

Economic Feasibility of Mass Timber Manufacturing in Minnesota

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The BBER was asked to supply an economic impact analysis only. This analysis does not consider the social or environmental impacts of the project and should not be viewed as a cost benefit analysis or environmental impact assessment.

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Table of Contents

- Research Team..... 2
- Table of Contents 3
- Table of Figures 3
- Table of Tables 4
- Executive Summary..... 5
- Lumber Availability..... 6
 - Sawmills 6
 - Familiarity with CLT 6
 - CLT Lumber Specifications 7
 - Current Lumber Production..... 8
 - Potential Production..... 10
 - Canadian Mills..... 12
 - Distributors 13
 - Current Lumber Distribution 13
 - Potential Distribution..... 15
 - Recommended Location 15
- Conclusions..... 16

Table of Figures

- Figure 1. Are you familiar with CLT (cross-laminated timber) or other mass timber products? 6
- Figure 2. Standard for Performance-Rated Cross-Laminated Timber (ANSI/APA PRG 320-2018)..... 7
- Figure 3. Characteristics of CLT-Suitable Lumber..... 7
- Figure 4. Lumber Production among Great Lakes Sawmills..... 8
- Figure 5. Number of Mills and Percentage of Lumber Produced by Board Length 9
- Figure 6. What percentage of lumber sales sold by your facility fall into the following categories? ... 10
- Figure 7. Assuming a profitable market is available and all lumber was sold, what is the maximum production capabilities at your sawmill? (2 x 6 or wider) 10
- Figure 8. Potential Increase in Production Capabilities (2 x 6 or wider) 11
- Figure 9. Lumber Distribution among Great Lakes Wholesalers..... 14
- Figure 10. What are the main reasons this city would be a good location to source this material? 16

Table of Tables

Table 1. For the most recent year, please estimate your facility's total lumber production.....	9
Table 2. Assuming a profitable market is available and all lumber was sold, what is the maximum production capabilities (MMBF) at your sawmill? (2 x 6 or wider)	12
Table 3. For the most recent year, please estimate your facility's distribution quantity of visually graded lumber	14
Table 4. For the most recent year, please estimate your facility's distribution quantity of machine stress rated lumber (MMBF) for the following species and grades	15

Executive Summary

The Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth's Labovitz School of Business and Economics was contacted by APEX to study the market and economic feasibility of introducing Mass Timber manufacturing (e.g. cross-laminated timber (CLT) production) for the state of Minnesota and/or Minnesota's Arrowhead Region. The overall study will address four primary objectives: an analysis of building construction market demand growth and projections, an estimate of the current and potential capacity of local lumber producers and wholesalers, an economic impact analysis of the new industry in the region, and an examination of barriers to market.

This draft report addresses the second objective: an estimate of the current and potential capacity of local lumber producers and wholesalers. The remaining three objectives will be addressed in the final report, which is anticipated to be finalized in March 2019.

To accomplish this objective, the BBER distributed surveys to Great Lakes states' sawmills and lumber distributors with the intent of determining the current and potential lumber being produced and distributed in the Great Lakes region that would be suitable for CLT manufacturing. Eight regional sawmills and eleven distribution locations provided data for the study.

Regional sawmills reported currently producing 300 million board feet (MMBF) of lumber in the grades and species suitable for producing CLT. Nearly three-quarters of that total volume (223.5 MMBF) was red pine. The remaining quarter was split about equally between spruce and jack pine (41.5 and 40.8 MMBF, respectively). Only a very small volume of balsam fir was produced in the region (0.7 MMBF).

More than half of the surveyed mills' current production was reported as 2 x 4 lumber, which is not currently preferred for CLT. When asked, however, about potential production capabilities in 2 x 6 or 2 x 8 dimensions, mills reported the ability to increase production to roughly 250 MMBF if there was a preference for wider lumber. This U.S. lumber would be considered from the spruce-pine-fir south species classification (SPF_S).

Wholesalers reported that they distribute roughly 100 MMBF of 2 x 6 and 2 x 8 lumber suitable for CLT but predicted they could supply more than double that volume if there was demand for the product. Roughly 60% of the total volume (58.4 MMBF) distributed in the last year was spruce-pine-fir (SPF), and 37% was southern yellow pine. Only a very small volume of Douglas fir-larch was distributed in the region (4.8 MMBF).

Additionally, the BBER estimates that more than 1,200 MMBF of lumber are being exported from Canada to Minnesota and Wisconsin. While not all of the lumber exported from Canada is suitable for CLT production, it highlights the significant opportunity for additional material just across the border. For example, if even a quarter of that amount was suitable for CLT, it would mean an additional 300 MMBF of lumber, more than double what is being produced by regional mills.

Distributors also selected Minneapolis as the ideal Midwest location to source lumber suitable for CLT production based on its proximity to market, price, availability of product, and quality of service. In addition, Minnesota has a well-developed transportation infrastructure that includes nine major airports, four major water ports, 4,450 miles of freight railroad, and 260 miles of waterway.

The results of this study demonstrate that lumber mills and wholesalers in the Great Lakes region produce and distribute more than enough lumber in the grades and dimensions suitable for CLT manufacturing and have the ability to increase production and distribution volumes if there was a demand for the product.

Lumber Availability

For this portion of the study, the BBER developed and distributed a survey to gather data from current lumber producers and distributors located within the supply area. This information was used to determine the potential lumber supply available in the Great Lakes states for a cross-laminated timber (CLT) manufacturer and to identify potential interest among sawmills and distributors in being part of a future supply chain. Specifically, the survey evaluated local producers' capacity to provide the necessary species, dimensions, and grades of CLT-suitable lumber to produce CLT and wholesalers' current distribution levels of suitable lumber. Follow-up interviews conducted by BBER staff and undergraduate student researchers, as needed, supplemented the survey data.

Sawmills

A survey was developed for regional sawmills that included questions regarding each mill's familiarity with CLT; the amount of lumber the mill produced in various species, dimensions, and grades; and the mill's ability to increase production to meet an increased demand for specific species, grades, and dimensions.

All sawmills in a roughly 200-mile radius from Duluth, Minnesota, were surveyed. These included three Biewer Lumber mills (Prentice, Wisconsin; McBain and Lake City, Michigan); Cass Forest Products in Cass Lake, Minnesota; Hedstrom Lumber in Grand Marais, Minnesota; two PotlatchDeltic mills (Gwinn, Michigan, and Bemidji, Minnesota); Pukall Lumber in Arbor Vitae, Wisconsin; and two Rajala Companies mills (Bigfork and Deer River, Minnesota). Eight of these ten mills responded to the survey. In addition, two Canadian mills (Eacom Timber Corporation in Ear Falls, Ontario, and Resolute Forest Products in Thunder Bay, Ontario) were contacted to participate but did not respond to the survey. Throughout this report, the eight mills that provided data will be collectively referred to as "regional" mills or producers, and the lumber they produced will be considered to be produced "in the Great Lakes region."

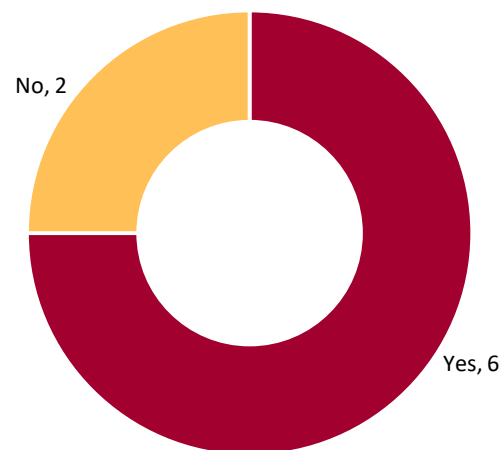
It should be noted that two of the surveyed sawmills are part of a larger corporate entity with additional mills located throughout the country. In addition to its regional mills, PotlatchDeltic has three sawmills in Arkansas and one in Idaho. Similarly, Biewer Lumber has a third sawmill in Mississippi.

Familiarity with CLT

All of the mills surveyed were asked about their familiarity with CLT. Six respondents indicated a familiarity with the product, as shown in Figure 1.

The mills were also asked whether they produced lumber that was visually or machine stress graded. Typically, visual grading is performed by a qualified grader who evaluates each piece of lumber on its strength-reducing (knots, slope of grain, and holes) and serviceability (wane, warp) characteristics. The highest visual grade that can be assigned to dimension lumber is "select structural," followed by No. 1, No. 2, No. 3, and then finally five lower grades suitable for studs, framing, and other construction purposes.

Figure 1. Are you familiar with CLT (cross-laminated timber) or other mass timber products?



SOURCE: BBER SAWMILL SURVEY

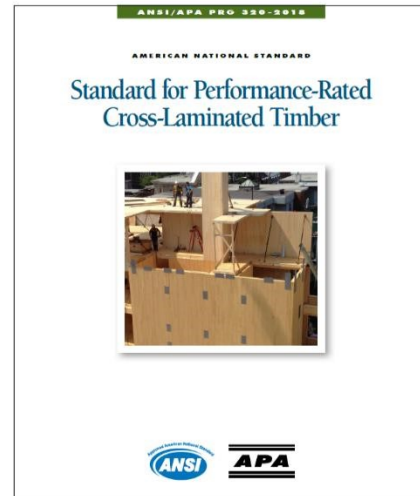
Machine stress rated (MSR) lumber, on the other hand, is evaluated by stress rating equipment, and grades are based on bending strength, stiffness class, and visual requirements. MSR grades and design values are in pounds per square inch with the highest values (2850 f-2.3E) indicating a stronger board and the lowest (900 f-1.0E) indicating weaker lumber. In response to the question regarding visually or machine stress graded lumber, all of the mills that responded indicated that they process visually graded lumber only.

CLT Lumber Specifications

Lumber used to manufacture CLT must meet species, dimensions, grades, and manufacturing specifications described in the *Standard for Performance-Rated Cross-Laminated Timber* (ANSI/APA PRG 320-2018) shown in Figure 2 and the *Standard Specification for Structural Glued Laminated Timber of Softwood Species* (ANSI 117-2015). The predominant species or species combinations used are Douglas fir (DF), spruce-pine-fir (SPFs and SPF_{south}), and southern yellow pine (SYP). The minimum specific gravity is 0.35.

SPF is produced in the U.S. and Canada. The SPF designation indicates that the lumber was produced from logs harvested in the U.S. (south of the Canadian border). Omission of “s” in the designation indicates that the log source was exclusively Canadian in origin (NELMA 2018). SPFs includes western U.S. species, such as lodgepole pine, Engelmann spruce, and Sitka spruce and eastern U.S. species, such as red spruce, white spruce, black spruce, Norway spruce, red pine, jack pine, and balsam fir. For more information on SPFs, please refer to <http://sprucepinefir.us>.

Figure 2. Standard for Performance-Rated Cross-Laminated Timber (ANSI/APA PRG 320-2018)



SOURCE: ANSI/APA PRG 320-2018

Figure 3. Characteristics of CLT-Suitable Lumber

- Any softwood lumber species with specific gravity of 0.35 or higher (i.e. spruce-pine-fir, southern yellow pine, or Douglas fir-larch)
- Visually graded lumber with grades of “select structural,” No. 1, No. 2, or No. 3
- Machine stress rated lumber of 1200f-1.2E MSR or higher
- Preference for wider lumber (2 x 6 or wider)
- Preference for longer lumber (8 feet or longer)

SOURCE: ANSI/APA PRG 320-2018, STANDARD PS 20; KARACABEYLI 2013; BBER

panels must be at least No. 2 (visual grade) or 1200f-1.2E MSR (machine grade) for the parallel layers, and No. 3 (visual grade) for the perpendicular layers.

The SYP species group includes shortleaf pine, slash pine, longleaf pine, and loblolly pine.

Most CLT manufacturers use 2 x 6 and 2 x 8 dimension lumber for their layouts due to availability, cost, and efficient manufacturing processes. Based on ANSI/APA PRG 320-2018, dimension lumber used in the manufacture of CLT

panels must be at least No. 2 (visual grade) or 1200f-1.2E MSR (machine grade) for the parallel layers, and No. 3 (visual grade) for the perpendicular layers.

Figure 3 provides an overview of CLT-suitable lumber.

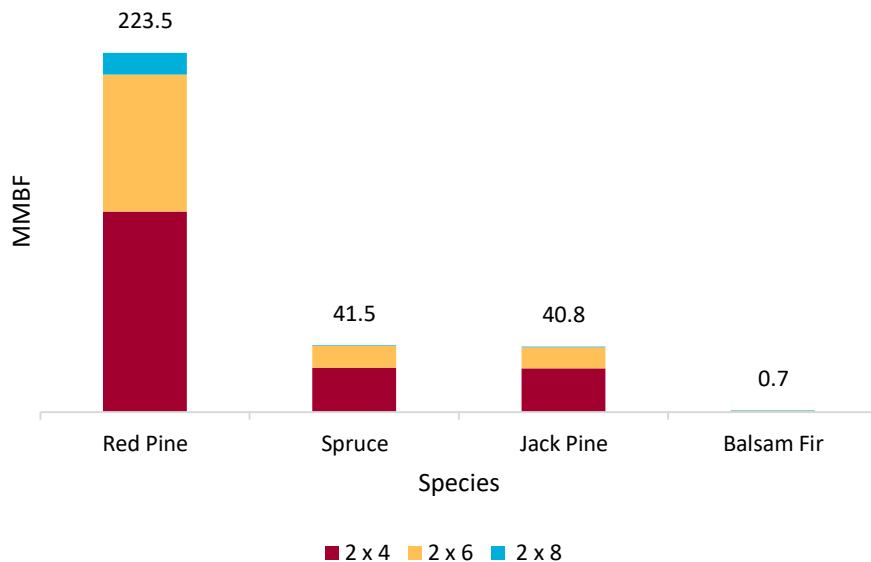
There are four species groups that meet those specifications and grow in the Great Lakes Region. These include red pine, spruce, jack pine, and balsam fir.

Current Lumber Production

The survey asked sawmills to estimate the quantity of red pine, spruce, jack pine, and balsam fir produced in the most recent year.¹ Mills were specifically asked to break out their answers by grade (No. 3, No. 2, and No. 1 or better²) and width (2 x 4, 2 x 6, and 2 x 8 lumber).

The survey found that Great Lakes sawmills produced roughly 300 million board feet (MMBF) of lumber that was 2 x 4 or larger with grades of No. 3 or better (Figure 4). Of this production, roughly 180 MMBF was 2 x 4, and 127 MMBF was 2 x 6 or 2 x 8.

Figure 4. Lumber Production among Great Lakes Sawmills



SOURCE: BBER SAWMILL SURVEY

Nearly three-quarters of that total volume (223.5 MMBF) was red pine. The remaining quarter was split about equally between spruce and jack pine (41.5 and 40.8 MMBF, respectively). Only a very small volume of balsam fir was produced in the region (0.7 MMBF).

For all species, approximately 60% of the volume produced was 2 x 4, about 35% in 2 x 6, and roughly 5% in 2 x 8.

More details on the volumes produced in each category can be found in Table 1 on the following page. In addition to the board species and dimensions shown in Figure 4, the table shows the volumes produced in each grade. Visually graded No. 2 lumber is the most commonly produced in most cases, with the exception of jack pine 2 x 4s, where slightly more No. 1 grade material is produced than No. 2.

¹ The sawmill survey was distributed in August 2018 and asked mills to report the amount of lumber produced “in the most recent year,” without stipulating a specific time period. It can be assumed that the numbers given might represent calendar year 2017 or a one-year time period in 2017-18.

² In the survey, mills were asked to report lumber grades as No. 3, No. 2, or No. 1 or better. The category No. 1 or better includes No. 1 grade and “select structural” grade lumber. For the remainder of this report, that category will be referred to simply as “No. 1.”

Table 1. For the most recent year, please estimate your facility's total lumber production (MMBF) for the following lumber species and grades

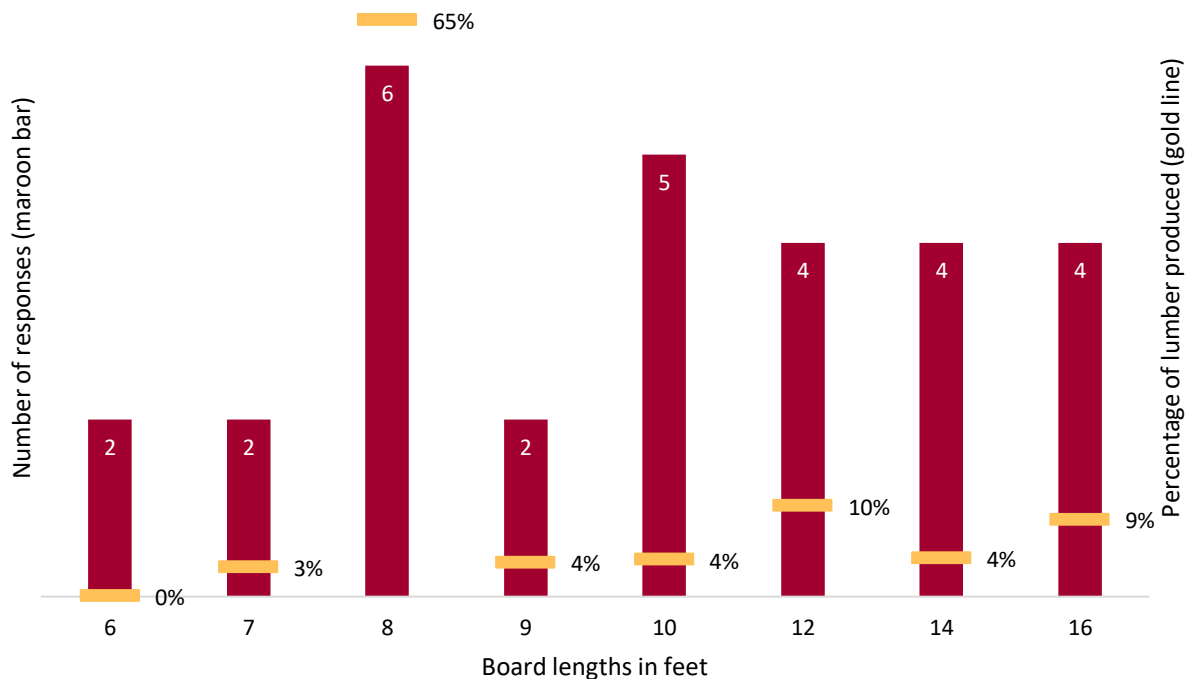
	2 x 4			2 x 6			2 x 8			Total
	#1 or better	#2	#3	#1 or better	#2	#3	#1 or better	#2	#3	
Red Pine	28.5	78.8	17.4	15.6	56.5	13.2	-	12.2	1.3	223.5
Jack Pine	10.1	11.7	5.3	4.3	7.0	2.2	-	0.2	0.0	40.8
Spruce	13.3	10.3	4.1	4.6	6.7	2.3	-	0.2	0.0	41.5
Balsam Fir	-	0.3	0.1	-	0.3	0.1	-	0.0	0.0	0.7
Total	51.9	101.1	26.8	24.5	70.5	17.7	-	12.7	1.3	306.5

*Totals may not sum due to rounding

SOURCE: BBER SAWMILL SURVEY

Regional sawmills were also asked to provide an estimate of length for the lumber species and grades they reported (e.g. “90% of our 2 x 6 lumber is 8 feet, and 10% is 10 feet”). Figure 5 shows, for each length, the number of mills that reported producing the length shown (maroon bars) and the percentage of the total lumber produced regionally of each length (gold lines). For example, six of the eight mills surveyed produce 8-foot lumber, but because of the large volume produced by those six mills, nearly two-thirds of all lumber produced in the region is 8 feet in length. On the other hand, five of the eight mills surveyed indicated that they produce 10-foot lumber, but only 4% of the total volume of lumber produced locally is cut at that length.

Figure 5. Number of Mills and Percentage of Lumber Produced by Board Length



SOURCE: BBER SAWMILL SURVEY

Sawmills were asked to report the amount of lumber produced at their facility that is sold directly to retail or industrial accounts (e.g. Menard’s, Home Depot) versus the amount sold to wholesalers. While most respondents reported selling some portion of their lumber to wholesalers – seven of the eight mills reported selling at least 5% – the largest mills tended to sell a greater share to retail accounts. Therefore, of the total volume of lumber suitable for CLT produced within the region, more than 80% is being sold to consumers through retailers (see Figure 6).

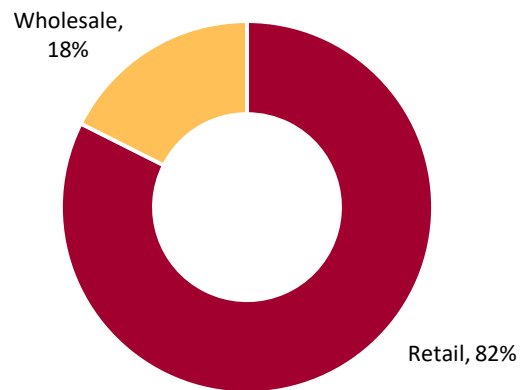
The amount of lumber currently being produced by sawmills is not necessarily reflective of the potential availability of lumber in the region. It can be assumed that regional mills might have the capacity to produce longer, wider lumber if there was a demand for such a product and the price was competitive.

Potential Production

In order to gauge the potential capacity of regional mills to supply a product that is suitable for CLT, the survey followed up by asking, “Assuming a profitable market is available and all lumber was sold, what is the maximum production capabilities at your sawmill?” Mills were given the option of 2 x 6 or 2 x 8 lumber only to encourage them to consider their potential capacity for those dimensions, assuming there was a preference by CLT producers for wider lumber.

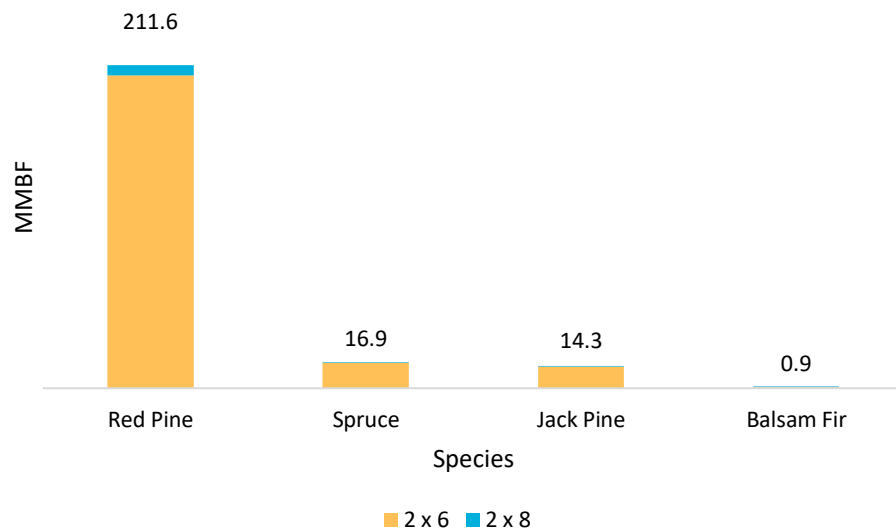
Figure 7 shows the mills’ responses to the question. As shown in the figure, if there was a profitable market for softwood lumber in wider dimensions, mills could potentially produce more than 243 MMBF annually, with 211 MMBF of that predicted for red pine 2 x 6 lumber.

Figure 6. What percentage of lumber sales sold by your facility fall into the following categories?



SOURCE: BBER SAWMILL SURVEY

Figure 7. Assuming a profitable market is available and all lumber was sold, what is the maximum production capabilities at your sawmill? (2 x 6 or wider)



SOURCE: BBER SAWMILL SURVEY

Figure 8. Potential Increase in Production Capabilities (2 x 6 or wider)

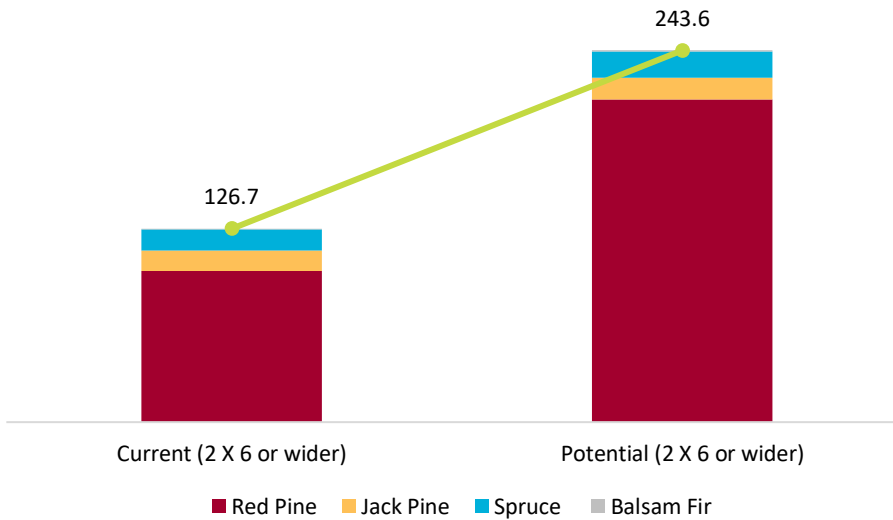


Figure 8 shows more detail regarding the potential increase in capacity. The figure shows the mills' current reported production levels of 2 x 6 (or wider) lumber (126.7 MMBF) compared with their reported potential capacity (243.6 MMBF).³ Overall, mills reported a potential capacity for 2 x 6 or wider lumber that is nearly double the amount they are

SOURCE: BBER SAWMILL SURVEY

currently producing (a 92% increase). While there were small potential increases reported in jack pine, spruce, and balsam fir, the main opportunity for growth is predicted in red pine. Combined, the eight surveyed mills estimated that they could increase production of 2 x 6 red pine lumber by 113 MMBF annually, if there was a profitable demand for that product.

It should be noted that this increase in production refers only to CLT-suitable lumber (softwood lumber in 2 x 6 or wider lumber of the appropriate grades). Some of the reported increase might reflect a movement from one dimension to another (i.e. producing less 2 x 4 lumber and more 2 x 6 lumber). Therefore, it should not be suggested that mills are likely (or able) to double their total production in response to an increase in demand for CLT-suitable lumber. Rather, the findings suggest that regional mills have the capabilities to provide a large volume of lumber that is suitable for CLT manufacturing if the demand and price were right.

More details on the volumes produced in each category can be found in Table 2 on the following page. In addition to the board species and dimensions, the table also shows the volumes produced in each grade (No. 3, No. 2, and No. 1). Also noted is that mills would be unlikely to produce a significant volume of 2 x 8 lumber, even if there was a demand for such a product. Instead, the largest potential volumes would likely be 2 x 6 lumber in grades No. 1 and No. 2, mostly in red pine, but with some small volumes in jack pine and spruce.

³ Mills' reported production volume for 2 x 6 and 2 x 8 lumber (current and potential) were summed to create the category "2 x 6 or wider"

Table 2. Assuming a profitable market is available and all lumber was sold, what is the maximum production capabilities (MMBF) at your sawmill? (2 X 6 or wider)

Width Grade	2 x 6			2 x 8			Total
	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	
Red Pine	25.7	158.8	20.4	0.8	4.5	1.4	211.6
Jack Pine	4.2	6.7	3.1	0.1	0.1	0.1	14.3
Spruce	5.5	7.8	3.2	0.1	0.2	0.1	16.9
Balsam Fir	0.1	0.4	0.3	-	0.0	0.0	0.9
Total	35.4	173.7	27.0	1.0	4.9	1.6	243.6

*Total may not sum due to rounding

SOURCE: BBER SAWMILL SURVEY

Sawmills were asked about their facility’s value-added manufacturing abilities. Three of the respondents indicated that their mill had re-manufacturing (molding, finger jointing, etc.) capabilities, and one indicated it produces semi-finished products or finished products (beams, millwork, pallets, etc.). These capabilities can be valuable if a mill is considering expanding into CLT production.

Finally, survey respondents were asked, “Would you or someone from your company be interested in receiving further communication and information about the project? (e.g. report results, CLT information)” All respondents indicated that they would be interested in further information, indicating an interest in learning more about the possibility of CLT manufacturing in the region.

Canadian Mills



According to an IBIS market report on Canadian sawmills, 90% of U.S. homes are built with softwood, but the U.S. is only able to meet 70% of its own softwood lumber needs. Nearly all of its remaining softwood lumber needs are fulfilled by Canadian exports. (Leach November 2017)

Two Canadian mills (Eacom Timber Corporation in Ear Falls, Ontario, and Resolute Forest Products in Thunder Bay, Ontario) were contacted to provide production level estimates but did not respond to the survey. One of those, Resolute Forest Products (RFP) is a major producer, representing roughly 5% of the Canadian softwood lumber market (Leach November 2017). Primarily a pulp and paper mill, RFP also operates 16 sawmills in Canada that produce construction-grade softwood lumber and has been growing its wood products segment in recent years.

Because Canadian lumber represents such a large portion of the softwood lumber used in the U.S., the BBER gathered data from secondary sources to quantify the volume of lumber coming from Canadian mills. Based on the Government of Canada’s trade data for 2017, the BBER estimates that more than 1,200 MMBF of lumber was exported from Canada to Minnesota or Wisconsin, roughly 20% of that which (213 MMBF) came from Ontario.⁴ In fact, Minnesota was Ontario’s second largest export market. While not all of the lumber exported from Canada is suitable for CLT production, these statistics highlight the large quantity of softwood lumber that is currently being distributed to Minnesota and/or Wisconsin from Canadian mills. For example, if even a quarter of the lumber coming from Canada to Minnesota and Wisconsin was suitable for CLT, it would mean 300 MMBF of additional supply, more than double what is being produced by regional mills.

⁴ <http://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/Home?OpenDocument#tag>

Distributors

A parallel survey was developed for regional wholesalers, with questions similar to those asked of regional sawmills. Like the sawmill survey, questions asked of wholesalers included their familiarity with cross-laminated timber (CLT) and the amount of lumber the wholesaler distributed in various species, grades, and widths. In addition, wholesalers were asked for their feedback on ideal locations throughout the Midwest to source lumber suitable for CLT production.

The process for collecting data from regional wholesalers was as follows: First, the research team identified all lumber wholesalers in a roughly 200-mile radius from Duluth, Minnesota. Identified wholesalers included BlueLinx, Manion's Wholesale, Viking Forest Products, Weekes Forest Products, Grove Wholesale Lumber, Midwest Lumber Inc., and Pine Point Wood Products. Based on feedback from the regional sawmills and other forestry experts, the first four companies were identified as being good candidates for the survey, while it was suggested that the remaining three companies did not likely supply a product suitable for CLT production. Through phone calls and email communication, the research team identified the appropriate person within each organization to complete the survey and sent an electronic copy of the survey to each individual via email. In addition to data collected using the survey instrument, some follow-up questions were asked of each company representative via email and phone conversations.

In total, data was requested on twelve wholesale facilities: six BlueLinx facilities (Maple Grove, Minneapolis, and Aitkin, Minnesota; and Madison, Schofield and Sparta, Wisconsin), two Manion's Wholesale facilities (Saint Cloud, Minnesota, and Superior, Wisconsin), three Weekes Forest Products facilities (Waukesha and Green Bay, Wisconsin, and Saint Paul, Minnesota), and Viking Forest Products in Eden Prairie, Minnesota. We received information on 11 of the 12 locations from four company representatives. Data for the one facility that did not respond was estimated by using information collected on the company from the Reference USA database along with some estimates provided by a representative at the company's sister facility. Throughout this report, the twelve wholesale facilities are collectively referred to as "regional" wholesalers and the lumber they distribute is considered to be distributed "in the Great Lakes region."

It should be noted that two of the surveyed distributors are part of a larger corporate entity with additional locations throughout the country. Headquartered in Atlanta, Georgia, BlueLinx has a vast network of distribution centers located throughout the U.S. Similarly, Weekes Forest Products has eight distribution centers throughout the U.S.

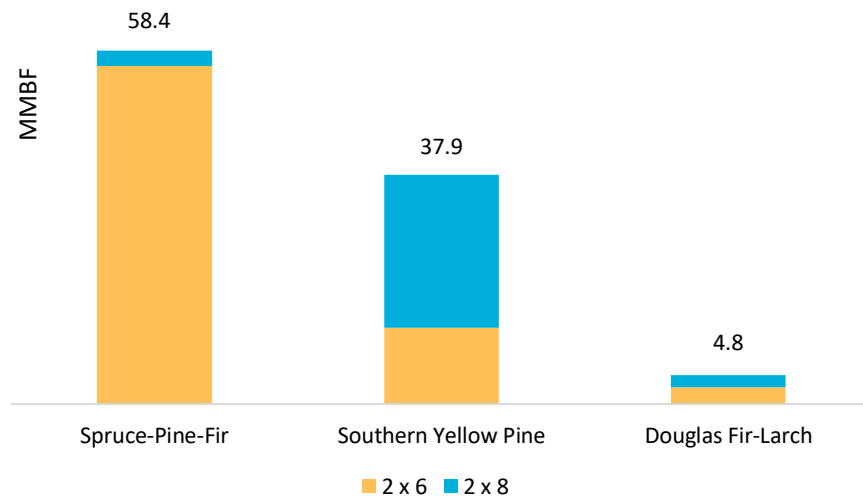
Current Lumber Distribution

As with the sawmill survey, wholesalers were first asked to indicate their familiarity with CLT production. Three of the four respondents indicated that they were familiar with the product, and one responded that it was not. Wholesalers were also asked whether their company distributed visually graded material, MSR material, or both. All four respondents indicated that their companies distributed both types of lumber.

Wholesalers were then asked to estimate the quantity of softwood dimension lumber that they distributed that meets the specifications required for CLT production. Wholesalers were asked specifically about their volumes of spruce-pine-fir, southern yellow pine, and Douglas fir-larch and how much of each was distributed in grades No. 3, No. 2, and No. 1 (or at the appropriate MSR grades). Finally, since CLT producers prefer wider lumber, the survey asked wholesalers to specify the amount of 2 x 6 and 2 x 8 lumber only.

Results of the survey found that Great Lakes wholesalers distributed roughly 100 million board feet of lumber suitable for CLT or mass timber (see Figure 9). Roughly 60% of that total volume (58.4 MMBF) was spruce-pine-fir, and 37% was southern yellow pine. Only a very small volume of Douglas fir-larch was distributed in the region (4.8

Figure 9. Lumber Distribution Among Great Lakes Wholesalers



SOURCE: BBER SAWMILL SURVEY

MMBF). Of the spruce-pine-fir distributed regionally, the vast majority was in the form of 2 x 6 lumber, whereas a larger percentage of southern yellow pine was in the form of 2 x 8 lumber.

Tables 3 and 4 on the next page show more details regarding the volumes distributed in each category.⁵ In addition to the board species and

dimensions, the tables also show the volumes distributed by grade. Visually graded lumber is shown in

Table 3, and MSR lumber is shown in Table 4. According to the wholesalers' responses, it was estimated that roughly 70% of the CLT-appropriate lumber distributed regionally was visually graded, while about 30% was MSR. Of the visually graded lumber, the majority being distributed was 2 x 6 spruce-pine-fir grade No. 2. The most common MSR lumber being distributed in the region was 2 x 6 spruce-pine-fir grade 1,650. A significant volume of 2 x 8 southern yellow pine grade No. 1 was also distributed regionally.

Table 3. For the most recent year, please estimate your facility's distribution quantity of visually graded lumber (MMBF) for the following species and grades

Width	2 x 6			2 x 8			Total
	No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	
Douglas Fir-Larch	0.1	1.0	-	0.1	1.9	-	3.1
Southern Yellow Pine	1.1	4.2	-	11.1	7.1	-	23.5
Spruce-Pine-Fir	-	38.3	1.1	0.1	2.5	-	42.0
Total	1.2	43.5	1.1	11.3	11.5	-	68.6

*Total may not sum due to rounding

SOURCE: BBER DISTRIBUTOR SURVEY

⁵ One respondent did not provide specific volumes for its MSR lumber but rather gave a total amount along with some examples of common species, grades, and widths. This information was used, along with information from the MSR Lumber Producers Council and other respondents' totals, to generate an estimate for that distributor.

Table 4. For the most recent year, please estimate your facility's distribution quantity of machine stress rated lumber (MMBF) for the following species and grades

Width Grade (pounds per square inch, psi)	2 x 6					2 x 8					Total
	1,650	1,800	2,400	2,700	2,850	1,650	1,800	2,400	2,700	2,850	
Douglas Fir-Larch	-	1.6	0.1	-	-	-	-	-	-	-	1.7
Southern Yellow Pine	-	-	0.2	7.2	-	-	-	4.0	-	3.0	14.4
Spruce-Pine-Fir	14.9	-	-	0.5	1.0	-	-	-	-	-	16.4
Total	14.9	1.6	0.3	7.7	1.0	-	-	4.0	-	3.0	32.5

*Total may not sum due to rounding

SOURCE: BBER DISTRIBUTOR SURVEY

In the case of spruce-pine-fir, there is a possibility that some of the regional wholesalers may be distributing lumber that was produced locally. While a large majority of the regional sawmills reported selling their product to retailers, the survey results estimated that roughly 18% of the total volume of lumber sold locally was sold to wholesalers. To account for the potential duplication, wholesalers were asked to estimate the percentage of spruce-pine-fir they currently distribute that comes from outside of Minnesota or Wisconsin. On average, the wholesalers reported that 96% of the spruce-pine-fir they distributed comes from outside of the region (mostly Canadian mills and a small portion from the Western U.S.), which suggests that the lumber being reported by sawmills and distributors is not being double-counted.

Potential Distribution

As a follow-up, wholesalers were asked, hypothetically, about their ability to provide a larger volume of lumber if requested. Each representative was asked about the ability to supply roughly double what was reported in the facility's survey response. All but one representative said they would have the ability to do so. Based on the representatives' responses, it appears that regional wholesalers could supply more than 200 MMBF in lumber if there was a demand for the product. And two of the representatives stated they could supply "any reasonable demand," suggesting that the actual amount available is likely even higher than 200 MMBF.

There also appears to be a potentially large volume of lumber that is being sold to regional secondary wood products manufacturers directly from large Canadian and western U.S. mills. The BBER research team asked the wholesale representatives whether most large customers (e.g. truss manufacturers, window and door manufacturers) buy primarily wholesale materials or directly from sawmills. The representatives stated that while some large manufacturers may buy wholesale due to lack of rail access and others buy a combination of mill-direct and wholesale lumber, the majority of large customers who buy MSR lumber buy directly from sawmills, most commonly Canadian mills.

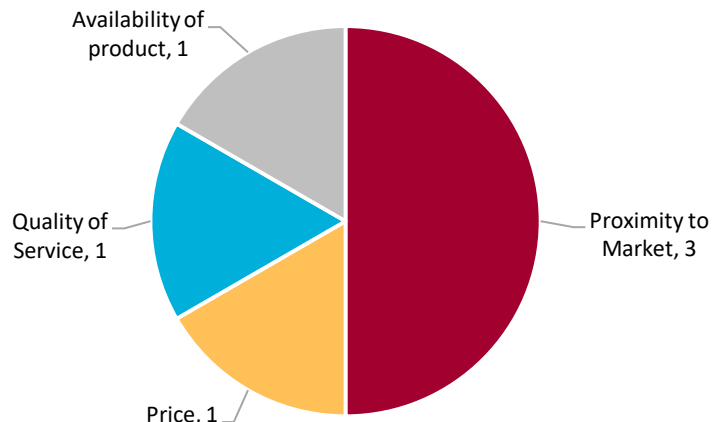
Recommended Location

Finally, wholesalers were asked, "In mass timber manufacturing, longer, wider lumber of higher grade is preferred. Given that, which city do you think would be the most competitive to source this lumber to the Midwest?" Choices given included Minneapolis, Chicago, Detroit, and Kansas City, as well as an option to name some other Midwest city. All of the distributors who responded to the question (n=3) selected

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Minneapolis. Wholesalers were then asked, “What are the main reasons this city would be a good location to source this material?” They were allowed to select multiple options, including price, proximity to supplier, proximity to market, availability of product, quality of product, and quality of service. The reasons most commonly selected included proximity to market (3 respondents), price (n=1), quality of service (n=1), and availability of product (n=1), as shown in Figure 10.

Figure 10. What are the main reasons this city would be a good location to source this material?



SOURCE: BBER SAWMILL SURVEY

It should be noted that respondents were primarily located in Minnesota and/or Wisconsin, so their response to this question would likely be biased toward cities in Minnesota or Wisconsin, Minneapolis being the only such city included in the survey options. However, according to the Bureau of Transportation Statistics,⁶ Minnesota has a well-developed transportation infrastructure, with nine major airports, four major water ports, 4,450 miles of freight railroad, and 260 miles of waterway. In addition, the state moved nearly \$500 billion in freight in 2013, up 8% from 2007. This suggests that, while the respondents may have a preference for Minneapolis in part due to their familiarity with the area, it is, in fact, a competitive location because of its existing infrastructure.

Conclusions

- Surveys identified 300 MMBF of lumber currently being produced by sawmills within a roughly 200-mile radius of Duluth-Superior and another 100 MMBF being distributed by regional wholesalers.
- Roughly 125 MMBF of the SPFs lumber currently being produced by regional sawmills was suitable for CLT production (No. 3 or better, 2 x 6 or wider)
- A large portion of the SPFs lumber being produced by regional sawmills was in 2 x 4 dimensions, but mills report the capability to produce nearly 250 MMBF in 2 x 6 or wider lumber in grades No. 3 or better if there was a demand for such a product.
- When asked about a hypothetical volume of lumber roughly double their current distribution levels, regional wholesalers stated they would have no difficulties sourcing that amount if there was demand.
- In 2017, Minnesota and Wisconsin imported a combined 1,200 MMBF of lumber from Canadian producers. Not all of that was suitable for CLT production, but the large overall volume suggests that there is likely more CLT-suitable material available across the border.

⁶ <https://www.bts.gov/content/state-transportation-numbers>

- Red pine was the dominant softwood species being produced by regional sawmills, and spruce-pine-fir was the most common species group being distributed in the region.
- Wholesalers overwhelmingly considered Minneapolis to be the most competitive Midwest city to source lumber suitable for CLT production, due mostly to its proximity to market.