

## TRAILERWRAP: Recon- structing Home

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*TrailerWrap: Transformation from stripped trailer chassis to affordable home*

### **Introduction:**

Often overlooked and looked down upon, the ubiquitous trailer house and its setting, the trailer park, constitutes an important but under-appreciated American housing typology. This statement is no less true of the urban and rural landscape of Colorado than it is of the cultural and vernacular landscapes of the American West.

Beginning in the mid-1940s, the use of the trailer and trailer park, originally developed to serve an emerging recreational market, was rapidly adapted to deal with the acute housing shortages precipitated by the war effort. By the late 1950s, trailer houses had become an

established housing typology and a part of the American vernacular landscape. They were mass produced as a seemingly ideal and efficient solution to the problem of affordable housing.

In the course of this adaptation and transformation, several important design ideas and environmental strategies that allow the house to be transformed into a home were discarded – or disregarded – with predictable psychological, environmental, behavioral and social consequences. Those mid-century trailer houses and trailer parks are currently deconstructing themselves, both literally and metaphorically. Unplanned obsolescence is affecting all aspects of their performance, with

the result that their presence and role as an affordable housing type is being threatened.

Neglected and abandoned, inefficient and unhealthy, the “modern” trailer houses are rapidly becoming fodder for the demolition yard and the landfill. As a response to the need to deal with this emerging problem, the TrailerWrap project addresses the difficult

questions surrounding the future of the aging trailer house. The project serves as a concrete example of a process that allows the debilitated trailer house that populates so many of the vernacular and cultural landscape of Colorado and the American west to be effectively rehabilitated into a contemporary and affordable American house, and home.



*TrailerWrap: North Facade, Morning*

**Intentions:**

TrailerWrap sets out to provide simple and affordable solutions that can improve the spatial and material quality, the energy efficiency, the environmental quality, the psychological context, and the social and behavioral consequences of an abandoned and debilitated trailer house through its reconstruction and rehabilitation.

TrailerWrap is a highly collaborative design/build project that connected a group of faculty and design students from the University of Colorado with a group of non-profits and other partners with interests in the areas of affordable housing, service learning, diversity, civic and ethical engagement to explore issues of socially and ecologically responsible design.

It explores the aspects of inhabiting simple shelter in ways that conventional trailer house design and construction have ignored in the interest of efficient manufacturing systems and mass production. The project's tangible outcome is a rich, affordable setting that exists as a portable example of how the debilitated trailer house can be economically rehabilitated to become a viable, contemporary home.

**The Partners:**

TrailerWrap involved collaboration between Thistle Community Housing and the Mapleton Home Association, both non-profits, a team of faculty and students from the College of Architecture and Planning at the University of

Colorado, the Office of the Campus Architect and the Department of Facilities Management at the University, and the college and university's Children, Youth and Environments Center for Research and Design, which originated the idea for the project.

Thistle Community Housing purchased the Mapleton Mobile Home Park in 2002 to ensure the long-term viability of permanently affordable housing in one of America's most expensive communities, where the average home price is just under \$500,000. While Thistle owns the land, individual households own the 132 trailers and lease their lots at subsidized rates from the Mapleton Home Association, which governs and maintains the Park on a day-to-day basis while working with Thistle on long-term planning.

The project received significant financial support from a wide variety of community and university sources. A 1965 mobile home was donated by its previous owner and was moved to a vacant lot in the Mapleton Hollow Trailer Park. Thistle Community Housing seeded the project with a \$20,000 commitment toward the reconstruction of the home.

Five grants supporting both the reconstruction and project evaluation were funded by the Outreach Committee, Service Learning Committee, the Office of Diversity and Excellence, and the Institute for Ethical and Civic Engagement at the University of Colorado at Boulder. Those grants totaled \$19,000. The balance of the funding needed to complete the



*TrailerWrap: North Facade, Evening*

\$46,000 project came from the university's College of Architecture and Planning, which has programs on both the Denver and Boulder campuses. All construction work, with minor

exceptions, was completed as voluntary work by students, faculty and other partners. TrailerWrap sell for under \$30,000 -- a really affordable price for a small contemporary

home in a market with a median home price of \$250,000. TrailerWrap is, in the words of Thistle CEO Mary Roosevelt, “the first of its kind in Boulder. While trailer homes too often are inefficient, this wrapped trailer is a green-built, energy-efficient home with innovative design.”

### The Project:

Diverted on its way to the landfill, a derelict, cramped 10ft x 46ft two bedroom trailer was donated to the project and 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 responds to the experiential conditions that affect human enjoyment of its intimate scale.

The project extends the potential of this affordable housing typology by adding layered inside/outside connections and transitions, a rich interior spatial hierarchy, green and recycled materials, energy efficient construction, passive systems, and interior spaces filled with natural light and air. All of these are qualities and aspects of a way of inhabiting shelter ignored in conventional trailer home design and construction.

The project incorporates a site strategy that links building to site through placement and circulation. The resulting interwoven spaces combine the linear character of a trailer house

with a processional sequence and social space more common to a traditional house with a large yard and spacious front porch. This promenade celebrates the relationship between the interior and exterior. A series of defined thresholds mark transitions and modulate the formal procession from the more public space on the front, west side of the house to the quiet and private space of the rear, east side.

The organization of the interior and exterior spaces compresses its day-to-day uses into compact, multipurpose zones that dissolve the boundaries typically associated with specific, partitioned rooms. The large, freestanding objects located in the center of the interior act to define the four main spaces of the interior: living/dining room, kitchen/work space, bedroom, and a spacious bathroom. The shed roof slopes to the south, facilitating optimum snow melt conditions as well as creating the opportunity for soft, indirect lighting through the expanse of clerestory windows on the north facade.

The roof slope also provides an advantageous solar orientation for a passive solar hot-water heating system and photovoltaic array in the future. The high, sloping ceiling of the interior also extends out to define and incorporate a large exterior room reminiscent of the screen porches of traditional homes. This extension of interior to exterior takes advantage of the temperate local climate and the adjacent Goose Creek wildlife corridor as it expands the



*TrailerWrap: North Facade, Night*



*TrailerWrap: Detail*

visual and functional limits of the protected space in the house.

In keeping with the low-impact design principles at work in the overall project, the interior was designed to emphasize the qualities of sustainable, recycled and reused materials. The space-dividing partitions were originally built of salvaged solid core doors, sometimes stained and sometimes faced with scrap maple plywood donated by a local cabinet shop. The counters and dining table are made of reclaimed butcher block. The redwood slats and deck forming the outdoor room were reclaimed from old deck material and culled wood from local lumber yards. Remnants of "utility" grade oak flooring were purchased at scrap prices, trimmed to avoid the knots and blemishes, and installed to give the trailer a rich, warm floor.

Originally, straw bales were going to be used to "wrap" the trailer's spaces to improve its thermal performance. Code issues forced a change to conventional frame construction. Recycled blue jean insulation was used in the ceiling and, in place of the straw bales, in the walls. The floor was insulated using Icynene, a state-of-the-art, spray-in-place soft foam insulation/air-barrier that is healthier, quieter, and non-toxic. The kitchen cabinets are inexpensive stock garage storage units from Home Depot.

Parts of the interior were deliberately left "incomplete" to encourage the eventual owner and user of the house to participate in finishing-off its design. The stub walls and lintels on the project's interior exist as deliberate design cues that suggest

opportunities for placing cabinets, wardrobes, shelving and furniture in ways that will allow the users to transform its unique spaces into their distinctive home. The photographs of the project include no furniture, for the same reason.

**The Process:**

Over the course of 27 months, a group of over 86 undergraduate environmental design students and four professors undertook all aspects related to the design, planning, budgeting, financing, coordination, material selection, detailing and reconstruction of this mobile home. The students were immersed in the complexities of a small but well-defined project from the initial conceptual stages through design development and the definition of construction details, and finally to its full-scale construction.

The participating students learned construction methods and practices, project management techniques, and interpersonal skills. They developed relationships among themselves, with their teachers, and with the different building trades to holistically enhance their design education. Students worked with skilled craftsmen/mentors in the electrical, plumbing, framing and metal working trades, gaining hands-on experience in construction that will, in the end, change the very nature and quality of their perspectives on design, architecture and professionalism.

A backup in the sewer serving the unit covered 60% of the completed floor with black sludge, damaging the walls and the oak flooring, and destroying much of the installed FatWall fitting.



*TrailerWrap: Interiors*

That disaster led to a major redesign/reworking of the interior to bring the project in on-time and slightly over budget. That disaster taught the students — and faculty — lessons in dealing with the unexpected, and recovering from what seemed to be a major setback to the project's integrity and success. The interior was redesigned to use stock utility cabinets bought at Home Depot, rather than the custom designed and hand-built Fatwall that had been ruined by the sewage backup.

Working in the field, meeting with the city's building and zoning officials, interacting with the trades, and learning to confront and overcome logistical hurdles in real time, the students encountered both the agony and ecstasy of making architecture at full-scale. This unique educational opportunity exposed students to the act of construction as a fundamental component of critical design practice and civic engagement. In addition to construction knowledge, this project increased students' awareness of unmet basic needs among the clients they serve, and strengthened their sense of social responsibility, deepening their motivation for further civic engagement in their future professional development.

The project's experiences offered a unique opportunity for students interested in a comprehensive, project-based approach to architectural education to enhance their traditional design experiences by participating in a teaching/learning event that provoked a direct, collaborative tactile immersion in a specific project. The experience integrated research, design, planning and construction in a way that exposed students to architecture's need for civic responsibility and ethical engagement

through the culturally specific, environmentally responsible, and socially empowering lessons that it taught.

### The Clients' Perspective:

Gaston Bachelard observed in his *Poetics of Space* that forests contain so many places that they become placeless — dystopic. The same could be said of clients for this project: there are so many clients that it becomes effectively clientless. It had five partners, four sponsors, thirteen donors, eighteen facilitators and sixty-four students. That adds up to eighty-four parties of interest. Each brought to the project a set of expectations for the project, and an agenda for their participation in its evolution. All, however, were totally committed to its participatory and collaborative process, and to working together so that all the major decisions affecting the project were arrived at by consensus.

The common goal of all of the "clients" was to take on the challenge of rehabilitating a debilitated trailer house in a way that would show how modern advances in materials and constructions methods, and new understandings of human responses to small spaces could be combined to constitute a new vision of the ordinary trailer house that would transform people's stereotyped view of the value and usefulness of this uniquely affordable American housing type in its high-density setting.

A second shared understanding among all the clients was that this was to be an educational project. Not just educational in the sense of exposing sixty-four students to the experience of hands-on construction and on-site design



*TrailerWrap: Interior with View*



*TrailerWrap: The Outside Room*

decision making, it was also to be educational in the sense of exposing the Mapleton Hollow community to a new process and new possibilities for their own homes. It also created a community within the university who began to see the possibilities inherent in architecture for service learning, for ethical and civic engagement, for enhancing diversity, and for creating cross-disciplinary understanding and practices. It finally educated a public: a community of observers who dropped by weekly to see TrailerWrap as it changed from a decrepit shell that seemed to have no real worth to a finished home that embedded and embodied a broad range of human, ecological, and architectural values.

The project was finally intended to serve as an example of how contemporary construction materials and techniques could be used to rehabilitate trailer houses that have become debilitated. The original impetus for the project arose out of a range of discussions in the University of Colorado's Center for Youth, Children and Environment. The center had been approached by the Tribal Council of the Pine Ridge Reservation and asked to assist them with two issues that were concerning the council. The first was the deteriorating condition of the trailer house stock on the reservation. Overcrowding, poor thermal performance, breakdown of materials with consequent indoor environmental impact and severe deterioration of the envelope were leading to abandonment of houses with no adequate replacement stock. The second was the need to find work and/or training opportunities for the post-high school youth on the reservation. The TrailerWrap project was originally designed as a considered response to these two issues. The project was originally conceived as a kit-of-parts that would help the reservation respond to the two problems in an integrated way. The major structural components for the reconstruction of trailers on the reservation would be prefabricated under controlled conditions at the college's CINC facility in Boulder. These would be shipped to the reservation on a flatbed car or trailer where teams of youth on the reservations would work on the reconstruction of the debilitated trailers under the federal YouthBuild program, creating jobs and training opportunities for this under-served population. They would also make the straw-bales which would be used to wrap the trailers to improve their thermal performance using materials grown on the reservation.

The original project on the Pine Ridge reservation was shelved for a range of reasons, and the university and its partners decided to pursue the project as an experiment in rehabilitation with deteriorating trailer housing stock that could be replicated by others in the urban and rural landscapes of Colorado and the west. The prototype project responds effectively and thoughtfully to these intentions and expectations of its many clients in many different ways. It will be sold as a market rate home on its lot in the Mapleton Hollow Trailer Park and its performance will be measured, tested and assessed over time.

The faculty members participating in the project were Michael Hughes, Peter Schneider, Willem van Vliet and Bruce Wrightsman. Campus Partners were the Institute for Ethical and Civic Engagement, the Office of the Campus Architect, the Office of Facilities Management, and the Office of the Vice Chancellor for Academic Affairs and Research, the Service Learning Program. Community partners were the Mapleton Homeowners Association and Thistle Community Housing.