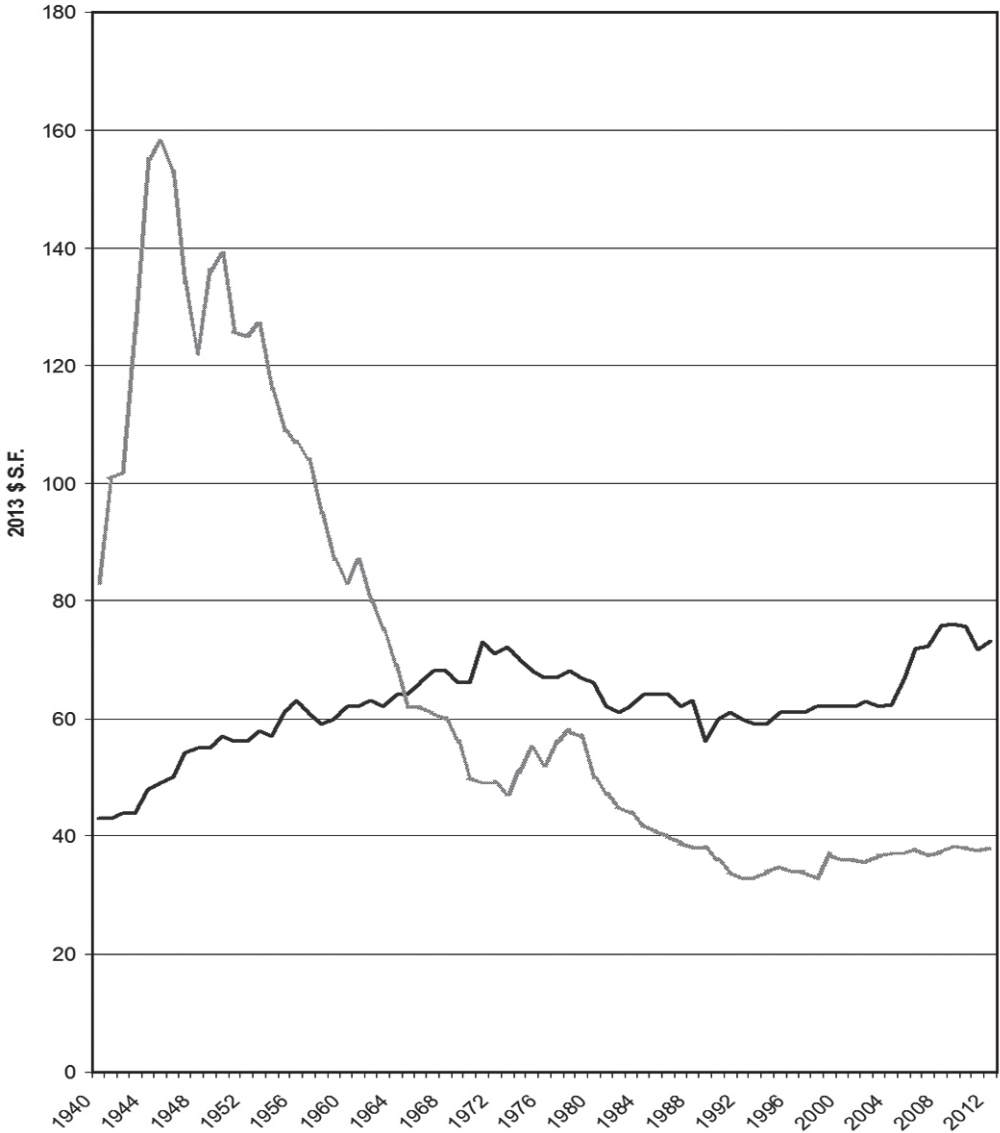


# DUELING CURVES **The Battle for Housing**



The cover has a polynomial version of this graph, both in 2013 dollars, summarizing the duel in question. Manufactured housing's learning curve, coming out of the blue to take on conventional stick built housing, the giant whose learning curve is so old it's going approximately nowhere.

The battle is fought over the cost and value of housing. Conventional "low cost" stick built houses, represented by the black line, creeping ever upward. The contender is "manufactured housing," whose learning curve brought the cost per square foot downward, until it's now about half that of the stick builders, with quality improving all the way.

So ... we have a new champ? Nope; no winner yet in sight. Efficiency is just part of the equation.

This book is the story of all that, including suggestions for moving forward with the challenge of industrializing America's housing.

# **DUELING CURVES** **The Battle for Housing**

**By Bob Vahsholtz**

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Dedicated to  
the generations of  
Mobe Men (and too few Women)  
who took on giants, and won

## **Acknowledgements**

This book would not have been written but for a casual conversation between David Funk and my wife, Marge, that led to renewing my life-long passion for factory-built housing. It would not have been possible without many mentors including Bob Richardson, John Slayter and Jack Fraser. It would not have been worth writing without the industry leadership that persisted over so many years to keep those factories humming and supplying good homes for people, against overwhelming odds. And a special salute to two women who did so much to help get these pages shaken into shape. JoAnne Heeg, daughter and wife of mobe men, who entered my life as our teenybopper secretary 45 years ago and never gave up on the mobes; and my wife Marge, who once again set aside so many other priorities to help with this project.



# DUELING CURVES

## The Battle for Housing

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## Foreword

Sometimes a book appears at the right time written by the right author. *DUELING CURVES, The Battle for Housing* is such a book and Bob Vahsholtz is such an author. Manufactured housing is at a crossroads, and in this book, Vahsholtz spells out why, and suggests what can be done.

Manufactured housing's production level has reached lows last seen around 1950. Industry share of the single family housing market was a third of the total in 1973, but has since eroded to just seven percent. In many ways it appears to be an industry on life support. Nonetheless, conditions point to an industrialized housing renaissance—a dire need for affordable housing, growing desirability for efficient, sustainable homes, and a continuing awareness that construction efficiency has been best achieved in a factory setting.

Through the years there has been no lack of commentators setting their sights on factory construction as housing's ultimate frontier of efficiency, but lacking a clear understanding of how that potential can be realized. There's also no shortage of conventional home builders who incorporate more and more pre-fabricated components, yet fail to improve housing productivity. Manufactured housing's advantages have been clearly demonstrated, but explanations for its recent malaise have been piecemeal and rare—until now. This book's central theme is how learning curve created manufactured housing's success, and how that process was stymied by housing's inherent and compounded volatility.

Bob Vahsholtz has been on his own learning curve with manufactured housing since he bought his first home—a truly mobile, used, 160 sq. ft. California-built unit as an affordable option for his family during a deployment to Alaska. Educated as an industrial designer, he saw potential and sought out manufactured housing as a vocation. After finding a design position with a leading manufacturer in the industry's Indiana home base, he bought a new mobile home right off the production line—just one other member of the office staff of 62 lived in a mobile home. He went on to head the largest design staff in the manufactured housing industry. Subsequently Vahsholtz and an engineer friend formed the industry's leading design and engineering consulting firm, specializing in modular systems. The team grew and ultimately became operational, successfully managing a huge modular manufacturing facility as a division of Bethlehem Steel.

Vahsholtz's evolving career coincided with the glory years of manufactured housing, where from 1960 through 1973 the industry's production rate quintupled, selling prices plunged, quality matured and profits soared. When it all collapsed as a result of American housing's inherent volatility, he held a variety of positions including hands-on factory operations, as well as head office responsibility for design, engineering and manufacturing. That heady rise and catastrophic fall provided author Vahsholtz a first-hand look at what is possible—and what is not. That education, from the school of hard knocks and unanticipated consequences, equally informs Vahsholtz's analysis of the

industry as an alternative interconnected, mutually dependent housing system. It all adds up to a credible overview, explaining how the industry got to where it is today, the potential that remains, and a veteran sage's context for finding a way forward.

*DUELING CURVES* provides thoughtful answers regarding what went wrong, and a viable prescription for the future.

A house is a simple thing, but the housing industry is highly complex and surprisingly inefficient. Manufactured housing is also complex—far more than just factories that build houses. It's a web of suppliers, assemblers, retailers, financiers, transport systems, community developers and set-up teams coordinated by specialized leaders, managers, designers and engineers. All of these components have come together to create a housing system far more efficient than the traditional stick building process. Until recently, none of the industry's segments played a dominant role, nor was any company or group in a position to apply strategic planning to the overall manufactured housing process.

As a consultant and as a corporate strategic planner, inside and outside the industry, much of Vahsholtz's career involved synthesizing pieces of information into coherent business strategy—thinking critically about the unique challenges and ultimate requirements for sustained success. With broad exposure to the entire manufactured housing process, he came to understand the critical role of leadership at both corporate and industry levels. Too tight a focus on management alone effectively blindsided otherwise exceptional companies.

*DUELING CURVES* shines light on an overlooked area of enduring business success—the evolution of efficacy and innovation through strategic feedback that leads to continual product improvement simultaneous with reducing cost—learning curve. Understanding that process and its potential is critical reading for those in operations, management, and leadership roles in all branches of industry.

Manufactured housing serves as a useful context for examining the benefits and challenges of learning curve in practice. From 13<sup>th</sup> century homes designed around open hearths to the failure of Edison's housing venture, the improbable success of Sears kit homes, right up to the cutting edge factory-built homes of today, *DUELING CURVES* provides a critical history of housing. That history is fascinating, and has broad applications, but does learning curve matter moving forward? Indeed, will the manufactured housing industry be relevant in the years that come? Vahsholtz eloquently and systematically builds the case that the potential is there. A solid foundation has been laid. Ultimately manufacturing efficiency must surely prevail against long-standing housing handcraft traditions. Whether success is at hand or awaits future attempts depends upon the current industry's ability to seize the opportunities that abound.

The recent financial crisis and ensuing fall in home prices served to release some pressure on a long term and frightening decline of affordable U.S. housing. Other economic ills such as a shortage of employment opportunities served to draw attention away from the plight of low income families seeking housing. For decades, there has been an affordability gap, with the bottom 40 percent of households increasingly unable to afford U.S. housing prices. Housing incentive packages were abused, are essentially gone and housing prices are headed up. New home prices continue their upward spiral in both price and size. The bottom 40 percent of families, with an upper income level of \$40,000, is increasingly excluded from the housing market. Credit standards are tight and as existing, distressed for-sale homes are worked through the system, options for the working poor diminish further. Rental affordability is near an all-time low. Stick builders are not focused on housing the bottom 40 percent, but manufactured housing has the potential to satisfy that huge market.

In his research, Vahsholtz found that the learning curve that is inherent in competitive factory production created manufactured housing's edge during a period of strong hous-



ing demand. But that great strength has been eroded by housing's volatility—those wild market swings that have always been a major factor in attaining efficient housing production. Stick builders have always faced that kind of volatility and found ways to cope. Manufacturers are still learning and devising methods of smoothing the production cycles. Manufactured housing's cost advantage over stick builders endures. Despite losing 90 percent of its peak volume, manufacturers emerged with their quality improved and price advantage intact.

Affordability is not the only ace in the manufacturers' deck. They provide good jobs for ordinary Americans and build homes at unmatched efficiency in use of materials. In addition to their price advantages those homes are green, creating minimal production waste, while providing efficient and ergonomic living space and optimum energy efficiency. Such factors appeal to today's small families, retirees on limited incomes, the baby boom generation and millennials desiring a transitional, sustainable, small-is-better housing paradigm.

Vahsholtz began this book with a desire to demonstrate the power of learning curve but with some pessimism about the future of the manufactured housing industry. His research, however, affirmed the industry's immense potential today, and serves as a call for strategic thinking, leadership and united action to move forward. Success will not be attained through a bold breakthrough, but rather the hard work of incremental innovation and application applied to specific markets and niches that play to manufactured housing's strengths. The industry's consolidation around a small group of dominant and efficient manufacturers is identified as the prime cause for optimism. Leadership potential exists in the form of Clayton, Cavco, and Champion. In addition, smaller companies such as Blu Homes can explore windows of opportunity for continued development of learning curve and innovation. Today's environment of focused manufactured housing competitors holds promise of evolving strategies to attract new markets, distinguish itself from stick built competitors and lead the way toward affordable and attractive housing for all.

Read to understand learning curve, and for a history of manufactured housing, but be prepared to come away inspired about the future of factory-built housing and a blueprint for getting there.

David L. Funk

Director, Baker Program in Real Estate and

Cornell University



## Introduction

Why hasn't housing made the tremendous advances over the past few decades that, say, the automotive, aircraft, medical and electronics industries have? Well, it may be that housing is carrying thousands of years of social, political and cultural baggage that these other industries need not cope with. Sure, there have been hundreds of technical advances with what we attach to a house, but not so much in how we create a house.

One sector of the housing industry that did see significant growth, as well as meaningful technological and process development, was mobile homes in the 1950s and 1960s. During that period our author was intimately involved with the design development of this product, and with the people and companies that made it happen. As such, he brings us a unique perspective on the who, why and how this strange concept came to be and where it might be going. Later as a principal of the nation's leading industrialized housing consulting firm, he had the opportunity to grapple with the generally futile efforts of our largest corporations to industrialize the housing process.

Using learning curve theory, he puts forth a convincing case that the mobes had it right the first time and remain viable today. We only need the kind of leadership and savvy management of the early years, but without its fragmentation, to once again mass produce affordable housing.

John Slayter

*Retired from 50 years with the mobes and mods*



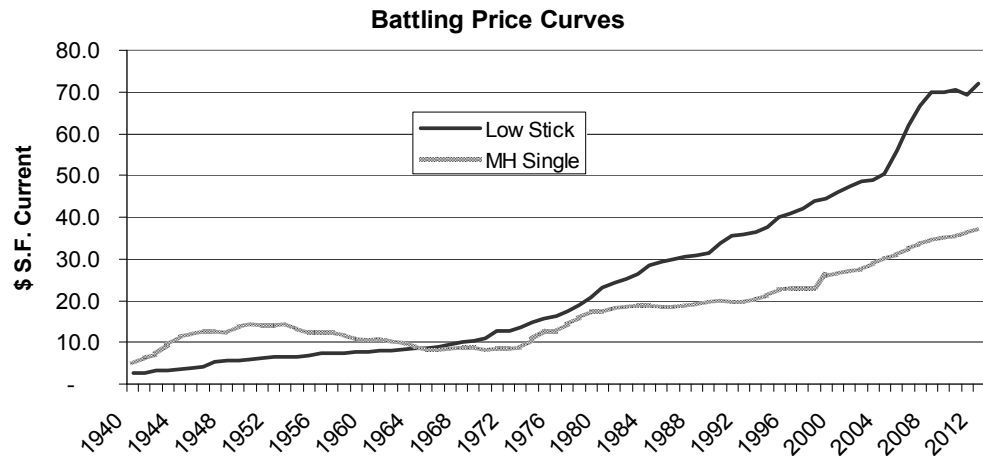
... the idea of business isn't to make a lot of money; it's to stay alive. ... Relative to that, I'd advise any company, no matter how big your ideas, to start small, borrow as little as you can, and grow with the capital you earn. There's a lot of learning involved in going into business and you can't race that process. If you grow with the capital you've earned, that just about links the speed of your growth to the pace at which you're learning best.

John C. Crean

# 1 The Battle for Better Housing

This is a wonderful time to be in the housing business, for those who thrive on challenge. If you're of the entrepreneurial sort, consider manufactured housing as your field. Yes, that's a small corner of the housing world and yes, it's widely disdained, but therein lies the challenge—the great opportunity.

Let's scale down that rosy looking cover graph right here, this time in current dollars, followed by three others to sum up the situation.

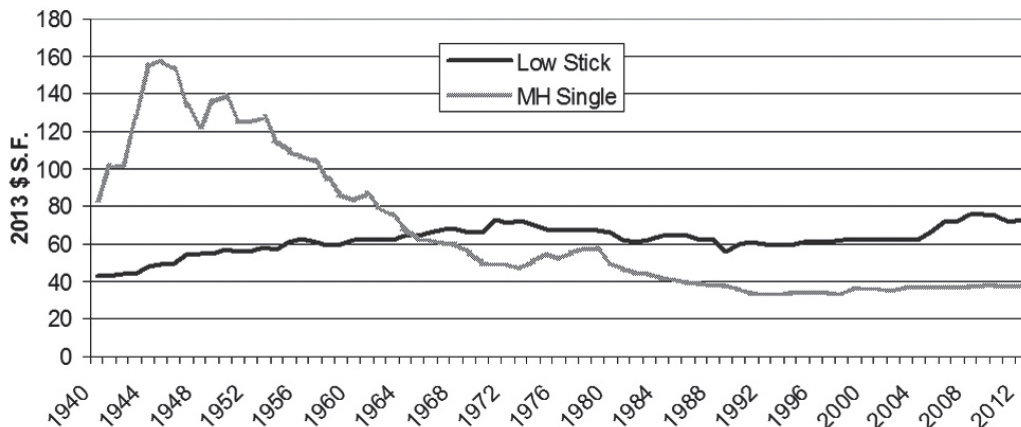


The black line is the construction cost per square foot of a “low-priced” 1,500 square foot conventionally built house over the years. The gray line is the retail cost per square foot of an average size and priced single section MH (manufactured home; aka mobile home), over the same period. Looks rather positive, doesn't it? Well, it represents a fine accomplishment. <sup>1</sup>

But the battle is far from over and victory is not in sight. Let's look at that same information from a different perspective. Below, the same data is converted to constant 2013 dollars, as shown on the front and inside cover, as a scaled up graphic.

<sup>1</sup> The stick cost component is based on data from the 2006 and 2012 *National Building Cost Manual* by Gary Moselle, assuming a 1,500 square foot “low cost” conventional home. The manufactured housing (MH) data is based on the average single wide statistics from the Manufactured Housing Institute (MHI) and the Mobile Home Manufacturers Association (MHMA).

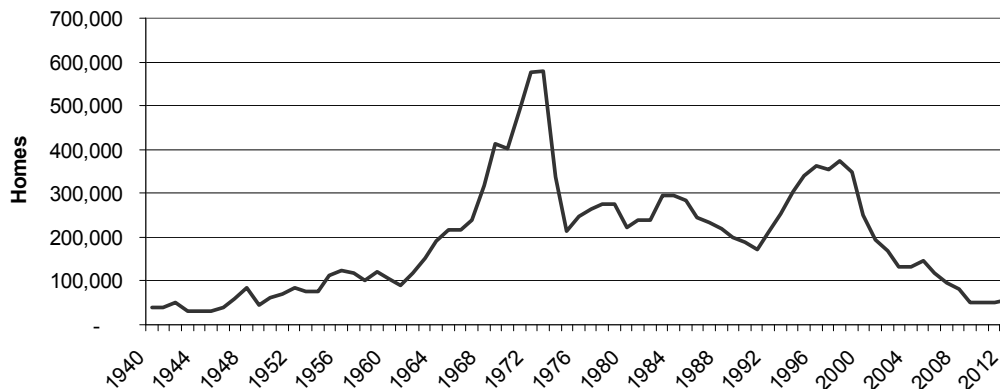
### Battling Learning Curves



This graph, the data behind the cover graphic, just clears away the fog of inflation, showing that the “real” cost per square foot of stick building has nearly doubled while the cost of manufacturing a home, once the housing target was in focus, plunged, and has now reached a plateau that’s well below the competition.

Manufactured housing traces its roots back to travel trailers, decades before 1940. They were small, simple boxes on wheels intended for vacation travel and camping. Lousy housing and expensive, per square foot. But they were shelter, and during WWII trailers were pressed into service for a mobile work force. Some people found them cozy and after the war, with the housing shortage continuing, demand stayed high. Trailer builders sprung up everywhere and brisk competition brought the prices down and sizes up. By 1970 mobile homes cost less per square foot than conventional houses and were fully equipped. That’s the progress of manufactured housing that both graphs depict. The sort of thing that occurs with unfettered free enterprise taking a fresh approach and competing against a staid giant. Meanwhile, the cost of conventional housing crept upward a bit faster than inflation.

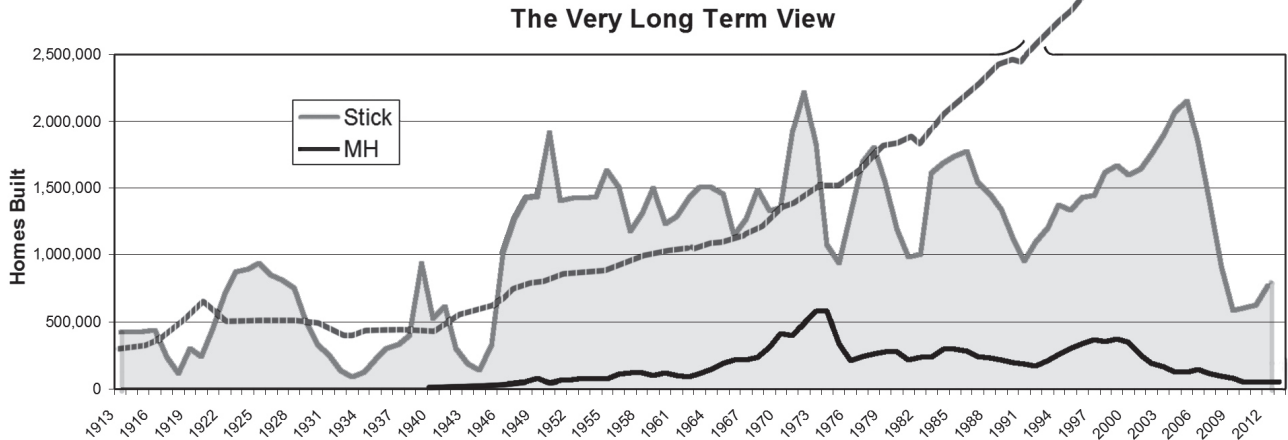
### MH Shipments



As the lines on the first two graphs crossed in the sixties, manufactured housing was in its glory years. That proved too good to last, as shown by this graph. How come? Exploring that question is the prime purpose of this book, but following is a quick peek.

In the seventies, manufacturers were in the process of adopting a national housing code under the auspices of HUD, which (it was hoped) would put mobile home financing on a par with the stick builder’s product. A gut-wrenching change in the midst of a market cut in half. It never really recovered. That resurgence in the nineties was largely illusory, propped up by bad paper and promises, as was the whole housing market.

Housing progress is hampered by the extreme volatility of the housing market. In good times, people upgrade. In bad times, they stay put. In the sixties, mobile homes were a hot item. As manufactured housing hit its peak, so did that of stick builders. Then the whole housing market collapsed. The following graph depicts the remarkably erratic history of American housing production over the past century.<sup>2</sup>



That, in brief, is where we find ourselves. Little David and his trailers took on Goliath and his McMansions, and knocked him for a loop. But Goliath got back up, and both contenders wobbled back to their respective tents, totally unprepared for the even bigger trouncing they both experienced in the past decade. Much of this book explores questions posed by the long term view summarized in the preceding four graphs:

- *Why does home building no longer track GDP growth?*
- *Why did home construction triple after WWII?*
- *And then, why did housing demand still have room for a whole new industry, manufactured housing, to approach the total volume of the prewar stick builders?*
- *Since housing now trails so far behind GDP, shouldn't there be a shortage?*
- *If there is a shortage, why has home construction been so volatile?*
- *How did the MH industry survive and thrive in early decades despite housing's volatility?*
- *After such a great start, why did the growth of the MH industry collapse into a pattern similar to that of conventional construction?*
- *Why did the recent MH housing collapse precede that of the stick builders?*
- *Given all that, including the most recent and biggest housing collapse, is the nation now faced with a shortage—or excess—of housing?*
- *Assuming a market for low cost homes, why has manufactured housing, the low cost producer, retreated to a shadow of its early success?*

Little David's not-so-secret weapon is learning curve. Unencumbered by the hoary rules and prejudices of "how we build houses," Li'l Dave simply found a better way, and mastered it. Those five smooth stones were preceded by a whole truckload of 'em used for target practice. Davey has some stones in reserve, but he's caught Ol' Goliath's attention. The big fellow is learning to duck and hide behind the walls of bureaucracy.

<sup>2</sup> It is difficult to find data in context over long periods of time. These are from various sources and include estimates. In this graph, manufactured homes are overlaid on, rather than added to, conventionally built homes.

Let's turn our attention to what we mean by "manufactured housing." Seems simple enough. Houses built in factories, as opposed to on the site where the home will reside. Well and good, but that's an all encompassing term that has been shanghaied by one branch (albeit the largest), of a surprisingly broad industry. What to call our product has never been clear. Don Carlson, publisher of *Automated Builder* magazine, estimates that some 90 percent of American single family homes have substantial factory-built content. Let's summarize the range based on his housing definitions.

**Custom Builders** specialize in built-to-order homes that are generally expensive and architect designed. A product of skilled craftsmen, this category of housing is the driving force of the upscale wing. Their manufactured content is small. Their impact on housing fashion is large.

**Production Builders** are probably the largest housing category, and they cover a lot of ground. Some build huge tracts, while others put up just a few homes per year. What they have in common is the use of significant quantities of prefinished materials, purchased cabinets, trusses and the like. Their use of factory-built components reduces time in the field, and cost.

**Panelizers** have been around for a long time and used to be called prefabbers. They supply wall, ceiling and floor panels to production builders, as well as small scale operators. Computer aided design has allowed them to emerge from the old cookie-cutter prefab image and produce house packages virtually customized to each owner.

*The homes in the above three categories are typically defined as "stick built," though many have masonry veneer.*

**Modular Homes** are built similarly to the above, but 75 to 90 percent of the construction happens inside a factory. The modules emerge in three dimensional boxes defined in size by shipping regulations and in general, two or more are joined together on site to construct single family or multifamily homes.

**Manufactured Housing**, the main subject of this book, originated nearly 100 years ago as trailers that could be towed behind an automobile and used for vacation shelter. Next thing you knew, people lived in "trailers" year round. That created an image of shelter just a jump up from tents and cardboard boxes. In the forties the larger units became "House Trailers." In the fifties, a stigma became attached to the "House Trailer" moniker and the industry started calling their product "Mobile Homes,"—"Mobes" for short. They weren't very mobile. Few moved from the site selected by the first owner. In the seventies, with the adoption of the HUD Standard, it was agreed that the name would change again to "Manufactured Homes," a name that's been slow to catch the public's fancy. Within the industry, the product is often referred to as "HUD homes" to distinguish them from other homes that are manufactured. "Park Models," tiny "RV mobile homes," have now come along. In Foremost's 2012 survey of more than 10,000 MH residents, 52 percent identified their dwelling as a "mobile home." Eighteen percent called it a "trailer," while a comparable percent referred to theirs as a "double wide" (twice that many actually were multi section units). Only eight percent called their place a "Manufactured Home." "HUD home" got no measurable mentions.<sup>3</sup>

It took about 30 years for "Mobile Home" to catch on and 40 years later, efforts to replace it must be deemed a work in process. The name of the product keeps changing, fueled by committee and anti-stigma efforts; attempts to be politically correct and definitive. Clarification does not emerge. In fairness to those leading the charge, the product itself is evolving at a breathtaking pace by standards of the housing industry.

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<sup>3</sup> 2012 *Mobile Home Market Facts*, Foremost Insurance Group.



This book threads the evolutionary maze of industrialized housing from the perspective of Manufactured Housing. Since nomenclature is in transition, we use the handy acronym “MH,” covering both bases. “Recreational Vehicles,” the manufactured cousin still used for travel, and “Modulars” share the same roots and are worthy of their own books, but will be touched upon as appropriate.

**A**s one might expect given wild swings in housing volume, any real systemizing of production has proven difficult. Conventional builders can switch to remodeling, lay off most of their work force or shut down and await the next upswing. Efficient manufacturing of just about anything requires reasonably steady volume. The typical formula for attaining that volume has been to offer the best value in town—be the low cost provider. A reasonable approach, but it can ding any builder’s reputation. It has done so. The “trailer trash” image has harmed the reputation of the young MH industry.

Meanwhile, our nation has become increasingly service-oriented and lost much of the manufacturing edge that served us so well. We’ve tended to price our manufactured goods out of the market. That’s working OK because we can import most material stuff at good prices. But we can’t (so far!) import our housing, and its cost increases faster than inflation. That’s hardly prudent, since housing is such a basic necessity.

Nearly all the approaches to industrializing housing that have been tried over the past hundred years found no success. Only “Manufactured Housing” has so far been proven to consistently buck housing’s cost trend—prices increasing *slower* than the CPI. Manufactured housing has been just one of so many approaches to the challenge, but *this is the one that has proven workable!*

How it works is simple enough. Building stuff in factories works lots better than building it outdoors on the spot where it will be used. And in that factory, everybody can repeat the production tasks over and over until they get very good at them. One might wonder why it took so long to figure *that* out?

The answer to that is not quite so simple. First off, the answer has been apparent for a very long time, and many attempts have been made. But homes are big, awkward sorts of things, hard to move around in factories and down the highways. And when broken down into subassemblies as panelizers do, the “factory” product is just the skeleton. It’s the guts and feathers of a house that run up the cost. Manufactured housing tackles that challenge by building great big housing chunks in sizes and shapes that can be towed down the road and squeezed through bridges and tunnels.

It was that simple concept that created the manufactured housing industry. Starting with rather small trailers and gradually making them bigger and better, industry pioneers used the time-honored process of learning curve to improve the product until it became fine little homes at unbeatable prices and dominated the low cost housing market. The progress of that process is best depicted on Page Two; the upper graph.

Problem solved? Not quite. In fact, not by a long shot. The major obstacle to an innovative housing approach is not cost, but inertia. Housing is a giant industry running on centuries of momentum. You might say more like a culture than an industry, and comparably resistant to change. Not much changes in housing, and yet everything changes over time. *Lots* of time. If you want an idea of how the creaky housing process evolves, read *At Home* by Bill Bryson (2010). Ancient and ponderous traditions create momentum that accepts change only in response to fundamentals too powerful to resist.

The brash young manufacturers showed the housing old timers a thing or two about the cost of building houses, but were put back in their place by bureaucracy. That’s the

voice of housing's momentum that rears its head as NIMBY and says, "We don't want your damn trailers in this neighborhood."

Long aware of that problem, manufacturers have attempted various fixes, to little avail. Any form of low cost housing meets comparable resistance. Perhaps there is no answer? Perhaps we will always build houses on the spot where they're to be occupied? C'mon, we really must do better than that.

It's very hard to convince skeptics with a "trailer" mindset that anything delivered on wheels is a good house. The potential for improving the product while reducing its cost has barely been scratched. The bigger challenge is to create an image to equal the quality of the current MH; to get past the market's perception. We must create a fundamental advantage too powerful for housing's momentum to resist. "Wow, how can I get one of those for myself?"

In this book we'll see how industrializing the housing process has resulted in producing economical and rather pleasant housing for millions, has been doing so for decades, and consumes no tax dollars in the process. It's important to understand though, that housing factories are a small part of the solution—and the overwhelming majority of them fail. It's a precarious business, dependent on a whole range of variables; yet when it works, good housing rolls out and profits roll in. We'll focus on what works—examples of success—as well as what's wrong. All are key components of the process that has been the driving force of manufactured housing.

**O**ur opening example is a housing producer that did a lot of things right and yet got hammered attempting to overcome the momentum of the housing establishment.

Way back in 1944 a Missouri company set out to produce a basic building material focused on supplying the South Central region of the U.S. The company prospered and became a major force in its region. With the postwar housing boom, their plant expanded and grew more sophisticated, keeping pace with demand while remaining competitive. A typical American success story.

A couple of decades later in the late sixties, a crunch came. The now-aging plant was running flat out, supplying a market that remained brisk, but profits were thin due to increasing competition in what had become a commodity market. Though strong regionally, they were up against major producers of comparable products having national marketing power.

With the old plant at capacity and the estimated cost of a new one making poor financial sense, what was to be done?

The board of directors decided on a management shakeup and brought in a new CEO; an engineer. The new guy quickly saw that the estimates for a new plant looked reasonable but unaffordable, and the company's future did indeed look bleak. He set out to see what could be done to increase the old plant's capacity.

A major bottleneck in packaging had not been resolved because prior management had deemed the cost of doing so excessive. Chipping away at the estimated cost, the new CEO managed to install some affordable upgrades. As expected, that saved a bit of labor, though not enough to earn a good payback. The important thing it did was clear the bottleneck, allowing the rest of the production line to run faster.

Seeking out the next bottleneck, he applied necessary tweaks to resolve that, too. And so forth through the whole works. Within a surprisingly short time, the old factory was spitting out material at twice its previous "capacity," earning fine profits with no increase in labor.

The new man was a hero, yet the fundamental problem remained. In that commodity market, building new branch plants seemed unwise, and the future remained clouded. What to do?

At that time, modular housing was a hot new industry and the second home market around that area looked promising, so he investigated, and invested a chunk of company capital in the modular potential.



The modular system was designed to enable production of a wide variety of cottages utilizing standard cores and low cost site labor.

With the help of industry specialists, a system of modular homes was developed, using a combination of modules and site construction. A brand new state-of-the-art plant was built to capture the nearby cottage market. It was, despite the great potential, an immediate failure. Restructured to build less glamorous modular housing, the new housing plant soldiered on, but the joy was gone, profitability did not come, and soon the former hero who'd bet on that sparkling opportunity moved on.

Why did that attempt at innovative housing, like so many others, fail? It was a good product, the target market loved it and the price was right. The little homes were well built, the new enterprise properly financed and the market was excellent.

That company's rocky attempt at diversification was not due to problems inherent in manufacturing or modularity, which might have been a good diversification. The company was simply up against a much larger challenge than its management could possibly anticipate. Dumping the housing venture, it went on to continuing success. The gigantic housing market welcomes competition, and kills them with kindness. It's like a high school freshman at a college dance. He or she might be welcome, but cannot truly participate. It just isn't done. It's a culture problem; a long-standing custom having enormous momentum.

The further down any learning curve's tail, the harder it becomes to rock the boat with new ideas and approaches. American housing is a formidable, albeit congenial, foe of innovation. Just ask 'em; they've tried everything and "know" that fundamental change is not possible.

Of course housing innovations do happen, all the time. Mostly they're minor refinements that sneak in from outside; contributed by suppliers and the like. Real innovators who come along (as they frequently do) tend to assume that all that's needed for success is the right product at the right price. 'Tain't so, and this book will spell out why significant housing innovations so rarely work—and the kind that sometimes do.

The modular plant cited above is a typical example of the usual, and fundamentally flawed, approach. Trying to do too much, too soon. It's an honest mistake that has been, and continues to be made, over and over, and not just in housing. Probably a genetic

flaw in humankind. We've seen so many "breakthroughs" in our nation's short history that we assume brilliant insight is the road to success. Often it is—when exploring poorly charted territory. Not so much when taking on well established competition and a market dominated by aged culture. Thumbing one's nose at long established traditions tends to get one tossed out the side door.

Everybody knows "breakthrough" stories. They're celebrated events that generate big gains in a hurry. Science is full of "Aha!" moments, as when Einstein got breathtaking insights by creating a picture in his mind. Science history, business history—all history—is filled with eureka breakthroughs. Perhaps because they make good stories. Perhaps because they're celebrated and have happened so frequently that people—in particular, Americans—are programmed to wait for their "ship to come in." And if it doesn't? Oh well, darn. Back to the drawing board. One survey asked people if they'd have enough money to fund retirement. "Yup," most answered. And where would it come from? One popular answer was "winning a lottery."

Suppose Steve Jobs had gotten an architectural degree from Stanford and chosen a career in housing. Suppose, with his brilliant mind and great design sense, he'd concluded houses should be built in factories, and spent a few years designing an Apple house, with a bit of help from Steve Wozniak. Do you suppose he'd have been able to get any housing company to put it into production? Nah. But suppose he did find someone willing, and it proved a dandy house at a great price. Do you suppose it would have changed the housing market? Nah. Same goes for Bill Gates. Perhaps you disagree? This book will change your mind. Creating brilliant breakthroughs in computers or any new field is a whole different ball of wax from innovating in housing.

Many fundamental management lessons can be boiled down to that Missouri engineer's original plant strategy. First, take something that works and make it work a little better. When you've accomplished that, take another step in the same direction—forward, always forward. If you make a mistake (and you will), correct it before moving ahead to the next step. Never bet the ranch. Never try to manage more than you can handle. Keep everything under tight control and take one more step forward. Never sit still. That's learning curve.

It seems simplistic and slow, but it can be surprisingly fast and the surest way to reach a reasonable goal. With its housing experiment written off, that material company went on to continuing success in its field of expertise.

Second, avoid that same engineer's mistake; becoming enamored of the green grass across the fence. There are those who believe "management is management" and transcends industry boundaries. That can be true, but there are limits to such portability. Good management practices can be adapted to another industry or business culture. But transferring business *experience* to another company can be tough sledding—far harder than it looks. Compound that by launching a shiny new enterprise into an industry that's firmly entrenched and hotly competitive, and it gets lots harder. The new gal on the block with her clever idea, if successful, tends to be the immediate target of the vaunted "establishment." The bigger and older the barons holding the reins of power, the tougher to make a successful breakthrough with something new.

Yet Schumpeter's "Creative Destruction" is alive and well. Adapt or die. The high and mighty industry giants' great defensive weapon is their momentum—the rules of the game that favor the established player. *Their great weakness is also momentum.* They

Even the cleverest of breakthroughs too often fail to pay off. One of the great inventions of the world was the cotton gin, and Eli Whitney got the patent. But it was easy to copy and too many Southern customers simply built their own gin and thumbed their nose at the Yankee inventor's royalties. Persisting, he invented the idea of mass production using interchangeable parts to make rifles, winning a huge contract with the U.S. government. The idea was great, but he didn't allow time for learning curve to work, and nearly all the weapons were built by hand, using the old-fashioned methods. And they were delivered eight years late, with the profits wasted fighting to protect his gin patents.

find it awfully hard to change “the way we do things around here.” Those ways are vulnerable to a clever and careful end run by nimble competitors.

Massachusetts Institute of Technology and Cornell University have both been hotbeds of advanced thinking about housing. Burnham Kelly taught at both and became dean of the College of Architecture, Art, and Planning at Cornell from 1960 to 1971. A driving force in the area of industrialization of the housing process, at MIT he wrote the following preface in 1959:<sup>4</sup>

*The production of houses is a tremendously complex business, and no single aspect of it can be mastered without taking into account its relationship to the rest of the process .... We hope to suggest the directions that offer most hope to the innovating entrepreneur and to deal with the difficulties that stand in his way. Such an analysis may help impatient executives in other fields understand why the field merits study, and why the turn of a screw here and the adjustment of a knob there will not immediately result in masses of fine new houses at vastly reduced prices.... The old ways cannot prevail much longer. Thus the question is not whether there will be changes, but only when and how.*

And at the tag end of the book:

*... the makers of mobile homes have all but eliminated site operations, and this, plus the fact that the mobile home is not treated as a piece of real estate, has almost entirely freed it from the shackles binding the rest of the industry. Here, almost alone on the housing front, the materials and methods of modern industry are in general use.*

Kelly’s book attempted, like this one, to point out the roadblocks and perils of innovation in housing. Both books also celebrate the boundless potential for those having the fortitude to find a way through the bureaucratic morass and see it through to success. Of all the industrialization opportunities Kelly’s book outlined, only mobile homes attained the potential he envisioned. And the road ahead remains hard. Things move slowly in the giant and dozy housing industry, and more storms will surely come, but consider them as opportunities. The neat thing is, decrepit industries like housing abound in opportunities. Manufacturers have established a strong foothold; carved out a parallel housing system that has been proven to work and holds the high ground on production cost.

**Y**our humble servant, this writer, is an industry old timer—a certified geezer. I chose this industry as a mere sprout, and if I were young, I’d do it again. I didn’t read Kelley’s book until 55 years after it was written, but I should have. If you, the reader, are in this industry—if you are, or plan to be—in a position of influence, lucky you! Before moving on please look back to that top graph on Page Two, the right side of the graph. Note that manufactured housing is now on the long tail of its learning curve. Does that mean we’re doomed to the little niche carved out so far? Heck no! Learning curves mature and fade away. New ones are born, though it’s more difficult at maturity. The one illustrated by manufactured housing is just one new and rather successful curve on the long learning curve tail of the housing industry. Hitch up your pants and carve out a new one! This book will provide plenty of clues for building your own. And why not make it a big one!

The next chapter shows how a couple of guys did just that, taking a learning curve approach to manufacturing homes, without even knowing the meaning of the word.

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<sup>4</sup> *Design and the Production of Houses*, Burnham Kelley and Associates, 1959

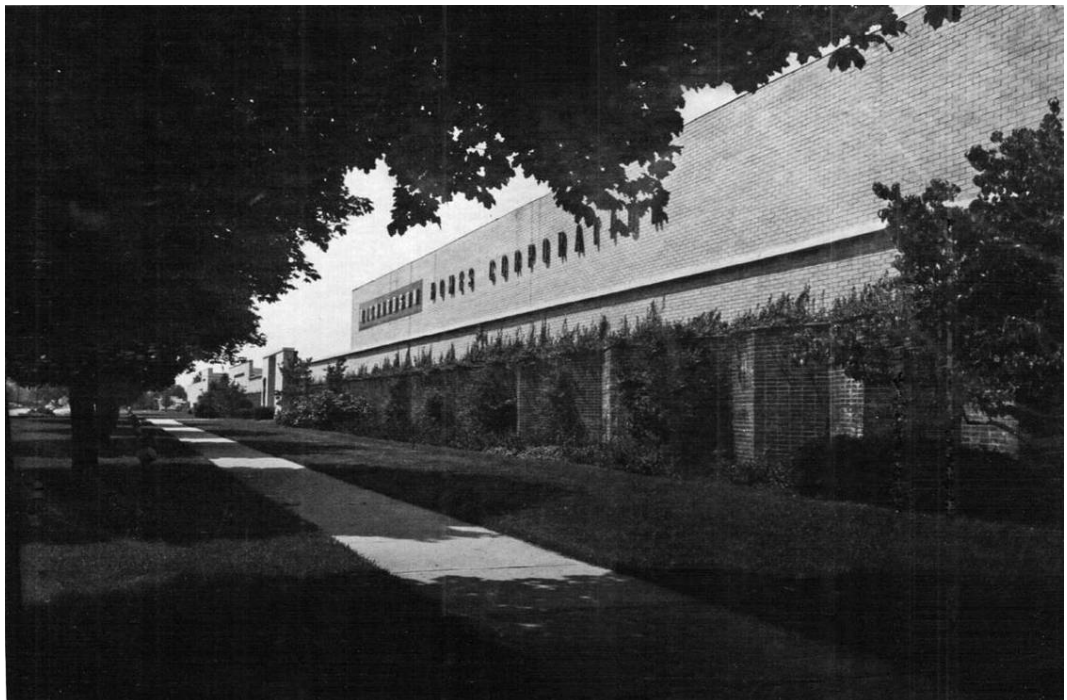


*[In 1950] Cliff made a complete product switch. He discontinued the low cost product. Copying the competition, he built a beautiful mobile home, with expensive exterior ... 47 feet long, eight feet wide, it wholesaled at \$3,750.<sup>5</sup> It was gorgeous. He introduced it in the Chicago show ... [to our] 63 dealers. Five days later when the show closed, he had only 33 dealers left. ... He decided we'd better stay in something that we knew how to do.*

*Bob Richardson, 1965*

## 2 Leadership and Innovation: An Example

Unless you frequent old mobile home parks, you've probably never heard of Richardson Homes. It was one of hundreds of manufactured home companies that came and went over the history of the industry. The rise and fall of Richardson Homes Corporation (RHC) was comparable to many of its competitors, yet unique in its own way. It's an excellent example of how learning curve worked during the prime growth years of manufactured housing.



The facade of the Richardson factory in Elkhart, Indiana, about 1965.

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<sup>5</sup> A significant premium—five or ten percent—above the competition.

Things were tough on the eastern Maryland shore a hundred years ago. Especially so for a kid with a limited education in the early part of the 20<sup>th</sup> century. At 15, Cliff Richardson was selling shoes in Salisbury, Maryland, and looking for a better opportunity in the big city of Baltimore; a challenge he was ready to take. Within a year he was appointed manager of one of Baltimore's larger men's shoe stores. Several years later his fiancée and her family decided to move to South Bend, Indiana. Her parents, liking Cliff, suggested he join them there. He did. Shortly thereafter, his fiancée died.

It was the early twenties and the automobile industry was growing rapidly. Elkhart and nearby South Bend had been the site of many auto manufacturing plants and still had lots of dealers retailing various brands. A great opportunity for an experienced salesman. Cliff applied at the local Hudson dealer and within six months was their top salesman.

By 1928 Cliff had made enough money to start his own automobile sales company. Richardson Motor Sales was formed and soon became northern Indiana's premier used car outlet. Then October of 1929 brought The Great Depression. Three years later Richardson Motor Sales was in bankruptcy. Seven years later all debts were repaid and his good reputation sustained. Cliff had become sales manager of the DeSoto-Plymouth dealership, remaining until 1939 when he opened another used car dealership. He kept that business until 1948—just in case!

In 1926 Cliff and his wife Florence had their first and only child; a son Robert (Bob) who showed an independent streak from the beginning. At age ten he was a substitute paper boy. At age 12 he had his own newspaper route. By 14, he had two. He was so independent that he refused gifts from his parents, except on Christmas and his birthday.

By the time Bob was 16 in 1942, WWII was on and he was working in factories after school. One was Schult Trailers, Inc., an early maker of factory built homes, building manufactured houses for workers at the Oak Ridge, Tennessee, atomic bomb manufacturing site.

In the spring of 1944, and with high school completion only a few months away, Bob enlisted in the Army Air Corp; the Cadet program of officer training. Like many other young men during those war years he had visions of flying a P-51 over Europe. By the time Bob had completed basic training though, he observed that his drill instructors were also cadets who'd been waiting up to 18 months to take the next step before the next phase of becoming commissioned officers and possibly pilots. Forget any thoughts of flying P-51's. The air war in Europe was winding down and President Truman's decision to use the A-bomb soon brought Japan to surrender.

The Army needed occupation troops and offered a one-year overseas tour. Bob could not imagine ever having another opportunity to see Europe, so he re-enlisted in October of 1946.

Prior to going to Europe, a family death called Bob home to Elkhart. It was then that Cliff suggested an idea, "With all the men coming back from war, the automobile business should be good, but it isn't. Too much demand and too little supply. I have tried to get a trailer dealership, but every manufacturer I have talked to is sold out for the next two years. To hell with them, I'm going to build my own."

Then he laid out his plan, "Here is what I have in mind: I know you're going overseas for a while, but I think I can get a company started, and when you return, if I am successful, you can be part owner." Stunned, Bob asked, "Just what do you have in mind?" Cliff's reply, "I have \$2,000 I'm ready to invest. How about you adding \$900 for a 30 percent ownership?" After some serious soul searching, an agreement was reached.





Richardson Plant Number One.

During the next two weeks both Richardsons went searching for a building, equipment and supplies. They rented the old garage pictured left for \$35 a month. For machinery they bought 4<sup>th</sup> and 5<sup>th</sup> hand Craftsman and other brands.

Now to find people who knew how to build these things. Cliff had sold cars to lots of men returning from service who had previously worked in local trailer factories. A few became the nucleus. Bob left for Europe.

Cliff rented two other small buildings. Partially completed trailers were hauled around from building to building, eventually to a paint shop and then to another building for final finishing. Richardson Trailer Mfg. Co. Inc. was immediately successful, but for financial security reasons Cliff hired a car sales manager and didn't phase out the used car business until 1948. By the time Bob returned in late October of 1946, Cliff was producing three trailers per day. In mid-1946 they purchased four acres of land and a new 40' by 60' Quonset building became the principal factory. One out-house provided sanitary facilities. They built 185 trailers that first year—1,000 by 1948.

The two entrepreneurs added no capital beyond that initial \$2,900. Until Bob bought out his father's interest in 1959 and borrowed money to build the giant Richardson plant, all growth was from retained earnings.

When Bob rejoined the company on a full time basis he chose to spend the first few months learning how to do every job in the factory. The first task was building screen doors, taught by Ray Weldy, whose tenure with the company matched Bob's own.

Postwar 1946 and 1947 were sellers' years. With 15 million men and women returning from military service, the demand for shelter was huge. Some materials were scarce. That didn't bother the dealers. If the trailer was short a window, refrigerator, even a heat stove, the dealer was usually able to find one and happy to pay the manufacturer's normal invoice price. In the case of the Richardson 24-foot trailer, that price was \$1,795.

Those trailers were minimal portable shelter. The first ones were eight feet wide but had only 168 square feet because the first three feet was hitch. No bathroom, one bed, a sofa, a six gallon water heater, a six cubic foot refrigerator, a three burner cook stove, and a small heater. The kitchen sink had a garden hose drain running down through the floor to the ground. This completed the "comfort" amenities.

Hardboard was the exterior covering. The roof was canvas, coated with an aluminum-based preservative. All early trailers were painted Ludington green. Later, pre-painted aluminum made possible a range of colors.

As the sellers' market morphed into a buyers' market, more sales force than just Cliff was needed. A former dealer was brought in as sales manager and gradually three salesmen were added. Three green Chevrolets were purchased for their use. Richardson now had a field sales force.

The first postwar recession struck in 1949. Dealers were having a difficult time and that slowed factory orders. What to do? Cliff had two Hackney show ponies and decided that the company might try building horse trailers. After building 125 of those, another idea surfaced.

People exhibiting their ponies often had no place to relax during the weekend of the shows. Why not incorporate a trailer for two ponies, room for their tack, and a place for the owner to relax, all in one unit? Within a week a prototype was finished. Eight feet wide and 19 feet long, the front looked like a normal travel trailer of the times. The rear had a heavy oak door that hinged down becoming a ramp for the horse to enter. The front 64 square feet featured a sofa, sink, small refrigerator and a closet. Richardson built 45 of those and sold them directly to owners. A predecessor to today's RV "toy-haulers."

Such supplements to regular trailer production allowed survival until the market improved.

In those early years, both father and son were feeling their way into the new venture, always keeping an eye on the competition. Trying to do better was an enjoyable challenge for both. If an idea presented itself, they'd grab a scrap piece of plywood, make a crude sketch and discuss it with the plant superintendent. If deemed practical for production, Cliff and a few employees might stay over and make the change in a trailer already on the line. Cliff was the sales department, so if the idea worked out OK, sometime during the next day all trailers would incorporate the new feature.

Good times continued at RHC but wouldn't last forever. Some sort of advertising was needed, starting with a brochure. Bob enlisted the help of a beautiful young lady—a high school classmate—serving as model. Her job was to stand in the doorway of a trailer and wave. The following year an ad agency was engaged and things were professionally done.

**I**n 1949 a good dealer in Greensboro, North Carolina, convinced Cliff that he'd take all the trailers the company could produce if Richardson would open a factory there. Cliff made a trip to Greensboro seeking a suitable building.

After WWII, the Army had a lot of 60 x 200 warehouses there. Perfect for a small trailer company. Cliff leased one that had previously served as an Air Corps replacement depot. Coincidentally, Bob had been there earlier, awaiting transport to Europe.

Cliff and Bob each put up \$2,500 and a separate company was formed. Bob, not quite 24 years of age, wanted to start up the company and run it until it was firmly established. On April Fools Day, 1950, Bob, his wife/secretary, a purchasing agent, a foreman and one worker from the Elkhart plant, arrived in Greensboro.

One month later the first trailer came off the new line. After that, things did not go so well. Already at that time, the emerging industry was dependent on its Elkhart suppliers. The new plant was 700 miles away and really missed its support network. Then things got worse. On June 20<sup>th</sup> President Truman declared war on North Korea and restarted the Controlled Material Program, grabbing everything needed for the war effort. Before summer's end, Bob packed up, locked the doors, and headed back to Indiana. End of the branch plant venture. Bob maintains he got the equivalent of a PhD education in those few months. Even so, by the time the factory closed it was producing ten units a week and had broken even on the capital investment.

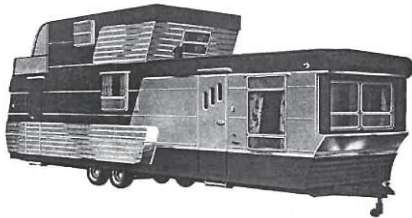
In 1952 Cliff had a serious heart attack. It was many months before he was able to resume his presidential role. Bob became general manager, handling all day-to-day operations. Cliff went into semi-retirement spending much of the winter in Florida, and some

summer months in his home state of Maryland. As senior partner and majority owner, Cliff continued to make major policy and strategic decisions. He also felt free to countermand Bob's operating decisions at will, without discussion. The two strong-willed individuals often banged heads.

A year after his heart attack, Cliff purchased another small Elkhart building and began a trailer company of his own. Eighteen months later he liquidated it. In 1955 he bought five acres of land and warehouse buildings as an investment which he leased to an individual for building mobile homes. That venture failed, leaving Cliff stuck with all those empty buildings.

**B**usiness slowed again in the mid-fifties and Cliff had another idea. A major competitor had built a special—very long—trailer, for display purposes only. It had several startling innovations, including a second story.

The first major Midwest Mobile Home Show was to be held in Elkhart in 1955. There was just enough time for Richardson to develop and show a 35 foot bi-level trailer intended for production, depending on dealer response.



It had a stairway behind the kitchen leading up to a modest bedroom that also featured a sun deck above the bedroom below. While not overwhelming, enough orders (and repeat orders), were taken to carry the company through 1955, producing another record year.

The company had grown. Unit volume was approaching 2,500 a year. Cliff's scattered and assorted buildings (right) made production efficiency elusive. The original concept, starting with no sales and limited funds, was appropriate in 1946. By the mid-fifties it was a huge problem.



Imagine seven small buildings, each having a specific purpose. Trailers were hand pushed over gravel to the next station. A concrete block paint shop was the only substantial building. The rest were of minimal framing with weatherboard exteriors. No blacktop on the entire property. As trailers grew in size, tractors pulled them between buildings. Labor and material handling costs ate a lot of margin and limited production volume.

**N**ext came another good year with sales far outpacing RHC's ability to produce. Being short of production capacity, Bob offered to lease his dad's empty buildings for the summer and fall months. Another record year.

The following spring, Bob, once again short of manufacturing space, rented Cliff's still vacant buildings. Cliff understood that a new factory was necessary and agreed to con-

struction on the condition that the company buy all of his land and buildings. Bob had another location in mind but it was obvious this was the only way he would get his new factory.

Father and son always had a contentious relationship. An age difference of 29 years played a part. Both were strong willed and had different visions for the future. Their differing management styles led to many disagreements. They stood shoulder-to-shoulder however, on governing fundamentals. The importance and treatment of customers, suppliers, and especially employees, were foremost. Honesty, integrity, and sincerity. Pay and collect due bills on time. Persistently look for ways to reduce costs and sales prices. Always try to promote from within. Constantly work to improve manufacturing and product procedures and features. Unsophisticated maybe, but eternally correct rules for good business. And incidentally, fundamental to learning curve.

Reiterating the company's success in his 1965 annual Christmas report to employees, Bob said, "... let's do an even better job next year. Let's spend more money if need be, but let's do it right the first time. We're going to gain a happy retail buyer; we're going to gain a happy dealer. We're going to gain, ultimately, lower cost. We're going to build a better reputation and a good image—quality, quality, quality."

The working relationship between father and son came apart after the 13<sup>th</sup> year. It concerned two things that had been brewing for some time. First, Bob had recently decided to hire a senior employee Cliff disliked and wanted to fire. The man had moved his family to Elkhart and purchased a house. Bob refused, as a matter of principle, to let the new guy go until he'd had a chance to prove or disprove his ability.

In addition, Bob deemed it necessary to have manufacturing facilities that could compete in the growing industry, producing better products at less cost. The days of having a group of inferior manufacturing buildings, separated from each other, made the cost of production too high. The jigs and fixtures used in the old buildings were as obsolete and dysfunctional as the buildings themselves.

Bob's future vision for the company had also become quite different from Cliff's; common when a business changes generations. Cliff's view reflected his experience, including his own bankruptcy during The Great Depression. A building's function, he said was just "to keep the bad weather out." Capital investment should be absolutely minimal. That had been sound reasoning in starting from scratch in a new industry with limited capital. Not in 1958. Also, Cliff had built a modest net worth and, at age 61, wanted to turn his real estate investments into cash.

In 1957 a fellow called from New York, "How would you like to participate in a TV show called *The Price is Right?*" It was a popular show at that time, starring Bill Cullen.

"Fine, what do we have to do?"

"Give away a mobile home."

Gulp. The company had a tiny ad budget, and the \$3,000 cost of the trailer, including delivery and setup for the winner, was a lot of money. Still, the show had an audience of 20 million.

"OK, we'll do it!"

By the time the project was completed, the investment was \$20,000, including the case of beer per day paid to the young switchblade toughs who guarded the home against damage during the time it was parked in front of the NBC studio in New York. Richardson felt they received two million dollars worth of product exposure; a pretty good deal.



Bob and Cliff break ground for the new factory.

In contrast, Bob expected at some point to sell Richardson to a large company that would share his vision and provide the capital to expand opportunities for all Richardson employees. He looked beyond mobile home manufacturing, ultimately hoping to vertically integrate. That is, include manufacturing, outstanding retail sales operations, and appropriate home sites, including financing of each phase. Accomplishing this on a national scale would require lots of money and talent—more than Richardson alone could expect to provide.

The factory would be the heart of such an organization, and Bob wanted the image, as well as the reality, of stability. The central factory he envisioned would provide a sense of personal pride for his family, the community, employees, dealers and suppliers. Fundamental to satisfying such conditions was the ability to produce profitably and sustain growth.

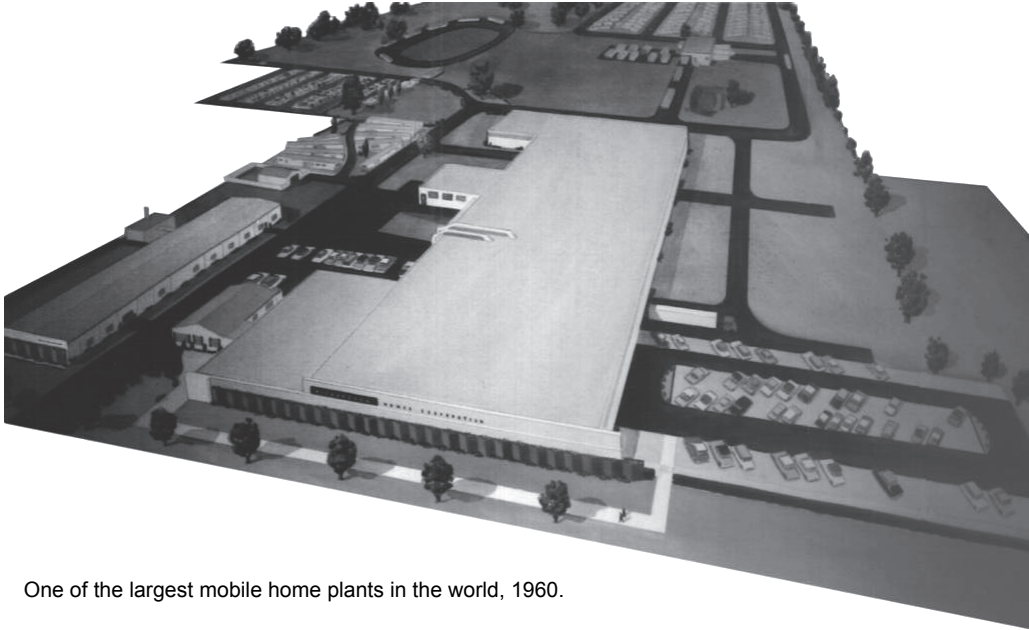
Cliff did not share Bob's vision, and Bob no longer shared his father's. Discussions triggered outbursts regarding "such damned foolishness." Cliff's rear-window outlook was, at the time, more common in the industry than Bob's view of the future.

After intense disagreements on such matters, Cliff called Bob into his office one morning in September of 1959. His remarks were crisp, "You and I have had our last business argument. You have 24 hours to make a decision. Buy or sell." After 33 years with his father, Bob knew Cliff didn't mean 25 hours. He said "24" and that was precisely what he meant. Cliff's terms seemed fair and reasonable. Bob spent the rest of that day and most of the night with a pencil, paper, and calculator. The next day they signed an agreement and Bob owned 100% of Richardson Homes Corporation, along with a huge financial obligation for a young fellow lacking a college education.

The decision in 1958 to build such a large plant, and then double its size six years later, was based on Bob's personal desires. Once he owned the business, he could do what pleased him. Bob wanted a plant that would incorporate the best of material handling, labor saving and cost control. A quality orientation that would inspire the entire office and work force as well as give pride to the community, dealers and suppliers. He wanted growth, but not at the price of being out of daily touch with his people. Bob was a "walking around" kind of guy; at the factory every day at 8:00, walking the floor and making a bit of conversation. He knew every person by their first name, even when they numbered more than 300.

The idea of building such a large central plant when others chose small factories all over the country was a source of industry discussion. As Bob built his Elkhart plant, Skyline, also located in Elkhart, built its first branch plant in Florida. Bob saw that as one way to go and was aware that his factory, running at capacity—a new home every 20 minutes—would be limited to a delivery radius of about 500 miles. He also felt the labor and material savings derived from this plant and his people could conceive, build,

and profitably sell homes within that radius. In due course, branch plants could become an option.



One of the largest mobile home plants in the world, 1960.

The new factory was first class, featuring the best in material handling, equipment and construction methods. Wall fastening, for example, was accomplished by an array of eight pneumatic nailers operated by a single controller, with cranes for moving walls, floors and steel frames. Similar attention was paid to details such as the factory lunch room, recreation equipment, company athletic teams, convenient employee parking and park-like grounds. Employees at all levels were treated well and respected as partners in the enterprise.

Richardson was not the only game in town, nor the only one with a unique strategy. Elkhart supported dozens of competitors. Experienced managers were in great demand, and had plenty of employment options. In those days, a rule of thumb was, four experienced managers with \$25,000 could start their own mobile home business. The Richardson team was among the best. How to hold them together?

Bob called a meeting of his five key managers; production, sales, purchasing, accounting and R&D. Each was given the opportunity to buy into the company at book value.

With the basic team in place, the company was restructured for the future, with an emphasis on building year-round sales, keeping the work force together and quality high. A major thrust was to invest in dealers—not through acquisition, but as partners with a common goal.

Another early decision in Bob's new regime was to invest in research. An early survey reinforced Bob's emphasis on working with dealers. It was found that 82 percent of Richardson's customers had never heard of the brand until told by friends, neighbors or the local dealer. Advertising was redirected to the dealer level.

One of Bob's key managers was head of R&D, a rare position in the industry. An early step had been to hire noted industrial designer, Bill Flajole from Detroit, and assign him two challenges. First was to design the facade of the new Richardson plant, which he did well. Next, redesign the product. That didn't work out so well.

It has always been easy to improve the appearance of a house, mobile or otherwise, and Richardson's product looked much like that produced by its competitors. Such design "improvements" tended to increase the cost of the home, but rarely paid off in the competitive core of an industry.

Flajole was a good designer and he tried, but his design innovations went nowhere. The mobile home industry was a housing system and each manufacturer was a cog in the industry's drive wheel. Flajole, for example, set out to introduce a Danish Modern interior; the design fashion of the moment. But none of the industry's furniture suppliers offered suitable products. The idea was dropped, and so was Flajole.

In 1960, Richardson hired a professional staff designer. The young man was quickly overwhelmed by the same challenges that beset Flajole. Almost any new innovation he suggested was rejected by production, purchasing or accounting.

But not by Bob Richardson. The support of the CEO is vital to any endeavor, and Bob believed in innovation. He was that kind of guy, and more importantly, understood that Richardson still needed a point of difference.

Richardson built good homes at competitive prices. Intensive and continuous value analysis efforts were made, enabling introduction of new features with optimum pricing for the next model year.

Examples of such innovations included simple things like ordering appliances delivered on skids instead of in cartons, loaded into semi-trailers by color in the order called for by the production schedule. Semi loads arrived daily and backed up to the appropriate dock. Refrigerators came out the back and directly to their destined kitchen. Standard procedure today, but innovative in 1959.

Richardson had a powerful purchasing department as well as the industry's leading design department, supporting that huge plant in the heart of the nation's major supplier center.

Richardson was noted for forward product thinking and made constant efforts to innovate. Some examples:

- First-in-first-out (FIFO) inventory for material handling efficiency
- Replacing the traditional folding trailer step with proper detachable triple steps
- An exterior storage unit matching the design of the home that could be shipped inside and set up across from the entry, including a canopy for weather protection
- An early double wide with a folding overhang that Bob believes was among the first
- A "roll-out" expansion room, placed at the rear with a special floor plan to best utilize the extra space in typical mobile home park lots
- Special units such as motels, offices and the like
- A special program targeted at encouraging dealers to develop and serve the rural private lot placement of mobile homes

Richardson's in-house R&D learned to design within the constraints of manufacturing and the materials offered by industry sources. Because of its volume, Richardson worked with suppliers in choosing materials and designs for the supplier's own inventories, yet specifically suited for Richardson's non-exclusive use. That tactic helped get the details right without bucking the system. RHC was able to offer professionally designed and fashionable interiors, which became a company point of difference.



At left, Richardson's lowest priced offering. It came fully furnished as shown, including the pictures on the walls.



Next, the mid-price offering wholesaled at about ten percent more. The gent at the right was one of Richardson's designers. The champagne was not included.



Another ten percent in price bought Richardson's top model—not the model on the sofa. She was the wife of another designer from R&D. As was common practice, she was chosen because her small size helped make the rooms look bigger.

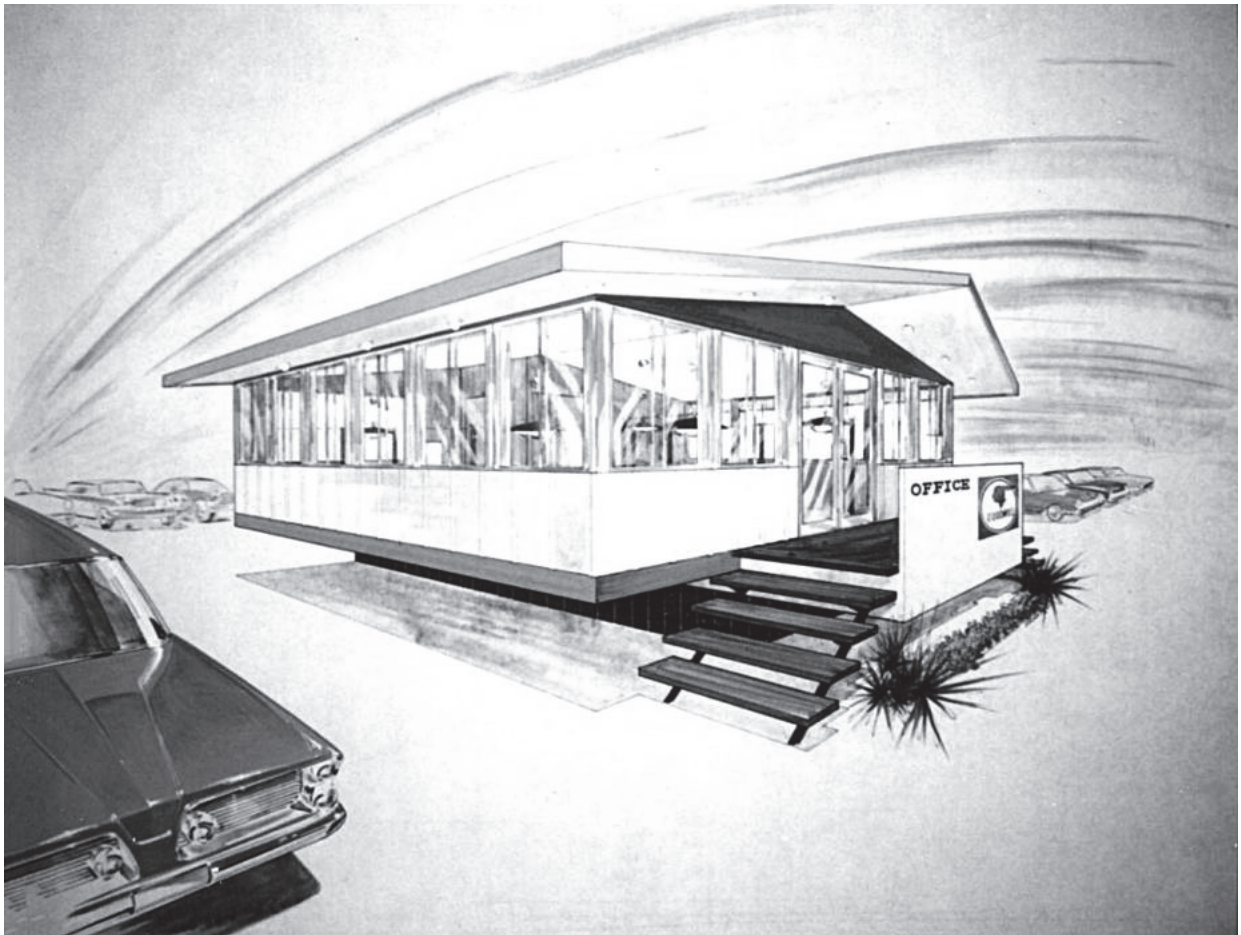


In addition to suppliers, Richardson attracted all kinds of inventors, eager to see their ideas put into production.

A fellow named Huffman proposed the idea of building a sectional home by cutting it crosswise instead of lengthwise. An attractive prototype was built and erected on the plant site for display, but its advantages were outweighed by cost, shipping, dealer resistance and production limitations.

Richardson tried utilizing a mothballed plant to build travel trailers with limited success. That attracted the attention of an inventor who proposed a system that would facilitate expansion of such recreational vehicles at the push of a button. He was provided space and a budget in R&D but never got beyond having some gears and tracks fabricated.

Too bad. Today nearly every RV has such expandable rooms.



Another inventor approached Bob with a system that utilized a patented steel structure that made optimum use of steel. It required no interior partitions and used a very simple and inexpensive foundation. It was put into pilot production as portable offices, but did not attain adequate sales to merit high volume production.

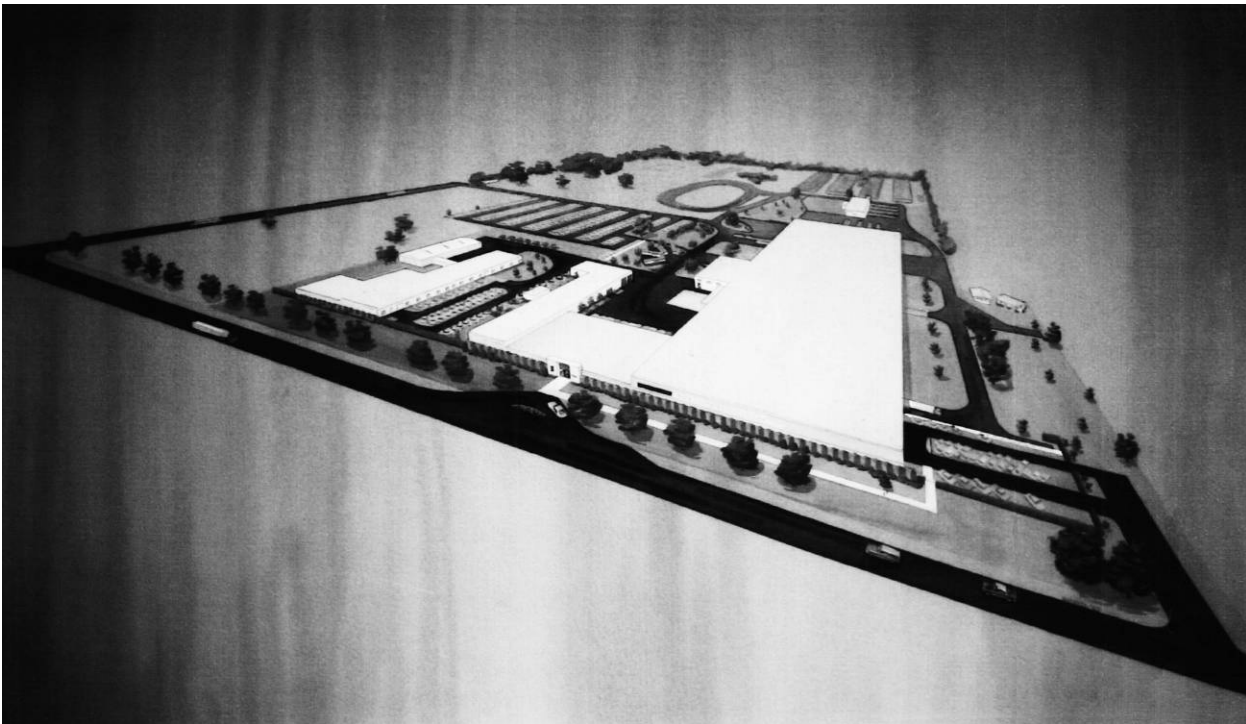
Attracted by such activity, Alcan Aluminum of Canada hired Richardson to develop multi section housing that would be attractive, code compliant and suitable for Canada's climate. Eight prototypes were built in R&D and a pilot production run of 32 homes was completed in the old plant. Bob was offered the opportunity to participate in a joint venture to produce the homes at a purpose-built plant in Canada. He declined. Alcan built the plant and it was operated several years, but was not successful.



Alcan prototypes on their way to Quebec.



Here's one installed on site.



By the mid-sixties, the Richardson plant was doubled in size and had a capacity of up to 40 homes per day.

Innovation in housing has always proved harder than it looked. Richardson's greatest success came from building rather ordinary mobile homes that stood out in their interior design and value offered. By the mid-sixties, Richardson Homes was building some 4,000 homes per year that sold retail on a square foot basis for about 25 percent less than a typical stick built house, but included all appliances and attractive furnishings. The customers were happy, the dealers were happy and RHC had never had a year in which it failed to make a profit.



Bob Richardson speaking to his staff, inside the factory

As a strategy for maximum growth and profit, Bob's plan was not the best. To achieve his objectives, it was just fine. Ultimately the single plant idea was changed, but not until world and government conditions reduced Bob's enjoyment of the business. Tardiness, absenteeism, government regulations, and family health problems weighed heavily on him.

Cliff lived 19 years beyond the sale and saw the company grow in a way he couldn't have imagined. The personal relationship between father and son, immediately after the sale became the best of their lifetime together.

In 1969, an industry consultant who'd worked for Richardson approached Bob with an inquiry from a major corporation interested in buying RHC. He was brushed off, as others had been. Persisting, he returned some weeks later with details about a subsidiary of the Penn Central Corporation that wanted to explore an acquisition. Penn Central was one of the nation's largest companies, having a book value exceeding seven billion dollars, suggesting capacity to finance their shared visions. The subsidiary operated with a high degree of autonomy and had massive real estate ventures across the land. As a major homebuilder and developer, they wanted to add mobile homes and mobile home communities to their capabilities. That got Bob's attention. He was flown to California for further talks and visits to projects. Their goals proved compatible and a deal was done.

The plan called for rapid movement into building branch plants, and capital was provided to do so. A nationwide search was begun for the necessary personnel. Plans were drawn up and locations found for four new factories; Texas, Florida, North Carolina, and Pennsylvania. Executive recruiting brought needed managers aboard. Their training and familiarity with the company and its program were underway while the factories were under construction. One-by-one, factories opened very successfully—a testament to excellent recruiting.

Unfortunately, those happy times were short-lived. Less than a year after the closing, the Penn Central Corporation declared bankruptcy. The largest business bankruptcy in the country at that time. The financial press was startled—how could this giant collapse so soon after publishing their bullish 1968 audited annual report?

Instant retrenchment was necessary. Terrible times. Outstanding managers and their families had moved to Elkhart and had to be let go. RHC's new owner was broke.

Bob and his Executive Vice-President had agreed upon and signed four-year management contracts to stay through the building process. The cash sale had included mutually agreed earn-outs. Those were gone, as was the dream. Generous severance was given to departing executives, but operations had to be governed by cash flow. Partially finished factories were sold. The North Carolina, Texas and Florida plants, already operating, were retained.

Despite the turmoil, 1970 was a break-even year. In 1971 the production line of the Elkhart factory was re-engineered to produce greater volume in the same space; over 250,000 feet on 50 acres of property.

The new layout proved successful. In 1972, all plants combined completed more than 8,000 homes and the profit was triple the best year prior to the sale. But it was a different philosophy. Run the business to maximize shareholder value instead of pursuing an owner's vision.

Shortly after the Penn Central bankruptcy was declared, operational salvage began. A national consulting company determined RHC was one of four companies to be kept. In 1973, both Bob and his COO (now president) ended their relationship with the company. The joy was gone. A new president, selected by the salvage company, was brought in to assume command. Ill-conceived changes were made to the products and pricing. Within three months, 50 percent of RHC dealers left. Within 17 months RHC was also in bankruptcy. A sad ending for a company that had been well respected and profitable for 27 years. Ray Weldy, who taught Bob how to build screen doors, was the last employee and locked the big home plant's doors.

As for Bob, the dream of his business career was over. Having bought his way out of the management agreement late in 1971, he focused on his family. His ailing wife died in February of 1973. He had two children in college and the third in high school. He also built a 288-unit Five Star mobile home community in Elkhart—one of the finest in the Midwest. In 1977 he sold it, and with his youngest child in college, remarried and spent his winters in Florida.

**C**ontrast Richardson Homes with the modular builder from the previous chapter. Both were well managed and led by entrepreneurs driven to innovate in housing. One became highly profitable year after year, building low cost housing. The other, despite a fine, innovative and competitively priced housing product, failed.

The difference? Many, but a major one was, Richardson rode a learning curve of development throughout its history, as opposed to trying to muscle its way into the housing market quickly with a clever new product.

Let's explore the different approaches to the dream of successful manufactured housing. We'll try to make them clear for the continuing benefit of the housing industry and people who need and want affordable homes. It's not a dream. It can be done. It has been done. It is being done.

*No matter how great the talent or effort, some things just take time .... You can't produce a baby in one month by getting nine women pregnant.*

*Warren Buffet*

## **3 Learning Curve: Theory, Practice and Guestimates**

**T**here is no magic involved in learning curve. It's really quite simple. The more you practice something—even having babies—the better you get at doing it. Well, *duh*.

Yet learning curve is a management tool—and what a splendid instrument it can be! For individuals, for companies, for industries and even for nations.

It has long been known that we learn stuff; practice makes perfect, and all that. In 1936, at Wright Patterson Air Force Base, it was observed that this applies to more than just figuring out how to use a wrench. Airplanes, even in those days, were complex machines, and it turned out that every time production of a certain model of aircraft doubled, efficiency of manufacture improved by a measurable amount. About 15 percent in that case. Interesting. That meant if you built enough of those planes you might hope to really bring down the cost of production. Further study—*reams* of it—proved that indeed you can. There are books filled with explanations of how it all works.

We Americans got the hang of it early—big time. Between 1850 and 1900 our country simply exploded in productivity. Population tripled but the economy grew three times as fast. The country had less than two-dozen millionaires in 1850, but forty thousand of 'em by the turn of the century. Steel, railroads and so many other innovations that arose in Europe came to fruition over here. We simply grabbed good ideas and ran with 'em, learning how to build things better than anyone else. Europe—the world—stood in awe. How'd those damn Yanks do it?

We can make this subject simple or crazy complex. Let's see if we can minimize the theory and get straight to how it works. Implementation is the hard part and no textbooks are needed for that. On the next page are, first a complex example, and then a simple one, both from the same textbook:<sup>6</sup>

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<sup>6</sup> *Time Study*, Seventh Edition, Benjamin W. Niebel, 1982.

Let's just forget about this top one. Another Warren Buffet suggestion; keep it simple, don't do any calculations with Greek letters in them. None in that mess, but what's with all those logs?

Following is a more understandable example of how the principle actually works out. The left column is a cumulative number of widgets built over a period of time, it could be in hundreds or thousands—it makes no serious difference—this example uses just one as a base. Next column, an assumed 100 hours per unit at the start, and that column shows the reduction of hours per unit with experience. The amount of gain with each doubling of experience in this example is ten percent, commonly called a 90 percent curve.

This simple chart from that same text-book assumes a given hundred-hour task, which can be broadly defined, takes about half as long to build after the experience of building 128 of that unit.

Mistakes may be made at first, but lessons are learned and the next widget should go better. The curve is predictable *given effort and a steady work force*. And that's just the beginning. By the time a thousand widgets are out the door, the factory might be producing them in about a third the time it took to produce the first. The selling price may come down but whether it does or not depends on business strategy. Aggressive manufacturers are confident enough to "price on the curve" and thus get a jump on the competition by taking a small hit at the beginning. Learning curve, also commonly referred to as "experience curve," is just a way of estimating—quantifying—the value of experience.

where:

Tc.a. = Cumulative average hours per unit for any number of units in logarithmic form

$$\begin{aligned} \log \text{ Tc.a.} &= \log K + N \log X \\ \log 20 &= \log K + N \log 50 \\ \log 15 &= \log K + N \log 100 \\ \log 20 - \log 15 &= N (\log 50 - \log 100) \\ N &= \frac{\log 20 - \log 15}{\log 50 - \log 100} \\ &= \frac{1.30103 - 1.17609}{1.69897 - 2.00000} \\ &= \frac{0.12494}{-0.30103} \\ N &= -0.415 \end{aligned}$$

and

$$2^{-0.415} = 75 \text{ percent (learning curve percentage)}$$

Cumulative production	Cumulative average hours per unit	Ratio to previous cumulative average
1 . . . . .	100.0	—
2 . . . . .	90.0	90
4 . . . . .	81.0	90
8 . . . . .	72.9	90
16 . . . . .	65.6	90
32 . . . . .	59.0	90
64 . . . . .	53.1	90
128 . . . . .	47.8	90

Industry	Curve
Raw Materials	95
Repetitive Welding, Machining Operations	90
<b>Manufactured Housing</b>	?
Purchased Components	87
Aerospace	85
Aircraft Assembly	80
Steel Production	79
Heart Transplants	79
Equipment Maintenance	76
Computer Disk Drives	76
Integrated Circuits	72

As noted, the ten percent gain from doubling as illustrated above is commonly referred to as a 90 percent curve, or a 90 percent slope, referring to a sort of compound curve graph that illustrates progress along the curve. The examples above, with the exception of the one on manufactured housing, are from various sources and should be considered estimates.<sup>7</sup>

But let us be clear. There's nothing automatic about it. The effectiveness of the process is highly dependent on how much repetition is involved, the complexity of the prod-

<sup>7</sup> The MH curve, as with any fast changing industry, is very difficult to estimate. The increasing MH size probably accounts for about half its gain, and the current product is vastly different from the one built in the early days. A learning curve of about 87 to 90 might be a fair estimate.

uct—and most of all, how well production is managed. Various industries and companies within them have been found to have markedly different learning curves, and results vary widely between organizations.

Those are significant differences. Recall that in our first example, the 90 percent curve, hours required to build a widget were cut nearly in half by about the 100th unit? Given a 70 percent slope, costs might be reduced to about 25 percent of the first sample by that same hundredth unit. A curve that steep is hard to achieve, but can happen with new technology that is evolving fast.

Kodak provides an early example of learning curve principles. In 1888 George Eastman set out to make photography affordable. Thumbing his nose at conventional wisdom, he developed the box camera, sold it for 12 bucks and kept lowering the price (down to a dollar), meanwhile improving the product, making it more attractive and easier to use. Never mind the low price; he spent a fortune on advertising, creating a “must have” product instead of something cheap. He made that niche product a consumer item, sold millions of them and made a fortune in the process.

The telephone has gone through a whole series of learning curves as technology advances. Patented in 1876, 40 years later it still took a half hour to place a call coast to coast and cost twenty bucks; minimum.

One of the advances that made it possible to make that call today for approximately nuthin’ was the transistor, a creation perfected by Moore’s law.<sup>8</sup> Gordon Moore’s 1965 prediction and others like it generally ignored learning curve theory, simply setting their sights on doubling circuitry output every couple of years. Their success may be attributed to the enormous growth in volume of that industry, the “built from scratch” nature of the technology and Silicon Valley’s entrepreneurial

determination to make it happen. The latter is the common case in business—“Damn the theory; let’s get to work.” That’s what the Richardsons did in the previous chapter.

For our purposes here, let’s try to sort out some details. Things that make learning curve work relatively well in one instance and not so hot in another.

- **Labor**

The founder of the feast. Set a fellow to the task of pounding nails and he soon learns to miss his thumb, spending less time at the first aid station, and then driving nails faster. Given commitment, good supervision and incentives, he’ll get awfully good at it. In due course, he doesn’t bend many nails and hammers them into the right places, first time.

- **Focus**

When congenial carpenters frame a building, given the opportunity and direction, they will divide the work according to skills and interests. Good management facilitates that process between those who fetch lumber, those who saw, drive the nails and hold things in place. A tightly focused team effort is a wonderful thing to watch.

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<sup>8</sup> Gordon Moore was quoted in *Electronics Magazine*, April 19, 1965, on the subject of how many transistors could be crammed onto an integrated circuit, “The complexity for minimum component costs has increased at a rate of roughly a factor of two per year ... Certainly over the short term this rate can be expected to continue, if not to increase. Over the longer term, the rate of increase is a bit more uncertain, although there is no reason to believe it will not remain nearly constant for at least 10 years. That means by 1975, the number of components per integrated circuit for minimum cost will be 65,000. I believe that such a large circuit can be built on a single wafer.” His “prediction” has been modified a bit over the years but continues to hold remarkably true after all these years.

- **Standardization**

In the real world, few factories build just one thing. A crucial element is producing similar or closely related products, the more alike the better. Switching from building henhouses to garages to Swedish saunas puts a heavy damper on the process.

- **Technology**

Give the carpenter a power nailer and he'll hate it for five minutes. But after firing a nail through his boot, he'll learn and wonder how he ever drove nails without it. The same goes for jigs and fixtures that make it easier to line things up and keep them square. Such things cost money though, and management's challenge is to be sure the investment will pay off. Learning curve involves much more than just labor.

- **Design**

There's more than one way to skin a cat. In fact, there seem to be endless ways. Open minded experience can be a great contributor to finding better ways of cat-skinning. The innovations can come from the production line or any other place inside the organization or out. Evolution is generally productive. Revolution; too often counter-productive.

- **Value Analysis**

Closely related to design, value analysis can occur at all levels of the product from the shop floor to purchasing, customer use and keeping a close eye on the competition's best efforts. Ultimately, it's management's job to choose and adapt good ideas without unduly dinging the learning curve.

- **Suppliers**

Locating the factory close to suppliers reduces transportation costs, but more importantly, improves communication, the ultimate expression being "Just in Time" manufacturing.

- **Competitors**

Efficient producers tend to be found in clusters, sharing suppliers and skilled people. Sure, they "steal" each other's secrets and each other's people, but in the great scheme of things, it's generally a fertile learning experience where everyone benefits—except those who don't pay attention.

- **Business Strategy**

Knowing when to hold 'em and when to fold 'em. The sales department wants fresh new product at every turn, and the production guys want to keep building the same thing. Change though, is inevitable and needs to be thoughtfully managed toward ever-increasing efficiency. That's where the CEO earns his or her pay. Or not.

- **Continuity**

Changes in management, direction, and goals disrupt learning curve progress. Holding a steady course is best, yet it is vital to respond quickly to competitive threats. When ownership of a company, or even its CEO, changes, learning curve can suffer setbacks. Transferring knowledge from one operation or management team to another is harder than it looks.

Of course all that involves standard kinds of management detail, generally known and broadly accepted. The trick—management's challenge—is to pull it all together, herd it in the same direction, and keep it rolling at a steady pace, year after year, as output continues to double.

Learning curve progress is hampered and can be reversed by notorious bugaboos such as excessive labor turnover, market volatility, failed attempts at innovation, trying to do too much, changing strategy and just plain lousy management.



An industry's learning curve can be hard to calculate. In 1915, a transcontinental phone connection took a half hour and cost \$20.70. Now it's virtually instantaneous and approximately free. That's a fine learning curve, but how can it be calculated?

The classic learning curve example is the Model T Ford. Let's take a look at it, bearing in mind that Henry Ford, like the Richardsons in the preceding chapter, didn't have a clue about learning curve or most of those other fiddly details listed above. Those outstanding managers from the old days were just smart men who rolled up their sleeves and set about building decent products, exceeding beyond their dreams. They defined learning curve on the shop floor.

Ford was not much of an inventor, but he was handy at recognizing good ideas, putting them to work and improving them. He tinkered at building cars for quite a few years, doing little better than the guy in the shed across town.

He was a man of vision though, who had this dream of making cars an ordinary farmer could afford and would find useful. Ransom Olds and others had similar ideas and got a head start. Henry Ford tried and failed, tried again and just wouldn't give up. The reason his eponymous car was called a Model T was because he'd used up eight other letters by the time he'd developed a car he felt was suitable for his vision. By the twenties a fourth of America's cars were Model T's.

With the benefit of hindsight, let's see how he did it:

### Model T Learning Curve



This graph<sup>9</sup> shows the selling price of a Model T Ford touring car over the duration of its manufacture in constant 1915 dollars. The gray line shows the price declined at 18 percent per year—an 82 percent learning curve—while the black line shows the actual price of the car for each year, both in 1915 dollars.<sup>10</sup>

That Tin Lizzie was primitive by today's standards, but Ford launched it with high strength steel superior to that used by the competition, and he took advantage of the

<sup>9</sup> Like nearly all historic learning curves, this one utilizes approximate data, pulled together from various sources.

<sup>10</sup> The actual price of the car, including inflation, was \$850 in 1909 and \$380 in 1927. To put that in today's dollars, assume Ford started building the Model T in 1994 at an actual dollar selling price of about \$14,000. Seems a bit pricey? If he was finishing that same length run today, the price of the car would be less than \$5,000.

most advanced manufacturing techniques he could find, as well as hiring the best people around. When his workers tired of boring production line work, Ford doubled their wages. It's worth noting that he went from virtually nowhere to dominating the fast growing automotive market, building more than half the industry's total annual output much of the time. Along the way he became one of the richest guys on the planet.

An important point. Ford's motivation was not wealth but success in putting his customers on wheels they could afford. Once his theories proved correct, he started plowing his efficiency gains back into cutting the price of the product. That proved a good business decision. He was not without competition in low priced cars. A huge fad sprung up for "cycle cars," smaller and very inexpensive vehicles, and for a while they looked like the wave of the future. Henry whipped up a lightweight prototype of his own, leaked photos to the competition, lowered the T price again and killed 'em in the crib. Altruism only goes so far, and you have to stay in the game to win.

Pretty neat, huh? But wait, there's more. Like any other strategy, learning curve has its limits.

Alfred Sloan over at General Motors could not compete with the Model T on price, but he outfoxed the old fox by sneaking up on his blind side.

Ford's ace production guy was Bill Knudsen. A man of vision, Bill saw that the Model T was not aging well compared to the competition's more customer-oriented offerings. In this view, he was supported by Henry's son and heir apparent, Edsel. But their best efforts to convince the boss of the aging Model T's need for updating came to very little. Knudsen felt strongly enough that he resigned and went over to General Motors. Ouch.

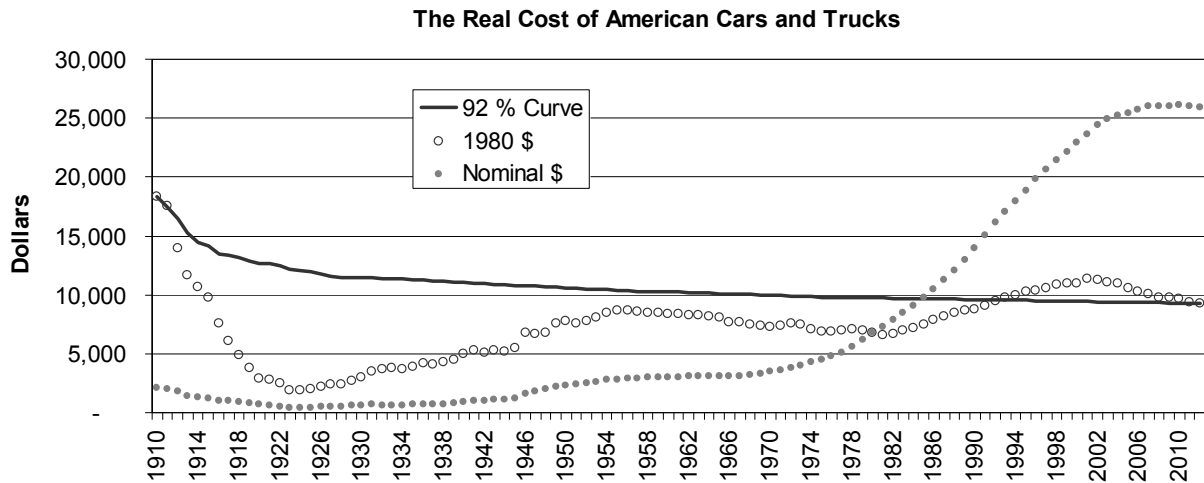
GM was growing fast, following its own learning curve and Sloan's vision of a car for every purse. He built brand loyalty by encouraging prospering customers to climb the success ladder from Chevys to Cadillacs as they prospered. Sloan didn't have the price advantage, but he had marketing moxie. With Knudsen on board and tapping Ford's experience, he was gaining ground on price, too.

A problem (or benefit) from learning curve is, the skills gained can be transferable, given good management and the right circumstances. GM started late but sneaked up on Ford and cleaned his clock. Note again on the preceding graph that Ford departed from his pricing trend in the T's last years of production. He'd made marketing errors, but his major selling tool, ever lower price, was running out of steam. Ford's learning curve was maturing. In the early years, cumulative production doubled every year. Even though he was producing at a much higher rate in the twenties, that last doubling took five years.

Chevy was earlier in its learning curve, doubling faster, and had learned well from the old master's experience. Competition can be brutal for complacent manufacturers, but great for customers.

Henry Ford wreaked havoc on his competition, forcing them to march with him down the learning curve or fall by the wayside. The competition, having started out with average prices about double Ford's, were forced to lower their prices faster, generating a blistering 80 percent curve for the industry by the end of the twenties (compared to Ford's 82 percent). It was a brutal pace and dozens fell by the wayside. GM, Chrysler and a few diehards hung in there, learning from Ford and each other how to efficiently build cars and make a buck in the process.

But keeping up such a torrid pace is tough, and circumstances tend to get in the way, even if the mighty moguls choose to keep slugging it out. The following graph charts the American automotive industry's learning curve over the past hundred years.



The smooth black sweep with the hockey stick on the left shows the sleepy hundred-year 92 percent learning curve that resulted from the auto industry's ups and downs. The dotted gray line (nominal dollars) shows what actually happened to the price of typical American cars and trucks over the past hundred years.<sup>11</sup> The middle line of open dots puts those same prices in constant 1980 dollars.

In general, the longer the time period, the lower the learning curve slope. That first 15 years illustrates the story of Ford's leadership in productivity. He truly put the nation on wheels, forcing his competitors to march with him or quit. Most quit. When Ford's Model T ran out of gas in the twenties, many circumstances discouraged others from picking up the ball and running with it. For example, The Great Depression. Surviving car makers saw their profits vanish and survival became the order of the day. Everybody's sales plummeted. Most remaining survivors of the Ford shakeout fell by the wayside. The history books tell how tough those times were on the citizens. By measures such as survival rate, that depression was even harder on car manufacturers. Still, a hardy dozen or so automobile companies came through that terrible decade, battered but more or less intact. In constant dollars, car prices almost doubled compared to the previous decade. But the cars built by the survivors had improved a lot. Brutal competition often does that, but learning curve's relation to improving quality is difficult to quantify. Part of Ford's achievement was due to the minimal changes and improvements he'd made to the Model T. Part of the lumpy post-Model T curve of the whole industry was GM's strategic choice to compete primarily on the basis of gussied up cars.

After World War II, the demand was great and competition was focused on finding materials, labor and factory capacity. General Motors was on a roll and set the pace. Holding about half the automotive market, GM was dancing carefully to avoid being broken up as a monopolist. The last thing they wanted was a brutal battle of the type Henry Ford undertook with his Model T. In those postwar years, no competitor was in a position to challenge GM's supremacy and no one wanted price wars, so car prices marched along with the rising economy.

Peace reigned in Detroit's corporate corridors. The price of cars increased steadily driven by inflation in materials, labor, benefits and features. Both real and nominal lines on the graph show the steady rise in car prices as Detroit grew fat and happy. Price growth was slowed by the arrival of serious foreign competitors who used their own

<sup>11</sup> The graph is based on total production of some 720 million vehicles. Prices are estimated by year from assorted sources.

learning curves to disrupt the peace. In the eighties, the price of all cars soared, sparked by regulation and Detroit's ceding leadership to its aggressive competition.

In the eighties and nineties, as Detroit shied away from a battle for market share in automobiles, it retreated to a regulatory loophole—large pickup trucks. That last bastion might end badly as the auto market turns to smaller fuel efficient vehicles, trucks become more regulated and foreigners enter that truck niche.

That long-tailed learning curve puts things in historical perspective. Taken over the hundred-year period, the American auto industry's learning curve works out to about 92 percent, going negative in some periods. If car prices had started on that slow curve from the beginning, the typical mid-twenties car would have cost some ten times as much as it did, and further learning curve advances would probably have been minimal. Think of the impact on history!

And think also what might have happened if that blistering 80-plus learning curve had been sustained. Today's vehicle might cost about a thousand bucks. Didn't happen. Could it have? That's impossible to know. Maybe so, had competition remained as free from constraint as it was in Ford's early years. Look what's happening in Silicon Valley where competition is hot, regulation minimal and progress is based mainly on raw competitive brainpower.

**L**earning curve can create giant industries. The giants that emerge tend to slumber once competition fades. They can become vulnerable. It was Henry Ford who interrupted an already lively industry learning curve with his own far more aggressive curve. It was Ford's curve (Page 29) that forced other car makers to march to his drum. That is the heart of aggressive corporate strategy.

One keen entrepreneur who understood learning curve and observed Detroit's slumber was Henry J. Kaiser. From humble beginnings as a Western gravel merchant, he proved a fast learner. During WWII, he set up production processes that turned out Liberty ships; as many as 37 in a month. *Fortune* said, "No industrialist since Henry Ford has achieved so much in so short a time." In addition to ships, he cranked out planes, military vehicles, dams and bridges, along with raw materials. America dazzled the world again, and Kaiser was on the leading edge.

Like so many of his generation, Kaiser was a "car guy" and even while spitting out military paraphernalia, he had a team of experts tearing apart Detroit's finest and figuring out how to go them one better.

With an initial \$53 million on hand, Kaiser leased the Willow Run plant that had once been Ford's pride and joy. Clay Bedford, his main man in manufacturing, told the boss it would take three times that kind of investment to succeed. Initial experience suggested he was right. The envisioned design innovations—front-wheel drive, etc.—fell by the wayside and Kaiser entered the market with a rather ordinary automobile, albeit brought to market in an eye-blink by Detroit standards.

Living "daringly, boldly, fearlessly" on a shiny new learning curve in the booming postwar market brought Kaiser early success. It faded fast. In the first five years of production, his automotive venture lost \$34 million. Not a quitter, Henry J. doubled down,



His dream was a postwar \$400 car, something like an updated Model A. This fiberglass 1945 prototype was one of several he had built (with styling by engineers!).

Courtesy Patrick Foster

introducing new models, making acquisitions and supporting it all with profits from other endeavors, before giving up in the mid-fifties. It is worth noting that he took on Detroit head-to-head, with a similar product, having no real point of difference. Kaiser's learning curve was fast, but industry experts agreed that he'd not committed enough capital or time to the endeavor.

Perhaps even more seriously, he failed to take full cognizance of the auto industry's momentum. When Henry Ford did his magic, the field was wide open; in its infancy. Opportunity abounded and Ford spent 15 years building on his good start. Henry Kaiser was bucking an industry in its prime, and his approach was to attempt a breakthrough. Confronting Goliath with your fists is risky if you're a 90-pound David. You need a slingshot, smooth stones, practice and the element of surprise—a strategic edge. Kaiser substituted chutzpah. His great venture failed after a decade of effort and millions in losses.

Many others shared Kaiser's view, but undertook the challenge with fewer resources, utilizing a niche strategy and borrowed money. They were buoyed by the American Dream of instant success. Crosley, Tucker, Davis and several others tried various unique product strategies, but lacked both capital and staying power.

None were successful. Like Kaiser, a few managed to hang on a few years, but all failed to earn profit from their venture. All but one.

Most postwar automotive startups shared Kaiser's view of the need for a lightweight and inexpensive automobile. It was widely assumed tough times would follow the war years. Ford and GM both had major developments under way, which they scratched as soon as they found they could sell all the heavy iron they could squeeze through the factory doors. Had either persisted with their innovative strategy, automotive history might have taken quite a different course.

Two WWII Civil Air Patrol pilots, Claud Dry and Dale Orcutt, shared the common expectation of returning hard times. They also admired the simplicity and rugged construction of small aircraft. Why, they wondered, could not such principles be adapted to reduce the weight and cost of an automobile? They talked about it between flights. After the war, they rolled up their sleeves and just did it. Between the years 1945 and 1966—until their retirement—they built the lowest priced car in the world and made a profit every year while doing so.

You've not heard of Midget Motors? Well, they were midget in more than name. The little company, based in Athens, Ohio, built an average of one car per day—a total vehicle output of some 5,000 over the life of the company. Dry and Orcutt sold out in 1966, for a healthy price that assured their comfortable retirement. The new owners switched to an "automotive" strategy patterned after the giants, never made a nickel, and Midget Motors hit the wall in a heartbeat.

How Dry and Orcutt managed their feat is a rather simple story of learning curve endeavor by entrepreneurs. The kind of story that has played out thousands of times in this country and established Americans as the guys to beat in business innovation. No magic required. Learning curve trumps eureka when taking on the establishment.

Alone among those postwar auto startups, Midget Motors did not start out by seeking capital, though they had none. They had no real business plan either; nor business or engineering degrees. What they did have was vision and patience, combined with experience gained in the school of hard knocks. They knew they could not compete with Detroit and didn't try. They took an end run, going into the automotive market where Detroit had no presence at all. They found a tiny niche and a unique way to exploit it, carefully, one step at a time.

Dry had a fairly broad background in publishing, printing and real estate. Orcutt's experience was more focused on fixing, building and maintaining machinery. Their shared passion was flying and tiny cars.

Midget Motors was incorporated in 1945 with one employee, Dale Orcutt. Claud Dry kept his day job. Orcutt worked on prototypes and plans while both of them bought and sold surplus materials via mail order. Evenings and weekends, Dry published a sort of newsletter that combined ads placed by readers with promotion of Midget Motors' plans and kits. By year-end, they were producing a few motor scooters and \$50 kits for a simple home-built car they called the King Midget. They made a profit, first year out of the box.

Within five years the kit car was available assembled for \$300 and the little company was developing a more sophisticated model. They'd sold about 500 scooters and a comparable number of King Midgets, all via mail order. Most of their earnings came from publishing and selling assorted merchandise through their *Midget Motors Directory*. That was a profitable niche publishing business—a sort of early eBay for home mechanics. Advertising charges were modest but so were printing costs and they paid nothing for content. They charged a quarter for the Directory and a dollar extra for information about their cars, earning a profit on that, too. The tiny car was so unique as to attract free publicity and a stream of dollars in envelopes mailed to Athens.

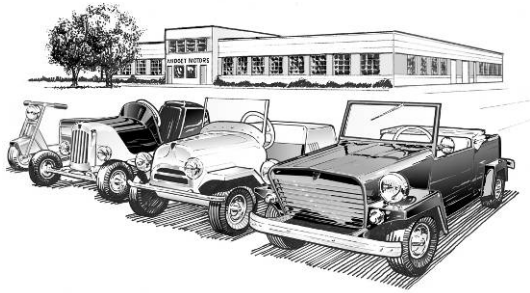
By the beginning of the fifties, the little company was operating in a brand new factory largely built by their own small work force. The new 1951 model was a solid hit from the beginning. Instead of expanding, they used profits to pay off the small mortgage on their factory, after which they operated debt-free. All cars were sold mail order—no dealers. No car was built without a deposit, and none shipped without payment in full. They were able to do this because their niche market was largely confined to home mechanic types reached through the pages of *Popular Science* and magazines of that ilk. And the little car was a bargain.

They didn't need huge volume because their cars were simple and light, using basic industrial engines. The little factory made nearly all the components, using a batch process. Workers spent most of their time building parts and subassemblies. When a couple of dozen orders with deposits had accumulated, everybody switched hats and assembled cars. Efficient? Not a bit. There were more labor hours in a King Midget than in a Chevy. But they paid small town non-union wages, and ran the whole shebang themselves. They had no beancounters, no sales department and no debt. Their overhead percentage was comparable to that of Detroit's and their car sold for about the same price per pound as the big boys. The price was half that of the cheapest Chevy.

Dry and Orcutt knew they were in a dicey business. In true entrepreneurial spirit, they took just one big risk—entering the car business that was dominated by Detroit's moguls. All other business decisions focused on the bottom line; keeping it black year after year. They never made huge profits but they lived well, enjoyed their families and their hobbies. They were liked by their employees and were pillars of the community.

Their estimate of the postwar automotive market was completely wrong. American car buyers had prospered and wanted upscale chrome-laden barges. Good times and easy payments made it possible for millions to buy such cars. For the rest, rapid depreciation made used cars cheap and plentiful. Who would buy a King Midget that had the performance and simplicity of a Model T?

As it turned out, there were enough niche buyers—folks who loved the little cars for their ingenuity and low price—to keep the annual profits rolling in.



As the years rolled by, Midget Motors developed more sophisticated, but still very simple vehicles—four-wheeled scooters, they've been called. The fleet is pictured above. The factory grew and efficiencies were gained, but in reality, little was changed over 25 years.

Besides misjudging the size of the potential market, Dry and Orcutt made just one serious business mistake, and it was a doozy; common to entrepreneurs. They made no real provision for succession. When the founders aged and their health was flagging, they lost a lot of their zip. Faced with their own mortality, they put the company on the market, sold out and retired. The new president, a “regular” car guy, promptly ran Midget Motors into the ground.

One can ponder whether such a tiny contender could have continued to succeed given sound continuing management. Impossible to say, but the hard part was behind them. The first energy crisis of the early seventies created a real demand for small, energy efficient vehicles, right after the last King Midget was built. The little car might have come into its own at last.<sup>12</sup>

But wouldn't their continuing success have aroused the quiescent titans of motordom? Maybe not. They were pretty sound asleep up there in their boardrooms. In 1954, less than one percent of new cars were imports. The amazing success of those funny little Volkswagen Beetles did not disrupt their slumber. A fad, the moguls opined. Then the Japanese joined in—and were also dismissed—until it was too late.

Industry learning curves are made up of hundreds of little learning curves that vary all over the pea patch in their relative slopes. Ford's 82 percent curve forced competitors to evolve at an 80 percent curve to catch up. A sleepy outfit running a 90 percent curve simply wouldn't last long, unless they had a very unique product strategy. Midget Motors had such a strategy. The British had one with their MG sports car. Volkswagen had one with their Beetle. Packard had one with high quality luxury cars. Each company, and each model, Detroit and elsewhere, followed their own learning curve within their industry. It was the combination of all those curves that must be estimated to come up with an industry's learning curve.

The postwar Japanese auto industry was in the dumper. Their industrial base, never a match for ours, had been decimated by allied bombs. Under McArthur's benevolent direction, they set about picking up the pieces. What they had going for them was a well protected domestic market that wanted efficient little cars. Japanese companies studied American methods and borrowed some of our industrial experts whom American experts largely ignored. They bought second-hand tooling from Detroit, and having no room for all the required presses, figured ways to make each do double, triple and quadruple duty. Recognizing the inferiority of their tiny tinny cars and the stigma against “made in Japan,” they introduced all-encompassing quality control procedures. To their own surprise, such techniques improved productivity.

The industry doubled their cumulative vehicle production every year for five years starting in 1950—doubling ten times by the late eighties. Their learning curve was modest compared to that of the Model T, but enough to run rings around Detroit, which was slogging along on the flat tail of its learning curve. The Japanese were able to cut the real price of automotive output in half during that period. In a nutshell, that's how Japan took on and beat mighty Detroit. The price of all cars was soaring, but the Japanese came in with an edge, their prices went up slower and their cars improved faster.

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<sup>12</sup> *KING MIDGET The Story of America's Smallest Dream Car*, Bob Vahsholtz, 2007.

In learning curve theory, an ingenious follower playing its advantages well can gain advantage over a stagnant giant relying on the momentum of market presence. Little David need not score a knockout. He can simply out-dance ol' Goliath Numbnuts and slip away with his market share. We all watched it happen to Motor City, USA. We watched it happen to Japan. We watched it happen in Korea. Here comes China. That nation has already become the world's largest auto producer. Can America's massive auto restructuring triggered by the recent recession reverse Detroit's long term downturn? Are the foreign inroads inevitable? By no means ... but likely. A wakeup call is not enough. The aroused Goliath needs an aggressive strategy and hard work to generate a new and aggressive learning curve.

In a competitive world, industries rise and fall with amazing regularity following Schumpeter's dictum of creative destruction. Generally, they use learning curve to get established—and then they crash when its benefits taper off. It's hard to think of industries that march on, decade after decade, without serious challenge from innovative newcomers. IBM and others have demonstrated that launching a new learning curve on top of an old one is possible. Most mature companies and industries just stagger along on momentum, hoping for the best.

One such plodding industry comes to mind. Home building, the prime subject of this book. Talk about a mature learning curve! The housing industry makes America's stodgy auto companies look sprightly. The housing industry's learning curve is so mature as to defy measurement, or even estimates, but one thing is certain, its efficiency is declining. This, despite endless clever innovations and excellent builders having assailed housing's momentum and been defeated by the totally entrenched "way we build and sell homes in this country." Other nations have their own housing momentum and unlike the case of vehicles, international competition is hardly in the cards—for the foreseeable future.

Manufactured housing, though decades old, is a shiny new idea in housing. Simple in essence, the industrialized process carries a mighty burden because it assails such a very old industry. Learning curve works wonderfully in a shiny new field where demand is strong. As industries and markets mature, they get all sticky—molasses in January. To avoid getting stuck, innovators need to avoid stepping in the puddle. Like Volkswagen, Midget Motors and the Japanese, the industry we now call manufactured housing came in, not as a challenger, but as a complete outsider without much of a plan. Just happened to get started in a period of strong demand, it went forth one step at a time, finding ways to make a buck. Busy competing with each other, the mobe guys woke up one year and found themselves to be a contender in an industry they hardly understood. Kind of exciting. Pretty scary.

Those brash housing newcomers muscled in riding a brisk learning curve and didn't even realize it. But the path has gotten very rocky and the Goliath's girlfriend, the fat lady, has not yet sung David's praise. Let's turn to the magnitude of the challenge faced by this MH upstart.



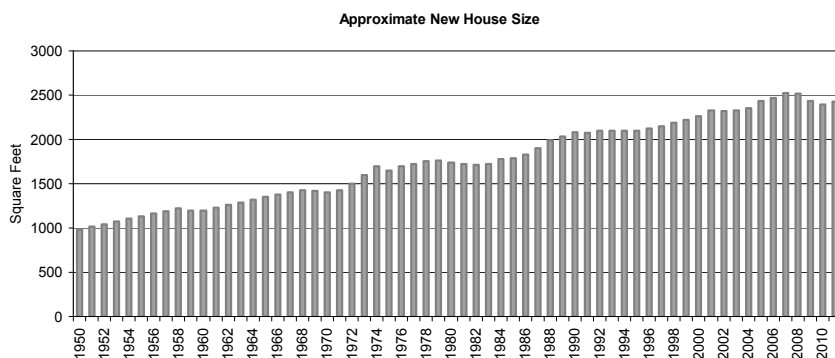
*Owning a detached home remains a firm part of nearly every American's vision of the good life. Decent housing is largely a matter of taste, but it surely includes security, a pleasant landscape, low maintenance, and low operating cost. It also means a pleasant home with access to jobs. ...Without some change in housing technology or policy, a growing number of Americans may find themselves faced with painful choices between cramped quarters and long commutes. It is possible that productivity would continue to decline, and U.S. home owners may be burdened with continuing increases in home prices, and with inefficient structures in which operating costs could rise sharply if energy prices increase.*

*Congress' Office of Technology Assessment, 1988*

## 4 The Biggest Market in the World: Housing

According to the National Association of Home Builders (NAHB), the construction of housing contributes close to five percent of our nation's Gross Domestic Product (GDP). That's big. The Office of Technology Assessment quoted above said housing represented some 20 percent of personal and government spending at that time. By contrast, the auto industry has tended to contribute up to three and half percent of GDP, and that includes dealers, suppliers and the whole nine yards. All of manufacturing *combined* contributes only about 11 percent of GDP.<sup>13</sup> Goliath is a giant indeed.

When the recent housing recession whacked housing's contribution roughly in half, everybody felt the result. Housing has been a foundation of the economy and the heart of our personal wealth for many decades. We Americans love our houses. Especially our single family houses, and the bigger the better. This despite the shrinking size of households. In 1950, new houses averaged a bit under a thousand square feet and accommodated 3.8 people. By 2005, house size had increased by 2.5 times and occupants dropped to 2.6.



Each member of the family had nearly four times as much room in which to rattle around. Here's the implacable trend, with just a hint of realism creeping in at the end.

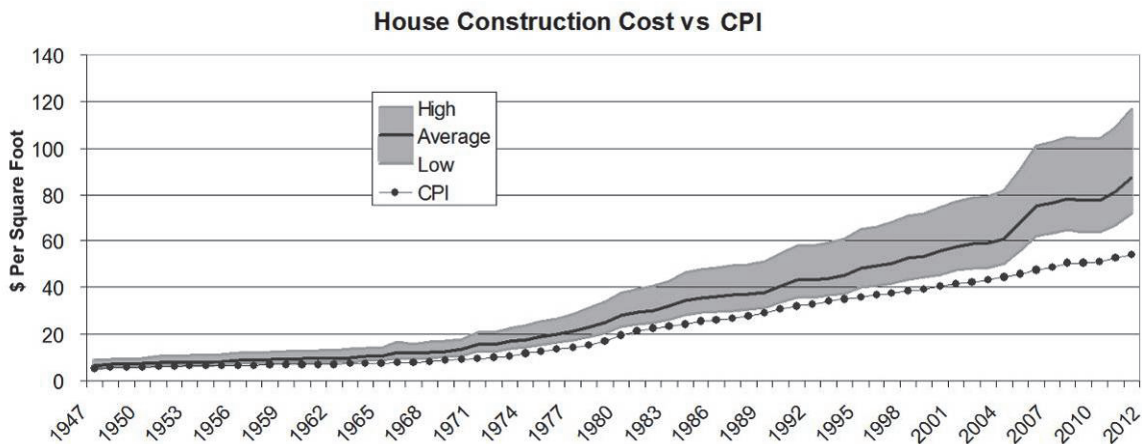
<sup>13</sup> Government spending is the biggest single contributor to the economy at about 12 percent of GDP, but that's a whole 'nuther story.

We're house rich in terms of accommodations; house poor if we look at our ability to afford such bounty. The family home sops up nearly a fourth of a home owner's spending. Its value equals about half their net worth and they owe about 75 percent of that value.<sup>14</sup> We gain wealth in good times because our home is usually our most leveraged investment. That leverage nicked the ol' bottom line during the recent housing crunch, and banged hardest those who could least afford it.

Where is all this headed? Let's look at it from a learning curve perspective. Let's calculate the learning curve for housing. But how?

Do we start with caves, mud huts, wigwams or what? Housing construction has been one of the largest endeavors of humankind since our ancestors came out of the trees. Yes, we're still learning how to build them better, but such progress as can be measured focuses on components of the process; new materials and methods that keep coming along. Add it all up and efficiency gains have not compensated for the inexorable cost increases that keep housing construction outlay rising faster than the GDP of the nation. Housing has been on the long tail end of its learning curve for centuries, and most innovations hardly make a dent.

The graph below illustrates the cost per square foot of building a house has increased faster than the Consumer Price Index over the past 65 years.<sup>15</sup>



The black line shows the average construction cost per square foot. The upper gray area illustrates the cost of a typical upscale house, while the lower shows the cost of building a modest bungalow. The Consumer Price Index (the row of little black dots) suggests those prices are half again what they should be if housing construction cost was on track with the economy. Our most treasured asset is pricing itself out of reach.

One key reason is housing productivity has approximately flattened. Like the nation's health, the housing industry has allowed itself to get flabby and uncompetitive. It's vulnerable to competition, as was our auto industry a few decades ago.

That doesn't mean we're not making improvements in construction methods and procedures. It means such gains are modest and largely offset by inefficiencies creeping into the process of building homes. There's no foreign competition and domestic builders are sheltered, as was Detroit, by an umbrella of momentum and tradition. Further, the construction industry's low productivity is partly attributable to lack of industry leadership. In 2002, for example, there were some 700,000 construction firms in the nation

<sup>14</sup> Data from the Federal Reserve, the Census bureau and HUD's Annual Housing Survey.

<sup>15</sup> Construction cost is based on historic data from the *2006 National Building Cost Manual*, updated to the 2012 edition.

and 80 percent of those had fewer than ten workers. Only two percent had more than 100. Apparently, even tiny companies can compete, but it's difficult to identify a company or companies providing leadership at the industry level. Competent leaders abound, but none are in a position to inspire the whole housing industry, nor is there much incentive to increase the efficiency of housing construction. Where's the competition?

Still, all else being equal, construction cost doesn't look too bad. But all else is far from equal. As already noted, we're treating ourselves to a lot more house than we really need.

The average construction cost of a typical 1,000 square foot family house in 1950 was about \$7,500. In 2012 dollars that would be about \$70,000. Good luck finding new stick houses of that size, never mind that price. As shown in the graph on Page 37, the typical size is now more like 2,400 square feet and its typical construction cost about \$184,000, per NAHB 2011 data (2,600 square feet at \$246,000 in 2013!). So the real construction cost of an average house has increased by some 2.6 times, as has its size. That would suggest construction efficiency has been reasonably steady. Except that cost should decrease as size goes up. The increase in average size should have reduced construction cost by about 25 percent.

And that's not all.

The preceding numbers are just for construction. That 1950 suburban house typically sat on a lot worth just over \$1,000, bringing its sale price up to \$9,500 after allowing for builder markup and profit.<sup>16</sup> That thousand dollar lot should, given inflation alone, sell for about \$9,300 today. But land cost has increased much faster than inflation.

According to NAHB, in 2011 the finished lot under an average single family house equaled about 22 percent of its selling price, or about \$68,000<sup>17</sup> (\$74,000 in 2013). Those figures are based on national average. It's much higher in urban areas and varies dramatically by region of the country. A typical lot might cost ten times as much on the coasts as in the Midwest, while construction cost might be only ten percent higher.

In small towns and rural settings, land remains a relatively small part of housing cost. Yet we are increasingly metropolitan people, so that the inflation of land cost seems likely to continue to grow as a factor in the cost of housing.

The cost numbers above are based on average builders. "Production Builders" can reduce construction costs by as much as 8 to 12 percent according to *The National Building Cost Manual*. Those builders also tend to buy and develop raw land, which can cut their lot costs nearly in half, according to NAHB. A total of 20 percent savings on the retail price of a typical house with lot might be possible. Yet even production builders find it increasingly difficult to get approval for developments of the size that make such savings feasible.

Which brings us to another chunk of the soaring cost of housing; the challenge of doing business under government supervision. NAHB's 2013 cost breakdown of the cost of a single family home includes more than \$6,000 for the building permit, impact fee and water and sewer inspection. A mere five percent of the cost of the completed home. Or is it? One NAHB study showed such costs nearly doubled between 1998 and 2009.

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<sup>16</sup> Historic data from a 1965 HUD annual report.

<sup>17</sup> Adding construction cost and lot cost gives a net selling price of a bit over \$250,000. Yet NAHB's breakdown shows the *actual* selling price some \$60,000 higher, the difference apparently being site amenities, finance, marketing, and builder's profits.

That assumes starting with a developed lot. The steps between acquiring a piece of land and being able to build houses on it can be strangling and probably account for much of the cost a small builder pays for building lots and that of a production builder. In either case, somebody’s money is tied up for what can amount to years of negotiation between owners, government agencies and partners. The process can be a snap in some areas, a nightmare in others, and can be facilitated by skilled developers. Bottom line, the bureaucracy involved in the provision of housing is a major barrier and cost factor to builders in most areas where housing is most needed.

Paul Cheshire and Christian Hilber of the London School of Economics call this a “regulatory tax,” creating a cost burden of 300 percent in European cities like Frankfurt, Paris and Milan. By contrast they estimate the burden in New York City at 50 percent, and Houston (which is largely bereft of zoning and the like), close to zero. That contrast suggests why Europeans live in smaller housing units, and increasingly, in multifamily high-rise apartments. Our country seems headed in that direction.

It is the combination of all the factors above that has put the cost of American housing so out of reach for so many people. An average 1950 house that cost about \$83,000 in current dollars is much bigger today and costs about \$310,000; about 3.7 times as much hard-earned cash. Median real household income over that same period has only doubled, and thus the pinch. The high cost of new construction makes existing houses more valuable and thus worth expensive remodeling and retrofitting.<sup>18</sup> Those enterprises tend to be even less efficient than new construction.

Despite all that gloom and doom, Americans continue to buy houses, but take a harder hit to the budget than would be the case if new homes came closer to fitting the family purse. These days, the common family question is, “Can we make the payments?” In 2005, the *New York Times* noted that despite soaring housing costs, “... families in the vast majority of the country can still buy a house for a smaller share of their income than they could have a generation ago.” They noted contributing factors of declining mortgage rates and fees, along with rising income—factors a bit unique to the particular housing paradigm of that time. The current view is not so rosy. Too much of that “affordability” proved attributable to financing legerdemain. As for looking ahead, historic economic growth seems a bit iffy as we grapple with mountains of public debt. It also seems unlikely that current low mortgage rates can last—or that “creative financing” will return.

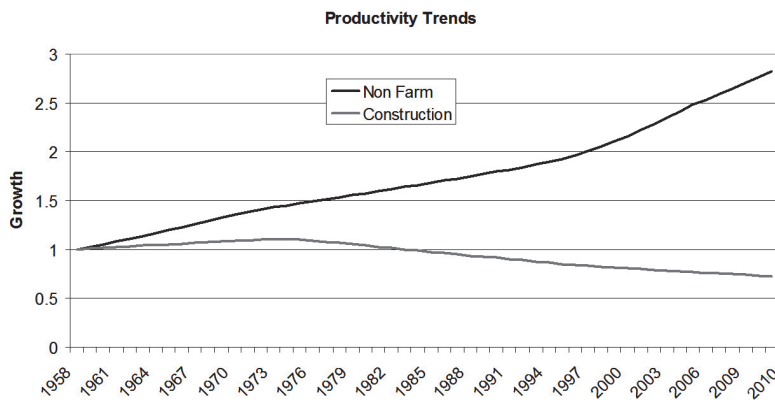
USA: -----	2,300
Australia: -----	2,200
Canada: -----	1,800
Denmark: -----	1,500
France: -----	1,200
Spain: -----	1,050
Ireland: -----	950
UK: -----	820

Much of the rest of the world deals with such challenges by getting along in less space. Here are some typical dwelling sizes in square feet:

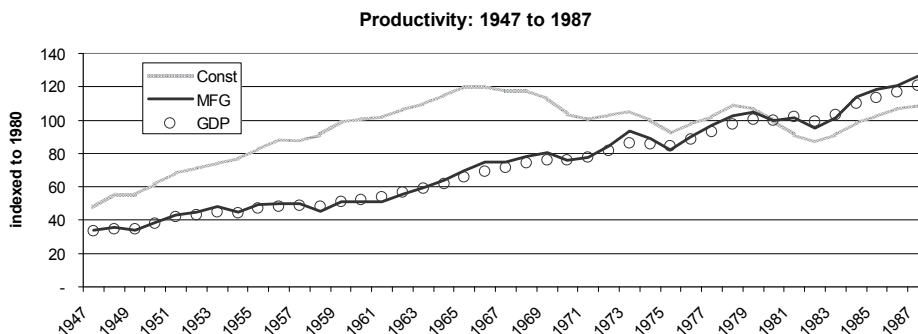
<sup>18</sup> The nation spends about half as much annually in remodeling existing houses as we invest in new homes.

Decreasing the size of the family home is not a happy prospect for most Americans, especially if it means moving into apartments or condos and giving up our already shrinking pieces of grass. What's to be done? Can we as a nation afford the ever-increasing size and prices of our homes? Perhaps we can, but surely at some cost to the nation's competitive position in the world economy. The value of investing in improving national productivity is clear. It is fair to ponder just what increasing investment in building, remodeling and inflating the price of our homes does for that objective.

Growth in productivity of our economy over recent decades has been sporadic but averaging around two percent. If you separate out the various components, they range widely, with some making greater contributions than average and some bringing down the total score. Construction is one of those that's been ding the average. Below is a graph that smooths the data and compares broadly defined "Construction" with the rest of the economy.<sup>19</sup>



It's that top line that has provided us our excellent standard of living. It supports those less productive activities such as the cost of government, retirement benefits and oversize houses. As a nation, we really ought to boost that top line. Construction productivity went up for a few years and it provides jobs, but the trend of recent decades is gloomy. We do need houses and lots of other buildings, but we need more efficient ways of producing them.



As noted, construction productivity such as approximated by the 50-year graph above is hard to find. This one from *The Economist* shows an earlier stretch of 40 years, indexed to 1980. It illustrates an earlier period when construction was contributing to the nation's economic growth, soaring above GDP up through the seventies.

This and the previous graph tell about the same story. Construction boomed after WWII, and outpaced the economy for a couple of decades. Then it declined, slipping further behind as the years went by. Manufacturing, the black line, tracked GDP (the bubble line) nicely and has tended to be the prime engine of our economy. But manufacturing is a declining portion of the nation's output and has to carry a lot of baggage to maintain the nation's prosperity. With construction such a big share of GDP, its poor

<sup>19</sup> Construction data is from U.S. Dept. of Labor, an unpublished 1985 study. The trend since is projected. It is important to note that housing productivity is deemed very difficult to ascertain. The graph includes all kinds of construction and is typical of other estimates that have been made. Notably, Paul Teicholtz of Stanford University went to great lengths in 2013 to create a graph (1964 through 2012) nearly identical to the above, but far more detailed. He noted that residential, commercial and similar branches of construction have experienced comparably poor productivity, with residential being the largest portion of the total.

showing is a real downer for all of us, just as it was a marvelous booster in earlier decades.

As near as can be estimated, that declining line of construction contribution between 1967 and 1987 continues. A significant factor because it's such a large chunk of the economy. Further, there's more to the equation than merely creating jobs. The true measure, though hard to estimate, is how construction (or any other component of the economy) contributes to the nation's competitive position in the world. The inefficient construction of stuff we don't really need is a luxury we can ill afford.

There's reason to believe the construction of conventional homes will remain in the dumper for quite a while. A recent survey by the Urban Land Institute found that 71 percent of Americans still yearn to own their own home, but upcoming generations lack their parents' enthusiasm for life in the suburbs. A much more detailed investigation confirmed that trend, but suggested such preferences would have little impact on the housing picture.<sup>20</sup> The vast majority of housing the nation needs is already in place, and new construction does little to change its content. More likely, the dream homes of previous generations will molder in their subdivisions as younger generations pay premiums for the urban locales they prefer. As those studies acknowledge, it is difficult to predict how young people's views will change as their generations mature. Baby Boomers, for example, seem to be following the preferences of their predecessors, though with a preference for single story, slightly smaller homes loaded with amenities.<sup>21</sup> Economist David Weil notes that "... demographics affect the housing market. We know they have to. But that effect is probably small ... kind of a gentle tug."

What is to be done about housing? Shall we resort to living in tightly packed hi-rise apartment buildings? Few like that prospect. 2008 and 2012 Market Facts studies for Foremost Insurance asked people's aspiration for their next home. The overwhelming preference was a "Standard built house," with about half as many lusting for double wide MH. Singles came in about half as desirable as twins, but still preferred over apartments, condos or other multiple housing choices. OK, those were MH owners, probably biased, but it's pretty clear that Americans don't yearn for an apartment. There seem to be two interesting possibilities (and there are almost certainly far more).

1. Revive the kind of construction productivity that occurred in the boom years after WWII. As noted above, good production builders can lower construction costs by as much as 20 percent. Planners and incentives could encourage tract building and construction of smaller and more efficient (and affordable) houses on smaller lots. Canadians do it all the time.
2. We're generally pretty darned good at manufacturing things. Why not build our houses in efficient factories that boost, instead of dampening, the nation's productivity? Nearly everybody likes that idea—in concept. Practice, however, is a different matter.

The prime obstacle to either of those two options (and many others) is housing's *momentum*. Our vine-covered cottage and similar traditions run deep, enhancing our natural dislike of change. We like shutters even though few of us recall they once had a function. Our entire home-building tradition and its support system are committed to

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<sup>20</sup> *U.S. Housing Trends, Generational Changes and the Outlook to 2050*, John Pitkin & Dowell Myers, 2008.

<sup>21</sup> Del Webb, 2005 Survey.

the current course of ever-larger “traditional homes,” even if built of non-traditional materials by new methods. Housing innovation becomes more difficult every year.

*Home, in the American dream, is a quaint little white cottage, shyly nestled in a grove of old elms or maples, bathed in the perfume of lilacs, and equipped with at least one vine-covered wall ... finishing touches include shutters in soft blue or green ... “Well,” you may say, “what’s wrong with that picture? It looks pretty good to me.”*

*There’s nothing wrong with the picture—except it remains what it always was, a dream ... when people try to realize it today, what they get is either a cheap imitation or an outrageously expensive fake ... given away by the late model Buick at the front door ....*

*Armed with a dream house, the bewildered citizen thinks he has one thing at least which will stay put in a changing world, a link to the past which suggests, but does not really provide, security.<sup>22</sup>*

Though written more than 60 years ago, the quote above remains as true today as then. Famed designer/architects Nelson and Wright provided examples of good residential building design that remain some of the most attractive and functional homes in the nation. Such work influenced a California builder, Joseph Eichler, who built more than 10,000 tract homes in the sixties and seventies. Popular priced and on small lots, they still command premium prices. Yet, the trend proved unsustainable in the face of the cultural momentum behind that dream of the vine covered cottage.

The visions of Nelson, Wright and Eichler included vast expanses of glass. Quite sensible in California’s mild climate and in the days of cheap energy, but not so good today. Their basic architectural view though, was valid then and remains so today. Homes built using the latest technology and materials that still put their owners in communion with nature.

How did they suggest their ideas be implemented? In the near term by builders like Eichler. But longer term they foresaw factory production:

*A while back we said that most people would someday be living in factory-produced housing ... because every other consumer product in this country has always moved from handicraft production to industrial production, and there is no technical reason why houses should be the exception ... we are not seriously concerned in this book with such factory-made houses because at this time, their manufacture is still in a very primitive state, and we all want our better homes right now.*

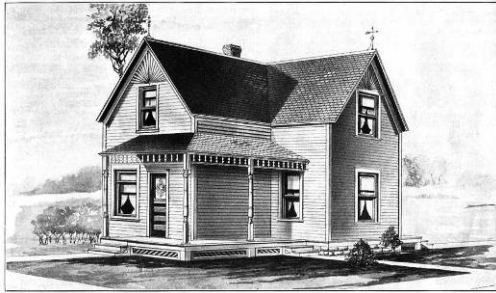
Apparently, some major American manufacturers and Congress agreed, and set out to do something about it. Though the challenge of efficiently manufacturing housing has proven a tough nut to crack, that doesn’t mean there’s been no effort. Housing remains a tempting target; a sitting duck; a pigeon waiting to be plucked. Let’s look at some attempts.

**T**homas Edison took an early crack at the challenge, building one of the largest cement plants in the world with the intent of producing concrete houses, right down to the furniture inside; he even tried a concrete piano. Some 30 of his houses were built in Newark, Ohio, all from the same slip-form mold. Dozens of his patents resulted in Yankee Stadium and concrete highways, but his concrete pianos didn’t fly, and neither did the houses.

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<sup>22</sup> *Tomorrow’s House*, George Nelson & Henry Wright, 1945.

About the same time, the equivalent of today's Walmart was Sears Roebuck. Ever since Richard Sears bought out Alvah Roebuck for a paltry \$20,000 and took on the more aggressive Julius Rosenwald as his partner, the company was on a roll. By 1896 Sears had sales of about \$1.3 million. By 1914, their sales doubled more than six times to more than a hundred million. That's an aggressive learning curve and they rode it hard. Sears came up with the first iron-clad customer guarantee that actually meant something. They developed and perfected the mail order business, sending out seven million catalogs per year. Each one weighed about three pounds and contained nearly 10,000 items from handkerchiefs to automobiles.



#### And houses.

Not the first to package houses, Sears went at it big time, offering a wide range of houses at nearly all price points. Many still stand today. Left are some examples of their many offerings.

The little \$725 cottage at left would look right at home on the modest farms and towns of the day, and thousands of similar houses are still around. Keep in mind though, that price bought just the materials. Quite a bit of assembly was required!



This next house still stands, recently remodeled, in California, looking much as it did when built. It is claimed to be a Sears house, but some evidence suggests it was built in 1904, whereas Sears production is said to have begun in 1908. It is, in any event, very typical of the type and quality of homes offered by Sears.

For about twice the price of the top cottage, one could choose the beauty below left, complete with pergola and recessed porches. The fine print confirmed that Sears did not furnish labor for assembly, cement, brick and plaster. Add those and they opined the finished house with full basement to come in at \$3,895. Heating choices were limited but the most expensive was less than \$300.



Call it \$4,200 total construction cost for a four bedroom, bath and a half with servant's quarters. Nice, though about 60 percent more than was typical for median houses of the day. The average of this and the top cottage would probably be pretty close to the typical construction of a new house at that time; about \$3,000. In today's money, \$65,000.

The Sears packages were assembled in Norwalk, Ohio, and shipped by rail to their destinations in three packages, timed according to construction pace. Sears sold an awful lot of those packages before they gave it up in 1938. John Crean, who built Fleetwood, was raised in a Sears house his dad built in South Dakota. In truth, Sears brought little to the table aside from merchandising and managing material flow. Maybe they were not real bargains, but the Sears name assured decent quality materials. Montgomery Ward also entered the fray with similar products.

Starting about the same time, Aladdin Homes sold similar house packages at comparable prices. Some 75,000 of them were sold over the life of the company, which endured until 1981. They also sold house plans and were noted for their many and varied choices. Poring over the latest Aladdin catalog was often the first step of a prospective family's path to their dream home.

In 1932 General Homes set out to become the General Motors of housing with a prefab steel house. Several others jumped into the fray but their combined efforts produced less than one percent of prewar housing. Home building tanked during The Great De-



pression, as did just about everything else. Just as the industry was getting on its feet, along came World War II.

The war created a need for housing in many places where it was in short supply. Builders and materials were also scarce. All sorts of companies fired up manufacturing plants as a fast way to respond. A few worked well. More on that later.

Shortly after WWII there was a huge pent up demand for housing. With an abundance of labor due to returning vets, it was possible for conventional builders like Abraham Levitt to systematize the production of homes. The site became their factory, where they built nearly identical houses and gained the benefits of learning curve as they cranked out as many as 200 homes per week selling for about a fourth less than average. Levitt and its giant competitors controlled some two-thirds of housing starts in the postwar years.



The original Levittown alone finally included more than 17,000 homes.

“... they’re all made out of ticky tacky and they all look just the same,”<sup>23</sup> the song goes. As Ms. Roberts’ lyrics noted, builders did vary the colors, but it’s difficult to mass produce the kind of architectural variety that makes for a nice community. One could argue with the “ticky tacky” aspect though. Those houses, whether the ones she saw in the California Bay Area or Levittown, have stood the test of time. Given maintenance, they remain good homes and those suburbs have taken on more of a community feel as owners remodel and the landscaping matures. These days they no longer “... all look just the same.”

Spurred by wartime demand, National Homes of Lafayette, Indiana, became a giant of the new prefab industry, starting in 1940 and building factories across the nation. Their

homes were generally targeted at the lower end of the market and featured many innovations designed to keep the cost down.

These and many other panelized systems were and are “factory produced,” but in essence, not much different from their site-built cousins. They make a lot of sense for customers placing a new home on their own lot, but a good production stick builder can compete nicely in a well designed tract development project. These days, most panel producers serve as subcontractors to conventional stick builders. Panelized houses serve many niche markets, bringing needed variety to the housing landscape. Learning curve and computerization have made it possible for them to produce a nearly endless variety of homes at competitive prices.

Those pioneers of industrialized housing all got rolling after WWII to supply the housing market of 12 million troops returning from the military, as well as pent up demand from The Great Depression. The federal government felt an obligation to respond to the housing shortage. “Housing Crisis.” Popular words in the halls of power. And housing was not the only item in short supply—think skilled labor, material and time. Observing the success of National Homes and others, government planners agreed that factory construction seemed the way to go.

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<sup>23</sup> Melvina Roberts, 1962.

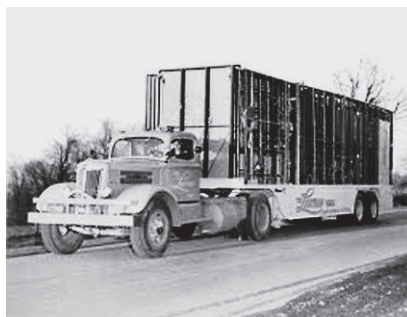
The Reconstruction Finance Corporation (RFC) had been established in 1932 to help battle hard times. During the war, it geared up, getting directly involved in ownership of defense plants and the like. Many billions were invested and contributed mightily to the war effort. Grim as that war was, it had the benefit of turning this country's productivity into a mighty engine of manufacturing output. That learning curve and its resulting momentum seemed well worth tapping.

After the war the huge RFC agency started to whither but not without taking a crack at the housing challenge. In 1947 Lustron got an initial \$12.5 million loan from the RFC to manufacture innovative houses made of steel. A subsidiary of the Vitreous Enamel Corporation, the outfit established a subsidiary in a million-square-foot former aircraft plant in Columbus, Ohio and set out to produce 15,000 homes the first year—double that in 1948. It was a small part of the government's effort to foster production of nearly a million prefabricated houses by 1947, using idle factories and loans totaling \$50 million. Lustron was just one of more than a hundred new operations set to the task.

The Vitreous Enamel Corporation had developed a construction system widely used for gas stations, featuring enameled steel panels like those commonly used for appliances. The finish is for the ages. Wash it with a hose and your house is like new. Never paint again. Adapted to nice little steel-framed two and three bedroom bungalows, they were priced to sell for less than those of stick builders and comparable to the likes of National and Aladdin's best offerings.



The whole house was delivered on a single semi-trailer and was to be erected on site in jig time.



Things did not go well. There were many glitches in the factory. The same for every step from factory to buyer (except for the marketing program, which attracted a lot of attention). People clamored for the few houses, if not to buy, at least to view. Site assembly proved tricky. Local zoning and building inspectors looked askance at this non-traditional offering. Selling prices increased by about ten percent, essentially wiping out promised cost savings. By 1950, having produced only some 3,000 houses, Lustron was bankrupt. The scheme premised on a whole series of innovative breakthroughs, many of which failed to work as envisioned.

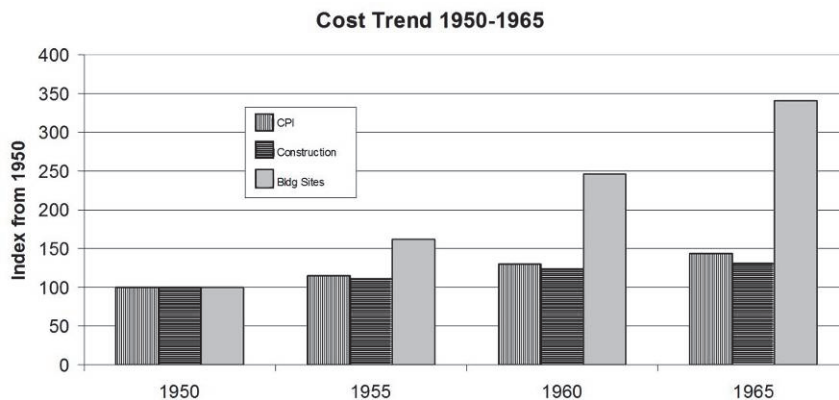
There were accusations of fraud, but no significant evidence. The process simply did not come together as hoped. By the time it was completed on site, labor for a Lustron house was comparable to that of a stick builder. Material savings also proved illusory. There was a \$15 million investment in tooling, excluding the value of that gigantic factory. Breakeven looked like 30 to 50 houses per day—ten times the rate required by the panelized competition. There was no financial or site infrastructure to support the innovative product. Competition proved stiff. Customers had to use magnets to hang pictures, and how in the world could you add on a bedroom for little Suzy? The government returned the factory to aircraft production.

The RFC's initial investment ballooned to \$200 million and fostered production of less than ten percent of the number of houses envisioned. Taxpayer cost; about a fourth the selling price of every Lustron built.

Lustron made many mistakes, but the biggest was probably the lack of any significant allowance for learning curve. The more innovative any new housing process, the longer and more difficult the startup. The more momentum in any existing system, the harder innovation becomes. The classic chicken/egg problem. And finding a high volume market for housing is far more difficult than innovating or producing. Real housing innovation requires big bucks for developing the system and perhaps an even bigger investment to see it through to profits. The challenge of creating and sustaining a reliable market has proven to be the toughest challenge of all.

Despite the failure of many attempts at mass production, the nation's need for housing was largely satisfied by thriving conventional builders. Learning from Levitt and others and boosted by improved materials and subsystems, builders increased their productivity, for a while. Yet as the years went by, the price of houses kept increasing faster than incomes. Low income people were being priced out of the market. What could be done?

At a 1967 conference on the subject, a dozen or more interesting possibilities were put forward. Raleigh Barlowe<sup>24</sup> best summarized the challenge, making two relevant points. First, the high cost of housing was essentially a factor of the increasing cost of land. The graph below, adapted from Barlowe's presentation, shows a 1950 through 1965 trend in housing prices.



The center (dark) bar of this graph shows that house construction cost (as indicated by the Boeckh Residential Construction Cost Guide) increased 31 percent for that period. That was a bit less than the 43 percent rise of the CPI for the same period; the left bar. The soaring gray bar on the right shows the burgeoning cost of land for housing sites; a 241 percent increase (based on FHA data). Typical lot cost went from 12 percent of a house's value to 20 percent.

Personal incomes, he also noted, rose a bit faster than construction cost, so the problem with soaring housing costs could be entirely attributed to the limited availability, and thus high cost, of land to build upon.

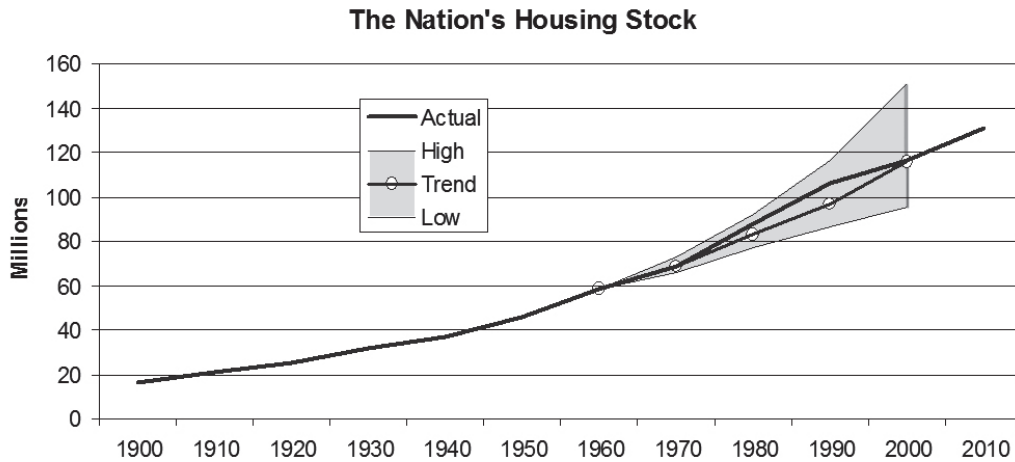
That site cost escalation, Barlowe said, could be attributed to three main factors:

- The rising cost of bare land suitable for housing
- The increasing size of building lots to accommodate larger houses and richer tastes
- Soaring costs of site development

Barlowe's arguments got to the heart of the matter. What could be done to bring land costs back under control? Not much, he figured, "There is little in the present and emerging situation to encourage hopes for lower land prices." He quoted President Johnson who had put forward in 1964 that by the end of the century, "... we will have to build homes, highways and facilities equal to all those since this country was first settled."

<sup>24</sup> Raleigh Barlowe, head of the Dept. of Resource Development, Michigan State U. at a 1967 Economy Housing Seminar in Lincoln, Nebraska.

Barlowe thought that Johnson's projection might be a bit high due to declining birth rates. He included a chart of data based on projections from the Census Bureau, summarized in the graph below, showing historic housing inventory and projections to the year 2000 based on population estimates.



The projection simply extended the trend forward, with upper and lower ranges to account for variations of population that might eventuate. The projection may have been the basis for Johnson's statement, as it shows the nation's 1960 housing stock of 58.5 million living units roughly doubling to 115.6 million by the year 2000—the center trend line. The black line shows the actual growth of housing stock through 2010, tracking the projection very closely.

The Census folks made a good forecast! In the eighties and nineties, some excess appears to have been built, which may have contributed to the “correction” that took place in the first decade of this century.

No rocket science required. As the population grows, more houses are needed, and the fixed supply of land is bound to increase in value and price.

Despite that rather obvious explanation for soaring home prices put forward by Barlowe and others, innovators everywhere continued to flog ideas for reducing the cost of home construction, though no one offered any magic bullets. It just seemed self-evident then, as it did before and since, that conventional home construction made little sense in this industrial age. Yes, building ever-larger homes and putting them on bigger and bigger lots would seem a trend in the wrong direction, but ... sigh ... it's the American way.

The lure of factory-built housing would not die. The government saw home prices going up unaffordably fast and wondered if that might be because too few were being built. The Great Society also envisioned the mass destruction of substandard housing. What was urgently needed was housing at affordable prices to replace homes headed for demolition. Previous efforts at industrializing housing had enjoyed limited success. Perhaps a combination of mighty corporations with government clearing the way through the red tape would get the job done. Many European countries, Japan and even the USSR, that great bugaboo of the era, were building housing units faster than us, largely due to government involvement and mass production of high-rise apartments.

Whoa! That got the competitive juices flowing in Washington. A plan was hatched, and put into motion.

*Today we are putting on the books of American law what I genuinely believe is the most farsighted, the most comprehensive, the most massive housing program in American history.*

*President Lyndon B. Johnson,  
Signing the Housing and Urban Development Act of 1968.*

## 5 Instant Housing: Operation Breakthrough

President LBJ was a get'er done kind of Texan, as long as what needed doing involved getting Congress off its butt to pass some legislation.

In 1968 the Department of Housing and Urban Development (HUD) estimated the nation had recently produced some 1.4 million homes per year; about half as many as needed. President Johnson decreed the nation needed 26 million houses in the next decade, and that became a near universal goal. HUD suggested about a fourth of them would be rehabs and publicly assisted starts; the rest from the private sector. More than a dozen government programs would be enlisted to provide financing and support.

*The Congress finds that [the goal of a decent home and a suitable living environment for every American family] has not been fully realized for many of the Nation's lower income families; that this is a matter of grave national concern; and that there exist in the public and private sectors of the economy the resources and capabilities necessary to the full realization of this goal.<sup>25</sup>*

As noted in the previous chapter, the Census Bureau's projections suggested a need to add 14 million housing units in the coming decade (plus or minus four million) to build the nation's housing stock. In addition, there were some eight million "substandard occupied units" in the nation (aka slum dwellings) needing replacement. Take the high side of need defined by population growth, replace the decrepit homes, and bingo—26 million.

"We must rebuild, open up and clean up the hearts of our cities. The fact that slums were created with all the intrinsic evils was everybody's fault. Now it is everybody's responsibility to repair the damage." St. Louis, Missouri, Mayor Joseph Darst, 1951. Massive construction began under his watch, with the 57-acre Pruitt-Igoe project completed in 1955, featuring 33 11-story buildings. Designed by leading architects, the cost was about \$12,500 per unit, for 2,870 apartments; 60% higher than typical construction. The project was a dismal failure and was dynamited in 1972.

The 1968 housing act was close to the heart of Johnson's envisioned "great society." This was in the days before the Pruitt-Igoe project was dynamited, but it stood there like a sore thumb illustrating government's previous housing efforts for the poor, gone sour.

There were plenty of others.

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<sup>25</sup> Housing and Urban Development Act of 1968.

Inadequate housing was deemed a root cause of much urban unrest. Dilapidated homes were being ripped out for slum clearance. A key part of the Great Society would be the provision of huge quantities of “affordable” housing; homes the lowest income groups could buy. Half of all American families, they calculated, could not afford an average priced 1968 house. Quite a challenge, they figured, and it was quickly established that traditional builders were not up to it. The answer would be mass production. The Europeans had done it in response to their massive housing needs after the war. It was agreed that “cheap” housing was not the answer. The intent was to aggregate and subsidize a big enough market to transform housing into a quality industrial product attractive to America’s giant corporations. Prices would come down with volume.

According to one housing expert, Professor Karl Pearson, University of Michigan, “We have been producing housing at less than 60 percent of our stated needs. ... Our housing shortage is now at its worst level since the end of World War II. ... We have been losing homes at a faster rate than we’ve been replacing them.” He proposed the construction of 28 million dwellings in the seventies, which HUD backed down to 26 million.

The theory was, housing limped along one stick at a time because of lack of coordinated capital investment in systems. Even the nation’s largest home builders were small potatoes in the giant housing market. It was recognized that fragmented markets and bewildering local requirements were big barriers to systems-oriented production.

Government sponsored Breakthrough would cut through the red tape, aggregate markets and clear the field for the giants of industry to mass produce affordable housing. Large scale demonstrations would engender public support and break through local barriers. Efficiency gains would be documented and spread to others. The National Bureau of Standards (NBS) would evaluate the proposals for suitability, bypassing the specification dictates of the building codes.

The entry of these industrial giants was expected to increase the number of housing units built by about 300,000 units annually, enhancing market competition, which in turn would drive down soaring housing costs. Programs would be established to provide favorable financing for all the new homes anticipated.

Harold Finger, HUD’s Assistant Secretary for Research and Technology, made the crucial point regarding the government’s role in all this, “We are trying to encourage [Breakthrough participants] to come in with the concepts they have had and that they have really not had an opportunity to apply in quantity. And we will provide the support for design, testing, prototype construction of those concepts and their marketing capa-



**George Romney, a manufacturing man (father of Mitt), was Secretary of HUD under Richard Nixon (left). In early 1968 Romney announced Operation Breakthrough. Supplementing the practice of subsidizing home building, American industry would be challenged to compete in designing factory systems that would “dominate the market” by the end of the seventies.**

bility to market these concepts for volume production. ... If they are going to fall back into a segmented kind of demand, for example, into a segmented market, there is no incentive for investment in this process.”

Bids to participate in Breakthrough were submitted by 236 firms, including several Fortune 500 companies. Those chosen would be awarded contracts to supply their product to nine demonstration locations selected from 218 site proposals submitted from around the country. Site contractors were engaged for demonstration site work, including the arrangement of financing and sale or rent of the homes. Large scale developments would follow as the demonstrations found success.

General Electric, for example, put forward a system where entire walls were made up of steel framing with wiring and other subsystems in place. As those walls came off one subassembly process, they were dropped onto an assembly line covered with wet quick-setting plaster. Shortly that wall was lifted by its framing, with smooth white seamless interior plaster ready for paint. Specially formulated joint compounds made the corners equally seamless and crack-free.

The housing system proposals submitted were breathtaking. Some of the nation’s best architects and engineers crafted dozens of highly innovative systems. Twenty-two of them were awarded contracts based on the merits of their proposals and the strengths of the sponsoring company. By 1973, about 25,000 Breakthrough homes had been produced and funding was called off after a loss of \$72 million; about 25 percent of HUD’s budget. Nearly all the homes built were multifamily—just seven percent were single family dwellings. Taxpayer cost; about \$3,000 subsidy per living unit.

Just another example of government ineptitude? Not entirely. Industrialized housing fever was in the air. Most of the Breakthrough winners were companies that had sniffed the opportunity and had already made a commitment to get into manufactured housing. That gave them an advantage over those newly solicited for the project—their plans were already in varying states of preparation or even production. They viewed Breakthrough as a way to tap some government funds and influence to advance their cause. While government manufacturing expertise may not have helped, it would be hard to think their mistakes *caused* all those well intended and well capitalized manufacturing ventures to fail.

In essence, all of those fine companies—all the well intentioned government agencies—grossly underestimated the challenge. To add insult to injury, the project, by its very name, thumbed its nose at any suggestion of learning curve. The focus was on the manufacturing challenge. Manufacturing is hard, but easy compared to bucking the establishment. The challenge is dealing with the momentum caused by the housing industry being so far down its learning curve that it shields itself against attack by new ideas and new methods.

It’s not just the fault of the housing industry, either. Large and ancient organizations—industries, governments and knitting clubs—tend to become stagnant. They know they should change ... but doing so is just too hard. Housing is part of the construction industry. Housing traditions are old and well fortified. Perhaps impenetrable. Manufacturers are more likely to understand that they have to adapt or be left behind.

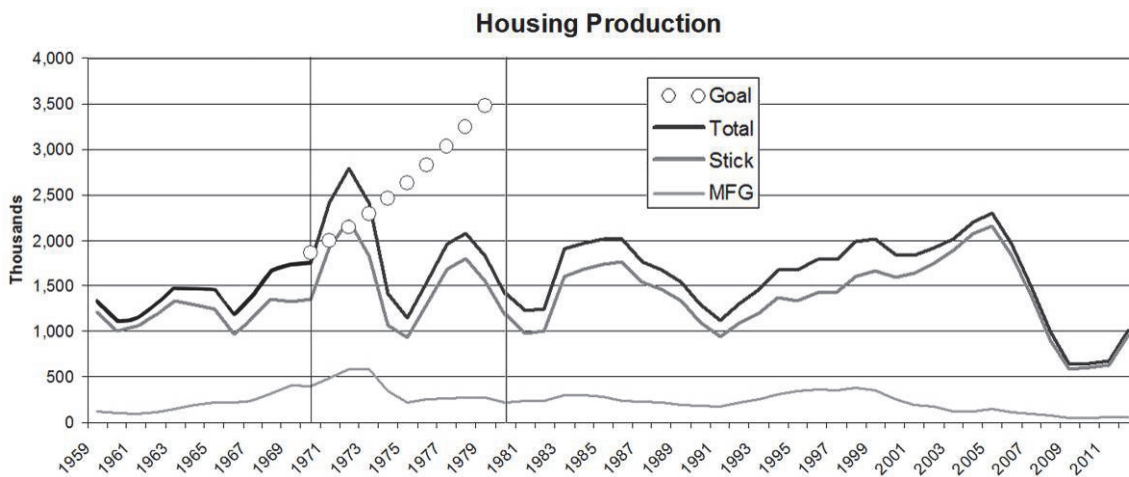
The elephant in the room—in housing’s bed—is well-intentioned government. An extensive 1976 post mortem survey of Operation Breakthrough conducted by HUD generated little enthusiasm for the results. Eighteen percent of conventional builders and twenty-eight percent of industrialized housing builders felt the program actually hurt their industry. A very small proportion found it greatly helpful. Most felt the project had shed light and some help on the building and zoning challenges.

Nearly all of the participants folded their housing operations, many before the program was well under way.

In its review of what went wrong, the official U.S. Government Accountability Office (GAO) report<sup>26</sup> noted the program had “not led to any major changes in the housing industry.” It went on to say that most of the 22 systems were no longer in production and the program failed to accomplish its objectives. Reasons cited were:

1. Unexpected decreases in the housing market (about half the rate expected for 1974)
2. “Fragmented” governmental jurisdictions
3. Lack of state and local government support
4. Resistance to change by “vested interests”
5. Government policies that inhibit new technology
6. The subsidized mortgages planned for the program were “suspended”
7. Some housing systems lacked cost savings
8. Some systems could not be made to work properly
9. The time frame allowed for system development was too short
10. Labor problems
11. Transportation problems
12. Management considerations needed more attention

Those are valid points, of differing degrees of impact, but that number one item was a jim dandy. Look at the three-part graph below:



That top black line is total annual American housing production through 2012. The little bubble dots show the decade-long projection that would have led to attainment of the decade’s goal of 2.6 million housing units per year. In 1973 and even 1974 the housing industry was on track—ahead of schedule! But not because of Operation Breakthrough. The stick builders merely continued their recent heady production trend (the middle gray line) and President Nixon made the decision that mobile homes (the bottom gray line) are actually homes and merit counting! He said the 26 million goal “... can be met, but only by including the production of mobile homes. The mobile home industry has grown so large it can no longer be ignored.”

Mobile home production added half a million homes to the gray “stick” line and bingo, the black-line exceeded the target—as long as the economy boomed. The housing industry would have had to continue that “goal” trend line in order to hit the decade’s target. Unfortunately, Operation Breakthrough and its attendant government programs amounted to a mere footnote in that short term accomplishment. Political and economic realities—including real world stuff like the Arab embargo and that first energy crisis—

<sup>26</sup> *Operation Breakthrough—Lessons Learned about Demonstrating New Technology*, GAO, 1976.



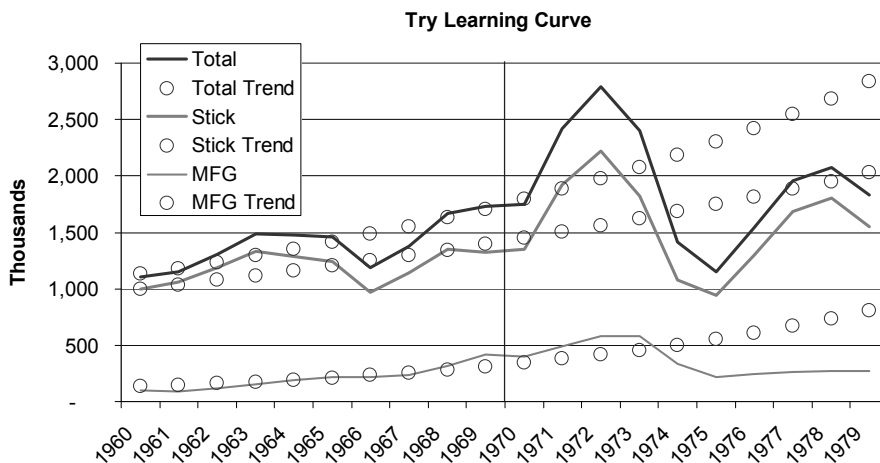
got in the way. The war in Viet Nam, combined with Johnson's "War on Poverty," had led to deficits growing considerably faster than the economy. The pace of deficit spending accelerated beginning in 1970, along with a doubling of the rate of growth of the money supply. The rate of inflation doubled and Nixon initiated wage and price controls starting in 1971. GNP soared at around ten percent in 1971 and '72.

Perhaps the inflationary boom was the prime factor in attaining that 1973 housing peak. Unable to control inflation, the government tried to dampen the economy by raising interest rates. Prime went from six percent to ten. With the economy soaring, productive capacity was taxed, so prices went up. So did wages, but at a slower pace. Credit availability dried up as people spent ahead of the foreseen inflation. Savings decreased and remaining savers sought the safety and high interest of Treasury Bills. Little was left for new mortgage financing. In addition, many of the programs the government had launched to encourage housing production were cancelled or left unfunded.

The whole plan for the economy fell apart, including Breakthrough, and the housing industry has been in some disarray ever since. This was particularly harmful to manufactured housing, which had blossomed on steady production increases as seen from 1959 through 1973.

Heroic measures are used in efforts to manage our complex economy, and no one is quite sure how they'll work out. A bit like dynamiting fish. Government efforts had limited effect on controlling inflation, but were ruinous for housing. When Nixon was run out of office, his successor, Gerald Ford, set out to deal with inflation by introducing half-hearted measures like issuing buttons with his slogan, "Whip Inflation Now," abbreviated to WIN. Some scoffing citizens wore them upside down, saying they stood for "No Immediate Miracles." Others, perhaps those wanting to buy a home, said the upside down slogan meant "Need Immediate Money."

In fairness, all governments in all of history have struggled with the challenge of controlling inflation. But look again at the graph on the previous page. With the benefit of hindsight, it appears Operation Breakthrough ran afoul of a bigger problem than the economy of the seventies. Note that in all the years since 1973, that peak of production has never been matched. In fact, housing production has averaged about 1.6 million homes per year for the whole period covered in that graph. Here's a detail.



History suggests those projections of the nation's need for 26 million housing units in the seventies were incorrect. If, instead of betting on Breakthrough, the Government had managed to keep a steady hand on the housing production tiller as suggested by the bubbles in this graph, our housing picture could be a lot better today.

Both conventional stick builders and mobile home producers were on nice growth trends. If sustained as shown by the bubbles labeled "Trend" on the graph, the total for the seventies might have gotten to the 2.6 million *annual rate* using existing housing systems, and thus able to sustain average production of at least a couple of million homes per year. Yes, there's pie in that sky, but consider the risks.

Chuck Biederman, VP of Technical Services at Levitt, argued that conventional builders could not do their share to meet the Breakthrough target due to a shortage of plumbers and other skilled craftsman. Perhaps so. The mobile home industry, following its learning curve, could readily have continued the growth rate it sustained in the sixties had government put its backing behind MH community development and reduction of other bureaucratic hurdles. Had it done so, manufacturers could have increased housing production by a couple of million in the seventies. Not, perhaps, the architectural gems imagined by Breakthrough, but good homes that most real people would prefer to multi-family Breakthrough apartments. Given a steady market, modular producers could have grown significantly and become a factor in the housing market without any government subsidy or other “help.” That steady market was a crucial objective, as stated by Harold Finger, but one that failed in a particularly dramatic fashion, due to the flameout of both Breakthrough and the economy.

In any case, return to the graph on Page 52, and note the little bubbles starting at 1969 showing the projected accomplishment of the 26 million housing units so sorely “needed.” Both actual and realistic production potential fell far short of the objective. Now look at the right part of the graph showing the top line peaking in 2007 following a few years of production that finally exceeded average. This suggests production in the late sixties and early seventies, rather than being skimpy, might have been *too robust* and thus contributed to the great housing crash of the seventies.

On the other hand, given a steady stream of housing coming on line, it seems likely that housing prices would not have accelerated so fast. Certainly the MH component would have nicely addressed the “low cost” segment HUD fretted about—especially if the HUD Standard had been phased in more reasonably. Given attractive pricing on new housing, existing home prices should have softened as well. And that was a prime objective of Breakthrough.

Whether the nation needs more housing than has been produced in the past fifty years can be debated. What we clearly do *not* need is more “boom and bust.” Suppose Breakthrough’s production target had been met. The following crash ... well, that bears pondering.

**I**t would appear that a big problem of Breakthrough and its participants was a lack of understanding of the nation’s housing need and the challenge of supplying it. Industrialized housing, a new field neither the government nor the “winners” really understood, was put forward to solve an equally misunderstood housing problem. We were all green as grass—this writer included. We saw escalating housing construction costs and correctly attributed them to the doddering housing industry. The proposed solution was unproven whizzbang technology. The only major form of housing with a proven track record of controlling the cost of housing, mobile homes, was roundly ignored, outside the industry itself. Except maybe for Nixon? His words “... can no longer be ignored” speak volumes. The “ignoring” largely continues.

Commenting on the lack of major builders in this country (as of 1970), Chuck Biederman said, “The only company—aside from the mobile home manufacturers, which incidentally, turned out 320,000 units last year—of which I’m aware is literally producing industrialized housing on an assembly line basis and delivering them in any volume, is Stirling Homex.”

Stirling Homex was indeed an early pioneer, with a strong record in producing conventional apartments. They built a state-of-the-art modular plant that produced as many as 400 multifamily housing units in one year and was bankrupted in July of 1972, owing

\$26 million. They left behind thousands of modules they could not deliver due to problems with zoning and codes.<sup>27</sup>

No mobile home companies participated in Operation Breakthrough. Why not? Here's a quote:

*The Congress declares that in the administration of housing programs which assist in the provision of housing of low and moderate income families, emphasis should be given to encouraging good design as an essential component of such housing and to developing housing which will be of such quality as to reflect its important relationship to the architectural standards of the neighborhood and community in which it is situated, consistent with prudent budgeting.*<sup>28</sup>

It's easy to blame governmental bumbling for failures like Lustron and Breakthrough, but at heart, it's in our DNA. As a nation we love breakthroughs and have little patience for the hard slog of steady improvement. We too often ignore the need for developing the support systems required to make technological development viable.

That sounds targeted at MH, but is in fact consistent with long-standing, and commendable, government policy to emphasize good architecture when spending the taxpayer's dollars on construction. Despite such commitments, government is constantly criticized for bad taste in public works. They're an easy target. In 1951 Pruitt-Igoe's design was deemed "the best high apartment" by *Architectural Forum*. Even the worst examples of public housing came with a certified architect's stamp of approval. Spiffy architecture however, can't overcome poor management.

Mobile homes have always been distasteful as viewed through the lens of government. The MH industry has long employed competent designers, but their "competence" has been judged *as viewed by the market* as opposed to esthetic niceties propounded by architects. The "prudent budgeting" quoted in the HUD Act needs to be read in context—coming from a government office where product value ranks low and scholarly journals are esteemed.

In the category of economics, the 95-page summary of the Operation Breakthrough made scant mention of what may have been the endeavor's two biggest mistakes. No allowance for learning curve or for the momentum of the housing industry. Perhaps the project's main problem could be reduced to one word.

*"Breakthrough."*

The name itself suggested government efforts would result in "breakthroughs," casting aside the difficulties that previously stood in the way of housing progress. True, the post mortem mentioned the cart getting ahead of the horse on many details. Those were viewed as merely impediments that could and should have been prevented by better program design. Perhaps so, if the plan and budget had envisioned some decades of sustained effort.

Point Nine on Page 52 was a glorious understatement of the learning curve challenge, "The time frame allowed for system development was too short." Breakthrough was a challenge such as Henry Ford might have faced had he launched his Model T in 1970 instead of 1910. The Japanese utilized no "Breakthroughs" to humble Detroit. They used learning curve and decades of patience, making an end run right over Detroit's long-tailed learning curve.

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<sup>27</sup> *Haunted Houses*: The Wall Street Journal, September 7, 1972.

<sup>28</sup> *Housing and Urban Development Act of 1968*.

Those other 11 points in the GAO review of Breakthrough were comparably understated components of the program’s failure to grasp how hairy the challenge of industrializing housing might prove to be.

“Demonstration projects,” the Breakthrough proposal said, “should be supported by systematic research designed to resolve major technical questions ...” Later, the GAO review noted, “The time frame allotted for reaching Operation Breakthrough objectives proved unrealistic ... innovation is not an instantaneous process.” Well sure. Yet the report still failed to recognize that the housing industry and government itself are mutually reinforcing bundles of stagnant momentum. With our best interests at heart, government can do great damage through their endless pondering, followed by new, complex and crippling rules enacted overnight. Turning the Queen Mary on a dime would be small work compared to bureaucrats standing on the shore and ordering the seas rolled back for Operation Breakthrough.

The well intentioned but heavy hand of government is firmly established—perhaps too firmly—as a key part of the nation’s housing system. For better or worse, that’s how it is. Government “assistance” has become a benevolent barrier to housing innovation. The housing “system” at federal, state, community and private levels is so well entrenched that experienced builders just accept that the old ways are working well enough. Why change? Change is hard. Especially when laid on thick, fast and murky, as it was with Breakthrough.

One of the biggest barriers to innovation in housing is the design and implementation of building codes. A pesky problem for all builders. True, it has been long established that housing is too important to leave to the whims of builders. Ordinary homebuyers cannot be expected to shop intelligently for such technical aspects of a home. Health and safety are at risk, not to mention the 30-year loans on the house. Codes are intended to define good practice, and inspectors are hired to see that those practices are followed. The code books that used to fit in one’s pocket are now luggable items that might be called momentum’s bible. Building inspectors are expected to know and understand the requirements of the code. For the most part, they do, because the codes generally call out time-honored specifications in a form familiar to most builders, and knowledgeable builders are generally hired as inspectors.

But ... for manufacturers of housing, building codes can be—often are—a deal-breaker. The problem, as with so much of housing, is momentum. The design and implementation of building codes has become a vast array of governmental bureaucracy at many levels. Local builders devote great time and effort to mastering the intricacies of code compliance in their market area. For housing manufacturers, doing so for all the markets served can be an overwhelming challenge.

Central to points two through five on Page 52 was the matter of building codes. The efforts of the National Bureau of Standards (NBS) focused on the performance clause of the codes, and that was a fine idea, but hard to implement. Here’s a quote from the 1976 GAO review on how it played out:

*The Guide Criteria developed by NBS [were] based on performance standards rather than by specifying the types of material and construction methods to be used. Housing experts advocated this approach to permit flexibility and innovation in building design and materials.*

*HUD believed that Operation Breakthrough builders would find local building code approval easier to obtain because their housing designs would have been thoroughly evaluated during the program. This evaluation, which included physical testing, was of some help to builders in obtaining code approvals, but local re-*

quirements still caused delays, increased production costs, and prevented marketing in some areas.

*Although the Guide Criteria were intended to promote innovative construction methods, their use created some difficulties for Operation Breakthrough builders. The Guide Criteria **were not developed until after industry had submitted proposals** for Operation Breakthrough. As a result, **housing manufacturers were faced with new and unfamiliar requirements during the design development process**, which created confusion and delay. Also, some Guide Criteria requirements exceeded prevailing building codes. These higher requirements created difficulties in designing most Operation Breakthrough systems. (Emphasis added)*

In other words, in order to help deal with the code problem, the bureaucrats added yet another layer of regulations, and did so very late in the game. Perhaps they thought code specifications were merely obsolete building customs to be waved aside because NBS said so. In principle, such things should be possible. In practice, years of testing, negotiations and schmoozing are required to make a minor change to prevailing specifications or prove that an alternative is workable. When, exactly, did they expect the ... *designs would have been thoroughly evaluated during the program?* Chaos reigned from beginning to end.

Most codes are designed to minimize the challenges of enforcement by listing commonly accepted and proven building practices that both building inspectors and home-builders understand. Those specifications are based on performance criteria of long-standing that are difficult to verify. Any builder can, in theory, ignore the specifications and use alternative materials and methods that meet the same performance requirements. Everybody salutes such "performance standards," but code inspectors tend to define them in terms of "proven" specifications, and 'round we go.

**I**n concept, and in the analysis of its failure, the folks in charge of Operation Breakthrough focused much on the problem of building codes, and for good reason. Every American attempt at industrialized housing has stubbed toes on that issue.

Every company entering the production of industrialized housing recognizes the code challenge and assumes it can be overcome. Everyone understands that codes are fragmented and subject to all kinds of jurisdictions. "Of course," reason the newcomers, "allowance must be made for local conditions, but such problems are surmountable." That is probably true. Think decades of effort. Think culture change. Think developing alternatives from scratch. Think fighting city hall. *Think long, slow, learning curve.* Think minimal payoff.

Building codes are at the heart and soul of the housing industry's damper on innovation. The culture and tradition of housing drives codes and their enforcement. Codes have evolved over many decades to serve the purposes of local communities in the context of conventional plain vanilla construction and centuries of building practice.

Building inspectors play a key role in that system. Like the builders they scrutinize, inspectors are human beings and have opinions. It doesn't take a genius to sort the bad apples from the good guys among local builders. It doesn't take local builders long to understand what "their" inspectors are looking for. As a result, competent builders win respect and the bad guys are driven out of business. A new stick builder starting up can expect fairly close attention from the inspectors until his or her credentials become established in the area. Bribes and payoffs rarely work, but being an established member of the community is a huge asset.

"Established member of the community." That's worth repeating. Communities are made up of many things, but the houses in them are a vital component. Local builders

make great effort to establish themselves in the community. Their reputation is key to their success—far more so than their attention to details of obscure specifications. Some dedicate decades to the process. Their efforts are recognized by far more than the building inspectors. Zoning officials, bankers, Realtors and Aunt Molly come to know and respect the good builders. That’s all vital because, despite the best efforts of codes and their enforcement agents, the quality of a house is ultimately a function of the integrity of its builder. The actual relationship between the specifications of the code and the quality of a home is tenuous. The specifications cited in the codes define common practice and too often rule out better and lower cost alternatives.

Steel electrical boxes are a construction tradition. It took decades of diligent work by suppliers to design plastic electrical boxes that would serve the purpose, sell for less and be easier to install—and then get them approved by most codes. A recent conversation with an electrician:

“Have you considered using plastic electrical boxes?”

“Yeah, I might if I was building a pig barn I didn’t care much about.”

That conversation with a master electrician was after plastic electrical outlet boxes had been widely approved and generally accepted in his area for decades. Housing traditions don’t change easily. There are probably plumbers hoarding oakum, hoping for a comeback of cast iron.

At all levels of conventional construction, such traditions drive the process. The driving force is culture as much as rules and regulations. Builders have learned to go along with that. They have to. It’s just the way things are.

Until something new comes along.

When an outsider wants to bring even one innovative house into a community, alarms go off at various levels of government. How is the building inspector to know if local requirements have been met? Why would the local banker provide financing for this newcomer? And if local money was not needed, why would that banker not resent the outside financing? Zoning boards and communities choke at the prospect of anything that might disrupt the neighborhood tranquility. And if the system or product is new, they will err on the side of expecting the worst. Slick presentations by outsiders can do more harm than good. What is sought is proven performance, which cannot be demonstrated because of code barriers. Catch 22.

About 50 years ago, Alcan Aluminum was one of Canada’s largest and most diversified corporations. In addition to ingots, they produced lots of products including residential aluminum windows—and houses that used those windows. One of Canada’s largest homebuilders and frustrated by the short building season, they decided to try building them in factories. An American mobile home company, Richardson Homes, was hired to design and build prototypes.

Canada’s building code is administered by Central Mortgage and Housing (CMHC). Their representatives were brought to Elkhart, Indiana, to ensure compliance with Canadian requirements. These were high level officials and things went well, for the most part. Alcan’s aluminum windows were deemed too expensive and not well suited to the modular construction that was contemplated. The windows proposed were specified from an American MH supplier. CMHC was aghast, “Not even close to meeting CMHC standards.”

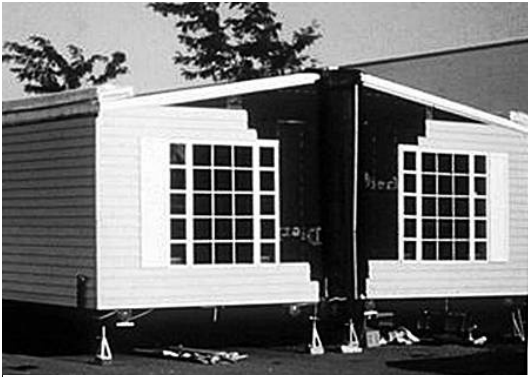
Canada’s national building code though, like virtually all codes, has a performance clause. In essence, the clause says alternate materials must be accepted if they can be

shown to meet or exceed the performance required by the code—such things as wind and water resistance. That clause is at the heart of nearly all housing innovation.

The American windows, built to the MH industry's American National Standards Institute (ANSI) performance standard, were sent to Canada's testing facilities, passed, and were accepted by CMHC.

Puzzled, the lab tested Alcan's own windows. They failed. They did not accomplish what the code intended in terms of protecting the occupants of the house. They tested other Canadian-made windows, with similar results.

It is the nature of traditional, well-intended solutions to evolve into routine specification exercises that too often fail to have their planned effect.



How could these inexpensive windows meet the requirements of Canada's cold climates?

Note that this example was international and very high profile, involving major builders and suppliers from both countries. It was handled at the top levels of Canada's bureaucracy, and a lot of time and money was expended. Joe the Plumber might have a wonderful idea for a better P-trap, but can hardly invest the time and money required to put it into broad use. That would require a big investment by somebody. Who? Not the current P-trap makers, unless the same materials, methods and margins could be enjoyed. Why rock the boat? And how is Joe to find an outsider to take on the "establishment" that "owns the market"? Joe's in a tough spot, but no more so than a home builder faces in proposing a new construction detail that's not written into the code specs.

Build a better P-trap and the world might want to beat a path to your door. Probably not. Not even the most ardent home buyer pays any attention to P-traps. The code system provides for innovation, but abhors change. Innovation is stymied at every turn.

Can this thorny problem be solved? Maybe, but not overnight. There have been four basic "model" building codes in this country, which used to be regionally oriented. In the nineties they were consolidated under the auspices of the International Code Council, which also publishes more than a dozen special codes such as plumbing, mechanical, fire codes and so forth. In addition, there's a national HUD Standard for manufactured housing, which puts the national code into a manufacturing context. Attempts are made to keep all this synchronized, updated and properly adapted to regional variations. Most states adopt the model codes with many local variations. Those differences may or may not be amenable to factory production, but it is interpretation and enforcement that is generally the killer. Some states have preemptive state codes for modulars which may or may not be reciprocal. The results rarely enhance clarity.

There is a rationale for regional variations in codes—climate and all that. There is a rationale for updates—things do change. There's a rationale for varying levels of inspection and enforcement—some areas are plagued with irresponsible builders. There's a rationale for government involvement—health and safety are at issue.

But the hand of government is heavy and bureaucratic by nature. Give any such process a hundred years to evolve and the result is a mess.

Data on the cost of code enforcement and similar regulatory procedures is scarce. Perhaps five percent of the cost of a house, and maybe more. One estimate put the impact on a single family house at 25 percent of the final price, with the greatest impact

on land development costs.<sup>29</sup> In any event, such costs take no account of the effect codes have on innovation, and that may be their biggest cost. Learning curve improvement hinges on having and making choices. The code process creates an unholy bible of strictures on the entire building industry. Thou shalt not change nuthin'. How then is home-building efficiency to improve? The one window left open is the performance clause (right).

Proper reports are to be filed with an *approved agency*, and the *building official* decides if performance tests by any *approved agency* will be deemed acceptable.

Not all codes are quite this blatant, but that's pretty much how the process works. Build according to the specifications listed in the code book or convince your *building official* your innovation is a good one.

If your particular *building official* is congenial and salutes your ingenuity, nothing says the next *building official* will agree.

Bottom line; forget about any innovation unless you go through a process of getting it broadly accepted with good documentation—ideally incorporated into the code's specifications.

For all practical purposes that means building innovations are limited to very large builders, manufacturers or suppliers, prepared to invest years and big bucks. Even with suppliers, innovation is largely limited to secondary sources. The dominant supplier has little reason to innovate.

In any case, it is the suppliers who originate most of the building industry's innovation. Try to think of any exceptions. Realistically, even for large builders, the overwhelming choice is to stick to the specifications listed in the code rather than swim against the current. Even among irresponsible builders, cheating on the specifications is not worthwhile. The inspectors might not catch the cheating, but they can recognize shoddy workmanship and can use the codes as a battering ram to bring shady builders into line.

**[A] 104.10 Modifications.** Wherever there are practical difficulties involved in carrying out the provisions of this code, the *building official* shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the *building official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

**[A] 104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose in quality, strength, effectiveness, *fire resistance*, durability and safety.

**[A] 104.11.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

**[A] 104.11.2 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved agency*. Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

**Above is an extract from the International Building Code, an attempt at code unification. The emphasis added is in the original. They find it important to emphasize that the *building official* has the final say until he or she approves.**

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<sup>29</sup> *How Government Regulation Affects the Price of a New Home*, Paul Emrath, Ph.D., 2011, NAHB.



An aggressive inspector can almost always find something in any home to interpret as compliance failure.

Despite all that, innovation does happen in the housing industry. Examples include:

- The use of steel plate gussets
- Computerized pre-built trusses
- Engineered floor trusses
- Engineered beams
- More and more prefinished materials
- The use of manufactured subassemblies, including walls
- Oversize sheets of drywall and ways to handle them
- Manufactured cabinets
- Prehung doors
- Prefabricated chimneys
- Plastic plumbing supply and drain lines
- Quick-connect electrical components
- Plastic electric boxes and conduit
- Ever-increasing use of air, electric and other power tools
- Plastic, cement and other new siding materials
- Structural adhesives
- One-piece tub/shower components
- Oriented strand board and other “manufactured” materials

... we do not have performance information. There is no single source of information available to architects, engineers and contractors advising them as to the technical performance and capabilities of building materials and equipment. Consequently, building officials who must rule on new methods and materials have no authoritative source which they may use for technical guidance. Officials who approve innovations are rare and they must do so at their own risk.

Production Dwellings, The Frank Lloyd Wright Foundation, 1970

The list could go on. Each of these innovations has gone through its own learning curve to gain acceptance against formidable barriers. Add it up and perhaps as much as half a typical volume builder’s house construction today can be said to be “manufactured.”

All of those listed innovations and many others, however, have not managed to overcome the rising cost of building. Neither are they what government planners envision as “factory production.” Factory construction of the homes themselves has had more success in terms of innovation, but the pace is slowing as the sway of codes increases. All builders are strangled by the traditions and practices that make site building inefficient. The most efficient site builders pay little attention to innovation and put their effort into optimizing use of tradi-

tional code-approved materials and methods. Modular manufacturers are largely caught in the same trap, and manufactured housing keeps edging in that direction. The siren song of community acceptance is strong bait.

**A** larger problem than code variations is enforcement of accepted codes and standards. In an extensive 1986 report on the challenges of housing innovation, the Office of Technology and Assessment confronted the issue as one of the major barriers to progress.

*Inconsistent state and local building codes and differing inspection practices are frequently cited obstacles to technological innovation in the U.S. housing construc-*

*tion industry. This regulatory morass prevents manufacturers from achieving the economies of scale needed to justify large investment in sophisticated production facilities.*

That's a tidy summary. Efficiency can't be attained without innovation and innovation is stymied by traditions.

In the early seventies, Multicon, a housing subsidiary of Bethlehem Steel, was operating a large modular plant in Ohio. The product was multifamily housing, shipped to the site 90 percent finished inside and out, in full compliance with national, state and local codes prevailing at the site. Inspectors from the various agencies were flown to the plant, expenses paid and given full access during production and upon completion, as well as their final inspections on site.

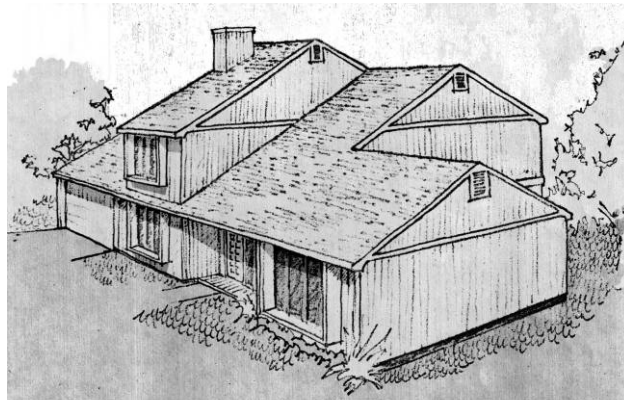
It is understood that inspectors cannot check everything, whether in factories or on site. In the case of one major project, an inspector pulled the cover plate off an electrical box in a module awaiting shipment, to be sure the wiring was correct. It was. However, he found a bit of paint had inadvertently gotten into the electric box when the wall was painted. The project was shut down until every electrical box in every module was removed, checked, and corrected if any paint was found. Justified perhaps, had there been any health or safety issue.

In that case, the project came in on budget because experience had led to planning for such setbacks. Similar problems bankrupted many industrialization attempts. It's hard to anticipate and budget for this kind of event. Doing so erodes much of the value of the manufacturing process.

Without codes, disreputable companies can build lousy products and trowel over the bad spots. A step toward a solution might be national performance standards applicable to all forms of housing with compliance certified by independent agencies such as Underwriter's Laboratories. That seems to work for most products where health and safety are at issue, but there remain plenty of challenges at many levels.

**F**or far too long, home builders and manufacturers have sat on their hands, accepting revealed wisdom that the regulatory problem is what it is, and will only get worse. Few attempts have been made to develop a truly performance-oriented national code that would take the politics out of enforcement and make innovation possible. Potentially, all forms of housing could enjoy reduced costs and improved quality. That's what Project Breakthrough was attempting to accomplish. It was an abysmal failure, having tried to accomplish an extraordinarily difficult task in the blink of an eye, as bureaucratic undertakings go.

In the creaking bones of the housing business, changes have always been slow and difficult. That's usually the case in very mature industries. On a one-to-ten scale, housing



This Multicon product used stacked modular boxes.

Where government intervenes to correct market failure, what is the evidence that they are effective? They either miss the problem or make things worse. People self-select to go into government. Those who do are risk-averse; they are intelligent but want to keep the status quo.

Cliff Winston, The Brookings Institution

ranks right up there with Methuselah. Can all that momentum at so many levels be overcome? Is there a workable answer? Maybe so. The halls of Congress appear to have given up on the idea of a housing “breakthrough,” but remain committed to the notion that the housing industry needs help.

The challenge is difficult, but not hopeless. There is one arena in which housing innovation has progressed rather briskly, overcoming many of the housing industry’s barriers to progress, and cutting the cost of decent housing nearly in half. The task was accomplished without a smidgen of government help at any level.

Among the endless attempts to industrialize the housing process, one has shown the most significant history of progress against incredible challenges. Here’s an opening quote from *Building Tomorrow*,<sup>30</sup> by Arthur Bernhardt, in 1980:

*As the housing crisis continues to worsen, many people are asking whether mobile homes might become a viable housing alternative. My personal answer is, “I hope not!”*

Nonetheless, being an open minded fellow who genuinely sought answers, he dug in and had the most thorough “outsider’s” look at the mobile home industry ever done.

At the end of his huge book, Bernhardt said this:

*The mobile home industry has become the world’s most efficient building industry because it has thoroughly understood and strategically manipulated virtually all of the important functions that operate in or affect the larger building industry.*

That’s an academic’s way of saying the tiny mobile home industry came at the challenge from a completely new direction, solving problems as they arose along the way. Rather than bucking the establishment, they thought outside the box, while building boxy houses.

Bernhardt’s book is long out of print, it’s a bit out of date and reading it’s a hard slog (nearly four times the length of this one), but well worth the effort. In upcoming chapters we’ll look at a much condensed version of how the mobe guys did it.

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<sup>30</sup> *Building Tomorrow; The Mobile/Manufactured Housing Industry*, Arthur D. Bernhardt, The MIT Press, 1980.



*I don't look to jump over seven-foot bars: I look around for one-foot bars that I can step over.*

*Warren Buffett*

## 6 **Manufacturers Climb the Blind Side**

Learning curve is very simple in principle, but ... oh, those details. Learning curve can work for any industry—any product—but depends heavily on two components of the process; consistency of repetition and quality of management. A dollop of luck doesn't hurt, either. As shown in previous chapters, these elements are hard to marshal in the construction industry. Levitt and others showed that it can be done if the circumstances are right. The first trick is to find a suitable market niche, as they did. As Levitt later acknowledged, that window of opportunity has largely closed, as opportunities tend to do.

Let's look at a more basic construction example, where less momentum got in the way.

The 1800s saw the nation crisscrossed with railroads. 'Twas the era of rail—the Silicon Valley of its day. By 1840, almost 3,000 miles of track had been put down, and things were just heating up. In the 1850s nearly 3,000 miles was laid in Illinois alone, approaching the amount of trackage already existing in Ohio. Surely then, the art of laying rail was far advanced along its learning curve? Indeed, the repetition component was nicely in hand, but management was still fumbling. Principles of effectively managing large endeavors had not yet been worked out.

Shortly before the Civil War, the pressure was on for a transcontinental railroad, connecting America's two shores. The story of how it was accomplished is fascinating; perhaps best told in *Nothing Like It in the World*, by Stephen E. Ambrose. The best railroading minds and managers in the country were put to the challenge, backed by Federal construction loans (it didn't hurt that Abe Lincoln had been a successful railroad lawyer). Great incentives were provided to two competing railroad companies. They started construction from California and Nebraska, winning huge parcels of raw land surrounding the track as well as loans and the promise of unparalleled future rail business. The company that built the most track got the most benefit.

They were good at putting down those rails, real experts at their craft, though tools were largely limited to picks, shovels, dynamite and muscle. Still, they laid as much as a mile of track per day in the early stages where the land was level. By the time the railroad was nearing completion, still using the same tools, they were much better. By 1868 the Union Pacific, coming from the East, bragged that they had laid 4.5 miles of track

across the hills in a single 12-hour day. Managers from the Central Pacific coming from the West wagered \$10,000 they could double that, laying ten miles in a day. The bet was on.

Special preparations were made for the day of the bet, with every piece of equipment and every item needed at hand. At dawn, an engine blew its whistle and they were off, laying track. Five men to a rail, thirty spikes per rail, three sledgehammer blows per spike, *wham, wham, wham*—move past the next man who was driving his spike and repeat. Five supply trains with 16 cars each carried supplies for two miles of track. They were unloaded, hauled by horse and wagon to the site and installed in a carefully orchestrated sequence. The next trainload pulled in, rails were grabbed and at the call of “*down*,” dropped into place. A pair of men managed the track gauge; others shoveled dirt and gravel, while another team bolted the rails together with fishplates. Tampers came along behind. Nobody stopped working. Telegraph wires and poles proceeded alongside, managed by other crews. More than a thousand men, moving at about one mile per hour. They stopped for lunch and were slowed by 20 curves where the rails had to be hand bent. Spikers drove 28,160 spikes that day and each track layer lifted 125 tons of iron. For their 12 hours of work, they got four days’ pay and they laid ten miles and 56 feet of track. Next day they ran a locomotive at near top speed on the new track to prove they’d done the job well.

Leland Stanford, given the honor of driving the golden spike at Promontory Point, was not up the learning curve and had to ask for help on the task.

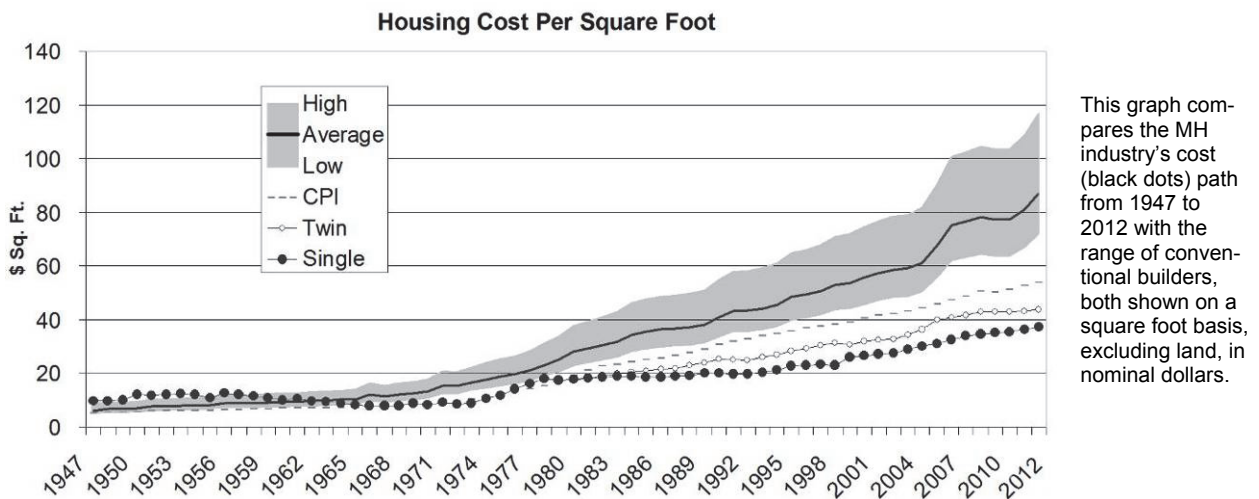
The media of the day sensationalized the abundant graft and corruption, but the huge enterprise turned out to be profitable for the government, the railroads and nearly everyone involved. The biggest winner; the American people.

It’s hard to find massive construction projects where that kind of repetitive learning and management can be demonstrated. Even if one could measure the historic learning curve of general construction, two things seem certain. The curve’s slope would be low compared to most industries and would have been on the flattest part of that curve for uncounted generations.

Need that be an insurmountable obstacle for new players in the field? Not in the short term. Every building contractor goes through some sort of learning curve at startup. As does every drywaller learning to mud. They always have. What’s tough is to pull everything together in such a way as to make a real and lasting reduction in the cost of building houses. More obstacles arise than short learning curves can overcome. Too many variables. Too much conventional wisdom “proving” it can’t be done. Too many saying it’s possible only through some radical breakthrough of unspecified dimension. The industry is strangled in red tape—many colors of tape.

People like Cliff and Bob Richardson, featured in Chapter Two, in a brand new branch of the housing industry overcame such obstacles and more during the three decades they were in business. Like Warren Buffet, they just stepped over surmountable hurdles along the way, one at a time. By the time they left the industry—just as before they started—many others did the same. Those pioneers didn’t attempt to enter the housing field as it was and is commonly defined.

These were not MBA types nor were they manufacturing tycoons. They were just good businessmen who set out to make a buck. After a couple or three decades, they found they’d bypassed most of the obstacles that defeated every other effort to industrialize the housing process. They built trailers, then mobile homes and now, manufactured housing.



The upper gray area represents an approximate historic range of stick-built housing cost per square foot, with the black line inside the gray area showing average construction cost for a 1,500 square foot house of simple design.<sup>31</sup> The dashed gray line is the Consumer Price Index. The bottom dotted lines represent manufactured housing, splitting at 1980, with multi sections above the split and singles below.

For the manufactured house, the dotted black line starting in 1947 shows the cost per square foot was higher than even that of a high quality stick house. The graph shows how MH costs in real (sans inflation) dollars declined rapidly starting in the mid-fifties as trailers became mobile homes.

The MH cost increase starting in 1970 is partly attributable to the growing number of multi section units (commonly called double wides) in the mix. About ten percent of the total in the sixties, growing to twenty percent in the seventies, so the industry started providing separate data on the two types. By the nineties, comparable numbers of each type MH were being shipped.

The cost per square foot rule of thumb for multi section manufactured homes tends to be about 23 percent higher than for singles. That's because singles are entirely packaged in one unit, which reduces manufacturing cost, cuts shipping cost in half and greatly reduces site setup costs.

The cost advantage of manufactured housing over stick builders has continued to increase. A common perception is that the price advantage is due to substandard materials and construction. That can be true if compared to the average or higher priced stick house. Not so much if compared to the stick guys' low cost product. There the quality and materials are reasonably comparable and the MH still enjoys a 40 percent cost advantage. Maybe more. If comparisons were made size-for-size using 1,000 square foot homes, the MH advantage would be enhanced.

It can be demonstrated that competent "production" tract builders can lower construction cost by as much as ten percent ... but where are their low cost houses? Stick builders tend to compete higher up the food chain of housing. Manufactured housing has

<sup>31</sup> See footnote on Page one. The 1,500 square foot size was typical, though not average for the whole period depicted. The more typical 2,400 square foot houses currently being built would cost about ten percent less per square foot. The 900 square foot houses being built in 1947, about ten percent more per square foot. The size of the modern single MH has increased about 4.7 times, while the house grew by only 2.7 times. The MH remains smaller than the comparison house though, so the cost comparison favors the house, if anything.

dominated the low cost market for decades and is striving to make inroads into more upscale products.

In order to understand how the MH advantage came to be, it's useful to peer again into industry history.

In Chapter Two, Cliff Richardson was just looking for an opportunity better than running a used car lot, and he found it. So did many others. After Henry Ford put the nation on wheels, it didn't take long for the automobile to become the focus of family vacations. Campgrounds and motels sprung up, and as night follows day, trailers.

Put the camping supplies in a luggage trailer, including a tent, and gee, why not make the tent fold out of the trailer, so you've got a floor up off the ground? Art Sherman tried one of those and found the tent erection to be a royal pain. He built a larger trailer with roof and walls, as had others. Fellow campers were envious, so with \$10,000 and a rented garage, Sherman set up a company he called Covered Wagon to build trailers.

As with Cliff Richardson's first used car lot, the timing of Sherman's new venture was terrible, but the market he'd discovered was hot. By 1936 he had a factory assembly line building 35 units per day and held 15 percent of the burgeoning market. Patterned after Ford's success, Sherman organized every step of the process, pouring retained earnings into capital investment. Oops, the strategy backfired. When the market softened in 1938, his more nimble competitors responded by widening their trailers 18 inches, gaining a big cost advantage. Forced to retool to compete, Sherman found that capital investment can be a risky proposition in an industry that is not inherently capital intensive. Many others learned the same lesson—generally the hard way.

Sherman's view, and one that persists in some circles to this day, was rooted in the automotive paradigm that said bigger is better. Outsider advocates of industrialized housing usually envision huge machines stamping out parts in huge factories. Such factories were not required to build trailers efficiently, nor to build homes. In the history of housing to-date, the materials used—the materials *available* to use—are rather simple. Jigs and fixtures are cheap. Everybody in housing uses power tools. Where and how, exactly, does large scale, high capitalization and complex tooling add value? No one has so far found a useful answer, at least for single family homes.

A simple secret, well established and hiding in plain sight: *efficiency in housing comes from the process; not from the factory*. Basically, the process is learning curve, and it just works better inside than out in the rain and dust.

Early in the game, Ford and General Motors investigated the hot new trailer industry and gave it a miss. They could see that their sophisticated manufacturing process and high overhead was inappropriate for the product. When General Motors was tempted into the far more complex motor home business 40 years later, they learned that their earlier decision had been the right one. Finding the right blend of capital and management intensity is not simple. The rules of thumb; tricks of the trade—the things that work—tend to develop with experience. Learning curve. So simple; so hard to execute in a hurry.

### Just a Bunch of Gypsies

A new problem is confronting the railroads, the tax assessor, the truant officer, and the greatest institution in the world—the American home.

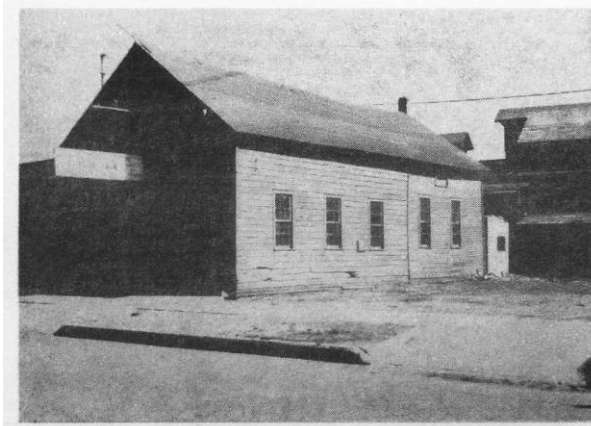
It is estimated that a million families (more than four million people) in the United States will be living and traveling in trailers this year. That is more than the entire population of Kansas and Nebraska combined.

This is a new problem. Many of these people will not be assessed. They will be on the go a good deal of the time. Their children will receive no schooling. They will acquire the wanderlust, a generation of nomads.

Well, it's something to think about anyway, and it's going to get worse each year.

*The Herington Kansas Times-Sun, 1936*





THIS BUILDING AT 515 Harrison St. was Elkhart's first trailer factory. When Schult began operation in 1935 his 20 carpenters put out one trailer a day. The trailers sold for \$198 apiece.

Wilbur Schult was a Covered Wagon dealer in Elkhart, Indiana. In 1934, with trailers in short supply, he saw that the darned things were really pretty simple to build. With Walter Wells, he established the factory shown left. If the caption on this old clipping is correct, it took about 150 man-hours to build trailers that sold for \$200. Fully equipped manufactured homes, four times as large, can be built today with comparable man-hours, and many of the "men" will be women. Nearly all will be what's classified as "unskilled labor."

Courtesy RV/MH Museum



By 1936 Schult had become the third largest manufacturer and was building simple but well built and competitively priced trailers. Annually, he batted out 1,400 of them from this Elkhart facility, the former Elcar automobile factory shown left.

Courtesy RV/MH Museum

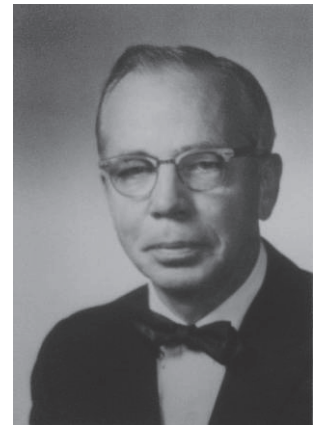
Schult acquired that plant from Milo Miller, another industry pioneer and Schult mentor, who had built the Sportsman trailer there.

Young Bob Richardson and hundreds of others who went on to run companies of their own got their start in that factory. Later, Schult built a new plant at nearby Middlebury, but that company established Elkhart's claim as the home of the industry.



That's Wilbur Schult, center left, receiving recognition at the RV/MH Hall of Fame. He and Walter Wells, right, saw it all. They experienced it all. They survived, and they learned.

Courtesy RV/MH Museum



In the thirties, trailers served vacationing families. Though requiring an investment comparable to the cost of purchasing an automobile, the trailers could be marketed as a money saving family vacation for the whole family or land yachts for upscale travelers. The Recreational Vehicle industry, producing travel trailers and motorhomes, prospers to this day.

Even in the thirties though, some people adapted themselves to tight quarters and lived in trailers having a couple of hundred square feet. They were widely used as low cost summer homes as well.

During World War II, the trailer industry got its big break. Hitler had stunned the world with his nation's ability to turn out war supplies, and he didn't hesitate to use them. No European country could match Germany's output. Nor could the U.S. until it became clear that we simply *had to*. In becoming the world's leading manufacturer, surpassing Germany and the rest of Europe put together, we overcame endless challenges. Among them, finding housing for millions of workers yanked off the farm and moved from one place to another as demanded by the war effort.

The government, which had shunned trailers as sub-standard housing, suddenly couldn't get enough of them. Trailer manufacturers got government contracts to build thousands. While Schult pioneered multi section homes for the TVA, others developed and produced thousands of folding houses—mobile homes that flipped open to double and triple floor space. Never mind a few leaks. Trailer builders got priority access to materials and manpower. Factories found out what they could do when they let it all hang out.

After the war, the industry set out to resume its mandate of trailers for travel and fun. But the demand for housing for returning vets, along with the shortage of homes due to lack of wartime conventional construction, kept demand for "trailer homes" at a fever pitch. Lengths soon increased to 35 and 40 feet, and complete bathrooms and kitchens became commonplace.

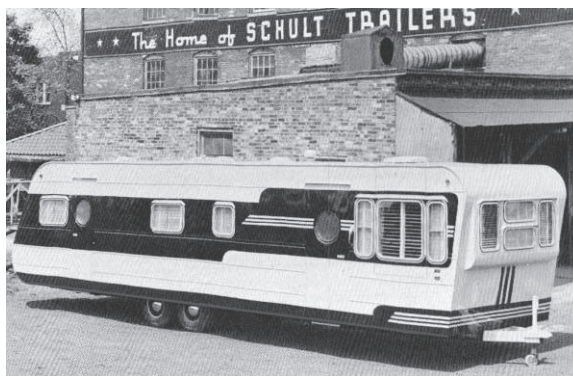
One could make a home of the unit shown right, but best not come home drunk at night. How would you find the door?

The old brick Schult building still stands, a tribute to the key role Schult and Wells played in creating the industry. The Middlebury Schult plant that replaced it is greatly enlarged and carries on. Branch plants around the country made Schult a national brand name. By 1969 Schult was the 16<sup>th</sup> largest mobile home manufacturer, producing more than 6,000 homes annually from five plants. Though ownership of the company changed from time-to-time, Walter O. Wells remained in charge until his retirement in the seventies, when his son Walter E. Wells (Wally) took the reins.

Schult Homes has become a division of Clayton Homes, the giant of today's industry, founded by veteran Jim Clayton, itself now a subsidiary of Warren Buffet's Berkshire Hathaway. Clayton's a major force in today's manufactured housing industry.



Always an innovator, Schult introduced steel frames, forced air heating, complete interior plumbing and built-in appliances. That was by the forties. During the war, they built 2,000 twin section homes for the Tennessee Valley Authority. A cluster of them adorns the Tennessee hillside above. Bob Richardson helped hammer some of these together for the war effort. Courtesy RV/MH Museum



This Schult from the fifties was typical. Too big to pull with a car, but still featuring streamlining and chrome hubcaps. Courtesy RV/MH Museum



Today's Schult homes are virtually indistinguishable from those built conventionally—except of course, they cost less. They even build a model called the Berkshire. Courtesy Clayton Homes

Elmer Frey was an industry pioneer from Marshfield, Wisconsin. A relatively small manufacturer operating outside the industry mainstream, his competitive options were limited. The local market in the fifties provided little growth. Large Indiana and Michigan producers could not only compete in Wisconsin but could also reach the lucrative Florida market—then as now, a huge one for the industry.

Everybody shipped mobile homes using stubby trucks called “toters.” Trailer toters—a natural progression from pulling them with cars. After all, the trailers had wheels. Thinking outside the square, Frey wondered, what if he shipped by rail? Might he be able to compete in Florida?

Maybe. The cost of rail shipping didn't look too bad, but special packing would be required to withstand the shocks of “humping” and the like. Further, Frey's Rollohome brand was hardly in the sweet spot of the price market. He needed an edge. He found one.

Utilizing favorable Wisconsin state and local shipping rules and loopholes, Frey had for some time been building mobile homes in ten-foot widths for local use on lakes and the like. That had provided a nice edge against eight wide products from out-of-state. Finding no enthusiasm among his partners for further building on that strategy, Frey jumped ship and took over nearby Marshfield Homes. Wisconsin, however, remained a small market and shipping the wider units outside the state was problematic.

Unlike the regulated highway system, rail shipping sizes are determined by what the railroaders can squeeze through their own bridges and tunnels. Why not, Frey reasoned, take advantage and ship ten wide mobile homes? Florida had lots of rail branches. At the destination, dealers could probably get permission to make nearby deliveries, using tricks Frey had worked out such as calling the product a “construction shack.” Then as now, “house trailer” was a bad word in government circles, but “construction” was good. Nomenclature does make a difference.

The first ten wide showed up at a big Florida mobile home show and caused quite a stir. The customers and dealers all wanted them. These were surely not RVs and enhanced the adoption of the newly devised appellation “Mobile Home,” intended to displace “trailer.” Competitors, who'd been fighting hard to get approval to ship longer homes, figured Frey's “subterfuge” would cook the industry's goose. The shrillest argument came from Spartan, an Oklahoma manufacturer spawned by Spartan Aircraft, and having a big capital investment in plant and tooling committed to the prevailing eight wides.

In the end though, Frey and the whole industry<sup>32</sup> proved big winners. The market wanted those wider homes, which were far more livable. And they cost less per square foot. Look at it this way. A building sized 50 x 8 has 400 square feet of floor and roof. In the case of a mobile home, it has one frame and one set of running gear. A 50 x 10 has twenty percent more floor space, with only four percent more wall area, and little change to the frame and running gear.

Propelled by that logic and soon joined by his fellow manufacturers, Frey led the battle that opened the highways to 10 wides, then 12 wides. Today, 14 footers dominate, 16 is common and 18 is allowed in some areas. With the easing of shipping regulations, floors became wider in multi section homes as well. Shipping safety has remained acceptable, despite flurries of concern at each widening of shipping regulations.

The market soared by the seventies. Fourteens were widely available and captured around 15 percent of shipments, as did double wides.

Nearly 400 companies operated more than 600 MH factories having an average output of about three homes per day. Around half-million homes annually. Mobile homes had hit the big time. Skyline had become the nation's largest home builder and others were in hot pursuit.

For the most part, manufacturers relied on dealers to handle retail sales. Many of those dealers were, like Cliff Richardson, former or even active used car dealers. Oh dear. Used car dealers? Actually, a great source of entrepreneurs. Jim Clayton is another who started with used cars.

The retail business was, and is, quite different from that of the manufacturers, but they learned to manage the same MH industry trick, low price, high volume, low overhead and high return on investment.

Suppliers learned the same technique, as did developers of mobile home parks, communities and subdivisions (at least as compared to those assembling housing tracts). Much of the industry's success relates to the entire system of interdependent profit centers. Companies that work together, not through negotiated contracts, but simply because everybody wins by doing so. The kind of "partnership" based on mutual respect that Bob Richardson and others treasured.

Lacking the market "protection" of patents, market dominance, huge capital investment, government backing or franchise contracts, what's left? Just management. The mobile home industry embodied capitalism in about as pure a form as it can be found. One reason learning curve worked so well.

Every manufacturer; every dealer, lived or died by demonstrated management ability. If, like Skyline, you aspired to volume, you'd better offer the right price. If, like Schult, you focused on the upper reaches of the market, you'd better make it worth the dealer's risk. Every manufacturer had to compete on price but dare not fall behind market trends. Innovate to lead; keep up or die. A dealer with a bad reputation would be



By the early seventies, mobile homes reached something of a zenith. Twelve wides like this Bendix were retailing for \$6,000 and capturing about three-fourths of the low cost housing market. Courtesy Dan Eacret

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<sup>32</sup> Not Spartan. They adapted to the ten foot width and always built a fine product, but ultimately, could not compete.

shunned by the better brands. A manufacturer with a bad reputation soon found his dealer body sharing it. Messy, but it works, and can be very efficient—especially in comparison with the established traditions of housing production.

The manufacturers cited in this chapter, and hundreds of others large and small, didn't accomplish all this by careful planning or brilliant insight. They discovered and built it, one step at a time, while serving a “trailer” niche. They capitalized on their initial success, finding additional niches. Learning curve was the tool, though few could name it.

**T**his very short manufacturing history makes this chapter's point. Neither Bendix, Schult, nor anyone else among the hundreds of companies that built this industry, as far as can be found, set out to build houses. They did not envision competing with Jack the Builder. They simply saw money to be made in a booming industry requiring little capital, and went for it. They competed vigorously with each other; fighting like cats and dogs to maintain their freedom to do so. They followed the market where it led, and that turned out to be low cost housing! Just the thing our government has so long craved—but my goodness, *not from trailer manufacturers!* Surely *they* can't build decent housing?

Well, they can. Ignoring the “rules” created by construction traditions, these little guys sneaked up on the blind side of the dozing housing industry, slipped past the momentous housing culture and figured out how to build good little houses at half-price. There turned out to be an enormous market for that sort of low cost housing. Bound by the constipated strictures of housing and regulatory momentum, stick builders were unable to devise competitive products suited for that huge opportunity. Customers flocked to the new product, seeking an escape from the confines of conventional housing wisdom, and attracted by the bargain prices afforded by this alternative.

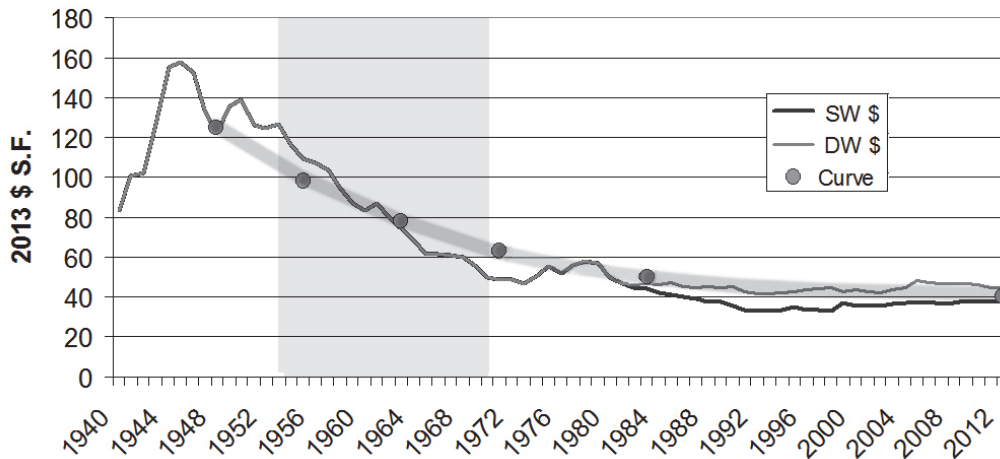
The essential key to that “impossible” accomplishment was learning curve. Two industries were born; recreational vehicles and manufactured housing. They followed much the same path, increasing features, size and price until the fifties. In that era, “mobile homes” hived off with rigorous pursuit of larger sizes and lower prices, with the latter partly made possible by the former. The graph on the next page charts the approximate learning curve of manufactured housing starting from 1940.<sup>33</sup> Cost per square foot of trailers (shown in 2013 dollars) soared during WWII and after as features were added. By 1947, a separate market for “year-round” trailer homes was starting to develop, and that's the chosen point for estimating the MH learning curve. That curve works out to about 82 percent, but is based on singles and includes substantial gains from increasing home size. All things considered, the learning curve is probably closer to 88 percent.

New modular plant startups have been found to generate a learning curve of about 86.5, but that assumes a steady market for the output. And of course, management competence makes a difference, as do many other factors.

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<sup>33</sup> Statistical data prior to 1980 is hard to come by. Special thanks to the RV/MH Museum and the access they provided to Carl Edwards' files and other historic data. Still, some of the components of the following graph are based on estimates. Note that the statistical MH learning curve, illustrated by the large dots and gray curve, begins in 1947, though trailer production started from 1930. The graph assumes a quarter-million trailers built prior to 1947. That is assumed as the logical starting point of the MH learning curve, but it built on prior experience that's hard to quantify. Such graph and resulting curves can be estimated in many ways, resulting in varying curves. The fundamental and crucial point is, the big benefits come early in the game, to innovators able to ride the curve.

**MH Learning Curve 1948 - 2012**



As this graph illustrates, the path was rocky. In the early days, prices of trailers soared, particularly during wartime as manufacturers scrambled for materials and labor. Then came the race to add features, culminating in full bathrooms and kitchens, as well as shiny metal exteriors. This graph suggests a learning curve calculated from 1955 to 1971 (the gray area) would illustrate the real potential of this industry—something like a 68 percent curve. During that period, 2013 \$ S.F. cost dropped from \$127 to \$49.

Length and width was added as the MH industry bloomed in the mid-fifties. Brisk competition and rapid industry growth, combined with increased size of the homes, brought down the cost per square foot of MH construction below the stick competition by 1964. That crucial crossing of curves is illustrated on the cover of this book.

There's a significant bump in the cost per square foot in the seventies. There appear to have been a number of causes:

- **The Economy**

Ending a strong market period, the economy went into a tailspin with housing taking some of the hardest blows. Used to heady growth, MH producers were failing left and right. MH financing collapsed, along with the savings and loan scandals.

- **Size**

The ability to rapidly and inexpensively add square footage was waning. Manufacturers were introducing expandable rooms, tipouts, double wides and the like to feed the market requests for more space, and those are expensive.

- **The HUD Standard**

It was in that period that the HUD Standard was introduced, with little concern for learning curve. Many manufacturers closed their doors. Others raised prices in reaction to production complexities for which they were ill-prepared.

It was a time of chaos in the industry but, as the economy recovered and the industry learned to cope with increasing regulations, competition nudged costs back under control. By the eighties, the learning curve resumed its predictable course. The glory days were over, but as the cost of conventional construction soared, the MH cost advantage continued to grow.

In the fifties, trailers were small and offered low cost housing only at the expense of very cramped quarters. Yet the housing shortage was such that demand exploded. Increasing experience and the ability to build larger homes brought costs down and fueled even more demand. It was then that the MH industry gained its real competitive edge.

It would be fair to ask (dream?) what might have been without the chaotic seventies. Hard to say, but if you look at that steep learning curve during the mid-fifties to the end of the sixties, you can get a glimpse of what's possible in an unfettered and competitive housing industry. Had manufactured housing continued to grow at the ten percent annual rate it once managed, that industry alone could have been producing two or three million homes per year by the early nineties, with cost per square foot as much as 15 to 20 percent lower, or turning out product offering at least that much additional value.

But those glory days of the old mobile home industry are over. The new era is simply manufactured housing, and there's no agreement on a rule book for the future. The cost advantage remains, fueled less by advances in MH efficiency than by strangled competition. The horizon should be wide open, but ... how to proceed?

In fact, the industry is a tiny shadow of its former self, with annual production bumping along at about a tenth that of the boom years. This despite continuing improvements in the product itself and the growing cost advantage over conventional builders. The question of why such a mess and what to do about this sorry state of affairs will occupy much of the rest of this book.

It may be worth bearing in mind that the railroad industry's brilliant early success bogged down when it ran out of learning curve advantage. Upstart truckers and airlines took over most of the nation's transport market as railroad moguls slumbered. The remaining rail companies made a comeback, retained some powerful advantages, and Warren Buffet has made a big bet on its potential, just as he has on manufactured housing. The outcome in the manufactured housing game will likely be defined by the MH industry's leadership and management capability.

Ultimately, any real success in housing production surely depends upon escaping the strictures that hogtie the hands and brains of conventional builders. Jamming the materials, processes and methods that define American housing through factories is a poor recipe for success. "Outsiders" who propose new methods have to start somewhere, and generally approach the challenge with innovative systems that run ahead of their support systems. And then they crash.

When Arthur Bernhardt examined the pluses and minuses of manufactured housing's potential some 40 years ago, he hoped to identify the best hope for the future of housing. Though he didn't quite say it, the illustrations in his book suggested he probably anticipated—or hoped—modulars would prove most promising. To his apparent disappointment, the answer turned out to be mobile homes. It was, he found, the only approach that had actually worked through the many challenges presented by factory production and found ways to resolve them. Imperfect perhaps, but a proven alternative housing system that circumvented the many intransigent roadblocks standing in the way of housing innovation. Working year-by-year, step-by-step, seeking solutions to the challenges and details, the mobile home industry managed to bring down the cost of housing. Those proposing or developing alternative manufacturing systems see the potential but generally minimize or even ignore too many realities. Pesky details that put a stick in the spokes of housing innovation.

"The real problem," as Bernhardt says in his introduction to *Building Tomorrow*, "is that the building sector represents a highly political system with tremendous vested interests, too complex and too intimately tied to other sectors for any one group of actors in it—industry, labor, or government—to fully understand or manipulate it."

He suggested the right approach for addressing all that is a strategy for "... improving performance [that] extends radically beyond present efforts to manipulate selected functions of the established building process and has not yet been extensively investigated or considered for adoption as corporate or public policy. The strategy amounts to a comprehensive evolutionary development of the entire building sector, entailing essential structural and operational changes in the industry proper and its environment."

He continued in that scholarly vein at some length, suggesting the kind of comprehensive effort needed from all directions to get on with such a plan. The result would be

“... to provide an atmosphere that would both stimulate needed new actions and encourage innovation in general. To create such a setting, industry and government must jointly restructure and synchronize the operations and organization of the building industry proper and the supporting and regulatory environments within which it operates. We must develop and adopt enduring corporate and public policy aimed at long-range planning for an initiation, stimulation, and coordination of the transformation process.”

“This,” he concluded, “is not a proposal for revolutionary change but rather for consistent, carefully planned, evolutionary development.”<sup>34</sup>

Those are academic words that add up to learning curve.

To investigate the MH potential and gain a better understanding of the challenges and opportunities ahead, we’ll next see more of how mobile home builders applied learning curve and made it all work, decades ago.

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<sup>34</sup> Arthur D. Bernhardt, *Building Tomorrow: The Mobile/Manufactured Housing Industry*, 1980.



*The world is changing very fast. Big will not beat small anymore. It will be the fast beating the slow.*

*Rupert Murdoch*

# 7 The Manufactured Housing System

A major factor that has blocked most attempts at systemizing the housing process has been the lack of support organizations needed to enable the innovative system to hang together and function as intended. People think of industrialized housing as factories, and there are lots of those, but they're just one component of an integrated housing system. The "factories" are the assembly line part of the equation.

Bernhardt first looked at three competing futures for the housing industry. On-site construction proved too deeply mired in its traditions. The emerging modular housing industry remained tied to "... the dated concepts underlying the organization and operation of the building sector, without questioning these concepts. This approach leads to the underestimation of the degree of potential improvements attainable ...." The mobile home industry, with all its flaws, turned out to be his choice because of the industry's ability to produce "low-cost, high quality shelter," as well as being "the most efficient ... in terms of economic performance," and because it was "... the youngest and least understood ...." In other words, the mobile home industry was well into its learning curve, but still had lots of room to run.

Bernhardt quickly identified a key strength of the mobile home industry; the interdependence between manufacturer, supplier and MH retailer/site destination for the product. He saw that the industry had evolved a unique, complete and workable integrated system that was already, in the seventies, very efficient. Let's look at the four basic components of the MH system; manufacture, supply, retail and finance:

## Manufacturing

Bernhardt tracked manufacturing performance by working out an estimate of total labor hours required to complete a ready-for-occupancy home, comparing the three competing systems of building 1,000 square feet of living space.

That was more than 30 years ago. While mobile home "total construction hours" may have changed little (and indeed be on the rise, when site erection is considered),

### Total Construction Hours

Conventional -----	700 to 1,000
Modular -----	350
Mobile Home -----	150 to 250

This, Bernhardt suggested, was "only a fraction of [the MH] potential ... the industry can achieve the objectives of producing more and much better shelter at lower cost."

the others seem to have increased more. Bernhardt and the fledgling MH industry were on the right track.

In addition to fewer construction hours, MH plants benefit from the low cost and high efficiency of their semi-skilled industrial labor force. Much of that is attributable to small town orientation and the industry's ability to develop its workers' skills through higher specialization and more consistent work schedules than found among conventional builders.

The preceding chapter noted the fundamentals of MH manufacturing and its learning curve evolution. That's part of the picture. Industry leadership sets the learning curve pace, establishing the standards that competition must meet or fail. Richardson and Schult were a couple of examples. Here's another from the other side of the country.

In the late nineties, Fleetwood was the nation's largest MH manufacturer, as well as its largest builder of RVs. John Crean, a reformed California alcoholic, built the company on retained earnings, starting in the forties with \$250 capital. Fleetwood was, during Crean's 50-plus years at the helm, another microcosm of the MH industry's learning curve.

In the rough and tumble early days, trailer startups abounded, going broke at about the same rate as new ones sprung up. Unlike Richardson and many of his other competitors, Crean was a hands-off manager. His main interest was innovation. He left operations to people he trusted and paid them well. Mostly, they earned that trust, but being human in a fast changing industry, they made mistakes.

In 1950 the young Fleetwood management team screwed up big time, by responding too easily to dealer requests. Offerings, options and pricing got muddled, efficiency faltered, debt soared and Fleetwood was within kissing distance of the wall. Crean jumped in, fired some managers and took the reins. The first thing he did was discontinue all products and design a brand new MH from scratch; a single floor plan, pared to the bare essentials, but of good quality. It would have been very competitive at normal margin, but Crean priced it at cost; about 25 percent under the market.

"Impossible!" cried those who did not understand the power of learning curve. That simple MH was the best deal any dealer had ever seen and Crean required they purchase them for cash and commit to 12 per year, creating a long waiting list. Thus his little factory team was free to concentrate its total attention on one task; increasing manufacturing efficiency. And they did. The product was quickly profitable, and creditors were soon paid off. Crean turned things back over to his team, provided them a set of new business guidelines, and never looked back. His simple policies were successful in the subsequent years of Crean's leadership. Here's a summary:

1. **Controlled Production**

Common practice was, and often still is, to build to demand. But seasonal market fluctuations typically cut winter orders by some 25 percent. Annual volatility can be even worse due to the market's economic cyclicality. Crean built Fleetwood's capacity and priced its product to assure that output was always in short supply. That cost the company sales volume, but created the efficiency that enabled solid profitability on sound products at low prices. Importantly, it built a stable and loyal work force, which enhanced efficiency and product quality.

2. **Profit Sharing**

Crean had a lousy education so he devised a very simple method of demonstrating profitability. Accounting determined the production costs of the homes, and thus the labor content required to make it work at the chosen selling price. Those numbers were made known to the work force. Each week's results were posted so the crew could see how they'd done compared to objective. To the extent they

were ahead of the game, the labor savings would be divvied up among the employees, proportionate to their hourly wages. Once the system was under way, homes were being built in as little as half time, enabling employees to double their hourly wage. Similar incentives were provided to management, and soon such systems became common throughout the industry.<sup>35</sup>

3. **Promote from Within**

Harder to do than it would seem, especially in a fast-growing company. Sometimes Fleetwood had to hire outsiders, but worked at avoiding that practice. It can be hard to believe that someone off the assembly line could do a better job than a qualified recruit from outside. Crean said, "... if there was some guy working on the line who looked like he could clean himself up and do the job, then he became sales manager." There are worse approaches, and this one assures a lot of motivation on the part of the appointee!

4. **Avoid Advertising**

As Bob Richardson and others found, retail advertising can be expensive, with a small payback when your company is a bit player in a fragmented industry. Crean went further though, avoiding trade shows, public relations, and even trade associations. Brochures were minimized. The policy was not rigid, but the principle was observed.

5. **No Debt**

In his years on the sauce, Crean lived on debt and learned from both experiences. He first gave up booze, and later, debt. After his team's fiasco cited above, "... I decided I would never, ever in my life borrow another nickel from anybody. And I didn't." Lack of leverage cramped expansion in boom times, but enabled Fleetwood to cruise profitably through downturns in the market and the inevitable mistakes the company made. Fleetwood's policy saw profits as just a tool for building the company. Survivability above all else.<sup>36</sup>

And as long as those policies remained in force, Fleetwood thrived and was profitable, good years and bad.

Fleetwood's policies were not sacred, but typical of good management among MH manufacturers. They illustrate why manufacturing discipline is at the heart of the industry's success. They also suggest why MH manufacturers who diversify, even into other branches of their own industry, do so at some risk. What Crean does not point out, is that his number five priority, no debt, is more than anything, a hedge against the combination of housing's cyclicity and the industry's slim manufacturing margins. The temptation of leverage ruined many Fleetwood competitors.

## Suppliers

It is apparent to those touring MH plants that more assembly than manufacturing is going on. The factory is but one cog in the manufactured housing machine; important but impotent, without its suppliers, retailers, bankers and all.

Stick builders purchase materials through distributors and warehouses for the most part, even picking up odd bits from local retail stores, where they receive a small discount. MH builders buy as original equipment manufacturers (OEM), and often in truckload quantities. The manufactured housing supplier industry helps coordinate this OEM pur-

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<sup>35</sup> A common reaction among outsiders is to expect quality to suffer. The reverse is true, given good management.

<sup>36</sup> Summarized from *The Wheel and I*, by John Crean with Jim Washburn, 2000.

chasing. Since material constitutes two-thirds or more of the wholesale price of the MH, the impact is significant. In areas such as Canada where the supplier network has been weaker, manufacturers have found it difficult to compete with homes built stateside and shipped in, even from hundreds of miles.

The main MH supplier network evolved in and around Elkhart, Indiana, the industry's home base. The shipping costs of both materials and finished homes are significant factors. Early branch plant attempts showed the importance of supplier relationships. The typical MH manufacturer purchases several thousand different items, from a couple of hundred suppliers; mostly industry specialists. Coordination is essential, and due to a well developed supplier network, was possible for large manufacturers and small, as long as they stuck around the Elkhart area.

Bill Deitch was a major force in developing the supplier network and gave this advice to those aspiring to build modular homes:

*Manufacturers of other types of industrialized housing can and should benefit by capitalizing on the enormous evolutions among mobile [home] manufacturers. The most profitable among them have invested their capital in production lines and manufacturing tools rather than carrying extensive inventories. These manufacturers measure their inventories in days or even hours, because they have dependable supply sources readily at hand.<sup>37</sup>*

While Schult and others got the supplier network system started, it was Skyline Corporation that was the leader in developing it nationwide. Founded in Elkhart by Julius Decio in 1951 to build "house trailers" in a garage behind his bar, Skyline was profitable from the beginning. In 1952 Julius' son Art left college and went to work in the plant. By 1956 he was CEO.

Skyline's products, which grew to include recreational vehicles, were targeted squarely at the volume high-value market. The Decio point of difference from the beginning was greater reliance on suppliers than was the norm. In those early days, it was far from clear what strategy was appropriate and "vertical integration" was a popular notion. Art preferred the flexibility and lower plant investment made possible by working closely with suppliers. Since the Northern Indiana / Southern Michigan area was the home of the industry, that strategy got off to a great start.

There were suppliers specializing in building frames, cabinets, roofing and all sorts of prefinished materials. Area startup MH companies relied on those suppliers. Skyline developed a national strategy based on them. Initially, Skyline's products and plants were designed around the offerings of the Elkhart supplier network. Art treated suppliers well and they became partners—not in a financial sense—but having mutual dependency and respect. Skyline was a major customer, paid its bills on time, demanded consistent quality and didn't chisel suppliers. The strategy proved very profitable, enabling very fast inventory turns on minimal investment, combined with national coverage of the MH market.

Elkhart itself served a limited MH market, well supplied by too many MH manufacturers. In order to maintain rapid expansion, Decio acquired a number of his competitors, kept them operating under their own names, and steered them toward the Skyline strategy of supplier harmonization.

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<sup>37</sup> From a speech at the Industrialized Building Exposition and Congress in Louisville, Kentucky, 1970.

In the sixties, Skyline went national, first putting plants in other areas such as Florida where the supplier network already existed, and in new markets like Kansas where it was embryonic. Before committing his company's capital to a new region, Decio studied the market, as any business strategist would do. But he also worked with his suppliers; doing whatever had to be done to be sure they'd join his expanding network. Decio's learning curve ensured that Skyline's and the supplier's growth worked to build the whole system, making it profitable for all parties—including the competition.

That plan worked remarkably well. In 1960, Skyline was first in the industry to make an initial public offering and it was an enormous success. Skyline's extraordinary profitability set Wall Street on its ear during the sixties and attracted many MH competitors and their suppliers into the same game. In the early seventies, Skyline was number one on the Fortune 500 for return on capital invested.

Those were torrid times in the major mobile home centers. It was hard to believe that little 70,000 square foot factories turning out homes at incredibly low prices could make a profit at all—never mind generate better returns than the best of the Fortune 500. The next chapter will explore more details on how they did it. The question here is: how did suppliers and other support systems fit into the equation?

The word “suppliers” covers a lot of territory. Some fabricate subassemblies, some distribute materials made by others, some act as brokers for manufacturers of components who know nothing of the small mobile home industry. There were, and are, two universal descriptions of how suppliers contribute: *Competition* and *learning curve*.

Look at the matter from the supplier's perspective. Say you operate a conventional building materials warehouse specializing in paneling. Who's your customer? Builders? Lumber yards? Remodelers? Hardware stores? The home handyman? They're all significant markets, with special needs. In order to serve as many of them as possible, you need a wide variety of material and significant inventories of each. Most of that goes out the door in dribs and drabs, making material handling, marketing and shipping a pain. Slow inventory turns require high margins.

A manufactured home account, on the other hand, buys in comparatively steady predictable volume of whatever items they're using, and tends to pay promptly. Cash flow is the heart and soul of both the manufacturer and supplier's business. Working together, suppliers and manufacturers have devised methods for ever-faster inventory turns, as well as other ways to make a dime do the work of a dollar.

Skyline and others proved that good profits can spring from low margins, if everyone works together. Suppliers in Elkhart learned from experience. Outsiders found it incomprehensible.

The MH industry originally used special toilets developed for RV's because interior space was tight. With the advent of larger homes, “full-sized” toilets became a feature, and suppliers provided them at even better prices than for the small scale specialty product. Initially, the pots came from “off-brand” producers of toilets, attracted by the large and steady market. As volume increased, the bigger “name-brand” plumbing companies saw opportunity and jumped into the game. The selling price was low but they could move mountains of toilets. Ship truckloads. Turn the inventories. Good profits.

Many years ago America's largest toilet maker, smelling opportunity—no pun intended—sent a sales team to explore the opportunity of supplying MH manufacturers. Purchasing agents welcomed them, but not their prices. Asked what price they'd pay,

those agents said, “\$17 each, delivered at the rate we need ’em.” Turned away time after time, the representatives resorted to hiring a consultant specializing in manufactured housing to find out why all those purchasing agents consistently lied about the price of a toilet.

“How do you know they’re lying?”

“Because we’re the largest and most efficient maker of toilets in the world, and that’s below our manufacturing cost.”

Once that giant company understood the workings of manufactured housing, and that participation would require rethinking their marketing and overhead calculations, they simply bowed out. Their distribution system could neither cope nor adapt. They were too far into their own learning curve and trapped in traditional methods.

**T**he trick, the key to the whole industry, is inventory turns. Cash flow. Managing inventory is a fundamental challenge in business. If your kind of business averages ten turns per year, and you only get five, you’re in trouble unless you can collect a high margin on that inventory. But if you can spin those inventories at double the average without losing sales, you can shave the margin enough to grab market share and still make a good return on equity.

A typical hard-line manufacturer in this country might feel pretty good about inventory turns of eight to ten per year. It’s an inefficient manufactured housing company that can’t double that. Triple and more is common. That’s a key component of MH profitability—and suppliers too.

In general, material distributors tend to turn inventories a bit faster than manufacturers. Ten or 12 turns might be a decent number. Let’s say you’re a maker of floor coverings supplying a manufactured housing company that produces 15 homes per day. Perhaps a couple of million square feet per year. Very nice business. Worth competing for—worth finding ways to bring the cost down.

MH suppliers learned, as MH manufacturers had learned, to avoid big warehouses and minimize material handling. For example, a plumbing supplier might represent a toilet maker to MH builders, but instead of erecting a large warehouse, keep just a few days’ supply on hand. Deliver uncartoned crappers by the semi-load from the toilet factory to the MH factory dock and assembly line for installation. Keep just enough in the local warehouse to allow for glitches in the transport system. Sure, it’s tricky to manage, but the rewards are great. The MH customer buys at OEM prices and the “distributor” acts more like a sales agency on commission than a traditional warehouse operator. With good management, the suppliers’ inventory turns can match or exceed that of the manufacturers and everybody wins. The mobile home industry was operating on “Just In Time” inventory before the Japanese “invented” it.

Conventional home builders need the “flywheel” of warehouse inventory that can be drawn upon as needed to meet their building schedule that fluctuates every week—every day. Weather, building inspectors, subcontractors and indecisive customers combine to defeat best laid plans. Truckload deliveries of materials to the building site are few, and tend to be assorted items.

By contrast, MH factories usually have lots of doors where semis can be backed up and materials delivered directly to the production line as needed. It’s a neat arrangement that depends on a greater system of housing where mutual reliance is established and made to work.

Perhaps because of such mutually beneficial relationships under the leadership of guys like Decio, the mobile home industry continued to rely more on good will than con-

tracts and lawsuits. Frank Vite, a retired industry veteran, remembers a dealer who gave his driver signed blank checks, and when the driver arrived at the plant, Frank would fill in the amount of the sale. The driver would hitch up and go. Mutual respect builds trust. Trust circumvents bureaucracy and builds efficiency.

## Retailers

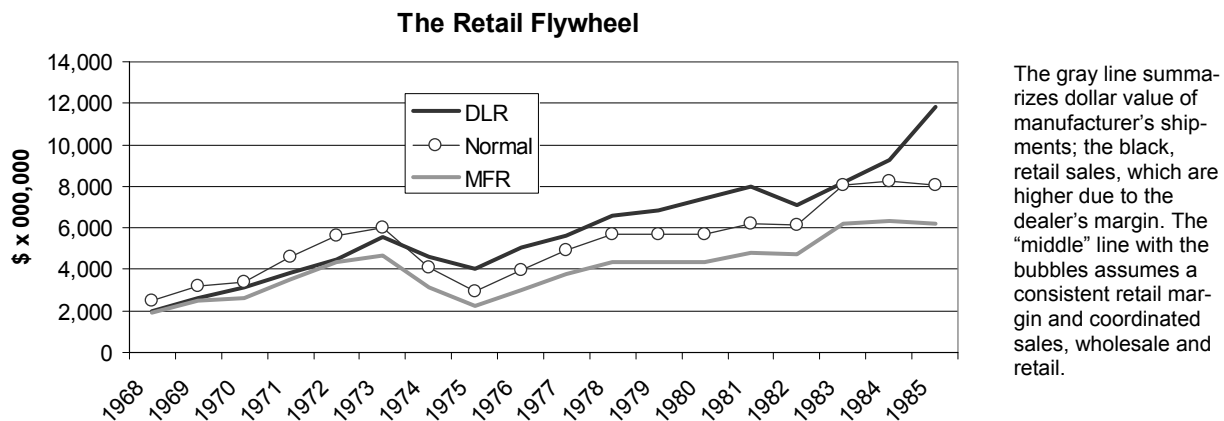
Suppliers feed materials into the MH factory. Retailers take charge after the factory door. They serve the folks who buy, make payments and occupy the home. The retailer usually operates a sales lot, a manufactured housing community, or both.

Typically, such dealerships are low overhead enterprises that represent several manufacturers and have a few display models available. Add together the cost of a sales office with a few desks and chairs, plus a display lot (often leased or rented at the edge of town) and it's apparent that the major investment required of a MH retailer is in the product on the lot. The wholesale price of a single home can exceed all other capital in the business. The margin on that home might be something like 25 percent of its selling price, so it doesn't take many such sales to generate an excellent return on investment—unless too much capital is tied up in inventory.

MH retailers learned long ago that the path to profits is financing the inventory and turning it fast enough to keep borrowing costs under control and credit good. Manufacturers need and depend on their MH retailers, but favor those whose “floorplan” (line of credit) can be counted upon. Everybody wins from fast-turning inventories.

An oft-touted advantage of factory construction is ability to build in all weather. It's true. Arthur Bernhardt found that the seasonality of stickbuilders is something like twice that of MH factories. But the market is quite a different story. MH retail sales, like other housing sales, are highly seasonal. It is retailers who provide the “flywheel in the system” that help factories chug along all year 'round.

That retail “flywheel” can also help balance the inherent volatility of housing. A wonderful tool when used properly, but it can take a bad bounce. The following graph summarizes a bit of detail from the MH debacle of the seventies.



Margins do vary, but not that much! Up to the peak of the early seventies wholesale and retail ran cheek by jowl. How could that be? Apparently manufacturers were overloading dealers with inventory. When the market at the manufacturing level was cut in half, retail sales declined only a fourth. This suggests production zeal caused manufacturers to shoot themselves in the foot. Had dealer inventories been at prudent level, they could have provided their usual benefit of smoothing market volatility. Having been badly burned by excess inventory, this graph suggests dealers spent a decade winding down inventory.<sup>38</sup>

<sup>38</sup> Data is from the U.S. Dept. of Commerce and MHI, as summarized by a Merrill Lynch industry report, *Manufactured Housing/Recreation Vehicles*, 1987.

That graph oversimplifies what happened in a very complex segment of MH history. But the data shows retail unit inventories plunged by a third during those years, and manufacturers by half. Good management of inventory is essential.

As with manufacturers, retailers come and go with industry volume. While that's hard on the businesses and employees involved, it enhances the flexibility of the entire system. It's a reality of the volatile housing business. Today many manufactured homes bypass traditional retailers, going directly into MH communities, where they are marketed, sold, and often financed by the management or owners of those properties.

**R**etailing the home would seem to be the easy part. It's not. Upon delivery of the home, the retailer's bank cuts a check, and those checks maintain the circle of cash flow. But closing the retail sale, the first step, is often the easiest. The MH retailer's role in the MH production system is the least predictable, and can involve great complexities.

Often, the customer has no place to put the home. Most used to go into MH communities. In recent years, nearly 80 percent are being placed on private lots.<sup>39</sup> MH retailers generally keep an ear to the ground—the local real estate market—in order to help customers find a suitable location. When a site is found, permits are usually required, utilities have to be hooked up—in many cases including the drilling of wells and installation of sewage systems. The MH retailer has to be certain that road access is workable and a foundation installed. Local codes can put a stick in the spokes, usually at the worst time. Sticks of the sort that plague conventional builders—maybe that's why they call it stick building?

Too often, even with the best of intentions by all parties, site costs can equal or exceed the factory price of the home itself, not including the land. Such variables are difficult to balance, and the MH retailer who builds up the kind of staff it takes to do the job well often finds profitability slim.

Some MH retailers have become active as investors in and developers of MH parks—communities designed for manufactured housing. At one time, MHI's predecessor, MHMA, was a major force in fostering development of such communities. Unfortunately, their design, construction, financing and management is foreign to the MH industry's financial foundation; fast turns and cash flow. Even more difficult to master than dealing with private lot placement. Manufacturers entering that field are also likely to stumble when trying their hand at community development. Yet the construction and management of land lease, rental or consumer-owned communities can be an excellent and profitable business for those who know what they're doing; usually people experienced in conventional land development or construction. They're used to dealing with the complexities involved. For them, acquiring the home itself is a snap. Consequently (in self defense, some say), many owners and developers of MH communities flip the system around and become MH retailers.

**T**he retail network wins the Rodney Dangerfield award, 'cause it don't get no respect. John Grissim, an industry booster, says, "... the industry remains stuck in a street dealer mentality."<sup>40</sup> That's a mild criticism by historic standards.

*Mobile Homes, The Low-Cost Housing Hoax* (Nader's 1975 group of grouchers) had few compliments for any aspect of the industry. Their take on dealers:

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<sup>39</sup> 79 percent average over the past ten years, according to MHI.

<sup>40</sup> *The Grissim Guide to Manufactured Homes & Land*, John Grissim, 2008.



*... many dealers, finding the mobile home business an easy way to make a fast buck, give little thought to the quality of the mobile homes and service they sell ... They simply buy three units, set up shop in a cornfield, and skip town as soon as those homes are sold. John Taylor [then retired president of the Mobile Home Dealers National Association] estimated that 20 percent of all dealers are 'curbstoners, gypsy operators ... [who] sure don't help our image any.' The mobile home industry is plagued with an unusually large number of fly-by-night dealers, partly because it is an easy business to enter and leave.<sup>41</sup>*

Consumers Union has done several investigations of manufactured housing. Here's one comment on dealers:

*Commission-driven, high-pressure sales techniques lead to problems similar to those found in automobile sales. ... retailers typically mark up homes 18 to 26 percent over wholesale, not including installation costs. However, without a requirement by most states to post the base price, there is little to limit the markup. The opportunity for fraud and economic loss through unscrupulous sales practices is exacerbated by a lack of controls in the financing used for most manufactured homes.<sup>42</sup>*

Whither the truth of this complex question? Once again, the most thorough analysis of the industry was done by Arthur Bernhardt and his group from MIT. They summed up the retail situation this way:

*As so often is the case, the most important policy implication was not detected by the computer [analysis] but rather in numerous "human" conversations with dealers all over the country. We found no higher incidence of "fly-by-night" operations among dealers than we had found among manufacturers in this or any other subsector of the building industry, but we did observe that the occasional fast-buck, fast-sell dealer has a much more negative impact on overall industry image than the occasional fly-by-night manufacturer. Dealers are the ultimate link to the consumer and their performance directly shapes public perceptions. We observed in most states a generally low esteem for the dealer, even among manufacturers, who suspect that dealers' markups are unjustifiably high and blame dealers for thus discouraging consumers.*

*More than 99 percent of all dealers are respectable business people and many have to accept low profits and high risk. The issue is not that "only" less than 1 percent of mobile home dealers are disreputable. The issue is that this minority largely determines public perception and thus should be perceived by the distribution system as business problem "number one." The extent of government intervention in the 1970s can in part be attributed to the usually exaggerated accounts of isolated instances of excessive pricing that eventually reach Congress.*

*The most important policy implication is that dealers must never forget that the mobile home distribution system represents a major component of the total industry. They must never forget that a highly efficient distribution system is crucial to the continued growth of the industry. The mobile home industry's major market advantage is its low price relative to conventional housing.<sup>43</sup>*

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<sup>41</sup> *Mobile Homes, The Low-Cost Housing Hoax*, The Center for Auto Safety, 1975.

<sup>42</sup> *Raising the Floor; Raising the Roof*, Consumers Union, May 2003.

<sup>43</sup> *Building Tomorrow*, Arthur Bernhardt, 1980.

Whether shady operators represent one or twenty percent of those engaged in the retailing of manufactured homes, there appears room for all of the above assessments to reflect some truth. The same goes for those engaged in the sale and resale of conventional housing. The sales game is a magnet for smooth talkers who rely on shortcuts to earn commissions.

It seems fair to say that, as in so many of the industry's aspects, the dealer network is one of its greatest assets ... and liabilities. By comparison with conventional home building, manufacturing is a very young and fast changing industry.

Consumer champions call for more regulation and more control of dealers by manufacturers. Manufacturers cite the merits of competition and low overhead as the means of protecting the "industry's major market advantage." There's no simple "right" answer to this complex equation.

Today's largest MH manufacturer, as well as largest MH retailer, is Clayton homes. Jim Clayton entered the industry from the retail sales side. Having built his organization from the ground up, Clayton is in a position to speak with authority on both sides of the manufacturer/retailer question.

*Our competitors wanted the margins, the loyal distribution, the dependable finance source, and the cash flow. Their shareholders demanded this. We made [integrated manufacturing and retail] look so easy. What they did not know was that developing expertise in manufacturing, retailing, lending, insurance, and communities (real estate) is very hard for any company to accomplish. However, to integrate the distinctive cultures normally found within these disciplines, if even possible, will take years. I believe it is impossible unless the organization is very small.<sup>44</sup>*

Clayton was commenting on the rush by his competitors to vertically integrate and too often failing to resist pressure to become "... too aggressive when sales are needed." Clayton, by contrast, cut his teeth on retail, easing carefully into manufacturing only when sustainable retail sales volume and his balance sheet suggested doing so would enhance overall operations. He expanded manufacturing only as success in that area was demonstrated. And did the same in other aspects of his growing empire, over a period of decades. A classic example of learning curve at work, and difficult to duplicate by merely changing strategy mid-stream.

The retail network, so roundly damned by casual critics, has played a vital role in the manufactured housing system. For all their many faults, those sweet talking retailers buy the product from the manufacturer for cash, sell it to the customer, arrange retail financing, collect sales tax, pay for delivery from the manufacturer as well as to the site, and handle installation ... plus take care of most warranty work. In exchange, they receive something like 25 percent of the retail price of the home.

Of course there are a lot of variables in the retail price, but one factor is constant—competition. Those who think MH retailers are getting rich should give it a try. Cost of entry is low, as the Nader group pointed out. Retailing manufactured housing may be more profitable than writing tell-all books about dealer faults, but those who make lots of money as MH retailers (some do) are generally just good managers.

It's also fair to say that, from the dealer's perspective, plenty of "exaggerations for emphasis" come their way from the other side. Sterling Kelley, a former car dealer says, "At one point Dad's old car was getting pretty tired, and I talked them into trading it for a better one. And my own mother was telling me about the new tires they had just put on it. I looked at them and they were badly worn. Mom just remembered a big check they'd had to write and had forgotten it was three years and lots of miles in the past. So I'm telling you, that even your own mother will spin out a story when it comes time to trade cars."

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<sup>44</sup> *First a Dream*, Jim Clayton, 2002.

## Finance

Perhaps the biggest challenge of all is financing the home to the retail customer, and it has become critical since the most recent banking crisis. Traditionally, mortgage financing was simply not an option. Banks, government loan agencies and the like didn't want anything to do with buildings mounted on wheels. C'mon, where's the security? The darned thing can just be pulled away during the night. Bankers like land, and for good reason. Land appreciates and it takes a heckuva flood to wash it away.

Conventional real estate wisdom says homes do not depreciate. Bankers know better. The typical life span of a house may range from 55 to 70 years, depending on location, quality of construction and maintenance. Many, if not most, homes are replaced due to obsolescence. Their land has become too valuable for the out-of-date house upon it.

Bankers tend to be a conservative lot and this new form of housing on wheels proved a difficult challenge. In the early days, no land came with the majority of mobile homes, so prudent bankers tended to steer clear, even if land was part of the package.

In those early days, as bankers looked askance, consumer finance lenders noted that mobile homes and their tenants are much less mobile than automobiles and refrigerators, so they saw opportunity. In due course, mobile home chattel loans proved more secure (and profitable) than other loans in that class, drawing competition into the game.<sup>45</sup> Competition, in combination with good loan experience, engendered longer financing terms at lower rates. Most of this evolution took place during the fifties and sixties, when learning curve was making its best progress in reducing the cost of factory construction. There was a boom in park development to absorb all the output. Park owners and developers found the mobile home business to be attractive.

Loans on mobile homes were for shorter terms and at higher interest rates than mortgages on conventional homes. But at the bottom line, the down payment and monthly payments, including park rental for the MH, were comparable to stick built and competitive with monthly apartment rent. Many chose the MH because, being smaller than a house, the net monthly bill was low, but provided some of the charm of a single family home, and the hope of building some equity.

In combination, it was an attractive proposition, and brought soaring sales volume. By 1970, mobile homes had about half the total single family housing market, and more than 90 percent of the low cost housing market. In constant dollars the price of mobile homes was cut in half over the 15 years between 1955 and 1970. An aggressive learning curve that paid off, big time, for the whole industry. But ... as shown by the graph on Page 83, manufacturers got carried away, overloading the dealer network. Dealers in turn got too aggressive in moving homes off the lot, extending loans to unqualified buyers. Is this sounding familiar?

Aggressive lenders had loved MH cash flow right up to the point where it quit flowing. Manufacturers, retailers, developers and home buyers did too little to manage the process and the system ran out of control. As it did again more recently. Note however, that there isn't, and never was, a fundamental flaw in the chattel finance system. Prudent managers such as Clayton got a grip, kept it, and built a financial and manufacturing empire. Yes, Clayton's backed by Buffet Bucks, but that happened because their system

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<sup>45</sup> A Foremost Insurance survey of the seventies noted a net yield to lenders of nearly double that of real estate mortgage loans, with repo rates about 25 percent lower than auto loans. Delinquency rates were higher than for most consumer loans, but that was credited to the greater length of time required to resolve financial issues involving a family's home.

is well proven, safe and profitable. Most importantly, it delivers reasonable financing to home buyers.

These days there's wailing and gnashing of teeth at the lack of finance, and it's a huge problem. Dodd-Frank has created havoc. But a shortage of money is not the issue. The nation is awash in cash looking for decent returns; something the MH industry has to offer. Chattel loans carry a premium rate reflecting their risk. Mortgage loans do the same, and that's appropriate. It is worth considering the elephant in the room—those who build low cost housing are likely to have customers who are low income people—the risk is higher, politically correct or no. Management is required. After fouling its financial nest repeatedly, the MH industry should not expect a quick return to the “good old days” of easy finance. Despair is not warranted. The MH industry's challenge is to demonstrate that it has cleaned up its act and will sin no more.

## Summing Up the System

The MH production system summarized in this chapter works together to produce good single family housing at low cost. The accomplishments have been substantial, especially considering that it happened without much industry leadership. Therein lies the most likely key to future success, for real leadership is finally possible. Good leadership can help avoid repeating the errors of the past.

Real leadership has been difficult because no leader from any sector of the system has been in a position to step up and command the respect of the industry at large. That has led to finger pointing and irresponsibility that continues to this day. The bright side of the recent crisis is that three of the few surviving manufacturers have prospered and dominate. Despite inevitable grouching from the sidelines, they are in the driver's seat. No other candidates for leadership spring to mind. Manufacturers are just one part of the system, but theirs is the biggest bet. The future of the industry is in their hands.

As Bernhardt found, it's a fundamentally efficient housing system that allows competition to thrive, bring down the cost and improve MH quality. Sure, flaws remain. Low cost of entry allows incompetent—even unscrupulous—companies access to this nifty enterprise. They're increasingly subject to the whims and bureaucracy of the construction industry, so every step is perilous.

When it works right though, manufactured housing operates on mutual respect, with little paperwork or regulation needed. Bad apples lose respect and fall by the wayside, but can do considerable damage on the way through. Naysayers also hounded Henry Ford and Sam Walton. The trick is to agree upon a tight focus, pull together and keep moving toward the objective of efficient industrialized housing.

Learning curve can be credited with most of the progress to-date. It brought the cost advantage that's vitally important. It's a great tool that, with leadership, can continue to smooth the rough edges of the industry and lead manufacturing to a dominant role in American housing. The potential has hardly been scratched.

Let's move on to look at how manufactured housing compares with the house of sticks. How the brash newcomer continues its innovative assault on the sluggish housing market.

*Mile by mile it's a trial; yard by yard it's hard; but  
inch by inch it's a cinch.*

*Anonymous*

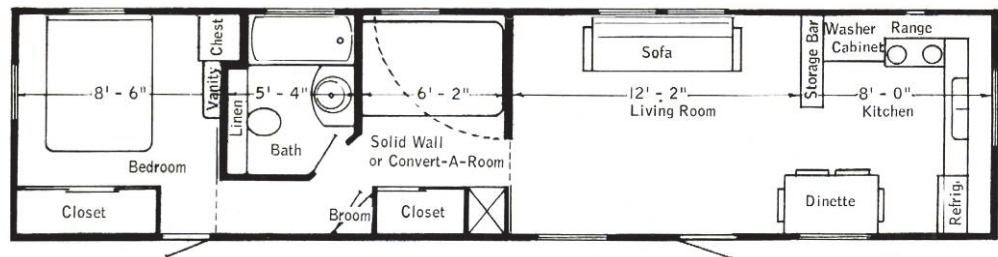
## 8 How to Cut Housing Cost in Half: Or Double it

Half you say? Actually, that's what the Manufactured Housing Institute (MHI) says. In 2012, citing data from the Census Bureau, they put the cost of an average site-built home, land excluded, at \$292,200 while an average MH sold for \$61,900. So the MH sold for less than a *fourth* the price of the stick built, both without land, at retail prices.

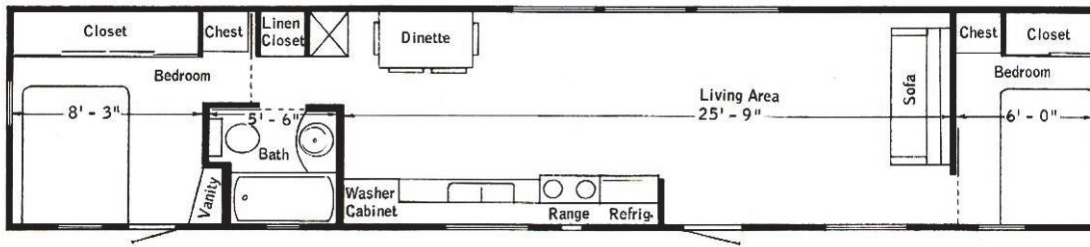
Not a fair comparison though, since the MH was, on average, just 1,475 square feet, while the stick house was 2,585 square feet. So in the interests of fairness, they compare cost per square foot and come up with \$86.30 per square foot for the stick house and \$41.97 for the MH—still less than half the cost of the home builder's product.

Those figures are still burdened with numerous apples and assorted oranges, but still; half price? *How do they do that?*

In previous chapters you've seen how the system works. The bottom line, of course, is learning curve. MH manufacturers have built around 13 million homes since WWII. Unlike conventional builders, that volume is clustered around a couple of dozen manufacturing centers and there are hundreds (as opposed to thousands) of companies involved at any given time. Each company tries to hold its "trade secrets" close, but can't. People change jobs, retailers spill the beans, everybody scrutinizes the competition at trade shows and there's no patent protection worth the cost of filing. Everyone learns from everybody else and progress is made. And competition is always hot.

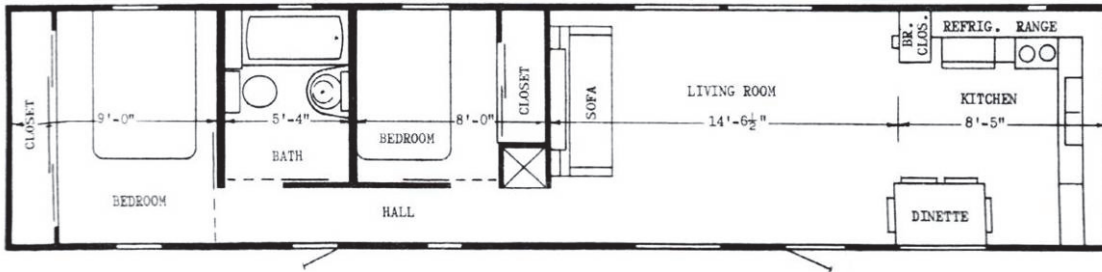


In 1960, this ten wide 45-foot mobile home was one large company's best seller featuring the popular front kitchen plan and a folding bedroom to enhance livability. At \$3,195 wholesale, furnished, F.O.B. factory, it was priced in the most competitive slot of the market, and was standing its ground. Not good enough.



Designers were sent back to the drawing board and came up with the plan shown above, five feet longer, same price and a three percent lower bill of material. Labor was equal for both and they shared all construction details.

The living area was bigger, and seemed bigger yet when viewed from the front door. Cost was saved by placing the kitchen and bath back-to-back. There was a bit less cabinetry and interior wall area, but the rest of the savings was in design details hard to detect. The new model was an immediate hit, and widely copied.



That plan remained a best seller for years, even when the front kitchen plan above, same size, was later introduced at a further five percent reduction in selling price.

As that sequence progressed, construction and quality details continued to improve. The accomplishments were made by a dozen representatives of most departments gathering weekly for hours in a smoke-filled room to haggle over value analysis. Each department defended current practice as regarded its own responsibilities but the CEO drove for cost reduction. Every stick or practice used had to be rigorously defended. Inputs from all levels of all operations were sought. Everyone looked for ways that cost could be cut without damaging quality, market appeal, production efficiency or the company's integrity. Some days, nothing could be found. Generally a few bucks savings proved acceptable here and there, many of which had to wait for the next model change. Some required substantial re-engineering and design to become effective. Add it up and substantial progress was made, every year.

Let us note that these were pretty good homes for their day and many of them remain in use. However, they were poorly insulated by today's standards, had those semi-rounded steel roofs, four-inch floor joists, two-inch exterior and interior walls, sliding doors and many other details that would make them a hard sell as new products today. Further, if adjusted for inflation, their price would be about the same as today's HUD approved MH of twice the size that has gained a whole pile of product improvements along the way.

You've come a long way, baby.

So, how far? Is a current MH the equal of a typical stick built house? No, it is not. If you want half price housing, some compromise must be made—at least so far. But not much, in terms of construction and quality.

First and most obvious, the great majority of manufactured homes are low cost housing, so a more appropriate comparison is to a "low cost" stick house, as opposed to average. Today's "average" stick house sets a high and rather luxurious bar for comparison.

Secondly, an “average” MH will usually appear upscale inside compared to the “low cost” stick house, but downscale on the outside. A low cost MH (cheapie in the vernacular) will be, and will appear to be a bit skimpy, inside and out, but the price will knock the socks off most prospects. Most will opt for an upgrade if their budget allows, just as with stick houses.

Let us acknowledge right up front that comparisons between manufactured and stick houses are difficult. The whole process of constructing and making a home ready for occupancy is different at virtually every stage. The two evolved in different ways, from different bases.

Let us also recognize that there is no magic involved. Yes, there are efficiency gains from building inside factories in all kinds of weather with better equipment than is available on building sites. But that much-celebrated advantage is small potatoes. A good stick builder with an assured market, solid sources of supply and the kind of labor that’s readily available in small towns might achieve construction costs close to those managed by MH manufacturers. Levitt did it in the housing heyday after WWII. Conventional builders can’t do it today because their whole system, never very efficient, has bogged down. MH manufacturers found a way around stick builder’s roadblocks and discovered a volume market for low cost housing. Learning curve evolved a system for supplying that market, and factories proved helpful in making it happen.

The following comparison of costs is intended to present the conceptual differences and provide a few examples of how some of the bottom line savings of manufacturing come about. For this exercise we’ll look at the various factors that enable an average twin section MH to be retailed at about 60 percent of the price of a “low cost” site-built single family house of the same size.

## **Building Material**

**T**he two homes are built of similar quantities of comparable stuff and yet the manufacturer spends about a third less to buy it. It might be fair to say the difference comes about because of OEM purchasing by the manufacturer, and that is a large factor. However, there are other substantial differences. The MH, for example, has a much more complex and expensive floor structure which includes a steel frame, yet rests on a minimal foundation. The low cost house is on a slab. That MH floor and frame, in conjunction with the walls and roof, must be capable of withstanding the loads of shipping the home from factory to site. That’s a challenge comparable to enduring a succession of small earthquakes. It has taken the industry decades to work out construction systems making it all possible. The challenge is compounded by the currently common use of drywall for exterior walls and ceilings. That material is stiff, but brittle, and does not perform well under the deflection loads of transport. To get the challenge in focus, consider the perilous undertaking of moving a conventional house.

There are basic construction cost savings though, because experience over many years has proven the suitability of certain grades and thicknesses of decking, sheathing and similar materials that most local builders would not consider, even though they meet performance requirements.

Because of volume and material handling systems, MH manufacturers can buy most materials precut to the exact sizes they’ll need, reducing the amount of material used, as well as reducing labor and scrap—a triple win.

Many manufactured homes use 2 x 3 studs for interior walls, a practice stick builders disdain, with some reason. For example, under many field conditions such studs can

warp and lead to warranty problems. In a dry factory, the use of kiln dried lumber solves that problem, and the home owner gains a few more inches of living space.

Exterior MH walls can be designed for careful placement of windows and doors, which can eliminate redundant framing members and header material by as much as ten percent while meeting all structural requirements. Each header can be designed for the specific spans of each window rather than making them all alike for the sake of convenience. Floor plans are designed from the ground up to minimize redundant lumber. It's a game of inches.

A big MH savings comes from rafters. All homes these days use engineered rafters designed for climate conditions. The MH must be designed for the broad market it serves. That cost penalty fades compared to the savings that come from building the trusses in the factory on purpose-built jigs and fixtures in high volume, right next to the production line where they'll be installed. Because of the volume of identical trusses involved, they can be carefully engineered to do their job without wasting a nickel or a nail. Builders typically buy trusses fabricated to order from a nearby supplier, in an assortment of sizes, using standardized bits and pieces that generally result in considerable over-engineering.

Such basic construction materials equal about two-thirds of the total material content of a manufactured home. There are very significant savings on the other third; the purchase of windows, doors, appliances, plumbing fixtures, wiring, cabinetry and HVAC equipment. Builders generally buy those items as needed from warehouse suppliers, whereas MH manufacturers buy them in truckload quantities at OEM prices.

Put it all together and the MH uses almost a third less material per square foot than the stick builder.

## **Scrap**

**D**rive by a building site and you'll usually see lots of scrap, though it's not as large a cost as it might appear. Perhaps five percent of the material purchased, which amounts to some two percent of the home's selling price. The same home built in a factory creates about a third as much scrap, largely because of production control and materials handling. Appliances and fixtures delivered on skids mean there'll be no cardboard packaging. Scrap reduction can amount to a couple of thousand bucks per home while providing significant relief at the land fill site. That makes manufactured housing among the greenest forms of shelter available.

## **Labor**

**I**t is difficult to tease out the labor content of a conventional home. Typically, the builder's work force is a significant but highly variable part of the total. For example, the cost of the trusses includes the labor, overhead, material and profit of the truss plant. Still, if it's all worked out, labor of about 20 percent of the home's selling price seems a fair estimate. Factory labor for the MH, on the other hand, equals less than ten percent of its retail selling price—less than a fourth of the total labor cost to construct a stick built house. Part of that is attributable to the use of lower cost "unskilled" labor. A misnomer. Nearly all the labor savings can be credited to systems management made possible by relatively high volume production in a purpose-built factory.

Because the process is broken down to repetitive tasks, new workers are easily trained and experienced workers soon learn to handle other assignments around the plant. The factory workers are dedicated to their assigned tasks, and are generally more skilled at what they do than the kind of all-around craftsmen employed to do much of the construction of a site-built house.



There's a reason the conventional process is described as "stick building"—constructing a house, one board at a time. In the factory, those sticks are pre-cut to size, come off a pallet right where they'll be used and are popped into a jig like clockwork. Very few fancy machines. Assembly is done with power tools similar to those used on site. Overhead cranes transport the finished components to their destination. Most of the gain comes from efficient repetition of similar processes by production workers who get very good at their assigned tasks. Learning curve.

MH factories often have incentive systems that lead to a willing workforce that can have the happy side effect of productivity ratios well in excess of 100 percent of labor norms.

Because the factory skills can be readily and quickly taught, MH factories tend to be located where unskilled or semi-skilled labor is readily available. As a result, they're able to employ the very kind of workers that are in surplus around the country. Workers who are delighted to have steady jobs at prevailing wages in the area. Those wages tend to be about a third lower than those of the skilled craftsmen who build houses. There's a seasonal factor due to generally higher sales in spring and summer, but it's a smaller constraint than that faced by the site builder.

## **Overhead**

**S**urely this is where the site builder should win, since there is no factory? Yes and no. Factory overhead is actually quite small as a percentage of selling price—something like five percent of retail, while the builder's overhead is nearly double the percentage of the home's much higher price. In dollars, the builder's overhead is nearly quadruple that of the factory.

The simple answer is volume. An efficient factory produces five or so homes per day vs. a typical tract builder's one per week, more or much less. The more complex answer is management. In the highly competitive MH market, an operation that lets its overhead soar gets bitten on the bottom line. In addition, if volume drops to a fraction of capacity, overhead can really sting.

Second, the actual bricks and mortar cost of such factories is surprisingly small. First, they're generally prefabricated industrial steel buildings with little or no bricks or mortar involved. Second, land is one of the biggest factory costs, and they're usually located on land that is low cost (or was at the time of construction). Tools are not terribly expensive and may be leased. Simple and reliable air tools are more commonly used than the expensive electric ones often preferred on site.

But that only gets the house built. Getting it onto a site so a family can move in is quite another matter. Typically, that process involves a retailer whose operations are more akin to the stick builder's. Add the typical retailer's overhead to the factory's and the total can be estimated to be comparable to the stick builder's.

## **Sales Cost**

**N**othing happens until somebody sells something and in the case of the MH, it has to happen twice. The factory must wholesale the home to a retailer and that retailer typically pays a salary and commission to its sales force. The combined costs tend to be comparable to stick builder's as a percentage—about four or five percent of the sale price, but half in terms of dollars as a component of the manufactured home's lower retail price.

## Site Costs

In this exercise, we're ignoring land cost, but that's a significant factor and another that's hard to compare. Land aside, in the case of the stick built, there's the building permit and an assortment of typical fees imposed by the jurisdiction that can easily add up to five percent of the home's selling price. Since this comparison is based on the same size house, the MH example is a twin section unit. That means high site costs, erection costs, double shipping and some fees. Such costs are highly variable (as are the site builder's). As a percentage, MH costs might average more than double those of the stick builder, perhaps 20 percent or so of retail price. These costs are too often ignored or covered up in the early stages of the transaction and can damage the credibility of the MH retailer and the industry.

## Profit

As with sales costs, two profit centers for the MH vs. the one typical for a builder. The two MH profits combined probably tend to work out to about two-thirds the profit per home of the stick builder. That's again primarily a function of volume of sales. The MH manufacturer builds a lot of homes in competition with other manufacturers who'd like nothing better than to eat the other guy's lunch. Though competition is very stiff, profitability can be very attractive for those who master the management of the process. That's because in the end, it's return on equity that really counts. Keep costs low, inventory turns high, and profits soar. Mess it up and you're toast. *Keep the overhead down.* Keep *all* costs down of course, but fixed overhead is, by definition, fixed. Factories have higher breakeven levels than either retailers or conventional builders. Combine that with their slim profit margins, and it becomes clear why MH plants come and go. The housing business is not for the faint of heart, whether on site or in a factory.

While the approximate comparisons above give some idea of how MH and conventional costs compare, there's far more to the equation. Many factors that contribute greatly to one MH producer's edge over another and make life miserable for a stick builder trying to compete at a low price point.

Presumably, no MH manufacturer has a psychologist on board, but psychology plays a substantial role in marketing success as well as contributing to keeping the cost down. The trick is to focus on what the buyer really wants and will pay for, as opposed to what he or she says in a survey or might choose when picking components. The MH design challenge is to get the whole package right, and it's a key part of the competitive challenge.

Consider what happens when people set out to build a home of their own, using sweat equity to "save money." Too often they over-specify and overbuild too many details and wind up paying more than had they turned the job over to a contractor. Their eyes are bigger than their budget. Market surveys purporting to define home buyers' "preferences" may be accurate, but "preferences" and "payments" live in different worlds. At least they should if home ownership is to be pleasant and affordable.

Home builders commonly provide a "service" to their customer by allowing them to choose components before construction begins—or even as it progresses. Many know this will result in a higher priced house at the end of the day. Whether the customer will be happier is questionable. There is general agreement though, that the customers won't get a return on their extra investment in "features." Those selling manufactured homes play the same game, but in their case, the customer is usually looking at a completed home, as opposed to a model home and an option list.

MH designers tend to be masters at shaving the fur off a buffalo nickel with value analysis. The manufacturer (or builder) can enhance the value of a home (and improve his or her competitive position) by understanding and providing the features that offer the best value and reflect choices most customers will prefer, while saving a few bucks on things that few will care much about—or even notice. Some examples:

- Plumbing fixtures are important in the master bath and perhaps the half bath for guests. In secondary bathrooms or lower cost homes, “builder quality” (the high volume stuff) is much cheaper and generally quite acceptable—often will last longer than the decorator items. Careful floor plan design can save on the cost of supply, drain and vents with no detriment to livability. Pop valves can save use of a vent stack through the roof. Stick homes will usually have “angle stops” (cut-off valves) at each place where water is used. Lower cost manufactured homes often have just one valve for the whole home. Not a big deal for a single storey home having no basement.
- Kitchens are often the biggest single factor in selling the home. The biggest features are such things as counter space, layout and number of drawers, storage in general and appearance. Stick builders buy their cabinets as prebuilt box units built elsewhere and carefully packaged for shipment. Most MH manufacturers build them in their own cabinet shop and save lots of labor and material, making it relatively easy for them to enhance this important feature. Concealed hinges are an example of something buyers will tend to specify if purchasing a set of cabinets, but largely ignore when purchasing a house. There, the key is whether the doors and drawers fit and work properly. The stick builder can more easily customize a kitchen. The manufacturer can put more effort into getting the design and value combination right for each floor plan and price range.
- Home heating and air conditioning are too often design afterthoughts, resulting in furnace placements that increase ducting cost and reduce efficiency. MH furnaces have been designed from the ground up for their job, and MH floors are typically designed around the ducting system, which is usually a straight run lengthwise directly under the furnace. Return air is normally provided by undercutting interior doors, allowing return air to flow through the rooms themselves. It’s not a perfect system but has a fourth the ducting cost. MH manufacturers tinker with the basic system at their peril, because few customers are willing to pay the additional cost for the minimal benefit gained. This is especially important because a fancy ducting system is not, in general, a cost effective option. Make an upscale system standard in the hopes of selling more homes? Maybe, if designing for the Alaska and Yukon markets.
- Electrical requirements in a manufactured home are as rigorous as in conventional housing and yet significant savings are possible. Routing of wiring is worked out to minimize waste. A floor plan having no hallway saves three-way switches. Stick builders typically choose light fixtures from their wholesaler’s limited selection, which typically includes only a few inexpensive “builder special” lights. MH suppliers willingly design fixtures to the manufacturer’s specifications and sell them in volume at OEM prices at a fraction of their cost through builder-wholesale channels. Similarly, builders typically use rocker switches or the like that are twice the cost of basic switches and outlets, simply because that’s their normal spec. No big deal? Hmm. The retail price of the MH might go up by \$170 for that “feature” few customers would even notice. Still, peanuts in the scheme of things? Not if it’s indicative of the slippery slope of “too small to bother about” additions that nick competitive position. Spend the money on lights! Make every dollar count.

- Interior doors are in a similar category. A manufacturer might choose a six-panel hardboard door as a styling upgrade compared to the lower cost slab door to offer enhanced value. Similarly, attractive door casings can add value. But a nice MH savings is the accuracy of manufacturing which enables doors to be hung directly on the “rough” opening using inter-leaf hinges without the cost or labor of mortised door casings. Cheap hinges? You bet, but they’ll last the life of any home. And basic locksets do the job just fine.

MH manufacturers have, over the years, become very good at determining and providing the amenities that lead to closing the sale. So have production builders. The MH advantage is their ability to provide those amenities at lower cost and market them far more broadly than all but the most efficient builders can manage.

**B**ottom line, most people taking a tour through the two comparable homes discussed above would, all else being equal, choose the MH, unless they were simply incredulous that the price could be 40 percent lower with no significant difference in quality. Many others might well choose a single section manufactured home having comparable space and cut their home cost much further.

So why don’t more buyers make that choice? There’s no simple answer, but it is vitally important to find a good one. Let’s talk about that challenge, starting with some reasons why houses cost so darned much. Perhaps a good part of the problem can be traced to our American housing culture and its origins. Let’s look at what doubles housing cost.

In 1776, Adam Smith wrote *The Wealth of Nations* and noted that complex tax codes are “more burdensome to the people than they are beneficial to the sovereign.” In this great nation today, we’re busy making the tax codes hopelessly burdensome to both the people and the “sovereign” on the pretext of helping the people, with benefits mainly flowing to banks, lawyers, accountants and those of us who don’t need the help. Unfortunately, our efforts toward complexity are not limited to tax matters.

Taking a long view, government housing subsidies have probably been more burdensome than beneficial to the housing industry. While it’s easy to point fingers, people in government are just ordinary folks, trying their best to enforce laws and regulations that were intended to benefit the people. Things just get out of hand in bureaucracies.

Back in the late 1940s George Orwell wrote *1984*, the science fiction book predicting the advent of Big Brother. By the time 1984 actually arrived, the Federal tax code had attained the kind of complexity he postulated, roughly tripling in size. By 2012, it ran to 73,608 pages, roughly tripling again since 1984. There are more than twice that many regulations in force, with 50 to 100 added every day. Fortunately, only a small portion of those relate to housing, but caution is in order. The helping hand of government has a long reach and a poor aim.

In assessing government’s role, *New York Times* columnist David Brooks said in 2013;

*We should start by acknowledging that except for a few rare occasions—the Civil War, the Depression—government is a slow trudge, oriented around essential but mundane tasks. ... It is just too balky an instrument. ... Governing is the noble but hard job of trying to get anything done under a permanent condition of Murphy’s Law.*

Since the mid-thirties, FHA and its successors have struggled to make housing affordable for low income Americans. “Affordability” is generally defined as net housing costs that do not exceed 30 percent of gross household income. It’s a tough challenge. Despite many governmental assistance programs over the past 80 years or so, about 20

percent of the population lives in housing they “can’t afford.” Some seven to ten million households in this country pay more than 50 percent of their gross income for housing. Governmental assistance is provided to nearly five million households, but that’s only a fourth of those who need it, according to commonly accepted definitions.

How did this all come to be? Following is a quote from *Time*, a July 13, 1950 issue having Bill Levitt on the cover:

*Suburbia required cars, highways and government guaranteed mortgages. It also required William Levitt, who first applied a full panoply of assembly-line techniques to housing construction. That insight enabled him, and the many builders who copied him, to put up houses fast and cheap. Levitt’s houses were so cheap (but still reasonably sturdy) that bus drivers, music teachers and boilermakers could afford them .... He could build fast because he had broken down the construction process into 27 operations, then mustered specialized teams to repeat each operation at each building site. Twenty acres were set aside as an assembly point, where cement was mixed and lumber cut. Trucks would deliver parts and material to homesites placed at 60-ft. intervals. Then the carpenters, tilers, painters and roofers arrived, each in his turn. There was a team for white paint, another for red. One worker’s sole daily task was to bolt washing machines to floors.*

Read that first line again. **Suburbia required ... government guaranteed mortgages.** Why? Those houses were selling for \$8,000, including appliances—about \$80,000 in today’s dollars. And Levitt stood ready to rent them to prospective owners working to save up the down payment. Those were mostly two-bedroom, one-bath houses with stairs to an unfinished attic where the addition of two more bedrooms and a second bath could be readily accomplished. They were good little houses and most still stand, though nearly all have been expanded. Government felt a deep obligation to vets and enabled them to buy those homes with no money down.

A fine thing, as was the G.I. Bill’s funding of education, but both established a precedent suggesting governmental funding obligations that grew and dominate today’s American culture. A “right” to higher education and a “right” to own a single family home; both accomplished by piling on debt. But partly as a result, the cost of education and housing both soared out of sight. Such are the costs of a free lunch.

Federal housing expenditures were projected in 2010 to amount to about \$137 billion in 2012. Some two-thirds of those tax benefits were expected to be in the form of mortgage deductions, with more than two-thirds of such deductions going to those having incomes above \$100,000. Two other big chunks go for the capital gains exclusion for those who sell their homes and the deductibility of property taxes. These are nice perks and, in combination with others of that sort, make up some 90 percent of Federal housing expenditures.

The low income folks (less than \$30,000 per year), most of whom can’t afford to buy a home, enjoy less than one percent of the bounty, collecting about a fourth as much of the Fed largess as those making more than \$200,000 per year. Most of their meager portion goes for tax credits to first time homebuyers and special extra depreciation on rental housing.<sup>46</sup>

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<sup>46</sup> *Estimates of Federal Tax Expenditures for Fiscal Years 2010-2014*, by the Staff of the Joint Committee on Taxation, December, 2010. In fairness, it’s worth mentioning that those with incomes above \$100,000 incurred 90.1 percent of the income tax liability, while those with incomes below \$30,000 incurred *negative* tax liabilities amounting to 8.7 percent.

It's hard to say the poor folks don't deserve their piddly \$14 billion portion, but even harder to think that the \$123 billion is well spent helping those earning big bucks. Sure, they carry the vast majority of the tax burden, but filtering it back to them through the tax maze is not an effective method of lightening their load.

This is the plan for helping low earners with their housing cost? There's something wrong with this picture.

**T**he theme of this book is how learning curve works to bring down the cost of housing so that more people can afford it. Despite best intentions, bureaucracy—government, corporate or otherwise—tends to work in the opposite direction. In the seventies, for example, government housing programs were budgeted in the \$60 to \$80 billion range, while direct outlays were relatively small. In later years, *planned* outlays settled down, but remained considerably more volatile (and lower) than *actual* outlays. Tax dollars actually spent vary as new programs are introduced and old ones, occasionally, are withdrawn. Most of those hundreds of billions of cost and foregone revenue have resulted in market volatility and distortions that disrupt the competitive functioning of the housing economy, encouraging most people to buy more house than they need and can afford.

Probably the most egregious program of all is mortgage guarantees. The government used to love them because in theory, they cost peanuts, and they actually got those vets and a lot of other people into houses of their own.<sup>47</sup> These well intended programs started with FHA in the thirties seeking to make housing affordable by providing government mortgage insurance in one form or another. Originally intended for low income families, the programs ballooned to become the staple of our nation's home finance. Back in the fifties before mortgage guarantees were broadly available, a general affordability rule of thumb suggested buyers should spend 20 percent of gross income for housing; with 20 percent down payment, and 20-year loan amortization. Default rates were low and about two-thirds of Americans were home owners. Not good enough in the circles that guide government housing policy. Home ownership is the American Dream. Politicians love to "help" their constituents by making things more "affordable." That's what Breakthrough was all about, but ... well, if you don't succeed, try something else.

It was in the eighties that, at government "urging," Fannie Mae and Freddie Mac started loosening standards to assist low income buyers. Congress set a quota of "helping" 30 percent of low incomers, those below median income, which was gradually raised to 56 percent by 2008. Terms were lengthened and down payments gradually dropped from 20 percent to zero. With their pseudo-government backing the two mortgage giants dominated the market, with similar terms extended to one and all. The housing market soared, and default rates remained low, sustained by the rising market. Buyers couldn't go wrong.

Before the bubble burst, zero down payment with 40-year amortization and interest-only in early years was common—and don't look too closely at household earnings capability. Sometimes 40 percent of gross income going for payments alone? Well, maybe that would work out OK because of equity growth? Or maybe not.

Let us suppose, for just a moment's reflection, that all these benefits had never been provided to the returning vets and all those others. Suppose we'd continued to function under the guidelines prior to that post-war boom. For starters, those vets would have

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<sup>47</sup> In the estimate quoted above, the mortgage insurance subsidy was budgeted to cost just \$300,000 by 2012.

had to come up with \$1,700 down payment for their new house. And home ownership rates might be lower today. Typical houses would likely be quite a bit smaller and fewer families would be bogged down by debt. Whether that adds up to a good thing is debatable, but there is general agreement that our nation, public and private, has been tempted into a habit of carrying way too much debt.<sup>48</sup>

The following table is based on the assumption of a “Low Cost” conventional single family house including lot, having an annual operating cost of \$3.50 per square foot, purchased by a typical family of modest means with a six percent mortgage, comparing

	<b>Current</b> Affordability		<b>Traditional</b> Affordability	
<b>Adjusted Gross Income</b>	<b>\$45,000</b>		<b>\$45,000</b>	
<b>“Affordable” House Price</b>	<b>\$131,000</b>		<b>\$84,000</b>	
<b>Low cost house, square feet</b>	<b>1,456</b>		<b>875</b>	
Closing cost at 2%	2,620		1,680	
Down payment	5,850	<b>5%</b>	16,800	<b>20%</b>
Affordable monthly payment	699	<b>30%</b>	493	<b>20%</b>
Balance payments will finance @ 6%	127,070	<b>40-yr</b>	68,880	<b>20 yr</b>
Monthly operating cost at \$3.50/s.f.	425		255	
Total payments P&I, life of loan	\$335,595		\$118,435	
Equity at five years	8,382		25,521	
Realtor’s 6% commission	7,860		5,040	
<b>Owner’s Net on Five-Year Sale</b>	<b>\$522</b>		<b>\$20,481</b>	

recent affordability guidelines with the old 20/20/20 rule of thumb.<sup>49</sup> The assumptions used in this table are arguable and approximated, but directionally reasonable:

Both of those houses are very small and “low cost” by the norms of today. Human nature being what it is,

guess which of those deals a young family will choose? The 40-year loan with five percent down enables them to buy a much larger house with a third the down payment.

What’s not to like? Here are a couple of dicey details:

- While the larger house is more suitable for long term occupancy, if it becomes the family’s permanent home, they’ll have paid 2.8 times as much principle and interest when they’ve made their last payment (if they live that long).
- If, as is far more likely in our mobile society, they sell after five years, and get the price they paid, they’ll have less than ten percent of their original down payment available for the next one.
- They and their banker are betting that appreciation will make it all work out—and that’s an increasingly risky bet, laid off on Uncle Sam.

It’s clear why most families in today’s society choose the 40-year deal. It’s clear why banks like such loans, given mortgage insurance. It’s not at all clear that society benefits, or that these arrangements are good for a family’s financial health. Given recent events in housing finance, such “good deals” have become scarce. The shock of it all brought the housing industry to its knees, and recovery has been slow.

The biggest stumbling block most young families face in opting for the conservative choice has always been how to save up that Big Mac-size down payment. And if they should be so prudent, they wind up with a White Castle house! The main reason for our culture’s eager adoption of ever easier financing guidelines was to help families “afford” what they arguably could not.

<sup>48</sup> The ratio of mortgage debt to income was about 14 % in 1920; up to 61% by 1932, back down to 18% by 1945 and climbing constantly ever since, up to 71% in 1990. Total mortgage debt in 1985 was \$1.5 trillion, growing to \$10.5 trillion by 2006 at twice the growth rate of the economy. By 2013 it was down from a peak of \$14.5 trillion to \$13.2 trillion.

<sup>49</sup> 20% down was set by FHA in 1940 and remains the basis of bank loans. Amortization periods grew from 10-year to the currently common 30 and 40-year loans, with 20 years being “normal” as a bank guideline for many years. A housing expense ratio of 20% was, for a long time, a conservative guideline used by banks, and financial advisors spoke of 20/20/20 to be “safe.”

The self-help financial planning books encourage people to manage their finances in the direction of the 20/20/20 guideline, so they'll have some money to invest for the future. Sensible. Why then, one wonders, does government try so hard to get people into homes they cannot afford?

There seem to be two main reasons. First, as we saw in the story of Operation Break-through, there is great concern for poor people's "self image." The poor should not be asked to live in tiny crackerboxes when others live in relative splendor. Nor can they bring themselves to suggest people choose rentals, shared housing, mobile homes or the like. Second, is that "blunt instrument" problem. Government has to yank the levers it can get its hands on. Extending the term of mortgages and requiring ever lower down payments was, in theory, a very low cost way to reduce monthly out-of-pocket housing cost. Since that strategy has taken such a bad bounce in recent years, one might hope for a better approach in the future.

Don't bet on it.

So far, the levers have been reset in the direction of increased housing turmoil. Mortgage rates are at historic lows, yet qualifying for a loan has been made notably more difficult through the application of greatly tightened credit standards and a plethora of new and complex regulations. Demand for housing loans is strong, while bank standards for making loans have tightened since the pre-crunch days. And Uncle Sam is out of money to throw at the problem.

All this has accentuated a major barrier to housing cost reduction—market volatility.

How'd we get into such a mess?

Debt is the foundation of the problem. As a nation, as a world, we're hooked on debt, and the more the merrier. In the private sector, mortgage debt is the biggest chunk, and that's widely seen as a good thing. Nearly everyone finances their home purchase, and is encouraged to do so as soon as possible, borrowing to the max—and a bit beyond. Home ownership brings a perception of wealth, and that's based on the fact that such leveraged investments multiply wealth, as long as prices increase. They generally do. This "wealth effect" also pushes up the price of houses in a virtuous circle that home owners, builders, banks and governments all love ... and encourage.

In those times when home values go the *opposite* direction, the virtuous circle turns vicious. That's what happened recently as the "virtuous circle" spiraled right out of control. It's happened before, but we're slow learners.

This is not all the fault of government programs. We've become a consumer society bombarded from all sides with inducements and incentives to consume more and more.

Few will incline to change the housing paradigm back to the old 20 percent guidelines, even if they could. Yet, if we've learned anything from the recent housing crisis, surely we could strive toward more sensible ownership goals:

- Finance homes as they do in Canada; with interest rates fixed for five years, rolled over with minimal paperwork at then-current five-year rates.
- Enforce net housing payments of no more than 30 percent of adjusted gross income after—at minimum—property tax, utilities and insurance.
- Require a minimum down payment equal to at least ten percent of the home's cost, to come from the buyer's savings.
- For those deemed by society to merit a housing subsidy, make it in the form of rent subsidy or a subsidized mortgage interest rate.
- Phase out the mortgage deduction and all such subsidies—the well-off don't need it and it does the poor no good.

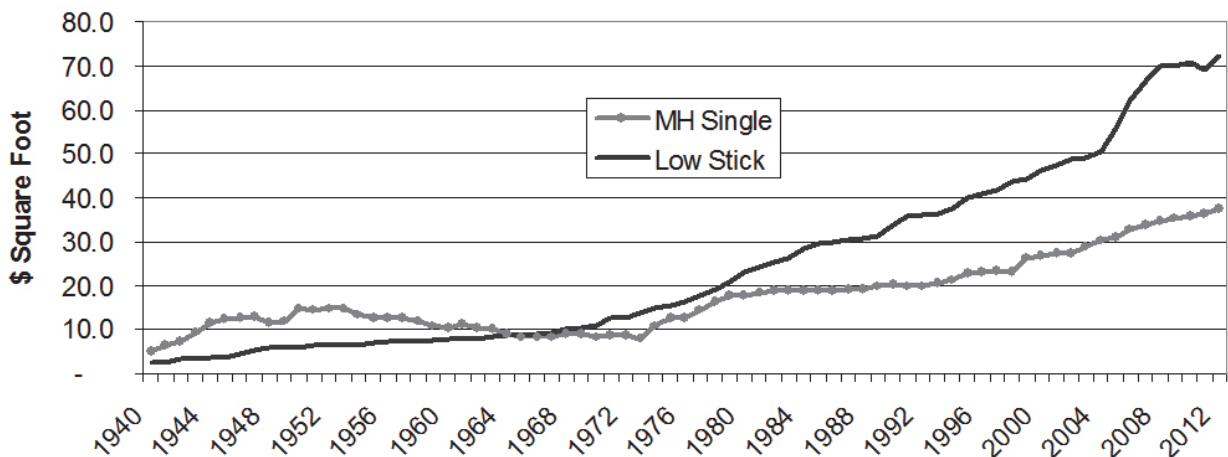


- Stop introducing new programs, unfunding existing ones and using housing as a tool for “managing” the economy.
- Get government out of the mortgage guarantee business (which they claim they’re not in).
- Encourage increased use of multifamily housing, manufactured home communities and other ways to increase housing density.
- Enforce a national residential building code that has a performance bias.
- Encourage a renaissance in small, efficient homes and the joys of living in them.

Such steps would go a long way toward easing the regulatory morass and might bring the spiraling cost of housing under control. It seems fair to estimate that the ill-conceived and volatile programs and regulations of the past have doubled the construction cost of housing, considering the effect such strategies have had on the doubling size of houses over the past 50 years and the prevalence of upscale features now “required” by the market.

If government policies encouraged our culture *away* from McMansions and toward affordable housing, we might live in more reasonable-sized homes, and not have to boost the self-esteem of the poor quite so far. In addition, such changes might smooth market demand, resulting in greater home building efficiency at all levels. The voracious increases in the cost of homes might slack off a bit. Consider this graph once more:

**MH vs. Low Cost Stick**



That little Levitt house mentioned earlier in this chapter would fit nicely at about 1950 on this graph’s black line, which excludes land cost. And if you follow that black line up to the right end, it suggests efficient production stick builders can still build for about \$70 per square foot today. They should be capable of offering new single family houses of a thousand square feet for about \$75,000, plus land. Why are such houses so scarce? First, because our society has come to expect twice as much living space, doubling housing cost, and second, the soaring cost of land makes any sort of low cost housing a difficult business proposition. Meanwhile, the business of mass producing homes, pioneered on site by the likes of Levitt, has come a very long way because of factory production. MH manufacturers have built many times the number Levitt managed to erect, and thus learned how to cut even his impressive construction cost roughly in half, as illustrated by the lumpy gray line. They are similarly affected by the markets yearning for big houses sitting on scarce land, but can construct the thousand square foot house for \$40,000.

Everybody wants to cut the cost of housing, yet the effective cost of stick homes has doubled, and while the MH alternative is available at half price, people don’t want low cost homes—or rentals such as apartments and condos. Our “market economy” is out of sync with the market’s needs. What’s going on? What’s the answer?



*Buy land. They ain't making any more of the stuff.*  
*Will Rogers*

## 9 Living the Dream: The Equation Gone Sour

This book is about fundamentals of the housing industry. There's nothing more fundamental to housing's future than land. Vast as this nation is compared to other wealthy countries, we're running out of land—land suited for housing. Overseas they deal with their more urgent land crisis by packing more and more people into taller and taller apartment warrens. That notion has not caught on here. Our land problem is not that bad ... yet.

The American Dream includes a 2,500 square foot three-bedroom house with full basement and two-or-three car garage on a half-acre lot (or perhaps a full acre?). City planners want us downtown in high-rise apartments—well OK, maybe condos. Houses gobble precious land. Multifamily dwellings conserve it. What to do?

For the next 50 years or so, how about negotiating a bargain that greatly reduces land use while providing much of the ambiance of single family homes? That's been the MH industry's pitch for decades and it's proven to be a pretty good compromise for many who are lucky enough to have access to the option.

	<b>Single Family</b>	<b>Condo</b>	<b>MH</b>	<b>Apartment</b>
Typical Square Feet	1,818	1,497	940	627
Lot Square Feet	10,000	2,640	2,337	1,063
<b>Homes per Acre</b>	<b>4</b>	<b>12</b>	<b>15</b>	<b>28</b>
Monthly Finance	\$2,181	\$1,812	\$1,008	\$750
Utilities	\$191	\$120	\$128	\$75
Total Monthly Cost	\$2,372	\$1,932	\$1,136	\$828
<b>Monthly per Sq. Ft.</b>	<b>\$1.30</b>	<b>\$1.29</b>	<b>\$1.21</b>	<b>\$1.32</b>

A recent version of the pitch summed up one area's housing compromises this way:<sup>50</sup>

This example was based upon older back-to-back communities in Pomona, California; thus the rela-

tively low utility costs and high MH densities. Bernhardt put the median densities at three for single family, eight townhouse, six MH and 20 for walk-up apartments. One

<sup>50</sup> *Sustainability in Manufactured Home Communities*, Resident Owned Communities USA, 2012.

can argue endlessly about the numbers above, and some no doubt will do so. They are, however, indicative.

Two important points for now: First, the majority of Americans dwell in single family homes, the priciest choice, while most of the rest of the world lives in apartments (which best conserve land), renting apartments according to their budget. Arguably, we Americans can't afford to maintain our current high-cost choice if we hope to remain competitive on the world stage. Second, that same choice soaks up several times as much prime land; a resource that's growing scarce as Will Rogers mentioned about a hundred years ago ... but what to do about it?

Manufactured housing suggests a rather neat American alternative to everyone's hankering for a home-on-a-half-acre. What if young people in this land of opportunity started out in apartments, saved a few bucks, moved up to a manufactured home, saved more; then to a condo or single family home depending on their career success?

Recent traditions say that won't—can't—happen. More to the immediate point though, what is the MH industry thinking in turning handsprings to move from the third column above and jump right over to the left, head to head with the toughest competition? There seems to be an excellent and wide open market between apartments and single family homes, where the only real competition is condos and the MH has a unique edge.

In urban areas, developers have discovered a new market for the dynamic young who disdain housing traditions. Micro housing. Google it. Tiny upscale apartments in the 200 to 600 square foot size with high but manageable rents. Or buy a 200 square foot trailer for \$60,000? A company called Tumbleweed has them in production. Micro homes for micro markets, but it's a trend to watch.

The RV industry is on top of that trend, as it relates to suburban, vacation and rural areas. They build rather pricey 400 square foot cottages that people find attractive places to live, year-round. The cost per square foot is high but the little homes are appealing and the net living cost affordable. Yes, those little rascals are supposed to be for recreational and seasonal use, but ... think rebirth of the mobile home industry. A kind of crazy, wonderful and innovative approach to housing, thinking outside the big box.

The housing situation in this country is a bit unique. Our short housing history and culture developed on the premise that land is plentiful, as it used to be. Now it's not, except in very small towns and areas of marginally useful land. Betting the future of the MH industry on that depleting resource smacks of short term thinking.

In 1950, the typical 250 s.f. MH was about a fourth the size of a single family house. Awfully



This little unit is built by Cavco and marketed by Modular Lifestyles in California, along with a range of environmentally innovative manufactured homes. This park model is code-limited at 400 square feet, so don't you dare move in and make yourself at home. Similar units have little "upstairs" lofts that tickle the RV code's arbitrary 400 foot ceiling. Millions of people worldwide live comfortably in such space, so why not here?

Courtesy Modular Lifestyles

small, but the teeny size made it affordable. By 1972, it was a little more than half the size of the house and still comparably affordable. Those were the years of heady growth of the MH industry. Since 1972, average single family home size has gone from 1,500 square feet to 2,400,<sup>51</sup> a 60 percent increase, with decreasing family size. The average single MH has marched lockstep, maintaining the ratio by boosting multi section units to around half the total production, and losing some competitive edge in the process.

In the seventies, the MH industry felt constrained by shipping limitations and continued the decades-long struggle to be able to offer larger homes, and they succeeded. Yippee! As long as those were singles, the MH cost advantage per square foot continued to grow. But that was not enough. Like conventional builders, MH builders aspired to move customers up to ever larger homes. Very logical. The overhead involved in building a large home and a small one are about the same, and the customers like 'em too; the bigger, the better.

That logic is short term. Everybody wins as long as the economy, family size and land supply grow apace. Economic growth however, is *slowing*, family size is *going nowhere* and the urban land supply is *drying up*. Why do we need ever larger houses? The public is showing signs of coming to its senses. So are home sizes, but whether those are due to economic fundamentals or just recession effects—who knows?

One result of increasing MH size has been the need for bigger spaces in MH communities—ever longer and wider homes crave larger lots and more site amenities to appeal to their targeted affluent buyers. The construction of new MH communities continued to adapt ... for a while. But as lot size grew and the cost of developed land soared, the value equation changed.

Site rent increased too, but not enough to keep up with the growth in land use and the challenges of MH community construction. The value equation that had made those communities a great investment has faded. Few new ones are being built and new manufactured homes gravitate toward private lots. Just where all this will end is anybody's guess. Guessers abound. Strategies too, but no industry focus seems apparent.

Before the crash, land cost was growing much faster than the cost of construction and accounted for a big chunk of the increase in home prices. Will Rogers had a pretty good idea. So did Warren Buffet a few years ago, when he suggested the best investment for an individual in a position to do so would be residential real estate. That was at the bottom of the cycle and who knows what's next. But investing in raw land hoping to ease it through the process that will result in a new MH community is a scary proposition.

The relationship between the price of land and that of construction is difficult to plot. A 2004 study published by the Federal Reserve Board<sup>52</sup> took a hard look at the challenge and concluded that between 1970 and 2000, the nominal price of residential land increased 10.4 times. In that same period, cost of replacement construction increased by about a fourth that amount. The price of existing homes reflected those realities by approximately doubling. But the relationship was complex. As has been shown earlier in this book, the cost of construction is volatile, but the cost of land is more so. The market value of land over that period, the study found, was about twice as volatile as that of

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<sup>51</sup> Those are larger sizes than the examples put forward by Resident Owned Community folks cited on Page 103. All those figures are based on the size of *existing* homes in the high density community they studied. Barnhardt's estimates were also based on smaller homes than prevalent today.

<sup>52</sup> *The Price and Quantity of Residential Land in the United States*, Morris A. Davis and Jonathan Heathcote.

family disposable income or the price of existing homes. That kind of volatility makes the planning of *any* sort of housing developments a dicey affair. MH communities? Perilous. To attract investors, the payoff has to be huge. Costs soar.

### **Solution One**

Raise the rent? That's hazardous. The MH stigma and lack of MH financing has scared off buyers, and many MH community vacancy levels are unacceptably high. Once the combination of MH payments, utilities and park rent exceed the local rent level for a comparable size apartment, the logistics tend to go kablooey. Rents that are too high in communities that are poorly suited for new manufactured homes result in excessive vacancy rates and depreciating homes—slumsville.

### **Solution Two**

To the woods! The figures above relate to the value of land destined for housing. Farm land is a horse of a different color. In that same 1970-2000 time period, the value of rural land increased about half as much as that of residential, and was even more volatile. Relatively speaking, farm land prices soared during the seventies, while land for housing was rather stable (presumably due to the collapse of the housing market in those days). Then in the eighties, residential land resumed its upward march while farm land settled down. The value of rural land is governed by entirely different factors. These differing trends may partially explain the increase in manufactured homes going to private country lots. That trend has been under way long enough that low cost country land is sprinkled with aging and poorly maintained homes—country slums. An environmental and marketing debacle.

As the new century opened, the unfortunate alignment of a surplus of manufactured homes due to overbuilding and repos, in combination with soaring value of land for development put the kibosh on the whole MH industry. These problems did not arise overnight.

Such trends may or may not continue, but who wants to be so brave as to bet the ranch on any housing trend? The recent collapse of residential housing may provide opportunity for those bold enough to invest in residential land for MH communities. Or country lots. Or more likely, forget it and leave the problem to others. But *which* others? Who knows.

We've all observed these trends in recent decades. The housing industry is too volatile, land development more so, and there is no industry strategy for the placement of manufactured homes. MH community construction generally lags way behind land development, and there's been too little of that for a couple decades. Where that leads short term is a guess; the long term trend is increasing land cost. And as the proportionate cost of land increases, low cost homes get squeezed out of the equation. Why put a cheap house on expensive land? Land for manufactured homes has traditionally been a relatively small cost factor handled by the retailer or MH community investors. The whole MH concept depends upon independent players working as a team. Historically, that's happened surprisingly well, considering there's been no coach to call the plays. The rules are changing. The industry needs a strategy to reckon with the challenges.

**S**o ... one big challenge is land. How to get manufactured homes—any homes—onto appropriate sites and make the resulting package both livable and affordable. It gets more and more difficult as the years go by; especially for the MH industry. Threatened by “trailer parks,” zoning officials and neighbors get their dander up, homes get ever larger and family housing budgets shrink. All of America's residential communities, the backbone of the economy, face big challenges. Extreme volatility is a major factor driving up both construction costs and the price of land. That same volatility is

perhaps the biggest barrier to the continuing evolution of manufactured housing. Let's try to sort out the factors behind all that.

Government at all levels is generally aware of all this. Major Federal efforts aim at managing the business cycle, the ups and downs of the economy that are the prime factor in economic volatility. The government also recognizes that it can only affect such matters at the margin. Partly as a result, and as noted in Chapter Eight, government subsidies in the form of loans, loan guarantees and manipulation of interest rates have long been intended to help ordinary and low income Americans own their own homes and provide them a leg up against the winds of change.

And not just housing. Our nation's tax code is fraught with such "benefits." Consider a tax break introduced about 90 years ago, aimed at helping farmers wanting to swap horses, land and the like without incurring capital gains taxes. A good thing that enhanced farming productivity—backbone of the country in those days. "Unfair!" cried industries engaged in similar business activities. They had a point, so the joy was spread around. That little horse-swapping idea has spread the subsidy to truck fleets, vacation homes, oil wells, race horses and who knows what all else. Net annual cost is hard to estimate but probably more than a trillion dollars. Unfortunately, that's just one of many, and they spread, becoming more broadly interpreted by clever accountants and tax lawyers. That's not to mention the lobbyists who stomp for widening mandates. Initiated to help the farmers, that old tax break has probably the perverse effect of increasing the cost of farmland, and that's not an isolated example.

Government benefits are hard to measure and even harder to control. When the D.C. levers are pulled to help reduce the cost of housing—as has been so often done—watch out. Apparently these efforts have hardly helped low income families with their housing expense, so why was all that legislation incurred?

As Charles Murray documented in his best seller *Losing Ground*, projected benefits of new programs often don't pan out and are sometimes counterproductive; "... transfers are inherently treacherous. They can be useful; they can be needed; they can be justified. But we should approach them as a good physician uses a dangerous drug—not at all if possible, and no more than absolutely necessary otherwise."<sup>53</sup>

After exhaustive study, Murray proposed three "Laws of Social Programs."

1. **The Law of Imperfect Selection**

As regards housing, Murray's first "law" would suggest that many who are most in need of the subsidy will fail to benefit from it. Rules and regulations, no matter how carefully written, tend to err in the direction of exclusion—often of those most needing the help. Trying to correct that deficiency often leads to the second law.

2. **The Law of Unintended Rewards**

Housing programs are usually aimed at those most needing help, but in fairness, where does one draw the line on need? Why should the penniless get help but not the needy? What, in fact, is the difference? What about those insolvent due to their own mismanagement? And how to keep those being helped from feeling patronized and robbed of self-esteem? Programs broaden to include nearly everyone. As with mortgage interest deduction, the biggest winners are those least in need of help.

3. **The Law of Net Harm**

Murray says, "In practice, the programs that deal with the most intractable behavior problems have included a package of rewards large enough to induce participation,

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<sup>53</sup> *Losing Ground*, Charles Murray, 1984.

but not large enough to produce the desired result.” This is because government programs (with certain exceptions such as military service) cannot force participation. They must provide virtually all carrot and no stick. The majority of home buyers take advantage of mortgage interest deductibility. By and large, those targeted by the program pay no income tax and gain no benefit.

Murray’s conclusion was that democratic social programs in general, “... tend to produce net harm in dealing with the most difficult problems.” The book did not focus on housing programs, but the ever-escalating cost of housing would surely qualify as a problem that’s proving intractable.

The affordability of housing seems to relate largely to the availability and direct cost of loans as determined by interest rates and down payments. Government programs focus much attention on bringing mortgage rates down to make homes “affordable.” Yet the launching and ending of such programs is subject to the vagaries of Congress and the economy, making the future housing market impossible to predict. Other, mainly local, programs and regulations stretch out the time required to prepare building sites. Such inconsistencies *destabilize* the housing market they’re trying to help.

Loan availability and cost drive all home prices up or down. Owners of existing homes make nice profits or take it on the chin, depending on circumstances at the time of the sale. Home buyers can choose to buy a new or used home, so supply and demand has significant effect on new home construction. New homes average perhaps a fourth of total home sales and have to compete in that chaotic market.

The current blizzard of complex and evolving regulations intended to protect the buyer from lending abuses has the unintended effect of drying up financing to those most in need. Joseph Heller might deem housing subsidies a typical Catch 22; a situation from which progress is impossible because of inherent contradictions in the rules governing progress. Builders, manufacturers, suppliers, developers and customers are caught in an ever-changing swamp of conflicting rules, regulations and programs intended—at considerable cost—to help. Dodd-Frank is an excellent current example—a noose around the industry’s neck.

This largely artificial ebb and flow of the “controlled” economy has a major effect on people’s choices, willingness and ability to buy. Builders ride an amplified market wave. These are the storm clouds that gather on the tail of a long learning curve. They add up to the forces of momentum that make the home building business volatile—all construction for that matter. They also include seasonality, a diminishing supply of skilled trades, increasing regulation, environmental factors, community resistance, the fight for construction loans and lots of competition. Who’d want to be a home builder? Construction costs run out of control.

The National Association of Homebuilders frets about such trends. A 2011 NAHB study by Paul Emrath<sup>54</sup> updated the costs of regulation at all levels, based on an extensive survey of actual builder’s experience. It concluded that such regulations increase the final selling price of a typical new house by some 25 percent. About a third of that premium was attributed to the house itself, and two-thirds to converting raw land to a finished lot.

Assume Emrath is right and put this into the framework of manufactured housing, where construction of an average twin section home costs a bit over half as much as building an average stick home. Assuming no additional bureaucratic glitches because the house came from a factory (!!), the cost of regulation might amount to *half* of the selling price. That assumes the same land and level of effort to negotiate each step. In the real world, the hurdles met by manufactured housing in the regulatory process tend to be more difficult because of their orphan stepchild status in the halls of bureaucracy.

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<sup>54</sup> *How Government Regulation Affects the Price of a New Home*, Special Studies, Paul Emrath, Ph.D. 2011.



It is for such reasons that manufactured housing increasingly retreats to the hinterlands and is a large factor in the decline of manufactured housing sales.

It all adds up. Volatility is the enemy of all types of construction, and government “help” in the form of regulatory burden is a major component of volatility. A large part of construction inefficiency can be traced to inability to plan and manage housing development projects. Construction undertakings that used to be completed in months now take years. Factory construction has proven its ability to make great gains in cost reduction, but site costs for manufactured homes present an even bigger challenge than that faced by stick builders.

The MH industry needs to think outside the square. Betting on government help has proven futile. Learning curve is a better tool than subsidy programs. People like manufactured homes and choose to live in them, if the economics work. The trick is to use the manufacturing advantage to do an end run around government “assistance” (that has so far proven to be more burden than help). So far the main thrust has been to retreat to less regulated areas such as country sites. That’s a stopgap measure.

Manufactured housing has long struggled to upgrade its image and thus participate at the government subsidy trough, where much is promised and little delivered. Results have been unsatisfactory for the reasons cited above. A bit of history will help illustrate what has changed for the worse in the economic equation.

Years ago Michigan State University’s Dr. Carlton Edwards documented the state of MH finance in his landmark book,<sup>55</sup> along with many papers and articles. He prepared several useful iterations comparing the cost and finance of mobile vs. alternative residential lifestyles.

The chart below is based on one he did in the early seventies, updated to 1974, as printed in *Mobile-Modular Housing Dealer* magazine.<sup>56</sup> It included several examples, from which we’ll use his estimates for a 670 square-foot average mobile home and a low cost 1,300 square-foot conventionally built tract house. Since the mobile home was furnished, he added the cost for furnishings and appliances to the stick house. The building lot was included with the house, so he included typical park space rental with the mobile home. All figures included an estimate for taxes, maintenance, water, sewer and insurance. Interest rates and terms were typical of that period. The house was nearly twice as large as the mobile home; reasonable assumptions faced by folks shopping for a low cost house in those days.

<b>1974 Example</b>								
	Price	Down	Term	Rate	Payment	Rent	Operating	Net
House	\$25,000	\$5,000	25-year	9 %	\$168	\$0	\$118	\$286
Mobile	8,000	800	10-year	14.25%	113	60	15	188

Edwards’ assumptions included a 20 percent down payment on the house vs. ten percent on the mobile. He showed the mobile home’s interest rate at 11.32 percent, but that was based on how consumer finance was calculated in those days. The actual annual percentage rate for such chattel loans was 14.25 percent. Edward’s commentary noted

<sup>55</sup> *Homes for Travel and Living: The History and Development of the Recreation Vehicle and Mobile Home Industries*, Carlton M. Edwards, 1977.

<sup>56</sup> *Mobile Homes Housing’s Best Buy*, Carlton Edwards, *Mobile-Modular Housing Dealer Magazine*, June, 1974.

the potential of greater equity appreciation on the house but suggested that would be somewhat offset by capital gains taxes prevailing at that time. He dealt with the difference in perceptions of quality by quoting census data showing that 85 percent of the mobile homes built since 1949 remained in use (the current ratio is about two-thirds of those built since 1949). His exercise also showed an apartment comparable in size to the mobile renting for \$200. His examples also included a typical condo, a higher (average) priced house and a 50 percent higher priced mobile home. Edwards' numbers suggested an annual income of \$11,500 needed to afford the house, while the MH in a nice park could be managed on a third less income.<sup>57</sup>

The old mobile financing assumptions made some sense. Build the homes fast and cheap; scrap 'em in due course and replace with new ones. That strategy had some charm, especially for the "newlyweds and nearly deads" who could manage in the smaller space necessitated by shipping regulations. That seems to have been the view of many home buyers of the period. That tiny down payment would have been a powerful attraction. Buyers could purchase a brand new furnished MH with a skimpy down payment, live in it for five years and expect to build equity. For those who could already afford the down payment for a house, why not dig a little deeper and buy a mobile home for cash? Many did. The industry was on a roll and came to dominate low-end housing.

Mobility ruled. Even though those homes were not very "mobile," and the interest rate was high, that low down payment of \$800 could be expected to triple to around \$3,000 of equity after five years. That would enable the seller to buy a much nicer mobile home at the family's new location. Selling a house after five years would likely result in a loss after paying the sales commission. Mobility appealed to many young families—in a pinch, the MH itself could be relocated.

There's an important point here. The high down payments on mortgages in those days created a wonderful market for mobile homes; a less painful alternative in terms of cash requirements for young buyers. Low down payments were possible and financing was readily available on mobile homes because of high interest chattel financing. Those rates and the good loan experience made mobile home loans attractive to lenders. *Competition worked in favor of the MH industry.* If all housing worked that way, we might live in a better world. Surely housing products would evolve a lot faster, as happened in the auto industry.

**T**he industry has chosen a different course, in an attempt to adapt manufactured housing to the reality of competing with homes that can last a century, securely tied to a little chunk of the earth. The bet was made that a little boost from HUD and a valiant fight against the stigma could change the industry's course. Manufacturers would demonstrate that the MH itself is as durable as one assembled on site, and still costs a whole lot less. Amazing progress has been made in that direction, but ... *against a target that has moved, due to subsidies.*

So now let's update Edwards' exercise, using 2011 values and interest rates more relevant to today's market. The 1,600 square-foot house used as an example is again typical of today's "low cost" builder house in a subdivision. The 1,100 square-foot MH is a single, based on their average 2011 retail price, installed, based on MHI data. Operating costs are shown at an estimate for the house and about half as much per square foot for the MH, because it's smaller and its real estate tax is in the park rent.

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<sup>57</sup> One might quibble about details such as the comparative operating costs for the house and the MH, but in general, the professor tried to overcome his MH bias.

**Update to 2011**

	Price	Down	Term	Rate	Payment	Rent	Operating	Net
House	\$165,000	\$16,500	40-year	6%	\$817	\$0	\$468	\$1,286
MH	40,600	4,060	15-year	9%	371	335	214	920

The net cost per month is comparable to that of Edward's day, even allowing for the assumed higher estimate of MH operating costs.<sup>58</sup> The down payment is a bit less attractive, but still looks good, and while both homes are larger, the MH is now 70 percent as large as the house, whereas in 1974 it was half the size.

But, there's a new wrinkle in today's MH equation. Back in the seventies, a mobile home "setup" as included in Edwards' assumptions would have amounted to little more than jacking up the home and lowering it onto cement blocks at a cost of a few hundred dollars. No skirt, no tie-downs, no carport, and just whatever landscaping happened to be on the park space. Today's buyers of both houses and manufactured homes expect more—demand more. MH community standards and HUD standards are much more demanding as well. Typically, that might add \$10,000 to the price of the MH. Further, about half the MH buyers will want one of the more spacious and attractive twin section units they'll see in shopping,

**Enhanced Setup**

	Price	Down	Term	Rate	Payment	Rent	Operating	Net
House	\$165,000	\$16,500	40-year	6%	\$817	\$0	\$469	\$1,286
Single	50,600	5,060	15-year	9%	462	335	213	1,010
Twin	84,200	7,420	15-year	9%	677	335	329	1,341

The single loses some of its price advantage. The average priced twin shown above is about the same size as the house, and also has the extra \$10,000 for minimal site amenities. The net cost works out about the same as for the house. While the down payment is lower and the term much shorter, the buyer does not get title to the land and can expect higher depreciation. Further, finding a suitable manufactured housing community can be difficult. Not to mention the scarcity of chattel financing.

The joy is gone; the competitive advantage is largely lost.

In theory, today's manufactured homes are HUD approved and qualify for long term loans at prevailing mortgage rates, given a list of site criteria, inspections and the like. Qualifying for such long term HUD financing will almost certainly require putting the MH on a lot and outfitting it with amenities comparable to a stick built house, all of which must be HUD approved. How much will all that cost? Hard to estimate. Here's one way to come at the question.

"The most sought-after benefit in the use of manufactured housing is a reduction in hard construction costs, compared to building houses on site." That's a statement from a recent book by Steve Hullibarger,<sup>59</sup> exploring that potential for MH use by developers. One might expect such developers to be efficient at creating site amenities. An example installation from that book was based on the wholesale purchase of a smaller than average twin section home that would normally retail at \$56,000, including standard shipping cost, sales tax and retailer site setup. Placed on a comparably minimal lot, Hulli-

<sup>58</sup> The house shown here is of tract builder quality and does not include garage or such site amenities.

<sup>59</sup> *Developing with Manufactured Housing*, Steve Hullibarger, 2001.

barger’s final retail selling price worked out to \$135,000; more than three times the factory invoice cost of the home itself. That final price however, included a full foundation, garage, entry porch, landscaping, air conditioning and the like. It does add up.

As a proxy for the cost of HUD acceptance for long term finance, the following costs are based on extrapolation from Hullibarger’s example. In order to be consistent with the other examples in this chapter, the size and price of the twin and single section homes are based on 2011 MH averages, and assume the developer bought them wholesale. The stick-built house’s price has been adjusted to include a comparable garage, landscaping and fencing:

<b>Add HUD Lot</b>								
	Price	Down	Term	Rate	Payment	Rent	Operating	Net
House	\$177,900	\$17,790	40-year	6%	\$881	\$0	\$482	\$1,363
Single	112,000	11,200	40-year	6%	555	0	334	889
Twin	155,600	15,556	40-year	6%	770	0	523	1,293

There are a number of differences between this table and the previous beyond the obvious addition of site amenities and MH lot. While the manufactured home prices shown represent MHI 2011 installed retail prices, realistically, the addition of skirting, landscaping, fencing, sidewalks, steps, garage, taxes and the like are commonly expected for long term finance. Notably, all homes are assumed to have a ten percent down payment and both the house and the manufactured homes have much longer financing terms than is normal for manufactured homes. Yet, those “generous” financing terms do little for the low income home buyer’s cash flow, except finance amenities that may or may not enhance the home’s value equation.

So what happened to the cost advantage of factory construction? What became of the gain from long term financing? Once more, one can quibble with the details, but in far too many cases, manufacturing benefits don’t survive the regulatory thicket between factory and home owner. It’s certainly true that the old process; concrete blocks on the grass and scamper away, was flawed. It’s also true though, that building a complete home is far more efficient than hiring subcontractors to do odd bits of work on site. It’s fair to conclude that the “benefits” of long term finance are a mixed blessing. Even though the final costs shown above are roughly comparable between the housing products, the MH carries the staggering load of its stigma, which at minimum, slows the project through the regulatory thicket. The numbers only work in exceptional circumstances. It’s tough to rebuild an industry on that shaky premise.

Surely there’s a better way.

According to MHI, the vast majority of manufactured homes go onto private land, yet less than a fourth are titled as real estate. That increasing trend may be traced to the diminishing availability of suitable sites in MH communities and urban lots, the stigma problem, and others described above. The best market remaining appears to be rural, semi-rural and small-town lots where zoning boards are less vigilant and customers simply seek good value in housing. A nice inexpensive home to put down by the creek as a place for the kids to get started or mom and pop to retire. Many are purchased for cash and tap into an existing well, septic tank and power lines.

For many years, mobile homes and sectional homes have found these isolated opportunities to be a prime market. There are still subcontractors to coordinate, but far fewer than for stick building. The customer can buzz around various MH retailer’s lots and

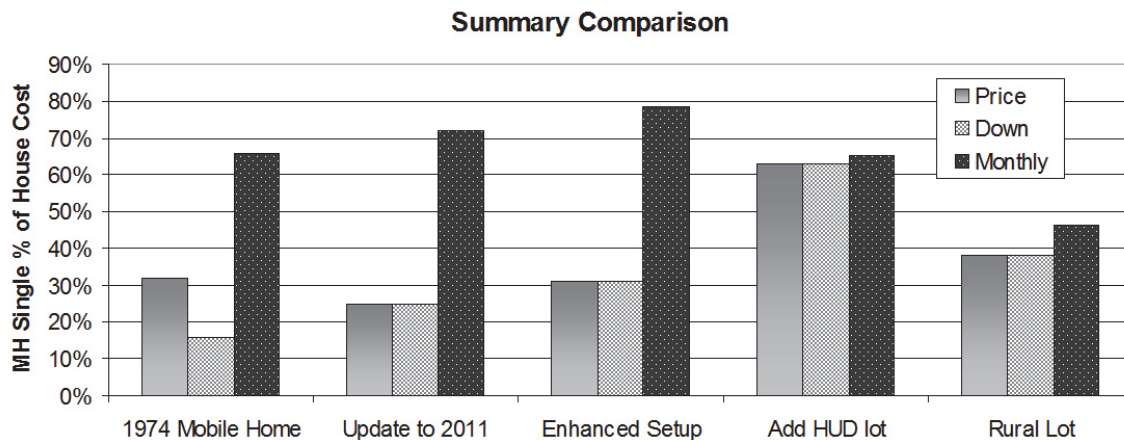
get a good idea of homes available and the prices. Increasingly, those retailers have become knowledgeable in helping to find and manage the needed subcontractors.

To look at an example, we'll assume the customer owns raw land that already has power and road access. Let's also assume three example homes will be provided with gravel drive, well, septic system, garage, air conditioning, skirting for the manufactured homes, covered entrance steps, and deck at a package cost of \$35,000. The manufactured homes have footings and tie-downs provided by the retailer. The stick built house is the same as in preceding examples, except it costs 15 percent more to build on this location. Financing will be provided by a local bank, based on 20 percent down and a 20-year loan.

<b>Rural Lot</b>								
	<b>Price</b>	<b>Down</b>	<b>Term</b>	<b>Rate</b>	<b>Payment</b>	<b>Rent</b>	<b>Operating</b>	<b>Net</b>
House	\$198,000	\$39,600	20-year	8%	\$1,324	\$0	\$482	\$1,806
Single	75,600	15,120	20-year	8%	506	0	334	840
Twin	109,200	21,840	20-year	8%	731	0	515	1,246
Sectional	130,800	26,160	20-year	8%	875	0	515	1,390

Here, the playing field is level in terms of finance and the benefits of factory construction are maximized. A fertile market for the three varieties of industrialized housing, largely because it assumes minimal stigma issues.

All those are ballpark, arguable numbers. Bear in mind we're talking starter homes here; low cost housing. Playing to the winning card of manufactured housing—MH vs. an undersize low-cost stick built home.



Here's a summary of the five preceding examples from a graphic perspective; showing how the single section manufactured home's major costs stack up as a percentage of the stick alternatives.

These examples suggest the HUD MH of today has gained construction cost advantages since 1975, lost ground on down payment and more or less holds its own on monthly cost. In concert with its relatively larger size and general upgrades, a pretty good deal. In addition, there are potential opportunities for long term finance, and chattel financing remains workable. The best opportunity appears to be rural lots.

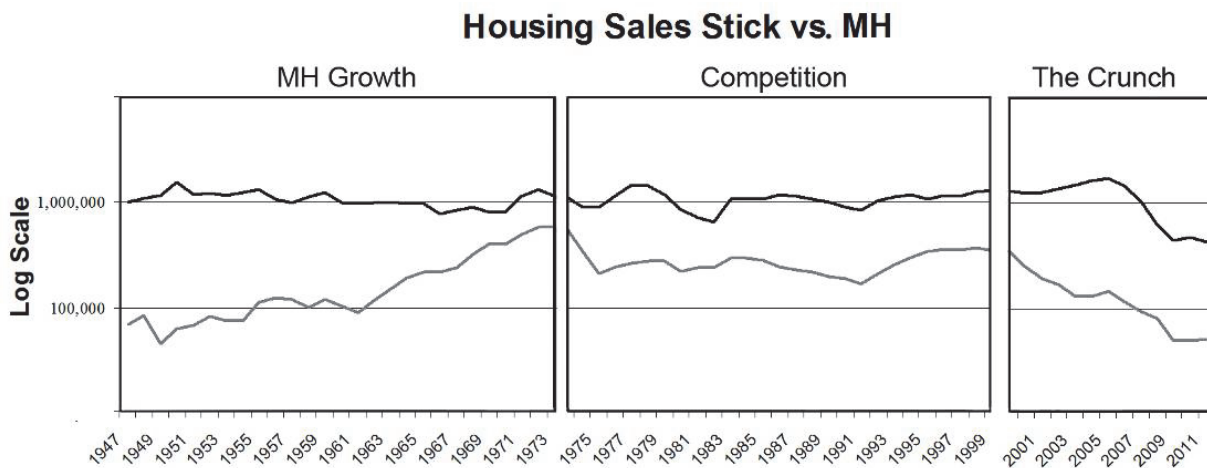
Prospects then, should be far brighter than 35 years ago, yet the industry is in a state of near collapse, with sales volume at ten percent of its historic peak and market share declining. Why did the boom in mobile home sales capsize, never again to attain the exalted record sales of the early seventies? Apparently because of the many penalties in-

curred once the MH leaves the factory. The HUD Standard that was going to make the MH competitive position all better has not done so.

In 1974, a mobile home cost a third as much as a starter house, but was half the size. Typically, the down payment was much lower; 16 percent that of the house, and monthly net cost including park rent was only two-thirds as much. These are the ratios that financially challenged customers tend to consider in choosing their purchase options. By 2011, they could choose a larger and more attractive MH and gain a larger price advantage compared to the stick house. But the relative glory diminishes after that. Despite comparative gains in productivity, manufactured housing has reduced competitive advantage in the crucial areas of down payment and net monthly cost. The best remaining market is rural lots; the path of least resistance in terms of regulations, and that's where the product has gravitated. Let us continue to explore the perils of the lumpy post-boom path.

As already recounted, mistakes have been made at all levels of the housing industry, including the extension of home financing to families who couldn't afford an apartment at market rate. The Great Housing Recession that lingers on as this is written will be the subject of scholarly papers for generations. The question though, is why manufactured housing, the best housing bargain around, carried such a heavy part of the burden.

To put the matter in perspective, below is a log scale history of housing sales—conventional single-family starts vs. manufactured housing shipments, since 1947. On average over this period, MH sales accounted for about 10 to 20 percent of the combined single family market.



The black upper line is conventional single-family starts and the lower gray line is MH shipments, shown as log scale for visual comparison purposes. In the left section of the graph, the MH industry started with less than five percent of the market, back when trailers were not housing in a conventional sense. As mobile homes evolved, the new housing form captured some ten percent of the market, and in the sixties it really took off, peaking at a third of the market by 1973. The whole housing market hit one of its brutal downturns at that point, just as MH manufacturers were earning HUD approval. The combination was a disaster, with nearly half the industry's factories closed.

MH survivors fought hard for market share and managed to hold 15 to 20 percent. One price of doing so was some compromise in quality—one perceived problem the HUD Standard was intended to fix. Also, retailers were overloaded with inventory and made too many shaky financing deals to move the goods. Anticipated HUD financing was nowhere in sight. Repossessions blossomed.

During the eighties, things settled down and repo rates returned to historic levels. In the good times of the nineties, the conventional housing market was over-stimulated by "creative financing." As shown on the center section of the graph above, that artificial

juicing had the desired effect short term, with stick house sales growing a bit through the decade. Manufactured housing jumped on the bandwagon. The right section of the graph shows both in the dumper by 2008 with MH taking a harder and earlier hit. During the years of crazy credit, conventional homes could be purchased with nothing down, guaranteed loans and ever shakier credit. With a smaller purse to tap, the MH industry also got “creative,” and did their own dumb tricks to lure people into homes they could not afford, but lacked the deep pockets facilitated by government backing. MH efforts pale beside the creative financing of conventional housing, fostered largely by quasi-governmental guarantees.

I do not think we are facing any kind of a crisis. That is, in my view, the two government sponsored enterprises we are talking about here, Fannie Mae and Freddie Mac, are not in a crisis ...I do not think at this point there is a problem with a threat to the Treasury.

Representative Barney Frank  
(D-Mass.), at a hearing in 2003

As it turned out, Barney was right—*sort* of right. True, the Treasury did take a \$180 billion hit, and the long term effects on the housing market will not be clearly evident until a historical perspective emerges in the years ahead. But fear not for the Treasury. In exchange for that bailout, the Fed took “temporary” operating control of those “independent” companies, stiffed the shareholders, took preferred shares paying 10 percent interest and 80 percent of the common stock. Losses were used to shelter income, which blossomed because of new regulations that decimated the competition and enabled these “private” companies to double their fees

while increasing market share. Most of the bailout money was recovered by the end of 2013. The Obama administration sees Fannie and Freddie as cash cows and does not envision any change in their status as long as the profits roll in.<sup>60</sup> Such are the fruits of governmental housing assistance.

It’s clear that the hope of HUD backed financing of manufactured housing never did amount to much, peaking at about 25,000 loans per year in the early nineties, and plummeting to virtually zero by the turn of the century (where it has remained). Scratch that option in all but a few unique situations. Despite all the effort to gain HUD’s blessing, most financing continued to come from chattel lenders as well as other private and commercial sources. As those loosey-goosey chattel deals unraveled, repo’s soared, and major suppliers of such financing wound up on the wrong side of the grass.

Some MH companies “diversified” into buying strings of dealerships and their own “banks” in the form of chattel finance operations. In general, they paid too much and the new operations went bust. Many remaining sources of funds ran scared. Add it up and the supply of money supporting both mortgages and chattel loans simply evaporated. Manufacturers, hoping for better days, continued pumping out homes creating another serious oversupply. That paled by comparison to the flood of available (and cheap) conventional repossessed housing. MH output dropped to annual production rates not seen since 1950, leaving the industry in ruins. Much the same happened to stick house production, which dropped to half its 1950 level.

The housing market simply collapsed. An unprecedented, unmitigated disaster.

Our ever-“helpful” Congress sprung right into action to deal with the housing crisis by conjuring up legislation to ensure that abusive lending practices will never happen again. Predictably, the result has been to make it far more difficult to arrange financing, even for well qualified buyers.

The stigma has an impact on the retail financing of manufactured housing. The immediate problem is the financial fiasco rooted in the broader housing market. Longer term, it has been the industry’s lousy management of chattel loans. Fixing the stigma won’t

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<sup>60</sup> *Two Albatrosses take Flight*, The Economist, November 23, 2013.

cure that problem and there's little use waiting for loosening of the government purse. Their wallet is empty, as is their zeal for manufactured homes.

If one steps way back from housing's traditions, it would seem the fundamental financing problem lies with lending on a *deteriorating* asset, the building, based on an *appreciating* asset; the land beneath it. The MH industry, coming at the challenge of home finance from an entirely unique direction, evolved an interesting approach to the challenge; *finance home and land separately based on their respective life spans*. The method has imperfections, as one might expect, but it seems a good start on a fundamentally better approach to housing finance, since all types of homes face the same sort of problem in varying degrees.

But ... tails rarely wag dogs. The MH industry took that fine new financing idea and messed it up in pursuit of short term sales. As a result, it's in a poor position to lead either governments or bankers into a new financing paradigm.

Best assume no "outside" help. The industry's best bet may be the traditional one that has worked so well. Use learning curve to take another end run around the system. Keep finding financing niches that bypass the traditional system and build them carefully, as Clayton has done. It may take years. Shortcuts, it should be clear by now, don't get the job done.

What's happening is adaptation. Doors close. Windows open. If manufactured housing is to resume its leadership role in low cost housing, new solutions are needed. A broader idea than just marketing low cost housing toward unique bits of cheap land. Right now, the most workable and acceptable American low cost housing appears to be apartments and condominiums. But that's not the kind of solution the public wants, so there's a window of opportunity for new and better housing ideas. A manufactured home is a single family home, and that provides a fundamental advantage. The answer must lie in finding ways to make better use of that appeal. Ways to provide low cost housing without creating slums. Apartment builders have managed the trick.

**T**he whole housing industry is reeling. The old single family home-on-a-half-acre dream is fading fast. Despite its increasing construction cost advantage, the MH industry has had much of its competitive edge eroded by regulatory and financing friction. There seems little point in charging forward again on the same old path. The equation has changed and there are other options available for those who think outside the housing square. Government will probably dream up a new housing stimulus program, but what are the chances of a place for manufactured housing at the subsidy trough? Can the MH industry come up with a free enterprise equation that builds on its economic edge to find a way out of the current slump? What's the best answer to providing low cost housing on high cost land? *Is there a good answer, or should the industry pick up sticks and start building apartment buildings?*



*A pessimist sees difficulty in every opportunity. An optimist sees opportunity in every difficulty.*

*Winston Churchill*

# 10

## The Stigma

Long, long ago, and far, far away, placement of manufactured housing was not an industry worry. There was no stigma. Early trailer owners could hitch up and take their land yacht wherever they went. That had a kind of romantic attraction that played well in this mobile nation. Park it in Uncle Henry's pasture or behind Aunt Mabel's house. In a pinch, there were trailer parks available for a couple of bucks per night. That was too good to last. By the forties and fifties:

*The travel trailer ... developed from a curiosity into a fad, and finally into a national movement which could no longer be ignored ...*<sup>61</sup>

Today's recreational vehicle industry evolved from that base, and so did mobile homes. It might be instructive to consider the image differences between the two industries.

RVs have largely continued to pursue portability, even as those offered today put early mobile homes to shame in terms of livability. As the RV industry prospered, it gravitated toward luxurious accommodations. Goodness, who can afford those motor home behemoths, and who'd want to herd one down the road? Americans, that's who. Fans who can't afford the latest and best surely wish they could. And you get to feel kind of kingly at the wheel of your diesel pusher, racing the Peterbilts and looking down on those scruffy little sedans that whistle past. Maybe mobile homes should have followed a similar upscale path? They didn't, so for the moment at least, that's the way it is. Each of the two industries chose their own course, in different directions, and it's been a mixed blessing.

House trailers swiftly gravitated in size to a point where specialized "toters" were employed to move them—generally no more than twice—from the factory to the sales lot and thence their permanent home. That "permanence" ran afoul of the local tax minions and the *eau de tin* trailer appearance sullied the taste of community planners. As RVs evolved toward increasing luxury, mobile homes progressed rapidly down toward the lowest common denominator. When mobes aged and depreciated, their desirability faded for occupants and especially, their neighbors.

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<sup>61</sup> *Wheel Estate*, Allan Wallis, 1997.

Thus, the stigma that was once attached to any sort of trailer intended to contain people increasingly focused on mobile homes—regardless of the name the industry might assign its product.

Perhaps the early success of the MH was too good to last, but let us pause here for overview.

**B**y and large, neighborhoods do not welcome low cost housing in their midst. Such homes, they reason, attract low-income people. Many low-income people do not manicure their lawns, or wash their cars. Planners, builders and developers seeking housing for those of limited means find strong community objections to mobile homes. *Please*, no new mobile home parks. *Heavens*, let's get rid of old ones. *My my*, let's not allow *trailers* to mix with "houses."

Mobile homes evolved fast in the early days, progressing from the typical 8 x 35 trailer to 14 x 70 mobile homes in a couple of decades, while increasing their cost advantage. Developers of new mobile home sites tried to keep pace. Old parks became obsolete. Contrary to public opinion, if maintained, old trailers don't "wear out." But they tend to become obsolete quickly and too many are of poor quality, encouraging depreciation. If repossessed, they can become what John Crean called "a 65-foot maggot." Owners rarely traded them in because moving a five or ten-year old trailer reduced its value, and there are few relocation options. So obsolete and junky mobs tend to stay in place, depreciating their surroundings as well as themselves, and find new owners.

Depreciation made a used trailer very low cost housing indeed, especially when located in an obsolete park. Oh *goodly!* Just what we're all looking for—truly low cost housing! Maybe not. The depreciation process that worked so well for the auto industry let the MH industry down.

If the MH park and the homes in them became a well maintained community, things tended to work out fairly well, but too often old parks and their old trailers were allowed to go to seed—not worth maintaining. Many attracted marginal tenants who provided no maintenance nor even modest rent payments. Poor management. In time such "parks" could properly be described as "slums." The occupants, "trailer trash." Bingo! The prophecies of "the community" fulfilled!

It's hard to think how it could have been otherwise, if we want innovation in low cost housing, obsolescence is a natural consequence of learning curve. Anyone want a 20 year old computer? Perhaps it was an error to make low cost housing both cheap and ... "unusual," in appearance. Not that there was any other viable option.<sup>62</sup> Omelets are created from broken eggs and a hot stove.

It is an unfortunate fact that this great land has way too many slums. The kind of "parks" described above represent a small percentage of them, but attract more than their share of attention. In many cases, such communities have become surrounded by upscale housing. Some park owners encouraged obsolescence, hoping to chase away their tenants so their land investment could be put to more profitable use.

The destructive trailer image was amplified by poor manufacturing and market practices, common to all new and growing industries. The low capital intensity of the manufactured housing industry proved a magnet for shady operators at all levels, further dinging the image. Fierce competition encouraged suppliers to provide, and manufacturers to purchase, substandard materials.

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<sup>62</sup> Designers and architects will say they didn't have to look so homely and cheap. Alas, those who pursued architectural options found themselves outside the mainstream, going nowhere.

Speaking of magnets, there's that matter of the MH as a storm magnet. Prior to the seventies, it was common practice to place skinny homes in rows, sitting on concrete blocks, counting on gravity to keep them there; even in tornado alley. That works most of the time, but when a tornado actually comes along, too many mobile homes become mobile once more. Their long narrow profile and airfoil roof enhances that vulnerability and the evening news blossoms with shattered trailer trash.

The stigma trend reached a crescendo when Ralph Nader took on the industry. Much of his criticism was fair. Most of it was sensationalized by both his organization and the media.

The opening salvo of the Nader book says, "When word leaked out early in our study that a 'Nader group' was investigating the industry, mobile home stocks took a brief but sharp dive on Wall Street."<sup>63</sup> Well, duh. If Nader's Raiders set out to investigate Mother Teresa, her stock would plunge on the Street.

As with Nader's "helpful" comments on Volkswagen and GM's Corvair, the book was largely founded in fact, presented in a pejorative context. It documented a litany of shady practices of the MH industry. It made much, for example, of the high cost of consumer loans with their phony interest rates. Chapter Four, entitled *Financing and Insurance: Doubling the Price of a Mobile Home without Even Trying* is presented whereby salesman "Billy" hoodwinks Nader's posing "customer" into a deal on a small MH having a retail price of \$4,795. After citing a list of high-pressure selling practices, kickbacks and the like, the book calculates that by the end of the proposed seven-year loan, the buyer would have paid a total of \$10,400 for the home. Shame on Billy and his boss. They did not serve their "customer" well. Shame on Nader's Raiders for not pointing out that after those seven years of relatively modest payments, a "real" customer would be living in his or her own home, free and clear. They did not point out that a comparable documentation of a conventional house's mortgage would ultimately double its cost to the buyer as well, and at seven years the debt burden would have hardly been scratched.

Instead, after many pages recounting industry misdeeds, they dismissed the value of such a purchase, noting that its value would be badly eroded by "rapid depreciation." So rapid that, if "thrown out on the street" for being "two weeks late on a single payment" at five years (!!), the customer might recover nothing. No citations listed. And how much depreciation? "... estimated at 50 percent in the first five years."

They cited a Minnesota tax paper that claimed MH depreciation can be "... as much as 20 percent in one year." They also quoted the industry's Blue Book<sup>64</sup> valuation, noting the wholesale value of a mobile home at 63 percent of its purchase price after 4.5 years, and 28 percent after 10.5 years. Census data, they noted, put the life of a mobile home at just 16 years.<sup>65</sup>

These were probably accurate (if selective) quotes documenting real problems of the industry. The book's conclusions relied primarily upon opinions and complaints voiced by individuals having some sort of beef. Such "research" is easily obtained to support

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<sup>63</sup> *Mobile Homes, the Low-Cost Housing Hoax*, a report by The Center for Automotive Safety, 1975.

<sup>64</sup> In the early days those valuations were set primarily to guide retailers on trade-in allowances—the very worst case scenario for depreciation.

<sup>65</sup> At that time, the average age of existing mobile homes was probably about 16 years. It goes up constantly as more such homes are built and few are scrapped.

most any viewpoint, yet it's hard to dispute. A chapter entitled, "The High Cost of Low Quality," provides a Nader prescription:

*Mobile home manufacturers have a huge, as yet largely unrealized potential for building high-quality homes that could still sell for far less than the average conventional house. Quality-control procedures can be applied to their factory-based production more readily than to conventional homes built on far-flung sites. Most of the savings that accrue from economies of scale, use of semi-skilled labor, and building from simple, uniform designs could be retained. Some manufacturers already produce homes priced a few thousand dollars more than those made by their "cheapie" competitors, but the difference in quality between the two types can be startling.*

The "startling" quality differences they observed appear to be based largely on comparison between the operations and products of two relatively small companies, one of which was out of business by publication date and the other apparently on the ropes. The pricier one put nearly twice as many hours into construction. They deemed the two "... still representative of many present day producers." No mention that "a few thousand dollars" could double the production cost of a mobile home in those days.

Perhaps a more thorough investigation would have revealed the situation is not quite so simple. In many cases what the Nader book called "cheapies" are better built than others of twice their price. In the days before codes, for example, some manufacturers used ordinary lamp cord for wiring. Fleetwood, serving the lowest price point of the market, used normal residential wiring. Why? Because it was the right thing to do, and the company's reputation was at stake. Neither should hours of labor be taken as a useful indicator of construction quality. As the Japanese so clearly demonstrated with automobiles, the quality of a product is far more dependent on the quality of management than gallons of worker sweat.

**I**n the late fifties, industry leaders, represented by the Mobile Home Manufacturers Association (MHMA; Manufactured Housing Institute; MHI, since 1975) and others ramped up efforts to deal with the stigma that had become an industry hallmark.

Many of the Nader prescriptions for the industry were sound—establish clear lines of responsibility, a single nationwide code, third party inspections and better warranties.

These problems and solutions had long been agreed upon by the industry's responsible leaders. How to implement them though, in an industry where 200 firms operated 500 plants and the largest single company's market share amounted to ten percent of the total? And those manufacturers dependent upon some 15,000 dealers, few of whom were committed to any particular supplier of homes? Who can take charge in such a situation?

A ticklish question. The Nader prescription (typical of Nader remedies) called for government intervention at many levels. Laws, regulations and standards. The very sort of morass that had made the cost of conventional construction so high.

The Nader book, with its provocative title, hit the industry hard but did not, in itself, trigger much new action. The MH industry response to its quality and image challenges had begun long before and was proceeding in the manner that had proven successful. One step at a time. Learning curve.

The most common criticism of mobile homes from Nader and other critics was that they did not comply with building codes. Manufacturers could not do so, since virtually every community has its own version of a variety of regional codes. In the fifties, a few producers of the pricier mobile homes saw a marketing opportunity and introduced the

Gold Seal Code. It was a performance code adapted from the various building codes of the time, and all participating manufacturers agreed to abide by the standards it set forth. The problem was, most volume manufacturers, dealers and the public failed to see the benefit. That laid a heavier burden on the few who did and the attempt had little effect. It was a start that failed to ignite.

Assuming that broad acceptance of agreed standards was crucial, MHMA soon developed the American National Standards Institute (ANSI) performance standard, which came to be mandatory for MHMA members and was also adopted by Trailer Coach Association (TCA), the Western association.

That code's cost was, for those building good products, modest and it was soon accepted by nearly all of the majors and most minor producers. It provided some comfort to buyers of mobile homes. Virtually none to communities and local building officials. It's questionable how much the mandate improved the product. For the most part, the plumbing, heating, wiring and basic structural integrity of mobile homes from reputable companies had already proven quite satisfactory. The ANSI standard did not, initially, require tie-downs, nor did it address the problem of irresponsible manufacturers, dealers and park operators. Yet those were the major problems.

Seeing that the MH industry had not solved its community acceptance problems, industry leadership encouraged the Federal government to step in, with tentative endorsement of manufactured housing. Partly based on what had been learned from Operation Breakthrough, HUD understood the need for a nationally acceptable building code that ensured health and safety and was strictly enforced. So did most of the MH industry itself.

Working with industry representatives, HUD's *Manufactured Home Construction and Safety Standards* (the HUD Standard) evolved from the preceding ANSI code, combined with many features of prevailing building codes, retaining a performance orientation.<sup>66</sup> Independent inspections became mandatory to verify compliance. Industry input preceded code revisions and upgrades. Later, HUD also enforced responsibilities for warranty service.

Anguish abounded at the HUD Standard's introduction. It was brought in too quickly, just as the industry was flat on its back from the seventies' housing crunch. Naysayers forecast adoption of HUD would drive many participants into bankruptcy. It did, in combination with other problems of those days. By the time the new code was fully adopted, hundreds of plants and quite a few companies had locked their doors.

There have been other problems, too. Regulations rarely work as hoped and are often counterproductive. There've been conflicts between various inspection agencies, accusations of manufacturers being too cozy with "independent" inspectors and the like. As regulations do, the HUD requirements have grown in scope and complexity, including siting standards that can be punitive. If it tends to go too far, that's where industry leadership needs to step in and make their case. It should not be necessary, but if HUD should prove to be unreasonable, other alternatives such as Underwriter's Laboratories could be hired to do the job of enforcing the existing code.

As noted earlier, all codes have a performance clause, and it's the key to innovation. The nearly universal problem has been the bureaucratic nature at all levels of code interpretation and enforcement that makes it more comfortable with accepted specifications than innovations. It is also much easier for those being monitored to simply accept code specifications without challenge. Taking on the system is just too hard.

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<sup>66</sup> A very similar process happened in Canada.

Fortunately, the HUD Standard has a provision called the Alternate Construction letter (AC) to deal with such problems (right).

Nifty, and the AC is being used, too. Unfortunately, a quick look suggests mighty few cases where an AC has been used to try out new materials or methods aimed at (ii) in the box. Surely that is the most important clause in the code? Well worth the effort to manage the AC process?

Certainly the rapid adoption of HUD was painful, particularly to the smaller companies that traditionally provided much of the industry's vitality. Boosters hoped HUD would solve the industry's problems. It didn't, though it proved helpful in many ways. Worth the estimated \$380 per home cost?

It is fair to ask just how much good HUD has done. Has its cost to the consumer been worthwhile? A Consumers Union study said, "The fact that a home was built since 1980 (a proxy for 1976, the implementation of the HUD Standard) does not ensure higher appreciation."<sup>67</sup> It seems certain that today's manufactured homes are better built than was the case prior to HUD. What's far less clear is how much HUD compliance had to do with it. The quality of mobile homes has been better than commonly perceived for decades and improved steadily since the founding of the industry. Yes, enforcement of tiedowns and the like have been beneficial, and largely attributable to HUD. Still, government regulations have a way of growing ever more complex, and often become counter-productive. Caution and sound management are in order.

As for financing, few manufactured homes have gained HUD or other long term finance. About 15 to 20 percent are titled as real property, which suggests they've qualified for conventional mortgages, but it seems safe to assume most are larger homes located on private land. Most were probably cash sales or financed by local bank loans.

How much HUD actually increased costs is difficult to estimate. Decades after its adoption, arguments still rage over the costs and benefits of HUD. However, two things are evident. First, the industry's competitive edge over stick builders continues to increase. That suggests compliance costs are manageable. Second, and crucial to the question, HUD proved no panacea. The stigma remains. Community zoning and site requirements are comparably effective tools to ban manufactured housing developments and placement. The anticipated long term financing, the greatest prize of all, has proven nearly as elusive as ever. Quality problems remain. Any inspector for any code will confirm that a code is a limited tool. Quality resides primarily in the hands of management, as it should.

Some "gain" in weeding out marginal manufacturers might be attributable to HUD. A fundamental industry problem has long been the presence of sleazy manufacturers and retailers who may thrive in the good years by shaving quality and appealing to the lowest common denominator of the market. In the boom year of 1970, more firms commenced MH manufacturing than left, continuing the trend of the sixties. Through 1977 though, twice as many firms exited as entered. Yet nearly 500 remained. In combination

To encourage innovation and the use of new technology in the manufactured housing industry, the Department of Housing and Urban Development permits manufacturers to build homes in accordance with its Regulations (3282.14) titled "Alternative Construction of Manufactured Homes." A manufacturer must request from the Department, an Alternative Construction (AC) letter for homes that do not conform to the requirements of the Manufactured Home Construction and Safety Standards (the Standards) at the time of shipment. Through alternative construction, HUD will permit manufacturers to use new designs or techniques not in compliance with the Standards in cases:

- (1) Where a manufacturer proposes to use construction that would be prohibited by the Standards;
- (2) Where such construction would provide performance that is equivalent to or superior to that required by the Standards; and
- (3) Where (i) compliance with the Standards would be unreasonable because of the circumstances of the particular case, or (ii) the alternative construction would be for purposes of research testing or development of new techniques or designs.

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<sup>67</sup> *Manufactured Housing Appreciation*, Consumers Union, 2003.

with early and recent rattling recessions, the industry has finally become concentrated under the ownership and management of three companies that produce some 80 percent of the units shipped. Those companies, one or all, are in a position to exercise much needed leadership for the industry. HUD's "contribution" to that benefit would seem to be that larger companies can more readily cope with the complexities of bureaucracy.

Over the long pull, rationalizing of the code problem is important to the future of manufactured housing. As long as all manufacturers agree to meet the same code, it remains performance based and the only competition is conventional builders, the added cost should prove manageable. A reasonable foundation to build upon.

It would be unfair to suggest that government "help" was aimed at wiping out the most fragile manufacturers in the housing industry. At most levels government continues to seek ways to reduce the cost of housing. There seems to be near universal agreement that, sooner or later, building homes in factories must be accomplished. Everyone's on the same side, with no agreement on the right path forward.

Many levels of government continue to deride the one proven system of taking a big chunk out of housing cost; manufacturing, as pioneered by the mobile home industry. What government, communities and Nader's Raiders seem to want is MH manufacturing efficiency, building traditional houses, without the stigma. And by the way, they want the homes immediately, with virtually no allowance for learning curve to bring the cost down and the quality up. The roadblocks thrown up by housing's cultural momentum make progress difficult and attainment ... well, maybe, way down the road, if the only competition is conventional construction.

In the very real world of manufactured housing, plenty of challenges remain. A shabby operator can still hire a few experienced managers and establish a manufacturing business with surprisingly little capital and crank out HUD certified homes. Plenty of suppliers and retailers will pitch in. By leveraging credit cleverly, several months—even years—can go by before the system catches up. All too often, it's the final customer who takes it on the chin. That's particularly true at the MH retailer level where investment is lowest and customer contact highest. It's a major component of the industry's image problem. Government agencies have no magic bullets to resolve those problems. What's needed is management and time for the aging but relatively young MH learning curve to mature the industry. Eventually the problems will be resolved unless the industry screws up. What's the answer? Choose one:

1. Bet the future on government regulation and supervision.
2. Focus on improving the product's quality and value.

How about both? Ideally that's the ticket. History suggests those are conflicted objectives.

The major components of an efficient MH housing system are in place. They can all work together to produce good quality, low cost housing—convert raw materials into homes, and do it fast. Orchestrating all this is the essential art of the MH industry, and it is foreign to the rest of the housing industry. And far more foreign to government.

As shown in the Ford example in Chapter Three, learning curve put the nation on wheels. And when the blessings of learning curve essentially ran out, the market for low cost transportation continued to be well served by used cars. These days, a used car costing a small percentage of the price of a new one can provide transportation more reliable than that enjoyed by the proud owner of a new Cadillac from a few decades back. The same should be true for manufactured housing—and often is,

There is, I think, nothing in the world more futile than the attempt to find out how a task should be done when one has not yet decided what the task is.

Alexander Melkiejohn

but not in those cases where owners and managers allow property or community deterioration.

Gnashing of teeth can only prove useful to the extent that useful suggestions emerge. It is important for all parties to understand that the stigma problem is not the fact that these homes are manufactured. Four aspects are more basic:

1. Manufactured homes are often chattels, placed on land owned by others who may have interests differing from that of the home's occupants.
2. Low cost homes generally tend to deteriorate, especially given obsolescence, poor maintenance and/or bad management; the foundation of slums.
3. The long term value of almost any home is primarily determined by the land part of the package; it's location.
4. The single, the most efficient MH product, cannot truly be made to conform to the public perception of how a house should look.

The good news is, most new manufactured homes go onto private land as people become aware of their value for such uses. In such placements, long term interests often coincide.

The bad news is, only a few go into MH communities where professional management prevails; the reverse of the ratio from the high growth era. The stigma was created largely by too many obsolete homes and parks that were and are poorly maintained.

There's no fundamental conflict between those two MH markets. If the sales to scattered lots had been maintained at recent levels, but sales into MH communities were at their historic two-thirds of the total, MH sales in recent years would have been doubled and manufactured housing would have been honored as a housing success story in the recent recession.

It's worth thinking about what happened to the biggest part of the MH market.

**B**ack in those glory days, most MH communities proved to be excellent places to live, their homes appreciated and owners of both home and community were tickled with their investment. It was the exceptions that enhanced the MH stigma.

In the early years, stigma be darned, survey after survey showed MH occupants to be overwhelmingly middle class folks of means, and their mobile home parks to be desirable places to live. That continues to be true in the newer communities designed and built for manufactured housing as well as similar homes on private lots. Older parks? Maybe yes, maybe no, depending primarily on the quality of management.

Three major trends dashed the pleasant trend toward continuing development and refinement of MH communities.

#### 1. **Downscaling of MH Prices**

As RVs evolved upscale, mobile homes beat themselves bloody scrambling for ever lower prices. They enjoyed amazing success, which spurred even greater efforts to extract a few more bucks from the product; too often at the expense of livability and quality. In particular, MH designers nearly gave up on trying to make the exteriors attractive, finding efforts toward interior design won greater praise from dealers and customers alike. "Shutters" became a small second layer of tin beside the windows. Exterior colors were chosen from the very limited shiny aluminum palette of bright colors shared by the industry. Big steel roofs became "decorated" with old tires to reduce roof rumble. MH owners and park operators became discouraged in attempts to make ever larger slabs of unrelieved MH walls attractive on ever tighter lots.



When your neighbor's home is so close and homely, why make a lot of effort to spiff up your own? But the surrounding communities filled with upscale homes were displeased.

2. **Temporary Became Permanent**

Those hundreds of thousands of mobile homes, given reasonable maintenance, proved to be far more durable than generally expected. But in too many cases, they got little maintenance because they quickly became obsolete as the industry rapidly evolved toward ever larger and more attractive homes. Tin roofs are gone. Nobody builds 10 wides any more and few build anything shorter than 60 feet. Want a bigger home? Move to a new community or private lot and take it on the chin in trying to recoup your current MH investment. A negative spiral can result, with perfectly adequate communities degenerating into slums.

3. **Land Value Changed the Equation**

As mobile homes grew larger and relatively cheaper, the price of developed land grew faster than the economy, more space was required to accommodate ever longer and wider homes, and planning boards became more difficult to negotiate. Development risks became higher and investment returns lower. Investors fled.

As that equation shifted, more mobile homes sought refuge on country lots. Manufacturers accommodated by yet again increasing the size and price of their homes, with production volume shifting toward multi section homes in the quest for the footage customers wanted and could afford, if other costs were minimized. New MH communities filled quickly with state-of-the-art homes (if not brand new ones). They all tend to become obsolete together, as new and more desirable MH choices come along. Older homes and communities become less desirable—the nature of fast evolving industries.

That doesn't mean the older homes and communities must depreciate. The same thing happens with conventional communities, but over longer periods of time. Community evolution depends largely on quality of original design and ongoing management. If the latter goes kerflooey, it may take a few years for "Trouble" to become evident on the P&L, and when it does, it can be overlooked for a while—until the problem is out of control. The quick answer then may be to sell the community, while the cash flow and occupancy rates look OK. Maybe the new owner will spring to the rescue—maybe not. The risk is such a property can deteriorate to slum status, where there's no money for the repairs and maintenance increasingly needed.

**D**epreciation is not as big a problem as commonly perceived, but it's big. All buildings depreciate if measured over long enough periods in real (sans inflation) dollars. One estimate suggests the life expectancy of a new single family home to be about 55 to 70 years, varying with its original quality. Multifamily units are expected to last 50 to 60 years, presumably because of additional wear and tear from renters. For manufactured homes, life span is estimated at 30 to 45 years.<sup>68</sup> Obsolescence is probably the main driving force in all those figures. The design evolution of stick houses is mighty slow.

Looking at the matter from a home owner's perspective and citing a number of studies along with their own research, Consumers Union (an organization better known for its support of Ralph Nader than manufactured housing) says that all homes tend to appreciate. Until the recent housing collapse, it was quite rare for a home to be sold for less than the price at which it was purchased. CU made an exception for manufactured homes financed using dumb loans that have minimal down payment and a contract loaded with front end costs. They talked about actual home values:

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<sup>68</sup> *The National Building Cost Manual*, 2012 Edition.

*On the whole manufactured homes appreciated 6% less a year than site built homes, but those packaged with the land appreciated similarly to site built homes. On average manufactured homes on leased land depreciated.*

*Manufactured homes, both those on rented and owned land, had significantly less predictability and higher variation in the appreciation of the units.*

*The factors driving MH appreciation are structurally different then the factors driving site built appreciation.<sup>69</sup>*

CU listed a whole range of factors accounting for the poor appreciation of some manufactured homes, including those cited in this book. Interestingly, considering their relatively low opinion of the product, CU did not name poor construction as a factor, nor did they find significant appreciation differences between homes built pre or post HUD. The biggest factor of all was *who owns the land?*

If we can agree that the many known cases of “trailer park slums” are the prime driving force behind the stigma, and that the stigma is the main barrier to zoning and community acceptance, perhaps useful solutions to the stigma can evolve. Ultimately, even the finance problem might come to heel. The HUD Standard didn’t get the job done. How could it, unless the homes built previously were poorly built? They weren’t. The issue is not structural but perceptual. But HUD can certainly contribute toward moving in the right direction, adding a bit of credibility.

One short term bonus to the recent housing boondoggle was abatement of the chronic shortage of park space. There are an estimated 250,000 vacancies in MH communities,<sup>70</sup> many of which are older, substandard places that are functionally obsolete with undersize sites and hardly merit the “park” appellation, never mind George’s favorite moniker “Land Lease Lifestyle Communities.” They’re the kind of run down MH parks that have contributed to the stigma problem and have high vacancy rates that are hard to bring up to snuff without capital investment.

Here’s a quote from a recent newspaper article:

*“It was a nice park when I came here, but it has been let go,” [MH Owner] said, “The laundry room, the showers and toilets closed off, the clothesline taken away are just some of the things the park has done to make it less livable. We would even fix it up ourselves if the park would let us.”*

*Despite [the park’s] tattered appearance, only small violations were found during a recent inspection by the state’s Department of Housing and Community Development, which is responsible for the oversight of trailer parks.*

*Some residents were cited for problems with their own trailers.*

*No major health or safety violations were recorded in the past decade, according to a department spokesman.<sup>71</sup>*

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<sup>69</sup> *Manufactured Housing Appreciation, Stereotypes and Data*, Consumers Union, April, 2003.

<sup>70</sup> Estimate by George Allen, whose ear is near the ground.

<sup>71</sup> *The Tribune*, San Luis Obispo, California, December 30, 2012.



The owner of that park was quoted as saying, "Sure. We like to have properties in good condition. First and foremost, it is safe. ... It's just an older property in town and its appearance comes from the conditions of many of the coaches."<sup>72</sup>

Residents felt that management was trying to drive them out so the land could be put to better use, a charge the owner denied. The "Notice" above suggests some truth in the resident's view. That MH on the left probably dates from the sixties. The one on right, closer to the forties.

This all-too-typical scenario is repeated across that town and across the nation. In the same article, the city's supervising planner, noting the city had more than 80 MH communities said, "They are in every nook and cranny of every community. They are tight-knit communities unto themselves, and they give each other support, emotional and otherwise."

Deteriorating MH communities can be revived. One step at a time, using good local management, a bit of capital and enlisting the support and assistance of the tenants. Once positive signs of progress are in evidence, the vacancy problem can be addressed. The lots are generally too small for most new manufactured homes. Anyway, trying to introduce pricey twins or huge singles would be disruptive, and why would those who can afford those big homes want to live in such an old community? Better to fill the spaces with used homes from upscale newer communities, retail lots or wherever. Buy them right, recondition and site them appropriately, then sell them in place. Profitable business. Low cost housing is always in demand.

Many manufacturers offer smaller units including HUD Standard park models designed for use on small lots and the small spaces common to older parks. Even RV based park models can be pressed into service (about half the homes in the park cited above were built as travel trailers, though their year-round occupancy is not kosher). The "yearning" for ever larger living space is as much a cultural phenomenon as real need. Micro houses and RV park models demonstrate that the appeal of raw square footage can be overcome with good design.



The 50 year old Richardson at left was built in Indiana and shipped to California, where it was apparently installed on this park site when new, at a cost of about \$4,000 retail. Today its retail value is several times as much and if rented, can bring in something like \$500 per-month, including space rent. But the neighbors surrounding this community are probably not impressed.

<sup>72</sup> These quotes are from the same article, and "coach" is an appellation for mobile homes that predates "house trailer."

Which brings us to the fundamental issue of the MH as an odd shaped home. Industry strategy to overcome the skinny tin box look has been to plunk two boxes side by side and then dress them up “just like a house.” It works, too, but at a substantial cost penalty in factory, shipping, site and maintenance. Multi section homes are just not as efficient as singles. Their great popularity indicates how pervasive America’s traditional housing culture has become. And the poor job designers have done with singles.

The shape of site-built houses has evolved from economic efficiency, even though today’s versions defy clean design with proliferations of doodads and details. Some cultures evolved round houses, others longhouses and even teepees in pursuit of economic efficiency. To date, the factory manufacture of homes has demonstrated its most efficient shape as long, skinny and one-storey.

Fundamental industry question; is it better to:

1. Accept that economic equation and focus on making skinny homes attractive and functional, or;
2. Accept the cost penalties and concentrate on multi sections. Continuing to ride the fence reduces industry effectiveness at pursuing either option.

**I**s the market responds to better times, demand for manufactured homes and communities for them is likely to rebound, at least to some extent. How much? Depends on leadership. Depends on management’s ability to create an industry strategy that can make manufactured homes so appealing that building new MH communities once again becomes an attractive investment, and old ones remain fine places to live at minimal cost. There are no magic bullets, but opportunities abound.

The industry stands on the threshold of enormous opportunity as the economy recovers and conventional builders grow ever more entangled in regulations. Manufactured homes, once housing’s great success story, risk being again relegated to niche markets strangled by regulations. The great question: can the industry’s bet on HUD be made to pay off? Can manufactured homes build on remaining niches toward markets with the potential to put the industry back on its growth pattern? Can the MH industry resume its role as the engine of manufactured housing?

On the positive side, the manufactured housing base is still strong in many areas, conventional housing has lost some momentum, and no alternative housing technology looks promising. MH industry growth depends on the wisdom and guts of its leaders.

There were birth pangs when this industry got started and the rebirth can be expected to be painful as well. The cultural resistance to innovation has gotten stronger, but the product has gotten better—and more cost effective.

There are no easy answers to the stigma and other problems discussed in this and previous chapters. Historically the industry’s segments have worked together toward the goal of lowering the cost of the product, but without any real strategy for competing against the entrenched forces of the housing industry. The stigma arose while industry leaders were not paying close enough attention, and no one was in a position to propose and implement an industry strategy. The stigma is everybody’s fault, and nobody’s.

It’s time to move beyond bashing each other’s heads. The need to pull together as an industry is at an all time high. The opportunities for an effective industry strategy have never looked better. But it ain’t gonna happen without leadership. There’s a grave risk it won’t happen at all.

What a shame that would be.

*The most important factors required to support industrialized housing production are: volume, concentration of demand, and continuity of production—the latter being a function of demand.*  
Battelle Memorial Institute, 1969

# 11

## Modulars to the Rescue?

Modulars are commonly defined as volumetric housing components comprised of one or more units without a steel frame, delivered by special transporters to sites where they are permanently installed on conventional foundations and comply with the International Building Code and/or local codes and requirements. Single family versions are often referred to as “sectionals” while multifamily examples provide the basis for the common “modular” appellation that differentiates these homes from mobile or “manufactured” homes. Some find “modular” an attractive (though false by definition) alternative to “manufactured,” since that new name for “mobile” has already become stigmatized. Confusion reigns, and is understandable.

Modulars are sold through builder/developers, street retailers, factory direct or whatever arrangement the manufacturer might devise. In theory, they have most of the advantages of mobile homes with less of the stigma, and thus should prove generally acceptable in nearly any housing community. Feature for feature, their cost should be comparable to that of a manufactured home, gaining some advantage from omitting the frame and incurring few, if any, of the cost penalties compared to multi section homes built under the HUD Standard.

It has not worked out that way.

Modulars have been around for more than 50 years. They did not start or end with Operation Breakthrough, but so far they’ve found it very difficult to attain their potential. Why, is a puzzle that’s worth a look.

Arthur Bernhardt’s monumental study of the mobile home industry some 40 years ago assumed that mobile homes would evolve into the kind of homes produced then and now by modular manufacturers. A natural progression from their well-established and efficient base. That has not happened, but progress is evident.

Though today’s “manufactured homes” are way past their mobile roots, they are still produced in relatively small factories much as they were 50 years ago. Bernhardt noted that mobile homes enjoyed double the labor efficiency of modulars and he expected that efficiency to continue to improve, noting that gains to that point had been largely “accidental” and hampered by “public regulation.” He expected continued progress would result from further investment in industrial organization and changes in the “social-

political-economic-environment.” He warned that could only happen by industry and government pulling together. By and large, that sort of cooperation has proven scarce.

Whether from a mobile or modular base, Bernhardt, the government planners, this writer and many other students of the industry expected far more from all forms of industrialized housing than has eventuated. Surely, we all thought, by the turn of the century—the past one!—most of the nation’s housing would be emerging from large efficient factories? Local “builders” would handle installation, using newly sophisticated procedures. The cost of housing would no longer escalate faster than the economy but would become, once more, its backbone.

That hasn’t worked out either.

In order for it to have done so, the potential promised by Operation Breakthrough would have had to be realized. Not in the blink of an eye as the bureaucrats expected, but over a period of two or three decades. No one has made the needed investment in technological development. Nor could they, given the hurdles posed at so many levels. No solid modular market has emerged, for a whole bunch of reasons.

Community resistance to modulares is comparable to its trepidation about mobile homes. Governments like them better, but not much. Modular factories operate much as they did 50 years ago using essentially the same building materials and techniques available then. No one has been able to assemble the kind of viable market promised by Operation Breakthrough—the sort of consistent volume that would facilitate the commitments needed to really get factories cooking and whittle down the cost. Progress has been limited to that which can be mainly attributed to tapping the learning curve of the MH industry, and has merely kept pace with the Consumer Price Index. Even those gains have come under heavy attack by the housing crisis. Modular progress has been crippled by constraints familiar to the MH industry. The majority of modular homes are built by companies that also build HUD homes, and that’s probably a good thing. Those companies provide a corporate umbrella to see their modular operations through the rough spots, as well as full access to the supplier and learning curve benefits of their brethren, the HUD “manufacturing” divisions.

What was not understood 50 years ago and has never been sorted out is just what sort of commitments might lead to the much-sought “breakthrough” in industrializing the housing process. Technology that would demonstrate the inherent advantages of factory construction. Nothing, that is, but learning curve as demonstrated by the trailer folks, and that process resulted in the stigma already discussed. No study, academic or otherwise, has demonstrated just what housing investments ought to be made, aside from wistful glances at a few factories in foreign countries. Those giant operations are generally a subsidized component of their government’s housing schemes, which provide solid markets for the output. The recurring dream of our own bureaucrats seems to envision following that sort of path, but without the subsidies. Oh, and no concrete high-rises, please. Those don’t catch the fancy of Americans.

In this country, industrialized housing depends upon simple factories with simple tooling, as they always have. The giant Richardson factory of the 1970s has been equaled in size, for both MH and modulares, but a rule of thumb suggests building factories much larger than 100,000 square feet is a risky business venture. Lacking a sound, continuing market, plus fundamental improvements in factory production techniques, further reductions of labor and material from increased investment have proven elusive. Neither government nor anyone else has proven able to define or supply such technology. Some nice efforts went bust.

Summing up reasons large modular factories have proven poor investments:

### **Systems Design**

What exactly might high volume factories and large capital investments expect to achieve? Bernhardt and many others have suggested investing in steel, aluminum and plastic as “materials of the future.” Theoretical models and prototypes have long echoed the notion. Yet even those theories have not been able to pin down just how the economies might arise or how significant they might be. Invariably, hopes are pinned on reduced labor, reduced weight, superior strength, longer life and the like. Projected savings depend on large volume and are typically stacked up against conventional construction. Few have suggested any innovative system might successfully compete with the proven savings available through the forthright and rather basic production systems and materials developed for the manufacture of mobile homes. The potential is there, but can’t be realized because of ...

### **Volatility**

The vital question of the housing market’s volatility is too often swept under the rug with the broom of assumptions. Volatility is central to the high cost of housing as discussed elsewhere in this book, but it hits modulares particularly hard. Better mouse traps only enhance door traffic if there’s already a path to that door. The great modular missing link is a route to market that can cope with volatility. Unlike manufactured homes, most modulares are specialized housing units, more like a typical builder’s output than a mass produced item. For the most part, and for good reason, retailers shun modular inventory. There’s no real dealer organization such as that developed by the mobile home industry.

A widely chosen marketing process used by modular manufacturers involves captive land development. Either creating their own or making a contractual relationship with one or more developers. Sounds fine in concept. In practice, they fail at an alarming rate. Bringing building lots on stream in coordination with factory output involves too many variables. Glitches arise in the process that are too large to predictably bridge.

Small conventional builders can survive volatility by switching to remodeling, laying off workers or simply closing operations. Large builders often become small ones or go bankrupt. Large MH producers can close their less efficient plants. The more overhead any builder accrues, the harder their survival becomes in downturns. Why would a builder deliberately invest in the increased overhead implied by modular construction, for the modest efficiency gains resulting? And if they did, who would put up the capital? Who, to sum it up, would want to make a big bet on modular production, given the limited cost advantages of the process demonstrated to date?

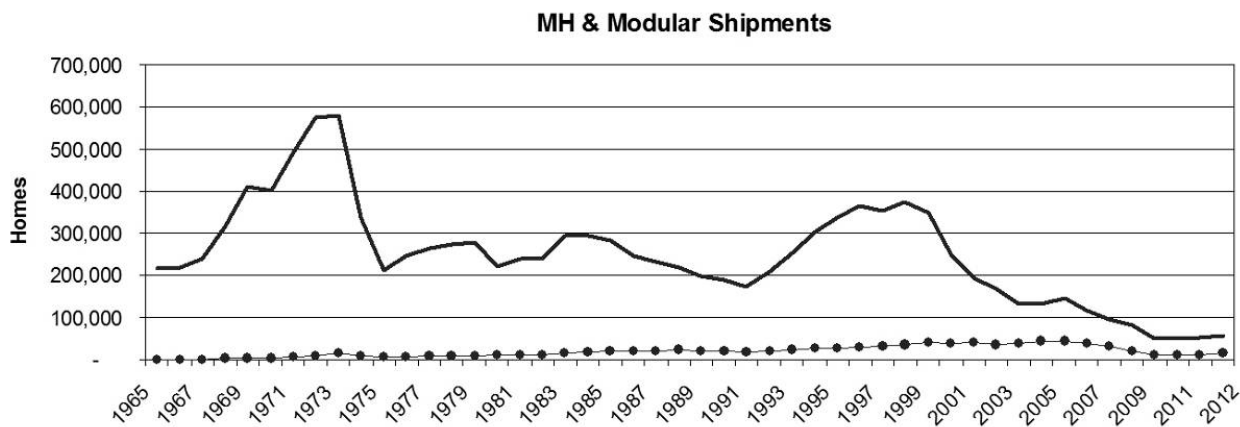
### **Scale**

Related to the above, hoped-for efficiency gains from high-volume production of industrialized housing have proven elusive. Bernhardt analyzed mobile home plants over a decade and found that once production reached modest (and typical) output, doubling that volume had no measurable effect on productivity. A larger operation might have more leeway for investing in research and development, but as with conventional builders, it’s difficult to find R&D projects with reasonable promise of paying off. Large multi-plant operations might also be able to invest in the development of land and home sites, but few have gained from doing so. What’s certain is, the greater the capital investment, the higher the risk of bankruptcy at the next downturn. It comes back to volatility. Scale is a real chicken/egg challenge. It is generally agreed that large-scale housing production should *ultimately* lower cost. It has not been shown that enough gain can be made to justify increased investment in the face of market volatility.

## Market Demand

The housing market's momentum cries out for "traditional" designs and materials. Technological advances generally involve innovations beloved by architects and designers, but not by customers, communities and regulators. Compromise rules. Material and design improvements face the same barriers that bog down innovation by conventional builders. Modular manufacturers—as with MH manufacturers and conventional builders—are forced to produce traditional home designs that resist innovation. For modulars, the challenge is most difficult of all. As the projects of conventional builders become increasingly varied in design, it gets more difficult for modular factories to offer acceptable and traditional architectural variety to the market. This is further complicated by striving to meet local and regional codes.

With the lack of a viable dealer organization or deep pockets, finding markets that can sustain production is hard. That modulars survive at all is a tribute to the fundamental viability of the factory-manufacturing concept.



This graph illustrates mobile home shipments since 1965 (top line) and an estimate of modular sales (bottom line), over the same period. The long term trend on mobile homes is disheartening. Modulars have shown some years of decent growth, albeit from a very modest base. Both trends are grim. All forms of housing have been hammered by the housing crisis, and modulars have never really gotten off the ground.

Modulars<sup>73</sup> have the benefit of capitalizing on the learning curve of the mobile home industry, and that's a big leg up. The factories and methods of the two industries are quite similar, to the point of intermixing production in some cases. But because of their sales volume and widely scattered market, modulars have not been able to achieve the levels of efficiency attained by mobile home factories. That's not for lack of trying. As noted in Chapters Four and Five, some mighty corporations built huge plants and invested millions, in addition to government support, in the quest of modular viability. The modular operations that are successful today tend to be small producers of sectional homes serving nearby markets and large manufactured housing producers building modulars as an adjunct to their HUD production.

Modulars tend to gain their main cost advantage through the efficient use of labor, but can lose much of that in market fluctuations. Typically, they cannot earn enough profit margin to carry their overhead through a major slump. A sustained market downturn or the failure of one or two major projects can be ruinous. Such variations are more likely because modular builders lack the "flywheel effect" of a dealer network with its established inventory and access to retail markets nationwide.

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<sup>73</sup> It should be noted that modular data is difficult to obtain, especially from years past, and this graph relies on estimates.



Manufactured homes, built to the HUD Standard and having the advantages of a well-developed learning curve and support network, are able to deliver even better labor efficiency and pour extra materials into the product, thus delivering greater value. An important part of their learning curve is the widespread and experienced retail and supplier networks. MH plants tend to be located close to supplier support and that supplier system keeps factory investment low. The MH retail network provides a field inventory cushion that helps smooth the irregularities of housing demand. That's the kind of major difference that led Bernhardt to make his bet on mobiles as opposed to modulares. That's a key reason so many modular factories find themselves sheltered under the wings of MH companies.

Phillip Rosedale was recently asked by Peter Diamandis, "Why does Silicon Valley have more successful software startups than anywhere else in the world? Are people just smarter there?" Rosedale's reply can be summarized in one short sentence:

"... just about everywhere *other* than Northern California, people are very unwilling to share information with each other."

That's not quite true. Makers of eyeglass frames in Italy, fine watches in Switzerland and small engines in China are examples of clusters of productivity, if not innovation. More relative to our point here, think of mobile homes getting their start in Elkhart—call it the Michiana area. There were no research laboratories, think tanks, venture capitalists, or startling new technologies. Just a bunch of entrepreneurs, all trying to beat each other to the punch, but sharing what they learned because they were bottled up in that small community. Think about that.

Why Elkhart? A rather ordinary little industrial town noted mainly for other industries. But Milo Miller happened to get his start there and sold a factory to Schult, who trained Richardson and so many others. Bob Richardson once estimated that the owners of some 75 percent of MH/RV companies in the Elkhart Yellow Pages had, at some time, worked for his company. Suppliers clustered there, not by intention but because those Elkhart Mobe Men bought a lot of merchandise and paid on time. Art Decio spread the good news across the land.

This did not happen as much with modulares. Their launch locations have been more happenstance. To the extent they have a common heritage, it traces back to Elkhart. In any event, the modular industry has found it difficult to find a common ground and voice. As a result, the modular industry's strategy and direction seems even less clear than that of its MH competitor.

Tom Hardiman is a leading modular consultant and Director of the Modular Housing Institute. Asked why modular companies don't climb on board with the HUD Standard, he responded, "If we built to the HUD code, it

would be manufactured housing, not modular—as the code built-to is the key difference. We are trying to capture more of the 90 percent of the market that is site built; not compete over the smaller piece of the pie."

OK, but hardly a rallying cry, or a very tight focus. Speaking to this issue, Don Carlson, another industry veteran says, "... there is no organized effort on the part of factory home building to let the public know what it is all about and why any type of factory building is superior to any type of stick building at a job site. Someday, who knows, the industry may come to the conclusion that it is time to all pull together because they are all really in the shelter business and not in the business of raining on each other's parades." Fair point, but behind the scenes there's lots of sharing going on as executives, middle management and workers switch between companies, including retailers and suppliers.

MHI and the several assorted associations that speak for the industry have made their pitches over the years, but leadership has not emerged, perhaps because the entire in-

dustrialized housing industry arose from such fractured origins. So far, there've been no Henry Ford's or Alfred Sloan's of housing.

Government experts recognize all these problems and are just as woolly as anyone else about what's to be done. They like the "low cost" part of manufactured homes but tend to view the existing MH product and its manufacturers askance. Closer to the Nader camp than the industry's. Modular? Maybe a nice compromise, but ... couldn't they get busy and build some fancy factories? How about some government help, perhaps in the form of investment in research? There has never been a shortage of government agencies seeking to lower the cost of housing. What's lacking is any clear notion of how to go about it.

A 2009 analysis of the prospects for getting construction on a more productive track summed up the challenges of attaining that government favorite, "breakthroughs."<sup>74</sup>

*To help determine which activities offer the greatest potential for resulting in breakthrough improvements, the committee first identified the attributes that characterize an efficient capital facilities sector:*

- 1. Production of quality products that meet owner's and the nation's needs;*
- 2. Competitiveness in the global marketplace;*
- 3. Well-integrated processes, supply chains, and workflows;*
- 4. Promotion of sustainability through the efficient use of time, materials, skills, and dollars;*
- 5. Attractiveness to a diverse, well-trained, knowledgeable, professional, skilled labor force able to work collaboratively to meet owners' and clients' objectives;*
- 6. Ability to adapt to new conditions and to deploy new technologies effectively;*
- 7. Use of best practices to reduce rework and delivery time, and to improve job-site safety and project quality; and*
- 8. Measurement of performance to enable innovation and improvements in products and processes.*

Those characteristics ignore the major problems but largely describe industrialized housing as we know it today. No "breakthroughs" employed. It was accomplished through learning curve. Modularity meets most of those criteria, and manufactured homes are reasonably adept at all. Well, perhaps not to the satisfaction of that study's authors.

The report goes on to suggest ways by which their prescription might be implemented. The language is tortured but the gist has merit. Here's a quick summary as relates to industrialized housing:

- 1. Communication**

The use of current technology to communicate among the scattered aspects of the construction process. Because of the close working relationship between manufacturers, suppliers, HUD and retailers, mobile home manufacturers have been on top of this for a long time. Modularity, less so. They are more subject to many of the communication bottlenecks that plague stick builders. They're more burdened by the construction industry's momentum that created its cul-

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<sup>74</sup> *Advancing the Competitiveness and Efficiency of the U.S. Construction Industry*, by a committee of the National Academies, National Research Council, 2009.

ture and so many barriers to efficiency. Both are hampered, as is the entire housing industry, by unreliable communications with housing authorities.

2. **Job Site Efficiency**

Here's the heart of the matter. In the committee's words, "Managing these activities and demands to achieve the maximum efficiency from the available resources is difficult and typically not done well." As more and more site work is mandated for factory housing, the efficiencies gained at the factory are eroded at the destination. The problem was "solved" in the old mobe days by plunking the home down on blocks and driving away, and that was no solution at all. It's a huge problem that remains challenging and unresolved, with modulars doing a more satisfactory job on site, but at a very high cost.

3. **Greater Use of Off-Site Processes**

Hear, hear! They're singing our song. They note the site logistics and code issues that stand in the way of progress on this front, and of course, those are major factors that make item two such a challenge. There are inherent conflicts between the archaic processes that govern site construction and those made possible by factory production. The committee suggests the two be "used appropriately" and that's the rub. What's the "appropriate" method of blending conflicting cultures? Appropriate and innovative ways of dealing with site challenges are constrained by local building and zoning codes. Neither can it be expected that site contractors will demonstrate their optimum efficiency when contributing a diminished portion of the building process and working with a competitor they inherently dislike.

4. **Demonstration Installations**

It is an unfortunate fact that for every "demonstration" of good factory housing installations, critics can point to others that do not pass muster. As a result, and also because of the cultural predilection against housing innovation, such demonstrations have lost most of their charm. Success in housing innovation has proven to be a game of inches, not breakthroughs. The best demonstration is probably happy families living in manufactured homes. By and large they are, but progress is slow.

5. **Effective Performance Measurement**

Against what? It is an unfortunate fact that the broader housing industry is so complex and moribund that its productivity has become impossible to measure. That's less true of industrialized housing, but where is the yardstick for comparison? In writing this book, records and sources were scoured, turning up only the broadest measures for comparison.

The report goes on to confirm the importance of point five, noting that it is impossible to determine if the construction industry's productivity is "improving or declining over time." It is clear that the productivity of industrialized housing is gaining over time compared to stick building, despite all the roadblocks in its path. In the case of modulars, progress is painfully slow, hampered by extra layers of housing bureaucracy. Either industry has boundless potential for improved efficiency, given relief from the inertia of housing momentum.

There has never been a shortage of studies such as the one referenced above. Well-intentioned and thoughtful efforts to chart a path forward. There has never been a shortage of ideas for housing breakthroughs. There have always been a few entrepreneurs willing to bet their careers on housing innovation. There've always been a surplus of agencies and builders willing to put up with the barriers that make innovation so difficult. No wonder the housing industry plods along attempting to sort

out the gaping inefficiencies in America's housing procedures and processes ... but not really grasping the extent of the challenge.

The nearly universal bottom line of all such research studies by outsiders and academics has been a conclusion that even more such research is needed: *C'mon guys, get on the ball! Spend some research dollars. Surely there's a better way? This is America! We solve problems! We invent things! We make it happen!!* Perhaps, but can anyone point to such research that has resulted in genuine progress in housing innovation? Where are the "breakthroughs"?

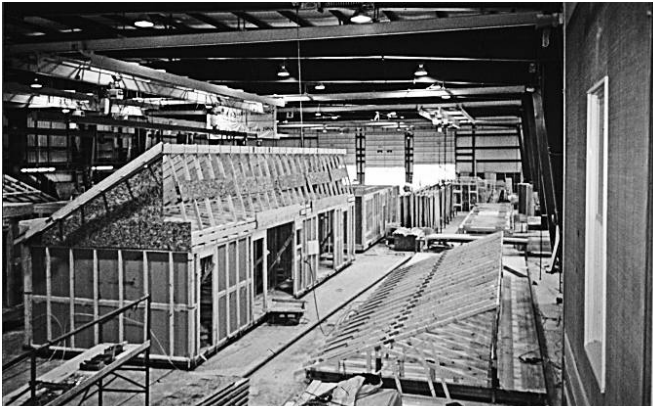
In many other industries, yes. Not in housing. Not in government. Not in any overgrown and creaking bureaucracy. Our nation finds its breakthroughs in unplowed fields, early in their curve. When the kinks have been worked out—at the flat part of the curve—we're no more innovative than those in other countries facing similar challenges. Our progress as a nation owes largely to being early in the curve, as industrialized countries go. Still, it's unlikely we can turn our housing challenges over to more competitive developing nations, so we need to get busy and find better ways forward.

It does seem likely that careful investment in research could lead to significant ideas and methods for improving how we build houses. What's much less clear is whether such research could produce useful innovations that might be *expected to attain practical application* within the constraints of our ponderous housing arena. Housing's momentum blocks innovation. The method of constructing the homes themselves, whether in factories or on site, MH or modular, is a minor part of the problem. Learning curve is, so far, the only proven tool for housing innovation, and it has worked best when as far removed from the rest of the housing industry as possible. Modularity is greatly handicapped by their efforts to square the circle. They attempt to produce conventional homes in a factory while living within the constraints of a fully evolved system designed for building with sticks and pieces in the boonies.

Can the modular system be made to work? Of course. It is being done, but progress is very slow, largely because efficiency gains from manufacturing are minimized by the torturous path to market. Is it the right approach to industrializing the housing process? Manufacturers of HUD homes should be watching closely, because since 1970, they've diverted their efforts toward a similar path with unimpressive results.

The best bet for the housing industry and its governing authorities is to pull together and support, rather than disdain, the manufacturers who have taken a fresh approach and shown steady progress toward making it work. Stop chasing breakthroughs and help learning curve buck the tide of momentum. Stop expecting manufactured homes "just like Mom's" to somehow emerge from factories.

**B**ecause of their great promise, modular homes have probably received a disproportionate amount of attention and research dollars in recent decades. A good example is Ryland Modular. The Ryan brothers did a lot of housing research and management development beginning in 1948. In 1967 James Ryan split off and set up a competing company that came to be called Ryland, a contraction of "Ryan" and "Maryland." A "production builder" utilizing their own truss and panel plants, Ryland became one of the nation's most efficient producers of conventional homes, able to dominate whatever markets they chose to enter. Both Ryan companies were and are successful, a rare thing in the housing industry. Back in the eighties, Ryland was building around 10,000 homes per year.



The third Ryland Modular plant at Fredericksburg, Virginia, 1987.  
Courtesy John Slayter

In its continuing quest for efficiency, the company established Ryland Modular Homes, which became the nation's largest modular producer, building a couple of thousand homes per year. They hired the best people available and built state-of-the-art modular factories, which produced homes suited to blend in with any housing community. The Ryland name gave credibility and access to the most suitable materials and financing. No product was to enter production without an order and assured financing, generally provided by Ryland's own financing division. A nice setup with boundless potential.

Ryland focused the modular plants on scatter-lot operations and continued stick building for tracts. Such odd-lot markets have been an example of where modulares have proven competitive over the years. The venture was reasonably successful and profitable, though unable to compete with Ryland's own production builder operations, given the same benchmarks for design, land, size and quality.

Even for Ryland, the vagaries of financing subsidies and scatter-lot marketing played havoc with maintaining a steady flow of production. As a plant's backlog approached zero, it would have to be closed, and that resulted in the cancellation of orders, making it difficult to sustain efficient operations. It all worked great, most of the time ... but it was those other times that hampered the system, increasing overhead and labor costs. Market volatility.

Ryland's senior management set out to determine how much efficiency was actually gained with modulares. Such comparisons are hard to make in a way that doesn't favor either building process. The test that was agreed upon involved two adjacent lots having the same conditions and site costs. They took a design that was being produced by Ryland Modular and produced a set of conventional blueprints and specs for the same house. A contract was made with a local builder for the stick construction. Another contractor was hired to build two identical basement foundations for both the stick and modular houses. Detailed accounts were kept of the construction of those identical homes. The factory order for the modular was entered the day the stick builder's first load of materials arrived at the site.

Five days later when the modules arrived, the stick crew had their house framed and under roof. Fortunately for them, the weather was good. As the first module was being set, it was discovered that the foundations had been built with a two-inch error; something the stick crew didn't even notice. They simply adapted their framing to the conditions they found on site. The modular crew however, had to furr out the sidewalls, apply new sheathing and reset the windows into deeper frames. That took an extra five days, utilizing factory labor for the task. The modular guys figured they still had an edge and finished up three weeks ahead of the stick workers.

When both houses were completed, an open house was held and the public was asked if they could tell which came from a factory, rate the perceived quality of both and so forth. Most could not determine which was a factory product, and that home got a slightly higher quality rating. Customers felt it was a bit "stronger." It probably was. When the bean counters reached their bottom line, it turned out the modular contained about five percent more framing lumber. Total construction cost differed by just one percent.

The winner, as determined by Ryland management, was ... a tie. The modular guys were devastated, and of course that foundation error was a setback for their team; the weather a gain for the other. Still, a hard lesson was learned. Stick builders can more easily adapt to site problems. And site problems abound.

A bigger lesson can be drawn from this exercise. When shiny new factory manufacturers attempt to compete with site builders, accepting ground rules established by the momentum of ages, they're fighting city hall. For example, look back at the photo on the previous page. That steep roof pitch on the modular added little practical value to the house and a ton of challenges to its production.

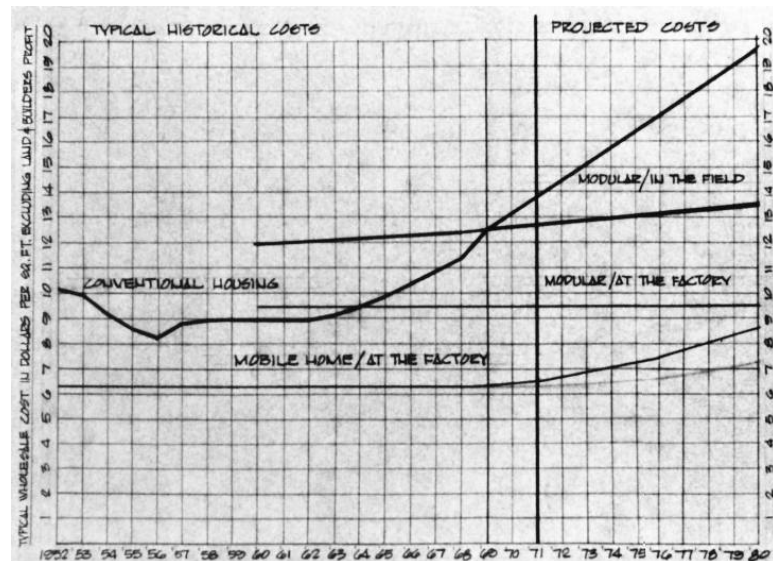
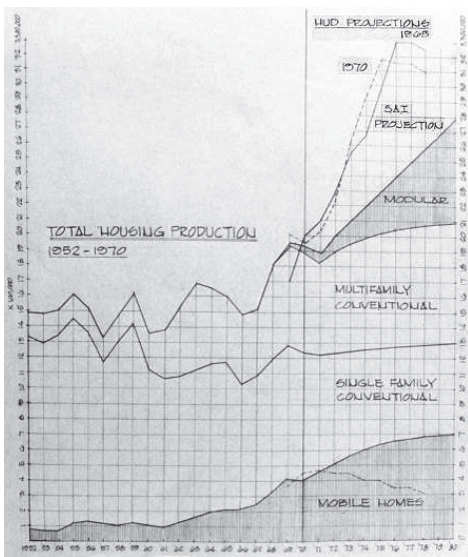
Yes, there are advantages to factory construction, but there are also disadvantages. Until the battle is won, manufacturers should play to their strengths. Successful industrialization of the housing process involves no magic. It's a matter of learning curve, and needs management and a process that can give learning curve a chance to work.

This Ryland example suggests that back in the eighties, factory construction could make clear wins only when playing by its own rules, and that situation probably prevails to this time. Modulares remain a niche market.

Fred Hallahan, a modular consultant who once worked for Ryland, says, "Modulars produced in low labor-cost areas like central Pennsylvania and shipped to metro New York City become very attractive for builders who can save anywhere from 10-20 percent on direct hard costs. In sum, it's production in a low cost area and consumption in a high cost area that drives modular growth." That defines a niche market.

The Ryland Modular division was reduced to one plant, building multifamily housing. Larger multifamily projects have better potential for sustaining continuity of factory production, when land development and factory are under the same ownership. The modular market remains small, with the majority of its products now being built by manufacturers who cut their teeth in the mobile home industry. Those manufacturers continue their process of whittling down modular construction cost, one stick at a time. Learning curve, albeit a slow one.

Mobile homes gained their initial success by evolving from a unique base and ignoring the "housing" market. Modulares trying to muscle in ahead of their learning curve do so at their peril. Those advocating exciting new breakthroughs in housing would do well to study the industry's history.



These two graphs were prepared in the late sixties by leading modular consultants of that period who bet modulars were the wave of the future.

The prevailing view in the early days was that mobile homes and modulars would comprise a large and fast-growing portion of the housing market of the seventies (beginning at the dark vertical line on both graphs above). Modulars, it was believed, would soar, seizing market share from both conventional builders and mobile home manufacturers. That projection was considerably more conservative than HUD's (the two top lines, left graph; 1969 and 1970 projections), but proved wildly optimistic nonetheless. The basis of the expert's confidence was the graph at right showing how the price of mobile homes had held steady despite increases in their size. Modulars, being larger, would cost more and incur more high cost site labor. Those field costs had kept modular prices marginally competitive to that point, but the trend looked favorable. And that same labor would doom stick homes to declining growth; a trend solidly under way.

Two points those consultants<sup>75</sup> failed to realize. First, that economic volatility would decimate all three kinds of housing during that decade. Second, that site work, which they projected at about 25 percent of factory construction cost, would turn out to average much higher. The nascent modular industry didn't really pick up much steam, and it never has.

Perhaps dismayed by all the boondoggle, before, during and after the seventies, the prime government assault on housing cost has continued to be subsidies and regulations—carrots and sticks—its prime tools for doing most things. As seen in previous chapters, government programs range from mortgage deductibility to grants and incentives too numerous to mention, combined with strangling regulations at all levels. Subsidies started and subsidies stopped; programs enacted and programs withdrawn. Rules introduced—regulations changed. A few of them may have been helpful in addressing construction cost. Most were surely counter-productive, not just for manufacturers, but for all builders.

So modulars remain a niche product, and manufactured homes are in grave danger of returning to a similar role as niche players. Let's not let that happen.

Let us not join the academics and bureaucrats who await the breakthrough that will finally lead to "proper" houses coming out of "proper" factories. The right question is, what can industrialized housing, as it currently exists, do to rise to the challenges and opportunities that must surely lie ahead? A hard question, but there's been progress, and the housing market remains huge and poorly served. The likelihood of a marvelous housing breakthrough emerging from some fertile brain and putting us all out of business is vanishingly thin. If housing is ever to be built in factories, the process will most likely evolve from what's currently being done by the MH and/or modular industries. The task before us is to find a way to make that happen. Let's dig into some numbers, looking for clues.

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<sup>75</sup> This writer was on that team.





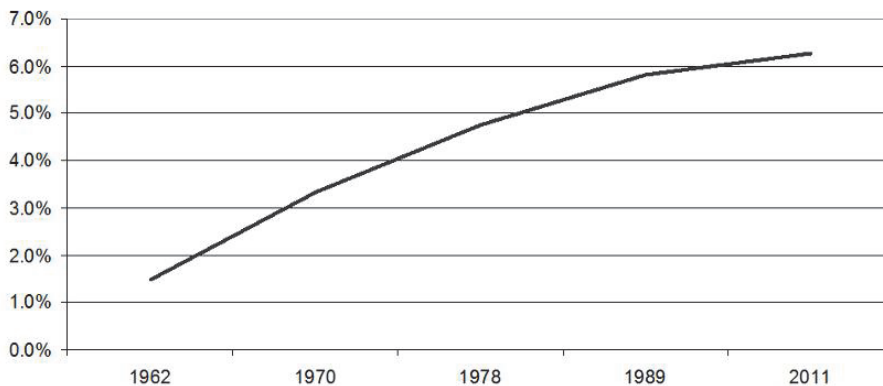
*Housing is a social institution undergoing relatively rapid change. And, as in any institutional sphere subject to marked change, the field of housing is rich in conflict and controversy. The type of housing to be built, for whom and by whom it is built—all these are matters involving great conflicts of interest and sentiments rooted in economy, society, and culture.*<sup>76</sup>  
Robert K. Merton, 1948

## 12 Seeking Direction in the Numbers

Merton's quote above is from the postwar years when housing was being wracked by change. Levitt and others were sowing the suburban landscape with tract houses and the housing shortage was leading some folks to live year-round in little houses on wheels. The "conflict and controversy" remains unresolved. Mainstream housing drifted along then as now, in its habitual patterns where change is sought, but not found. Just keep makin' 'em bigger and fancier; "... human nature changes with geological leisureliness," said historian Ariel Durant.

More than a decade after Merton's quote, with builders unable to supply demand, Margaret Drury envisioned those conflicts being resolved in favor of the trailers. She quoted 1962 Elrick and Lavidge statistics showing that about 1.5 percent of American households were living in mobile homes. Starting from nearly zip a decade earlier, that was exhilarating progress. She noted that nearly three percent of starting households chose the MH alternative. Pretty exciting stuff. She suggested the trend was likely to continue, and it did.

**MH Percent of Occupied American Homes**



The trend has leveled off in recent years. Still—an unparalleled accomplishment for a truly innovative form of housing going up against the housing traditions of ages.

<sup>76</sup> Quoted by Margaret Drury in *MOBILE HOMES The Unrecognized Revolution in Housing*, 1968. Merton was a towering figure in sociology and was the first sociologist to win a National Medal of Science, in 1994.

Let's delve into some indications of what has driven this achievement; what happened that accounts for the leveling and the market potential it portends.

Back in those early days, the industry's trade group, the Mobile Home Manufacturer's Association (MHMA) was at pains to portray mobile home occupants as just plain folks. Surveys were done and MHMA's annual summary, *Flash Facts*, outlined the good news. Yes, MH owners were younger than average (a good thing), but their incomes and occupations suggested normal American families on their way to, or enjoying, success in their field.

In 1957 *Trailer Dealer* magazine, a major industry publication in those days, said, "Who buys mobile homes? Craftsmen in mobile occupations, such as construction, account for the largest group of purchasers. Next come military personnel, then retired people, followed by business and professionals." The biggest state markets (16 percent of the total) were California and Florida, and industry publications were rife with handsome young families splashing in pools and happy seniors stroking the pucks on shuffleboard courts in elegant MH parks.

This rosy view was confirmed by a Foremost Insurance study showing the 1980-81 median income of MH owners was \$16,881; virtually the same as America's median household income of \$16,830. Note however, that median *household* income is typically about a third less than median *homeowner's* income, so caution is urged, as always with statistics. In any case, the current median income of MH owners has dropped well below national median income levels.

A graph of census data in the 1969 edition of *Flash Facts* showing 94 percent of single family housing starts were accounted for by mobile homes; up from 65 percent just four years earlier.<sup>77</sup>

Citing the headline news of the nation's need for 26 million new homes in the following decade, *Flash Facts* of 1969 forecast, "barring economic instability," a continuing industry annual growth rate of ten percent, forging into four prime markets; urban housing, MH communities, single sites (already about half the market), and second homes. Specifically, it foresaw production of 665,000 mobile homes in 1974.

Forecasting is a risky proposition. Yet by 1973, the industry was on track to attain that objective, when "economic instability" interfered—big time. Only half the projected mobile homes were produced in 1974, 42 percent fewer than built the preceding year. Never mind that the rest of the housing industry was in comparable turmoil. This kind of setback is devastating to any manufacturing industry. It was overwhelming to the young MH industry that was just finding its legs and had accomplished so much, in such a short time, against such incredible odds.

In those days, with no company having a dominant MH position and no clear strategic industry leadership, it was generally agreed that two of the industry's major problems were that homes were too small and finance costs too high. Manufacturers sought governmental blessing (and mortgages) while hunkering down to play the game that had worked so well up to that point: Build ever bigger homes and fight to keep reducing their cost per square foot.

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<sup>77</sup> A bit misleading. As a footnote mentioned, mobile homes represented 48 percent of new single family housing, if MH were included, which HUD did not at that time. Much hinges on statistical definitions.

**At the price shown, which would you (the dealer, or the buyer) choose? Some example answers:**

	Dealer	Buyer
Carpet throughout (\$125-175)	61%	55%
Better grade carpet (\$100-150)	58%	62%
Better interior paneling (\$75-100)	52%	63%
Shingle roof (\$100-150)	36%	33%
House-type lap siding (\$500-625)	36%	39%
Better quality furniture (\$400-600)	36%	58%
Central vacuum system (\$125-175)	1%	20%

Which of the answers was more nearly correct? It was and is impossible to know, for perception, which governs such answers, is chancy.

In 1969 and 1974 Owens Corning Fiberglas (OCF) sponsored major industry surveys. About 30 percent of those counted were doubles, and representative samples were in parks or on private sites. The 1974 version confirmed that 72 percent of MH buyers were “extremely or very satisfied” with their home. Much of that satisfaction was traced to the basic home itself, with respondents least satisfied with the “free” furniture that came with their home (in those days nearly all were sold and financed fully furnished). Customer’s prime reason for choosing their MH was economics and their aspirations tended toward a larger home; preferably a double wide.

Manufacturers responded, but were more guided by dealer feedback. After all, the dealer is on the front line and in the best position to evaluate what customers want. The OCF surveys attempted to validate that perception by asking MH buyers and dealers the same questions on design details. Responses were similar, with some interesting differences.

If a home was furnished, certain items—like beds—were expected. But folks buying a home paid scant attention to the beds in question until they tried sleeping on them. Thus the differing response to the question on “furniture quality.” John Crean said, “... the beds used throughout the industry were made of foam rubber only a couple of inches thick. The whole mattress couldn't have weighed more than a pound and a half ...” They were, in fact, low density polyfoam, and weren’t that bad when you first tried them, but quickly softened and became rather pathetic. But any manufacturer who responded by installing good beds got little credit for doing so, because shoppers didn’t notice. Where to draw the line on quality vs. price was, and remains, a challenge. As does interpreting statistics.

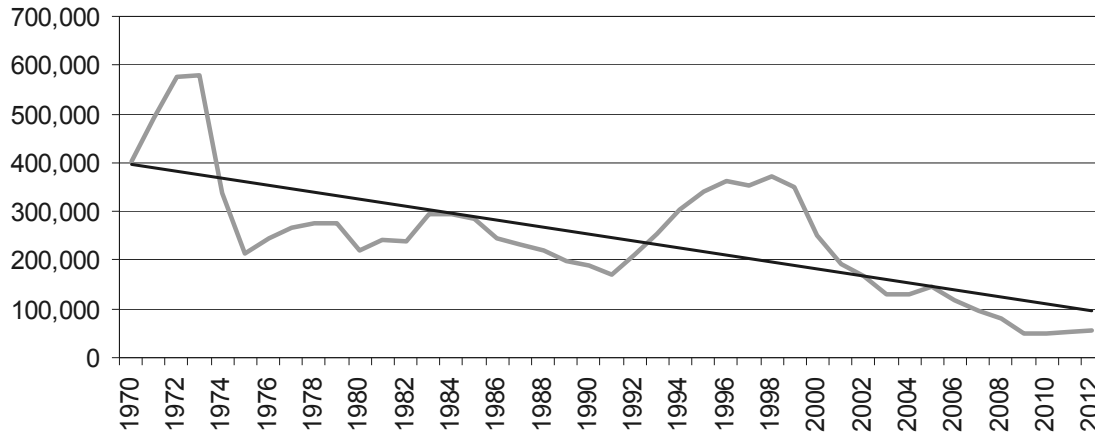
Interestingly, details on the OCF California and Florida survey results indicated a lower inclination toward better exterior home appearance (average; about 16 percent) than the national average of 25 percent. That option was priced for survey purposes at \$200-300, which would not go far toward resolving that challenge anyway. It seems likely the national results reflected a greater prevalence of single section homes. In any case, exterior MH design, the bane of communities around the nation and a big factor in the stigma, ranked relatively low among the wants of MH buyers.

Then as now, the road ahead was far from clear, but all signs pointed toward a great MH future in single family housing. The immediate task was to gain long term finance, an idea championed by HUD, so damn the immediate market crisis; the industry plunged full speed into gaining HUD’s acceptance of “manufactured housing”—the new industry label that would banish “mobile home” and its tarnished image. But that move did little for long term financing or image refurbishment. Still, progress was made on two fronts deemed crucial to the future. In due course quality continued to improve and twin section homes gained market share. Manufactured homes no longer suffered from being undersize. Even singles grew to today’s typical size of nearly 1,200 square feet.

Crucial question: Why didn’t all that result in a resumption of pre-crisis growth rates?

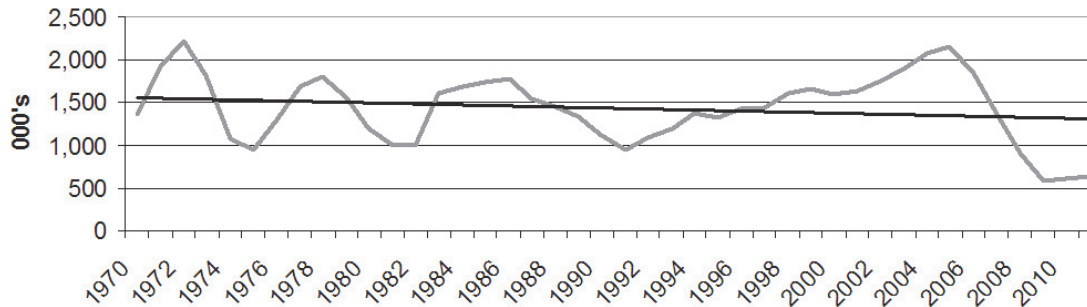
The following graph depicts the story of an industry in trouble. Yes, there were hopeful bounces. And if measured in terms of current dollar volume, the graph would look better because of inflation and increasing home size. But for our purposes here, it's best to face up to reality. That trend line is simply going the wrong way. Can it be reversed? Is 100,000 annual units the new objective? That's the \$64 question—make that the multi-billion dollar question.

### MH Annual Unit Shipments



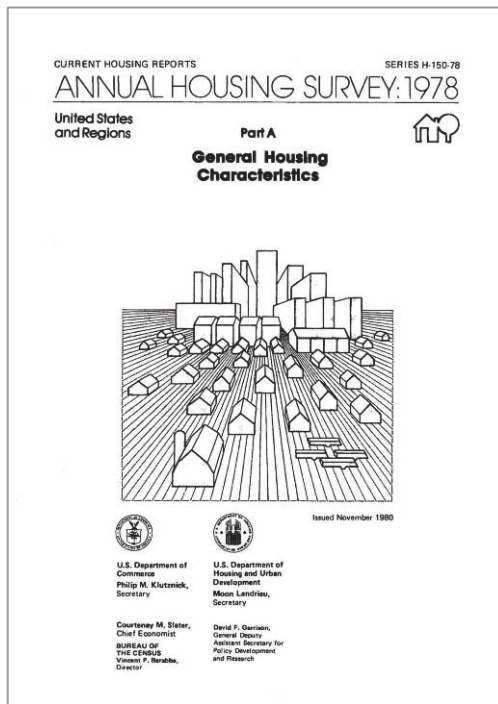
This graph depicts an industry in decline. Before getting too gloomy, it's worth a look at how the stick builders fared over the same period (compare MH above with stick below). The MH down-trend line is much steeper, but if you look at the early seventies, both plunged comparably. And as a percentage, the same thing happened from 2005 to 2010. The big difference is the stick builders had a longer (and inflated) run-up from the nineties to the crunch. Both types suffer from similar volatility and both are struggling in the current housing quagmire.

### Annual Stick Built Trend



Had the competition become too stiff? Hardly. Their construction cost continued its upward march. Had manufacturing run out of learning curve? Well, it slowed as the curve flattened, but the competitive edge held and gains continued. Was the lack of anticipated mortgage financing the deal breaker? That remained a huge problem, but the industry had thrived on consumer finance, and with the S&L crisis over, those loans were again readily available. Maybe *too* available!

Some say that HUD and its intrusion into our business has been a large part of the problem. Perhaps so, depending on how broadly you look at HUD's larger and smaller involvements in housing. One very positive thing though, must surely be credited to HUD. With the help of the Census Bureau, they've provided the MH industry with the best statistics it has ever enjoyed. A fresh batch arrives yearly, since 1970.



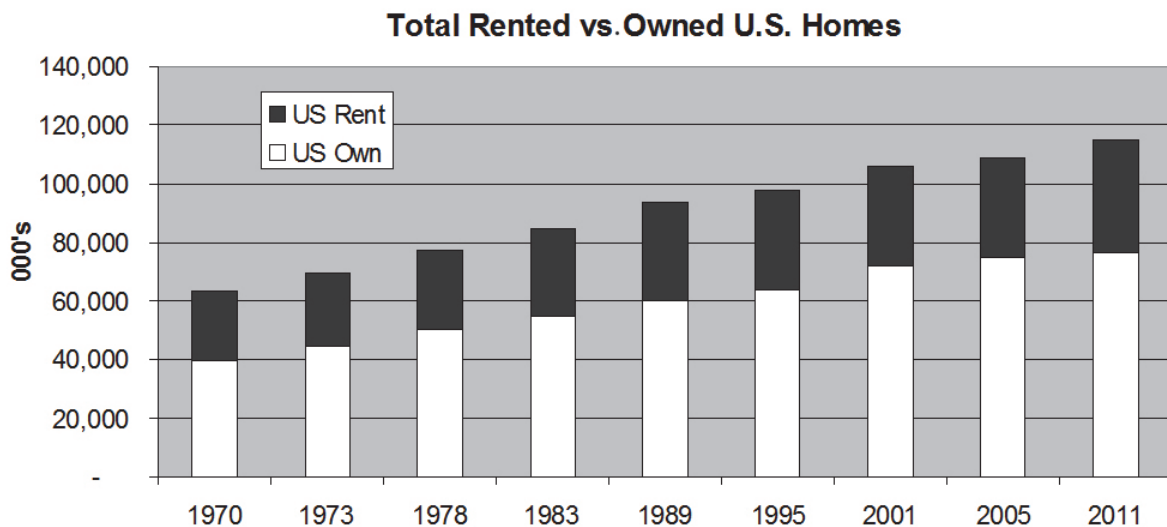
This is the cover of the 1978 edition, issued in 1980. It is noteworthy for having manufactured homes, wheels and all, right there on the cover. See 'em there at the right, just across from the barn? Barn? Why the barn? Ah; mobes in the country?

The HUD data is available on the web, with the older versions (to 1973) scanned from photocopies. That makes them hard to analyze, but the price is right. Those statistics are a treasure trove that merit far more attention than can be summed up in this book. We'll have a quick look.

Each edition gets larger and more detailed. This one is around 300 pages, densely packed. Though the information is not in the format one might choose, the editors have tried hard to include cross references and data summaries that make it possible to gain a good idea of what's going on in housing.

For our purposes here (and in due consideration for the author's aging eyesight), only a few editions have been sampled, and at that, the contents only skimmed.

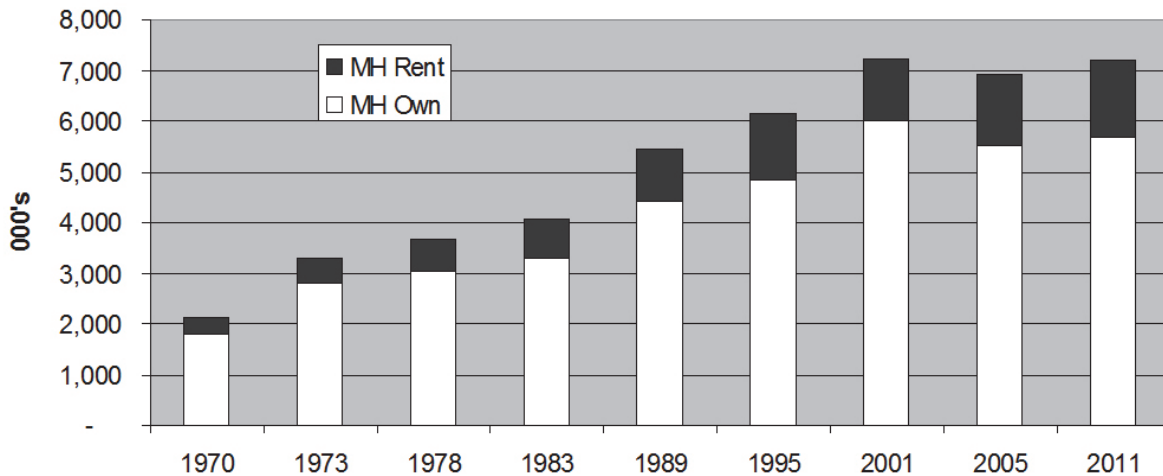
About a third of the American populace lives in rentals of one kind or another, and they are strong competition for manufactured housing. Following is a breakdown:



This graph depicts the success of the nation's strategy to encourage home ownership. In 1970, about 37 percent of American families rented their homes. By 2011, that ratio had dropped to about 34 percent. Still, there are about seven times as many rental dwellings out there as all existing manufactured homes combined.

It was perhaps hoped that manufactured homes would help boost that home ownership ratio, and it appears they did—but the effect was small. Conventional wisdom has tended to assume that manufactured homes are owned, but rent their space. It's not that simple. Most manufactured homes are sited on land titled to the MH owner, and quite a few are rented, both in communities and on private land. The following graph illustrates MH rentals of the home, including the ground it sits upon:

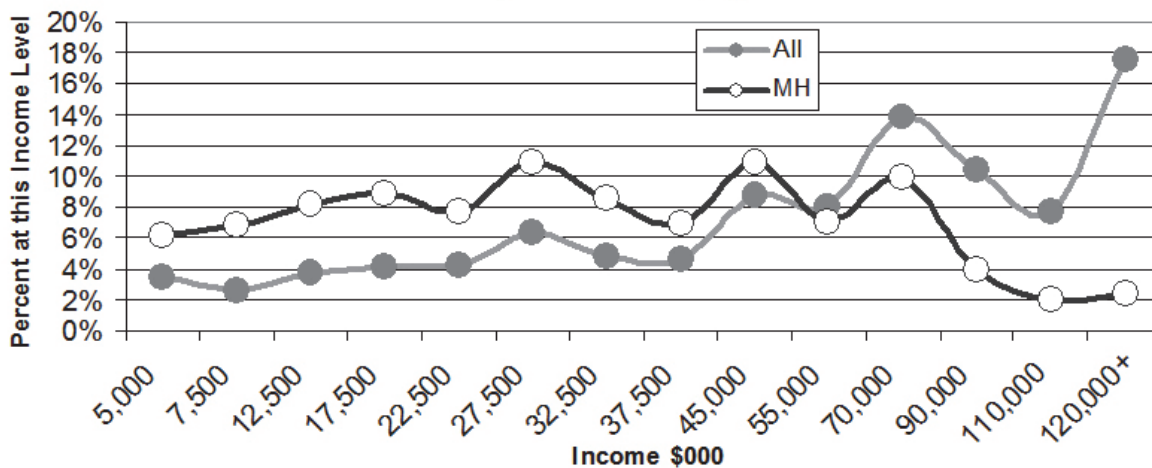
### MH Rentals vs. Owned



The MH rental ratio (among those surveyed) has increased from 15 percent in 1970 to nearly 21 percent in 2011. Perhaps that can be attributed to industry challenges in recent years? Is this an industry strategy or market happenstance?

Perhaps a bit of both. Let's dig a little deeper.

### Home Buyers Choices, by Income



The 2011 HUD Housing Survey graph above shows some statistics on "All" the owners of occupied homes in the survey (the dotted gray line) indicating the approximate percentage of home owners at given levels of income. The median value of those homes was \$200,000 and they'd been purchased about ten years prior to the survey. The black line with white dots shows the approximate incomes by percentages of MH owners, also purchased about a decade previously. As you'd expect, the high income folks (\$70,000 and up) dominate the right side of the graph, and MH owners the left, with few MH owners being in the big money.

It is clear from the Annual Housing Surveys that manufactured homes are low cost housing. The thing is though, that low cost homes are sold or rented to *people with low incomes*. Families with median household incomes can only afford to buy low cost homes. That's a bit contrary to the image the industry has tried to portray. Median priced manufactured homes financed with chattel loans are marginally affordable.

These HUD surveys make it fairly clear that MH buyers, like everyone else, tend to reach hard for all the home their income will allow them to acquire. MH owners spend a higher percent of their income on housing<sup>78</sup> than buyers of stick homes.<sup>79</sup> Both had to

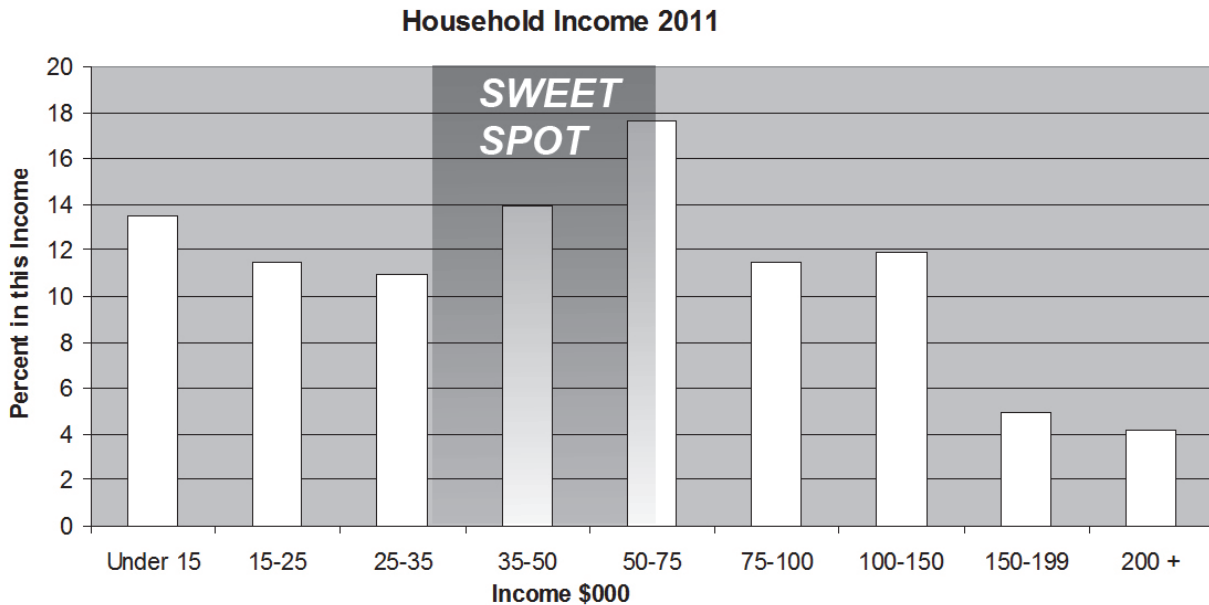
<sup>78</sup> Those at or below poverty level pay a much higher ratio.

<sup>79</sup> Part of the difference can be attributed to the typical MH being newer than the typical house.

dig deeper to make the original purchase and have tended to benefit from increased incomes over the years of ownership. We are well trained as home buyers to stretch to 30 percent or more to buy a home, assured that increases in home value and income will make the equation work out in due course. It did so for a long time. In recent years though, there have been enough exceptions to generate well-founded skepticism on the part of home buyers, and particularly bankers extending long term loans. Whether that “new” perception will last remains to be seen.

Look at it this way. Once a family’s household income gets above \$50,000 per year, options open up, partly because of financing deals typically available for conventional homes. Such deals are more likely to be available for new homes. Builders of manufactured housing can attempt to compete in that market, but historically have found limited success in doing so. One reason is the poor appreciation of manufactured homes—part of the stigma. That tainted reputation is perhaps as big a barrier to the pursuit of upscale markets as the lack of conventional financing.

There’s a big market for housing among those earning \$30,000 or less, but they can’t afford a new home of any type. The sweet spot for manufactured housing appears to be buyers having incomes of \$35 to \$65 thousand. The median U.S. income is about \$51,000 so that range represents a very large potential market—nearly a fourth of American households.



The average MH selling price in 2011 was \$60,500; affordable to prudent buyers in the middle of that income range.

As noted earlier, rental homes represent about a third of the total housing market, but only 21 percent of existing manufactured homes, a substantial increase over the years. Back in the earlier days, landlords offering to rent manufactured homes were scarce—and scared. Doing so was generally deemed a risky proposition, for fear those homes would not stand up under rental use. There was some justification to such concerns, as conventionally-built apartment units often have durability features built in for rental use while manufactured homes skate the lower edges of material standards. These days new manufactured homes set up as rentals often feature floor coverings and other details chosen more for enhanced durability.

Rental or lease is proving an increasingly acceptable MH proposition, partly because the homes are now better suited for the purpose and because it is often easier to obtain financing for a professionally managed investment based on manufactured homes. This

can be a particularly attractive proposition in that manufactured homes can usually be rented or leased at market rental rates and are often attractive rentals, since each home has its own little yard, parking and privacy. Some see this as the future of manufactured housing.

<b>Owned Homes</b>	<b>Conventional Homes Median</b>	<b>Conventional "New" Homes Median</b>	<b>Manufactured Homes Median</b>
Household Income	\$58,918	\$68,082	\$27,984
Mortgage Balance	120,000	198,000	34,000
Mortgages P & I	843	1,064	412
Real Estate Tax	51	185	28
Property Insurance	58	58	40
Utilities	188	191	178
Cost Per Month	\$1,240	\$1,498	658
Percent of Income	19%	22%	24%

One can juggle figures from the HUD Housing Surveys forever, but at left are some typical ranges of monthly costs for various home ownership choices, including utilities, taxes and the like from the 2011 Survey.

The median age of conventional homes in the survey tends to be ten years or older. That's one reason the "Percent of Income" is relatively low. Those listed as "New" were built in the preceding four years. Typically buyers of new homes stretch up to and above the 30 percent "guideline" for affordability. Note that MH affordability is in line as a percentage of income, except when utilities are considered. MH utilities are comparable to conventional, but higher per square foot, and higher as a percent of overall cost.

Renters typically have lower income, can't afford to buy, and pay burdensome rent:

<b>Rented Homes</b>	<b>Conventional Homes Median</b>	<b>Conventional "New" Homes Median</b>	<b>Manufactured Homes Median</b>
Household Income	\$28,000	\$36,000	\$22,000
Monthly Rent	845	1,052	660
Property Insurance	16	17	17
Utilities	167	173	183
Cost Per Month	\$1,028	\$1,242	\$860
Base Percent	37%	35%	39%

The percentage of income paid by MH renters is high, but the monthly cost is low, and thus attractive to a broad range of prospects. Their low income precludes MH renters from buying, but that rental figure makes them attractive leasehold prospects.

It should be borne in mind that the costs for all these homes are based on median figures. The size, quality, location and age of the homes involved vary broadly.

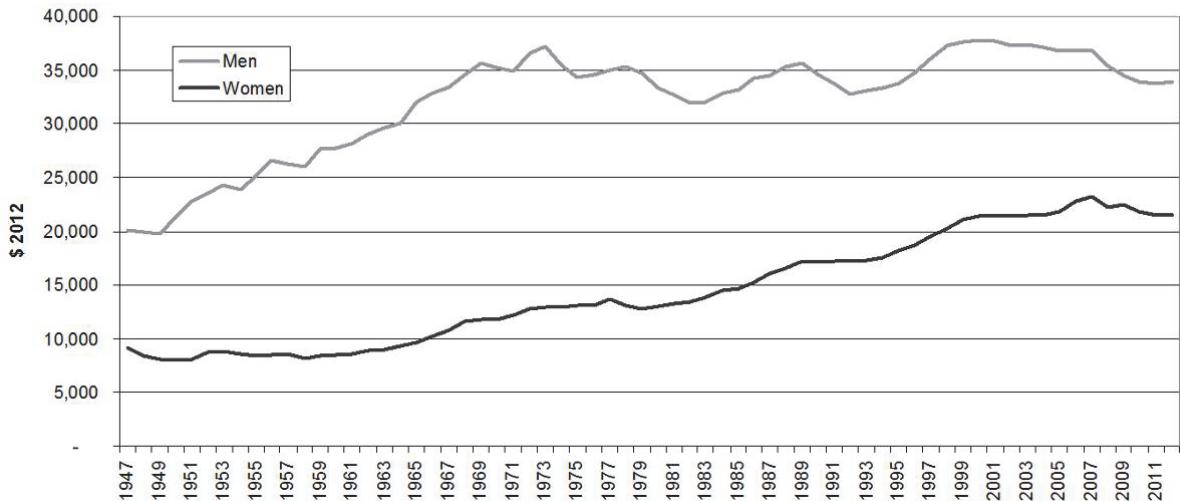
If manufactured homes are to be rented on more than an exceptional basis, the challenge is to work out arrangements that attract good long term tenants, and do so without disrupting the community's tranquility. Rental and owned homes often fail to mesh as a tranquil neighborhood.

Lease/purchase is currently demonstrating some usefulness as a means of creating happy leaseholders who make longer term tenants. Managed well, the resulting lower operating costs can provide enough equity to make lease/purchase work for all parties.

Let's look for statistically good tenants or leaseholders.



### Income by Gender

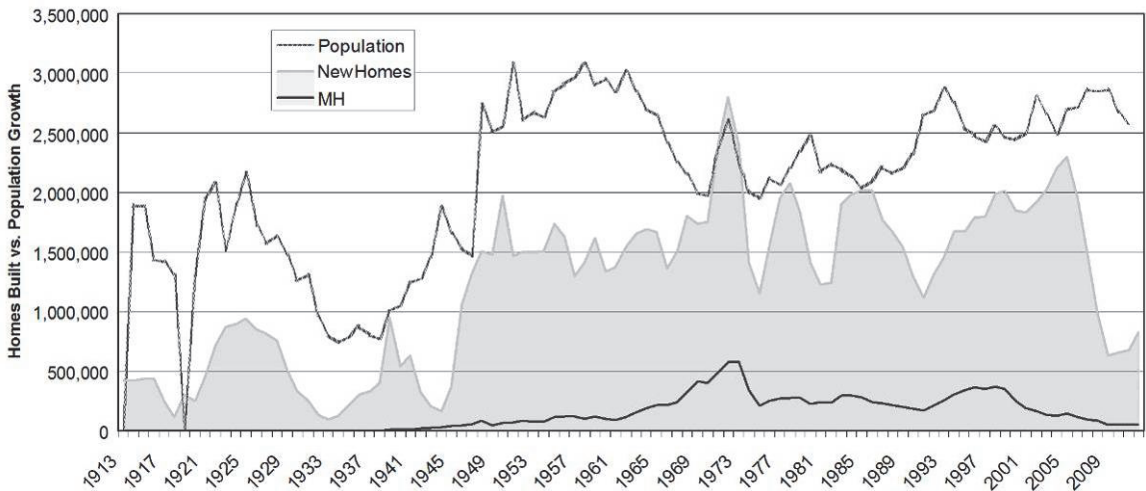


On average, men earn more than women, and the gap looks comparable back over the years, right? It's not. In 1947, earnings of women were 44 percent of men's. But men's earnings grew faster, so by 1973, women earned only a third as much as men. Remember women's lib? It worked. By 1984 women were back up to 44 percent and just kept climbing as men's earnings leveled off (all this in real dollars). Now women are up to 63 percent of men's earnings.

That graph is worth thinking about. No wonder men have their dauber down. Traditionally, they were the breadwinners and called the shots. Their earnings soared during the heady times of the housing boom. Now women are on a roll and constitute a new driving force in the market. As more and more women joined the work force and families could comfortably splurge on housing, they did. Single professional women should be a great MH market for small rented or leased, manufactured homes.

In the years ahead, niches will be increasingly important. Consider the following graph:

### The Very Long-Term View



This is a different look at the graph from Page Three. It puts housing growth in a rough context with population growth. Over that period of time, annual growth in population averaged 2.4 times homes built (the lower gray area, with the black line indicating MH shipments). You might say each 2.4 people added to the population require another house. That lump in the middle of the population line represents the Baby Boom. A huge new demand that builders pulled out all the stops to fill, and could not, creating a wonderful market for manufactured housing. Just as production finally got geared up in the early seventies, the boomer demand was approximately sated, along with the housing and finance muddles cited in Chapter Five. Ouch. Then population resumed moderate growth with smaller families and all builders, plus government, turning handsprings to "satisfy" growth that was below normal, building houses that were too big and too expensive, financed by too much debt.

Mason Doan, a long-time economist with FHA and HUD analyzed all this in a fascinating little book.<sup>80</sup> He noted the years between 1957 and 1969 were the most productive housing era in our history since 1880. That was also a time when population growth slowed from 2.6 percent per year to 1.4. Legal and illegal immigration accounts for a lot of the population increase, but recent immigrants probably don't buy many homes. So, where did all those houses go?

Doan estimated household formation was up by about a third due to smaller households, immigrants, retired people and "kids" itching to get a place of their own. "Normal" husband/wife families, he found, went from 75 percent of the total down to 54 percent. Single person households approximately doubled as a percent, and they are financially biased toward renting. Many of those small households are headed by professional women who can't afford a house but have a yearning for an alternate to apartment living. Their options are few, especially if they have kids, and many do.

Yet builders keep slapping up those great big houses. It's a cultural trend apparently driven by poor economic perceptions. With rising incomes, few kids and working couples, suburbia blossomed, with population on the fringes of cities exceeding that of the core by 1980. Another major exodus from the industrial heartland was to the South and West, a major continuing trend, with a majority of the American population now living in those areas. Those who moved were able to spend, if not afford, the low cost of gaining "ownership" and commensurate debt. They grabbed at the American dream.

With building sites scarce, builders used available land to enhance the quality, amenities, price and size of the new homes they built. Much of the nation's growth in GDP was expended on building ever larger and more luxurious housing to fulfill expectations of continuing boom times.

All this was largely financed by enthusiastic borrowing, with residential mortgage debt growing from \$114 billion in 1956 to three trillion in 1990. Doan said, "This is a very large increase in the extent to which housing is leveraged and thus seriously vulnerable to disinflation." And from there it blossomed to a peak of more than *14 trillion by 2009*, before moderating a bit. Finding all that money was a challenge, largely met by wild and wonderful packaging of securities deemed very safe (as mortgages had been for so long), which were packaged and sold worldwide.

In 1890, Doan noted, only 28 percent of owner-occupied non-farm homes were mortgaged, and the ratio of mortgage debt to disposable personal income was about 25 percent. Half of those loans were provided by individuals and the other half by small banks, S&Ls and the like. By 1990, the leverage ratio was 71 percent.

Doan notes that the prime beneficiaries of government assistance have been the aged, middle class and upper classes, while the poor remain in crappy housing. The cost of adequately housing them would be formidable—his estimate, \$10 billion annually, which does not include the homeless. For them there's "... no long run solution in sight."

After that wonderful era of housing production, why so much volatility in the market? Doan puts much of the blame on "... systemic departmental problems ..." at HUD, with "... effective administration ... almost totally lacking ..." leading to Congressional hearings, indictments and conviction of HUD officials. He asserts such problems continued at the time of his writing. In his opinion, pronounced fluctuations "... clearly have been due to specific political and economic events ...." All that from a department insider.

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<sup>80</sup> *American Housing Production 1880-2000: A Concise History* by Mason C. Doan, 1997.

It was Doan's 1997 opinion that the era of high production had "probably come to an end." He noted population growth continuing to slow and baby boomers approaching middle age. He saw government's role declining and suggested "... the housing industry could easily meet the requirements of ongoing demand." Apparently he didn't reckon with the extremes to which creative financing and activist government would go to sustain the artificial housing boom in the decade after his book was published.

Doan was not a big fan of stick builders, but credited them with most of the success in cranking out homes despite "... sustained criticism for backwardness, excessive cost, and fragmentation." Given their constraints, they accomplished "... all that could reasonably be expected..." He noted federal efforts to industrialize housing had gone nowhere and "... mobile homes remained the principal industrialized housing product."

During the "high growth" era (1956 to 1974), MH production went from 7.6 percent of the total housing market to 24 percent. Annual MH production nearly quintupled, while stick production increased some 20 percent. It was that period of relatively steady markets that provided the basis for the MH learning curve to work its magic. Those hoping for a return to such growth and market penetration for manufactured housing will need to find a very potent strategy.

**I**n the light of all these many pages of harping on the problems, let's return to the questions raised on Page Three. The responses are the author's conclusions, which are (and should be), debatable:

- *Why does home building no longer track GDP growth?* National expansion stopped and like other nations, we choose to build housing for the ages rather than changing needs.
- *Why did home construction triple after WWII?* Pent up demand from The Great Depression, good times, an explosion of population and easy financing.
- *And then, why did housing demand still have room for a whole new industry, manufactured housing, to approach the total volume of the prewar stick builders?* In the postwar era, stick builders couldn't keep up with demand, priced themselves into a corner, and created a big opening for low cost alternatives.
- *Since housing now trails so far behind GDP, shouldn't there be a shortage?* Theoretically yes, but the high cost of new construction, approvals and land sparked an enormous renovation market, so homes rarely get replaced and poor people continue to live in slums.
- *If there is a shortage, why has home construction been so volatile?* There is no real shortage, and erratic artificial stimulus created a questionable market for the wrong kind of homes, exaggerating economic cycles.
- *How did the MH industry survive and thrive in early decades despite housing's volatility?* The good fortune of arising during a rare period of economic stability, providing a viable low cost alternative—more attractive than renting and lower cost than owning the stick choice.
- *After such a great start, why did the growth of the MH industry collapse into a pattern similar to that of conventional construction?* The fast-growing industry overbuilt; lost its market appeal and then sought refuge in risky financing and the hope of government help.
- *Why did the recent MH housing collapse precede that of the stick builders?* Government backed financing did not materialize and most chattel financing institutions lacked the staying power of the major institutions having deep pockets and government backing.

- *Given all that, including the most recent and biggest housing collapse, is the nation now faced with a shortage—or excess—of housing? A shortage of low cost housing and an excess of overpriced dwellings.*
- *Assuming a market for low cost homes, why has manufactured housing, the low cost producer, retreated to a shadow of its early success? A lack of suitable low cost land, too much emphasis on higher priced products, and a poor reputation.*

In her 1968 book, quoted at the opening of this chapter, Margaret Drury foresaw two possible paths toward the future of manufactured housing. “First, it can continue to move along the path of producing larger and larger units and aim for approval in the conventional housing market. If the industry follows this path, it is quite likely that in the future the mobile home unit, in the form we know it today, will disappear as a distinguishable form of housing.” This path, she suggested, would lead to bureaucratic strangulation, unless “... we could precipitate change in conventional controls ....”

The second path she envisioned was to continue to build mobile homes under their own regulations. Ditch the “shiny box” but “... innovate by using new materials, new designs, and new techniques of construction ....” She clearly favored the second path, suggesting “... it might be possible for the development in the United States of a major industrialized housing industry ... The industry can either let the advantage slip by unnoticed or it can capitalize on its advantage and bring about a complete industrial revolution in American housing.”

In the seventies, on the eve of a housing recession, the industry committed itself to the path of moving into the housing mainstream, adopting the HUD Standard in an attempt to “precipitate change in conventional controls.” Maybe that was the right choice, but it has not revolutionized American housing. Perhaps doing so is beyond the reach of the manufactured housing industry that started out so promising a few decades ago. Perhaps “revolution,” like “breakthrough,” is simply not in the cards for the housing industry, bogged down in bureaucratic momentum of historic proportions. Perhaps dogged pursuit of the current path is the best option.

Yet something must be wrong when essentially everyone agrees that housing should be industrialized, and that the cost of housing is too darned high, and that our poor are housed disgracefully ... and our efficient manufactured housing industry is in the dumps.

The revolution Drury hoped for has not materialized. Traditional construction and design retains its stranglehold on housing progress.

The good news is, manufactured housing largely held onto its cost advantage and is in a position to capitalize on the accomplishments it has made to-date. Manufacturers hold a trump card—the ability to produce the good, low cost housing the market needs and wants. Opportunities abound to seize that card, innovate and use it to create a new market-based learning curve.

The game is very much on the table, and it’s our move.

*Management is doing things right; leadership is doing the right things.*

*Peter Drucker*

# 13 Leadership: Setting the Course

During the formative years, some giants of the industry emerged and left their mark. Art Decio, Elmer Frey, John Crean, Ed Hussey, Wilbur Schult, Bob Richardson and the list goes on. Some leaders built great and profitable companies, some pioneered innovations, some launched industry trends and more. They all focused on leading their companies and did a fine job, but who has truly led the way in industrialized housing—or the housing industry in general? Guys like Steve Jobs and Bill Gates could and did exercise leadership in their industry. In housing, manufactured or otherwise, that kind of leadership has not happened—has not been possible due to the industry’s fragmentation.

When asked to write this book, I declined, saying, “Hey, nice fight guys, but where’s the future?” Two facts changed my mind.

1. **The Competitive Edge Holds**

I was surprised to find the MH production cost advantage has actually *improved continuously* over the years, in spite of truly formidable opposition and having taken on the giant housing industry with little more than determination to make a buck in an interesting new industry.

2. **Industry Leadership is Finally Possible**

A few relatively large MH companies have come to dominate the field of manufactured housing, are profitable, and are in a position to take charge and lead the MH industry out of the woods. From there, the potential is breathtaking.

Previous chapters have explored how the MH industry developed its ability to produce housing at unbeatable prices. The fact that it was done at all owes primarily to the advantages of factory production, learning curve and floundering competition from the guys banging houses together in the dirt. The housing industry has to be a real mess, when a couple of hundred ever-changing little companies operating out of steel sheds can out-produce and undercut housing giants while facing opposition from all quarters. Way to go, mobe guys!

None, however, was in a position to exercise the kind of leadership so badly needed by the industry, mainly because the MH field has been nearly as fragmented as the rest of the housing industry. The entire housing field is leaderless.

Great leadership can arise anywhere anytime, but only results in fundamental change when the leader in question has the ability, respect and vision to bring most of the players together, working toward a common and well defined goal. Stephen Ambrose wrote many books about history and leadership. *The Victors* focused on Eisenhower's role in World War II. Speaking of leadership Ambrose says:

*Someone had to give the bureaucracies direction; someone had to be able to take all the information they gathered, make sense out of it, and impose order on it; someone had to make certain that each part meshed into the whole; someone had to decide; someone had to take responsibility and act. It all came down to Eisenhower.<sup>81</sup>*

Back in the seventies, the largest MH company, Skyline, held about ten percent of the market—the top three companies, about 25 percent. Those “Giants of the Industry” each owned and operated a string of relatively small factories scattered across the nation. Each of those factories was in stiff competition with locally strong small companies, and all were dependent upon a supplier network that worked for everybody, along with thousands of dealers, most of whom owed allegiance to no one. That diversity made for heady competition, but provided a poor forum for the emergence of industry leadership.

The only universal goal was price. Get the price/value formula right and the profits rolled in. Get it wrong ... you're toast. Much of the innovation was left to smaller companies like Marshfield, dependent upon creating a point of difference because they could not compete on pure price. The big companies pioneered at considerable risk because if the product didn't click—even at one or two of their plants—market share could be hammered in that region. Pioneers get arrows in their butt, and all that. Want to play safe? Build a good standard mope at a price that's tough to match.

“My original plan was to build homes that were nothing like the competition,” said Jim Clayton, “... I quickly found out how difficult it would be to build homes that unique.”<sup>82</sup> He went on to explain how the industry is interdependent and relies on a high degree of standardization to attain its efficiency.

It has always been hard for any one company to truly break out of that self-reinforcing pattern. The only clear road to success was to play the price game so well as to eventually dominate one regional market after the other. The bigger and better companies scored, making good profits and avoiding killer price wars, yet bringing the prices steadily downward as compared to the flabby stick competition.

In the broader picture though, the whole industry played a risky niche strategy laced with stigma potential. Starting from an extremely small niche—house trailers—that itself originally competed largely on price, the older manufactured homes' success was built upon niche details such as small size, freedom from real estate tax, escape from codes, zoning and so forth. That niche strategy reached a point where the product was competitive with stick houses on a square foot basis. Inch-by-inch, square foot-by-square foot, learning curve produced a unique housing value that was and is very hard to beat, dollar-for-dollar. But the manufactured homes that resulted became poor cousins, seeking a seat below the salt.

It was much the same game played by automakers from Germany and Japan who niched their way around mighty Detroit—except the winning foreigners had clearly superior quality.

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<sup>81</sup> *The Victors*, Stephen Ambrose, 1998.

<sup>82</sup> *First a Dream*, Jim Clayton, 2002.

Company leadership often blossoms in trying times, leveraging up from niche markets. The following example shows how leadership can overcome overwhelming odds, and make a decent stab at industry leadership, albeit it in a small foreign market.

In 1969, a small Canadian builder was bleeding cash, building a very unique plastic house that was laying a goose egg in the market. Jack Fraser, inexperienced new CEO of Northwest Design and Fabrication, was desperate. Observing U.S. housing from a distance, he wondered if the American mobile home phenomenon could be duplicated in his country. True, there were already MH manufacturers up there, but they looked like amateur night compared to the Americans. He already had a nice factory in Winnipeg, smack in the middle of Canada, though its unique product was a fiasco. The Canadian housing market also resists innovation. Few buyers want an “odd” house.

Dumping the plastic house in exchange for a tax write-off, Jack convinced his financial backers to loan the capital needed to retool for mobile home production. Knowing nothing about such products, he hired the best professionals he could find in Canada and set them to the task. In short order, the factory was converted, mobile homes were spitting out the door and being delivered far and near. Within a couple of years the company, renamed Norfab, was the largest of the six Manitoba MH producers.

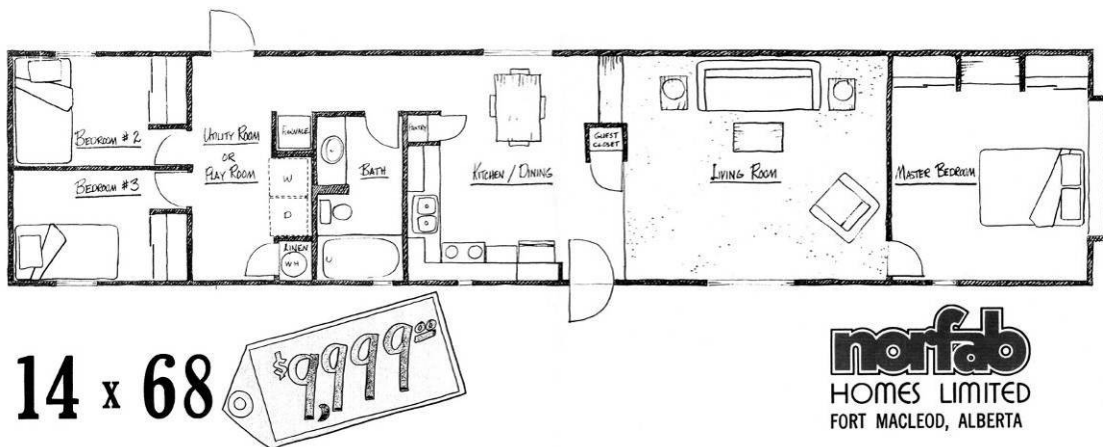
And the market was saturated. It’s a small province, population-wise, and Canadians had never been able to compete with American MH producers despite shipping, import and exchange rate advantages. (MH materials, for example, cost a third more in Canada at that time.) Norfab was profitable despite operating entirely on borrowed money in a very limited market. What to do for an encore? Jack needed growth to keep his team challenged.

With provincial government help, an American consulting firm was hired to determine what Manitoba’s MH future potential might be. “Gloomy,” said the Yanks, “best thing would be if half the current factories closed their doors.”

Norfab held half that province’s market. Jack closed shop in Manitoba and hired Americans to design a state-of-the-art plant in Alberta, Canada’s largest and best market at the time. The consultants introduced Jack to the use of learning curve to gain competitive advantage. Other American pros were hired to operate the new plant, and it quickly became profitable. American marketing consultants were engaged to find the best location for a second plant; Quebec. A plant was soon opened and profitable there, with Jack Fraser personally directing a team of French Canadians. Though he spoke no French, Jack had the entrepreneurial fire in his belly.

This was happening at a time when the Canadian MH market growth was slowing, and Norfab was still a bit player, up against more than two dozen Canadian competitors, most of them larger and many long established. There were also new and used American imports at unbeatable prices. Jack’s strategy was simple. He moved heaven and earth to snag Bob Phinney, one of Canada’s best and most experienced sales managers, whom he complemented with his American production team who knew manufacturing. Great effort was expended on creating a fast learning curve, riding the coattails of American innovation. Jack recalls, “... we were able to get the Fort McLeod plant cranked up to four mobile homes per day ... and no matter how many we produced, he [Bob Phinney] could sell more ...” A similar strategy was nicely under way in Quebec. Though a relatively new and small company, Norfab’s products offered the best value in Canada.

In 1973, MH output soared to record levels in both the U.S. and Canada. By 1974 though, the bottom had fallen out of the American MH market while Canada’s remained strong—until mid-year.



Faced with a dreadful second half, Jack's team created a line of new products in four weeks. With a price reduction of ten percent, Norfab offered the lowest priced mobile homes in Canada. The new line had no compromise on quality, held the profit margin, sold well, and Norfab finished the year on budget, with solid profits.

As Norfab sales held and competitors slumped, Jack's little company became one of the top five MH producers in Canada. The largest was Commodore, a division of Commodore in the States.

One day Jack gathered his senior management team in a Montreal hotel room and said, "Commodore is in Chapter 11 because of the American market crisis. The bank would like to dump their five Canadian plants, and I believe we could snap them up at a fire-sale price. Shall we go for it?"

The team gulped twice and saluted. Years later Jack said, "I never lacked guts!"

There were a couple of hitches. First, Norfab had no money (!) and second, the Canadian market was declining (!!). The team had mixed opinions on the crucial question of market outlook, so a leading Canadian market research firm was engaged to make a forecast. "Reasonably positive," came the thick and expensive report's bottom line, laced with the usual "weasel words." Given the quality of the deal, plus Norfab's good reputation (and his own), Jack was able to borrow the money and the deal was done at a purchase price about equal to the value of the land and buildings. Norfab and Commodore Canada were merged, redundant plants were sold, the company was renamed Norcom, the Commodore products were quickly redesigned, and new management was placed in weak operations.

Norcom emerged as the largest MH producer in Canada.

Whoops. The forecasted market recovery did not materialize. There was no recovery. The shallow decline became a deep one. As President of the Canadian Manufactured Housing Institute (CMHI), Jack gathered the heads of the industry seeking a way forward. A consensus was reached that Canadian mobile homes simply didn't have enough price advantage to overcome the burden of chattel financing. "If we could get CMHC approval,<sup>83</sup> the industry would soon be back on its feet."

Jack took one of Norcom's homes to Ottawa, parked it on the lawn of CMHC, and opened it to the public. He cornered the Minister of Housing in that home, extolling the virtues of manufactured housing. With solid backing from the industry and a stream of public traffic gushing over the home on CMHC's lawn (and loving its price!) the sale

<sup>83</sup> Central Mortgage and Housing Corporation, comparable to HUD.



was not too difficult. A deal was done, conditional on meeting the performance requirements of Canada's national housing code; something never before attempted.

Jack sent his CMHI technical advisors (mostly Norcom employees) to meet with CMHC's technical people. Within 18 months, the CMHI's existing performance code had been upgraded and accepted nationwide by CMHC, utilizing the Canadian Standards Association (CSA) certification process already in place. Heat loss was cut in half and many other upgrades accepted. An estimated cost increase of nine percent in prices resulted—a fraction of the cost involved in complying with CMHC's specification code. When all was said and done, Norcom's own certification compliance added less than two percent to that company's lowest priced products.



At left, the Commodore MH parked on the lawn in Ottawa, being checked out by building officials and the public. Right, Bill Teron, Chairman, CMHC; Ray Hession, President, CMHC; and right; Jack Fraser, President of CMHI and CEO of Norcom Homes makes the industry's case.

There were, of course, a few snags. Details. Attainment of long term finance required the homes to be suitably anchored to a CMHC accepted lot, of which there were approximately none. And there was no readily apparent improvement to the product, from the consumer's viewpoint.

And the market's dive continued. Down 26 percent in 1975, 14 percent in '76, 33 percent in '77 and 40 percent in 1978.

Financing was indeed a problem, but was not *the* problem. Of larger issues there were four:

### **AHOP**

At about that same time, the "Assisted Home Ownership Plan" was introduced by the Canadian government to help first-time home buyers purchase stick built, but not manufactured homes.

### **Zoning**

Canadians are tolerant people, but they have no more love of mobile homes than do Americans. Once things started going sour, the welcome that had hardly been extended was withdrawn. Mobile homes were not wanted by communities; never mind what CMHC had to say on the matter.

### **Price**

The Canadian industry was following the American path, battling for market share based primarily on price. Unlike the American industry though, the Canadians had a weak and scattered supplier network. Neither material prices nor inventory turns could be accomplished at levels comparable to those south of the border. The MH cost advantage was about half that found in the States.

## Learning Curve

The Canadian industry was early in its learning curve and had little grasp of its potential. Jack Fraser understood the concept and, as the Japanese did with automobiles, piggybacked on the American experience. That's how Norcom stole a march on its Canadian competition—but learning takes time. Jack, Norcom and the Canadian industry ran out of time.

Sales of mobile homes, which had represented about 20 percent of Canadian single family housing starts, almost disappeared. Norcom diversified into sectional homes, building MH communities and recreational vehicles, but those were small operations and had limited impact. Nearly all Canadian MH producers went out of business, including Norcom.<sup>84</sup> These days a few Canadian producers struggle on, primarily building modulars and products for very small MH niches.

Timing, they say, is everything, and the Canadian MH industry missed that great post-war opportunity to build its learning curve. An equally good case can be made that *leadership* is everything. The right combination of the two makes history.

**D**oes this story sound a wee bit familiar? A synopsis of the American MH industry in a nutshell. Just a decade, start to finish. While it shows what leadership can accomplish, it also summarizes the challenges involved.

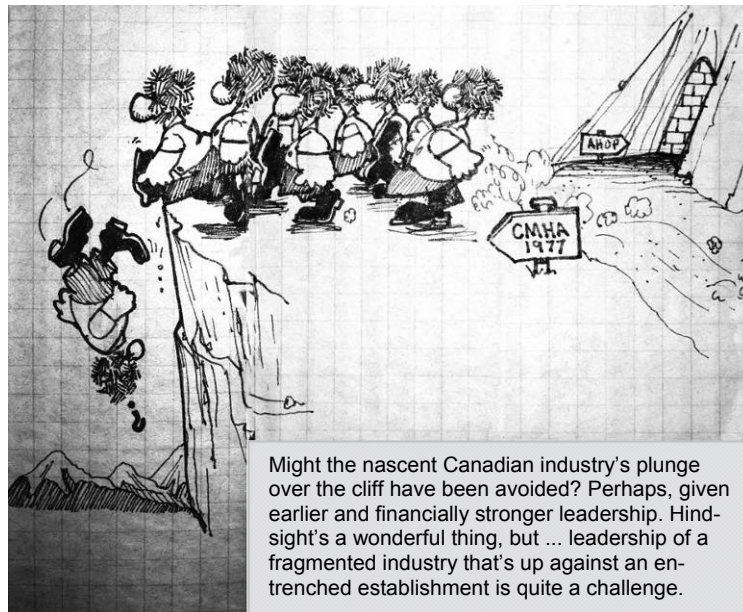
Could the Canadian industry have been led to a better outcome? More to the point, what about the American industry that now finds itself in similar straits, market-wise. Do current market conditions spell doom or opportunity? Best not count on luck. Sound industry leadership is the best bet for finding a successful way forward toward the real potential of manufactured housing.

The Norcom story illustrates what a well led and tightly focused team can accomplish in a niche market—and the risks of betting the ranch, in any kind of business. Especially if highly leveraged. It takes good business judgment to know when to go for the gusto ... and when to duck for cover. Leadership makes the difference.

Yes, Norcom failed. If Jack Fraser's company'd had a solid balance sheet and Jack more experience, he might have pulled it off. Even without the Commodore deal, Norfab was destined to fail, and it's unlikely that any alternative approach Jack might have initiated could have saved it. Businesses are subject to the vagaries of market forces.

As for those "unlucky" investors who backed Jack Fraser, they came out OK. They lost most of the money they'd put up, but had enough faith in

Jack to back his next venture, and their confidence paid off handsomely. And the team Jack built to run that failed Canadian MH company? As far as is known, they all went



Might the nascent Canadian industry's plunge over the cliff have been avoided? Perhaps, given earlier and financially stronger leadership. hindsight's a wonderful thing, but ... leadership of a fragmented industry that's up against an entrenched establishment is quite a challenge.

<sup>84</sup> The story is summarized from *A Life in Business*, by Jack Fraser, 2010.

on to bigger and better things, and Jack retained their support and respect. Had he not taken on such challenges, Jack Fraser might have finished his career running a store in Winnipeg rather than serving as Chairman of the Board of Air Canada.

There have been lots of “Jack Fraser” equivalents in this country. They led the fledgling MH industry to heights of success and profitability that were legendary on Wall Street, and did it in the bureaucratized and stodgy housing industry, battling out ultra-low-cost homes from cheap and simple factories.

One major lesson from the past. The days of the one-man entrepreneurial leader starting from scratch are dwindling. Once, a fellow like Bob DeRose, with his family pitching in, could launch a little operation in a shed and build it into a successful public company, just as Art Decio and so many others did. The formula had been proven to work. So should each remaining manufacturer just roll up its sleeves and give the old formula another spin? Or try something new?

The leadership potential has long been abundant. But leadership of a company and leadership of an industry are quite different matters. Industry leaders can lead by example, by commanding respect or force of will, but they can’t call the shots. Leadership direction has to be clear enough, and important enough, that the major players choose to follow. They’re much less likely to follow a bit player, whose success is likely to be attributed to luck or addressing a unique niche.

The industry’s learning curve has flattened, but there’s no reason a new one can’t be launched. It’s what great leaders do. A real leader sets his or her company apart from the pack, not by superb management skills but by inspired leadership. Demonstrating a good direction so clearly that others just naturally climb aboard.

Because so many MH companies have left the arena, the remaining few are now at center stage, and some appear to be strong. So what’s the game to be? Continue to beat each other bloody stretching to reach that last dollar, fuss around with long-standing problems that have never been resolved, or launch a bold direction that takes the housing industry by storm?

Alfred Sloan, the great leader who brought GM to the top, once said, “There has to be this pioneer, the individual who has the courage, the ambition to overcome the obstacles that always develop when one tries to do something worthwhile, especially when it is new and different.” Bob DeRose and others did make sincere efforts at innovation and got the arrows to prove it.

Neither Alfred Sloan, Henry Ford or any other industry leader had any crystal ball to provide the key insight that could assuredly define the future of the automobile business. Typically, such insights only become evident later on, from a historical perspective. Some day in the future mobe folks (or whatever they come to be called), will look back and see where the MH industry found—or lost—the critical path forward. If the right path is found, those historians will almost certainly point to one person who made the key difference to the industry’s success. That’s who’s needed ... ASAP.

So, who *will* choose the way forward and take the lead to make it happen? That’s not for this author to say. I’m over the hill and out of touch.

One thing is certain. Some fine MH companies have fallen by the wayside, victims of ill fortune, hard times, poor management or whatever. Only the strong survive. Some 50 companies with a hundred or so factories are still operating. Some of those are hanging on by strong fingernails and sheer persistence, hoping for a market comeback.

There are three obvious and strong candidates in key positions to carry the torch. Further, there are hundreds—thousands—of bright people in the trenches who are likely to see the industry’s challenges more clearly than old timers like myself. With a little luck and a lot of effort, any one of them could whisper in the right ears at this critical time

and start the ball rolling in an opportune direction. Leadership often emerges from unlikely places.

There is never a single right or wrong way forward, nor are the best strategies apparent. The right direction will probably emerge from the circumstances in which the industry's ultimate leader finds him or herself. Options and opportunities abound, as they always have. No single vision dominated the past and that's one reason the industry has lacked a united front in its assault on the housing market. Now's the time to unite behind one powerful leader who has a sound vision and plan, plus the ability to unite the industry.

While the MH industry has been able to agree upon some *actions*, industry *direction* has remained foggy; strategy unclear—lacking the vision needed to pull the industry together and resolve fundamental problems. The MH stigma springs to mind as a problem in great need of an industry strategy. Jack Fraser and those other Canadians urging the “CMHC Solution” tell of one that did not work. Nor has the HUD strategy in this country shown much promise. That doesn't mean they were bad ideas. Think *inadequate to the challenge*. Those may or not have been excellent tactics, but they were more like crisis management than fundamental solutions. The challenge of leadership is to define and articulate a sound goal and see it through to attainment. Strategies and tactics will succeed and fail, but leaders press on to the goal.

Some might suggest industry leadership should fall to industry associations such as MHI. Maybe. More typically though, especially in entrepreneurial fields, real leadership comes from the well advised CEO of a major company active in the industry. An executive having the vision to see opportunities, who is able to assemble workable strategies and has the moxie to bring the majority of industry participants to the table and forge a strong and enduring consensus on where the heck we're going and how to get there. Associations can provide a forum for discussion and greatly assist in facilitating what's agreed upon, but leadership is vital.

Alfred Sloan also said, “If we are all in agreement on the decision—then I propose we postpone further discussion of this matter until our next meeting to give ourselves time to develop some understanding of what the decision is about.”

As this is being written, I've not had the opportunity to meet the guys who head the major MH companies. Perhaps a good thing. Either such leadership potential exists or it doesn't, and who am I to judge? From this perspective though, it seems most likely to reside in one of three places—the three major companies that now dominate the industry, accounting for some 80 percent of sales volume.

## **Champion**

One of the oldest MH companies around, Champion has participated in practically every aspect of MH and RV business. In the process it has enjoyed notable successes and suffered plenty of setbacks. Persistence has been a hallmark. Champion builds HUD homes, modulars and park models, serving most regions of the nation. Long known for price leadership, they also led in development of such innovations as production drywall installation.

In 2010, Champion emerged from bankruptcy, substantially refinanced and under management that's new to the industry. Jack Lawless, an “outsider,” has done a remarkable job in the past few years. That outside perspective can be a great strength or a serious weakness. As noted in Chapter Two, in Richardson's last days, “outside” experts managed to blow a fine MH company into the weeds in short order. All industries have their idiosyncrasies requiring special expertise, but MH ... perhaps more than most. Manufactured housing has typically run more on gut feel than scientific management. Success calls for an intricate dance between manufacturer, supplier and retailer, and margins are thin. Brilliant moves can pay off quickly ... or send a company right down the tubes.

This industry's interdependence can stifle innovation. Yet fresh eyes can lead to a clear vision of the best path forward, and if that vision is inspiring, could find an abundance of followers. A new outlook is badly needed, and who better to provide it than Lawless? As noted previously, a new guy in the person of Jack Fraser jumped in from outside and quickly led his little company to the top of Canada's small MH industry. A new perspective can often sort the forest from the trees and chart a good path that works—or miss the obvious. There have been plenty of examples of both in the MH industry—and at Champion. Too often, the promising new path turns out to be a dead end, as happened in Canada. A strong voice alone is not enough. The direction chosen has to be viable for both the short and long term—for the industry and the company.

In addition to new leadership, Champion has a cadre of proven veterans. Being smallest of the “big three” needn't be a handicap. The risks are higher of course, but the rewards can be mighty. Entrepreneurial spirit has always been the hallmark of this industry.

### **Cavco**

This company seems a clear example of leadership over the short and long term. The CEO, Joe Stegmayer, is a seasoned MH veteran with a proven record in leading industry companies over the years. He has fought the battle for acceptance of manufactured homes on many fronts and has a solid grip on industry fundamentals. He was able to take Cavco, a relatively minor player spun off by Centex Homes, and turn it into a publicly held MH giant in less than a decade. He did it in the worst decade in industry memory, and emerged profitable.

Cavco is now comprised of its own brand, as well as Palm Harbor (acquired in 2011), and recently, the MH operations of Fleetwood. These are solid and proven companies building a full range of MH products, from park models to modulars. Cavco is financially strong in this down market, with lots of spare manufacturing capacity.

Cavco and Palm Harbor are up-market products, while Fleetwood is concentrated in the popular price range. Operating nationally, Cavco is focused on the best MH markets in the South and Southwest. The company has a financing arm involved in retail and wholesale financing, as well as insurance. The Cavco division also has some retail sales facilities. Though relatively small, these operations keep Cavco in touch with the markets for its products.

Cavco's operations have a history of design orientation, are well liked by consumers and have won lots of awards.

With outstanding people and sound operations assembled and well positioned, Cavco is in a good position to lead the industry forward toward its potential.

### **Clayton**

Many MH companies have tried their hand at operating their own retail chains. Clayton's *foundation* is in retail. They expanded into manufacturing both HUD and modular homes, as well as MH communities, insurance and finance. Clayton made a success of all and has become the giant of manufactured housing, sometimes called the “Walmart of the industry.” Owned by Berkshire Hathaway, it's now the nation's largest home builder. Warren Buffet does not list Clayton among his manufacturing companies, but as a “financial” operation. No flies on Buffet. He recognized that Clayton's ability to find the right customers, sites and financing for its MH products was key to the company's success. With the acquisition, Berkshire Hathaway's very deep pockets enable Clayton to finance any retail deal that makes sense. Clayton carries some \$14 billion dollars worth of mortgages, mostly on manufactured homes—perhaps a million or so of them. With broad experience handling total responsibility for the product from nailing boards to collecting rent and payments, it has always been in Clayton's best interests to

sweat the details. The company's experience in retail finance may well be its greatest strength, and one the industry badly needs.

How did Clayton accomplish so much? Read Jim Clayton's book for much of the story, but in short form, *learning curve*.

*Our competitors wanted the margins, the loyal distribution, the dependable finance source, and the cash flow. Their shareholders demanded this. We made it look so easy. What they did not know was that developing expertise in manufacturing, retailing, lending, insurance and communities (real estate) is very hard for any company to accomplish. However, to integrate the distinctive cultures normally found within these disciplines, if even possible, will take years. I believe it is completely impossible unless the organization is very small.*<sup>85</sup>

What? *Very small*? It's easy to forget that Jim Clayton did indeed start very small. He was a retailer, and like so many who'd not experienced the manufacturing side, figured he could do it better. He gave it a spin and made the usual mistakes. Clayton's first prototype was too big for the door of the rented factory building. He envisioned glorious new designs that proved impossible to build given the constraints that make economic production possible. "That's why," he said, "today, a Chevy looks much like a Ford."

By 1964, Clayton entered the "big time" with annual sales of \$2 million. By 1980, net income had reached nearly a million. And 35 years later, net income reached \$155 million, doubling about eight times, with never a year of declining profits. Similarly, the Clayton mortgage portfolio doubled about eight times since 1985 and remained profitable right through the housing crisis. Those are big and impressive numbers. The sort of thing that catches Warren Buffett's attention and admiration.

Learning curve. Starting with nothing but a guitar and hankering for a musical career, Jim found he had sales talent, and he built on it. One step at a time. Used cars, new cars, rebuilt mobile homes, new ones and on and on. Even the music came in handy as a promotional tool.

Since Jim Clayton retired, his son Kevin has taken the helm and steered a steady course, right through the housing crisis.

Clayton is in a position to exercise real leadership. Competent and experienced in all aspects of the business, Clayton and Berkshire Hathaway have placed the biggest bet of all on the industry's future. Backed by Buffett's deep pockets and patient long term focus, Clayton has the resources and experience to truly become the leader of the whole housing industry in the years ahead. There's a lot of work to be done.

All three of these companies are experienced in the major areas of manufactured housing across the nation. Together, they dominate today's diminished MH market. They build homes representing the low to high ends of the market in a huge variety of floor plans, designs and features. All build good products and have good reputations.

Each of the three probably has the ability to go it alone, and might even create a tide that lifts all boats. Ideally though, the three should move toward an industry consensus potent enough to pull in most of the competitors as well as suppliers, retailers and financing institutions. The sort of issues to be confronted and perhaps resolved, given time:

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<sup>85</sup> *FIRST A DREAM*, Jim Clayton, with Bill Retherford, 2002.

1. Make quality the priority, forswearing shoddy products, practices and price wars.
2. Stand behind all products, going the extra mile to keep owners happy.
3. Avoid price wars among suppliers that encourage shaving quality of materials.
4. Share “secrets” of learning curve development that contribute to industry efficiency.
5. Encourage the development of new materials and methods by providing assured markets that make research pay off for both manufacturers and suppliers.
6. Enforce good financing practices at both dealer and consumer levels.
7. Build products suitable for sustaining home replacements in aging communities.
8. Improve systems of managing finished inventory at all levels to smooth business and seasonal cycles.
9. Work with HUD and the certifying agencies to assure sound performance standards are maintained while minimizing bureaucracy.
10. Welcome competition from smaller producers, respecting their vital role in innovation.
11. Lead industry associations in promoting the industry as a whole.
12. Create nationally recognized brand names and independent rating systems that give proper recognition to genuine housing value.

So ... agree on a dozen nifty ideas and clear sailing ahead? By no means. That’s just a list of tactical priorities. Just sound management. Agreement on “all of the above” is unlikely to happen and not good enough anyway. The industry remains volatile and arrayed against mighty forces, the biggest of which is the rest of the housing industry, where manufacturing has lost ground. The challenge is a bit like Midget Motors taking on Detroit. Meet ’em head-to-head and you’ll get squashed.

What’s needed is a unifying theme that addresses those tactical issues and encourages strong competition, based on each company’s major strengths. And that unifying theme needs to be summed up into a strategic plan—a rallying cry—that can enable manufacturers to become the dominant force in housing. Something potent enough to replace, and do as much for the industry, as the original unspoken battle cry of “More Mobe Per Dollar.” It has to be a lot better than that though, because the market opportunity is less clear, and less receptive.

There was a time when government, major home builders and huge corporate outsiders saw manufactured housing as the future. They watched with interest and encouraged MH progress. By and large, that’s no longer true. Too many let them down. Too many MH industry leaders focused their firepower on each other, scrambling for market share and propelled by the singular industry focus; building cost-effective housing. A concentration on price competition that led too many to overplay that trump card. Strong companies wiped out the weak in classic American free enterprise. Devil take the hindmost. But that cutthroat competition resulted in too many corners cut, and cost the industry a lot of respect.

Don’t knock it—that tight focus got the job done and created the cost advantage that’s the industry’s greatest asset. Fortunately, most manufacturers have now moved beyond that singular focus toward building better housing. Unfortunately, no new focus—no compelling industry direction—is in evidence.

While the MH industry is in tatters, the stick builders have been hammered as well, if that’s any consolation. And it should not be any cause for celebration. Those fellows are worthy competitors who have no factories to sustain and have learned to survive, if not

thrive, in a dysfunctional housing environment. They're under no big threat from manufactured housing. They hold the strong cards in a weak game.

They have a serious weakness though. Leadership is much harder for them to establish, and they've had a long time to try. Today, the largest housing producer in the nation is a manufacturer, Clayton, and other manufacturers have held that position in the past. Given a solid industry strategy and strong leadership, manufacturers of housing can seize the initiative and get on with leading housing out of the dark ages.

It's time to think big, but do so without abandoning the learning curve process that has brought us so far. A contradiction? No. The trick is to establish a worthy goal, and get to work on it. Take what Peter Drucker called "results oriented action." Set the goal, plan the execution, and then take consistent, incremental steps to get there.

*Leadership through learning curve.*



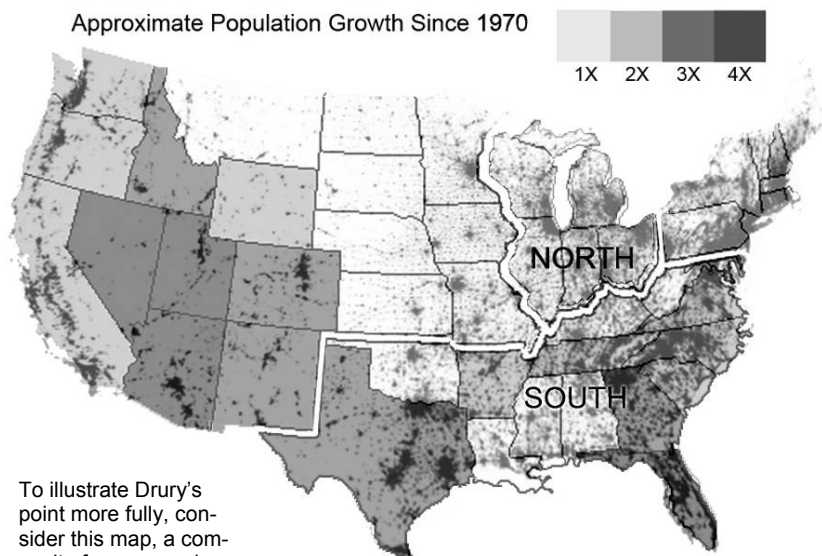
*Do not wait to strike 'til the iron is hot; but make it hot by striking.*  
*William Butler Yeats*

# 14 A Few Market Opportunities

Manufactured housing faces no end of challenges, and no end of opportunities. We've looked at a lot of problems, and they're grim enough to merit even more attention. The opportunities are greater yet and could comfortably fill a larger book. A book better written by younger minds in tune with the current situation on the ground. This chapter and the next will suggest just a few opportunities from various sources that may have some merit.

## Southern Strategy

The best MH market is low cost housing and the biggest market for low cost homes is the South. Areas where population density is low, growing fast, land is relatively cheap and MH ownership is less stigmatized than elsewhere. Four decades ago, Margaret Drury showed that MH market penetration increases with population growth and has an inverse relationship with population density.<sup>86</sup>



To illustrate Drury's point more fully, consider this map, a composite from several sources.

The lighter gray states are areas where population growth has been modest. States shaded darker—mostly Southern and Western—have grown at multiples up to four times that of the slower, mainly Northern, states. The blotches of shading depict the approximate density of the nation's current population. So, the fastest growing areas are in the South and West, with most of the North lagging. The Northeast has lots of people, but it is very concentrated, settled; and resistant to innovative housing.

<sup>86</sup> *Mobile Homes, The Unrecognized Revolution in American Housing*, Margaret Drury, 1972.

In 1960, Michigan and Indiana, where manufactured housing began, dominated the market, producing nearly half the nation’s output. That’s where the experts were and that East North Central Region (let’s just call it North) also hosted the largest chunk of the nation’s mobile home market—about 20 percent. Competition was fierce, since more than half the region’s output had to be shipped to other areas of the country. No single producer held a significant share of the national market and most were single-plant operations, thinly capitalized. Among the stronger players, the obvious question arose—what next?

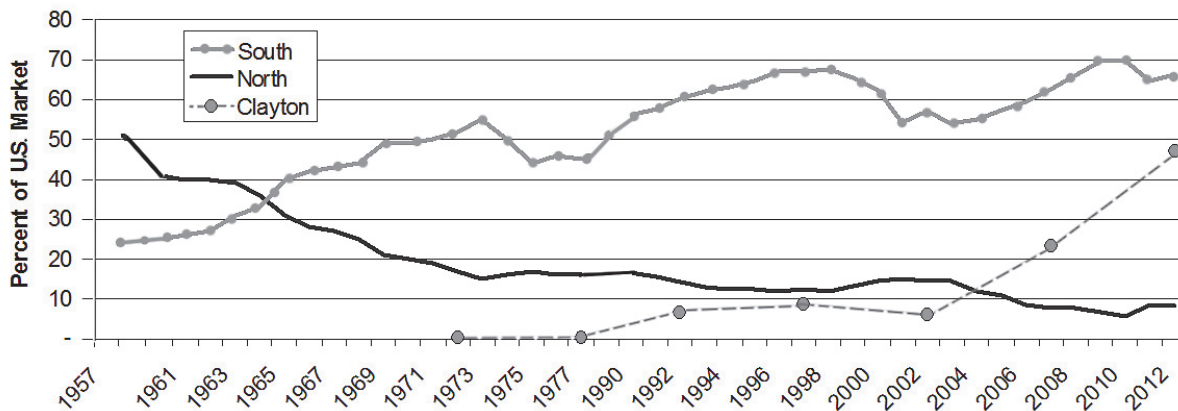
Richardson, as noted in Chapter Two, had been burned in an early branch plant attempt. Bob chose to bet the ranch on enhanced productivity from a single plant. Value analysis was the watchword and though they knew nothing of learning curve theory, the Richardson team practiced it diligently from the beginning. In the first five years of the sixties, that giant plant doubled its sales and profits, quadrupling its net worth. Bob built his own trucking fleet to deliver the homes, manufactured quality products at attractive prices and developed a national sales force. By 1964 a majority of Richardson’s dealers were more than 500 miles from Elkhart. Some major dealers were nearly twice that distance in four directions. Pretty slick, and Bob Richardson was justifiably proud of his company’s progress, as was his team. “Elkhart built” was a badge of honor through much of the nation.

Art Decio of Skyline, along with others having the financial and management ability to do so, pursued a similar market but with a different production approach, building or acquiring branch plants around the country. That turned out to be a more efficient and profitable strategy, leading Skyline to the top of the industry for many years.

That branch plant strategy drained production away from the home market to the point where current production in the North region approximately matches its own market area’s sales. In today’s diminished market, that region’s production is a tiny fraction of the output enjoyed in its heyday. Elkhart and many such Northern industrial towns are focusing on other business endeavors.

Clayton and others *originated* in the South and concentrated on products best suited for that large market.

**MH Production, North vs. South**



A general market pattern seems to have emerged; where conventional housing is most firmly established, resistance to new approaches is highest.

The South has a nice combination of relatively high density population, well scattered; combined with generally rapid growth. They need, and seem to appreciate, low cost manufactured housing. MH shipment records confirm a positive MH orientation, as does the relative success of the region’s manufacturers.

MH shipments to the East North Central region benefited modestly from the boom through 1972 while the South (the three southern regions combined) soared. Then all markets collapsed with the great housing debacle of the late seventies. The South took the hardest blow in numbers, but was more branch plant oriented. In the nineties, there was a substantial recovery in the South, while the North continued to bop along the bottom supported mostly by regional sales. How can a region get back on its feet after that? How, indeed, is the industry to recover from the kind of intermittent collapses experienced in recent years? Though the South was hardest hit, it has survived best. The major production, the major market and the best growth potential appears to be the South. The best place for volume production of high value manufactured homes.

### **Western Strategy**

Much of the West and Southwest are growing very fast despite low population density. As with the North Central Region, California had an early concentration of MH production. It was there (and in Florida) that the most advanced MH communities developed. Those areas also led in product development and design innovation. California, in particular, has since suffered from stagnation, similar to that of the North Central region. The innovative spirit seems to thrive best in the Southwest, which is also enjoying dramatic population growth. As in the South, the climate is favorable, site labor is available at reasonable cost, the people are willing to work, local regulation is tolerable and consumers tend to look favorably upon manufactured housing.

The West should continue to be the hotbed of MH innovation, both in terms of products and communities. A good place to try out new designs and marketing concepts.

### **Traditional Markets**

Northern and urban markets that approach MH saturation would seem a good place to develop a viable MH rental/lease strategy. Many (most?) rental manufactured homes seem to spring from happenstance. A home is traded in or repossessed, no buyer is available and the owner prefers rental income to none. This can be a workable interim strategy, but there are risks in such a random approach to the rental market, especially in an established MH community.

One of the charms of the MH lifestyle is neighborliness. Surveys have shown how well managed communities develop strong internal bonds; even stronger than in typical single family developments. This may be due to the higher density, the presence of a recreation center or just good management. It is, in any event, desirable both from the resident's view and that of the community's owner. Such "feel-good" neighborhood relations lead to long term residency, which reinforces the good will and minimizes management costs. The occasional rental home in such a situation should prove no problem but ... caution is in order.

The typical American family moves every five to seven years. Tenants move about three times as often. People may not know that highly variable statistic but they understand that tenants come and go, while owners hang around. So, if the rental ratio becomes noticeably high, neighborhood spirit may tumble and that's a bad thing. Further, older homes and repos may not be ideal rental units, especially if in poor condition. It's all too easy to accept the first tenant who comes along and has the deposit in hand. Managing rental manufactured homes is a different proposition from managing a "normal" MH community or even an apartment building because the ground rules are still under development.

MH rentals are climbing and now equal about 20 percent of all manufactured homes. Lots more people can afford to rent than can buy, and the market is wide open. Well managed MH communities targeted for rentals should have great potential. Renters often have a hard time finding a home that allows pets and kids, and especially any that

has its own yard. Ideally, MH rental units should be small, comparable in size to local apartments. Equip them with high density carpet (which can cost less and last longer than the fluffy stuff), upgraded hard surface floor coverings, etc. and install them on good foundations. Such homes can have a lifespan comparable to multifamily apartment buildings, if comparably maintained. And good maintenance makes happy tenants.

Right now there are thousands of vacant spaces in older MH communities built 50 years ago and fraying a bit at the edges. People who live in those communities generally choose to do so for economic reasons. The lowest cost option for filling those vacancies is used mobile homes and that's a great choice. But manufactured homes have swollen in size to the point where many used models won't fit the available spaces. Further, potential buyers who choose to live in places the broader community defines as squalor are unlikely to win favorable finance.

Small singles can fit well into those older sites and are low in cost. Site rental tends to be low, further increasing customer value. And those old parks are often close to employment opportunities. Once secured on the site for a few years, the value of these homes will increase as vacant spaces again become scarce. So will the perception of their communities. Such increases will chip away at the "depreciation" myth. Make them attractive and they'll dilute the prevailing stigma.

So ... two options for played out markets. As vacancies occur, fill each spot with a small new or used MH and sell it. Or as an alternative, convert the whole park to rental or lease, one space at a time as vacancies arise.

Rural rentals can also provide a great housing option for both land owner and tenant. Grandma does not need a lot of room, and the city council often looks favorably on that sort of low cost housing. The rental market is generally more focused on location and monthly cost than square footage, and the stigma is not as much of a barrier. Today's manufactured homes blend in much better than the shiny tin boxes of yore.

Recognizing the risk of mixing rental and owned homes, innovators are defining a growing market that helps with the financing problem and gets "renters" into manufactured homes on a long term basis. The formula calls for low cost and relatively small but attractive manufactured homes, purchased by the owner of the community directly from the manufacturer and made available to prospects through lease-purchase arrangements. Manufacturers have responded to requests for "community series" homes that are relatively small, affordable, durable and attractive.

Community management and the residents they carefully choose work together to convert families of modest means into home owners as they demonstrate their ability to manage the responsibilities involved through lease purchase. New residents unable or unwilling to cough up the kind of down payment required these days can get on a path to ownership without a large financial commitment and total payments comparable to rent. The community's owners and managers have strong incentives to screen carefully and manage well. Those who choose this option are more likely to stick around than normal tenants because they're "buying in." Yet if things don't work out, it's fairly easy for the resident to move on and management avoids complex eviction and repossession procedures. Because the homes are purchased and owned by the community, which generally has substantial net worth, financing can be easier to find.

It's a learning curve approach to home ownership that shows promise as the way forward for new community development as well as renovation of old ones.

"Land Lease Lifestyle Communities" is the torturous name that George Allen hangs on MH parks that are pioneering an interesting wrinkle to MH ownership. Because of recent hard times there are a substantial number of MH communities having vacancies. They'll fill up soon with the improving economy and fundamental shortage of park space. Meantime, owners of those communities are buying rental homes to fill empty spaces, for rent or sale.

## Small Towns

There are thousands of small towns all across the Southern and Mid-Western sections of the country that are filled with dilapidated housing and struggling industry. They can be revitalized, and good inexpensive housing is a vital component of the process.

Back in the sixties through the eighties, an Ohio company named Cardinal Industries built, installed, owned and managed thousands of single-story rental units ranging from motels to apartments and nursing homes. They were constructed from 12 x 24 modules joined together on site, with some interconnected and others as single dwelling units. Their marketing focus was small towns, and they were generally well received, since they filled a substantial need. As a bonus, they were very efficient in use of land and did not look like mobile homes. There's lots of market for that kind of product.

Serviced lots and tear-downs are plentiful in such towns and local government will generally support an innovative system that cuts the cost of new housing. There'll be scant competition from production-scale builders. Further improvements in value should be possible when local communities work with, rather than against, the process. Local banks might pitch in with financing. Modulares could prove the best product for this purpose, since they meet local codes and are likely to be well received by communities that want and need low cost housing.

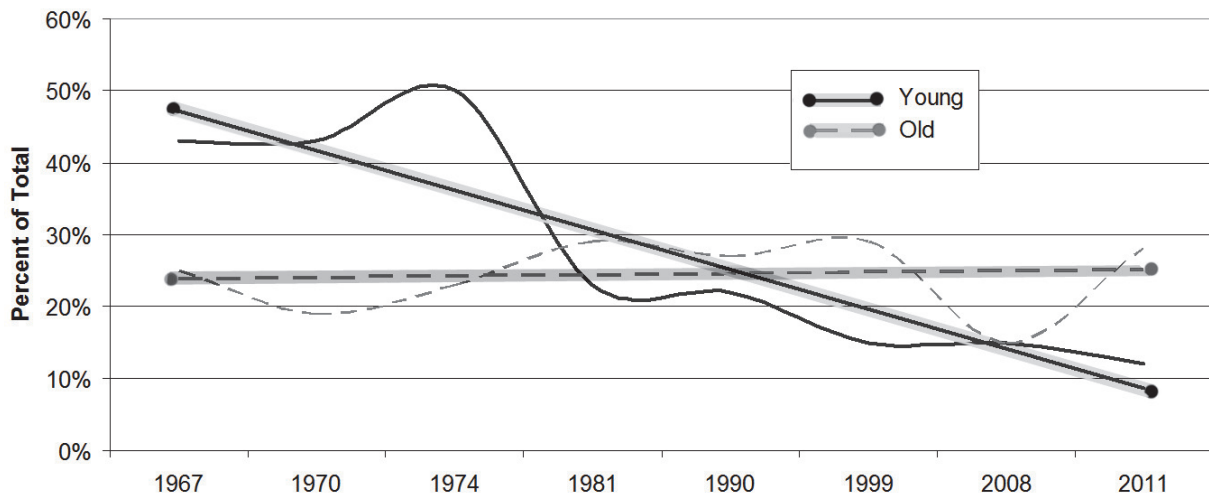
Those small towns are equally great markets for scatter-lot placement and small MH communities.

## The Youth Market

They're the future of the nation and of the industry. Back in the sixties the MH market was strongly youth oriented. Families like Tom Brokaw's parents and grandparents lived in mobile homes as the best solution to their housing needs. Tom says, "I always bristle when I hear the phrase 'trailer trash' or any of its degrading variations."<sup>87</sup>

That youth orientation has changed since, with MH residents now fitting the general age patterns of the populace and today's young wanting different kinds of housing.

### Young vs. Old MH Residents



On this graph,<sup>88</sup> black lines indicate the trend among MH owners under the age of 34, dropping from nearly half the market in 1967 down to just over ten percent today. The trend of youth ownership peaked in 1974, correlating with the peak in mobile home sales. The trend is exacerbated by the shifting age of the populace, but alarming nevertheless. Meanwhile, among seniors, MH ownership has remained relatively steady at around 25 percent.

Perhaps that explains why mobile homes used to focus on fully furnished and highly decorated interiors, while today's MH strives to look "just like a house." Back then,

<sup>87</sup> *A Long Way from Home*, Tom Brokaw, 2002.

<sup>88</sup> Data is from Market Facts surveys sponsored by Foremost, Owens Corning Fiberglas and Census tables.

young MH families were concentrated in mobile home parks, where shiny trailers did not seem out of place, while today, the market wants its manufactured home looking “traditional” and placed upon its own piece of ground, using their own furniture, which they tend to have in abundance.

Savvy young folks are often less thrilled than their parents’ generation with the idea of financing homes to the limit lenders allow. Certainly they seem more inclined to the single life, or very small families. And the look of “the family home” does not appeal.

To recapture that youth market, consider marketing smaller one and two bedroom homes that are affordable but not “cheap.” Retailers might sponsor local classes such as those offered by Dave Ramsey that encourage people to live within their means, and promote the contribution the MH can make to that objective. Hire a young local interior designer, in his or her off-hours, to decorate a show model, using only furnishings and decor materials available from the local Target store and thrift shops. Post the cost of that decor package to inspire young minds to create their own individualized home. Consider offering furniture packages from the likes of IKEA. A quick look at the styles of micro housing being created suggests exterior design innovations that could attract young adults and professionals, and there are lots of savvy young interior designers who know the trends among their peers.

Monthly cost will generally be important to the young crowd, and they’ll tend to be environmentally conscious. Small, inexpensive manufactured homes tend to have small windows and are required to be well insulated. Extra wall insulation probably won’t pay off, but more in the roof might. Encourage the display of such homes with their heating/cooling efficiency posted in comparison with an average single MH and an average new and old conventional home in the same area. Make it fashionable to live in a small, efficient and environmentally sound manufactured home. Post the typical scrap created in building an average home in the market area, along with the scrap generated in building the small MH. These are very efficient homes. Promote their environmental attributes. Jay Shafer, author of *The Small House Book*, notes that the typical American house “... consumes about three-quarters of an acre of forest ... produces about 7 tons of construction waste ... emits 18 tons of greenhouse gas annually and uses 2,349 square feet.” He makes a good point. Capitalize on it.

Campus housing, particularly off-campus rentals, could be a way to reach a young audience. It is true that students can be difficult tenants, but if treated fairly (and like adults) they can be expected to observe reasonable housing rules. Small singles that could comfortably accommodate up to four students should prove economically viable with affordable rent. The homes could be placed at high density, with community parking arrangements. Lots of universities have problems with providing student housing and might tend to be cooperative. Feedback from those students could be valuable in targeting the broader youth market.

## Rethink Finance

A constant industry refrain is the sad song of the MH financing handicap. In a very real sense, it’s those who choose *stick built* homes who are being discriminated against. They wind up paying far more interest than principle during the few years when most of them own their dwellings. Then they take it on the chin when faced with a career move. Living in homes tailored to a family’s immediate lifestyle needs and tying financing to typical ownership periods makes better sense. Rather than talking about interest rates, show comparisons of the interest vs. principal components of competing finance packages. The front end loading of long term finance is a dramatic but not intuitive disadvantage, and it’s rarely mentioned by the seller or banker.

But what about that premium interest rate that’s part of the MH chattel financing package? That’s best viewed from the lender’s perspective. Let he or she who thinks MH financing rates are too high take up the MH lending business. Most of those who have done so got badly burned, fooling around in an area where they lacked the bankroll, expertise and discipline to be effective.

Financing precedent has been set. Back in the sixties, all kinds of lending institutions discovered the good profits available from this type of consumer loan, but the S&Ls went overboard. As we saw in Chapter Thirteen, new leadership emerged from the MH rubble of the seventies. Look back at the graph on Page 166 showing Clayton's production growth (estimated; the gray bubbles) approaching half the total U.S. market. Clayton's financing operations grew even faster.

Already in the sixties, Clayton and many others realized that there was big money to be made in financing, but none of the manufacturing companies had the financial capability and/or know-how to take on such a challenge.

Jim Clayton had a big advantage over Northern competition. Located in the heart of the strong Southern market, he earned his stripes retailing the product and later undertook to build his own. Successful at both endeavors and a practitioner of learning curve management, he entered the finance field, one step at a time. First, he mastered relationship banking with his local bank, ensuring that Clayton paper was always good. In due course, he bought his own bank, expanding it step-by-step to become the industry's colossus, attracting the attention of Warren Buffet. Tapping the credit rating of its new parent, Clayton borrows at prime and is said to earn more money on the loan spread than on manufacturing. Clayton and Buffet understand the risks and potential of MH financing. Having finance under control has proven to be a major key to riding the roller coaster market without too much barfing over the rails.

Our borrowers get in trouble when they lose their jobs, have health problems, get divorced, etc. The recession has hit them hard. But they want to stay in their homes, and generally they borrowed sensible amounts in relation to their income. In addition, we were keeping the originated mortgages for our own account, which means we were not securitizing or otherwise reselling them. If we were stupid in our lending, we were going to pay the price. That concentrates the mind.

If home buyers throughout the country had behaved like our buyers, America would not have had the crisis that it did. Our approach was simply to get a meaningful down-payment and gear *fixed* monthly payments to a sensible percentage of income. This policy kept Clayton solvent and also kept buyers in their homes ....

... a house can be a nightmare if the buyer's eyes are bigger than his wallet and if a lender—often protected by a government guarantee—facilitates his fantasy. Our country's goal should not be to put families into the house of their dreams, but rather to put them into a house they can afford.

Berkshire Hathaway Annual Report, 2010, emphasis in original.

The question industry grouchers should be asking is, how come finance is the best part of Clayton's business and a stone around the neck of so many others? Perhaps that's best answered by Warren Buffet, the man who puts up more money to finance manufactured homes than anyone (box left).

In that same annual report, Buffet noted that the 47 percent of Clayton's loans were to buyers whom banks would deem questionable, yet Clayton's net losses on loans averaged less than two percent.

Berkshire Hathaway has no shortage of money to lend. Neither do the nation's banks and other lending institutions. The interest rate charged for utilization of all that money is, at bottom line, simply a matter of the lender betting the return will compensate for the risk involved. All of those in the MH business have the responsibility to manage down such risks, and if that's done, attractive financing will follow. As Peter Drucker has noted, it is management's job *to manage*. The industry has, after all, a dandy product to sell, and a terrific market to serve.

It is true that shiny new government programs aimed at helping have made it cripplingly difficult to arrange even chattel financing. Honestly though, who can blame them? Blame them for bureaucracy, yes, but feckless financing is nobody's friend, and in their cumbersome way, even Dodd-Frank is trying to help. What's needed, perhaps, is clever bankers who can create viable financing programs that evade the bureaucratic grasp while dealing realistically with the problem. Something similar to the Clayton/BH approach, where the seller of the home has skin in the game. Few retailers have access to deep pockets, so perhaps a "loan insurance" plan; call it "Fannie MH." Retailers and manufacturers would pay an insurance fee to a consortium of manufacturers and banks

that would guarantee each loan, with the insurer setting fee schedules based on experience. Over time, chattel rates should come down and offset the cost of the fee.

## Value

True or false: Manufactured homes offer the best housing value. The answer needs qualifying. We've nailed the cost/value equation for the *structure*, but beyond that the picture is murky.

Most families find their budget stretched when buying a home. All too often, retailers encourage stretching to “qualify” customers whose best interests might be served by “underselling,” or even urging them to continue to rent and save. Perhaps steer such families into a small inexpensive or used home, having minimal but adequate space for their family. The bottom of the market economic pyramid is much larger than the top. The objective is to provide a better and more affordable housing alternative than other choices offered in the marketplace.

More effort is needed beyond the factory doors, at the site where too much value is lost. Never mind, for the moment, HUD's long term site guidelines and unfulfilled lending promises. Focus on sound alternative site setup systems and standardize them for large market areas. Accept the “penalty” of chattel financing, and use it to include such necessities as skirting and exterior storage. Earn a solid reputation from demonstrating that site setup can be both economical and affordable. Stop waiting for the government to enforce its notions of sound engineering. Had those trailer guys set out to follow government housing guidelines, the industry would have died before it got off the ground.

Manufacturers have historically had limited control over what happens when the tail-lights disappear down the road. With today's dominant producers, that excuse no longer holds water. Clayton has demonstrated that manufacturers can control the destiny of their product, particularly in terms of finance. Whether other critical factors that will govern the industry's future can be brought under strategic control remains to be seen, but the deck is stacked in favor of sound management, and the major MH producers are positioned to establish and enforce good policies.

## The House/Land Equation

Perhaps the whole housing industry should put its heads together and attempt to confront the basic challenge posed by the scarcity of land suitable for homes. Must the solution be the sort of multifamily dwellings that other nations have come to accept, or can the manufactured housing industry find better ideas that take advantage of our country's comparative abundance of land and our willingness to think outside the square? Japan has shown that very high densities of good single family housing can be built on minimal plots.

We Americans have accepted the need to tone down our increasing impact on our environment in many aspects of our lives. Signs can be seen of young people looking for better solutions to their housing than those taken for granted just a generation earlier.

If you step back a bit, the chattel financing of mobile homes based on their value as dwellings made a lot of sense, and still does. Financing building and lot on the same terms makes decreasing sense as the value of land goes up and the cost of the structure comes down. What if the industry focused on using chattel and other methods to demonstrate that the homes themselves merit finance terms and rates based on the quality and market value of the building? Find ways to finance the land under the homes in ways that reflect its endurance and scarcity as a resource. Such thinking might put a pinch on housing traditions, but it's such ability to think strategically that differentiates

“... if it were possible to reduce the cost of building a housing unit itself, by 50%—that is cut in half the costs for materials and labor ... this would reduce the monthly cost to the occupant by only about 17 to 20%. The other costs—land and land improvements, interest, taxes and maintenance and operating expense [are the rest].”

Edgar Kaiser, speaking to the Portland Cement Association some 40 years ago.



this industry from traditional builders. Such an approach should encourage Americans to design homes and developments that best serve both the long and short term needs of the market.

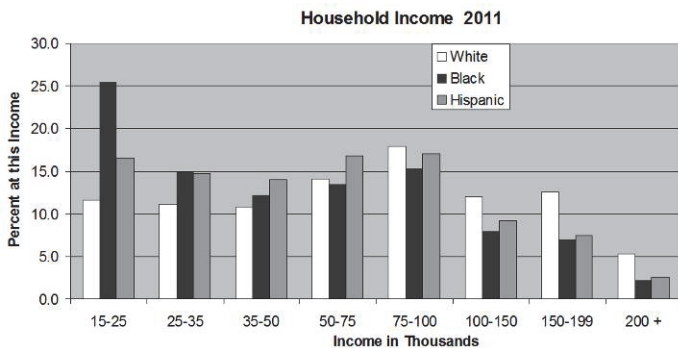
The three-bedroom two-bath house on a half-acre is ill suited to today's small families and budgets. Apartments, condos and townhouses are poorly tuned to the market's wants. Thirty and forty year financing for fast-changing families that move every five years makes no sense. Maybe somebody needs to once more invent a little house you can hitch to your car and move as family and employment needs change? Maybe that's why so many people are living in RVs and micro houses? Maybe the current king of housing has no clothes. Naked McMansion Palaces.

Manufactured housing has been a pioneer in separating the financing of house from soil beneath it. Depending mainly on location and housing fashion, all homes in this country have a life span measured in decades of diminishing real value propped up by remodeling and inflation. The value of land, depending primarily on its location, marches steadily upward and only deteriorates if sorely abused. Financing the two components as one is a bit like financing railroads based on the life span of locomotives.

The MH and its site has evolved from a rented spot to park for the weekend to land lease arrangements where an investor makes the long term commitment to a piece of land and a home owner makes a shorter commitment to the building upon it. Their interests largely overlap, yet each party's investment is best tailored to that part of the property they use. This does introduce some constraints on the part of both, and yet the whole seems to show more promise than the current practice of dividing ownership of the land into ever smaller chunks requiring ever longer commitments on the part of occupants facing ever faster-changing housing requirements.

### Cultural Niches

Blacks and Hispanics are under-represented as residents of manufactured homes. That's strange, since those races are *over*-represented in the income groups that are the industry's best target market. Maybe "strange" is not the right word, but let's not bother with the history of just why that condition exists. What's important for this discussion is the opportunity the situation presents.



This data is from the 2011 HUD Housing Survey, suggesting there are lots of black and Hispanic families in the sweet spot of MH affordability.

Welcome to the 21st century. Race issues have been addressed and largely resolved—from a legal perspective. Most of the heavy lifting of integration is behind us. Culture, however, is a different matter and does not change quickly. Selling or renting homes to these groups—any cultural groups—is essentially a matter of targeting them on their own terms, understanding their wants and working with them to use this alternative form of housing that is so well suited to their needs. Cultural issues are always challenging. Those of a "different" race or culture face stigmas similar to those faced by the MH industry itself. Welcome cousins!

Another such niche market is single parents; often working women. A small MH, owned or rented, in a nice community can provide the sort of family atmosphere that is generally missing from apartment complexes, and do so at comparable cost. Those who do not work can often provide child care for those who do. Community spirit encourages car pooling and similar "neighborhood" benefits.

## Quality

In the context of this discussion of opportunities, how best to define quality? Perhaps the best approach would be to start with a clean sheet of paper. If sociologists were to assess our nation's housing needs in terms of today's fast-changing technology and culture, they'd likely conclude it is impossible to define the housing that will be appropriate a couple of decades down the road. The entire housing industry has made little effort to think in those terms. Free thinking architects and designers do so all the time, but overwhelmingly conclude that their own spiffy vision will define the new housing paradigm for generations to come. Architects design a vanishingly small percent of homes built in this country. Few ordinary folks are willing to pay for the ministrations of those creative thinkers. Frank Lloyd Wright's "Falling Waters" house stands out as a visionary and much loved example of a house that has become obsolete yet provided many architectural innovations of merit. The Frank Lloyd Wright Foundation even designed a manufactured home one time for the mobile home division of National Homes, but nothing came of it.

Yet something really should be done to "improve" manufactured homes. Even if full agreement can't be reached on what that means, it's time to come to grips with the challenge.

Everybody gripes about software that's hard to learn and becomes obsolete and unsupported before ordinary mortals learn how to use it. The "planned obsolescence" charges long filed against American manufacturers had varying degrees of substance, but led to this country's leadership in innovation. MH manufacturers have stood accused of such thinking, but as was the case so often, they were simply competing dynamically. Better and lower cost housing evolved as a result. Learning curve has that downside. There's little point in building castles of solid rock that will serve their intended purpose for just a generation. In this country, we're not in the monument business.

The engineering actually required to build a substantial home has never been properly explored because specification codes block innovative effort. The Japanese build homes designed for earthquake standards using a fraction of the lumber required by American specifications. Those homes may not have the brute strength of their American counterparts, but they're strong enough to last just as long, and they resist earthquakes better.

Construction of the homes, as Consumer's Union found from their research, is not the problem. Pouring more money into basic construction materials and labor is not the solution. Excellent manufactured homes can be, always have been, and are being, built at all price points. Junky ones too, but tougher codes and regulations have had limited effect. Walls made of 2 x 6s make room for more insulation space (and less floor space) but add nothing to the life of a home. This nation has thousands of mobile homes still in use, built with 2 x 2 walls, half a century ago. Many of those oldies have not stood the test of time, but very few benefited from any sort of structural analysis. Vanishingly few were placed on proper foundations. Bow-string trusses did not "fit" any engineer's slide rule calculations. Yet thousands of those old mobes survive and their owners generally don't want to give them up. They're the very lowest cost housing available. American housing is grossly overbuilt, an enormous waste of resources. Environmentalists everywhere should celebrate manufactured homes. Regulators should pitch in and help us get rid of redundant lumber and other materials that make no contribution.

Yet product quality is a prime issue. Consider how the Japanese and Koreans dealt with a very similar problem. They used to build small cars of modest quality that Americans disdained. Instead of responding by imitating American cars, they chose to pattern after

The future of the mobile home industry will depend on its ability to provide better, not cheaper, units. The double standards which are currently responsible for its economic advantages are slowly being stripped away and in their place the most severe competition any major industry has had to face will emerge with little warning. If the mobile home industry capitalizes on its experience and forges ahead with more imaginative and carefully conceived products it can cultivate, and enjoy a true advantage. If it continues to exploit the present market, it will soon begin a steady decline.

*Production Dwellings*, The Frank Lloyd Wright Foundation, 1970

Volkswagen. First crank up the quality, then their style, going after niche markets. Once their quality was established and Americans deemed them attractive second cars, the pesky little foreigners evolved upscale until even huge Ford, Chev and Dodge pickups are under severe threat and the city of Detroit and its once proud burghers wrestle with bankruptcy.

The American automaker's mistake was to confuse ornaments, iron and horsepower with quality. A quality reputation is established by doing the intended job well, attractively and consistently, at a winning price. A reputation is ruined by overpromising and poor delivery of tacky products. On that score, the MH industry is justly accused. Manufactured homes are the scullery maid of the housing industry. They do their job, but not in a very attractive manner. They're seen as cheap, and PR won't fix that. Neither will higher construction standards or finicky regulations.

Our industry has long touted the benefits of building inside under controlled conditions, thus assuring better quality. Far too often, it does not turn out to be true. Fit and finish, the first thing customers see, is often set aside in favor of cheap features like increased square footage and fancy cabinets that don't work very well.

It has been demonstrated over and over that a clean factory where nothing out of tolerance will be accepted is more efficient than one with looser standards. We have no excuse for shoddy work. It has been proven again and again that ordinary American factory workers can produce fine quality and are happy to do so. It is management's task to make that happen.

Manufactured homes of today, properly installed, have a lifespan that's far greater than their likely design life. Just like "regular" houses, they'll be obsolete long before they wear out. Better to build them economically for their intended purpose than for the ages. Sooner or later, the problem of recycling them needs to be faced, but let us not compound that problem by competing with stick builders to see whose obsolete edifice will stand longest. The nation faces more important and immediate challenges.

All that to one side, the issue of quality remains and a process is needed for winnowing out disreputable manufacturers. HUD can't do it. The marketplace can only do it if customers have the data—better information than is available by asking a competing retailer or checking a few websites. MHI could perform the industry a great service by retaining an organization such as J.D. Power to annually survey MH owners and rank MH products by brand name. Consumers would then have a source of useful product information, builders of the good stuff would gain a reputation worth advertising, and those at the bottom of the scale would get the kick in the butt they need.

## **Direct Sales**

The internet has revolutionized marketing. It will change MH retailing in due course, but who can say how? Perhaps through the use of "agents" as opposed to "dealers." Such agents might maintain a show home or two to supplement full descriptive product detail available on the web. Shipping cost has always been a problem, and was greatly reduced by the use of branch plants. These days, it would be relatively easy for a family whose interest has been piqued by an agent to drive a few hundred miles to a company's nearest plant, take a tour and see various products in a professionally executed setting. The agent would schedule delivery, setup and maintenance, with minimal overhead. Such a sales system could evolve through learning curve, because the basic ingredients have long been in place.

From the manufacturer's perspective, they'd have direct contact with the customer to show off their product to best advantage, take the customer on a plant tour and generally tighten up the sales pitch.

## **Sales to Builders**

There's a conflict between stick builders and manufacturers—they're fundamentally different housing systems. Yet modular manufacturers derive a substantial portion of their sales from builders and contractors who find the modular product extends their season, reduces their labor force and expedites completion of projects, saving a few bucks along the way. Few of them show much interest in manufactured homes, despite the potential for even more benefits.

The MH stigma is one reason. Another is manufactured homes are more of a mass produced product, not so readily tailored to a particular builder's requirements. The biggest problem is the everlasting wrangle over code compliance. A builder having a good local reputation can go to bat for a modular supplier, telling local building officials that the product is built to comply with their requirements. That counts for a lot, and that can't really be said about a manufactured home. Few builders will stake their reputation on fighting the MH industry's basic battle.

Producers of both MH and mods have an opportunity to do their builder/developer customers a favor by making them aware of the MH potential for situations where that product is most appropriate. Such a customer with a good reputation and modular experience in his or her market area can do much to get the MH product accepted, and everybody wins. Local builders, building officials and the mayor may well go along with a manufactured house, particularly if it is supplied by one of the major producers having a good reputation and able to supply either HUD or modular product, and stand behind either. A good start toward such a strategy might be to market a simple basic sectional home that meets modular requirements, thus getting a foot in the door.

The day will come. Start with small towns and rural areas where the prime need is for good affordable housing. A good reputation and proven integrity will go a long way in the battle for credibility.

## **Granny Flats**

There's a big market in Australia and a few other countries for small secondary dwellings, often added onto existing lots. Originally, they were intended to provide a better alternative than packing grandma off to a nursing home. They're catching on in this country, too. Planners sometimes abhor the idea, since it messes up their orderly plans. Cooler heads at city hall often like them because they provide low cost housing and fatten the tax base, at very low drain on the coffers. Homeowners like them because a small apartment for Mom can provide needed space efficiently and when not needed, excellent additional tax-advantaged income. And Mom can be expected to prefer one to even the spiffiest senior apartment complex.

Park models are often used for this purpose, but are generally frowned upon because they do not meet any city's code requirements and are not intended for year-round living. More typically, small units are hammered together by local contractors. Manufactured homes are usually too large to squeeze into available back yards. A 12 or 14 by 30 foot MH having a tidy residential exterior look would seem to be about ideal.

Sociologists often suggest that neighborhood planning works best when a variety of home sizes, types and cost are integrated within neighborhoods. Some enlightened areas encourage the use of small manufactured or stick built homes by writing provision for secondary units on "normal" lots into their planning documents. An imminently sensible way to provide low cost, mixed-use housing with minimal neighborhood friction.

## **Volatility**

The greatest opportunity MH producers experienced was the challenge of building ever better houses with ever fewer sticks, one day at a time, during a rare period of sustained strong demand for housing. There's been no similar opportunity since, nor has the

research undertaken for this book suggested big housing markets arising in the foreseeable future. If one thing is clear from that research, it is this: *Volatility is the enemy of efficiency in housing production*. It cripples stick builders, and is even harder on manufacturers.

A central lesson of the history of manufactured housing is the overwhelming challenge a factory faces in coping with the volatility of the housing market. Consider the efficiency gains that might have been made if the whole industry had continued its steady growth pattern of the sixties. Or that depicted by the gray dots indicating Clayton's rise from nowhere to market domination over a few decades as shown on Page 166. True, much of that growth was due to acquisition and thus limited in true learning curve gain. Still ... the MH industry is simply crippled by volatility, combined with opposition from every quarter.

The branch plant strategy evolved as the most common defense against such volatility. Small local plants can be opened and closed as demanded by market forces, though efficiency potential suffers right along with the laid off employees of those plants.

John Crean's strategy of pricing the product low and limiting peak production to create strong demand had a lot of charm. A shortage of product enables factories to operate profitably, year-round and is also a useful approach to sustaining output and profitability in bad years. There's a bonus benefit of maximizing plant efficiency.

A good blend might be to combine the above. Operate plants of minimum size, structured to function efficiently with a minimal crew and a strong incentive system. Work fewer hours at slow times, use casual labor and overtime for peak production, and hold the nucleus together at all costs. Go back to Page 78, or better yet, read John Crean's book. When Fleetwood was on the ropes because of overextending itself, he swooped in and installed discipline in the form of five guidelines that put things right and led Fleetwood to the top of its industry.

One thing I've preached all my life is that when business is good, it's going to get bad, and you'd better get ready for it; and if it's bad it's going to get good, and you'd better get ready for that.

John Crean

A steady need for housing can be predicted from studying population and social trends, though it will be subject to the vagaries of the economic cycle. That cycle, alone, is manageable using an approach such as that suggested above. But the crazy yoyo of housing finance accentuates the fundamental economic phases, as does culture. The American Dream of a big fancy house on sprawling lawns has been encouraged by government, banks and merchandisers. None of them

has a plan for moderating the natural ebb and flow of housing demand and seem hell bent on making it worse. The manufactured housing industry, going with the flow, has contributed its share.

As long as the MH industry is fragmented and liberally peppered with marginal players whose prime interest is surviving the end of next month, volatility is likely to be reinforced. And with it, new layers of stigma. There's no easy answer to this challenge, but there are precedents. Revisit Pages 162 and 171 and read Jim Clayton's book. Or Warren Buffet's annual reports. They've found ways to finance homes sensibly and profitably while using the cash flow to sustain reasonably steady production.

There've always been those who cast aspersions on MH industry leaders. *Any* industry leaders. Making fun of GM and its peers is a national pastime. Well, everybody makes mistakes, but what's needed is a concerted effort to distill the scattered wisdom of the manufactured housing industry into a plan of action that presents a united front against volatility. Neither stick builders nor anyone else involved with housing seems capable of doing that. A concentrated housing industry with a huge cost advantage should not allow itself to fall victim to housing traditions of the past that have not worked well for as long as anyone can remember.

## Summary

Perhaps we can agree that the industry has more to overcome than a nasty slump in the market. The MH market has been decimated. The housing industry itself has suffered a mighty blow. In the normal course of events, one might expect the MH industry to deteriorate into a splinter housing niche of no great importance in the overall housing market. Major hurdles must be faced and overcome to avoid that fate.

Business as usual appears to be an unpromising choice. Boldness is called for. Boldness applied carefully and sequentially, continuing to build on the learning curve that finally got industrialized housing off the drawing board and competitive. Yes, that curve has flattened, but it's alive with potential for new minor and even major curves.

The dreadful MH stigma is a major hurdle. It flowered on the aura of cheapness inherent in all kinds of low cost housing, combined with very real quality issues evident after windstorms of the past—two kinds of trailer trash. It adds up to the ever-present NIMBY attitude of neighborhoods and government, who plead for low cost housing, but don't want it nearby—especially in the decaying urban areas where it is most urgently needed.

Finance is the issue on the industry's lips today—a yearning for more generous terms, more readily available. “Lord,” they seem to echo from oil patch wild catters, “give me one more chance, and this time I promise I won't piss it away.” The lords of finance can hardly be expected to line up once more with generous letters of credit to back an industry that has exercised so little fiscal discipline. Until such time as fiscal credibility has been won, industry growth will probably be constrained to those like Clayton, who have used a long learning curve of their own to develop a workable and effective system of financing manufactured housing. Others can be envious or roll up their sleeves and come up with their own solutions to this wicked problem, but a return to past practice hardly seems in the cards.

Mighty housing momentum is stacked against the industry, and if anything has been learned from the past 50 years, it would be: *don't underestimate the competition*; they own the housing market, and they beat down the young MH industry's best effort in the seventies, with both hands tied behind their back. Fortunately, their hands are still tied, locked in a stranglehold of bureaucracy, with no apparent way of returning to vitality. Still, with a bit of help from circumstances they could wipe out this new MH approach to housing, should they decide that houses with wheels are too pesky to tolerate. Fortunately, they rarely think strategically and their plates are full of their own problems. There's plenty of room on their blind side, and if manufactured housing doesn't take advantage of it, in due course, someone else will.

Housing is too big a market to be so poorly served.

*Nothing is done. Everything in the world remains to be done or done over.*

*Lincoln Steffens*

# 15

## **A Few Product Opportunities**

One advisor suggested that this book show some examples of outstanding future MH concepts that might come to fruition through the efforts of a reinvigorated MH industry. There have been lots of such industrialized dream home ideas floated over the years, but none seems to have sparked new directions for the industry. The problem has been that such efforts tend to skip over the industry's learning curve foundation and ignore the momentous barriers in search of breakthroughs. Manufactured housing doesn't work that way. Housing is too complex and culturally stagnant to be open to whizbang new designs that leave us slapping our heads, "Why didn't I think of that?"

Yet that surely does not mean remaining stuck in the mud, defining innovation as finding ways to remove three sticks and add extra shutters. Fundamental improvements can be—should be—*must* be made if industrialized housing is ever to really get off the ground. The best way to make them is one small step at a time; the technique that got us this far.

### **Small and Handsome Housing**

Back in the 1960s when *Playboy* was in its heyday and hippies were going to change the world, that magazine published an article citing an opportunity for quiet revolution. Hippies should take over a state (was it Vermont?), vote out the establishment and demonstrate how the "back to the land" movement could become reality. Where were all these new age pioneers to live? Why, in small factory-built houses containing all essentials in minimal space, to be imported from Japan. It was ironic and discouraging, that no mention was made of just such a product, already being produced in American factories.

If you read books like *Wheel Estate*, *The Unknown World of the Mobile Home*, *Mobile Homes*, *the Unrecognized Revolution in Housing* and the like, it becomes clear that our product never did catch the eye of the fashionistas. It still doesn't. The MH industry is governed by a Walmart, as opposed to Target, marketing strategy. Only two aspects of our industry present a tentative challenge to that design challenge.

Many high-end multi section homes are gorgeous, but still hold little charm for the *avante garde*. In general those homes are designed (and loved) by middle-class people of modest means who appreciate good value. Young families usually can't afford to buy

or finance them, nor are they “cool.” Good efforts are being made to develop that market in places like California and Florida, but they face strong competition at the lower end of conventional housing producers, once fully erected and equipped on site. And it remains very difficult to get long term financing for them.

Our sister RV industry is more accustomed to designing for those to whom price is not the prime factor. Upscale park models, code-limited to 400 square feet, are little manufactured homes that often utilize the best materials and design innovations to optimize their small space.

Park models are a sort of reincarnation of the mobile homes of the fifties, when shipping limitations defined size. They’re small and pricey, but cute as the dickens, taking advantage of today’s much better selection of materials, inside and out. The market niche is small, but coming on strong.



Shown above left is a park model from the seventies. It had the “tight-two-storey” approach often used in today’s versions, with the sort of residential look that has become the hallmark of park models.



Above right, a 400 square foot housing code version, available as “off grid.”

Both Courtesy Norcom Homes

Left it is a current park model being installed at Herkimer KOA in Herkimer, New York. It’s built by Cavco and has porches on both ends to extend the living area a bit.

Courtesy Herkimer KOA



The matched pair of Fleetwoods at left occupy a single MH site in California, where land prices are a huge problem.

Courtesy Modular Lifestyles Inc.

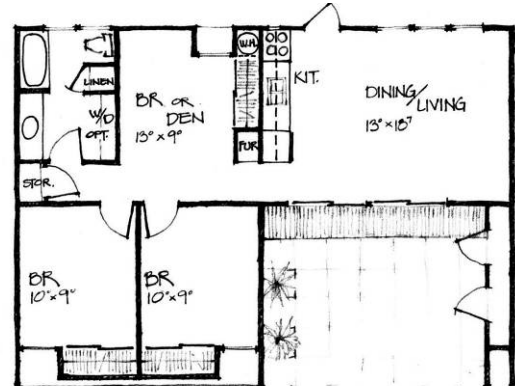
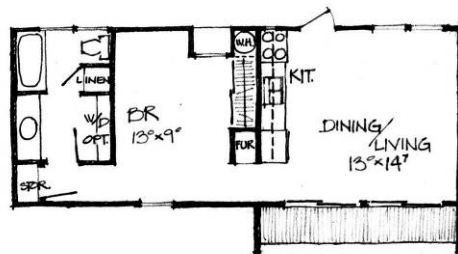


These little guys are thriving, partly because they can be built to the less restrictive RV ANSI code, but the code aspect has faded in importance. Park models can be sited in RV parks, old mobile home parks with undersize lots, and all sorts of resort areas where they're accepted because ... well gee, *they're attractive!* All sorts of code and zoning problems go away when the product looks right at home in the neighborhood. And because they're so small, park models can be affordable, despite prices per square foot comparable with stick construction.

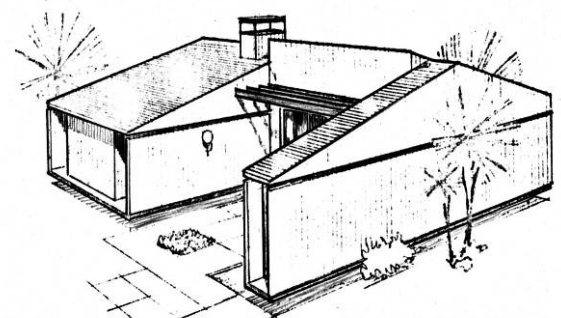
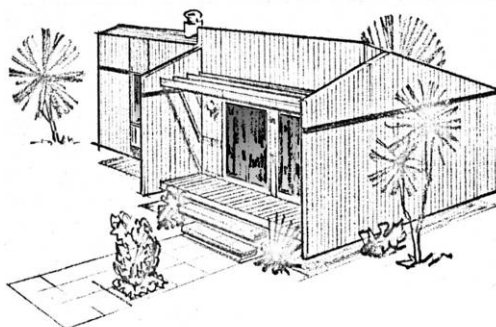
The RV definition and ANSI code limits them to part-time use, but they are, in fact, quite livable little homes—despite regulations that say otherwise.

Both MH manufacturers and RV manufacturers build park models. Nothing prevents the construction of versions larger than 400 square feet, designed for year-round use, as long as they comply with the HUD Standard. Unless that code can be modified to recognize the validity of micro housing, their selling price would increase and livability decrease. With volume, little homes like these could be just the ticket for good economical design in small space. It might be hoped though, that another race to the price bottom might be avoided.

Park model RV parks attain densities of 12 per acre or more. Suppose a piece of land or existing park was developed to make optimum use of land, based on manufactured homes of 600 to 800 square feet—density of perhaps ten units per acre. Land use might approach that of typical low-rise walkup apartments, and rental rates to match. These pups could become the best MH opportunity since the sixties.



This plan is about 500 square feet; the one at right, 750. Apartment sized living units. They'd make nice Granny Flats.  
Drawings by Steve Hucek, 1973



Perhaps each home would have its own carport with additional parking provided for second cars and guests. Suppose each space was provided with attractive exterior storage, all designed to harmonize with the fences, carports and buildings of the community. Suppose those homes were rented to carefully selected tenants. The rent should be competitive with that of comparable sized apartments, and yet each would

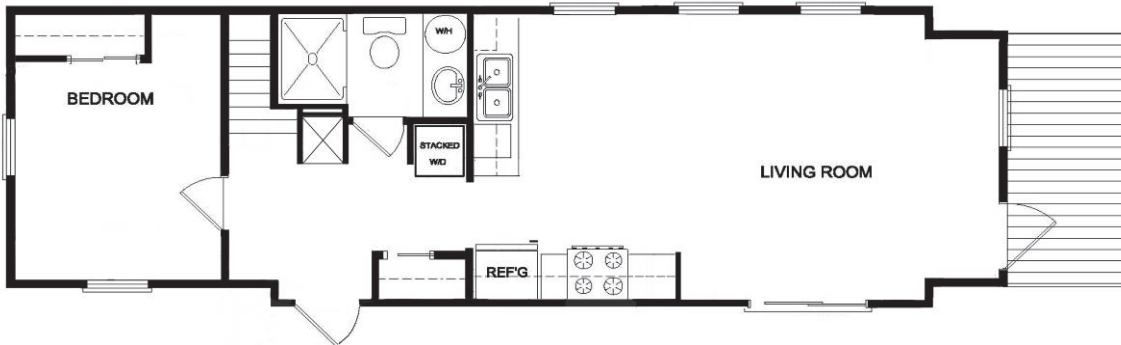
have its own small yard and other attractive elements of single family housing. The owner of the property and structures, given a good financial record, might expect to finance that project on terms and rates comparable to an apartment building. It would be in that owner's interest to maintain the property similarly to any other real estate rental investment, and it should have the same kind of life span.

Suppose further that instead of renting the units, they were sold, including land, on a condominium scheme—a variation of a land lease community; one that personifies a *youthful* lifestyle. The builder would finance the whole package as a real estate development, and “owners” pay what amounts to condominium fees covering site rental, and could buy and sell their homes at will.



Above left and below is a possible HUD version of a park model currently available as shown above right, from Champion's Athens Park Homes division. With a floor width of just over 13 feet, it would ship as a 14 wide single, and have roughly 50 percent more floor space than the largest ANSI park model. A one-bedroom unit, it features (perhaps as an option) a “mom's attic” for extra storage.<sup>89</sup> This floor plan (below) “wastes” about three percent of its potential floor space in the three “notched” setbacks, and costs a premium in materials and labor in the process. Not to mention that “attic,” which might be deemed a total write-off in terms of value for money. Worth the premium? Park model success suggests it might be.

Park model courtesy Athens Park Homes Division, Champion Homes, redesign by the author.



As with any other real estate venture, the depreciation and operational aspects of such projects would depend far more on the skill of the developer and manager than that of the homes that happened to be factory built.

Suppose we come at the challenge from the direction of a product being built today.

### Upscale Singles

High-end multi section homes and fancy park models are niche products whose potential is burdened by the industry's image, but are useful as stigma fighters. Those

<sup>89</sup> Would HUD grant permission for that “storage?” Maybe with an AC to prove the concept if well reasoned arguments were put forward.

niches provide some material and design stimulus that can be brought to bear on the main issue. A learning curve design process that evolves toward satisfying the broader market and paves the way toward MH products that can blend into neighborhoods.

Think about it this way. Whatever became of those tin can mobes of days past? *Market-driven learning curve*. HUD and twin section markets demanded pitched roofs with shingles, residential siding and drywall interiors. The broad housing market always despised that tinny look that carried over from RV days, but MH customers were unwilling to pay the cost of upgrading just to please the neighbors. HUD and multi section requirements created a volume demand for new materials and methods. The suppliers responded. The production challenges and cost premiums came under control and significant design progress became possible.



The 16 x 80 MH at left is typical of today's singles. All residential materials—no shiny tin—so why does the market still perceive it to be a homely house? Think about it. No stick builder creates homes of this shape, and such "odd" proportions can't be hidden behind shutters and shingles.

Since the dawn of time, the shape of homes has been defined by materials, methods and economics. In the case of American homes, a squarish box with pitched roof has emerged to define the basic shape of a "house." For manufactured homes though, shipping and site setup dictate that the most efficient dwelling shape requires stretching that rectangle and restricting its width to road size. Yet about half the manufactured homes produced are multi section, incurring a 23 percent cost penalty at retail.<sup>90</sup> That chunky penalty is one cost of allowing the momentum of traditional design to dictate the MH shape. Why is the market willing to pay such a premium? Maybe more effort is needed to make singles attractive.

Tipouts became a hot item in the sixties as a way around the shipping limitations. The simplest versions were about 3 x 8 feet, hinged at the bottom and "tipped" into the living space for shipping. Early versions were expensive and leaky, but as the idea caught on, they got bigger, the cost came down, the leak problems were solved and they were broadly offered by most MH companies.



Could a similar "innovation" be skated past HUD's requirements? If not, the problem is with the HUD Standard. Would it be economically viable today? That would probably depend on the producer's commitment to the product. Widening floors is the more economical way of gaining space, but the sketch suggests some value gained from breaking up the linear look. DCIH, 1973

A recent innovation arose primarily from the demands of the land lease community. Faced with chattel financing, aging park sites of limited size and ever increasing cost, neither park models nor giant multi section homes do the trick. Yet most communities

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<sup>90</sup> Based on the cost differences at retail reported by MHI in recent years.

seeking low cost housing and investors considering innovative financing want the “residential look.” The individual customer on a sales lot tends to be guided largely by price. Those in the industry battling the stigma can take a broader approach. One emerging answer is “community series” homes, championed by George Allen and his merry band of MH community owners, managers and investors. The homes are mostly smaller singles and doubles designed to present curb appeal when placed on optimal lots, with ownership potential and monthly cost competitive with rental apartments.

That changes the value equation a bit. The “maximum house for the buck” tradition continues to want enormous singles, but those tend to be homely, little improved from the tin can days, and can degrade the value of the land they occupy. Community Series designs seek a balance better suited to the changing home/land value ratio, and enforce it with unique financing schemes.

The photo sketches below show what might be done, and is being done, with a basic single; how value can be added by addressing site needs with factory construction.



At left is a basic but attractive HUD single, well sited and landscaped on a typical sized lot in a nice resident-owned community. The use of “residential” materials and a dressed up front end do a pretty good job on this smaller than average MH. The storage building is of the same color and style, nicely placed to harmonize, and the landscaping is good.



Here the home has site accessories added including a skylight in the living area, gutters and downspouts installed on site and a practical shelter over the main entrance. Worthwhile improvements, but they add little to “sight value” while incurring significant additional “site cost.”

This photo courtesy Don Westfal

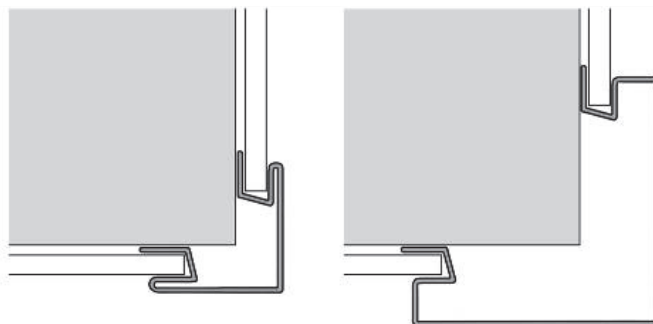


Here, the same basic home gets a photo-facelift by the author, adding factory installed gutters and downspouts, plus a factory-built entry and sidewall detail. The look is accomplished by flipping and shipping that aluminum canopy up onto the shingled roof. The little stub walls that support it fold into a recess the thickness of the sidewalls for shipping. Another recess up front uses a darker shade of siding to enhance the illusion of depth and add "dimension." Behind the second door, the siding simply changes color. There are costs, but every dollar added at the factory replaces about two dollars of work at the site. Considerably more when account is given to the fact that such details cannot reasonably be accomplished at the site. When it all comes out in the wash, given volume, this design should retail comparably to the bottom one on the previous page.

### Exterior Trim

A major step in improving the exterior design of manufactured homes came with the use of "residential" siding of various types as shown on the preceding example. In the old days, the side of a mobile home was a continuous slab, interrupted by as many unintended bulges as fabricated design lines. Even the windows and doors were essentially flat to the surface, grasping for every fraction of interior width. Much of the gain in appearance these days comes from stiffer siding materials and "shadow lines" having as much as a half-inch depth.

Seems insignificant? Well, god and the devil are both in the details. Those old mobile homes had a shadow line of about a quarter inch, and increasing that made a big visual difference. Traditional homes have even deeper shadow lines—often an inch or more—especially on trim details. Consider the following example, based on an exterior corner trim piece:



The extruded corner piece on the left seems designed to fit as flush as possible with the siding. Making it like the one on the right would give corners a beefier appearance, requiring no more material per square inch covered. Horizontal trim pieces above and below would require comparable profiles, would also look better and again, there should be no cost increase.

## **Steel Roof**

A big improvement in MH design, from the customer's perspective, was getting away from the old "one-piece" steel roof in favor of traditional shingles. That viewpoint was justified as those steel roofs rattled, rumbled and buckled. That's because they were fastened only at the edges and the roofs were nearly flat. In their favor, the steel roofs required less maintenance than shingles, lasted longer and cost considerably less. Two problems included the engineering of bowstring trusses to certify their performance and the excess condensation in bowstring-based roof cavities, given today's insulation standards.

Fashions come and go. Today, "lifetime" steel roofs are "in." Prepainted and ribbed, they minimize buckle problems and enable fastening through the rib ridges. It's good roofing material if properly applied. Expensive though, because of the forming, cutting to order, installation labor and the like. Such a roof is used on the Cavco park model on Pages 104 and 180. An updated one-piece design could be better, look about the same and cost considerably less.

Mobile home steel roofs never were actually one piece. Individual sheets were cut from galvanized steel and bonded together using a system of sealants and locking strips. The resulting steel roofs were cut to the length of the homes and delivered as one rolled-up roof per home. Installation was inelegant, but simple and quick. Early versions developed leaks due to expansion and contraction, a problem soon resolved through learning curve. The system was used successfully for many years and was the best value available.

So ... use that same roll-forming equipment, along with prepainting the galvanized steel, to form one-piece coils the width of half a pitched roof, with the ribs roll-formed in. The resulting product would require two bulky rolls per single section, one per double section. Matching ridge cap and trim would be needed. Much less fastening would be required—and less material—than existing residential steel roof systems. Labor and material cost should be lower than for asphalt shingles.

## **Asphalt Shingles**

Shingles are traditionally sold in bundles originally devised for roofers using ladders, hammers and shingle nails. But asphalt shingles are manufactured in continuous strips, then chopped to length and width, with "design lines" cut in to simulate wooden shingles and hide seams.

John Slayter has suggested shipping the same product in continuous rolls, sized to be placed above the end of the shingle station. Workers would roll off the length needed for each row, cut to length, and staple in place before rolling out the next row. This would reduce labor, packaging, waste and cleanup, both at the shingle plant and the MH factory.

As a bonus, potential leakage between the shingle joints would be eliminated. With that problem gone, a further logical step would be to eliminate the notching that does a poor job of simulating wood shingles anyway, and replace it with black stripes on the surface and minor notches at the bottom edge. Theoretically, this could eliminate the bulk of the existing shingle that is covered by the weather surface, though gaining approval might take years. In the meantime, the process could be simulated using roll roofing, die-cut down the middle to simulate 18-inch shingle rows.

## **Drywall Learning Curve**

A great example of learning curve innovation is drywall interiors. Desirable for fire safety, it's the customer's number one choice as well as the lowest cost material available for interior wall surfaces. Unfortunately, the stuff is rigid and hates being bounced down the road. Force it to do so and it often rewards you with cracks that can

be costly and difficult to repair. Further, it's miserable and messy to work with on the production line. Site builders allow days (depending on weather) for curing between the several processes that result in finished walls and ceilings.

These problems are being overcome by drywall suppliers and MH factories, step-by-step, and great rewards await the company that brings optimum production efficiency to the task while eliminating cracks.

An early and still common solution is the use of square-edged gypsum board with vinyl wall covering. Unfortunately, the cost savings potential is lost and the customer is left with unsightly seams at the joints as well as surfaces that are extremely hard to patch in case of damage.

Some companies ship homes with bare drywall, leaving the finishing to site labor. That reduces the factory invoice and makes patching easier, but adds to net cost and creates a mess along with high cost at the site.

An early answer was hot grouting and fast setting paint processes that allowed speedy production at the cost of adding a couple or three work stations. Skill was required, but trainable. One producer found housewives often got the hang of it quickly—just like whipping up a new recipe. Nowadays much better quick-set materials are available. The next logical step? John Slayter suggests wall-length sheets of drywall, delivered by semi, directly to the production line. One horizontal seam, and no verticals.

In due course, the use of paneled walls should become a premium feature with painted drywall the base cost item.

## **Stucco**

If drywall can be made to work, why not stucco? It's been around for 200 years, introduced as an improvement on brick, it needs no paint, is fire and weather resistant and inexpensive. Tests have shown that, if properly applied, it can withstand the rigors of shipment. The biggest problem is timely factory application. The solutions that are making factory drywall possible should do much the same for stucco.

Back in 1966, United States Gypsum set out to see if both drywall and stucco could be used in industrialized housing. Two prototypes were built. First was just a pair of boxes with windows and doors, on a steel frame, adding up to the size of a standard MH of those days. A key purpose of the experiment was to see if such construction could withstand normal MH delivery. It was put through its paces attempting destruction, rattled across bad roads and railroad crossings at high speeds. It survived intact; not a single crack in either the drywall or the stucco. The test unit was erected as an office and is still in use.



Final touches before shipment. This is the same size structure, built as a dwelling unit.



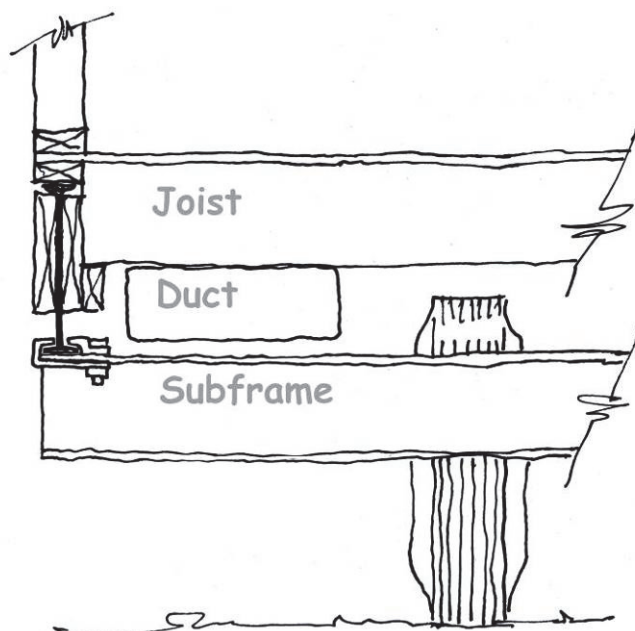
It was shipped more than 200 miles as a single load and erected on site without incident. Ironically, it burned to the ground in a freak accident. Today, homes like this could be built on a production line. Designed for high density MH communities, it was a one-bedroom home of about 650 square feet. For transport, the frame was bolted together, fitting the home on a single load for shipping. At the site, the home was erected as shown by the model, above right. All windows except those facing front were clerestory for privacy as shown by the interior photo, above left. Courtesy U.S. Gypsum

## Hudulars

Surely the day must come when most housing is built in factories and “modular” /“mobile” nomenclature will be long forgotten, along with traditional design details. Looking toward that day, which will prove to be the superior system in terms of cost and structural performance? The key is site setup. In theory, the MH steel frame facilitates inexpensive foundations, as long as the space beneath the home is not utilized. The modular approach is theoretically lower in cost given efficient transporter systems and a need for basements. To put a full foundation under a manufactured home would seem the worst of both worlds.

The market for multi section manufactured homes is large, and would be much larger if the cost premium came down. HUD multi’s work best in MH communities and have a cost advantage over modulars. Modulars have the advantage of being more broadly acceptable in small towns and zoned rural areas having code enforcement.

“Hudulars” attempt to bridge the gap between HUD twins and modular twins, which should be a piece of cake. Following is a sketch showing a hermaphrodite frame/running gear setup that might prove interesting as a hudular.



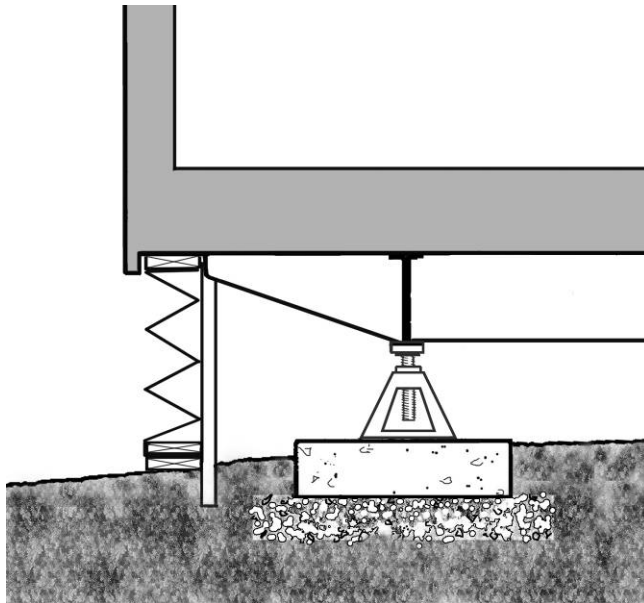
The I-beam is bolted between the rim joists. A subframe bolts to the bottom of the I-beam at four or more points, making the running gear detachable, similar to the hitch. Ducting then, can hang below the joists, and a basement stairwell can be designed in or cut in later, at a planned location.



## Site Erection

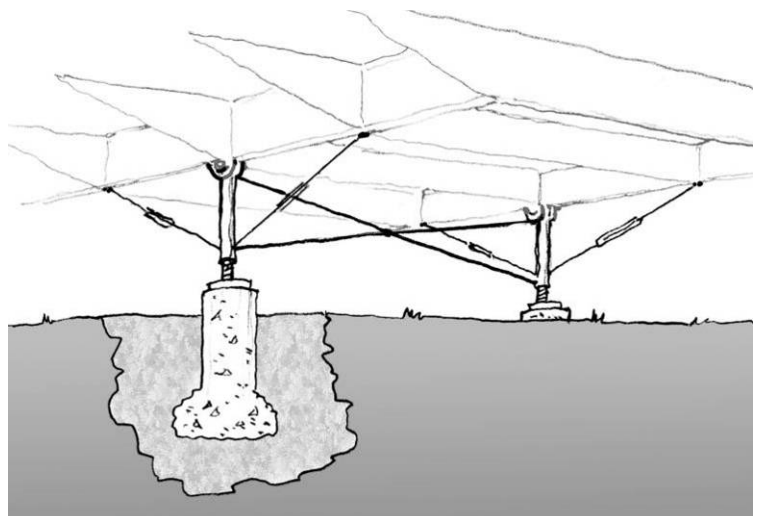
Structurally sound site setup at low cost is a field with great potential for MH designers, suppliers and manufacturers to resolve. It's in everybody's interest to find efficient solutions. Learning curve potential suggests doing as much of the work as possible at the factory, as long as net cost to the retail customer does not increase. The factory can use its learning curve advantage to bring costs down further with experience. First step, determine current costs for field-built foundations; minimum, maximum and median. Design a factory system that will meet that median, and then use learning curve to cut it in half.

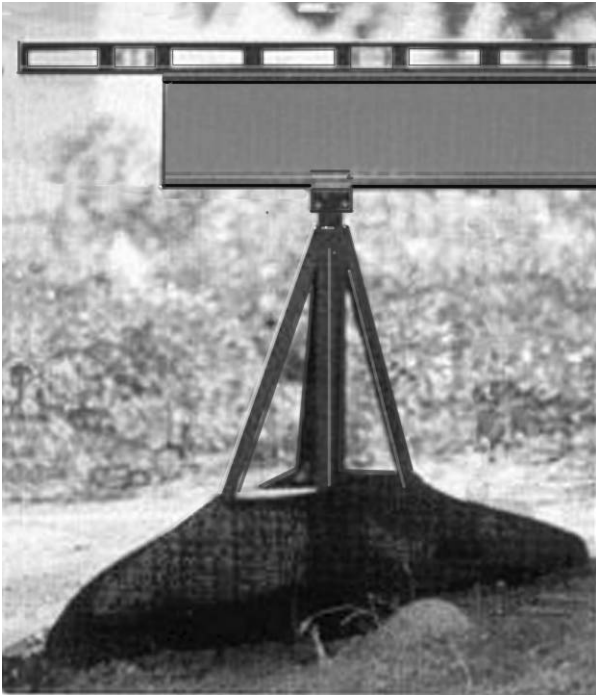
That rationale suggests utilizing some form of chassis mounted jacks that can be adjusted to reasonable site variations. In many communities, such systems could be utilized in conjunction with existing site "runways," or pads. Given proper drainage and soil conditions, simple prefabricated concrete pad blocks can do the job. In many locations, these systems, in conjunction with proper tie downs, can provide satisfactory lifetime foundations with minimal site labor and materials.



The sketch at left shows a home set on concrete pads, which would be spaced according to manufacturer's recommendations and soil conditions. In some areas, such pads could be set directly on the ground. In others, it might be appropriate to mount the pads on a layer of coarse gravel. The skirt illustrated could be fabricated from weather-proof kraft fiberboard such as is commonly used for bottom board. It would be prefinished and have "fold-lines" embossed so it could "accordion" up into place for shipment, then be unstrapped and pulled down to ground level at the site. The bottom 1 x 4s and stakes would be pressure-treated, with extruded corner posts.

The sketch at right suggests the possibility of a folding jack setup, which could retract to the frame for shipment. It could be set on pads as above or on concrete piers, which could be cast into cardboard tubes, with pre-drilled holes "belled" at the bottom as required for footings in some areas.





There are a number of existing foundation systems specifically designed for manufactured housing. One by Suresafe is illustrated left. It uses a series of jacks clamped to the frame rails and dangled a few inches above grade. Special breathable sacks are slipped over the bottom of the jacks and pumped full of concrete. When the concrete has set, temporary blocks are removed and the result is a permanent foundation that can be HUD approved in many areas, directly on the ground. Less expensive than typical foundations, the big savings would come if such systems were purchased O.E.M. and furnished with the homes, in volume.

Wide adoption of any such system might suggest adding value by using deeper I-beams and thus fewer blocking points.

Much of the stigma problem can be traced to aging mobile homes that sag, list and leak due to poor foundations. Any house on a bad foundation deteriorates unacceptably. Leaving the responsibility solely to retailers and site subcontractors is chancy.

### **Structural Integrity**

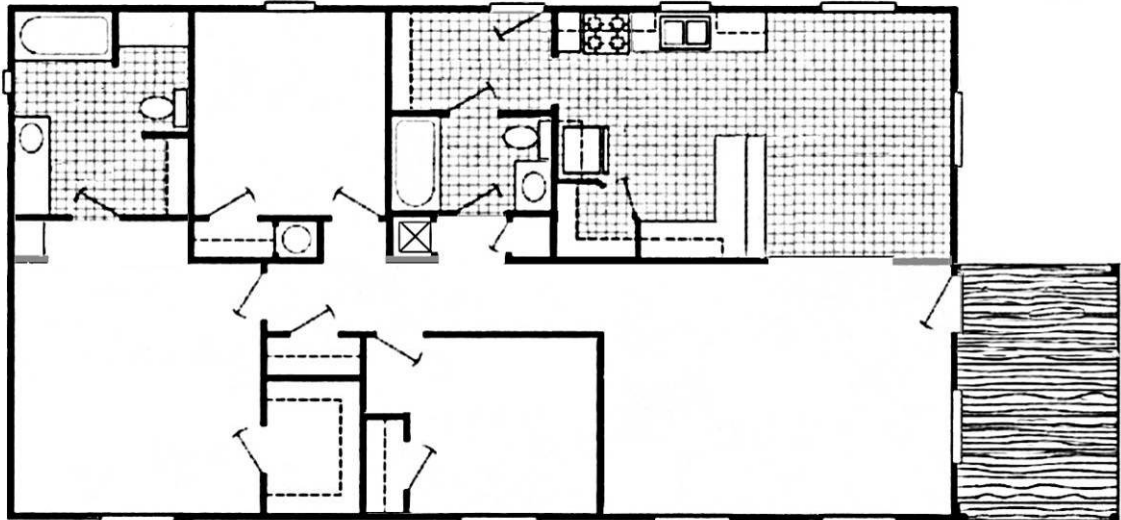
The MH industry takes a lot of flak over wind damage in tornadoes, hurricanes and the like. That's understandable, given the number of these homes erected without tiedowns and proper foundations. Those old singles that had bowstring trusses and a long side facing into the wind were sitting ducks for storms. Yet even those oldies were structural marvels, able to bounce down the road for hundreds of miles and arrive at site undamaged. They've gotten better in recent years, with properly braced interior walls and pitched roofs well tied to the site. The image though, remains, and has some basis, since the shape of a single is vulnerable to side winds.

Studies have shown that the single best thing that can be done to minimize storm damage is improved fastening. More nails, screws, staples, glue and straps, properly placed, systemized, with everything working together. Don Carlson tells of a system where studs are mortised into top and bottom rails by perhaps 3/8 to 1/2 inch. He has seen the results of tests showing such mortising can as much as double the strength of such a wall system. This is an area where a little research could pay big dividends. Conventional wisdom throws material at such challenges, and for stick builders, mortising would be very expensive. Under controlled factory conditions, it could become routine.

### **Multi Section Homes**

Multi's are particularly difficult because construction tolerances tend to multiply between separate sections. The problem is compounded by deflection from shipping stresses. In combination, they can make site alignment a tough proposition. In the early days this was handled (unsatisfactorily) by the use of wide trim pieces and lots of hope. The problem can be minimized by building the sections together and separating them for shipment, but the same problem is made worse by floor plans where open ceilings and floors flow across the joining lines. MH manufacturers take pride in offering designs with such open plan details, but the customer can wind up with a big bill for site finish, plus future problems.

Those joining points require careful work on site that is expensive and fraught with opportunities for unacceptable appearance. To compound the misery, virtually all homes settle a bit over the years due to wood shrinkage and ground movement. That's why old houses have cracks in their walls. Trying to preclude such cracks at joints between separately constructed housing sections is a challenge stick builders don't have to face. For producers of manufactured housing, it's a work in progress that needs careful attention if optimum housing value is to be maintained.



This twin, adapted from a Fleetwood plan, has some of the joining walls (gray) on one section, with the rest on the other, each overlapping the floor seam by half. Ceiling join lines are minimized and floor join lines are covered at site by lapping over carpet from the "dry" side. No doors are at the join line, unless an optional basement stair is ordered. It would go at the right side of the dining area, with no duct interference. All plumbing is on the "wet" side and duct crossover challenges would be minimal. The porch is on the dry side only. The idea is to utilize every possible design opportunity to keep site erection simple and service problems minimal.

## Multi Rentals

Customers prefer the look of twins. At right is what the home above might look like in a land lease community. Expensive though, for that purpose. Better to cut the plan down to a two bedroom, with about 1,000 to 1,200 square feet.



Let's suppose that you're an investor, having a nice community set up for doubles, and want to maximize your return, while attracting good long term lessees. It would be no big trick to design a multi section duplex, where each half was a separate living unit, joined at the site by exterior trim pieces only. One half might have an end entrance as pictured above, and the other on the side.

Two per homesite, like the Fleetwood park models on Page 180, but with the look of a single family home. Major manufacturers might not jump at the opportunity to produce such units, but there are smaller operators who would likely do so. This sort of product could make inroads into the apartment market—the main economic competition for manufactured homes.



The Living System was a modular multifamily concept developed by Slayter Associates Inc., in the sixties in conjunction with Cornell University. It was designed from scratch to make the most of modular potential, rather than emulating residential architecture.  
Rendering by Dan Eacret, 1969

The illustration above and the design it represents was created a long time ago, but is perhaps indicative of the MH future as rental and townhouse dwellings. It was conceived as a modular product, but learning curve makes that distinction hazier every year, as it should.

If you visit a modular factory and compare what's happening inside with a plant building manufactured homes, similarities will be evident, but there'll be differences, too. Those differences are so small that one industry expert said he was sometimes confused which was which on an active production line.

In essence, modular and manufactured homes are the same product, except for classification details. Manufactured homes utilize the HUD Standard while modulars fight the battles for community acceptance, using whatever code they find workable in the situation. The token difference is manufactured homes have a steel frame, an arbitrary transport alternative left over from the house trailer days, while modulars are shipped on reusable transporters. More than that though, modulars tend to have more material in them. That's partly tradition and partly the pressure of the modular struggle for local code acceptability.

The hudular notion mentioned on Page 188 could be an early start at demonstrating how manufactured housing can readily evolve into whatever form best suits the market. A plan to avoid getting caught in the modular chicken/egg trap could be to pursue learning curve growth from within the MH system that has enabled our industry to produce good housing at unbeatable prices. It's happening every day as the major producers of both manufactured and modular homes are the same company, often producing both simultaneously, in the same factory.

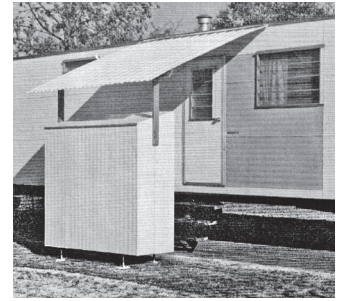
### **Site Storage**

The complex above has storage and parking under the homes, as is common in apartments. MH communities typically have a hodge podge of storage buildings from the local lumber yard. A few good community planners coordinate the needed exterior

storage as illustrated in the photos on Pages 184/185.

MH manufacturers could use casual labor in a corner of the factory to build prefabricated storage buildings using OEM purchased materials that are coordinated with their homes, and ship the packages inside as an accessory.

The storage unit shown right was offered by Richardson Homes in the sixties as an accessory, including the shelter for the entry. The storage box itself was fully assembled and sat on adjustable posts.



## Mobile Renewal

Analysis suggests combining market and product opportunities into solutions for industry problems. The industry's prime problems today are shortages of sites for new homes, financing and stigma. Annual production hovers around 55,000 homes.

In the past 65 years MH production has averaged about 210,000 units per year. Census data suggests that some 55 percent of those homes remain occupied. Vacancy ratio looks to be on the order of ten percent, suggesting two-thirds of all manufactured homes that have been built remain viable homes. Very low cost homes, for the most part—just what the nation needs; but too many of those older homes are stuck in deteriorating MH parks and country lots, where they are a prime source of the industry stigma.

There are estimated to be about 50,000 MH communities in the nation and Census data suggests they accommodate 2.1 million households. George Allen, Frank Rolfe, Dave Reynolds and others estimate there are about 250,000 vacant spaces, which would put the nation's total MH community sites at 2.35 million spaces—about 50 spaces per park. George frets that too many of those vacant spaces are in downscale communities, while Frank and Dave see those old small town MH parks as great profit opportunities. Such owners and operators have been filling their vacancies with repos, using up the glut from years of over-production and over-hyped selling.

But repo supply is running short and most of the vacant sites have neither space nor budget for the kind of new MH being built. Moving any new MH into a park like the one on Pages 127-128 makes no sense. Old parks like that one are being decommissioned despite being in prime locations, because the land is too valuable to be occupied by old mobs. Frank Rolfe says one can't build new communities because of cost and stigma. It's certainly true that darned few *are* being built.

Used single wide manufactured homes in decent condition can be purchased for five to 15 thousand dollars. They are, in fact, *mobile* and can be relocated for perhaps three to five thousand dollars. When a family moves out of an older and obsolete MH, the market for the home they leave behind is limited, Realtors are rarely interested and the community owner often wants the home removed. Yet just across town there will be a downscale park trying to get rid of an even older and more obsolete unit. All park owners seek affordable replacements and it's in everyone's interest to find them.

If owners of those communities work together, it can make great sense to relocate older and smaller homes to older parks having smaller spaces, enhancing the value of the MH communities themselves. Such a process can, over the years, reduce the stigma by steadily replacing deteriorating homes. When and if homes reach such an age or condition that they are no longer viable housing, they can be demolished, just as happens in any housing community.

On the other end of the scale, obsolescence and stigma of newer communities can be greatly reduced by a continual input of new homes, as old ones move down the chain. The same sort of thing can and should happen with country lots, with that process managed by retailers—another source of decent used homes for older parks. Multi section homes cost about twice as much to move, but are more easily updated on site, so

the renewal process would be expected to move slower.

An active program to upgrade the nation's MH communities should provide an ongoing replacement market for perhaps 100,000 new manufactured homes per year, particularly in the next decade as so many aging 10 and 12 wide are deemed functionally obsolete.

The owners of such communities should profit best, keeping their land value and space rent increasing over time. Manufacturers should support the process by providing new homes at sizes and price points aimed at keeping all existing communities vital and prosperous. As the value of existing communities increases, the stigma will fade, new communities will become viable and everybody wins.

Ultimately, the industry can best prosper by finding ways to make low cost housing thrive without creating slums.

## **Summary**

History has clearly demonstrated that the industry bloodies its nose trying to cross a three-jump chasm in a single bound. Breakthroughs don't work—have never worked—in an antiquated hide-bound industry like housing.

This chapter suggested moving toward increased use of drywall and perhaps even stucco. But those and other suggestions in this chapter are details—stopgap measures—adapting materials that are on the shelf. Creating manufactured homes from those materials designed for stick, because that's what's available at reasonable prices and that's what the customer expects.

Ultimately though, Bernhardt and other academics, architects and designers who urge the use of new materials and methods to produce houses have the right idea. Look how the introduction of wall-size sheets of plastic changed the RV industry. With increasing volume, an evolving performance code and leadership, the day must come when most materials used to manufacture housing will be produced for the task, and factory-built homes will be tailored to the housing market they serve. Easier to build, better looking and lower cost. Learning curve can do that, but not without effort and direction.

The new and old ideas set forth in this chapter are worth about as much as the paper they're printed on. Ideas are overpriced at a dime a dozen. Anyone and everyone can say, "Yeah, I thought of that." Or, "We tried that and it didn't work." It's easy to hide behind such statements and change nuthin'. The housing industry at large does it every day. The trick is to say instead, "Huh. That's not so hot, but what if we \_\_\_," fill in the blank, roll up our sleeves and try something. Then improve it. Then try, try again. Learning curve.

Someday, most of America's housing will surely be produced in factories. But not because someone popped up with a brilliant idea, launched a startup and quickly set the world straight. The trick will most likely be accomplished by an industry outside the housing mainstream—like manufactured housing that came out of left field. Makers of radio tubes did poorly at building transistors. The housing innovation that ultimately dominates will be one that's open to innovation and willing to make the effort to change the world, one step at a time. MH, park model and modular efforts are the only contenders in sight, and they're all close cousins, but that does not assure success. It's incredibly easy to become ensnarled in housing's bureaucracy, but ... so far, so good.

We're on our way. Opportunities abound, the challenge is huge; the rewards mighty. Those opportunities can best be developed by the whole industrialized housing family, working together. The time for wrangling over patches of turf is past.

*Whether you think you can, or think you can't—you're right.*  
*Henry Ford*

# 16 **Going Forward**

There should be a broad consensus for going forward toward an objective set by industry leadership, with each company tailoring its part to best suit its own capabilities and objectives. It's surely not for a duffer like me to set the strategy or lay the plan, but can we not agree that the objective is to build most of America's housing in factories? Let me end this book with a personal biography as a basis for qualifying my opinions on industrialized housing's potential, tossing in some suggestions on how to get things moving in a useful direction, while bearing in mind the endless (and surely better) alternatives available.

After getting my industrial design degree from Art Center, the design school in California, and a year at my new profession, plus a hitch in the Army, I realized I'd made an unfortunate educational choice. Wife Marge and I were country kids from Kansas and disliked city living. And designers live in big cities.

"Why not," I asked my bride of five years, "find a job in the mobile home industry? They could certainly use some design help, and they're small-town oriented."

With our new baby and puppy, we set out for Elkhart, Indiana. Our first venture east of the Mississippi. A dozen sketches landed me a position at Richardson Homes, where I started at line worker wages. We bought a new Richardson MH for \$3,000 cash, paying a hundred bucks to have it set up. Space rent was \$21 per month—the 2013 equivalent of a \$25,000 purchase price and \$164 rent.



In 1958, as an Army draftee serving near Fairbanks, Alaska, I bought a 23-foot 1952 California-built trailer for \$500, in order to bring Marge up there to join me in the cold. We preferred Fairbanks to Los Angeles, and after a few months sprucing it up, that little old trailer was surprisingly cozy.

Yes, I was that "young designer" who followed in Bill Flajole's footsteps in Chapter Two, working my way from being Richardson's only designer to heading the largest design staff in the industry. John Slayter, inventor of the Space Frame modular system, headed engineering.

After completing the Alcan project, that company wanted to hire us both. Instead, we resigned from Richardson and formed Slayter Associates, with Alcan as our first client. I was the single “associate” in the back room, with Marge at home doing our secretarial work. By 1970 we’d built an international reputation and a staff of some two-dozen. With great faith and fervor, we focused on modulares. We lacked marketing expertise, but believed solutions to that challenge would emerge, and the code problem could be managed. About half the winning Breakthrough bids were clients of ours. “Breakthrough” was our mantra in those days. We learned some hard lessons.

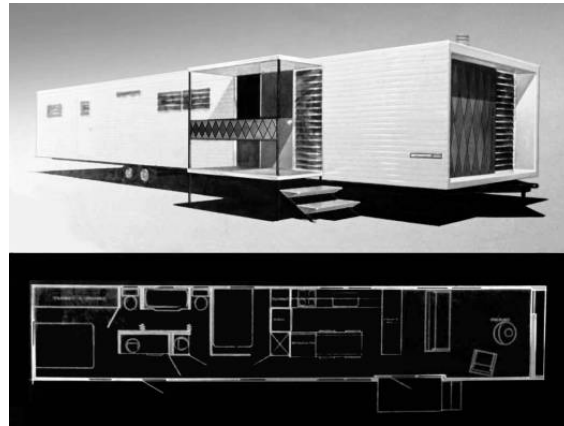
Frustrated by all those failed innovative housing attempts (surely it couldn’t be *our* fault?), we set out to show how “experts” get it done. Working with Multi-con, a proven home-builder and marketing organization owned by Bethlehem Steel, we got our hands on a huge modular plant in Ohio that had failed, moved our team there, redesigned the plant, and produced some truly fine multifamily modular homes at competitive prices, on budget. That is, until Bethlehem pulled the plug on the whole operation for reasons apart from housing. It happens.

Our little team dissolved and went our separate ways. John spent most of his career in the modular field, notably with Ryland, the nation’s largest modular producer in its day. I went back into consulting. A former client from Canada complained a plant we’d designed could not produce at its design capacity and challenged me to fix it. We’d introduced Jack Fraser to the concept of learning curve and made a believer of him. He was pushing the process fast and hard, selling more homes than he could produce and betting the cost would come down—and it did.

That plant had been designed by one of our engineers and I’d not run anything but a lawnmower in my life, but find it hard to resist fair challenges. I knew it was a good factory and Jack Fraser was a good manager. It took six months to get the plant’s production ramped up and then the industry debacle of the seventies hit Canada. We made the dreadful mistake of assuming growth would return, and used acquisition to vault Norcom to a position of number one in Canada, in the face of an ever-declining market. Learning curve in a competitive field requires staying power. Financed entirely by debt, we didn’t have it.

Jack finally bailed out, taking a position as CEO of a much larger company. Shortly thereafter, in 1980, I retired to pursue personal interests. It took Jack a year or two to turn around the conglomerate he’d taken on, and then—the man can be very persuasive—he talked both Marge and me into joining him. I was to be his “Strategic Planner” (I had to go to the library and look up the term) and Marge became secretary to both Jack and me. It turned out that business strategy had been a major part of my whole career. We had a great run, but after a few years, Marge and I yearned to depart for warmer climes and get back to country living. After a couple more years working for Jack part-time here on the Central Coast of California, we fully retired in 1991.

During my working career, I had the opportunity to observe this industry in its prime, and meet some truly great executives. Jack Fraser and I agreed that there’s no better training ground for entrepreneurial management than manufactured housing. At Slayter Associates, John and I observed smart business leaders of fine companies stubbing their toes on the challenges presented by bucking the stodgy momentum of the housing industry. Industry? Make that *culture of long standing* ... standing in the quicksand on the



After my Army discharge in 1960, I spent a month creating a portfolio of design concepts like this one.



far tail of its learning curve, where attempting an innovative leap can suck you under forever.

In my new planning career and retirement, I had assumed manufactured housing was pretty much toast. One of those “might have been” industries that couldn’t stand the heat and got out of the kitchen, as I had done.

In late 2012, in a chance encounter with David Funk, a Cornell U. professor, we happened to discuss mutual backgrounds. He asked me to write about my MH experience. I declined. I enjoy writing as a hobby but have no interest in lost causes. David took the trouble to convince me that the essence of the industry is alive and well. When I learned that three companies now dominate the market, are financially strong, and that the MH construction cost advantage remains intact, the old juices started pumping and this book was launched.

So ... I’m no expert on the industry as it stands today, but I bear the scars of fighting the good fight at many levels. The first book I ever attempted to write was about mobile homes.<sup>91</sup> I believed then, and believe now, that housing’s future belongs to manufacturers. The obstacles ahead are formidable, but not in comparison to what has been accomplished. On Page Three of this book is a series of questions I pondered in doing my research. After a year of digging into the matter, my conclusions are on Pages 151/152. Others will surely see things differently. What’s important is to think through the challenges ahead and agree upon a coherent and viable strategy for going forward.

*Yeah, yeah Mr. Not-So-Expert, so get on with your prescription for returning the industry to glory.*

**Y**ou’ll not be surprised to learn that my recipe for success depends on learning curve, continuing to build on our one proven strength—our efficient construction process—and taking one sound step at a time, in the right direction, avoiding the deep excreta and remaining profitable always, tightly focused on our best potential markets. So ... caution? Heck no! It’s time for leadership to launch an aggressive new learning curve, powerful enough to force other manufacturers to keep up or drop out. Win a big chunk of this soft housing market from the real competition, stick builders. Hit ’em while they’re down with products that take a big enough swath of the market that growth can plow ahead, good times and bad.

I’d suggest concentrating first on our best product strength; the low cost construction of single section homes. True, that’s not the market’s or the critic’s first choice among our products, but it is the housing market’s greatest need, we can fill it and financing is easiest when the price is right and the customers are hungry. The small single can provide good single family homes proven to deliver customer satisfaction, at unbeatable prices, with no subsidies needed. Economics drives markets, especially in tough times. Sure the customers yearn for upscale products. Sure it’s easy to add goodies that nip away our competitive edge. *Don’t do it.* Just get the product right, the price right, the financing affordable and fire up those vacant plants to keep up with demand.

Consider again, multi section manufactured homes. They were introduced half a century ago as a way around shipping size limitations. Since then, learning curve has enabled us to find a way around the singles shipping problem. These days singles average a bit above 1,100 square feet, nearly 80 percent the size of doubles, which is more than big enough for today’s families. Doubles average 23 percent more per square foot, so the average twin MH can cost nearly twice as much as a single. The average single is

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<sup>91</sup> *Look Out World, Here Come the Mobes*, unpublished manuscript, 1975.

larger than the average apartment, and that's our real competition for low cost housing. It's time to think carefully about what business we're in. Back when manufactured homes dominated the low cost housing market, they were half their current size and quite livable. Doubles have great potential, but by the time financing is calculated, have little economic edge over comparable stick houses. That's simply not enough.

In the soggy old housing paradigm we inhabit, toting around the industry stigma, making a major switch to building homes in factories is unlikely to be accomplished as long as the typical buyer sees no potential for gain on the monthly housing budget. As shown in this book, and as you already knew, most of our construction cost advantage is lost to friction caused by operating outside the prevailing housing system, and saluting HUD didn't change that. No magic bullet will make that problem go away but disciplined learning curve can do the job. To attain the goal of converting housing into a factory-built product, we have to scramble to find ways to boost the family's net living cost benefit.

Back in the days when our construction cost advantage was ephemeral, we won our spurs by being forced to build a lot of living into a little bit of space, using tricks that would (and did) leave HUD appalled. The cost per square foot of those old eight wides was no bargain, but since they were so small, the net cost of a livable home was surprisingly affordable, compared to alternatives. The MH appealed to a niche market that declined the challenge of keeping up with the Jones' ranchburger. How about we work that game again, from a much stronger base? And start while the stick builders are still on the ropes?

The advent of windows, refrigerators, central heating, etc. all had major influence on the shape of houses. Factory manufacture offers similar advantages, and is most efficient when the shape of the house is most compatible with getting the building out of the factory and into the hands of its dwellers.

Seeking to cater to the market, we spend half our effort building multi-box homes whose major advantage is that they look like the houses people are used to seeing. That seems a compromise we can ill afford in the light of the goal. True, the battle of the stigma must also be won, but it won't be won overnight, giving up a major chunk of our cost advantage.

It is my conclusion that if our industry is to regain its mojo, we need a bigger advantage than we have in hand. In the near term, our best cost advantage lies with handsome singles small enough to keep the monthly cost of our homes to the consumer well below the stick competition's *apartments*. Apartment size singles are inherently more attractive than 80 footers and with some design effort could become appealing little homes. Move styling in the direction set by park models.

Woodrow Wilson was a rather stodgy President but his long-forgotten VP was a man of some wit. Presiding in the senate as it droned on about the challenges facing the nation after WWI, Thomas Riley Marshal quipped, "What this country really needs is a good

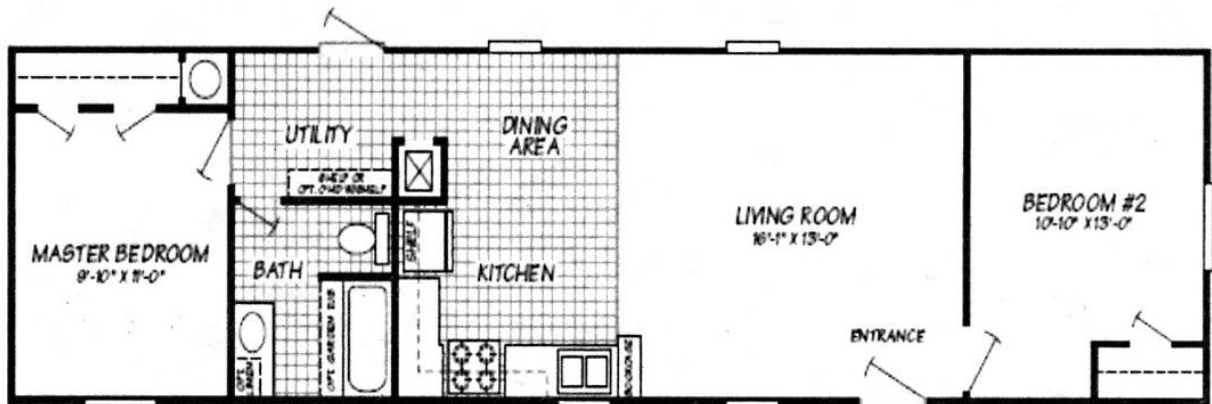
Bill Bryson's 2010 book, *At Home*, makes it clear that most housing changes happen *despite* what the customer desires. An example:

*... in medieval times ... nearly all the space above head height was unusable because it was so generally filled with smoke. An open hearth had clear advantages—it radiated heat in all directions and allowed people to sit around all four sides—but it was also like having a permanent bonfire in the middle of one's living room. Smoke went wherever passing drafts directed it—and with many people coming and going and all the windows glassless, every passing gust must have brought somebody a faceful of smoke—or otherwise rose up to the ceiling and hung thickly until it leaked out a hole in the roof.*

This problem, Bryson explains at length, required high ceilings to keep the atmosphere tolerable, and those ceilings created the advantage of a sort of heat sink of smoke that provided a degree of radiant heating. The invention of firebrick enabled the building of decent chimneys, popularized in England in about 1330. That cleared the smoke, allowing boards to be laid across existing ceiling beams and the invention of "upstairs," a wonderful bargain in living space. The citizens griped about the lack of heat from the smoke, but the environmental benefits and additional usable space tipped the balance, and the idea caught on. Two storey construction changed the shape and utilization of houses; a constant theme through the book.

five-cent cigar.” Let me paraphrase, “What this country needs now is a good \$50,000 house.”

Let’s build it. The hard work is already done. Start with this 764 square foot Fleetwood:



This apartment size MH is about equal to the typical two bedroom stick house that was so popular after WWII, when families were bigger than they are today. Courtesy Fleetwood Homes

My own young family of four was snug and happy in our Richardson home having less than 500 square feet. We Americans aspire to be globally competitive, so why do our families need twice as much space as the competition around the world? *Keeping up with the Joneses* was a comic strip that ended 75 years ago. Now we need to ditch the consumption impulse and concentrate on *outproducing* the Joneses. Our houses should be efficient places to live. Celebrate the reduced house-keeping and maintenance. The kids spend all their time glued to electronic toys anyway.

Our industry can put nice little homes like this one into decent communities for less than half the cost of any other new house and competitive with apartments as well as old houses that are obsolete and a burden on the economy.

Most MH producers offer small singles like this Fleetwood, but customers are not banging on their doors for more. One reason; we as an industry don’t push them, preferring the higher margins to be earned from doubles and big singles. Another reason; nobody wants the cheapest Ford on the lot.

Stripper cars, cheap shoes, and shopping at the Dollar Store hold limited appeal. The marketing image conjured is one of people gritting their teeth because cheap is all they can afford. Walmart got to be the world’s biggest retailer because they outdid dime stores competing to make merchandise affordable, *but not too cheap*. The MH industry could do the same. People will prefer Macy’s, but ... low price is a great motivator. People will stretch a bit in order to save face and create for themselves a rationale for buying a cheap car, “Hey, I got the deluxe package; you should hear the stereo ... and it makes great gas mileage!” These days folks are disdaining Walmart and heading for Target.

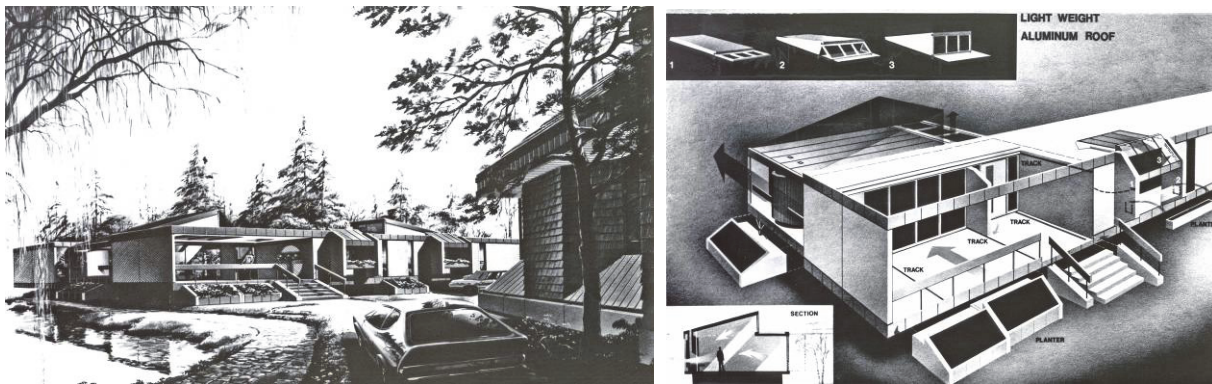
Appealing to that “trade up” rationale has traditionally geared our industry toward seeing how big we can make our homes, along with tossing in a dollop of what used to be called “Alabama Flash.” We add “shutters” that won’t shut and are just a slab of cheap ornament. The very favorite industry trick though; is bumping up the square footage. “Bigger” is the American way, and it works.

But ... we’ve created an unfortunate market perspective of single section mobile homes as cheapo housing suited only for those of laughably indiscriminate taste. That’s a ma-

major part of the stigma problem that really needs to be addressed. Let's think about how to do so.

Five decades ago there was an organization of MH designers called the Design Council of Industrialized Housing (DCIH). It was formed in the sixties to address the issue of the MH industry's already tattered image. In the early seventies, Reynolds Metals sponsored two national design contests where designers and architects were challenged to create new and refreshing architecture for mobile homes. In order to give a note of realism to the outcome, DCIH served as judges for both competitions and helped develop the contest rules. At that time, I was operating the DCIH Research Center. Having seen so many extravagant but impractical "solutions" put forward for factory home design by "outsiders," we were determined to bring a dose of reality to the Reynolds contest by, for example, limiting the contest to single section homes.

There were hundreds of submissions, and beautifully presented, highly creative—and unworkable. An example shown below, courtesy of Reynolds Metals Transhelter Design Competition, is the second place entry for 1973, by Uri Hung of Los Angeles.



Like most, this entry focused on the challenge of reshaping the shoebox shape that so much defines a single section MH. Courtesy Reynolds Metals

That the entries generally followed the dictates of architectural fashion is understandable, but really now ... building a home like this in a factory would probably cost more than building it on site. Also, avoiding leaks would be a monumental challenge. And this was one of the best submissions. It's certainly creative, and it addresses the problem of the box, even if the proposed "solution" is questionable. A quote from the judges; "Mr. Hung's design includes a practical use of wings to break up the 'boxy' look. This design seems to offer good livability, and should be very marketable." A bit of hyperbole there. Bottom line, neither contest went far toward solving the inherent architectural challenge of low cost factory-built housing. A shame. That contest had the typical hallmarks of designers seeking a dramatic breakthrough solution to a fundamental problem of long standing. The creativity was there, but no real answers.

How about we try again to tap young minds, this time with a learning curve approach? Workable steps in the right direction. Talking with old buddy John Slayter and new friend David Funk, we came up with a proposal that might stand a better chance of initiating some progress.

Suppose the industry and its suppliers sponsored a new contest, perhaps annually, this time judged by senior manufactured housing executives—guys having a deep understanding of manufacturing realities. Suppose each contest involved two phases. First, a preliminary round with students from engineering, architecture and design schools. Class members would submit ideas, concept sketches or papers. Most of these would,

no doubt, be “interesting” but a bit out in the woods, like those in the Reynolds contests. The judges would seek ideas deemed worthy of a second look, such as Uri Hung’s folding bays. The frontrunners from the first round would be teamed with an engineer or design professional from the MH industry, who would work with the contestant in factory and/or classroom, discussing and demonstrating how things actually work in the real MH world. Between those pairs of candidates, the initial (or any alternative) idea would be developed for submission in a final round, winners determined by the same judges.

The main prize, instead of a new Vega as in the Reynolds competition, would be the honor of the designer seeing his or her winning concept put into production for, at minimum, a trial run. Winners might also be eligible for a position as an employee or intern within the industry. Each entrant’s MH “partner,” being on a manufacturer or supplier’s payroll, would not qualify for prizes, but would have a great opportunity to get his or her creative juices pumped.

Such contests might be run sequentially, one year focused on exterior design, another on engineering or interiors. Perhaps a year on singles and another on multi’s. Yet another on building materials; another on marketing ... there’s no limit to the potential of learning curve development. We, as an industry, need to stimulate thinking outside the box—pun intended. The resultant publicity alone should be worth the modest cost of the competitions.

**A**s for yours truly, my creativity has been dampened by many years in the saddle. But let me suggest how a dollop of learning curve can be applied to the challenge of product innovation. Let us reconsider the Fleetwood shown on Page 199. How might learning curve be used to help such a product evolve within its cost constraints toward better and more marketable housing?

In my educational process at Art Center 60 years ago, an early class assignment was to sketch ideas for a new grille for Oldsmobile. Grille design is a traditional marketing identity for a make of automobile, and evolves year after year. Us kids were asked to sketch some two dozen Oldsmobile grilles, all different, all identifiable as “Oldsmobile,” by next week.

Impossible.

After grunting through a dozen variations, I was out of gas. And yet ... budding designers were being tossed out of school for bogging down on such basic assignments. Sweating the midnight hours, I came up with the requisite number of sketches, some of which overlapped more than I would have preferred. The following week each of us posted our plethora of sketches on the “crit wall” awaiting the instructor. In the meantime, we checked out each other’s work and most of us were astounded at the creative grille ideas of competing aspirants. There were, in fact, *hundreds* of great ideas—much better than mine. *Why couldn’t I think of those?*

Lesson learned. There’s always a better way. It takes effort to find it, and those of us immersed in the industry will always find it hard to maintain a fresh perspective. We need new inputs, but pie in the sky is seldom as tasty as it looks. Constraints can be the best creative stimulus.

Current MH design is generally uninspired; especially in the lower price ranges where the main market resides. Market appeal is easily increased by the addition of materials, labor and features, but doing so is too often counter-productive. The market always wants more than it can afford. The real challenge ahead is to enhance both community acceptance and market appeal while *improving the value equation*. We need to continue the good work that has been done and move forward, one step at a time, always opti-

mizing value added to the product. Following is one simple example of how that might be done:

### First:

Note that the floor plan on Page 199 is very basic, stripped down to meet a price point. The obvious way to “improve it” is to add space. Everybody likes more room and our industry is good at building it. *Maybe too good for our own good.* To stimulate creativity, let’s try the old constraint that made it possible to sell mobile homes when they cost *more* per square foot than houses. Accept the challenge of enforced creativity, using space so cleverly that customers salute the result. One benefit; the net cost of the home will be lower, even if it costs a bit more per square foot. So let’s set a challenge to make a very low cost MH *smaller* but more appealing, without raising the price. How about 10 or 15 percent smaller? Yes, compromises will be necessary, but let’s see what can be done.

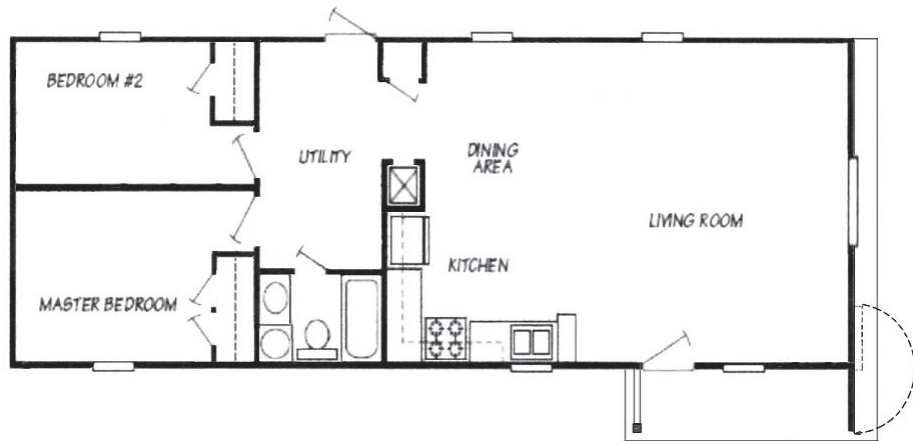
In order to minimize the penalty, let’s take advantage of the huge market area that is Southern, MH friendly, and generally allows the transport of 16 wide singles.

This 16 wide is just forty feet long and has about 625 square feet, 18 percent smaller than the 14 wide on Page 199. The kitchen /dining/living area is a bit larger; the bedrooms and bath, a bit smaller. There’s bonus space in the utility room suitable for a small office or play room. The proportions of this home are better, particularly as viewed from the “street” end, and it will fit nicely on a smaller lot. Perhaps two or three could be squeezed onto a typical city lot.

To keep the cost down, this sketch utilizes a 2/12 pitch roof and a flat 7 ½ foot ceiling. At that slope, a steel roof works fine. Basic low cost vertical siding de-emphasizes the long side.

That wing at the left folds over the front wall and the canopy flips up over the roof. It is supported at site by the folding wing and a diagonal pipe at the rear. The pipe drains rainwater from the roof above the entry as well as condensate from a rooftop air conditioner concealed in the “chimney.”

There’s a one-foot overhang at the front only. As for the fancy front windows, they’re just picture windows, surrounded by vacuum-formed ABS panels that replace the siding underneath. Similar panels are above and below the side windows. Three variations at right.

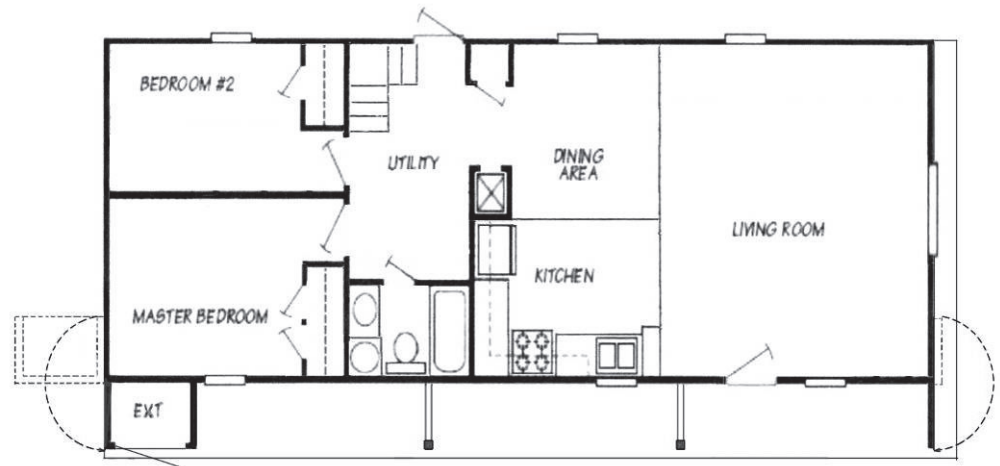


It should be possible to produce this little rascal for no more than the Fleetwood shown on Page 199. Call it \$27,000 retail, roughly the same cost per square foot a well equipped new MH. But that's a third lower *net home cost* than average, opening up a lot of market potential. That lower price should help customers afford chattel financing and generate more cash sales, too. It should attract customer traffic, since it has better proportions than most homes on sales lots and has a bit of "cute" factor going for it.

What's described above is the first step of a single product—one innovation—that will not immediately dominate the MH market. MH companies large and small should surely continue to produce the homes that have been the mainstay of the market. And if this idea doesn't work (most don't) scrap it and try something else, but don't give up on an innovation without giving its own learning curve a good chance to show its stuff.

### **Second:**

Offer an upscale version of essentially the same home. Its purpose would be to attract buyers, some of whom will be able to afford the goodies and might well choose this product instead of a larger bare-bones offering. The number one objective is to maintain good value and secondly, to differentiate from the MH products that have engendered the industry's reputation for lousy design—and thus the stigma.



That's the same floor plan and size as the base model pictured on Page 202, except it features upscale appliances and cabinetry, along with a storage loft above the dining area, and a partially open ceiling with clerestory windows above the living area.

At the rear there's a hinged exterior storage closet that increases the shipping length a bit. With the help of pipe braces, it supports the folded overhang that extends the length of the home. The "family appearance" is important for both production and marketing reasons. Most customers will aspire to the upscale and settle for the home they can afford.

There's a bit of a loft above the dining area accessed by a small stairway that might be used for storage or a play area for kids. HUD will frown. The popularity of this feature in park models might not sway them. Maybe not the opinion of focus groups either. But where is it written, based on what health or safety grounds, that such space is verboten? If HUD presents logical arguments, accept them. Omit the loft.

This is not as difficult as creating the base model, because it's far easier to add to a base model than to strip down a product designed to a higher price point. It's also important for this product to avoid the traditional thinking that has dictated so many existing offerings. Time to give the design team a little more leeway and throttle down the sales department's input. Following is an example of how the exterior might turn out:



### **Third:**

Once both of those products are on the market and chugging through the plant efficiently, concentrate on making them into ever-better homes. Of course, the HUD Standard must be met, but it is, in principle, a performance code. Ensure that this little home meets the code, using ACs as need be, but more importantly, *performs*. Stand behind them as well as anybody warrants any other housing product, and when things go wrong, fix them, and do it quickly. This is an easy and simple home to build, so there's no excuse for sloppy work or marginal quality. Make this the VW Beetle or Honda Civic of manufactured homes. Put experienced MH engineers to work seeking better, faster and less expensive ways to do everything, one step at a time. A basic management step; yet so often ignored.

Don't fret about the competition from manufacturers down the road. We're all in this together. Good ideas should be pooled. Japanese car manufacturers compete fiercely but stand back-to-back on quality. Join hands to win HUD acceptance on innovations. The potential for improvement in factory manufacturing of homes has hardly been scratched. Work with suppliers, banks, land owners and everyone involved to improve the total system of manufactured housing. Aim to reduce manufacturing costs a percentage point or two each year, using the savings to improve the product. Some specific suggestions:

- **A Good Foundation**

Engineer the home with the minimum number of support points that will fully support the home under load conditions in its market region. Supply it, as delivered from the factory, with site supports that can be, or are, permanently attached to the frame at those key locations assuming a "floating pad" foundation—providing as much as can be factory supplied and shipped with the MH. Make it so easy to set up that "... a cave man can do it." Warren Buffet and Geico might grant permission to use that tired advertising slogan. That foundation is going to cost some bucks, but everything that can be efficiently supplied by the factory should cost half as much as that generated at site. Just keep refining foundation approaches for these homes that will get the job done, shrug off storm damage and last the life of the home—which will then be the same as any other home. In the South, climate is relatively forgiving, so it's a good place to develop sound foundation principles that can gradually be adapted to harsher climes.



- **Improve the Financing System**  
 Never mind, for the moment, HUD’s long term site guidelines and unfulfilled lending promises. Focus on workable site setup systems and standardize them for large market areas. Accept the “penalty” of chattel financing or leasing and use it to include such necessities as skirting and exterior storage. Repos should result only from family disasters and crooks. Ever better financing—even from local small-town banks—will come with a proven track record. Good affordable homes need no subsidies. Earn a solid reputation from performance rather than waiting for the government to enforce its arguable notions of engineering and finance.
- **Basic Roof**  
 This proposed econobox and its deluxe sibling have simple low-slope steel or asphalt roofs such as proposed in the previous chapter. Maintaining a traditional steel roof is a piece of cake and it will outlast “lifetime” asphalt shingles. But the old “one-piece” steel roofs rumble, rattle and look like the devil. With proper ridges rolled in, this one won’t. Ultimately, manufactured homes should have much better roofs than conventional construction can build, and they should cost less. But for starters, work with what’s available.
- **Develop Alternative Siding Materials**  
 The sketches assume hardboard or OSB prefinished siding. Perhaps steel or aluminum if it has substantial ribs. Cement has great potential. Get away from the “tinny” look and use ABS or vinyl plastic for alternative accent panels as suggested on the sketches. Develop extruded trim as suggested in the preceding chapter to provide depth and attractive detailing.
- **Factory-Installed Roof Air Conditioner**  
 The sketches assume a large window or RV-type air conditioner, roof-mounted in a box to simulate an oversize chimney. An attic duct would deliver air to the rooms at the rear (through a drop ceiling over the kitchen in the upscale version). In a home of this size and design, such a unit should provide enough cooling, and reduce both cost and site work.
- **Southern Strategy**  
 Develop a very short line of small homes produced on such principles and focus them tightly on small communities in Southern growth areas. The climate is favorable, site labor is available at reasonable cost, the people are willing to work, local regulation is minimal and consumers look favorably upon manufactured housing. The basic model should retail at around \$50,000, including the lot and ready for occupancy. Don’t offer models of this design more than five feet longer. The stick competition will be rentals and existing homes in need of bottom-up renovation. Make the product irresistible in those prime Southern markets, and it will spread elsewhere, just as small mobile homes did from Elkhart so long ago.
- **Specialist Innovators**  
 Innovations often arise from smaller manufacturers who cater to upscale MH markets. Welcome them. Encourage their promotion of innovative upscale features that can create market variety and a significant point of difference as small homes evolve. There’s always room for innovative producers. Such manufacturers could offer similar homes but further jazzed, similar to the Champion sketch shown on Page 182.
- **Drywall**  
 Use painted drywall for interior paneling, except perhaps immediately around the entry doors. Stick to off-white paint, except for coordinating accents. These little homes should provide an excellent test bed for working out the kinks of cost-effective and foolproof drywall.

- **Low Margin**

It will be tempting to put a premium price on such units at the time of introduction. Bad idea. Learning curve works best when pricing is used to build volume on the assumption that volume will follow. Have faith in the process.

- **Simple, Tasteful, and Durable Cabinetry**

Make this the IKEA of manufactured homes. Good design is generally simple, can be inexpensive, and contributes to improving the market perception of the product, instead of catering to the market's lowest common denominator.

- **Promote It**

Some national advertising might be in order, and every effort should be made to attract media attention. Free local publicity at the retail level is probably best of all, and can be obtained by demonstrations of environmental wizardry and the like.

Park cars on the roof. Loan a home to a local TV station or church in need of temporary shelter. This is America. Good marketing works.

Of course, there will be problems. Work them out. Innovate. In the context of pursuing efficient manufacturing, whole new material and construction systems should evolve for use by the entire housing industry. Surely we can improve on current housing materials and methods created decades ago for guys swinging hammers? There's lots of incentive for suppliers to work with manufactured housing, where minds tend to be open and receptive to new approaches and "performance standard" has meaning.

Starting such programs should be easiest in the South, but take nothing for granted. Find the best niche opportunities and pursue each of them vigorously. Every project—every sale—should create a great reference for the next one and another step in the industry's learning curve as well as the product's learning curve of the moment. Take advantage of the ongoing housing slump, where every customer is important and each sale contributes toward the future; working toward the potential we all know is there.

The American housing market outlook is poor, but the competition is weak. There's an enormous market for the right product. If the little home proposed in this chapter isn't it (probably it is not), then for goodness sakes figure out what is and build it. The greatest barrier to the industrialization of housing is volatility. The best answer to that fundamental conundrum is targeting a market so fertile that demand becomes a driving force. The home-buying public's gotta love the product, and it's gotta be affordable so they can buy it. Get that equation right and barriers fall away.

#### **Fourth:**

Learning curves are highly dependent on initiative. Critics decry manufactured housing for its apparent lack of R & D, and there's substance to the charge. Yet our industry has been a hotbed of innovation as housing producers go. We use on-the-job learning curve instead of think tanks and academic consultants. But learning depends on concentrated effort. The industry can accelerate its overall learning curve by launching new and innovative curves. For example:

- **Product Development**

Easy to say. Hard to do, in this low overhead industry. What's needed is some sort of test lab. No white coats—just a small factory with a big shop and some creative people who can build prototypes and try out things in limited production. Keep it busy cranking out a couple or three homes per day for prototypes, test marketing and limited production runs. Properly conceived and managed under ownership of a major manufacturer, it could be a profit center. Market the output locally and have factory teams monitor field performance. The overhead of such an operation will be high, but if reasonably managed, it should be able to break even. The trick is to avoid trying to do too much, too soon. One step at a time. Perhaps one in five inno-

vations will ring the bell; be found worthy of introduction to the company's system of plants. When successful, they'd be copied by other companies. That's how it has always worked in this industry.

- **Manufacturing Efficiency**

"Sidesaddle" vs. "Inline" production evolved through happenstance of one building's layout. Similar experimentation evolved the notion of "Just-in-Time" materials handling systems before the Japanese thought of it. The list goes on. A manufacturer might dedicate one factory to, for example, increasing the efficiency of dry-wall. Another to developing a small twin as efficient as singles. All that's lacking is systems development, which takes time and patience. It's more easily done in dedicated and tightly focused plants than system-wide.

- **Incentives**

Much of our industry's cost advantage derives from the efficient and productive use of labor. A manufacturer might focus one small factory in a large market area on producing a basic single section home such as described in this chapter, with minimal options. Ensure that factory has a constant year-round demand by pricing on a very thin margin. Make no changes except as agreed upon by the production team to increase efficiency. Reward that team well for bringing down the production hours per home, consistent with uncompromised quality. Keep lowering the product's selling price as manufacturing cost comes down. Spread what's worked best to other plants. Learning curve squared. It's a strategy that worked well for Japan, and has been well demonstrated in our industry.

- **Land Use**

The foundation of the MH industry in the glory years was land developers who prospered by building MH park spaces nearly as fast as manufacturers built homes. Rising land cost and increasing stigma snuffed that movement, driving most new homes out into the countryside, where the stigma has also taken root. Land, some might say might be said, is too valuable to be used for low cost housing. It might better be said that low cost housing is too important to be driven out of town. One might even suggest that people are too important to be confined to apartment warrens. It is vitally important to the future of the industry that solutions to this site dilemma be found. Highly efficient singles such as those suggested in this chapter can further reduce the construction cost of housing. They can also use less land than traditional MH communities. But new communities of any type won't be built in volume until a better equation for land use has evolved. The first step is to stop the deterioration of existing MH communities by a combination of enhanced management, reduced siting cost and some means of dealing with obsolescence such as suggested on Pages 193-194. Get the land/house equation right for the lower half of the income spectrum and the market will be vast.

**I**nnovative undertakings are difficult. Persist. Make it happen, knowing that progress depends on such effort. The nation needs good low cost housing. This industry has the proven ability to build it. It may seem the progress is slow, and it is, but it is important to keep the challenge in perspective. Manufactured housing is one part of the housing industry; an ancient, enormous and hidebound culture that resists innovation like no other. As a component of that industry, manufactured housing is relatively fast on its feet and in the housing industry's best position to take leadership.

One step at a time, keep improving the product and bringing the cost down and the quality up. In due course, the stigma will be gone. Only the Amish still travel in horse and buggy. The manufactured home is an inherently superior housing product that's in its Model T stage of development. In due course, commentators will marvel at how long

this country continued to build housing stick-by-stick. One day only the rich or ostentatious will waste their money on stick built homes.

The power of learning curve got us this far and there's worlds of room for progress ahead. The gods must look down and marvel at the primitive ways we mortals continue to build our homes.

Mainstream housing has lost its mojo—stuck in a time warp. The factory manufacturing of homes is a vibrant youngster with boundless potential. What other manufacturing industry could suffer the loss of 90 percent of its volume and emerge with its price advantage intact? With its leading companies strong and profitable?

This industry invented workable industrialized housing and used learning curve over a period of decades to develop it. Much remains to be done but manufactured housing producers created an alternative housing system that works. Let us continue to develop the system and lead the housing industry out of the apathy in which it has languished for centuries. ■

Since technological changes in home building seem to have evolved on a geological time schedule we must somehow find means to hasten them. It seems to me there is a lack of basic science of home building and specific criteria and data by which to judge new developments. These basic data must be developed so that houses can be designed for the needs of the people who occupy them and for the forces, loads, and climatic factors which they must resist. Once the problems are established, then the industrial laboratories, together with the home builders, will be able to develop the new products or new materials to provide better quality housing for a lower cost in all price brackets. And perhaps we can dispense with building codes handed down from Aristotle.

In one respect, and it may be a significant one, we have made considerable progress, that is, transportable houses. The nomadic Indians of our Great Plains had a very functional portable home—the teepee. Our modern counterpart—the trailer—is a great improvement and is gaining increasing recognition.

James B. Austin, U.S. Steel Corporation, speaking at a 1959 conference on the future of housing

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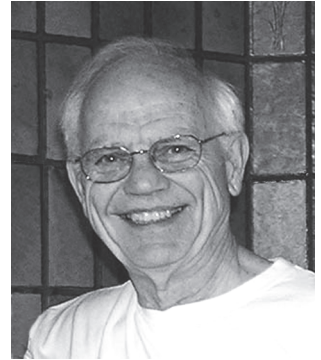
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### **About the Author:**

During his many years in the industry, Bob tended to be the “back room” guy, preferring to study and analyze problems, leaving leadership to others. It’s leadership, he believes, that gets the job done, but it’s teamwork that guides good leaders toward optimum solutions.

Retired now for some 25 years, Bob writes as one of his hobbies, and this is his tenth self-published book.

Bob and Marge, his wife of 59 years, moved to the Central Coast of California in 1988, retreating from the winters of Winnipeg. Their children and grandchildren all live on the West Coast.

Life is good.