

IECE Final Report

Project Title:

Building Civic Engagement by Building Affordable Housing in a University Without Walls: A Prototypical Design-Build Studio for Undergraduate Students in Partnership with the Community

1) Description and Goals of the Project.

This proposal aims to *foster campus connections to the community and promote social justice* through a course that will result in construction of a home for a low-income household. The course will be a pilot for curricular innovation and development. The home will also serve as a demonstration model pivotal to the success of planned applications for external funding to support our future work, extending the current initiative.

The project is collaboration among a team of faculty, researchers, and students, working with the Affordable Housing Alliance, Thistle Community Housing, and the Mapleton Mobile Home Owner's Association as community partners.

TrailerWrap is an innovative, community design + build project focused on engaging students in issues of sustainable and affordable design in the context of the trailer park. At the scale of an individual building the project explores the potential for providing affordable housing through the adaptive reuse and re-cycling of old, inefficient mobile homes. At the urban scale the project reexamines the mobile home park as a model for equitable, high-density urban planning alternatives to suburban sprawl. In pushing the envelope of sustainable reuse, the TrailerWrap project seeks to create exciting, small scale, high density, and affordable architecture with a social and environmental conscience.

Often overlooked or looked down upon, the ubiquitous mobile home constitutes an important but under appreciated housing typology that serves wide range of citizens. Since the mid-1900's mobile homes and manufactured housing have been mass produced in an attempt to provide a solution to low cost housing; however, in doing so, several important factors that make a house a home have been overlooked. Unimaginative aesthetic and spatial design combined with inefficient energy strategies and poor construction techniques define the major shortcomings common in the industry. Such conditions make these homes difficult to maintain leading to extreme conditions of disrepair and often abandonment. In response to common misconceptions related to trailers and the clichéd stereotypes associated with the people that occupy them, TrailerWrap strives to provide simple and affordable solutions to improve both the spatial quality and energy efficiency typically found in conventional manufactured housing.

Beyond the individual housing unit, land use patterns established in the familiar trailer park provide a uniquely American urban planning model combining relatively high density with individual land ownership. As such, the urban mobile home park constitutes a rare opportunity for people of minimal or modest income to live in the center of town, close to jobs, retail, and entertainment. In terms of both scale and cost, the trailer park fills an underserved niche in spectrum of contemporary housing options. Slotted between the typical suburban ¼ acre lot and the multi-unit condominium/apartment complex, the standard 25ftx75ft mobile home lot offers a single-family option, complete with it's own plot of land, at an affordable price.

Diverted on its way to the landfill a cramped, 11ft x 47ft, two bedroom donor trailer at the heart of TrailerWrap is now being transformed into an open, expansive example of small-scale architecture. Conceived as a single, loft-like volume oriented toward a new outdoor room, the project privileges experiential conditions that affect the immediate scale of human occupation. The spatial organization compresses functional utility into dense, multipurpose zones that dissolve boundaries typically associated with specific, partitioned rooms. Similarly, the high ceiling of the interior extends out to define and incorporate the occupiable landscape. Programmatically, this extension takes advantage of the surprisingly temperate local climate and expands the visual and functional limits of public space in the house.

This interwoven sensibility begins with a site strategy that links building and site through placement and circulation. The resulting hybrid mixes the linear character of the trailer with a processional sequence and social space more common in traditional houses with large yards and gracious front porches. This unobstructed path celebrates the relationship between the interior and exterior while a series of subtle thresholds mark transitions and modulate the formal procession from the more public character on the front, west side to the relatively private space of the rear, east side.

Organizing the interior a thick, freestanding wall houses aspects of the bathroom and kitchen along with storage and the dining room table while simultaneously defining the four main spaces of the interior. Following the adaptive reuse principles at work in the overall project, a framework of salvaged solid core doors structure the thick wall and frame cabinet openings in addition to serving as the dining table surface. The mono-pitch shed roof slopes to the south allowing for indirect lighting through the expanse of clerestory windows on the North elevation. The roof slope also provides advantageous solar orientation for the passive hot-water heating system.

2) Number of students and faculty impacted by the project.

Approximately forty undergraduate students and 8 graduate students in the College of Architecture and Planning participated for credit over a four-semester sequence. In addition three faculty full-time faculty members were involved with the project.

3) Assessment Topics:

3a) Describe the development and implementation of the course or project.

A series of design studios and internship classes have been offered to introduce and engage architecture students in a project that promotes civic responsibility and community involvement as a viable, exciting and worthwhile use of their design education. The project provides students with a better understanding of the pressing housing needs of low-income households. Through the project, students will also gain hands-on experience in the construction of an affordable housing unit using sustainable building technology that combines straw bales with a mobile home core.

The project began with a schematic design produced in the Spring 2005. During the Summer 2005 a group of 10 students enrolled in a seminar and began working with a local structural engineer to design the specific structural elements of the project. In the fall of 2005 12 students were enrolled in a design studio where they developed the construction document drawings and took the project through the building permit process in City of Boulder.

Construction of the project began in February 2006 with 15 students enrolled in a Community Outreach Internship through the Center for Youth in the Environment. Students will continue construction through the Summer 2006 and hope to complete the project by August 2006.

In conjunction with the design and construction our team members at Ethnography & Evaluation Research group in the Center for Advance Research and Teaching in the Social Sciences have begun their evaluation phase. Their work will include three in-depth, minimally structured interviews, conducted by Lianne Pederson-Gallegos. The first interview was with a group of student participants, the second interview with faculty and/or staff who planned and implemented the project, and the third interview with occupants of the first completed house. These qualitative interviews are designed to both ascertain the meeting of the project goals and to discover and collect any unanticipated insights emerging from the project.

The first phase of this report focused on the participating students and found, "The students were enthusiastic about working on a project that promised tangible benefits to others. Over the course of the interview they occasionally voiced their hopes of making a meaningful contribution to solving problems of energy-efficiency and improved low-cost housing." The full text of the draft report, entitled *Evaluation Report on the Straw Bale Wrap Project* authored by Liane Pedersen-Gallegos, is attached to this document.

In further support of this work we hired a Phd student to place the current project against the background similar endeavors elsewhere around the country. This research identified good practices from which guidelines will be drawn to help inform our future collaborations with community partners. Pamela Wridt produced *Constructing Curriculum: A literature review of design/build educational programs* and the full text of this report is attached to this document.

3b) Describe progress and problems in achieving project goals.

The greatest challenge was to obtain administrative approval for the project, requiring review by legal counsel, which took an inordinate amount of time and countless follow-up requests. Positive surprises were readily granted requests for assistance with certain services and acquisition of materials, and the positive reception of the project w/in our college.

As faculty we have learned the arduous and long road of preparations before being able to even start the project, including the challenges of obtaining funding from several sources and many months of back-and-forths with University legal counsel concerning questions of liability. This experience has not discouraged us but made us more aware of what to expect next time. The most obvious beneficiary of the project, the occupant of the home we're building, remains to be selected.

3c) Analysis of impact on students and faculty and impact on community issues, organizations, and community members.

Students have learned hands-on skills in construction, working with a community client, dealing with city agencies, obtaining donations in materials and services.

We have established strong relationships with a number of community organizations including the Thistle Community Housing Non-Profit, the Mapleton Mobile-home Owner's Association, and the Boulder Housing Partnership. In addition we have developed a relationship with the

Department of Facilities Management at CU in which we are pooling our resources to work together on community outreach projects.

Through our outreach efforts and the TrailerWrap website, (www.trailerwrap.net) we are receiving significant interest in expanding the project from people the local and regional community.

Further, the project has already been the subject of two radio interviews, a newspaper story, and a journal article and a number of journals and magazines are interested in publishing the project upon completion.

3d) How this project has furthered IECE goals namely enhancing engaged scholarship and fostering civic engagement and/or ethical inquiry and their integration in the university's academic offerings?

The pedagogy underlying the studio offers a unique opportunity for students interested in a comprehensive, project-based, hands-on approach to architectural education that is engaged in a diverse spectrum of issues related to the complex act of making Architecture at full-scale. The emphasis on engaging architecture as an integrated endeavor provides the basis for a wide range of explorations into tectonic materiality, formal gymnastics, spatial landscapes, sustainable technologies, and community outreach. Specifically, the goal is to augment traditional design education with a curriculum based on collaborative, firsthand, full-scale, tactile immersion in a specific, cultural environment. The program utilizes a cross- disciplinary, research/design/build model designed to teach civic responsibility through culturally specific, environmentally responsible, and socially empowering lessons that engage underserved communities.

Students involved with the project draw upon the knowledge of skilled craftsmen in the electrical, plumbing, and metal working trades as they gain hands-on experience in the construction of an affordable housing utilizing sustainable building technologies, straw bales construction, passive and active solar energy, and material recycling. Working in the field, meeting with the city, interacting with the trades, and learning to confront/overcome logistical hurdles in real time, students will encounter both the agony and ecstasy of making, and sometimes re-making, architecture at full-scale. This complex context provides a unique educational opportunity in which students are exposed to the act of construction as a fundamental component of critical design practice and civic engagement. We also expect that this course will increase students' awareness of unmet basic needs among the clients they serve and strengthen their sense of social responsibility, deepening their motivation for further civic engagement in their future professional development.

3e) Project evaluative data/information

Please refer to the response in section 3a and the attached *Evaluation Report on the Straw Bale Wrap Project* authored by Liane Pedersen-Gallegos.

3f) Describe the potential sustainability of the project in regard to offering the course or project on a continual basis

Please refer to the response in section 3b .

3g) Additional funds raised to leverage IECE funds.

To date the project has received significant financial support from a wide variety of Community and University sources. A 1965 mobile home was donated by its previous owner and has been moved to a space in the Mapleton Mobile Home Park. The Thistle Community Housing group purchased this park in 2002 to ensure the long-term viability of affordable housing in Boulder Colorado and they have pledged \$16,000 toward the construction. Three grants supporting both the construction have been received from the Outreach Committee, Service Learning Committee, and the Office of Diversity + Excellence at the University of Colorado-Boulder. These grants, along with support from the Dean of the College of Architecture and Planning total approximately \$31,000 with \$26,000 earmarked for construction related expenses.

4) Financial Report

The overall grant from IECE was for \$5000. The following describes our expenditures-

Ethnography & Evaluation Research	\$1500
Best Practices Research	\$2000
Construction Materials	\$1500