Manufactured Housing Research Alliance

Eliminating Barriers to the Use of HUD-Code Housing in Attached Construction

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Preface

In the late 1970s, an innovative federal program called Operation Breakthrough promised to reduce housing costs by applying the techniques of industrialization, honed in industries such as automotive production, to the home building industry. The program fell short of its ambitious agenda; however, the building industry and the U.S. Department of Housing and Urban Development (HUD), recognizing the inherent advantages of building in volume under controlled conditions, have continued to seek ways of applying the efficiencies of factory production to residential construction.

The majority of the nation's new homes still are erected at the building site by a large number of small builders, and technological advances are slow to make their way through this fragmented building community. However, some macro trends are in evidence. As housing prices have continued to rise, traditional builders have looked toward prefabricated components and subassemblies to better meet the demand for more affordable homes. At the same time, manufactured, or HUD-code housing, has expanded into higher income markets and has been increasingly used by innovative developers.

Among the factors driving home builders to industrialize are: the decline in the number of skilled tradespeople, difficulties with maintaining construction quality, the complex system of regulations that control on-site construction, and the need to construct homes at a competitive price. This is particularly the case with affordable housing, where small changes in price have a huge impact on the financial viability of a project. It is increasingly difficult for the affordable home builder to deliver a quality product without having some, if not most, of the components built off-site.

Along with these pressures, there have also been significant incentives for the HUD-code home industry to produce innovative designs. While in the past, HUD-code homes have developed largely apart from the mainstream home-building industry, this housing type has been increasingly used by on-site developers. As such, manufactured home designs have become more complex and sophisticated to meet the demands of a more affluent customer base.

Utilizing HUD-code homes in the single-family attached housing market is a natural step for the manufactured housing industry. It seems especially appropriate since attached housing traditionally has been considered an affordable choice in the site-built industry. HUD-code homes, too, have long been recognized for their affordability. For some people, competitively priced manufactured homes are the only available avenue to homeownership.[1]

Proving the value of manufactured homes as a building block for single-family attached construction is research that requires understanding and resolution of several interrelated issues. There are several major factors that determine under what conditions manufactured homes are viable for attached construction. These factors are addressed in this report and include the following:

- **The potential market size.** The market size was determined in order to measure if there is sufficient demand for this use of manufactured housing. Demographic and trend data were examined in order to establish potential market size, distribution, and characteristics.
- **The combination of market conditions most likely to encourage single-family attached developers to consider manufactured housing.** This information was

compiled through interviews with a cross-section of experts in the HUD-code and single-family attached industries.

- **The regulatory barriers to such applications.** A detailed review of the HUD standards and enforcement procedures was conducted in order to identify the impediments to using manufactured homes in two-story and attached configurations. The process of removing these barriers was begun by recommending changes in the federal regulations, under a procedure established by the Manufactured Housing Improvement Act, for updating the HUD construction standards and enforcement regulations.
- **The architectural and engineering feasibility of using manufactured homes for single-family attached applications.** Practical case studies providing real-life examples, facilitated as part of this research, clearly illustrate the feasibility of this new application. In spite of the long development cycles typical of multi-unit attached development, the current research made significant headway with several developer partners. The status of these collaborations and lessons learned thus far are described in this report.
- **The cost impact of alternative methods of construction.** Cost information was culled from the case studies in order to demonstrate the bottom-line impact of developing single-family attached housing with manufactured homes. While anecdotal and preliminary, the data are encouraging and suggest that the hypothesized economic advantages of developing with single-family attached manufactured homes are indeed being realized in practice.

This study presents compelling arguments for further research and development of new applications for manufactured homes, and highlights the significant cost and time savings that this technology can offer to the development community in its efforts to provide affordable housing.

Introduction

The research reported in this document was predicated on the supposition that increasing the level of industrialization in residential construction is one of the most effective strategies for improving home affordability. The purpose of the study was to explore how the cost of single-family attached construction might be reduced by building with one of the most cost-efficient building elements available in industrialized housing: the HUD-code home.

This report is intended primarily for home manufacturers and builder/developers involved or interested in the emerging single-family attached market segment for manufactured housing. This document also contains substantial information of vital interest to anyone with a vested interest in advancing manufactured housing. It is intended to summarize and evaluate the key issues that manufacturers and developers face when embarking on such projects, as well as the latest developments affecting this market segment.

The guidance to home manufacturers is intended to:

- Summarize the market for single-family attached housing, including its opportunities and pitfalls.
- Describe the state-of-the-art design, technology, and regulations with respect to manufactured housing in the single-family attached configuration.
- Help manufacturers who wish to explore this market get started.

The guidance to builder/developers and traditional site builders is intended to:

- Enable successful integration of single-family attached manufactured homes into appropriate developments.
- Assist developers in understanding the special concerns of factory construction.
- Describe the opportunities and pitfalls of developing with manufactured homes.

The barriers to applying factory technology to single-family attached home construction are not primarily technical in nature, although attached housing is more technically challenging than the typical double- or triple-section detached home. Manufacturers have already made great strides in developing home designs, such as for multi-story homes, that can be adapted to the needs of attached construction. Instead, the barriers mainly relate to the limitations of the HUD code, other regulatory impediments, and to the differences in building process between traditional site developers and factory homebuilders.

This report addresses these concerns and helps to bridge the gap between the existing technology of the manufacturer and the market expertise of the developer.

Facilitating the elimination of these barriers furthers the goals of HUD's Partnership for Advancing Technology in Housing (PATH) to improve the affordability and value of the nation's housing by.

- Developing new housing technologies by applying manufactured home technology to single-family attached housing.
- Disseminating information about new and existing housing technologies through case studies and published articles and reports.
- Encouraging familiarity with, and the availability and use of, advanced technologies among the homebuilding and manufacturing communities.
- Studying and establishing mechanisms for sustained housing technology development, including investigating the insti-

tutional barriers that impede innovation and proposing alternatives to overcome the barriers.

This report also suggests some of the commercial reasons for the HUD-code industry to more aggressively develop and market their technology to developers of attached housing and for those developers to take a serious look at HUD-code homes. For example, the single-family attached sector of the housing industry constructed 160,000 units in 2002, a 36% increase over 1998. A great number of these homes are built as affordable or entry level homes in suburban and urban areas by developers for whom cost and speed is critical. Developers of these projects will be interested to learn that incorporation of manufactured housing technology has proven to shave 15 - 20% off construction costs if market conditions are right. Other advantages of manufactured housing include shorter construction time, increased control over quality and security, and repeatability over a wide geographical area.

Background

Over the last five years nationally, and for a longer period in certain markets, the manufactured housing industry has started to reach "outside the box" from its traditional home designs. The typical HUD-code home is a one-story ranch, consisting of one, two, or sometimes three connected boxes. These are the commonly referred to "single-, double- and triple-wides," which are the backbone of the industry, accounting for close to 100% of the homes produced each year.

Although these are the bread-and-butter units for the industry, several manufacturers recently have begun to experiment with multi-unit and multi-story configurations. For example, in 1999, Fleetwood Enterprises constructed a nine-section "Lifestages" prototype home at the NAHB Annual Convention in Dallas and now sells a four-unit, two-story home through its retail network. Champion Enterprises has done groundbreaking work in creating two-story homes. To meet developer demand, Champion Enterprises also started Genesis Homes, a division of the company that builds innovative factory-built homes marketed to traditional site builders. Many other manufacturers have subsequently developed an expertise in two-story manufactured homes.

One of the earliest projects involving two-story manufactured homes was undertaken by the Manufactured Housing Institute, the trade association for the industry, in 1995. The Urban Design Demonstration Project was a program in which a series of two-story urban infill units, designed by Schult Homes and New Era Homes, were constructed in cities across the United States. The demonstration program proved that manufactured homes could indeed break out of the traditional housing forms and be an asset to developers in urban and suburban centers.

Clearly the manufactured housing industry is on the cusp of significant changes to its core product: changes in design and engineering, changes in production technology, changes in delivery and installation, and changes in marketing and consumer education.

There is, at the same time, an emerging interest in bringing factory fabrication technology to the attached housing market, a sector that is nearly equivalent in annual unit sales to the manufactured home market. Manufacturing homes for this sector of the housing market will engender profound changes in the technology, both in the fac-

tory and at the building site. Attached housing is expected to become a huge market for manufactured housing in the future, a factor that underlines the importance of developing design solutions that are cost-effective, esthetically pleasing, adaptable, and energy-efficient.

Challenges for single-family attached HUD-code homes

When attractive and cost-competitive attached-home designs using manufactured housing begin to enter the market, the housing landscape will be profoundly altered. As they were for two-story homes, the first designs successfully completed will be imitated by following manufacturers. The initial designs will quickly become the standard for industry, because of their proven success in the marketplace and in the regulatory approval process. Since regulatory approvals are expensive and can take months to complete, a successful design will include the engineering framework needed to move the design through the HUD certification process.

The attached-home designs in this report utilize many off-the-shelf components and features associated with site-built attached homes, such as party walls, permanent foundation systems, and on-site components. The integration of current technologies into a new application for manufactured housing required innovation in design and construction detailing.

Some of the technical solutions for two-story and attached HUD-code construction were borrowed from the modular industry, where single-family attached homes are an established product. Modular solutions that can be applied with little or no modification to HUD-code construction include: party walls, fire separation, vertical utility connections, egress requirements, and, in some instances, response to local regulatory issues. However, some aspects of HUD-code construction will demand unique solutions, including the integration of the chassis into the floor system to minimize second-floor depth; new foundation designs to accommodate increased load transferred through the marriage line and sidewalls; and connections between utility services, such as ductwork and plumbing systems, that are normally completed in the factory.

Project strategies and structure of the report

The overall goal of this project is to reduce barriers to the use of manufactured housing in single-family attached construction. These barriers come in many forms, including technical, regulatory, market awareness, and acceptance. This report describes the progress made toward overcoming these barriers.

- Chapter 2 summarizes the single-family attached home market in the United States, including market demographics, regional distinctions, and the current site builders in the market. This section provides a summary of the market demographics for this type of housing construction, including total starts, regional distribution, and trends in market growth. Regional variations in the market are explored, including architectural styles, pricing, housing density, and size. The major builders of single-family attached housing are identified.
- Chapter 3 of the report assesses the opportunities for and barriers to the use of manufactured housing for attached construction. It outlines the competitive characteristics of manufactured homes in various U.S. markets. It concludes with a set of recommendations for manufactur-

ers and developers wishing to pursue this market. To develop this information, interviews were conducted with industry leaders and developers involved in this market, a literature review was performed, and case studies were undertaken (see Chapter 5).

- Chapter 4 analyzes the federal and local code barriers to the use of HUD-code housing in single-family attached construction and recommends changes to applicable regulations to accommodate the unique features of the attached design. This section also evaluates the potential effects of HUD's proposed on-site completion rule on the development of the single-family attached market for manufactured homes.
- Chapter 5 presents case studies of single-family attached housing developments utilizing manufactured homes. It gives the background of each project, outlining the opportunities, the considerations unique to each case study, and the lessons learned. Five projects were profiled at various stages of completion.

The Single-Family Attached Market

Single-Family Attached Home: A one- or two-story living unit attached to another one- or two-story living unit. Adjacent units are structurally independent and have their own permanent foundations and utilities that are not shared, but have the appearance of a physical connection. They may also be referred to as townhouses, duplexes, or row homes.

The single-family attached housing form in America originated in high-density town and city centers, where narrow lots encouraged its development. Many eastern and midwestern cites were developed with townhouses in the 19th and early 20th centuries. As the cost of suburban land increased, the townhome form spread to other areas, often as entry-level, affordable housing. Today's suburban townhouses are typically clustered in planned communities. As the new urbanist movement has spread, with its appreciation of the benefits of higher density development, single-family attached housing has gained new favor in small towns and planned community centers across the nation.

Single-family attached homes make up a growing share of the nation's housing starts[2] and an even larger share in urban and high-density suburban areas. As the statistics in this chapter show, these areas are the strongest market for single-family attached homes. This trend, along with other market forces in these regions,[3] such as the high cost of labor, may contribute to increased acceptance of single-family attached manufactured homes.

Single-family attached homes in perspective

Nationwide Starts

The United States housing market continues to experience one of the longest expansion periods on record. Since 1991 total housing starts nationwide have increased almost every year, and the total of 1,704,900 starts in 2002 represented a 68% increase from 1991's total.

Total housing starts grew by 5.4% from 1998–2002 and starts of single-family attached structures increased by almost seven times that rate.[4] More than 9% of single-family starts in 2002 were attached units. Table 1 shows the number of starts by housing type for the past five years.

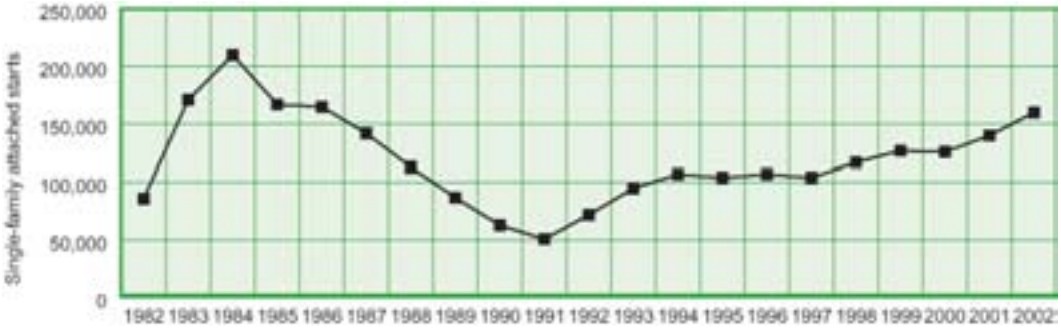
Trends in market growth

As seen in Figure 1, nationwide starts of single-family attached structures declined from peak levels in 1984, reached near-term lows in 1991 and have generally increased

Housing starts	1998	1999	2000	2001	2002	% Growth 1998-2002
Total housing starts	1,616,900	1,640,900	1,568,700	1,602,700	1,704,900	5.4
Multi-family starts	345,500	338,500	337,800	329,400	346,400	0.3
Single-family starts	1,271,400	1,302,400	1,230,900	1,273,300	1,358,600	6.9
Single-family attached starts	117,000	127,000	126,000	140,000	160,000	36.8
Manufactured home placements	373,700	338,300	280,900	196,200	171,600	-54.1

Source for Total Housing Starts, Multi-family Starts and Single-family Starts: U.S. Census Bureau Construction Reports, New Privately Owned Housing Units Started - Annual Data, available at http://www.census.gov/const/www/newresconstindex.html. Source for Single-family Attached Starts: U.S. Census Bureau Construction Reports, Quarterly Housing Starts by Purpose of Construction and Design Type (United States - Annual Data), available at http://www.census.gov/const/www/newresconstindex.html. Source for Manufactured Home Placements: U.S. Census Bureau Manufactured Housing Statistics, Placements of New Manufactured Homes by Region and Size of Home, available at http://www.census.gov/const/www/mhsindex.html.

TABLE 1
National housing starts



Source: U.S. Census Bureau Construction Reports, Quarterly Housing Starts by Purpose of Construction and Design Type (United States - Annual Data), Table Q-1, New Privately Owned Housing Units Started in the United States, by Intent and Design, available at http://www.census.gov/const/www/newresconstindex.html.

FIGURE 1
Single-family attached starts

annually ever since.

The single-family attached market has shown strength recently as compared to the multi-family market. Single-family attached starts rose 14.3% in 2002 from 2001 totals, while multi-family starts only rose 5.2% (Table 1).

Townhouse apartments are similar to single-family attached townhouses in that they are attached with no other units above or below them, but they are not fully independent and share some infrastructure facilities such as water supply, and sewage disposal. Townhouse apartments are included in Table 1 as part of multi-family starts. Starts of attached townhouse apartments in structures with five or more units declined from peak levels in the middle 1980s, and have remained relatively constant since the early-1990s. Starts of townhouse apartments with five or more units remain small compared to single-family attached starts, holding at between 10,000 and 20,000 starts per year since 1991 (Figure 2). Regionally, they are largely built in the Midwest and South (Table 2).

Source: U.S. Census Bureau Construction Reports, Series C-20, Housing Starts: Report for Feb. 1999 and Feb 2000. Data for years after 1999 is not available.

FIGURE 2
Townhouse structures containing more than five units

Starts of townhouse structures containing more than five units	1998	1999
Midwest	4,000	6,000
Northeast	250	1,000
South	4,000	6,000
West	3,000	2,000
Total	11,250	15,000

Source: MIT-Harvard Joint Center for Urban Studies, State of Nation's Housing, 2000. Original source: U.S. Census Bureau, Construction Reports, Series C-40 and U.S. Census Bureau, 2000 Census.

TABLE 2
Starts of townhouse structures containing more than five units, by region

Distribution of single-family attached homes

Rural versus urban

During the early to mid-1990s, population continued to shift away from urban centers and toward suburban and exurban (areas farther away from the city center than traditional suburbs) regions. The majority of housing construction growth occurred in these low-density metropolitan counties, with only small increases in high-density metropolitan counties. Population growth in suburbs and rural areas outstripped that of cities in all regions, and many cities in the Northeast and Midwest experienced a net population decline.[5]

Despite these trends, single-family attached structures continued to be concentrated in urban areas. Total sales[6] of new single-family attached homes in 2000 amounted to 91,000 units. Of the total, 85,000 were located inside Metropolitan Statistical Areas (MSAs) and 7,000 were outside.[7]

Regional

Housing starts and housing start growth vary widely across the country. The South and West typically contain the lion's share of new home starts, mirroring population shifts and growth trends. Five states together account for 42% of home building activity nationwide: Florida, Texas, California, Georgia, and North Carolina. Total housing production in these states increased in 2001 and 2002. Nationally, annual construction permits for single-family housing increased significantly from 1993 to 2002, with the South and West regions showing the largest growth during this period (Table 3).

Table 4 shows housing stock growth for the 23 metropolitan areas that experienced a 25% or more increase in total housing stock between 1990 and 1998, ranked in order of the total permits for all types of housing and by the ratio of permits to housing stock. The dominance of the South and West is also evident in these figures.

However, starts for single-family attached homes do not necessarily follow this pattern. High-density regions, such as midwestern metropolitan areas, have experienced the strongest growth of single-family attached starts in recent years (Table 5). More highly developed regions such as the Midwest, where land is more costly, are driven to develop at higher densities and have a longer tradition of single-family attached housing.

This pattern can also be observed in the total existing single-family attached stock nationwide. In 2000, there were approxi-

U.S. State	1993 Permits	1994 Permits	1995 Permits	1996 Permits	1997 Permits	1998 Permits	1999 Permits	2000 Permits	2001 Permits	2002 Permits	Growth 1993 - 2002 (%)	Mfd. housing plants (2003)
Florida	91,300	96,300	84,100	91,300	90,300	97,900	106,600	106,400	118,700	128,700	41.0	13
California	69,600	77,800	68,100	69,600	84,100	93,400	102,800	105,000	107,400	123,000	76.7	10
Texas	62,700	70,400	70,400	62,700	82,200	99,800	101,800	108,600	111,900	122,600	95.5	23
Georgia	47,600	52,500	55,000	47,600	59,600	67,900	71,500	68,900	71,500	75,500	58.6	17
No. Carolina	45,900	49,100	47,700	45,900	55,500	62,400	64,100	59,100	62,700	66,400	44.7	19
Arizona	34,700	42,100	39,900	34,700	44,400	50,500	53,200	48,800	51,800	55,800	60.8	12
Virginia	39,400	39,500	34,700	39,400	35,900	40,000	42,100	40,000	24,800	45,700	16.0	3
Illinois	36,200	38,500	35,400	36,200	32,800	36,200	39,200	37,800	39,400	42,500	17.4	0
Michigan	33,700	38,500	39,300	33,700	40,200	44,200	45,400	43,000	40,500	41,700	23.7	0
Ohio	34,100	35,600	32,600	34,100	32,700	36,600	40,000	38,000	38,800	39,800	16.7	3
Penn.	35,900	37,000	32,000	35,900	32,300	35,100	36,600	34,500	34,800	38,700	7.8	14
Colorado	25,900	29,300	28,400	25,900	31,900	36,100	38,400	38,600	36,400	35,000	35.1	1
Indiana	25,900	28,500	27,900	25,900	28,100	31,600	33,400	30,400	32,400	30,800	18.9	27
Washington	30,400	31,500	26,800	30,400	27,800	28,600	28,100	25,500	26,700	30,200	-0.7	2
Tennessee	24,100	26,800	27,700	24,100	26,700	28,300	29,900	24,400	26,200	29,100	20.7	16
So. Carolina	18,700	20,000	19,300	18,700	22,200	24,500	27,200	24,900	24,800	28,600	52.9	0
Minnesota	23,000	21,300	20,700	23,000	20,100	25,000	26,700	25,500	26,900	28,600	24.3	3
Nevada	19,500	22,900	22,500	19,500	23,500	24,400	24,300	25,700	27,000	27,600	41.5	0
Wisconsin	21,700	22,800	20,700	21,700	20,600	24,000	24,800	24,000	25,400	26,100	20.3	3
New York	21,100	22,200	19,900	21,100	19,600	22,800	24,700	23,900	24,100	25,600	21.3	1
Maryland	25,400	25,000	23,200	25,400	21,100	23,800	24,200	25,100	23,700	24,000	-5.5	0
New Jersey	21,300	22,400	18,300	21,300	23,500	25,500	25,100	25,300	21,500	22,400	5.2	0
Missouri	18,300	20,900	19,000	18,300	18,800	20,000	20,700	17,900	18,800	20,700	13.1	2
Utah	13,900	14,700	15,200	13,900	14,800	16,300	16,600	15,600	16,300	17,400	25.2	0
Kentucky	12,400	14,200	12,800	12,400	13,700	15,400	16,500	14,800	15,000	16,300	31.5	3
Oregon	15,200	16,100	15,400	15,200	16,300	16,900	16,600	14,700	15,000	15,700	3.3	10
Louisiana	10,400	12,800	12,500	10,400	13,200	13,900	14,600	13,100	13,300	15,200	46.2	1
Alabama	12,800	14,400	13,400	12,800	13,600	14,700	14,900	13,700	14,000	15,100	18.0	19
Mass.	15,800	16,500	14,400	15,800	15,200	16,300	15,500	14,200	13,000	13,600	-13.9	0
Oklahoma	8,300	8,200	7,800	8,300	8,500	9,700	11,100	9,000	9,900	11,200	34.9	2
Idaho	8,800	9,300	8,400	8,800	8,800	10,300	10,500	9,700	9,700	10,800	22.7	5
New Mexico	8,100	9,200	8,600	8,100	8,200	9,200	8,600	8,200	9,000	10,400	28.4	2
Kansas	8,900	10,200	8,700	8,900	9,700	10,900	11,300	9,300	10,100	10,300	15.7	4
Iowa	7,400	7,900	7,300	7,400	7,400	8,900	9,700	8,500	8,800	10,000	35.1	0
Mississippi	6,900	8,000	7,300	6,900	7,800	8,700	9,600	7,600	8,100	8,900	29.0	1
Connecticut	7,800	8,100	7,600	7,800	7,800	9,100	9,200	8,200	7,800	8,500	9.0	0
Arkansas	7,000	7,800	7,300	7,000	6,800	7,200	7,700	6,900	7,500	8,000	14.3	0
Nebraska	5,500	5,400	5,200	5,500	5,600	6,000	6,600	6,500	6,600	7,200	30.9	3
New Hamp.	3,700	4,100	4,100	3,700	4,600	5,300	5,700	6,100	5,900	6,800	83.8	0
Maine	3,600	4,300	4,200	3,600	4,300	5,700	5,400	5,700	5,900	6,400	77.8	1
Delaware	4,600	4,700	4,300	4,600	4,100	4,600	4,800	3,900	4,400	6,100	32.6	0
Hawaii	4,600	4,500	3,900	4,600	2,600	2,900	3,400	4,200	4,000	4,600	0.0	1
W. Virginia	2,200	3,300	2,900	2,200	2,900	3,100	3,600	3,300	3,500	4,500	104.5	0
So. Dakota	2,300	2,400	2,200	2,300	2,500	2,600	2,900	3,100	4,500	3,800	65.2	1
Vermont	2,000	2,000	2,000	2,000	1,600	1,800	2,200	2,200	2,300	2,500	25.0	1
Rhode Is.	2,400	2,300	2,100	2,400	2,300	2,500	2,700	2,300	2,200	2,200	-8.3	0
Montana	1,900	2,100	1,700	1,900	1,500	1,500	1,600	1,600	1,800	2,100	10.5	0
Alaska	1,400	1,500	1,700	1,400	1,900	2,000	1,500	1,400	1,500	1,800	28.6	0
No. Dakota	1,600	1,600	1,500	1,600	1,500	1,700	1,400	1,300	1,500	1,800	12.5	0
Wyoming	1,100	1,700	1,400	1,100	1,300	1,600	1,500	1,600	1,800	1,700	54.5	0
D.C.	100	100	0	100	0	300	300	200	100	400	300.0	0
U.S. Total	987,100	1,068,300	997,500	987,100	1,062,400	1,187,600	1,246,700	1,198,100	1,235,600	1,332,600	35.0	223

Source for Permit Data: U.S. Census Bureau, Housing Units Authorized by Building Permits, Annual Data, Table 2au, New Privately Owned Housing Units Authorized, available at http://www.census.gov/const/www/C40/table2.html#annual. Source for Manufactured Housing Plant Data: Manufactured Housing Institute.

TABLE 3
Single-family housing annual construction permit totals (attached and detached)

Ranked by total permits				Ranked by ratio of permits to stock			
Metropolitan area	**Permits 1990-1998**	**1990 housing stock (units)**	**Permits as share of 1990 stock (%)**	**Metropolitan area**	**Permits 1990-1998**	**1990 housing stock (units)**	**Permits as share of 1990 stock (%)**
Atlanta, GA	361,000	1,224,400	29.5	Las Vegas, NV	233,600	376,100	62.1
Phoenix, AZ	278,200	1,004,800	27.7	Naples, FL	44,100	94,200	46.9
Las Vegas, NV	233,600	376,100	62.1	Provo, UT	28,400	72,800	38.9
Orlando, FL	163,200	524,200	31.1	Boise City, ID	44,200	114,000	38.8
Charlotte, NC	124,100	472,900	26.2	Laredo, TX	12,900	37,200	34.7
Raleigh-Durham, NC	113,800	359,300	31.7	Wilmington, NC	30,200	94,200	32.1
Fort Myers, FL	47,600	189,100	25.2	Raleigh-Durham, NC	113,800	359,300	31.7
Boise City, ID	44,200	114,000	38.8	Orlando, FL	163,200	524,200	31.1
Naples, FL	44,100	94,200	46.9	Atlanta, GA	361,000	1,224,400	29.5
McAllen, TX	32,900	128,200	25.7	Fort Collins, CO	22,800	77,800	29.3
Wilmington, NC	30,200	94,200	32.1	Greenville, NC	12,500	43,100	28.9
Reno, NV	28,600	112,200	25.5	Fayetteville, AR	25,500	88,800	28.7
Provo, UT	28,400	72,800	38.9	Myrtle Beach, SC	25,200	90,000	28.0
Fayetteville, AR	25,500	88,800	28.7	Lawrence, KS	8,900	31,800	28.0
Myrtle Beach, SC	25,200	90,000	28.0	Phoenix, AZ	278,200	1,004,800	27.7
Fort Collins, CO	22,800	77,800	29.3	Fort Walton Beach, FL	16,900	62,600	27.0
Fort Walton Beach, FL	16,900	62,600	27.0	Clarkesville, TN	16,400	60,700	27.0
Clarkesville, TN	16,400	60,700	27.0	Columbia, MO	12,000	44,700	26.7
Bellingham, WA	14,200	55,700	25.5	Charlotte, NC	124,100	472,900	26.2
Laredo, TX	12,900	37,200	34.7	McAllen, TX	32,900	128,200	25.7
Greenville, NC	12,500	43,100	28.9	Reno, NV	28,600	112,200	25.5
Columbia, MO	12,000	44,700	26.7	Bellingham, WA	14,200	55,700	25.5
Lawrence, KS	8,900	31,800	28.0	Fort Myers, FL	47,600	189,100	25.2

Notes: Metropolitan areas are CMSAs and MSAs with only the name of the principal central city given. Metropolitan areas are defined by the Office of Management and Budget as of 1993. Estimates understate actual growth because they exclude manufactured housing placements. Source: U.S. Census Bureau, Construction Reports C-40, and U.S. Census Bureau 1990 Census.

TABLE 4
Housing stock growth - top metropolitan regions

mately 115,904,641 housing units in the nation with single-family attached structures totaling 6,447,453 units, or about 5.6% of all existing homes (Table 6). Not surprisingly, mid-Atlantic and northeastern states with high population densities, along with California and Florida, topped the list of states with the highest percentage and largest stocks of single-family attached housing.

Single-family attached starts	**1998**	**1999**	**2000**	**2001**	**2002**	**% Growth 1998-2002**
Midwest	31,000	37,000	38,000	43,000	55,000	77.4
Northeast	24,000	26,000	24,000	19,000	23,000	-4.2
South	45,000	45,000	49,000	59,000	62,000	37.8
West	17,000	19,000	15,000	18,000	21,000	23.5
Total	**117,000**	**127,000**	**126,000**	**139,000**	**161,000**	**37.6**

Source: U.S. Census Bureau Construction Reports, Quarterly Housing Starts by Purpose of Construction and Design Type, available at *http://www.census.gov/const/www/newresconstindex.html.*

TABLE 5
Starts of townhouse structures containing more than five units by region

Ranked by percent of total existing housing units that are single-family attached				Ranked by total number of existing single-family attached units			
State	**2000 housing units**	**% Single-family attached**	**Total single-family attached**	**State**	**2000 housing units**	**% Single-family attached**	**Total single-family attached**
Dist. of Col.	274,845	26.4	72,668	Pennsylvania	5,249,750	17.9	940,396
Maryland	2,145,283	21.0	451,411	California	12,214,549	7.6	931,873
Pennsylvania	5,249,750	17.9	940,396	Maryland	2,145,283	21.0	451,411
Delaware	343,072	14.1	48,340	Florida	7,302,947	5.9	429,457
Virginia	2,904,192	9.6	279,789	New York	7,679,307	4.9	379,926
New Jersey	3,310,275	8.6	285,268	New Jersey	3,310,275	8.6	285,268
Hawaii	460,542	8.3	38,260	Virginia	2,904,192	9.6	279,789
California	12,214,549	7.6	931,873	Texas	8,157,575	3.1	249,018
Alaska	260,978	7.0	18,340	Illinois	4,885,615	4.8	235,485
Colorado	1,808,037	6.3	114,410	Ohio	4,783,051	3.8	183,922
Arizona	2,189,189	6.0	131,317	Michigan	4,234,279	3.9	164,910
Florida	7,302,947	5.9	429,457	Arizona	2,189,189	6.0	131,317
Nevada	827,457	5.4	44,977	Colorado	1,808,037	6.3	114,410
Minnesota	2,065,946	5.2	107,385	Minnesota	2,065,946	5.2	107,385
Connecticut	1,385,975	5.1	71,185	No. Carolina	3,523,944	3.0	106,066
New York	7,679,307	4.9	379,926	Massachusetts	2,621,989	4.0	104,129
Utah	768,594	4.9	37,902	Georgia	3,281,737	2.9	94,150
Illinois	4,885,615	4.8	235,485	Wisconsin	2,321,144	3.4	77,795
New Mexico	780,579	4.5	35,454	Washington	2,451,075	3.1	75,807
New Hamp.	547,024	4.4	24,233	Indiana	2,532,319	2.9	74,224
North Dakota	289,677	4.1	11,779	Dist. of Col.	274,845	26.4	72,668
Massachusetts	2,621,989	4.0	104,129	Connecticut	1,385,975	5.1	71,185
Michigan	4,234,279	3.9	164,910	Louisiana	1,847,181	3.8	70,863
Ohio	4,783,051	3.8	183,922	Tennessee	2,439,443	2.8	68,969
Louisiana	1,847,181	3.8	70,863	Missouri	2,442,017	2.7	67,120
Wyoming	223,854	3.6	8,165	Delaware	343,072	14.1	48,340
Kansas	1,131,200	3.5	39,495	Oregon	1,452,709	3.3	47,671
Vermont	294,382	3.4	10,080	Nevada	827,457	5.4	44,977
Wisconsin	2,321,144	3.4	77,795	So. Carolina	1,753,670	2.3	40,185
Oregon	1,452,709	3.3	47,671	Kansas	1,131,200	3.5	39,495
Washington	2,451,075	3.1	75,807	Alabama	1,963,711	2.0	38,560
Texas	8,157,575	3.1	249,018	Hawaii	460,542	8.3	38,260
No. Carolina	3,523,944	3.0	106,066	Utah	768,594	4.9	37,902
Indiana	2,532,319	2.9	74,224	Oklahoma	1,514,400	2.4	36,344
Nebraska	722,668	2.9	20,916	Kentucky	1,750,927	2.1	36,124
Rhode Island	439,837	2.9	12,682	New Mexico	780,579	4.5	35,454
Idaho	527,824	2.9	15,211	Iowa	1,232,511	2.3	28,118
Georgia	3,281,737	2.9	94,150	New Hamp.	547,024	4.4	24,233
Tennessee	2,439,443	2.8	68,969	Nebraska	722,668	2.9	20,916
Missouri	2,442,017	2.7	67,120	Arkansas	1,173,043	1.8	20,908
Montana	412,633	2.7	11,044	Mississippi	1,161,953	1.7	20,145
Oklahoma	1,514,400	2.4	36,344	Alaska	260,978	7.0	18,340
So. Carolina	1,753,670	2.3	40,185	Idaho	527,824	2.9	15,211
South Dakota	323,208	2.3	7,381	Maine	651,901	2.2	14,387
Iowa	1,232,511	2.3	28,118	West Virginia	844,623	1.6	13,209
Maine	651,901	2.2	14,387	Rhode Island	439,837	2.9	12,682
Kentucky	1,750,927	2.1	36,124	North Dakota	289,677	4.1	11,779
Alabama	1,963,711	2.0	38,560	Montana	412,633	2.7	11,044
Arkansas	1,173,043	1.8	20,908	Vermont	294,382	3.4	10,080
Mississippi	1,161,953	1.7	20,145	Wyoming	223,854	3.6	8,165
West Virginia	844,623	1.6	13,209	South Dakota	323,208	2.3	7,381
United States	115,904,641	5.6	6,447,453	**United States**	115,904,641	5.6	6,447,453

Source: U.S. Census 2000, DP-4, Profile of Selected Housing Characteristics.

TABLE 6
Single-family attached structures as a portion of total existing housing units in 2000

Physical and market features of single-family attached homes

Architectural styles and features

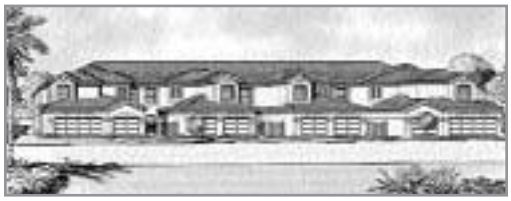
The following drawings and photos illustrate the typical site-built, single-family attached housing developments that are built today, along with approximate pricing. The homes range from one to three stories. Most have garages, while a few do not. The townhouse style is most common, with anywhere from four to eight units per building. The main ridge line of the roof typically runs parallel to the row of homes, and in many examples, turn-gables open up toward the street. Most roofs are high-pitched, with the exception of the development in Florida, which contains a number of shallow, hipped roofs. A combination of turn-gables, dormers, entryways, finish materials, and offsets are used to visually distinguish a unit from its neighbor. The homes in these examples range in sales price from approximately $100,000 to $235,000.

Beazer Homes: "The Madison", High Point, NC ($99,990 and up)

Beazer Homes: "The Huntington", Lawrenceville, GA ($111,900 and up)

Fox Ridge Homes: "The Villas at Belle Parke", Nashville, TN ($120,000 - $130,000)

Fox Ridge Homes: "Fairway Pointe at Nashboro Village", Nashville, TN ($130,000)



Pulte Homes: "Jasmine Pointe at Colonial Country Club", Fort Myers, FL ($166,900 and up)

Ryan Homes: "The Villages of Adams Ridge", Adams Township, PA ($160,000 - $170,000)

Ryan Homes: "Inniscrone View", Avondale, PA ($190,000)

Brookfield Homes: "Dunbarton", Bristow, VA ($200,000 and up)

Crana Homes: "The Fahan", Brookside Glen, IL ($234,900)

Pricing

Single-family attached homes are generally less expensive nationwide than their detached counterparts. The average sales price for a single-family attached home in 1999 was $169,800, and the median price was $140,000. The average price for a single-family detached residence was $201,900, and the median price was $162,800.[8]

One of the significant target markets for manufactured, single-family attached homes appears to be the middle to lower-middle income sections of the U.S. population. However, the higher price housing markets should not be discounted, given the success of some manufactured housing companies that have provided two-story, middle- and upper-income housing in selected markets. Potential customers in this income range are wealthy enough to consider purchasing a site-built home, but cost-conscious enough to value the savings that a manufactured home offers.

Market Focus: Chicago Area

Prices for single-family attached homes in relation to those for detached homes can vary depending on local market conditions. Home sales data from Illinois for 1999-2000 indicate that, contrary to initial expectations, single-family attached homes are significantly more expensive than single-family detached homes in the city of Chicago – although this may be due to the cost of land in the neighborhoods in which attached homes are located. This trend is reversed in the suburbs and outlying counties surrounding the city. Table 7 displays the median cost for both types of homes in Chicago and the counties surrounding it.

Organizations that build or purchase single-family attached housing

A variety of organizations, including major home building firms, build or purchase single-family attached dwellings. In addition to for-profit developers, a significant number of single-family attached housing units are constructed or funded in whole or in part by HUD; state or local public housing agencies; and non-profit corpora-

tions, often in coöperation with government funding sources.

For-profit builders

The top 10 list of for-profit builders of townhouses/condominiums in 1999 (Table 9) contains many names that are among the top single-family detached production builders in the U.S., with the exception of Heritage Construction Co. and Hunt Building Corporation. These companies specialize in attached housing and build little or no single-family detached housing.

Heritage Construction produces a small number of single-family detached homes, but the company's primary focus is on multi-family housing such as townhouses, condominiums, and apartment complexes. Hunt Building Corporation is a leader in the upgrade and conversion of military housing, creating private residential communities and commercial properties by redesigning former barracks and compounds.

U.S. Department of Housing and Urban Development

HUD provides funds through a variety of programs to local housing authorities and issues grants to housing developers, including non-profit organizations, to stimulate the construction and rehabilitation of affordable housing. HUD also builds and manages a portfolio of public housing projects nationwide. HUD's proposed budget for fiscal year 2004 is $31.3 billion.[9] HUD's budget has been roughly this amount since 2001. The following major elements of the HUD budget may directly or indirectly provide funds to construct single-family attached housing:

Geographic area	Single-family attached median price Q3/1999	Single-family detached median price Q3/1999	Single-family attached median price Q3/2000	Single-family detached median price Q3/2000
Chicago	$175,000	$135,000	$200,500	$138,000
Suburban Cook Co.	$111,000	$165,500	$118,500	$172,000
Du Page County	$116,000	$195,000	$123,000	$215,000
Grundy County	$105,500	$129,000	$109,750	$125,750
Kane County	$124,500	$159,000	$130,000	$167,900
Kendall County	$117,000	$151,000	$125,000	$167,500
Lake County	$137,000	$204,300	$143,000	$213,000
McHenry County	$110,500	$165,000	$113,000	$174,900
Will County	$105,000	$157,900	$112,000	$161,500

Source: Chicago Association of Realtors, available at *www.chicagobusiness.com/cgi-bin/article.pl?portal_id=32&page_id=643.*

TABLE 7
Chicago market area: single-family attached housing prices versus single-family detached housing

Community Development Block Grant (CDBG) Program: $4.7 billion (2004 proposed) [10]

CDBG provides funding to meet locally identified community and economic development needs. It gives cities and smaller communities flexibility to meet local housing and economic development priorities. The $4.7 billion proposed for 2004 is the same as was budgeted in 2003.

Builder	1999 Single-family attached unit closings	1999 Total revenue
Pulte Corporation	10,608	$3,840,642,000
NVR Corporation, Inc.	3,074	$1,942,660,000
Heritage Construction Co.	2,024	$147,500,000
U.S. Home Corporation	1,731	$1,752,834,000
Centex Corporation	1,581	$3,320,267,536
D.R. Horton, Inc.	1,475	$3,225,703,000
Lennar Corporation	1,239	$2,671,744,000
Hunt Building Corporation	1,081	$85,024,558
The Ryland Group, Inc.	1,050	$1,937,387,000
K. Hovnanian Enterprises, Inc.	996	$908,553,000

Total 1999 housing revenue includes a company's entire production, not just its townhouse/condominium output. Source: "Builder 100" Builder: The Magazine of the National Association of Home Builders, Vol. 23 Issue 6, May 2000, p. 126.

TABLE 8
Top builders of townhouses/condominiums

Home Investment Partnership (HOME) Program: $2.2 billion (2004 proposed)[11]

The HOME program is another flexible block grant program that communities use to build and maintain affordable housing and expand home ownership. States and localities use HOME grants to fund a wide range of activities that build, buy, and/or rehabilitate affordable housing for rent or home ownership, or provide direct rental assistance to low-income households. The $2.2 billion proposed for 2004 is up slightly from the $2.1 billion budgeted in 2003.

HOPE VI program: $574 million (2003 budget)[12]

The HOPE VI program has a mandate to replace poorly maintained public housing developments with mixed-income, livable communities. A principal goal of the program has been the demolition, replacement, and rehabilitation of 86,000 severely distressed public housing units identified in the 1992 final report issued by the National Commission on Severely Distressed Housing. Because progress is often slow under the HOPE VI program, billions of dollars in HOPE VI funds remain in the pipeline. No new funds were allocated to HOPE VI in the proposed 2004 budget.

Public housing providers

Thousands of public housing authorities exist across the United States. Many of these are operated at the local level. Some actively build new housing, while others manage rental units. HUD maintains a database of U.S. housing agency profiles on its web site.[13]

Non-profit organizations

Non-profit developers are strategically positioned to benefit from utilizing the emerging building technologies in manufactured housing. Like manufactured housing buyers, developers of affordable housing are extremely cost-conscious. Also, many non-profits work in inner cities on narrow lots where manufactured housing provides the additional advantages of security, rapid construction, and a reduced need for skilled construction trades on site.

Trade associations representing these non-profit developers, such as the Local Initiatives Support Corporation (LISC), were asked to publicize an offer for technical assistance to those that were willing to develop single-family attached housing projects using HUD-Code homes. The technical assistance offer appeared in trade publications and association newsletters. While a few of the non-profit developers contacted in this process were strongly negative about the idea of using manufactured housing, most were intrigued by the idea and several were enthusiastic.

Forty-three organizations either contacted MHRA after reading announcements of the opportunity or were contacted directly between the fall of 2001 and the spring of 2002. Of these, approximately 10 had projects at the right stage of development (i.e., the concept phase) that might benefit from the use of manufactured units to help drive down costs and improve quality. Of the 10 potential developers, 6 were non-profit housing developers and 4 were for-profit developers of affordable housing. It became clear that non-profit as well as for-profit developers of affordable housing were a potential market for single-family attached technology. However, a great deal of education about the product and benefits was needed since many, if not most, of the organizations were unfamiliar with manufactured homes or had outdated perceptions of them.

An important consideration in working with non-profits or other housing developers who are dependent on either government funding or grants is the length of time it takes to assemble a complete financing package. The duration from concept to construction may be difficult to predict and the development process may be subject to more funding approvals than private developments are, which may impact the likelihood of success. The Foothill case study discussed in Chapter 5 illustrates this potential stumbling block. After over a year of work on the project, including conceptual architectural designs and detailed site analysis, the City of Oakland rejected the developer's funding application for political reasons. However, the site could still be developed in the future as the developer works through the political process to procure funding.

Factors That Drive Demand For HUD-Code Single-Family Attached Construction

3

Introduction

This chapter describes the major factors that affect the attractiveness of manufactured homes as a construction option for single-family attached housing developments. It examines how specific characteristics of local markets in the United States can impact the potential success of manufactured housing for single-family attached construction. Suggestions for countering barriers to success are provided. Twelve examples of regional U.S. markets are examined with respect to these characteristics.

Along with the market, attributes of the developer and the project also affect a project's chances of success, and some characteristics and business practices of the manufactured housing industry pose potential barriers to the development of the single-family attached market segment. The reasons these practices conflict with the needs of single-family attached developers are discussed in this chapter, and suggestions are offered to resolve this problem.

The reader should come away from this chapter with a sense of the major issues that a manufacturer will face, and the changes a manufacturer must make in order to succeed in the single-family attached housing market.

The information in this chapter was developed by polling representatives of home manufacturers, developers, industry suppliers, government, and other industry segments. It was then supplemented through in-depth communications with developers, some of whose projects are included as case studies in Chapter 5.

Factors that impact the appeal of manufactured housing for single-family attached developments

Certain conditions enhance the competitive position of manufactured housing relative to site-built as a construction technology option for a single-family attached development, while others impede it. It is important for manufacturers and developers to recognize the effects of these characteristics. Factors that favor the use of HUD-code homes for single-family applications include the following:

- *Local construction costs.* High local site building costs, in the range of $80 per square foot or more, enable manufactured homes to compete favorably with on-site construction. This figure includes the foundation and construction cost, but not the land, site-work, permits, or fees.
- *Construction labor availability.* A shortage of trained construction labor available on-site may increase the advantage of manufactured housing. Whereas site construction may be impeded by the need to import or train workers, the manufacturer has a trained labor force that can deliver finished product to the site. Shortages of trained labor are often prevalent in areas of low population and/or high growth, in resort regions, in areas where blue-collar workers cannot afford to live, and in inner cities where skilled construction tradespeople may be in short supply.
- *Proximity of housing plant to the market.* A manufactured housing plant typically can ship product cost-effectively within a range of approximately 250 miles. Beyond this range, transportation costs tend to erode the cost advantage. This distance will be impacted by highway constraints such as roadway size and speed limits, as well as the level of pre-transportation economic advantage of the manufactured units. If there are multiple manufactured housing plants serving the

market segment within this range, the developer may enjoy more competitive pricing.

- *Availability of alternate technologies (such as modular).* Some markets and projects will be more suited to modular construction than HUD-code construction. Modular manufacturers enjoy many of the same factory advantages as HUD-code manufacturers and often have more experience with single-family attached and other multi-story, multiple-unit structures.
- *Risk of site theft and vandalism.* Reducing theft is an advantage manufactured housing brings to areas where this is a risk. Because the home is installed and "buttoned up" within a matter of days, versus months, the chance for theft is greatly reduced as compared to site construction. In some areas, losses due to theft can be substantial.
- *Impacts of local zoning ordinances.* Zoning may impart advantages or disadvantages to the use of manufactured housing.
    - As urban and suburban areas have grown, many older manufactured home communities may be located on land that has become quite valuable. In these cases, the owner has options to benefit from the increased value of the property: apply to re-zone the land or re-develop with HUD-code homes. The latter option presents two distinct advantages: 1) it avoids a potentially costly and time-consuming legal and regulatory process; and 2) sites zoned for HUD-code homes typically permit development in a less costly manner, such as higher densities, reduced setbacks, and less stringent roadway specifications. Changing the zoning would eliminate these advantages.
    - Manufactured housing is in many markets subject to restrictive local zoning ordinances. This phenomenon is discussed in Chapter 4.
- *Availability of blanket regulatory approvals.* Some national, regional, or state blanket approvals that preempt local requirements may be available for manufactured housing. For example, in California, the seismic calculations and approvals required by the local codes (which also govern modular construction) for home foundations can be extensive, time-consuming, and expensive. HUD-code earthquake foundations are pre-approved and therefore no additional engineering expense is required. However, developers should be cautioned to consider building to the local requirement when the seismic risk is very high.
- *Tradition of, and attitude toward, manufactured housing technologies.* Awareness of manufactured home technology and receptiveness on the part of the local building department, lenders, local contractors, and the local community will smooth the approvals process for a project utilizing manufactured units. If this awareness does not exist, the manufacturer and developer may be faced with an extensive process to educate key members of the community. The developer must take the lead role in this process. Strong technical support from the manufacturer will be critical, particularly if the developer does not have experience with manufactured units.

- *Strength and prevalence of local building trade unions.* Local building trade unions may oppose the use of off-site construction because it transfers jobs away from local workers to those at the plant. This may diminish the likelihood of local approval for a project. However, manufactured housing may instead increase local employment in locations where site-built development would otherwise be impractical, by creating local jobs for on-site work, such as building garages, installing foundations, and landscaping. To date, local construction trade unions have not been a major impediment to manufactured housing projects of this type; however, most manufactured home developments have not been located in areas with strong unions.

Examples of Markets

Table 9 contains examples of 12 market regions in the United States ranging from very receptive to manufactured housing for single-family attached construction to less receptive, based on the market criteria described above. These examples were culled from discussions with manufactured housing industry members and developers of attached housing. They are sample markets and not inclusive of all markets in the nation.

Developer attributes that increase the likelihood of a project succeeding

In addition to the basic design characteristics of a proposed development—such as having one- to three-story single-family attached homes on an accessible lot—a few other key factors should be assessed when evaluating the potential for success of a given project or developer, including the following:

- *Replicable designs and quantity of homes.* The developer must plan to construct a minimum number of units of like design that make the project practical for the manufacturing plant. There are three advisable approaches:
  - Using a home model that is already produced by the plant and has been pre-approved and engineered. This allows purchases on an as-needed basis.
  - Committing to the plant for a large number of homes, perhaps 50 to 100, and ordering in smaller batches keeping pace with sales. The plant may request engineering and approval fees from the developer. However, these fees can usually be credited back to the developer after a certain number of homes are purchased.
  - Making a bulk purchase of perhaps 15 to 20 homes to be produced at a time convenient for the factory while still meeting the developer's schedule. The factory may also request engineering and approval fees, depending on the number of homes ordered.
- *Developer standing.* Financial strength and outstanding relationships with the local building department and local trade unions will assist a developer in any type of project, but may be more crucial when using a technology unfamiliar to local authorities and trades. A strong track record and construction experience are crucial.

Market	Characteristics relevant to manufactured housing	
	Advantageous for manufactured units	Disadvantageous for manufactured units
GOOD FIT		
Southern California from San Diego to the L.A. metropolitan area, including the Inland Empire	• Cost of land and construction quite high • Positive attitude and experience with manufactured housing • Beneficial regulatory environment for HUD-code homes • Numerous manufactured housing plants locally	
San Francisco Bay area, from Monterey to Santa Rosa	• Cost of land and construction quite high • Positive attitude and experience with manufactured housing • Beneficial regulatory environment for HUD-code homes	
Salem, Eugene, Portland, Oregon; and Vancouver, Washington	• Cost of land and construction quite high • Positive attitude and experience with manufactured housing • Numerous manufactured housing plants locally	
Puget Sound, Washington	• Cost of land and construction quite high • Positive attitude and experience with manufactured housing	
MODERATE FIT		
Salt Lake City, Utah; Colorado Springs, Boulder, and Denver, Colorado	• Cost of land and construction is high	• Limited number of manufactured housing plants
South Florida	• Cost of land and construction is high	• Wind Zone 3 presents added technical challenges
Metropolitan areas in Minnesota and Wisconsin	• Brief construction season enhances the advantage of manufactured housing • Construction cost is high	• May be more receptive to modular construction • Trade unions may resist off-site construction
Atlanta, Georgia metropolitan area		• Zoning is not favorable • May be more receptive to modular construction • City of Atlanta does not permit HUD-code housing
POOR FIT		
Midwestern and Eastern cities	• Construction cost is high	• Trade unions may resist off-site construction • Zoning is not favorable • May be more receptive to modular construction
Urban areas of the Carolinas		• Many zoning restrictions
The Southeast, outside urban areas		• Cost of land and site construction is low
Central plains urban centers		• Distant from manufactured housing plants • Cost of land is not great enough to require higher densities

TABLE 9
Evaluating the fit of manufactured housing with single-family attached construction, in a sampling of U.S. markets

- *Developers working in multiple markets.* Where a developer is building across many jurisdictions, manufactured housing allows use of a single product type and building code. The developer may also be able to switch manufacturing plants if more capacity is needed, or work with a closer plant on a specific project without changing home suppliers and losing time. Developers should take care to ensure that the additional plant locations have the requisite capability and experience with the single-family attached product. Re-using similar designs on subsequent projects can save significant amounts of time and money since engineering and HUD approvals have already been completed and the plant has had experience building the product.

Manufactured housing industry practices that impact the likelihood of a successful single-family attached project

A number of characteristics of the manufactured housing industry were identified that rendered the use of manufactured housing for single-family attached developments disadvantageous compared to site-built housing. These non-regulatory barriers often stem from traditional business practices that evolved with the manufactured housing industry and have served it well in conducting business with the traditional retail customer who typically purchases affordable single-family detached homes.

Many of these practices, however, are in conflict with the needs and expectations of developers of single-family attached housing. Other practices relate to financing or regulatory procedures that were designed to facilitate traditional single-family detached manufactured housing construction. While these practices do present difficulties for the manufacturer-developer relationship, they are not insurmountable. Through creative rethinking by manufacturers of how they operate and a deeper understanding by manufacturers and developers of their respective counterpart's practices and constraints, these hurdles may be overcome. Indeed, many of these potential impediments have been surmounted in practice (see case study descriptions in Chapter 5).

Sales process

- Manufacturers' sales staffs typically are attuned to their traditional retail network and so are product-oriented rather than project-oriented. To work with a developer, one needs to be focused not on merchandise, but on longer term project planning. To succeed in this market segment, manufacturers will need salespeople with education or experience in community development, real estate, planning, and finance. Manufacturers will need to know the single-family attached market. They will also need to extend their planning horizons because developers, especially non-profit developers who figure prominently in this market segment (see Chapter 2), have planning horizons spanning many years.
- Plants are accustomed to working with retailers with whom they have repeat business for similar products over many years. Each transaction is relatively simple and similar to previous ones. Developer projects will be radically different in the terms of the deal as well as the product. Developers may require more complete product specifications spelled out in writing in the sales agreement or in an attached specification book, as is standard practice in site-built

multi-family construction. This may include complete specifications on each product and material going into the home, such as door hardware, lighting and plumbing fixtures, appliances, etc. Manufacturers will need to provide this information to develop successful relationships with developers of single-family attached housing.

Distribution

- HUD-code home manufacturers have developed a retail distribution network that is very effective at distributing single-family detached homes to retail customers. Unlike for single-family homes, there is no formal distribution system in place to supply the developer market, nor are most of the traditional retailers in a position to add value to the developer transaction. Developers will need to work directly with the plant in the detailed design process and to coordinate logistics for large developments. Retailers, who see no place for themselves in the process, could be expected to resist the commitment of industry resources to a business that will not involve them. Manufacturers will either need to develop dealers who are knowledgeable about the single-family attached market and can add value to projects by offering such services as design, installation, or on-site construction elements, or they will need to set up direct relationships with developers and bypass their retail network for large scale development projects.

Regulatory

- The alternate construction (AC) letter process is the route by which manufacturers must get HUD approval for construction methods that differ from, or are not anticipated in, the Manufactured Home Construction and Safety Standards (MHCSS). This process entails up-front design and engineering costs and an unknown and uncontrollable delay (estimated at two to nine months) as HUD considers the request. A few promising developments may reduce this barrier in the future: possible implementation of a new HUD rule pertaining to on-site construction, and potential revisions to the HUD code that have been incorporated into the National Fire Protection Association's 501 Standard on Manufactured Housing (see Chapter 4). One way manufacturers today are minimizing the impact of this barrier is to eliminate the need for a new AC approval by building units for which design approvals already exist.
- Site work requires approval by local code jurisdictions. The manufacturer and developer must have a method in place to deal with issues such as zero-lot-line construction, which is not covered by the HUD code. This is a potential role for the installation contractor, the developer's general contractor, a retailer if one is involved, or the developer (once they become familiar with using HUD-code units).

Financing

- Manufacturers typically require upfront payment from their retailers for product and are very reluctant to accept other terms or methods of payment. Manufacturers rarely work with liens, notes, trust deeds, or mortgages—instruments often used by developers of single-family attached housing. Manufacturers, developers, and their finance partners will have to find common ground in this area. Since some manufactured housing

finance providers may not be interested in this market segment and may resist committing industry resources to its development, alternative financing sources may be needed.

Production

- The traditional way homes are produced in a HUD-code factory imposes constraints on home design and customization that are difficult and expensive to modify. Introducing a new product to a plant involves changing well-honed material acquisition and production procedures. The majority of manufacturing plants are typically production driven and emphasize volume versus design flexibility, resulting in a built-in bias against product customization or changes. This results in a smaller appetite on the part of manufacturers to create radically new designs that will likely not be purchased in great quantities, at least in the near term.

  Additionally, some products and materials required by a developer, such as upgraded fixtures, hardware, or appliances, may be alien to factories and not available from their current suppliers. Purchasing managers can be expected to resist the addition of new inventory items to their already formidable material management process.

  Expanding a plant's capacity to customize product without inflating costs is a challenge that manufacturers are increasingly taking up and meeting, just as many other industries have done in the past few decades. Future industry research will continue to advance this capability. Suppliers to manufacturers will need to keep in step by offering products demanded by this market.

- Manufacturers new to the single-family attached market, and developers new to manufactured housing, undoubtedly will experience a learning curve. Developers interested in manufactured housing for the lower costs should approach it with a long-term attitude. A developer's costs for manufactured single-family attached units may not be lower than for a site-built structure for the first single-family attached project attempted, especially if the design is dramatically different from the plant's typical portfolio of homes. However, as manufacturers figure out how to produce such homes more efficiently, and construct them in higher volumes, costs will drop significantly.

- Manufacturers have engineered multi-section one-story manufactured homes to have a great deal of tolerance in their assembly (i.e., installers can accommodate some imprecision in the manufactured units through the use of mating walls and trim joints). Single-family attached housing, especially if it is multi-story, requires greater precision. This precision is attainable in the plant and is increasingly achieved by manufacturers constructing multi-story homes or homes that are installed over basements.

- Manufacturers will need to increase the level of sophistication of the technical documentation they provide to their customers. The installation of attached, multi-story homes is more complex than for the traditional double-section homes that are the bulk of most plants' production. Developers may hire general contractors who are unfamiliar with manufactured homes and therefore this documentation takes on an added degree of importance and requires an increased

level of specificity. In addition, each project may require special instructions specific to that design. This will require an additional investment by the plant in documentation, technical support in the field, or both. Fortunately, manufacturers are getting experience with this due to the increased prevalence of two-story manufactured home projects.

- Manufacturers typically are not involved with anything on-site, such as installation, permitting, or infrastructure. They are geared toward performing as much of the work as possible in the plant, where it is most cost-effective. In developments of attached construction, more work will be required on-site, including attachments between the manufactured units, add-on structures, roofs, and stairways. Manufacturers must design and ship the units to accommodate this need; if they do not perform the work themselves, they must facilitate the completion of the on-site work by the installation contractor. Once again, the increased demand for two-story manufactured units is allowing manufacturers to gain valuable experience in this area. HUD-code manufacturers may benefit by studying modular manufacturers, many of whom do become involved in on-site activities, particularly in setting up a home.

Warranty

- Many HUD-code manufacturers offer one-year warranties on their products. Extended warranties are offered less frequently for manufactured homes than for site-built homes, although ten-year, HUD-approved third-party warranty programs that are identical to those in the site-built industry are available, and manufacturers and manufactured home retailers are offering these warranties in increasing numbers. Developers may expect these longer warranties and manufacturers should be prepared to negotiate this item.

While each of these barriers is significant and can potentially derail a project, they may all be overcome by determined professionals who are open to new ideas and possibilities. The greatest barrier of all may simply be the lack of a history to "prove" to the manufacturer that a commitment of time and resources in the single-family attached market is a good investment. It is hoped that the case studies in Chapter 5 will demonstrate that the investment can pay generous dividends to manufacturers, builder/developers, and the homebuyers they serve.

Summary of recommendations to manufacturers and developers

The first step in considering a single-family attached project should be for the manufacturer and developer to evaluate the competitiveness of manufactured housing in the particular market with respect to the characteristics described in the first part of this chapter. Will manufactured housing be cost competitive compared to local site-built home costs? Can the community and local officials be expected to embrace or oppose the use of HUD-code units?

When interacting with a developer, a manufacturer should be prepared to work in a somewhat different manner than it is normally accustomed. A manufacturer must be proactive in educating the developer about manufactured housing and not assume the developer is familiar with the terminology and practices of the industry. Plants must help developers prepare for the specialized issues that arise when using manufactured

housing. The plant salesperson must make a greater effort to understand more fully the development process and the particular needs and concerns of the developer, and especially to think in terms of long-range project planning rather than expecting a quick sale.

The plant should be prepared to provide a copy of the complete specifications for the home prior to going to contract, and be prepared to upgrade certain materials or products that are not part of the plant's typical offering. Importantly, the plant must increase the level of flexibility it offers in design and customization and be prepared to earn a slimmer profit margin as it learns this new business.

Finally, when the project is engineered, the manufacturer should develop a design package for the approval of HUD and the plant's design approval primary inspection agency (DAPIA) that allows maximum design flexibility, can be efficiently produced at the lowest production volume, and may be re-used for future projects.

Developers of single-family attached housing must make an effort to understand the manufacturing process and how it differs from the on-site process. Developers are well advised to take several plant tours and to limit the number of modifications they expect from the manufacturer. In the end, this extra effort in understanding the manufacturing process will save both headaches and money.

The developer should be open to learning about manufactured housing technology and the manufacturer's business practices. By understanding the constraints faced by each side, rather than fighting them, the full advantages of constructing HUD-code homes can be attained to the benefit of everyone involved.

Regulatory Barriers

4

Introduction

This chapter reviews the regulatory framework in which manufactured housing operates and describes the construction standards and enforcement procedures that shape how HUD-code homes are used for single-family attached applications. It also describes a number of developments underway that may alter the regulatory landscape, with an emphasis on changes that may facilitate single-family attached manufactured housing construction.

The regulations governing the construction and placement of manufactured homes are likely to undergo substantial change in the next few years, and the changes are likely to reduce hurdles to using HUD-code homes in innovative ways. However, the regulatory environment in which the industry operates will continue to be quite unlike the code process faced by site builders. The differences are significant and success in bridging between site-built attached-home and manufactured home development practices requires understanding the trends and mastering the differences.

The main elements of the regulatory framework when building manufactured homes, regardless of the form of the structure, are the following:

Manufactured Home Construction and Safety Standards (MHCSS) (24 CFR Part 3280).

Also known as the HUD code, these standards were implemented by HUD in 1976 to provide minimum requirements for the construction of what were at the time principally "mobile homes." The standards were then and continue to be progressive in two important respects: first, they were nationally preëmptive, allowing manufacturers to ship the same home design across state and regulatory boundaries. This is an essential condition if manufacturers are to realize the economies of scale afforded by factory building. The fact that the industry today constructs three-quarters of the nation's affordable housing[14] is partly the result of preëmption. Second, the standards are performance-based rather than prescriptive. This encourages manufacturers to be innovative while meeting a widely accepted target of building performance. Performance-based standards also lead to cost-effective construction, and with regard to this report, the flexibility to use manufactured homes in new and innovative ways that may not have been considered by the drafters of the 1976 standards.

Under the current HUD enforcement procedures, manufacturers wishing to build homes that are interpreted as outside the practices described in Part 3280 must request from HUD an alternative construction approval (the approval is referred to as an AC letter). This is oftentimes a cumbersome process. This chapter discusses possible changes to the HUD standards. These changes, which are intended to eliminate the AC letter requirement when building single-family attached housing, were authored as part of this research.[15] Elements of the HUD standards pose barriers to the construction of single-family attached housing and the recommended changes are intended to accommodate the unique features of attached design while maintaining the safety and quality provisions embodied in the standards.

Manufactured Home Procedural and Enforcement Regulations (MHPER) (24 CFR Part 3282).

The MHPER, the "regulations," were promulgated in 1976 to implement the HUD Secretary's responsibilities under the National Manufactured Housing

Construction and Safety Standards Act of 1974. Under this Act, the Secretary should:

1. Conduct inspections and investigations necessary to enforce the construction standards (the HUD code);

2. Determine if and when a manufactured home fails to comply with the standards or contains a defect or imminent safety hazard (both defined in the regulations);

3. Direct the manufacturer, when necessary, to furnish notification of these failures and, in some cases, to take remedial actions; and

4. Describe procedures for implementing these responsibilities.

The regulations establish operating rules for manufacturers, retailers, state administrative agencies, primary inspection agencies (the design approval and production inspection agencies), and the Secretary's monitoring agent(s), and also outline departmental oversight policies.

The regulations that stipulate procedures for enforcement of the standards were developed when the industry was exclusively building one-story single-family detached homes. As with the standards, a number of proposed changes to these regulations are presented below to facilitate use of manufactured homes in attached applications.

To address the growing demand for site customization of manufactured homes, HUD intends to issue a draft proposed on-site completion rule for public comment. The proposed on-site rule is intended to give manufacturers greater latitude in completing on-site work for a home that cannot reasonably be completed in the factory, but which will conform to the HUD code when completed. This chapter contains an analysis of the potential effects of this proposed rule on the development of the single-family attached market for manufactured homes, including language proposed as part of this research.

State and local regulations

Local codes governing site work and zoning laws affect how and whether HUD-code homes can be placed on a particular site. Zoning ordinances often stipulate housing density, parking requirements, building heights and set-backs, and other site-related parameters. Local building codes impact many of the site-constructed elements of a project, including the foundation, garage, stairways, and infrastructure. The role these factors can play in developing with manufactured homes is explored later in this chapter.

Of particular interest is a State of California law that establishes a special multi-unit non-HUD-code manufactured housing program. This chapter discusses the potential implications of the law and lessons it offers to users and stewards of the HUD standards.

Manufactured Home Construction and Safety Standards

Procedures for updating the MHCSS were formalized, and the time frame for considering changes to the standards explicitly defined, with passage of the Manufactured Housing Improvement Act of 2000 (the Act). The Act is expected to greatly accelerate the pace at which changes are made in the standards and enhance the ability to use manufactured homes in new and innovative ways.

Under the Act, the Manufactured Housing Consensus Committee (MHCC) (established by the Act) makes recommendations to HUD at least every two years for

changes to the MHCSS, which HUD must act upon within one year of receipt. (MHCC consists of representatives from industry, regulators, and consumer groups.) The MHCC is provided administrative services by the National Fire Protection Association (NFPA) following ANSI-accepted procedures. The MHCC appears to be adopting for HUD's consideration the majority of changes to the MHCSS incorporated in NFPA standard 501, a document that has evolved to incorporate new technological developments. In this way, NFPA proposes updates for the HUD code every two or three years.

The National Fire Protection Association standards revision process

The NFPA 501 standards revision process consists of the following steps:

1. Changes to the NFPA 501 standard, including a substantiation of those changes, are proposed by the public each time the NFPA announces that the standard is under revision.

2. The appropriate NFPA 501 technical committee (TC)—Administration, Electrical, Fire Safety, Mechanical, Plumbing, or Structural—evaluates the proposed changes and responds with a recommendation for each change. This recommendation is reviewed by the Technical Correlating Committee (TCC), which oversees the work of the six TCs. The responses of all of the TCs and TCC that are approved in whole or part by written ballot (where two-thirds approve) or that are rejected are published in a "Report on Proposals" (ROP) for public review and comment.

3. The public has the opportunity to comment on the decisions of the NFPA committees and make recommendations for modifying or rejecting the proposed revisions.

4. Each NFPA 501 TC then considers the public comments, which they may accept, modify, or reject, and produces final recommendations that are subject to committee letter ballots. The TCC also reviews and votes by letter ballot on the commented items. The recommendations receiving two-thirds acceptance are published in a "Report on Comments" (ROC).

5. The final approved changes to the standard (those reflected in the ROP that were not changed, as well as those reflected in the ROC) then go before the full NFPA membership for vote at a general meeting. Those accepted by the membership are incorporated into the next edition of the NFPA 501 standard, but are subject to a two-part appeal process that may occur before publication.

Eliminating barriers to single-family attached construction

In the 2000 edition of the NFPA 501 standard, omissions were identified in the HUD standards that, by their absence, pose barriers to the construction of single-family attached housing. As part of this effort, 35 recommended changes were submitted, two-thirds of which were incorporated in the 2003 edition of NFPA 501. The rejected items were not resubmitted, as their exclusion was considered not critical to the successful use of manufactured homes in single-family attached applications.

A summary of the proposed changes, as accepted for the NFPA 501, 2003 edition, can be found in Appendix A. Also included is a recap of the NFPA committees' responses to each of the recommendations and an assessment of the impacts of these changes on the single-family attached construction program, if and when they are accepted by HUD for inclusion in the MHCSS.

Changing the standards: how the NFPA 501 recommendations for updating the HUD standards impacts rulemaking

The NFPA 501, 2000 edition recommendations for updating the HUD standards have been accepted by the MHCC, except for a voluntary fire sprinkler standard. The MHCC is expected to forward proposed revisions to the HUD code to HUD in final-rule format early in 2004. HUD will consider the proposal, accepting or rejecting individual changes, and then issue a proposed rule for public comment by fall 2004. The final rule could become effective in late 2005. These recommendations include 150 or more changes to the MHCSS. If and when adopted by HUD, they will be the first major update of the standards since 1994.

The 2003 NFPA 501 recommendations for updating the HUD standards include those recommendations submitted as part of the initiative that will facilitate single-family attached construction with HUD-code homes. These could be submitted by MHCC to HUD by the fall of 2004. Based on this set of recommendations, HUD could issue a proposed rule by late 2005 that could become effective in late 2006.

Recently, the MHCC announced that it will be accepting proposed revisions to the HUD standards directly from the public, allowing anyone to bypass the NFPA 501 standards process. Interested parties could take advantage of this opportunity to submit directly to the MHCC further recommended changes to the HUD code related to single-family attached program. If included with the changes the MHCC may send to HUD in the fall of 2004, this could save perhaps two years in the process.

Once these changes are incorporated in the HUD code, manufacturers will be able to design and build single-family attached homes under the HUD standards and avoid mixing local code requirements in the same designs. Because of this, design costs and "red tape" requirements will be reduced. At this writing, it is not possible to estimate the net savings on time and costs, but the impact will be substantial.

Manufactured Home Procedural and Enforcement Regulations

Based on a review of the Manufactured Home Procedural and Enforcement Regulations, a few substantive changes were proposed to address issues related to single-family attached housing. The proposed changes were intended to integrate the enforcement regulations with the changes proposed to the HUD code. Because there is no formal process for proposing changes to the enforcement regulations, these proposals were provided to the Manufactured Housing Institute, which incorporated them into comments on the HUD-proposed on-site rule (see below) submitted to the MHCC. The full text of the proposed changes is included in Part 2 of Appendix A.

Proposed rule for on-site construction

HUD has asked the MHCC for comments on a pre-publication draft of a proposed rule for on-site construction of manufactured homes. The draft proposed rule and its potential effects on the development of the single-family attached market for

manufactured homes are described below.

Overview of the Draft Rule

On March 4, 2003, in a draft rule presented to the MHCC for comment prior to release for public comment, HUD proposes to allow limited on-site construction of new manufactured homes without the need for alternative construction letters—if the homes would otherwise be in compliance with the HUD code once completed on site. HUD is proposing a process by which manufacturers and state and private primary inspection agencies (PIAs) could agree to permit limited work on site under certain conditions.

The new process will continue to require substantial completion of the home in the factory. Under the draft section 3282.15, work to be permitted on site in accordance with the HUD code will include partial completion of structural assemblies or systems (e.g., electrical, plumbing, heating, cooling, thermal, fuel burning, and fire-safety systems) and components built as an integral part of the home when:

- Completion of the partial structural assembly or system during the manufacturing process would result in transportation damage or would be precluded because of road restrictions;
- the homeowner is or may be providing a building component on site, such as a bath tub, water heater, gas appliance, or cooking range;
- the home design involves work that cannot reasonably be completed in the factory;
- the home design allows additions, such as garage, basement, room addition, or natural gas ready home, to be completed on site based on the requirements of the authority having jurisdiction; or
- the home has exterior or marriage line designs that are susceptible to transit damage, such as exterior doors, installation of dormers, or non-load-bearing marriage line walls.

The proposed new rule does not change the current authority for the following details of home completion on site as a part of the siting process, in accordance with the manufacturer's installation instructions:

- Close-up details for multi-section units, including exterior and roof coverings, siding, ridge caps, sheathing, roof, wall and floor connections, crossover ducts, and utility connections;
- close up-details for single-section units, including utility connections, exterior roof coverings, and siding for expandable rooms; and
- the final framing and decking of hinged roofs that are not penetrated for other connections or windows.

Nor does the proposed rule change the current AC letter regulations, at 24 CFR 3282.14, for work that may be permitted on site that is not in compliance with the HUD code.

Other noteworthy aspects of the draft rule

- The manufacturer must request in writing and obtain DAPIA approval for work completed on site, and the in-plant primary inspection agency (IPIA) must concur in the applicable quality assurance system. The manufacturer must include instructions, approved by the DAPIA, for completing the on-site work.
- A home approved to comply with this rule will be shipped with a tag, or other identifying marker, that permits it to be moved to the home site.

- The manufacturer must inspect all aspects of the work completed on site. It must also prepare a final site inspection report and arrange for the IPIA to review and approve of the completed on-site work, as provided for in the agreement between the manufacturer, DAPIA, and IPIA.
- The IPIA must inspect enough of the work on site to assure itself that the manufacturer's on-site quality control system is working adequately. It must also have a tracking system for homes built under these rules.
- Within 30 days of the IPIA's notification to the manufacturer of acceptance of its final inspection report, the manufacturer must also report the completed work back to HUD or its agent.
- Each home that is shipped under this rule must include a notice to the consumer that on-site work will be completed in accordance with the HUD code.

Potential effects of the on-site rule on single-family attached construction

As noted earlier, HUD currently permits limited work on site through the AC letter process, found at 24 CFR 3282.14. That regulation, created in 1984 to encourage innovation, permits a manufacturer to construct manufactured homes with some features that are not in full compliance with the HUD code at the factory, but that otherwise will meet acceptable standards (such as from a model building code).

For the last several years, HUD has also required manufacturers to use the AC letter process to gain permission to complete limited work on site that, for safety-related reasons, would require IPIA oversight, even though the completed home on site meets the HUD code. This procedure is time consuming and costly. Hence, the HUD on-site rule, once enacted, would cut down on the "paper work" and eliminate the need for many AC letters by permitting the manufacturer to coordinate closely with its PIAs to speed up the completion of on-site work design, approval, and construction. The new rule will eventually appear at 24 CFR 3282.15.

Presently, construction of single-family attached homes typically requires manufacturers to request and obtain one or more AC letter approvals from HUD for safety-related on-site construction, such as a heater vent through the roof. The above outlined "on-site construction" draft rule, once it is finalized and enforced, will reduce dramatically the number of AC letter requirements. All on-site work that meets the HUD standards may then be completed under the draft proposed rule or as a part of the siting process.

Only work performed on the home that does not meet the HUD standards, such as an innovative roof assembly that meets a model building code, will continue to require prior approval from HUD under the AC letter process.

How the on-site rule may proceed

It is noteworthy that the above "overview" of the draft rule is subject to three future events: MHCC final comments to HUD; HUD's modifications of the draft, released as a proposed rule for public comment; and HUD's final rulemaking.

The following are the key milestones in this process:

1. The MHCC completed its comments for HUD in August 2003.
2. Most likely, HUD will make modifications to both the rule and its draft

preamble and release a proposed rule for public comment by late 2003.

3. Following an approximately 45-day public comment period, HUD will prepare a final rule for release by late 2004.

4. The final rule might become effective as soon as early 2005.

State and local regulations

Working with local code officials

Manufacturers routinely work with local officials to complete work on site for construction features such as basements and garages, in a way that meets the local building codes. These construction features are easily identified on house plans and as unique structures on site. Therefore, local officials have no difficulty in their plan reviews and on-site inspections.

However, for single-family attached construction, a number of construction features in the home, such as stairwells, are not covered by the HUD code. Many local officials are reluctant to attempt to approve plans and inspect inside a HUD-code home on site. Consequently, HUD requires manufacturers to include such features in AC letter requests. As noted above, that paperwork will be eliminated when such construction elements are picked up in the HUD code and the proposed on-site rule, described above, is placed in the HUD regulations.

When these actions are completed, the separate authorities of HUD and local code officials will become even more easily distinguishable.

Restrictive zoning

The degree to which local zoning regulations can infringe on the use of manufactured housing for single-family attached construction varies dramatically depending on geographic region. Zoning requirements are written and enforced at the local level (city, county, etc.), usually under state-enabling legislation or constitutional authority. Historically, manufactured housing has often been subject to restrictive local zoning ordinances. Due to the increased production of multi-section manufactured homes and improved construction standards as defined in the HUD code, there has been a trend by states during the 1980s and 1990s to limit the authority of local governments to exclude detached manufactured housing or to confine it to specifically designated communities.[16] The interpretation of zoning regulations as they impact placement of manufactured single-family attached structures has not yet been addressed.

Since 1987, eighteen states have adopted revised zoning standards that are less restrictive to single-family detached manufactured housing: Arkansas, Connecticut, Florida, Idaho, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Mississippi, Nebraska, Nevada, New Mexico, Ohio, Oregon, Utah, and Virginia.[17] The growth of more inclusive statewide zoning laws facilitates broader use of manufactured housing outside of traditional communities and expands its potential markets.

Across the nation, state laws regulating local zoning of manufactured housing can be organized into several categories, depending upon their inclusivity. Table 11 lists six groups of states in order of the degree to which they prevent or restrict local governments from zoning to exclude manufactured detached housing (ranked from most restrictive of local governments to least restrictive).

California multi-unit manufactured housing

In 1996, California amended existing law, enabling the construction of affordable multi-unit housing using manufactured home technology. This law should be of interest to the HUD-code industry across the nation as it demonstrates an innovative use of HUD-code manufacturing technology and may serve as a template for future changes to the MHCSS. While the California law pertains to multi-family housing, which is explicitly outside the purview of the HUD code, it may also provide lessons for single-family attached (or zero-lot-line row housing). Currently, HUD has no authority to set standards for the multi-family application of HUD-code homes. This authority can be granted only by Congress.

The California law was created primarily to facilitate the construction of duplexes on small San Francisco Bay area lots using HUD-code homes. It permits the demising wall between the two units of the duplex to run perpendicular to the home's marriage line rather than in line with it. This results in two units, one behind the other, roughly square in proportion rather than two long, narrow units in a side-by-side configuration. In the seven years since the law was passed, it has not been used extensively. According to California Department of Housing and Community Development (HCD), the state agency responsible for the program, there has been an increase in its use recently, with high-end projects being built in Napa and on Catalina Island.

The applicable sections of the California code[18] provide for the construction of multi-unit (or multi-family) dwellings utilizing manufactured home design. This may include attached units such as townhouses and duplexes on a commonly owned lot.

The units must be built on a permanent chassis and designed to be used as dwelling units with or without a permanent foundation. If the structure contains three or more

States	State laws regulating local zoning of manufactured housing
California, Idaho, Iowa, Kansas, Michigan, Nebraska, Nevada, Ohio	Prohibit exclusion from single-family districts if esthetic, installation, age, size, and/or other standards are met.
Arkansas, Colorado, Connecticut, Florida, Indiana, Kentucky, Minnesota, New Jersey, New Mexico, Utah	Prohibit exclusion of some (or all) units, unless based on criteria applicable to other types of housing.
Maine, Mississippi, New Hampshire, Tennessee, North Carolina	Prohibit total exclusion from the jurisdiction, but permit special criteria to be applied to manufactured housing.
Oregon, Virginia	Prohibit exclusion from specified districts (i.e., within agricultural areas or urban growth boundaries).
Montana, Washington	Exclusion not prohibited but some protection is available for manufactured housing.
Alabama, Arizona, Delaware, Georgia, Illinois, Louisiana, Maryland, Massachusetts, Missouri, New York, North Dakota, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Vermont, West Virginia, Wisconsin, Wyoming	No specific mandatory state legislation exists addressing exclusion of manufactured housing.

Source: Manufactured Housing Institute.

TABLE 10
State regulation of local zoning laws

dwelling units, it must be installed as a fixture or improvement to real property with a corresponding permanent foundation system. Two-dwelling unit structures may be designated as chattel. Structures may be one or two stories.

Multi-unit manufactured housing must comply with California's egress and fire separation requirements that apply to structures containing two dwelling units. Multi-unit manufactured housing that contains three or more units must comply with the accessibility and adaptability requirements found in the California Building Standards Code, Title 24, which are applicable to dormitories, hotels, and apartment houses. The dwelling units must be designed and constructed to comply with the federal MHCSS, but are not labeled as HUD-code units. Rather, they are labeled with California insignia.

The process for utilizing the code is relatively straightforward. Construction drawings and specifications are prepared by a California licensed architect or engineer and submitted to an HCD-approved third party quality assurance agency (QAA). If the design and inspection of the units are approved, the QAA issues to the manufacturer California insignia, which is affixed to the unit in place of the HUD label. As the homes are no longer under the purview of the federal MHCSS, no alternative construction approval from HUD is required; approval is however, required through HCD.

While the law has been in effect since 1996, HCD has never drawn up specific regulations governing its implementation. It is therefore crucial for a project's success that the manufacturer contact their third-party design and inspection agencies and HCD early in a project's development to closely coordinate project plans and specifications with department staff.

California's experience with this law, while limited, does provide some useful lessons for the industry at large. While the number of attached projects constructed is small, they further demonstrate the technical and economic feasibility of producing HUD-code units in attached configurations. The recent increase in the application of this option for manufacturers and developers, including the Villas Del Paraisio development discussed in Chapter 5, may indicate a strengthening of the market forces that make this an attractive construction technology. Anecdotal reports indicate that the state regulatory process is straightforward and not unduly burdensome on the plant or developer. A number of the developments completed under the provisions of this law are higher end projects, demonstrating that HUD-code technology is viable for this market.

Case Studies

The case studies described in this report provide an opportunity to evaluate the real-world application of manufactured homes in the single-family attached housing market. Several organizations interested in pioneering this new technology were selected to receive technical support to develop with manufactured single-family attached homes.

While it is recognized that design and engineering are important to the successful application of the technology, the projects were undertaken to test the equally important regulatory and approvals process.

These case studies clearly illustrate to industry and government a variety of technical and regulatory solutions needed for widespread application of this technology. They also document the economic viability of manufactured single-family attached homes under various circumstances by revealing costs and exposing unforeseen barriers that were encountered by the developers and manufacturers. Where it was possible, the costs were weighed against comparable on-site development.

Aided by the example of these pioneers, the next generation of builders and developers can gain some guidance to successfully navigate future projects utilizing single-family attached manufactured homes.

The projects selected demonstrate the application of the technology at geographically diverse sites with strong single-family attached housing markets. The projects that emphasized affordable housing were given preference in the selection process.

Candidate developments had a minimum of 20 dwelling units, to achieve the economies of scale inherent in factory production. While no maximum size was set, a proposed development of 20 to 60 units was preferred.

Because of the innovative approach of using manufactured units to produce attached housing, candidate developers were required to have experience, expertise, and a successful track record in delivering conventional attached housing.

Ideally, chosen projects would have completed the concept phase and be in, or about to enter, the predevelopment phase. In the interest of time, the objective was to choose projects that were far enough along for the project to be successful, yet early enough in the process to design the project from the beginning with the special considerations of attached manufactured homes. (See Chapter 2 for a brief description of the search process for the demonstration projects.)

Due to the lengthy nature of the land development process, particularly when working with non-profit organizations dependent on government or other outside funding sources, most of the case studies described here (with the notable exception of Noji Gardens) are still in the process of development, and so progress to date is described herein.

Learning from the case studies

As the projects progressed, the developers and manufacturers were interviewed about the lessons they learned. These findings are included at the conclusion of each case study. Within these sections, several themes emerged:

- A manufacturer that wants to develop a market aimed at developers needs to employ a liaison who will shepherd the project through each step of the process. This person should be trained to understand the needs of the developer. The plant should treat the developer as a customer and work toward meeting his needs.

- The plant should develop recommended guidelines for the developer to follow when preparing the site, mapping a transportation route, and installing the home. The manufacturer should be willing to send someone to the site to assist in the installation.
- The developer and architect need a thorough education about the manufacturing process and the limitations of the HUD code. Recommendations include industry seminars such as the annual Developing with Manufactured and Modular Homes seminar, given by the Manufactured Housing Institute, and educational and training programs offered by some states.
- Manufacturers and developers must realize that developing with manufactured homes may require a planning cycle of several years, both because developers must win local approvals and because of the current AC letter process at HUD. It is advisable to use designs that are already approved to shorten the cycle.
- Common sense changes to the HUD code are needed to streamline the process for single-family attached manufactured homes. One example is the requirement that an "attached" unit must be able to be removed from its neighbor without damage. Currently, recommendations taken from this study are making their way through the NFPA process (see Chapter 5).
- Site work is a critical component to developing with any home, including manufactured homes, and must be carefully considered in the process, especially as it relates to preparing foundation systems. Accuracy in this aspect is more critical than with a site-built project.
- The transportation of manufactured home units through urban areas is complicated. The route to the site and the clearance for the installation must be carefully orchestrated and planned. The state department of transportation and city officials must be contacted and often negotiated with for the timely delivery of homes.
- A plan to tackle any political or zoning issues must be developed at the start of the planning process. Sophisticated presentations and close contact with neighborhood groups can ensure the success of the development. Conversely, ignoring these realities can make a development impossible.

Case Study: Upton Street Community

Project name:	Upton Street Community
Location:	Upton Street, Lancaster, NY
Developer:	Metro Triton Realtors
Developer type:	For profit
Architect:	Roberto Kritzer, Champion Homes
Engineer:	Mike Metzger
Planner:	Donald C. Westphal Associates, Rochester Hills, MI
Manufacturer:	Titan Homes (division of Champion Homes), Sangerfield , NY
Type of site:	Suburban
Pre-development site use:	Vacant
Type of units:	One-story duplex and two-story townhomes, two bedrooms each
Number of units:	12 one-story duplexes and 8 two-story townhomes
Market:	55-and-older
Rental/fee-simple/land-lease:	Rental
Total estimated development costs, including land:	$985,000
Status as of report completion:	Site-work spring 2004, installation summer 2004

Background

Metro Triton Realtors is a longstanding and well-established manufactured home community owner, retailer, and real estate developer with strong ties to the manufactured housing industry in upstate New York. They enjoy a good relationship with Lancaster, NY town officials, including chairmen of the Lancaster Village Economic Development Committee, Zoning Board of Appeals, and Planning Committee.

Lancaster is a fast growing suburb of Buffalo. Over 30 years ago, Metro Triton Realtors acquired a property in Lancaster that they hoped to develop with an apartment complex. Zoning problems led them to abandon their plans, and the property was never developed.

In the meanwhile, the company gained a lot of experience in the manufactured housing business, buying their first community in 1978. Today they own five communities and two retail sales centers.

A fortuitous acquisition of the access road to the Lancaster property led the developer to rethink developing it with manufactured homes. The initial reaction of the town officials to the proposed project has been positive.

Project description

Metro Triton Realtors conducted the necessary market research and introduced the project to the town planning board. Lancaster officials were quite interested in facilitating new development in their town, particularly one that would cater to seniors. On July 17, 2003, the planning commission granted a preliminary approval to the Upton Street Community site layout.

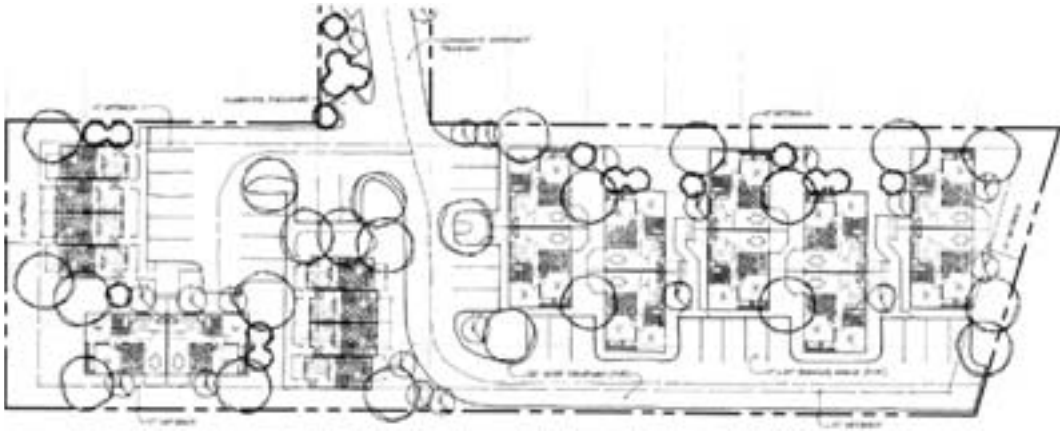


FIGURE 3
Site plan of the Upton Street Community

FIGURE 4
Elevation of two-story four-plex, Upton Street Community

The plan calls for a total of 20 attached rental units: 12 one-story and 8 two-story. The one-story units are grouped in pairs and the two-story units are assembled into rows of four homes each. The market research indicated that 750 to 850 square foot, two-bedroom units would be desirable to the target market of seniors 55 and older, and that rental rates up to $500 per month could be supported.

The two-story units will include internal stairs, with the kitchen, living, dining, and ½ bath on the lower level, and two bedrooms and a full bath on upper level. Appliances will be included in the package.

The developer did look at a cost comparison of using modular versus HUD-code homes. An analysis of the two-story unit was conducted and it was determined that it would be approximately 10% less expensive ($6,000 to $8,000, depending on length of the unit) to

build with HUD-code construction. This difference would be reduced by $1,200 to $1,300 if the HUD-code unit included a 5/12 pitch roof and by a further $1,000 if it had sheetrock walls. This reduced the price advantage of the HUD-code construction to approximately 6%. One-story HUD-code units, however, were significantly cheaper, costing only 61% of the two-story HUD-code units. A large chunk of this difference was due to higher transportation costs of the wider two-story units. By using a mix of one- and two-story HUD-code homes, the project could meet its financial goals. Table 12 breaks down the estimated total development cost of the project into its major components.

Opportunities and considerations

Triton had some difficulty developing a site plan that enabled it to fit enough living units on the site in an esthetically attractive and economical manner. When the developer was unable to come up with a workable site plan, MHRA enlisted a planner experienced with manufactured home community design to develop an attractive and feasible layout. This layout was well received by the local planning officials and given a preliminary approval by the town planning board.

One concern was that the building inspector was confused about how the HUD code dovetails with the codes of New York state and the International Residential Code, recently adopted by the state. The New York State Administrative Agency (SAA), the entity that regulates manufactured housing at the state level, was enlisted to help answer these code-related questions and the local inspector was satisfied.

The developer was interested in using 14-foot-wide, two-story homes because 14-foot-wide units are simpler and less expensive to transport in New York than 16-foot-wide units.

Housing units	$528,000
One-story housing units ($22,000 per unit x 12 units)	$264,000
Two-story housing units ($33,000 per unit x 8 units)	$264,000
Sales tax on housing units	$26,136
Transportation	$34,800
One-story housing units ($1,000 per unit x 12 units)	$12,000
Two-story housing units ($3,600 per unit x 8 units)	$28,800
Permits	$12,000
Engineering fees	$15,000
Foundation slabs	$100,000
Utility connections	$40,000
Installation and trim-out	$44,000
Crane fees	$35,000
Site-work and paving	$50,000
Total development costs not including land	**$885,000**

TABLE 11
Development costs for the Upton Street Community

FIGURE 5
First floor plan of two-story four-plex, Upton Street Community

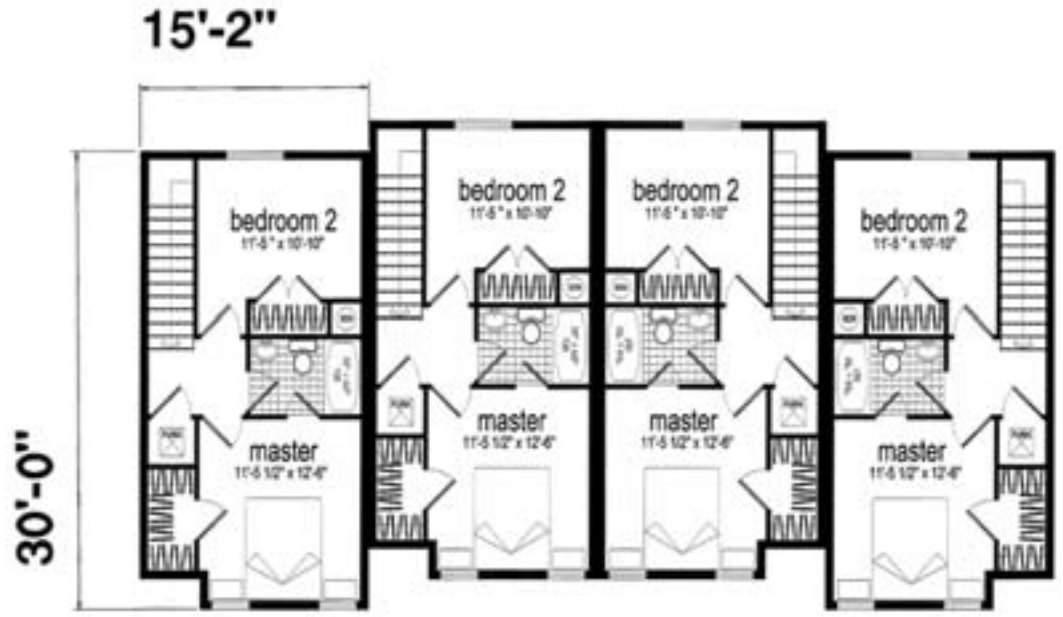


FIGURE 6
Second floor plan of two-story four-plex, Upton Street Community

The manufacturer did not have a HUD approval in place for that particular configuration, however, it did have approvals for a 16-foot-wide, two-story home. Since the manufacturer estimated that re-designing the unit as 14-foot-wide would be costly to engineer and take up to six months for regulatory approval, Triton agreed to use the existing approved design, but limit the number of two-story units included in the plan.

Status

As the project moves forward, Triton will focus on shepherding the Upton Street Community project through the necessary town planning board approvals, and on completion of required environmental reviews to resolve a wetlands issue. This is a time-consuming and protracted process, but not unusual for land development.

Simultaneously, Triton will refine the site plan; line up subcontractors for site work, infrastructure, and installation; develop foundation designs; and work with Titan Homes to engineer the homes. It expects this process to take through the winter of 2003/2004. Barring any major roadblocks, Triton expects to order units by early spring 2004. As such, site work is planned for spring 2004, with home installation planned for summer 2004, and occupancy by fall 2004.

Lessons learned

- Laying the proper groundwork in relationship-building with the local government can facilitate the approvals process.
- Factory tours for local officials help to educate them on the quality aspects of manufactured housing.
- It is critical to understand the local politics and local building process.
- It is important to educate the local building inspector about the HUD-code.
- The cost difference between HUD-code and modular construction can be very minimal. It is advisable to consider both options when planning a project.
- Even if they are not ideal for the project, using pre-approved designs, instead of pursuing new alternative construction approval from HUD, will save money and time on engineering and approvals.
- A well thought-out and professional presentation of the project is important to win approval.

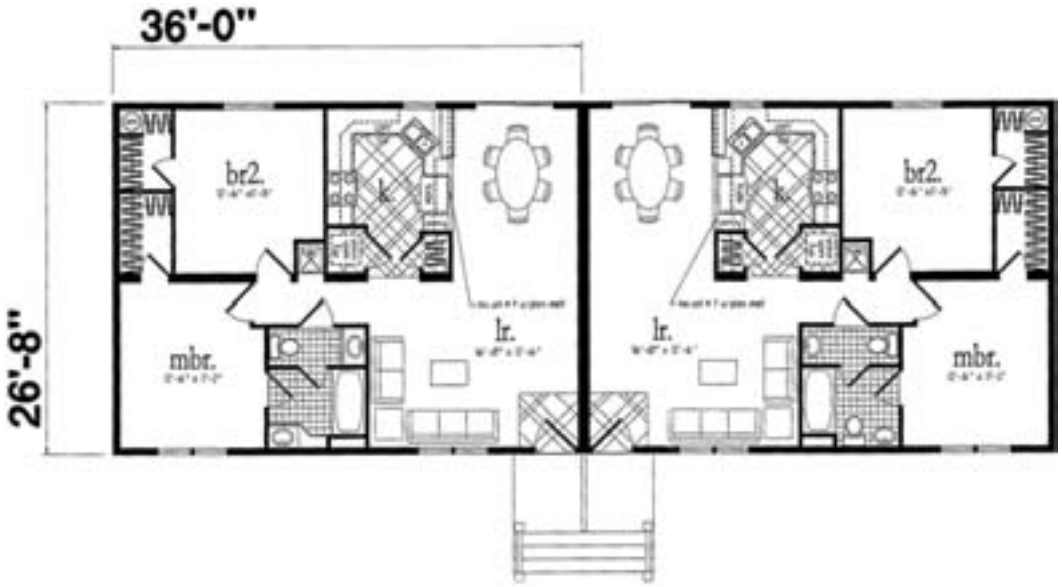


FIGURE 7
Plan of one-story duplex, Upton Street Community

FIGURE 8
Elevation of one-story duplex, Upton Street Community

Case Study: Villas Del Paraiso

Project name:	**Villas Del Paraiso**
Location:	324 Amesti Road, Watsonville, CA
Developer:	Mid-Peninsula Housing Coalition
Developer type:	Non-profit
Architect:	Paul Wang Architect, Berkeley, CA
Landscape architect and site design:	SSA Landscape Architects
Manufacturer:	Silvercrest Homes, a unit of Western Homes Corp. (division of Champion Homes), Woodland, CA
General contractor:	Segue Construction
Type of site:	Suburban
Pre-development site use:	Former travel-trailer campground
Type of units:	One-story duplex and triplex, one to four bedrooms per unit
Number of units:	22 residential buildings containing 51 dwelling units plus one community building with a manager's unit
Rental/fee-simple/land-lease:	Rental
Estimated costs:	
Housing units:	$2,170,350 (50 units - does not include modular community building containing one apartment)
Foundations:	$620,000
Transportation, installation, and finishing:	$500,000
Status as of report completion:	Site-work summer 2003, homes installed spring 2004

Background

Mid-Peninsula Housing Coalition (MPHC) is a non-profit organization that develops high-quality affordable housing communities, professionally manages the properties in those communities, and provides services to residents. MPHC is one of the largest and most respected non-profit developers of affordable housing in the San Francisco and Monterey Bay regions. Between 1970 and 2001, MPHC designed and built or acquired and rehabilitated more than 5,100 units of affordable housing. MPHC is one of the leading non-profit sponsors and developers of assisted rental housing for low- and moderate-income families, seniors, single adults, and persons with special needs in Northern California.[19]

Affordable housing is a critical need in this region. Santa Cruz County itself has a dire shortage of affordable housing options. According to the California Association of Realtors, only 16% of California households were able to afford the median-priced Santa Cruz County home in April 2003.[20]

Mid-Peninsula acquired two former travel-trailer parks that were being used for permanent housing by low-income residents of the county, and is in the process of redeveloping them in an effort to address a portion of this need.

Project description

Mid-Peninsula elected to re-develop the property known as "Marmo's at Pinto Lake" first. This property sits alongside Pinto Lake on a sharply sloping site. The planned development includes 52 housing units in two groups of about 11 duplex and triplex structures each. One group sits low along the lakeshore while the other sits higher up on the slope.

Buildable space is at a premium on the site. The hilly conditions have resulted in a sharp escalation of site construction costs. The septic system is now estimated to cost about $1 million more than originally expected, and unforeseen earthmoving was required to stabilize the site. These issues resulted in an approximately $2.5 million budget overrun, forcing Mid-Peninsula to seek additional funding.

Due to the extensive extra site work, the project will be built in two phases. Phase I, consisting of the units on the hill, will be constructed first, followed a year later by those along the lakeshore.

Mid-Peninsula hired Paul Wang, an architect with extensive experience designing projects using manufactured homes, to design the homes. Silvercrest Homes, a division of Champion Homes, was selected as the manufacturer because of its experience building innovative attached manufactured homes for developers.

The cost of the homes will be approximately $50 per square foot, not including transportation, installation, or work performed on the site. Upgrades to the typical Silvercrest specification package include: a 5/12 roof pitch, foundation-ready design, 96-inch sidewalls, 12-inch eaves, 16-inch roof overhangs, Tyvek wrap, Energy Star specifications, grided windows and doors, solid-surface countertops, upgraded millwork, garbage disposals, stainless

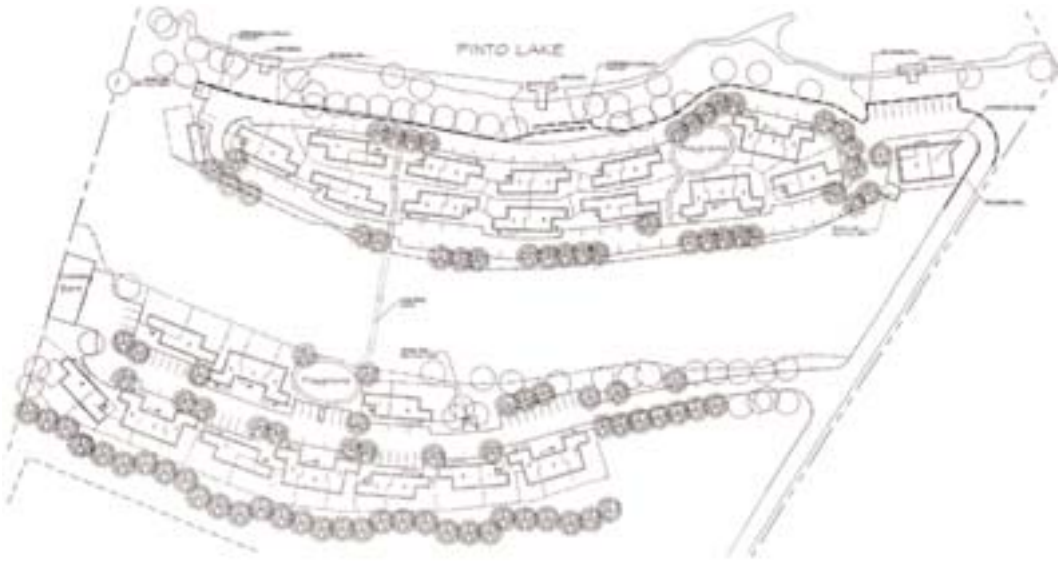


FIGURE 9
Site plan of Villas Del Paraiso

FIGURE 10
Plan of 1-bedroom/3-bedroom structure, Villas Del Paraiso

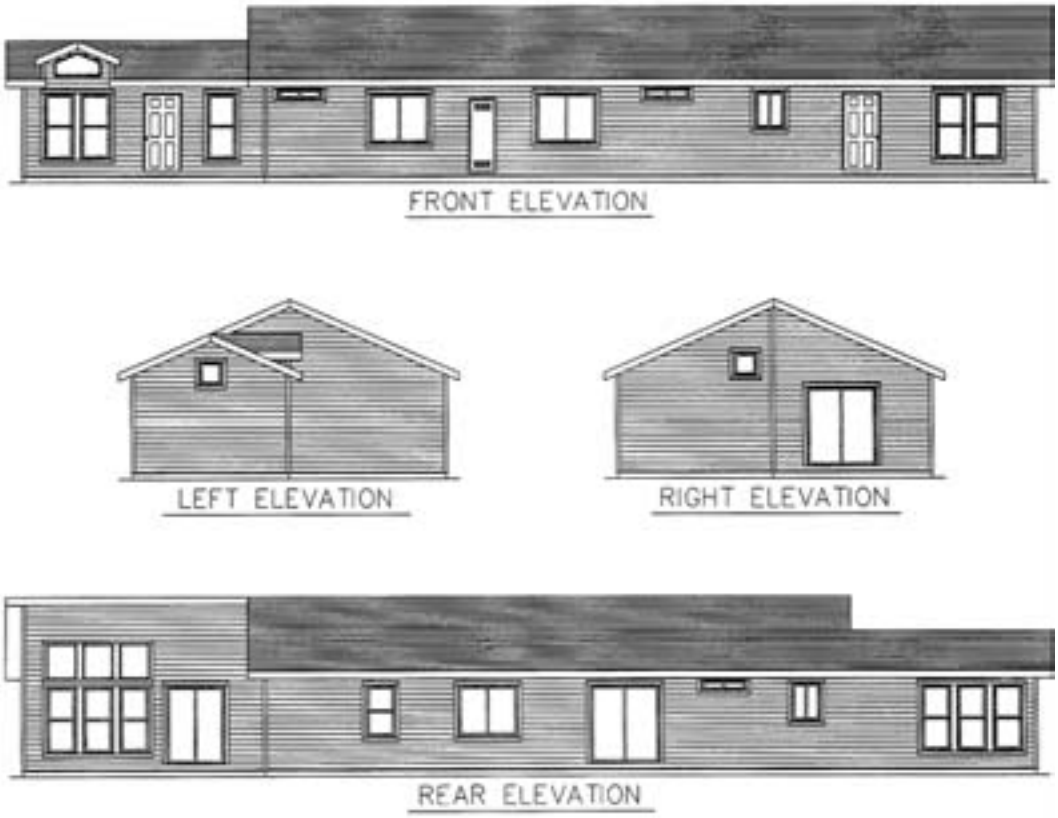


FIGURE 11
Elevations of 1-bedroom/3-bedroom structure, Villas Del Paraiso

FIGURE 12
Plan of 1-bedroom/4-bedroom structure, Villas Del Paraiso

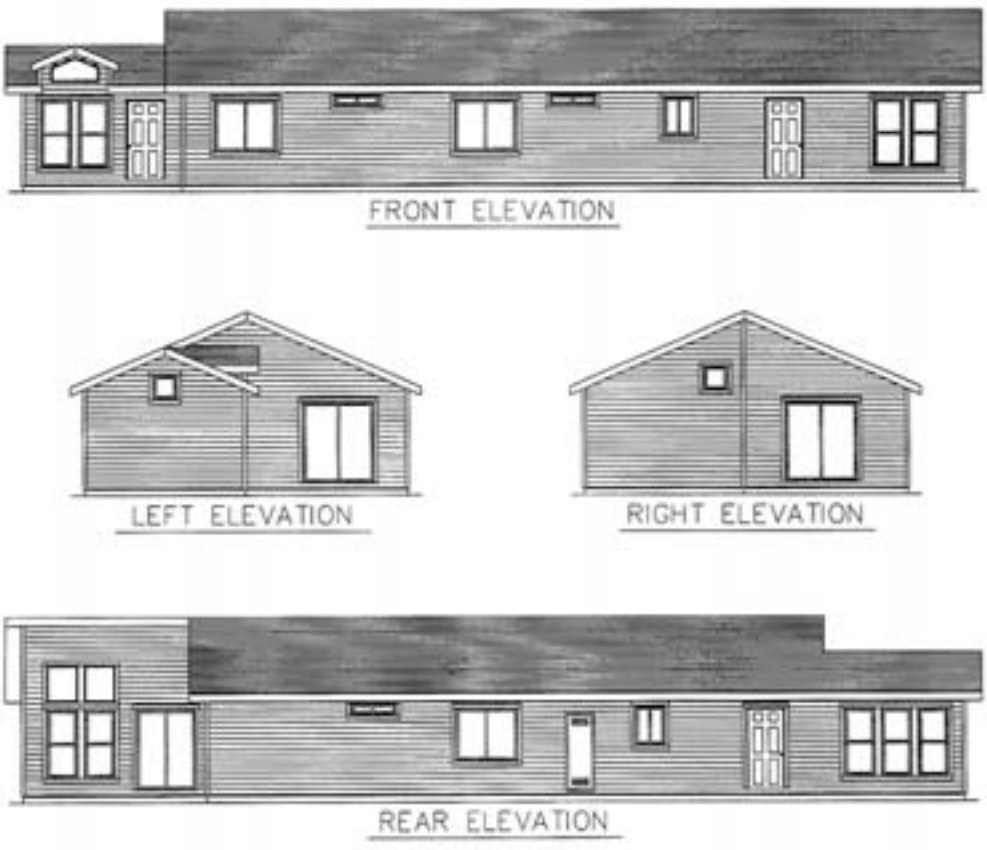


FIGURE 13
Elevations of 1-bedroom/4-bedroom structure, Villas Del Paraiso

steel sinks in the kitchen, upgraded plumbing fixtures, copper plumbing lines, and fluorescent lighting. Flexibility on the part of the manufacturer to accommodate these requirements was essential to the project.

Mid-Peninsula paid Silvercrest for the engineering of the custom units. This is a common practice, but it is also common to negotiate for the return of those fees after an agreed-upon number of homes have been purchased.

Opportunities and considerations

Since the site was already zoned for manufactured housing, using HUD-code homes to redevelop the new community was a key advantage. Rezoning would have carried the risk of non-approval by the authority having jurisdiction and could have led to significant delays and increased costs. Additionally, the high cost of labor in the area leads to steep costs for site construction. In this environment, homes manufactured in the factory can be extremely cost-competitive.

An advantage specific to California is that a HUD AC letter is not required, both simplifying the construction process and making these innovative units cost-effective.

Because the homes for the project include demising walls that run perpendicular to the marriage line, the homes are considered duplexes or triplexes under a special California law. As such, the project can be built under the state of California Multi-Family Code instead of the MHCSS. Plans are then approved by the state of California, which issues a label for the home. In all other respects the home is constructed under the HUD-code. See Chapter 4 for a description of this law.

This California Multi-Family Code was created in the early 1990s primarily to facilitate the construction of HUD-code duplexes on small San Francisco Bay Area lots while avoiding having two long, narrow residences. The code provides for one- or two-story homes.

One regulatory barrier for the developer has been that California law requires manufactured homes to be sold through licensed manufactured home retailers. Since this would have added unnecessary transaction costs, the developer preferred to purchase the homes directly from the manufacturer. Under the state law, a contractor may purchase the homes directly from the plant if the manufacturer grants them corporate approval for a specific project. Silvercrest granted corporate approval to a specially created unit of MPHC as a Silvercrest retailer specifically for the Villas Del Paraisio project.

In this type of innovative HUD-code development, there is a learning curve for both the manufacturer and developer that must be negotiated to ensure success. One of the most difficult barriers to overcome is managing expectations and learning to appreciate the needs and requirements of the business partner. This is especially difficult because the way that traditional site-developers and manufacturers conduct their day-to-day business is so different.

One example where differing business practices led to a near impasse in this project was the developer's expectation of a product specification book. Developers of site-built multifamily housing are accustomed to soliciting bids from contractors based on a fixed set of plans and product specifications drawn up by the developer's architect. The specifications typically include brand name and model number of hardware, fixtures, and all other products going into the home. The contractor selected to build the project submits samples and/or product

specifications for the developer's and the architect's approval throughout the building process. The contractor may also request to substitute an alternative product in this manner. A complete set of specifications was important to MPHC, as they wanted to know what they were getting and to have these specifications guaranteed in the sales agreement. Because the homes will be rentals and MPHC is going to manage the property, they were particularly concerned with maintenance costs. MPHC wanted the option to substitute materials that might have a longer service life.

Initially, the manufacturer was reluctant to provide a complete set of specifications as it is accustomed to providing "like materials" based on availability. Manufacturers are typically leery of committing to particular brands and models of building materials lest these materials stray too far from the standard or cause a slowdown on the line. In their opinion, the developer did not appreciate this limitation of large-scale factory production of houses. In the end, an agreement was reached whereby the specifications would be provided to MHPC.

One issue that complicated the design process for Silvercrest was that the architect did not always adhere to factory-specified constraints, such as available window and doors sizes. Silvercrest modified the architect's designs to meet the plant's specifications. Manufacturers are accustomed to getting very specific directives from retailers who are intimately familiar with their product, so these types of designs changes were unexpected and consumed time and money. This point highlights the need for the developer and the manufacturer to understand each other's business and to make an effort to find a middle ground. This is difficult to do, however, unless the need to educate the partner is recognized. MPHC was quite concerned, for example, that they did not fully understand the particular characteristics of the manufactured housing product, an issue that was addressed partially by reading industry publications.

Status

At the time of this report, MPHC and Silvercrest Homes had consummated an agreement for sale. The project was designed, engineered, specified, and priced. Site work was underway, and a plot plan showing utility hook-ups was completed.

The plant is undergoing final plan approvals and MPHC is soliciting installation bids. Once the plant gets final stamped approvals, MPHC will apply for local permits. The plant needs four weeks lead time to build the homes.

Mid-Peninsula expects to complete the site work for the project in fall 2003, with the homes manufactured in the winter and installed in spring 2004. The project should be completed by fall 2004.

Lessons learned

- Even non-profit developers of affordable housing may require significant specification upgrades, particularly if the units will be rentals.
- Developers are much more sophisticated about life-cycle costs than the typical manufactured home purchaser, and will want to minimize long-term maintenance and energy expenditures.

FIGURE 14
Plan of 3-bedroom/2-bedroom structure, Villas Del Paraiso

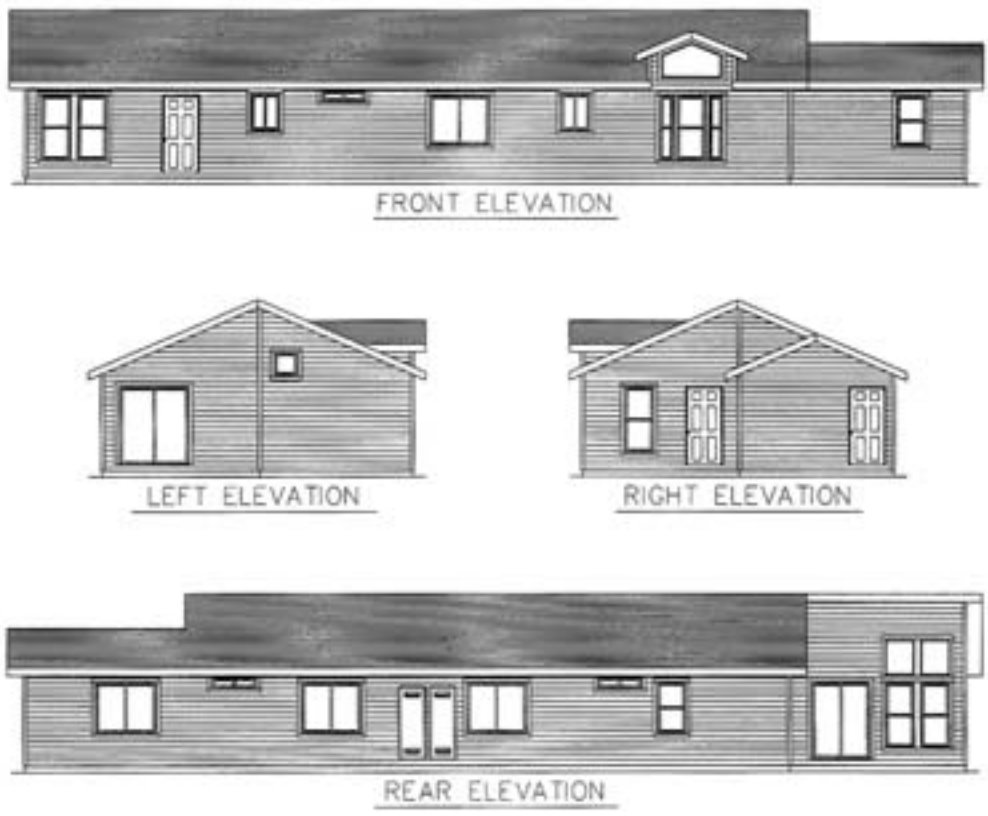


FIGURE 15
Elevations of 3-bedroom/2-bedroom structure, Villas Del Paraiso

FIGURE 16
Plan of 2-bedroom/2-bedroom/2-bedroom structure, Villas Del Paraiso

FIGURE 17
Elevations of 2-bedroom/2-bedroom/2-bedroom structure, Villas Del Paraiso

- The developer may require a book of specifications and wish to have it guaranteed in the sales agreement. They want to know what materials will be used and what they may need to specify as an upgrade.
- The project architect should work within the agreed-upon constraints of the manufacturing process; these constraints should be negotiated in advance.
- Education of the developer is important to assure the developer's comfort level with, and understanding of, the manufactured home product.
- Site work delays, including order and delivery of the manufactured units, can significantly impact a project schedule.
- The manufacturer must establish a direct relationship with the developer. There is often no role for an intermediate retailer.
- A clear delineation of responsibilities and division of labor is important. Additionally, someone needs to orchestrate all of the interrelated responsibilities. This may require a new position that supervises the whole process, similar to a construction manager, to make sure that nothing falls through the cracks.

Case Study: Golden Torch

Project name:	Golden Torch
Location:	6100 Freedom Boulevard, Aptos, CA
Developer:	Mid-Peninsula Housing Coalition
Developer type:	Non-profit
Architect:	John McKelvey, Santa Cruz, CA
Manufacturer:	To be determined
Type of site:	Suburban
Pre-development site use:	Former manufactured home community
Type of units:	One- and two-story units with one to four bedrooms
Number of units:	67 units in 16 residential buildings, each with two to seven units per building plus a community building
Market:	Low-income families earning 70-90% of the area market index
Rental/fee-simple/land-lease:	Rental
Estimated costs:	Not available
Status as of report completion:	To be constructed in 2004/2005

Background

Mid-Peninsula Housing Coalition (MPHC), which is also developing Villas Del Paraiso, is the developer of Golden Torch. MPHC is a non-profit housing developer and manager in Santa Cruz County, CA that builds low-to-moderate income rental housing and manages the properties.

Project description

The Golden Torch site is the second of two former travel-trailer parks that MPHC is developing with single-family attached manufactured housing units. As with the Villas Del Paraiaso site, Golden Torch is being used for permanent housing by low-income residents of the county.

The Golden Torch community will be located in Aptos, a city located on the California coast, halfway between Santa Cruz and Watsonville in Santa Cruz County.

Golden Torch will be comprised of 67 one- and two-story units, arranged in buildings of two to seven units each. This project will have a site-built look, with many of the manufactured sections nearly square in proportion.

Opportunities and considerations

Like the Villas Del Paraiso, Golden Torch is zoned for manufactured homes. Rezoning would carry the risk of non-approval by the county and could lead to significant delays and increased costs. Additionally, the high cost of labor in the area would lead to steep costs for site construction. In this environment, homes manufactured in the factory can be extremely cost-competitive.

The developer plans to use HUD-code homes, which will require alternative construction approval from HUD.

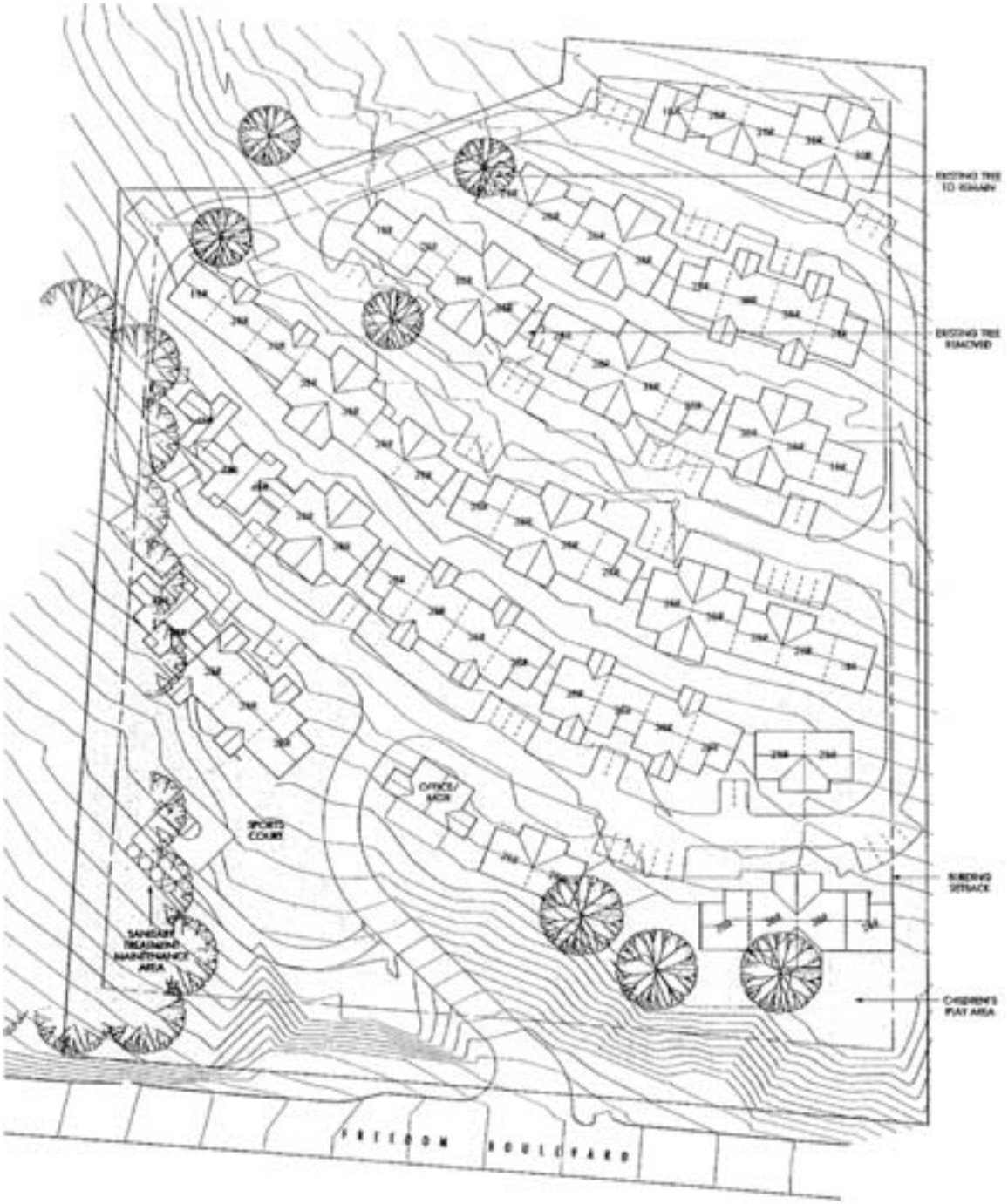


FIGURE 18
Site plan of Golden Torch

Status

The developer plans to build the Villas Del Paraiso first, with the Golden Torch community to follow later. Mid-Peninsula expects to start the site work on this project in summer 2004.

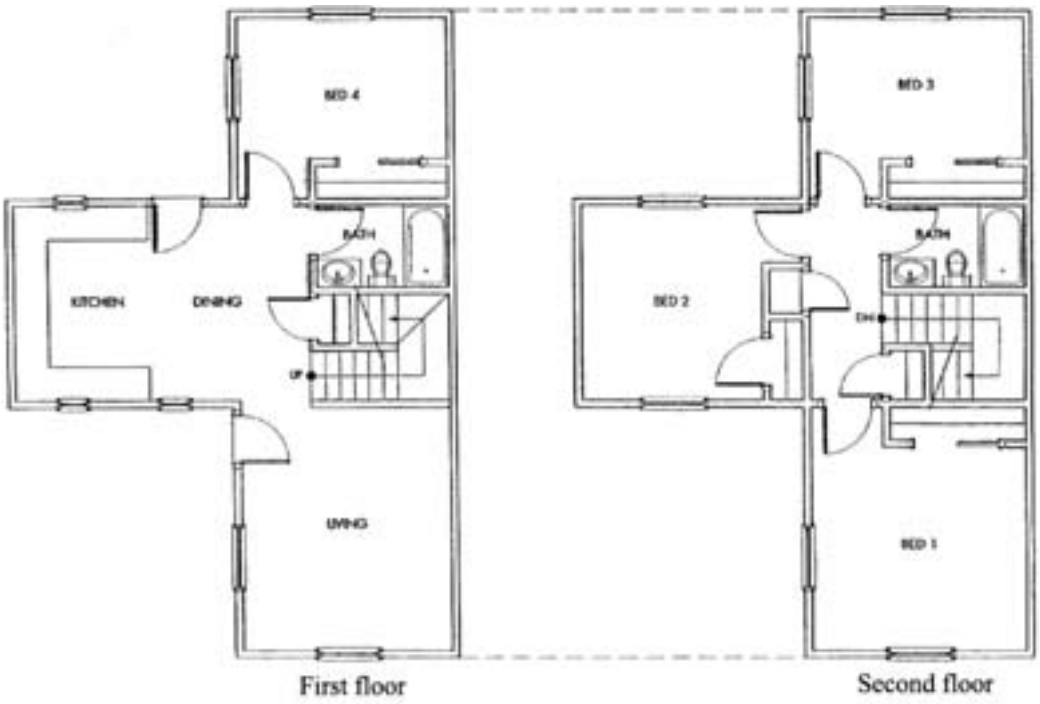


FIGURE 19
Plan of 4-bedroom/2-bath unit, Golden Torch

FIGURE 20
Entry elevation of 4-bedroom/2-bath unit, Golden Torch

FIGURE 21
First floor plan of 3-bedroom/2-bath unit, Golden Torch

FIGURE 22
Elevation of 3-bedroom/2-bath unit, Golden Torch

FIGURE 23
Plan of 2-bedroom/1-bath unit, Golden Torch

Lessons learned

Since this project is yet to be started, it is too early for many concrete lessons; however the design phase of the project instructs that:

- Relatively straightforward manufactured units can be configured to have a site-built appearance.
- The design illustrates the variety of layouts and designs that can be expected in a project of this size.

FIGURE 24
First-floor plan of management building showing community room, Golden Torch

FIGURE 25
Second-floor plan of management building showing manager's unit, Golden Torch

FIGURE 26
Elevation of management building, Golden Torch

Case Study: Foothill Work-Live Townhomes

Project name:	Foothill Work-Live Townhomes
Location:	5803-33 Foothill Blvd., Oakland, CA
Developer:	Oakland Community Housing, Inc. (OCHI)
Developer type:	Non-profit
Architect:	Michael Pyatok, Oakland, CA
Manufacturer:	To be determined
Type of site:	Urban
Pre-development site use:	Vacant; a bowling alley and movie theatre previously occupied the site
Type of units:	Three-story (ground floor site-built), two to three bedrooms
Number of units:	27 units in six buildings with one to six units per building
Market:	Low-income families earning 70-90% of the area market index
Rental/fee-simple/land-lease:	Fee-simple
Estimated total development costs, including land:	$7,205,886
Status as of report completion:	OCHI will re-submit funding application to the city of Oakland in November, 2003

Background

Oakland Community Housing, Inc. (OCHI) has developed and managed affordable housing, including homeownership and rental units, since 1973. OCHI's primary target populations are low-income families, the elderly, disabled, and other special needs populations in Oakland, California and the East Bay. OCHI specializes in developing housing in low-income areas where private development activity is minimal. OCHI works closely with community groups to incorporate their desires and needs into proposed housing developments.

The Foothill Work-Live Townhomes is proposed to be constructed in a depressed area of inner-city Oakland. The project has been delayed because it did not receive the necessary funding approval from the Oakland City Council. The funding was rejected due to a disagreement about the best use of the site. It is, however, generally agreed that the neighborhood is in dire need of housing, and OCHI is hopeful that the funding will be approved in the next cycle (fall 2003).

Although the Foothill project has not yet come to fruition, an examination of the experience of the developer as well as the project design up to this point will be of interest to developers and manufacturers considering similar projects.

Project description

The proposed Foothill Townhomes site is a 42,913 square foot vacant lot in the heart of Central East Oakland. One of Oakland's older residential areas, the neighborhood is characterized by single- and multi-family homes along the major thoroughfares. Some properties in the area are well-kept, while others have deteriorated. A significant portion of commercial space is vacant or underutilized.

FIGURE 27
Foothill Work-Live Townhomes site plan

FIGURE 28
Foothill Work-Live Townhomes location map

In this neighborhood, OCHI planned to construct six buildings of three-stories each, containing a total of 27 living units in a neo-traditional architectural style. An additional 50 sites in the area were available for future development. Each building would contain up to six attached townhomes. The top two floors of each unit would be assembled from manufactured units; these would sit atop a site-built ground floor containing a one-car garage and a "flex room" for use as a home-based business or extra bedroom. This is especially helpful as the center units have only two exposures on the third floor and can accommodate only two bedrooms. Placing a third bedroom in the site-built ground floor is an innovative solution for providing three bedrooms. Each unit measures 15½ feet wide by 38 feet long.

OCHI's preliminary schedule calls for an architectural design and engineering phase lasting 180 days followed by a construction phase of another 180 days.

Opportunities and Considerations

OCHI's incentive for looking at using manufactured homes in its development was cost savings. The non-profit developer was looking for alternatives to control its skyrocketing constructions costs and provide "truly affordable" housing.

According to the architect's estimate, using manufactured units with site-built ground floors would result in a savings of $1,323,250 compared to a 100% site-built project (Table 14).

Status

While the land acquisition was completed with funds from the city of Oakland, an application made to Oakland for housing development funds that was critical to financing the project was not granted. The next round of financing applications will be considered in November 2003 and OCHI hopes to receive approval and move forward with the project at that time.

Even if this particular project does not proceed, OCHI feels that using manufactured housing is the key to providing affordable housing in urban areas such as Oakland.

OCHI is also working with a manufacturer to develop three additional sites in Oakland with single-family attached manufactured homes. They are committed to developing with manufactured homes due to the cost savings they expect to achieve. OCHI hopes to realize an approximately 37% saving over using site-built homes on these projects.

Lessons learned

- Non-profit developers have a multi-year planning horizon, which can be an obstacle for manufacturers that operate on shorter business time frames.
- One pitfall in the large-scale housing development business, which is exaggerated in the non-profit development process, is the possibility that

	100% site-built	Combined site-built and manufactured
Price per sf	$155	$119
Unit size (sf)	1,600	1600
Cost per unit	$248,000	$190,250
Number of units	27	27
Project construction cost, excluding land	$6,696,000	$5,136,750

Costs include all site work, infrastructure, and foundations.
Source: Architect's estimate.

TABLE 12
Pre-development cost estimate for the Foothill Work-Live Townhomes

FIGURE 29
Foothill Work-Live Townhomes site as seen from Foothill Boulevard facing east

FIGURE.30
Building directly adjacent to Foothill Work-Live Townhomes site to the east on Foothill Boulevard

the project can come to a temporary or even permanent halt due to political factors. These forces may not have to do with the project's economic viability.

- Non-profits can recognize the benefits of manufactured housing, even if an initial project does not go to completion. OCHI is embarking on at least three new single-family attached manufactured home projects in addition to working with local officials to resume the Foothill project.
- The planning for the Foothill project illustrates the potential for significant cost savings by using single-family attached manufactured homes.
- The project plan shows the level of innovative design that is possible with manufactured homes—such as site-building a ground floor to make a three-story, three-bedroom unit possible.
- The developer emphasized the importance of finding a manufacturer that would invest the resources necessary to the make the project successful.
- The project illustrates the potential of using HUD-code homes for the inner-city housing market, particularly where site building costs are high.

FIGURE 31
Rear of Foothill Work-Live Townhomes site on Bancroft Avenue and adjacent buildings to the west

Case Study: Noji Gardens

Project name:	Noji Gardens
Project location:	Juneau Street, Seattle, WA
Developer :	HomeSight
Developer type:	Non-profit
Architect:	John McLaren, Seattle, WA
Manufacturer:	Marlette Homes (division of Oakwood Homes), Hermiston, OR
General contractor	Marpac Construction, LLC
Type of site	Urban
Pre-development site use:	Garden center
Type and number of units:	75 total dwelling units, including: 40 two-story, single-family attached HUD-code duplexes 11 two-story, single-family detached HUD-code homes 24 site-built four-plexes in a row housing configuration
Market:	Typical buyer earns 67% of the area median income or less
Rental/Fee-Simple/Land-Lease:	Fee-simple
Estimated costs:	$13 million
Status as of report completion:	Completed in 2002

Background

Seattle-based non-profit developer HomeSight had seven large site-built developments and 11 years of experience under its belt when it started Noji Gardens in 1999. With a mission of providing homeownership opportunities to moderate-income, first-time homebuyers in Seattle, HomeSight offers housing to people making 67% or less of the area median income.

HomeSight used manufactured home technology in this $13 million project to help it better realize its mission through cost savings that simply could not be realized with site-built homes alone. The developer's analysis of the duplex manufactured units revealed that using manufactured homes cost an estimated 15% less in hard construction costs, not including the foundation, than a site-built structure would have. Now that HomeSight has some experience with manufactured home duplexes, it expects to realize closer to a 20% savings for future projects of this type.

According to the Northwest Multiple Listing Service, the median single-family home price in King County was $290,000 at the time that Noji Gardens was completed in June 2002. In June 2003, median home prices were up 1.7%, to $295,000. The homes at Noji Gardens listed far below this median home price, at $155,000 to $250,000, a bargain by Seattle standards. Additionally, these prices did not take into account down payment assistance, which was available to qualifying buyers.

The land chosen for the project is situated four miles southeast of downtown Seattle and was once a garden center owned by the Noji family. The 6.5 acres of previously vacant and blighted urban land was transformed into a vibrant, high-density community located near jobs, shopping, parks, neighborhood resources, and a proposed light rail station.

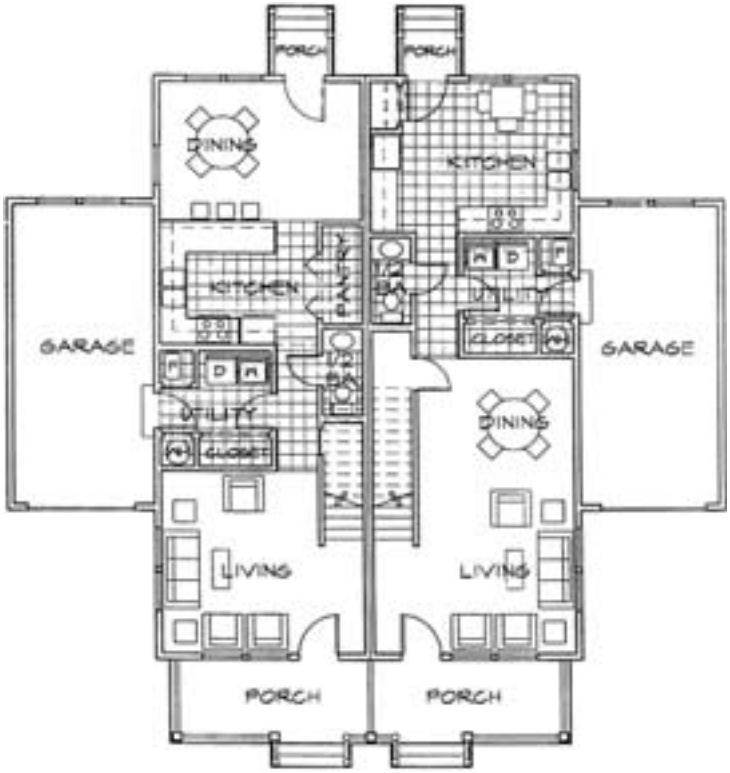


FIGURE 32
First-floor plan of HUD-code duplex, Noji Gardens

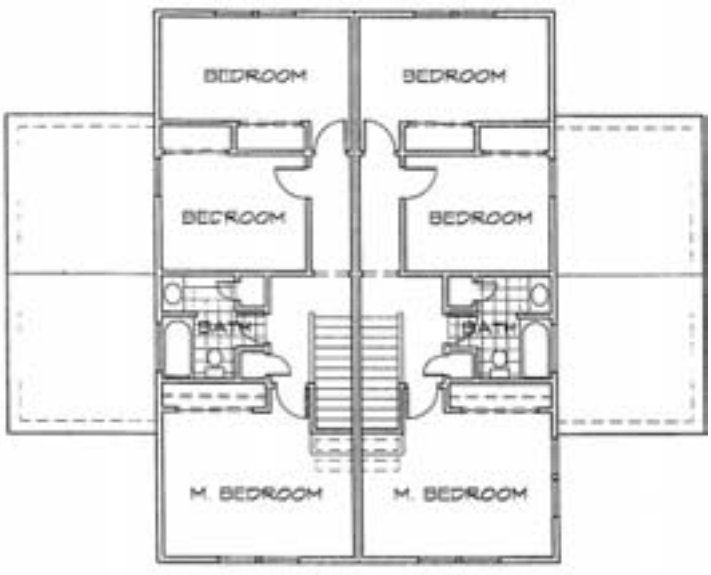


FIGURE 33
Second-floor plan of HUD-code duplex, Noji Gardens

Project description

HomeSight was the first developer in the nation to build single-family attached homes with HUD-code units. The project included 75 homes, 40 of which were single-family attached manufactured homes. The remainder were single-family detached manufactured homes and site-built row houses that could not be built as manufactured homes because the design was not approved by HUD.

The site-built single-family attached homes were two-bedroom, 1½ bath, 1,000 square foot townhomes. The manufactured homes were three-bedroom, 1½ bath, 1,200 to 1,300 square foot duplexes or single-family detached homes. The manufactured home duplex design was approved by HUD through an AC letter.

The duplexes were constructed in four sections with a two-story configuration. The roofs were 8/12 pitch, which is common for attached homes in the Seattle area. A one-car, site-built garage was constructed adjacent to each townhome, in some cases creating rows of manufactured housing duplexes separated by site-built garages, with the appearance of a continuous structure. Each home abuts another townhome, in a zero-lot-line configuration, but shares no utilities or supporting walls.

The project was financed with a combination of loans and grants, including $4 million in construction financing from Wells Fargo Bank; $2.75 million in construction financing from Local Initiatives Support Corporation/National Community Development Initiative; $1.1 million in construction financing from U.S. Bank; and $3.4 million in HUD Community Development Block Grant funds obtained through the city of Seattle's Float Loan program.

Additionally, $1 million from the State of Washington Housing Trust Fund and $500,000 in HUD HOME funds were obtained through the city of Seattle for purchase assistance. A $500,000 HUD Special Purpose Grant and a $500,000 program-related investment loan from Fannie Mae Foundation were obtained for down payment assistance.

Fannie Mae Foundation also provided $145,000 in grant support to the Noji Gardens project through its Home Team program and its partnership with HomeSight and the Seattle Supersonics.

Opportunities and considerations

Noji Gardens was a successful project primarily because HomeSight's leadership and staff were willing to work with city leaders and funding sources to remove preconceived ideas about, and regulatory obstacles to, the use of manufactured homes.

Additionally, the manufactured homes producer, Marlette Homes, was eager to work with the non-profit to develop an innovative product and create a new market. The combination of HomeSight's determination and identification of innovative manufactured home architecture, as well as a flexible manufacturer, paved the way for Noji Gardens.

This spirit of coöperation was essential because the team faced many obstacles as they proceeded. The first was the design review boards. The five design review boards in Seattle have great influence in the esthetic appearance of any new development. The project architect, John McLaren, provided leadership in working closely with these citizen groups to meet their concerns. As a result, the project enjoyed community support.

The transportation of the units to the site also proved to be a hurdle. The city administration sets the rules for transportation in any urban area and this proved to be a difficult

FIGURE 34
Front elevations of HUD-code duplex, Noji Gardens

sticking point. HomeSight finally worked out an acceptable solution with the city, but not before being told at one time that only three homes a week could be delivered, and only from 3:00 to 5:00 a.m. on Sundays.

One of the barriers to using homes built to the HUD-code was a requirement that the homes be sited to avoid damage to the adjacent structure if an owner ever chose to move the house. This requirement led to unnecessary costs, since it was clear that these homes would never be moved. In the future, code changes may help to alleviate this problem, but for now it was a costly and arguably unnecessary nuisance for the developer.

The financing for the project was complex. The lines between acquisition, construction, and permanent financing were blurred. The development and finance team had to determine when the homes became real property for financing purposes, a complication that is unique to manufactured units.

The developer estimates that using manufactured homes cut two months from the construction schedule. Each home could be sited in less than two hours by a relatively small construction crew, resulting in major labor and cost savings. Additionally, HomeSight was able to offer better amenities, such as appliances and upgraded cabinetry, which would not have fit into the budget without the use of manufactured homes.

The developer feels that a limiting factor preventing manufactured housing from taking off in the single-family attached market segment is the lack of developers who have experience with the product and the small number of consultants that specialize in this area. To overcome this lack of experience, HomeSight sent one of its employees to a HUD-code train-

FIGURE 35
Rear and side elevations of HUD-code duplex, Noji Gardens

ing class offered by the Washington Department of Labor and Industries. The general contractor also sent the superintendent for the Noji Gardens project to the class. The installer was certified by the program as well. This significant commitment of time and money to understand the product enabled HomeSight to get the most from its investment.

The Local Initiatives Support Corporation (LISC), a Washington D.C.-based organization that assists community development corporations in expanding homeownership opportunities for inner city neighborhoods and distressed rural communities, offered the following list of attributes needed by developers who hope to replicate a project like Noji Gardens:[21]

- A non-profit developer that is willing to pro-actively educate and negotiate with local officials and lenders to build support for and remove regulatory or statutory hurdles to manufactured homes.
- The identification of an innovative design and a flexible manufactured home producer.
- Willingness to work with the neighborhood and accommodate neighborhood concerns.
- Flexible financing sources that can accommodate changes.
- A certain amount of in-house development capacity.
- A careful plan of production logistics, including the transportation, staging, and installation of the structures.

FIGURE 36
Noji Gardens duplex unit

FIGURE 37
Row of duplex units, Noji Gardens

Status

Noji Gardens was completed and sold out in 2002. HomeSight is currently working on a similar project on Airport Road in Snohomish County, north of Seattle. The 35 units of manufactured home duplexes in this project are scheduled to be installed in spring 2004.

Lessons learned:

- Working within the political framework of the neighborhood council system assured the success of Noji Gardens. Getting public and political support is a key element of any development, especially one that utilizes new technologies.
- The potential for savings is impressive. The developer estimates savings of 15 to 20% over site-built housing. This savings can be of even greater value to non-profits, which are often more cost-constrained than for-profit developers.
- There is a learning curve in the first project that might reduce initial cost savings. However, if a successful project such as Noji Gardens is completed the experience can be leveraged into future projects, which will enjoy even greater cost and time savings.

- Developers that understand HUD-code regulations and construction are critical to the successful utilization of the technology in the attached housing market. It is of great value for a developer to invest in training of its employees in the HUD-code product and process.
- Investing the time to understand the developer's business and champion the project may be key to a successful venture. A plant employee should represent the interests of the developer in the plant, and be invested in the project.
- A spirit of coöperation between the developer and manufacturer is paramount to the success of a project. Since the parties may have conflicting business models, they must share a willingness to be flexible.
- Careful planning of logistics, including the transportation, staging, and installation of the structures, is critical to a complete development plan utilizing single-family attached manufactured homes.
- The HUD alternative construction approval process can take much longer than expected. Developers should expect this time delay and build it into the process.

Changes Proposed to the Federal MHCSS

A

This appendix contains proposed changes to 24 CFR 3280, Manufactured Home Construction and Safety Standards, and to 24 CFR 3282, Manufactured Home Procedural and Enforcement Regulations.

MHRA Proposed Changes to NFPA 501

This section of Appendix A contains a summary of each proposal submitted by MHRA to NFPA as a proposed revision to the 2000 edition of NFPA's Standard on Manufactured Housing, which is a shadow standard for 24 CFR 3280. Also included for each proposal is the NFPA committee's action and a summary of its response. If MHRA submitted a comment on the response, this is included, along with the NFPA committee's final action.

NFPA 501 Section — *Recommendation / Response*

1.2 **Intent of recommendation:**

Add new definitions required to incorporate single-family attached dwellings for: Attic; Exterior Balcony; Basement; Common Wall; Deck; Draft Stop; Fire Separation Distance; Guard; Hand Rail; Height, Story; Single-family Attached Dwelling; and Story.

Committee Action: Accept in Principal

No specific action to be taken at this time. The technical committee chose not to incorporate the definitions into the document, but instead to accept the concept in principal. A recommendation will be forwarded to the technical correlating committee to investigate the possibility of establishing a separate chapter within the document, or possibly any other document, that would address the required on-site construction elements.

1.11.4 **Intend of recommendation:**

Permit the certification label to be installed at alternative locations if the normal location will prevent the label from being visible after installation, since sections in multi-unit homes may not be oriented in a side-by-side position.

Committee Action: Accept in Principle

Accept the proposal with minor revisions to wording.

Final Analysis:

Intent accomplished.

2.3.1.3 **Intent of recommendation:**

Provide that windows facing a porch may be part of the required room glazed area

Committee Action: Accept in Principle

Accept the proposal with minor revisions to wording.

Final Analysis:

Intent accomplished.

2.5.1.2.5 **Intent of recommendation:**

Add requirements for fire sprinklers when the maximum 35 foot travel distance from each bedroom door to an exit door cannot be maintained.

Committee Action: Accept in Principle in Part

Accept the fire sprinkler requirement, but not provisions regarding exit door to garage, sprinkler head location and testing.

MHRA comment:

Add text prohibiting exit doors from exiting through a garage to a new location in the standard.

Committee Action: Reject

The committe rejected this requirement, explaining that it relates to activities that occur at the site and are not under the control of the manufacturer and therefore should not be in the standard.

Final Analysis

Intent accomplished. The committee action to incorporate NFPA 13D has no effect on single-family attached manufactured homes. The committee action to remove the caveat that a door discharging into a garage is not an exit door has no effect. However, it is noted that Section R3111.1of the International Residential Code (IRC) requires that the exit door shall provide for direct access from the habitable portions of the dwelling to the exterior without requiring travel through a garage.

2.14 **Intent of recommendation:**

Include stairways and stairway requirements.

Committee Action: Accept in Part

Accept all the provisions except for that relating to lighting which is being replaced by another proposal.

Final Analysis:

Intent accomplished. The proposed section included a paragraph on stairway illumination. The committee rejected this paragraph in favor of a similar requirement proposed by others. This substitution has no effect on single-family attached manufactured housing.

2.15 **Intent of recommendation:**

Include stair landings and landing requirements.

Committee Action: Accept in Part

Accept the basic requirement for landings with specifics from another proposal.

Final Analysis

Intent accomplished. The committee action editorially clarified that the exception at Section 2.15.1.1 applies only to basement stairs. The clarification has no effect on single-family attached manufactured housing.

2.16 **Intent of recommendation:**

Include handrails and handrail requirements.

Committee Action: Reject

Alternative proposal for handrail requirements was accepted.

Final Analysis:

Intent accomplished. The requirements of the alternative proposal accepted are more stringent than those of the MHRA proposal, and of the IRC. However, the accepted requirements will adequately serve the purposes of single-family attached manufactured housing.

2.17 **Intent of recommendation:**

Include guardrails and guardrail requirements.

Committee Action: Accept in Principle

The committe accepted the proposal with a minor revision requiring 42-inch high instead of 36-inch high guardrails on upper floors.

Final Analysis:

Intent accomplished. The amended proposal is acceptable for single-family attached manufactured housing.

3.6 **Intent of recommendation:**

Add new section on fireblocking, since the probability of concealed spaces between stories exists with the advent of two-story manufactured housing.

Committee Action: Reject

The technical committee chose not to require this provision because of the limited number of units for which it would be applicable and because the unique construction of a manufactured home may not require the same construction provisions needed for homes built on-site.

MHRA Comment:

Change title of proposed section to draftstopping. To reject this proposal, which is essential to residential fire safety, on the basis that there are a limited number of such units is both irrational and irresponsible.

Committee Action: Accept in Principle

Accept the proposed text with minor revision.

Final Analysis:

Intent accomplished.

3.11 **Intent of recommendation:**

Provide for fire separation since manufactured homes may be installed as single-family attached dwellings with a zero lot line, or with a separation of less than three feet between dwelling units.

Committee Action: Reject

The technical committee requested that the technical correlating committee review all the applicable proposals related to site-specific activities and consider establishing a separate chapter that would address them.

Final Analysis:

Intent accomplished. While this proposal was rejected for inclusion in Chapter 3, it is included in its entirety in the proposed new Chapter 11. Inclusion in proposed Chapter 11 satisfies the requirement for single-family attached manufactured housing.

3.12 **Intent of recommendation:**

Provide for fire separation between the home and the garage.

Committee Action: Accept In Principle

Accepted the proposed text with minor wording revisions.

Final Analysis:

Intent accomplished.

4.5.1 **Intent of recommendation:**

Address the structural connections between stories of multi-story manufactured homes.

Committee Action: Accept

Final Analysis:

Intent accomplished.

4.5.8 **Intent of recommendation:**

Codify the requirements for completion of roof systems on-site and specify the conditions that must be met for on-site installation of part or all of the roof assembly.

Committee Action: Reject

The committee requested additional information, stating that the recommended language was vague.

MHRA Comment:

Revised proposal with more specificity.

Committee Meeting Action: Accept in Principle in Part

Accepted the proposed text with minor wording revisions.

Final Analysis:

Intent accomplished.

4.7 **Intent of recommendation:**

Codify the process whereby units are shipped without the exterior finish in place and are temporarily protected from the elements, as is necessary for on-site completion.

Committee Action: Reject

The Technical Committee encouraged a Technical Correlating Committee (TCC) task group for on-site completion issues to consider the issues brought forward by this proposal.

MHRA Comment:

It is recognized that the TCC included this recommendation in a new proposed chapter because it is applicable to single-family attached housing. However, the requirements are also applicable to single-story, multi-unit homes and to multi-story homes.

Committee Meeting Action: Accept

Final Analysis:

Intent accomplished.

4.7.6 **Intent of recommendation:**

Permit the bottom board to be omitted on transportable sections intended to become the floor/ceiling assemblies for the upper stories of a two-story dwelling unit.

Committee Action: Reject

The bottom of the home must be in place for protection of the unit during transit.

Final Analysis:

The rejection does not affect the single-family attached concept as the section can be transported and installed with the bottom board in place.

6.2.2 **Intent of recommendation:**

Revise the definition of Thermal Envelope to include the definition of, and calculation procedures for, multi-story dwelling units.

Committee Meeting Action: Accept in Part

Accept with minor change.

Final Analysis:

Intent accomplished.

6.4.1 **Intent of recommendation:**

Permit the omission of the ceiling vapor retarder when, in multi-story units, the story directly above is part of the same dwelling unit.

Committee Action: Accept

Final Analysis:

Intent accomplished.

6.4.2 **Intent of recommendation:**

Emphasize that a vapor retarder is required in the common wall of a single-family attached dwelling unit.

Committee Action: Accept in Principle

Revised wording.

MHRA Comment:

Revised wording back to the original "common wall", instead of "mating wall", since "common wall" is defined in the Standard.

Committee Meeting Action: Accept in Principle

Made wording changes to clarify intent.

Final Analysis:

Intent accomplished.

6.6.1.2 **Intent of recommendation:**

Emphasize that insulation is required in the common wall of a single-family attached dwelling unit and that insulation between stories of a multi-story dwelling unit is not necessary.

Committee Action: Accept in Principle

Accept with wording changes.

MHRA Comment:

Clarified intent.

Committee Meeting Action: Accept

Final Analysis:

Intent accomplished.

7.8.2 **Recommendation:**

Address the vertical support of water and drain lines.

Committee Action: Accept in Part

Accept with request for clarification.

MHRA Comment:

Proposal clarified.

Committee Meeting Action: Accept in Principle

Accepted with minor change.

Final Analysis:

Intent accomplished.

7.9.1.2/2.1 **Intent of recommendation:**

Clarify that each dwelling unit within a series of single-family attached dwelling units must have its own hot water supply and water supply connection.

Committee Action: Reject

The committe rejected the proposal, stating that the additional terms used in the pro-

posal do not add the needed clarification but introduce the possibility of confusion as dwelling unit is currently defined within the document.

MHRA Comment:

Clarified terminology and relocated the proposal to another section within the Standard.

Committee Meeting Action: Accept

Final Analysis:

Intent accomplished.

7.9.1.3 **Intent of recommendation:**

Codify the requirements for shipping the water heater loose with the home for on-site installation, such as in a site-built garage, or in a basement.

Committee Action: Reject

The technical committee was not comfortable with the inclusion of these requirements within the document since these appliances can be located in a basement or an attached garage, which would not be covered by the Standard. This provision was related to heat producing appliances and should not be addressed within this section.

MHRA Comment:

Relocate to mechanical chapter with some revisions.

Committee Meeting Action: Accept in Principle

Accept with addition of an exception for water heaters listed as resistant to the ignition of flammable vapors.

Final Analysis:

Intent accomplished.

7.9.3.1 **Intent of recommendation:**

Permit installation of a water heater in a garage, basement or upper story by providing for alternative locations to terminate the pressure relief valve. Additionally, when the water heater is installed in the garage, require any source of ignition to be at least 18 inches above the floor.

Committee Action: Reject

Further review and direction is needed to determine how this document will address provisions for multi-story facilities.

MHRA Comment:

This proposed revision was originally proposed as one of three proposals related to water heaters. The entire proposal was rejected on the basis of objection to the other two parts of the proposal.

Committee Meeting Action: Accept in Principle in Part

The proposal is accepted with minor wording changes.

Final Analysis:

Intent accomplished.

7.10.3.5 **Intent of recommendation:**

Provide for on-site connection of drain lines between stories of a multi-story dwelling unit.

Committee Action: Accept in Principle

Accept with wording change.

Final Analysis:

Intent accomplished.

7.12.5 **Intent of recommendation:**

The manufacturer's installation instructions must include the requirement to test any on-site connections of the water and drain, waste and vent systems.

Committee Action: Reject

The committee recognized that testing of the piping is already done in the factory. The proposed text, if strictly enforced would require each and every field connection to be tested. The committee requested greater clarification as to the level of testing that should be required for these connections.

MHRA Comment:

Added more specificity to testing requirements.

Committee Meeting Action: Reject

Proposed requirements are not adequate.

Final Analysis:

Single-family attached manufactured housing includes plumbing connections which must be made on-site and most of the connections will be concealed when the house is finished. It is essential that these connections be properly made to prevent damage in the concealed spaces. The integrity of the water and drainage systems cannot be assured without appropriate testing after all on-site connections are made. Testing will protect the homeowner from future damage and the manufacturer from future liability.

8.4 **Intent of recommendation:**

Define the accessibility requirements for connections of gas lines between stories of multi-story dwelling units.

Committee Action: Accept in Part

Accept with wording changes.

Final Analysis:

Intent accomplished.

8.4.12.7 **Intent of recommendation:**

Provide for support of vertical piping of gas lines between stories.

Committee Action: Accept

Final Analysis:

Intent accomplished.

8.4.12.8 **Intent of recommendation:**

Test field connections of gas pipes that run between stories.

Committee Action: Accept

Final Analysis:

Intent accomplished.

8.7.1.1 **Intent of recommendation:**

Provide for field connection of the gas dryer exhaust system.

Committee Action: Accept

Final Analysis:

Intent accomplished.

8.7.1.6 **Intent of recommendation:**

Limit the length of the dryer exhaust duct so as not to be excessive for proper operation of the dryer vent system.

Committee Action: Reject

The Standard addresses this issue by requiring following manufacturers' instructions; therefore this recommendation is unnecessary.

Final Analysis:

Rejection of this proposal is not critical to single-family attached manufactured housing.

8.8.1 **Intent of recommendation:**

Provide the opportunity for heating appliances to be installed in the basement or garage by allowing the appliance to be shipped loose for field installation while still assuring the proper safeguards.

Committee Action: Reject

The committee objected to the lack of inspection and safety-related provisions, such as lack of specifics on non-sealed combustion and integrity of venting system requirements.

MHRA Comment:

Added provisions addressing the committee's concerns.

Committee Meeting Action: Accept in Principle

Accepted with changes to wording.

Final Analysis:

Intent accomplished.

8.9.2.1 **Intent of recommendation:**

Provide for on-site installation of parts of the fuel-fired heating appliance ventilation system in multi-story dwelling units that may extend to the roof through upper stories of the unit.

Committee Action: Reject

The committee objected to the absence of inspection and safety provisions.

Final analysis:

On review, this section is more applicable to heating appliances which are installed in the factory without completely installing the vent system. Revisions made under to 8.8.1 adequately address the concerns for site-installed appliances and this proposed revision is not required.

8.14.6.1 **Intent of recommendation:**

Editorially change section on connecting ductwork to include multi-section and multi-story dwelling units that are installed or erected as opposed to coupled.

Committee Action: Reject

The committee felt the proposed recommendation needed substantial editorial corrections.

Final analysis:

Although this section should be revised to reflect the installation of modern manufactured housing, rejection is not detrimental to single-family attached manufactured housing.

9.3.1 **Intent of recommendation:**

Emphasize that each dwelling unit must have a separate power supply connection.

Committee Action: Reject

Current language already states what the submitter intends.

Final analysis:

This proposal is included verbatim in the proposed Chapter 11 as Section 11.6.

Proposed Revisions to 24 CFR 3282, Procedural and Enforcement Regulations

Based on a review of 24 CFR 3282, Manufactured Home Procedural and Enforcement Regulations three substantive changes are required to support the proposed single-family attached dwelling standards. The proposed changes affect the following sections:

- 3282.7: new section proposed
- 3282.15: new section proposed
- 3282.362(c)(2)(i)(E): revision proposed

Proposed revision to 3282.7

A new definition is proposed for section 3282.7 as follows:

"Completed", as it applies to affixing a certification label, means that the manufactured home, as it leaves the factory, is in full compliance with these Regulations and the Standards except for structural, electrical, mechanical and plumbing installations and connections necessary to complete and connect the transportable sections onsite and the installation of weather finishes designed to cover these field connections, provided that the approved designs and manufacturer's installation instructions specify the work, connections and coverings which are to be field completed.

Substantiation

The Regulations, at 3282.204(c), require that the certification label be affixed only to completed manufactured homes, but do not clearly define what a completed manufactured home is. Since the inception of the HUD program, double-section and even triple-section homes have been labeled in the factory, even though certain structural and utilities connections had to be made in the field. This practice has been tacitly accepted with the understanding that the manufacturer's installation instructions will address the field completion.

However, the multi-section and multi-story manufactured homes currently being produced can require extensive field finishing to include:

- Horizontal and vertical structural connections.
- Installation and finish of roof components or even entire roof structures.
- Horizontal and vertical connections of electrical systems, gas line, plumbing lines and duct systems.
- Appliances and appliance vent systems.
- Exterior weather resistance coverings.

The regulations must properly address completion of as much of the home in the factory as is practicable and must assure that the completion in the field maintains the home's compliance with the standards. This proposed definition provides the regulatory tools to assure completion of the home in accordance with approved designs, and the prevention of abuse in the field installation process.

Proposed revision to 3282.15

Add a new Section 3282.15 as follows:

3282.15 Onsite completion of manufactured homes

(a) Policy. When it is not possible or practicable to complete the home in the factory, the

manufacturer may make provisions for the onsite completion of the manufactured home without approval by the Secretary when the following requirements are met:

(1) The manufacturer shall submit to the DAPIA such information as the DAPIA may require in order to carry out the design approvals in accordance with sections 3282.203 and .361. This information shall include designs and supporting materials to define all work to be completed onsite, and to demonstrate that the completed manufactured home will comply with the Standards. At a minimum, this information shall include the following:

(i) A summary list of all work required to be completed onsite in order to assure that the finished home complies with the standards.

(ii) Construction drawings and/or specifications showing the details and layouts of each item of construction or installation which is to be completed onsite.

(iii) Structural analysis and calculations, test data and/or other accepted engineering practices used by the manufacturer to validate the designs.

(iv) Installation instructions and details when such instructions and details are not clearly delineated in the construction drawings and specifications.

(v) A list showing all materials, parts and components which shall be provided by the manufacturer, and a list, with detailed specifications, showing which materials, parts and components are to be provided by the installer.

(vi) Specifications and instructions for the connection and/or installation of all appliances and utilities systems, including onsite test requirements.

(vii) Provisions for a warning label or other appropriate procedure to prevent the operation of appliances or utilities systems prior to completion and test of the field installation/connection.

(2) The manufacturer shall provide the IPIA approved plans and supporting material for the onsite completion of the manufactured home. At a minimum, such information shall include:

(i) All DAPIA approved installation information required by 3282.15(a)(1).

(ii) A quality control checklist which outlines all work to be completed onsite, including appropriate tests and inspections.

(iii) An inspection form, acceptable to the IPIA, which includes provisions for identifying the manufacturer, the manufactured home serial number, the installation site, the installer or contractor, the IPIA, the IPIA's approved inspection agency (if different from the IPIA) and the name of the inspector.

(3) The manufactured home shall be completed onsite in accordance with the DAPIA approved construction details and installation instructions.

(i) All site work will be accomplished by a qualified installer or contractor selected by the manufacturer, and acceptable to the authority having jurisdiction.

(ii) The contractor or installer shall be provided with the DAPIA approved plans and installation instructions required to complete the onsite work.

(iii) The manufacturer shall maintain responsibility for all aspects of the onsite work until all work required to complete the home in accordance with the DAPIA approvals is performed and accepted by the IPIA, or its approved inspection

agency.

(iv) The manufacturer shall provide, to prospective purchasers, a notice stipulating that the manufactured home will meet all provisions of the Standards after completion onsite.

(4) The completed inspection form shall be signed by the IPIA or its designated representative, and the manufacturer or its designated representative, and shall be maintained on file by the manufacturer.

(5) All site construction shall be inspected by the manufacturer's IPIA or by a qualified and experienced inspection agency or individual acceptable to the manufacturer's IPIA. The inspection entity shall inspect the site installation(s) for completion in accordance with the DAPIA approved designs and installation instructions.

(i) A construction site is a geographical location where all affected homes are in close proximity and under the supervision of a single inspection entity and a single contractor or installer.

(ii) 100% of all onsite construction and installation of the first four homes at a construction site will be monitored. A minimum of 25% of all homes in excess of four homes at a construction site will be monitored, except that 100% of all appliances installations, utilities installation and connections and required testing will be monitored on all homes.

(iii) The inspection entity will document all inspections, deviations and corrective action, and will verify compliance of the home in a format acceptable to the IPIA. Upon completion of the inspection, the IPIA shall obtain the manufacturer's concurrence in the report, and shall process the report in accordance with the IPIA standard procedures and these regulations.

Substantiation

NFPA Standard 501 has been extensively revised to address the design and construction of multi-section, multi-story manufactured homes, including provisions for completion of certain elements of the home onsite. Revision to the regulatory process is essential to assure that the design, construction, inspection and installation of the home is in full compliance with those regulations. This proposed revision addresses all of the elements.

Proposed revision to 3282.362

Revise section 3282.362(c)(2)(i)(E) as follows:

The label shall be located on the tail-light end of each transportable section of the manufactured home approximately one foot up from the floor and one foot in from the road side, or as near that location as practicable. The road side is the right side of the manufactured home when one views the manufactured home from the tow bar end of the manufactured home. When locating the label on the tail end of the transportable section will prevent the label from being visible after the manufactured home section is installed at the installation site, the label shall be installed on a permanent part of the exterior of the manufactured home, in a visible location as specified in the approved design. It shall be applied to the manufactured home unit section in the manufacturing plant by the manufacturer or the IPIA as appropriate.

Substantiation

The same wording has been proposed to (or has been approved by) the NFPA 501 on manufactured homes as a revision to section NFPA 501 section 1.11.4 [MHCSS section 3280.11(d)]. This proposed regulatory change will harmonize the standards and the regulations.

Resources

B

This section lists a variety of resources available to those who want to learn more about manufactured housing in general, as well as for those who wish to study specific aspects of the market for HUD-Code homes in single-family attached applications.

The **Manufactured Housing Institute** (MHI), located at 2101 Wilson Boulevard, Suite 610, Arlington VA 22201 (telephone 703-558-0400), is the principal national trade association for the manufactured housing industry. MHI offers numerous publications for sale or free of charge, sponsors research, performs lobbying, and compiles and publishes a variety of statistics concerning the industry. The MHI Web site is at www.mfghome.org.

MHI has state-level affiliates around the U.S. Many of these affiliates maintain their own Internet sites, which are sources of state-level information about manufacturing plants, retailers and communities. These sites include:

Alabama	www.amhi.org
Arizona	www.mhiaz.org
Arkansas	www.amha.net
California	www.cmhi.org
Colorado	www.coloradohome.org
Connecticut	www.ctmha.com
Delaware	www.firststatemha.org
Florida	www.fmha.org
Idaho	www.idahomha.org
Illinois	www.imha.org
Indiana	www.imharvic.org
Kansas	www.kansashome.net
Kentucky	www.kmhi.org
Louisiana	www.lmha.com
Massachusetts	www.massmha.org
Michigan	www.michhome.org
Minnesota	www.mnmfghome.org
Mississippi	www.msmmha.com
Missouri	www.mmha.net
Montana	www.mtmha.org
Nebraska	www.nemanufacturedhomes.com
Nevada	www.nevadamha.org
New Jersey	www.njmha.org
New Mexico	www.nmmha.com
New York	www.nymha.org
North Carolina	www.ncmhi.com
North Dakota	www.ndmha.com
Ohio	www.omha-usa.org
Oklahoma	www.mhao.org
Oregon	www.omha.com
Pennsylvania	www.pmha.org
South Carol	www.mhisc.com
South Dakota	www.sdmha.com
Tennessee	www.tnmha.net
Texas	www.texasmha.com
Utah	www.utahmha.org
Virginia	www.vammha.org
Washington	www.nwpride.org
Wisconsin	www.wmha.org

The **Manufactured Housing Research Alliance** (MHRA), located in New York, NY (telephone 212-496-0900), is an industry organization with the mission of developing new technologies for manufactured housing. MHRA's research products are available on its Web site at www.mhrahome.org.

The **Housing and Building Technology division of the National Conference of States on Building Codes and Standards** (NCSBCS), located in Herndon, VA (telephone 703-437-0100), is actively involved in the HUD-code program and can provide information about national and state-level regulatory issues relating to manufactured housing. The NCSBCS Web site is at www.ncsbcs.org.

Thousands of **public housing authorities** exist across the United States. Many of these are operated at the local level. HUD maintains a database of U.S. housing agency profiles at www.hud.gov/pih/systems/pic/haprofiles/

The **National Congress for Community**

Economic Development (NCCED) is the trade association and advocate for the community-based development industry. NCCED represents over 3,600 community development corporations (CDCs) across America. CDCs produce affordable housing and create jobs through business and commercial development activities. NCCED services the community development industry through public policy research and education, special projects, newsletters, publications, trainings, conferences, and specialized technical assistance. To learn more about NCCED and its members visit www.ncced.org.

Manufacturer Internet Sites

Virtually all home manufacturers maintain Internet sites containing information for consumers, retailers and in some cases for investors. Most offer the ability to search for plants or dealers by geographic location or provide this information in the form of maps or lists. Some sites show floor plans and pictures of model homes. The Web sites for some of the largest publicly traded producers include copies of annual financial reports, which generally contain a great deal of information about the firm, its divisions, its operations and its finances. Mergers and acquisitions within the industry are constantly taking place, so this list may rapidly become out of date.

American Homestar
www.americanhomestar.com
Burlington Homes
www.burlingtonhomes.com
Cavalier Homes
www.cavhomesinc.com
Cavco Industries, Inc.
www.cavco.com
Clayton Homes
www.claytonhomes.com
Champion Enterprises
www.championhomes.com
Commodore Corporation
www.commodorehomes.com
Crestline Homes (Commodore)
www.crestlinehomes.com
Fairmont Homes
www.fairmonthomes.com
Fleetwood Enterprises
www.fleetwood.com
Four Seasons Housing
www.fourseasonshousing.com
Fuqua Homes, Inc. [Oregon]
www.fuquahomes.com
Fuqua Homes, Inc. [Missouri]
www.fuquahomes-mo.com
Hi-Tech Housing, Inc.
www.hi-techhousing.com
Horton Homes
www.hortonhomes.com
Jacobsen Homes
www.jachomes.com
Kit Manufacturing
www.kitmfg.com
Liberty Homes
www.libertyhomesinc.com
Marlette Homes, Inc. (Schult)
www.marlettehomes.com
New Era Building Systems
www.new-era-homes.com
Nobility Homes, Inc.
www.nobilityhomes.com
Oakwood Homes
www.oakwoodhomes.com
Palm Harbor Homes
www.palmharbor.com
Patriot Homes
www.patriothomes.com
Pine Grove Manufactured Homes, Inc.
www.pinegrovehomes.com
Ritz-Craft Corporation, Inc.
www.ritz-craft.com
Rochester Homes, Inc.
www.rochesterhomesinc.com
Schult Homes (Oakwood)
www.schulthomes.com

Silvercrest (Champion)
www.silvercrest.com
Skyline Corporation
www.skylinehomes.com
Wick Building Systems
www.wickmarshfield.com

Regulations and Financing Requirements

7 CFR Part 1924: RHS rural housing loan program regulations
7 CFR Part 3550: RHS direct single-family loan program regulations
24 CFR Part 201: FHA financing rules for Title 1 (personal property) loans
24 CFR Part 203: FHA financing rules for Title 2 (real property) loans
24 CFR Part 3280: Manufactured Home Construction and Safety Standards
24 CFR Part 3282: Manufactured Home Procedural and Enforcement Regulations
38 CFR Part 36: VA personal property and real property loan programs
Federal National Mortgage Association, Selling Guide
Federal Home Loan Mortgage Corporation, Single-Family Seller/Servicer Guide
Note: The Code of Federal Regulations (CFR) is accessible on-line at www.gpo.gov/nara/cfr.

Periodicals, Newsletters and Magazines

Allen Letter. Monthly newsletter. PMN Publishing, Indianapolis, IN.
Automated Builder. Monthly magazine. Ventura, CA.
Crittenden's Manufactured Housing Community Report. Monthly newsletter. Crittenden Publishing, Inc., Novato CA.
Manufactured Home Merchandiser. Monthly magazine. RLD Group, Inc., Chicago IL.
Modern Homes. Monthly magazine. Manufactured Housing Institute, Arlington, VA.
Urban Land. Monthly magazine. ULI-The Urban Land Institute, Washington, D.C.

Books and Reports

Albern, William F. and M.D. Morris, Ed., *Factory-Constructed Housing Developments, Planning, Design and Construction.* CRC Press, Boca Raton, FL.

Alley, David I., and Donald C. Westphal, *Navigating the Manufactured Housing Zoning Process.* Manufactured Housing Institute, Arlington, VA, 2002.

Allen, George, David Alley, and Edward Hicks with Joseph Owens, Development, *Marketing and Operation of Manufactured Home Communities.* John Wiley & Sons, Inc., New York, NY. 1994.

Apgar, William, Allegra Calder, Michael Collins and Mark Duda, *An Examination of Manufactured Housing as a Community- and Asset-Building Strategy*, Joint Center for Housing Studies of Harvard University, Cambridge MA. September 2002.

Hullibarger, Steve, *Developing with Manufactured Homes.* Manufactured Housing Institute, Arlington, VA. 2001.

Manufactured Housing Institute, *Quick Facts.* Arlington, VA. 2003.

The Manufactured Housing Zoning Forum, Report. Sponsored by U.S. Department of Housing and Urban Development, American Planning Association and Manufactured Housing Institute.

Sanders, Welford, *Manufactured Housing: Regulation, Design Innovations and Development Options.* American Planning Association, Planning Advisory Service Report Number 478. Chicago, IL, July 1998.

U.S. Department of Housing and Urban Development, Office of Policy

Development and Research, *A Community Guide to Factory-Built Housing*. 2001.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Factory and Site-Built Housing: A Comparative Analysis*. 1998.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Building Innovation for Homeownership*. 1998.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Guide to Foundation and Support Systems for Manufactured Homes*. 2002.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Home Builders' Guide to Manufactured Housing*. May 2000.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Manufactured Home Producers Guide to Working in the Site-Built Market*. 1999.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Permanent Foundation Guide for Manufactured Housing*. September 1996.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Technology Roadmapping for Manufactured Housing*. March 2003.

Vermeer, Kimberly and Josephine Louie, *The Future of Manufactured Housing*, Joint Center for Housing Studies of Harvard University, Cambridge MA. January 1997.

Visit the HUD **Office of Policy Development and Research** (PD&R) Web site, www.huduser.org, to find this report and others sponsored by PD&R. Other services of HUD USER, PD&R's Research Information Service, include listservs; special interest, bimonthly publications (best practices, significant studies from other sources); access to public use databases. HUD USER maintains a hotline (1-800-245-2691) for help in accessing the information you need.

Endnotes

1. Meeting Our Nation's Housing Challenges, Report of the Bipartisan Mellenial Housing Commission appointed by the Congress of the United States, Washington, D.C., May 30, 2002, available at www.mhc.gov. According to the report, manufactured housing accounted for 72% of new unsubsidized units affordable to low-income homebuyers between 1997 and 1999.

2. According to the U.S. Census Bureau, a housing start is registered at the start of construction of a new structure intended primarily as a residential building. The start of construction is defined as the beginning of excavation of the building's foundation.

3. See Chapter 3 for a more complete discussion of market forces.

4. U.S. Census Bureau Construction Reports, Quarterly Housing Starts by Purpose of Construction and Design Type (United States - Annual Data), available at http://www.census.gov/const/www/newresconstindex.html.

5. MIT-Harvard Joint Center for Urban Studies, State of Nation's Housing, 2000. Original source: U.S. Census Bureau, Construction Reports, Series C-40 and U.S. Census Bureau 2000 Census.

6. U.S. Census Bureau defines "houses sold" in a given year as all houses for which a sales contract has been signed or a deposit accepted. This includes houses for which these transactions have occurred before construction has begun. It also includes homes sold while under construction or after completion. Land, in some form, is included in the sales transaction.

7. U.S. Census Bureau, Series C-25, Characteristics of New Housing Report, available at http://www.census.gov/const/www/charindex.html.

8. U.S. Census Bureau, Series C-25, Characteristics of New Housing Report for July 1999.

9. U.S. Department of Housing and Urban Development Fiscal Year 2004 Budget Summary, available at http://www.hud.gov/about/budget/fy04/budgetsummary.pdf.

10. Ibid.

11. Ibid.

12. Ibid.

13. U.S. Department of Housing and Urban Development Public Housing Agency Profiles, available at www.hud.gov/pih/systems/pic/haprofiles/.

14. See endnote 1.

15. The proposals, discussed in detail in Appendix A, were submitted by MHRA to the NFPA Committee on Manufactured Housing, a body convened by the National Fire Protection Association to provide guidance to HUD on changes to the HUD standards.

16. U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Home Builders' Guide to Manufactured Housing*. May 2000.

17. Manufactured Housing Institute, Arlington, VA.

18. California Health and Safety Code, General Provisions, Division 13-Housing, Part 2-Mobilehomes and Manufactured Housing, Sections 18000-18014.

19. Mid-Peninsula Housing Coalition Web site, available at http://www.midpen-housing.org/.

20. California Association of Realtors, Interest Rates Keep California's Housing Affordability Index Unchanged in April Despite Rise in Median Home Price, C.A.R. Reports, June 12, 2003 press release, Los Angeles, CA, available at http://www.car.org/index.php?id=MzIxMzY=.

21. Local Initiative Support Coalition Center for Home Ownership, Best Practice Profile: Manufacturing Affordability in Seattle, September 2002.