

A bridge linking housing research and practice

Volume 1, number 6

Safe at Home

Federal Agencies are Working Together to Protect Our Health

Each year, environmental hazards in the home place millions of children and adults at risk. Indoor environmental hazards typically pose far greater risks to human health than outdoor pollution. Since people spend most of their time inside, the home typically accounts for a major share of exposure to the toxins, irritants, allergens, and gases that can cause diseases and adversely affect our health. When housing is of sub-standard quality, the risks are even greater. Older, dilapidated properties usually pose the most severe indoor health hazards as they are prone to a combination of lead dust and deteriorated paint, along with hazards such as carbon monoxide, mold, cockroaches, dust mites, pesticide residue, and radon.

According to the Alliance for Healthy Homes, the following indoor environmental hazards constitute the main offenders: Mold, mildew, and pests; carbon monoxide



A worker demonstrates lead-safe work practices.

poisoning from combustion appliances; lead-based paint; exposures to asbestos particles, radon gas, and second-hand smoke; and pesticide residues in the home.

These hazards often have overlapping causes, effects, and in some cases, solutions. For example, inadequate ventilation increases the concentration of indoor pollutants and exacerbates moisture and humidity problems. Moisture causes paint deterioration, which increases exposure to leaded dust and paint chips. Moisture also encourages the growth of mold, mildew, and dust mites which contribute to asthma and other respiratory diseases. The use of common pesticides to control infestations can contaminate homes with known carcinogens.

A growing body of scientific research has demonstrated that children who live in homes that are well ventilated, dry, and free of pests, poisons, and dangerous gases will be healthier and lead fuller lives. According to the National Low Income Housing Coalition (NLIHC), the burden of housing-related health hazards falls disproportionately on the most vulnerable children and communities. For example, lead paint has not been allowed in residential use since 1978, but as many as 38 million homes and apartments still have lead-based paint. Of those, 25 million have significant lead hazards. Households with annual incomes

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A growing body of literature is renewing interest in the connection between living in poverty and serious detrimental effects on a person's health, well-being, and opportunities. In a recent *New York Times Magazine* article, author Helen Epstein reports that Ana Diez-Roux, an epidemiologist at the University of Michigan, has shown that people who live in disadvantaged neighborhoods are more likely to have heart attacks than people who live in middle-class neighborhoods, even taking income differences into account. In addition, researchers at the Rand Corporation found that neighborhoods where many buildings are boarded up and abandoned have higher rates of early death from cancer and diabetes than neighborhoods with similar poverty rates and similar proportions of uninsured people, but intact housing.

In the Housing and Health issue of their 2003 *Advocates' Guide To Housing and Community Development Policy*, The National Low Income Housing Coalition reports on the findings of a 2001 study of families on the voucher waiting list in Boston, where participant families were exposed to significantly higher levels of health hazards in their current housing in comparison to those in the general population. In a similar vein, a study of infant mortality and low-income mothers in Philadelphia found that housing stability is a statistically significant factor in determining whether children lived past one year, and that the influence of housing stability was found to be more important, in fact, than the mother's health and social behaviors in determining birth outcomes. Doubling up in someone else's home, or moving two or more times while pregnant, made women twice as likely to lose a child to death before one year of age than women who were stably housed.

But how do we really know that housing and neighborhood are truly to blame and not the attributes of the families themselves? In an effort to answer this question, for the past 10 years, HUD has been conducting an experiment designed to test the long-term effects on adult and child well-being when families move from public or project-based assisted housing in very poor areas to private-market rental housing in areas with much lower poverty rates. Section 152 of the 1992 Housing and Community Development Act authorized this experiment, known as the Moving to Opportunity demonstration (MTO). The Act provided funding for tenant-based rental assistance and supportive counsel-

ing services to test and evaluate the effectiveness of metropolitan area-wide efforts to increase housing mobility. HUD's Offices of Policy Development and Research, Fair Housing and Equal Opportunity, and Public and Indian Housing jointly administer MTO.

The MTO program grew in part out of research on the Chicago Gautreaux Program, which was established in the late 1970s as part of a court-imposed public housing desegregation remedy. African American families, who were residents of public housing, or eligible to move into public housing, received Section 8 certificates that had to be used to move to predominantly white or racially mixed neighborhoods. Participants also received screening, counseling, and home referral services. Professor James Rosenbaum of Northwestern University found that adults in the Gautreaux program who moved to suburban communities experienced notable improvements in employment experience, and that the prospects for children who moved improved dramatically. Although the causal link between the new residential locations and the improvements was not certain, the findings sparked significant interest among housing advocates and policy makers. In March of 1994, five sites were selected for participation in MTO: Baltimore, Boston, Chicago, Los Angeles, and New York. Public housing authorities (PHAs) and non-profit and local organizations implemented MTO between 1994 and 1999. Among those who applied for the program between June 1994 and July 1998, 4,608 families were found to be eligible. Of those, 3,169 families were offered vouchers, and 1,676 were able to find a unit and successfully move.

The experimental design randomly assigned each family to one of three groups:

- **The experimental group**—offered housing vouchers that could only be used in low-poverty neighborhoods (less than 10 percent of the population was poor).
- **The Section 8 group**—offered vouchers in accordance with the regular rules and services of the Section 8 program at that time, with no geographical restriction and no special assistance.
- **Control group**—not offered vouchers, but continued to live in public housing or received other project-based housing assistance.

The study is longitudinal in that it follows families over a period of 10 years, collecting data on various aspects of

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What happens when housing industry leaders put their heads together to come up with a design for the ideal home of the future? A select audience of housing industry and policy officials got a sneak peek at the answer this past June, when the Industry Steering Committee of the Partnership for Advancing Technology in Housing (PATH) — the public-private partnership for housing innovation administered by HUD's Office of Policy Development and Research — unveiled the first architectural model of the PATH Concept Home in Washington, D.C. The model was made possible by the generous support and sponsorship of Dupont and the Portland Cement Association.

With a keen awareness of the risks involved in predicting what almost anything might look like in years to come, PATH and its partners have turned a well-polished lens upon the horizon, and come up with something that just might stand up to the passage of time. The Concept Home demonstrates advanced technologies and building practices that hold enormous potential for



The first architectural model of the PATH Concept Home.

improving the American home. The project is quite ambitious, in that it proposes changes in the home-building industry that would make home design and construction more efficient, predictable, and controllable, with a median cycle time of 20 working days from groundbreaking to occupancy. These methods will result in cost savings that will make homeownership available to an estimated 90 percent of the population by 2010.

"Working with builders and manufacturers, we will over the next year develop detailed plans and specifications for this home and, in the not too distant future, work with the housing industry to build this home," said Darlene Williams, HUD General Deputy Assistant Secretary, who addressed a crowd of builders, manufacturers, congressional staffers, and various housing industry professionals at a private reception in Union Station. "The future is exciting, and we invite you all to join us as we work to improve the affordability, durability, and quality of tomorrow's homes."

The Concept Home is an outgrowth of PATH's *Technology Roadmap: Whole House and Building Process Redesign*, and the *Technology Scanning* report. Modern homes are currently built to be inflexible, with systems tangled behind interior walls and embedded in structural elements. But the home of the future will combine functions that make better use of labor, materials, time, and money, consequently reducing installation time and cost.

The Concept Home represents one vision for the future of housing, with an emphasis on flexibility of systems to meet the specific needs of the homeowner. Innovations in the Concept Home include flexible interior walls that can accommodate family changes, customizable designs that will give the home the quality and curb appeal of a custom-built house without the high cost, and improved production methods that will speed construction and improve durability.

Roger Glunt of Glunt Development Company and past chair of the PATH Industry Steering Committee served as the evening's host. Other speakers included architect Chris French of Torti Gallas and Partners, Inc., the architectural firm that designed the Concept Home model; Bill Asdal of Asdal Builders, a member of the Industry Steering Committee; and Roger Lewis, architect and author of *The Washington Post* column "Shaping the City," who noted the growing demand for — and shrinking supply of — affordable housing.

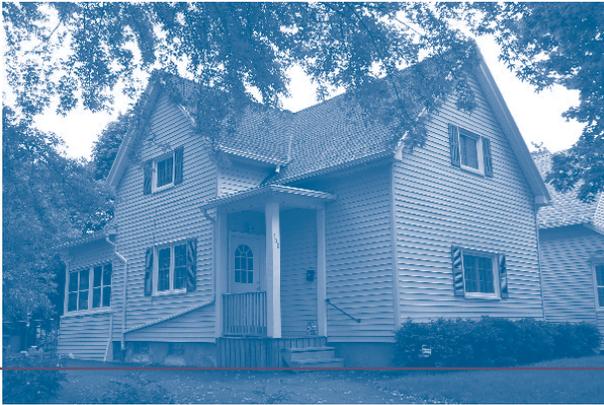
"The homes in the model and graphics are intentionally traditional in nature," said Chris French, a key contributor to the Concept Home design. "The breakthroughs that PATH demonstrates here transcend style. Our goal is to show that these concepts can be applied to all types of housing to foster diversity and community."

As the Concept Home exhibit explains, the utilities — electrical, plumbing, HVAC, and communications — are

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Rochester and Syracuse LEAP Towards Lead Safe Housing

A working class family manages to earn just enough money to pay the mortgage on their home, a modest older house in a lower income, urban neighborhood. And while the neighborhood outside their door may have its share of troubles, who would have thought that the greatest risks to the family's health and well-being would lie within the walls of their home? This scenario describes the plight of city residents living in Rochester and Syracuse, NY; particularly those in older, lower income neighborhoods where many of the houses have a rate of lead poisoning four times greater than the national rate of 2.2 percent. As a result, children in those neighborhoods show a higher incidence of childhood lead poisoning, a serious health condition likely to have a debilitating effect on a child's



A Syracuse home-based child care house after rehabilitation.

development. Although both cities already had lead hazard control programs in place, before last year, none of those existing programs dealt with the unique situation of home-based child care. Fortunately, the dedicated staff at the National Center for Healthy Homes (NCHH), a Maryland-based nonprofit organization that focuses on improving the quality and safety of indoor housing, knew what needed to be done and already had a plan in place.

Thanks to funding from HUD's Office of Lead Hazard Control, NCHH is proceeding with plans to rehabilitate, educate, and stimulate private sector contributions to help children grow up in homes that are free from lead paint hazards. Although lead-based paint was outlawed in 1978, HUD estimates that there are currently more than 24 million dwelling units with lead hazards across the country. NCHH's two-year, \$931,000 Lead Elimination Action Program (LEAP) grant funds the Home-Based Child Care Lead Safety Program. The program strives to create a healthy and safe environment for children, and to minimize the risks of unintentional injury and lead

poisoning, while improving energy efficiency and indoor air quality.

In many low-income neighborhoods like those in Rochester and Syracuse, the most common type of child care is home-based child care, where caregivers are trained and licensed by the state to care for a limited number of children in their own homes. The low-income status of many of these providers often precludes them from participating in conventional home repair programs. As a result, these homes are often at risk for conditions such as lead-based paint, and are often in need of safety-related repairs. "Finding affordable, quality child care is hard enough without worrying about whether your child will be exposed to lead poisoning when you drop them off every morning on the way to work," observes Rebecca Morley, Director of NCHH.



*Rebecca Morley,
Director of NCHH*

NCHH and their national non-profit partner, the Enterprise Foundation, joined with four community-based nonprofit organizations in Rochester and Syracuse for the pilot Home-Based Child Care Lead Safety Program. Twenty-five home-based child care facilities were selected for rehabilitation.

Once a home-based child care provider is selected, the house undergoes a two-step inspection process. First, examiners perform a visual overview of the site to get a better sense of how much funding will be needed for the home's rehabilitation. Second, certified professionals perform a formal lead risk assessment inspection, and private contractors are hired to perform the lead hazard control work within 14 days. Other rehabilitation work is usually completed within 60 days.

Lead hazard control measures can include window replacement, paint stabilization, the creation of smooth and cleanable surfaces, treatment of friction and impact surfaces, and specialized cleaning. In addition to lead hazard control, the program uses other funds to make such safety-related home improvements as installing hard-wired smoke detectors; upgrading electrical systems; remediating trip hazards; fixing stairs, handrails, and improperly spaced spindles; placing/replacing fire extinguishers; upgrading heating systems; fencing child play areas; and also any necessary roofing or siding repairs.

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below \$30,000 are twice as likely as others to have lead hazards in their homes. Low-income children are eight times as likely to be lead poisoned as high-income children, and African-American children face five times the risk that white, non-Hispanic children experience. Even low-level lead poisoning affects a young child's developing brain and nervous system, causing reductions in IQ and attention span, learning disabilities, hyperactivity, aggressive behavior, hearing loss, and coordination problems. High-level lead exposures can cause comas, convulsions, and even death.

NLIHC also reports that an estimated 40 percent of asthma diagnoses in children under 16 years of age are associated with residential exposures where triggers such as dust, mold, pests (roaches, rats, mice), household pets, cold air, and dry heat are often present. Asthma is the most common long-term childhood disease in the United States, affecting 4.8 million children, and is one of the leading causes of school absenteeism, accounting for more than 10 million missed school days each year. Asthma hospitalizations and deaths for minority and low-income children are significantly higher than for the general population.

The problems associated with indoor environmental hazards are evident, but what about the solutions? In particular, what are federal agencies doing about it? In April 1997, Executive Order (E.O.) 13045 established The President's Task Force on Environmental Health Risks and Safety Risks to Children. The Task Force is co-chaired by the Secretary of the Department of Health and Human Services (HHS) and the Administrator of the Environmental Protection Agency (EPA). The E.O. directed each federal agency to make it a high priority to identify, assess, and address children's environmental health and safety risks. The Task Force initially identified four priority areas for immediate attention: asthma, unintentional injuries, developmental disorders (including lead poisoning), and cancer. Since then, the Task Force has added environmental health in schools, the National Children's Study, and Children's Health Month to its interagency activities.

As a part of The Residential Lead-Based Paint Hazard Reduction Act of 1992, the Office of Healthy Homes and Lead Hazard Control was established by HUD to bring health and housing professionals together in a concerted effort to eliminate lead-based paint hazards in America's privately-owned and low-income housing. One of the great achievements of this office is the "Lead Safe Housing Rule", which was published in the Federal

Register in September 1999. The new regulation puts all of the Department's lead-based paint regulations in one part of the Code of Federal Regulations, making it much easier to find HUD policy on the subject. The regulation sets hazard reduction requirements that place greater emphasis on reducing lead in house dust. As a result, federally assisted housing now includes modern, more effective and scientifically proven hazard identification and control methods to help ensure children's safety.

This regulation brings lead hazard control procedures into routine housing finance, maintenance, and rehab systems, a major change from the way the problem was approached in the past. The focus now is on prevention: taking action long *before* a child is exposed. HUD's procedures for federally assisted housing provide a template for promoting lead safety in other housing with lead paint hazards. HUD is building the capacity to implement lead-safe work practices among painters, remodelers, renovators, and maintenance personnel, many of whom often work in both assisted and non-assisted housing.

As efforts to eliminate lead hazards under the Lead-Based Paint Hazard Control Program proved successful, attention turned to addressing other household hazards. As a result, Congress established HUD's Healthy Homes Initiative (HHI) in 1999 to "...develop and implement a program of research and demonstration projects that would address multiple housing-related problems affecting the health of children."

Since the 1980s, EPA and its federal partners have phased out lead in gasoline, reduced lead in drinking water, reduced lead in industrial air pollution, and banned or limited lead used in consumer products, including residential paint. States and municipalities have set up programs to identify and treat lead poisoned children and to rehabilitate deteriorated housing. Parents, too, have greatly helped to reduce lead exposures to their children by cleaning and maintaining their homes, having their children's blood lead levels checked, and promoting proper nutrition.

HUD is committed to eliminating childhood lead poisoning by 2010. HUD's 10-year strategy to eliminate childhood lead paint poisoning, which was published by the President's Task Force, marked the first time that all three agencies (HUD, EPA, and the CDC) have worked together in a coordinated effort to address the hidden dangers posed by lead and other common household contaminants.

Is *Where We Live* More Important Than *How*? cont. from page 2

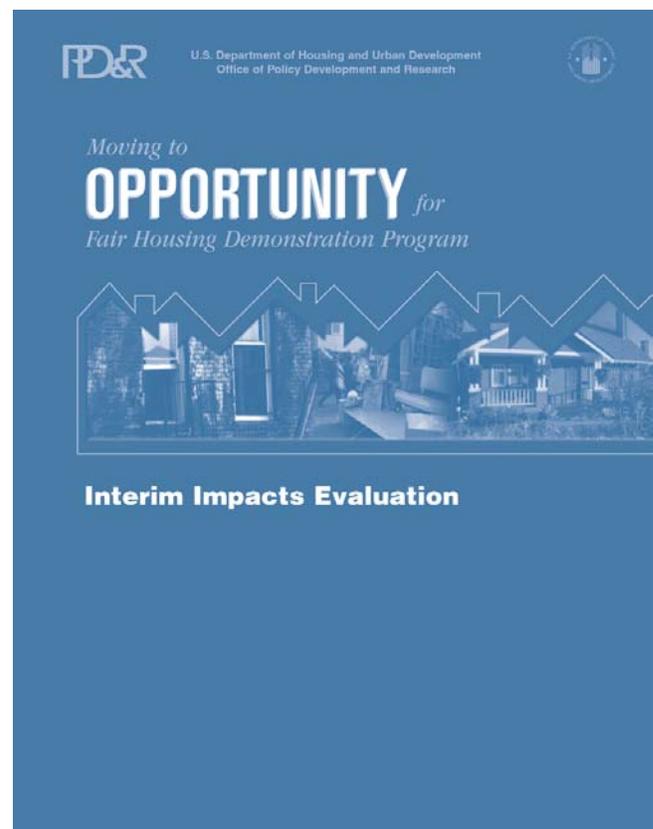
the adults' and childrens' lives, and comparing the experiences of each group to that of the control group. The current interim findings assess the program at about the midpoint of the 10-year research period. A final impact evaluation will be conducted approximately a decade after the end of program operations. The interim evaluation assessed MTO's effects in six study domains:

- Mobility, housing, and neighborhood;
- Adult and child physical and mental health;
- Child educational achievement;
- Youth delinquency and risky behavior;
- Adult and youth employment and earnings; and
- Household income and receipt of public assistance.

The findings suggest that MTO has substantial positive effects on the mobility of families in the treatment groups and on the characteristics of the housing and residential environment in which they lived. Adults in the experimental group experienced a large reduction in the incidence of obesity and a reduction in psychological distress (but not for the Section 8 Group). The number of adults working more than doubled for both the treatment and control group members. Research also shows that the AFDC/TANF receipt rates have fallen by half across the entire sample. However, participation in MTO did not affect incomes in either of the treatment groups.

Girls in the experimental group experienced a substantial decrease in psychological distress. Girls in the Section 8 group experienced a substantial decrease in the incidence of depression and girls in both treatment groups experienced reductions in the incidence of generalized anxiety disorder. Participation in MTO resulted in a large reduction in the proportion of girls age 15–19 in the Section 8 group who had ever been arrested for violent crimes. There were no effects on the incidence of arrests for other crimes for girls. Girls age 15–19 in the experimental group, but not in the Section 8 group, experienced reductions in risky behavior but boys this age in both groups had significant increase in smoking (one type of risky behavior). Boys experienced very substantial increases in the proportion ever arrested and the frequency of arrests for property crimes in the experimental group. However, this increase may be attributable to more stringent policing.

While not representative of public housing nationwide, the conditions of distress and concentrated poverty where the families were living when they joined MTO were not uncommon in big city public housing across the country. By offering tenant-based subsidies (vouchers) to such families, MTO provides a test of what difference it might make to switch very low-income families from place-based to mobile subsidies. At the present time, these are the major forms of low-income rental assistance with about 1.1 million families and individuals living in public housing, 1.5 million households in privately owned assisted projects, and 1.8 million households using vouchers. However, many households receiving vouchers are confronted by an array of barriers — market conditions, discrimination, lack of information and/or transportation among others — that force them to rent housing in neighborhoods of intense poverty. This is why the counseling aspect of MTO is so critical. If the long-term results of MTO research show significant improvements in the well-being and life changes of experimental group members, it is reasonable to assume that, when administered in tandem with mobility counseling, housing vouchers can provide access to meaningful opportunities for poor families.



A PATH to the Future Concept Home Promotes Flexibility, Affordability *cont. from page 2*

tangled together and buried behind finished interior walls in the typical American home; a fact that makes home upgrades both difficult and costly. A better approach is to separate the three major home systems: the structure, the utilities, and the floorplan.

Disentangling the systems opens up new possibilities for the floorplan, and for the maintenance and upgrading of utilities. The Concept Home is designed to make it easy to move walls and to access utilities, which might be located in chases, raceways, and between ceilings and floors. While the structure is built for long-term durability, utilities and interior walls are configured to allow for the inevitable changes in the lives of all homeowners, especially as we try to keep up with advances in technology.

The Concept Home also champions the idea of standardized measurements for building components, as well as increased use of factory-built components, which offer greater precision and improved quality control. These advances would make building easier, faster, and more efficient. Homebuyers would enjoy a

bigger selection of home products at lower cost, and more moderate home prices overall, while everyone would benefit from less construction waste clogging landfills. Making the PATH Concept Home a reality will require a team of willing industry partners committed to collaborative problem solving and investment in the future, and a home buying public who sees the enormous promise of better homes and better communities... and demands that they be built.

Several PATH partners sponsored the reception, including NUCONSTEEL, CertainTeed Corporation, the North American Insulation Manufacturers Association (NAIMA), and SEISCO/Microtherm, Inc. All sponsoring partners complemented the Concept Home model with their own educational technology displays, which were available for viewing in the reception hall.

The Concept Home model went on display at the U.S. Department of Housing and Urban Development in June and will be displayed at several other venues throughout the year. To learn more about the Concept Home, visit www.pathnet.org.

Rochester and Syracuse LEAP Towards Lead Safe Housing cont. from page 4

A prospective participant's home-based child care business and family lifestyle are taken into careful account. Each family is given the option to be moved into a fully furnished, temporary placement house in either city for the duration of their home's lead hazard control repairs, where they are able to continue offering child care.

Residents may also take advantage of complimentary storage for their home furnishings while the work is being performed. When they return to their home, they find improvements beyond those related to lead safety concerns, which they might not have otherwise been able to afford. Ms. Morley explains that "Few cities have dealt with lead problems in properties where home-based day care is provided. Fewer still have come up with temporary housing for those whose properties are being worked on." Each family presents new challenges. "This is unique," said Morley.

NCHH believes that education advances the goal of primary lead prevention, and so incorporates education practices into the program's primary goals. National safety experts educate providers, parents, and housing advocates on the details of lead and non-lead home safety. Child care providers are given one-on-one instruction on the effects of lead poisoning and daily

maintenance techniques that can reduce lead and other environmental hazards. Parents are also educated and then asked to provide consent to have their children tested for lead poisoning in order to protect both children and providers.

Funding is largely sourced from HUD's LEAP grant. However, Syracuse pools rehabilitation funds from other public sources, such as HUD CDBG and HOME grants, and both cities use New York State Affordable Housing Corporation funding. At the end of the two-year LEAP grant period, the relocation houses will be sold to a pool of daycare providers currently renting to own.

As a direct result of the Home-Based Child Care Lead Safety Program, NCHH has begun to raise national awareness on the importance of lead safety, and has fostered working relationships with home-based child care providers and other organizations in the at-risk communities. It is estimated that by May 2005, the program will have improved the quality of more than 150 children's lives through the mitigation of lead and safety hazards. NCHH is using the results of this demonstration program to develop a template that can be replicated at the national level.

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

- We'll look at some of the latest technological and design innovations in the manufactured housing industry, as well as some promising trends in the use of factory-built homes in affordable housing development. This article will also examine the role of new technologies in helping the industry address and incorporate many of the aesthetic, energy efficiency, and value standards associated with traditional site-built housing. It's no secret that manufactured housing has faced lean times in recent years; our investigation will explore some of the ways the industry is fighting back.
- A review of the recently published PD&R publication, *A Community Guide To Basic And Cost-Saving Construction in the American Southwest*, will describe the long-term cost benefits of energy-efficient home construction and rehabilitation in the rural Southwest.
- In recent years, a new emphasis on design excellence in affordable housing has yielded encouraging alternatives that are changing the way that local residents view this vital community resource. This article will highlight an exhibit currently installed at the National Building Museum in Washington, D.C. that illustrates 18 projects from across the nation. A variety of urban and rural settings serve as the backdrop to well-designed developments that are offering new opportunities for the least wealthy Americans, while creating real value for their surrounding communities.
- Manufactured housing today bears little resemblance to the factory-built predecessors of years past, and is often almost indistinguishable from its site-built neighbors. The growing scarcity of affordable housing throughout America has led many families to reconsider manufactured housing as both an affordable and attractive home-ownership alternative. This article will explore the history of the manufactured housing industry, examine the current state of the industry, and evaluate the pros and cons of today's factory-built homes.

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