lumber demand on WoodWorks-influenced projects alone, and 106.6 MM BF in Think Wood touchpoint projects.

I want to thank Chair Dauzat for her steadfast support of the expansion of our program efforts during her tenure, and I am excited to see them continue to flourish as I step into that role. I know that our impact will only continue to increase under our incoming Programs Chair Brad Thorlakson, and I look forward to working with him to achieve that goal.

Sincerely,



Brian Luoma
Programs Chair

MAJOR ACHIEVEMENTS IN 2022 INCLUDED:

Codes:

The AWC influenced changes to the 2024 IBC that will allow for 100% exposed mass timber in 12-story buildings (see page 5). It also expanded tall mass timber code provisions, working with and educating code officials to bring the

TOTAL NUMBER OF STATES THAT HAVE ADOPTED THE PROVISIONS IN THE 2021 CODE TO 19,

creating more opportunity than ever before for mass timber consumption.

AMERICAN WOOD COUNCIL

Communications:

Think Wood's lead nurture program saw an

82% INCREASE IN LEADS

ready to make specification decisions about using wood

QUALIFYING MORE THAN 500 LEADS

for potential project conversions (see page 7).

THINK WOOD®

Conversions:

WoodWorks influenced more than

1,700 PROJECTS

in 2022, representing 869 MM BF of incremental lumber demand and

3.6 MILLION METRIC TONS

of avoided greenhouse gas emissions (see page 9).

WOODWORKS WPC — WOOD PRODUCTS COUNCIL

Education:

In 2022, the SLB's education program launched a

SUCCESSFUL FACULTY OUTREACH PILOT PROGRAM

to address the significant gap in architecture education at universities and developed an advisory panel chaired by Virginia Tech architecture professor Edward Becker to help guide the program to deeper engagement with other faculty at select universities (see page 11).

THE WOOD INSTITUTE

CREATING NEW OPPORTUNITIES CHAMPIONING CARBON AND MASS TIMBER

Tall mass timber construction got a major boost in 2022 when the AWC achieved a critical win in the 2024 International Building Code (IBC) cycle, allowing for nearly 100%, rather than 20%, exposed mass timber ceilings in Type IV-B construction in buildings up to 12 stories. This provision eliminates the requirement for two layers of gypsum board over most of the ceiling area, reducing material and labor to the tune of a 1.65% savings in total building cost while further reducing the embodied carbon of the structure. This change makes switching to mass timber more financially attractive for developers and more sustainable because of the reduced material use, while also allowing for exposed ceilings that display the beauty of wood.

The win is a key example of the AWC's efforts to maximize opportunities for wood through improvements in codes and standards, enhancing the efforts of Think Wood and WoodWorks to nurture and convert new wood project leads. The code change has been incorporated into the 2024 IBC, which will be published later this year.

Tall Mass Timber Code Adoption

In addition to the successful changes to the 2024 IBC, the AWC continues to actively support adoption at the state level of tall mass timber provisions in the 2021 IBC through engagement with code officials. The District of Columbia and Tennessee are examples where AWC's tall mass timber education for code officials is expected to garner adoption of provisions consistent with the I-Codes in the near future.

Leadership on Carbon and Sustainability

The AWC staffed up its sustainability brain trust in 2022, ensuring its continued success in advocating for sustainable developments in the industry. Examples include:

- After strong industry participation in data collection, the AWC developed the Life Cycle Inventory and Analysis Database, which is foundational to softwood lumber's environmental value proposition and critical to differentiating our products from the competition. The EPDs and other analyses created from this data will be important drivers in capturing market share in nontraditional market segments and growing the use of softwood lumber products in the built environment.
- The AWC's Sustainability Committee approved a 2023 Work Plan for the Markets & Sustainability Program to prioritize emerging issues.
- Ongoing participation in ASHRAE committees ensures the wood industry's perspective is represented on changes to codes and standards such as the International Energy Conservation Code and Wildland-Urban Interface Code.



Ascent
Photo Credit: C.D. Smith Construction

2022 saw the opening of the world's tallest timber-concrete hybrid building, Ascent, in Milwaukee (above), which used 15 BF/SF, and was made possible through tall mass timber code adoption, which is being encouraged by the AWC. This is paving the way for mass timber adoption in other typologies, such as office (below).



The Beam on Farmer
Photo Credit: Mike Duffy, RSP Architects

In 2022, the AWC supported

11 NEW STATES AND JURISDICTIONS

to enact or advance adoption of the tall mass timber provisions in the 2021 International Building Code

GENERATING NEW INTEREST FROM AEC PROFESSIONALS BY LEVERAGING SUSTAINABLE CONTENT

Think Wood's use of compelling content to develop and nurture project leads continued to grow interest in building and designing with wood. This lead-nurture program generated 21 new projects in 2022 and contributed to more than 9,000 professionals becoming highly engaged with wood-related content and more than 500 asking project-related questions fielded by WoodWorks as potential project conversions.

Sustainability Drives Content Engagement

In January 2022, Think Wood surveyed 500 AEC professionals to assess the year's Timber Trends. The top three trends—low-carbon construction, affordable housing, and prefabrication/modular construction—drove Think Wood's 2022 content strategy.

At the beginning of Q3, Think Wood launched its Sustainable Building Resources Library, which collected years' worth of high-value white papers, infographics, articles, and case studies into an indexable database that will serve as a living resource to share with our core audiences to help encourage wood adoption and construction. The Sustainable Architecture, Design & Forestry page on Think Wood's website, which houses that library in addition to other content, generated the most traffic to the site in Q3 and Q4, with more than 100,000 page views. Continued content creation around the themes of carbon and sustainability—as well as refinement and updating of existing resources—will continue to drive and expand upon interest in this sector in 2023.

Mobile Tour for Pros, Educators

With continued funding support from the USDA Forest Service, the Think Wood Mobile Tour completed a full-year, 12-stop schedule to educate and inform construction and design professionals at trade shows and association events and to engage postsecondary students and educators to help effect change for wood education in design schools. All told, the mobile tour traveled over 11,000 miles and was seen by more than 50,000 professionals, students, and educators in 2022. A refreshed design at the end of the year ensures that this magnetic resource is ready for its 2023 commitments.

Authoritative Content With Media Partnerships

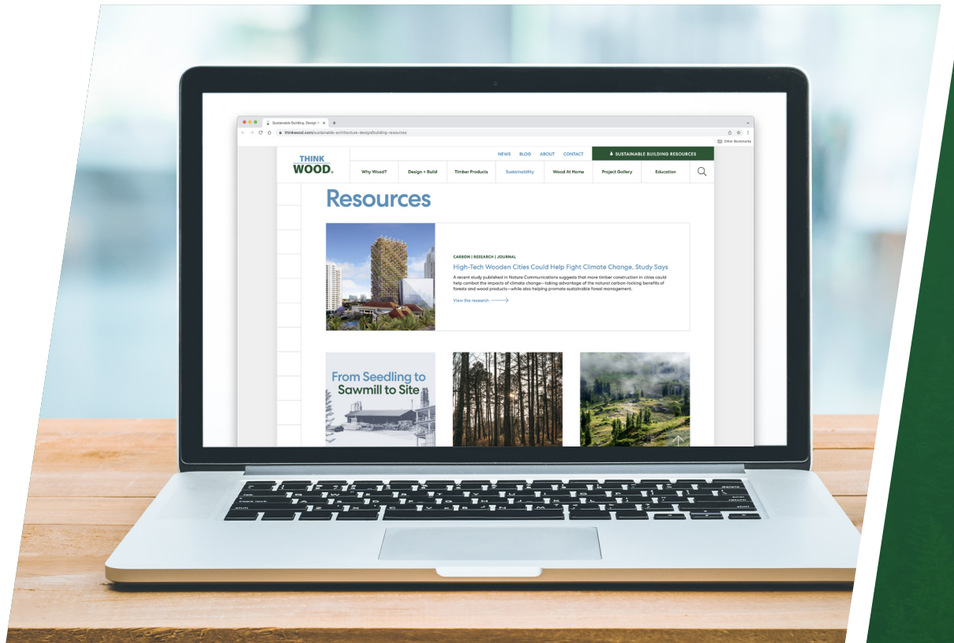
Think Wood's continuing education and media partnerships continue to drive engagement, with more than 9,000 new contacts (29%) generated from media partnerships, 4,965 from CEUs (16%), and 3,852 from event sponsorships (12%).

Think Wood's commitment to quality content can maximize those opportunities: For example, a sponsored continuing education panel with *Architect* magazine, "Advances in Wood Construction and Sustainability: Reimagining the Future of the Built Environment," launched in Q1 but became a top course (with 1,541 course completions) in Q4 because our partner promoted it independently due to its strong performance.



Pine Street Duplex
Photo Credit: Caitlin Murray

Profiling diverse wood projects such as innovative multifamily (above) and commercial projects remains one of the most effective teaching tools to engage AEC professionals in becoming interested in building more with wood. Leveraging those and sustainable resources (below) drive much of Think Wood's content strategy to encourage conversion to specifying with wood.



THINK WOOD
CO-NURTURED LEADS ON

48 PROJECTS THAT BROKE GROUND IN 2022, REPRESENTING

106.6 MILLION BOARD FEET;

169 UNBUILT PROJECTS REMAIN ACTIVE IN THAT PIPELINE

NEW TYPOLOGIES AND MASS TIMBER BRING OPPORTUNITIES FOR CONVERSION

Despite a slowing in project schedules in Q4, WoodWorks influenced 1,728 projects in 2022, including 465 with direct technical support. Those projects represent 869 MM BF of incremental lumber use, $857 million in incremental lumber sales, and 3.6 million metric tons of avoided greenhouse gas emissions.

Emerging Trends in Building Types

Multifamily made up 50% of new projects, and WoodWorks has assisted with several projects converting 3-story light-frame multifamily buildings to Type III 5-story-over-1-story buildings, frequently in secondary markets. WoodWorks supported 23 factory/industrial buildings in 2022, a slight increase from only 14 warehouse projects in 2021; this is in line with the findings of the 2023 forecast commissioned by SLB from Forest Economic Advisors, which found that the warehouse and distribution center category is seeing unexpected growth, proving that wood is starting to compete more with traditional materials in that sector.

Although 74% of the projects WoodWorks supports continue to be light-frame, mass timber projects grew from 21% of total projects in 2021 to 26% in 2022, and contributed to the year's increase in projects and lumber consumption by volume.

Helping Meet Needs for Qualified Workers

Building on the success of the Mass Timber Construction Management Program, Q4 saw the launch of 10 mass timber installer training modules. Intended for use by contractors, subcontractor erectors, training centers, community colleges, and workforce development programs, the modules complement efforts to ensure qualified workers are available to construct mass timber projects.

In addition to this curriculum, WoodWorks has partnered with more than a dozen training centers and three universities to develop mass timber installation training programs and has provided mock-ups to facilitate hands-on installation, with funding support from the SLB, to educate and train the next generation of project managers.

Overcoming Knowledge Gaps

A new library of WoodWorks resources on biogenic carbon is addressing an important knowledge gap for designers on the embodied carbon of building materials and the importance of considering the entire carbon footprint of those materials in sustainable design. The resources have already garnered 7,000 views and are facilitating new conversations about the sustainable benefits of wood in construction, creating more opportunity in the industry.

In addition, WoodWorks is continuing to coordinate with researchers from the University of Colorado Boulder to develop whole-building life-cycle assessments of prototype commercial and multifamily buildings using the Department of Energy database of commercial building prototypes. Developed under the direction and support of the U.S. Endowment for Forestry and Communities, the program and the data collected in it will help provide consistent, accurate benchmarking to help inform the design and material choices for sustainable nonresidential buildings in the future, providing more information about how wood compares to other structural materials. The first phase of research effort is expected to be completed in 2023.



The Nine at Tallahassee
Photo Credit: Grey Street Studios

WoodWorks influenced 1,728 projects in 2022, half of which were multifamily projects like The Nine at Tallahassee (above), a 5-over-1 student housing complex that used 6.25 BF/SF. But while converting individual projects is essential, so is training skilled trades like mass timber installers to allow more projects to go to construction. With continuing support from WoodWorks, the Chicago Carpenters Training Center completed its first mass timber installation mock-up project in 2022 (below).



TRAINING ON MOCK-UPS FUNDED BY THE SLB AND USDA FOREST SERVICE GENERATED

6,124 HOURS OF INSTALLER TRAINING FOR

226 STUDENTS ACROSS 11 SITES IN 2022,

AN INCREASE OF **364%** FROM 2021

EDUCATING THE DESIGNERS OF TODAY AND TOMORROW TO GENERATE DEMAND

Design and construction technology is constantly evolving, and AEC professionals need access to the latest resources and education about wood products to ensure they are fairly evaluated alongside other structural materials. But that education shouldn't come only through continuing education for established architects—it should start in the classroom.

Educating AEC Professionals

Now in its second full year, the Wood Institute has become a growing resource for the AEC community, providing a single destination for 176 continuing education courses created by Think Wood, WoodWorks, the AWC, and other industry partners. A total of 2,666 building and design professionals created accounts on the Wood Institute this year, up from 1,200 in 2021 and surpassing the goal by 7%. Architects, engineers, and code officials made up 75% of new accounts.

The Wood Institute continues to enhance its offerings by partnering with practitioners and educators on the leading edge of wood design and construction. This year featured courses created with organizations including the WRCLA and the SFPA, as well as courses featuring well-known architects Susan Jones of atelierjones and Alan Organschi of Gray Organschi Architecture. The latter two were created as no-cost, value-added benefits of a partnership with the University of Texas at Austin and now live permanently on the Wood Institute.

Making Inroads in Higher Education

The SLB's investments in engaging with the students and recent graduates who will become future industry leaders continued to show promising results.

- The Think Wood Mobile Tour completed several successful stops at universities in 2022. At Virginia Tech during National Forest Products Week, professors guided students through the display and their own professional research on wood construction, which they are incorporating into their curricula.
- The SLB partnered with the Association of Collegiate Schools of Architecture on two scholarship programs: the Timber Education Resource Library, which will fund video content for mass timber education, and the Timber Education Prize, which recognizes innovative timber-focused courses. The Mass Timber Competition: Timber in the City recognizes student-designed mass timber solutions to real-world problems.
- A new audit of architecture schools conducted by the Center for Tall Buildings and Urban Habitats provided a snapshot of the programs and professors embracing mass timber and identified the schools best positioned to integrate more education about timber systems into design curricula.
- A new advisory panel, chaired by Virginia Tech architecture professor Edward Becker, will help guide program strategy and overcome obstacles to expanding wood education in the nuanced and dynamic environment of higher education.



Photo Credit: Virginia Tech

Established professionals require continuing education through online course and in-person resources like the Think Wood Mobile Tour (above), but the same content can be leveraged to help increase the amount of wood education in architecture schools through campus visits and materials distribution (below).



Photo Credit: Virginia Tech

LEARNERS COMPLETED

5,288 COURSES,

A 22%

INCREASE FROM LAST YEAR, SURPASSING GOAL BY 8%

DEMONSTRATING THAT THE WOOD INSTITUTE IS GAINING TRACTION AS AN INDUSTRY HUB FOR REQUIRED CONTINUING EDUCATION RESOURCES



Industry partnerships were critical to ensuring an effective presence at trade shows such as JLC Live (top) and the International Builders' Show (below left), and with leveraging high-value education assets such as the case studies in the Western Red Cedar Lumber Association's Cedar Book 14 (below right) with other SLB audiences.





Hiatus Benham
Photo Credit: Thomas Story

ENHANCING OUR IMPACT WITH PRODUCTIVE PARTNERSHIPS

Strategic partnerships with other allied organizations play a critical role in the SLB's mission to grow awareness and demand for softwood lumber products, and offer an efficient way to reach specialist audiences, seed innovation, and add size and depth to programs.

In 2022, partnership with the USDA Forest Service saw the SLB provide $272,000 in matching funds to winners of Wood Innovations Grants, specifically to elevate the use of mass timber in commercial and residential construction. The matched fund recipients are engaging in research ranging from identifying barriers to the competitive construction of all-wood buildings; developing new tools to aid in the design of CLT buildings; and conducting extreme-conditions testing and architecture, engineering, fire safety, building code, sustainability, and cost analyses for mass timber components and structures.

The SLB continued its work with the Council of Tall Buildings and Urban Habitat, funding the 2022 Steel-Timber Hybrid Building Conference as part of a broader research endeavor on the future of timber-hybrid buildings. In April 2023, this partnership worked with the Chicago Architecture Center on the launch of REFRAMED, an exhibition showcasing how mass timber technologies are redefining community and city building. The exhibit will run for six months; companion seminars will explore next-generation climate-smart urban development with mass timber.

To help sustain and grow market share in the nation's residential market, the SLB partnered with the Energy & Environmental Building Alliance (EEBA) to sponsor its High-Performance Home Summit—a yearly conference that attracts 500 homebuilders and residential industry members focused on developing eco-friendly homes that target above-code efficiency. The collaboration brought embodied energy to the forefront and produced the first-ever EEBA-certified designation for low-carbon building professionals.

Throughout 2022, the SLB continued to collaborate with regional association partners such as SLMA, NeLMA, WRCLA, WWPA, WWPI, SFPA, and Georgia Forestry Foundation (GFF) by co-exhibiting at major trade shows such as the International Builders' Show, JLC Live, and the AIA Conference on Architecture. The SLB also funded special projects such as WRCLA's Cedar Book 14 as well as GFF's construction of a pavilion to educate the public about mass timber and Georgia's forests.

COMPETITION WINNERS HIGHLIGHT LOW-CARBON MASS TIMBER DESIGN

In June 2022, the SLB, the USDA Forest Service, and WoodWorks announced six winners of the 2022 Mass Timber Competition: Building to Net-Zero Carbon—an initiative that provides funding to mass timber building projects demonstrating innovative net-zero designs. The winning projects share $2 million in total funding (provided by the USDA Forest Service with matching funds from the SLB) upon meeting certain agreed-upon milestones toward construction. This second iteration of the competition helped make the case for expanding the use of mass timber in the United States by demonstrating its versatility and low-carbon benefits across a wide range of commercial building types, including healthcare, education, industrial, community/office, and multifamily.

Each entrant is sharing case studies, research, lessons learned, and practical tools with the broader AEC industry; the resulting built projects will become precedent-setting examples that can inform future mass timber construction and design across the country.

In January 2023, Harbor Bay Ventures, the developer behind the INTRO Cleveland, Phase 2 project—a high-rise multifamily building designed by Hartshorne Plunkard Architecture and Forefront Structural Engineers—met its first deliverable: the determination of the ideal mass timber structural configurations for the project and their impact on reducing embodied carbon.

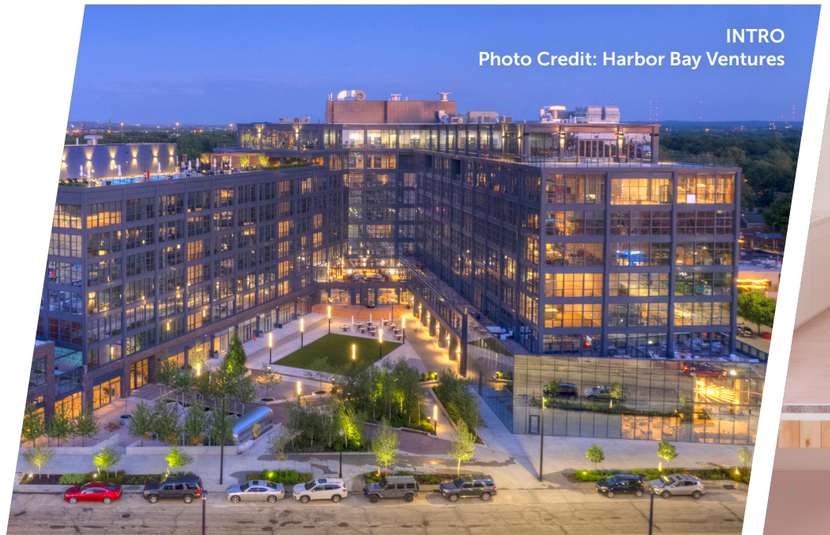
The 2023 Mass Timber Competition launched in March, and the winners will be announced this fall.

> ***We are incredibly grateful to the SLB for their support in our goal to build with mass timber and lower the carbon footprint of the built environment. Your efforts help us all push toward a more environmentally conscious design and construction industry.***
>
> *Andrew Katz | Katz Development*



Return to Form
Photo Credit: Katz Development

The 2022 Mass Timber Competition Winners are beginning to hit milestones: INTRO in Cleveland (bottom left) has finalized plans for its ideal mass timber structural system, and Return to Form, slated to be the tallest mass timber project in Denver, is set to break ground this year.



INTRO
Photo Credit: Harbor Bay Ventures



Return to Form
Photo Credit: Katz Development

EVALUATING GROWTH OPPORTUNITIES FOR LUMBER PRODUCTS

In 2022, the SLB explored new opportunities and threats, convened working groups, and forged outside partnerships to help determine new avenues for driving market growth for wood products.

Benefits Abound in Standardizing Environmental Impact Metrics

Businesses across the U.S. are facing mounting public, internal, and regulatory pressure to level up their environmental performance and reporting. One way of doing so is by turning to low-carbon, naturally renewable building materials to meet increasingly aggressive climate targets for new capital projects.

Wood products offer clear sustainable advantages when it comes to prioritizing decarbonization in the built environment, but as an industry, we fail to provide a consistent set of environmental impact metrics and disclosures to help tell that story. To take full advantage of the opportunity to increase the use of wood, the SLB engaged the consulting firm Pollination Group to help develop a series of consistent metrics that the SLB can report on relevant to the impact of our efforts in four categories: climate change, forest management, water management, and waste management.

These metrics will work in concert with other efforts—such as compiling industry-wide EPD data (see page 6)—to provide proof points about the sustainable benefits of wood and enhance our environmental value proposition. Reporting on these new standardized environmental impact metrics will begin in 2023.

Minimal Market Opportunity Found in Timber Bridges

In 2022, an SLB Ad Hoc Working Group in collaboration with Forest Economic Advisors evaluated the market potential of timber-built bridges in the U.S. Research findings showed that the opportunity for timber bridges is low, at only 6 MM BF to 133 MM BF, with the high end of the estimate representing 10% market penetration. By comparison, the opportunity represented by the mass timber market is expected to top 4.9 BBF through 2035. As such, this market does not present a notable growth opportunity at this time.

Sponsorship of Benchmark Carbon Studies Provides Insight

With the fast-growing focus on embodied carbon in the built environment comes the need for benchmark data on construction materials—including on wood products. In addition to supporting EPD data collection for wood products through the AWC, the SLB is working in partnership with AWC and WoodWorks to ensure that Building Transparency accurately represents wood products in its Embodied Carbon in Construction Calculator (EC3), a database of construction EPDs paired with a building impact calculator, as well as in its TallyLCA tool and TallyCAT Revit plug-in. The SLB is also participating in a Whole Building Life Cycle Assessments (WBLCA) Benchmark Study conducted by the Carbon Leadership Forum, which incubated the EC3 tool up to its public launch. These partnerships and the resulting data will provide the radical environmental transparency that the building industry is demanding of its products and will create opportunities for further gains in market share in nonresidential sectors.



High Line – Moynihan Train Hall Connector
Photo Credit: Empire State Development

Despite high-profile examples in progress, such as the Timber Bridge at the High Line – Moynihan Train Hall Connector, timber-built bridges do not represent a notable growth opportunity for timber. The market potential for 3D-printed concrete homes, such as Lennar's community (below) outside Austin, Texas, remains uncertain.



Photo Credit: Lennar and ICON

3D-Printed Homes Pose Little Near-Term Threat to Wood's Dominance in Single-Family

Despite recent industry efforts to scale up 3D printing of concrete homes—most notably, one of the nation's largest homebuilders, Lennar, is undertaking a 100-residence development using the material outside Austin, Texas—the market potential for the technology remains uncertain. In 2022, the SLB's Ad Hoc Working Group examined the underlying technology and potential disruption lumber might make to this emerging market opportunity, which is likely to be tested in wildland-urban interface zones that have seen wildfires and in hurricane-prone regions. The work will continue in 2023 and will include research by the Home Innovation Research Labs and funded by the U.S. Department of Housing and Urban Development.

SUPPORTING OPPORTUNITIES FOR ADOPTION IN THE AEC COMMUNITY

Carbon Tools and Calculators

The construction industry is demanding more transparency about the environmental impact of building products. EPDs are an important tool for presenting verified and objective data; this information is critical to being able to consider the environmental impact of the built environment through WBLCAs—an evaluation of projects and all the materials within them from cradle to grave. The wood industry was early to adopt EPDs but has been lagging behind steel and concrete in updating them; penalties are being applied to wood products because of the limited EPDs, and more robust data is essential to being able to share the cradle-to-grave carbon benefits of wood.

The AWC worked in 2022 to collect EPD data from its member companies to help tell a more complete carbon story for wood—from fiber sourcing to end use—that can be used to generate WBLCAs and environmental impact studies. These efforts will continue into 2023, as will the development of a new tool to parse that data. (To participate in AWC's data-collection efforts, contact Anna Ostrander, the AWC's LCA Data Specialist, at aostrander@awc.org.) WoodWorks developed a series of business case studies, as well as tips for design professionals to engage with these carbon tools and adopt them in their own practice. Think Wood and the Wood Institute generated educational content highlighting the importance of considering embodied carbon in communities.

Wood has an incredible carbon story to tell, starting at seedlings and continuing through to a building site. As the importance of embodied carbon advances in the construction industry, the collaborative efforts by all the SLB's programs are essential to highlighting wood's carbon benefits and to generating demand.

Modular Construction

Modular construction has long been hailed as a solution to producing more affordable housing, but difficulties in achieving economies of scale have historically kept modular construction's impact on the housing market statistically negligible. But new advances in overcoming those hurdles keep the very real opportunity for finding efficiencies in materials consumption and cost, labor, and construction timelines alive.

In single-family construction, big builders like PulteGroup are turning to modular off-site construction and on-site assembly to increase efficiency. CEO Ryan R. Marshall told NPR's *Planet Money* that he sees a future in fabricating construction assemblies and shipping them to new development sites. If modular component construction can reach scale and can help speed timelines onsite, be it for residential or commercial projects, it could allow for increased construction output and, in turn, more lumber demand.

In multifamily, companies like Autovol are pioneering solutions in automated volumetric construction to save time, labor, and money by using robots to craft factory-built modules that can be shipped to a building site to be assembled into housing complexes. So far, the majority of the company's projects have focused on creating more affordable housing in California, but if this model proves successful at addressing issues of increasing housing demand, the need for affordability in housing, and a shortage of skilled labor, this could prove to be a scalable solution that could increase output and, with it, incremental lumber demand.



If modular construction operations can achieve scale, building components in factories like the one above could increase the capacity of the construction industry to complete projects, providing increased lumber demand. Demand could also rise in the interiors market as the embrace of biophilic design principles in the commercial and residential sectors could drive demand for more appearance wood (left).



LiveOak
Photo Credit: Mark Herboth Photography LLC

Biophilic Design

Biophilic design is the use of natural elements such as natural light, plants, water, outdoor views/access, and exposed wood to boost occupant comfort and well-being. Increasingly, companies are seeing the benefits of biophilic design in timber architecture, as credible research suggests it can boost employees' morale, productivity, and sense of wellness. Major green building standards, such as LEED, have also expanded their criteria to include biophilic design, and the federal government recognizes biophilic design's benefits as part of its High-Performance Green Buildings and Sustainable Facilities Tool.

Post-pandemic, interest in biophilic design is only expected to grow, and an increasing number of studies confirm its business case. While it is challenging to estimate biophilic design's current global market impact, a recent market research report estimated it will grow to a $98.8 billion industry by 2025, at a compound annual growth rate of over 16%. With exposed wood a key feature of biophilic design, the industry stands to benefit from the ongoing growth of this sustained trend, and encouraging its adoption among our AEC audiences will increase that opportunity—particularly in nonresidential sectors.

OPPORTUNITIES FOR WOOD IN NEW MARKETS: PROJECT HIGHLIGHTS

These four projects highlight areas of growth opportunity for wood construction, be it with light-frame, mass timber, or hybrid systems or in established or emerging market sectors.

Light-Frame:

Anton Pacific
Santa Cruz, California - Multifamily

13.9 BF/SF

This 205-unit multifamily property in Santa Cruz, California, ran into snags in the design process when the team at Architecture Design Collaborative was confronted with conflicting information about detailing the floor-to-wall intersections in this Type II-IA structure, which has five stories of light-frame over two of concrete. The team reached out to WoodWorks, which provided resources and pulled in AWC to speak directly with local code officials on the group's behalf. Through this program collaboration, this project was a success, and is currently under construction with the equivalent of 4.3 MM BF.

Hybrid Light-Frame/Concrete Construction:

Blue Horizon Elementary School
Buckeye, Arizona - Education

7.1 BF/SF

This elementary school in Arizona is the first prototype school built with a kit-of-parts design that DLR Group created to rebuild another elementary school nearby. In the first phase, five modules arranged around a central community oasis on campus provide classroom, gym, and cafeteria spaces. More modules will be added in future phases until the campus can accommodate 900 students. Daylight is a priority for this learning environment, and the design incorporates open web trusses in large gathering spaces and white-painted wood beams in classrooms to reflect light and brighten the space. This prototype was developed to allow quicker reviews and faster construction; projects like this that are designed to be replicable and create more opportunity for lumber in schools.

Hybrid Mass Timber/Concrete Construction:

Redmond Senior & Community Center
Redmond, Washington - Community

22.1 BF/SF

Designed with collaboration from the community and stakeholders, this 40,000-square-foot community center designed by Johnston Architects and Opsis Architecture is an example of less is more. The project team approached WoodWorks for help determining a code path using the new IBC tall mass timber provisions that had not yet been adopted locally. But in addition to identifying a way forward, WoodWorks identified that switching to Type V or III construction (up to six stories), would cut project costs considerably. The building is now under construction with concrete walls, glulam beams and columns, and a CLT roof, and will provide dedicated social space for seniors, in addition to gym facilities, community space, and a kids area to serve Redmond.

Mass Timber:

619 Ponce
Atlanta, Georgia - Office

22.1 BF/SF

WoodWorks provided active support for this project, a showcase mass timber office building at the center of a major redevelopment in Atlanta, not only by providing relevant resources for design and engineering, but also to address insurance challenges and help the team at Jamestown narrow in on the right building system. Jamestown wanted to take the use of mass timber further, using locally sourced wood to help stimulate the regional economy. The wood was harvested from a Jamestown-managed forest in Columbus, Georgia, and produced into lumber at Georgia Pacific's mill in Albany, Georgia, making it a compelling case study for the state.

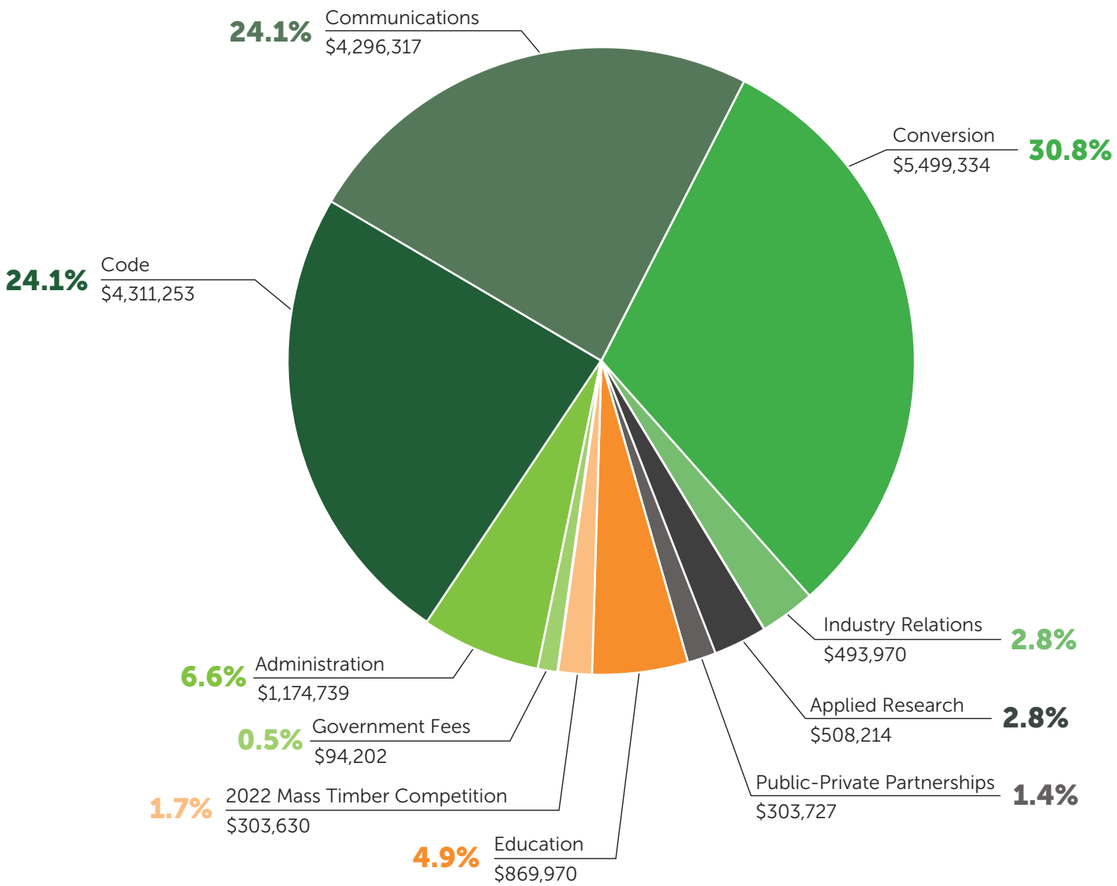

Photo Credit: HBA courtesy Architecture Design Collaborative


Photo Credit: RedBuilt

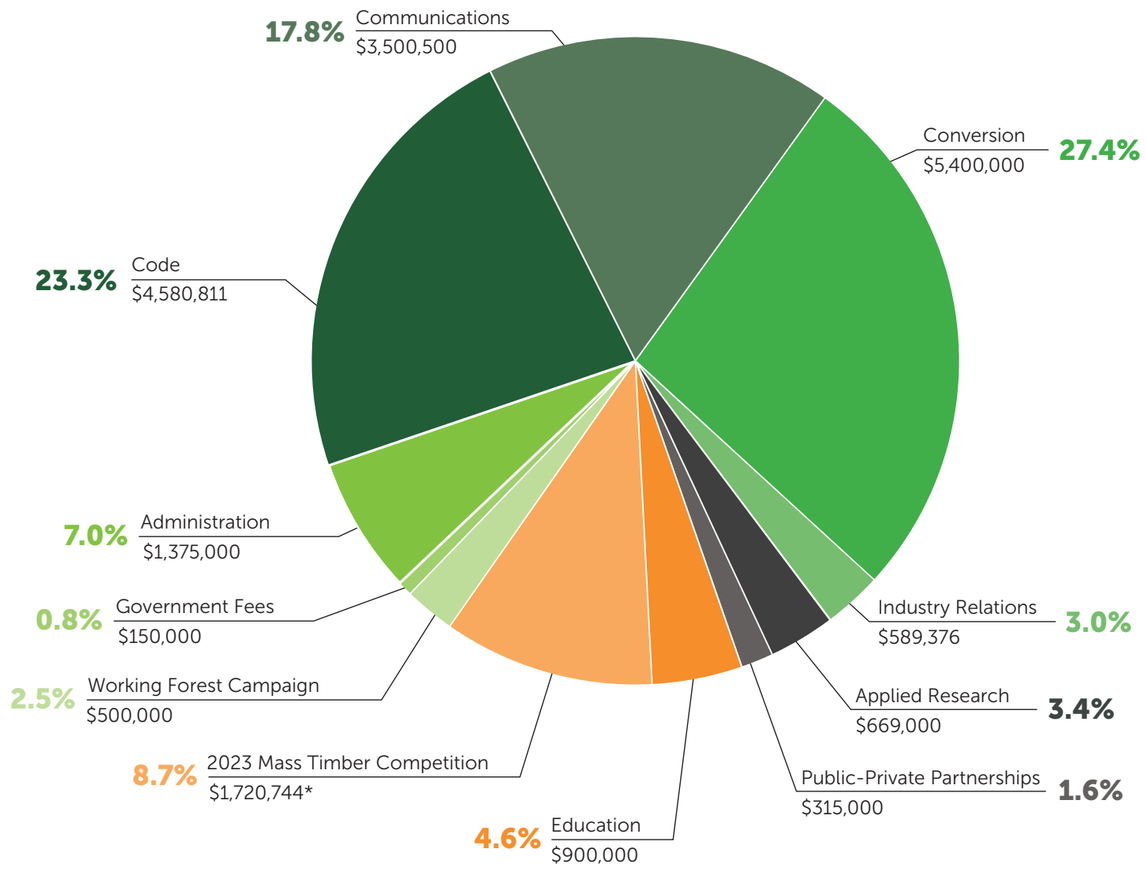

Photo Credit: Johnson Architects and Opsis Architecture


Photo Credit: Jamestown

TOTAL EXPENSES:
$17,855,356



TOTAL BUDGET:
$19,700,431



*Includes $860,387 provided by the USDA Forest Service.

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