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Trends in North American Wood Construction and Products

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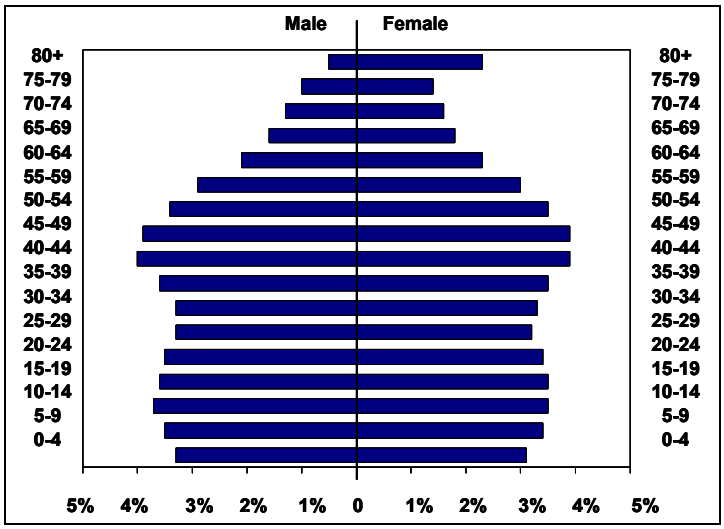
Summary

This presentation focuses on three areas of trends in North American House Construction: 1) Trends in consumer demand; 2) Trends in residential construction; and 3) Trends in building products and materials. The focus of this presentation is the US market due to its relative market size and economic dominance. Demographics and global business trends towards consolidation and increased efficiency drive many of the changes in all three areas discussed.

Trends in Consumer Demand

Demographic factors drive much of consumer demand and can not only explain the past but help predict the future. The following demographic pyramid shows the US population (predicted to be 296 million) by five year age class for 2005. The first impression is that this graphic has little resemblance to the traditional pyramid, where large numbers of workers support a small group of retired citizens, but is shaped more like a rectangle. This reflects the declining birth rate, increased longevity and improved medical treatment for the overall population in almost all developed countries. Demographics impact many social, economic and political aspects of society however the focus of this paper is on what demographics will mean to housing over the decade.



Picture 1: Population Pyramid for USA 2005 (UN data)

In the United States (as well as Canada) specific age groups tend to purchase certain types of houses. For example from the ages of 30 to 39 families are formed and children are born creating drivers for young couples and families to purchase starter homes. Once a significant part of the mortgage is paid and the income of the family increases the family moves up and purchases a custom home. Tax laws in the US encourage the maintenance of high ratio mortgages (due to interest deductibility) and shifting towards higher valued housing when moving (due to capital gains tax laws). This housing shift is usually towards a larger house with many of the amenities missing from starter homes. This typically occurs when the adults are aged 40 to 49.

Data (from United Nations and US Census Bureau) indicate that during the next decade retirement and vacation homes will see the greatest growth, a good indication of increased construction of post and beam wood houses. At the same time there will be a decline in both starter homes and a slowing down of the growth and then a decline in custom homes after 2005. The data is summarized in Table 1 where the assumption is made that the age classes noted above will drive housing demand for each of the four different types of houses.

	Starter homes 30-39 yrs	Custom homes 40-49 yrs	Vacation homes 50-59 yrs	Retirement homes 60-69 yrs
95 - 00	-4.3	13.2	24.1	1.0
00 - 05	-7.2	6.4	19.7	14.5
06 - 10	-1.2	-4.0	13.4	24.6

Table 1: Change in Demand by House Type (based on USA age class)

Therefore while overall housing starts are expected to remain stable at 1.5 – 1.7 million starts per year (or 1.8 – 2.0 million starts including HUD mobile homes) the make up of these starts will shift from starter homes and even custom homes to vacation and retirement homes.

Vacation homes tend to use a lot of wood for both construction and finishing. Many are constructed using post and beam (a.k.a. timber frame) techniques. They are often customized from basic plans and are constructed using factory built components that are then assembled on site. This facilitates construction in terrain which lends itself to recreation but is sensitive to inappropriate building methods. Design and construction of vacation homes tend to focus on natural beauty and low maintenance since the occupants do not reside in the house full time.

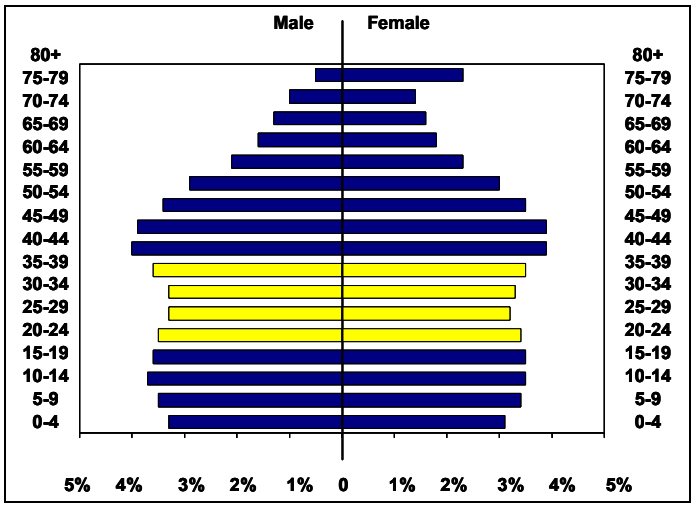
Picture 2: Vacation homes

There will also be growth in retirement homes which span the range from low maintenance, small apartments or condominiums to renovation of existing structures to facilitate aging in place. These two different approaches are both popular and create opportunities for different types of building materials, products and systems.

The general trends in consumer demand for housing and building products is towards more customized products for the growing demand for vacation and retirement homes. Wood will have a major place in both structural and architectural applications for its performance and environmental characteristics but its growth in use will be predominantly due to its aesthetic appeal.

Trends in residential construction

Trends in residential construction are also impacted by demographic factors. A shortage of skilled labour over the next decade will accelerate the trend towards increased automation of the house construction sector. This shortage is highlighted in yellow in the accompanying population pyramid. This will drive a shift towards more factory built building components. This trend will be exacerbated by the litigious nature of business, and particularly building materials, in the United States.



Picture 3: Population Pyramid for USA 2005 (UN data)

Litigation and an increasing number of lawsuits are driving builders into using materials and building systems with known performance characteristics. This performance must be able to be proven in a court room. Absolutely consistent quality and performance are required. This contributes to the trend towards increasing use of engineered products as substitutes for more variable natural lumber products as well as the automation of the construction process to minimize human error. It should be noted that automation of residential construction is not the same as prefabrication of buildings. It refers to the production of building components in a factory setting. The use of I-beams instead of solid wood lumber for floor joists is a simple example of the automation of the construction process since I-beams require no cutting or fabrication on site just installation. Panellized wall sections and pre cast concrete basement floors and walls are more sophisticated examples of this automation. Automation encourages assembly on site and changes the role of site construction rather than replacing it with manufactured or modular housing. This type of automation facilitates customization, a key customer requirement, more readily than prefabricated structures.

An additional result of both demographics and the litigious nature of construction in North America is an increased impetus towards consolidation. Only very large homebuilders can afford both the technology and the insurance premiums necessary to build houses in the United States today. In some States house builders cannot find third party construction insurance (often due to mould issues) and must be large enough to be self insured. In addition size is very necessary to have the ability to borrow sufficient funds to purchase and hold large tracts of land during the multi-year process necessary to develop raw land into lots suitable for house construction.

Currently in the United States house building has few “giants” but several companies are expanding at a tremendous rate. The largest US firms shown in Table 2. These firms, while building over 20,000 houses per year each have only a small share of the overall house construction market. This leaves substantial room to grow as each of the top five firms has experienced annual double digit growth for several years.

	# units	Sales in $millions	% of total starts
Centex	**26'060**	**7'757**	**1.5%**
Lennar	**23'889**	**6'029**	**1.3%**
Pulte	**22'915**	**5'560**	**1.3%**
DR Horton	**22'772**	**4'728**	**1.3%**
KB Home	**21'486**	**4'574**	**1.2%**
Largest five builders			**6.5%**

Table 2: Largest U.S. House Builders 2001

The increasing power of the largest homebuilders combined with growing automation is leading to the emergence of a new supply method for building materials using long term contracts to supply consistent quantities of building materials at fixed prices. This supports the trend towards consolidation in the wood products industry as larger and larger producers of wood products are needed to supply the larger and larger house building firms. This trend mirrors what has already occurred in Home Centers which is dominated by large retail chains supplied by building material giants.

Consumer demand for more customized houses (along with materials and products) along with more consistent performance is resulting in the adoption of mass customization in house construction, particularly in the United States. Mass customization uses mass production technologies and efficiencies to produce personalized products for individual customers at a price competitive with a mass produced product. The adoption of this technique will enable the large house builders to automate building construction using flexible manufacturing techniques to meet the needs of the growing segment of the wealthy baby boomers looking to build both vacation homes and retirement homes. A large homebuilder in the US now uses pre-cast concrete slabs to construct a perfectly square basement that is designed for each house. This enables the builder to construct the top two floors using structural insulated panels and results in a high quality, custom designed houses. This mass customization contributes to some of the trends in building products and materials, the third section of this paper.

Trends in building products and materials

While there are numerous trends in building products and materials the most significant is the substitution of materials and products and an increasing number of material and product choices while at the same time the supply chain flattens and consolidates.

The flatter chain reflects a power shift from limited supplies and suppliers to the large retailers/builders as representatives of the final consumer. The power shift from suppliers of scarce resources towards the purchasers of an oversupplied commodity from a global supply basket has resulted in significant changes for building material suppliers. They must not only supply the actual physical product but also become an integral part of the value chain often adding service attributes along with the physical building materials and products. This service can include many non-performance attributes such as square edged lumber, delivery of small and mixed lots, JIT (just in time) delivery to the job site, special wrappings and fixed pricing. There is increasing integration and communication between the building material and product supplier and the builder with the large builder holding more power than in previous times.

One result has been an explosion in new products to better satisfy some of the consumer and builder needs outlined in previous sections.

One family of new products that has been embraced by the North American building community has been engineered wood products. There has been widespread substitution of engineered wood products such as I-beams, laminated veneer lumber, and structural insulated panels for solid wood. In addition steel studs have captured significant market share for interior wall supports and concrete slabs are taking market share from wood framed floor joists. One impact is to reduce wood use per unit area and stabilize wood demand despite a booming housing sector concurrent with a global oversupply of solid wood construction materials. Innovation, cost and value added will determine the profitable suppliers of wood building materials and products in North America.

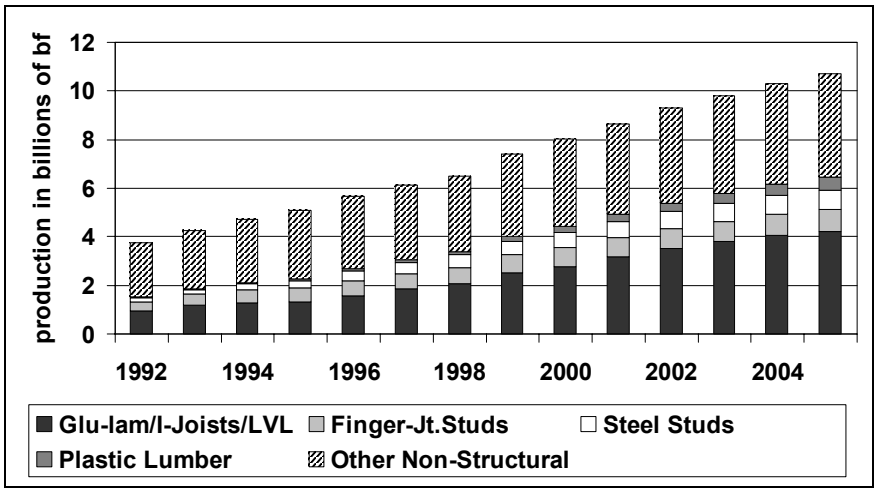


Figure 1: Growth in Use of New Structural Products in USA (from Taylor's Wood Markets)

Substitution has been rapid and wide spread. Some of the more notable substitution trends are noted below. I-beams now support over 40% of the floors (by area) in new residential construction in the US. Only 15 years ago their use was so low that it did not get reported. There use has drastically reduced the market and price premiums for wide dimension lumber previously used for both roof rafters and floor joints. Oriented strand board (OSB) has captured over 50% of the market share for wood panel use in new construction from plywood while only 20 years ago their production was negligible. Substitution has also been occurring for both non-wood and wood/non-wood products. There has been increased use of steel studs for non-bearing interior wall supports.

There are also some newer products starting to capture market share from wood products. Structural insulated panels (a sandwiched panel made with OSB with a foam core) are growing in popularity replacing both 2 by 4 and timber frame housing. Wood cement siding has been replacing wood and wood panel siding throughout the nineties. Wood plastic composites are continuing to capture market share for decks and other outdoor construction replacing chemically treated wood. While wood has maintained a high overall market share for construction it is losing ground to other, often less environmentally friendly and more costly, materials. Much of this substitution contributes to the shift towards automation of the construction industry and a shift into more factory construction of building products with assembly on site.

Summary

While many of the trends in North American wood construction and products have been discussed there are three key points to remember. These are:

- Demographics point to increased construction of vacation homes and retirement housing creating some unique opportunities for high value, aesthetic wood products;
- There will be increased automation, consolidation and (mass) customization of the construction industry, particularly in the US partially fuelled by demographics, and,
- Continuing material and product substation will create both new threats and opportunities to suppliers of traditional and new building materials and products.