SLB® SOFTWOOD LUMBER BOARD

AN INDEPENDENT EVALUATION OF THE IMPACT OF THE SOFTWOOD LUMBER BOARD

2022 Calendar Year

By Douglas C. Adams, MBA
Prime Consulting

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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***.

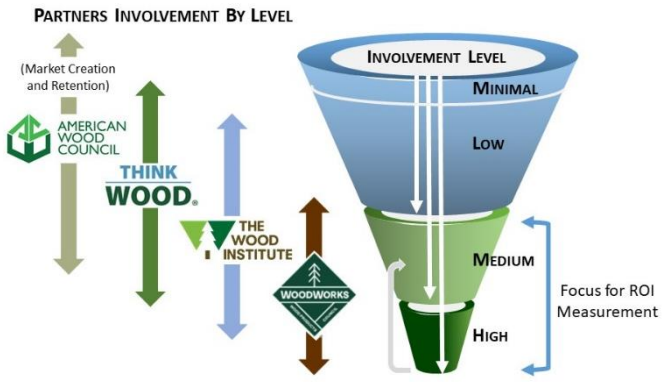
The SLB engages Prime Consulting (Prime) to provide a comprehensive measurement and evaluation program covering the SLB program activities. This includes the independent review required by the USDA, which SLB has requested be conducted annually, beginning with 2020.

I. The initial full review measured 2012-2015 and compared to wood usage in 2011, the year before the SLB program commenced.
II. The second independent review covered 2016 – Q3, 2020. That review established the methodology for future independent reviews, which SLB wishes to have completed each year. The 2020 and 2021 calendar year independent evaluations were completed in March, following each year end.
III. The 2022 calendar year independent evaluation is contained in this report.

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.

In some cases, SLB provides partial funding to partners already in the funnel space. In other cases, the partner entity is fully funded by SLB. This approach has provided an opportunity for leadership in the partners' strategic direction and extension of the SLB impact 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 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, along with 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 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 2022 calendar year. The impact is defined as the:

- Amount of lumber used from (Millions of Board Feet or MM BF) WoodWorks converted projects, plus the anticipated 'tail' effect over the coming three years from the educational efforts with 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 40+ years of analysis and measurement experience, including 26 years as the principal at 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

This 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 have additional value beyond that quantified in WW's reporting, and therefore, this analysis. ThinkWood impact has begun to be incorporated through coordination with WoodWorks. This includes converted projects that ThinkWood has played a role in bringing about the conversion and/or referring the "prospect" for WoodWorks to assist. Prime is in the early stages of this type of development with AWC. We anticipate this AWC gap to be addressed by parallel/ separate methodology, and enhancing the independent evaluation in future years. The result will be adding to the impact attributed to SLB programs.
- 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, is an accurate view 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's construction.

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 2022 calendar year, WoodWorks reported 465 "converted" projects, up from 448 in 2021. 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 178 WoodWorks converted projects, providing a 95% confidence interval for the results with a margin of error of +/-5.78% 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 +/- 4.86%, as shown in the table below.

Sample Size & Margin of Error
Universe = 465

MARGIN OF ERROR	CONFIDENCE LEVEL 90%	95%
+/- 4.00%	223	263
4.86	**178**	
5.00	**173**	**212**
5.78		178
6.00	135	171

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

The verification audit involved 178 (38%) projects from the universe of 465 reported projects during 2022. The sample was used to achieve at least a +/-5.0% margin of error (with 90% confidence) for the 2022 calendar year. The 178 was a slight over-sampling as 173 was needed for the +/-5.0% margin of error. No stratifying criteria was used to select the sample.

The audit plan verified the:

a. **Project's actual construction** (in some cases, construction is still underway),
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 new subsequent-tail 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-November to expedite the verification work. Prime received confirmation from Ms. Jennifer Cover, President and CEO, of WoodWorks that the methodology for reporting in December remained the same. Therefore, we are confident the same audit results would result as if December was part of the sample.
   - Prime verified the reporting of projects through the review of each project file for the 178 randomly selected projects. Actual construction of 178 projects was independently confirmed through building websites (public buildings such as schools, government offices, hotels, churches, office buildings, multi-family residences, etc.), Google maps covering different timeframes, phone calls and other search techniques. Prime also reviewed the reporting by third-party services used by WoodWorks (Dodge and Construct Connect).

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 178 sampled projects were constructed.
   - 155 of the 178 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.
   - 23 of the 178 were confirmed through other information in the project file, such as building owner websites, news coverage, etc.

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 (178 projects) and all 465 projects. The sample projects contained 722.5 MM BF of lumber, or 36% of the reported lumber usage, which totaled 1,998.9 MM BF during 2022.

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 2022 average price was $759/M BF, a decline of 11% over the 2021 level.

E. SLB spending during 2022 was $17.7 MM, according to the 2022 audited 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 178 sampled projects were constructed, and that the calculation methodology was followed for all 465 projects. This audit confirmed the amount of lumber, expressed as millions of lumber in board feet (MM BF) attributable to the SLB program activities.

Prime concludes the reported 1,999 MM BF during 2022, to be the amount of lumber resulting from the SLB program activities within +/-5.0% margin of error.

Our findings are +/- 5.0% with a 90% confidence interval. This means that we are 90% confident that a full audit of all projects would yield results within +/- 5.0% of the 1,999 MM reported number or +/-100 MM BF.

Expressing the amount of lumber in dollars indicates $1,517.1 MM resulted from the $17.7 MM in SLB spending.

Benefit Cost Ratio

Lumber Usage		1,998.9 MM BF
Lumber Price	x	$ 759 per M BF
Dollar Value	=	$ 1,517.1 MM
SLB Spending	÷	$ 17.7 MM
Program Benefit per $1 Spent		$ 85.71 per $1

The Softwood Lumber Board Benefit Cost Ratio (BCR) was $85.71 per $1 spent during the 2022 calendar year.

Applying the margin of error at a 90% confidence interval, the BCR ranges from $81.42 on the low side, to $90.00 on the high side. Given the consistency of the sample and the results listed above, I believe the mid-point, $85.71, represents the BCR from the SLB program during the 2022 calendar year.

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 US 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.