

“Tiny” Row Houses: an Affordable Housing Strategy for California

A joint UC Santa Cruz-Cabrillo College Project

Chuck Mornard, Construction & Energy Management, Cabrillo College &
Ronnie D. Lipschutz College Eight, UCSC

Summary: UCSC and Cabrillo College are developing an educational training program to design, develop and build “Tiny Row Houses” (TRHs) in order to address the need for affordable housing in Northern California and, especially, the Monterey Bay Region. These structures can be built in groups of 3-6 on standard urban parcels. Students from both institutions, as well as Watsonville High School, are currently participating in this project. A budget and timeline are attached.

Rationale: As real estate and rental prices rise across the San Francisco and Monterey Bay regions, there is growing demand for affordable housing, especially for those being pushed out of their homes because their wages are too low for them to live in the communities where they work. Communities, governments and developers are seeking ways to address the shortage of affordable housing, but there are daunting obstacles standing in the way. In the affected regions, a primary obstacle is high land costs—in Santa Cruz, for example, land is frequently more valuable than the structures on it. In some places, there are significant building regulation barriers to new construction. Where new housing is being built, upper income markets are targeted because they generate greater profits to developers.

Solution: We propose an alternative strategy: construction of “tiny row houses” on parcels zoned for single houses or structures. Tiny row houses are fully-operational, fixed foundation, two-story structures of 500-700 square feet (12 ft. x 25 ft. footprint). These houses are ergonomically well-designed, energy-efficient and resource conserving, grid-interactive with smart systems, costing about \$50-75,000 (exclusive of land and labor, built with “sweat equity”). A typical land parcel (50 ft. x 100 ft.) can accommodate up to six of these structures, which would be sited relative to one another so as to share utilities and energy through a common renewable microgrid. Each unit would include two upstairs bedrooms, a downstairs living room (also usable as a bedroom), kitchen and 1-1/2 bathrooms. The units will be designed to ADA specifications and to fit with surrounding architecture and design. The goal is to use the prototype designs initially developed in the Tiny House partnership (see below) to create high performance, low cost, efficient and standardized modules that can function as small individual units, or be stacked and combined into townhouses sharing core utilities. TRHs will allow people of modest means to own an affordable house and to avoid temporary or long-term homelessness.

Context: UC Santa Cruz and Cabrillo College students, staff and faculty are collaborating to build a “Tiny House” for a collegiate competition sponsored by the Sacramento Municipal Utility District (SMUD). The Tiny House Movement is sweeping the country, but most such structures are designed with aesthetic trends in mind, rather than as low-cost housing. Our “Ecotopia House” is designed to be a high-quality practical structure that can be easily replicated and built through sweat equity. In addition to application of efficient building practices, we combine advanced construction techniques (e.g. zero-cut shell construction and modular designs that support multiple configurations) with proven techniques that support sustainable, comfortable, efficient, and affordable water use, heating, cooling, ventilation, energy use and on-site production, and urban food production. Ecotopia House will be mounted on a trailer for the SMUD competition but, ultimately, is intended as a model for permanent installation.

Design considerations: The TRH project constitutes “Phase II” of the UCSC-Cabrillo collaboration, and is intended to shift the current focus of tiny house design and development concepts away from decorative trends, focusing instead on scalable and socially-useful approaches to design and construction. The TRH project is oriented, in particular, to the opportunities and issues associated with designing and building high-performance, sustainable, low-cost infill housing that can be readily integrated into multiple neighborhoods across the region, sited in existing urban and suburban spaces that might otherwise remain vacant or unused. Moreover, no matter how good physical building designs and implementations may look on paper, they must include a critical component that ensures they will meet the needs of their target constituency and ensure stable, supportive, and vibrant mixed neighborhoods wherever these sites are located. An important feature of the TRH project is, therefore, its focus on a critical but often ignored component of infill housing: how to best integrate logistics, infrastructure, design, development, with sustained community participation and active social engagement. These best practices are already being applied in existing and proposed low-income housing developments in Portland and Seattle, and we will work directly with some of the principal planners and developers involved with these projects.

Opportunities: Project personnel (see below) have begun discussions to design, develop and build prototype TRH groupings. We are in conversation with the Veterans Transition Center (VTC) in Monterey, which seeks to develop low-cost housing at the Fort Ord Military Reservation in Seaside, California, for VTC’s homeless veteran constituency. Design support and construction labor will come from a Cabrillo educational program specifically developed to provide homeless veterans with a foundation in net-zero energy design strategies, sustainable design principles, and advanced best-practice construction skills. We are also discussing a partnership with the City of Watsonville, to design and advise in the construction of a block of TTHs on a downtown, city-owned building site. We anticipate that these two projects, if realized, will provide experience, skills and knowledge required to scale up the prototypes and disseminate TTHs around the Greater Bay Area.

Institutional participation: Cabrillo’s Construction and Energy Management program provides students with a basic background in the management of construction projects and continuing education for those already employed in the construction industry. Hands-on learning takes place at Cabrillo’s Soleri Green Technology Center in Watsonville (the second largest, agricultural, mostly Latino, and much poorer city in Santa Cruz County). The site includes an advanced building construction lab, is for faculty, students, and Monterey Bay area building and infrastructure experts. UCSC’s College Eight Sustainable Systems courses and research programs provide students from a broad range of disciplines with the skills required to analyze and understand today’s pressing environmental and social programs, and the hands-on experience that enables them to work in the Green Economy.

Personnel: These projects are being supervised by Cabrillo and UCSC faculty, with students from the two institutions as well as Watsonville High School also participating. Chuck Mornard, Chair of the Cabrillo Construction & Energy Management Department; Ronnie D. Lipschutz, Professor and Chair of Politics and Provost of College Eight at UC-Santa Cruz; Kevin W. Bell, MPA, Principle in Covergence Research, Instructor at College Eight, UCSC; Tela Favaloro, PhD in Electrical Engineering from the University of California, Santa Cruz and researcher with the Center for Sustainable Engineering and Power Systems; and Thomas Rettenwender, a licensed Architect, principal at the EcoLogic Design Lab and instructor at College Eight, UC-Santa Cruz.