



Florida International University

**RE: PROPOSED WORK PLAN
DCA AGREEMENT # 02-RC-11-13-00-05-001**

**PROJECT: HURRICANE LOSS REDUCTION FOR RESIDENCES AND
MOBILE HOMES IN FLORIDA**

BACKGROUND

During its 1999 session the Florida State Legislature enacted a Hurricane Loss Mitigation Program (s. 215.559) also known as the “Bill Williams Residential Safety and Preparedness Act” (the Act). This program is to be funded by an annual appropriation from the Florida Hurricane Catastrophe Fund (s. 215.555) and it is to be managed by the department of Community Affairs (DCA)

The Act allocates ten percent of the annual allocation to the International Hurricane Center (IHC) at Florida International University (FIU) for the purpose of:

..supporting programs of research and development relating to hurricane loss reduction devices and techniques for residences and mobile homes and relating to the development of credible data on potential loss reduction.

During its 2000 session the Florida State Legislature in authorizing the annual allocation under the Act approved the research topics listed below to be included in the work to be conducted by the IHC/FIU during the fiscal year that ends June 30, 2002:

- (a) Eliminating state and local barriers to upgrading mobile homes and communities;
- (b) Research and develop a program for the recycling of existing older mobile homes;

- (c) Programs of research and development relating to hurricane loss reduction devices and techniques for site-built residences.

In addition to working on these specific research topics the IHC/FIU has also been tasked with assisting DCA in preparing a full report and accounting of activities under Section 215.559, Florida Statutes, and an evaluation of such activities. Such report is to be submitted to the Speaker of the House of Representatives, the President of the senate, and the Majority and Minority Leaders of the House of Representatives and the Senate by January 1, 2002.

GUIDING CRITERIA AND OBJECTIVES

Work to be conducted by the IHC/FIU will abide by the following guiding criteria:

- (a) The IHC/FIU will emphasize assessing the scope of the issue by identifying those factors, ranging from the physical and structural to the social and regulatory, that may contribute to or influence the incidence of hurricane damage to site-built residences and manufactured housing in Florida.
- (b) The IHC/FIU will build upon the findings and recommendations that resulted from work completed for this project during the fiscal year that ended June 30, 2001.
- (c) The IHC/FIU will continue to work on specific areas initiated during the first year of this project that are critical to enhancing our assessment of the scope of the issue as it related to the three specific research tracks approved by the State Legislature.

The main objectives of the work proposed by the IHC/FIU are:

1. To meet the requirements established by the Act related to the development of hurricane loss reduction devices and techniques and credible data on potential loss reduction;
2. To understand the issues, and the factors that may influence the same, that may act as barriers or incentives to hurricane loss mitigation;
3. To identify specific issues arising from work under this project that are relevant to the mission and objectives of DCA and other interested parties, including homeowners and regulators having jurisdiction over housing-related matters;

4. To identify potential policy alternatives that may be considered by state policy-makers that address issues of hurricane loss reduction for the housing stock in Florida.

WORK ELEMENTS

The IHC/FIU proposes to complete the following specific elements of work:

1. Eliminating state and local barriers to upgrading existing mobile homes and communities:
2. Research and develop a program of recycling of existing older mobile homes:
3. Programs of research and development relating to hurricane loss reduction devices and techniques for site-built residences:
4. Project progress reports:
5. Assisting DCA in drafting annual report:

WORK PLAN

The work plan will include the following tasks and activities:

1. Eliminating state and local barriers to upgrading existing mobile homes and communities:
 - (a) The IHC research team will conduct research to identify issues in (i) land use regulations, (ii) community design guidelines, and (iii) building/zoning codes, that may be contributing to knowledge gaps or regulatory obstacles that act as barriers to the upgrading of existing mobile homes and mobile home communities. The main objective of this specific area of research is to make recommendations on ways by which the most serious of these barriers could be eliminated. It is proposed that this work will focus on the west central and the panhandle region of Florida. Key areas of research include:
 - Issues of platting to address the problem faced by newer or larger mobile homes that do not meet existing older plats.

- Building code and zoning issues where requirements under one code may not be supported by the other, or where enforcing officials may lack the expertise or training to uphold specific requirements
- Hurricane hazard zones and issues of wind damage.

(b) The IHC team will also research other types of barriers that may involve technical issues. The main goal here is to identify specific contributors to hurricane losses and alternatives to reduce such damage, but also to collect credible data relative to the effectiveness of such devices in reducing potential hurricane damage. This could be achieved through research that draws on the expertise and information of the manufactured housing industry coupled with actual testing on a cross section of first and second generation mobile homes.

(c) The IHC team will also research the specific performance of various structural components of mobile home installation and design that may be relevant to the issue of hurricane loss reduction. One such area of work could involve the testing in-situ of anchoring devices for mobile homes to assess their performance after having been in service for some time.

2. Research and develop a program of recycling of existing older mobile homes:

The IHC proposes a research and development program that includes four phases, as follows:

Phase I

Research will be conducted to identify and assess the following issues:

- a. Technical details and costs relating to the logistics for removal, disassembly, transportation, recycling and dumping of manufactured housing units.
- b. Costs-benefits associated with the above technical issues.

- c. Regulatory issues pertinent to promoting the recycling of manufactured housing units.
- d. Support and incentives from the various sectors that may benefit from a recycling program. This will be a key step in developing a prototype program for Florida. Without support from key sectors, it will be impossible to implement a program.
- e. Sources of funding to implement an eventual program in Florida. This is a key step in the development of a program. Without support from the industry, the state and HUD any program will fail to address the needs of the poorest, most vulnerable households.

This phase will build on work completed during Year 1 of this project. Support from various sectors will be key to moving forward with the development of a recycling program that addresses both the technical and social dimensions of the issue. Without this support, a recycling program will not be able to address these social issues, and as a result, will leave the most vulnerable units and people still in harm's way.

Phase II

Based on the findings from Phase I of this research, a prototype recycling program will be designed to address both the technical and social dimensions of the issue. Once such a prototype is developed, various methodologies such as focus groups, telephone interviews and mail surveys will be employed to get feedback from stakeholders including but not limited to homeowners, industry representatives and government agencies. Based on this feedback, the program will be fine tuned and finalized.

Phase III

Once Phase II is completed and a final program developed, *pilot projects* will be used to test the sensitivity of the program, analyze the logistics involved, and develop accurate operating budget figures. These pilot projects may include acquiring pre-1976 manufactured housing units, and following them through the recycling process from removal, transportation, disassembly and recycling.

Phase IV

Based on the findings from Phases I, II, and III, a proposal will be developed as a base for policy consideration by state legislators. Such a proposal will include timelines and budgetary estimates for implementation of a state-wide recycling program that would phase-out most of the pre-1976 generation of mobile homes by a given date.

3. Programs of research and development relating to hurricane loss reduction devices and techniques for site-built residences:

The IHC team proposes a two-tier approach to this specific research topic. They are as follows:

(a) The first is based on technical aspects involving materials and methods of construction and specific performance under hurricane conditions that may lead to given types of damage. This work will be based on the proposition that the development of devices for loss reduction and of credible data regarding their effectiveness in reducing potential damage can be best achieved through a program of actual physical field-testing supported by laboratory tests and theoretical qualitative work through computer simulation and modeling. Some specific areas to be subjected to such testing may include:

- Roof coverings, such as asphalt or fiberglass shingles, regarding their resistance to uplift or their performance depending on specific locations such as along the edges of a gable roof. This work is expected to lead to recommendation on how to improve the performance of these materials under hurricane conditions.
- Roof sheathing connections with regard to how and why such connections may fail under hurricane conditions. Work is proposed to test individual fasteners used in these connections and also full roof panels. It is expected that this work could lead to the development and design of appropriate retrofit

methods to improve the effectiveness of these devices on site-built housing.

- Roof to wall connections with regard to how the structural assembly supporting a roof is required to work to transmit complex loads, experienced under hurricane conditions, through the walls to the foundation.

(b) The second tier of work will look into qualitative issues that may contribute to the relative vulnerability of individual site-built houses or whole communities. Some of these qualitative factors may include:

- Site selection with regard to the hazard mitigation “value” that may be effective in reducing potential damage.
- Landscaping and community design under the theory that well planned landscaping and community design may play a role in reducing the potential for damage, under hurricane impact, to individual site-built houses.
- Additions to existing houses done in-situ and post initial construction and the role these may play in exacerbating the relative vulnerability of this and neighboring houses under hurricane conditions.
- Architectural design including layout, materials and construction technology as well as location, in order to identify those designs that may improve the performance of the house and contribute to hurricane loss reduction. The IHC team is looking into the possibility of building some scale models of these effective design that could, where possible, be tested under wind tunnel conditions.

The ultimate goal of work conducted under this tier is to arrive at the development of a ‘best practice’ guidelines for planning, siting and the design of housing units and the residential communities in which they are located.

4. Project progress reports.

5. Assisting DCA in drafting annual report.

TIMELINES

Main timelines for this project are:

1. By September 7, 2001: submit detailed work plan and milestones chart to DCA.
2. By September 15, 2001: initiate research work related to “elimination of barriers to upgrading existing mobile homes and communities” in Polk, Pinellas and Hillsborough counties.
3. By September 21, 2001 complete organizational/contractual phase including: (a) subcontracting with researchers/consultants outside FIU, (b) hiring/retaining graduate students, affiliated FIU faculty.
4. By October 1, 2001: define with DCA the methodology for gathering information from the different participants in the RCMP project for purposes of assisting DCA in preparing the annual report to the Legislature’s leadership. Obtain from DCA complete listing and contact information of all participants in the RCMP project whose activities will need to be reported on and included in the annual report.
5. By October 5, 2001 complete ordering/purchases of major equipment and materials required for project.
6. By October 15, 2001: submit quarterly progress report to DCA.
7. By November 15, 2001 complete assembly/set-up of testing apparatus
8. By November 19, 2001: initiate testing on roof covering.
9. By November 30, 2001: submit draft of annual report to DCA.
10. By January 7, 2002: hold working meeting of research team.
11. By January 15, 2002: submit quarterly progress report to DCA.
12. By January 22, 2002: initiate testing on roof sheathing connections.
13. By February 1, 2002: initiate work on hurricane loss reduction devices and techniques for site-built housing based on the “best practices” approach to planning, siting, and design of residential communities, with a focus on Polk, Pinellas and Hillsborough counties.
14. By March 1, 2002: initiate testing on roof to wall connections.
15. By March 15, 2002: initiate testing of mobile home anchoring in-situ.
16. By April 7, 2002: hold working meeting of research team.
17. By April 15, 2002: submit quarterly progress report to DCA.

18. By May 1, 2002: complete focus-group assessment of identified alternatives for a mobile home recycling program.
19. By June 1, 2001: complete draft of final report and distribute for review and discussion to all members of IHC/FIU research team.
- 20.** By June 29, 2002: submit final report including key findings and recommendations to DCA.