

research works

A bridge linking housing research and practice

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Affordable Housing: Designing an American Asset

HUD's Affordable Housing Research and Technology Division recently joined with the National Building Museum to produce an informative—and remarkably persuasive—exhibit on the subject of affordable housing as an architectural and economic asset. With a clear goal of adjusting visitors' perceptions of what affordable housing looks and feels like today, the exhibit conveys some of the more striking results of a recent surge in design excellence being applied to affordable housing. The curators' approach is to teach by example, in that the exhibit presents well-designed affordable housing developments in ways that encourage a broader understanding and recognition of their value to the communities they serve.

It's no secret that the demand for affordable housing is high, while the lack of affordable housing can be a difficult barrier for low-income homebuyers. Contributing to this unfortunate circumstance is the fact that some



Howard University/LeDroit Park Revitalization Initiative, Washington, D.C.

communities continue to view the inclusion of affordable housing as undesirable, rather than beneficial. Rallying behind a faded NIMBY ('Not In My Back Yard') banner, the most commonly cited objection to affordable housing among some community members is a perceived erosion of property values. The key to changing this attitude is to build well-designed affordable housing that blends into the existing neighborhood, thereby enhancing all residents' quality of life and creating an atmosphere in which individuals and families can thrive. Indeed, a growing body of research shows that affordable housing can exert favorable economic and social influences on healthy neighborhoods, and can serve as a force of positive change in distressed neighborhoods.

The Economics of Design

Quality design can be affordable, and affordable housing can embody quality design. That's the mantra that the joint PD&R/Building Museum exhibit hopes to instill among its viewers both in its premier installation in Washington, DC, and in various stops across the country. The traveling exhibit will appear in ten cities across the country over the next 24 months, including stops in New York, Chicago, Los Angeles, Miami, Boston, Houston, Atlanta, and Raleigh, as well as Yale

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Manufactured homes today bear little resemblance to their predecessors, the mobile home or trailer, but unfortunately, mainstream public perception seems deeply rooted in the past. Here at *ResearchWorks*, we like nothing better than to dispel outmoded stereotypes—especially when we see things changing for the better. And while the ubiquitous double-wide is still very much a part of the American landscape, many of today's leading manufacturers are going toe to toe with site-built housing, and are coming out ahead on issues such as speed of delivery, cost, and in some instances, even aesthetic value.

One of the key reasons that affordable housing developers, advocates, and buyers are approaching manufactured homes with renewed interest is that these products are built and assembled under the controlled conditions of a factory. After being constructed, the unit is transported to the site and installed, often in several component parts. Many of the noticeable distinctions between manufactured housing and site-built housing are disappearing, as most manufactured housing today is no longer single units in trailer parks, but double and even two-story multiple units placed on permanent foundations on private land.

Originally an outgrowth of the recreational vehicle industry, mobile homes were initially subject to little or no regulation in terms of their construction and installation. As mobile homes became a permanent housing choice for many people, government officials began to acknowledge this reality, and concerns arose regarding issues of public health and safety. In 1974, Congress passed the National Mobile Home Construction and Safety Standards Act—also known as the HUD Code—which directed HUD to develop national building standards and a federal oversight program for the construction of manufactured housing. These regulations went into effect in June of 1976, and preempted any existing state or local construction and safety codes. The underlying effect of federal regulation was to more clearly define mobile homes as buildings, rather than vehicles. The Housing Act of 1980 officially adopted this interpretation, mandating the use of 'manufactured housing' to replace 'mobile homes' in all federal law and literature for homes built after 1976.

The federal standards in place today regulate manufactured housing design and construction, strength and durability, transportability, fire resistance, energy efficiency, and quality. The HUD Code also sets performance

standards for the heating, plumbing, air-conditioning, thermal, and electrical systems that can be used in factory-built homes. On-site additions such as garages, decks, and porches must be built to conform to local, state, or regional building codes.

Every three years, Foremost Insurance Company, a manufactured home insurer, conducts a market study to gauge their clients' needs so as to tailor their products to better meet those needs. The last survey was conducted in 2002, and it revealed some interesting facts about the manufactured homeowner. For example:

- The homeowners' average age is 54.1;
- Forty-seven percent have some college education, and eighteen percent have earned a degree;
- At 56 percent, married couples make up the majority of households;
- More than half are employed full time, and 30 percent are retired;
- Household median income is \$28,900;
- Average household size is 2.3 people;
- The median installation year of the homes owned by those surveyed is 1985;
- The median market home value is \$20,000; and
- Forty-nine percent of surveyed homeowners have their homes sited on their own private property.

Affordability and sound construction are two of the major draws of manufactured housing. Other positives include speed of on-site assembly (manufactured homes typically can be assembled in days or weeks, rather than the weeks or months required for site-built housing), reduced disruption of existing neighborhoods when used as infill housing, and increased quality assurance made possible by the factory setting. On the flip side, there is still a stigma attached to this type of housing on the part of local governments, lenders, and community members.

The selling price for a new manufactured home ranges from under \$20,000 for a single-section unit with basic features to prices in excess of \$100,000 for a deluxe multisection home. Although many manufactured units are still of the single unit variety, increasingly, more are double units and units with two-stories. Today's units have a life expectancy of 30 to 55 years, depending on the owners' maintenance of the unit. With per-square-foot costs averaging 10 to 35 percent less than site-built homes, depending on geographic region, today's manufactured homes provide homebuyers with affordable options in the housing marketplace.

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After bearing up under years of negative stereotypes, manufactured housing is steadily climbing its way up the affordable housing ladder. As the industry continues to seek ways of enhancing the value of new manufactured homes, fostering technological advances, and embracing innovation in both design and assembly practices, demand for manufactured homes continues to grow. Despite lagging sales activity in recent years, more and more homebuyers and developers are recognizing that manufactured housing offers quality homes at affordable prices.

HUD's Partnership for Advancing Technology in Housing (PATH) has long supported the progress being made in the manufactured housing industry. PATH stands behind three of the most recent advancements that industry groups are currently developing to improve construction efficiency, performance, and education on the importance of manufactured housing and related research.

In cooperation with PATH, the Manufactured Housing Research Alliance (MHRA) is immersed in a 'lean production' effort; a product-centered approach to applying efficient production techniques to factory-built housing. Companies in the manufactured housing industry created the non-profit MHRA ten years ago to serve as the public arm in public-private manufactured housing research ventures. MHRA and PATH share the goals of making production more efficient while improving performance and quality.

In order to apply 'lean production' methods to factory built housing, MHRA is concurrently engaged in two vital and complementary efforts. Sifting through the results of a large number of manufacturers' surveys, MHRA plans to turn plant performance data into benchmarks that can be used to gauge production plant operating efficiencies. The information collected will be expressed in several ways, such as worker hours per home, service costs per unit, volume of waste, and other product- and process-oriented metrics. MHRA Executive Director Emanuel Levy states "Despite being the most efficient home builders in the nation, factory builders have joined together in this effort to do more with less: eliminate production bottlenecks, zero defects, zero waste." With support from PATH and the New York State Energy Research and Development Authority, MHRA is piloting these efficiency techniques at Capsys, a New York City-based modular home producer. MHRA will add three additional lean production demonstrations working with HUD-code builders. These projects

are slated to begin in the fourth quarter of 2004. Manufactured (also referred to as HUD Code) homes are built in accordance with standards established and maintained by the HUD Office of Housing Standards.

Another MHRA and PATH multi-year effort is underway to solve moisture issues and related concerns in America's Southeast. High humidity and high temperatures, coupled with the pervasive use of mechanical cooling, make moisture condensation a major concern for all buildings in this region. Common features shared by most manufactured homes make their problems a bit easier to solve than site-built structures. Virtually all manufactured homes use forced air distribution systems, have a basic rectangular footprint, and share similar methods of construction, making corrective measures readily transferable. MHRA spent the past three years identifying the nature and source of moisture problems in factory-built housing. After a careful analysis of 75 homes conducted in cooperation with the Florida Solar Energy Center, MHRA identified a short list of the conditions that often lead to moisture condensation. The number one concern is depressurization of the building relative to the outside (hot, humid outside air constantly drawn into the home through small openings, such as vents, in the home walls, floor, and ceiling). For every potential source of moisture condensation there is a solution, and MHRA is testing a series of strategies that, taken together, will minimize the odds of moisture problems.

Vapor barriers are used in constructing the walls, roof, and floors of most homes. In hot and humid areas such as those in the Southeast, vapor barriers are best utilized on the outside of the wall. However, HUD Standards call for placing vapor barriers on the *inside* of the wall, regardless of geographic location.

Over the next year, MHRA will test and evaluate the moisture abatement strategies in two new South Florida manufactured homes. Once testing is complete, a major information blitz is anticipated. MHRA plans to produce three documents: a set of industry tips for manufactured housing producers, retailers, and installers; a homeowner's brochure containing basic operating and maintenance procedures; and a diagnostics guide for service providers so that they may better evaluate the underlying causes and resolve moisture problems when they appear.

PATH demonstration sites such as the one currently in development in Barrington Hills, New Hampshire

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A handful of non-profit developers have successfully implemented advanced building technologies and strategies aimed at producing quality, low-cost housing in some of the poorest communities in the American Southwest—and PATH is making sure their stories get told. This is good news for other low-cost housing providers, who can profit from the lessons learned by their peers, as well as for all of those who rely on their services. This is especially true of HUD's Colonias-related initiatives, and the community organizations and housing providers located along the U.S.-Mexico border and in rural America.

The Office of Policy Development and Research has just published *A Community Guide to Basic and Cost-Saving Construction in the American Southwest*, which was produced by the architectural research and consulting firm Steven Winter Associates, Inc. The publication is designed to guide the reader through the process of developing affordable housing by highlighting cost-saving technologies and construction strategies. With text in both English and Spanish, the guide should appeal to regional non-profit developers and homeowners, who will come away with a better understanding of the cost-saving technologies and design strategies they need to build affordable housing.

HUD produced this guide because of the lack of well-constructed, affordable housing in the American Southwest, particularly in the colonia region bordering the U.S. and Mexico. The book presents more than 30 low- or no-cost construction techniques that can improve the quality and energy efficiency of a home. Among the topics covered are how to prevent mold growth (which is very prevalent in substandard housing); passive solar techniques (strategies for taking advantage of natural cooling and heating); advanced framing techniques (which can reduce the amount of framing lumber used without sacrificing quality and strength); cool roofing (a strategy that incorporates advanced insulating techniques to mitigate heat transfer to living spaces); proper HVAC sizing (which can help reduce construction costs and limit excess moisture); and rainwater harvesting systems that reduce water usage in hot, arid regions.

The information on the various topics is supplemented by guidance on where to apply such strategies, some of the associated cost/benefits, and the skill levels required for implementation. Also discussed are the regulatory obstacles that can get in the way of affordable housing development, and benefits of energy efficient mortgages. The guide is generously illustrated with photos of new affordable housing projects, and also includes pictures

and diagrams of technologies, products, and materials that are appropriate for application in the Southwest U.S.

The ideas and technologies presented in the book come to life in the case study section, which illustrates how they are being applied in the field. For example, one case study demonstrates a unique approach to promoting homeownership, practiced by Proyecto Azteca. Started in 1991 by the United Farm Workers (UFW) and Texas Rural Legal Aid (TRLA), Proyecto Azteca is a non-profit housing developer that provides affordable housing for colonia residents in Hidalgo County, Texas. Families served by Proyecto Azteca make about \$4,500 to \$13,500 per year, usually from seasonal employment as migrant farm workers or construction workers. These families are attracted to colonia villages because plots of land can be bought from developers for very little money. Colonia villagers can purchase an \$8,000 to \$12,000 plot of land from developers for as low as \$100 down. If they can afford it with the little money left over, families typically build substandard, unsafe, makeshift homes. Sometimes, one late payment to the developer results in the loss of both land and home. Developers often apply penalties and other fees for unsubstantiated 'violations.' If residents cannot afford the fees, developers can apply previous mortgage payments to the fee amount, reducing any equity in the property... and the cycle continues.

Proyecto Azteca ends the cycle that renders colonia residents powerless by refinancing the land and ending the relationship between the family and the developer. The strategy here is to provide homes that are not fully completed. Known as *cascarones*, or 'shells,' the homes are 80 percent finished. They are fully framed and enclosed, including doors, vinyl siding, an asphalt shingle roof; all mechanical, plumbing, and electri-

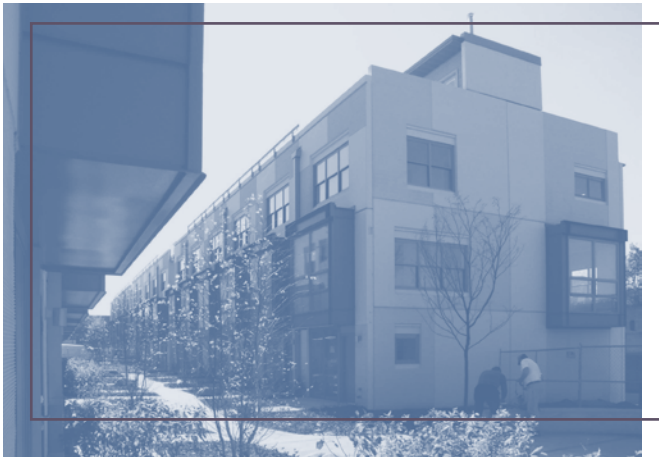
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University, University of Pennsylvania, and the University of Indiana. Along the way, visitors to the exhibit will find a wide array of technological innovations that are making advances in design-enhanced affordability possible: durable and resource-efficient building materials; energy-efficient heating, ventilating, cooling, and lighting systems; and sustainable, environmentally sound construction practices. When integrated as complementary elements of thoughtful, 'whole building' design, these materials and approaches contribute to reducing long-term operating costs—a central and often overlooked aspect of affordability.

Helping to bridge the transition between good ideas and their realization are a variety of government initiatives, working in tandem with private, non-profit and for-profit programs and ventures to provide financial and other assistance in the development of high quality affordable housing. Some of the key players include HOME Investment partnerships, Block Grant program, HOPE VI, Low-Income Housing Tax Credits, Fannie Mae, and the Local Initiatives Support Corporation (LISC).



Arthur Courts Rehabilitation, Chicago, IL

Good Design Creates Value

In addition to the aesthetic advantages that promote community acceptance, good design yields benefits at all stages of the development process: conceptual, construction, occupancy, and maintenance. It also nourishes the economy by creating jobs and supporting commerce. A well-designed, well-built project that fits into its neighborhood is advantageous for residents, the community, and the development team—everyone wins.

Developers of low-income, affordable housing are employing design excellence as a tool to create value in economic, social, and cultural terms. Not only can good design enhance property values, it can also spur



Stoney Pine Affordable Housing for the Developmentally Disabled, Sunnyvale, CA

neighborhood revitalization and build a renewed sense of civic pride. Low-income families benefit from being a part of income-integrated communities in many ways, particularly in terms of improved access to education, job opportunities, and a better quality of life in general. The community as a whole benefits from reduced commuter traffic, lower police and social service costs, and the culturally enriching effects of a diverse social fabric.

According to Troy Patterson, Sponsorship Manager for The National Building Museum, "Affordable Housing: Designing an American Asset" was featured in several national publications such as *The Washington Post*, *The Wall Street Journal*, *Architectural Record*, *Metropolis*, and *Metropolitan Home* just to name a few. From a pure marketing perspective, this coverage reached a potential of more than 20 million individual households talking about the benefits of, and need for, affordable housing." By the closing of the exhibit's initial Washington, DC run, Patterson estimates that over 20,000 visitors will have passed through the gallery doors. He went on to observe that "This is easily one of the most popular exhibits we've ever done."

Examples of Good Design

The exhibit features 18 projects from across the nation, in contexts ranging from urban to rural. Together, they illustrate how well-designed developments are offering new opportunities for the least wealthy Americans, while creating value for their surrounding communities. As the exhibit makes its rounds over the next two years, it is hoped that the various approaches to affordable excellence in design will serve as a prologue to the exciting possibilities inherent in the future of affordable housing. Responding to the demand for affordable housing, some forward-thinking planners and architects have quietly set about reinventing the concept of affordable housing, and in so doing, are changing some peoples' perceptions—and many others' lives—for the better.

Manufactured Housing: Past, Present and Future cont. from page 2

The affordability factor in manufactured housing can be attributed to the efficiencies that are endemic to the factory-built process. A controlled environment and assembly line techniques eliminate many of the problems encountered in on-site construction, such as poor weather, theft, vandalism, and damage to building products and materials stored on site. Also, factory employees are often scheduled and managed more efficiently and effectively in comparison to the system of contracted and subcontracted labor employed by the site-built housing industry. Manufactured home building also benefits from the economies of scale that result from being able to purchase large quantities of building materials and products. As a result, manufactured homebuilders are able to pass some of these savings on to the homebuyer.

Manufactured homes are traditionally classified as personal property and are financed as such. Personal property (or chattel) loans typically have higher interest rates and shorter terms, but are easier to obtain and require little or no downpayments. This type of loan also does not require the buyer to purchase a home site for the unit, and while more expensive than a conventional mortgage, personal property loans are the most common choice among manufactured homebuyers.

Increasingly, however, manufactured housing units are being placed on permanent foundations and can be classified as real property. Despite this, some lenders still cling to the historic view, considering manufactured housing as personal property rather than real property, and so only provide personal property loans. In addition, many communities still retain outmoded regulatory prohibitions against manufactured housing, and work with their local governments to exclude all types. Some local governments try to limit placements because they believe that manufactured homes will cause property values to decline and will provide limited property taxes to the community.

Several years ago, in an attempt to end discrimination against manufactured homes in communities, the American Planning Association ratified a policy guide on manufactured homes. The policy urges all levels of government to recognize manufactured homes as an acceptable form of housing and a viable alternative to more costly site-built construction, thus allowing for an affordable homeownership alternative to low- and moderate-income families.

Research conducted by several universities, including Harvard, has shown that there is little evidence to

support the contention that siting today's manufactured housing in a given neighborhood impacts surrounding properties by depreciating property values. Research has also found that, when properly maintained and on private land, manufactured housing units hold their value.

Even in light of this research, manufactured housing sales have been suffering, and indeed, sales of new units have fallen steadily. According to *U.S. Housing Market Conditions, May 2004*, not since the fourth quarter of 1959—45 years ago—have quarterly shipments of new manufactured housing units been so low. With so many middle-income households able to afford site-built homes, the manufactured home market was left to those with poor credit ratings and little cash. The industry is struggling to work through the excess inventory of repossessed homes competing with new production.

Despite this setback, the industry is forging ahead in several areas to meet consumers' needs. To serve the growing market of senior homebuyers, manufacturers are offering a range of 'Universal Design' plans that can accommodate wheelchairs and walkers. Floorplans include larger hallways and bathrooms, variable counter heights, and Lazy Susans in the kitchen. Attention to aesthetic features is also injecting new life into the market. Tilt-up roofs are now offered, which allow for attic space and increase the square footage. Two-story models are becoming more common, and many of these are virtually indistinguishable from their site-built neighbors. Other features, such as garages, decks, and porches, are helping manufactured homes blend into existing neighborhoods. Inside the home, vaulted ceilings, working fireplaces, and state-of-the-art appliances offer homebuyers the opportunity to customize a home to fit the family's particular lifestyle and needs, at a price they can afford. Greater focus on energy efficiency within the manufactured housing industry has resulted in a significant jump in the numbers of manufacturers building Energy Star®-labeled manufactured homes.

Implementation of the Manufactured Home Improvement Act of 2000, enacted in December of that year, should facilitate greater public acceptance and more opportunities for the placement of manufactured housing. The Act establishes a consensus committee composed of members from the industry, users, general interest groups, and public officials selected by procedures advanced by the American National Standards Institute. The committee is empowered to recommend to the HUD Secretary the adoption, revision, and

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promote the use of new technologies by ensuring that their benefits are well understood and accepted. The New Hampshire Community Loan Fund (NHCLF) is finalizing the design of this 44-lot, HUD Code, land-lease community, which is located in one of the ten areas of the country identified as having the greatest need for affordable housing. Working with PATH and local environmental groups, NHCLF is working to promote high standards of environmental responsibility and construction, while working within a very tight budget. PATH proposes to place all the ranch-style homes on floating slabs with foundation anchorage that meets the lending agency's

criteria for a 'permanent foundation,' and to devise a form of solid and permanent skirting to replace the usual vinyl. Depending on budget, it is hoped that a number of the homes will be produced using the *Next Generation* style Cape Cod design, and be placed on full basements.

For more information about MHRA projects, visit www.mhrahome.org or contact Emanuel Levy, Executive Director at (212) 496-0900, e-mail: elevy@research-alliance.org

For more information on the Barrington Hills project, visit <http://www.pathnet.org/sp.asp?id=1453>

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cal systems; the kitchen sink and all bathroom fixtures. *Cascarones* do not include flooring, sheetrock, insulation, kitchen and bathroom cabinets, and other amenities. Homeowners are expected to complete the unfinished home at their own pace, as they choose, and as money allows. This approach to housing development has significantly reduced the cost of homeownership in Hidalgo County.

Proyecto also offers fully constructed homes to families that can afford them. Both the *cascarones* and fully constructed units are 1,000 square feet (a simple rectangular plan 24 by 36 feet) with three bedrooms and one bathroom. Fully constructed homes can be bought for as little as \$27,500, while *cascarones* sell for about \$12,500. Home prices include labor, materials, and closing costs.

Housing construction can begin within two to three days after purchase from Proyecto. Using 100 percent self-help labor, the complete homes and the *cascarones*

are constructed off-site from the final location of the home on a large lot of land owned by Proyecto Azteca. Usually more than one home is constructed at the same time by a number of families. While one construction crew is building a house on the Proyecto lot, another is at the site where the home will be delivered, preparing the foundation. *Cascarones* can be constructed within six to eight weeks, while fully complete homes may take several more weeks to finish. When the homes are ready for delivery, the modules are trucked to the site and lowered onto the foundation. All plumbing, mechanical, and electrical hookups are done by professionals.

Copies of *A Community Guide to Basic and Cost-Saving Construction in the American Southwest* are available as a free download on the HUD USER website at: www.huduser.org/publications/destech/cost_saving.html. Printed copies are available for a nominal charge by calling 1-800-245-2691, option 1.

Manufactured Housing: Past, Present and Future cont. from page 6

interpretation of the federal manufacturing and safety standards, procedures, enforcement, and scope and conduct of monitoring. The Act also addresses installation standards, affordable homeowner finance and protection issues, and the federal preemption, and is intended to encourage innovative and cost-effective construction techniques. With continued advances in technology and public acceptance, manufactured

housing is positioned to be a major provider of quality, affordable housing in the 21st Century.

Over the past ten years, HUD has conducted research and studies on the manufactured housing industry in the areas of policy, design and construction techniques, and financing. For a complete list of PD&R-sponsored publications, visit HUD USER at <http://www.huduser.org/publications/manufhsg.html>.

U.S. Department of Housing and Urban Development

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In the Next Issue of ^{research} **works ...**

- A profile of the Mississippi HUD Field Office tells of their efforts to recognize community needs for Rural Housing and Economic Development (RHED) funding in coordination with other HUD programs, as well as their strategic vision for helping local nonprofits obtain this important funding. Approximately 60 percent of Mississippi's counties are considered rural, in a state that ranks last in the U.S. for per capita income.
- According to the 2000 Census, approximately 55.4 million people, or 20 percent of the U.S. population, reside in nonmetropolitan areas. Rural America's population is growing and is becoming more diverse than ever before. Rural residents are aging, and both single-parent and single-person households are increasingly common. Rural education levels still lag behind those of metropolitan areas, and the economy remains a problem in many rural communities. Housing affordability problems are also increasing in rural places. This article will explore issues pertaining to rural housing, including homeownership, the rural rental market, the unique sanitation challenges endemic to rural areas, and financing and funding issues.
- In one East Coast rural resort community, the local slogan reads: 'Live where you play.' But many employees in this resort area and many like it across the country can't afford to live where they work. And the problem is not limited to just lower-wage resort workers. With its breathtaking views, world-renowned ski resorts, and safe, well-equipped schools, Aspen, Colorado is a dream place to live and work for many teachers, but even the most basic apartments are out of the price range of the typical educator. This article will explore these rural housing challenges and what some communities are doing to help solve the problem.
- When one thinks of rural housing and community development work at the federal level, the agency that first comes to mind first is not always the U.S. Department of Housing and Urban Development, but rather, the U.S. Department of Agriculture's Rural Housing Service. HUD is hard at work in rural and non-metro areas; our customers are numerous and our programs varied. Next month, our readers will have a chance to learn more about these distinctions and others as we look at HUD's efforts in areas far removed from the urban core.

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