SLB® SOFTWOOD LUMBER BOARD

AN INDEPENDENT EVALUATION OF THE IMPACT OF THE SOFTWOOD LUMBER BOARD

2024 Calendar Year

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TABLE OF CONTENTS

INTRODUCTION/BACKGROUND

The Softwood Lumber Board is an industry-funded initiative established to promote the benefits and uses of Softwood Lumber products in outdoor, residential and non-residential construction, and to increase demand for appearance and softwood lumber products.

The Softwood Lumber Board (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***.

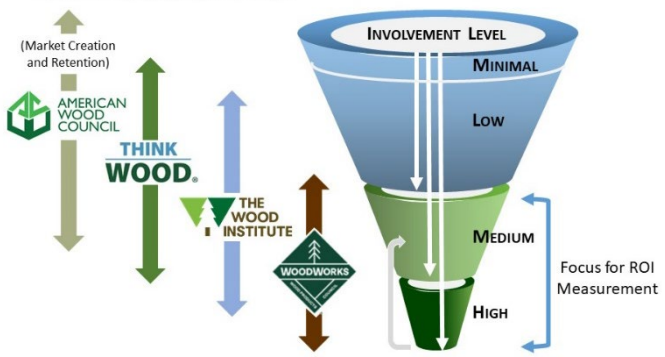
The SLB engages Prime Consulting (Prime) to provide a comprehensive measurement and evaluation program covering the SLB program activities. This includes the independent review required by the USDA, which SLB has requested be conducted annually, beginning with 2020.

I. The initial full review measured 2012-2015 and compared to wood usage in 2011, the year before the SLB program commenced. The second independent review, covering 2016 – Q3, 2020, established the methodology for future independent reviews, which SLB has elected occur each year.
II. The 2020–2023 calendar year independent evaluations were completed by April of the following year.
III. This report contains the 2024 calendar year independent evaluation.

The SLB uses 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 that influencers and purchasers travel through before making a purchase or recommendation in the case of influencers.

SLB provides various levels of funding to partners already in the funnel space. In other cases, the partner entity is fully funded by SLB. This has provided an opportunity to influence the partners' strategic direction through previously established initiatives. For the SLB target market, commercial non-residential and multi-family residences, the "purchase" is not the actual act of purchasing wood; rather the decision to specify the use of lumber for the building system, and numerous detailed aspects of a given building project, a combination of the project architect, structural engineer, and/or the developer.

SLB Partners Cover Multiple Levels of Industry Involvement



The most tangible measurement of impact comes quantifying projects "converted" to increase their use of wood, along with projecting the further application of that learning in subsequent buildings.

Therefore, the objective of the funnel structure is to provide multiple points of potential contact for architects, structural engineers and developers; 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 influenced importance in the "sales cycle".

OBJECTIVE/SCOPE

This report provides an independent evaluation of the effectiveness and impact of the Softwood Lumber Board programs during the 2024 calendar year. The impact is defined as the:

- Amount of lumber (Millions of Board Feet or MM BF) used by WoodWorks' converted projects, plus the anticipated 'tail' effect over the coming three years from the educational impact on that architect, structural engineer developer or contractor (see Appendix II for further information on the "tail effect").
- Benefit/cost ratio of the converted project's dollar value (plus tail) for each dollar of spending by the SLB program.

This independent evaluation was carried out by Prime Consulting, under the direction of the firm's President and owner, Mr. Douglas Adams. Mr. Adams has over 40 years of analysis and measurement experience, including 30 years as the principal of Prime offering measurement and analytics consulting services. Doug has provided measurement services for a variety of industry marketing initiatives, including several USDA check-off programs. Mr. Adams has published numerous articles, and contributed to two books on marketing program measurement.

DATA LIMITATIONS

The analysis is based upon project data from WoodWorks (WW) (see Appendix III), Fastmarkets/ RISI, an industry price reporting service, and the Softwood Lumber Board. While these are deemed to be the best available, there are several gaps that limit the extent of use of this analysis.

- The first limitation is the lack of data on SLB's impact from the building code work of American Wood Council (AWC), and the PR/educational activities of ThinkWood that do not result in initial project involvement by WoodWorks. Both of these deliver additional value beyond that quantified in WW's reporting, and therefore, this evaluation. ThinkWood impact has begun to be incorporated through coordination with WoodWorks and includes converted projects that both ThinkWood and WoodWorks played a role in bringing about the conversion by ThinkWood referring the "prospect" for WoodWorks to assist. AWC has elected to pursue a few case studies each year to demonstrate their impact. These case studies are not included in this quantification.
- The second limit is the lack of complete industry-level data from a syndicated provider with sufficient detail to conduct a causal analysis, and isolate the impact of SLB program on a broader macro-economic level. The industry data is at best, annual, with projections by building type, and developed top-down rather than built-up with causal detail allowing attribution modeling.

Despite these two limits, the reporting of impact of the SLB programs, while likely understated by the first limitation, provides a consistent trending of the impact from WoodWorks converted projects and their subsequent impact.

METHODOLOGY TO ASSESS BENEFIT/COSTS

WoodWorks maintains detailed records for each program activity, including constituent involvement in programs, and more specifically, the direct work by WoodWorks staff to "convert" proposed building projects, and increase the amount of softwood lumber used in the building.

In 2015, Prime helped WoodWorks refine the method of calculating the incremental lumber and projection of the additional lumber expected in future projects from the education and expertise provided on the original project.

During the 2024 calendar year, WoodWorks reported 391 "converted" projects, down from 470 in 2023. Each project has an extensive file of information covering the project (see Appendix III for a description of the project file information), including the building structural elements, size (sq. ft.) and the extent of WoodWorks involvement to add wood to the building.

For this evaluation, Prime conducted an independent audit of 160 WoodWorks converted projects, providing a 95% confidence interval for the results with a margin of error of +/- 5.85% of the reported levels of incremental lumber (MM BF) in the SLB reporting. Using a 90% confidence interval, the margin of error is reduced to +/- 4.94%, as shown in the table below.

Sample Size & Margin of Error

Universe = 391

MARGIN OF ERROR	CONFIDENCE LEVEL 90%	95%
+/- 4.00%	204	238
4.94	**160**	
5.00	**161**	**195**
5.85		160
6.00	128	159

Source: Maple Tech International LLC. https://www.calculator.net/sample-size-calculator.html

The verification audit involved 160 (41%) projects from the universe of 391 reported projects during 2024. The sample was used to achieve at least a +/- 4.94% margin of error (with 90% confidence) for the 2024 calendar year. No stratifying criteria was used to select the sample.

The audits verified the:

a. **Project's actual construction** (in some cases, construction is still underway or mobilization has just begun),
b. **Calculation of the incremental lumber (MM BF)** from WoodWorks (and by association, SLB) involvement, and
c. **Conversion from MM BF to dollars** using the same approach as the SLB annual ROI reporting.

The data used to develop the Softwood Lumber Board impact in MM BF came from multiple sources:

A. Lumber (reported as millions of board feet or MM BF)
   - The amount of reported lumber comes from WoodWorks converted project reporting using the "Direct and Indirect" methodology implemented in 2016 (see Appendix II information on the 'tail' or 'indirect impact').
   - The project details and structural information needed to calculate wood use were verified in the WoodWorks project files (see Appendix III). The calculations covering lumber use from the converted projects were audited to evaluate compliance with the agreed-to approach for reporting.

B. Construction Verification
   - The sample was drawn from projects reported by WoodWorks during January-October to expedite the verification work. Prime received confirmation from Ms. Jennifer Cover, President and CEO, of WoodWorks that the methodology for reporting in November and December remained the same. Therefore, we are confident the same audit results would result as if November and December were part of the sample.
   - Prime verified the reporting of projects through the review of each project file for the 160 randomly selected projects. The sources used to verify included: building websites (public buildings such as schools, government offices, hotels, churches, office buildings, multi-family residences, etc.), Google maps covering different timeframes, issuance of building permits, phone calls to confirm mobilization was underway and other search techniques. In a few cases, Prime also reviewed the reporting by third-party services used by WoodWorks (Dodge and Construct Connect), when we could not confirm actual ground breaking.

The dollar value of the incremental board feet and SLB BCR/ROI calculations added:

C. Pricing ($ per 1,000 BF or $/M BF)
   - Lumber pricing per thousand board feet ($/M BF) reported by Fastmarkets/RISI.
   - The monthly average Random Lengths framing lumber composite price in North America is reported at the end of each month in the online newsletter. The price for each month is averaged to develop an annual average price.

D. SLB Spending
   - SLB financial reporting from internal financial statements. Spending was rounded to the nearest hundred thousand.

RESULTS

In completing the evaluation:

A. Prime was able to verify that all 160 sampled projects.
   - 127 of the 160 were confirmed through inspection of Google Earth maps and street-level pictures. Prime viewed current images, and then rewound the clock in that application to see earlier time frames prior the building construction.
   - 33 of the 160 were confirmed through other information in the project file, such as building owner websites, news coverage, etc.
   - None of the 160 project verifications required the third level of verification, direct phone contact with the building professional that worked with WoodWorks.

B. Projected lumber reported by WoodWorks and SLB, accurately reflects project inputs from the individual project files.
   - Prime was able to trace such metrics as building square feet, wood use in structural elements, the degree of influence the WoodWorks engineer had on the project, etc. to the underlying project files (see Appendix II for further information on "influence").

C. The calculation methodology implemented in 2016 was used.
   - Prime was able to verify that the methodology has been accurately applied to both the sample (160 projects) and all 391 projects. The sample projects contained 615.0 MM BF of lumber, or 39% of the reported lumber usage, which totaled 1,589 MM BF during 2024. The portion of projects and reported lumber usage were 41% and 39% respectively in 2024. Each project's lumber usage was calculated by WoodWorks using project specific inputs including building square feet, the amount of structural elements using wood and estimated softwood Board Ft./Sq. Ft. (BF/SqFt) based upon the type of construction (Light Frame and Mass Timber).

D. The Fastmarkets/RISI Random-Length dimensions price reporting information was utilized to express the amount of lumber used in value terms – dollars. The pricing data is expressed as the dollars per thousand board feet ($/M BF). The 2024 average price was $399/M BF, a decline of 2.9% versus the $411/M BF reported in 2023.

E. SLB spending during 2024 was $19.4 MM, as shown in the 2024 financial reports provided by management.

   These expenditures were compared to the board feet of lumber, expressed in dollars.

CONCLUSION – EXECUTIVE SUMMARY

The analysis confirmed all 160 sampled projects were either constructed, under construction or in early mobilization to be constructed and that the calculation methodology was followed for all 391 projects. This audit confirmed the amount of lumber, expressed as millions of board feet (MM BF), attributable to the SLB program activities.

Prime concludes the reported 1,589 MM BF during 2024, to be the amount of lumber resulting from the SLB program activities within +/- 4.94% margin of error.

Our findings are +/- 4.94% with a 90% confidence interval. This means that we are 90% confident that a full audit of all projects would yield results within +/- 4.94% of the 1,589 MM reported number or +/- 78 MM BF. 1,589 MM BF represents 3.2%* of the industry overall volume.

Looking across the past five years (2020-2024), the Softwood Lumber Board campaign increased consumption of softwood lumber by an average of 1,791 MM BF per year, compared to what it would have been in the absence of the program. In other words, had the SLB not existed, softwood lumber use would have been 3.5%* lower than it was each year 2020-2024.

Expressing the amount of lumber in dollars indicates $634 MM resulted from the $19.4 MM in SLB spending.

Benefit Cost Ratio

Lumber Usage		1,589 MM BF
Lumber Price	x	$ 399 per M BF
Dollar Value	=	$ 634 MM
SLB Spending	÷	$ 19.4 MM
Program Benefit per $1 Spent		$ 32.68 per $1

The Softwood Lumber Board Benefit Cost Ratio (BCR) was $32.68 per $1 spent during the 2024 calendar year.

Applying the margin of error at a 90% confidence interval, the BCR ranges from $31.07 on the low side, to $34.30 on the high side. Given the consistency of the sample and the results listed above, in my professional judgement, the mid-point, $32.68, represents the BCR from the SLB program during the 2024 calendar year.

*U.S. market size data provided by Forest Economic Advisors

Submitted by Douglas C. Adams, President, Prime Consulting

APPENDIX I
The following resources were used in designing the evaluation.

- Guidelines for AMS Oversight of Commodity Research and Promotion Programs, January 2020, USDA (from USDA website).
- Quarterly reporting by WoodWorks provided directly by WoodWorks.
- Individual project files for sample projects were provided by WoodWorks.
- Audited financial statements and internal financial reports provided by Softwood Lumber Board management.
- Fastmarkets/RISI price reporting service via subscription to www.risiinfo.com.
- Sample Size calculation utilized the Maple Tech International LLC Sample Size Calculator: https://www.calculator.net/sample-size-calculator.html Maple Tech International is operated by a group of IT professionals dedicated to providing mostly free online tools. The company is based in The Woodlands, TX.

APPENDIX II – WoodWorks Terms: "Tail" or "Indirect impact" & "Influence Factor"

These two terms refer to portions of the reporting that has been applied for several years. **"Tail effect"** is also known as the "indirect impact", and refers to the subsequent use of the new learnings provided by WoodWorks (by the individual or their firm) in the three years following the project that was specifically converted. Very often, when WoodWorks helps a client learn how to incorporate more wood in a given building system or application, the client goes on to use that learning in subsequent projects without needing any assistance from WoodWorks. To quantify what we called the tail or indirect impact, a survey of projects and clients was done in 2015 to develop average values for subsequent use of the learnings. We elected to limit the tail to three years (even though some applications are used much longer) due to the surveying limitations, and recognition that further new developments or market changes will cause the indirect impact to fade over time.

"Influence factor" refers to the extent to which WoodWorks influenced the amount of wood in the final plans. The values range from 0% to 100%, and are derived by evaluating the plans against a set of criteria developed by WW and applied to each project.

Both of these were part of a U.S./Canada joint project over several years that resulted in the current method of calculating the wood value of projects. This was implemented in 2016 in both the U.S. and Canada after a long and collaborative development process that involved representatives from SLB, Forestry Innovation Investment (an investor in WoodWorks U.S.), FP Innovations, WoodWorks U.S., WoodWorks! Canada, and Prime Consulting.

APPENDIX III - WoodWorks Sources of Information

Each project file has information about a proposed building as provided by the WoodWorks 'client' (architect, structural engineer, etc.). This can, but does not always include, draft blueprints, building specification sheets for the primary building systems (floors, walls, roofs, etc.). Meeting/call notes and working papers are also included. These come from addressing the challenge the client is facing, or ideas the engineer offers to increase the wood content in the building systems.

Depending upon the project, the WoodWorks engineer might obtain further details through the Dodge Data & Analytics service, if the project has already been put in Dodge for project bidding. The WoodWorks engineer often receives the building information under a non-disclosure agreement, and in some cases, must use a disguised name for the project prior to construction. WoodWorks uses an outside firm to confirm that construction has started before reporting the project to SLB in their quarterly reporting. All project information is secured in the digital project files using www.Salesforce.com.

WoodWorks has a self-verification process when reporting a project has begun construction. WoodWorks uses the Dodge database status indicator field (in the database), along with the Construct Connect service. The two services are not identical, and occasionally report contradictory information. When that occurs, we conduct further research to have tie-breaking information.

APPENDIX IV – *Sample Size Calculation**

Sample size is a statistical concept that involves determining the number of observations or replicates (the repetition of an experimental condition used to estimate the variability of a phenomenon) that should be included in a statistical sample. It is an important aspect of any empirical study requiring that inferences be made about a population based on a sample. Essentially, sample sizes are used to represent parts of a population chosen for any given survey or experiment. To carry out this calculation, set the margin of error, **ε**, or the maximum distance desired for the sample estimate to deviate from the true value. To do this, use the confidence interval equation, but set the term to the right of the ± sign equal to the margin of error, and solve for the resulting equation for sample size, **n**. The equation for calculating sample size is shown below.

Unlimited population: $$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Finite population: $$n' = \frac{n}{1+\frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

where
z is the z score or confidence level
ε is the margin of error
N is the population size
p̂ is the population proportion

The confidence level calculation determines the ± outer distance/sign equal to the margin of error to allow solving for the sample size. z-score results were:

90%	1.65
95%	1.96

The universe (N) = 391 projects converted by WoodWorks during 2024 and p (population proportion or sample) was 160 projects/391 = 0.41.

** Source: Maple Tech International LLC. https://www.calculator.net/sample-size-calculator.html*