# Appendices

# A: Questionnaires

The following questions evolved after many conversations, and could be used in future phases as a starting point.

### For builders and building owners

1. What construction types and occupancies does your organization typically work with or focus on?
2. How many completed mass timber projects has your organization been involved with? Any current projects, and what is the status?
3. In what ways is mass timber used in the building? (Construction type, structural frame design, product types, hybrid, etc).
4. Have builders' risk or permanent property insurance costs been a major decision factor when deciding between structural systems? Is one more difficult or costly to procure than the other?
5. How do the premiums compare with light frame or NC construction?
6. Have you gotten different feedback from insurers on different structural frame types?
7. Who are you working with / tried to work with on your mass timber building for insurance?
8. What questions do they ask you? What do they cite as their biggest concerns?
9. What issues have been the most challenging to navigate?

### For insurers and brokers

1. What do you feel like you already know about mass timber buildings?
2. What would it take to make you comfortable underwriting a mass timber building?
3. Is your company offering, or considering offering products for mass timber builders risk and/or permanent property insurance? Why or why not? If so, what is the business case for entering this market?
4. Do these two products use the same data set, or are two different sets of actuarial data required?
5. How does your company classify mass timber buildings - internal, ISO?
6. Does your company offer coverage as a sole provider for a building or require a quota share?
7. How common are pooled products for single clients/multiple projects, for both builders and buildings? For multiple clients/projects?
8. Do you offer any discounts for preferred teams?
9. How does your company differentiate between a completely light framed wood building, hybrid buildings, and a fully mass timber building?
10. Where do you get your loss data? Multiple sources? Do you reference the FM Global DS 1-36 Mass Engineered Timber data sheet, and does it influence your company's approach to coverage?
11. Are you aware of the mass timber performance data resources provided on the WoodWorks website? If so, do you have any feedback on the usefulness of these resources, or suggestions for additions or improvements?

# B: Key Contacts

Building relationships with innovative individuals - both brokers and carriers - within the insurance industry is key. The following individuals were interviewed for this study or were otherwise recommended.

**Table 1: Key Contacts**

| Role | Company | Name | Specialty | Phone Number | email | Loc. |
|---|---|---|---|---|---|---|
| Indep. | M.D. Hastings Risk Consulting | Mike Hastings | Consulting | 404-307-5101 | mike@mdhastings.com | |
| Broker | Gallagher | Jake Concannon, Ted Way, Brian Burg | Builders Risk & Permanent Property | 510.861.2385 | Ted_Way@ajg.com jake_concannon@ajg.com | CA |
| Broker | Heffernan Insurance Brokers | Susan Brodahl | Builders Risk & Permanent Property | (503) 419-5805 | SusanB@HeffINS.com | OR |
| Broker | Marsh | Sedat Kunt | National Property Practice – Construction | 347-602-0638 | Sedat.Kunt@marsh.com | NY |
| Broker | USI Insurance Services | Sky Wolfe | | 503-998-3907 | Sky.Wolfe@usi.com | OR |
| Broker | Brown & Brown | Ken Hoggins | CPCU \| ARM Senior Vice President | C (617) 851-0983 | Ken.Hoggins@bbrown.com | MA |
| Insurer | The Hartford | Peter Mielert | Head of Y-Risk Innovation Labs | W: 860-547-2656 M: 703-517-0302 | peter.mielert@thehartford.com | CN |

# B: Key Contacts (cont.)

**Table 1: Key Contacts**

| Role | Company | Name | Specialty | Phone Number | email | Loc. |
|---|---|---|---|---|---|---|
| Insurer | AXA XL | Cheri Hanes | VP, Construction Innovation & Sustainability | (469) 719 1178 | cheri.hanes@axaxl.com | TX |
| Insurer | Zurich | Patrick McBride | | | patrick.mcbride@zurichna.com | |
| Insurer | FM Global | Timothee Rodrique | Staff Engineering Specialist, Climate & Structural Resilience \| Chief Engineer's Group | 401 415 1393 M: 774 545 6689 | Timothee.Rodrique@fmglobal.com | RI |
| Insurer | Insight Risk | Bret Bush | | | bret.bush@insightrisktec.com | |
| Insurer | Rosetta RM | Philip Callow | Entrepreneur | | philip@rosettarm.com | UK |
| Insurer | Chubb | Brian Link | | | Brian.Link@Chubb.com | |

# Appendix C: Verisk Mass Timber White Paper

Verisk™

# Mass Timber: New Technology Drives a New Construction Class

**By Xiaochuan (Lydia) Shi, PhD, CFPS and Kevin Kuntz, PE, CFPS, MIFireE, UL-CRP - Property**

# Introduction

Mass timber is an umbrella term referring to a number of large solid, built-up, panelized, or engineered wood products. Mass timber construction, in general, uses solid wood panels to frame a building's walls, floors, and roof. It is a sustainable and more carbon-friendly alternative to steel and concrete.

Technology evolving in modern engineered wood products has generated worldwide interest in construction using mass timber as a structural and architectural material. In response, a major change was made to the 2021 edition of the International Building Code (IBC). Three new construction types (Type IV-A, IV-B, and IV-C) were created to embrace the use of mass timber in tall buildings.[1,2]

Verisk is monitoring an increase in the use of mass timber in commercial building construction. We foresee accelerating market share growth for this new construction along with the urgent need to properly insure mass timber buildings. To help carriers properly underwrite and rate the risks associated with this emerging building type—which isn't expressly addressed in any of the existing ISO construction classes—a new construction class is included in the forthcoming 2025 Specific Commercial Property Evaluation Schedule (SCOPES). We are adapting our pricing and under-writing guidance to help address the different risks (including fire and wind) for this new class.

# Why mass timber and why a new ISO construction class?

## Climate-friendly, aesthetically appealing, and less costly

**Climate-friendly**
A greater focus on environmental responsibility is driving the construction industry to be more resilient and leverage renewables. Mass timber, as a green and renewable material, draws a surge of interest. Timber continues to store carbon absorbed by the trees while growing, rather than decaying and releasing it back to the atmosphere. Timber and wood products typically require less embodied energy to manufacture than other building materials, such as concrete and steel, which often leads to less greenhouse gas (GHG) emissions. The carbon-reducing impact of timber buildings goes beyond the sustainable forests that produce the products and absorb the carbon; due to its good heat insulation property, less energy is typically needed to heat and cool a timber building.

Counterintuitively, increasing the use of wood in the United States, mass timber in particular, also benefits forest health. As wildfires are getting worse in the United States, the U.S. Department of Agriculture (USDA) Forest Service states its concerns in a research paper—that the overly dense forests from a century of fire suppression are increasingly susceptible to large and severe wildfires.[3]

**Aesthetic appeal**
Beginning with the expansion of cities in the late 19th century, steel and concrete became the primary materials used to build high-rise structures. Around the world, modern skyscrapers are constructed almost entirely of steel and concrete. Architects and engineers have only begun to reconsider the merits of using timber as a structural building material over the past few decades. In the U.S., the mass timber movement was initially led by public-sector organizations and early adopters in the private sector attracted by the opportunity to create innovative, beautiful buildings.[4]

Because of timber's versatility, architects may choose it to realize their intended design over other, less flexible building materials. Timber isn't just aesthetically appealing, it is also tactile and multisensory, which facilitates a deeper relationship between people and their environment—promoting a sense of nature, even in urban spaces. Early adopters and investors have experienced superior velocity and resilience in terms of leasing and occupancy.[4]

**Overall lower costs and shorter construction schedules**
Compared with concrete and steel, wood is often less expensive. It's typically readily available and often delivered faster than other materials. Although current prices of mass timber products are relatively high, this is largely due to the cost of importing and transporting it from Europe. But wood can be locally sourced from North American forests, and we expect prices to decrease with the rise of more mass timber manufacturing capacity and increased local product supply in the United States.

Compared with concrete and steel, wood is often less expensive. It's typically readily available and often delivered faster than other materials.

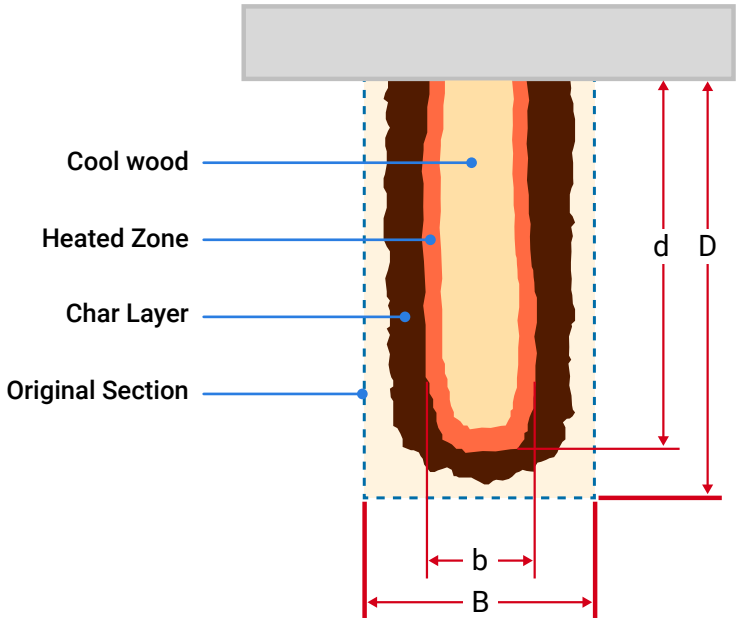
Since a mass timber building is much lighter than one constructed from steel and concrete, it needs less of a concrete foundation, which can be cost saving. In addition, mass timber components are often prefabricated, with advanced fastener technology that allows faster building erection, shortens construction schedules, and improves the return on investment. These benefits make the on-site installation faster and simpler. Fewer on-site workers are required, which helps to reduce labor costs and exposure to labor shortages.

## Good strength and good fire resistance

Wood is strong in the direction of the grain but weak in the cross direction. By setting each lumber layer perpendicular to the next, cross-laminated timber (CLT) is made strong in both directions. When a building's support structure is comprised of these modern engineered wood products, the building can effectively resist both vertical and lateral forces in earthquakes and high winds.

Because wood is combustible, people often doubt its performance in a fire, even though the evidence demonstrates that large size timber is difficult to ignite.Over decades[5-8], scientific studies have shown that timber can have effective fire resistance, making it a viable alternative to steel and concrete. Upon exposure to a fire, timber chars at a predictable rate, and the char layer acts as an effective thermal insulator to keep the inner core of the remaining wood cool and protect it from burning.[9]

With proper design, the remaining wood in mass timber elements can maintain the ability to support the building design load and continue performing a given structural function for the required time duration of fire exposure. This time duration is defined as the fire resistance rating (FRR), an important fire design measurement for compliance in both building codes and ISO SCOPES. With the known average charring rate derived from the char depth, the size of a mass timber element can be determined for a given structural element. This "effective cross-section" fire design method is the only building code accepted design method for fire-resistive exposed wood members in North America, which engineers and architects have adopted internationally to determine the sizes of mass timber elements that meet the fire resistance requirements.[9,10]




**This figure illustrates the reduction in demensions due to charring. B and D represent the size of a mass timber structural element; b and d represent the effective cross-section.**

In the United States, CLT design must comply with the National Design Specification for Wood Construction,[11] while structural glued CLT must be manufactured and identified in accordance with American National Standard for Performance-Rated CLT ANSI/APA PRG 320.[12]

### Code groups' advocation

Code groups recognize these trends and have accommodated fire-protected mass timber into building codes since 2015.[13] More recently, the International Code Council (ICC) has added three new construction types (Types IV-A, IV-B, and IV-C) to the 2021 edition of the International Building Code (IBC) to embrace the use of mass timber as structural members in tall buildings. This is the first time in modern building code (IBC) history that significant new construction types have been added.[14] This addition allows structural elements (columns, beams, floors, walls, roofs, etc.) to be constructed using mass timber materials. New provisions allow up to 18 stories (270 feet) of Type IV-A mass timber construction for buildings with business and residential occupancies fully protected by sprinkler systems.[1]

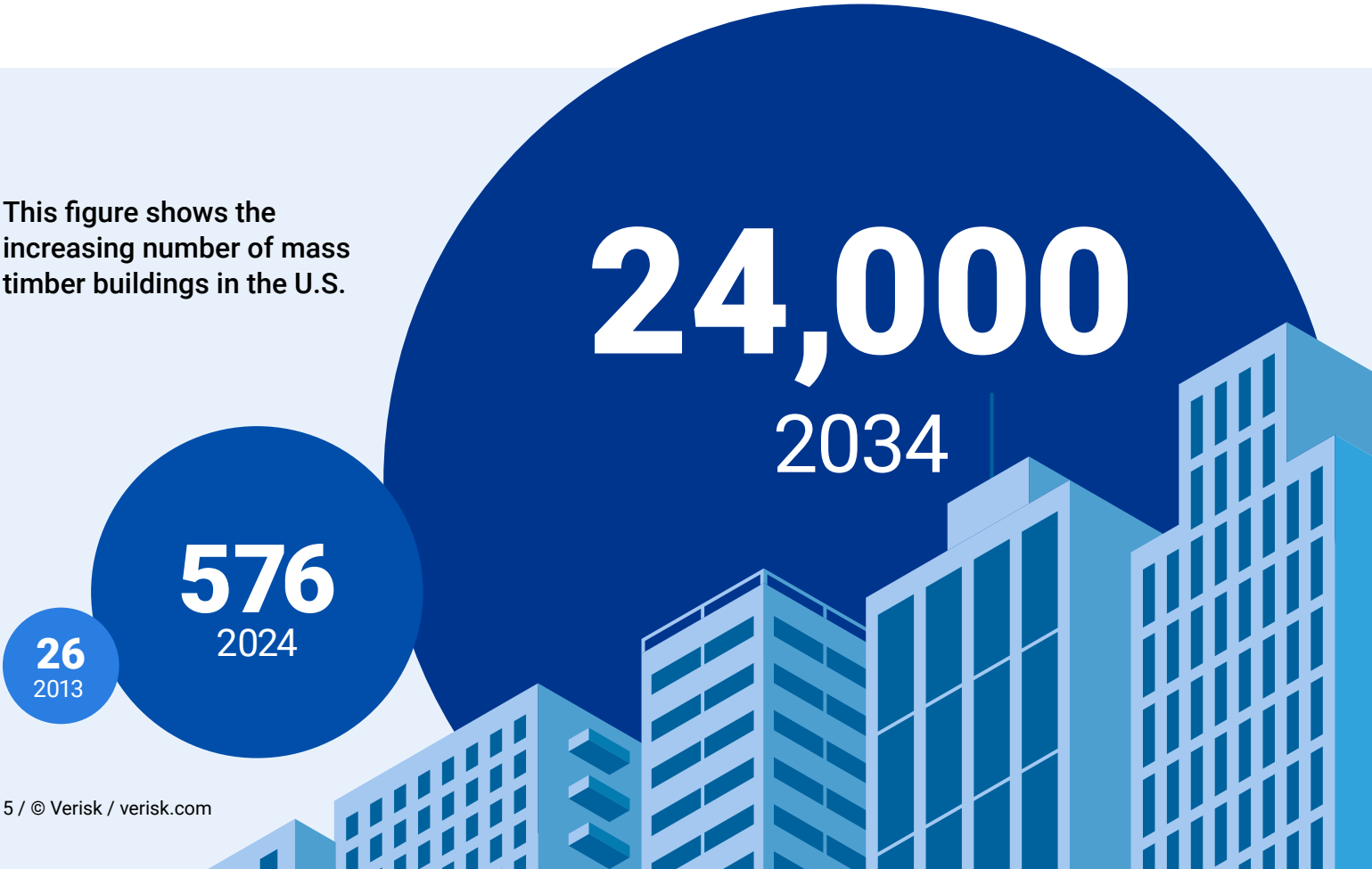
### Anticipate proliferation of mass timber buildings in the U.S.

CLT is the innovative technology driving the timber revolution in building construction worldwide, as it is considered sufficiently strong to be a viable alternative to steel and concrete. The new CLT technology and the approval of the new mass timber construction in the IBC model code have inspired the rapid proliferation of mass timber buildings in the United States.

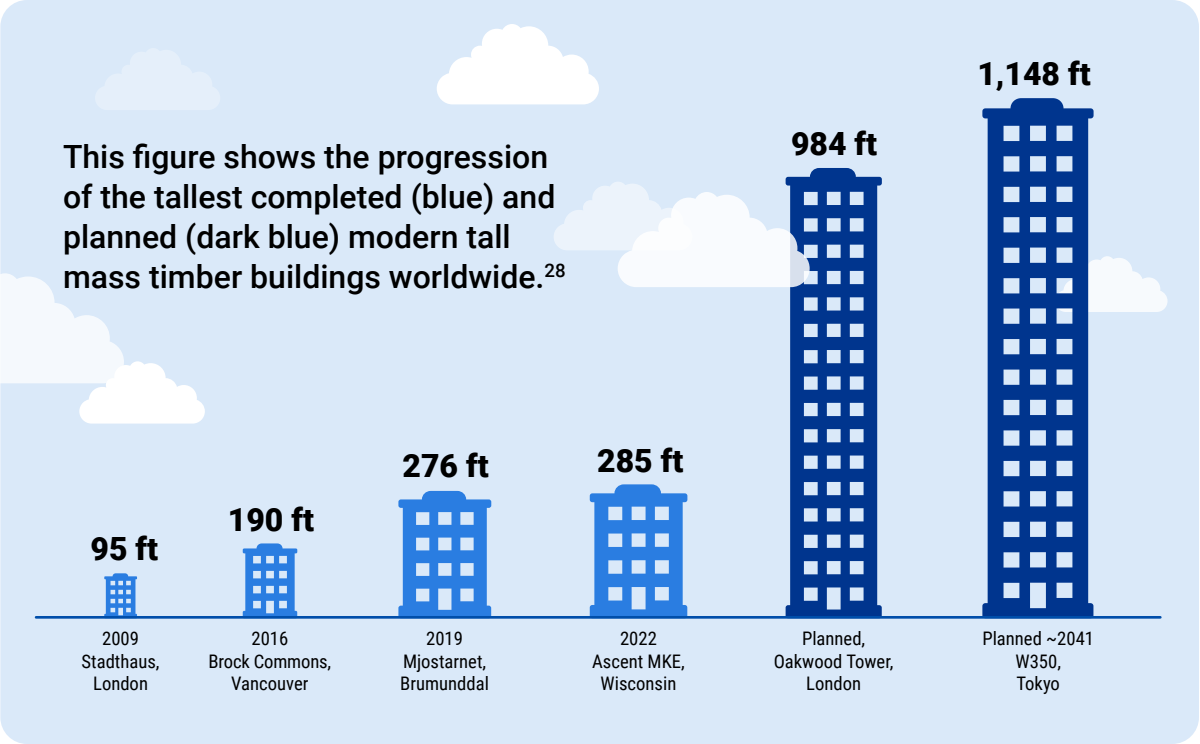
According to a PBS report in November 2021 by Megan Thompson, "In 2013, the U.S. had 26 mass timber buildings. Today there are 576 built or under construction. And several hundred more are in the works."[15] The number of mass timber projects completed, under construction, or in design increased about 40% from September 2022 to June 2024, according to data from Woodworks, the Wood Products Council. More than half of those projects involved CLT. The Forest Business Network has projected the number of mass timber buildings under construction could double each year to more than 24,000 by 2034.[16] As technology continues to evolve in mass timber development, we expect even more mass timber buildings to be built.

> "In 2013, the U.S. had 26 mass timber buildings. Today there are 576 built or under construction. And several hundred more are in the works."
>
> *Megan Thompson*

**This figure shows the increasing number of mass timber buildings in the U.S.**



It's also good to note that, internationally, planned heights of super high-rise mass timber buildings are increasing to 1,000 feet and more (300 – 350 meters), while in the United States, the 2021 IBC only allows up to 270 feet or 18 stories.[1]

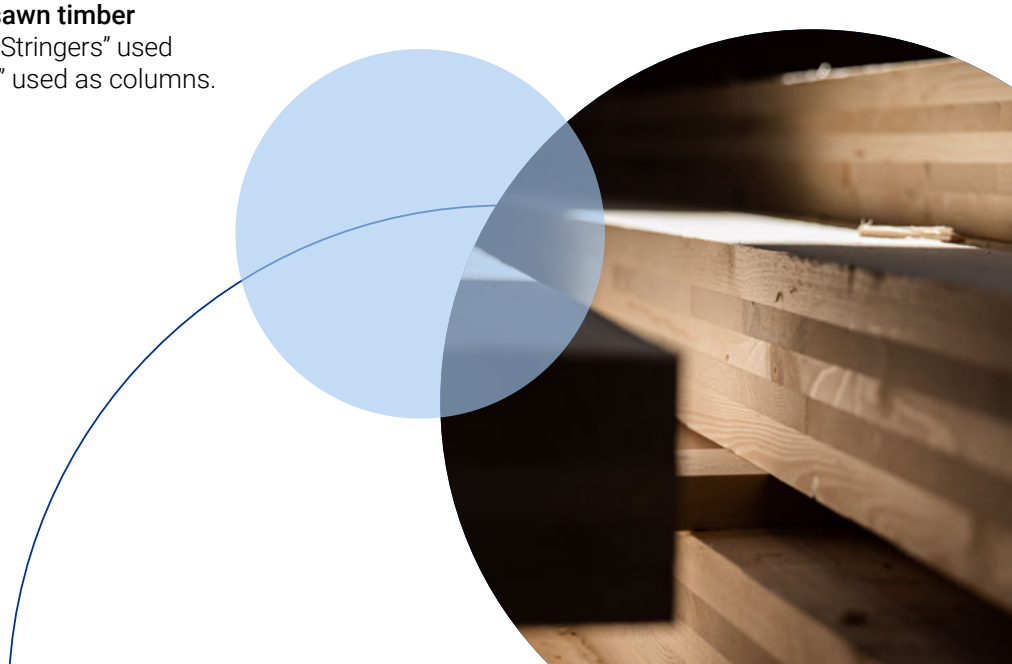



# Code groups' response

### Mass timber materials

Mass timber materials are rooted in heavy timber. However, when heavy timber is used to form structural elements in mass timber buildings, it must meet the minimum dimensional requirements.[1] The minimum dimensions are determined based on the effective cross-section method, which calculates a smaller cool core section retained in a fire that is capable of supporting the design load for a required time period.[9] This duration is defined as the fire resistance rating.[9,10]

Heavy timber initially was the term for **solid sawn timber (or saw lumber)**, which includes "Beams and Stringers" used as bending members and "Posts and Timbers" used as columns.



## Types of mass timber materials:

### Glued laminated timber (GLT) or Glulam

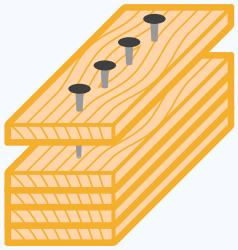
was included in the 2006 IBC and is used for beams and columns (Glulam) as well as panels (GLT).

Glulam, when used as a beam or column

GLT when used as a panel

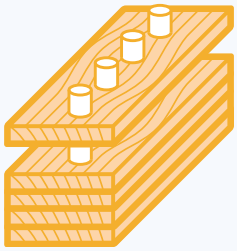
### Nail-laminated timber (NLT)

which is mechanically laminated using nails, is generally used in floor and roof decks.



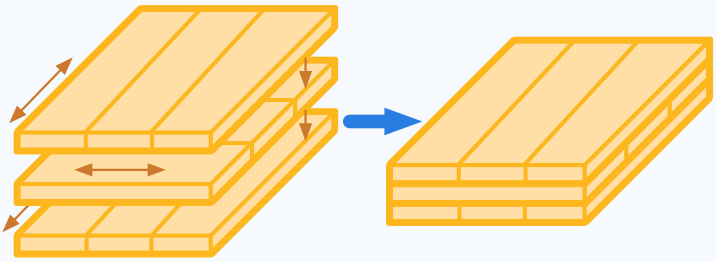
### Dowel-laminated timber (DLT)

is a new-generation mass timber material popular in Europe. Like NLT, it is mechanically laminated, but with dowels instead of nails.



### Cross-laminated timber (CLT)

was introduced into the heavy timber category in the 2015 IBC and is often used for load-bearing walls, floors, and roof decks.



### Structural composite lumber (SCL)

was introduced into the heavy timber category in the 2015 IBC and is good for beams, headers, rafters, and scaffold planking.

1. PSL: Parallel Strand Lumber
2. LSL: Laminated Strand Lumber
3. LVL: Laminated Veneer Lumber
4. OSL: Oriented Strand Lumber

In addition to the materials on the previous page, timber-concrete composite (TCC) and post-tensioned timber (PTT) are also included in the FM Global Property Loss Prevention Data Sheet (FMDS0101)[17] as mass timber products.

## Mass timber construction

Mass timber construction refers to a new construction category that uses any of the aforementioned large solid, built-up, panelized or engineered wood products that meet both dimensional and fire resistance rating requirements for building structural elements, including walls, columns, beams, floors, and roofs.

**In the 2021 edition of the IBC,[1] there are three types of mass timber construction:**

1. Type IV-A: Mass timber elements are 100% encapsulated by approved non-combustible material—no exposed mass timber permitted. FRR requirements are 3 hours for walls, 2 hours for floors, and 1.5 hours for roofs (up to 18 stories or 270 feet).
2. Type IV-B: Mass timber elements with limited portions of ceilings, beams, columns, or interior walls exposed. FRR requirements are 2 hours for walls and floors and 1 hour for roofs (up to 12 stories or 180 feet).
3. Type IV-C: Mass timber can be fully exposed without requirement of encapsulation, except shafts, concealed spaces, and outside of exterior walls. FRR requirements are 2 hours for walls and floors and 1 hour for roofs (up to 9 stories or 85 feet).

| | IBC 2021 | | | IBC 2015 |
|---|---|---|---|---|
| | TYPE IV-A | TYPE IV-B | TYPE IV-C | TYPE IV-HT |
| Type of protection required | Fully encapsulated | Protected exterior<br>Partially exposed interior | Protected exterior<br>Exposed timber interior | None |
| Maximum number of stories | 18 | 12 | 9 | 6 |
| Maximum building height | 270 | 180 | 85 | 85 |
| Allowable building area | 972,000 sq. ft. | 648,000 sq. ft. | 405,000 sq. ft. | 324,000 sq. ft. |
| Average area per story | 54,000 sq. ft. | 54,000 sq. ft. | 45,000 sq. ft. | 54,000 sq. ft. |

**4. IBC also requires that:**

1. All structural elements, including non-load bearing exterior and interior walls, must be constructed from mass timber or noncombustible materials.
2. Exposed mass timber elements must meet the same FRR requirements as the encapsulated mass timber elements. This means the exposed mass timber element must be designed properly to maintain its minimum cross section when exposed to a fire to support the design load during a required time period.
3. The mass timber construction Type IV-A has the same FRR requirements as those for the fire-resistance-rated, noncombustible construction Type I-A, while the required FRRs are the same for Type IV-B, Type IV-C, and Type I-B. The only difference is that the mass timber constructions have no FRR reduction for sprinklers.

This means mass timber construction can be hybrid when constructed along with noncombustible materials such as steel and concrete, as long as the materials meet the FRR requirements.[1] This definition also aligns with the FM Data Sheet.[17] However, the FM Data Sheet doesn't further differentiate the construction type based on the percentage of exposed timber as the IBC does.

**Required fire-resistance ratings (hours by element) by constrution type (IBC 2021–Table 601) and comparison to fire-resistive/non-combustible (I-A and I-B)**

| Building Element | 1-A | 1-B | IV-A | IV-B | IV-C | IV-HT |
|---|---|---|---|---|---|---|
| Primary structural frame | 3 | 2 | 3 | 2 | 2 | HT |
| Exterior bearing walls | 3 | 2 | 3 | 2 | 2 | 2 |
| Interior bearing walls | 3 | 2 | 3 | 2 | 2 | 1/HT |
| Floor construction | 2 | 2 | 3 | 2 | 2 | HT |
| Roof construction | 1.5 | 1 | 1.5 | 1 | 1 | HT |

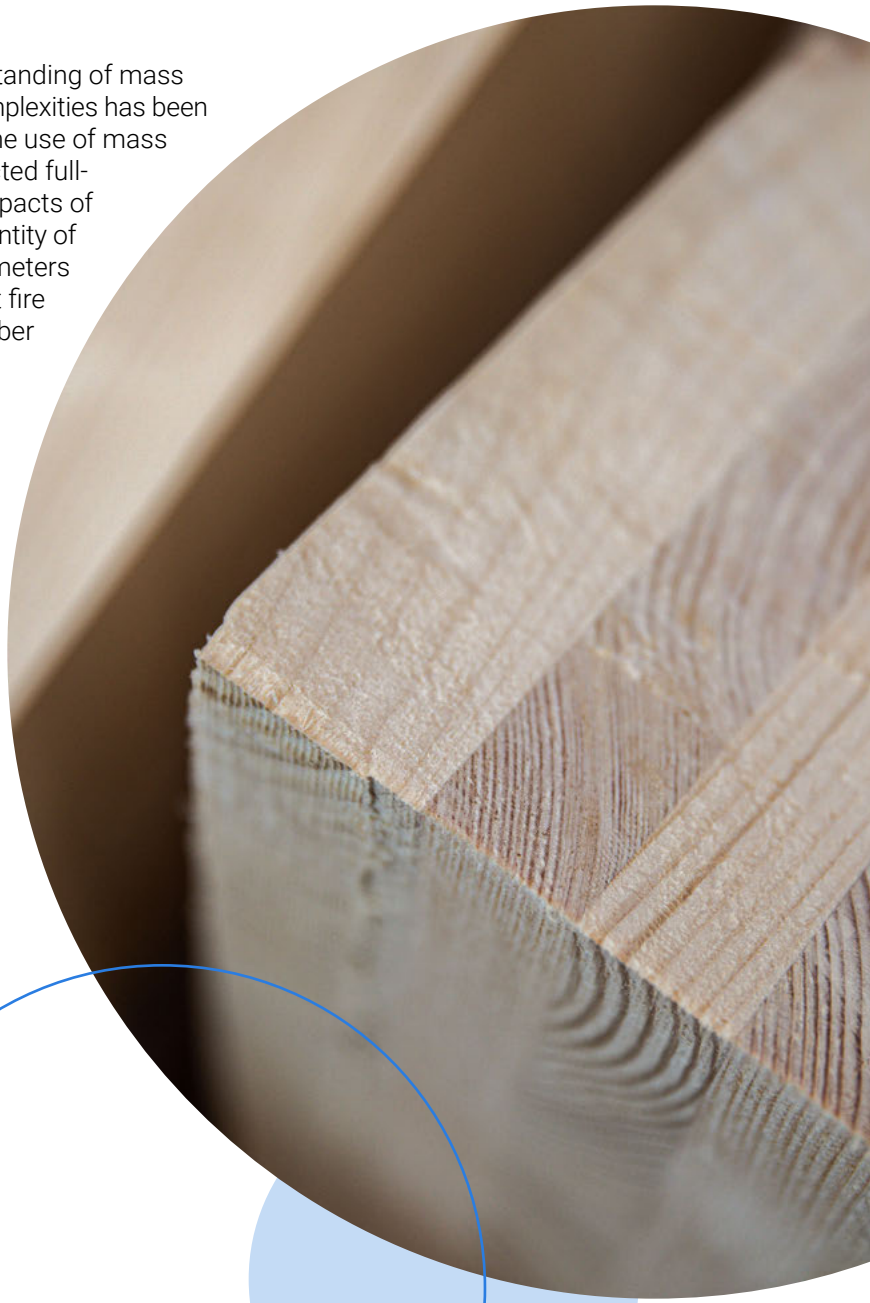
These values can be reduced based on certain conditions in IBC 403.2.1 which do not apply to Type IV buildings.

# Fire testing

As one of the oldest construction materials, timber was extensively used in building construction before steel and concrete were widely used for construction. Light-framed wood constructions were popular in the mid-19th century as timber was inexpensive, sustainable, and easy to use. However, massive fires in cities such as Chicago (1871), Baltimore (1904), and San Francisco (1906, post-earthquake fire) resulted in strict building codes limiting the height of residential wood buildings to less than five stories.[18]

In the late 19th century, steel and concrete started to be widely used for high-rise buildings, and timber was largely discarded as a building material for larger buildings in urban areas for a long period. Technology has enabled this sustainable material to become more inherently fire resistant,[19] paving the way for its use in high-rise buildings.

Achieving fire-safe tall wood buildings requires an understanding of mass timber's fire behavior. Research at different scales and complexities has been carried out ever since architects once again considered the use of mass timber in building construction. Researchers have conducted full-scale compartment fire experiments to investigate the impacts of compartment size, construction, size of openings, and quantity of exposed mass timber. They select these key design parameters to evaluate their influences on mass timber compartment fire behavior, including temperature, contribution of mass timber as a fuel to fire, and charring behavior of mass timber structural elements.[20-28]



Researchers in the United States and Canada conducted a series of full-scale compartment tests to quantify the contribution of unprotected (exposed) and protected (encapsulated with gypsum board) CLT assemblies to fire, charring rates, decay, and self-extinguishment for various sizes of compartment and opening under loading conditions.[20-28] Test results showed that fully protected CLT did not contribute to the fire as charring can be minimized or even prevented when its surfaces are protected by commercially available noncombustible materials such as gypsum board.[20-28] However, delamination, char fall-off from exposed CLT, and gypsum board fall-off from protected CLT were observed in most of the full-scale compartment tests mentioned above.[20-28] Fire regrowth occurred as a fresh timber layer was exposed and fed the fire, consequently resulting in increased charring rate and fire intensity.[20-28] It was also identified that delamination of unprotected CLT was due to adhesive failure under high temperatures.[20-28]

In 2017, the USDA Forest Products Laboratory (FPL) led two-story mass timber building fire testing in support of the mission of the ICC Ad Hoc Committee on Tall Wood Buildings.[26] Five full-scale fire tests were conducted to observe the fire performance of a two-level, apartment-style structure constructed of mass timber (CLT), with and without sprinkler suppression. The structure had a one-bedroom apartment, an L-shaped corridor on each level, and a stairwell connecting the two levels. The CLT walls and ceilings were protected by gypsum board at different levels from 100% to partial protection.

These FPL compartment fire tests were specifically designed to understand the structural performance in fire for up to four hours and guide the fire resistance requirements of Type IV-A (Test 1), IV-B (Tests 2 and 3), and IV-C (Tests 4 and 5) proposed during the 2021 IBC model code development on mass timber construction.[26] The results showed that no delamination and fall-off occurred with protected CLT elements, which confirmed the importance of proper protection to mass timber construction fire safety.[26] Localized delamination of exposed CLT occurred at 115 minutes in Test 3.[26] Results also proved that sprinklers can effectively control fire spread and prevent mass timber ignition.[26]

To address the delamination caused by adhesive failure, the conditions of the NIST compartment fire testing[25] are used as the basis for current regulations in ANSI/APA PRG 320-2018, Standard for Performance-Rated Cross-Laminated Timber.[12] In early 2018, five full-scale compartment tests were conducted using the second-generation CLT panels[27] produced in compliance with PRG 320-2018. Results showed the second-generation CLT with thermal-resistant adhesive improved significantly in fire performance and resisted char layer fall-off.[27] There was no delamination and char layer fall-off after the char front had passed the glue bond line.[27]

# Major concerns from an underwriting perspective

Although research has demonstrated the fire resistance of mass timber, there are still concerns related to underwriting mass timber buildings.

## Insufficient understanding of overall mass timber building fire performance[29]

**We need to better understand the contribution of exposed mass timber elements to building fires.**

Mass timber as a combustible material can add additional fuel to the fire, especially when char fall-off occurs, as it would continuously fuel the fire

Additional fuel contributes to longer fire duration, higher temperatures, and the risk of fire spreading to the building façade.

**Fire decay and post-fire decay have not been fully investigated, as fires were suppressed earlyin most experiments.**

- Non-flaming charring (smoldering) can continue long after the cessation of flaming during the fire decay period and further affect the structural capacity.
- After the end of flaming, heat transfer into the timber elements can lead to continued degradation of their structural integrity, including causing adhesive glue line failure in CLT.

**The fire performance and structural capacity of connections, joints, and fasteners in mass timber buildings are poorly understood.**

There is a lack of fire testing for commercial buildings with large, open floorplans.

- Previous research mostly focused on residential buildings with smaller compartments (apartments). Commercial buildings with larger floor areas, such as offices, need to be assessed.
- Timber ceilings can span the entire floor area of the compartment, and fire spread across and over these surfaces requires further research.

There is a lack of sprinkler system design requirements for mass timber buildings.

Previous research has proved that sprinklers can effectively control fire spread, but not many tests have focused on the role of sprinkler systems in mass timber buildings. The 2021 IBC model code requires mass timber buildings to be fully sprinklered, but the sprinkler design requirements for these buildings employ the same requirements as for fire resistive buildings. Mass timber is a combustible material that changes the fire dynamics in these buildings, which can impact the entire sprinkler design, including design density and water supply. Insufficient sprinkler protection will likely lead to severe property loss.

## Water damage

Besides fires, water damage is another major concern for mass timber buildings. Whether due to sprinkler discharge, water pipe failure, water extrusion, or moisture, the impact on structural capacity is not very clear. Further research and clear code guidance are required for underwriting purposes.

## Post-damage restoration, including the cost of repairs and replacement

From an underwriting perspective, one must consider the following:

- The definition of different levels of damage—including fire, water, earthquake, fungus, mold, etc.—and the approach to evaluating damage
- When the damage is repairable, the cost of the repair, and when a replacement is required
- Whether different timber material is allowed for a replacement, and how to match the replacement to the damaged element
- The approach to evaluating and recertifying post-repair structural integrity (for instance, after removing the charred section)

## Concerns regarding evacuation time and access by fire services for tall mass timber buildings

Is it safe to enter a post-fire mass timber building? Most fire tests were terminated when the fire was extinguished, so post-fire thermal penetration into CLT (adhesive) has not been fully researched. Design guidance could be inadequate to make sure the building does not collapse, and therefore it could be unsafe for fire services to enter the building.

# How Verisk addresses it

Verisk has been closely tracking the growing interest in tall wood buildings, especially since the formation of the International Code Council (ICC) Tall Wood Building (TWB) Ad Hoc Committee in 2015. To effectively adapt to the new technology and evolving building codes, we've enhanced the Specific Commercial Property Evaluation Schedule (SCOPES) and added a new construction class M to provide guidance on fire risk rating for this unique construction type. We've also modified our loss cost and underwriting reports for wind risk rating accordingly.

### Basic Group I – Fire risk

Although studies have been conducted to understand the fire performance of CLT and Glulam/GLT, many other factors need to be considered from a fire safety perspective—so that stakeholders (designers, engineers, manufacturers, underwriters, insurers, etc.) can better understand overall fire performance, damageability when exposed to a fire, and post-damage restoration (fire, water, etc.) for mass timber buildings.

Therefore, after a thorough analysis, Verisk has added mass timber construction to the 2025 SCOPES Revision as follows:

1. All three mass timber construction types defined by the 2021 IBC will be categorized between "Non-combustible construction" (CC-3) and "Joisted Masonry construction" (CC-2) in SCOPES as "Mass Timber construction" (CC-M).
2. Weighting factors are created to reflect the fire risk posed by Mass Timber construction. These factors are determined based on the results of an engineering analysis the Verisk risk engineering team conducted.

### Basic Group II – Wind risk

Timber inherently has the ability to withstand high loads for short periods and retain its elasticity and ultimate strength, making it conducive to meeting the challenges of wind-resistive design.[30] The CLT shear wall and diaphragm—which are designed to provide good lateral resistance[1,2]—enhance its wind-resistive performance. Additionally, mass timber high-rise buildings are designed using concrete foundations and cores. This hybrid construction enables mass timber buildings to achieve wind-resistive performance similar to Fire Resistive or Modified Fire Resistive constructions as defined in SCOPES and Rule 70. Therefore, the same BGII symbols are assigned to mass timber construction.

As we change the systems to reflect the fire- and wind-related performance and risks of new mass timber construction, insurers may want to consider changing their systems and underwriting guidelines accordingly.

# Summary

The rapidly increasing popularity of mass timber in building construction raises several questions. Is the insurance industry ready for the mass timber revolution? What rating methodology can insurers use to help them accurately underwrite property insurance policies for mass timber buildings?

We are planning to provide a mass timber rating schedule in the 2025 SCOPES Revision. With the release of the revision, Verisk will start to collect mass timber construction data through our unique on-site data collection system. Additionally, as a member of the Property Insurance Research Group (PIRG), Verisk has been sponsoring projects of the Fire Protection Research Foundation, a research affiliate of the National Fire Protection Association (NFPA), since 2018. Several potential mass timber research projects have been discussed and initiated with the PIRG group, which are expected to address these concerns from an insurer's perspective. After the SCOPES revision release—and with more mass timber building data being collected and an improved understanding of mass timber fire performance—Verisk will continuously monitor the progression of this new type of construction and provide enhanced rating methodology to customers.

# References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# Appendix D: FM Global Data Sheet

**MASS ENGINEERED TIMBER**

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## List of Tables

## 1.0 SCOPE

This data sheet provides recommendations on the construction and fire protection for mass engineered timber buildings. This data sheet does not address natural hazard exposures and recommendations.

See Section 4.1 for other data sheets that provide design information and guidance for mass engineered timber.

### 1.1 Hazards

The use of mass engineered timber in construction is expanding and is considered a sustainable product. Mass engineered timber is constructed with smaller pieces of soft wood that are adhered into one piece to withstand structural loads. These mass engineered timbers perform well from a structural standpoint but pose unanswered questions in other areas that traditional noncombustible structural elements do not. These open unanswered questions are related to moisture concerns, understanding the criticality of the joints and assembly, transfer of fire through joints or fasteners and the ability to complete repairs.

Mass timber (large single pieces of wood) has been in use for hundreds of years. What is new is how small soft pieces of wood are adhered together to create a structural element and built to greater heights. The old mills that were built over 100 years ago used mass timber (solid wood, not adhered small pieces) and were typically less than 7 stories in height. Mass engineered buildings are now being constructed hundreds of feet in height, providing new challenges and unanswered performance questions. These concerns increase as the height and size of the buildings increase. The changes in height and size lead to new engineering designs, the need for individual component tests, and a lack of loss and repairability history.

Understand that mass engineered timber is wood and that wood burns. New areas should be considered when building with a combustible engineered building product, such as performance of the adhesives and the criticality of the joints and fasteners. There are longer term concerns related to the adhesive's performance with respect to moisture, both during and after construction. Little is known with respect to repairability of mass engineered timber. Repairs will utilize an engineered solution based on other materials, and concepts such as those used in lower mass timber buildings, or taller concrete and steel buildings. The concern becomes greater as mass engineered timber buildings are built taller with more creative, intricate designs and patterns.

### 1.2 Changes

**July 2023.** This is the first publication of this data sheet.

## 2.0 LOSS PREVENTION RECOMMENDATIONS

### 2.1 Construction

#### 2.1.1 Moisture Protection of Roofs and Floors

2.1.1.1 Provide an FM Approved roof cover assembly for steel deck that includes a pliable sheet and meets one of the following criteria:

A. Provides temporary protection from water intrusion and allows for drying by moisture vapor diffusion or:

B. Provide an ice-water protector (a.k.a. as separator sheet), such as one with a modified bitumen base sheet applied directly on top of the cross laminated timber deck.

2.1.1.2 An alternative to using a FM Approved roof assembly which includes a pliable sheet meeting section 2.1.1.1 is to provide an FM Approved active leak detection system per Data Sheet 1-29, *Roof Deck Securement and Above-Deck Roof Components.*

2.1.1.3 Seal splices, seams, joint or interfaces in cross laminated floors internal to the building structure as soon as possible during construction.

Manufacturers will recommend the type of sealing tape to be used. A tape is generally used for ease of installation. The sealing of these joints will help keep moisture out of the joints while under construction and prior to covering the floor deck with any barrier such as soundprofing, concrete or lightweight concrete.

2.1.1.4 Provide moisture protection between mass engineered columns and finished floors.

2.1.1.5 Provide a minimum roof slope of 1/4 in./ft (6.4 mm/304 mm) toward roof drains or building edge when constructed of mass engineered timber.

### 2.1.2 Vegetative Roofs Systems and Roof Mounted Solar Photovoltaic Panels

2.1.2.1 Install a noncombustible gypsum cover board or equivalent noncombustible material, such as mineral wool or expanded glass, directly below the roof membrane when installing a vegetative roof system or roof mounted solar photovoltaics on cross laminated timber roof decks or other types of mass engineered timber roofs. (See Data Sheet 1-15, *Roof Mounted Solar Photovoltaic Panels* or Data Sheet 1-35, *Vegetative Roof Systems*).

### 2.1.3 Roof Membrane Securement and Pull-out Testing

2.1.3.1 Use Roof*Nav* assembly designed for use on steel deck with appropriate ratings described in Data Sheet 1-28, *Wind Design*, and in accordance with Section 2.1.1.1. Use a Roof*Nav* assembly that includes a gypsum thermal barrier directly over the deck or a gypsum coverboard over the insulation. Comply with the following:

A. Do not modify fastener spacing that is specified within the Roof*Nav* listing unless adequate wood screw resistance cannot be met following the guidance presented here. In this case, a tighter spacing can be utilized, and the analysis checked per the equations and limits specified in Table 2.2.3. However, the specified fasteners should be replaced with wood screws that have an equivalent head shape and size, regardless of spacing.

B. Calculate the required minimum penetration of the wood screws as presented within Table 2.2.3 without exceeding the upper resistance limit of the screw.

C. The penetration length of the wood screw must be less than the thickness of the cross laminated timber deck.

*Table 2.2.3 Fastener Resistance*

| *Wood Screw Size* | *Required penetration of screw into Solid Sawn Lumber Wood Members (including CLT)* | *Upper Resistance Limit (Factored Load/Fastener)* |
|---|---|---|
| #8 | Req'd penetration [in.] = (1/115 * Rating * Trib Area) + 0.3 > 1 in. | Factored Load per fastener [lb] ≤ $F_u$/111 |
| #10 | Req'd penetration [in.] = (1/133 * Rating * Trib Area) + 0.4 > 1 3/16 | Factored Load per fastener [lb] ≤ $F_u$/83 |
| #12 | Req'd penetration [in.] = (1/151 * Rating * Trib Area) + 0.4 > 1 5/16 | Factored Load per fastener [lb] ≤ $F_u$/65 |
| #14 | Req'd penetration [in.] = (1/169 * Rating * Trib Area) + 0.5 > 1 1/2 | Factored Load per fastener [lb] ≤ $F_u$/50 |

**Notes:** See Section 3.2 for an example calculation.

The equations provided are based on the following:
- NDS equation 12.2-2
- NDS Appendix L wood screw dimensions
- Wood Specific Gravity value of 0.35 (conservative)
- For actual wood specific gravity > 0.5, a pilot hole is required
- Wood moisture content < 19%
- Wood not exposed to temperatures > 150°F [66°C] for extended periods
- Load Duration Factor of 1.0 (conservative)
- Minimum wood screw penetration is 6 x screw diameter; this is depicted by the value on the right side of the inequality
- Required penetration includes the tapered end of the screw but not unthreaded portions. In other words, required minimum penetration is met with threaded portion of the screw only.

Notes specific to the upper resistance limit:
- The value $F_u$ is the tensile strength [psi] of the selected wood screw. If this is unknown, use 45 ksi as a conservative estimate.
- Upper resistance limit is based on allowable tension in screws per AISI S100-16, J4.4.3, $\Omega t$ = 3.00, and derivation based on tensile strength and net area calculated using root diameter (Dr) of wood screws in NDS Appendix L

Manufacturer's data, when available, may be used in lieu of the calculation for the upper resistance limit (Factored load per fastener must be less than ultimate strength). If the upper resistance limit is violated, either a larger screw size or higher-grade screw material should be used and the analysis checked per the equations and limits specified in the table above.

Note that although an FM Approved above roof deck assembly is used as the basis, the entire roof assembly will not be considered FM Approved.

### 2.1.4 Adhesives

2.1.4.1 Use mass engineered timber constructed with a heat resistant adhesive that meets ANSI/APA PRG-320 (2018 edition or later): *Standard for Performance-Rated Cross-Laminated Timber*.

### 2.1.5 Fire Ratings, Connections and Joints

2.1.5.1 Provide fire-resistant ratings using noncombustible materials when required by other FM Global Loss Prevention Data Sheets.

2.1.5.2 Provide FM Approved fire stopping material around any concealed joints that use metal in a fire-resistant assembly. Seal all fire-rated penetrations.

### 2.1.6 Maximum Foreseeable Loss and Space Separation

2.1.6.1 Use noncombustible construction for maximum foreseeable loss (MFL) walls within mass engineered timber buildings.

2.1.6.2 Mass engineered timber is considered a combustible-exposing fire hazard for purposes of Data Sheet 1-42, *MFL Limiting Factors*.

## 2.2 Fire Protection

2.2.1 Provide automatic sprinkler protection in all mass engineered timber buildings in accordance with FM Global Loss Prevetnion Data Sheet 3-26, *Fire Protection for Nonstorage Occupancies*, or other applicable occupancy Data Sheet. Protect concealed spaces in accordance with FM Global Loss Prevention Data Sheet 1-12, *Ceilings and Concealed Spaces*.

2.2.2 An alternative protection is to provide an FM Approved water mist system that is listed for HC-1 applications.

## 2.3 Operation and Maintenance

### 2.3.1 Moisture Mitigation

2.3.1.1 When a mass engineered timber building is exposed to river, coastal or storm water, use noncombustible structural components, such as steel or concrete, for any level that may be exposed to river, coastal or storm water. The use of mass engineered timber, especially with end grain near the ground, will absorb water and could produce significant damage to the structure of the building.

### 2.3.2 Moisture Mitigation Planning

2.3.2.1 Develop and implement of a moisture management plan for mass engineered timber buildings under design and construction. The development of the moisture management plan is necessary at the architectural design level, which includes specifications. These documents ensure adequate steps are taken to prevent moisture and subsequent damage to the mass engineered timber.

### 2.3.3 Design Stage

2.3.3.1 Develop a moisture management plan during the design phase. If possible, the contractor should be included and understand their responsibilities and duties. The moisture management plan must indicate who is responsible for the implementation and actions of the moisture plan during construction. Include the requirements of the moisture management plan in the specifications for the general contractor and sub-contractors. Provide clear expectations that the plan is to be followed during construction and on weekends and holidays. Include the following, as applicable.

A. Install the wooden building components during the dry season.

B. Install a factory applied moisture resistant coating on the mass engineered timber prior to shipment.

C. Cover each panel individually prior to shipping with using taped and secured lumber wrap or a self-adhesive membrane.

D. Design the structure and each assembly to minimize the potential for trapped moisture and promote the ability of the wood to dry.

E. Include actions to be taken in the event of any delay in delivery or construction.

F. Install the façade and enclose the building as soon as possible.

### 2.3.4 Construction

2.3.4.1 During the construction phase include the following as part of the moisture management program as applicable:

A. Provide boards between the CLT panels or glulam beams for ventilation and to keep the wood off the ground during storage.

B. Provide an active water management team onsite with team members identified. Identify who will implement the moisture management plan (such as deployment of small tarps, leaf blowers, squeegees/ vacuums, etc.). Begin removing water as soon as rain or snow ends.

C. Measure the moisture content prior to the installation of any barrier such as soundproofing, roof covering, concrete, or lightweight concrete. Measure the moisture content of the wood in several places, including any available end grains. Measurements should be taken near any areas that appear wet, exterior openings, as well as interior locations, which have had recent moisture or possibility of moisture. The moisture content of each measurement must be below 19% prior to enclosure. Averaging moisture content is not acceptable. Any measurement greater than 19% must be dried out and moisture content remeasured to ensure it is below 19%.

D. Install a FM Approved membrane, which is part of an Approved roof assembly to serve as a temporary cover as soon as possible following the installation of the roof deck. If providing an FM Approved active leak detection system, provide a temporary cover to prevent moisture from penetrating into the wood and prior to the installation of the roof covering. Check for moisture prior to installing the roof cover. Complete the roof and enclosure as early as possible to protect the entire structure.

E. Sealing any splice, seam, joint and interface as soon as possible following panel installation to prevent trapped moisture.

F. Provide tarps if rain, snow or ice is forecast including prior to night or weekend weather events.

G. Update the moisture management plan with the owner, contractors and design team throughout the construction. Complete updates after each moisture event. Modify the moisture management plan as needed.

### 2.3.5 Remediation

2.3.5.1 During construction moisture will enter the building. Long term leaks must be resolved and repaired upon detection. During the remediation phase include the following as applicable:

A. Dry wetted wood (e.g., CLT and joint splines areas) before they are sealed, covered or enclosed. Dry wood with mechanical ventilation. Verify moisture content is below 19% prior to covering with roof cover, concrete, lightweight concrete or other materials.

B. When the ambient environment is not ideal for drying or needs to be accelerated, recommend drying by fans or dehumidification.

C. Remove any non-structural components such as drywall, insulation, and other coverings that have been installed to verify and ensure there is no trapped moisture.

## 2.4 Human Factor

2.4.1 Conduct infrared thermography of the roof cover and deck every three years. Conduct infrared thermography of walls constructed of mass engineered timber every three years.

2.4.2 Develop a three-year frequency cycle after completing the initial infrared thermography, based on the following:

A. One year after construction is complete

B. One year after any roof work has been completed that has the potential to introduce moisture within the building

C. One year after any wall or component of a wall constructed of mass engineered timber has had work completed that has the potential to introduce moisture within the building

2.4.3 Determine the source of moisture found during infrared thermography. Hire a structural engineer to review the area affected by moisture and determine if the structure is capable of carrying the original structural design loads safely. If not, develop a repair plan. Plan to repair the structure back to the original design requirements. Conduct repairs to eliminate the source of moisture, repair any damaged material and ensure the woods moisture content is less than 19% prior to re-covering.

2.4.4 If the roof is protected with an FM Approved ice-water protector or FM Approved active leak detection system, the infrared thermography of the roof cover and deck can be conducted every six years.

2.4.5 Avoid hot work. Where it cannot be avoided, hot work involving a mass engineered timber building should be considered high-risk. Recommend the appropriate precautions as outlined in Data Sheet 10-3, *Hot Work Management*, and use the FM Global Hot Work Permit System.

2.4.6 Do not use torch-applied roof systems. See Data Sheet 1-0, *Safeguards During Construction*, for further loss prevention guidance during construction.

## 3.0 SUPPORT FOR RECOMMENDATIONS

### General

Engineered timber is a wood product that is manufactured by binding or fixing small pieces of wood with adhesives or other methods, such as dowels or nails. It is referred to as mass engineered timber when it meets minimum dimensional sizes in accordance with building codes. It has become popular for several reasons including sustainability, lighter weight and lower overall cost compared to traditional construction. One of the biggest cost savings is the reduction in labor to construct a mass engineered timber building. The ability to construct and transport pieces for just in time installation and the speed of installation is beneficial in congested areas.

### Mass Engineered Timber Building Design Approaches

The design approaches are provided for information. The client, in conjunction with the design team, will decide which approach is best for their project. Recognize that in mass engineered buildings, the majority of the work is completed at the beginning of the process, including coordination and cutting of all penetrations at the factory. This requires significant coordination of the architect, structural engineers, mechanical, electrical and plumbing trades. Design changes are very unlikely after the design is completed due to the upfront coordination work. It is imperative that FM Global be involved in the design at the onset of a project.

There are four different mass engineered timber design approaches. Understanding the different design approaches greatly affects the ability to impact changes during the design. The first two designs identified below rely heavily on upfront planning. In these designs, months are spent on the layout of mechanical, electrical and plumbing to be pre-cut at the factory during manufacturing. Once completed, any changes to the design are unlikely or, at best, very difficult to affect. The sprinkler protection layout and design have been completed as well. Companies may refer to these approaches differently, but the goals of each are similar. All four designs have the delivery of the mass engineered timber as part of the service. The design approaches are as follow:

Design and Supply – The manufacturer has the ability to provide full engineering and partners with the architect to retain the original intent while maximizing the mass engineered timber elements and members. Complete detailing and CAD services are provided. This service includes coordination and pre-drilling for mechanical, plumbing and electrical.

Manufacturing Design Assist – The mass engineered timber manufacturer will assist the engineer of record and architect on the design to achieve cost optimization. Complete detailing and CAD services are provided. This service includes coordination and pre-drilling for mechanical, plumbing and electrical.

Traditional Bid – The engineer and architect of record will complete the design and drawings as they normally would for any project. The mass engineered timber manufacturer then provides complete detailing and CAD services.

Fabrication Only – The mass engineered manufacturer provides the supply of mass timber per single piece drawing or possibly fully detailed 3D model and delivers to the site.

All manufacturers offer a pre-staging service for mass engineered timber. This service allows for coordinated delivery and installation. This is common in congested areas where the mass engineered timber arrives by truck in the order in which it is to be installed.

### Material Optimization and Service Integration

Involving the manufacturer as early as possible in the design allows for optimization of the mass engineered timber (column and beam spacing). The manufacturer will work on the layout of columns, beams and cross-laminated timber (CLT) flooring to minimize panel thickness, increase the span of the columns, save materials and minimize waste.

One benefit of using mass engineered timber and the Design and Supply or Manufacturing Design Assist options is the ability to pre-cut all penetrations in the mass engineered timber. This requires a lot of coordination up front with the different trades. Determination of how best to run the mechanical, electrical and plumbing is done well in advance. This will ensure the penetrations are engineered in the wood and eliminate the need for onsite work, thereby reducing the cost of the material and labor. As with any building project, changes will be needed and may require unanticipated penetrations and further review.

Many times, a concrete or lightweight concrete is installed on top of cross laminated timber floors for vibration control or as part of the sound proofing. It is important that the cross laminated timber moisture be measured prior to the installation of the concrete or lightweight concrete. Trapping additional moisture may lead to deterioration of the soft wood.

### Vibration

Mass engineered timber can be used in areas of vibration concern. Several options exist to deal with vibration; but typically, a concrete or lightweight concrete is added on top of the CLT floor is used. Generally, a soundproofing material or mat will be installed beneath the concrete or lightweight before covering the CLT floor.

### Charring Effect

Charring is typically used as a method of fire resistance in mass engineered timber construction. The column, beam or member is designed to char for a specified duration (wood is consumed); such that after the specified fire resistance time, the remaining wood (uncharred) is able to carry the design load. To achieve this, the original member is over-designed to account for charring, while maintaining the anticipated loading. Charring is generally calculated at .02 in/min (.65 mm/min). This equates to about 3 inches (76 mm) on all sides to achieve a two hour fire resistance rating. See Section 3.2.1 for additional information on fire resistance testing.

## 3.1 Loss Experience

At the time of publication, there were two known losses involving mass engineered timber.

## 3.2 Mass Timber Construction

This is a relatively new type of construction in which the majority of structural elements are fabricated from small pieces of wood adhered and engineered to develop a mass timber wood product. It was first seen in the 1970s in Europe and Canada. It became more common in Europe in the 1990’s and is now becoming common in the United States. Mass engineered timber is seen as a means of sustainable construction, protecting communities from wildfire and providing jobs. This data sheet focuses mainly on cross laminated timber at this time but includes other types of mass engineered timber such as nail laminated timber (NLT), glue laminated timber (glulam), laminated veneer lumber (LVL), dowel laminated timber, timber-concrete composite, and post-tensioned timber.

Mass engineered timber is considered sustainable and a highly desired carbon sequestration tool. Mass timber is considered an environmentally friendly construction approach, because the use of prefabricated materials can expedite construction time and reduce material waste. Like traditional wood construction, mass timber is combustible. Metal connections can make this construction susceptible to heat, as with standard steel construction. The use of glue creates unique challenges (such as potential delamination during fire and water exposure) that are not fully understood and subject to ongoing research.

Mass engineered timber construction uses a category of engineered wood products of a large size for columns, beams, roof, floor and wall panels. Mass engineered timber wood products are engineered for high strength, comparable to steel and concrete, but are lighter in weight. A building is considered mass engineered timber when the majority of the vertical and horizontal structural framing system is comprised of engineered mass timber wood products. (See Appendix B for examples.). Mass engineered timber can be a hybrid with other materials, such as heavy timber, steel and concrete. Mass engineered timber wood

products are comprised of multiple wood pieces laminated (glued with adhesives) or nailed together to form larger, stronger members which can be used for columns, beams, roofs, floors, walls, etc. They are typically built off-site.

### 3.3 New Construction

#### 3.3.1 General

The use of CLT is increasing due to the sustainability of the product. Glulam and other engineered wood products have been available for decades. In all engineered wood products, the largest risk is wetting of end grain boards. The end grain is more water absorptive than face grain. Water can be trapped in lamination gaps and splines at joints. If the boards are exposed to water at the end grains, swelling is expected parallel to the wood. Cross laminated timber makes swelling more difficult due to the adhesives and alternating layers of wood.

Wood can generally be dried once the moisture source is removed. Moisture evaporation can occur in warm, low-humidity and ventilated environments. Drying may take weeks or longer when moisture has penetrated deep in a large member. Drying will become extremely slow or even impossible if the members are covered with low vapor-permeance materials.

The majority of cross laminated timber is used in residential and office buildings. Cross laminated timber can be used in many other ways or occupancies. Some known uses are:

- For shear walls and diaphragms. See DS 1-2, *Earthquakes for additional guidance*.
- Sometimes used to meet requirements for both vapor retarders and vapor barriers in walls and roofs.
- Starting to be used in place of concrete tilt up walls and for manufacturing and warehouse facilities, although all fire testing has been geared towards office and residential settings.

There are no FM Approved roof assemblies for cross laminated timber. To determine the fastener spacing, pull-out tests and calculations will need to be completed.

**Mass Engineered Hybrid Timber Buildings**

A mass engineered hybrid building is one in which mass engineered timber is combined with steel or concrete. This is generally done to obtain larger spans between columns.

#### 3.3.2 Fire Tests

The National Fire Protection Association, Fire Protection Research Foundation conducted testing on compartmented units constructed of cross laminated timber. Six tests were conducted in a compartment size of 30 ft x 15 ft x 8.75 ft (9.1 m x 4.6 m x 2.7 m). These tests were conducted using 5-ply CLT with polyurethane adhesives, not meeting the ANSI/APA PRG-320: *Standard for Performance-Rated Cross-Laminated Timber*. The compartment fuel size was 550 MJ and contained two ventilation configurations and various amounts of gypsum board. The testing showed that the adhesives delaminated during the fire, adding more fuel to the fire load.

The International Code Council in conjunction with Alcohol, Tobacco and Firearms (ATF) conducted compartment fire tests similar to the arrangement conducted by the Fire Protection Research Council. These tests were designed for a typical residential unit. The compartments were two stories and used adhesives complying with ANSI/APA PRG-320: *Standard for Performance-Rated Cross-Laminated Timber*.

The conclusion was that heat resistant glues did not delaminate during the test. From these tests for a residential unit the wood remained in place and did not delaminate for four hours. The fuel load was consumed, and the mass engineered timber did not contribute to the fire. Heat resistant adhesives allow the timber to remain in place during a fire and char in order to limit contribution to the occupancy fuel load. Without heat resistant adhesives, the timber falls off adding additional fuel to the fire.

#### 3.3.3 Introduction of PRG 320

The tests conducted by Fire Protection Research Foundation and ATF resulted in the development of ANSI/APA PRG-320-2018: *Standard for Performance-Rated Cross-Laminated Timber*. Mass engineered timber used for construction in North America is required to meet this standard.

This standard was released in 2018. Mass engineered timber produced after 2019 will probably meet this standard. This test used a prescribed fuel load controlled by gas. The CLT adhesive qualifies under ANSI/APA PRG-320: *Standard for Performance-Rated Cross-Laminated Timber Annex B* if the temperature measured within the compartment stays below 950°F (510°C) during the last 90 minutes of the test. This test is designed to ensure no delamination and fire regrowth occurs during the decay phase of the FPRF fire test.

Heat resistant adhesives for use in cross laminated timber were introduced in 2018 in North America. Assume buildings made prior to 2019 were constructed using non heat-resistant adhesives.

### 3.3.4 Fire Design

Two options are commonly available to achieve fire resistant ratings when using mass engineered timber. These are referred to as encapsulation and charring using sacrificial layers of wood. Sometimes these options are combined to create the fire resistance rating. Tall mass engineered timber buildings (greater than 12 stories) in North America are required to use a combination of the two methods to achieve the fire resistance rating.

Cross laminated timber is often referred to as fire resistant, pointing to its ability to char. The manufacturer's marketing specifically avoids the term "burn" and some market it as being equivalent to or better than steel or concrete. There are positive and negatives to each of the construction products. Ultimately, mass engineered timber is wood; and wood is combustible and burns. Charring is part of the burning process. The standard for mass engineered timber is its ability to pass the same ASTM E119 test. Passing this test provides a fire resistance rating. For purposes of mass engineered timber, it means the product can maintain its structural strength while being exposed to an increasing temperature for up to the time tested. The same criteria are used for steel and concrete. However, many buildings do not require fire resistance ratings at all.

### 3.3.5 Moisture

Moisture is the enemy for soft woods. Soft woods are utilized in mass engineered timber. Soft woods are susceptible to decay during a wet-dry cycle. This decay is common when there are roof or cladding leaks. These leaks are typically hidden until severe decay has already occurred.

A moisture management plan is critical during the construction of a mass engineered timber building. Due to the potential for severe decay, which can be hidden, yearly infrared thermography image is recommended for the exterior of a mass engineered timber building to provide for early detection and repair.

### 3.3.6 Biophilic Design

Mass engineered timber is marketed not only as sustainable but has the ability to promote better overall health for people living and working in the building. This is known as biophilic design. The architects look to design and incorporate more natural features in the building. The mass engineered timber is one part; but live trees, living walls and other natural environments are being introduced. The goal is to increase the natural plantings (trees and living walls, etc.) and to the use mass engineered timber to provide an outdoor feeling. Several biophilic studies associated with the use of mass engineered timber and the inclusion of natural features show a positive health effect.

## 4.0 REFERENCES

### 4.1 FM Global

Data Sheet 1-0, *Safeguards During Construction, Alteration and Demolition*
Data Sheet 1-4, *Fire Tests*
Data Sheet 1-12, *Ceilings and Concealed Spaces*
Data Sheet 1-20, *Protection Against Exterior Fire Exposure*
Data Sheet 1-28, Wind Design
Data Sheet 1-29, *Roof Deck Securement and Above Deck Roof Components*
Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*
Data Sheet 3-26, *Fire Protection for Nonstorage Occupancies*
Data Sheet 10-3, *Hot Work Management*

### 4.2 Other

American Wood Council (AWC). The 2018 National Design Specification (NDS) for Wood Construction.

American Iron and Steel Institute. AISI S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

## APPENDIX A GLOSSARY OF TERMS

**Biophilic Design:** A concept used in the building industry to increase the occupant connectivity to the natural environment. Biophilic design incorporates natural light, ventilation and landscape. It is thought to create a healthier and more productive environment.

**Conventional Light-frame Construction:** Construction whose primary structural elements are formed by a system of repetitive wood-framing members. (Typically used in residential construction.)

**Cross Laminated Timber:** A prefabricated, engineered wood product consisting of not less than three layers of solid sawn lumber or structural composite lumber where the adjacent layers are cross oriented and bonded with structural adhesive to form a solid wood element. To be considered mass engineered timber, the floors are a minimum of 4 in. (101 mm) and roofs a minimum of 3 inches. Exterior walls a minimum of 4 in. (101 mm).

**Dowel-laminated timber (DLT):** Similar to NLT, but the laminations are held together with wood dowels to form a wood panel.

**Engineered Wood:** Wood products that are manufactured by binding or fixing the strands, particles, fibers, veneers or sawn lumber together with adhesives or other methods, such as dowels.

**Finish Rating:** Refers to a fire resistance rating that is achieved by applying a noncombustible material, such as gypsum board, to a mass engineered timber element.

**Fire Resistance Joint System:** An assemblage of specific materials or products that are designed, tested and fire-resistance rated in accordance with either ASTM E1966 or UL 2079 to resist the passage of fire through joints in or between fire-resistance-rated assemblies for a prescribed period of time.

**Fire Resistance Rating:** The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or methods based on tests based on ASTM E119 or UL 263.

**Hardboard:** A fibrous-felted, homogeneous panel made from lignocellulosic fibers consolidated under heat and pressure in a hot press to a density of not less than 31 pcf (497 kg/m$^3$).

**Gypsum Board:** The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing.

**Laminated-veneer Lumber (LVL):** Multiple layers of thin wood (veneers) stacked in parallel and bonded with adhesives to form beams or headers.

**Ice and Water Shield (Protector):** A waterproof underlayment membrane designed to protect the roof from ice and water damage. It is typically made with a polymer-modified bitumen designed to seal penetrations, such as those from screws or nails installed as part of the roof membrane (cover), after installation.

**Mass Engineered Timber:** Engineered wood meeting minimum sizes established by codes or regulations. Generally, the minimum component size is 6 in. (152 mm) in width and 8 in. (203 mm) in depth or greater.

**Mass Timber Construction:** Consists of structural elements used in building construction, primarily of solid, built-up, panelized or engineered wood products.

**Nail-Laminated Timber (NLT):** Multiple laminations of lumber stacked on edge and successively nailed perpendicular to the face to form a wood panel.

**Particleboard:** A generic term for a panel primarily composed of cellulosic materials (usually wood), generally in the form of discrete pieces or particles, as distinguished from fibers. The cellulosic material is combined with synthetic resin or other suitable bonding system under heat and pressure.

**Post-tensioned Timber (PTT):** Engineered wood beam or column used in combination with steel post-tensioning cables to place the member in a state of precompression, increasing the load carrying capacity.

**Prefabricated Wood I-Joists:** Structural member manufactured using sawn or structural composite lumber flanges and wood structural panel webs bonded together with exterior exposure adhesives, to form an I-shaped cross-section. See ASTM D 5055.

**Solid Sawn Lumber:** Timber cut from a single log.

**Structural Composite Lumber:** Structural member manufactured using wood elements bonded together with exterior adhesives. See ASTM D 5456.

**Structural Glued-laminated (glulam) Timber:** An engineered, stress-rated product of a timber laminating plant. It is composed of assemblies of specially selected and prepared wood laminations in which the grain of all laminations is approximately parallel longitudinally, and the laminations are bonded with adhesives.

Glulam beams can be bonded in shapes for architectural design while providing structural support. Glulam can be manufactured to 60 in. (1.5 m) deep and 100 ft (30 m) or greater in length. (ANSI/AITC A 190.1 or ASTM D3737).

**Timber-concrete Composite (TCC):** CLT, DLT or NLT panels with poured in-place concrete slab on top, connected with metal screws or dowels to form a roof or floor.

**Wood Structural Panel:** A panel manufactured from veneers, wood strands or wafers, or a combination of veneer and wood strands or wafers, bonded together with waterproof synthetic resins or other suitable bonding systems.

## APPENDIX B DOCUMENT REVISION HISTORY

The purpose of this appendix is to capture the changes that were made to this document each time it was published. Please note that section numbers refer specifically to those in the version published on the date shown (i.e., the section numbers are not always the same from version to version).

**July 2023.** This is the first publication of this data sheet.

# Appendix E: USI Commercial Property & Casualty Market Outlook

# 2025

## Commercial Property & Casualty

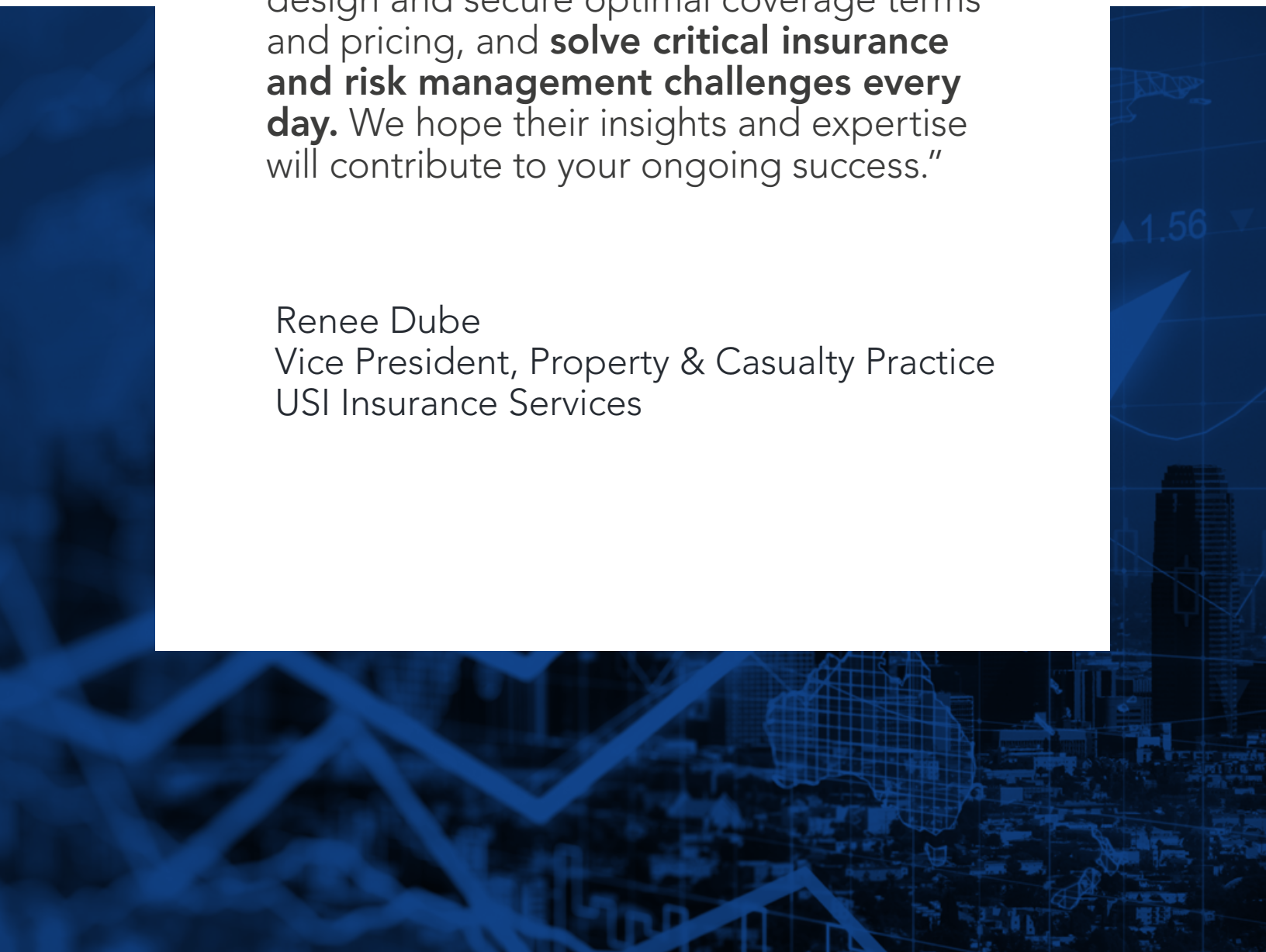
# MARKET OUTLOOK

Forecast Insights From USI National Practice Leaders

# CONTENTS

“This publication provides the expertise and firsthand knowledge of our property and casualty specialists, who help organizations like yours to stay abreast of industry trends, design and secure optimal coverage terms and pricing, and **solve critical insurance and risk management challenges every day.** We hope their insights and expertise will contribute to your ongoing success.”

Renee Dube
Vice President, Property & Casualty Practice
USI Insurance Services



# Executive Summary

The insurance market outlook for 2025 shows stabilization in several areas, with continued challenges and evolving risks across property, casualty, executive and professional risk, aviation, environmental, and international lines. Insurers are adapting to changing conditions, regulatory pressures and emerging threats, leading to a dynamic yet cautious market.

- **Property:** Showing signs of stabilization, with ample capacity available following favorable underwriting results on the insurance and reinsurance side. With natural catastrophe (CAT) insured losses around $135B globally in 2024 according to Swiss RE, policyholders can expect insurers to remain vigilant in risk selection and deductible levels, although some rate relief is expected for favorable risk profiles. It remains difficult to place certain risks, such as senior housing, affordable and subsidized housing, frame apartments, vacant properties, and those in foreclosure or receivership. Wildfire and severe convective storm exposure continues to impact capacity available. Rebuilding costs have stabilized as inflation subsides, with U.S. averages around +5% YOY.
- **Casualty:** Workers' compensation rates and premiums are continuing to decline overall, but at a much slower pace than prior years. The commercial auto market remains cautious about providing coverage, and the general liability market is facing legal challenges that are increasing settlement costs.
- **Executive & Professional Risk:** While still a competitive marketplace, underwriting apprehensions exist. Directors and officers (D&O) liability is still a key area of concern, with emerging risks related to securities class actions and deceptive claims related to artificial intelligence (AI). Healthcare and financial services are seeing continued regulatory challenges, while rising costs for employment practices liability and fiduciary liability claims may begin impacting all industries. Cyber incidents continue to be a significant threat, and professionals in various industries are grappling with the unknown effects of AI.
- **Aviation:** 2024 was stable, with ample capacity and more competitive pricing compared to 2018-2023. Buyers are experiencing price relief, though challenges remain for insurers as they balance competition with underwriting discipline. The market should remain favorable for buyers in the short term, as new entrants and established carriers compete to maintain portfolios.
- **Environmental:** Stable, with new entrant carriers potentially bringing creative coverage solutions in 2025. As regulatory scrutiny grows, securing coverage for per- and polyfluoroalkyl substances (PFAS), or "forever chemicals," has become more difficult. Environmental regulations worldwide are tightening, which is driving demand for pollution liability insurance and coverage for emerging risks in areas like construction and M&A.
- **International:** Experiencing mixed conditions, with property insurance rates remaining flat or declining in most regions except for CAT-exposed areas. Casualty rates have increased globally, driven by litigation costs and regulatory changes. Geopolitical risks, especially in the Middle East, Africa, and Central/South America, are prompting insurers to impose stricter coverage restrictions.

Organizations are encouraged to utilize risk control strategies to present their accounts favorably to insurance carriers, and to leverage all available tools to align asset values with industry standards. There are ample opportunities to positively influence insurance costs, coverage and risk quality. The "How We Can Help" sections in this report offer ways to strategically position yourself for future insurance market opportunities.

We wish you success and a prosperous new year!

# Market Update & Rate Forecast

To view historical rate index charts (trajectory of rates 2018-present), click on a product line below:

| PRODUCT LINE | SECOND HALF 2024 | FIRST HALF 2025 (PROJECTION) |
|---|---|---|
| **PROPERTY** | | |
| Non-CAT Property w/ Minimal Loss History and Favorable Risk Profile | -5% to Up 5% | -5% to Up 5% |
| CAT Property w/ Minimal Loss History and Favorable Risk Profile | -15% to -5% | -10% to Up 5% |
| CAT or Non-CAT Property w/ Unfavorable Loss History or Risk Profile | Up 10% to 20% | Up 5% to 15% |
| **CASUALTY** | | |
| Primary General/Product Liability | Up 5% to 10% | Flat to 10% |
| Primary Auto Liability w/ Fleet Less Than 200 & Good Loss History | Flat to Up 5%*^ | Flat to Up 5%*^ |
| Primary Auto Liability w/ Fleet Less Than 200 & Poor Loss History | Up 20% to 30%^ | Up 15% to 30%^ |
| Primary Auto Liability w/ Fleets in Excess of 200 | Flat to Up 5%*^ | Up 5% to 10%*^ |
| Excess Auto Buffers | Up 40% | Up 40% |
| Workers' Compensation Guaranteed Cost | -10% to Up 5% | -5% to Up 3% |
| Workers' Compensation Loss Sensitive | -7.5% to Flat** | -5% to Flat** |
| Umbrella & Excess Liability (Middle Market) | Flat to Up 12.5%*** | Flat to Up 10%*** |
| Umbrella & Excess Liability (Risk Management) | Up 5% to 20%*** | Flat to 15%*** |
| **INTERNATIONAL** | | |
| International Liability | Flat to -5% | Flat to Up 3% |
| International Property, CAT Exposure | Up 5% to 12% | Up 15% to 20% |
| International Property, Non-CAT Exposure | Flat to Up 5% | Flat to Up 5% |

| PRODUCT LINE | SECOND HALF 2024 | FIRST HALF 2025 (PROJECTION) |
|---|---|---|
| **ENVIRONMENTAL** | | |
| Environmental Combined General Liability/ Pollution | -5% to Up 5% | Flat to 8% |
| Excess Combined General Liability/Pollution | Up 5% to 15%+**** | Up 5% to 15% |
| Environmental Contractors' Pollution | Flat to -10% | -10% to Up 5% |
| Environmental Pollution Legal Liability | -10% to Up 5% | -10% to Up 5% |
| **Aviation** | | |
| Aviation | Up 10% to 20%*** | -5% to Up 5%*** |
| **EXECUTIVE & PROFESSIONAL RISK** | | |
| Public Company Directors & Officers (D&O) Liability — Overall | -10% to Flat | -5% to Flat |
| Private Company and Not-for-Profit (NFP) D&O Liability — Overall | -10% to Flat | -7.5% to Flat |
| Employment Practices Liability (EPL) | -5% to Up 5% | -5% to Up 10% |
| Fiduciary Liability | Flat to Up 10% | -5% to Up 5% |
| Crime | -5% to Up 5% | -5% to Up 5% |
| Kidnap & Ransom | Flat to Up 5% | Flat to Up 10% |
| Professional Liability/Errors & Omissions (E&O) | Flat to Up 10% | -5% to Up 10% |
| Transactional Risks (Representations & Warranties Insurance (RWI)) | Flat to Up 5% | Up 5% to 10% |
| Cyber (Network Security & Privacy) | -10% to Flat | -5% to Up 5% |
| Technology E&O | -10% to Flat | -5% to Up 5% |

^ Geographical radius of operations will impact pricing.
* Including need for primary limits up to $2M.
** Dependent on state.
*** In some cases, depending on class of business, historical losses and limits purchased. Factors in contraction in limits.
**** If heavy truck exposure, increase can be higher than 15%, especially in certain geographies.

View all Historical Rate Index charts here

# Property

## Developments Since 2024 Mid-Year Market Outlook

The property market continued to stabilize in the first half of 2024. Insurers realized favorable underwriting and investment results, marked by loss ratios 19% less than they were in the first half of 2023. Written premiums increased about 5% YOY, investment yields increased to 3.7%, and return on equity was nearly 10% for the property and casualty (P&C) industry.[1]

Despite insured losses reaching $60B globally in the first half of 2024, insureds found themselves absorbing a higher percentage of losses through increased deductibles, lower CAT limits, and lower policy limits implemented by insurers during the last few years of the hardening market.[2]

With the 2024 U.S. hurricane season initially slow to develop, the activity quickly escalated in late September, with Hurricanes Helene and Milton making landfall in Florida within a two-week period. Hurricane Helene made landfall as a Category 4 storm in Florida's Big Bend region, bringing severe storm surge across the Gulf Coast of Florida with devastating flooding in Georgia, South Carolina, North Carolina, and Tennessee.

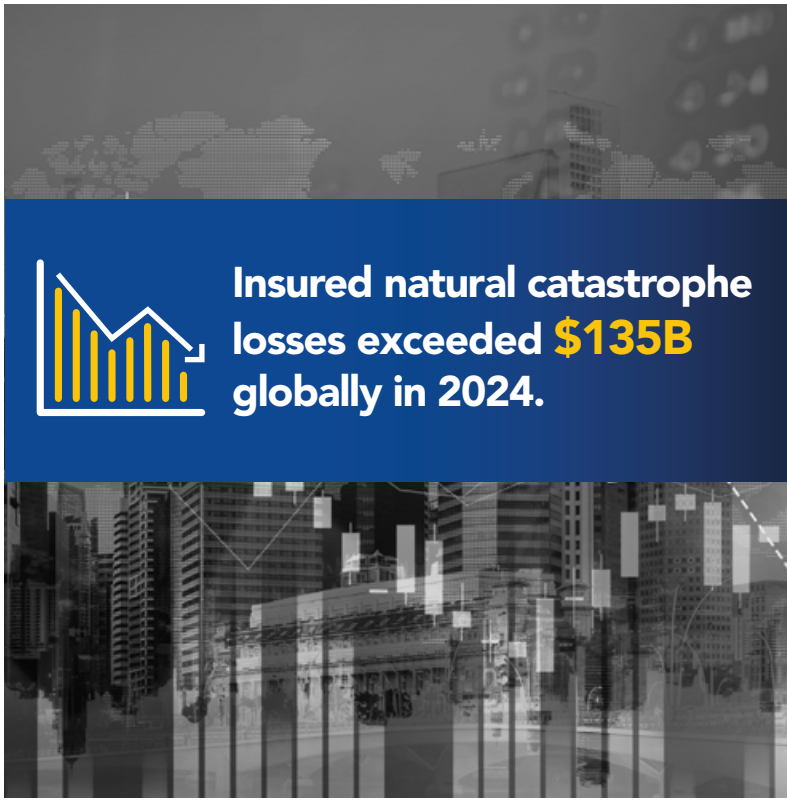
Helene caused unprecedented damage, with losses estimated between $30.5B and $47.5B, but insured losses are lower at $10.5B to $17.5B due to flood exclusions.[3] Hurricane Milton hit Florida as a Category 3 storm in October, resulting in expected insured losses of $22B to $36B, making it the largest loss driver for property insurance in 2024.[4,5]

With global insured catastrophe losses exceeding $100B for the fourth time in four years, insurers remained cautious in risk selection and maintaining current deductibles and rates on renewals, particularly for natural catastrophe exposures. Increased capital flow led to more competition in the property insurance market in 2024. Renewals saw rate decreases or slight increases, with shared/layered placements receiving rate reductions of 5% to 15% or more. Top-tier risks experienced rate decreases of 10% to 20%.

Even with increased competition and capacity in the market, we continue to see some difficulty placing certain risks, including:

- Senior housing
- Affordable and subsidized housing
- Wood frame apartments
- Vacant properties and those in foreclosure or receivership
- Wildfire-exposed risks
- Loss-prone accounts, and accounts with critical open recommendations not addressed

These renewals continued to see pressure on rate and terms, with most of these risks being placed in the excess and surplus market, which saw property premiums increase 33% over the previous year.[6] With less protection behind them due to higher treaty retentions, insurers are reluctant to absorb these losses, and therefore transfer the risk to the insured via higher deductibles and limited capacity.



# Trends to Watch: First Half of 2025

## Reinsurers to Hold the Line on Treaty Renewals

Despite the reinsurance market being well-capitalized with dedicated capacity nearing $620B — up 9% YOY — there is no expectation of reinsurers altering their positions and attachment points on the upcoming treaty renewals.[7] The increased retentions and favorable rates over the past few years have helped insulate the reinsurers from the midsize CAT losses, such as severe convective storms, and have been largely absorbed by the insurers, equating to record profits for property reinsurers. This change in reinsurance structure for insurers has provided less balance sheet protection, which ultimately resulted in increased deductibles for insureds for fire and natural catastrophe perils leading up to 2024.

As investors look for long-term return on capital, reinsurers are becoming more cautious about offering lower premiums or attachment points (the level at which reinsurance coverage kicks in) due to the increasing frequency of midsize catastrophic (CAT) events. With abundant capacity, downward pressure on rates, and increased demand from insurers for secondary catastrophic perils, such as severe convective storm and wildfire, reinsurers are split on what rate changes will take place on the upcoming treaty renewals, with 39% stating that price rises in this line would be sufficient to compensate for increasing loss trends, 36% saying they wouldn't, and 25% being unsure.[8]

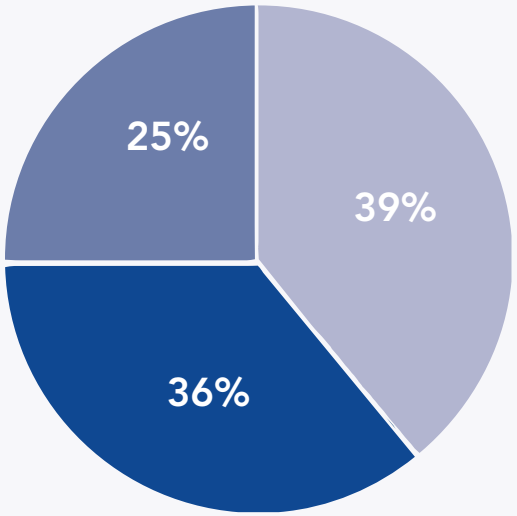
Given the expanded capacity in the market, it's uncertain how any increased treaty costs can be passed on to insureds. Regardless of rate change, insureds can still expect to see higher deductibles for fire and natural catastrophe exposures until insurers have more balance sheet protection from the reinsurance market.

## Reconstruction Costs Remain Slightly Elevated

After the severe inflation spike and supply chain disruptions seen between 2020 and 2023, the cost of reconstruction of commercial buildings has returned to a more manageable level, with national replacement cost indices averaging around 5% YOY. Although the costs have decreased from the peak of nearly 20% YOY in 2021 after record inflation, supply chain disruptions, and labor shortages, we are still seeing elevated material and labor costs for certain commodities that are impacting commercial reconstruction prices.

Concrete block, rebar, steel deck, and steel studs remain elevated, with YOY cost increases of around 6% to 18% for these building materials. Meanwhile, drywall, lumber, galvanized pipe, and plywood have retreated, with the largest drop being 6.6% YOY. National average materials costs are up approximately 2%, with labor costs up 3.8% as of September 2024.[9]

### Will price increases be sufficient to compensate for increasing loss trends in property-catastrophe?




Source: Fitch Ratings reinsurance online survey held during Rendez-Vous de Septembre 2024. There were 81 responses from reinsurers, insurers, and others with an interest in the market.

As renewals approach, it's crucial to review property values annually, taking into consideration geography, construction type, and special attributes of the building. During the hard market, many policies introduced valuation clauses like margin clauses, occurrence limit of liability, scheduling, and coinsurance, which affect recovery after a claim if valuations are insufficient. Not updating values annually may result in large, uncovered claims due to these clauses. As the market continues to shift, proper valuations will lead to fewer policy restrictions and better outcomes after a loss.

## Continued Pressure on Wildfire-Exposed Risks

As discussed in our 2024 Mid-Year Market Update, wildfire exposure continues to complicate placements and cause concern for insurers. More than 8 million acres have burned across 10 states as of November 2024, which is 24% higher than the average between 2014 and 2023.[10] The Park fire in California was one of the largest in the state's history, burning more than 239,000 acres and destroying more than 700 structures while damaging 54 others. The Smokehouse Creek fire, burning more than 1,000,000 acres in Texas and another 70,000 acres in Oklahoma, was one of the largest in Texas history. Other notable wildfires include the New Mexico South Fork and Salt fires, causing an estimated $25M in damage, and the Watch fire in Arizona.

With insurers reducing capacity offered or refusing to write locations in these areas, insureds find themselves more reliant on the state-sponsored plans like the California FAIR Plan, the excess and surplus market, or wildfire parametric products. None of these alternatives come without risks to consider, including named peril coverage in programs like the FAIR Plan, premiums that could be multiples of the existing premium in the excess and surplus market, or problematic language within parametric policies that can exclude coverage for wildfires that start within the perimeter of the property.

Difference-in-condition (DIC) wrap policies can be used to fill in coverage gaps created by the FAIR Plan, but coverage gaps can still exist. Although some insureds in high-risk areas may have limited options, understanding the coverage offered, exclusions and triggers for claim payment is key. Since coverage between policies can vary drastically, we recommend requesting and reviewing a copy of the specimen policies prior to binding.

## Alternative Risk Solutions Still in High Demand

Despite some increased competition and more favorable renewals in 2024, interest in alternative risk strategies or products has not faded. Insureds seek ways to control escalating costs and minimize market fluctuations. A recent poll found parametric solutions lead with 40% of the vote, structured solutions at 25%, captives at 21%, and complex risk offerings at 14%.[11] While many parametric products exist, some obstacles prevent wider adoption by insureds. The most noted obstacle was lack of available data and models, followed by lack of education on the products.[12] Lenders are also slow to approve of these products to replace or supplement traditional insurance of their borrowers, even if it may be the only available coverage for that specific property.

The insurance industry still has some work to do to not only accurately assess risk but also educate insureds and other stakeholders on the appropriate structure, triggers and usage of parametric products. Like insurance policies, no two parametric products are identical, with differing exclusions, payout schedules and triggers. A single sentence in the policy can mean the difference between a loss being covered or excluded, even if the cause of loss occurs at the location and triggers are met. Alternatively, some products are as simple as advertised, with sensors detecting flood depth or seismic activity from an earthquake on a specific building, which can eliminate or significantly reduce the post-loss inspection and claim processing time.

As the effects of climate change and the inability to obtain coverage in CAT-prone areas increase, the utilization and adoption of these products are expected to increase — but only if the advantages, triggers, and structure of these products can be clearly communicated and understood by the entire insurance community and related interested parties.

**The property market shows signs of stabilization, with ample capacity available.**

## Escalating Vacancy Rates Create Coverage Challenges

Vacancy rates for office buildings hit a record 19.6% in 2023 due to remote and hybrid work, with a 24% vacancy rate expected by early 2026.[13]

While Class A office space remains in high demand in desirable locations with amenities, Class B and C offices have lower prospects of being repurposed. As these properties remain empty, insurers view them as higher risks due to potential losses from vandalism, leaking pipes, theft, glass breakage, and arson.

Insurers often limit coverage for vacant properties, and can exclude losses on these properties entirely. They often impose up to a 90-day period for coverage to apply, and exclude specific perils or apply higher deductibles after a loss. Insurers can also impose a protective safeguard, which is a condition of coverage that requires heat be maintained in the building, fire or burglar alarms remain operable, or even a regular watch service be maintained in some areas. Any one of these conditions can determine partial recovery from a loss, or a loss being completely excluded.

Once a building reaches less than 31% occupancy by square footage, these restrictions could be triggered following a loss. These properties often find themselves on stand-alone policies placed separately in the excess and surplus market with higher deductibles, lower policy limits, and increased rates, which can also impact adherence to lender requirements.

Identifying current occupancy rates by location well in advance of a renewal will allow for a more strategic approach to cover these properties and meet lender requirements.

## Lithium Batteries Create New Hazards for Insureds

As the market share of electric vehicles (EVs) and other electronic modes of transportation grows, new hazards place properties and people at risk. Battery fires caused by thermal runaway while charging or from improper handling or use are on the rise. In the U.S., there have been 445 lithium-ion battery fires, 214 injuries, and 38 deaths.[14] Lithium battery fires generate intense heat and can be difficult to extinguish, risking uncontrolled spread that can cause severe damage to property.

EVs often weigh 30% more than gas-powered internal combustion vehicles due to their lithium battery weight.[15] Because of this, the risk of parking structures collapsing has increased. Parking structures that are old, have defects, or have not been properly maintained are at higher risk of collapse from the increased weight, as seen in the New York parking garage collapse in 2023, where a three-story parking garage collapsed due to unaddressed structural defects, despite various building code violations being issued.[16]

As consumers continue to adopt EVs, these hazards will increase and need to be carefully considered, planned for, and addressed by working with local fire departments, structural engineers, and fire protection specialists. For more protection strategies on these hazards, please refer to our recent article on this topic.

## Building Conversions: A Difficult Risk to Place

With more vacant office properties, the pressure is on commercial real estate owners to repurpose these buildings to maximize returns. With $150B of commercial mortgages coming due in 2024 and another $300B due by the end of 2026, commercial office space owners are resorting to conversions to drive revenue and position themselves to navigate the wave of maturing debt.[17]

Since 2021, office-to-apartment conversions have skyrocketed 357%, producing over 55,000 new housing units.[18]

Cities have started offering incentives for developers to complete conversions, fueling the increased activity while solving the need for more affordable housing by bringing on additional inventory in the market. The most common conversion seen is office-to-apartment; however, office properties have also been converted into condominiums, medical space, hotels, or mixed-use.


**Insurers remain vigilant in risk selection and deductible levels, but some rate relief is expected.**

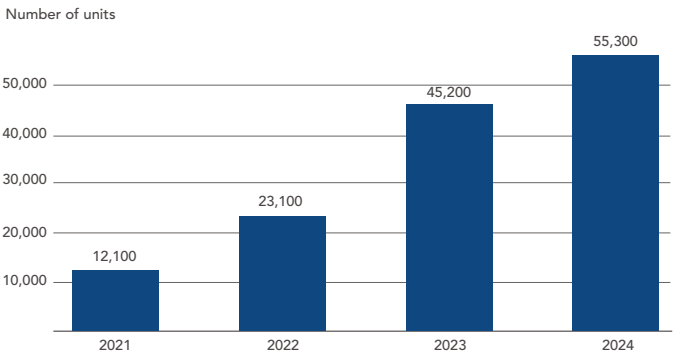
Completing major renovations with structural changes to accommodate another use is a major undertaking, and it also poses challenges from an insurance perspective. When placing these risks in the market, there are two separate issues to account for before securing coverage: the value of the existing structure and the value of the project.

First, the value of the existing structure must be covered to the appropriate replacement cost. Builder's risk insurance carriers often do not want to cover the value of the existing structure in addition to the cost of the project. Meanwhile, the existing property insurance carrier does not want to cover the building while it's under major structural renovations, causing an impasse that must be resolved before renovations commence.

Insureds looking to complete a conversion must start the insurance purchasing process well in advance of the project start date, given the time required to underwrite, additional information required, and limited appetite in the market for these structural conversions. For example, engineering reports will be required for the existing structure and for the work to be completed. The policy term will need to be carefully aligned with the planned schedule, all the way to temporary certificate of occupancy or certificate of occupancy, to ensure the entire project term is covered. Additionally, fire protection system details and any planned impairments will need to be outlined depending on the values of the existing structure at the project start.

These programs often require multiple insurers to build the necessary capacity and terms, which can take months, depending on total values at stake. Therefore, the key to insuring these projects is to allow adequate time for underwriting and placement.

**U.S. office-to-apartment conversion pipeline**




Source: ResiClub

## Builder's Risk: Top Challenges and Opportunities

While the general building renovation insurance rates for non-CAT and non-frame constructions have improved, frame constructions and rehab projects remain challenging. Here are the top challenges that we expect builders to face in 2025:

- **Renovations where over 50% of the existing structures are in place** — This high-risk category continues to face rate and capacity challenges.
- **Frame constructions** — Insurers are scrutinizing these projects closely due to losses related to water and fire damage, structural collapse, discovery of hazardous materials, compliance issues, and other problems. Insurers now require extensive protective measures, such as closed-circuit television (CCTV), monitoring, water mitigation systems (such as shutoff valves and water sensors), and protective coatings for combustible materials. Typically, these projects require a shared, layered, or quota-share approach (in which multiple insurers each take on a percentage of the total risk). Despite these measures, rates for frame projects have not shown much relief. For smaller frame projects (under $25M), some direct and niche carriers still provide coverage without excessive requirements, but these opportunities are limited.
- **Coastal projects with superior construction** — Builders can obtain insurance for these projects, but pricing remains high and limits for wind and flood must be negotiated and modeled. Recent hurricane and flood events have driven up prices for coastal exposures. Water damage deductibles are higher for projects taller than three stories, but can be negotiated when water mitigation measures and protective equipment are in place. Wildfire, hail, freezing, and tornado risks continue to be hurdles to obtaining capacity and competitive terms.

While challenges receive the most attention, many builders will benefit from improving rates and terms. These builders will use superior constructions and be in non-CAT areas, but many will still face stricter warranties on security, water sensors, and fire protection. For projects with minimal CAT exposure, capacity is increasing depending on the level of delay and start-up exposure.

# How USI Can Help

The property market is shifting from steady rate increases and reduced capacity to increased capital flow and competition, leading to lower rates and higher risk appetites. USI can help organizations navigate this transitioning market via several methods.

- We quantify and analyze your loss exposure through various underwriting tools and data, taking the guesswork out of securing adequate coverage.
- By aggressively marketing renewals to all viable markets for your risk profile, we help you obtain the best possible terms and rates.
- We explore various strategies and program structures to lower the total cost of risk.
- To help you get back coverage previously lost, we identify coverage, limits, deductibles, clauses and exclusions to target for improvement.
- We provide side-by-side comparisons of program limits, deductibles, terms and premiums to help you make informed decisions.

## Key Benefits for Organizations

- When using quantified exposures to design insurance programs, organizations purchase the right amount of coverage to meet their budget and third-party requirements.
- By aggressively marketing renewals and exploring cost-effective strategies, USI helps organizations better manage their risks.
- Identifying and targeting areas for coverage improvement helps organizations obtain the best possible protection.
- Providing detailed comparisons of different insurance programs allows organizations to make well-informed decisions about their property insurance and risk management.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

USI PATH™: Revolutionize your approach to risk management | Learn More

1,2 Swiss RE
3 CoreLogic
4 Reuters
5 Moody's
6 Insurance Business Magazine
7,8 Reinsurance News
9 CoreLogic
10 National Interagency Fire Center
11,12 Reinsurance News
13 BOMA International
14 SENECA
15 Center for Transportation Research
16 Associated Press
17,18 Business Insider

# Casualty

## Developments Since 2024 Mid-Year Market Outlook

The second half of 2024 has performed as expected to date. Workers' compensation continues to be a mostly profitable line overall for most buyers, with declining claims frequency and moderate loss severity trends continuing to benefit the coverage line. However, headwinds are building as net profit margins are shrinking.

For commercial automobile, general/products and umbrella/excess liability lines, capacity remains adequate and rate increases are stabilizing overall for most insureds, with YOY rate increases slightly lower than in past years and in some cases flat.

However, deployment of capacity remains discretionary, and rising rate pressures persist for insureds that have experienced large losses within the past few years, as well as insureds in tougher classes of business such as transportation, habitational, certain manufacturing classes, and life sciences. Social inflationary forces causing increasingly large jury verdicts and settlements continue to create negative loss ratios, adverse reserve development and a less predictable underwriting environment for a growing number of insurers — which may put pressure back on rate increases in the coming quarters.

To fill the void of limited capacity, excess and surplus (E&S) insurers have increased their market share accordingly. E&S insurers offer insureds with less desirable or challenging risk profiles an alternative to markets that are reducing or eliminating this capacity. While offering capacity, E&S markets are not offering price relief, and rates are expected to increase for insureds seeking coverage with these markets.

To offset a prolonged period of rising rates and corresponding higher premiums, the trend of guaranteed cost buyers moving to loss-sensitive programs is rising. For insureds already on a loss-sensitive program, many are raising their deductible levels to take on more risk themselves and lower risk transfer costs.

## Trends to Watch: First Half of 2025

### Workers' Compensation

**Pros:** Workers' compensation (WC) rates and premium continued to decline overall, but at a much slower pace than prior years.

- **Combined Ratio:** The combined ratio for 2024 is expected to come in below 100% for the 11th consecutive year (anything below 100% indicates profitability for insurance companies), but the ratio will increase to a minimum of ~95% from 88% in 2023, according to Fitch.
- **Profitability:** WC remains profitable for most insurers that write on both a guaranteed-cost and loss-sensitive basis. The average rate in most states has decreased YOY, and the supply of capacity remains high with many markets, including new market entrants. This has resulted in rate and corresponding premium reductions in most cases, despite increasing payrolls (premiums are usually calculated based on the total payroll of a business).
- **Reserve Redundancy:** Insurers are carrying adequate reserve redundancy, although the pace of reserve releases is slowing.

**Cons:** The expected increase in the combined ratio to a minimum of 95% indicates that claim costs are rising relative to premium levels in an increasing number of states.

- **Claim Costs:** For premiums to decline or remain flat in the coming year, continued rate reductions must be matched or exceeded by declining claim costs. This trend is slowing down or reversing in many states.
- **Medical Severity Costs:** While the frequency of medical injuries remains low, higher medical severity costs and rising indemnity payments for wage replacement are contributing to a gradual rise in claim costs in many states.
- **Reserve Releases:** The amount of reserve release redundancies of many insurers is also dropping, reducing much of the cushion insurers could fall back on to supplement adverse loss development. As such, we will begin to see rates level off, or moderate rate increases in more states in 2025.

- **High-Risk Industries:** Industries like sawmills, recycling organizations, bridge builders, and heavy construction contractors face greater pressure and coverage restrictions for WC insurance due to their high-risk nature, rising injury rates, regulatory scrutiny, higher medical costs, and inadequate safety protocols, leading to increased claim costs and stricter coverage terms.
- **Legislative Trends:** A legislative trend to expand WC presumptions for mental conditions is waning.

**Workers' compensation insurance remains profitable for insurers despite rising claim costs.**

## Commercial Automobile

**Pros:** Some challenges in recent years have shown signs of improvement.

- **Stable Market:** For many smaller fleets (fewer than 200 vehicles) with good loss histories, the market remains stable and rates are flat or increasing only slightly.
- **Driver Shortage:** The driver shortage has eased somewhat, spurred by technological advancements. This issue was the No. 1 concern for companies for five years in a row, but has dropped to No. 9, according to the American Transportation Research Institute (ATRI).
- **Tort Reform:** Tort reform is working toward reducing litigation costs in this market, which can lead to lower insurance premiums and greater coverage availability, especially for high-risk sectors like trucking. However, rising jury verdicts remain a top issue.

**Cons:** In many cases, deployment of capacity remains discretionary, meaning insurers are cautious about providing coverage.

- **Large Fleets:** This is especially true for companies with recent large losses or those with large fleets of 10,000 or more, such as long-haul truckers.
- **Insurance Costs:** Insurance cost and availability is the No. 4 issue according to the latest ATRI survey, whereas it didn't appear in the top 10 issues in the previous year.
- **Social Inflation:** Social inflation — rising jury verdicts and settlements — continues to drive adverse reserve development (when the reserves set aside by an insurer to cover future claims turn out to be insufficient), creating negative loss ratios and a less predictable underwriting environment. This trend may increase rates again in the coming quarters, particularly for high-risk insureds.

## General/Products Liability

**Pros:** The general liability (GL)/products primary market continues to stabilize.

- **Rates:** Although rate increases still prevail for the majority, more insureds are obtaining less severe rate increases and flat renewals in industry segments that have achieved rate adequacy. Sufficient capacity exists, and moderate competition for new business has returned to GL/products for a growing number of sectors, including retail and certain segments of manufacturing.
- **Multiple Lines:** To increase profitability, the insurance market increasingly requires that GL insurance be combined with WC insurance and often other lines as well, including automobile liability, umbrella, and property. This can offer several advantages for insureds, including convenience, cost savings, integrated coverage

## Trucking Industry Issue Ranking

1. Economy
2. Truck Parking
3. Lawsuit Abuse Reform
4. Insurance Cost/Availability
5. Driver Compensation
6. Battery Electric Vehicles
7. Compliance Safety Accountability (CSA)
8. Detention/Delay at Customer Facilities
9. Driver Shortage
10. Driver Distraction

Source: American Transportation Research Institute, Critical Issues in the Trucking Industry – 2024

solutions, access to risk management services, and more. However, buyers should carefully evaluate the terms and conditions of insurance packages to ensure they adequately address their unique risk exposures.

**Cons:** Despite calls for tort reform from a number of senior insurance leaders, the plaintiff's bar continues to have the upper hand, driving higher jury verdicts and settlements for both individual and class action lawsuits.

- **Litigation Financing:** Social inflationary pressures are not abating, nor is the practice of litigation financing to generate a revenue stream.
- **Challenging Risks:** Real estate and habitational risks continue to be challenging to place, and insurers willing to cover the risks are typically increasing rates from high single digits to low double digits. The focus on assault and battery exposures contributes to these sectors' challenges. An increasing number of markets are seeking to hold insureds accountable for their risk management programs and loss experience by moving away from guaranteed cost and requiring loss-sensitive program structures.
- **Foodborne Illness:** For food manufacturers, high-profile foodborne illness outbreaks, like those linked to McDonald's and Boar's Head, can lead to substantial changes in the products liability insurance landscape. Insurers may respond to these events by adjusting rates, tightening underwriting standards, and, in some cases, reducing capacity.

## Umbrella/Excess

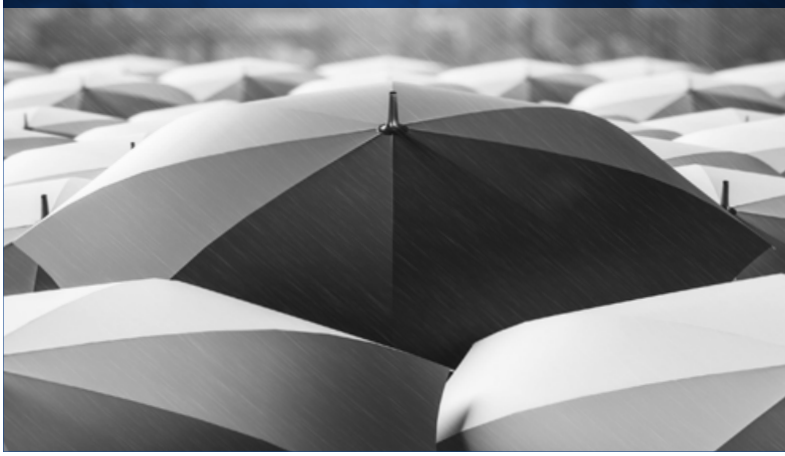
**Pros:** Generally, markets are still willing to negotiate on price, coverage, terms and conditions for many industry classes.

- **Rate Expectations:** Rates for middle-market buyers are expected to be flat to up 10%, and risk management buyers can expect flat to up 15%, depending on prior loss history and class of business.
- **Capacity Deployment:** Average capacity deployment is between $10M and $15M and higher if layers are ventilated.
- **Multiple-Line Benefits:** The combining of umbrella liability with other lines, including primary casualty and property, can often result in lower premium costs.

**Cons:** Overall capacity is sufficient, but a growing number of national markets are deploying capacity selectively or reducing capacity for insureds in certain industry classes including transportation and habitational.

- **Auto Premium Challenge:** If auto premium is greater than 50% of total underlying, it's even more challenging to place the umbrella/excess at competitive premiums with sufficient capacity. Social inflationary issues and inadequate loss reserves that need to be increased drive many of these challenges.
- **Social Inflation:** As social dynamics continue to evolve, navigating the complexities of social inflation will remain a challenge for umbrella/excess liability lines.
- **Reserve Strengthening:** Insurers are increasing their reserves to cover potential future claims, which reflects a less predictable underwriting environment and can lead to higher premiums and stricter coverage.

**Insurers are selectively deploying umbrella and excess coverage.**



# How USI Can Help

## General/Products and Umbrella Liability

Organizations and brokers should stay alert and take proactive measures to secure favorable outcomes. Solutions can address issues like rate hikes, reduced capacity, and tighter coverage terms. In the current market, USI advises organizations to:

1. **Ensure that policy limits, terms and conditions are sufficient** — especially in the face of adverse loss trends — by engaging with USI to perform a benchmarking analysis, review coverage, and analyze litigation trends in the insured's industry.
2. **Start renewal preparations early.** Create a comprehensive plan, and begin discussions with markets at least 150 days before renewal. Discuss capacity reductions, per-million pricing, and new exclusions like infectious diseases.
3. **Focus on key risks that concern underwriters.** Highlight your risk profile's strengths, such as loss control investments, safety measures, contractual risk management, and capital expenditures.
4. **Start early discussions with markets to build relationships.** Identify minimum limits for umbrella coverage early on and consider self-insuring above required limits. Compare umbrella/excess limits with peers to ensure adequate coverage.
5. **Leverage data analytics** to evaluate risk financing alternatives.
6. **Evaluate the costs and benefits of higher retention levels**, quota-share participation in umbrella/excess programs, swing plans with loss-dependent costs, and multiyear single-limit policies within insurance programs.

## Workers' Compensation

Insureds and brokers should proactively identify factors that will secure the best renewal terms related to program structure, pricing, and coverage. Key strategies include:

1. Verify that **payroll information is correctly categorized** by classification codes to avoid errors in premium calculations.
2. **Ensure** experience modification factors **are accurately calculated** to reflect the insured's loss history.
3. Proactively **manage claims** to control premium costs and foster continuous improvement in safety and loss prevention.
4. **Inform underwriters** about changes related to wellness promotion and measures to protect workers from occupational injuries. Also communicate changes in claims handling initiatives that can reduce claim duration.
5. Be prepared to **selectively market** the account, tailoring the submission to highlight strengths and risk management efforts.
6. Have a comprehensive understanding of the **advantages and disadvantages of loss-sensitive deductible program** structures.
7. **Present objective evidence** to the insurer to minimize rate increases and secure more favorable renewal terms.
8. **Assess pre-loss safety measures and post-loss claims handling.** Collaborate with brokers and insurers to optimize results.
9. Collaborate with your broker to **harness proper loss and financial analytics** to determine risk capacity at various retention levels.
10. **Reassess applicable collateral alternatives**, premium levels at various retentions, and loss allocation methodologies to optimize cost-effective risk management.
11. Evaluate **independent contractor utilization** and assess impact on WC costs and losses.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

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# International

## Developments Since 2024 Mid-Year Market Outlook

Globally, property insurance rates were flat, declining, or moderating in every region except for CAT-exposed territories. Caribbean property insurance rates have increased by at least 10% due to the 2024 hurricane season. The above-average number of named storms and major hurricanes has increased pressure on insurers, especially in P&C sectors exposed to coastal areas.

The heavy reliance on reinsurance to mitigate risks and manage claims may moderate the direct impact on primary insurers, but the overall reinsurance market faces rising pressures. This has already led to an increase in reinsurance rates, affecting insurance costs downstream and raising premiums.

### International Casualty Lines

International casualty lines rates increased by 3% globally. The U.K., India, Middle East (except Israel), and Africa remained flat. Canada and China showed declines in casualty lines, mainly attributed to those markets coming out of the post-pandemic hard market. The overall increase in casualty rates was driven by several factors, such as rising litigation costs, evolving regulatory environments, and inflationary pressures that impacted claim payouts. European countries in particular have seen an increase in the frequency and size of litigation costs.

Regarding environmental and climate-related claims, the EU has implemented stricter regulations that increase the risk exposure for companies and casualty insurance providers. Countries like Germany and France, with aggressive stances on environmental regulations, have played a notable role in increasing rates due to higher risk levels in compliance costs.

## Trends to Watch: First Half of 2025

Continued and new geopolitical conflicts across Africa and the Middle East will result in underwriters imposing coverage restrictions on all lines of business. Political instability in certain Caribbean and Central/South American nations has also raised alarm bells with insurance companies when they consider risks in certain locations. We have seen a reduction in property limits and outright exclusion of coverage in Israel, Sudan, and Haiti. Concerns over employee concentration levels located in countries and regions involved in hostile actions or war have resulted in limited appetite to provide foreign voluntary workers' compensation coverage.

**Property insurance rates are flat or declining, except in catastrophe-exposed areas.**

**Casualty rates are increasing globally due to litigation costs and regulatory changes.**

**Geopolitical risks are prompting stricter coverage restrictions in high-risk regions.**

# How USI Can Help

USI has a dedicated international practice that will work with you to provide the optimal multinational insurance program. Our position is to function as our clients' international risk management arm. With our deep knowledge and passion for international business, we not only coordinate our clients' multinational insurance placements, but also proactively collaborate on risk solutions to provide maximum protection to our clients' balance sheets globally. In the event of an occurrence, we ensure the claim is covered and paid quickly.

USI utilizes global market reports, multinational carrier resources, and USI Preferred Broker network partners (especially in U.K./European markets) to monitor potential global issues and threats. Together, we offer creative solutions to cover clients' needs where a traditional approach may not be available.

USI has found that by moving to a centralized program, clients can save on premium, maintain concurrent and consistent coverage, and eliminate coverage redundancies and potential gaps. We do this by:

- Developing an action plan and dialoguing with incumbent and new markets at least 150 days in advance of renewal.
- Reviewing alternative program structures to ensure optimal limits, cash flow, retention level, cost, and collateral perspectives.
- Reviewing and confirming that all necessary admitted (local) insurance is purchased in alignment with local regulations, while also partnering with umbrella coverages to eliminate duplication of coverage.
- Continually engaging with our network of international broker partners to understand changes in local coverages, requirements, and laws related to insurance that could impact ongoing operations. In addition, we suggest quarterly check-ins to get ahead of any new expansions into a new country/risk.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

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# Environmental

## Developments Since 2024 Mid-Year Market Outlook

The market remains stable, with a few new entrants potentially adding more creativity and capacity in 2025. However, underwriting scrutiny of per- and polyfluoroalkyl substances (PFAS) has intensified, particularly for companies producing products containing these "forever chemicals." Insurers are increasingly excluding PFAS coverage or raising premiums due to growing potential liability claims and regulatory actions.

## Trends to Watch: First Half of 2025

As sustainability gains importance, the environmental insurance market is projected to grow 10% in 2025 due to increased demand and expanded coverage. Environmental risk awareness and stricter regulations drive this growth. Insurers are offering more comprehensive policies to meet new regulatory standards and public expectations.

Heightened environmental regulations and carbon reduction goals worldwide are boosting the need for site-specific pollution legal liability (PLL) insurance. This type of insurance protects businesses from pollution-related liabilities at specific sites, especially in sectors like M&A, brownfield redevelopment, and urban construction, where unknown contaminants pose significant risks.

- **Unknown contamination** — Insurers report that claims for unknown contamination have risen sharply in recent years as more companies undertake redevelopment projects on previously industrialized land. The unexpected discovery of these pollutants can lead to significant claim payouts, particularly in urban areas with a history of heavy industry.
- **Corporate responsibility** — This has shifted from a peripheral concern to a central business imperative. With stakeholders and investors increasingly valuing companies based on their environmental, social, and governance (ESG) criteria, firms are actively investing in sustainability initiatives. The need to protect against potential environmental hazards, including pollution events and natural disasters, is pushing businesses to secure environmental insurance as part of their risk management portfolios.
- **Mold** — Insurance claims for mold have become a growing concern, particularly in older buildings or those with water damage. These claims are common in real estate, hospitality, and healthcare sectors due to costly remediation and potential health liabilities. Insurers often face high cleanup expenses and liability claims, resulting in coverage restrictions, higher deductibles, and premiums for at-risk sectors.
- **Social inflation** — Rising insurance claim costs from increased litigation, higher jury awards, and broader legal definitions of liability challenge the environmental insurance sector. Social inflation stems from changing public attitudes, a litigation-friendly environment, and greater corporate scrutiny, especially in environmental issues. Environmental insurers will likely adjust CPL and PLL policy pricing to reflect the increased litigation risks and claim costs due to social inflation.
- **PFAS** — Coverage will be challenging except for de minimis exposures. Other emerging contaminants or environmental risks, such as 1-4 dioxane, ethylene oxide (EtO), nanomaterials, and microplastics, will also add to the challenges.

**Tightening environmental regulations are driving demand for pollution liability insurance.**

# How USI Can Help

USI can take several actions to help clients navigate PFAS liability:

- Estimating value of limits and reviewing insurance coverage, including historical and current general liability, pollution liability, and directors and officers (D&O) liability.
- Assessing risk, including both direct and downstream liabilities, and identifying key contracts (those who have indemnity or should be indemnified).
  - — Do any existing or former products contain PFAS? If so, what are the sales figures, and when and where were they sold?
  - — Is your exposure to PFAS from products or construction or premises?
- Identifying potential defenses if tagged with liability — is there a legal expert providing advice on regulations and compliance?
- Analyzing jurisdictions that may create greater risk (e.g, toxic tort liability).
- Examining current and future mitigation strategies and controls.
- Assessing due diligence protocols for acquisitions of companies or properties now that PFOA and PFOS are on the hazardous substances list under CERCLA.
- Exploring creative coverage solutions for PFAS either through environmental insurance or an alternative risk solution such as a captive.

In addition, we can help clients with:

- Creating an environmental profile to identify exposures associated with operations, which helps quantify and qualify the impact on the organization to determine appropriate risk management and insurance solutions.
- Delivering formal and customized risk maps to identify the frequency and severity of fines and penalties for noncompliance, spill events, known and unknown remediation, and toxic tort liability.
- Creating sophisticated risk model platforms for significant liabilities, using Monte Carlo analytics to look at a range of probabilities and forecast potential liabilities over an extended period.
- Developing effective environmental risk insurance strategies for acquisitions or divestitures of businesses and/or real estate to facilitate transactions and protect corporate assets.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

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# Aviation

## Developments Since 2024 Mid-Year Market Outlook

The aviation insurance market has stabilized in the U.S. for most classes of business. There is ample capacity across the aviation insurance market, with new entrants providing buyers with multiple options when choosing an insurance partner. In 2024, many aviation insurance buyers experienced price relief from the premium hikes experienced 2018-2023.

Globally, the industry is expected to reach a 20-year high of more than $8B in gross written premium (GWP) at the close of 2024.

This is driven in large part by post-pandemic growth in air transportation and price increases achieved 2018-2023. Additional lift has also come from significant price changes in the war hull segment.

## Trends to Watch: First Half of 2025

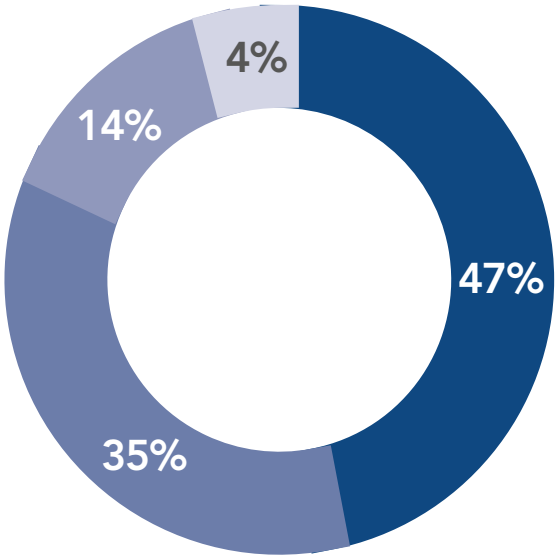
The aviation insurance market is stable as we start 2025. There are numerous challenges that will likely impact the health of the market throughout the year; however, most buyers should continue to see multiple options if they choose to market their account this year. New entrants are looking to write new business, and legacy carriers will continue to compete to maintain their portfolios with well-performing operators that demonstrate a commitment to safety and operational improvement.

Here are some of the challenges USI's aviation experts will be monitoring closely in 2025:

- **Russian confiscation of Western-leased airliners:** This confiscation of more than 500 foreign-owned and leased airliners has led to billions of dollars of claims being submitted from aircraft leasing companies to aviation insurers. These claims are currently being litigated in London courts and will likely see resolution in 2025. The settlement of these claims will likely have a continued impact on the contingent hull, war hull, and liability segments. It's unclear whether this impact will be spread across the broader global aviation insurance market at this stage.
- **Inflation and increasing costs:** Aviation claims for physical damage (hulls) costs are soaring due to inflation, lack of spare parts availability, labor shortages, and significantly increased repair times. The costs and time needed to repair even minor attritional physical damage claims have increased

## 2024 Aviation Insurance Market Share

- General Aviation 47%
- Airlines 35%
- Aerospace 14%
- Contingent 4%




Source: Allianz

dramatically since 2020. These increased costs will ultimately impact insurers' bottom-line results and necessitate rate adjustments to keep pace with the current cost of repairs.

- **War and instability:** The wars in Ukraine and Israel are creating significant instability in war facilities and war coverage providers. USI sees this category of aviation insurance as the most likely to experience continued rate increases and challenges in 2025. Excess war coverage that is purchased by airports and international aircraft operators are under the most pressure and will likely see this part of their programs increase by 10% or more.
- **Social inflation and increasing jury awards and settlements:** In recent years, aviation liability claim costs have continued to soar, as plaintiffs seek policy limit settlements and juries award high judgments to parties who have been injured in aviation accidents. This was evidenced by a 2022 jury award of $352M for an aviation ground handler who was injured while marshaling a United Airlines aircraft in Texas.

## General Aviation

The post-pandemic pilot shortage has abated somewhat, and airline pilot hiring is expected to see reductions for most airlines. This will likely ease some of the pressure on general aviation operations to hire and retain pilots. Underwriters are continuing to maintain high standards for new and transition pilots in turbine aircraft, but are working with brokers like USI to offer flexibility.

Pilot age continues to be closely scrutinized, and older pilots may have trouble finding coverage. Additional strategy is needed for pilots over 65 years old on many general aviation placements.

Average renewal premiums are expected to be flat to down 5% for many loss-free aviation accounts, and accounts with increasing exposures or recent loss experience will likely see rate increases of 5% or more. The majority of U.S. carriers continue to prefer a "quota share" approach to fleet operators and large commercial accounts. We expect to see carriers compete for larger line sizes in 2025, and may see some carriers break from this strategy and begin to fully underwrite attractive and well-performing accounts.

Aircraft operators who operate internationally should expect additional scrutiny on the countries they are operating in. Most major aviation insurance carriers continue to add countries to the territory exclusion in the policy. Aircraft operators that purchase war limits above $100M will continue to see significant rate increases of 10% or more.

## Manufacturers' Product Liability

- There is abundant capacity for noncritical aviation products liability manufacturers.
- Manufacturers with higher criticality products or poor loss history will continue to be under pressure to find competitive pricing and adequate capacity.
- Average renewal premiums are expected to be -5% or flat.

## Airport and Municipality Coverage

- Airports that carry high limits of war liability should expect to see increases of 10% or more for war lines.
- Capacity and appetite for U.S. airports remains high with abundant competition.

# How USI Can Help

USI works closely with our aviation clients to develop a comprehensive risk management strategy tailored to their unique exposures and focused on mitigating their cost of risk.

To achieve a favorable coverage outcome, USI suggests:

- Starting the renewal process as early as possible to allow time for renewals to be fully marketed and to schedule virtual meetings with underwriters.
- Consulting with USI's national aviation team to help guide the process. The team suggests ways to improve submission integrity and timelines, and advocates on your behalf.
- Providing detailed information that allows us to better understand your company's risk management situation and needs.
- Completing applications and questionnaires completely.
- Highlighting your company's focus on safety and pilot training protocols, especially training that goes above and beyond Federal Aviation Administration (FAA) requirements.
- Being open to underwriter and loss control visits.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

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# Executive & Professional Risks

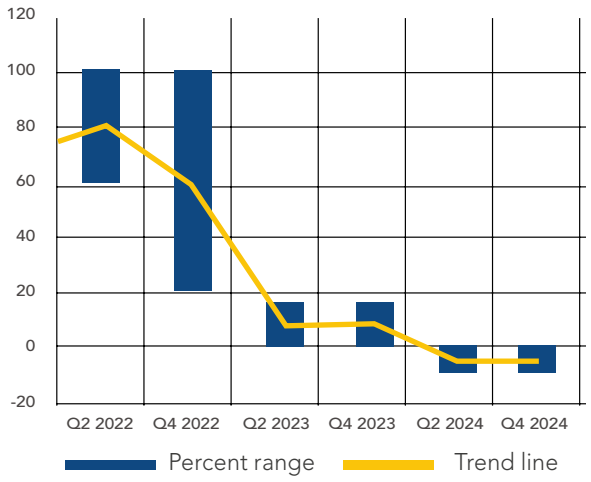
## Developments Since 2024 Mid-Year Market Outlook

Availability of capacity and premium-reducing competition within the executive and professional risk marketplace continued in the second half of 2024.

- **Directors and Officers Liability (D&O):** Premiums for public, private, and not-for-profit organizations almost universally decreased. The market competitiveness extended to terms and conditions, making expanded coverage more readily achievable on both primary and excess bases. This included expanded coverage for regulatory investigation costs, higher limits for derivative demand response costs, and the ability to recoup a portion of the self-insured retention (SIR) if certain claims are resolved favorably.
- **Employment Practices Liability (EPL):** The market remained competitive despite the EEOC pursuing employment discrimination charges, especially around pregnancy and ADA violations. What hasn't impacted the market yet: Heightened employment-related privacy exposures from more genetic and biometric data collection, and a charged atmosphere around political and ideological affiliation.
- **Fiduciary Liability:** Overall, stability in the marketplace remained, particularly for insureds that showed attention to containing the costs of their retirement plan advisors and service providers. Despite high-profile events, the fiduciary liability marketplace is stable due to strong underwriting discipline, robust capital reserves, and ongoing demand for coverage.
- **Crime (Fidelity):** Premiums remained stable. Underwriters remained concerned about social engineering exposures, and sublimits for this type of loss remained the standard. Employers that implemented training for payment and procurement teams and recidivism strategies to stop chronic offenders obtained optimal results.
- **Kidnap & Ransom (K&R):** No material changes, but the targeted killing of a large company's CEO caused immediate concern in C-suites around the world.
- **Professional Liability/Errors and Omissions (E&O):** Premiums trended much closer to flat in many industry verticals. SIR reductions and terms and conditions' expansions also continued to evolve more favorably for insureds.
- **Transactional Risks (Representations and Warranties Insurance (RWI)):** Rates remained near all-time lows despite persistent claim frequency and severity. We saw a slight firming in rates in Q4. M&A transactions increased which we attribute largely to the Federal Reserve's September interest rate cut.
- **Cyber/Technology E&O:** In July 2024, a leading cybersecurity firm suffered a large IT outage that disrupted business in virtually every industry. Despite this, cyber insurance competition remained strong, but the trajectory of softening flattened, meaning that premium decreases lessened.

## Network Security & Privacy (Cyber)

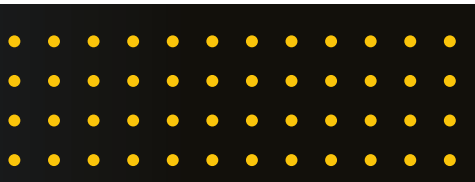
Rate changes, year over year



## Trends to Watch: First Half of 2025

- **D&O:** Federal securities class action (SCA) litigation is slightly increasing, with more claims involving false AI impact statements on businesses. As SCAs rise and premiums drop, some D&O underwriters may halt further premium decreases in 2025.
  - **Financial Services:** Without systemic risk events, the market should stay competitive. Financial institutions, with constant regulatory oversight, are always at risk of high-profile investigations and D&O liability claims.
  - **Healthcare:** Healthcare organizations see less competition due to heavy regulation. Anti-trust litigation and government-related claims, like False Claims Act (FCA) suits, remain significant D&O risks. The FCA's whistleblower provisions allow individuals to sue for fraud on behalf of the government.
- **EPL:** Costs to defend claims will likely continue to increase. The EEOC's focus on the rights of vulnerable workers could lead to more discrimination claims. Higher retentions for claims in California, claims by highly compensated employees, and/or class- or mass-action claims are common.
- **Fiduciary Liability:** Higher retentions for "excessive fee" claims are stabilizing profitability, but the focus of the plantiffs' bar on other factors create uncertainty. New risks also arise from the SECURE Act 2.0, which introduces changes to 401(k) distribution rules, disclosures, and testing procedures, with auto-enrollment and terminal illness payments set to begin in 2025. ESG investing faces legal challenges following the overturned Chevron Doctrine, potentially impacting fiduciary risk. State and local healthcare regulations, especially around abortion, could also complicate compliance. Other emerging litigation targets include alleged deficiencies in COBRA election notice requirements and claims related to pension risk transfers or buyouts.
- **Crime (Fidelity):** We expect social engineering and business email compromise (BEC) exposures to continue. Better alignment of coverage for these exposures between crime policies and cyber policies will be a 2025 focus. Considerations of whether insurers will provide coverage under both policies for the same insured, which policy pays first, and how retentions or deductibles apply in the event of a larger loss are critical.
- **Cyber/Technology E&O:** We expect 2025 to experience as many as, if not more, cyber incidents than 2024. The need for greater scrutiny of vendor-related risks will continue, as will the development of AI-related threats. The long-tail nature of cyber incidents may develop adversely into loss payments based on past cyber incidents. Because many small and midsize enterprises do not prioritize IT in the same way that larger organizations do, they may be more vulnerable to attacks. This is especially true for non-regulated industries where there are lower levels of adoption and implementation of critical IT/privacy controls, processes, and systems.
- **Professional Liability/E&O:** The impact of AI on virtually all professions and businesses is still unknown. While the proper adoption and use of AI could reduce risks for certain companies, overreliance on AI could result in erroneous counsel given to clients and other alleged wrongful acts like copyright infringement or invasion of privacy.
- **Transactional Risks (RWI):** We expect to see more premium transition during the first half of 2025, with rates remaining steady initially and increasing as we move through the year. We expect M&A deal activity to increase, particularly if interest rates decline further. Capacity should remain abundant with broad coverage terms available, and the underwriting process should remain insured-friendly. Underwriters' interest in writing RWI for smaller transactions continues to grow, despite persistent claim frequency and rising claim severity.

**AI-related risks and securities class actions are impacting D&O liability.**



# How USI Can Help

## For All Lines:

- Start the renewal process early (at least 120 days prior to expiration).
- Prepare a risk profile analysis and review it to determine perceived (by underwriters) strengths and weaknesses.
- Set appropriate and realistic expectations based on risk profile.
- Use analytical tools, including benchmarking, to determine an optimal program structure (limits, retention, amount of dedicated Side A coverage).
- Evaluate captive solutions, where appropriate.
- Market all layers and access multiple insurer channels and marketplaces (geographies).
- Negotiate coverage grants and navigate coverage restrictions via USI's proprietary solutions.
- Ask primary insurers for options, including multiple retention options.
- Opine on the historic claims-paying performance of current and prospective insurers.

## D&O Liability

- Encourage reducing governance risk by:
  - — Establishing and maintaining sound board and committee reporting protocols.
  - — Making sure that boards closely monitor mission-critical operations and risks, particularly cyber-related risks.
  - — Instituting tests to see how effective a board's oversight governance is performing.
  - — Encouraging the addition of federal forum selection clauses to organizing documents, specifying that the federal court is the exclusive jurisdiction for litigation brought under applicable securities laws.

## EPL

Insureds and their brokers should take a proactive approach in identifying distinguishing factors to secure the most advantageous renewal terms in terms of program structure, pricing and coverage. Here are key strategies to achieve this:

- Know evolving EEOC priorities, federal legislation, notable changes in state-focused enforcement strictures and emergent claims activity.
- Understand EEOC guidance regarding industry focus areas and the use of algorithms and AI in the hiring process.
- Prepare to respond to underwriting questions about HR and workplace training, biometric information collection practices, and any year-over-year changes to employee handbooks or HR manuals.
- Host and navigate successful underwriting calls with EPL underwriters and clients' HR, risk management and legal departments.
- Approach the broader marketplace (U.S., Bermuda, other) for additional and emergent EPL considerations including punitive damages wraps and wage and hour coverage.

## Fiduciary Liability

- Prepare underwriting questions about plan service provider selection and comparison processes.
- Establish prudent processes for fiduciary decisions, documentation of the processes, and compliance with ERISA, DOL and IRS regulations regarding participant disclosures and government reports.
- Discuss emergent items, like the addition of a forum selection clause to plan documents and impact of M&A on plans and sponsors.
- Utilize risk management support from fiduciary liability insurers and USI resources.

## Crime/Fidelity Bonds

- Understand transaction verification processes and procedures to thwart BEC risks. Insureds with advanced and thoughtful risk practices can differentiate their risk profile and secure more favorable terms.
- Look into potential coverage crossover with cyber insurance, helping clients understand differences and manage coverage applicability across different policies.

## Professional Liability/E&O

- Discuss any minimum limit requirements by insureds' clients in managed service agreements and contracts.
- Provide curated, advanced underwriting questions, and help craft appropriate responses specific to operations.
- Track the most competitive insurers in the E&O space to understand their underwriting appetites and willingness to address risks creatively.
- Identify and highlight risk control and management differentiators across the insured's operations (including third-party (vendor) risk management)
- Examine the scope of professional services, as many firms have modified and diversified their offerings. Amend coverage terms as needed.

## Cyber: Network Security and Privacy

- USI's comprehensive cyber risk control continuum includes services and solutions designed to assess a company's cyber hygiene/security stack and cyber risk exposures, and connect them with curated third-party providers that specialize in emergent cyber risks. Our Answerlytics™ and customized eRiskHub solutions can help you improve your cybersecurity and insurance marketability, pricing and terms.
- USI's Answerlytics Curated Providers (ACPs) know that the cyber threat landscape is increasing:
  - **Attack surface expansion —** Employers continue to rely heavily on cloud-based technology to allow for the greater utilization of remote environments. Cloud accounts can expose organizations to attacks when they are misconfigured or if vulnerabilities are allowed to persist.
  - **Identity system defense —** Identity-driven attacks often directly leverage compromised credentials to launch larger, more catastrophic attacks.

- **Supply chain concerns —** Bad actors have continued to bombard organizations that rely on a software supply chain and vulnerabilities caused by a) third-party software products that require privileged access; and b) third-party software products' requirement of frequent communication between a vendor's network and the vendor's software product located on customer networks.
- **Diversified attacks —** Cyber criminals utilize multiple attack surfaces including smishing, phishing and vishing to trick people. These bad actors target disgruntled employees and offer them nominal amounts for access to their credentials.

USI can connect you with the appropriate Answerlytics Curated Provider (ACP) that specializes in addressing identified cyber risk(s).

## Technology E&O

- Evaluate full scope of operations, and seek to secure broad coverage with limited gaps.
- Act as nexus for an insured's finance, IT and legal/compliance group to address technology E&O risks.
- As emergent technologies are widely adopted, review the need for additional limits of liability.
- Align the coverage in your insurance program between technology E&O liability and products liability/bodily injury/property damage to achieve maximum recovery of a loss.

## Transaction Liability

Engage early in the M&A process to help identify the risk profile for the contemplated transaction.

- Review current market conditions and expected areas of coverage insurers are likely to raise for planned M&A transactions.
- Provide clarity and set expectations for the procurement process and timeline (the process is unlike most other insurance coverages).
- Provide a dedicated team of transaction liability specialists with 24/7 service availability.
- **Fiduciary:** Our specialized team can assist clients in highlighting the emergent areas of risk that underwriters will focus on, including nontraditional fiduciary considerations like evaluating third-party providers (TPPs) and cyber-related ERISA exposures.
- **Crime:** USI can help place coverage, including robust social engineering with physical goods coverage. We also offer third-party provider (TPP) vendor reviews, including verification and in-band procedures alignment and customization.
- **Professional Liability/E&O:** We provide TPP vendor reviews of representative service contracts. We liaise with your procurement, compliance, and risk management groups to allow for security processes, both technical (DMARC, DKIM, SPF alignment, etc.) and redundancy-based (out-of-band confirmation numbers established, passcodes for authorized user acknowledgment).
- **Transactional Risks:** We engage early in the process to identify the risk profile for the contemplated transaction, and identify areas of coverage insurers are likely to focus on. We help clarify and set expectations for the procurement process and timeline, as the process is unlike most other insurance purchases. We can also provide 24/7 service availability to transactional risk specialists.

For additional information, contact your USI representative or email us at pcinquiries@usi.com.

» Return to the insurance rate forecasts

# Industry Updates

**Our industry experts offer insights into current trends, challenges and developments across various sectors, to guide you in making informed decisions.**

## Agriculture

- **Property Loss Recommendations:** There is continued pressure on insureds to adhere to property loss recommendations on a timely basis. Underwriters have increased focus on risk characteristics (COPE information), especially for large property schedules, and often will look to limit exposure by moving to a loss limit structure. Strong cooperation with loss recommendations and positive risk characteristics provides an opportunity to leverage new capacity from a property insurance standpoint.
- **Outside Capital:** The agribusiness industry has become a target for outside capital via institutional investment vehicles, including private equity, pension funds and family offices. The influx of capital has created an uptick in M&A activity, which is reshaping the D&O liability risk profile.
- **Labor Costs and Technology:** With labor costs rising, organizations are leveraging technology to optimize supply chain operations, which is heightening cybersecurity risks and necessitating stronger network security controls and cyber liability insurance.

## Architects & Engineers (A/Es)

- **Claims:** Economic and social inflation are driving up the cost and duration of claims.
- **Capacity Reduction:** Some carriers are reducing capacity to $5M or less, resulting in more excess placements and increasing total costs.
- **Higher Limits:** Firms are often required to carry higher limits due to the increasing complexity and scale of projects.

## Aviation

- **Capacity:** The market has seen new capacity, with abundant capacity for most aviation operations. A competitive environment exists for operations with strong safety management systems in place and favorable claims experience.
- **Geopolitical Tension:** High levels of international geopolitical tension and ongoing claims associated with the Russia/Ukraine war continue to have a negative impact on war pricing.

## Construction

- **Umbrella/Excess Liability:** Pricing and capacity are under enormous pressure from nuclear verdicts, auto liability exposures, and construction defect claims.
- **Property:** Market pressures impact capacity and pricing for CAT exposures on builder's risk programs.
- **Cyber:** Continued emergence of cyber liability exposures in the construction industry including the:
  - Emergence of AI and reliance on mechanical means.
  - 3D printing of materials.
  - Record pace of new tech center construction.
  - Exposure to cranes and heavy equipment.

## Distributors

- **General/Product Liability and Auto:** These lines will continue to be major loss drivers for distributors.
- **Third-Party Hauling:** Due to increasing exposures, insurers want to see that the right controls are in place for insureds to mitigate losses and the risk of nuclear verdicts.
- **Third-Party Litigation Funding:** The increased use by plaintiff firms is resulting in distributors being named as defendants in products suits more frequently.

## Education

- **Liability:** Coverage continues to be challenging due to the increased cost of claims.
- **Sexual Abuse and Molestation:** This continues to be challenged due to the extension of reviver statutes in many states.
- **Antitrust Coverage:** This is becoming problematic due to multiple class action claims against higher education institutions, as well as student athlete issues related to the changing landscape with NIL payments, athletic scholarships, and whether they should be considered as employees.

## Energy

- **Power Demand:** After nearly 25 years of declining electricity demand, we expect it to increase significantly due to AI, cloud, data-centers, EVs, crypto, and the ongoing migration to e-commerce. This may lead to higher power generation costs, increased insurance premiums for energy-related risks, and the need for comprehensive risk management programs.
- **Renewables and Political Uncertainty:** Potential tariffs can increase costs and risks for renewable projects, while IRA credits can provide financial incentives. This dual impact may require adjustments to insurance coverage to account for higher project costs and potential delays due to tariffs.

## Entertainment and Media

- **Private Equity Investment:** Increased investment in youth and professional sports is reshaping the industry. With more investment comes increased scrutiny for better governance, safety, and overall operational practices to reach profitability. Risk management has, and continues to be, at the forefront of protecting these organizations and ensuring their viability.
- **Climate Change and Active Shooter Impacts:** Weather events and active shooter threats are increasingly affecting the safety and viability of all sports. Event managers must ensure the safety of the public while attending these events, and be prepared in the event of an incident. The development of emergency response plans, as well as event cancellation coverage, are critical components of a risk management program.
- **Sports Betting Regulation:** The regulation of sports betting is creating new challenges and opportunities for risk management.

## Financial Services

- **Cyber Risks:** Boards must ensure cyber programs are fit for purpose and limits are sufficient to mitigate risks.
- **AI Impact:** AI's role in decision-making and customer service raises new risk and insurance considerations.

## Healthcare

- **Employee Recruitment and Retention:** Healthcare faces challenges in attracting and keeping skilled professionals due to high demand.
- **Increased Litigation Costs:** Legal expenses are rising as healthcare providers navigate complex regulations and lawsuits.

## Hospitality

- **Property Market Impact:** Due to severe storms and water damage claims, expect property carriers to raise catastrophic (CAT) and water damage deductibles, limit wind/hail coverage, or reduce their interest in insuring hotels and resorts.
- **Casualty Market Trends:** In 2025, anticipate human trafficking exclusions, and sublimits for abuse/molestation and assault/battery. Strong risk management, maintenance checklists, and security procedures are crucial for favorable terms and coverage.

## Manufacturing

- **Supply Chain:** Continued risks, disruptions, delays and elevated costs are expected due to several factors, including geopolitical tensions, labor shortages across the value chain, rising costs in raw materials and changes in government policy. A comprehensive risk management program focused on supply chain planning, transparency, and supplier collaboration will assist in mitigating losses and overall cost of risk.
- **Investment in Digital Technologies and Smart Operations:** Companies are continuing these investments to address elevated material and labor costs, an ongoing skills gap, and potential disruptions from geopolitical factors. Manufacturers should remain diligent in integrating cyber resilience into their organizational culture to help boost their own security, as well as the security of suppliers and vendors in their network.

## Marine

- **Capacity and Appetite:** Both are increasing on almost all marine lines, with the Lloyd's and London markets leading the charge and the U.S. markets responding in kind.
- **Protection and Indemnity (P&I):** The IGA Clubs are seeking increases between 5% and 7.5%, driven by inflation and several large claims, such as the Baltimore bridge incident. The fixed P&I market and excess liabilities are generally flat, assuming acceptable loss ratios.
- **Rates and Trends:** Rates for hull and machinery and ocean cargo are softening slightly, with this trend expected to continue for the next 18 to 24 months. Marine general liabilities and excess are generally flat, but port/terminal property appetites are increasing, leading to significant savings.

## Professional Services

- **Data Management and AI:** Many firms (especially law, consulting and accounting) continue to be targets for the data they hold. The untrained use of AI and how to effectively utilize it to provide correct advice are additional issues firms are attempting to manage. While cyber premiums have moderated, underwriter scrutiny continues to place pressure on internal controls.
- **Staffing Challenges:** Many firms are attempting to do more with less staff, causing mistakes to occur, impacting clients and resulting in professional liability claims. Despite stable rates, clients with poor loss history are seeing premium increases.

## Public Entity

- **Law Enforcement Liability:** Placements continue to garner strong underwriting attention, with pricing and retention facing upward pressure.
- **Excess/Umbrella:** Challenges arise from capacity and the impact of larger verdicts, with certain jurisdictions seeing significant reductions in available capacity without tort reform.

## Real Estate

- **Deferred Maintenance:** This has been a looming issue for several years, and insurance carrier demands are making the problem more acute. As operators consider catching up, some are beginning to see rebuilding as a more cost-effective option. Also, the decrease in office demand versus the housing shortage is causing office and retail operators to evaluate conversions of existing space. However, construction challenges can drastically increase the insurance burden. This has led to more rebuilds as well.
- **Social Inflation:** This has created tremendous volatility in liability markets, which has contributed to a slower-than-expected re-entry of capital and capacity into the market. Crime scores are now baseline underwriting information and a primary determinant of cost and capacity.
- **Property Schedules:** They are growing, and underwriting for property and liability can drastically depend on geography and risk characteristics. This has changed the approach of the market players. Comprehensive single-player programs are harder to find. More shared and layered programs are emerging, and splitting up programs with regional markets is once again becoming more prevalent.

## Retail

- **Supply Chain:** Retail supply chains face various disruptions and risks, including issues like fluctuating demand, supplier delays, transportation bottlenecks, natural disasters, and geopolitical instability. Insurance can be utilized to mitigate these risks, covering aspects like inventory protection, business interruption coverage, and logistics insurance.
- **Cyberattacks:** As more people shop online, e-commerce crimes are on the rise. A distributed denial of service (DDoS) attack can cripple business servers, preventing customers from purchasing items. Cybercriminals can also target brick-and-mortar retailers by hacking into physical point-of-sale (PoS) systems. Cyber insurance protects retail business and covers damages in the event of a data breach.

## Social Services

- **Fundraising:** Nonprofits must adapt to a rapidly evolving digital landscape to effectively engage audiences and maximize fundraising efforts. By focusing on digital marketing, personalized communications, AI tools, simplified donation processes, and audience preferences, organizations can create impactful strategies that resonate with supporters while driving meaningful change in their communities.
- **Cybersecurity Risks:** Nonprofits often hold data on donors, and these records may include sensitive financial information. A data breach may expose this information and put donors at risk. Ransomware and phishing attacks have become a constant threat. Stringent updating and focus on training while managing cyber hygiene is critical for 2025 and beyond.

## Trucking

- **Driver Shortage:** Technological advances have eased the driver shortage as the trucking profession has become more attractive and manageable.
- **Litigation:** Rising jury verdicts remain a top issue despite tort reform efforts.
- **Insurance Cost and Availability:** Rising operational costs, increased litigation, and high-profile nuclear verdicts continue to impact the availability and cost of insurance.

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## How We Can Help

To help clients navigate complex business challenges, USI shares expert insights and key solutions through our Executive Series. Our cross-functional teams work to provide timely information on new and evolving topics in risk management, employee benefits, personal insurance and retirement. We then share tailored solutions to successfully guide your organization, enhance insurance coverage, and control costs. For additional information and resources, please visit our Executive Insights page: usi.com/executive-insights

Revolutionize your approach to risk management
Learn About USI PATH™

# Appendix F: AXA XL “Mass Timber and Insurance” presentation

# Mass Timber and Insurance – The Road from Challenges to Solutions

Cheri Hanes, Head of Construction Innovation and Sustainability, AXA XL
Advancing Mass Timber Construction | Nashville, TN | 09 25 24

# Mass Timber and Insurance – The Road from Challenges to Solutions

## Meet Your Speaker


**Cheri Hanes**

Head of Construction
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**AXA XL**

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# AXA XL Ecosystem

An innovative business initiative that leverages partnerships and services to help our clients advance risk management, support ESG, and grow their businesses.

We act for human progress by **Protecting What Matters.**

# AXA XL Ecosystem

Mass Timber and Insurance – The Road from Challenges to Solutions 2024

## Preferred Partners Network

Our portfolio of solution providers are curated to help our clients reduce risk, promote sustainability, and grow their businesses.

Discounts and/or preferred terms are available for AXA XL clients. Learn more

## Risk Benchmarking Services

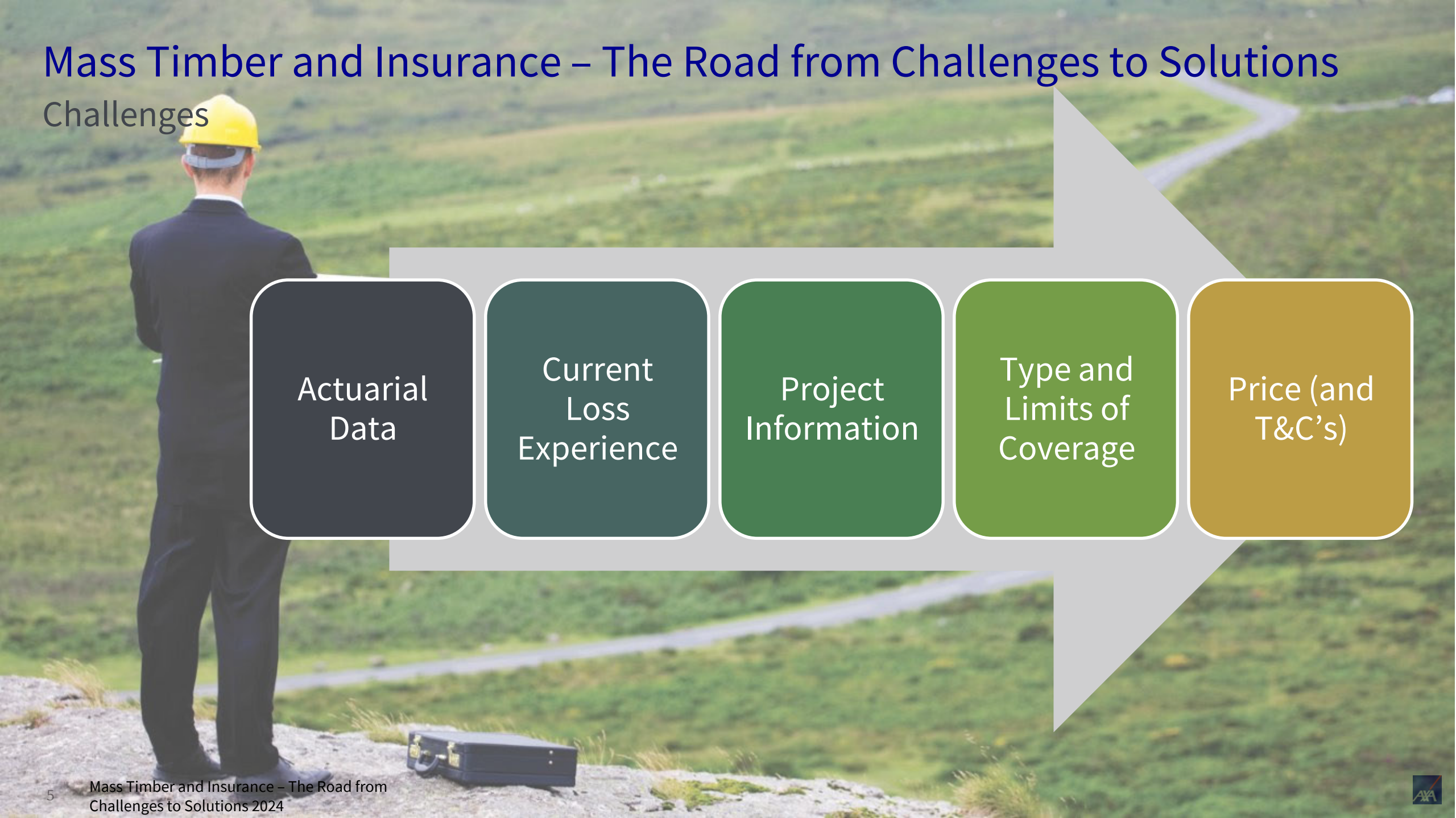
Our proprietary Risk Benchmarking Services are designed to help our clients advance risk management through comparative assessments and personalized recommendations.

## Thought Leadership

Promoting a culture of innovation across the industries we serve through educational content, roundtable peer networks, and knowledge-sharing workshops.

# Mass Timber and Insurance – The Road from Challenges to Solutions

## Challenges



# Mass Timber and Insurance – The Road from Challenges to Solutions

## Challenges

# Builders Risk

- Hot Works Management
- Water Management
- Materials Storage, Protection, & Handling
- Manufacturing
- Rehabilitation after Damage
- CAT Exposures

# Mass Timber Practices

**Supply Chain**

Production monitoring

Quality monitoring

Transportation –

- Logistics
- Protection of materials
- Communication
- Insurance

# Mass Timber Practices

**Design and Planning Considerations:**

Experience of the parties

- Owner
- Design Team, Consultants
- Manufacturer
- Builder and Proposed Project Team
- Subcontractors (direct placement & others for coordination)
- Authorities Having Jurisdiction (AHJs)/ Building Officials

Completeness of design

Level of specialized details in plan

# Mass Timber Practices

**Plan for Construction:**

Coordination with specific subs, manufacturer, consultants.

Mock-ups and testing

Details specific to Mass Timber

Production monitoring

Quality practices specific to Mass Timber

# Mass Timber Practices

**On Site Materials Management**

- Logistics / Sequencing
- Plan for receipt of materials on site

What are planned measures to protect material over course of construction from:

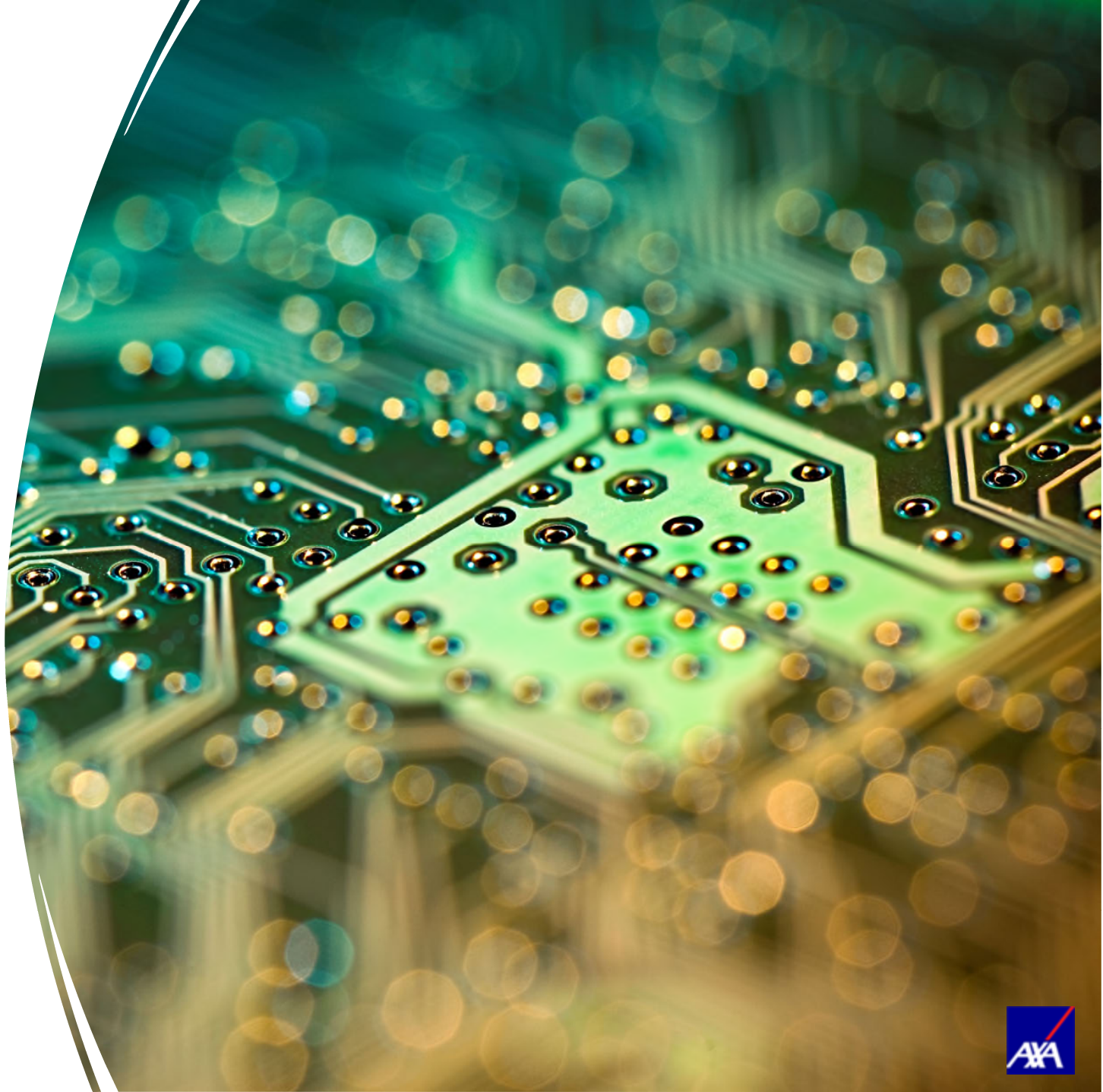
- Water
- Fire
- Weathering/Discoloration
- Vandalism

Safety

# Mass Timber Practices

**The Role of Technology**

- BIM
- Awareness of incoming weather
- Monitoring and managing water, humidity, temperature
- Fire and Security Monitoring
- Supply Chain / Logistics



# Summary

To address insurers' concern around Mass Timber, be prepared to address :

| |
|---|
| Project Details |
| Supply Chain, Transportation, and Materials Management |
| Quality Management – including Water Management |
| Safety – including Hot Works Management |
| CAT Exposures |
| Prequalification of all parties – not just subcontractors |
| Schedule Risk |
| Methods for Repair after Damage |
| Technology that reduces risk |

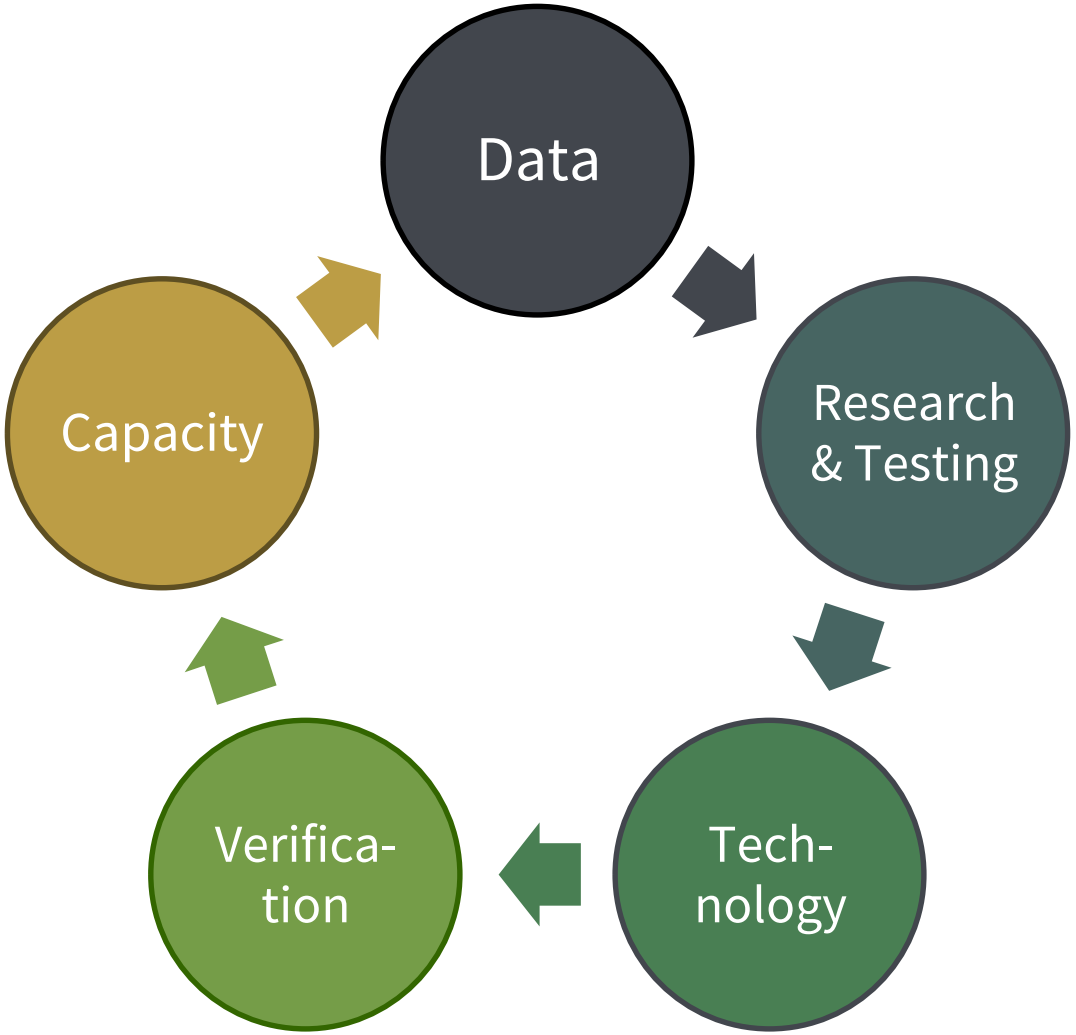
# How to Make Your Mass Timber Projects More Insurable

## Strategies

- Be realistic with price and timing – move discussions to the left
- Don’t rush in without all the facts
- Do your homework and be prepared to “show your work”
- Look for experienced help
- Collaborate!

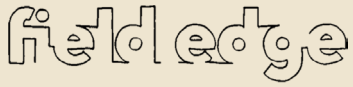
# Mass Timber and Insurance – The Road from Challenges to Solutions

## Next Steps




Questions?

# Know You Can



*making buildings behave more like plants, and industries more like forests*

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