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ASSET OWNER RESEARCH: ROADBLOCKS TO TIMBER USE

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ABSTRACT: One of the primary objectives of Timber Unlimited is to accelerate the adoption and increase the volume of timber used in commercial construction, aiming to boost the number of buildings with low carbon footprints. This study conducted by Timber Unlimited explored the motivations and barriers faced by asset owners in Aotearoa New Zealand when considering timber as a primary material for commercial buildings, beyond its aesthetic benefits. The goal was to provide insights that will positively influence decision-makers' perceptions and choices, thereby creating more opportunities for timber use. The study uncovered significant gaps in knowledge and best practices related to building with timber among asset owners. While many recognize timber's strong sustainability credentials, they often struggle to find hands-on expertise, which leads to the perception that timber is "exclusive." The study found that it is essential to facilitate the transfer of knowledge from experienced practitioners to those less familiar with timber. Highlighting hybrid construction projects, which combine timber with other materials, can also help ease the transition. Furthermore, improving regulatory frameworks is crucial to streamline the building consent process for timber construction.

KEYWORDS: Timber Unlimited, timber buildings, asset owners, Scion, New Zealand Timber Design Society

1 – INTRODUCTION

Timber Unlimited, formerly Timber Design Centre, is a non-profit organization dedicated to promoting timber use in building and infrastructure projects, with a focus on commercial, industrial, public, and multi-story sectors. Timber Unlimited mission is to accelerate New Zealand's transition to low-carbon timber construction by showcasing timber as a sustainable, practical, and viable material. It supports architects, engineers, and the wider construction industry by providing resources, guidance, and education to overcome barriers, inspire innovation, and unlock timber's potential.

Through collaboration, Timber Unlimited connects industry professionals to share knowledge, skills, and best practices, helping the industry embrace timber more widely. It was stablished in March 2022 by New Zealand's Ministry of Primary Industries (MPI) and run by a consortium consisting of Building Research Association of New Zealand (BRANZ), New Zealand Timber Design Society (NZTDS), New Zealand Forest Research Institute (Scion), and the Wood Processors and Manufacturers Association of New Zealand (WPMA). Late in 2024 a licencing agreement was signed with MPI transferring custodianship to NZTDS, which operates as a member-driven organization led by dedicated volunteers.

For this study, Timber Unlimited identified a key obstacle to the widespread adoption of timber in construction: the limited understanding of this material among asset owners, who play a pivotal role in determining when and where wood is utilized in building

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projects. In the context of timber building, "asset owners" refer to the individuals or entities that own or hold the rights to a property or building. They are responsible for the development, management, and maintenance of the building. They are also decision makers in aspects like construction methods, materials, and when and how a building project will proceed.

Asset owners encompass a diverse range of stakeholders, including individuals developing commercial properties, government bodies, and groups working collaboratively to design and develop structures and communities. They are the ones that set the expectations, take the final decisions and write the cheques. Interestingly, asset owners represent a demographic that is seldom studied within the context of the forest-to-timber buildings value chain. The primary objective of this study was, therefore, to explore the motivations and barriers surrounding the use of timber among a diverse range of asset owners in New Zealand, with the aim of transitioning timber from a material primarily valued for its aesthetics to a leading choice for commercial applications.

A follow up piece of research to provide wider industry insight was also completed and discussed in this paper.

"To help make timber an easy choice for the industry at large, you first need to understand it"

2 – BACKGROUND

Timber Unlimited commissioned qualitative research encompassing a wide range of New Zealand asset owners, with the primary goal of understanding the motivations and barriers faced by this diverse group of stakeholders. By gaining deeper insights into their needs, preferences, and perceptions regarding the use of timber in both commercial and government contexts, Timber Unlimited aimed to enhance the adoption of mass engineered timber in construction projects.

Two studies were commissioned by the Ministry for Primary Industries - Te Uru Rākau, leading to the creation of two internal reports: "Asset Owner Research: Roadblocks to Timber Use" [1] and "Benchmark Research: Full Report" [2]. A summary of the first study can be found on Timber Unlimited's website under the title "Asset Owner Research: A Summary of Findings" [3].

Asset Owner Research was delivered in 2023. It was based on in-depth interviews that were conducted with key asset owners and primary decision-makers within development organizations. The results were rigorously analysed to identify key themes, including gaps in general knowledge. These themes encompassed the current awareness of timber and wood products in commercial or light commercial buildings, the understanding of sustainability in construction, the perceived benefits of using timber, and the rational and emotional barriers to its use.

Benchmark research was delivered in 2024. It involved a survey of the wider industry to further assess the awareness and understanding of the benefits of incorporating timber into building design. A total of 165 specifiers, engineers, builders, building owners, and other industry stakeholders participated in the survey. This survey targeted professionals within the Timber Unlimited network and aimed to measure the current engagement of architects and builders with timber and wood products in commercial and light commercial buildings.

The benchmark survey explored the understanding of sustainability in construction, the role of timber in shaping design choices, and the practical and aesthetic advantages of using timber. It also identified both rational and emotional barriers that could influence the adoption of timber as a building material. Additionally, the survey explored whether specifiers and builders consideration of timber had increased or decreased since the establishment of Timber Unlimited. It gauged unprompted and prompted awareness of Timber Unlimited and other organizations advocating for timber-based construction.

3 – PROJECT DESCRIPTION

Asset Owner Research involved in-depth interviews with key asset owners and primary decision makers and influencers within development organizations [1]. Representatives from 15 development organizations, each with varying degrees of experience with timber in commercial settings, were interviewed across Auckland, Wellington, Christchurch, and other locations. Main findings from this study are summarized in sections 4.1 to 4.6 of this paper.

For the Benchmark Research an online survey was conducted between January and February 2023, targeting 7,167 contacts from Timber Unlimited industry database [2]. Of the initial invitations sent, 2,625 recipients opened the email, and 265 clicked the survey link. A reminder email was subsequently sent to 7,084 recipients, leading to 3,109 opens and 118 additional clicks to the survey. Ultimately, 165 contacts completed the survey beyond the classification questions. Main findings from this study are summarized in section 4.7 of this paper.

Important note: This research was conducted in the aftermath of Cyclone Gabrielle (February 2023), which had a significant impact on several regions of New Zealand. The resulting slash issue led some participants to feel less favourable toward timber, as they believed the New Zealand forestry industry needed to "clean up its act." While many were able to separate their views on timber as a product from the broader controversy, it is important to acknowledge and address these concerns as part of the context surrounding the study.

4 – RESULTS

4.1 ASSET ONWERS CATEGORIES

The term "asset owner" typically suggests a singular entity, but in reality, asset owners vary widely - from individuals with a passion for developing commercial property to government bodies, and collectives of individuals working collaboratively to design and develop structures and communities. Based on timber usage, three distinct categories of asset owners emerge:

- Not Yet Using Timber: These asset owners primarily rely on concrete and steel and have limited interest in using timber at present. Their focus tends to be on cost-effectiveness and immediate practicality, even though they may plan for long-term sustainability. For them, material choices must make financial sense, and while timber might be recommended, they are hesitant to navigate the complexities of timber-based design. These owners are more likely to invest in properties for lease, particularly those where tenants are not required to report on sustainability metrics.

- Exploring Timber Use: Asset owners in this category are aware of the potential of timber for commercial applications but remain cautious. They understand that the building landscape is evolving and that new sustainability considerations must be integrated into their decisions. However, they still balance these demands with financial priorities. While they may observe others utilizing timber, they are not necessarily well-connected with experts in the field. These owners tend to invest in a mix of properties for use, lease, and sale.

- Timber Experienced or in Progress: These asset owners have a solid understanding of timber and may have practical experience incorporating it into their projects. They prioritize building "better," putting long-term sustainability ahead of short-term financial considerations. Their teams are often sustainability-focused, equipped with the skills and dedication to navigate the challenges of timber-based design. These owners are more likely to retain the properties they build, ensuring that their investments reflect a commitment to both quality and environmental responsibility.

4.2 ASSET ONWERS ECOSYSTEM

No asset owner is an island; they are embedded in an ecosystem that significantly shapes the decisions they make regarding materials, aesthetics, and requirements. This ecosystem consists of key influencers, as illustrated in Fig.1, which includes architects, project managers, main contractors, quantity surveyors, and, in some cases, engineers.

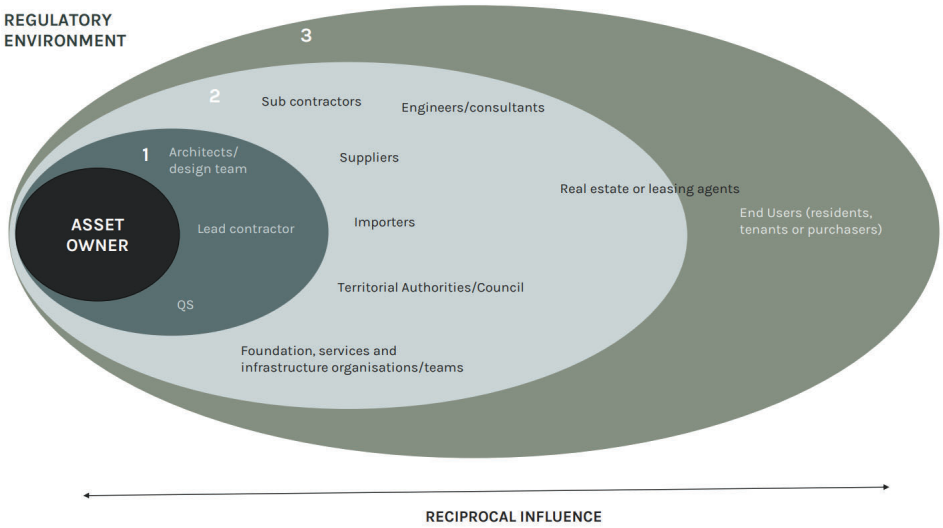

Figure 1. Asset owners ecosystem

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Additionally, end users, owners, and tenants can also play a role in shaping these decisions. It's evident that both ends of the ecosystem have influence over material choices. Layer 1 is generally the most influential, but Layer 3, representing end users, owners, and tenants, also plays an important role. Specifiers, typically well-connected with these groups, must balance the needs and desires of the end users with broader project requirements. Layer 2, while seemingly the least influential, can still have a strong impact, especially when it comes to timber selection, where their input can either contribute to a positive or negative outcome.

"It's a real circle of trust. We've all learned the highs and lows together and we trust them to do the right thing now."

4.3 ASSET ONWERS EXPERIENCE

The timber industry operates within a tightly knit ecosystem, which has created a significant bottleneck in the flow of expertise. Innovators and early adopters have been at the forefront, developing and applying a wealth of knowledge and experience. However, this valuable insight is not reaching the broader market with the speed it needs. While these experts are advancing intellectual property (IP) and refining techniques that streamline their practices, there is a tendency for them to focus on sharing the outcomes rather than the practical lessons learned along the way.

As a result, timber is beginning to feel like an exclusive 'closed club' – one that is difficult to access and navigate for those outside this inner circle. Asset owners, along with their teams, are not always able to tap into the accumulated knowledge of these pioneers, hindering the broader adoption and progression of timber-based practices:

- Innovators and early adopters: They view timber as an ideal material for sustainable, buildable, and natural construction. While it may not be as easy to use as concrete and steel with a traditional mindset, it becomes much more accessible when approached with innovative thinking. Timber is particularly well-suited for refurbishment or renovation projects, offering a better carbon footprint from the outset. However, there are concerns about the reliance on a single CLT supplier in New Zealand, as importing solutions does not significantly impact the carbon equation. The next step for timber is likely prefabrication.
- Late majority and laggard: They perceive timber as 30% more expensive than traditional materials and have concerns about its long-term performance and whether it saves carbon while avoiding unhealthy buildings. Additionally, they have concerns about extra costs for fire regulations, including sprinklers, and the availability of materials like screws and nails is a burden. They believe that the approval process takes longer due to inconsistent council systems and feel that it's better to wait for regulation to clarify the rules. Overall, the adoption of timber is seen as a learning curve, with time and cost being significant factors.

"Clearly it's a better environmental choice, but you do have to think differently."

4.4 THE LEARNING CURVE

As timber use in commercial construction is still in its early stages in Aotearoa New Zealand, it's no surprise that widespread expertise remains limited. Those with experience in commercial timber projects have typically built their knowledge over time, leaving newer entrants struggling to access the necessary skills and insights to deliver timber buildings efficiently. This lack of expertise is a key barrier to scaling up timber construction, representing a critical gap that needs addressing.

Experienced asset owners highlighted the steep learning curve involved in transitioning from concrete and steel to timber, emphasizing the need to shift both mindset and skillset. Throughout the construction process, from design to execution, these experts spoke of the continuous learning required across all disciplines to make timber construction as routine as traditional materials.

On the other hand, less experienced asset owners, along with their teams, are keenly aware of these challenges and are cautious about the potential costs of trial-and-error. Many are advocating for open-source learning opportunities to level the playing field, allowing everyone in the market to grasp the fundamentals of timber construction and proactively address potential hurdles. For a commercial building, incorporating timber thinking from the earliest stages of development is crucial:

- Business planning and site selection: Timber should be considered as a viable option early on, as it requires a significant shift in mindset.
- Preliminary budget and conceptual design: Timber needs to be integrated into the planning process from the outset; otherwise, it may be too late to incorporate effectively.

- Developed building design: Consultants must be confident in working with timber to avoid complications later in the process.
- Value engineering and construction: Timber must be accurately valued to ensure it is properly specified. Additionally, construction techniques suited to timber could be prioritized, but this often gets overlooked due to outdated thinking.

"*Get timber into the thinking as early as possible, because once the process starts it's too hard (and costly) to go back and re-think.*"

4.5 TIMBER AS A PRODUCT

Those comfortable with concrete and steel still raise concerns about using timber in commercial structures, including higher costs associated with sustainable products, a lack of familiarity leading to more work and potential delays, perceived risks from changing practices, challenges with fire regulations and encapsulation, and the overall resistance to change driven by habit and the belief that existing methods are sufficient.

However, experienced asset owners acknowledged others' concerns but emphasize the need for a shift in the market attitude towards timber in construction. They argue that using timber as a substitute for steel would lead to the issues mentioned, but a new approach that designs buildings specifically for the benefits of timber would avoid these problems. Once this mindset change occurs, they believed the challenges would be no more complex than those in any other build.

Additionally, it was suggested that the term "timber buildings" may perpetuate negative perceptions, pointing out that many international timber buildings are actually hybrid structures with concrete cores, making them seem less unfamiliar to those less experienced with timber. Experienced participants in timber construction highlighted several key benefits of using timber in building projects:

- Natural Aesthetics: Timber enhances the building environment by contributing a warm, natural feel.
- Sustainability: Timber is a renewable resource when sourced responsibly, ensuring a continuous supply.
- Lower Carbon Footprint: Using timber reduces embodied carbon, contributing to a smaller overall carbon footprint.
- Lightweight: Timber is lighter and easier to transport, reducing health and safety risks.
- Healthier: Unlike some materials, timber doesn't produce harmful dust or contain toxic chemicals.
- Cost-Effectiveness: When used efficiently, timber can be comparable in cost to other materials.
- Adaptability: Timber is highly versatile, making it suitable for both new builds and renovations, with flexibility for future modifications.
- Future-Ready: Timber buildings are seen as better equipped to meet the evolving needs of the future.

"*It's a wonderful product in terms of the way it adds a sense of naturalness to the building.*"

4.6 PROMISES, PROBLEMS AND NEEDS

Asset owners' perception of timber as a building material encompasses various promises, problems, and needs.

- Promises: Include the preservation of the planet, improvement in the built environment, and the construction industry adopting a higher level of accountability and responsibility. There's also the potential for "better" building through mixed materials and hybrids - more timber, but not timber alone.
- Problems: Arise as traditional ways of thinking and operating are challenged, leading to a sense of risk and increased costs. It's also difficult to prove return of investment (ROI), and changing regulations create fears of heading in the wrong direction. Rapidly evolving technology may lead to overspending, and there is a notable lack of skills and experience within the industry.
- Needs: Include creating, supporting, and sharing a new vision for construction, renovating practices from early concept stages through to maintenance, and educating the industry to a higher level of professionalism. The goal is to normalize discussions about better building - focusing on mixed materials as a pragmatic solution, while reassuring stakeholders about the reliability of the supply chain.

4.7 PERCEPTIONS FROM THE BROADER INDUSTRY

The following is a summary of key statistics from an online survey conducted by Timber Unlimited, with 165 industry stakeholders - including specifiers, engineers, builders, asset owners, and others participating. Of those who completed the survey, 79% were involved in one or more types of commercial or multi-level residential construction.

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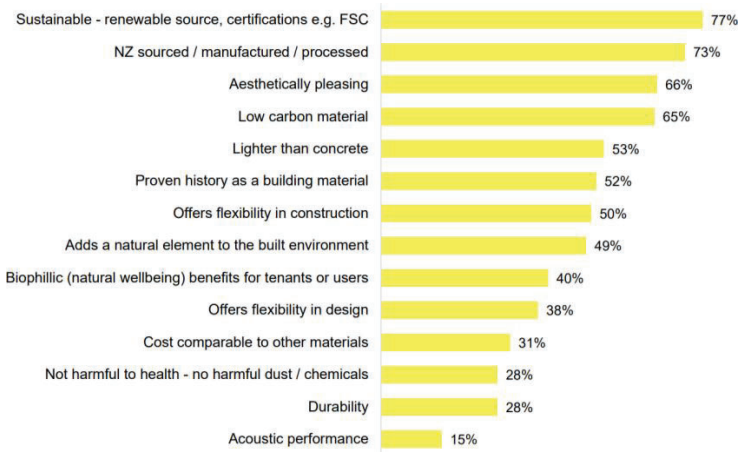

Figure 2. Main benefits of using timber

- Main benefits of using timber: The main benefits of using timber in construction (Fig.2) are its sustainability (77%), being NZ-sourced and processed (73%), its aesthetic appeal (66%), and its low carbon footprint (65%). Additionally, over half of respondents recognize timber as being lighter than concrete and possessing a proven history in construction.
- Main three reasons for not using timber: The primary obstacles to using timber are cost, moisture-related issues, and unclear fire regulations and fire design requirements, all of which were mentioned by one third of respondents (Fig.3). When only three main barriers were asked, 49% of the sample identified unclear fire regulations and fire design as one of the three main barriers, 42% pointed to moisture issues, and 40% cited price as a major concern. Those in commercial and multi-unit residential construction are more likely to be unclear about fire regulations and fire design requirements related to timber. Additionally, 45% of engineers also report being unclear on these regulations and requirements.
- Future interest in timber: Nearly 80% of respondents expressed interest in incorporating timber into commercial or multi-level residential projects in the future. Furthermore, 46% noted that their interest in building with timber has increased in the past year. Those most interested in incorporating timber into commercial and multi-unit residential construction are typically individuals already engaged in this sector, particularly those with 11 to 20 years of experience in the industry.
- Timber adoption in construction: 80% use timber at least occasionally, with a further 16% not having used it before but willing to use it in the future (Fig.4). Among those involved in commercial and multi-level residential construction, 40% use timber whenever possible. However, 3% are not interested in using timber or are not aware timber can be used in commercial buildings. This presents an opportunity for Timber Unlimited to further raise awareness about the benefits of timber.

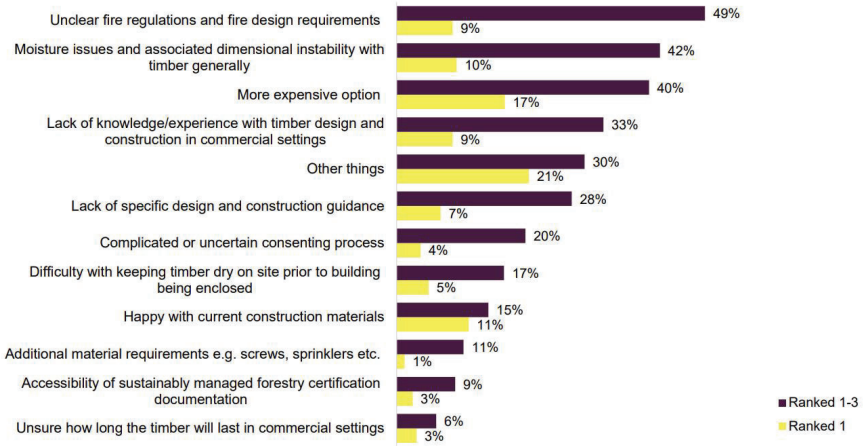

Figure 3. Main three reasons for not using timber

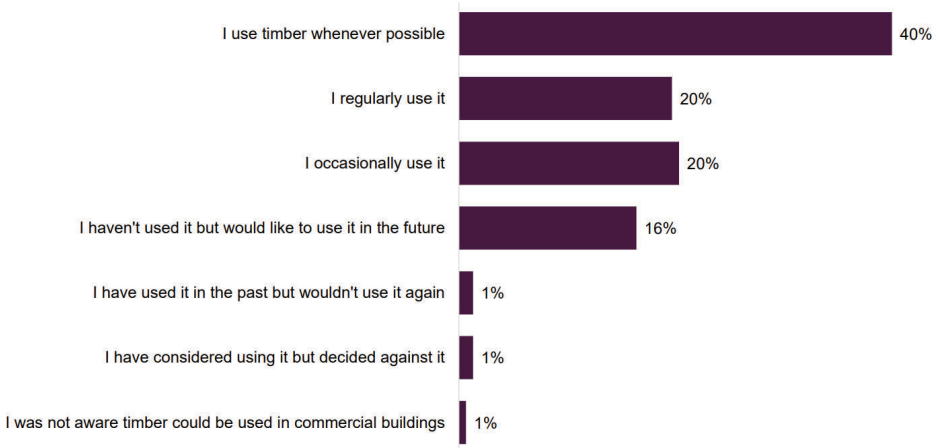

Figure 4. Use of timber in commercial buildings / multi-level buildings

- Timber Use Trends: There is a widespread perception that timber use is on the rise in the industry, with 28% of respondents reporting that they have observed a large increase in timber adoption by others (Fig.5).
- Role of Timber Unlimited: After prompting, 87% say they are aware of BRANZ, followed by Timber Unlimited on 72%, and the Timber Design Society on 67%. Among those who responded unprompted, two-thirds believed the primary role of Timber Unlimited is to promote the use of timber in construction, with 28% noting its role in providing design information for professionals.
- Key Services and Areas for Improvement: When prompted, respondents identified that satisfaction is highest for Timber Unlimited's role in celebrating the use of timber in design through the Timber Design Awards [4]. Availability of up-to-date relevant standards is seen as Timber Unlimited's most important role. Key areas for Timber Unlimited to focus on are providing timber design & specification guidance documents and technical tools, availability of up-to-date relevant standards and providing technical assistance to enquiries (Fig.6).

Full figures and more detailed statistics are available in the Benchmark Research report [2] upon request.

4.8 FUTURE POTENTIAL

The Timber Unlimited Asset Owner Research summary of findings [3] offers valuable insights into the future potential of timber buildings: Timber presents an opportunity for the construction industry to demonstrate greater accountability and responsibility in material selection, particularly within the context of a rapidly evolving, sustainability driven environment.

However, it is essential to consistently frame timber as a means of enhancing the built environment. Traditional modes of thinking and operating are often challenged by the unique characteristics of timber, which can contribute to perceived risks and increased costs. The ongoing evolution of regulations, often inconsistent and subject to change, presents significant challenges, resulting in time-consuming and frustrating delays. Additionally, the lack of experience with timber construction introduces a learning curve that can lead to undesirable time and cost impacts.

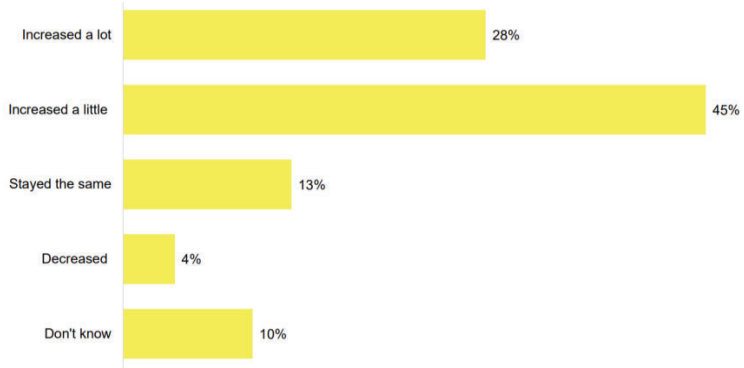

Figure 5. Changes noticed in the use of timber

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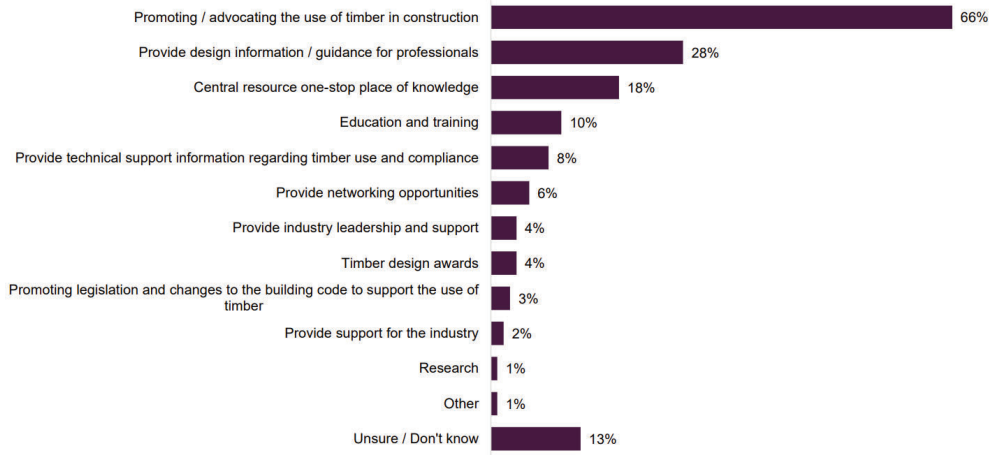

Figure 6. Key Services and Areas for Improvement

The future of timber in construction depends on fostering and sharing a new vision for the industry. This requires improvements in practices from the early conceptual stages through to ongoing maintenance, as well as efforts to elevate professional standards across the sector. To realize this vision, we must normalize expertise in timber and other sustainable building materials, positioning them as part of a broader dialogue focused on improving the quality of the built environment, emphasizing mixed-material solutions as a pragmatic approach.

5 – CONCLUSION

There has been a noticeable increase in the use of timber in commercial and multi-level construction, along with a growing interest and willingness to incorporate timber into these types of buildings. However, several main barriers hinder the increased use of timber: unclear fire regulations and design requirements, moisture issues, and the perception that timber is more expensive than other building materials.

To further promote timber construction in Aotearoa New Zealand, it is essential to continue showcasing timber projects, particularly those that demonstrate how timber can be used in combination with other materials to inspire architects and architectural designers. Promoting timber's benefits, such as its sustainability and low carbon footprint, and sharing success stories from industry advocates are also crucial.

Additionally, increasing awareness through national and international events, such as the Timber Design Awards and the World Conference on Timber Engineering (WCTE), can help highlight timber's potential. Maintaining a focus on asset owners and their immediate influencers is vital to convincing them of the benefits and cost-effectiveness of timber in commercial and multi-level construction. Fig.7 is an example of participant comments about the question: *How do you think Timber Unlimited could add further value and increase the use of timber in buildings*?

Figure 7. How do you think Timber Unlimited could add further value and increase the use of timber in buildings?

6 – REFERENCES

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