SLB
SOFTWOOD
LUMBER BOARD

Comprehensive Program ROI 2012-2015

February 2016

PRIME
CONSULTING

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Table of Contents

Background

The Softwood Lumber Board (SLB) is an industry funded check-off program established to promote the benefits and uses of softwood lumber products in outdoor, residential and non-residential construction.

Programs and initiatives supported by the SLB focus on increasing the demand for appearance and structural softwood lumber products in the United States.

The SLB was established with the promulgation of the ***Softwood Lumber Research, Promotion, Consumer Education and Industry Information Order*** dated August 2, 2011 by the Secretary of Agriculture of the United States Department of Agriculture pursuant to the statutory authority provided in the ***Commodity Promotion, Research, and Information Act of 1996***.

SLB engaged Prime Consulting to support the development and ongoing execution of a comprehensive Measurement Plan that:

- Serves the requirements of the SLB for ongoing program measurement and resource optimization.
- Supports the SLB ROI evaluation needs in advance of the five-year referendum by the program investors.
- Fulfills the independent review requirement of the USDA.

Background *(cont'd)*

The ***Commodity Promotion, Research, and Information Act of 1996*** provided statutory authority for USDA to establish the softwood lumber check-off program. **SEC. 515. Required Terms In Orders** of the Act states:

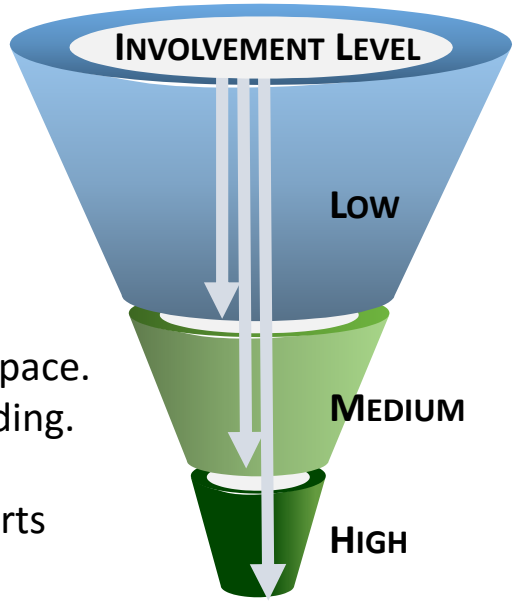
- "(h) PERIODIC EVALUATION. –In accordance with section 501(c), each order shall require the board established under the order to provide for the independent evaluation of all generic promotion, research, and information activities undertaken under the order."

The ***Softwood Lumber Research, Promotion, Consumer Education and Industry Information Order*** dated August 2, 2011 contains this required term in **§ 1217.61 Independent evaluation**.

- "At least every five years, the Board shall authorize and fund from funds otherwise available to the Board, an independent evaluation of the effectiveness of the Order and the programs conducted by the Board pursuant to the Order. The Board shall submit to the Secretary, and make available to the public, the results of each periodic independent evaluation conducted under this paragraph."

SLB Portfolio Approach

The SLB has taken a portfolio approach based upon the traditional sales and marketing funnel. The "funnel" is a visual metaphor for a business process that provides structure for increasingly focused stages (also thought to be increasing odds of a decision to purchase) influencers and purchasers travel through before making a purchase or recommendation in the case of influencers.



In most cases, SLB provides funding to partners already in the funnel space. They represent a substantial portion, but not 100%, of a partners' funding. This has provided the opportunity for both leadership in the partners' strategic direction and extension of the SLB impact through larger efforts than if limited to only SLB funding.

For the SLB target market, commercial non-residential and multi-family residences, the "purchase" is not the actual act of purchasing wood; rather it is the decision to specify the use of lumber for the building system and numerous detailed aspects of a given building project by the project Architect and/or Structural Engineer.

Therefore, the objective of the funnel marketing structure is to provide multiple points of potential contact for Architects and Structural Engineers, the key influencers and specifiers of softwood lumber. These contact points, or levels in the funnel, vary in their objective, information content, the cost to provide, the desired outcome and their importance in the "sales cycle".

Executive Summary

This independent evaluation of the Softwood Lumber Board program was completed to satisfy both the 5 year review requirements of the USDA and the SLB Board needs in advance of the 2016 referendum.

Various industry reporting and responses to the custom constituent survey, conducted by Prime Consulting and Clear Seas Research, were used to project the amount of incremental lumber associated with SLB activities from inception through 2015. SLB activities and the $38.3 million of spending (2012-2015) have delivered the following results to SLB investors:

- Incremental softwood lumber volume of 1.683 billion board feet or $596 million dollars during 2011-2015.
- The wood BF /SqFt used by professionals involved in the SLB programs grew +22.9%, versus -5.9% for those with minimal/no involvement.
- The incremental demand of roughly .5% each year for the industry as a whole delivered an incremental $143 million of margin as projected by the FEA Price Elasticity model.
- Taken together, the resulting return on investment has been $15.55 of incremental sales and $6.73 of investor incremental profit for every $1 spent.
- In addition to the financial P&L returns, the share of structural materials that were wood rose 4-8 share points, depending upon involvement level, while share for those with minimal involvement rose only +0.8 points.

MEASUREMENT & ROI OVERVIEW

Nickel & Nickel Winery, Oakville, CA
WoodWorks.org

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Objectives

The objectives of the Measurement Plan are to successfully:

- Serve the requirements of the SLB for ongoing program measurement and resource optimization. This includes:
  - Evaluate overall program effectiveness in driving incremental lumber use.
  - Evaluate individual program partner effectiveness and contribution to incremental lumber use.
  - Enhance internal evaluations and decision-making of the individual partners by enabling them to add these metrics to their continuous improvement efforts.
  - Fulfill the independent review requirement of the USDA.
- Support the SLB Board and Management ROI evaluation needs in advance of the five-year referendum by the program investors.
- Fulfill the requirement for an independent evaluation pursuant to the USDA governing authority in the Commodity, Promotion, Research and Information Act of 1996 and the Softwood Lumber Research, Promotion, Consumer Education and Industry Information Order (Softwood Lumber Order) dated August 2, 2011.

Addressing these objectives together, through a singular integrated effort, provides a number of benefits:

- Consistent evaluation for both individual program components and the SLB program activities as a whole.
- Information transparency for all constituents: investors, Board members, management and the USDA.
- Metrics investment efficiency for the SLB program and investors.

SLB Partners Cover Multiple Levels

Partners by Involvement Level

(Market Creation and Retention)

American Wood Council

American Wood Council

reTHINK WOOD

WoodWorks

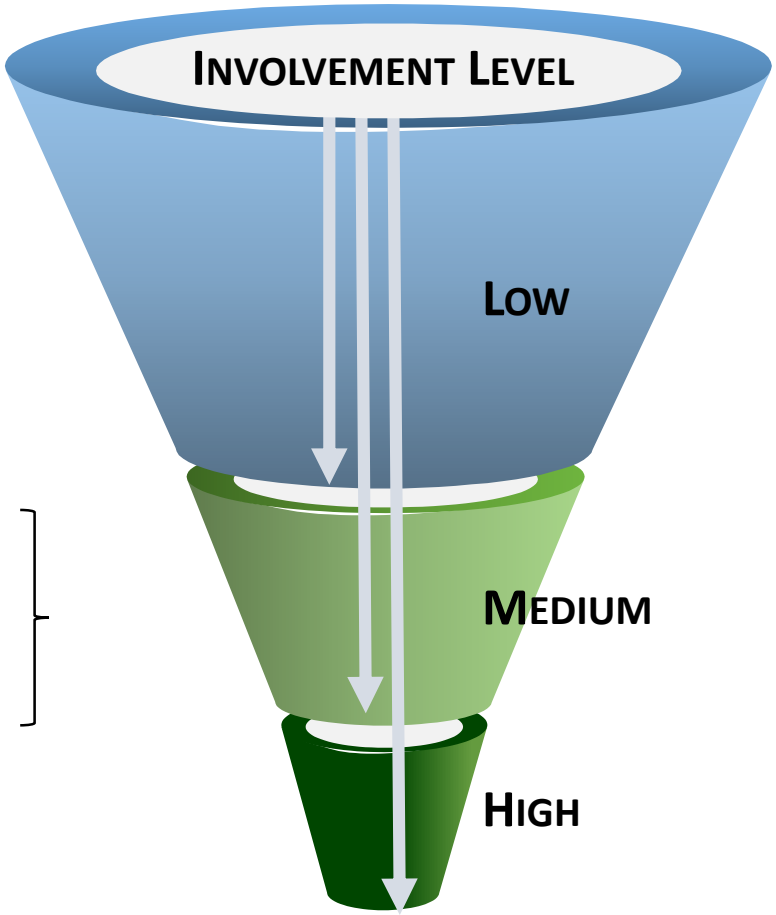
American Wood Council

reTHINK WOOD

WoodWorks

American Wood Council

WoodWorks



NOTE: None of the respondents reported no involvement with the industry. This led to revising the lowest group label from "no involvement or contact" to "minimal" and "low" involvement

Measurement Scope

Measurement of the SLB portfolio impact for the first five year period required decisions on focus and assessing the ability to quantify impact given the varying maturities of the programs. The primary focus for measurement has been Architects and Structural Engineers in Non-Residential and Multi-Family segments. In the process, two areas have posed challenges:

- *Wood, Naturally*, is a PR program designed to increase structural and appearance uses of softwood lumber in and around the home, such as decks, trim and siding. The program, aimed primarily at home owners and contractors, began during 2014. Given the recent implementation, we concluded it premature to go beyond the consumer response analysis conducted together with the program's agency.
- Building Code Research and Market Retention by the American Wood Council (AWC). The purpose of AWC is to increase the use of wood by assuring broad acceptance of wood products, developing standards, design tools and guidelines for wood construction, and guiding the incorporation of pro-wood standards into national consensus standards used throughout the construction community.

  AWC's impact occurs in three different forms:

  a. Industry support and education in the use and interpretation of building codes and standards.
  b. Market creation by guiding the incorporation of pro-wood standards into national consensus standards used in the industry.
  c. Retention of existing markets by preserving pro-wood standards when they become challenged.

  The first two impact areas are measured in the portfolio measurement study, to the extent they have been realized by 2015. A separate discussion is also provided on market creation and retention.

Market Creation & Retention Measurement

- The development of new market opportunities and the retention of existing opportunities to use wood in building construction are important areas of value for SLB investors.
- By their nature, these are tied to the cycle of building code development and implementation, both nationally and locally. As such a measureable impact from this portion of the SLB portfolio requires a longer view and somewhat different metrics than other portion of the SLB portfolio.
- Current metrics developed by AWC, on a case-study basis, project the full potential market impact from either a new opportunity or preserving of an existing opportunity.
  - The case studies provide some good examples, but are not able to cover the universe of activity and impact. In some instances lack of appropriate data hampers their ability to quantify the potential impact from opening or preserving a given softwood lumber market application.
- Given these factors, Prime has provided an example case-study on the following page and then offer some comments on aligning the metrics in this area going forward.

AWC Case Study - Market Protected Example 1

With AWC's lead, a proposal by the Portland Cement Association was defeated that would have eliminated the area increase when sprinklers are installed in Types III and V buildings.

Proposed AWC Action	Success Level	Building Groups	Geography	Application
Building area increase for sprinklers would not have been permitted	Approved	All building except 1 and 2 family dwellings	All U.S.	All Type III and Type V wood buildings

Data Analysis – The dataset was obtained from the National Multi Housing Council for 2014 new starts. Emphasis was placed on Types III-A and V-A (protected, 1-hour fire rated) to determine impact.

Reduction in Size: Protected Market

	Type III Allowed	Type V Allowed
With Sprinkler Increase (mil sqft)	893	808
No Sprinkler Increase (mil sqft)	427	227
Loss- Floor Area (mil sqft)	466	581
Potential Loss (% floor area)	52%	72%
Protected Potential Loss (BBFe LEP*)	2.3	2.9

BBFe - Billion Board Feet equivalent
LEP - Lumber + EWP + Panels
* Max conversion opportunity

Wood Volume & Value Protected by Averting Loss of Area Increases in Type III & V (Wood) Buildings

	Volume (BBFe)		*Estimated Value ($M)*	
	Type III Allowed	Type V Allowed	Type II Allowed	Type V Allowed
Lumber	1.4	1.7	$518	$646
EWP*	0.4	0.5	$1,554	$1,938
Panels	0.6	0.7	$115	$143
Total Protected**	**2.3**	**2.9**	**$2,188**	**$2,728**

BBFe - Billion Board Feet equivalent
* EWP estimated value - assumed as having 3x lumber value
** Max conversion opportunity

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Market Creation & Retention Measurement

- A challenge exists in translating the current "potential" quantification from the market creation and retention work by AWC to the actual wood volume realized by that retention and creation work once realized in the marketplace.
- 'Market creation' is about new potential for wood where it was not previously allowed/used. This can be quantified as a standalone activity and is done so currently at "full potential" without regard for likely levels of realization over time. While this may be meaningful for internal management, actual realization is needed for measuring the impact on investor revenue and profits.
  - Current ROI measurement design does capture current realization of these new opportunities and they are part of the change in wood usage reported.
  - Consideration should be given, going forward, to reconciling actual realization with potential to learn the extent of adoption.
  - Consideration should also be given to the speed to market and what can be done to accelerate code adoption, a critical step to realize a return from the AWC efforts.
- 'Retention of opportunities' is another way of saying avoidance of a loss. No incremental softwood lumber is sold as a result, sales have continued, and a loss was avoided. This can be quantified and tied to volume and profit, but should be reported separately from the projecting of incremental sales from the SLB program activities.

Research and Analysis Overview

Background

Prime Consulting commissioned Clear Seas Research, a unit of BNP Media, to conduct a survey to understand perceptions of wood use in non-residential/ light commercial and multi-family residential structures, as well as to understand perceptions of wood industry programs.

Research Objectives

The research focuses on understanding the overall impact wood industry associations have on wood use or specification among structural engineers and architects. Specifically the research explores:

- How frequently industry professionals interact with wood industry products/services
- How helpful various resources are in encouraging future wood usage
- How support from wood industry associations has benefited industry professionals
- Structural building material preferences for non-residential and multi-family residential structures
- How wood usage has changed from 2011 (before SLB programs were in effect) to 2015
- Industry professional reactions to various building applications
- Which forms of information are most important during project development

Non-Residential ROI Measurement Methodology

This initial 5 year measurement focuses on quantifying funder ROI through analysis of survey information gathered from a statistically reliable sample of targeted constituents in the non-residential market. The analysis takes into account the information available in the industry and the different maturities of various portfolio activities.

Architects and Structural Engineers were surveyed about their level of contact or involvement with SLB programs and their self-reported use of wood as a structural element in projects. Information was captured covering both before the SLB program (2011) and 2015.

Response data was used to classify each respondent into one of three involvement groups:

1. **LOW** - Online, print and other impersonal contact (top of funnel).
2. **MEDIUM** - Personal contact, but not project specific (top and middle of funnel).
3. **HIGH** - People who received project specific help from WoodWorks or the American Wood Council (all levels of funnel).

Methodology *(cont'd)*

- Target Audience: Full-time Architects and Structural Engineers with a minimum four years of experience, with at least half of their building design/construction work in multi-family residential and/or non-residential buildings of seven stories or less, who are likely to make the decisions regarding building materials used on a project and at least sometimes use wood as a structural element
  - Sample sources included *Architectural Record*, *Engineering News-Record* subscribers and members of the myCLEARopinion panel
  - Partial web and phone sample lists provided by SLB partners

- Survey Method: Web and phone surveys conducted by Clear Seas Research and additional phone surveys conducted by Prime Consulting
  - Avg. survey length: 17 minutes via web and 34 minutes via phone.
- Field Dates: November 12 – December 17, 2015
- Incentive: Each respondent that qualified and participated in the Clear Seas Research web study received a $50 Amazon.com gift code. Each respondent that qualified and participated in the phone study received a $75 Amazon.com gift code.

	Total Completed Surveys	365
WEB	Clear Seas Research Sample	184
WEB	SLB Partner Sample	71
WEB	Third Party Sample	20
PHONE	Clear Seas Research Phone Completes	55
PHONE	Prime Consulting Phone Completes	35

Analysis & Preparation

- Tabulations were generated using a statistical software package. Additional analysis was conducted using SPSS, a statistical software program.
- The data is presented in graphic and tabular format detailing the number of respondents who answered each question.
- Some questions in this survey requested respondents to write in a response. These responses have been categorized to be quantifiable, where appropriate.

Note: Data for some charts may not equal 100% due to rounding

Study Analysis - *Statistical Explanation*

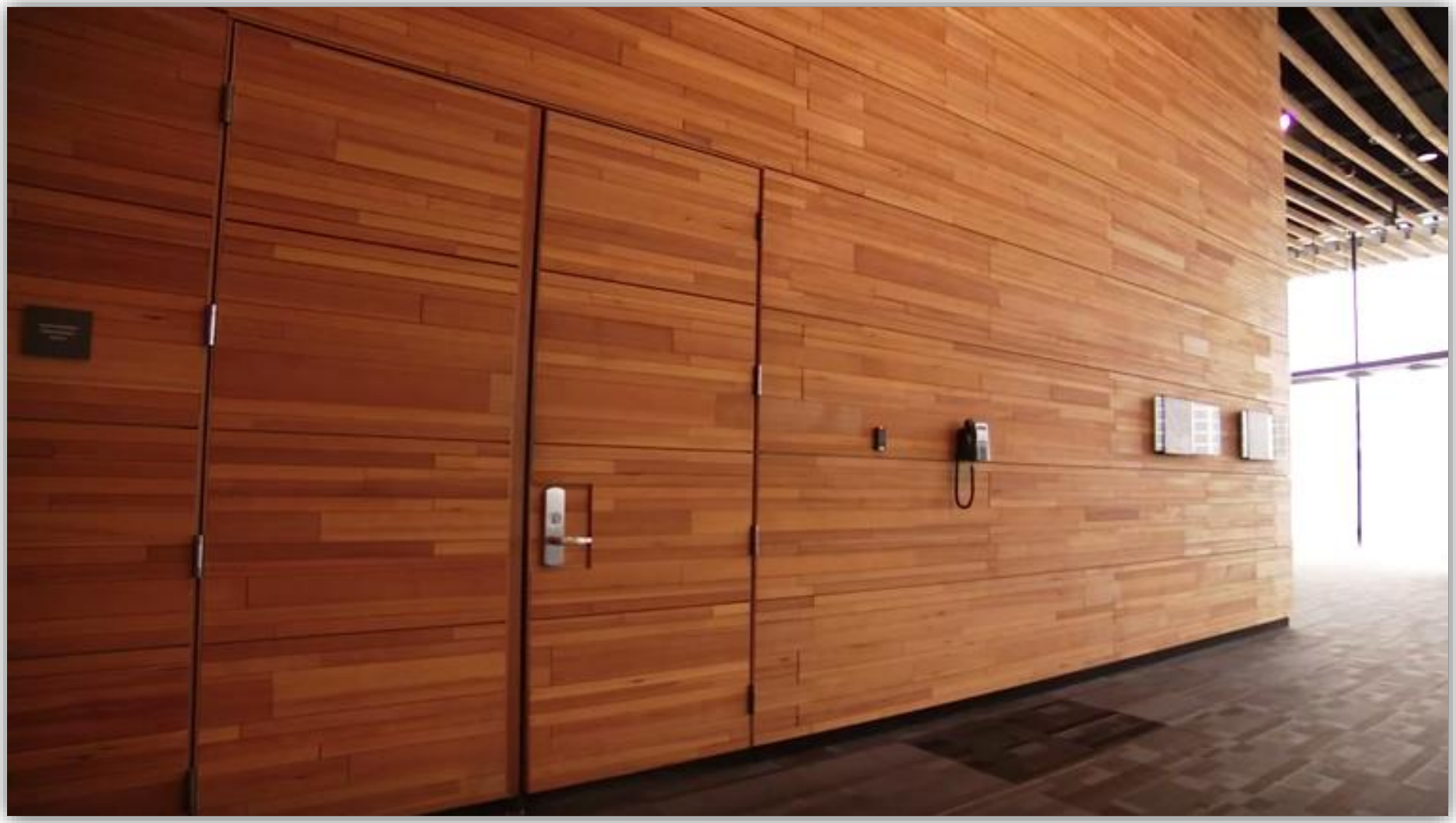
- Mean - Arithmetic average; the sum divided by the number of cases.
- Median - Middle value in an ordered list of responses with 50% of the values above and 50% below it.
- Sample Size (base) – Shown throughout the report as "n=xx" to indicate the number of respondents.
- Statistically Reliable Sample Size – Sample sizes of 30 respondents or greater are generally considered to be statistically reliable, meaning that if the study was run again with a different random sample, results would not differ significantly. Sample sizes of below 15 are too small for reliable quantitative analysis and must be interpreted directionally only.

- Statistical Significance – Results of statistical significance testing are presented to illustrate data that is statistically significant at a 90% confidence level (meaning that there is reasonable support that the results are actually different and not different due to error or variance in the data).

Statistical significance testing results illustrate data points that are different enough that they fall outside the margin of error. This means that if the study were conducted multiple times with the sample population, those data points would still be statistically different 90% of the time. The larger the sample size, the smaller the percent difference needed for a statistical difference to be found. Note: The results of these tests illustrate statistically significant differences. This does not imply that the differences necessarily have practical implications.

The following are the ways statistically different data points are presented in this report:

- Statistical differences between response options in a list are indicated with
- Results are illustrated where Architect data is statistically higher than Structural Engineer data indicated by
- Results are illustrated where Structural Engineer data is statistically higher than Architect data indicated by A
- Differences considered significant between Involvement Level answers are indicated by corresponding letters S
- Statistical increases/decreases in 2015 project data from 2011 project data by touch level are illustrated by and respectively.



RESPONDENT PROFILE

Vancouver Convention Centre
Naturallywood.com

Survey Sample Composition

Architect and Structural Engineers were targeted by Clear Seas Research, using professional journal subscription databases (Architectural Record and Engineering News-Record) along with a random sampling from SLB partner databases to complete the survey that was conducted both online and by phone.

The goal was 330 completed surveys with 60-65% being Architects, due to their having more influence in initial selection of structural materials. 365 completed surveys were realized.

Roughly one-quarter (90) of the respondents were surveyed by phone using the same instrument as those completing the survey online. A $50 incentive was provided for completing the survey online and $75 for the phone survey which took longer.

Architects	Structural Engineers	Total
232	113	365
64%	**36%**	**100%**

Respondent Profile - General

Respondents in low and medium involved categories are more likely to be architects, while highly involved respondents are more likely to be structural engineers.

Current Role
Q2

	Low	Medium	High
Architect	76% H	68% H	44%
Structural Engineer	24%	32%	56% LM
n=	147	106	112

Age
Q36

	Low	Medium	High
Average age	50 H	48	45
n=	147	106	112

Use of Wood as a Structural Element
Q5*

	Low	Medium	High
S Always	1%	6% L	8% L
Often	49%	46%	61% LM
Sometimes	50% H	48% H	31%
n=	145	100	85

Building Product Decision Involvement
Q4*

	Low	Medium	High
Very likely; I make the decisions regarding building products myself	38%	36%	56% LM
Likely; I seek outside guidance, but ultimately make the decisions myself	42%	46%	34%
Somewhat unlikely; I frequently consult my design team for assistance in decision-making	20% H	18% H	9%
n=	145	100	85

Years of Industry Experience
Q6

	Low	Medium	High
4 - 10 years	14%	15%	18%
11 - 20 years	22%	30%	42% LM
21 - 30 years	34% MH	24%	21%
31 - 40 years	25% H	25% H	11%
41 - 50 years	5%	5%	8%
More than 50 years	0%	1%	1%
n=	147	106	112

*Note: Data not collected via Prime Consulting phone surveys
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q2. Which one of the following best describes your current role? (Single mention)
Q4. In general, how likely are you to make decisions regarding what building products are used in new developments? (Single mention)
Q5. How frequently do you use wood as a structural element? (Single mention)
Q6. How many years of experience do you have in the building design/construction industry? (Single mention)
Q36. In what year were you born? (Single mention)

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Respondent Profile - Employer

Architects surveyed are more likely to be involved with non-residential buildings. Structural engineers are more likely to work on high rise buildings and work at larger companies than responding architects.

Average Company Work
Q3

	Low	Medium	High
Non-residential buildings (seven stories or less)	69% H	63% H	51%
Multi-family residential	15%	17%	26% LM
Single-family residential	9%	10%	12%
Non-residential high-rise buildings (eight or more stories)	3%	4%	9%
Other	4%	5%	3%
n=	147	106	112

Company Size
Q37

	Low	Medium	High
More than 1,000 employees	2%	4%	21% LM
501 - 1,000 employees	1%	3%	4%
101 - 500 employees	11%	17% H	8%
26 - 100 employees	15%	21%	16%
2 - 25 employees	56% MH	43%	43%
I work independently	15%	12%	9%
n=	147	106	112

Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S
Q3. What percentage of your company's work in building design/construction is for each of the following types of buildings or housing? (Numeric open-end)
Q37. Including yourself, how many employees does your company employ, including all locations? (Single mention)

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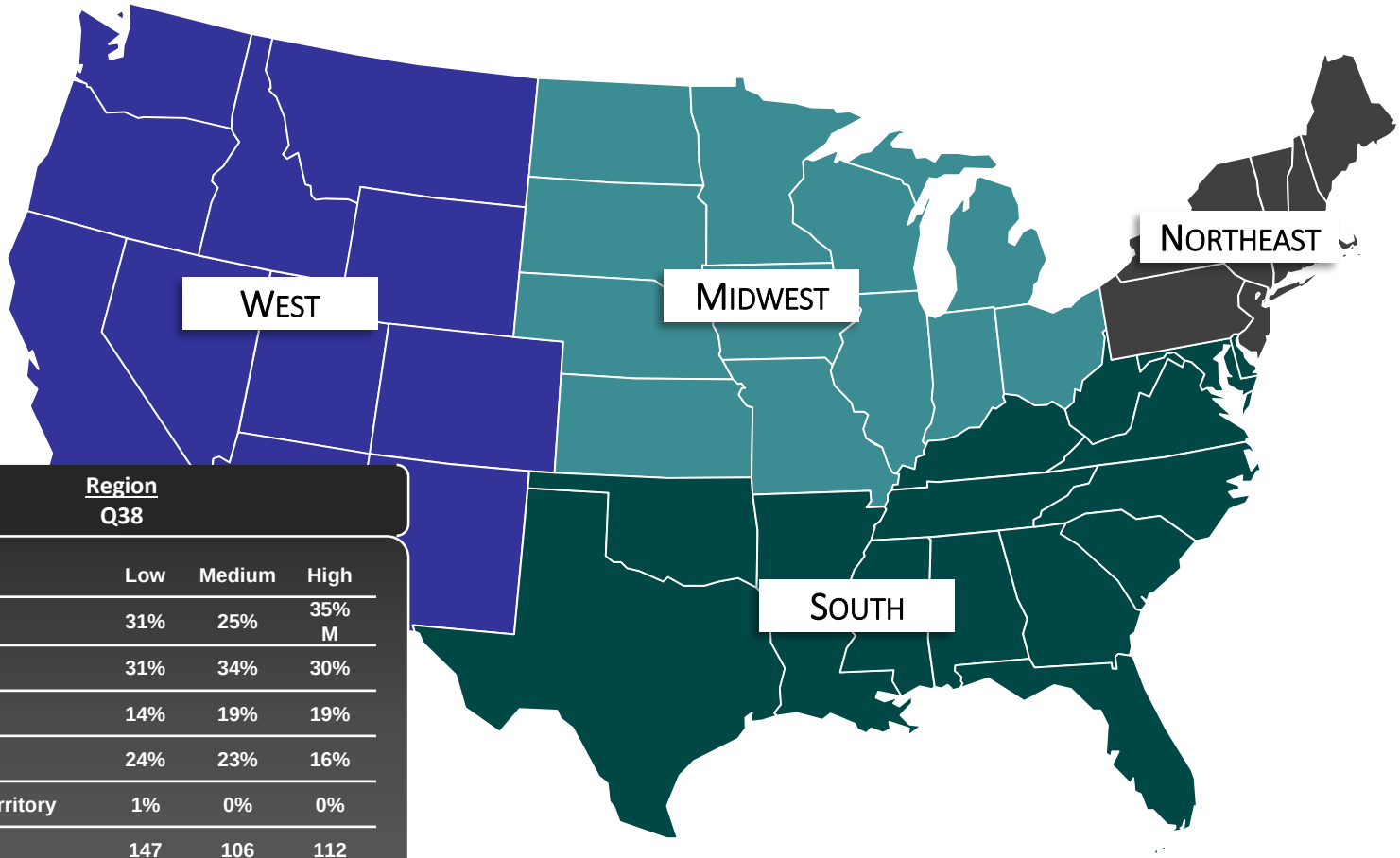
Respondent Overview – Geographic Diversity

All regions of the United States are represented in this research.



Region
Q38

	Low	Medium	High
West	31%	25%	35% M
South	31%	34%	30%
Northeast	14%	19%	19%
Midwest	24%	23%	16%
Other U.S. Territory	1%	0%	0%
n=	147	106	112

Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q38. In which state do you currently live? (Single mention)

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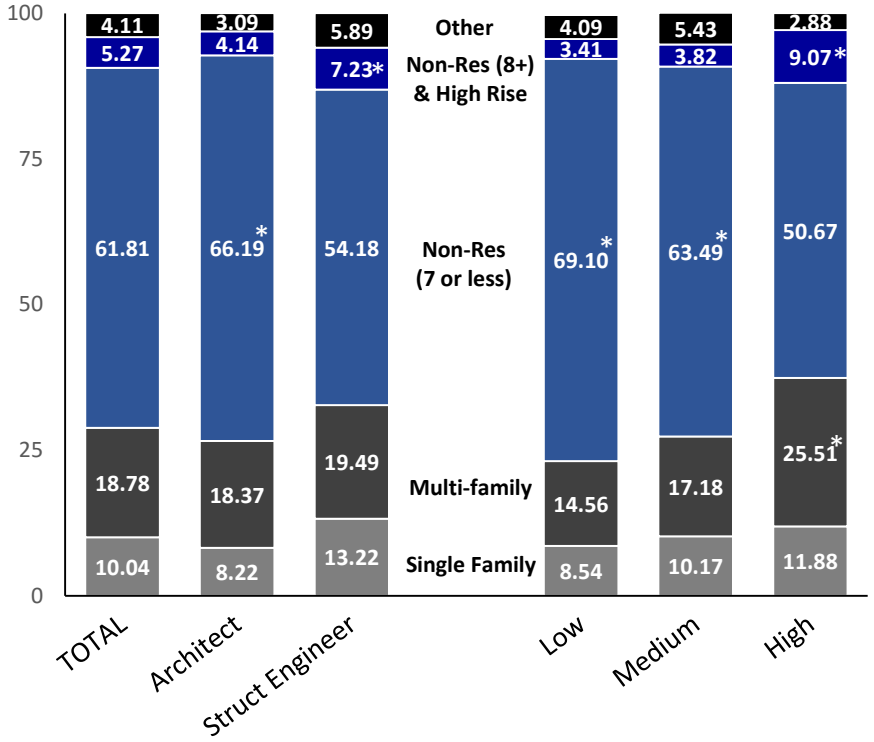
Respondent Overview - Project Mix

What percentage of your company's work in building design/construction is for each of the following types of buildings or housing?

Across all respondents, Non-Residential (7 stories or less) comprise 62% of projects, while multi-family are 19%.

Among those highly involved, multi-family represents ~26% of projects, nearly double the level of low involvement professionals. Likewise, Non-Residential over 8 stories were 9%, over double the mix for medium and low involvement peers.

Structural engineers reported a statistically larger mix of projects in High Rise Non-Residential



* Statistically Significant

INVOLVEMENT LEVELS

Bullitt Center, Seattle WA
reThinkwood.com

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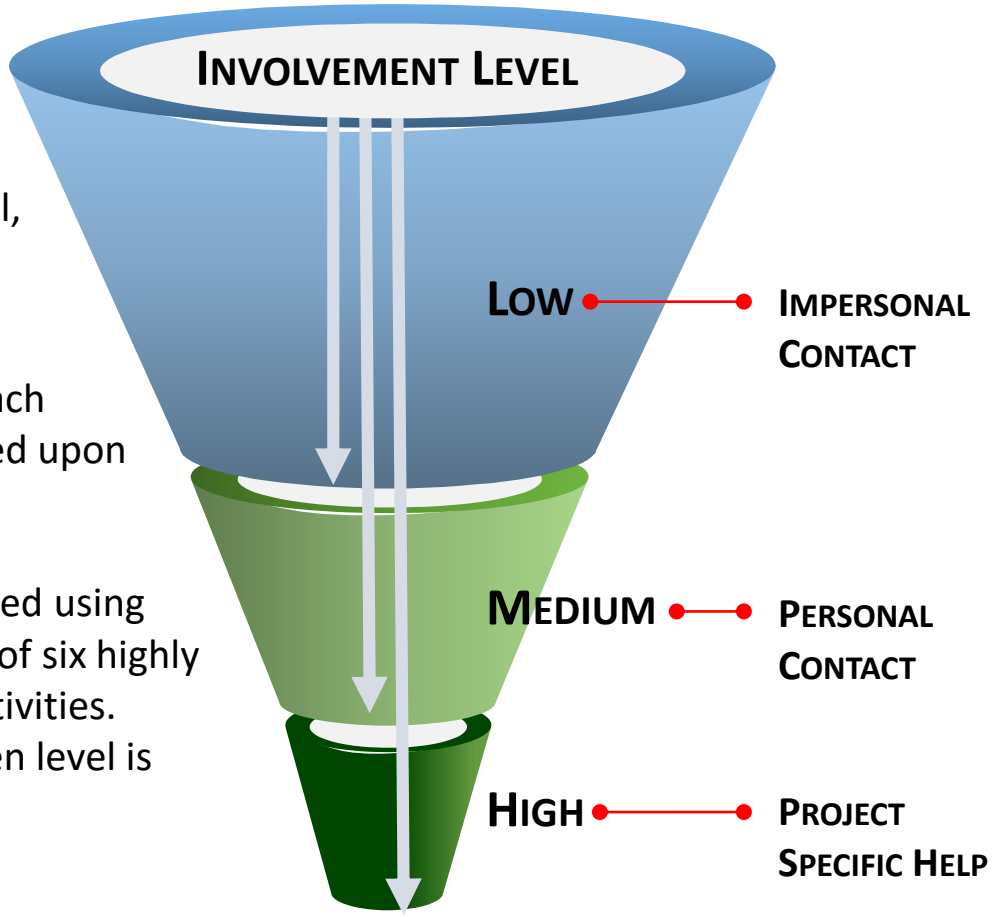
Establishing Involvement with the Wood Industry

Architects and Structural Engineers were questioned about their involvement in various industry educational, informational, technical support and communications initiatives.

Based on their answers across 15 areas, each respondent was assigned to one level based upon their highest level of involvement.

All “medium involved” respondents reported using resources associated with “low”. Five out of six highly involved also were reached by medium activities. Therefore the reporting of impact at a given level is inclusive of the lower levels.



NOTE: None of the respondents reported no involvement with the industry. This led to revising the lowest group label from “no involvement or contact” to “minimal” and “low” involvement

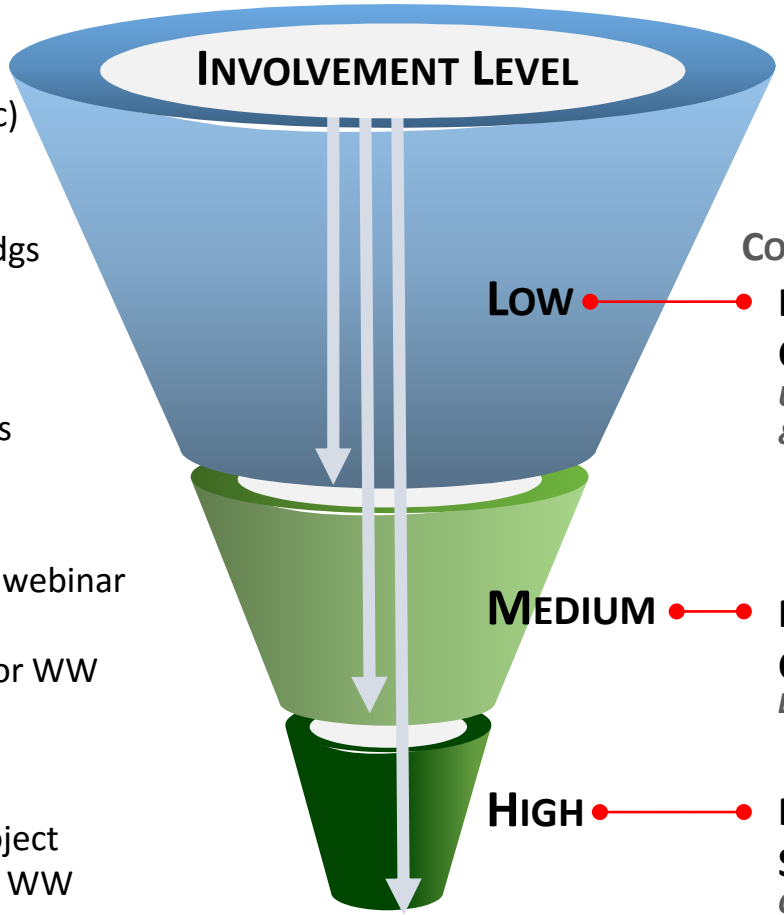
Areas of Involvement with the Wood Industry

Specific Involvement Questions*

- Used online calculators (heights, spans, carbon, etc)
- Used websites of reThink Wood, WW and/or AWC
- Referred to AWC building codes
- Read brochure/document on commercial wood bldgs
- Read info for multi-family and/or non-res bldgs
- Accessed social media channels
- Submitted projects for design awards
- Read or heard about the use of wood in taller bldgs

- Took an online CEU course
- Attended a WW Wood Solutions Fair, workshop or webinar
- Attended a national tradeshow on wood design
- Participated in an event with AWC, reThink Wood or WW

- Reached out to AWC or WW helpdesk
- Worked directly with AWC or WW on a specific project
- Received wood application/design assistance from WW



* SLB Partner abbreviations: AWC – American Wood Council; reTW – reThink Wood; WW - WoodWorks

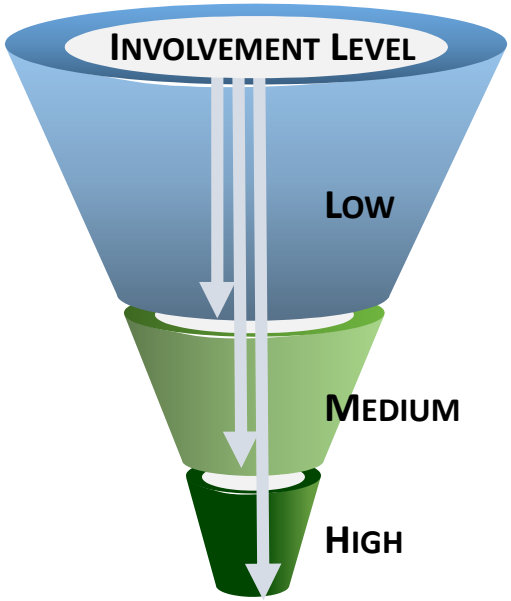
Sample Distribution by Involvement Level

All respondents reported some level of involvement with the wood industry.

Low represents 40% of respondents, while Medium and High were each about 30% of the sample.

Architects were more likely to be low involvement while Structural Engineers were more likely to have high involvement.

Involvement Level	Architects	Structural Engineers	TOTAL	% Mix
Low	111	36	147	40%
Medium	72	34	106	29%
High	49	63	112	31%
Total	**232**	**133**	**365**	
% Mix	**64%**	**36%**		**100%**

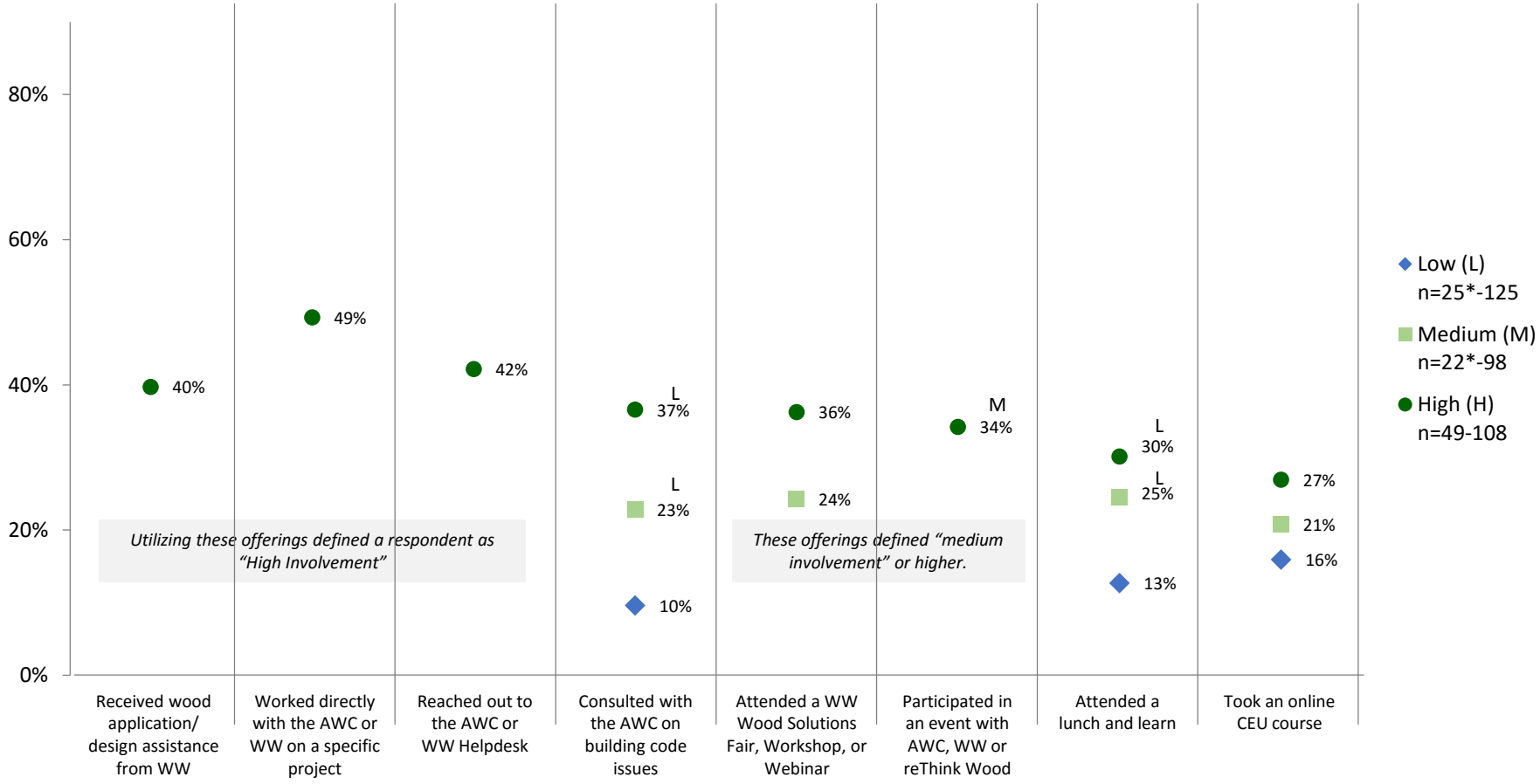


SURVEY RESPONSES

GSA Office Building, Albuquerque, NM
Woodworks.org

Helpfulness of Resources – *Extremely Helpful Scores* *(p.1 of 2)*

A larger portion of highly involved respondents rate each offering as “extremely helpful”, the highest rating available.



*Interpret with caution due to small sample size
Note: Attribute labels have been shortened for display purposes
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Q8. Please indicate how helpful each resource has been in increasing your use of wood in building structures. (Grid)

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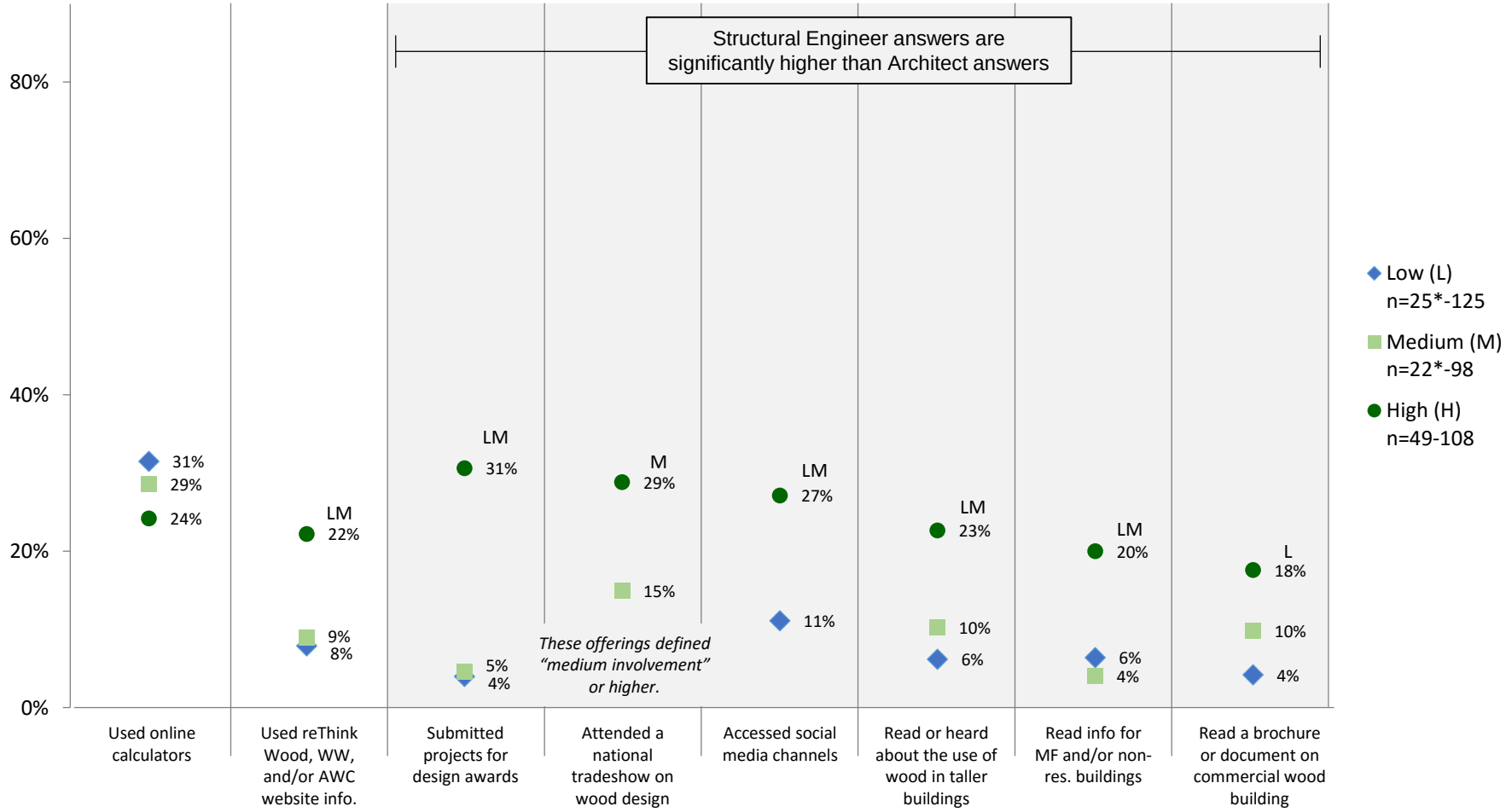
Helpfulness of Resources – *Extremely Helpful Scores* *(p.2 of 2)*



Note: Attribute labels have been shortened for display purposes | *Interpret with caution due to small sample size
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are noted in the shaded area

Q8. Please indicate how helpful each resource has been in increasing your use of wood in building structures. (Grid)

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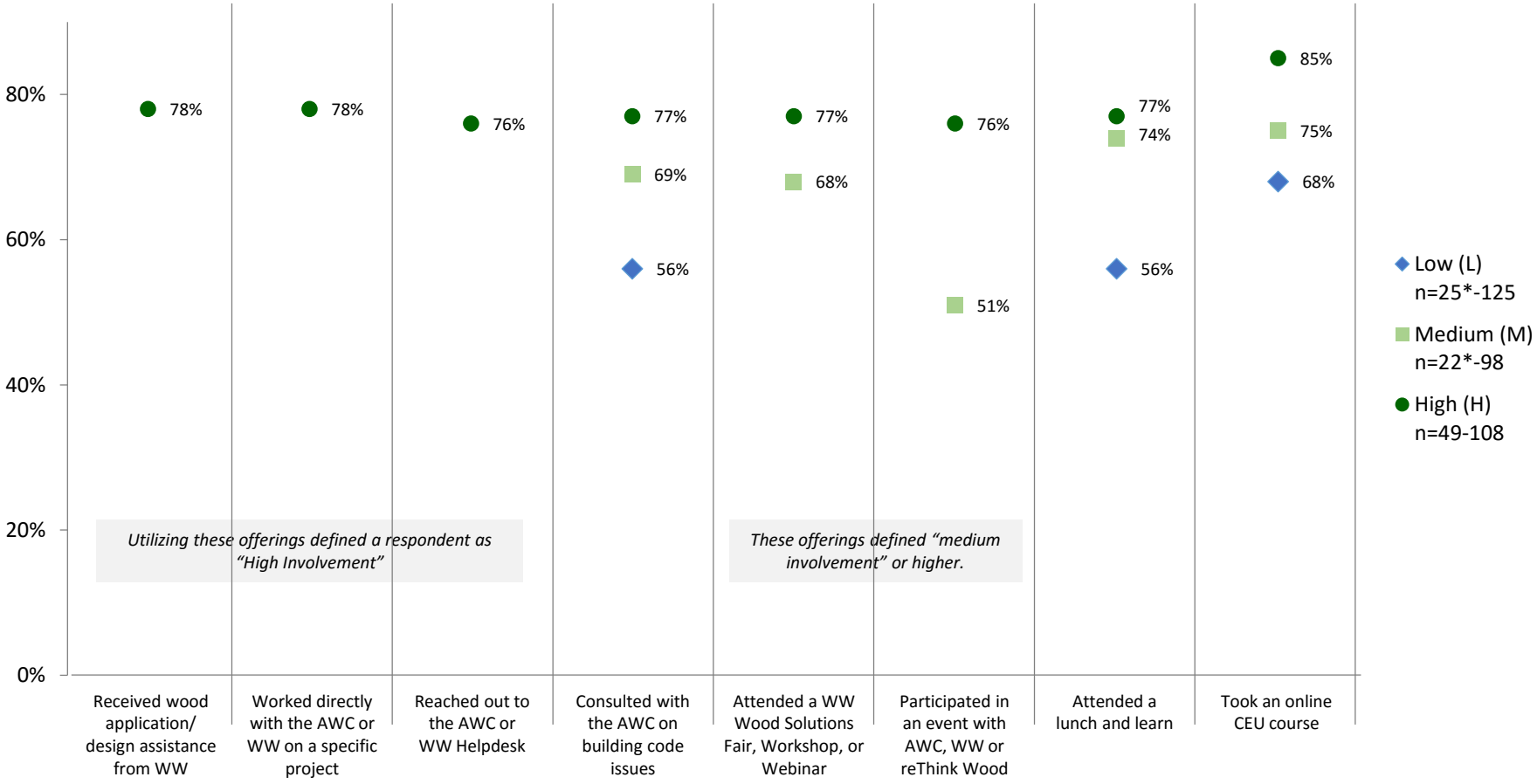
Helpfulness of Resources – *Top 2 Box Score* *(p.1 of 2)*

When combining the "Top 2 scores", the gap between the groups diminishes. High involvement respondents rate each offering as more helpful than their peers with lower levels of involvement.



*Interpret with caution due to small sample size
Note: Attribute labels have been shortened for display purposes
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Q8. Please indicate how helpful each resource has been in increasing your use of wood in building structures. (Grid)

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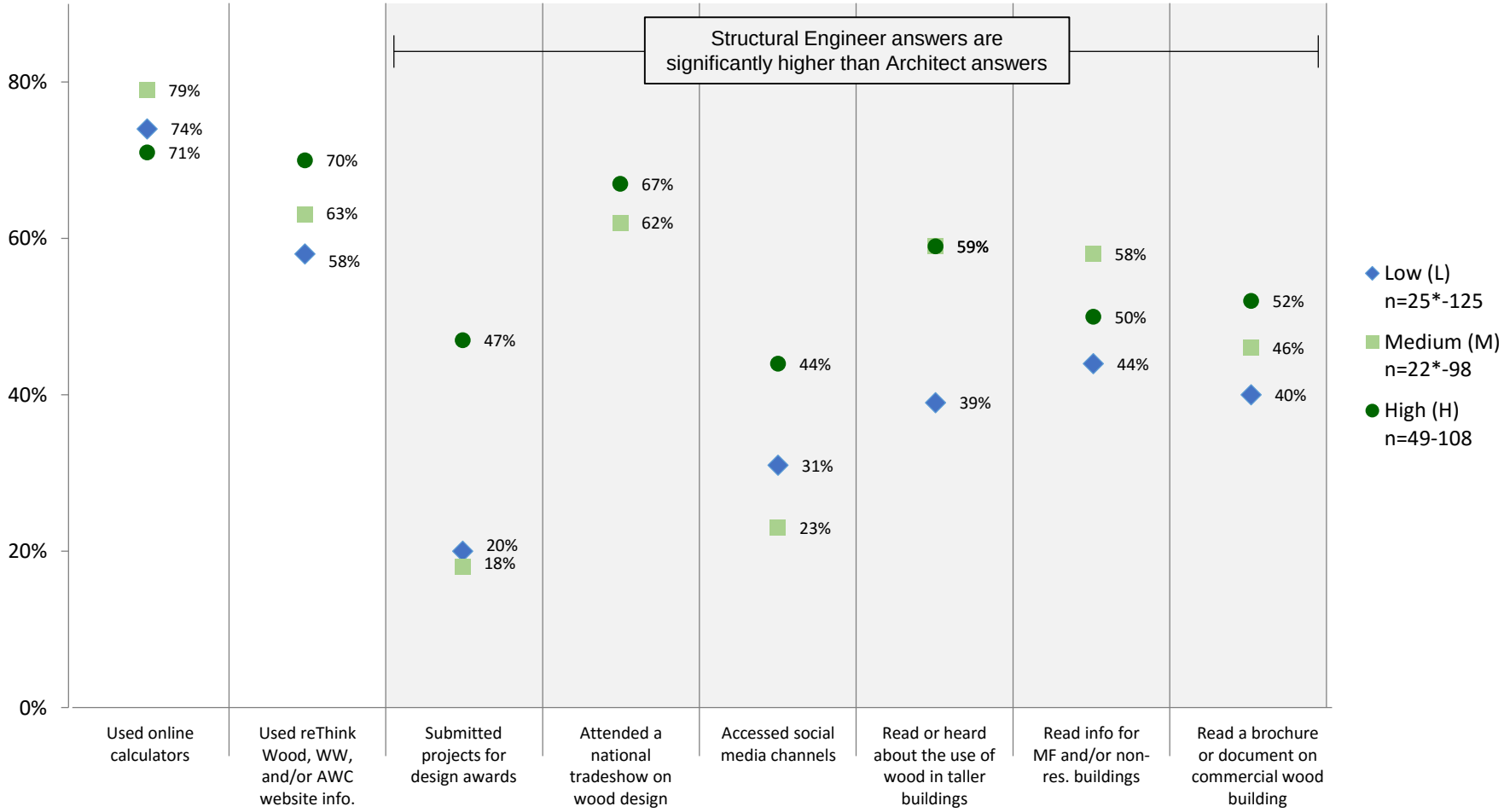
Helpfulness of Resources – *Top 2 Box Score* *(p.2 of 2)*

Online calculators and websites received the highest Top 2 Box usefulness scores.



Note: Attribute labels have been shortened for display purposes | *Interpret with caution due to small sample size
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are noted in the shaded area

Q8. Please indicate how helpful each resource has been in increasing your use of wood in building structures. (Grid)

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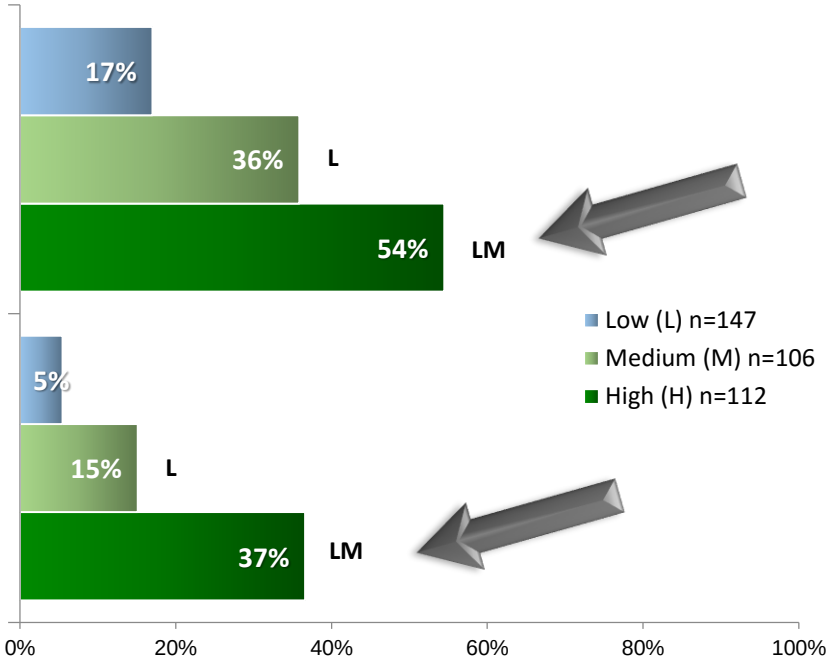
Wood Statement Agreement – *Strongly Agree Scores*

Highly involved respondents strongly agree more often than less involved peers with the statements. Structural engineers agree more strongly than do architects that the wood industry helps make them more comfortable with wood framed design as well as use more wood in structural elements.

The assistance from various organizations in the wood industry has …

S ...made me more comfortable using wood framed design

S ...helped me use more wood as a structural element in my projects



Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Please rate your level of agreement with the following statement:

Q9. Assistance from various organizations (i.e. American Wood Council, WoodWorks, reThink Wood) has made me more comfortable using wood framed design. (Grid)

Q10. Assistance from various organizations (i.e. American Wood Council, WoodWorks, reThink Wood) has helped me use more wood as a structural element in my projects. (Grid)

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Wood Statement Agreement – *Top 2 Box Score*

The Top 2 score adds a further 30-40% of respondents beyond those who strongly agree. The difference between the groups and the statistical significance was the same for the highest and Top 2 ratings.

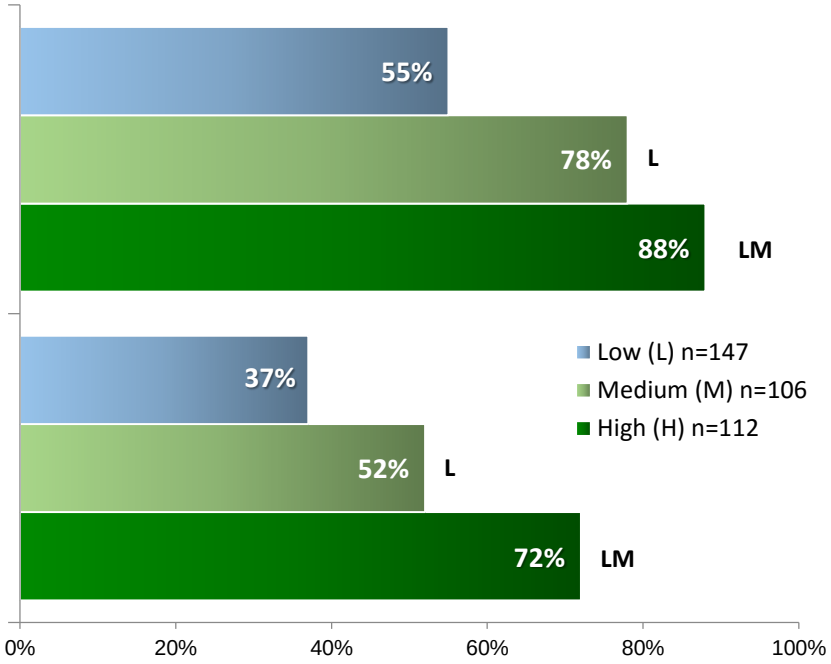
The assistance from various organizations in the wood industry has …

S ...made me more comfortable using wood framed design

Architects 68%
Structural Engineers 79%

S ...helped me use more wood as a structural element in my projects

Architects 46%
Structural Engineers 63%



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Please rate your level of agreement with the following statement:

Q9. Assistance from various organizations (i.e. American Wood Council, WoodWorks, reThink Wood) has made me more comfortable using wood framed design. (Grid)

Q10. Assistance from various organizations (i.e. American Wood Council, WoodWorks, reThink Wood) has helped me use more wood as a structural element in my projects. (Grid)

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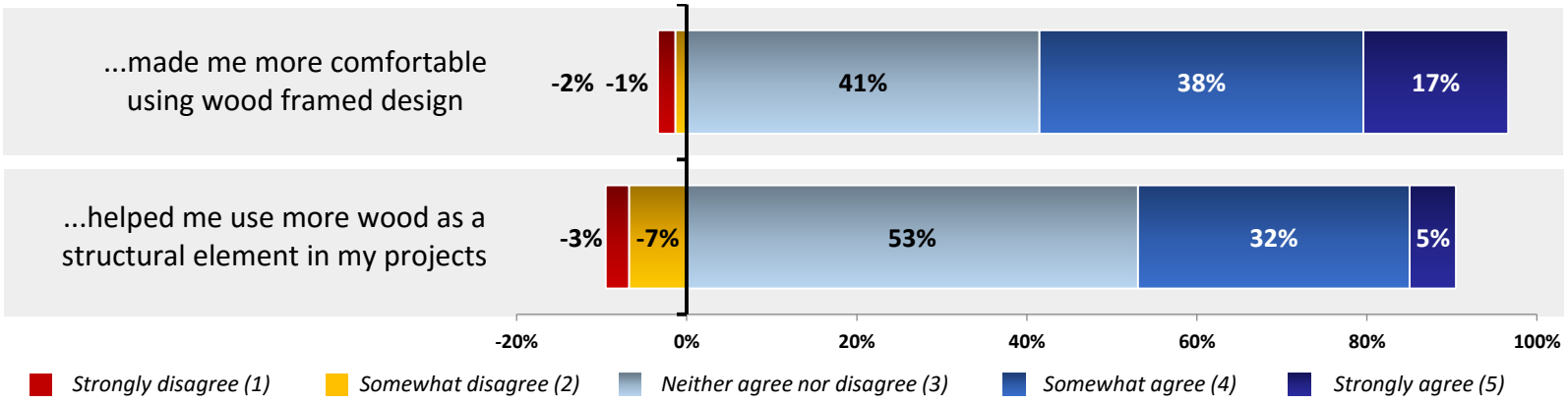
Wood Organization Statement Agreement – *Low Involvement*

The assistance from various organizations in the wood industry has…



INTERACTIONS WITH WOOD INDUSTRY ORGANIZATIONS HAS HELPED INCREASE WOOD USE AS A STRUCTURAL ELEMENT BY…

"Provided information on fire ratings that allowed wood to be used in lieu of other more costly materials"

"Makes it easier to design and thus more economical"

"WoodWorks helped with learning how to build five-story wood buildings"

"The interaction has provided actionable guidance that I can reliably share with clients to support using wood"

"Information provided helps to overcome some of the common misconceptions of wood as being a cheap material, or a material only used for light commercial construction"

"It has made me more comfortable with a less used structural media"

n=147

Q9. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has made me more comfortable using wood framed design. (Grid)
Q10. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has helped me use more wood as a structural element in my projects.(Grid)
Q11. How has your interaction with these organizations in the wood industry (led to the use of more wood as a structural element in your projects? (Open-end)

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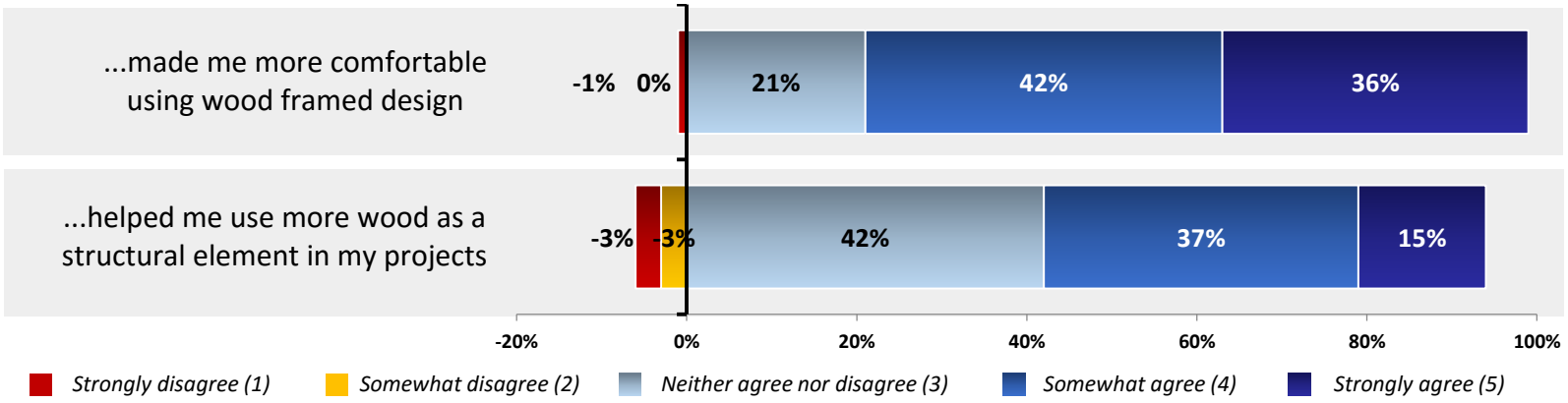
Wood Organization Statement Agreement - *Medium Involvement*

The assistance from various organizations in the wood industry has…



INTERACTIONS WITH WOOD INDUSTRY ORGANIZATIONS HAS HELPED INCREASE WOOD USE AS A STRUCTURAL ELEMENT BY…

They have very unique ways of approaching design that our normal structural engineers would not think of"

"More comfortable with using wood in taller structures"

"I have learned some of the challenges with using wood as a structural element can be overcome"

"It has let me see where wood use is possible where I would have previously thought it was code prohibitive"

"They provide data that supports the use of wood in our projects to be presented to both the clients, as well as the code officials"

"Used wood instead of steel on a large multi-family project"

n=106

Q9. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has made me more comfortable using wood framed design. (Grid)
Q10. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has helped me use more wood as a structural element in my projects.(Grid)
Q11. How has your interaction with these organizations in the wood industry (led to the use of more wood as a structural element in your projects? (Open-end)

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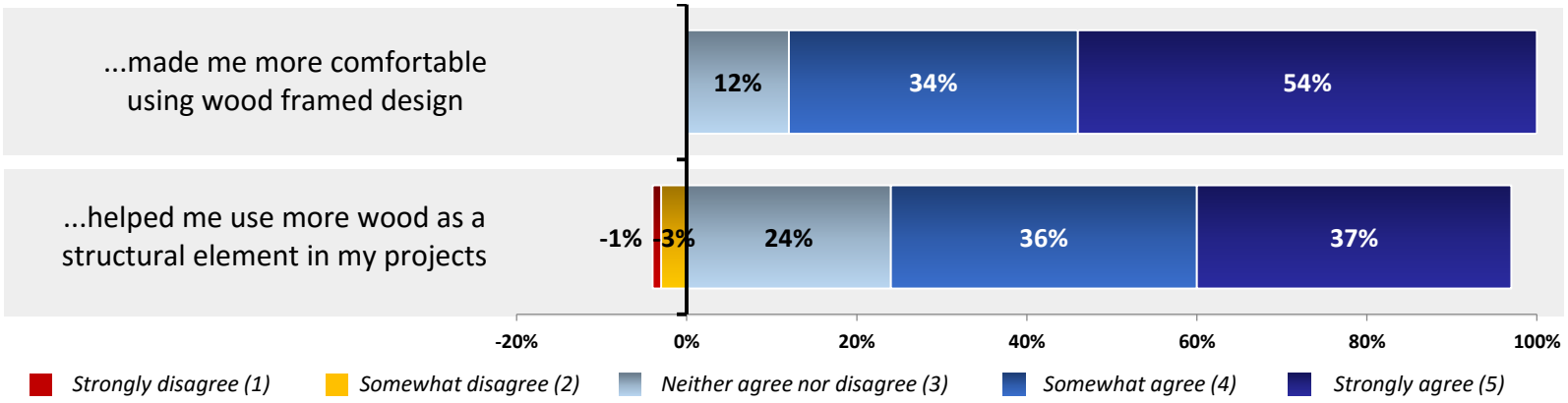
Wood Organization Statement Agreement – *High Involvement*

The assistance from various organizations in the wood industry has…



INTERACTIONS WITH WOOD INDUSTRY ORGANIZATIONS HAS HELPED INCREASE WOOD USE AS A STRUCTURAL ELEMENT BY…

"They have helped me utilize wood to its fullest advantage to produce an economical structure that meets the owner's requirements"

"Successfully promoted wood as a better choice than masonry and steel"

"Able to have data to check costs and communicate environmental and structural impact"

"We are able to use wood in more situations where fire ratings and other code issues are a challenge"

"WoodWorks helped with a project involving CLT. Was going to substitute masonry for CLT, but WoodWorks helped with connectors."

"More confident in using wood for stair shafts"

n=112

Q9. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has made me more comfortable using wood framed design. (Grid)
Q10. Please rate your level of agreement with the following statement: The assistance from various organizations in the wood industry (i.e. American Wood Council, WoodWorks, reThink Wood) has helped me use more wood as a structural element in my projects.(Grid)
Q11. How has your interaction with these organizations in the wood industry (led to the use of more wood as a structural element in your projects? (Open-end)

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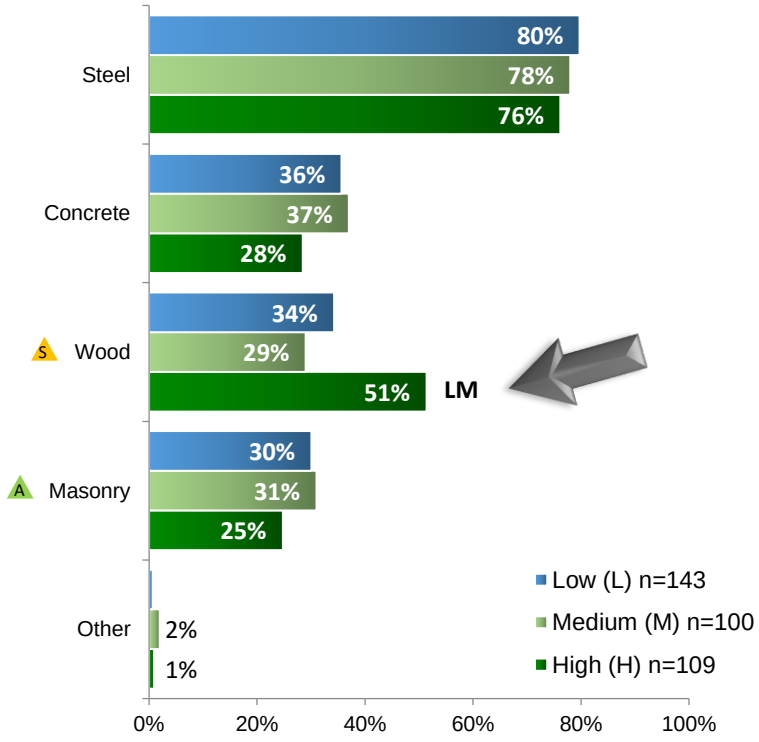
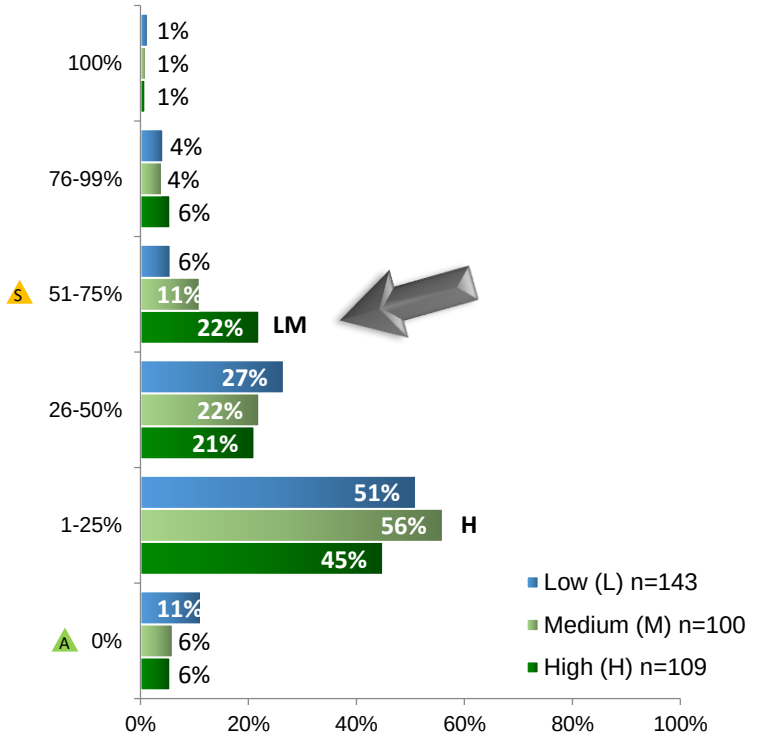
Non-Residential - Structural Material Use

A large majority prefer steel as a "Top 2" structural building material for Non-Res. developments. Roughly one-half of highly involved users also indicate they prefer to work with wood as a structural materials for non-residential developments. When asked what percentage of their structures used wood as a structural material, roughly one-quarter of high involvement users indicated 50+% of the time.

Preferred Structural Materials
Q12



Wood Use as Structural Material
Q13



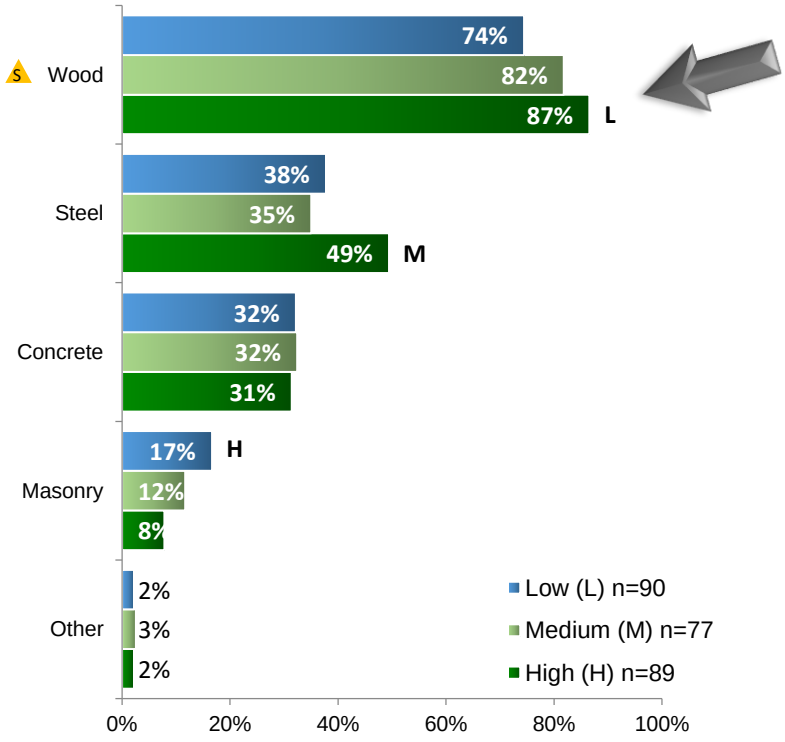
Among those doing non-residential work
Differences considered significant between Involvement Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q12. In general, when making choices for structural building materials in a non-residential development, what materials do you most prefer? (Up to 2 mentions)
Q13. Of the non-residential developments that you have developed, approximately what percentage of them are each of the following structural materials? (Grid)

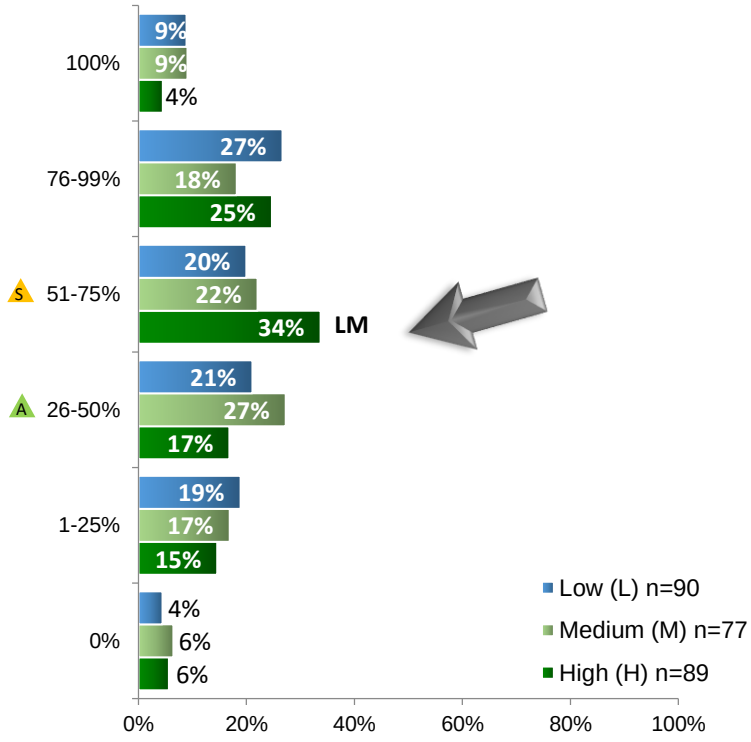
Multi-Family Residential - Structural Material Use

For multi-family residential projects participants agree wood is their preferred structural building material. Over half of low touch users indicate that more than 50% of their multi-family residential projects use wood as a structural material, similar to medium touch users; while three in five high touch users indicate that over 50% of their projects include wood as a structural material.

Preferred Structural Materials
Q16



Wood Use as Structural Material
Q17



Among those doing multi-family residential work
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q16. In general, when making choices for structural building materials in a multi-family residential development, what materials do you most prefer? (Up to 2 mentions)
Q17. Of the multi-family residential developments that you have developed, approximately what percentage of them are each of the following structural materials? (Grid)

Wood Share of Structural Elements

Respondents indicated that Wood share has increased across each structural element. The largest shares and increase in share were reported by those with highest involvement.

		Total	Structural Engineers: Architects	Structural Engineers	Involvement Level: Low	Involvement Level: Medium	Involvement Level: High
Walls	2015	34.5	37.3	29.6	32.2	37.2	34.8
	2011	32.5	35.5	27.2	31.7	35.6	30.2
		2.0	1.8	2.4	0.5	1.6	**4.3** ↑
Roof	2015	37.6	39.3	34.8	32.7	41.4	40.5
	2011	36.5	37.9	34.0	33.0	42.0	35.7
		1.1	1.4	0.8	-0.3	-0.6	**4.8** ↑
Floors	2015	31.7	31.9	31.3	26.7	35.0	35.0
	2011	29.3	28.7	30.4	25.5	31.5	32.3
		2.4	3.2	0.9	1.2	**3.5** ↑	**2.7** ↑
Interior Finishings	2015	27.6	27.4	28.0	23.9	28.8	31.6
	2011	25.9	24.5	28.5	24.1	26.8	27.7
		1.7	2.9	-0.5	-0.2	2.0	**3.9** ↑

Outliers/"Don't know"/"Not applicable" responses have been removed for data analysis
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers are significantly higher than Architect answers using a 90% confidence interval are indicated by S
Statistical increases/decreases in 2015 project data from 2011 project data by touch level are illustrated by ↑ and ↓ respectively

Q23. Still thinking about 4 years ago, what percentage of each of the following structural elements was wood on an average project? (Numeric open-end)
Q28. Still thinking about the past 12 months, what percentage of each of the following structural elements was wood on an average project? (Numeric open-end)

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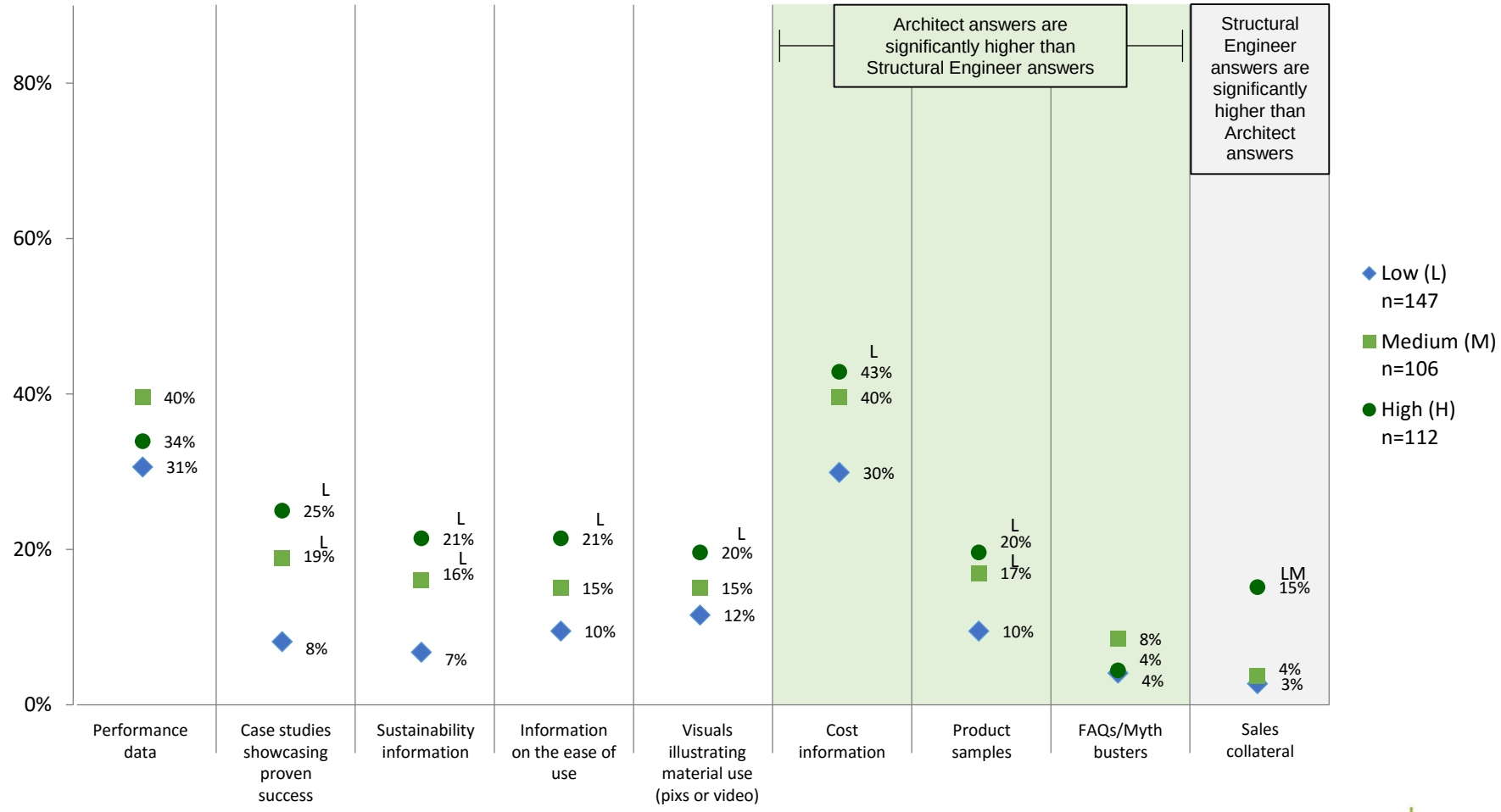
Important Information – *Extremely Important Scores*

Each group identified performance data and cost information as the most important pieces of information when developing a project. Sales collateral was the information with a statistically significant difference between high and lesser involved peers. Low touch users place less importance on case studies, sustainability information, and product samples relative to higher touch users. Architects place higher importance on cost, product samples and FAQs compared to structural engineers. Structural engineers place higher importance on sales collateral than architects.

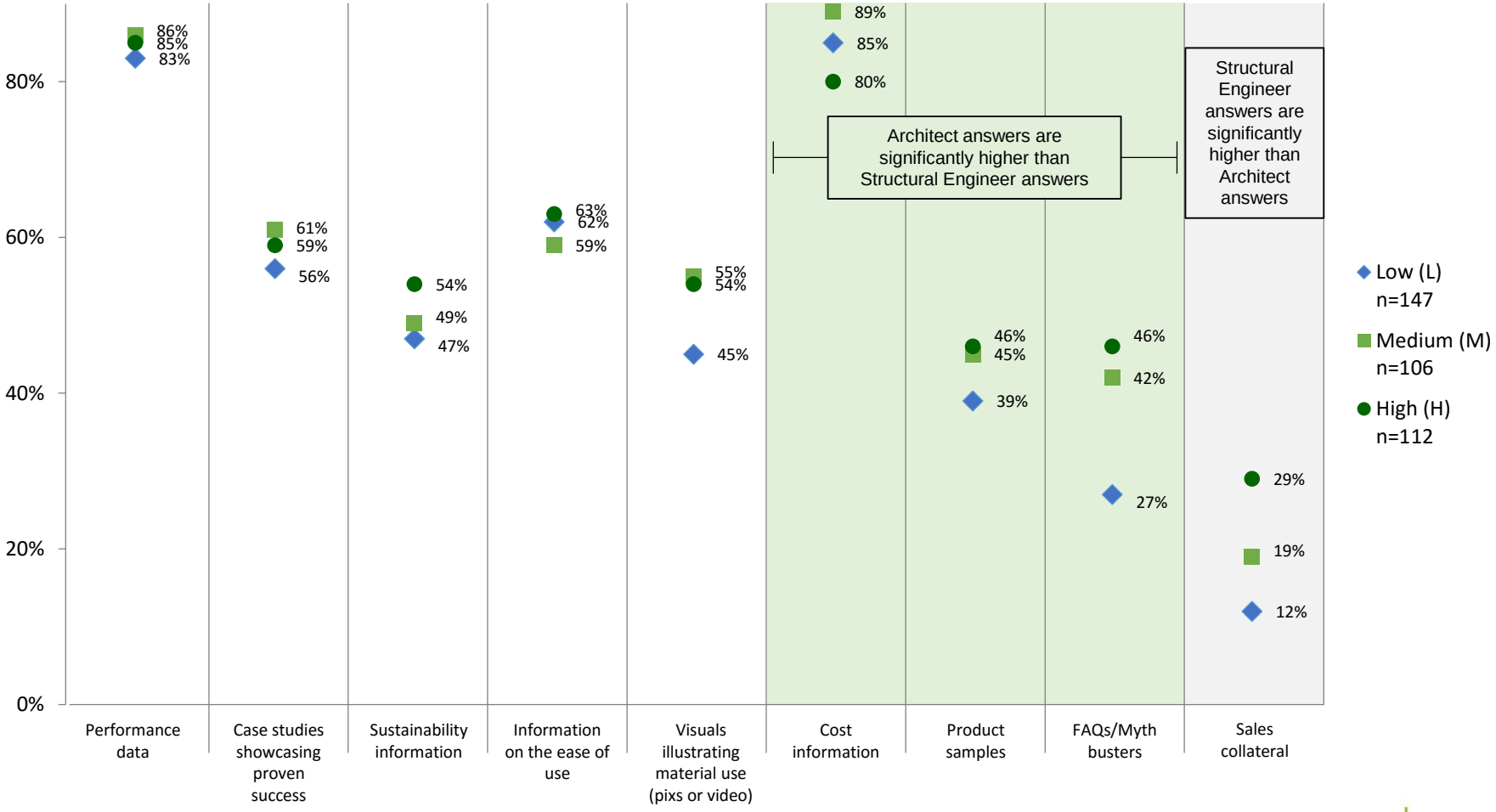


Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect or Structural Engineer answers that are significantly higher using a 90% confidence interval are noted in the shaded areas

Q34. Please rate the importance of each of the following types of information regarding structural building materials when considering a development project. (Grid)

Important Information – *Top 2 Box Score*

When looking at Top 2 Box scores, performance and cost information continue to score much higher than other type of information. Across most other type of information, the portion who rated them as Top 2 was consistent across involvement groups. Architects place higher importance on cost, product samples and FAQs compared to structural engineers. Structural engineers place higher importance on sales collateral than architects.

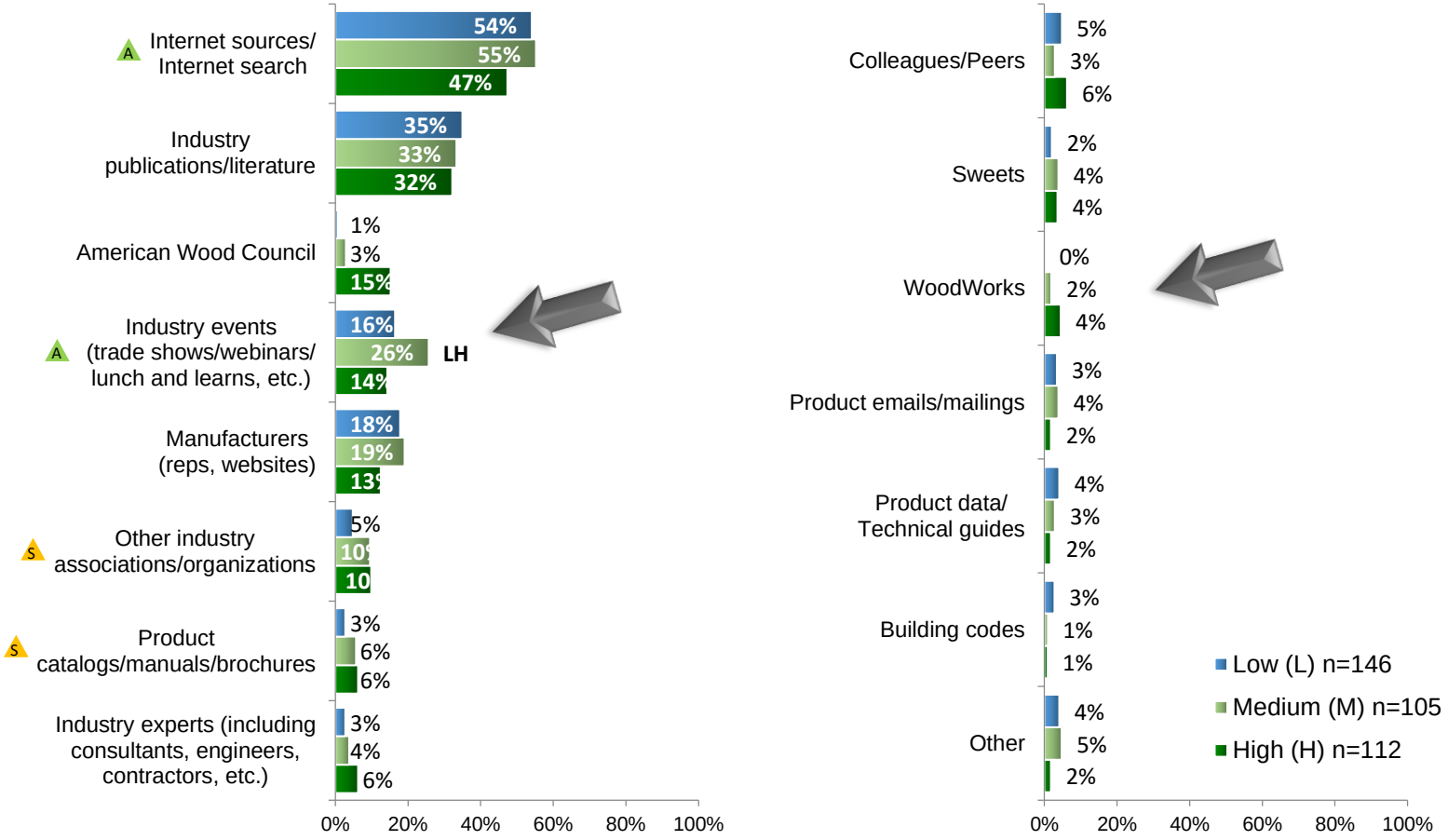


Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect or Structural Engineer answers that are significantly higher using a 90% confidence interval are noted in the shaded areas

Q34. Please rate the importance of each of the following types of information regarding structural building materials when considering a development project. (Grid)

Sources for Learning About Building Materials

Across the board, internet sources are preferred when learning about new building materials followed by industry publications/literature. Industry events are more important to medium touch users than to low or high touch users. Structural engineers have a stronger preference toward industry associations and product catalogs than do architects.



"Don't know"/Unusable answers have been removed for data analysis
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q35A. What sources do you prefer to reference for the following purposes? - To learn about existing or new building materials (Open-end)

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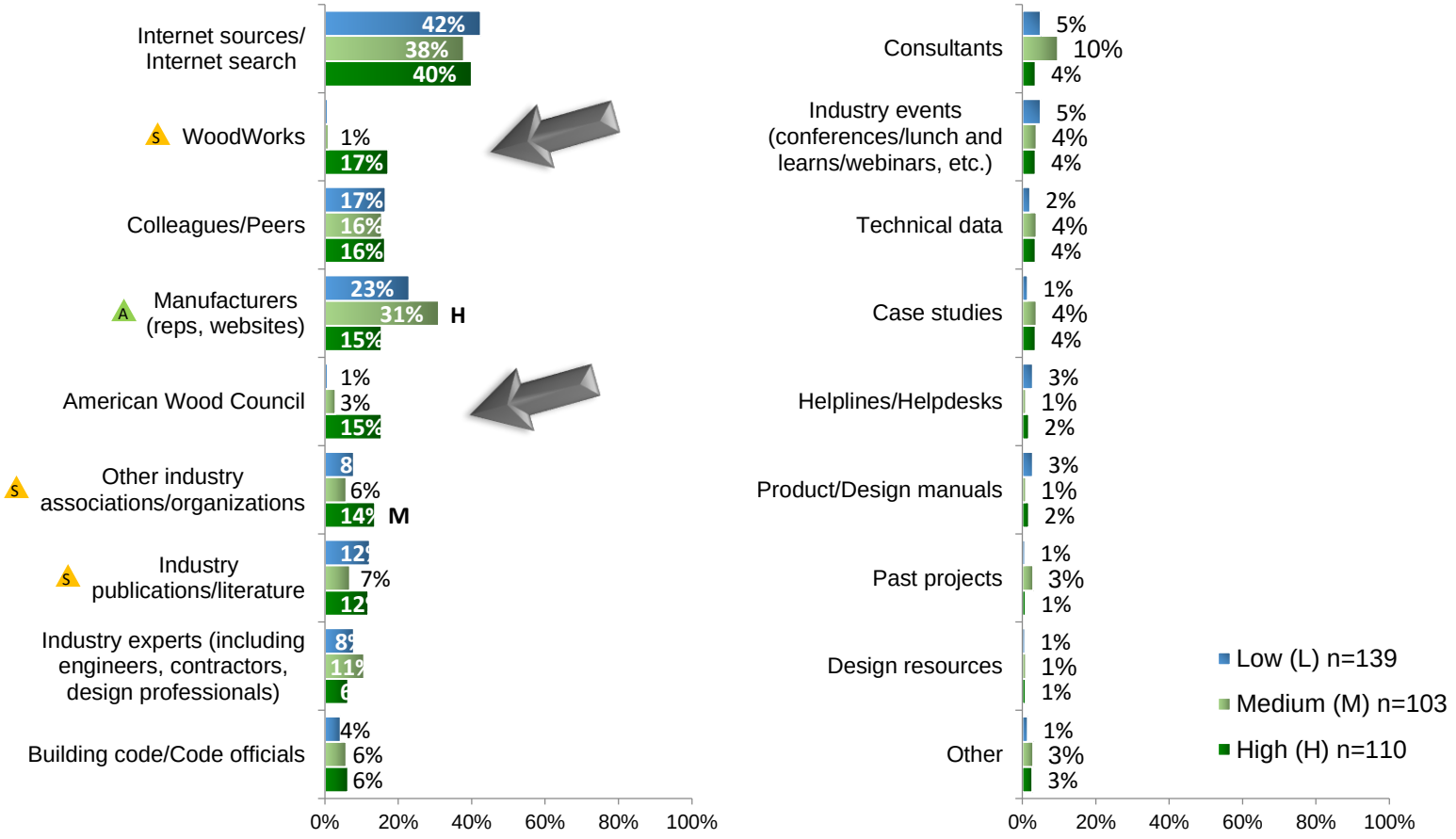
Sources for Solving Development Challenges

Internet sources are mentioned most often for solving development challenges. Structural engineers prefer to reference Wood Works, other industry associations, and industry publications more so than do architects. Architects reference manufacturers more than structural engineers.



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Q35B. What sources do you prefer to reference for the following purposes? - To help solve development challenges (Open-end)

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Awareness/Use of Newer Building Applications

High involvement users are much more aware and are more likely to be using or planning to use almost all the newer applications than are low and medium groups.

		Aware			Using/Planning to Use		
		Low (L) n=147	Medium (M) n=104	High (H) n=111	Low (L) n=147	Medium (M) n=104	High (H) n=111
S	Use of wood as a structural element in taller buildings (more than 4 stories)	89%	87%	96% LM	7%	17% L	42% LM
	Utilize Glue Laminated (GLULAM) or Nail Laminated (NLT)	96%	94%	95%	52%	58%	63% L
	Exposed wood for the structural frame	81%	83%	95% LM	28%	33%	48% LM
	Type III construction to get larger areas or increased number of stories	74%	77%	93% LM	14%	24% L	36% LM
	Incorporate heavy timber into type I or type II structures	84%	81%	88%	16%	24%	37% LM
S	Wood framing in elevator and/or stairway shaft walls	67%	63%	87% LM	19%	20%	48% LM
S	Utilize an innovative structural solution narrow shear walls, CLT, complex connections	64%	67%	86% LM	11%	11%	35% LM
	Use a building code change to increase the amount of wood in a building	57%	69% L	78% LM	7%	15% L	40% LM
S	Open front/cantilevered diaphragm design to allow more openings and greater flexibility in exterior walls	59%	57%	76% LM	11%	15%	36% LM
S	ACI 530 engineered design option to allow brick veneer backed by wood framing over 30' in height	52%	54%	71% LM	4%	8%	14% L

Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect awareness is significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer awareness is significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q32. Please indicate your awareness of, and reaction to, each of the following building applications? (Grid)

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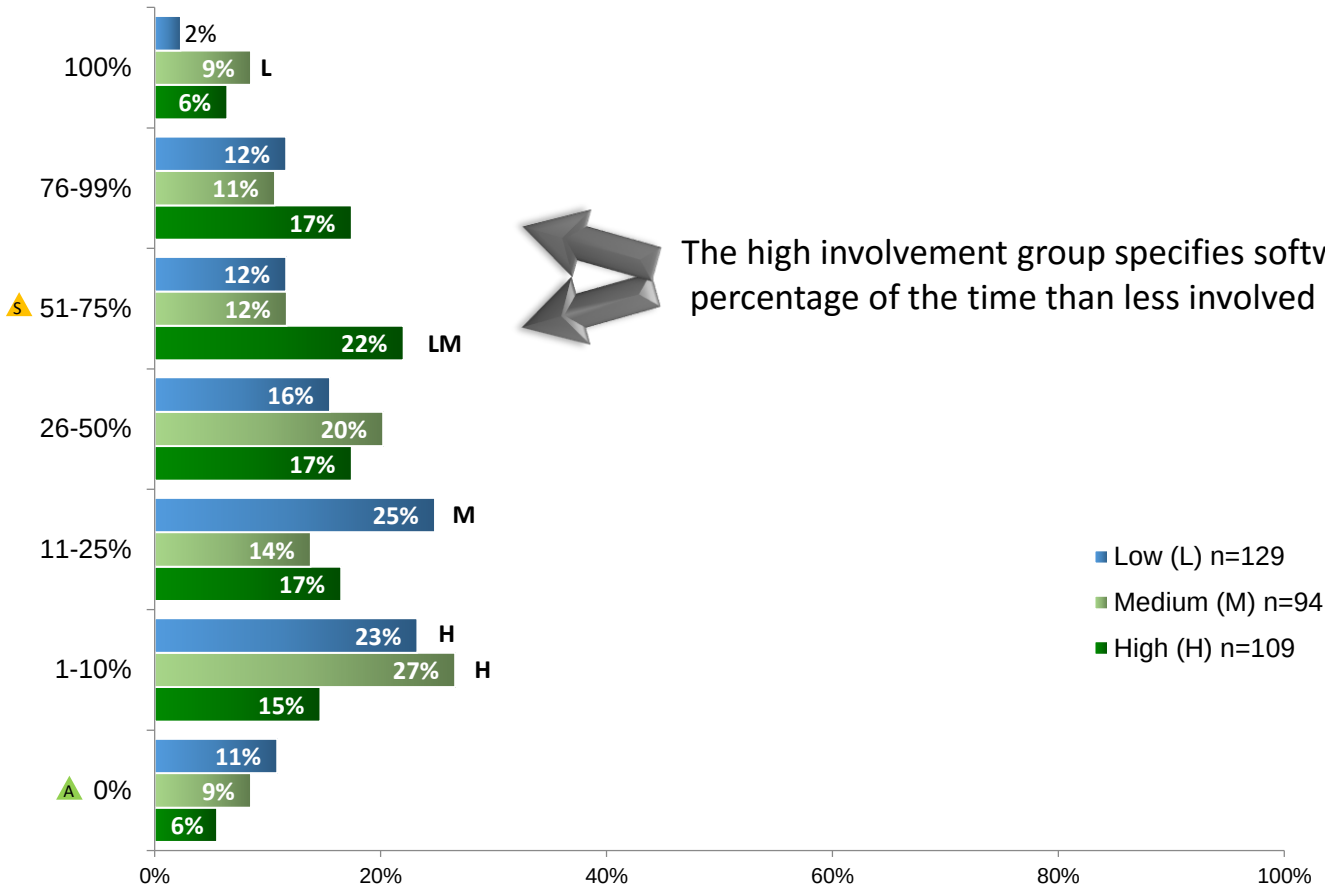
Softwood Purchase/Specification for Structural Systems



The high involvement group specifies softwood a higher percentage of the time than less involved peers.

Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
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Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S

Q33. For approximately what percentage of your development jobs is softwood purchased/specified for structural systems? (Single mention)

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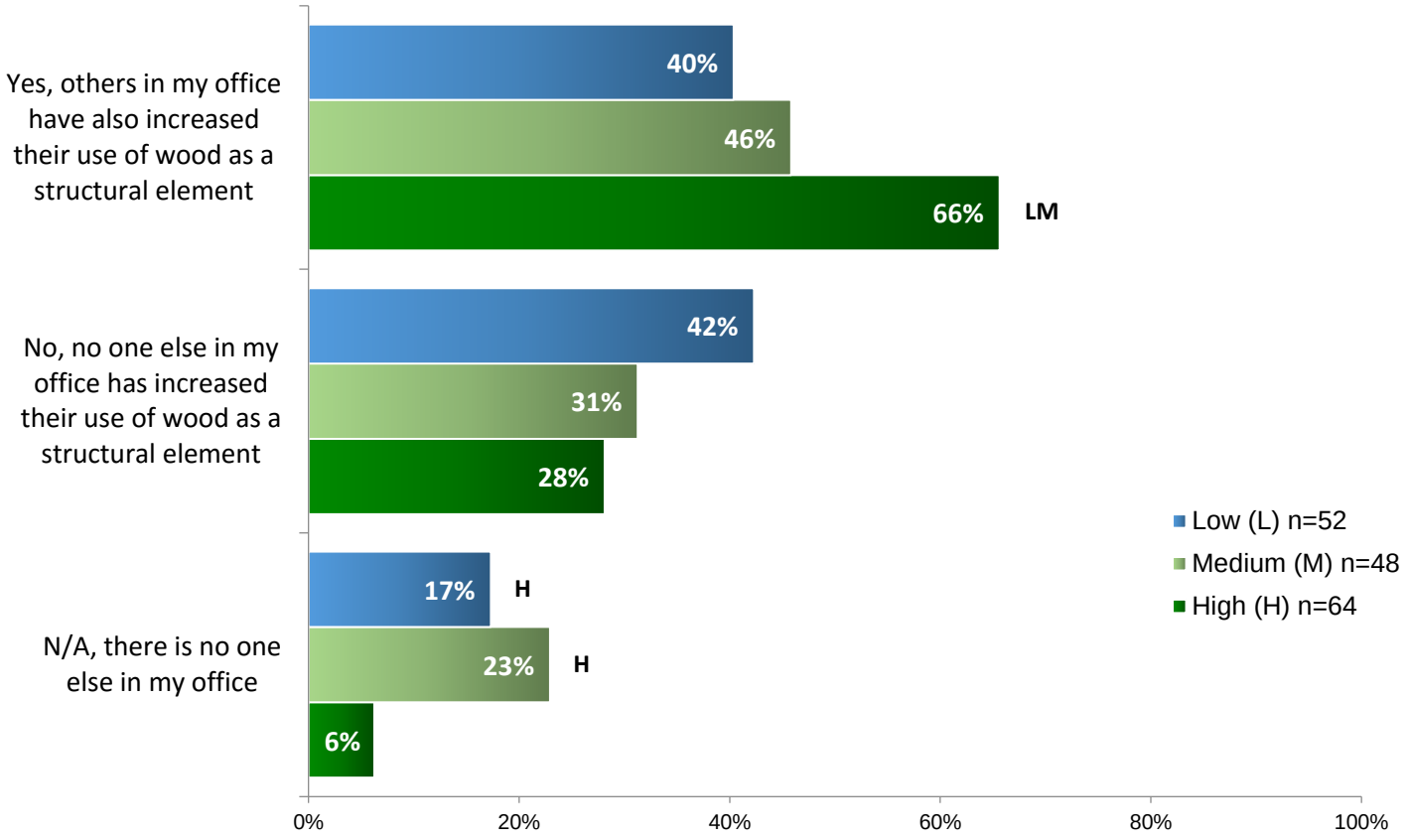
Perceived Increase in Wood Usage Among Colleagues

The most involved also believe their colleagues in the office have increased their use of wood as a structural element by a sizeable margin.



Among those who have indicated an increase in wood usage in Q26 from Q21
Differences considered significant between Touch Level answers using a 90% confidence interval are indicated by corresponding letters
Architect answers that are significantly higher than Structural Engineer answers using a 90% confidence interval are indicated by A
Structural Engineer answers that are significantly higher than Architect answers using a 90% confidence interval are indicated by S
Q30. Are there other people in your office that have also increased their use of wood as a structural element in their projects? (Single mention)

INDUSTRY IMPACT & ROI

Cathedral of Christ the Light, Oakland, CA
Woodworks.org

Industry Impact & ROI for SLB Program

- The overall industry impact and ROI were projected using independent third-party industry size data reported by Forest Economic Advisors (FEA), respondent answers to the survey questions and the FEA Price Elasticity Model.

A
- A Lumber volume cause-of-change analysis was developed by:
  - utilizing FEA data for lumber use in Multi-family and Non-Res. by year for 2011 to 2015.
  - allocating FEA 2011 data to each involvement level based on survey respondent mix.
  - calculating respondent change in wood used (Board Feet - BF).
  - projecting growth in both project square footage and board feet usage, for each involvement level, based on respondent answers for 2011 and 2015 projects.

- Using these measures we calculated the 2011, 2015 and change in:

B
  - BF/SqFt, a key measure of wood usage.

C
  - Wood share of structural materials.

D
- The amount of lumber associated with SLB program involvement was then converted to incremental sales using FEA reported average lumber prices across 2012-2015.

E
- The Incremental Sales were:
  - compared to SLB program spending to determine the Revenue ROI.
  - Converted to projected profit using industry margins to determine a Profit ROI.

F
  - Used in the FEA Price Elasticity Model to project industry margin improvement from unexpected volume growth.

Cause of Change by Involvement Level

A Survey respondents were categorized based on their involvement with SLB programs.

Those involved with various components of SLB programs experienced a +22.9% increase in the amount of lumber Board Feet used per Sq.Ft. (BF/SqFt) in their projects. This compares to -5.9% among their peers with minimal involvement with the programs.

The involved group also compares favorably to the +11% industry-wide usage change as reported by Forest Economic Advisors (FEA).

Group	Portion of Respondents	2011 BF	2015 vs 2011 % Change in SqFt **	BF	Change in BF/SqFt	2015 vs Base* M BF	2012-15 4 Yr. Impact M BF
Low	20%	14.5%	+49.0%	+67.0%	+12.1%	57	143
Medium	29%	39.8%	+82.7	+105.6	+12.6%	243	608
High	32%	38.2%	+28.0	+72.0	+34.4%	373	932
SLB Involved	81%	92.5%	+50.4%	+84.9%	**+22.9%**	673	1,683
Minimal Involvement	19%	7.5%	+29.7%	+22.0%	**-5.9%**		
Industry (per FEA)			+48%	+64%	+11%		

* 2011 was designated the "base" year.

** Total SqFt change over 2011-15 was +47.5% across the sample compared to 48.2% per FEA.

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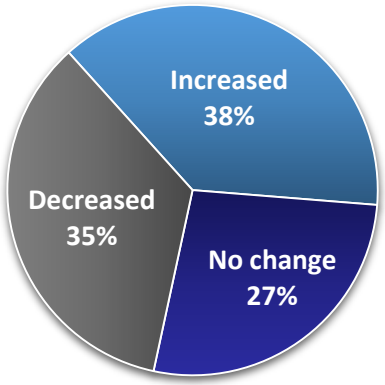
Change in Board Feet Usage by Level of Involvement

B The change was also more wide-spread the higher the involvement level. Among the High Involvement group 49% experienced an increase in wood use, versus 38% in the low group.

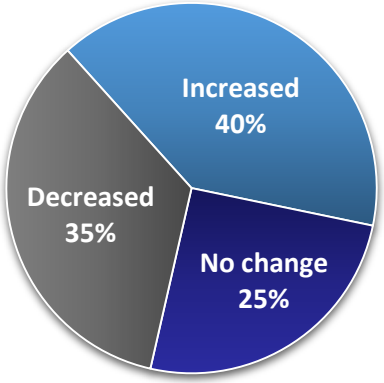
% of Respondents by the Change in Board Feet per Square Foot (△ BF/SQFT)

LOW



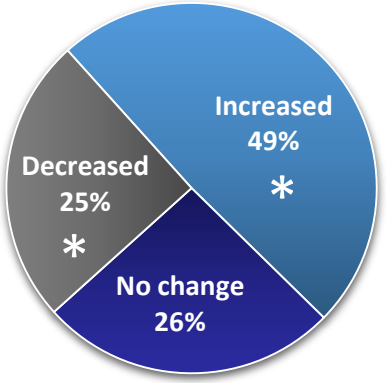
Net Change: 12 pt. Increase

MEDIUM



13 pt. Increase

HIGH



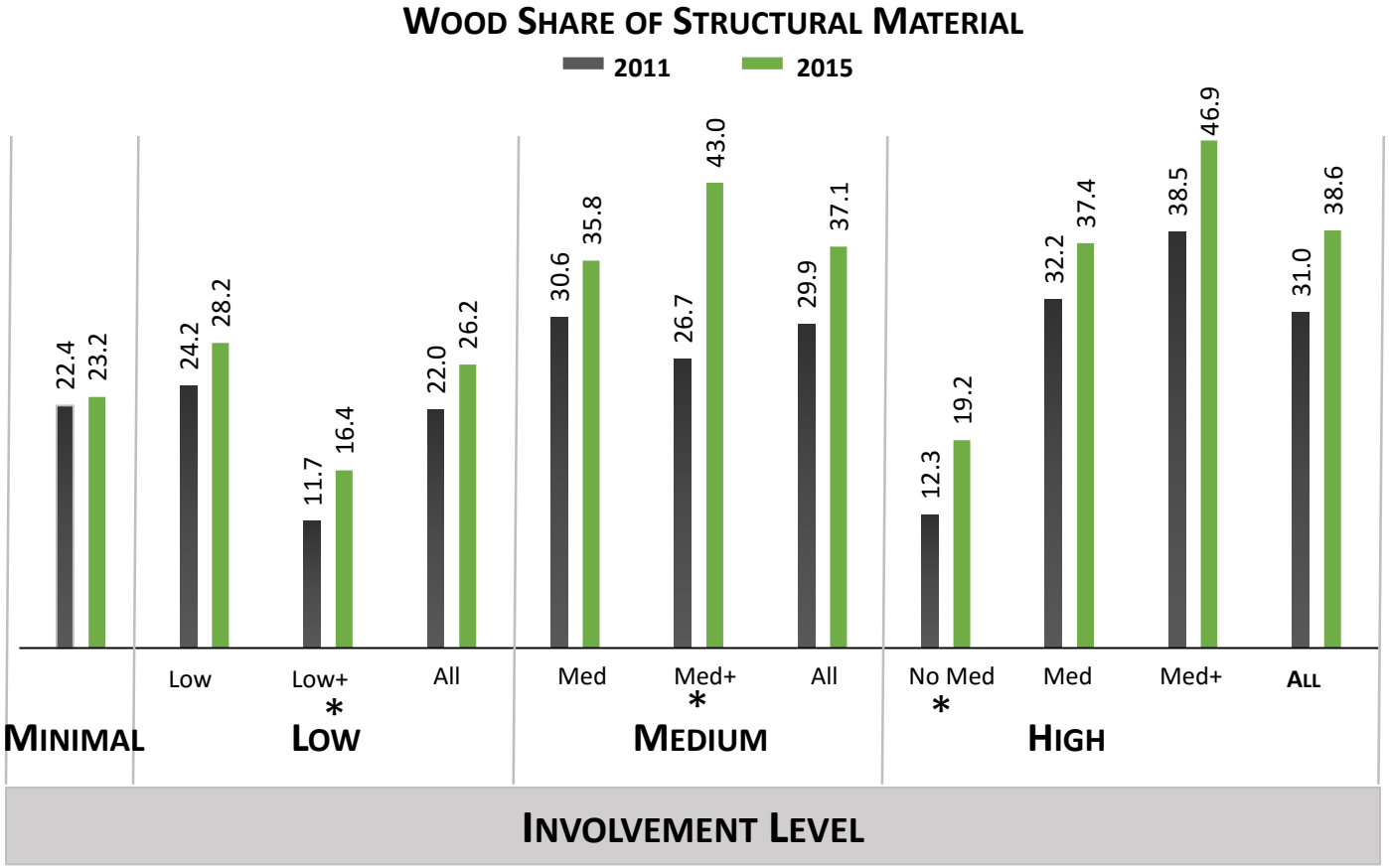
35 pt. Increase

* Statistically significant

Data calculated by Prime Consulting based on responses to Q20-Q28

Wood Share Rose Across All Levels of Involvement

C Wood has enjoyed a share gain across all levels of involvement.

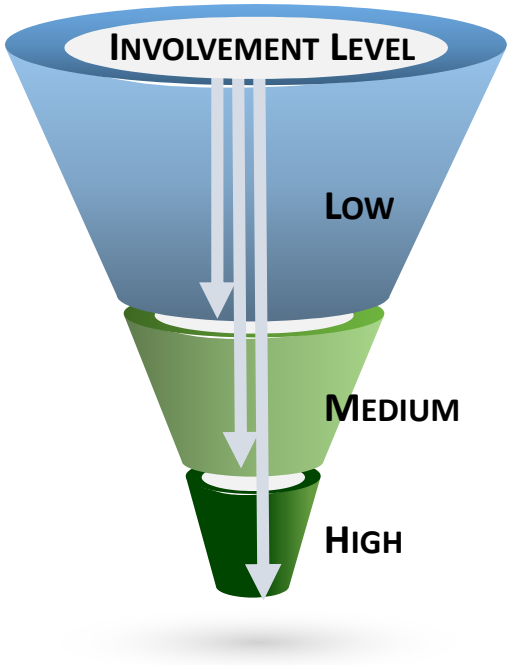


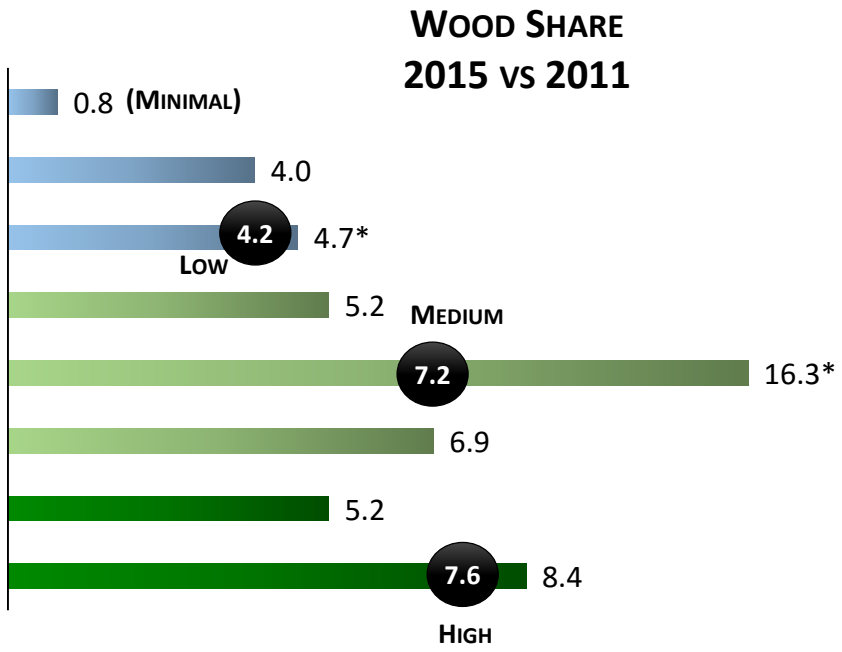
* Small Sample

… As Did The Change In Wood Share

C

The higher the involvement the greater the share gains. Share gains ranged from 4 points for lower levels of involvement to nearly 8 points for those with the highest involvement.



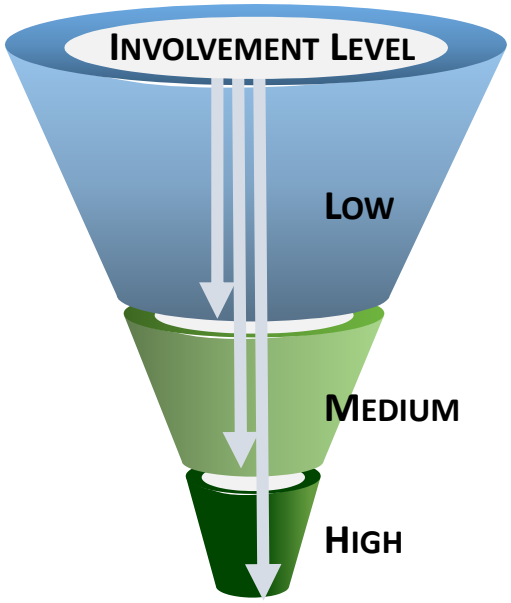


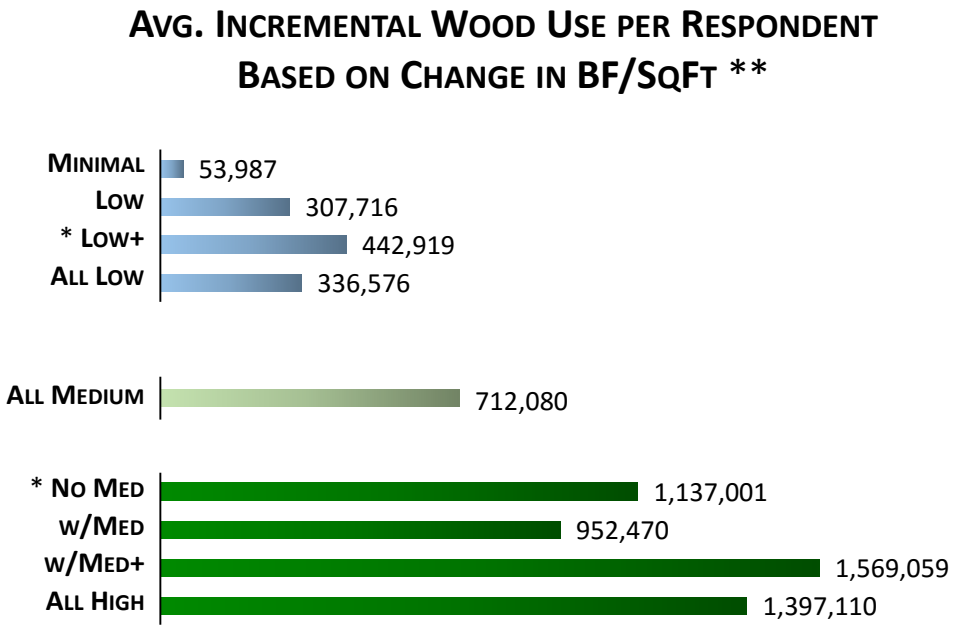
7.6 Share change for entire high group

* Small Sample

The Greater The Involvement, The Greater The Wood Use

Clear connection between involvement level and a respondent's level of wood use (BF/SqFt). Largest increase came from High involvement, an incremental 1.4 MM Board Feet per respondent.



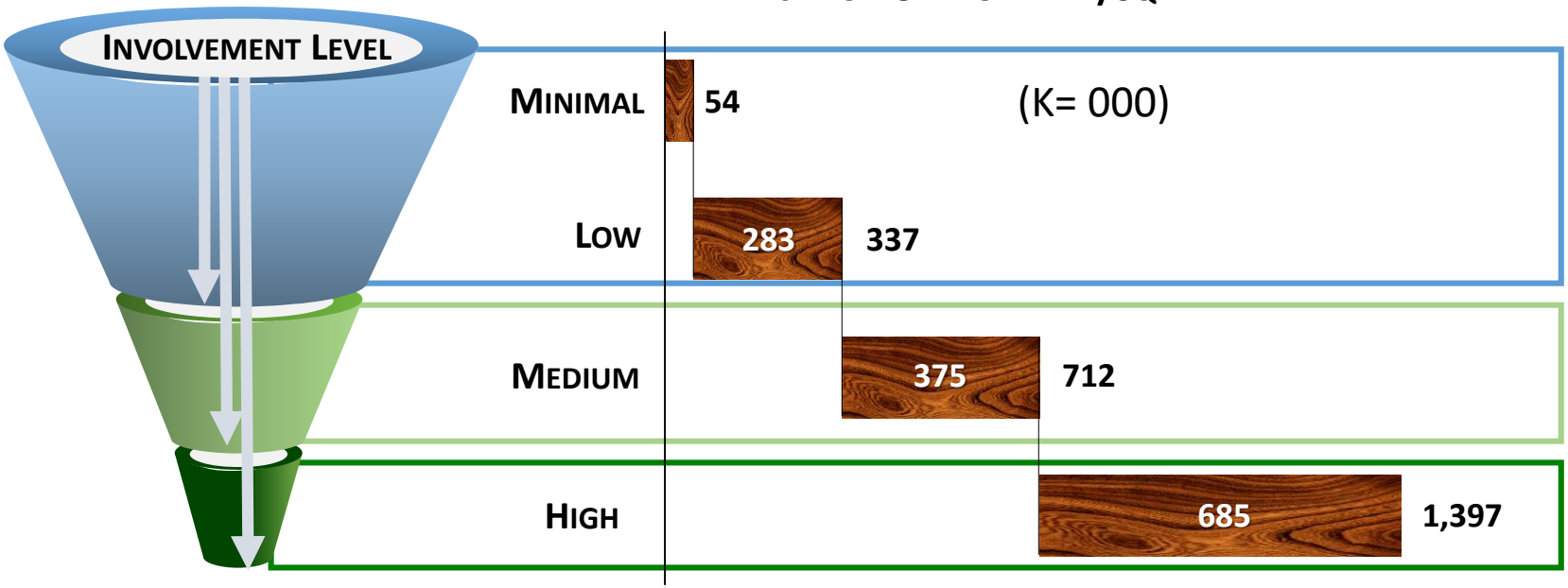


* Small Sample
** Changes in Project size were removed.

The Greater The Involvement, The Greater The Wood Use

By comparing the wood use from respondents at each involvement level, the incremental wood associated with the change in level (aka added marketing elements from one level to the next) was calculated. This suggests the "Medium activities" contributed 375K incremental Board feet compared to specifiers with "Low" involvement, while the "High involvement" activities delivered an incremental 685K beyond the wood use by those in the "medium" group.

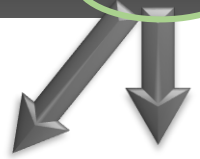
AVG. INCREMENTAL WOOD USE PER SPECIFIER BY INVOLVEMENT LEVEL BASED ON CHANGE IN BF/SQFT **



** from 2011 to 2015 after removing the changes due to project size.

Softwood Lumber ROI Calculation

	SLB 2015 Influenced Lumber Volume Gains		673	BF in Millions
	2015 as % of 2011-15 Reported Growth [1]	÷	40%	
A	4 Year Projection of SLB Impact on Lumber Volume		1,683	BF in Millions
D	Average Wholesale Price [2]	X	$ 354	Per 1,000 Board Feet
	INCREMENTAL SALES		**$596**	**MILLION**



X	19.3%	Average Margin during 2011-2015 [4]
	$ 115	Incremental Profit Dollars (M)

Plus Price Elasticity Impact

SLB Expenditures Inception thru 2015 [3] ÷ $ 38.3

E **INCREMENTAL SALES PER DOLLAR SPENT** **$15.55**

Sources:
[1] Projection for Multi-Family and Non-Residential lumber use: FEA
[2] Average wholesale price 2011-2015 for Random Length lumber: FEA
[3] Expenditures information from Softwood Lumber Board
[4] Average Margin per FEA Lumber Elasticity Model

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SLB SOFTWOOD LUMBER BOARD

Incremental Volume Drives Pricing & Margin

F

- The industry experiences measureable price elasticity for unplanned volume gains within a given year. FEA developed a Price Elasticity Model to project the incremental margin associated with a 1% demand gain under different capacity utilization levels.
- Version 1: Applying the model for 2012-15 using FEA projected incremental volumes yields incremental margin of $143 million from the annual increases in demand.

Base Demand	1% Demand Gain	Capacity	Base Cap Util	Alt Cap Util	Base Margin	Alt Margin	Variable Cost	Base Price	Alt Price	1% increase in Demand Yields as % Gain in Px	
50	50.50	70	71.4%	72.1%	5.6%	5.8%	350	369.5	370.2	**0.2%**	
55	55.55	70	78.6%	79.4%	7.8%	8.1%	350	377.3	378.4	**0.3%**	0.35%
60	60.60	70	85.7%	86.6%	10.9%	11.4%	350	388.3	389.9	**0.4%**	
65	65.65	70	92.9%	93.8%	15.3%	16.0%	350	403.6	406.1	**0.6%**	
70	70.70	70	100%	101%	21.5%	22.5%	350	425.1	428.8	**0.9%**	

	Avg NAM Margin	Non-Res +MF BBF	Mix of Years	Increm Demand vs. YA BBF	% Increase in Demand	Prod Capacity	Prod	Avg Px/ M BF	Margin Impact	Industry $MM
2011		2.207				65,149	48,509			
2012	17.5%	2.528	21%	0.321	0.49%	65,567	51,444	$319	0.17%	28.2
2013	24.5%	2.884	23%	0.356	0.53%	67,117	54,403	$381	0.19%	38.5
2014	21.1%	3.291	27%	0.408	0.60%	68,404	56,143	$381	0.21%	44.6
2015	14.6%	3.622	29%	0.330	0.48%	69,104	57,986	$331	0.17%	32.1
		12.325	100%	1.415				$354		**143.3 Cumulative Margin**
AVG	**19.3%**									

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70	70.70	70	100%	101%	21.5%	22.5%	350	425.1	428.8	**0.9%**	

- Version 2: Applying the model for 2012-15 using the projected incremental volumes from the Prime cause-of-change analysis yields incremental margin of $172 million from the annual increases in demand, roughly $ 30 million more than the FEA projections.

	Avg NAM Margin	FEA Non-Res +MF BBF	Mix of Growth	Increm Demand vs. YA BBF	% Increase in Demand	Prod Capacity	Prod	Avg Px/ M BF	Margin Impact	Industry $MM
2011		2.207				65,149	48,509			
2012	17.5%	2.528	9.2%	0.160	0.24%	65,567	51,444	$319	0.09%	14.0
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2015	14.6%	3.622	40.4%	0.673	0.97%	69,104	57,986	$331	0.34%	65.3
		12.325	100%	1.683				$354		**172.0 Cumulative Margin**
AVG	**19.3%**									

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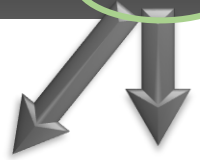

	X	19.3%	Average Margin during 2011-2015 [4]
		$ 115	Incremental Profit Dollars (M)
F		$143	Incremental Industry Margin (M) from FEA Price Elasticity Model
		$258	Total Incremental Profit (M)
SLB Expenditures Inception thru 2015 [3]	÷	$ 38.3	÷ $ 38.3 SLB Board Expenditures Inception thru 2015 [3]
E **INCREMENTAL SALES PER DOLLAR SPENT**		**$15.55**	**$6.74 INCREMENTAL PROFIT PER DOLLAR SPENT**

Sources:
[1] Projection for Multi-Family and Non-Residential lumber use: FEA
[2] Average wholesale price 2011-2015 for Random Length lumber: FEA
[3] Expenditures information from Softwood Lumber Board
[4] Average Margin per FEA Lumber Elasticity Model

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SLB SOFTWOOD LUMBER BOARD

APPENDIX

Library Square, Kamloops, BC
rethinkwood.com

Appendix

- Examples of What Others Are Saying

- Source Tables
  - Market Size for Multi-Family and Non-Residential Buildings, 2011-2015, FEA
  - Average Lumber Prices, 2011-2015, FEA
  - Softwood Lumber Board Assessments and Expenses, 2012-2015, SLB

- Profile of Respondents by Involvement Level
  - Low, Medium and High Involvement specific response detail

Examples of What Others Are Saying

- The Softwood Lumber Board has a strong Public Relations campaign as part of the program. Besides their extensive efforts, others have been noticing the wood use has been on the rise.

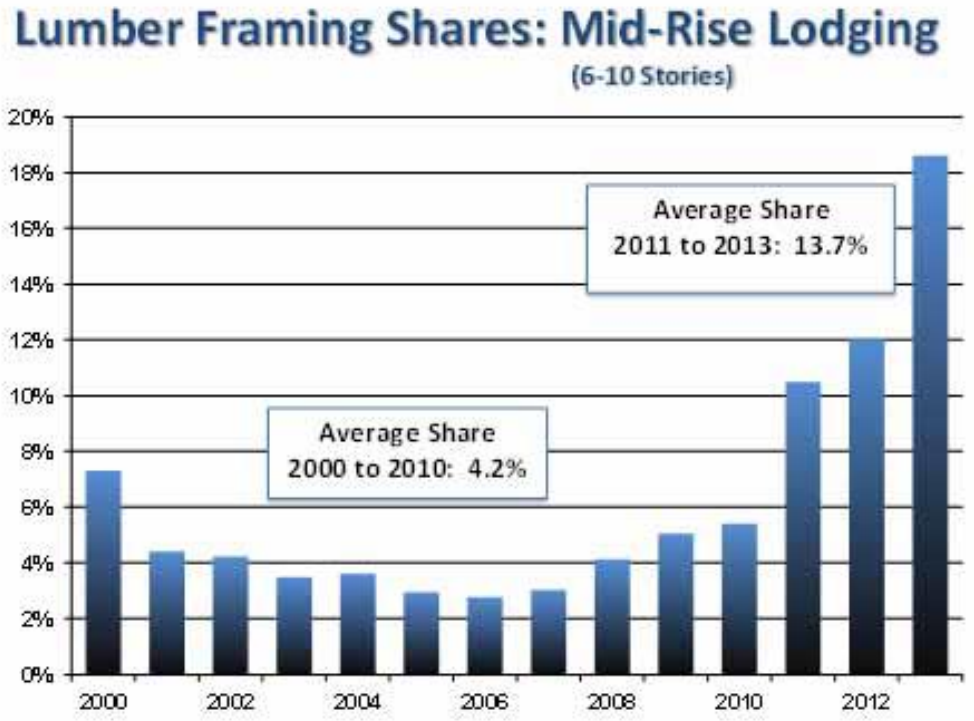
- The following pages provide just a few of the many examples of the reporting about wood growth by competitors, third-parties, practitioners and trade publications.

What Competitors Are Saying

PCA
America's Cement Manufacturers™

Cement's share in "mid-rise remains at substantial risk."

D. Zwicke
Director of Market Intelligence
Sr. Regional Economist



Lumber is concrete's largest competitor in the housing market and displaces more than 40 million metric tons of potential cement consumption.

Because of weak lumber prices, coupled with aggressive promotion, lumber has gained significant market share at the expense of concrete. Concrete's share of the above-grade wall market has declined from 14% in 2005 to about 7% currently.

Bruce McIntosh, June 12, 2015

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What Competitors Are Saying *(cont'd)*

CONCRETE CONSTRUCTION

"The wood industry is taking a very aggressive approach that could take some of concrete's market share… organizations (such as reThink Wood and WoodWorks) are… redefining for architects where wood is an appropriate building material."

Wood or Concrete – B. Palmer

… and Third-Parties

“Use wood wherever possible as a structural substitute for steel and concrete”

US National Climate Assessment

“Wood based wall systems entail 10-20% less embodied energy than concrete and steel”

IPPC Working Group III

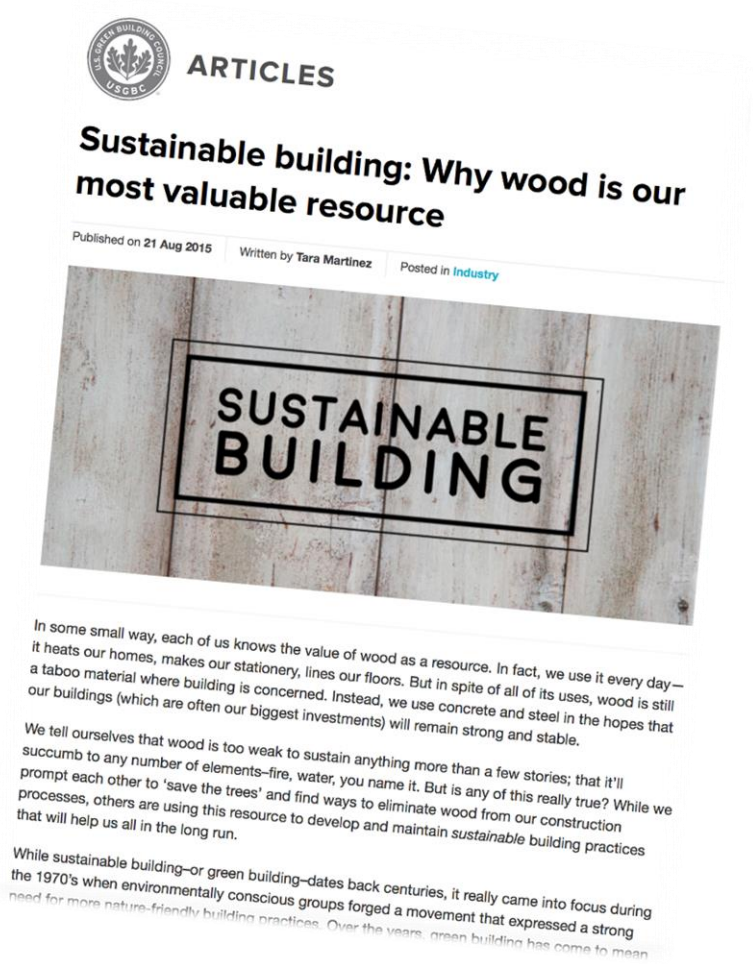
“Increasing Wood Usage: An Environmental Win-Win”

Yale University

… and Third Parties

"With a carbon footprint that's 75% less than that of concrete or steel, is it any wonder that wood has become a top contending material for green builders?"

US Green Building Council



ARTICLES

Sustainable building: Why wood is our most valuable resource

Published on 21 Aug 2015 | Written by Tara Martinez | Posted in Industry

In some small way, each of us knows the value of wood as a resource. In fact, we use it every day—it heats our homes, makes our stationery, lines our floors. But in spite of all of its uses, wood is still a taboo material where building is concerned. Instead, we use concrete and steel in the hopes that our buildings (which are often our biggest investments) will remain strong and stable.

We tell ourselves that wood is too weak to sustain anything more than a few stories; that it'll succumb to any number of elements–fire, water, you name it. But is any of this really true? While we prompt each other to 'save the trees' and find ways to eliminate wood from our construction processes, others are using this resource to develop and maintain *sustainable* building practices that will help us all in the long run.

While sustainable building–or green building–dates back centuries, it really came into focus during the 1970's when environmentally conscious groups forged a movement that expressed a strong need for more nature-friendly building practices. Over the years, green building has come to mean

… and Trade Publications

dezeen magazine

Architects embrace the beginning of the timber age

November 9, 2015

"If the 19th Century was the century of steel, and the 20th century the century of concrete, then the 21st century is about timber" UK architect Alex de Rijke November 9, 2015

Concrete Pumping Dollars Lost to Wood

The Concrete Producer

January 6, 2016 and December 29, 2015

"Over the past 10 years, the soft wood industry, through its calculated and extremely well-funded **WoodWorks campaign**, has steadily increased market share in the low/mid-rise market sector, culminating in a now-alarming shift of demand for low/mid-rise building materials. **Concrete's share of the low/mid-rise building sector has deteriorated significantly, from 30% in 2004 to 22% in 2014, whereas the increase in wood's share has increased from 23% to 40% during that same period.** In 2014 alone, the wood industry boasted it successfully converted 380 projects from concrete to wood, half of which were three stories or taller.

So what do we do about it?

NRMCA's board of directors recently voted in favor of an increase in membership dues to fund an aggressive five-year, $20.5 million plan aimed at recovering market share specifically in the low/mid-rise sector. One of their strategies is a **Design Assistance Program** (DAP), which will work with developers and their design consultants on preliminary designs, cost estimates, and operating cost benefits, with the purpose of influencing them to use concrete framing for their projects.

On a wider focus, Portland Cement Association (PCA) has hired a strategic marketing and development firm to develop a collaborated plan for promoting concrete in all market segments of concrete construction. Phase one of the project, currently underway, consists of widespread data collection and assessments from each sector of the concrete industry.

The American Concrete Pumping Association will continue to support both NRMCA and PCA programs, as well as the Alliance for Concrete Codes and Standards (ACCS). However, influence in the early development stages of a project is crucial. You can help by spreading the word to your contractors and asking for their help in identifying upcoming projects in your area which may be built with wood as opposed to concrete, and then advising NRMCA of these projects. NRMCA will contact the developer and offer support through their DAP plan. Please forward all project information to Kathleen Carr-Smith at **kcarrsmith@nrmca.org** ."

Multi-Family & Non-Residential Market Size

Forest Economic Advisors (FEA) data was used to size the market and understand volume change during the evaluation period.

	2011	2012	2013	2014	2015	CUMULATIVE VS 2011	
Multi-Family	0.705105	0.998102	1.378031	1.666705	1.882806	3.105223	B BF
Non-Residential	1.501675	1.530105	1.505885	1.624759	1.738857	0.392907	B BF
	2.206779	2.528206	2.883916	3.291463	3.621663	**3.498130**	**B BF**
Change vs 2011 in B BF		0.321427	0.677136	1.084684	1.414883		
% vs YA		15%	14%	14%	10%	64%	
% of Cumulative Change		9%	19%	31%	40%		
NOTE: Total Industry	*34.19377*	*37.10622*	*39.82455*	*41.3889*	*43.60205*		
Change vs 2011 in B BF		*2.912441*	*5.63078*	*7.19513*	*9.408272*	*25.14662*	

Source: FEA

Average Lumber Price 2012-2015

Forest Economic Advisors (FEA) data was used to convert the lumber volume into wholesale sales dollars for ROI calculations.

	2011	2012	2013	2014	2015	SUM 2012-2015
Multi-Family & Non-Residential	2.206779	2.528206	2.883916	3.291463	3.621663	12.32525
Mix		20.5%	23.4%	26.7%	29.4%	100%
Average Price*		$319	$381	$381	$331	$354

* Average Price for Random Length Lumber in the U.S.

Source: FEA

Softwood Lumber Assessments & Expenses

The assessments and expenditures associated with the Softwood Lumber Board, as recapped below, were provided by the Softwood Lumber Board management.

The expenses amount was used in the ROI calculations as that represents the funds spent to-date. Prime elected to not use the Assessments, because the current balance (difference between Assessments and Expenses) would not have had an impact on softwood lumber volume. Those funds will be associated with 2016 and beyond impact evaluations.

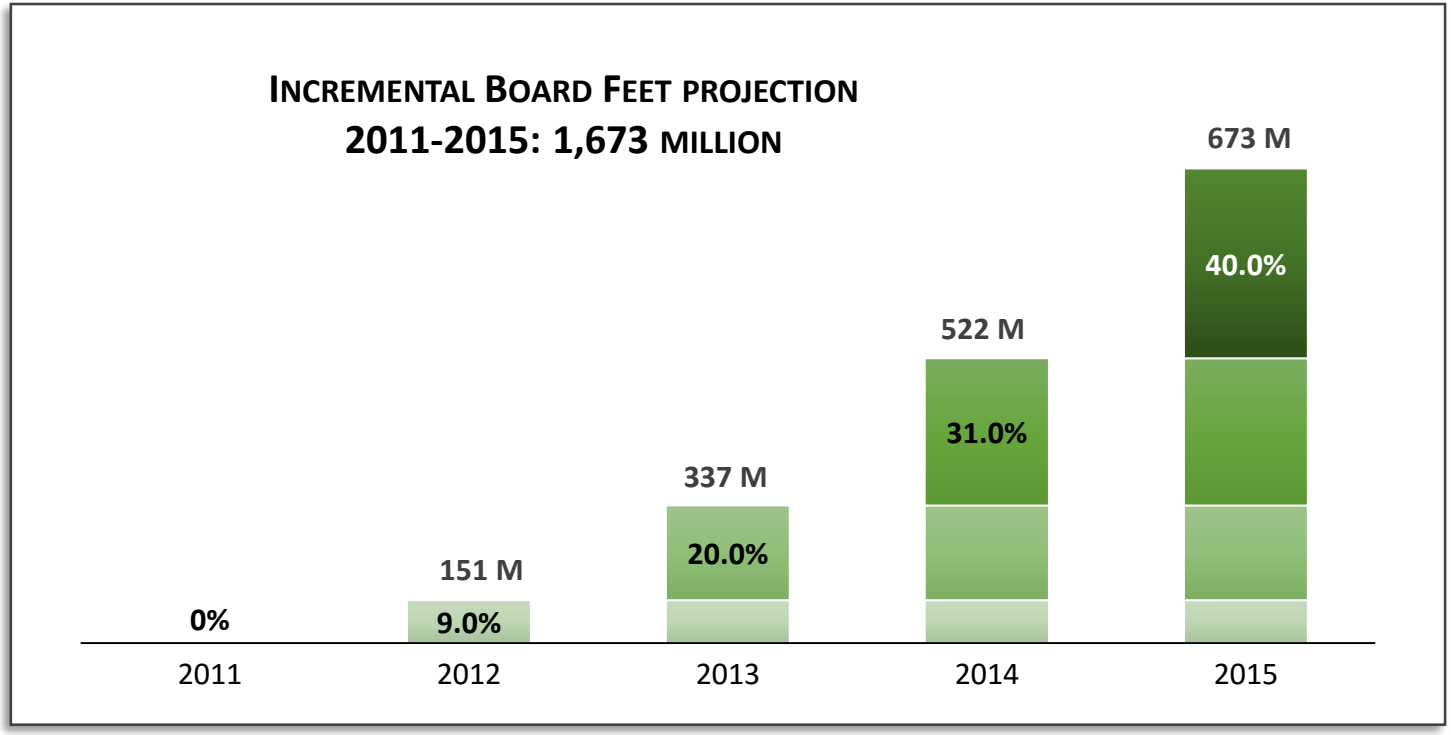
$000	2012	2013	2014	2015	CUMULATIVE
Assessment Revenue	**$11,563**	**$12,039**	**$12,589**	**$14,341**	**$50,532**
Total Expenses	$4,890	$8,681	$12,354	$12,370	$38,295
Admin Expenses	$749	$694	$878	$904	$3,226
User Fees	$232	$259	$204	$175	$869
Program Expenses	$3,227	$7,659	$11,206	$10,940	$33,032
Industry Relations Expenses	$30	$69	$67	$350	$516

2015 Numbers are estimates. 2015 Includes $1,000,000 from USDA (both expense & revenue)

Volume Gains Across 2012-2015

Respondent's reported levels of lumber use for 2011 and 2015 were used to calculate the wood use change as of 2015. Once the 2015 vs. 2011 change was calculated, the four year impact was projected using the year-to-year growth pattern seen in the FEA projected lumber use for these markets.

2015 was 40% of the FEA four year growth. In the absence of specific information, the intervening years (2012-2014) were assumed to follow the FEA year-to-year growth pattern.



Source: FEA & Prime analysis