



Micro Housing for Homeless and Disabled Veterans

NC STATE Design



MICRO HOUSING FOR HOMELESS AND DISABLED VETERANS

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The School of Architecture | NC State University College of Design
The North Carolina Coalition to End Homelessness

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NC STATE Design

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TABLE OF CONTENTS

02	INTRODUCTION The Importance of Home Project Process Project Goals
08	DEFINING THE PROBLEM Characteristics of Homelessness Homelessness by the Numbers Effects of Homelessness The Affordable Housing Gap Housing Support Programs
16	THE MICRO HOUSING SOLUTION Micro Houses in History Micro House Villages Micro Apartments
22	CASE STUDY RESEARCH Case Study Examples Managing a Micro House Village Funding a Micro House Village
36	DESIGNING MICRO HOUSING Human Centered Design Project Site and Space Planning Principles Building and Zoning Codes for Micro Housing Sustainability Strategies for Micro Housing
58	DEMONSTRATION PROJECTS Durham Projects Raleigh Projects Wendell Projects
92	CONCLUSIONS AND RECOMMENDATIONS
96	APPENDIX Service Learning Projects and NC State University Project Team Veterans and Micro House Villages Resources Interview Script
100	NOTES AND FIGURE CREDITS

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Thomas Barrie, AIA

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Thanks to all for our collective efforts to find sustainable solutions to veteran homelessness in North Carolina.

FOREWORD

Terry Allebaugh | North Carolina Coalition to End Homelessness

In late September 2017, I was invited to lunch by Jim Kinney, a long-time Durham friend and Navy veteran, to join him and Lewis Sadler, a Raleigh area contractor, to discuss ideas around housing for veterans experiencing homelessness. As the statewide Ending Veteran Homelessness Coordinator employed jointly by the North Carolina Coalition to End Homelessness and the North Carolina Department of Military and Veteran Affairs, such meetings or phone calls about housing veterans were routine. Many of the ideas were good, but tended to be long on vision and short on concrete steps and available resources. At our lunch, Lewis relayed his concern about recently reported increased rates of veteran suicide in our state and across the country. He also had been following the developing storyline about “tiny houses” as a possible solution for homelessness. With his experience as a contractor specializing in aging-in-place housing, he offered that he could use his resources and build a couple of tiny homes at no cost for a veteran or two in need of housing. Lewis reflected aloud, “Surely a home for a vulnerable veteran might provide a buffer to suicide.”

The lunch conversation led to a subsequent discussion with the members of Operation Home, a task force established under the auspices of the North Carolina Governor’s Working Group on Veterans, for which I provide lead staffing responsibilities. Charged with the development and implementation of strategies to address veteran homelessness, Operation Home engaged regularly with local communities. The most requested help from around the state was to improve housing availability for veterans experiencing homelessness, either by increased access to existing affordable housing and/or increased stock of affordable housing. We were close to starting a landlord incentive pilot program with state partners to increase access and thought a tiny home project might be a small step toward addressing the need for increased housing stock.

However, as a statewide task force, we are challenged to address solutions that can be implemented statewide, both in rural and urban settings. We decided to follow through with another suggestion made by Lewis and contact the College of Design at NC State University to explore the suitability of a student project to design small homes in clusters suitable for veterans moving out of homelessness. Finding the term “tiny houses” diminutive and faddish-sounding, we substituted the name “micro housing” to signify the dignity and self-respect we hoped one day would be experienced by veterans who might occupy them. Fortunately, Thomas Barrie and David Hill at the College of Design, not only found the project suitable, but were very excited about the project idea, both the tremendous value it would hold for the students and the potential impact it might have for veterans experiencing homelessness. The NC Coalition to End Homelessness sought and obtained private funding to pay for the class and publication materials. A graduate-level studio class was designed and conducted during the fall semester, 2018.

Members of the Operation Home Task Force, including the builder Lewis Sadler, were frequent guests, commentators, and advisers for the class, providing the “boots on the ground” perspectives for the students. Graduates of the Sanford School of Public Policy at Duke University provided a presentation to the NC State design students at the outset of the class that reported the findings of a Human-Centered Design project on veterans and housing they conducted during the summer of 2018. Their insights are noted later in this report.

What you are now holding now are results that occur when you bring together informed and talented masters-level design students under the tutelage of engaging and knowledgeable professors like Thomas Barrie and David Hill, and outside experts on issues around design, building, veterans, and homelessness. It is meant to be a “playbook”, something that we hope will serve both to inspire and guide people across the state who want to provide workable solutions to the challenge of veteran homelessness in North Carolina. It could be a church with available land, or a veteran group with available labor, or a local government with available publicly owned land, or a new collaboration of concerned citizens that are able to utilize the findings presented to chart a course toward helping to end veteran homelessness. Though the project’s focus has been to design micro housing and villages particularly suited to the needs of veterans who have experienced homelessness, many of the findings reported and designs depicted are applicable to other populations as well.

We have lost two veterans along the way who contributed their knowledge and expertise to this project: Dale Beatty, Co-founder of Purple Heart Homes, and Jim Prosser, former Assistant Secretary of the North Carolina Department of Military and Veteran Affairs. We dedicate this playbook to their memory and their continued inspiration.

INTRODUCTION

INTRODUCTION

Ten years ago, Harvard University's Joint Center for Housing Research stated in *The State of the Nation's Housing*:

"Thus far, there has been little national outcry about the fact that growing numbers of low- and middle-income families are spending half or more of their incomes on housing, and that so many children are living in unhealthy, unsafe conditions - or, worse yet, forced to make their way on the streets. The grim plight of many veterans has also failed to rally a groundswell of support to tackle these urgent issues."

Since then the national veteran homeless population has declined. However, veteran homelessness continues to be a state and national problem. A point-in-time count in 2018 revealed that, of more than one half million homeless nationally, over 38,000 were veterans. A North Carolina point-in-Time Count in 2018 found 801 homeless veterans in NC, 16% of which were in Durham and Wake Counties. That is 801 too many.

Even though there are many factors that may lead to homelessness, at its core is what is referred to as the affordable housing gap – the mismatch between incomes and housing costs. Affordable housing is often defined as not costing more than 30% of gross income. Cost-burdened households often pay a much higher percentage, and they are often one paycheck or family emergency away from eviction.¹ Veterans

face the same housing challenges that many do, but also distinct issues. Many veterans who experience homelessness, similar to national profiles, suffer from mental illness and substance abuse. Some also have Post-Traumatic Stress Disorders and related mental health conditions that are the result of their wartime service often performed during multiple deployments. Returning home, veterans have particular challenges reintegrating with their families and communities. Some also return home with physical handicaps. All deserve affordable housing where they can live with dignity.

One contemporary solution to veteran homelessness are micro house villages. Micro houses are small, complete, single dwellings that range from 150 to 400 square feet. Micro house villages are groupings of homes on a single property that allow residents to live independently while benefiting from supportive services. For veterans, they provide permanent, affordable homes that offer the privacy of single units but in communities of other veterans and with the specialized supportive services that many need, deserve, and are qualified for. Living with other veterans is an important component. The military is often described as a "second family" where selfless service to the nation and others provides a sense of community and shared purpose. After veterans leave the military, the loss of this community results in separation from an essential sense of self, and feelings of isolation in a culture that too often doesn't understand the sacrifices veterans have made in distant wars that few comprehend and some don't support.

The Micro Housing for Homeless and Disabled Veterans Project was a research and design project conducted in 2018-19 by the School of Architecture, NC State University and sponsored by the North Carolina Coalition to End Homelessness, to research and envision solutions to veteran homelessness. Eleven graduate students worked under the direction of professors Thomas Barrie, AIA and David Hill, FAIA. They conducted research on veteran homelessness and support services, documented precedents and best practices of micro house villages, engaged with various constituencies, and designed prototypical micro house villages for sites in Durham, Raleigh, and Wendell. An Advisory Committee comprising local homelessness, affordable housing, and design experts guided the project and provided input at critical points in the project process. National and local experts on affordable housing and micro house villages shared their projects and design approaches, and worked with students and faculty during visits to the campus. The program for the project, based on best practices, included housing units, a supportive services building, and associated landscape areas and amenities, and incorporated accessibility and other special needs of homeless and disabled veterans.

This publication is a record of the key findings of the research and design work of the project. Included are: the project process; the background and contributing factors of veteran homelessness; the case for micro house villages as an essential component for ending veteran homelessness; best practices of micro house villages nationwide; regulations affecting housing of this type; design, cost, and sustainability strategies; and student-designed examples of micro house village demonstration projects on sites in Durham, Raleigh, and Wendell.

THE IMPORTANCE OF HOME

Micro house villages are a response to the recognition that most desire to live in a place they can call their own and that provides a mix of security, privacy, and community. The desire

for home, to be at home, is a perennial human need. In the words of contemporary philosopher Thomas Moore:

“The need for home lies deep in the human heart: when our homeland is threatened we go into action to defend it, and when our family house is violated we are profoundly offended. We spend our lives trying to ‘make a home’ – building, buying, renting, borrowing houses, staying in the old family homestead or moving from house to house according to the winds of fate. Few things are more important than finding a home and working at it constantly to make it resonate with deep memories and fulfil deep longings.”²

Home is the center of our lives, the hub from which we may depart but always return to, a place that shelters our bodies and nurtures our souls. As a bulwark against the uncertainty of our lives, it serves as the hub of our personal world and its safety and stability are essential to our sense of wellbeing. The feeling of “being at home” describes a condition of ease and comfort, and so it is not unusual that people tell guests to make themselves “at home.” But home is not simply a physical container of our lives, but one we appropriate, personalize, and express ourselves through. We may rent or buy a house or housing unit, but it is through occupation and personalization that the house becomes a home. Inhabiting a home establishes an identity in the world, while communicating this self-definition to others. As Claire Cooper Marcus states, “A home fulfills many needs: a place of self-expression, a vessel of memories, a refuge from the outside world, a cocoon where we can feel nurtured and let down our guard.”³ Our homes are an important means of orientation, safety and ease, and individual identity and expression. To experience homelessness is to be disoriented, exposed, and anonymous, bereft of these essential physical and psychic needs. Those experiencing homelessness have no place to return to at the

end of the day, no address for job applications and mail, no neighbors to rely on, no location for their lives. Recognizing the disorientation and even terror of being homeless prompts us to care for those without homes, to insist that we all share the responsibility to house our fellow citizens. Housing, as has often been stated, is a basic human right. It is particularly disturbing that veterans, who sacrifice much in service of the common good, are one of the most vulnerable to suffer homelessness. We all share the responsibility for solving the veteran homeless problem. This project recognizes that even the humblest of dwellings, if designed with care and situated within a larger supportive community, can serve the needs of veterans experiencing homelessness. As simply stated in Henry Bishop and John Payne's popular nineteenth-century song "Home Sweet Home," "Be it ever so humble, there's no place like home!"

PROJECT PROCESS

The research and design phase of the project was conducted during fall semester of 2018. The semester began with students from the Sanford School of Public Policy at Duke University presenting a human centered design study they conducted with veterans who have experienced homelessness. The exchange afforded the NC State students at the outset of their class the opportunity to learn from the experiences of homeless veterans and to be informed how the values around pride, purpose, and community could guide and be an integral part of the design phase to follow. Students formed teams to research five areas critical to the project's subject: micro houses, micro apartments, micro house villages, off-site constructed and manufactured housing, and the design of sustainable built environments. They also designed prototypical micro houses and analyzed the physical characteristics, contexts, and zoning requirements for the demonstration project sites in Durham, Raleigh, and Wendell. The research also included visits to the project sites and Penny Lane, a micro house village currently under construction in Chatham County.

The outcomes of the preliminary research and design efforts were brought to the design workshop where students, faculty, and members of the project advisory committee brainstormed ideas for the design of the project sites. Following the design workshop, students worked individually on the site-planning and design of a micro house village on their chosen sites. Two experts, Davin Hong, architect and founder and principal of the Living Design Lab in Baltimore, and Omar Hakim, architect and design director of bcWorkshop, which has offices in Texas and Washington, DC, visited the School of Architecture. During their time on campus, they presented the micro house and micro house village projects they have designed and built in an open forum, worked one-on-one with students, and participated in group reviews. There were also a number of reviews during the semester where members of the advisory committee, housing experts, and local professionals reviewed the progress of the project designs. Students and faculty benefited from the real-world perspectives of outside experts, and developed and refined their projects according to the input they received. The design and research phase of the project concluded with a final review, recap, and discussion at the end of the semester.

PROJECT GOALS

1

To provide the students with the enriched educational experience of a real-world project as part of their education as future leaders in the profession.

2

To provide the public resources regarding the problem of veteran homelessness, and the need and means for sustainable solutions.

3

To provide The North Carolina Coalition to End Homelessness with viable models and strategies for accomplishing their goal of ending veteran homelessness in North Carolina, and a foundation for the professional design and development of the project



Davin Hong reviewing student research



David Maurer and students at design workshop



Final Presentation and Review

DEFINING THE PROBLEM

DEFINING THE PROBLEM

CHARACTERISTICS OF HOMELESSNESS

The United States has a significant population of people who are currently experiencing homelessness. While many communities have made significant gains, the country's treatment of its homeless populations has been described as cruel and inhumane.⁴ From the very first settlements, the promises of freedom and opportunity have been hampered by the steady growth of inequality. Historically, poverty has been a diverse experience, from New York City tenements to rural privations during the Great Depression. However, systemic racism, deinstitutionalization of the mentally ill, and the reworking of the welfare system in the 1990s, have increased the vulnerability of populations that are now most likely to experience homelessness.

Fundamentally, homelessness is a problem of income versus cost of housing. However, it is also a complex social matrix of a person's background, informal networks, education, employment, location, and luck, and its victims come from all ethnic, racial, and economic backgrounds. Homelessness affects all demographic groups and can be a one-time experience or a cyclical one. The only characteristic shared by people experiencing homelessness across the United States is persistent poverty. However, research illustrates disproportionate rates of homelessness by demographic.



Homelessness by household type

“African Americans are considerably overrepresented among the homeless population compared to the overall U.S. population. While accounting for 13 percent of the U.S. population, African Americans account for 40 percent of all people experiencing homelessness and 51 percent of people experiencing homelessness as members of families with children.”⁵

People with disabilities comprise 42.9% of the sheltered homeless population but only 15.7% of the total U.S. population.”⁶

HOMELESSNESS BY THE NUMBERS

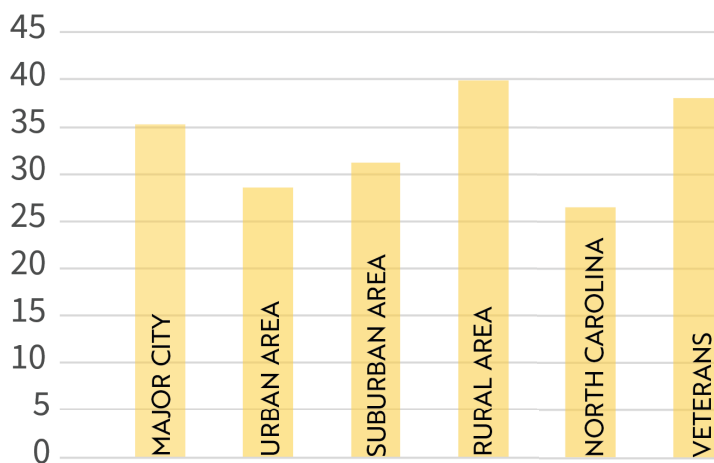
Each year the United States Department of Housing and Urban Development (HUD) publishes a report on the state of homelessness in America. The report includes a point-in-time count conducted in January, when the largest possible number of homeless individuals seek services to shelter from winter weather. According to HUD, a homeless person is anybody who lacks “a fixed, regular, and adequate nighttime residence.”⁷ According to the most recent report:

“On a single night in 2018, roughly 553,000 people were experiencing homelessness in the United States. About two-thirds (65%) were staying in

sheltered locations—emergency shelters or transitional housing programs—and about one-third (35%) were in unsheltered locations such as on the street, in abandoned buildings, or in other places not suitable for human habitation.

Homelessness increased (though modestly) for the second year in a row. The number of homeless people on a single night increased by 0.3 percent between 2017 and 2018. The increase reflects declines in the number of people staying in emergency shelters and transitional housing programs being offset by increases in the number of people staying in unsheltered locations. Between 2017 and 2018, the unsheltered population increased by two percent (or 4,300 people).”⁸

According to the same count, the homeless population in North Carolina in a single night was 9,268 people. In addition to the one-night counts, North Carolina and HUD collect annual counts of sheltered homeless populations. These counts are much higher since they account for each individual who spent a night in an emergency shelter or transitional housing over the course of the year, including some who experience only brief episodes of homelessness. The point-in-time counts underrepresent the number of people experiencing homelessness,



Unsheltered as a percentage of total homeless.

especially unsheltered people dispersed in rural areas. The count also does not capture families and individuals that are “doubled-up” or sheltering with family and friends. Doubled-up persons are more vulnerable to abuse due to their dependence on others for shelter, and unsheltered homeless populations are both more vulnerable and harder to count than sheltered populations. The point-in-time counts for the past two years document increases in the number of unsheltered people.⁹ According to the National Alliance to End Homelessness, the top reasons for avoiding shelters were overcrowding, bugs, rules, and full facilities.¹⁰

HOMELESSNESS AMONG VETERANS

In 2010, President Obama’s Opening Doors Initiative set a community-wide goal of eliminating veteran homelessness in five years. The initiative provided incentives for cities and communities to achieve benchmarked reductions in homelessness. The 2018 point-in-time count documented 38,000 homeless veterans nationally - 801 who resided in North Carolina. For the purposes of the count, HUD defines a veteran as, “any person who served on active duty in the armed forces of the United States. This includes Reserves and National Guard members who were called up to active duty.” According to the most recent report,

WHO IS HOMELESS?



North Carolina homeless population

“Between 2010 and 2018, the number of veterans experiencing homelessness was cut nearly in half (49%), a decline of 36,000 people since 2010.”¹¹ However, the shelter rate of homeless veterans is lower than the overall homeless rate, which means that more veterans experiencing homelessness are unsheltered and thus largely unconnected from services and social supports.

Veterans who experience homelessness can face a myriad of challenges, including mental and physical traumas from their service. The Department of Veterans Affairs administers several programs for veterans experiencing homelessness, but many veterans face impediments in receiving them. One of the largest barriers is the eligibility criteria of veteran support programs. Generally, the higher the level of support, the more restrictive the criteria. Veterans who were dishonorably discharged do not qualify for any of the Veterans Affairs programs.

The highest possible level of support for a homeless veteran is the HUD-VASH program, which combines a housing choice voucher (also referred to as a Section 8 Voucher) for rental assistance with clinical and supportive services at VA Medical Centers and community clinics. To qualify for the HUD-VASH program, candidates must have completed 24 months of service and received an honorable discharge.¹² Other supportive services provided by Veterans Affairs include VA contract beds, which are beds in emergency shelters that are reserved exclusively for veterans. The VA Grant and per Diem Program funds transitional housing solutions, while Supportive Services for Veteran Families (SSVF) is a rapid rehousing program that provides temporary rent support.

EFFECTS OF HOMELESSNESS

The effects of homelessness are well documented. This is particularly true for children, where the psychological impact of homelessness after only a short time spent as housing insecure is correlated with cognitive and developmental delays.¹³ Additionally, substance abuse is both a cause and effect of

homelessness. Finally, the criminalization of homelessness is on the rise in cities across America, which makes accessing services much more difficult. As a response to the well documented challenges and impacts of homelessness, the federal government and many homelessness organizations have switched to a Housing First model. Housing First considers housing a human right, and seeks to provide permanent and secure housing for individuals, with no restrictions. Concurrently, case management programs generally try to avoid evicting people in need of help from their programs, but instead practice harm reduction, which focuses on incremental positive change. This is in contrast to more regressive policies that required sobriety and/or employment before providing services, as a means to make people experiencing homelessness “earn” their housing. In addition to the human impacts of homelessness, there is also a large economic cost, incurred primarily through increased emergency room visits. Many studies have shown that providing permanent supportive housing for the chronically homeless is a cost-effective strategy for governments and communities, as the decreased medical expenses outweigh the increased housing costs.

THE AFFORDABLE HOUSING GAP

The causes of homelessness are as varied as the people whom it affects. At its core, homelessness in the United States is a mismatch between the number of Extremely Low Income (ELI) households, whose income is at or less than 30% of the Area Median Income (AMI), and units that are available and affordable to those households. The National Low-Income Housing Coalition documents the growing difference between households and units, known as the Affordable Housing Gap. As of the last report, there was a shortage of 7.4 million rental units available for ELI households.¹⁴ As cities gentrify and rents increase in previously affordable neighborhoods, fewer units serve the needs of low-income households. A steady loss of market rate affordable housing, especially in urban centers, has exacerbated this disparity.

Rental assistance programs, while not directly associated with homeless services, are critical to the prevention of homelessness. In fact, funding for affordable housing eclipses that for homelessness. Even though the funding of affordable housing is increasing, it is not keeping pace with inflation so the number of funded units continues to decrease. Additionally, housing is the only basic need that is not met through entitlement programs. Unlike SNAP and Medicaid, very few of the people who are eligible for housing support actually receive it.

HOUSING SUPPORT PROGRAMS

In the United States, there are many different programs, with a variety of strategies and philosophies regarding the best way to eliminate homelessness. These programs typically fall into one of five categories: emergency shelters, transitional housing, rapid rehousing, permanent supportive housing, and non-targeted rental assistance.

Emergency Shelters provide temporary, low-barrier shelter to individuals experiencing homelessness. Sheltered individuals are still counted as homeless in point-in-time counts. The quality of shelter facilities and services can vary dramatically. Research from the University of Pennsylvania delved into the backgrounds of families in emergency shelters, and found that:

“A substantial majority of homeless families stay in public shelters for relatively brief periods, exit, and do not return. Approximately 20 percent stay for long periods. A small but noteworthy proportion cycles in and out of shelters repeatedly. In general, families with long stays are no more likely than families with short stays to have intensive behavioral health treatment histories, to be disabled, or to be unemployed. Families with repeat stays have the highest rates of intensive behavioral health treatment, placement of children in foster care,

disability, and unemployment. The results suggest that policy and program factors, rather than family characteristics, are responsible for long shelter stays.”¹⁵

In North Carolina, there were 7,963 beds to serve the 9,268 people experiencing homelessness during the 2018 point-in-time count.¹⁶

Transitional Housing is a time-limited relief program, with most participants eligible for a maximum of two years of support. Tenants in transitional housing programs have no tenant rights, and are still considered to be homeless in point-in-time counts. A high amount of case management services are provided and it is not uncommon for transitional housing programs to have work or other requirements that tenants must satisfy in order to remain housed. Because there are requirements and conditions set for housing, traditional transitional housing is not consistent with a Housing First philosophy, which recommends the use of harm reduction strategies to help vulnerable populations move toward recovery instead of returning them to the streets. Because of their intensive staffing needs, transitional housing programs are also the most expensive way to provide supportive services. HUD has stopped funding transitional housing, and the Department of Veteran Affairs has shifted to more specific programs that offer short term medical support.

Rapid Rehousing started in 2010 as part of the Obama administration’s Opening Doors initiative, and as one solution to long housing choice voucher waitlists. Programs that employ the rapid rehousing model focus on moving families out of shelters and transitional housing and into rental units as quickly as possible to limit the trauma of temporary housing or shelter. Some families are able to use rapid rehousing to fill a gap before receiving a permanent voucher but, according to the 2016 Family Options Study, many families cycle back into emergency shelters soon after rental support ends.

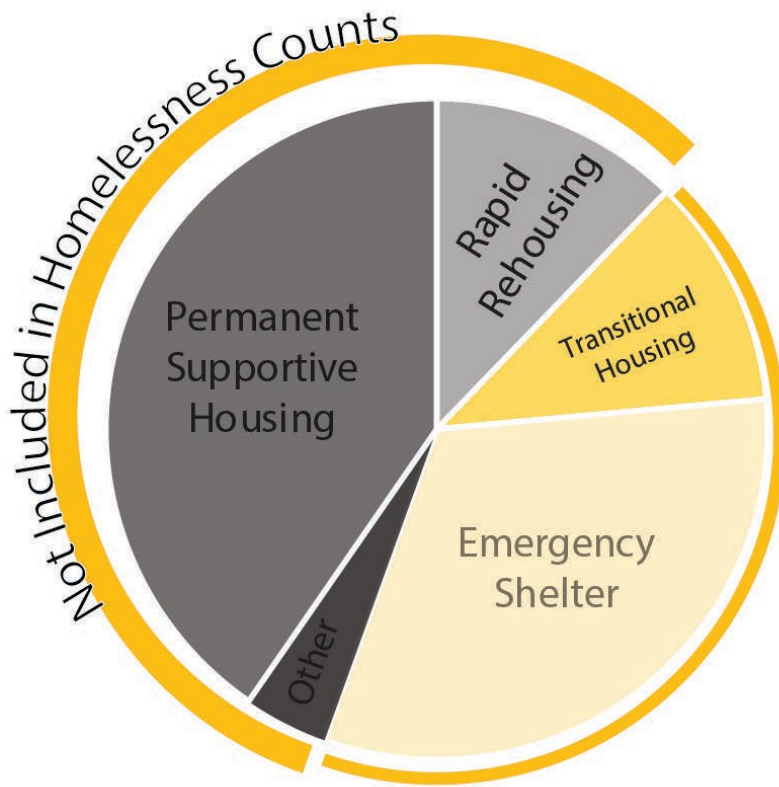
Permanent Supportive Housing is government rental assistance, usually a housing choice voucher that tenants can apply to any units or a project based unit, paired with supportive services. Households enrolled in permanent supportive housing are no longer considered homeless. Typically, only individuals with disabilities, or families with one member who is disabled, are eligible for permanent supportive housing.

Non-targeted Rental Assistance programs are administered by Public Housing Authorities, and help tenants by paying the portion of rent that the household is unable to pay. Non-targeted Rental Assistance support can either be project based, or tenant based. It is the most effective strategy for preventing homelessness, but has significant and growing waitlists. Vouchers help alleviate stress factors and childhood hunger, and have better long-term positive impacts on children than other interventions.¹⁷ Recipients of vouchers need to re-qualify each year and bureaucratic barriers are often a concern. There are also disincentives to increasing one’s income, since even a small rise can disqualify a household, without providing them the means necessary to afford an apartment without assistance. Project Based Rental Assistance is also funded by Public Housing Authorities, and works much the same way, except the funding remains with the unit instead of the tenant. Rent is typically set at 30% of income.

OTHER TYPES OF PROGRAMS

While housing support is most often associated with ending homelessness, there are other programs that also play critical roles in addressing the affordable housing gap. Low-Income Housing Tax Credits (LIHTC) are administered by Housing Finance Agencies in each state and provide funding through tax credits to developers of affordable housing. The LIHTC is a production subsidy from the Department of the Treasury which aims to lower rents by lowering the debt service carried by housing developers. When developers use LIHTCs, they commit to maintaining a certain

percentage of units affordable for people at a certain percentage of the Area Median Income (AMI). However, the production subsidy alone is often insufficient to create self-supporting housing developments, so other tax credit programs, and either tenant or project based housing choice vouchers, are often a part of the ongoing maintenance plans for these developments.



Distribution of Beds

THE MICRO HOUSING SOLUTION

THE MICRO HOUSING SOLUTION

Proponents of micro houses, often referred to as tiny houses, position them as antidotes to the economic burdens and environmental impacts of traditional housing. Some have added value statements regarding the “personal freedom” of micro homes, which have helped popularize and drive the national micro house movement. They have also been proposed as a model for affordable housing and a solution to homelessness. However, these claims have been hotly debated, especially their use as affordable housing. On one hand, advocates claim that the smaller footprint of micro houses and micro house villages are an economical and environmentally sound solution to homelessness. On the other hand, others argue that concentrating people experiencing homelessness into housing, that in some cases has been without electricity and plumbing, is equivalent to building a shantytown.¹⁸ Communities also worry that micro house villages will have negative impacts, including lower property values.

According to the 2015 Building Code, micro houses are dwellings 400 square feet or less. They can be located on the same lot as a single-family house, as in the case of accessory dwelling units, or on their own lots, as infill properties.¹⁹ Or, they can be in rural locations as “off grid” dwellings, independent of electric and water sources. In each case, zoning codes often dictate what form micro housing can take. Units on wheels, for example, are often not governed by the same building codes as homes with foundations.

The micro house has the potential to be an affordable solution in two different ways. First, the smaller footprint lowers the costs of construction. Research conducted by the Urban Land Institute indicates that micro housing could be a market rate solution for some middle-income households.²⁰ However, market rate units do not fully address the affordable housing gap, since they are still “out of reach” for Extremely Low-Income households. The second is that micro houses can leverage the lower construction cost, along with vouchers and LIHTC support, to keep rents within the affordability range for ELI households. This strategy takes advantage of the fact that the fair market value of micro housing is lower than for standard size units, decreasing the per voucher cost for local public housing authorities. In order to address the affordable housing gap, public housing authorities could reinvest the per-voucher savings to generate vouchers for more families.

MICRO HOUSES IN HISTORY

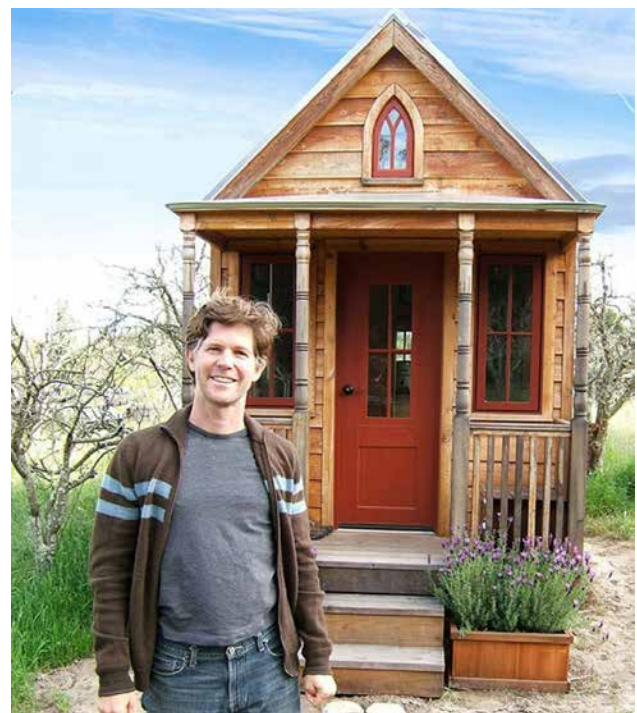
The micro house is not a new idea – for most of human history, the majority of families lived in what would now be considered a “tiny home.” One of the first examples of micro houses in the United States were the English Settler Cabins that were built in Jamestown, Virginia in the 17th century. These houses, which were less than 200 square feet, were built out of post and beam construction, and were often enlarged as families grew. The Cape Cod Cottage, developed by settlers in New England, were

typically under 300 square feet, but could also be expanded over time. In the early 19th century, Frontier Log Cabins were a response to new settlements that necessitated small and quickly constructed houses that could also be expanded. Perhaps the most famous micro house is Henry David Thoreau's self-built cabin on Walden Pond in Concord, Massachusetts. Thoreau carefully documented his building process to argue that by only providing basic needs the cabin freed him to pursue what he viewed as the important things in life. Since then, the micro house has inspired the national imagination.



Cape Cod Cottage

Historically, economic disadvantage has created versions of micro housing. Traditional Single Room Occupancy (SRO) and efficiency apartments would have qualified as versions of micro housing by today's standards. Manufactured, or mobile, homes emerged as an affordable housing solution during the Great Depression, and were popularized during World War II as worker housing for war time factories. According to one source, "throughout the 1990s, 66% of new affordable housing built was mobile homes,"²¹ and they remain an affordable option though an unstable one because their owners still need to pay rent to landowners. Tiny houses and what is often referred to as the tiny house movement, emerged in the early 21st century as a means to live simpler, cost-effective, and sustainable lives. Jay Schaffer, an early proponent, founded Tumbleweed Tiny House Company around this time and was one of the first to produce tiny houses for sale. During the economic downturn of 2008, the movement garnered more attention as a generation priced out of the traditional housing market looked for alternatives to housing-cost-burdened lives.



Jay Schaffer and early Tumbleweed House

MICRO HOUSE VILLAGES

Much like micro houses, micro house villages are not a new concept. An early example, dating from the early 1800s, was the Methodist Summer Camp community on Martha's Vineyard, Massachusetts – a summer revival camp that evolved into small wooden cottages clustered around courtyards. In the early 1900s, Southern California Bungalow Courts featured clusters of small homes surrounding an internal courtyard. Pasadena, for example, has many bungalow courts, the result of a city regulation at this time requiring that all multi-family housing must include a landscaped courtyard.²²

Pocket Neighborhoods are a contemporary version of bungalow courts where modest houses are clustered around common spaces. Popularized by books such as *Pocket Neighborhoods: Creating Small-scale Community in a Large-Scale World*,²³ they provide smaller houses paired with generous shared community spaces. There are also contemporary housing models that pair small units with community spaces and amenities. RV parks, though not specifically affordable, comprise groupings of small mobile homes with community and recreational facilities.



Pasadena Bungalow Court



Third Street Cottages, Langley, WA



Methodist Summer Camp Cottages, Martha's



Third Street Cottages, Langley, WA

Co-housing pairs small, self-sufficient units with the shared kitchens, dining and other community spaces valued by these quasi-intentional communities. Vacation villages feature rental micro houses for short-term stays. Micro house villages have also been proposed as disaster relief housing, group homes, or permanent supportive housing. Affordable micro house villages are often described as places that support groups with similar needs and experiences, and generally strive to promote a sense of community through shared common spaces and programmed events.

MICRO APARTMENTS

Micro apartments are a housing type that, like micro housing, aims to provide small, economical, and environmentally sustainable housing. They are related to traditional forms of affordable housing, such as efficiency apartments, where each unit has one space for sleeping and living and a minimal bathroom and kitchen. There is also a history of micro

apartments in modernism, where mass-produced housing solutions to address post-war shortages were proposed. One extant example is the Nagakin Capsule Tower in Japan, which comprises 140 prefabricated housing capsules, which were attached to a service core with only four bolts. The units were 172 square feet and construction was completed in just 30 days. A later adaptation of this typology is the Kasita House by Jeff Wilson. These units can be stacked into steel grids or stand alone, and can be adapted to either apartments or small businesses.

While much of the housing across the globe could be characterized as micro housing, this research looked specifically at purpose-built examples with units under 400 square feet. Successful examples of affordable micro apartments minimize square footage while maximizing usable and perceived space through efficient planning, adaptability, views, and natural light. Community spaces expand the living spaces of each unit and facilitate a sense of community. Because of the small footprint of

each unit, their dense amalgamation in apartment buildings, and their location near public transit, micro house apartments can be very energy efficient and sustainable. Richardson Apartments in San Francisco, designed by David Baker Architects, provides 120, approximately 300 square foot units of permanent supportive housing for tenants at risk of homelessness. Located near public transit, it includes on-site services, a bakery that provides resident job training, and many shared amenities, including a landscaped south-facing central courtyard, an urban agriculture green roof, and commercial spaces.



Richardson Apartments, San Francisco, CA David Baker Architects



Nagakin Capsule Tower, Tokyo, Japan

CASE STUDY RESEARCH

CASE STUDY RESEARCH

While micro house villages have been positioned as a national social and political movement, their implementation has been modest and local. That said, organizations across the country have created micro house villages to serve homeless populations and there are a number of built examples that can provide context and lessons learned. This research included phone interviews with eleven groups across the country who have implemented micro house villages as a solution to homelessness. Please note that the scope and specifics of projects can change. The questions covered in the interviews addressed funding, management, and populations served, and are included in the Appendix.

Micro house villages are particularly popular in the Pacific Northwest where the affordable housing gap is severe. In almost every case study the organization owns their own land, in most cases donated abandoned or unwanted lots. All are connected to city water, sewer, and utilities. Most claimed that access to public transportation was a major factor in their site selection. Some villages used either design competitions and personal networks to partner with architects. Others, such as A Tiny Home for Good in Syracuse, NY, and the Veterans Community Project in Kansas City, MO, designed the units themselves. None of the villages in the case studies allow residents to customize their homes. Units range from 128 square feet at The Cove at Dundee in Savannah, Georgia, to 596 square foot units planned for Casa Grande West developed by Build us H.O.P.E. in Phoenix, AZ. Quixote Village, and

Community First!, a micro house village in Austin, TX, are the only villages with common bathhouses, the rest have plumbing in the units. Many of the projects include ADA units or accessibility planning in the design of their micro houses. While some of the developments include mobile units, all also have housing on permanent foundations.

Build Us H.O.P.E | Singleton Community Services | Phoenix, Arizona

Build Us H.O.P.E. (Housing Opportunities Provided for Everyone), part of Singleton Community Services, a local community development corporation (CDC), has been providing affordable housing and housing for veterans at risk of homelessness in Phoenix, Arizona since 2017. The organization was founded after the state cut services for people with chronic disabilities, during a time when 65% of the homeless were veterans and there was very little available housing stock. They have seven micro house villages at various stages of planning. One, Casa Grande West, will have 243 units, on foundations and wheels. There will be five models, ranging from 160 to 596 square feet. Another, the Village on 35th, will have 22 micro house units.

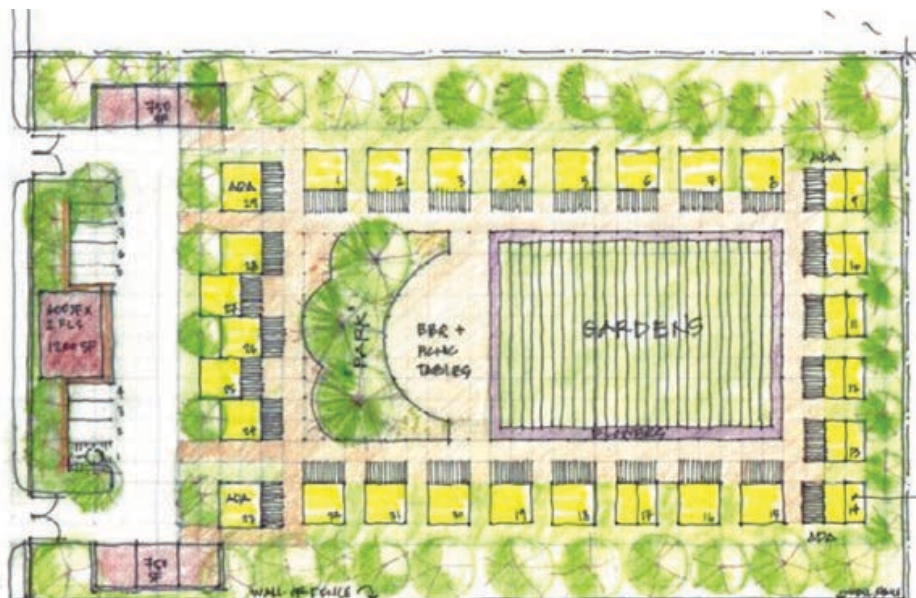
Build Us H.O.P.E. created a demonstration project, named Micro on Madison, as part of their efforts to change the Arizona building code to allow for micro house villages. They also found that knowledge about zoning codes and creating draft site plans, were essential to the permitting processes of their projects. Singleton Community Services will manage the villages using the same management protocols of their market-rate developments. They will contract

for case management services. The funding for the villages is from private investment, donations, and conventional loans. They are currently exploring government funding.

The Village on 13th is specifically dedicated to veterans. So far, three units have been completed, each 288 square feet. Applicants must have served in active duty, but discharge status is not considered. For this project, Build Us H.O.P.E. partnered with Arizona State University for solar and greywater strategies.



Build Us H.O.P.E., The Village on 13th



Site Plan: Build Us H.O.P.E., The Village on 35th

The Farm at Penny Lane | UNC's Center for Excellence in Community Mental Health | Chatham County, North Carolina

The Farm at Penny Lane is a micro house village in Chatham County, North Carolina that will serve residents with long term mental health challenges. The farm was incorporated as part of the University of North Carolina at Chapel Hill Center for Excellence in Community Mental Health (CECMH) in 2011. This new micro house village takes advantage of their zoning classification as a rehabilitation facility, which has no additional permitting or zoning requirements. The 40-acre site will have fifteen units arrayed around a central courtyard, a clubhouse with laundry and gym, an outdoor pavillion, a community garden, a therapy dog training center, and on-site services. A first prototypical 388-square-foot house has been built. It was tested by caregivers and potential clients, who stayed overnight and were surveyed to determine any improvements to future units. All will have a full bath and kitchen. The village will be built by volunteers.



Prototypical microhouses, The Farm at Penny Lane

CECMH will offer case management and services, with property management subcontracted to a separate group. As it grows, the community will have a resident selection team to help identify potential future residents and set resident requirements. Five of the units will be set aside for veterans. The construction cost for each unit has been predetermined so that rent can be set at \$250 a month, which is approximately 30% of social security income. The Farm is looking at potential partnerships with a neighboring housing development to offset the costs of sewer or septic infrastructure.



Site Concept: The Farm at Penny Lane, Chatham County, NC

Quixote Village | Community Frameworks and Panza | Olympia, Washington

Quixote Village in Olympia, Washington, created by Community Frameworks, a local non-profit affordable housing developer, offers permanent housing and a moderate level of support services for individuals who have experienced chronic homelessness. Quixote Village is unique because originally it was a homeless camp. Residents and local community organizers secured 2.17 acres owned by Thurston County and convinced Olympia's city council to pass an ordinance allowing single-room occupancy as a conditional use on the property, which is zoned for industrial use. Today, it includes thirty, 144 square foot units, a community center and a vegetable garden. Each unit has a half bath, and the village includes communal kitchen and shower facilities.

Quixote Village employs two full-time staff - a program manager, and a resident advocate, who works with each resident to identify appropriate services. Some services are provided, but residents are also directed to other programs when necessary. Residents must meet the HUD definition of chronic

homelessness and commit to avoiding alcohol and drugs. Drug tests are a part of intake, and residents can be evicted if there are repeated issues with alcohol or drug use in the community. The development cost over three million dollars. Funding came from a mix of state funding, community development block grants, and donations from local organizations and individuals. Community Frameworks is currently planning two more communities like Quixote Village, and national organizations use it as a model for tiny home communities across the United States.



Quixote Village, Olympia, WA

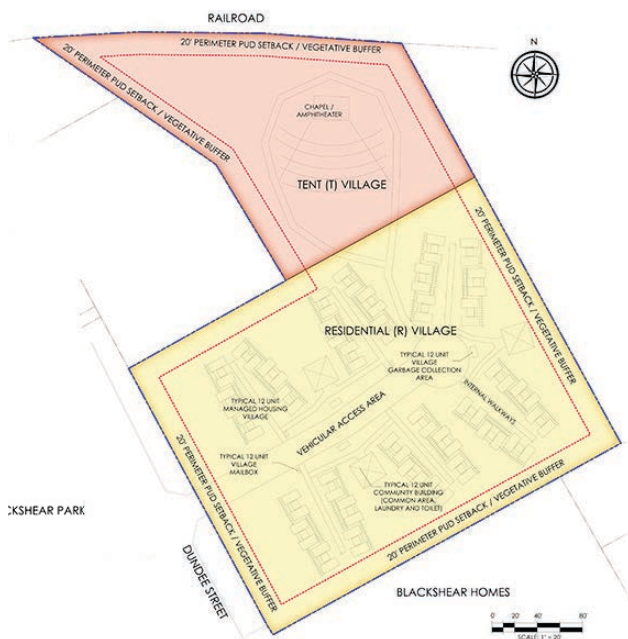


Original site concept: Quixote Village, Olympia, WA

The Cove at Dundee | Chatham-Savannah Authority for the Homeless | Savannah, GA

The Cove at Dundee in Savannah, Georgia, was created by the Chatham-Savannah Authority for the Homeless as a response to the large number of informal encampments in the city. Frustrated by the lack of affordable housing for those at risk of homelessness, they chose the micro house solution. The zoning for the site is Light Industrial but, because there was an informal homeless encampment on the site already, the organization received a variance allowing residential use. The site faces a pocket park and is on an existing bus line, though it had no utility infrastructure. The site will eventually contain 72, 128 square foot micro houses for homeless veterans, each with a water closet and a kitchen. Four will be ADA compliant. The kitchens have a hot plate instead of a stove and minimal storage. The units will be clustered around smaller courtyards in groups of 12 with three community “clubhouses” spread throughout the site which have group meeting spaces and bathrooms.

Property management will be resident-focused with residents employed for basic maintenance. CSAH will provide case management and select residents. There are no resident requirements other than having served in active duty. Housing First principles guide the planning and administration, since the community is designed to house many previous residents of the encampment. Currently, the lease has few regulations, since CSAH envisions most of the restrictions being framed by the residents. The total cost of the project is \$2.2 million, including in-kind donations of architectural and construction services. The project is entirely privately funded and the land is financed with 0% interest for the first eight years.



Site Plan: The Cove at Dundee, Savannah, GA



Prototypical Unit: The Cove at Dundee, Savannah, GA

Community First! Village | Mobile Loaves and Fishes | Austin Texas

Community First! Village is a micro house village located outside of Austin, Texas that serves chronically homeless individuals. The organization started as a food truck ministry in 1998, and started housing people in RVs in 2004, opening their current village in 2015. Because the village is located in the extra-territorial jurisdiction (ETJ) of Austin, it is exempt from Austin zoning rules and thus did not need special permits. The masterplan comprises a 51 acre campus, which includes micro houses, RVs, and tents on concrete foundations, and gardens, trails, bathhouses, and craft shops. Currently, over two hundred units are occupied. It was designed to integrate with the surrounding community by hosting outdoor movie nights and selling resident-made goods at a craft fair and farmers market. The micro houses were designed through a design competition and have half baths and small kitchenettes.



Community First! Village, Austin, Texas

Mobile Loaves and Fishes is a ministry with members that live on site and help with property maintenance. Residents also hold some of the janitorial/lawn work contracts. There are on site spaces for case management, and the ministry has agreements for case management, a medical clinic, and a drug and addiction therapy group who provide residential services. The project was privately funded with a total cost of \$14.5 million. Rent is between \$200 and \$450 based on the type and size of the unit.



Masterplan: Community First! Village, Austin, Texas

Veterans Village | Veterans Community Project | Kansas City

The Veterans Community Project (VCP) in Kansas City, Missouri is a community organization that began to include housing as part of its case management model in 2017. Located in an area zoned residential, the Veterans Village homes are arranged in clusters, with sidewalks leading from a cul-de-sac road. Ultimately there will be 50 units, each 240 square feet. The only veteran-led project in this study, VCP is also the only organization with plans to expand outside of their origin city, with other projects planned in Nashville and St. Louis.

Case management is a primary focus of VCP. The organization provides a food pantry, job training, financial assistance, clothing, free bus passes, and free legal services to veterans. Each case manager has eight residents on their caseload, with an individualized care plan for each focusing on life skills training. Residents provide some of the site maintenance. The housing model is transitional but is not time limited. Residents do not pay rent but are classified as “guests” of the organization and do not have any tenants’ rights. The village in Kansas City is privately funded, including the largest investment, a two million dollar sewer improvement project.



Veterans Village, Kansas City, Missouri



Veterans Village, Kansas City, Missouri



CASS Community, Detroit, Michigan

CASS Community Tiny Homes | CASS Community Social Services | Detroit, Michigan

The CASS Community project is a micro house village on two adjacent blocks in downtown Detroit, Michigan started in 2016. The properties were subdivided so that the 25 micro houses are on separate 30-foot by 100-foot lots. No special permitting was required, though CASS did need approval to subdivide. Parts were brownfields that needed to be remediated. The building designs for each of the micro houses were purchased online or provided pro-bono by local architects. The homes range from 250 to 400 square feet and include full bathrooms and kitchens.

CASS Community Social Services is both the case manager and the property manager. The micro houses are located a few blocks from their offices, which house supportive services and amenities. The rent is \$1 per square foot, including utilities. CASS offers classes on financial literacy and home ownership and, once residents have completed the programs, they

assume ownership of their houses, with the condition that they sell them back to CASS at a set rate to keep them affordable for new families. There are no specific resident qualifications, but CASS considers candidate income and independence before placing residents in units. The total cost of \$1.5 million, including the purchase of the land, was funded by donations from local companies and organizations, including a \$400,000 contribution from Ford.

A Tiny Home for Good | Syracuse, New York

A Tiny Home for Good (ATHFG) was founded by a case manager at a local shelter who was frustrated by the poor quality of housing and lack of long term stability for the chronically homeless. Unlike many of the other case studies, the eleven micro houses built since 2014 are on scattered lots. The permitting benefited from the residential zoning of some lots, though commercial and industrial zoned lots have also been used. The 300-square-foot individual units, initially designed by the founder with the assistance of a local architect, have evolved based on resident feedback. Each unit has a full bath and a kitchen, with a large front porch and vestibule space.

ATHFG holds all leases and is the property manager. They pay utilities for the first year before transferring them to the residents. In order to qualify, residents must be receiving case management and have a source of income. Veterans have a priority and rent is set at \$300, or 30% of monthly income, whichever is lower. Each unit cost \$28,500 and was primarily built with volunteer labor and donated supplies. The majority of the funding was from private donations; the rest from grant support and rent.



Tiny Home for Good, Syracuse, New York

Second Wind Cottages | Newfield, New York

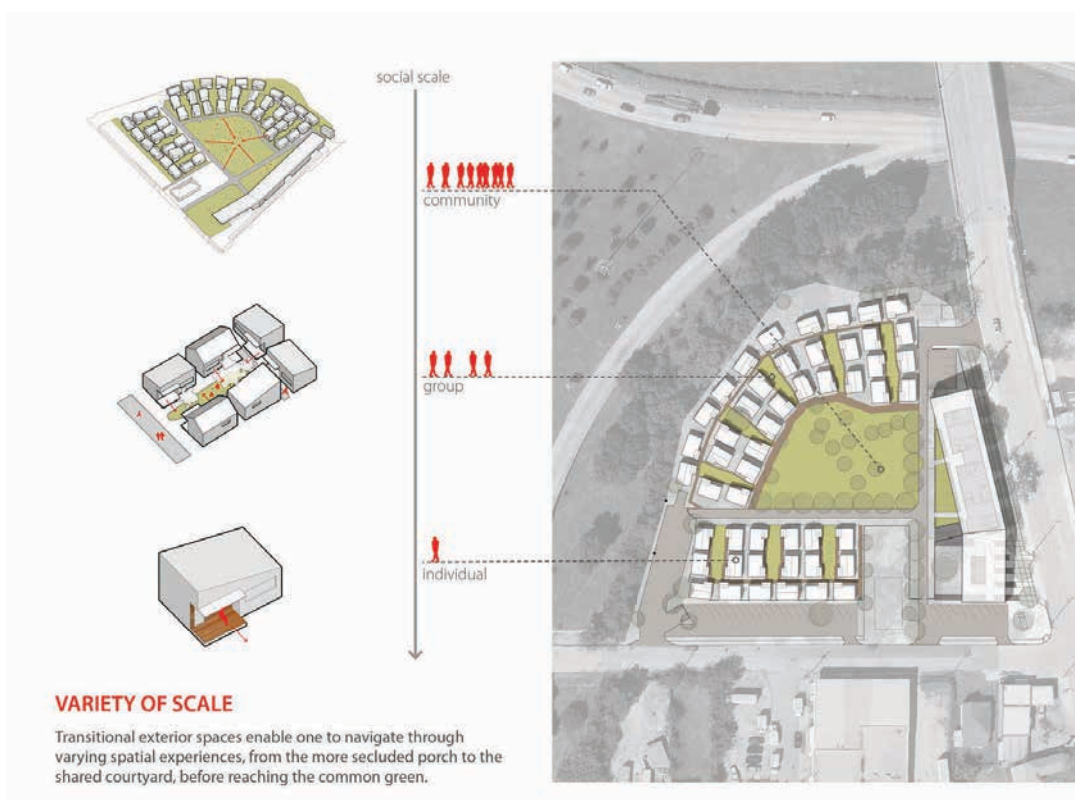
Second Wind Cottages is a micro house village for single men in Newfield, New York. Created in 2017 as long-term transitional housing, its goal was to provide more independence and community support than existing dormitory-style transitional housing. The site plan includes 18 cottages, oriented toward a central green and community building used for weekly dinners, movie nights, and other community events. The units were designed by a local architect and include kitchens and full baths. Second Wind Cottages is the property manager, and residents maintain the 7-acre property. Case management for each resident are arranged by a program manager, and are generally off site. Residents are required to abstain from drug and alcohol use. The land was donated for the project, and the homes were funded from private donations. Second Wind Cottages also holds project based vouchers to subsidize the rent.



Second Wind Cottages, Newfield, New York



Second Wind Cottages, Newfield, New York



Site Plan and Diagrams: Cottages at Hickory Crossing, Dallas, Texas

Cottages at Hickory Crossing | CitySquare, Dallas, Texas

The Cottages at Hickory Crossing was modeled on Katrina disaster relief housing, and built in Dallas in 2014 to serve chronically homeless individuals with criminal justice issues. It has fifty, 430 square foot houses, arranged in clusters around a large green and a 4,000-square foot community center. It's mixed use zoning allowed for a retail laundromat to be included. Each unit has a kitchen, bathroom and porch. The architects, bcWorkshop, designed the site to provide three scales of public space for flexible programming and resident interaction. The large green provides space for community events, smaller courtyards between the units are scaled for "group" interactions, and porches provide individual spaces and thresholds between the public and private spaces.

CitySquare Housing, a local CDC, is the developer and property manager, Case management services are provided by CitySquare at a comprehensive social services center located across the street. The project

cost \$6.8 million, \$2.5 million of which came from the city and county, and the rest from a foundation grant, private donors, and local organizations. Each month the operating cost of the project is about \$5,000 higher than total rent, a loss which is subsidized by income from other properties in CitySquare's portfolio.



Cottages at Hickory Crossing, Dallas, Texas

Emerald Village | Square One | Eugene, Oregon

Emerald Village was created as permanent supportive housing in Eugene, Oregon. Its founder, Andrew Heben, is the author of *Tent City Urbanism*, which documents unsheltered homelessness in America and proposes micro housing as a solution. The 1.1 acre site is close to downtown on an existing bus line, had city infrastructure, and was zoned for multifamily development. When completed, the site will comprise 22 houses, a community building, gardens, and a space dedicated to temporary events. Most were designed and built by architects, who also procured most of the construction materials. Some were panelized and built by a local contractor. Each unit has a kitchen and a full bathroom, with unit sizes ranging from 160 to 288 square feet.

Square One is the property manager. Case managers will have individual relationships with residents and spaces for their use in the main building. Residents are required to participate in site maintenance. The only eligibility qualification is verification that residents will be able to pay \$250 to \$350 a month in rent. Residents will have a share in the appreciation of the property, which will be paid when they move out. Residents are required to complete a

certain number of community hours maintaining the property. The property cost \$400,000. The total cost of the development will be around two million dollars, not including the value of in-kind design, labor and donated supplies. The village is funded through private donations and fundraising events.



Emerald Village, Eugene, Oregon



Site Concept: Emerald Village, Eugene, Oregon

Managing a Micro House Village

Most micro house villages provide property and case management services. Property management includes leases and maintenance – case management focuses on resident supportive services and programmed community activities. Property management is almost always located on site, while the locations for case management are more varied. For many villages, property management and case management are explicitly separated to avoid conflicts of interest and maintain confidentiality for residents who might disclose information to their care team that could jeopardize their lease. About half of the organizations surveyed were property managers, with agreements with case management groups. The other half were case management groups who contracted for property management services.

Property maintenance can include resident labor, though there is often flexibility based on their ability and availability. Several villages rely on volunteer labor, while others have contracts with professional companies that provide these services. Rental models include set fees, monthly payments as a percentage of income, or equity-building rent-to-own. Rents are often subsidized by either tenant or unit-based housing choice vouchers. The villages have a wide range of criteria for identifying and selecting residents. Some serve veterans specifically, or even exclusively. Some forbid alcohol or drugs and/or have community contracts for behavior which, in some cases, were created by the residents. Hickory Grove specifically mentions eviction prevention as part of their programming, claiming a 70% year-to-year retention rate.

For some projects, case management is handled by service providers located within walking distance of the site. Some have a resource officer who connects residents with off-site services. For others, case management is informally supervised and managed independently. There are often distinctions between services provided at urban, suburban and rural sites. Sites located close to city centers

often only provide basic on-site services, while villages located outside cities are more likely to have on-site programming and case management services.

Funding a Micro House Village

The majority of funding for affordable housing is from the United States Department of Housing and Urban Development, the Department of the Treasury, and Veterans Affairs. Local Public Housing Authorities and Continuums of Care²⁴ receive these funds and allocate them to projects. Project funding may also include Community Development Block Grants for land acquisition, and Low-Income Housing Tax Credits to lower initial investment costs. The latter are federal tax credits awarded by each state's Housing Finance Agency on a competitive basis with criteria outlined in Qualified Allocation Plans (QAPs). In North Carolina, many affordable housing projects depend on LIHTCs. Local Community Development Corporations (CDCs), which are private non-profits, also use these sources to develop affordable housing.

The funding for micro house villages has typically depended on diverse sources. Most of the organizations surveyed depended on private donations, fundraising, and corporate support. Some villages use project based vouchers to subsidize the rent in some or all of their units. As micro houses become more common, more public housing authorities around the country are allowing both project and tenant-based vouchers to be paired with micro units. However, in areas where micro houses are disqualified from receiving vouchers, the small size of the units often allow rents to be affordable.

Some micro house villages set rent at 30% of resident income, which is equivalent to the rental contribution of tenants with vouchers. Other villages have a fixed rate for their units, established by carefully considering affordability for the population it serves. However, the rent for micro house villages is not typically set to cover operating expenses and is often insufficient to support operations and

maintenance costs. In most cases, the cost of utilities, property maintenance, property taxes, and insurance exceeds the amount of rental income. Vouchers are an important funding component that can help keep micro house villages solvent. Some villages subsidize their operating costs with income from profitable properties in their housing portfolios. Others rely on consistent private donations.

The cost to build a micro house is dependent on many factors, including material costs and the location of the project. Most of the case studies were located on donated or deeply discounted land, often with existing infrastructure. For many developments, architects donated design services and contractors donated labor and materials. Organizations seeking to build micro house villages find ways to offset the costs for materials, labor, fixtures and site through donations and strategic partnerships.

Successful projects also take into account material and labor cost escalations over the course of the project and include contingencies to buffer unexpected costs. Final project costs, including land acquisition, planning and design, permitting, and construction will depend on the professionally-designed plans for specific projects. The pricing percentages outlined in the diagram below are based on one of the student’s demonstration projects. As such, it serves to provide general parameters and guidelines regarding the costs of units for micro house villages.

FUNDING SOURCES for micro house villages

LOCAL PHILANTHROPY AND FUNDRAISING

Most micro house villages significantly depend on private sources of funding.

MUNICIPAL SUPPORT

Through waiving of impact fees, density bonuses, and/or donated or reduced-price land.

CORPORATE SUPPORT

For example, Home Depot offers substantial grants for the development of affordable housing by qualified non-profits.

PROFESSIONAL SUPPORT

Through donated services, materials, or labor.

USDA RURAL ASSISTANCE FUNDS

Provides low-interest loans and grants.

THE HOME INVESTMENT PARTNERSHIP PROGRAM

Provides support for low-income housing developments.

COMMUNITY DEVELOPMENT BLOCK GRANTS

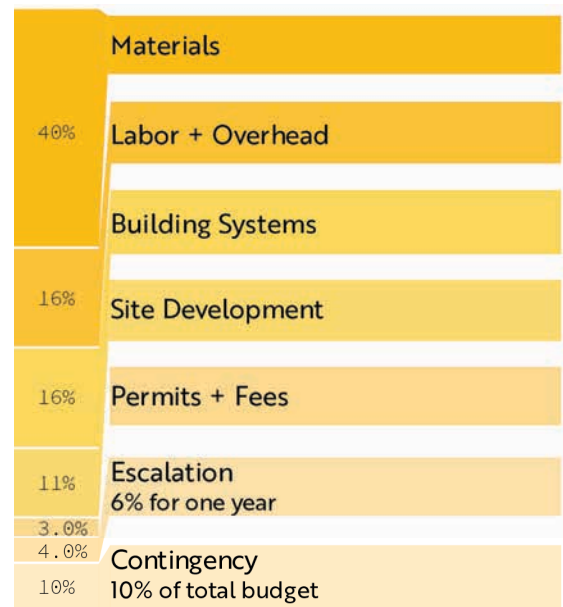
for land acquisition.

LOW INCOME HOUSING TAX CREDITS

for project costs.

OTHER TAX CREDIT PROGRAMS

For renewable energy or historic preservation.



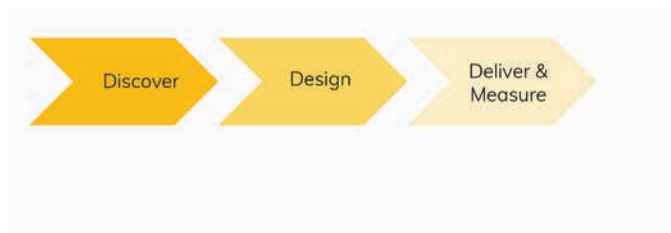
Construction costs for micro houses

DESIGNING MICRO HOUSING

DESIGNING MICRO HOUSING

HUMAN CENTERED DESIGN PROJECT

In the summer of 2018, three graduates of the masters' program at the Sanford School of Public Policy at Duke University – Sarah Thelen, Jessica Jenkins, and Mark Kubaczyk – undertook a Human-Centered Design (HCD) study to determine what current and formerly homeless veterans want and need from a housing intervention. Human-Centered Design starts with a deep understanding of the people utilizing the intervention and then using their expressed needs and desires to co-design a solution. The process explores the emotional, physical, and social experience of the intended beneficiaries of a policy or intervention. HCD is a framework for thinking and uses a repetitive three-phase process, which is discover, design, and deliver and measure. Once measurements are completed in the third phase, shortfalls or surprises are researched and the process of discovery and design begins again.



The Duke trio tackled the “Discover” phase of the process, utilizing lessons learned from their classes on Human-Centered Design taught by Adjunct Professor Tom Allin, and Housing Policy and Implementation taught by Adjunct Professor Terry Allebaugh. They conducted in-depth personal interviews with 25 veterans, typically in homes of veterans who previously experienced homelessness or in a shelter for those currently experiencing homelessness. The conversations were unscripted, but the interviewers came with some baseline questions such as:

- What does “home” mean to you?
- Is your current housing satisfactory to you? What makes it so or not so? If you could change one thing about it, what would it be?
- What are the important elements of a home? What is really needed? What is just nice to have? Can you draw it for us?
- When you think of your home, either what you have or what you wished you could have, how much space do you think you need or would like?

The long, ethnographic interviews revealed key themes of community, structure, and purpose. The students distilled their findings into a paper and PowerPoint presentation, the entirety which can be found on the North Carolina Coalition to End Homelessness website. The following are some of their key discoveries:

Home is a personalized reflection of self.

Home is a place where veterans regain their pride. From the moment they enlist, the military trains service members to be proud. Failure is not an option. When service members exit the military and fail to find or keep a home, they consider it a personal failure and a loss of pride.

Maximize purposefulness, minimize feelings of isolation.

The transition from the military to the civilian world is difficult. Service members had their “three hots and a cot” - their meals and housing - provided for, often since they were 18 years old. They were told where to go, what to do, what to wear, and how to behave in a very insular society. When all of that familiarity and structure disappears, the transition can be harsh, unforgiving, and bewildering.

Personal space is important, but veterans need a community where they do not have to explain themselves.

The housing solution needs to build in personal space, but still foster community. Ideas for community events in community spaces included: group exercise, barbecues, group therapy sessions, and welcome and farewell gatherings. Pocket communities situated around a green space, community center or picnic shelter were suggested ways to create community while preserving individual space.

Simplicity and normalcy are paramount.

No one is looking for an ornate home; just a safe, quiet place to put their lives back together. Making each unit look similar is helpful from a

design standpoint, and is something veterans who have lived in base housing or barracks are used to. We heard from several: “Just normal stuff.” “It doesn’t need to be fancy.” “Make it like base housing.”

Safety and security are very important.

The first word we heard from every single participant in our study when asked what home meant for them was either “safe” or “secure.” The units need to have good locks on doors and windows and other physical trappings of security and safety.

Storage solutions are required.

After not having a home, study participants wanted storage to put the few possessions they have in their place. Many were accustomed to a tidy existence in the military. Homelessness destroys that. Storage helps to make a home a more personalized reflection of who they are now, instead of who they used to be during homelessness. A tidy space of their own starts the rebuilding of pride.

Micro houses should be soundproofed.

Study participants wanted quiet homes that don’t share walls. Ideally, the design should include soundproofed walls and situate units far enough apart so outside noises do not penetrate easily.

Veterans desire creature comforts too.

The suggestions listed below include details that would make the units more comfortable and user-friendly:

- Fan and light in the bathroom on different switches (noise concerns)
- A secure place to put clothes (security, pride)
- Storage for cleaning and cooking supplies (security, pride)

- Bedroom that is somewhat partitioned from other parts of the house (security, pride)
- Furnished (practical, coming with very little)
- A mailbox (important for those trying to find work, get VA services sorted out)
- Yard or space around the front and sides of the units for both a sense of space and security
- Close to medical care, grocery store, church, gas station and mechanic (practical)
- Multi-purpose room or community center where group activities can be held (community)

SITE AND SPACE PLANNING PRINCIPLES

Programming the Project

The programming of a project is typically determined by site, functional needs, and budget. However, it should not be limited to these but should also incorporate the best practices of successful projects regarding units per acre, site amenities, security and accessibility, and other considerations. Additionally, as much as is feasible it should be a public process where professionals, owner, clients, and community representatives collaboratively outline the scope and organization of the project through modeling a series of alternatives.

The student demonstration projects incorporated the project case studies to develop the programs for their projects. The houses typically included small kitchens with adjacent dining and living areas, a full bath, a separate bedroom or open sleeping area, and generous storage. Porches were included as a cost-effective means to add living spaces and as important thresholds between public and private. All projects included a community house, the programs of which included kitchen and dining areas, offices for case management, classrooms, spaces for job training or community businesses, guest rooms, galleries, mailrooms, laundries, or gyms. The programming of outdoor spaces included some of the following: gardens, ponds, kitchen gardens, amphitheaters, gathering spaces, dog parks, sports fields or courts, pavilions, fire pits, meditation spaces, labyrinths, and natural areas and paths. Roads, parking, and pathways to the houses, as well as fire truck access requirements, were also incorporated. Some projects recommended mixed uses as the means of employment for residents, income for the community, or a place where the residents and the surrounding community might interact.

Site and Space Planning Principles

Micro housing and micro house villages, especially ones designed for homeless and disabled veterans, present unique design challenges. Micro houses, which typically range in size from 150 to 400 square feet, need to be designed to be spatially rich, programmatically efficient, and adaptable to special physical and emotional needs, within the limitations of their compact plans. Because of their small size, they should maximize natural lighting, cross-ventilation, and inside-outside relationships. Micro house villages for homeless and disabled veterans comprise not only housing, but also restorative and community-enhancing buildings, places, and elements on their sites and adaptable spaces for the on-site services many veterans need. Consequently, they should balance the scale, character, and uses of their surrounding contexts with issues of security, privacy, community, and the special services they provide. Site planning decisions need to consider minimizing environmental impact, maximizing the character of the site, site drainage and stormwater remediation, the capacity of shared spaces to foster community, and the special demands of security and privacy. Because micro houses need to be affordable to build, rent, and maintain, they also need to employ conventional materials and assemblies and incorporate sustainable design strategies, without sacrificing the beauty, livability, and generous quality of life they aim to supply.





Community Courtyard: Austin Corriher

MICRO HOUSES

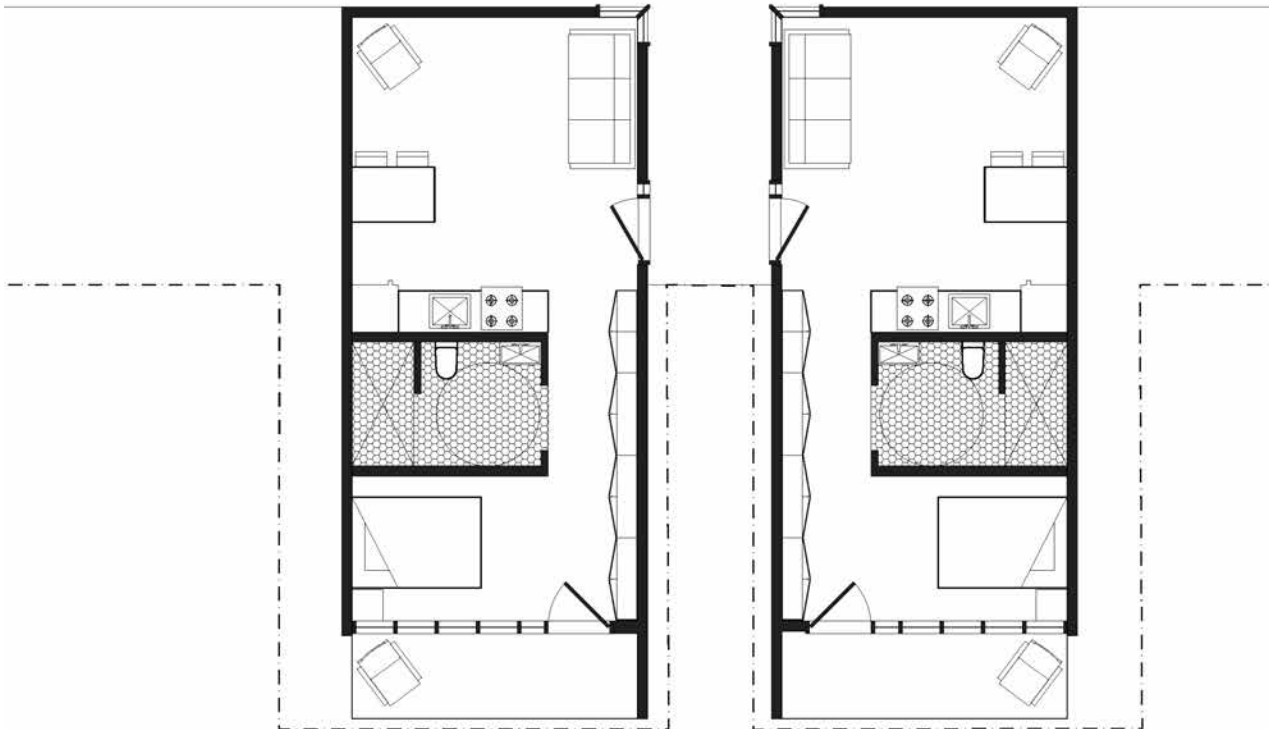
With these general principles in mind, the following are specific recommendations for the design of micro houses and micro house villages.



Unit Plan: Justin McNair

Space Efficiency

Space efficiency begins with minimizing or eliminating circulation. As much as possible, movement through the house should be through living spaces not corridors. Minimum sizes for bedrooms, bathrooms, kitchens, and dining and living areas, should be established for each project. Building codes can vary from county to county but, generally, kitchens should be galley types, which avoid the awkward and unusable corners of u-shaped kitchens. Kitchens should have a minimum amount of linear countertop for food preparation, and carefully planned storage areas with a mix of open and closed shelving, pull-out drawers, and innovative storage systems. Plumbing should utilize shared wet walls, and mechanical systems should be efficiently located to reduce the amount of supply and distribution lines.



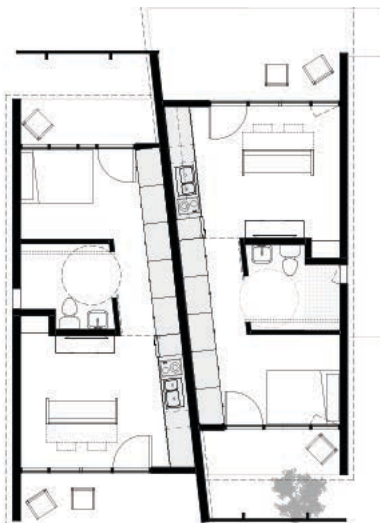
Unit Plans: Scott Needham



Unit Interior: Austin Corriher

Adaptability

Adaptable houses accommodate multiple uses for spaces and the ability to change for guests and aging-in-place. Living areas, in particular, can have retractable tables for dining or murphy-style beds for sleeping. Kitchens and baths can be designed so that they are adaptable to comply with ADA. Paired units can be designed so that they can be connected to create a larger unit.



Paired Unit Plans: Amelia Murphy

Universal Design

Universal design incorporates design elements that allow physically handicapped residents, or their guests, to use their unit without restrictions. This includes kitchens where residents in wheelchairs have countertops with knee space, reachable cabinets, or ones that telescope for easy access, and cabinet pulls that accommodate restricted arm and hand movements. Appliances should have controls that use a minimum of twisting and locking, cookers that have safety features if they are inadvertently left on, and accessible refrigerators that allow for efficient food storage and removal. Bathrooms have doors sized for wheelchair access, a five-foot turning radius inside, and roll-in showers with ADA compliant controls. Bedrooms also have wheelchair sized doors and layouts that allow for easy wheelchair access. Storage areas and retractable furniture should also accommodate easy use for one in a wheelchair, or with other hand or motion limitations. Porches and entries should similarly accommodate residents and guests in wheelchairs, with walkers, or who have other mobility restrictions, to enter and move easily.

Privacy and Security

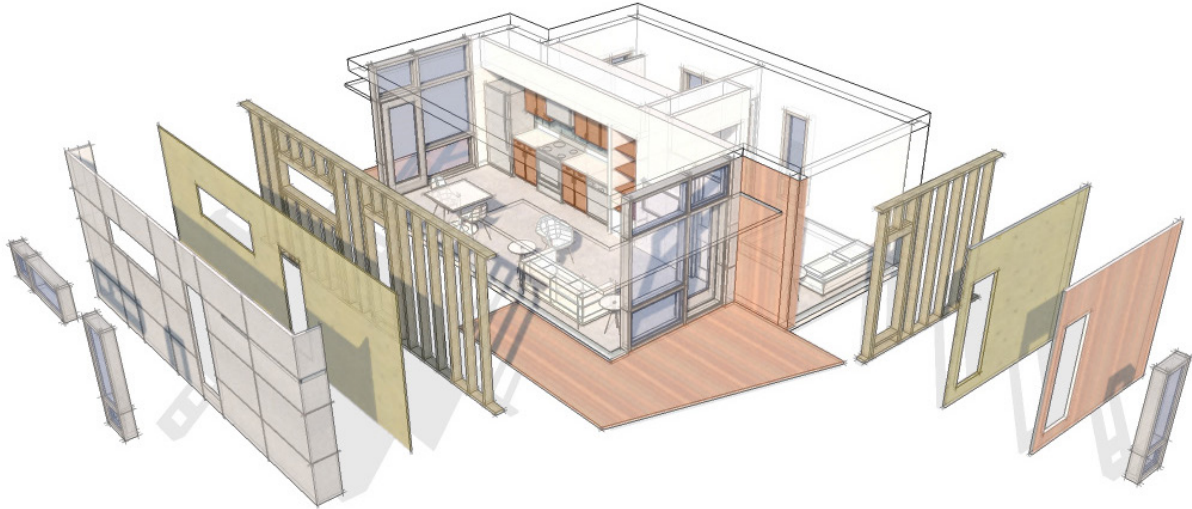
Small units in densely planned clusters must balance the benefits of natural light, ventilation, and access to the outside with the privacy that convivial homes need to provide. Windows and doors should be strategically located so that residents can look outside and open windows and doors without sacrificing their privacy. Generally, living areas can be the most open – sleeping areas and bathrooms should be the most private. House orientations can minimize visual access from the outside. Exterior privacy walls allow for private outside access. Clerestory windows located above sight lines provide light and ventilation without sacrificing privacy. Visual privacy elicits feelings of safety, but so do in-between spaces such as entry courts with few adjacent houses, porches, other design means to avoid living spaces and entries that are next to public ways.



Section showing clerestory windows: Amelia Murphy



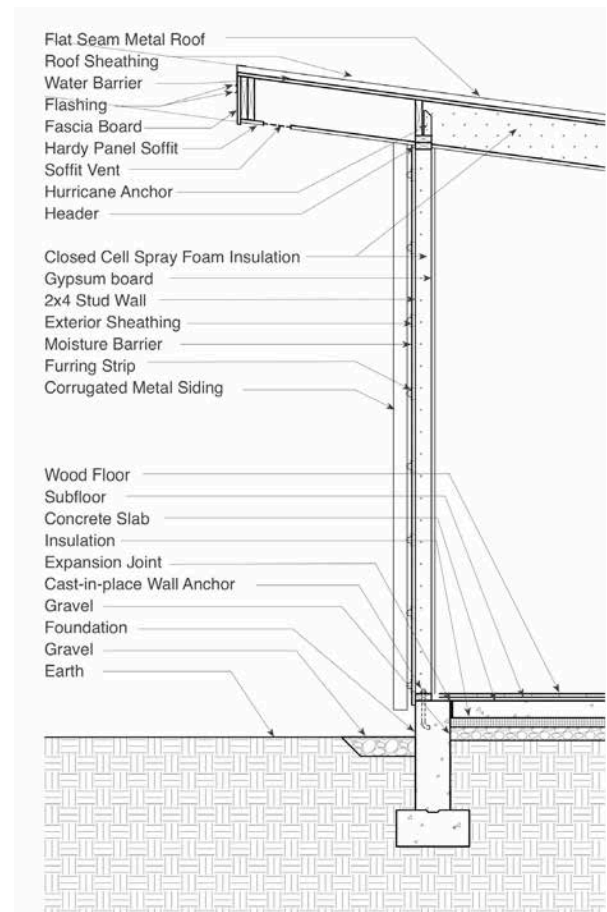
Bedroom with private garden: Amelia Murphy



Assembly system of a micro house: Nicole Simeonsson

Conventional Materials and Assemblies

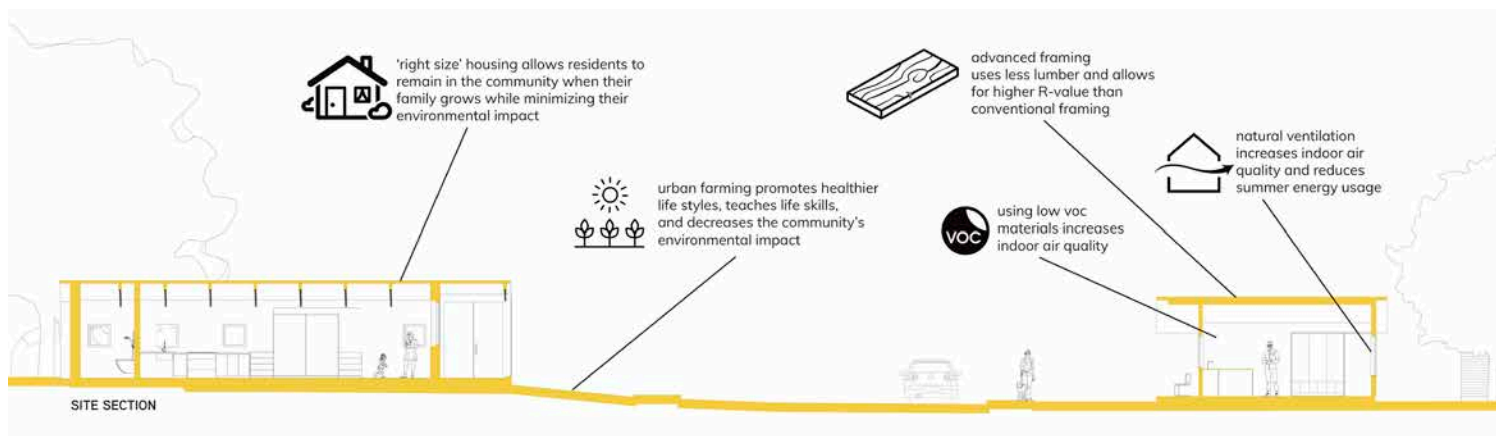
The affordability and cost-effective maintenance of houses can be realized by using materials that are mass-produced and readily available. Conventional building assemblies facilitate cost-effective construction, either by professionals who prefer construction methods that can dependably priced and executed, or volunteers, who have limited skills or training. Materials and finishes should be chosen that have proven to be cost-effective and low maintenance. Houses should use standard sized windows and doors with a minimum of different sizes. The use of conventional materials and assemblies, however, does not mean that the design of the units must be conventional. The special space and site planning demands of micro house villages demand innovative design solutions that use ordinary materials and assemblies in extraordinary ways. For example, just two or three different standard sizes of windows can be arranged and mullied in a variety of combinations. Good design not only satisfies program and budget, but also provides places that enrich one's life, and are emotionally and physically restorative and uplifting.

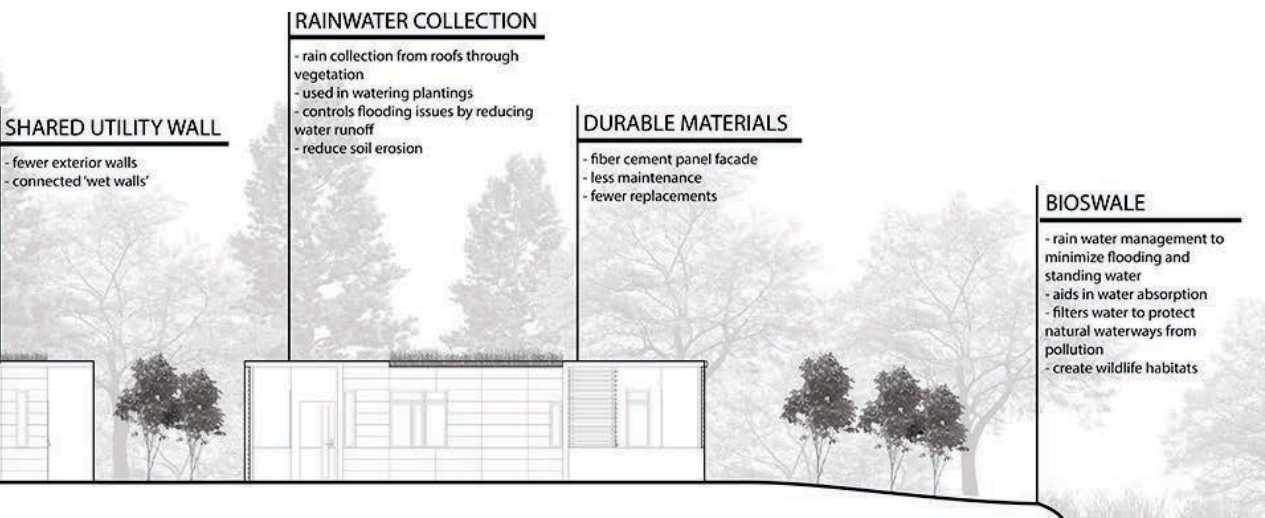


Typical wall section: Scott Needham

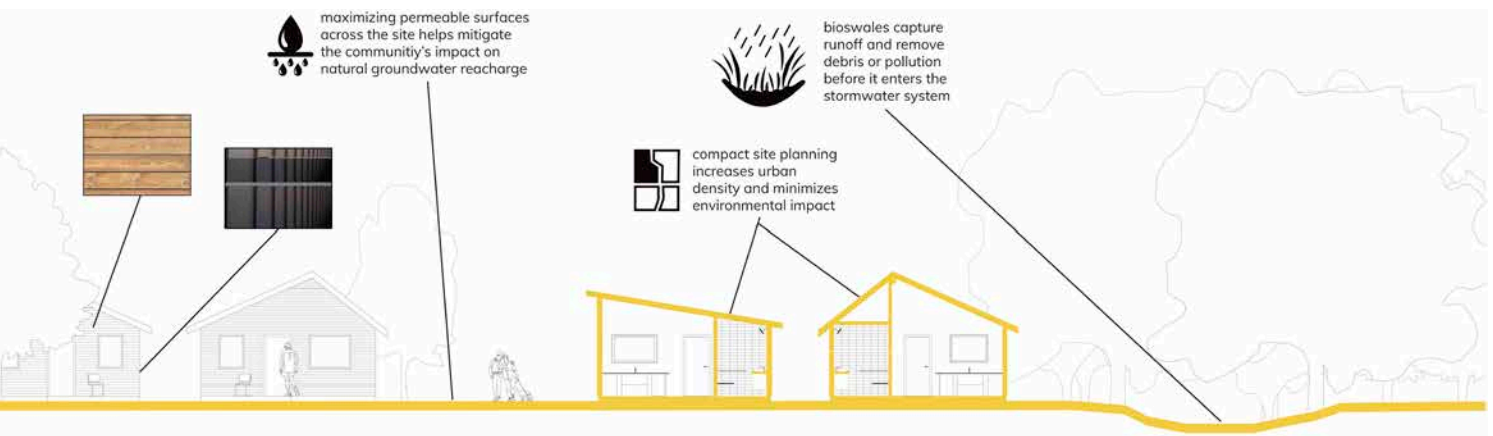
Energy and Sustainability

Energy efficient and sustainable design practices can minimize energy, infrastructure, and maintenance costs over the life of the project. This may include investing in one-time costs that pay for themselves over time. However, sustainable practices should be employed not only for budget reasons, but because it is everyone's responsibility to create a more sustainable future. To these ends, guidelines for sustainable strategies are included in the section that follows.





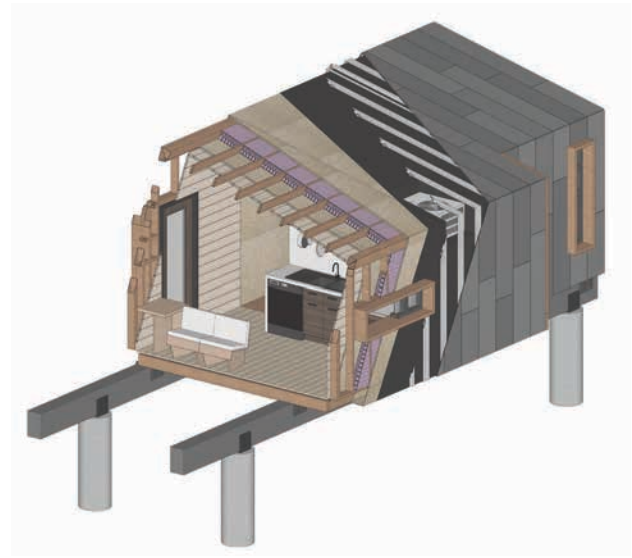
Sustainable Site Strategies: Elenor Methven



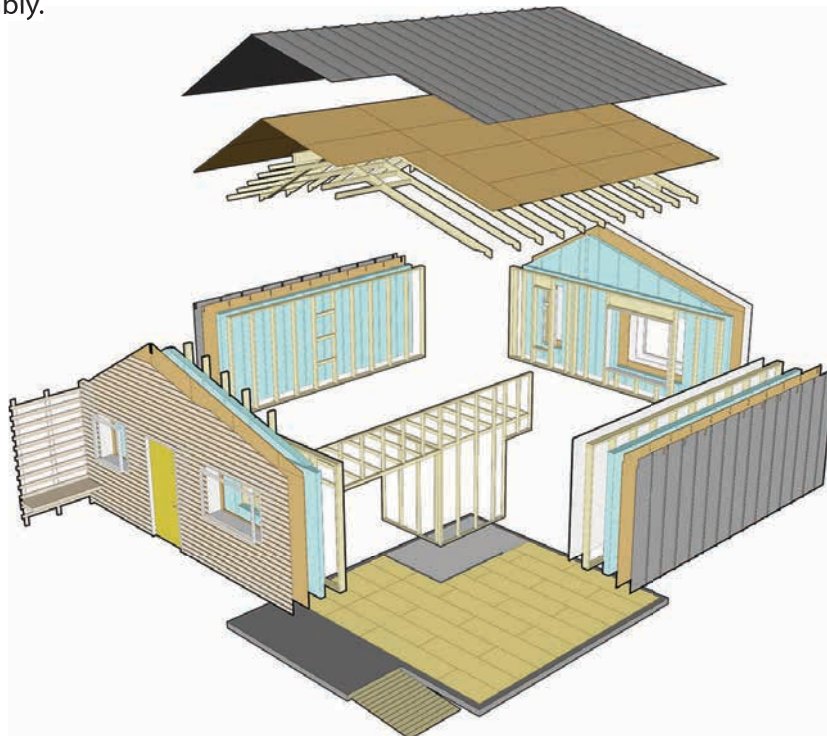
Sustainable Site Strategies: Ross Davidson

Panelized, Modular or Off-Site Construction

The construction of multiple units, whether by professionals or volunteers, provides opportunities for efficient, repeatable construction methods. Units should be designed so that basic plans, orientations, and forms can be adapted to conform to particular site conditions and for a variety of units. On-site construction can effectively utilize assembly-line type construction methods, where teams are tasked with constructing specific building elements that allow for efficient construction processes. This might include panelized systems, where teams are organized to construct composite enclosure systems in a centralized area, which can be easily transported to each housing unit. Plumbing and mechanical systems should be designed so that the work of these trades can be streamlined. Off-site construction of panelized walls, roof and enclosure systems, and modular building elements, can decrease construction times and even costs, because they are constructed in controlled and predictable environments. However, they need to be designed for easy and cost-efficient transport and uncomplicated site assembly.



Modular Unit: Ryan Kilgannon

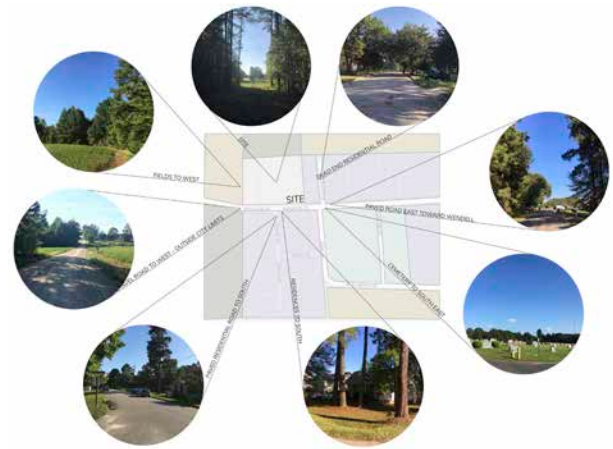


Advanced Framing System: Ross Davidson

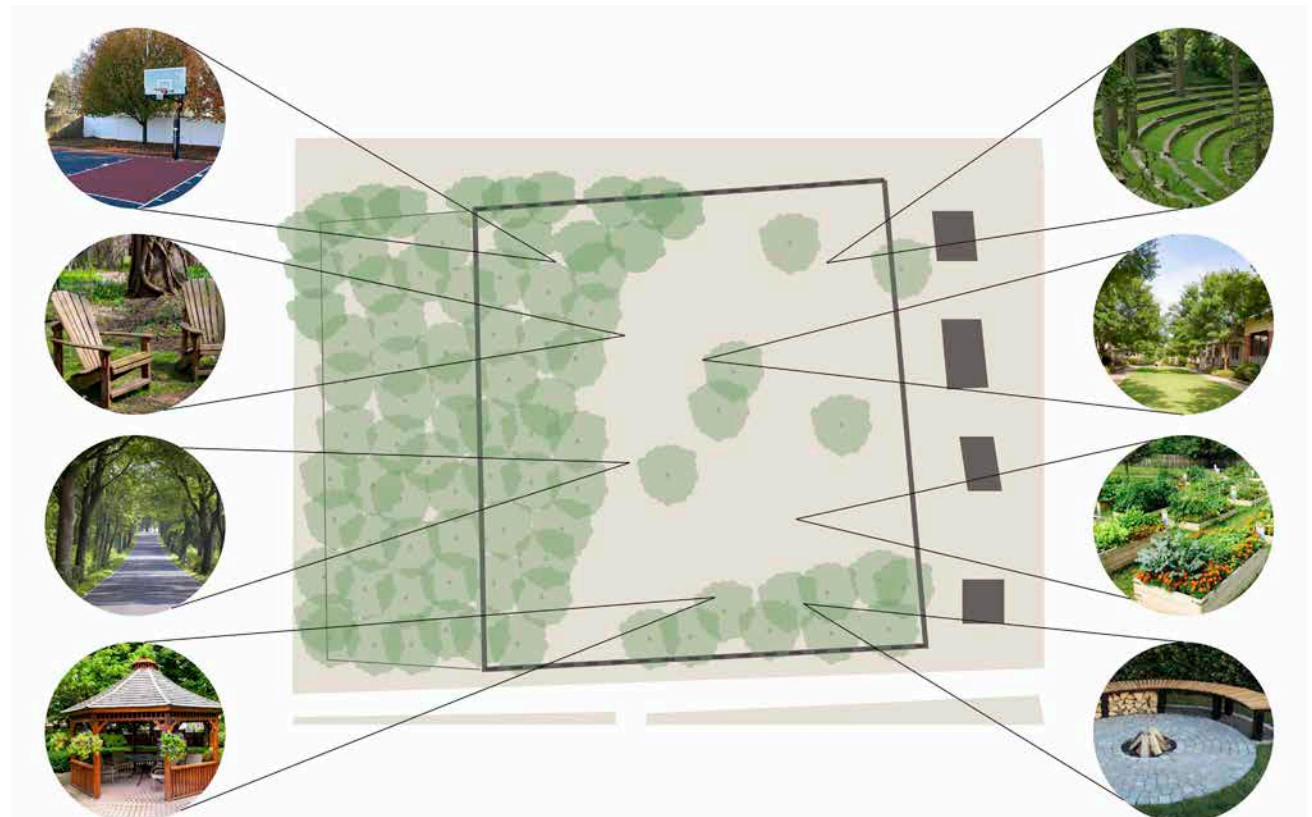
MICRO HOUSE VILLAGES

Site Analysis

A careful and comprehensive analysis of a site reveals its unique physical, bioclimatic, and historical conditions and opportunities. Design strategies can be tested on sites as a means to reveal the best responses to topography, existing vegetation, ground water and drainage, views, adjacencies, and orientations. Site analysis should also incorporate surrounding and regional contexts, with a particular focus on the existing character, history, and services within which the project is placed. The goal is cost-effective, environmentally-responsible, and context-respectful strategies that maximize the potential of the site while minimizing its limitations.



Site Analysis: Wendell Site



Site Potentials Analysis: Wendell Site

Site Planning

The design of micro house villages challenge designers to incorporate a range of complementary uses and create a diversity of uses and opportunities for residents. Crucial is a sense of appropriate scales that balance the civic functions of the common house and community spaces, with the residential character of the housing. A gradient of scales from the private realm of porches and gardens, to clusters of houses around shared courtyards, to unifying community spaces, can effectively define specific areas while integrating the village as a whole.



Site Diagrams: Amelia Murphy



Site Concept: Scott Needham

Boundaries and Thresholds

A sense of place and purpose is dependent on clear definitions, boundaries, and thresholds. Each project should respond to the particular character of its surroundings so that it seamlessly integrates with its contexts, but also needs to be defined as a separate and distinctive place. Boundaries can be articulated through walls and fences, but also by houses and buildings that create a clear street edge, and environmental features such as plantings, slopes, and berms that reinforce the autonomy of the village. Thresholds and entries can be articulated through physical and environmental means, but also by strategically planning the orientations and porches of the houses, and the staffed or heavily-used spaces of the common house, so that there are consistent “eyes on the street.” There are also benefits from providing public access to particular functions and places that allow for interactions between residents and community, but clear environmental cues are required to communicate what is public, and what is not.



Site Concept: Justin McNair



Site Concept: Justin McNair

The Community House and Common Spaces

A sense of community depends on places and spaces where residents can come together. Paths and places should be designed to respect the privacy of individual homes while facilitating impromptu and planned meetings and interactions. The community house is both a symbolic and practical place for the community to gather and, as such, can play an important role in defining the village. Shared meals and activities are social lubricants that can aid in convivial community-building activities. Consequently, the siting and planning of the community house is crucial to the long-term success of capitalizing on the “second family” that many veterans value. Laundry and mail rooms are public spaces that can serve as gate keepers to the village and places where residents

can meet informally. The pairing of kitchen, dining, laundry, and mailrooms creates clear public zones with multiple and often complementary uses. Other program elements such as the rental office, case management rooms, classrooms, and guest rooms need to be located in a manner that responds to their often private and even stressful functions. Lastly, staffed areas are best located at the entries to the community house and village to create secure and monitored thresholds.



Site Concept: Ryan Kilgannon



Ground Floor plan of Common House: Nicole Simeonsson

Site Amenities

Site amenities are places that aid in community building, but also provide places for individual repose and restoration. Pavilions for cookouts, outdoor theaters for performances, sports courts and fields, kitchen gardens, and community parks are effective means to define a village and offer places for a variety of group activities. They can be places where the public is invited to community celebrations and gatherings. Site programs may also incorporate public places, such as community farms, farmer's markets, neighborhood stores, dog parks, farm-to-table restaurants, or playgrounds, as a means to choreograph interactions with the community, or to create mercantile and job-

training opportunities for the residents. Because these places are publically oriented, either within the village or connected to the community, they need to be carefully planned so that they do not compromise the privacy of the houses. Places of repose, such as a meditative gardens and natural areas and pathways, serve the restorative needs of villages and need to be skillfully located and designed to insure their privacy and sense of place without sacrificing safety and security. Throughout, connections and accessibility of paths and places can serve to knit together the village and define its character.



Community House and houses surrounding a pond: Alyssa Dohler

Services

The locations of micro house villages should be carefully chosen according to the appropriateness of their distinct uses within their larger contexts, but also considering the availability of local services and amenities. Villages that are located near public transportation, city parks, shopping, job training, and veteran services can expand the opportunities they provide. Multimodal transportation is crucial for residents who likely will not have cars.

Security

The security of villages depends on effective management and self-governance, but also demands physical strategies. Many villages use fences to control unwanted or uninvited guests, but there are other means to accomplish security demands. As outlined previously, eyes-on-the-street planning and programming can often provide secure boundaries without the

need for physical barriers. The social contracts that enforce desired behaviors also have a role – low walls signal boundaries, defined residential areas communicate privacy, and defined entry points provide cues regarding permissible places of entry. Signs that announce “private” and “no trespassing” may declare boundaries, but more subtle means go a long way to communicating a place as secure and welcoming.



Shared and public spaces: Nicole Simeonsson



Shared and public spaces: Katie O'Campo

Connections

Overall, villages need to balance the need for privacy with the benefits of planning and functions that integrate them with their surroundings and even invite the public to visit.

Building and Zoning Codes for Micro Housing

All housing on permanent foundations is subject to specific regulations and restrictions. The building codes are primarily concerned with the health and safety of occupants, and set prescriptive standards to insure a minimum safety standard. In North Carolina, the governing code is the North Carolina Residential Building Code, which recently was updated to include Appendix V, regulations for “Tiny Homes.” Residential homes built in North Carolina must also comply with the North Carolina Energy Conservation Code and national fire regulations. Building inspectors look for compliance with all of these codes before issuing certificates of occupancy for units. Units that will receive federal housing choice vouchers have additional regulations and requirements. However, these regulations are primarily concerned with older housing stock in their requirement that housing be “decent, safe, sanitary and in good repair.” Regulations also mandate the minimum number of units that must comply with the Uniform Federal Accessibility Standards for ADA compliance

Organizations that apply for Low Income Housing Tax Credits have an additional layer of regulations that are outlined in a Qualified Allocation Plan (QAP). For example, QAP requirements can include minimum square footage for units and bedrooms, minimum counter space for kitchens, and the types and kinds of cladding that can be used on the exterior of buildings. QAPs can also mandate that projects are located near grocery stores, pharmacies or other public services. Any project considering applying for LIHTC should carefully review the QAP, as it can substantially limit choices, design strategies, and materials.

All projects must also comply with local zoning requirements, which dictate uses and site and building design, and can vary for each city and town. Local architects and officials are knowledgeable about building codes, federal regulations and zoning, and can be an essential resource for new micro house developments.

Sustainability Strategies for Micro Housing

Sustainability strategies aim to minimize building energy use and environmental impact, preserve resources, and promote health. Sustainability is a critical concern for affordable housing. It is also central to the “tiny house” movement, though it is also a controversial issue since living in a smaller home is not automatically more sustainable. For example, smaller homes may use less building materials and energy than typical single-family homes, but have larger energy footprints per square footage than higher density apartments.

Strategies for achieving sustainability can be broken into four main categories: energy use, resource use, impact, and health. Energy strategies can be either active or passive systems. Active systems use technologies such as photovoltaic panels, while passive systems use traditional approaches such as building orientation, sun-shading, natural ventilation, and insulation. In addition to reducing energy use, sustainable buildings reduce daily water demand by low-flow faucets and collecting, treating and reusing rain water. Material consumption is reduced through specialized construction systems, smaller footprints and minimizing construction waste. Materials are also chosen for their low embodied energy, the energy required to extract, manufacture and transport materials, and by choosing locally sourced materials to reduce their transportation energy footprint.

Sustainability also extends beyond the borders of the site. The impact of new buildings varies depending on site selection and development. Smart growth strategies plan for the increased density of urban environments and minimize destruction of open space. When

greenfield development is unavoidable, either because of zoning restrictions or site availability, good design minimizes the environmental impact through regenerative practices that not only preserve, but restore the natural environment. Finally, the physical and emotional health of residents and neighbors is a primary goal of sustainable strategies. Health can be addressed in the built environment through introducing initiatives to promote healthy lifestyles and buildings through walkable neighborhoods, community gardens, and air and water quality control.

To maximize the potential of living small, and capture many of the benefits of sustainable design, site selection for micro house villages should be carefully considered. In rural environments, new micro house villages will most likely be situated on a greenfield or agricultural land, may be far from existing utilities and sewer connections, and could have few transportation options. Buildings should be designed to minimize impact through preserving existing vegetation, habitats, and drainage. In rural environments, active and off-grid strategies, such as compostable toilets and photovoltaic and solar hot water panels may be more cost effective than new infrastructure. Rural sites also offer opportunities for natural environments and privacy that are hard to replicate in other settings.

Suburban and urban settings offer more low-impact development opportunities. Suburban micro house village sites are often located on land designated for future development. They may have more transportation options, such as public transportation and bike paths. Utility and sewer infrastructure is typically available. Sites can be restored using sustainable materials. Sidewalks and other amenities can increase walkability and promote health.

Micro house villages on urban sites pose sustainability opportunities and challenges. Urban sites can be built at a higher density than suburban and rural ones, but cannot match the unit-per-acre counts of other forms of multi-family housing. Utility and sewer infrastructure are most easily accessed, and public

transportation can serve to reduce the overall carbon footprint. Some sites can be remediated for more sustainable environments, especially brownfield sites. A greener urban landscape can promote physical and emotional health.

DEMONSTRATION PROJECTS



DEMONSTRATION PROJECTS

Three sites were identified for the demonstration projects to provide a diversity of potential settings for veteran micro house villages. Urban, suburban, and rural sites were chosen to represent the statewide potential of micro house villages. In Durham, an over 3-acre site owned by the Durham Housing Authority was chosen as a typical urban site. In Raleigh, a 2 ½ acre site adjacent the Wake Med campus and owned by Wake County was chosen as a suburban setting. And, in Wendell, a 2 ½ acre site on the edge of farmland, also owned by Wake County, was chosen as a rural type. Each has specific zoning requirements and provides particular attributes regarding the needs of veteran micro house villages. Students conducted a preliminary zoning analysis for the demonstration projects to provide general design parameters. However, a more thorough analysis by professionals, including meeting with local planning officials, is a necessary early step in project implementation. It is likely that, due to the typology of micro house villages, site approval will require a variance but, based on the case studies, this should not pose undue impediments.

DURHAM PROJECTS

The Durham site is in East Durham and close to the downtown area. It is a collection of parcels that straddle Goley Street between Main and Angier Streets, and is part of a larger group of parcels owned by the Durham Housing Authority. Its local context is mostly single-family houses and low-rise multifamily housing, but also includes a range of nearby business and

industrial uses. The Durham site’s urban setting positions it near to services a micro house village needs. It has an adjacent bus stop, and is close to Durham County human and veteran services, and local food stores and businesses. Its urban setting also presents challenges – the scale of the surrounding housing is different from micro housing and the pedestrian nature of urban neighborhoods may pose security issues. In some cases, urban sites can have less zoning restrictions than suburban and rural ones, and may also have density bonuses for affordable units. The Durham site is in a RU-M: Compact Neighborhood zone. The Durham zoning code does not include micro house villages as a building type, though the Durham Planning Department has proposed comprehensive amendments to the zoning code that does allow for small houses up to 800 square feet by right in residential districts in the urban and suburban tier. Using the multi-family designation, and applying the affordable housing density bonus, the zoning code may allow up to 40 units per acre. There is also a requirement for one parking space per unit, some of which may be satisfied by on-street parking. Height and set-back requirements do not present any challenges.

The site plan of this project incorporates a variety of social scales that range from private, to small group and large community spaces. The units are either single or duplex and incorporate private porches that expand the living spaces of the efficiently planned units. Units are organized into a series of clusters with their own interior courtyards. These courtyards create a path system that radiates from a large, centralized community space located adjacent to the community house. In addition to providing spaces for resident groups and services, the community house also includes a small branch library. In this manner, the public and residents have a defined place where they might interact. Elsewhere on the site, low walls and plantings provide environmental cues regarding the boundaries between public and private. Overall, the scale of the houses and the community house respond to the surrounding context of single and multi-family housing.

Project by Austin Corriher



Site Plan



Community Courtyard



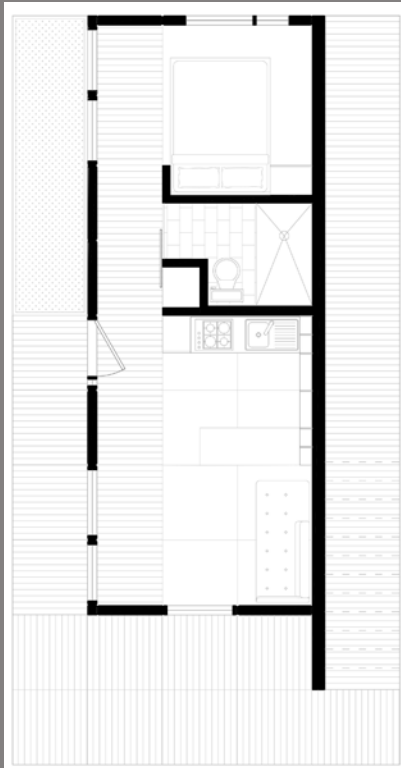
Site Concept



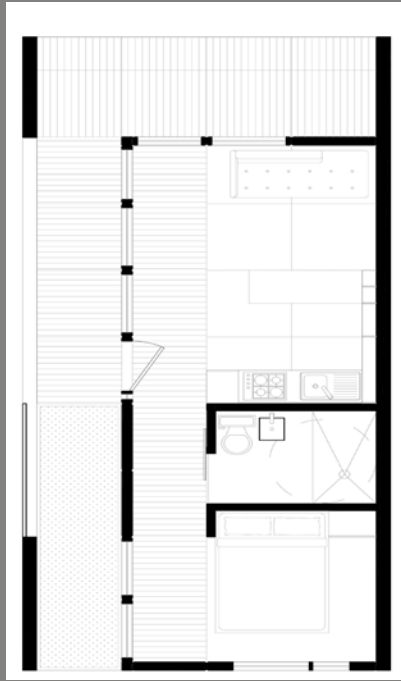
Single unit



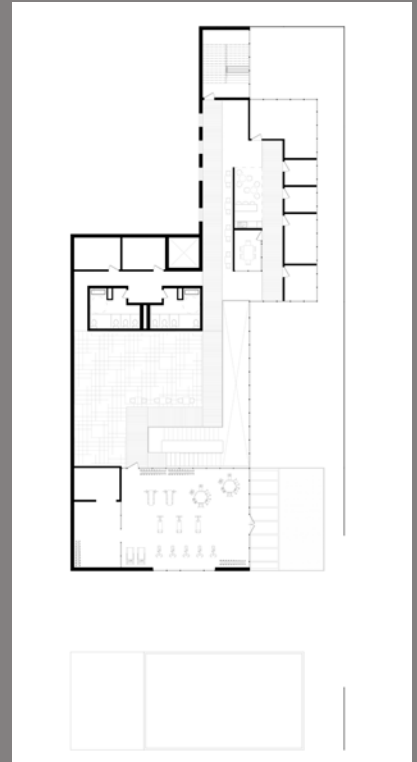
Interior of living space



Unit Plan



Unit Plan



Common House Plan: First Floor



Interior Courtyard

In this project, houses line the streets and courtyards providing consistent edges and definitions of public spaces. The parking is mostly on-street on Goley, which becomes a limited access road that provides pedestrian access across the site. A community farm with a farm-to-table restaurant provides employment opportunities for residents and serves as a place where residents and the community interact. The mail room, offices, and laundry in the community house provide staffed and active areas to monitor its main entrance. A large community space faces the street and opens to a patio area. An adjacent kitchen and dining pavilion anchors the community house courtyard. (For plan see p. 52.) Micro apartments on the second floor of the common house are for guests or residents in transition. The micro house units are 400 square feet with clear definitions of public and private spaces. An efficient wet wall organizes the services and are part of the sustainability strategies of the house. All are ADA compliant.

Project by Nicole Simeonsson

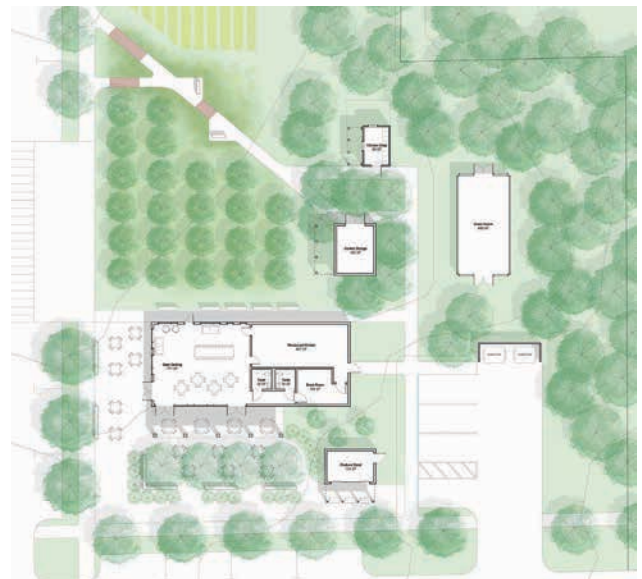




Housing Courtyard



Site Concept



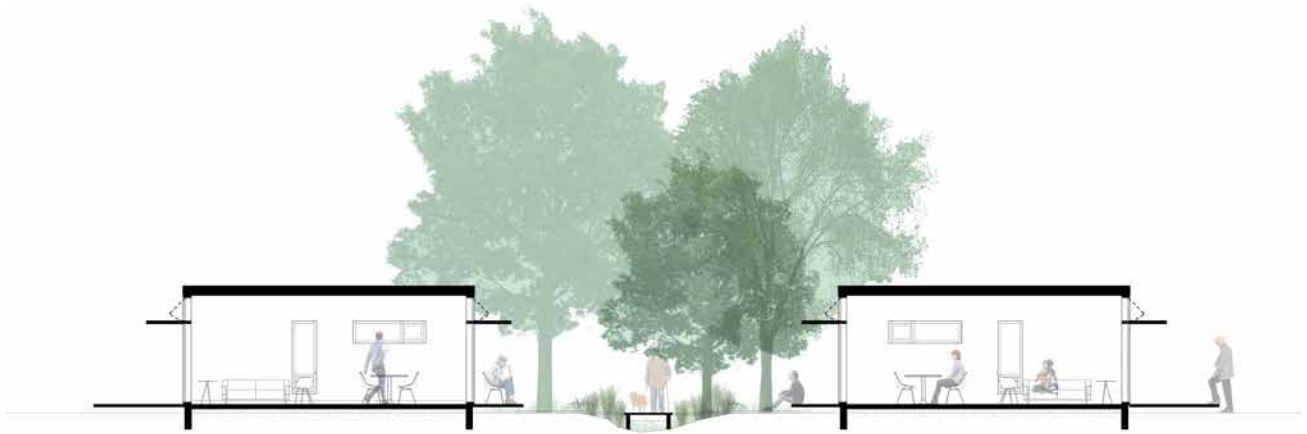
Plan: Farm-to-Table Restaurant



Typical micro house



Interior

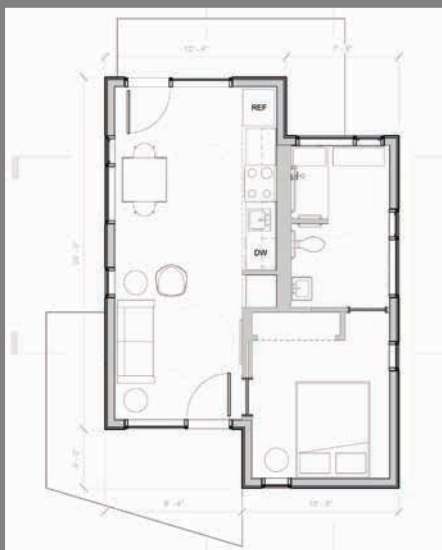


Section through micro houses



Partial Site Plan

Demonstration Projects



Unit Plan



Micro Apartments, Second Floor of Common House

The sustainability strategy of this project includes pairing units to create common utility walls, green roofs, rainwater collection, passive solar shading, and low maintenance materials. Bioswales provide storm-water remediation throughout the site. (For site section see pp. 46-47.) Multifamily housing lines the two busy, urban streets providing visual and physical boundaries. The community house comprises two separate buildings – one for group use, the other for services. A branch library, community gardens, and a neighborhood park provide interfaces with the community. Interior courtyards insure privacy for the residents.

Project by Elenor Methven





Site Plan



Unit Plans



Demonstration Projects

Typical Paired Units

This project includes a mix of 400 square foot micro houses and 600 square feet. single-family houses to provide a range of housing types for residents. The micro houses are organized on an efficient square footprint. They utilize advanced framing, which includes using larger stud spacing and no headers in non-load bearing walls to reduce material use and maximize insulation to achieve construction efficiency. The units are clustered around courtyards, each with its own laundry building. The community house bisects the site and includes a separate gym with showers and lockers. (For site section see pp. 46-47.)

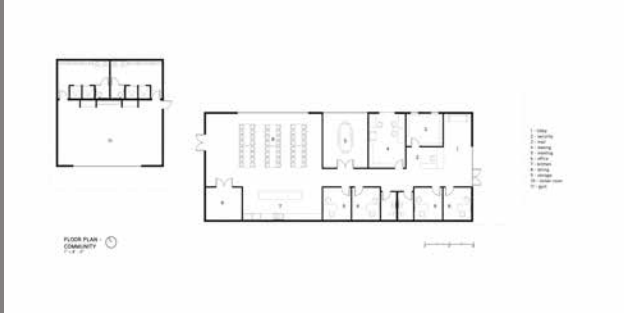
Project by Ross Davidson



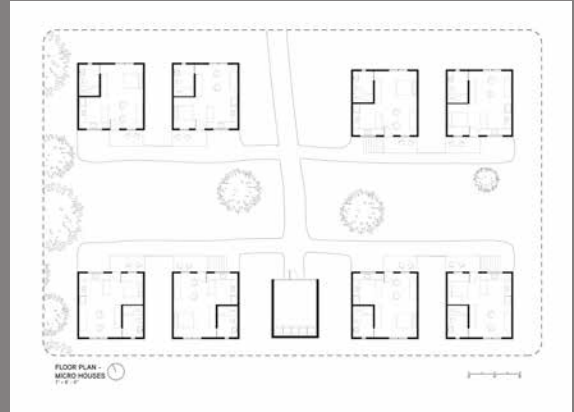
Site Plan



Units and Common House



Plan: Common House



Housing cluster



Typical Units

This project proposes off-site construction of modules for the micro houses to control construction processes and costs, a system that is envisioned as serving the creation of micro house villages state-wide. The modules are designed to be easily transported and efficiently assembled on the site. They combine in a variety of ways that results in a range of unit types and courtyard configurations, and adaptability over time. Some would be built on podiums containing local businesses on the ground floor and along the street edges of the site. (For site concept see p. 52.)



Site Plan

Project by Ryan Kilgannon





Courtyard Options



Courtyard Options



Courtyard Options



Unit Plans



Typical Units and Common House



RALEIGH PROJECTS

The Raleigh site is on Falstaff Road adjacent to the suburban campus of Wake Med, an area that comprises a variety of medical and human services, including an adjacent Veteran Alcoholism Treatment Center. Bus service is within walking distance on New Bern Avenue; grocery stores and local businesses, however, are more dispersed congruent with suburban settings. Because suburban development is generally on large lots with buildings set back from property lines, neighborhood scale and character are less of an issue than at urban sites. This is certainly the case with the Raleigh site, which, because it is also thickly wooded, provides additional buffers from its surroundings. It is also a site that could include security fencing that might be inappropriate on urban sites. The Raleigh site is in the OX-5-PL zone, which is a mixed-use designation. Raleigh's zoning code includes a Cottage Courts, which correspond to micro house villages. It allows ten units per acre with minimal parking requirements. Height and set-back requirements do not present any challenges.

This project strategically locates the community house as a means to monitor traffic and visitors to the village. It is visually linked to a gathering pavilion by a centralized public space. Elsewhere, walking trails lead to planned and natural areas. (For site concept see p. 50.) The entry road connects with the adjacent existing veteran service building. Paired micro houses, each 400 square feet, provide generous storage along a shared wall, which also provides sound insulation. (For unit plans see p. 43.) The porches of the units line the public ways and bedrooms open to private enclosed gardens. (See p. 44.) Comprehensive sustainable strategies ensure energy efficiency – conventional, materials and assemblies, cost effectiveness.

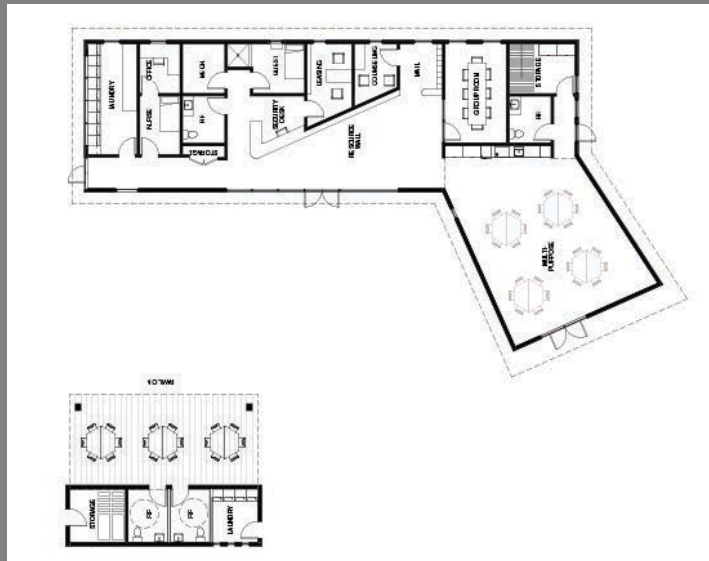
Project by Amelia Murphy



Site Strategy diagrams



Path and micro houses



Plan: Common House



Interior



Common House and micro houses

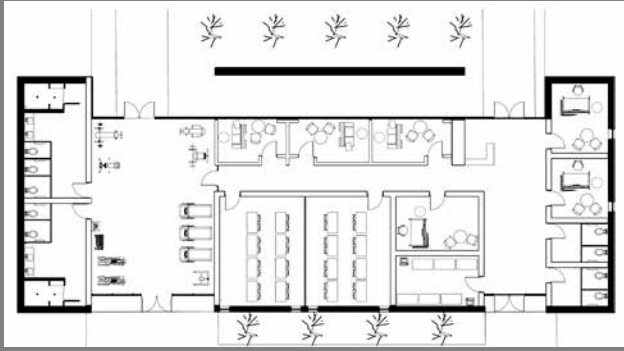
The community house in this project creates a civic presence and security buffer at the front door of the village. (See p. 51.) Clusters of micro houses create a series of interior courtyards, with porches and gardens performing as in-between spaces that residents can personalize. These are linked by pathways to a formal, central, public space, which unifies the public and private spaces of the village. Trees and vegetation create buffers at the edges – fencing provides security. There are two unit types, one 384 square feet, the other 320 square feet. Both include adaptable outdoor living spaces and storage.

Project by Justin McNair

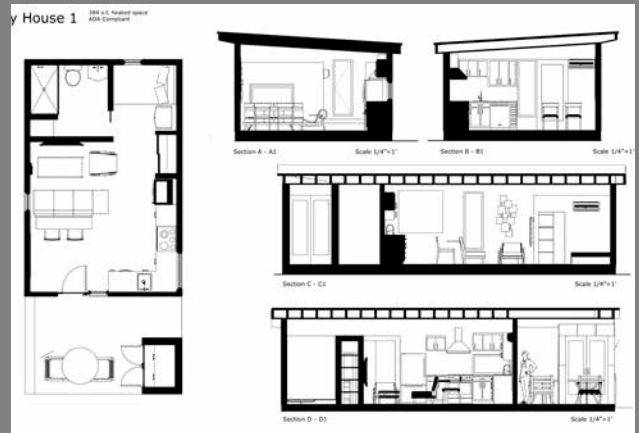


Site Plan





Plan: Common House



House Plans + Sections

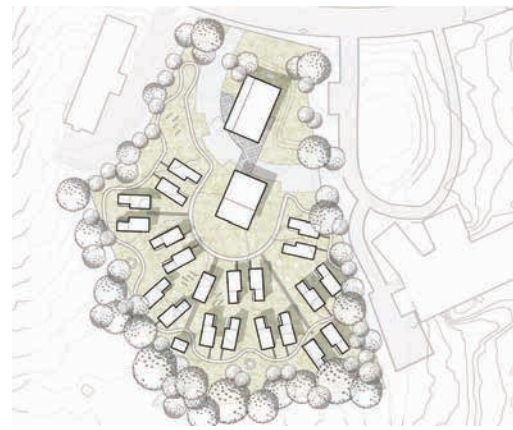


Typical courtyard



Path and micro houses

The radial planning of this project aligns the housing with paired community and service buildings and a public green. Informal paths connect to natural areas, fire pits, pavilions, and a laundry building. The community building includes job training spaces and an outdoor classroom. The narrow houses, 350 square feet each, maximize cross ventilation, which is part of a sustainability strategy that includes exterior gardens and vegetation. The exterior spaces also provide gradients of privacy for the clustered housing units.



Site Plan



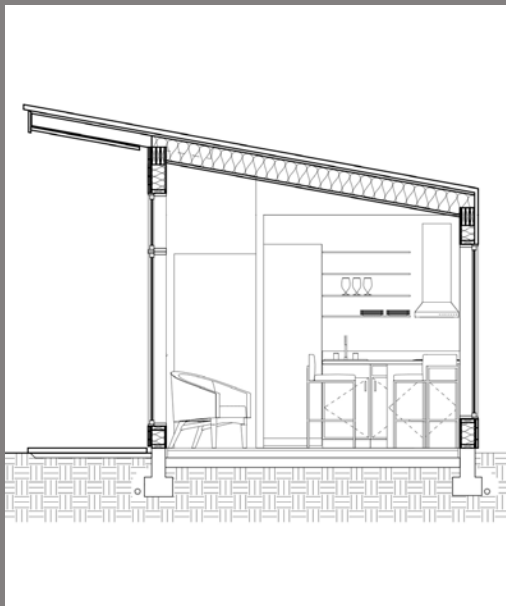
Common House + micro houses



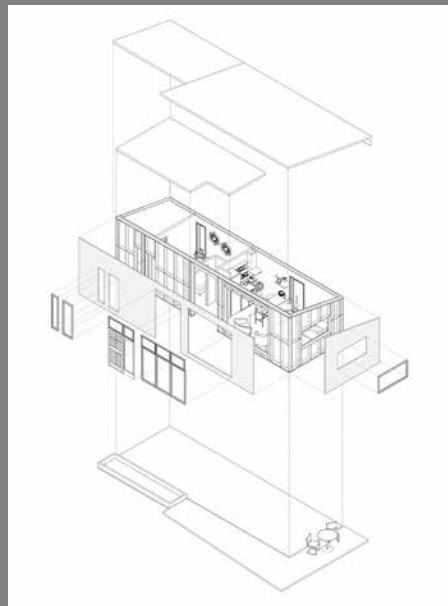
Site Concept



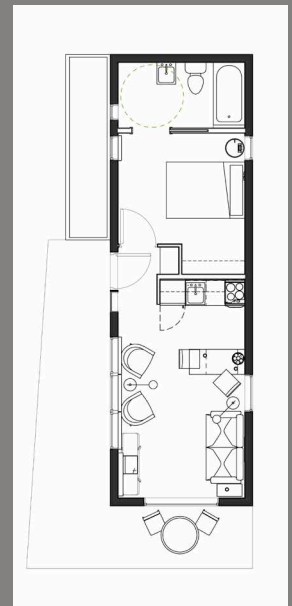
Interior



House Section



Assembly System



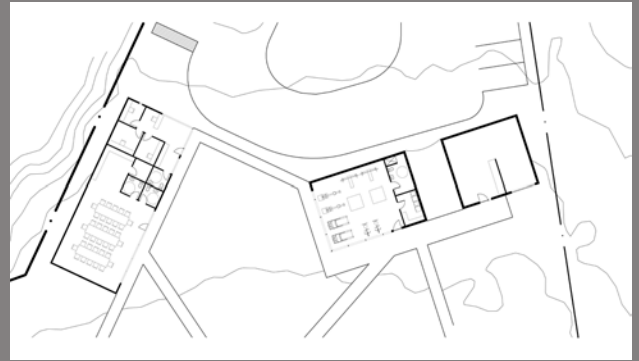
Floor Plan

This project preserves as much of the wooded, natural character of the site by placing the housing at the periphery and minimizing roads and parking. The housing is unified by a saw-tooth roof, resulting in a clear demarcation of edges and articulation of the central community space. Paired units are connected by pathways and incorporate shared courtyards and gathering spaces. (For unit plans see p. 42.) The program of the common house includes resident employment in a bicycle repair shop.

Project by Scott Needham



Site Plan

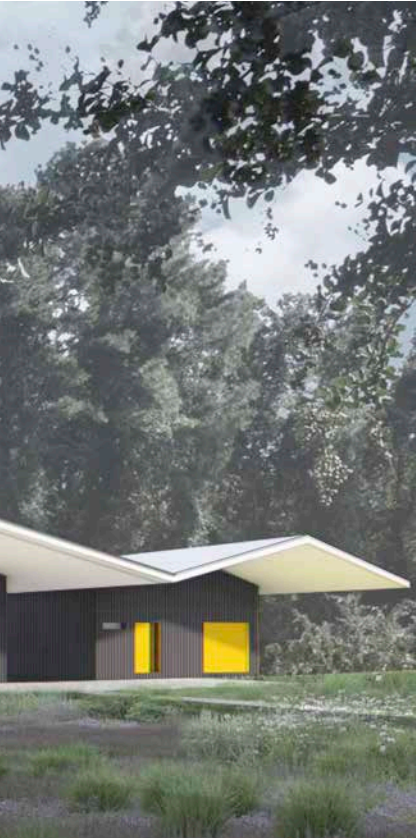


Plan: Common House





Interior



Common Houses



Path and micro houses



Housing Courtyard

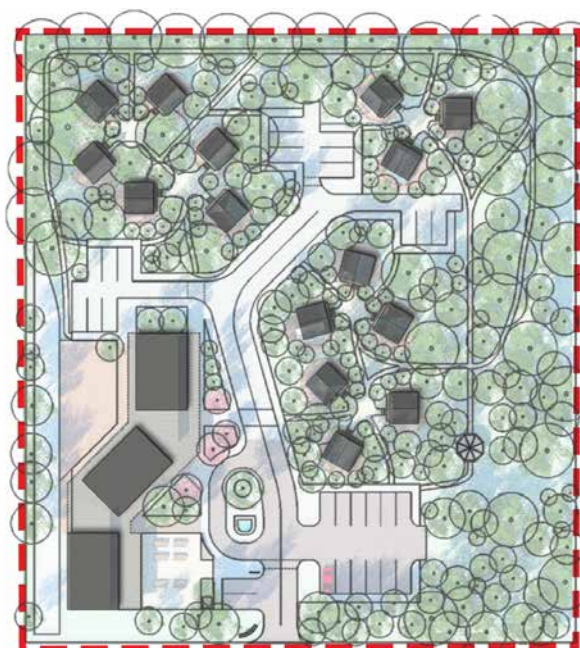


WENDELL PROJECTS

The Wendell site is on Industrial Drive adjacent to East and Church Streets and is approximately one mile from Wendell's downtown. It is adjacent to farmland and wooded, undeveloped areas, and low-density single-family housing. Its rural setting provides much privacy and connections to nature, but also lacks convenient access to public transportation, services, and shopping. It is a site that could easily accommodate security fencing but, because of its isolation, may not need to. It is located just outside of the town of Wendell its zoning is in an Extra Territorial Jurisdiction (ETJ), and, similar to other rural settings, is the most restrictive. Its zoning designation is R-3, which allows for 7.25 single-family houses per acre, and requires one parking space per bedroom. Height and set-back requirements do not present any challenges, but building form, materials, and character provisions may present challenges.

This project recalls state campgrounds with its preservation of trees and small, clustered houses. The A-frame micro houses are 250 square feet, constructed from common materials, and are on post foundations to minimize site disturbances. Most are ADA compliant, but some include lofts for extra sleeping or office spaces. The community house includes a country store that serves as a village business and a place for residents and the community to interact. Its position marks a threshold to the village and the boundary between public and private. Much like at state campgrounds, gravel drives lead to small parking areas near the houses, and informal paths lead to natural areas.

PROJECT BY KAL FADEM



Site Plan



Housing Courtyard



Unit Plan



Site Section



Country Store

This project aims to create a place of healing and wellness set in a natural environment. 350 square foot units are organized in clusters around a new lake, which serves as the community center of the village, its surface reflecting the trees and houses that surround it. (See p. 53.) A walking trail around the lake connects to the houses and places of repose throughout the site. There are also 800 square foot family units which face the street much like the adjacent single-family houses. They, along with a farmer's market pavilion, create a public face and threshold to the village. The pavilion is visually connected to the community house, which faces the lake, and incorporates offices, a community kitchen, and a large outdoor deck.

Project by Alyssa Dohler



Site Plan

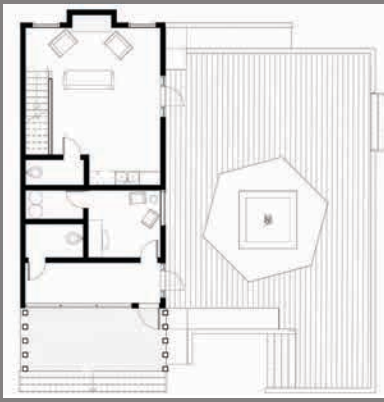




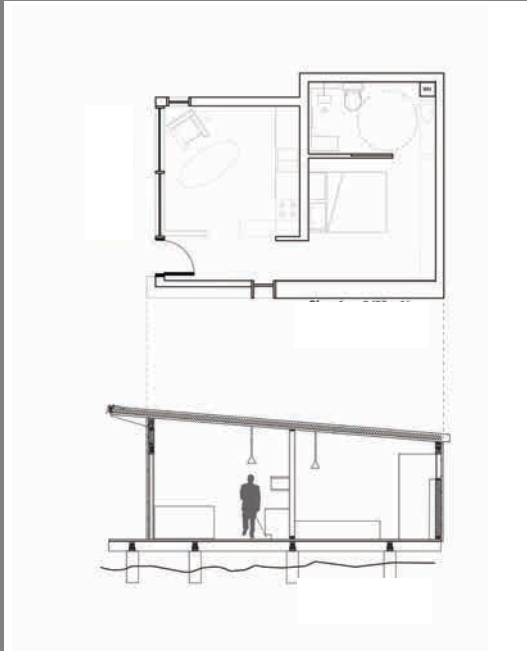
Site Section showing sustainable strategies



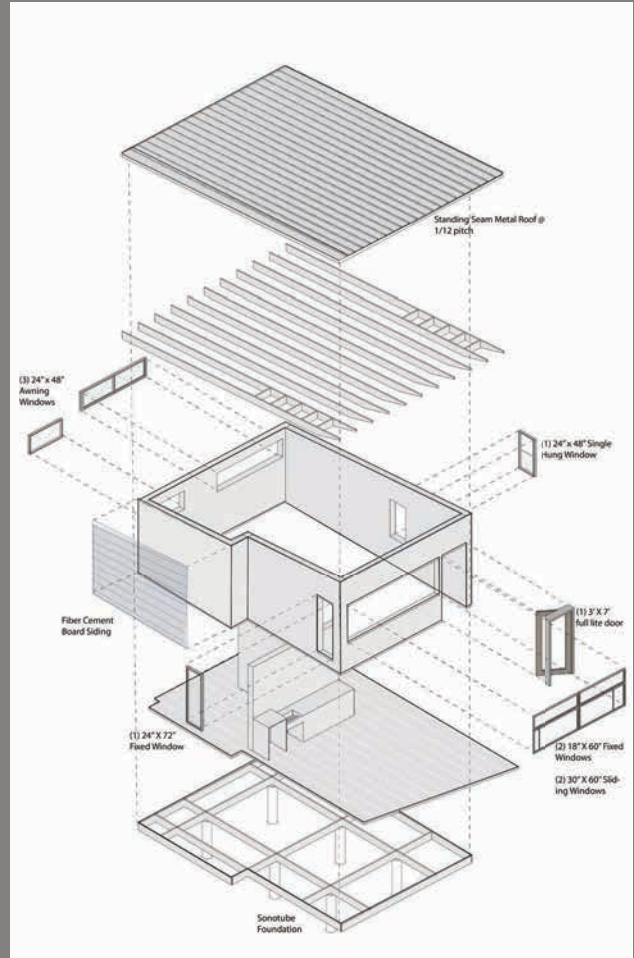
Common House



Plan: Common House



Unit Plan and Section



Construction System



Interior

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS AND RECOMMENDATIONS

Employ Best Practices

Even though nationally there are not many micro house villages, those that have been built and are successful can provide essential models, approaches, and cautionary tales. Consider the range of organizational, planning, design, and construction management models each employed in crafting strategies for micro house villages for veterans on rural, suburban, and urban sites statewide.

Consider Public-Private Partnerships

Strategic partnerships with public and private entities can be an effective model in the creation of micro house villages for veterans. Local city and county housing departments are charged with providing affordable housing and often own land that may be appropriate. State and city departments of government agencies, such as the Department of Military and Veterans Affairs, can play crucial roles in promoting projects, contacting user groups, and identifying funding sources. A local Community Development Corporation with a track-record of successful project completion and management may be an appropriate partner.

Develop a Comprehensive Funding and Fundraising Strategy

Projects of this type require a diverse portfolio of public and private funding sources. For public funding, most affordable housing development in North Carolina significantly depends on Low

Income Housing Tax Credits, which are awarded each year by the North Carolina Housing Finance Agency through a competitive process. Savvy CDCs have learned effective ways to work within the NCHFA's requirements for funding, though satisfying specific areas of the QAP may present challenges. Perhaps more importantly, considering the funding models of the case studies, are private sources. The fundraising strategy should include a robust public information program and include committed and well-connected individuals on the fundraising team.

Select Appropriate Sites

Carefully consider a range of issues when choosing a site. Is it close to services and businesses and accessible to public and multi-modal transportation? Is there infrastructure already in place or nearby? Is the surrounding community stable and supportive of the project? Is there buy-in from local municipal officials and agencies? Is it the right size, orientation, and configuration to accommodate sufficient unit counts and community buildings? Will it require environmental remediation or infrastructure investments? Are the zoning requirements amenable for a project of this type, including units per acre, parking, and mixed-use? Can the site provide restorative places to serve the physical and emotional needs of veterans? Just because a site is available, donated, or cost effective, doesn't mean it will be the best long-term place for veteran housing.

Hire Professionals

Working with local architects, landscape architects, planners, and contractors with experience in projects of this type is essential to the long-term success of the project. They are knowledgeable about local planning and building requirements and effective in navigating the approval, pricing, and construction phases. Local professionals can be interviewed early in the process, and some could be willing to provide services at reduced rates. Local professional organizations, such as the American Institute of Architects and the American Society of Landscape Architects, may be willing to lead efforts for pro bono services or design workshops.

Organize a Design Competition

Design competitions can coordinate and advance otherwise disparate elements of the project. They can create a high public profile for the project and communicate the needs it addresses and goals it intends to achieve to a broad audience. Design competitions can also generate a diversity of planning and design approaches to a particular site, and identify the best professionals for the project.

Make it a Public Process

Early in the process include a diverse mix of partners and stake holders. Once a site has been secured, invite the community to participate in its planning through interactive information sessions and design workshops. The latter, typically led by professionals, can be an effective means to communicate precedents, project goals, and design approaches, and advocate for its implementation. Participants learn about best practices and the design process, and can offer input in a non-confrontational setting. Veterans, in particular those who have experienced homelessness, bring essential perspectives to the planning of a micro house village and should be included in all sessions and workshops. The outcomes of community input can meaningfully inform the design of the project and create a structure for sustained community support.

Practice the Housing First Model

The planning of micro house villages and the selecting and retaining of residents should be governed by the Housing First model of permanent, supportive housing. Homeless veterans, regardless of their discharge status, criminal record, or addiction, should be eligible for housing. A tenant code of behavior should be developed, preferably by residents, and should prioritize retention through compassionate intervention and treatment. The “village” should be a place where residents, managers, and caregivers look after and care for each other.

Create a Restorative Place

It is well known that many veterans suffer trauma during their service and some return with PTSD and other mental health conditions. Homeless veterans need good, stable, and permanent housing, but they also need places that restore their souls, dignity, and sense of worth. In these contexts, micro house villages should incorporate places of repose and restoration – spaces for individual relaxation; areas for community activities; and opportunities for meaningful work or job training.

Build Sustainably

Sustainable practices should be comprehensively employed in the planning and maintenance of micro house villages. Energy efficient, low maintenance, sites, buildings and appliances can reduce energy and resource use and make a project more affordable. Energy tax credits may also productively add to a project’s balance sheet. Restorative landscapes and net-zero options can minimize site infrastructure and, in some cases, utilities. Non-toxic materials, healthy building performance, and restorative landscapes, can aid in the health and well-being of residents. But, just as importantly, we all have the responsibility to create sustainable built and natural environments.

Advocate and Educate

There are many misunderstandings regarding what veterans experience during their service, ignorance about the causes and remedies of homelessness, and stigmas attached to mental illness and addiction. Success in creating micro house villages for veterans who have experienced homelessness will depend, in part, on advocacy and education about their experiences and special needs, and our collective responsibility to provide them. Print and web-based educational materials should be broadly distributed, advocacy of key individuals, groups and government entities effectively employed, and public forums and broadcast media forums strategically utilized. Partnering with related groups to create cohesive and consistent messaging should also be part of diverse advocacy and educational efforts.

Make it Home

Everyone wants a home they can call their own, one they can retreat to but also venture from to meaningfully engage in their community. Everyone needs a place they can make their own and share with others. Veterans who have experienced homelessness may need a house to shelter them, but one should always keep in mind it's home we all desire.

APPENDIX

APPENDIX

Service Learning Projects and North Carolina State University

North Carolina State University is North Carolina's largest comprehensive university. Founded in 1887 as a land-grant institution under the Morrill Act of 1862, NC State has a three-part mission: instruction, research, and extension. The latter describes the unique model of land-grant universities that were founded following the Civil War. Congress deeded land to establish new universities that would not only educate students but would serve their citizenry. This unique American model has the goal of accessible education paired with an extensive outreach and service mission.

Like other land-grants, NC State began by serving the agricultural needs of the mostly-agrarian state through its schools of agriculture and veterinary medicine. Today all 100 counties continue to be served through the County Extension program. As the state's demographics and industrial profile have changed, however, so have the services provided by NC State. Its broader service mission now includes economic development, re-tooling industry, technology transfer, urban affairs, community services, housing and urban design. Where in the past a farmer might contact a County Extension Officer to seek answers to a problem, now it is municipal and business leaders who come for the expertise that only a Research Intensive institution can provide.

Increasingly NC State is serving more and more cities, small towns and communities in areas of housing and urban design – most of which is performed in the College of Design's Office of Research, Extension and Engagement. Through a diverse group of initiatives and faculty, issues such as environmental health, universal design, landscape urbanism, community art programs, and Public Interest Design are addressed. The Affordable Housing and Sustainable Communities, founded by Thomas Barrie in 2007, focuses on research, community-based demonstration and service-learning projects, and the development and dissemination of a knowledge base in its subject area. Its mission is primarily educational – to provide educational resources for government, non-profit and community leaders, students, and the general public, and innovative and applicable solutions to the housing and urban challenges that North Carolina communities face. Traditional research and applied research through funded projects and service learning studios are potent means to produce substantive, applicable and measurable outcomes. The education of qualified practitioners and future leaders in the profession remains central to our mission, and therefore the integration of professional education and research is essential.

PROJECT TEAM

Faculty

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David Hill, FAIA, Professor of Architecture, Chair: School of Architecture

Project Sponsor

Terry Allebaugh, Community Impact Coordinator North Carolina Coalition to End Homelessness

Project Research Assistant

Alyssa Dohler, (M. Arch., 2019)

Visiting Experts

Davin Hong, Living Design Lab, Baltimore, MD
Omar Hakeem, Design Director: bcWorkshop, Dallas, TX

Advisory Committee

Andy Fox, Associate Professor of Landscape Architecture
David Harris, Wake County Human Services Housing Division
Mary Haskett, Professor of Psychology, CHASS
David Maurer, AIA, TightLines Designs
Lewis Sadler, Sadler Construction/Wake County Home Builders Association
Jeff Smith, Military and Veterans Programs Liaison, NC Dept. of Health and Human Services
Abbie Szymanski, Executive Director, Partnership to End Homelessness

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Ryan Kilgannon
Elenor Methven
Justin McNair
Amelia Murphy
Scott Needham
Katie O'Campo
Nicole Simeonsson

VETERAN AND MICRO HOUSE VILLAGES RESOURCES

To find additional resources in North Carolina for veterans experiencing homelessness, please contact or visit:

DEPARTMENT OF MILITARY AND VETERAN AFFAIRS

<https://www.milvets.nc.gov/resource-guide>

A comprehensive guide for all veterans regarding benefits, employment, health care, and housing, and resources specifically for veterans experiencing homelessness.

VETERANS AFFAIRS CRISIS LINE | 1-800-273-8255

NORTH CAROLINA COALITION TO END HOMELESSNESS

<https://www.ncceh.org/veterans/>

A link to information and data on veteran homelessness in North Carolina
To explore how to make micro housing a reality for veterans and other persons experiencing homelessness in your community, contact:

Terry Allebaugh at terry@ncceh.org

Jeff Smith at jeff.smith@dhhs.nc.gov

The following books are resources for the planning, financing and managing of micro house villages:

Andrew Heben, *Tent City Urbanism: From Self-Organized Camps to Tiny House Villages*, Eugene, OR: The Village Collaborative, 2014

Reverend Faith Fowler, *Tiny Homes in a Big City*, Detroit: Cass Community Publishing House, 2018

Interview Script

ORGANIZATION NAME:

Site Address:

Email:

CONTACT NAME:

Phone:

1. What is the history of your organization's involvement in tiny home villages?
2. How was the site selected for your tiny home village?
 - a. Does your organization own or lease the site?
 - b. Does your organization own or lease the buildings?
 - c. How many acres is the site?
 - d. Are you connected to water and electricity from a city or municipality?
3. Did you have any challenges with zoning in your location?
 - a. What is your Zoning Classification?
 - b. Do you have a special variance or overlay?
4. Who designed your homes?
 - a. Can residents customize any of the built elements of their home?
 - b. How many units are on your property?
 - c. How many are occupied right now?
 - d. How many are ADA Accessible?
5. Do residents sign their own lease?
 - a. What are the qualification requirements? (*Veteran/ELI/disability/housing choice voucher*)
 - b. Is housing contingent on behavior or compliance with program objectives?
If yes, what are those objectives?
 - c. Are there other lease requirements that are different than normal leases in the private market?
6. What do residents pay for rent?
 - a. Are any of your units subsidized by vouchers or other programs?
If yes, how many?
 - b. Do any residents own their units?
7. What is your property management model?
 - a. Does your organization serve as the landlord? If not, who does?
 - b. How is the property maintained?
8. What services are offered to residents?
 - a. Are services offered formally (a contract with a specific agency)?
 - b. Is there space for case management on site? Is there space for other services, like child care or health care?
 - c. Does the site have any community amenities or programs?
9. Where did your startup funding come from?
 - a. Where does your ongoing maintenance and operations funding come from?
 - b. How do you keep rents low?
10. What was the biggest hurdle you faced when starting or running your tiny home collective?
11. What resources were helpful for you when starting your work?
 - a. Are there other organizations you worked with or were inspired by?
 - b. Are there other people from your organization we should speak with?

NOTES

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