STRUCTURAL BUILDING COMPONENTS MAGAZINE (FORMERLY WOODWORDS)
August 2001

Knowledge is Power

"Market Statistics for the Structural Building Components Industry" by Kirk Grundahl

This article will consist of statistics that are of interest to our industry, along with some brief comments along the way to highlight points of interest. You may draw a variety of observations and conclusions from this data, depending on your frame of reference. Special thanks to **David McKeever** and **Henry Spelter** of **Forest Product Laboratory, Al Schuler** of the **Forestry Sciences Lab, the Wood Products Council, the NAHB Research Center** and the **NAHB Economics Department** for various parts of the raw data that has been used in this compilation. In particular, I would like to single out Dave McKeever, Henry Spelter and Al Schuler of the U.S. Forest Service System and **Michael Carliner** and **David Crowe** of **NAHB**, who have always been willing and able to help us with valuable statistics, which allow us to have much greater understanding of our markets. This provides our industry with the opportunity to make much more intelligent decisions as we change and grow.

THE MACRO ECONOMIC HOUSING PICTURE

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Completed (000s)	1,123	1,085	1,026	966	838	964	1,039	1,160	1,065	1,129	1,116	1,160	1,307
Full or Partial Basement	39	39	37	38	40	42	40	39	39	37	37	37	37
Slab	43	41	43	40	38	38	40	41	42	44	45	45	47
1 Story	49	46	46	46	48	48	48	49	49	49	49	48	48
2 stories or more	46	49	49	49	47	47	48	47	48	47	49	50	51
1,200 sq. ft. or less	13	12	13	11	12	10	9	9	10	9	8	7	7
2,400 sq. ft. +	21	25	26	29	28	29	29	28	28	30	31	32	34
Average sq. ft.	1,905	1,995	2,035	2,080	2,075	2,095	2,095	2,100	2,095	2,120	2,150	2,190	2,250
Median sq. ft.	1,755	1,810	1,850	1,905	1,890	1,920	1,945	1,940	1,920	1,950	1,975	2,000	2,030

TABLE 1
CLICK ON IMAGE FOR LARGER VIEW

	1998	1999	2000	2001	2002
Total Starts (000)	1,622	1,675	1,698	1,524	1,564
Single-family (000)	1,278	1,340	1,262	1,212	1,240
Multifamily (000)	344	335	336	312	324

TABLE 2
CLICK ON IMAGE FOR LARGER VIEW

The Census Bureau recently published a report stating that the demand for housing in the U.S. is rising faster than expected. This is encouraging news for our industry, indicating that underlying demand for housing is being bolstered by the following factors:

- New U.S. household formations are approximately 1.35 million per year, which is about 200,000 more per year than previously estimated.
- A huge influx of immigrants from nations such as China, Mexico, India and the former Soviet Union are entering the housing market.
- About 250,000 building units must be replaced each year due to demolitions caused by age or destruction from natural phenomena.

This report estimates that a minimum of 1.6 million new units per year will be required to keep up with basic demand. As one can see, the estimates for 2001 and 2002 in the table above may be on the shy side.

Estimated Housing Square Footage—Structural Elements

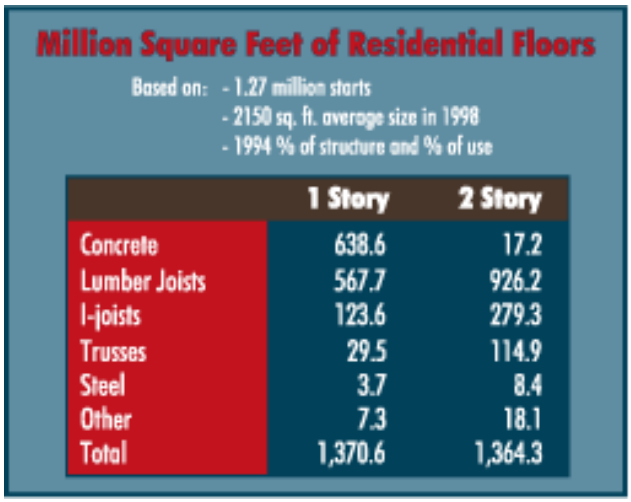


TABLE 3
CLICK ON IMAGE FOR LARGER VIEW

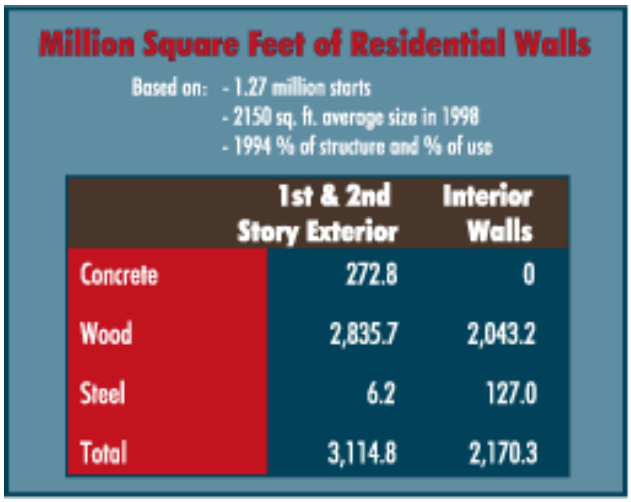


TABLE 4
CLICK ON IMAGE FOR LARGER VIEW

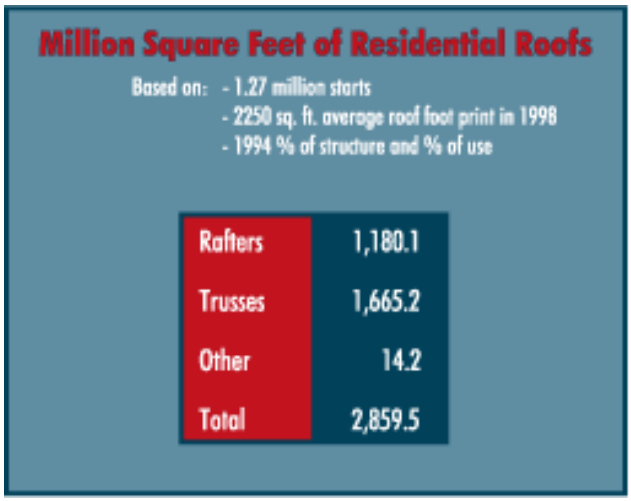


TABLE 5
CLICK ON IMAGE FOR LARGER VIEW

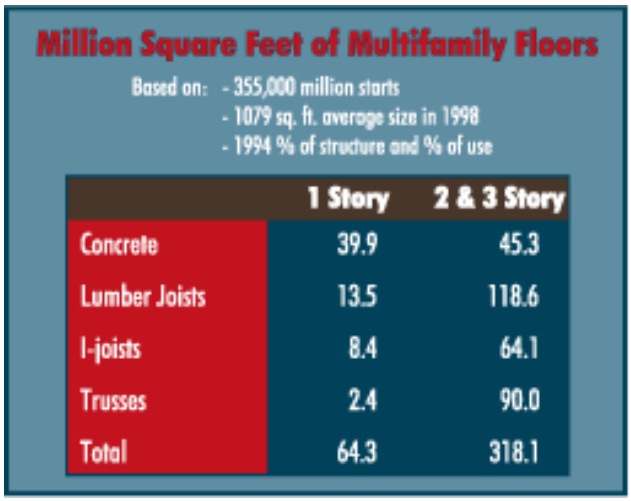
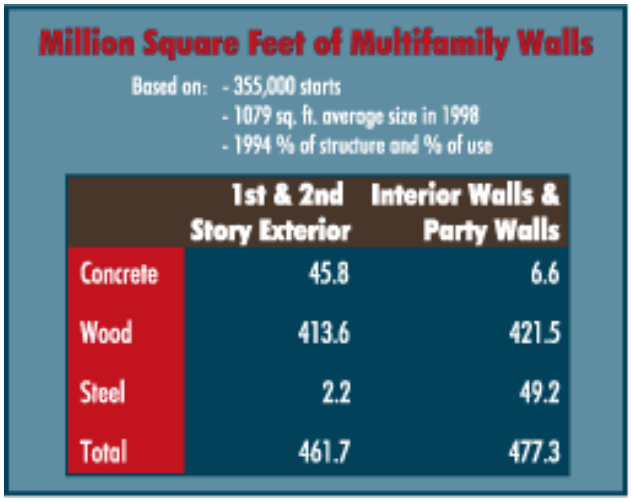
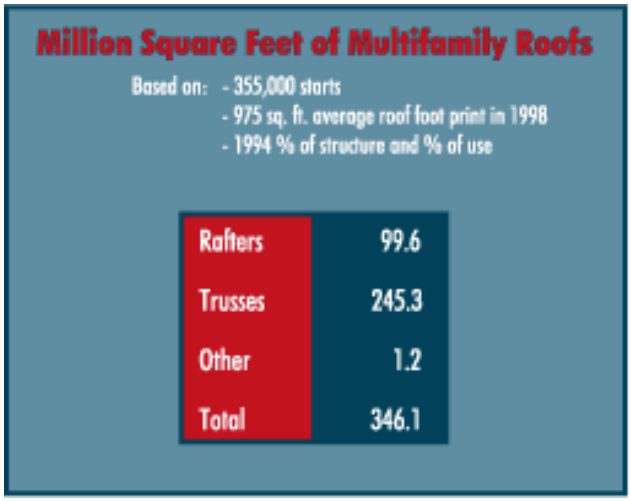


TABLE 6
CLICK ON IMAGE FOR LARGER VIEW



	1st & 2nd Story Exterior	Interior Walls & Party Walls
Concrete	45.8	6.6
Wood	413.6	421.5
Steel	2.2	49.2
Total	461.7	477.3

TABLE 7
CLICK ON IMAGE FOR LARGER VIEW



Rafters	99.6
Trusses	245.3
Other	1.2
Total	346.1

TABLE 8
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- Since we used the 1994 penetration statistics, these tables would change a bit if the 1998 percentage for each component type was used. Time constraints did not allow us to pull this together for this issue of *WOODWORDS.* However, the key to the data is the total square footage available in each market segment.
- If the Census data is correct, and if housing sizes continue to increase, it is important for our industry to understand this growing market potential.

MICRO-ECONOMIC RESIDENTIAL MARKET SHARE CHANGES—1994 VERSUS 1998

Single Family Truss Market Share								
Ground Floor	1994	1998	1994	1998	1994	1998	1994	1998
Floor Type	North	North	South	South	West	West	US	US
Poured concrete	2.19%	7.94%	64.12%	51.58%	69.39%	53.81%	46.51%	39.56%
Lumber joists	75.41%	59.92%	31.31%	30.67%	16.95%	15.88%	41.42%	35.58%
I-joists	16.42%	25.09%	2.67%	11.32%	12.15%	22.79%	9.03%	17.99%
Plated wood trusses	4.28%	6.67%	0.87%	3.58%	0.44%	5.45%	1.81%	4.91%
Other wood	0.93%	0.05%	0.08%	0.24%	0.91%	0.20%	0.53%	0.18%
Metal-web trusses	0.54%	0.00%	0.38%	0.00%	0.03%	0.00%	0.35%	0.00%
Steel	0.24%	0.28%	0.38%	0.10%	0.10%	1.20%	0.27%	0.41%
Pre-cast concrete	0.00%	0.01%	0.18%	2.51%	0.03%	0.67%	0.09%	1.35%
Stress skin panels	0.00%	0.04%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%

TABLE 9
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- Trusses (including metal web in 1998) and I-joists made significant gains from 1994 to 1998 in this market at the expense of lumber joists and poured concrete.
- An initiative that is now beginning in earnest this year is to "upgrade to above grade." The intent of this initiative is to replace concrete slabs with wood floor systems. The key to measuring the success of this initiative, which is largely taking place in Florida through an initiative by the Southern Forest Products Association and the Florida Building Materials Association/Florida Wood Council, is the pace with which poured concrete floors reduce in market share in the South. The reduction was already

significant without this program, so much will be able to be learned over the next few years.

- An emerging market to watch is the steel joist market. With the advent of the trade ready steel joist, further gains are possible. The key to growth for this product line in this market segment is cost competitiveness and long term price stability.
- The trend over the long term is away from solid wood joists, due primarily to price volatility, dimensional stability and quality. It is toward I-joists, and to a lesser extent open web trusses, that provide solutions to these issues.
- Trusses have a shot at increasing market share if work is done to make trusses more price competitive. The trimmable metal web products and Open Joist 2000 have proven this to be the case.
- Growth will probably not continue at the rate of 2.0 times (I-joists) and 2.7 times (trusses) as we have seen from 1994 to 1998.

Single Family Floor Truss Market Share

Second Floor	1994	1998	1994	1998	1994	1998	1994	1998
Floor Type	**North**	**North**	**South**	**South**	**West**	**West**	**US**	**US**
Poured concrete	0.00%	0.00%	0.20%	1.34%	0.04%	0.17%	0.08%	0.59%
Lumber joists	77.02%	63.81%	78.39%	44.17%	25.48%	36.84%	68.12%	50.02%
I-joists	14.71%	27.62%	9.44%	34.14%	57.55%	43.62%	20.54%	33.71%
Plated wood trusses	6.39%	8.36%	5.34%	19.92%	14.75%	18.77%	7.52%	15.30%
Other wood	1.47%	0.06%	0.76%	0.02%	0.17%	0.10%	0.97%	0.05%
Metal-web trusses	0.26%	0.00%	1.23%	0.00%	1.95%	0.00%	0.93%	0.00%
Steel	0.16%	0.05%	1.40%	0.44%	0.06%	0.38%	0.62%	0.28%
Pre-cast concrete	0.00%	0.04%	3.14%	0.00%	0.00%	0.00%	1.18%	0.02%
Stress skin panels	0.00%	0.06%	0.12%	0.00%	0.04%	0.11%	0.05%	0.05%

TABLE 10
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- Trusses (including metal web in 1998) and I-joists used in second floor construction made significant gains from 1994 to 1998, although not as great as ground floor applications. In this case the gains were made at the expense of lumber joists.
- The steel joist market declined. This is prior to the advent of the trade-ready steel joist, so gains are possible here in the next few years. It would be interesting to see a study of the 2000 market to get a better handle on the changes taking place. We will be sure to provide an update for our readers when information becomes available.
- Surprisingly, I-joists declined in the West and lumber joists increased. This suggests that the market moves based on the price differential and is very price sensitive. This is bad news for high cost products in the market.

Multifamily Floor Market Share				
	1994	1998	1994	1998
Floor Type	Ground	Ground	Second	Second
Poured concrete	62.05%	64.61%	14.22%	5.30%
Lumber joists	21.03%	19.65%	37.23%	40.10%
I-joists	13.17%	12.02%	20.14%	25.23%
Plated wood trusses	1.63%	3.30%	25.73%	26.21%
Other wood	0.00%	0.24%	0.00%	0.49%
Metal-web trusses	2.12%	0.00%	2.53%	0.00%
Steel	0.00%	0.18%	0.00%	1.39%
Pre-cast concrete	0.00%	0.00%	0.00%	0.00%
Stress skin panels	0.00%	0.00%	0.00%	1.21%

TABLE 11
CLICK ON IMAGE FOR LARGER VIEW

Lineal Ft. 1st & 2nd Story Wall & Garage Wall	Single Family Exterior Above Grade Walls							
	1994	1998	1994	1998	1994	1998	1994	1998
Wall Type	North	North	South	South	West	West	US	US
Light Frame	90.50%	83.62%	74.60%	91.82%	98.00%	84.04%	85.40%	78.56%
Panelized	7.50%	9.95%	1.86%	5.48%	0.00%	4.77%	3.48%	8.37%
Modular	1.20%	1.43%	2.80%	0.14%	0.81%	1.68%	1.80%	1.06%
Structural Insulated Panels	0.12%	0.07%	0.03%	0.02%	0.00%	0.00%	0.07%	0.11%
All Concrete	0.03%	4.74%	20.40%	1.36%	0.25%	9.05%	8.75%	11.48%
Post & Beam		0.10%		0.91%		0.46%		0.28%
Logs		0.09%		0.26%		0.00%		0.14%

TABLE 12
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- It is interesting to note that poured concrete on the ground floor increased share, and I-joist and joists decreased. Trusses are the bright spot here, probably due to the ease of running HVAC, plumbing and electrical. There may be an opportunity in this area, although cost is king.
- Poured concrete on the second floor took a beating and lumber joists, I-joists and trusses were the beneficiaries.
- Steel joists made a big splash. Continue to watch this segment of the market.
- As noted in “Single Family Floors” (Table 10), you will be able to monitor the success of the “upgrade to above grade” program using these benchmarks.

Lineal Feet of Interior Wall	Single Family Interior Wall Panel Market Share							
	1994	1998	1994	1998	1994	1998	1994	1998
Wall Type	North	North	South	South	West	West	US	US
Light Frame	99.96%	96.75%	87.65%	92.79%	92.40%	96.98%	94.14%	95.02%
Steel	0.03%	3.25%	12.34%	6.29%	2.09%	2.99%	5.85%	4.55%
Masonry	0.00%	0.00%	0.00%	0.92%	0.05%	0.03%	0.00%	0.42%

TABLE 13
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- The big winner is panelized walls, which is not surprising given labor demographics. It should be expected that, the next time a survey is done, the percentage for panelized walls will again increase significantly.
- The growth of use in concrete walls is a surprise. The innovative insulated concrete solutions must be attractive.
- Another element to watch is structural insulated panels (SIPs). The next survey should be enlightening with regard to market penetration of SIPs as compared to panelization of wall systems.
- It is unfortunate that a breakdown of the wall types (e.g. light frame, panelized, SIPs, etc.) for interior walls is not available to us. What is surprising here are the statistics for steel. This is one area where steel is competitive with wood and is poised to capture market share for all the right reasons—cost, price stability and reduction of callbacks. This is one to watch in the next survey to see where the steel market is going and exactly what type of penetration can be reached in the residential marketplace.

Multifamily Exterior Above Grade Walls		
Linear Feet 1st & 2nd Story Wall & Garage Wall	1994	1998
Wall Type	US	US
Light Frame	85.83%	73.62%
Panelized	2.54%	5.81%
Modular	0.33%	1.31%
Structural Insulated Panels	0.70%	0.00%
All Concrete	9.92%	15.64%
Steel	0.48%	3.49%
Logs	0.00%	0.13%

TABLE 14
CLICK ON IMAGE FOR LARGER VIEW

Multifamily Interior Walls		
Linear Feet of Wall	1994	1998
Wall Type	US	US
Light Frame	88.95%	93.12%
Steel	11.05%	5.77%
Masonry	0.00%	1.11%

TABLE 15
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- These statistics are similar to the results for single family homes listed above (Table 13). What is shocking is the fact that market share for exterior steel walls is trending in one direction while it is moving in the opposite direction for interior steel walls.

Single Family Roof Truss Market								
% Roof Area	1994	1998	1994	1998	1994	1998	1994	1998
Roof Type	North	North	South	South	West	West	US	US
Roof Trusses	54.14%	65.38%	52.66%	48.65%	74.80%	82.36%	58.23%	61.82%
Rafters	45.45%	34.37%	46.66%	49.38%	24.96%	17.04%	41.27%	37.06%
Stress Skin Panels	0.13%	0.08%	0.05%	0.09%	0.01%	0.05%	0.07%	0.08%
Beam & Purlin	0.28%	0.17%	0.05%	1.28%	0.08%	0.38%	0.13%	0.73%
Other wood	0.00%	0.00%	0.58%	0.59%	0.14%	0.16%	0.30%	0.31%

TABLE 16
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- Trusses made minor gains from 1994 to 1998 at the expense of lumber joists.
- The surprising market is the South where rafters gained market share, possibly due to price and availability issues. SIPs roof market share is worth watching in the roof market as well. Market share gains by this product will primarily reduce truss market share. Using SIPS, roofs become a beam (I-joist, wood joist, LVL, glulam rafter/beam or girder truss) and inset panel market, reducing truss use significantly.

Multifamily Roof Market Share		
% Roof Area	1994	1998
Roof Trusses	70.87%	63.87%
Rafters	28.78%	33.52%
Stress Skin Panels	0.00%	0.02%
Beam & Purlin	0.36%	0.69%
Other Wood	0.00%	1.91%

TABLE 17
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- The decline in truss market share is a surprising result and must be due to the lower cost of rafters and/or the lack of availability of trusses.

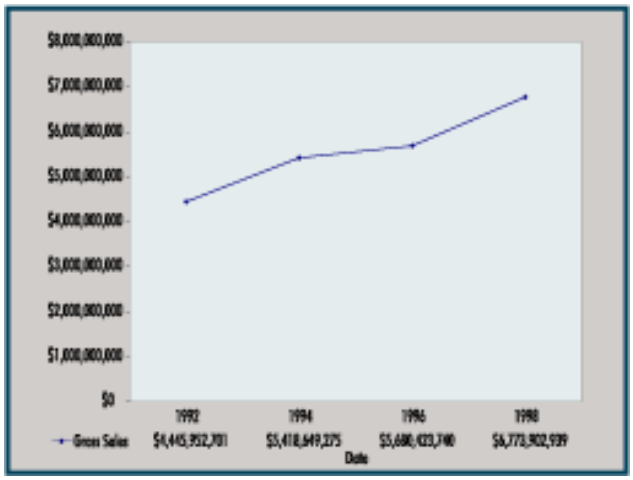
THE MICRO ECONOMIC STRUCTURAL COMPONENT INDUSTRY

Here is what I used to create the component market graphs and data that follow:

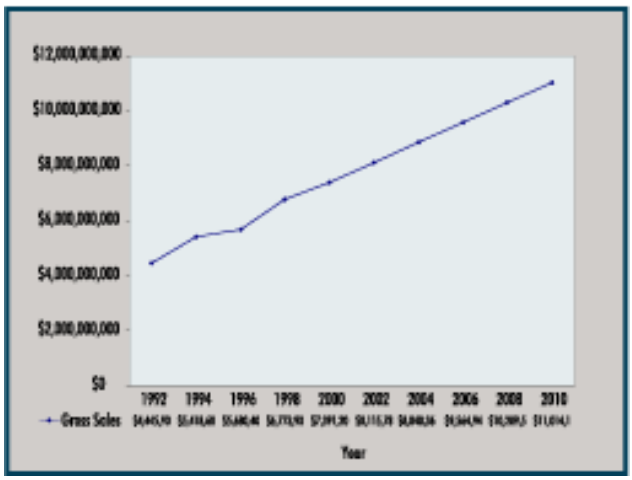
	1992	1994	1996	1998
Under 3 million	55%	58%	55%	49%
3-7 million	40%	28%	31%	32%
Over 7 million	5%	14%	15%	19%

TABLE 18
CLICK ON IMAGE FOR LARGER VIEW

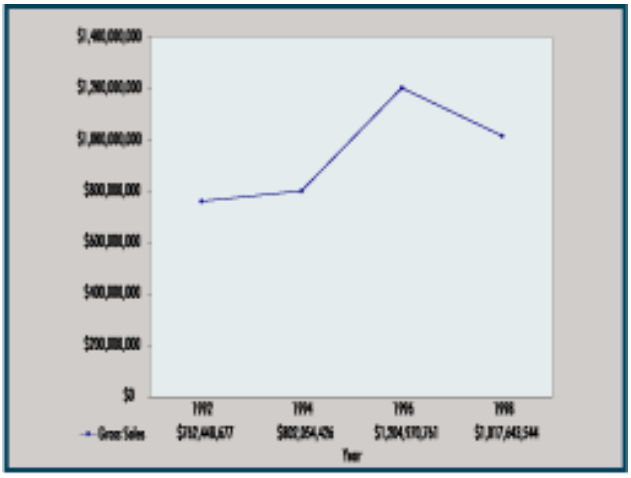
- The Financial Performance Survey Data produced by WTCA. This sample size for this analysis is 119 for 1998, 115 for 1996, 109 for 1994 and 36 for 1992. Obviously, the data for 1992 is the least reliable. For 1996 and 1998 this represents about seven percent of the industry; for 1994, six percent of the industry; and for 1992, two percent of the industry.
- This data was allocated to exactly the same proportions as the WTCA membership, assuming the membership is a fair representation of the distribution of income for the truss industry. The percentages are shown in the table below.
- These percentages were then used to take the average gross sales from each of the product lines to determine the composite average for the industry, as the large members that participate skew the average from the financial performance survey.
- The composite average was then multiplied by 1,700, the total number of truss manufacturers in the U.S., which is mildly conservative as our numbers for the last year based on the *WOODWORDS* mailing list have been 1,730 corporations (2,250 plant locations). This has remained consistent over the last several years.



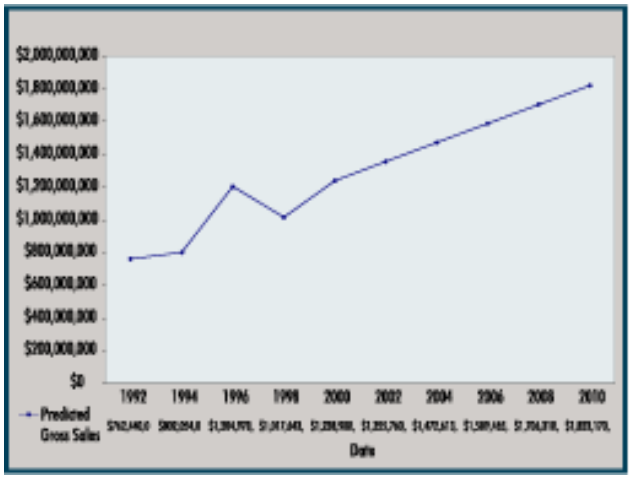
GRAPH 1:
ROOF TRUSS SALES 1992 TO 1998
CLICK ON IMAGE FOR LARGER VIEW



GRAPH 2:
PREDICTED ROOF TRUSS SALES 2000 TO 2010
CLICK ON IMAGE FOR LARGER VIEW

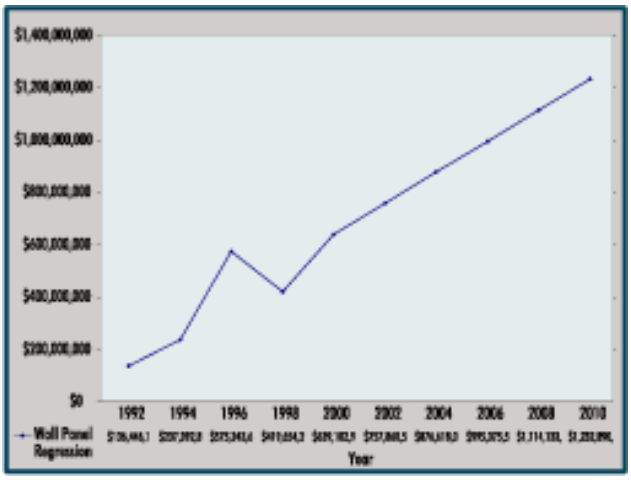


GRAPH 3:
FLOOR TRUSS SALES 1992 TO 1998
CLICK ON IMAGE FOR LARGER VIEW

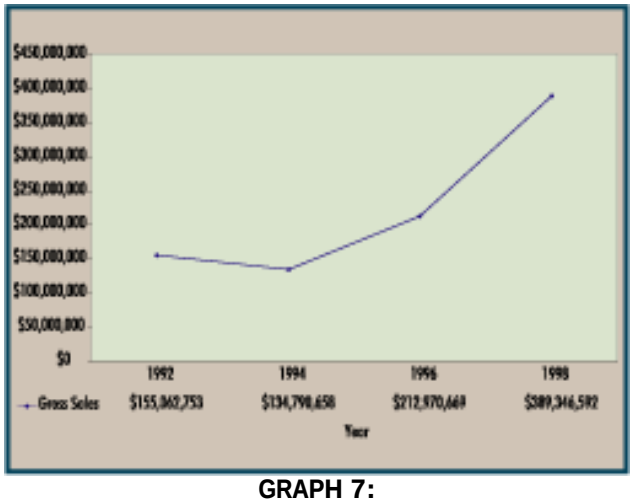


GRAPH 4:
PREDICTED FLOOR TRUSS SALES 2000 TO 2010
CLICK ON IMAGE FOR LARGER VIEW

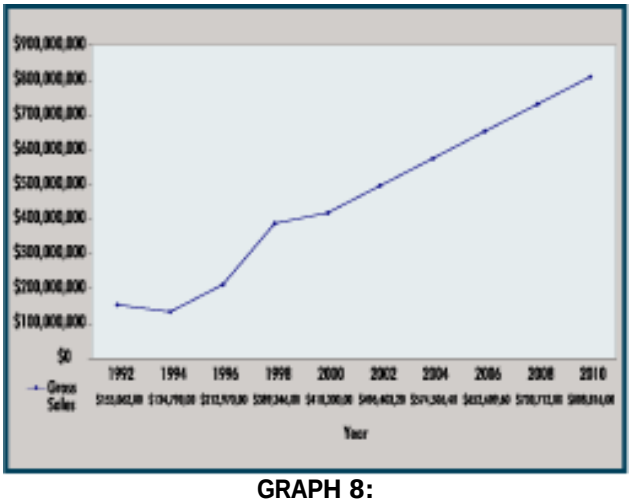
GRAPH 5:
WALL PANEL SALES 1992 TO 1998
CLICK ON IMAGE FOR LARGER VIEW



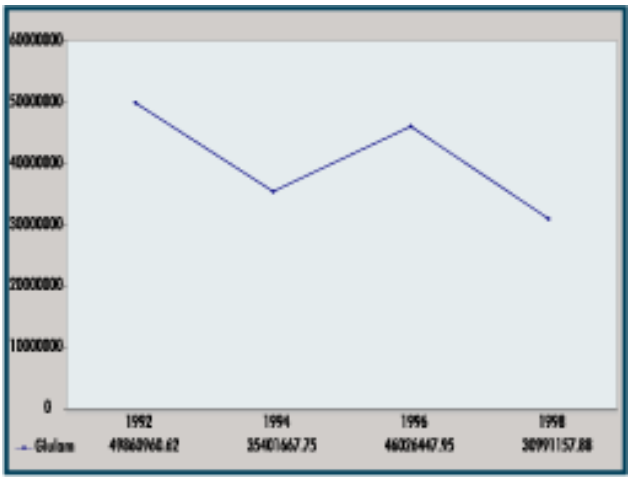
GRAPH 6:
PREDICTED WALL PANEL SALES 2000 TO 2010
CLICK ON IMAGE FOR LARGER VIEW



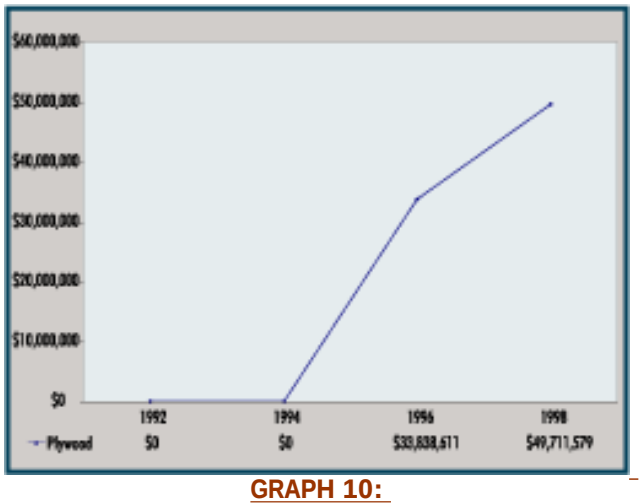
GRAPH 7:
I-JOIST SALES 1992 TO 1998
CLICK ON IMAGE FOR LARGER VIEW



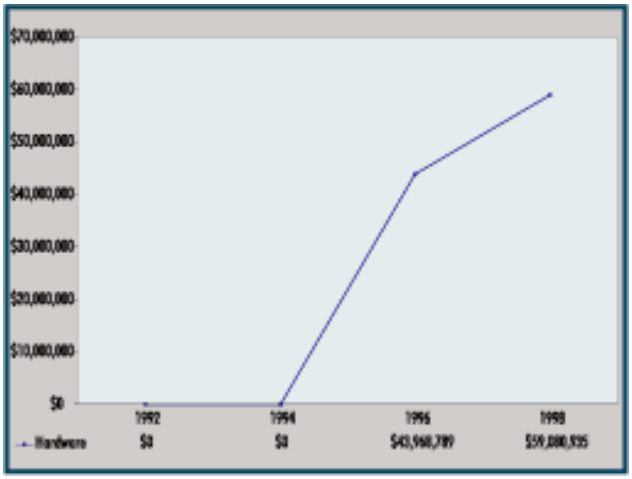
GRAPH 8:
PREDICTED I-JOIST SALES 2000 TO 2010
CLICK ON IMAGE FOR LARGER VIEW



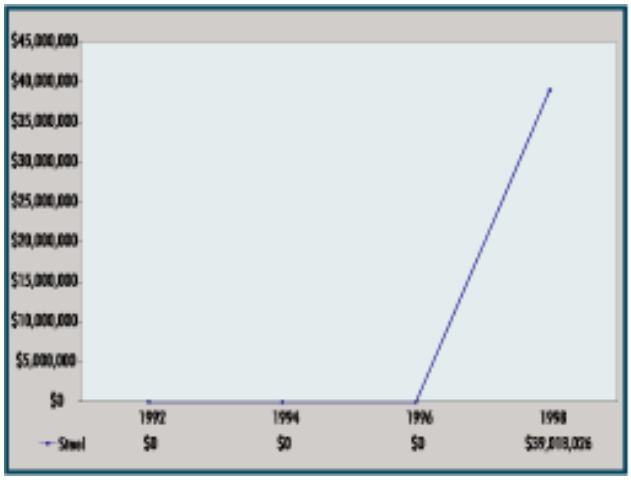
GRAPH 9:
GLULAM SALES
CLICK ON IMAGE FOR LARGER VIEW



GRAPH 10:
PLYWOOD SALES
CLICK ON IMAGE FOR LARGER VIEW



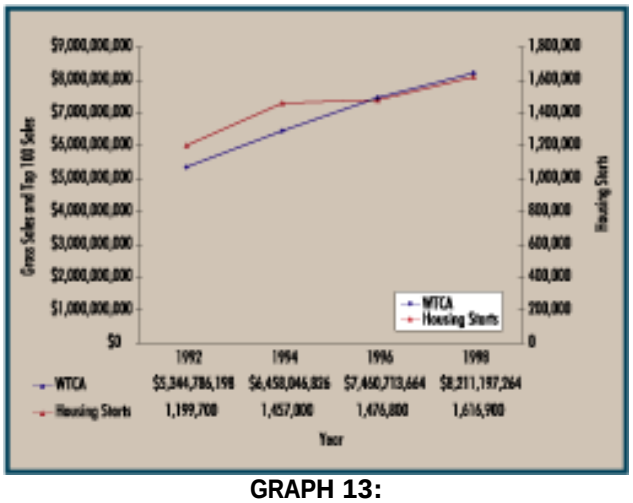
GRAPH 11:
HARDWARE SALES
CLICK ON IMAGE FOR LARGER VIEW



GRAPH 12:
LIGHT GAUGE STEEL SALES
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- These graphs generally speak for themselves and as we add data over the next few years the trends will become more clear. The predictions are based on a simple linear regression of the 1992-98 data. Given this, the prediction accuracy is questionable, but allows us to think about trends.
- Glulam sales are erratic and the declining trend is surprising.
- Steel's growth is quite surprising as well, but going from zero to something will always look compelling.
- Obviously, we did not have good data in the early years for hardware and panel products (in our Financial Performance Survey (FPS) generically called plywood). The accuracy of these figures will improve after we compile the results of our next survey.



GRAPH 13:
TRUSS INDUSTRY REVENUE TRENDS BASED ON WTCA'S FINANCIAL PERFORMANCE SURVEY & HOUSING STARTS
CLICK ON IMAGE FOR LARGER VIEW

<

Observations:

- Graph 13 shows that the structural component industry is grabbing market share. Housing starts are stable and the structural component industry continues to grow.

ESTIMATED COMMERICAL SQUARE FOOTATE - STRUCTUAL ELEMENTS

Million Square Feet of Commercial Floors
1995 Data

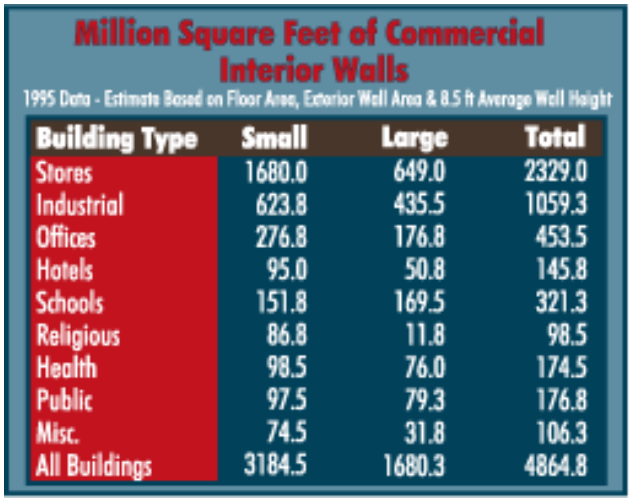
Building Type	Floor Area
Stores	876.0
Industrial	766.0
Offices	334.0
Hotels	103.0
Schools	277.0
Religious	57.0
Health	133.0
Public & Misc.	273.0
All Buildings	2819.0

TABLE 19:
CLICK ON IMAGE FOR LARGER VIEW

Million Square Feet of Commercial Exterior Walls
1995 Data

Building Type	Small	Large	Total
Stores	224.0	259.6	483.6
Industrial	249.5	174.2	423.7
Offices	110.7	70.7	181.4
Hotels	38.0	20.3	58.3
Schools	60.7	67.8	128.5
Religious	34.7	4.7	39.4
Health	39.4	30.4	69.8
Public	39.0	31.7	70.7
Misc.	29.8	12.7	42.5
All Buildings	825.9	671.9	1497.8

TABLE 20:
CLICK ON IMAGE FOR LARGER VIEW

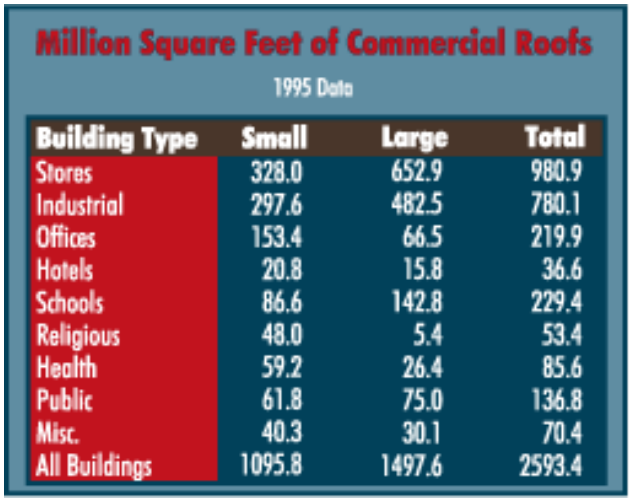


Million Square Feet of Commercial Interior Walls

1995 Data - Estimate Based on Floor Area, Exterior Wall Area & 8.5 ft Average Wall Height

Building Type	Small	Large	Total
Stores	1680.0	649.0	2329.0
Industrial	623.8	435.5	1059.3
Offices	276.8	176.8	453.5
Hotels	95.0	50.8	145.8
Schools	151.8	169.5	321.3
Religious	86.8	11.8	98.5
Health	98.5	76.0	174.5
Public	97.5	79.3	176.8
Misc.	74.5	31.8	106.3
All Buildings	3184.5	1680.3	4864.8

TABLE 21:
CLICK ON IMAGE FOR LARGER VIEW

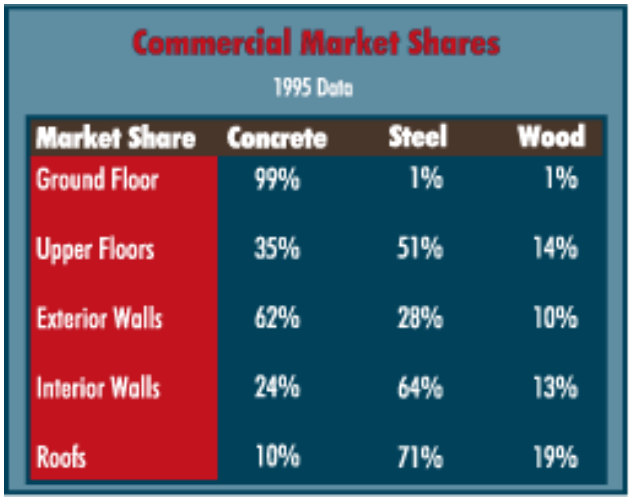


Million Square Feet of Commercial Roofs

1995 Data

Building Type	Small	Large	Total
Stores	328.0	652.9	980.9
Industrial	297.6	482.5	780.1
Offices	153.4	66.5	219.9
Hotels	20.8	15.8	36.6
Schools	86.6	142.8	229.4
Religious	48.0	5.4	53.4
Health	59.2	26.4	85.6
Public	61.8	75.0	136.8
Misc.	40.3	30.1	70.4
All Buildings	1095.8	1497.6	2593.4

TABLE 22:
CLICK ON IMAGE FOR LARGER VIEW



Commercial Market Shares

1995 Data

Market Share	Concrete	Steel	Wood
Ground Floor	99%	1%	1%
Upper Floors	35%	51%	14%
Exterior Walls	62%	28%	10%
Interior Walls	24%	64%	13%
Roofs	10%	71%	19%

TABLE 23:
CLICK ON IMAGE FOR LARGER VIEW

Observations:

- There are great opportunities for wall panelization in the commercial market, whether wood or steel.
- In the non-combustible commercial segment, converting the market to light gauge steel truss use is a huge market opportunity.
- While the commercial market is obviously different than the residential market, primarily due to engineering demands, understanding how this market operates will present growth opportunities for both wood and steel component manufacturers, and, in particular, anyone who handles both wood and steel product lines.

CONCLUDING THOUGHTS

- Our markets continue to be driven by the following factors:
  -Lowest In-Place Costs
  -Cost Stability
  -Construction Cycle Time

-Labor Efficiency
-Labor Availability
-Durability and Quality—No Call Backs

- The above factors will determine which product is used, whether wood or steel. It appears clear that steel's impact in the structural framing market will be driven by cost, improved tools for ease of use, stable pricing and locations where noncombustibility is required. How the lumber industry reinvents the way it transacts business with a focus toward meeting the customer needs listed above will determine the depth of penetration made by steel.
- Obviously, the component manufacturer who innovates around the above factors and supplies the best-cost system is going to prevail in the market.
- The wild card in all of this is labor supply and labor skill. We are consistently losing both each year and this will foster greater component use and grow the industry faster than it otherwise would grow as builders become more familiar with using these products to their full advantage. It is difficult to quantify which of the factors overwhelm the others between labor, housing starts and material costs. All of the indicators we have at our disposal point to labor supply as the critical factor for the construction industry well into the future.

Your association will continue to do what it does well—provide an information support system for the entire structural component industry. In particular, we will continue to work with those companies that really take advantage of the resources WTCA provides. Knowledge is power; and we do have a wealth of knowledge to share in an effort to support and grow the structural components industry. We are convinced that those who are actively engaged with our association have a distinct competitive advantage in the market. By working hard and working together, we can achieve the goal of making components the exclusive future of framing.

SBC HOME PAGE

The mission of Structural Building Components Magazine (SBC) is to increase the knowledge of and to promote the common interests of those engaged in manufacturing and distributing of structural building components to ensure growth and continuity, and to be the information conduit by staying abreast of leading-edge issues. SBC will take a leadership role on behalf of the component industry in disseminating technical and marketplace information, and will maintain advisory committees consisting of the most knowledgeable professionals in the industry. The opinions expressed in SBC are those of the authors and those quoted solely, and are not necessarily the opinions of any of the affiliated associations (SBCC, WTCA, SCDA & STCA).