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# Barriers to Mass Timber Adoption Mid to High-Rise Buildings

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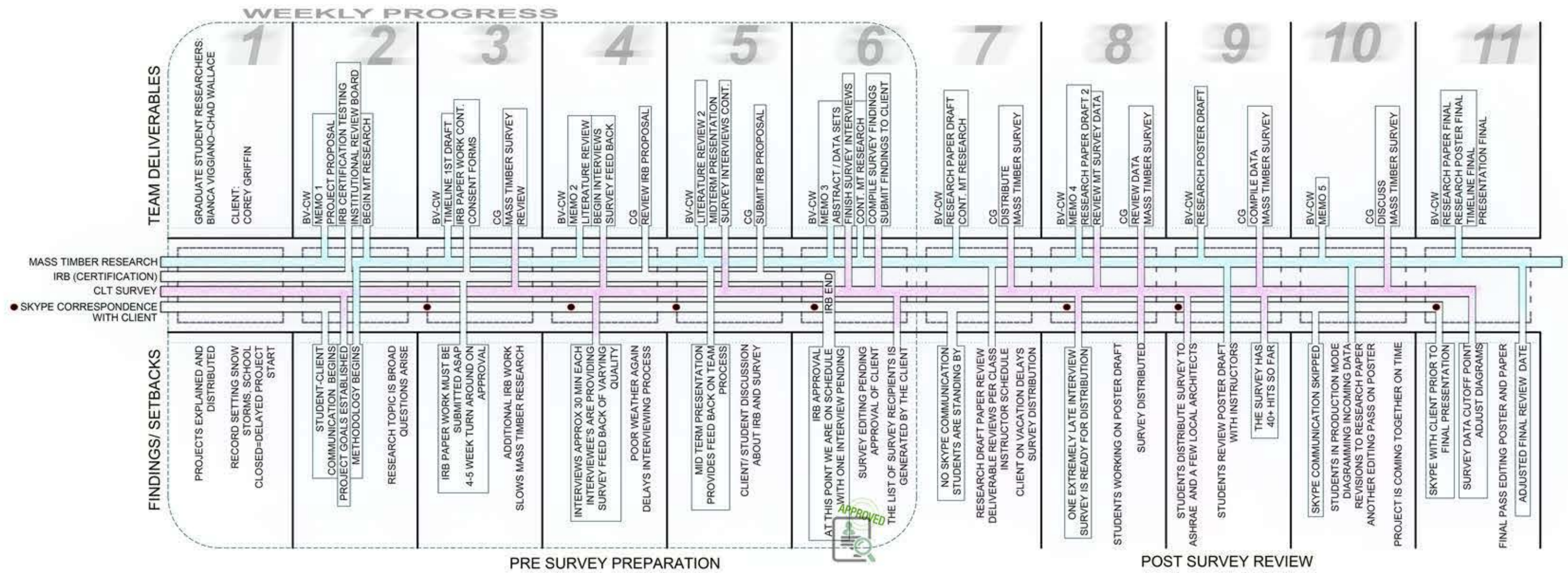
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# Barriers to Mass Timber Adoption MID TO HIGH-RISE BUILDINGS

BIANCA VIGGIANO – CHAD WALLACE – with COREY GRIFFIN  
ARCH 563 | Papaefthimiou | Winter 2017

## Introduction

Advancements in technology and manufacturing have provided the means to construct tall wood buildings that are safe and cost effective while gaining the aesthetic and environmental benefits associated with mass timber. The objective of this research is to identify perceived barriers of the integration of mass timber as a desirable building material for architects and structural engineers. Building on a previous study, surveys will be distributed to professionals in the building science field to detect information gaps pertaining to wood as a viable alternative to concrete in mid to high-rise applications.



## Results

The survey yielded 62 responses during the three week period.

The Participants-

96% had heard of CLT  
85% knew the various attributes of CLT

The median of the self-assessed familiarity of the professionals with mass timber was seven and over two-thirds of the participants have previously or are currently working on a project that uses mass timber. This knowledgeable and experienced pool of professionals give meaningful results as they are amongst the community affected by current barriers and will benefit the most from future research in this field.

### PSU Seismic Testing -



Simulated earthquake movement on a full-scale beam-column-floor assembly. Data analysis will inform the construction and design of Framework, a 12-story primarily mass timber building.



### Fire Testing -



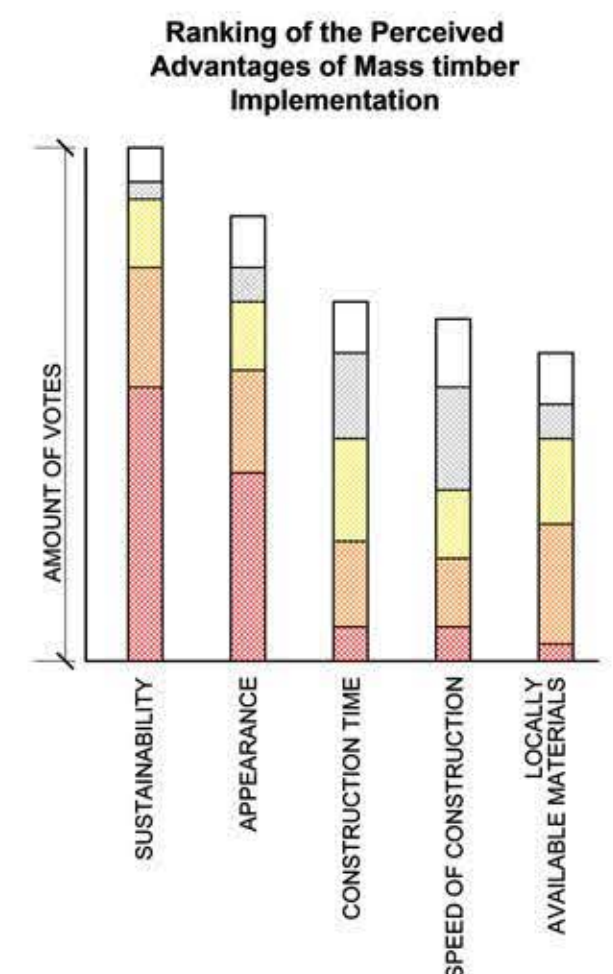
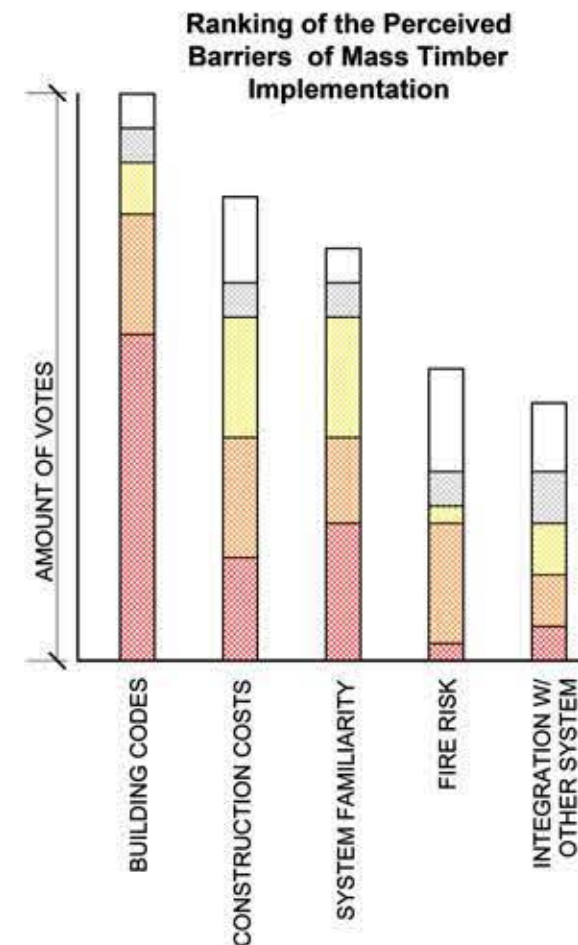
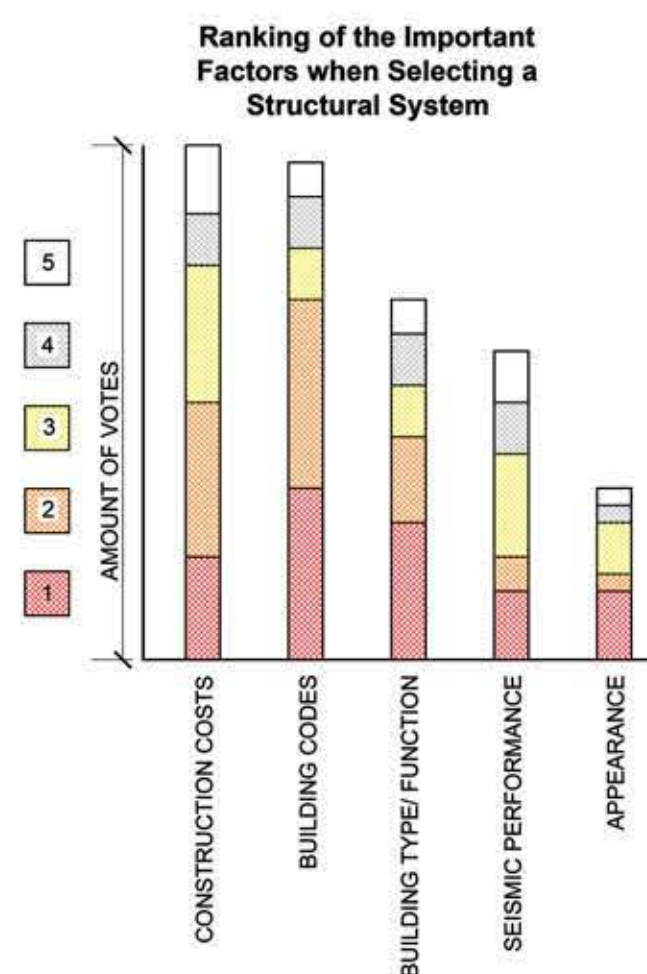
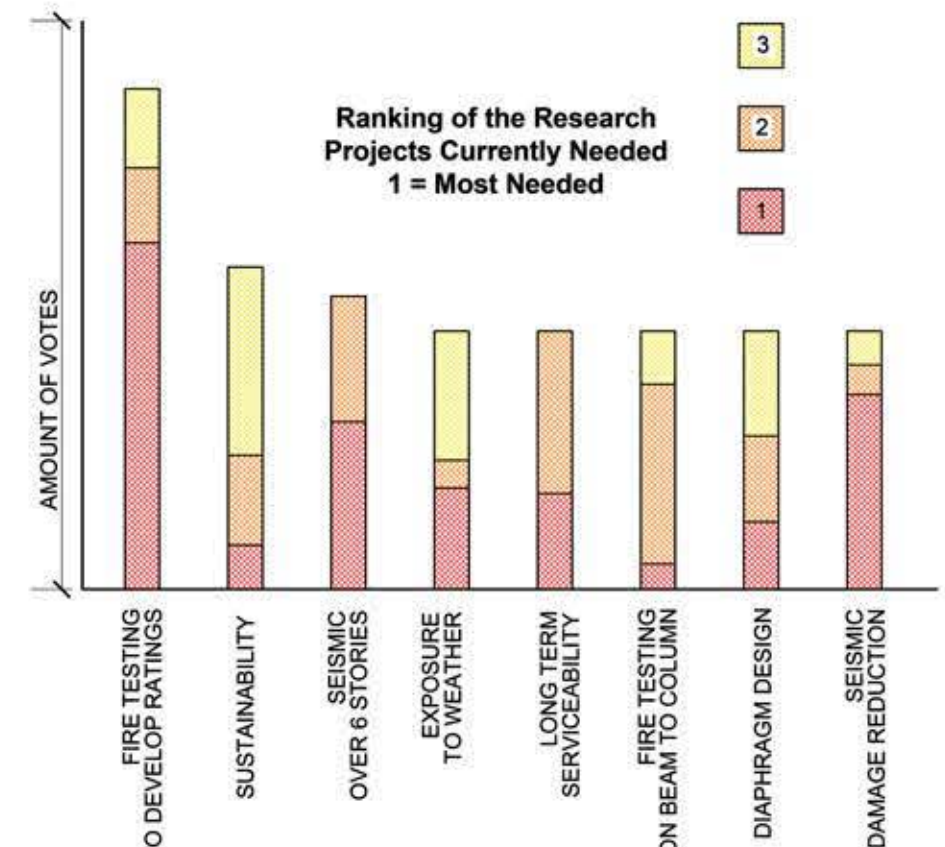
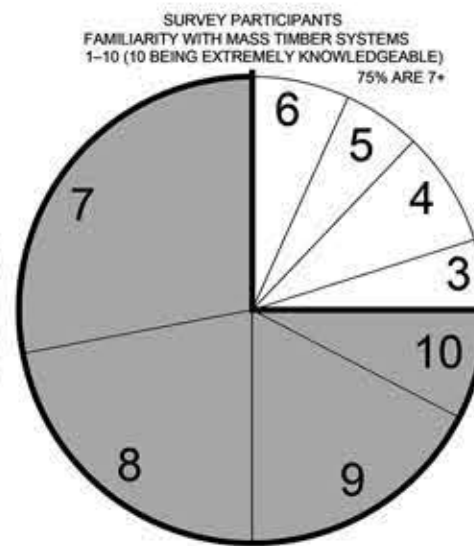
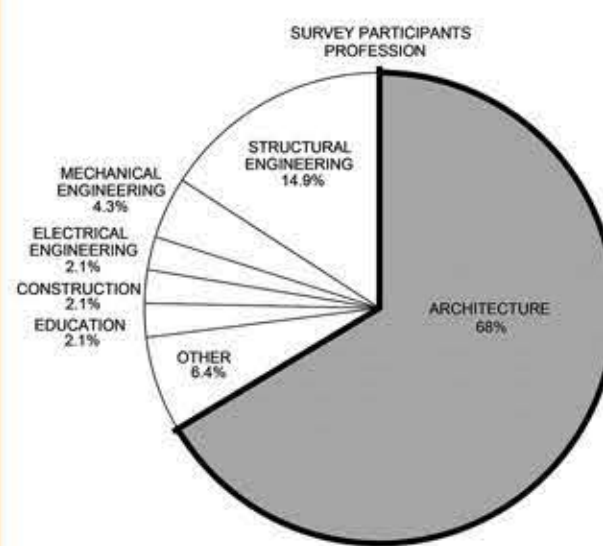
Fire testing is the highest ranked research project needed based on participant responses. Specifically to develop more accurate ratings associated with mass timber. The less conservative values will make it a more desirable option for assemblies.



### Renewables -



Further research is also needed to validate and amplify the sustainability benefits of mass timber when compared to other building materials. This includes life cycle analysis, embodied energy, carbon emissions, etc.



## Conclusion -

There is a large correlation between the top ranked factors for the selection of any structural system and the main barriers associated with the implementation of mass timber in urban, mid to high-rise buildings. Of the participants surveyed, building code is the top ranked factor and construction cost is the third ranked factor for both criteria. This identifies that research needs to be initiated or expanded upon with respect to fire rating, seismic response modification factor (R-value) and other code related projects. This correlation is further highlighted by the responses to the survey question regarding what mass timber research projects are currently needed. Fire testing to develop fire ratings for mass timber assemblies is the top ranked project, followed by research on seismic load resisting systems that minimize damage to mass timber elements. Research on the seismic response modification factor (R-value) and public education and outreach about the benefits of mass timber also ranked high among participants.