



A Resource of the State of Florida

## Hurricane Loss Reduction

FOR

Residences and Mobile Homes  
in Florida

A Research Project Funded by  
The State of Florida Department of Community Affairs  
Through Contract 01-RC-11-13-00-22-004

PRELIMINARY REPORT ON  
THE FEASIBILITY FOR A  
**MOBILE HOME RECYCLING PROGRAM IN FLORIDA**

DELIVERABLE #6  
DUE BY MAY 1, 2001

PREPARED BY  
THE INTERNATIONAL HURRICANE CENTER  
FLORIDA INTERNATIONAL UNIVERSITY

## PURPOSE

This report provides preliminary findings regarding the feasibility for a Mobile Home Recycling Program in Florida, under one of five research tracks included within a research project titled “Hurricane Loss Reduction for Residences and Mobile Homes in Florida”

The scope of work for the specific research track is as follows:

*Mobile Home Recycling Program: Research will focus on the parameters of recycling programs implemented in other states, including both the technical and regulatory issues involved. The Contractor will coordinate with the Department of Environmental Protection to investigate the feasibility of creating a similar program in the State of Florida. The issues that will be addressed by this research include:*

- (a) *The incentives needed to make a recycling program work in the State of Florida;*
- (b) *Does the existing regulatory environment in Florida facilitate the administration of such a program in the state; and*
- (c) *Would such a program be feasible across the board or will there be significant impediments for mobile home residents at the lower end of the socio-economic spectrum?*

Early in the development of said research track the International Hurricane Center (IHC) research team concluded it was necessary to place the mobile home recycling program within the context of the need for such a program in Florida, before focusing on the parameters of recycling programs in other states.

Toward that end the IHC posed the following question:

*What role, if any, can a mobile home recycling program have in pursuing the objective of hurricane loss reduction?*

The answer to the above question hinges, to a large extent, on the benefits that would accrue to the various stakeholders with an investment in the issue of hurricane loss reduction. These stakeholders include:

- (a) Federal, state and local agencies with responsibility for housing programs;
- (b) Owners and residents of mobile homes;

- (c) Manufacturers of mobile homes;
- (d) Federal, state and local agencies with responsibility for emergency management, hazard mitigation or disaster recovery, and
- (e) Insurance companies

Benefits to these stakeholders are predicated on the thesis that such a recycling program could be one of several factors that would contribute to an upgrading of the mobile home stock, by a process of facilitating the replacement of older units with those that meet the 1994 HUD design and manufacturing standards.

From this foundation the IHC research team has looked at recycling programs implemented or under consideration in other states including: Michigan, Montana, North Carolina, Vermont and Wisconsin.

Analysis of such programs in other states was helpful in identifying the main technical and regulatory parameters that must be taken into account when considering a similar recycling program here in Florida.

More importantly however, this review of programs in other states has resulted in some preliminary findings that should assist in defining the context for considering a mobile home recycling program in Florida. These preliminary findings include:

- (a) Without exception the programs the IHC research team looked at in other states are limited in scope and magnitude, with some best described as pilot programs;
- (b) With the exception of North Carolina, where a limited experimental program is under consideration, none of the other programs are in states that share the same hurricane vulnerability that is present in Florida;
- (c) The focus of all these programs is the actual recycling of materials, but not the potential for contributing to loss reduction;
- (d) The magnitude of these programs, in terms of the numbers of units or tonnage involved, is minuscule when compared to the numbers that would be involved here in Florida.

This report has been completed with contributions by the following members of the IHC Research team: Nicole Dash (IHC), Ricardo A. Alvarez (IHC) and Janaina Monteiro (IHC).

This report has been prepared in compliance with the deliverable requirements of DCA Contract Number 01-RC-11-13-00-22-004 executed September 8, 2000 and modified through Amendment #1 executed January 18, 2001. This report specifically complies with Deliverable #6 of said contract, due by May 1, 2001, which reads as follows:

*By May 1, 2001, the Contractor shall submit both in hard-copy and electronic format a preliminary Report on the Feasibility for a Mobile Home Recycling Program in Florida. The report shall include the identification and analysis of economic and regulatory incentives that would increase the chances of developing a successful recycling program for mobile home residents in the State of Florida.*

## A WORK IN PROGRESS

As required this is a preliminary report. Key regulatory and technical factors have been identified already. Based on preliminary findings from the review of programs in other states the IHC research team has reached an initial conclusion, as follows: *the scope of the problem in Florida is vastly different than that in other states. In Florida the issue of hurricane vulnerability, the objective of hurricane loss reduction, and the magnitude of the problem based on the sheer volume of units, distances for transportation etc. can best be addressed through a comprehensive statewide program instead of the limited-scope programs implemented in other states.*

Although regulatory and technical factors have been identified during the short time frame of this study, no consideration has yet been given to the role such factors may play as incentives for the development of a recycling program in Florida. Also, it would be premature to analyze potential economic incentives for the development of a recycling program in Florida, without first designing a model program and without defining the criteria for implementing such a program.

The IHC research team will gain additional knowledge regarding the potential for acceptability of a recycling program by residents of mobile homes in Florida, from the person-to-person and the telephone surveys being conducted throughout the state. This knowledge will be critical when exploring the feasibility of implementing a statewide program that would require policy-making decisions by

the state legislature and the various agencies that may have jurisdiction over such a program.

Due to the time constraints already mentioned, the design of a model program and the definition of criteria, and the testing of these for statewide acceptability would need to take place during the second year of this research project. More importantly, the issue of how such a program would be financed, and the identification of policy alternatives for the implementation of the same, will require additional research and analysis to be completed during the second year of this project.

## **Mobile Home Recycling Program**

### **The Issue**

According to the 1990 Census (Census 2000 figures for housing units have yet to be released), a little more than 13% of all housing units in the State of Florida are mobile homes. In absolute figures, this amounts to over 800,000 housing units in a state where no county escapes the hurricane hazard. Only a handful of states have attempted to address the issue of older mobile homes and how to dispose of them ecologically. We have found no state that has approached the issue comprehensively through not only a program that promotes recycling, but at the same time, addresses the housing issue for these homeowners.

While regulatory structures are now in place that result in more wind resistant manufactured housing, this was not always the case. As a result, it is important to keep in mind that as mobile home building standards have changed, generations of mobile homes have been left behind with less stringent standards. The goal of this research endeavor is to assess whether a program can be developed in Florida to more effectively cycle these older more vulnerable homes out of circulation while replacing them with safer later generation mobile homes.

As a framework for this research track, it is important to understand the regulatory environment, and the historical changes to this environment that has resulted in three distinctive mobile home generations. To most effectively do this, the following section quotes from IHC Deliverable #2, *Report on the Regulatory Environment for Mobile Homes*.

### Regulatory Environment

Relatively speaking, mobile homes are a recent phenomenon. The first commercial generation appeared in the 1950s and was truly mobile (on wheels and towed behind a vehicle, a “trailer,” which also explains the origin of their being defined as vehicles). During this period their construction was unregulated.

In the early 1970s, uneven quality control led to a series of well-publicized scandals over mobile home safety, including fire hazard, and the problems led to political pressure for government regulation of the mobile home industry. A preeminent federal regulatory role was justified under the constitutional

“interstate commerce” clause (mobile homes were manufactured in one place but then marketed, transported, and installed across state lines).

The second mobile home generation therefore dates from 1976, when the federal Department of Housing and Urban Development (HUD) promulgated the first construction standards for mobile homes. The legal basis was and remains *The National Manufactured Housing Construction and Safety Standards Act of 1974*, 42 U.S.C. 5401 et seq.; 24 CFR Part 3280 and Part 3282. Congressional intent was explained as follows:

*The Congress declares that the purposes of this chapter are to reduce the number of personal injuries and deaths and the amount of insurance costs and property damage resulting from manufactured home accidents and to improve the quality and durability of manufactured homes. Therefore, the Congress determines that it is necessary to establish Federal construction and safety standards for manufactured homes and to authorize manufactured home safety research and development.*

The third mobile home generation dates from 1994 and was inspired by the losses inflicted in south Florida by 1992’s Hurricane Andrew. Thousands of mobile homes were destroyed or severely damaged in that disaster. HUD mobile home construction regulations, especially for wind, were strengthened after Hurricane Andrew and took effect July 13, 1994.

As noted above, the HUD regulations are contained in the *Code of Federal Regulations* (CFR). More specifically, 24 CFR 3280 contains the “Manufactured Home Construction and Safety Standards,” and 24 CFR 3282 contains “Manufactured Home Procedural and Enforcement Regulations.” It should also be noted that HUD provides a document entitled “Permanent Foundations Guide for Manufactured Housing” (Washington, DC: Department of Housing and Urban Development, September 1986).

The original definition of a mobile home (manufactured housing) was as follows:

*A structure, transportable in one or more sections, which, in the traveling mode, is eight body feet or more in width or forty body feet or more in length, or, when erected on site, is three hundred twenty or more square feet, and which is built on a permanent chassis and*

*designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air-conditioning, and electrical systems contained therein; except that such term shall include any structure which meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the Secretary and complies with the standards established under this chapter.*

In one of its latest fact sheets HUD defines and explains manufactured homes as:

*Dwelling units of at least 350 square feet in size with a permanent chassis to assure the initial and continued transportability of the home. All transportable sections of manufactured homes built in the U.S. after July 15, 1976, must contain a red label. The red label is the manufacturer's certification that the home section is built in accordance with HUD's construction and safety standards. HUD standards cover Body and Frame Requirements, Thermal Protection, Plumbing, Electrical, Fire Safety and other aspects of the home.*

In terms of the “box” (body and frame), the key is subsection 305, “Structural Design Requirements,” of 24 CFR Part 3280. The general statement is as follows:

*Each manufactured home shall be designed and constructed as a completely integrated structure capable of sustaining the design load requirements of this standard, and shall be capable of transmitting these loads to stabilizing devices without exceeding the allowable stresses or deflections. Roof framing shall be securely fastened to wall framing, walls to floor structure, and floor structure to chassis to assure and maintain continuity between the floor and chassis, so as to resist wind overturning, uplift, and sliding as imposed by design loads in this part.*

Subsection 305 then goes on to detail wind zones and corresponding wind load design requirements:

--(1) *Wind loads: design requirements.* (i) *Standard wind loads (Zone I).* When a manufactured home is not designed to resist the wind loads for high wind areas (Zone II or Zone III) specified in paragraph c)(I)(ii) of this section, the manufactured home and each of its wind resisting parts and portions shall be designed for horizontal wind loads of not less than 15 psf and net uplift of not less than 9 psf.

(ii) *Wind loads for high wind areas (Zone II and Zone III),* the manufactured home, each of its wind resisting parts (including, but not limited to, shear walls, diaphragms, ridge beams, and their fastenings and anchoring systems), and its components and cladding materials (including, but not limited to, roof trusses, wall studs, exterior sheathing, roofing and siding materials, exterior glazing, and their connections and fasteners) shall be designed by a Professional Engineer or Architect to resist: (A) The design wind loads for Exposure C specified in ANSI/ASCE 7-88, 'Minimum Design Loads for Buildings and Other Structures,' for a fifty-year recurrence interval, and a design wind speed of 100 mph, as specified for Wind Zone II, or 110 mph, as specified for Wind Zone III (Basic Wind Zone Map); or (B) The wind pressures specified in the Table of Design Wind Pressures....

The succeeding subsection 306, "Windstorm Protection," shifts the focus from the box to "support and anchoring systems" and details the requirements for Wind Zones I, II, and III. Questions subsequently arose over roof sheathing and testing for mobile homes to be sited in Wind Zones II and III. As a result, HUD issued (effective May 12, 1998) *Manufactured Home Construction and Safety Standards: Metal Roofing; Interpretative Bulletin I-2-98.*

In Florida Wind Zones are as follows:

Zone III Broward, Charlotte, Collier, Dade, Franklin, Gulf, Hendry, Lee, Martin, Manatee, Monroe, Palm Beach, Pinellas and Sarasota

Zone II All other counties in Florida

Clearly, the issue of when a mobile home was manufactured (its "era") and where it will be sited are relevant to all areas with a hurricane risk, but it is crucial to Florida because of the large numbers of mobile homes in the state.

Attrition might be expected to move the pre-94 mobile homes out of the building stock, but mobile home attrition appears to be quite low. The result is that pre-94s and even pre-76s will remain a significant part of the building stock for the foreseeable future.

### Mobile Homes in Florida

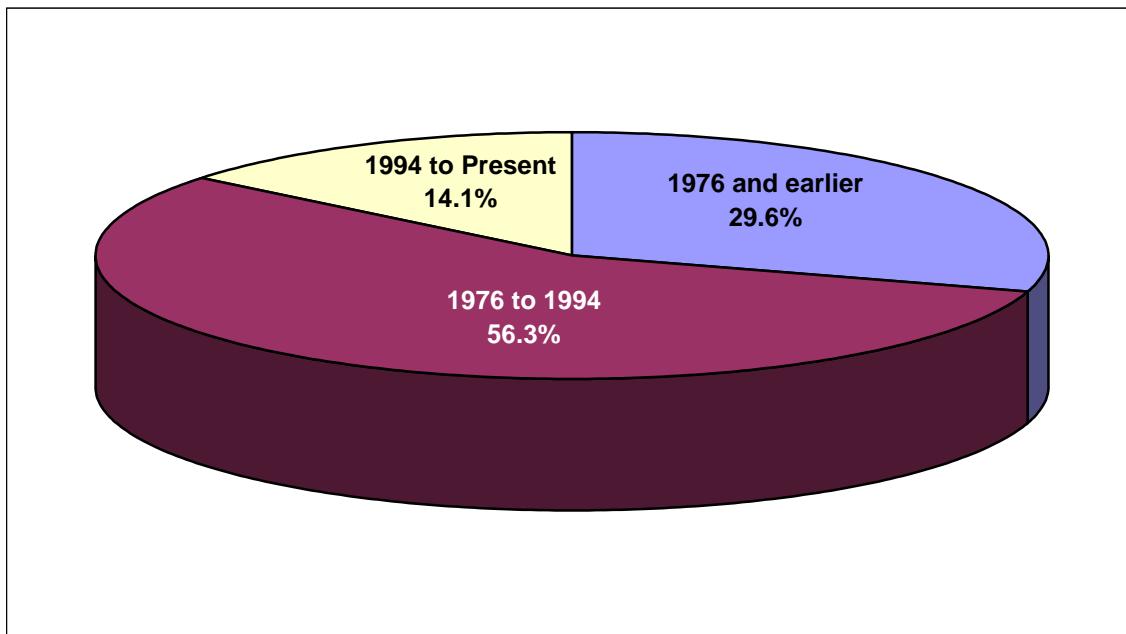
In fact analysis of Department of Motor Vehicle data for mobile home registrations indicates that the majority of mobile homes in Florida were constructed before the more stringent 1994 standards. Before we address the particulars of the analysis it is important to discuss a limitation of this preliminary analysis.

Mobile homes are legally considered to be vehicles. In Florida, a mobile home is a motor vehicle and requires a certificate of title just as your car or truck does. An increasing number of mobile homes are two sections ("double-wides"). Each section requires its own title. Because each section requires its own title, those living in double-wides or triple-wides will be listed in the database two or three times. Therefore, these figures represent how many sections of mobile homes are in the State of Florida. We believe it is safe to assume that the majority, if not all, of the pre-1976 mobile homes are single-wide units, whereas the majority of the post-1994 units are double-wide. As a result, this analysis will tend to underestimate the proportion housing units built before 1976. Limitations, then, exist when trying to correlate these figures with number of housing units.

Additional problems exist when trying to aggregate the data by generation as discussed above. The data includes the year the section of mobile home was manufactured. However it does not include what month. Initial HUD regulations went into effect June 15, 1976. As a result, there is no way to know whether all mobile homes built in 1976 were built to the new standards. Likewise, the major changes in wind resistance occurred mid-year in July 1994. Because there is no definitive way to determine during what part of the year a section was manufactured, the following break-down is being used: Generation 1: any mobile home built in 1975 and earlier, plus half of the mobile homes manufactured in 1976; Generation 2: half of the mobile homes built in 1976, all mobile home built between 1977 and 1993, and half of the mobile homes built in 1994; and Generation 3: half of the mobile homes manufactured in 1994 and any mobile home manufactured since 1995. For the final report, we are hoping to get a better estimate of the two critical years of 1976 and 1994.

Despite these limitations, the DMV data analysis is an invaluable tool in understanding the composition of the mobile home stock in Florida. Using the above-discussed breakdowns, close to 339,000 Generation 1 mobile homes were registered in the State of Florida during 2001 with about another 643,000 Generation 2 mobile home sections registered during the same period. Combined, close 982,000 mobile home sections without adequate wind standards are currently positioned throughout the State of Florida. See Figure 1 for a graphical representation of the proportional distribution for the three generations.

Figure 1: Proportion of Mobile Homes by Generation



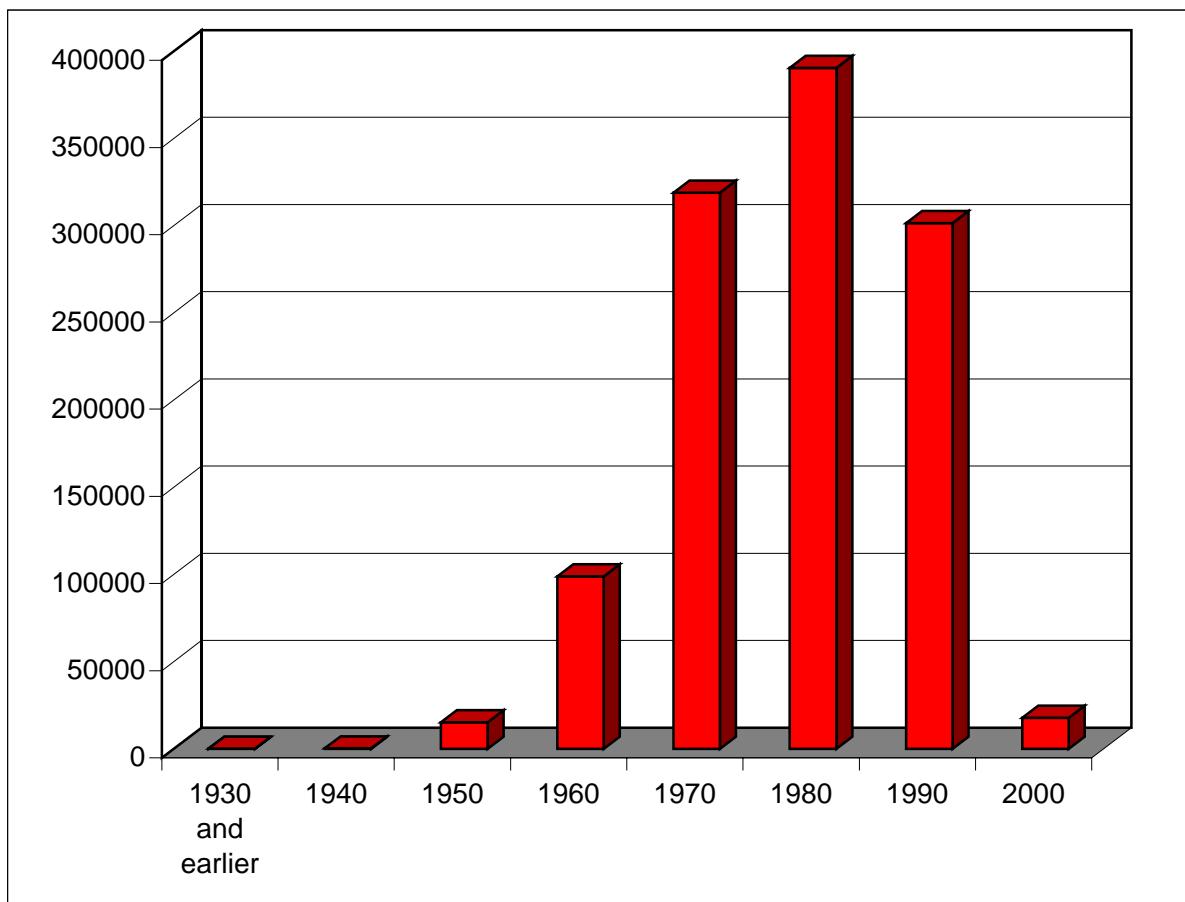
As Figure 1 indicates, only 14.1% of mobile home sections in Florida have been built to the strictest wind standards. As a result, the mobile home population in Florida is particularly vulnerable to hurricane damage.

To get a more detailed look at mobile home ages in Florida the data has also been analyzed by decade of manufacture. This helps us understand the rate of mobile home sales in Florida over time as it stands today. While there has clearly been some attrition of old mobile homes, it is remarkable to see that many older units are still being used as viable structures.

Today, close to 319,000 units manufactured during the 1970's still are registered with the Department of Motor Vehicles. Another 114,000 from the 1960's and earlier are still being used in the State of Florida. Figure 2 represents this decadal analysis. While the information does not correlate perfectly with the changing standards, it shows a more detailed distribution of the mobile home stock in Florida.

Over 1.14 million mobile home units are distributed throughout the state. With the largest population centers being coastal counties, it is safe to say that the majority of these units are at the greatest risk of hurricane effects. With the average age of the mobile home stock 19 years old, it is increasingly important to address how we can speed a long the slow process of attrition.

Figure 2: Mobile Home Age by Decade



## **The Program**

### Goals

A possible solution to the problem of an aging mobile home stock is to develop a program that would cycle older units out of circulation replacing them with newer safer units that are built to the highest wind standards. Such a program would need to address two very distinct issues. The first issue is to find an ecologically sound and cost-effective method of disposal. The second is to develop a program that would assist homeowners in replacing their older units with post-1994 safer units. Neither issue is an easy one to address.

With the average weight of a mobile home unit close to eight tons (see <http://www.anr.state.vt.us/reflect/nov6.htm>), the sheer volume of potential waste material is overwhelming. Taking a conservative approach by considering only those units in Generation 1, the potential is for 2.7 million tons of materials from the disposal of these units.

If we consider the addition of Generation 2 mobile homes, the amount of potential waste material increases exponentially to almost 8 million tons of materials. Clearly, any discussion of making mobile homes safer by replacing the most vulnerable units must include a plan to deal with the by-product of this policy. A program then needs to be developed to encourage not only this replacement, but also a method of disposal that will limit the impact of these disposed units on an already burdened waste management system.

Further, with the emphasis on clean up after storm events the quick disposal of destroyed units is much more prevalent than recycling, according to a representative of the Florida Department of Environmental Protection. Even the loss of 2,000 mobile home units in a storm event translates to 16,000 additional tons of storm debris. Clearly, a plan needs to be developed to address these most vulnerable structures.

Recycling and salvaging while not a perfect environmental solution can significantly reduce the amount of waste destined for landfills. According to an October 2000 report on "A Feasibility Study of Mobile Home Recycling," 20 to 37

percent of a mobile home can be recycled or reused. (For more details see, <http://www.anr.state.vt.us/dec/wastediv/solid/trailer.pdf>)

The second component of any plan needs to address financial incentives and programs that can help those who currently own these older units to replace them with post-1994 units. The fact that over 330,000 Generation 1 mobile homes are still in circulation indicates that voluntary attrition is not effectively removing these units. How then can we motivate homeowners who may be relatively satisfied with their current units to replace them?

A program then needs to address both of these issues. First, what incentives can be given to motivate homeowners to acquire safer units? And second, what methods of disposal can be developed to lessen the environmental impact of these disposed units.

### Who Benefits

Developing a recycling program is a win-win situation for all those involved. Such a program has the potential to benefit not only the homeowner, but also the federal government through FEMA, the State of Florida, county and local governments and the mobile home industry itself.

Both the state and federal government benefit from a recycling program through the reduction of exposure to hurricane losses. It appears that the majority of mobile home owners do not have adequate, if any, wind insurance. As a result, FEMA and the state step in after a hurricane to cover these losses. By increasing the proportion of post-1994 units and reducing the proportion of pre-1994 units both FEMA and the State benefit by reducing their potential pay outs after a disaster declaration.

An additional benefit to the state is to be able to recycle as much of the disposed materials as possible. By creating a program that aggressively pushes recycling instead of straight disposal, some costs can be recouped (even if it is a small amount), and a significant amount of landfill space can be preserved.

Counties and local governments benefit for similar reasons in that removing these first generation mobile homes make their communities safer during storm events. An additional benefit, however, is that it helps to improve neighborhood conditions. While not all first generation mobile homes are degraded to such an

extent that they become blight, many have reached this stage. Recycling these units help the overall atmosphere of a community.

Finally, a mobile home recycling program benefits the mobile home industry itself. As with counties and local governments, the industry itself benefits from the deconstruction of the stereotypes that can surround mobile home residents. Poorly maintained units and older units in poor condition help to perpetuate the myths surrounding mobile homes.

A program that increases the number of safer, post-1994 units also benefits the industry. As more and more of these safer units replace the older units perceptions of the vulnerability of mobile homes will change. A program that encourages the replacement of these units will result in safer, newer units being more widespread in the state.

### Stakeholders

In any program addressing mobile home recycling, the parties that benefit should likewise be the parties who contribute to the program. For this program, the key parties to a successful program will be: HUD, the State of Florida Department of Community Affairs, State of Florida Department of Environmental Protection, the mobile home industry, and the homeowner. Other potential stakeholders who might contribute to a program include FEMA, Florida Department of Motor Vehicles, and the Florida Manufactured Housing Association.

### Program Components and Issues

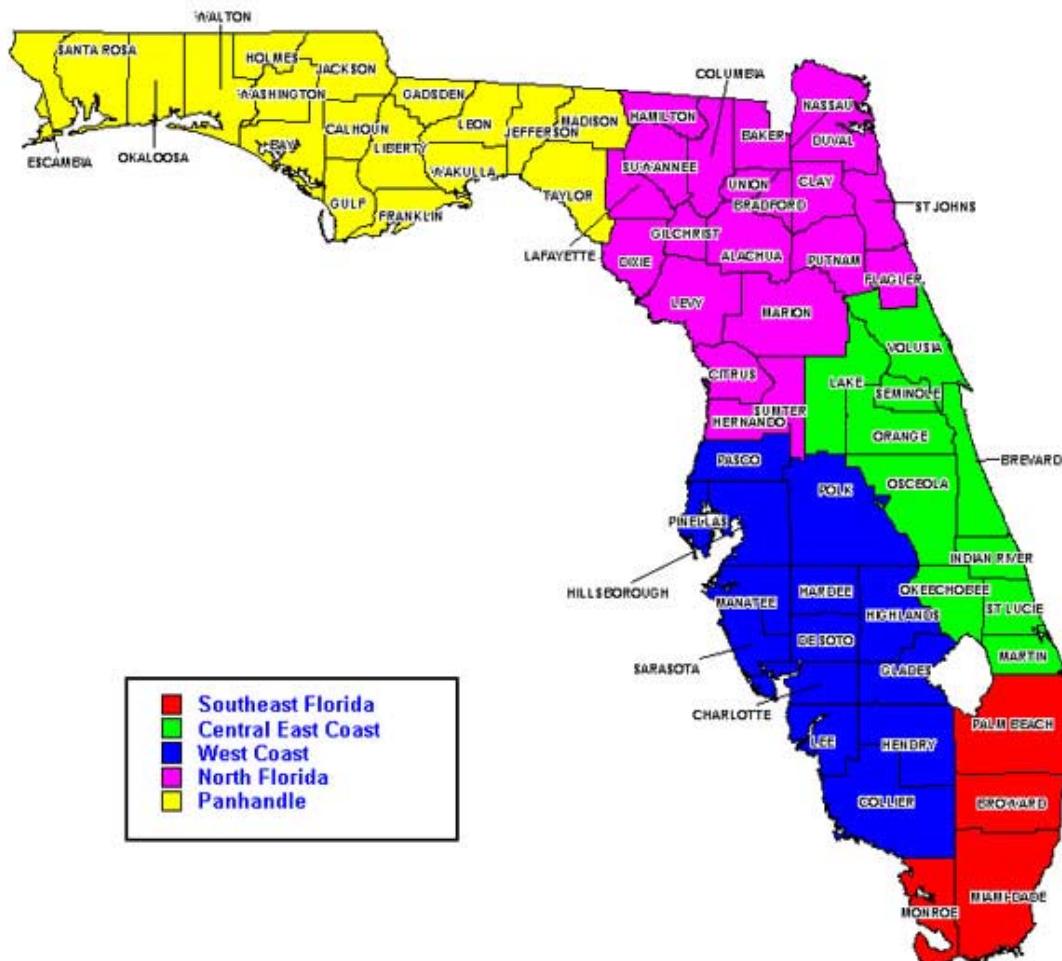
While it is too early in the investigative process to propose a pilot program at this time, we do know many of the technical and social components that will have to be integrated into a recycling program. The discussion to follow looks at these various components and how they relate to an overall recycling program.

1. Technical Issues. What technical issues must be considered when setting up a recycling program? What issues need to be addressed as part of a program?

(a) Regional Approach: Because Florida is large both in terms of land area and the total stock of mobile homes, it may be necessary to think of a program in terms of regions. One approach is to break the state down as shown in Figure 3. Once this is done, contractors, transportation, recycling facilities and landfills can be found and listed based on these regions. It would be prohibitively expensive, for example, to transport a mobile home unit from Jacksonville to Palm Beach if the only facilities were located in Palm Beach County. By focusing on regions, costs for transportation hopefully can be contained.

Figure 3: Potential Regions in Florida

## Potential Regional Approach to Recycling



- (b) Contractors: Since one of the goals of this program is to find ecologically sound ways to dispose of the most vulnerable mobile home units, merely taking these old units to landfill facilities is unacceptable. Instead, the goal would be to dismantle these units and recycle or reuse as much material as possible. Reusable materials include kitchen and bathroom fixtures, while recyclable materials include copper piping and aluminum. To do this, it will be necessary to find contractors to remove the reusable/recyclable material, and dispose of the remaining materials. The Vermont study found that it took between 79 and 97 person hours to dismantle a unit.
- (c) Onsite vs. Transport Whole: Ideally, any units to be recycled should be transported to a specified facility for dismantling. However, some research needs to be undertaken to find out how realistic this is for these old units. If units cannot be transported, what can be done to motivate park owners to allow dismantling on site?
- (d) Transportation. According to administrators of the Wisconsin Recycling Program (discussed in the last section of this report), costs for transportation of the units are the most prohibitive issue for their program. Our research has found that even in Florida these fees can vary greatly. In South Florida, we have been quoted \$550 for 50 miles, and in Central Florida, we were quoted \$175 to \$200, plus any escort fees, for a 50-mile transport. Enough facilities around the state need to be found to minimize transport costs.
- (e) Recycling Facilities. Lists of facilities that accept the types of materials found in a mobile home need to be accumulated. Using information from Florida EPA should minimize the time and effort needed in this area.
- (f) Landfill Space and Issues. In Wisconsin, mobile homes are shredded at facilities in the state, and this shredded material is then used as landfill cover. Determination needs to be made as to whether this type of process is available in Florida, and if so, where. Working closely with the Florida Department of Environmental Protection will be vital at this stage.

## 2. Social Issues

- a. Motivation and Incentives. How do we motivate those who own older mobile homes to recycle them, particularly if there is personal cost to such a program? Will such a program have to be legislated? Is it even possible to legislate the elimination of these older units?

- (i) Incentives to buy new units: What types of incentives can the industry furnish for those who turn in their older units? Can there be a type of rebate program to help motivate owners to buy a post-1994 mobile home?
- (ii) Can loan programs be developed to help homeowners to buy newer, safer units? Can some type of interest rate incentive be determined?
- (iii) Can insurance programs be used as incentives?

### 3. Program Issues

- (a) Location. In what Florida Department would this program be housed? While initially it seems like anything involving recycling would be housed in the Florida Department of Environmental Protection, any program would be much more comprehensive involving issues of replacement housing. Wherever the program finds itself, out of necessity it will have to be supported by multiple state departments in order to guarantee all interests are covered.
- (b) Cost. Depending on the scope of the program, the cost can vary greatly. Once a program is outlined, costs will have to be evaluated, and funding sources determined. It is believed that any effective program will require financial input, in one form or another, from a variety of sources, and will not only include monetary sources, but likewise, possible rebates that will not require cash input. The Vermont study discussed earlier and detailed in the last section of this report, found that the cost of dismantling, recycling and disposing of a mobile home was approximately \$780. Transportation of the unit was not included. Likewise, no consideration was given to replace those units since they were post-disaster abandoned units. However, until the scope of a program is determined for the State of Florida, it is impossible to determine the possible costs for such a program.

### 4. Legislative Issues

- (a) If it is determined that older mobile homes are significantly vulnerable to hurricane effects, should we legislate their removal?
- (b) Any program will need significant legislative changes.
- (c) Land Use and Zoning: Under a recycling program, as more and more units are removed from mobile home parks, what impact will this have on the parks themselves? The majority of these older units will be

single-wide homes. Will newer, and larger, units cause land use and zoning problems in communities with strict requirements for set-backs and distance between parallel units?

## **Summary**

Developing a recycling program for mobile homes in Florida is possible. But before moving on more information is needed as part of the foundation to any program. With over 330,000 highly vulnerable pre-1976 units in the State, the necessity of such a program is obvious. Florida's exposure to hurricane losses due to mobile home damage is incredibly high. By replacing these older units with newer, safer post-1994 units, Florida can reduce its potential for hurricane losses from the direct effects of hurricanes on mobile homes, and from the collateral damage mobile homes can cause their surrounding neighborhoods.

Florida is unique in its geographic position where hurricanes can significantly threaten from both the Atlantic and Gulf Coasts. As a result, mobile homes must meet at a minimum zone 2 standard for wind resistance. Couple this with Florida's large mobile home population, and it is easy to see the unique dimensions of the issue in the state. Any program that is developed must keep this uniqueness in mind.

The pieces of the puzzle are still coming together. Results from the telephone survey and face-to-face interviews will help fill in some of the missing pieces. But the picture is slowly emerging.

Once a framework for a program is developed in order for it to be successful it will be necessary to test it and fine-tune it. Getting from a pilot program to a final program will take time, but is an achievable goal.

**Appendix A**  
**Brief Summaries of Efforts in Other States**

Prior to thinking about a recycling program for Florida, time and effort have been taken to research, as much as possible, programs other states are developing. Wisconsin appears to be the furthest along in developing their program. In fact, most states do not have statewide programs. As will be apparent, some have sponsored pilot programs of varying detail, while others have had their attempts to develop a program thwarted in the legislature.

Overall what is clear is that the issues are larger in Florida. Whereas safety and the desire to reduce the potential for hurricane loss may motivate the need for such a program in Florida, other states seem to be motivated by wanting to improve the overall aesthetics of the mobile home community. Perhaps this is understandable in states without hurricane risks. In Florida, then, while we can learn from other states, we must look at our conditions and needs from our own unique perspective.

### Wisconsin

While few states appear to be developing statewide programs for recycling mobile homes, Wisconsin is moving forward with a demonstration project. The project is housed in a non-profit charitable foundation of the Wisconsin Manufactured Housing Association, Tomorrow's Home Foundation, and is being financed by the State of Wisconsin, Department of Natural Resources.

"The program is aimed at assisting counties and townships that have identified problematic homes in which the private landowner is seeking financial aid for the removal and recycling." (Industry Insights, p. 6)

The program allows county and local municipal officials to submit an application to receive funding assistance for removal of old, uninhabitable homes within the jurisdiction. Criteria for funding assistance is based on a scoring system that includes the following criteria (from, Recycling Remnants of Our Past by Amy Bliss, pp. 20-21):

- Is the home within eyesight of a public highway? This criteria rewards applicants with homes in setting that create the most visual pollution.
- Age of the home? These criteria rewards recycling the oldest homes first.
- Willingness of the homeowner to financially participate. This criterion creates an incentive for property owners to participate financially. This will have the effect of leaving more dollars for recycling of additional homes.

- The Foundation seeks to give priority to those homes identified by local or state officials as blight.
- Priority will be given to homes located in environmentally sensitive areas such as flood plains, critical habitat areas and wetlands.
- If the home is not transportable, it will not be eligible for the program at this time.

“Members of the manufactured housing industry have made generous contributions to make this program a reality. The Tomorrow’s Home Foundation Recycling Program is unique in that it combines the financial resources of a conscientious industry, a charitable organization and governmental agencies.”  
 (from, Recycling Remnants of Our Past by Amy Bliss p. 21)

In personal communication with Amy Bliss, she indicated that transportation of the units is the most expensive and most troublesome. She estimates that the cost of shredding is about \$250 to \$350, but then transportation is on top of that. They originally identified 6 facilities in the state to do the work, but lost 2. Of the remaining 4, 2 shred the mobile home and 2 manually dismantle them. The first step in developing a program, she says, is to find a list of metal salvage dealers in the state, and move forward from there.

As discussed earlier, any program in the state of Florida will require a regional approach in order to mitigate transportation costs.

### Vermont

After a flood disaster along the New Haven River in June 1998 destroyed mobile homes in Bristol, Vermont, “the Waste Management Division of Vermont’s Agency of Natural Resources spent several months searching for reports detailing the recyclability of mobile homes. After sifting through a sea of vague information, the agency decided to take matters into its own hands by conducting its own trailer recycling feasibility study.” (Waste News, December 4, 2000)

While this is the most comprehensive report found on the recyclability of mobile homes, it appears that this is as far as the State has gone on the issue. The report, which is referenced in above sections, can be found on the Internet at <http://www.anr.state.vt.us/dec/wastediv/solid/trailer.pdf>.

According to the abstract of the report, “*For the project, ultimately, five mobile homes were transported to the Town of Bristol Landfill, and a contractor was selected to deconstruct the homes in a controlled manner. The components of each mobile home were segregated into various categories and materials of each category were documented and weighed. Depending on the material, a component was then either recycled, salvaged, burned, or landfilled.*” (p. 1)

The focus of the study was to evaluate the deconstruction of the mobile homes, determine what can be reused and recycled, measure material quantities, evaluate the amount of labor required, and determine the economic feasibility of recycling units. It is argued that “mobile home deconstruction will not currently be profitable, but neither is it overwhelmingly expensive.”

Interesting enough, this study does its best to evaluate the number of “functionally-obsolete” mobile homes in Vermont. The report focuses on the number of pre-HUD code mobile homes that appear to be two-thirds of all mobile homes in Vermont, or approx. 12,000 to 15,000 units. So, while this study itself focused on units damaged in a disaster, at least the issue of pre-HUD standard mobile homes is being addressed. What the State of Vermont does as a result of this study will be interesting to watch.

However, while there is much to learn from this study, clearly the scope of the issue in Florida is much larger, and will take considerable amounts of time and study to determine the best course of action.

### Montana

During the 1999 Montana legislative session, Senator Bartlett sponsored Senate Bill 366. The bill was entitled: “*An act authorizing local governments to remove, recycle, and dispose of abandoned and deserted mobile homes; authorizing the use of county junk vehicle program funds for the purposes; requiring state approved plans prior to reimbursement of costs; describing allowable costs*”. (See <http://data.opi.state.mt.us/bills/billhtml/SB0366.htm>)

According to the act’s findings and purpose section, “*the legislature finds that there are numerous abandoned and deserted mobile homes throughout Montana and that in many cases, the condition of these structures may adversely affect surrounding property values and may adversely affect the public, health, safety and welfare. The legislature finds that current state law does not provide local*

*governments with a method or a funding source to address the removal, recycling, and disposal of abandoned and deserted mobile homes. The purpose of [this act] is to provide counties with the authority and the funding to remove abandoned and deserted mobile homes from public or private property in the state.”* The program idea was to localize the program in the county with mechanisms in place for reimbursement of county expenses for removal, recycling and disposal. It required all the counties to have a plan to address the issue that include the procedures the county planned to use to first get the homeowner to dispose of the unit. Public funds were to be spent only after failing to motivate the homeowner to remove the unit.

Ultimately the act legislates that county junk vehicle funds could be used for the process of recycling and disposing of abandoned mobile homes. It additionally mandates that “*abandoned and deserted mobile homes removed, recycled, and disposed of under [the act] must be recycled and disposed of in an environmentally sound manner.*”

The process for this Act began December 4, 1998, and died in standing committee on April 22, 1999. It does not appear that the issue was brought back in subsequent legislative sessions.

The program appears to have been based on more aesthetic issues, and concentrated only on units that already were abandoned. It does not attempt to proactively motivate the removal and disposal of units.

#### North Carolina

According to John S. Blaisdell, Market Development Specialist of the Division of Pollution Prevention and Environmental Assistance, North Carolina does not have a state program. Mr. Blaisdell states that “*We only have select counties and a few private businesses that undertake this activity currently. However, after Hurricane Floyd destroyed eastern NC, the Emergency Management folks did a collective contract for demolition/recycling. The contract allowed counties to condemn mobile homes and add them to a statewide contract.*” (personal communication)

During winter 1999-2000, the North Carolina Department of Environment and Natural Resources, Division of Pollution Prevention and Environmental Assistance awarded two of their 17 public and private sector project grants aimed

to reduce the amount of construction and demolition debris to two mobile home recycling facilities.

One establishes a new mobile home recycling collection and deconstruction business in Staley, North Carolina. The second project deconstructs and recycles mobile homes at the Brunswick County Construction and Demolition landfill. (see Recycling Works, Volume 6, Number 1, Winter 1999-2000)

While the state of North Carolina has taken some interest in what to do with old mobile homes no longer being used, it does not appear that a statewide program to replace older, more vulnerable units is even a consideration. The focus is to reduce C & D debris, and not to reduce hurricane exposure.

### Michigan

Little has been found on the program in Michigan. What we do know is from the findings of the Bristol, VT report. From page 6, "*The Michigan Manufactured Housing Association is coordinating a mobile home salvaging operation for the Association's state member-dealers. For a \$100.00 fee a dealer can bring an obsolete home, generally taken in trade, to "Ferrous Processing & Trading" in Detroit. Ferrous reduces the intact mobile home into approximately 12' section, and those sections are sent through a automobile shredder. Ferrous and non-ferrous metals are separated and collected, while the residual shredded waste is destined for the landfill, often being used as cover material. A typical 12' x 60' mobile home will produce about eight cubic yards of waste, and one or two cubic yards of scrap metal.*" (<http://www.anr.state.vt.us/dec/wastediv/solid/trailer.pdf>, page 6 of report, page 8 of pdf file)

Attempts are being made to gather more information on the Michigan program. However, from the above description it appears that the program is aimed at helping manufacturers dispose of older units, and not a proactive program to motivate attrition.