LIVING TINY

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LIVING TINY

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ABSTRACT

Living Tiny is a thesis that explores the role of architecture as a tool for designing both the built environment as well as the social realm of living. In a rapidly urbanizing world, the current pattern of city development results in unwanted isolation, expensive housing prices, and unsustainable growth. Can alternative forms of densification produce more appealing economical, social, and environmental results?

This thesis proposes a design that builds upon the already existing infrastructure of alleyways and streets of typical urban neighborhoods. Through the implementation of a secondary scale, a new housing typology can emerge that satisfies the needs of the missing middle. Based on case studies of tiny houses and cohousing principles, Living Tiny envisions a two-part system of collective living that involves tiny house accessory dwelling units (ADUs) and communal buildings for shared amenities.

Sited in Austin, Texas, the thesis presents its design for Mueller Tower District, a neighborhood featuring mixed-use zoning and a variety of housing typologies.

The envisioned community benefits not only from the increased affordability and sustainability of living, but also from a greater quality of life through social interactions with the people around them. Through thoughtful, human-based architecture, cities of the future can avoid becoming concrete jungles; instead, they can become vibrant communities that support diverse, interconnected populations.

ADVISOR

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Thanks to:

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INTRODUCTION

THE MISSING SCALE

With a significant portion of the world's population moving into cities, urban environments are rapidly depleting earth's natural resources. Never before in history has change occurred so quickly and so drastically in cities, resulting in unprecedented consequences of growth; the needs of urban areas constitute 76% of carbon emissions from human activities, 76% of industrial wood use, and 60% of water tapped for human use (Grierson, 2003). Based on the 2018 Revision of the World Urbanization Prospects—published by the Population Division of the United Nations Department of Economic and Social Affairs (UN DESA)—55% of the world's current population lives in urban areas, but this percentage is estimated to increase to 68% by 2050. When considering the growth of the world's population, this could mean the addition of another 2.5 billion people to urban areas (68%, 2018).

The drastic amount of urbanization predicted to take place could lead to significant issues such as unsafe water, informal settlements, and urban sprawl. Furthermore, the rapid influx of urban migrants could exacerbate other problems, including poverty, slum development, and social disruptions (Luoma, 2018). As cities become increasingly dense and populated, how can a different scale of living provide solutions to the environmental, social, and physical health of urban areas and their inhabitants?

There is a missing scale in the building typologies of modern cities. Single-family homes are being built in the outskirts of cities, contributing to urban sprawl. Meanwhile, within the cities, expensive high-rise apartments have become the standard development for housing. Without a gradient of scale, this pattern of building is unsustainable economically, environmentally, and socially. The "missing middle" of denser single-family neighborhoods and mixed urban blocks is crucial to create affordable housing options within a reasonable commute to city

centers (MIT DUSP, 2018). As referenced in Figure 1, by creating more housing types between the extremes of high-rise apartments and single-family suburban houses, a more diverse community can develop and flourish.

This thesis explores the creation of collective tiny homes to provide a new hierarchy of living for urban dwellers. By examining an existing site in Austin, Texas, it aims to imagine a co-operative society overlaid upon the neighborhood of Mueller Tower District. The role of architecture in urban futures relies on not only the design of buildings and spatial environments, but also the crafting of communities and social worlds. Through envisioning a new scale of architecture, "Living Tiny" devises a secondary system of inhabitation for already existing and future cities.

Through the study of tiny house and cohousing precedents, the thesis aims to evaluate and analyze both the architectural and social design of existing spaces. Building upon the understanding of such designs, the thesis proposes a system and structure for collective living in the neighborhood of Mueller Tower District in Austin, Texas, a site that envisions novel, collaborative, and sustainable communities of the future.
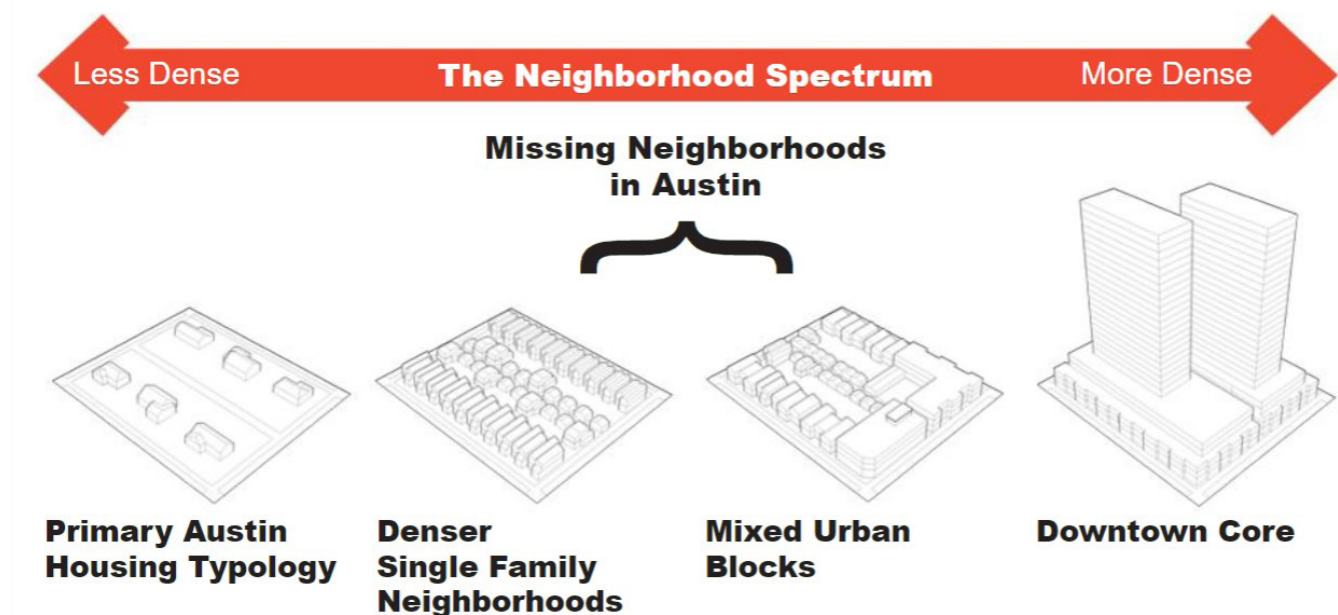

Fig. 1: Diagram of the Missing Middle (MIT DUSP, 2019)

I. ISOLATED BODIES

MODERN LONELINESS

The scene of a busy city with a vibrant nightlife does not come to mind when thinking of loneliness or isolation. Intuitively, it seems that residents in rural areas would experience greater levels of loneliness and isolation. Surprisingly, it is actually urban living that corresponds to unwanted loneliness. City dwellers tend to report a lack of community and belonging, lower participation in organizations and activities, and greater feelings of isolation. A survey done by the U.K. Office for National Statistics Understanding Society saw that, in contrast, rural residents felt more trust for their neighborhood, expressed a greater willingness to provide help to others, and had a sense of belonging. The "social loneliness" that urbanites often experience derive from a perceived lack of social circles—groups of friends who comprise a support system (Corcoran, 2017).

In bustling cities, bodies become isolated. Modern loneliness permeates throughout so-called "communities." The urban worker leaves for the office early in the morning, riding the crowded subway or driving into downtown. After a long day at work, they return home with a takeout dinner, watch Netflix for an hour or so, and head to bed only to wake up and repeat the day. They pay an exorbitant rent to live in the city, lowering their budget for nights out with friends. Neighbors are anonymized, introductions and names quickly forgotten upon moving in. The hallways and lounge spaces of apartment buildings are quiet and unoccupied.

According to a TimeOut City Index survey in 2017, 55% of Londoners reported feelings of loneliness. In Japan, people can even rent friends to keep them company (Smith, 2018). Despite being surrounded by other human beings, it is not enough just to be physically near people. It takes social contact and interaction to develop a sense of belonging and community. When living in extremely high densities, such as an urban city, residents feel less in-control of their social environment and become

more withdrawn from their communities (Williams, 2005). Although urbanites are not physically distant from their neighbors, there is a lack of control over their social distance. The sheer size of city apartment buildings further contribute to this sense of loneliness and detachment. Larger communities typically have fewer social interactions, since most residents live unknown to each other (Williams, 2005).

The four-lane highways and fast, uninterrupted street flows of cities hinder the social flow of urban space, allowing pedestrians to cross only at designated points. Individual migration becomes secondary to vehicle transit. The urban fabric is unattractive and damaging to the curious human, who struggles to find areas for free movement (Corcoran, 2017). Additionally, cities often lack an adequate amount of shared space, especially when compared to suburban and rural settings (Smith, 2018). The looming towers of high-rise apartment buildings add to this alienating effect. If the infrastructure itself could support interaction and connection, perhaps power and wellbeing could be restored to the inhabitants.

"Density needs to be
painted in a new light
appropriate to the
Austin context."

MIT DUSP
*A Handbook for Complete
Communities in Austin*

II. FOUND HABITATS

SITE ANALYSIS

AUSTIN, TEXAS

Austin is an apt city to consider the effects of urbanization and imagine new ways of growing. Between 2016 and 2017, Austin's population increased by an average of 151 people each day (MIT DUSP, 2018). In just the last eight years, the city has grown by 20 percent. It has become one of the fastest growing cities in the United States, with a current population of over 2 million in the metropolitan area (Cross, 2019). Demand for housing in Austin is soaring, but availability cannot accommodate such rapid growth. Additional housing must be built and provided, but the current development pattern of high-rise apartments in the urban-urban area of the city and single-family homes in the suburban outskirts of the city are unsustainable. Austin lacks the "middle scale," which is a housing typology that lies within the two extremes of high-rise apartments and single-family homes (MIT DUSP, 2018). This imagined middle scale typology would prevent urban sprawl while also providing affordable housing options for those who cannot afford to pay the high downtown rent prices.

By reducing urban sprawl and adding density, Austin's urban landscape could be painted with better quality of life, improved transit services and efficiency, decreased congestion, more centralized commerce, and more accessible green space (MIT DUSP, 2018). The fabric of the city would become more flexible and accommodating to the influx of urban newcomers. This disruption in the current development pattern is necessary for the sustainable growth of Austin's urban future.

However, beyond the issues of urban sprawl and affordable housing, a new vision for Austin includes the redefinition and kindling of community within a modern city. What would it mean to nurture cultural identity? Could spaces for arts, commerce, culture, work, and inhabitation become seamlessly woven together?
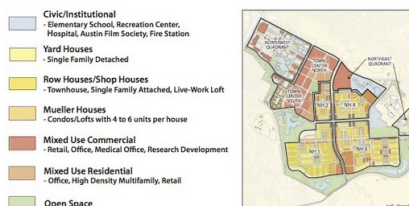
Illustrative Plan

Civic/Institutional
- Elementary School, Recreation Center, Hospital, Austin Film Society, Fire Station

Yard Houses
- Single Family Detached

Row Houses/Shop Houses
- Townhouse, Single Family Attached, Live-Work Loft

Mueller Houses
- Condos/Lofts with 4 to 6 units per house

Mixed Use Commercial
- Retail, Office, Medical Office, Research Development

Mixed Use Residential
- Office, High Density Multifamily, Retail

Open Space

Fig. 2: Illustrative plan of Mueller Tower District (McCann, 2017)

MUELLER TOWER DISTRICT

Mueller Tower District used to be the site for Mueller Municipal Airport, which for more than 70 years had created a void in the urban fabric of East Austin. The airport had led to a deterioration of surrounding neighborhoods as well as a disinvestment of them. In 1984, the Citizens for Airport Relocation (CARE) plan set forth a new vision for the site: a town that would promote compact and higher density development as well as compatibility with the nearby communities (Figure 2). The project envisioned a pedestrian-oriented, mixed-use community to epitomize the city's commitment to sustainable urban development and provide an archetype for future growth. It was seen as a viable alternative to sprawl, while breaking down the social and physical barriers associated with the IH-35 highway. With the plan for a cohesive, responsibly-built neighborhood approved by city council in 2004, construction began on Mueller Tower District (McCann, 2017).

1/4in = 25ft

Fig. 3: Map of Mueller Tower District, Block Scale
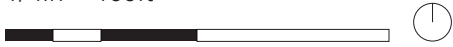
1/4in = 100ft

Fig. 4: Map of Mueller Tower District, Neighborhood Scale

Design Principles (McCann, 2017)

The community is designed around seven principles: open space, streets, transit, town center district, northeast and northwest quadrants, neighborhoods, and sustainability.

(1) Open Space

The community has an interconnected system of open spaces that encourage walkability through pedestrian ways. There is a great diversity of spatial experiences, such as large parks, urban plazas, recreational areas, and landscaped greenways. Lake Park, a 30-acre park adjacent to the Aldrich Street District, is a central open space that accommodates both informal gatherings and large civic events. The site is also connected through walkways and greenways to surrounding neighborhoods and their open spaces, including Pattern and Bartholomew Parks and the Morris Williams Golf Course

(2) Streets

The roadways and streets of Mueller are designed to minimize traffic and impacts on adjacent communities. Acting as the connective tissue of the community, the street pattern allows for multi-modal circulation between IH-35 and regional roadways (Airport Boulevard, East 51st Street, Manor Road). There are multiple connections to these perimeter streets, providing an even distribution of traffic while discouraging cut-through traffic within the community. Furthermore, Mueller has a comprehensive network of bicycle lanes and pedestrian-friendly public paths to welcome alternative modes of transportation. This network of streets and pathways is evident in Figures 3 and 4.

(3) Transit

The community is planned in parallel with a comprehensive program of transit improvements in Austin, which aspires to reduce automobile dependence in the region. Mueller believes efficient transit is essential to achieving a compact, pedestrian-oriented community, and the master plan for the community includes the alignment of a future rail or high capacity bus service that would run through the center of the neighborhood. This would put more than 26,000 people within a five to ten-minute walk of transit, decreasing the amount of single-occupancy vehicle trips by as much as 10%. Other alternatives such as car and bicycle share programs combined with the abundance of walkable destinations could further decrease this statistic.

(4) Town Center District

The community has a walkable and transit-oriented Town Center District, which acts as the social, cultural, and commercial epicenter for the community and surrounding neighborhoods. It is vibrantly mixed-use, including various cultural institutions, shops, restaurants, parks, commercial office buildings, and higher density residential buildings.

(5) Northeast and Northwest Quadrants

These quadrants of the community act as sites for economic opportunities and job creation. The additional 120 acres of land will house buildings for additional employment opportunities, non-profit organizations, and other uses that promote Austin's broader economic goals.

(6) Neighborhoods

The community is composed of four mixed-

use residential neighborhoods. At the center of each neighborhood is a park, with smaller pocket parks and play areas mixed throughout. Housing landscapes are configured from a variety of housing typologies: yard houses, garden houses, row houses, mixed-use shop houses, multi-unit Mueller houses, and mixed-use apartment houses. They are mixed to promote a diverse and inter-generational population. The community also has an affordable housing program, where at least 25% of the homes are allocated for the program and indistinguishably interspersed throughout the community.

(7) Sustainability

The community takes on an integrated "Green Urbanism" approach, which provides an alternative to the automobile-dominant patterns of development that are commonly seen in metropolitan Austin. Mueller applies LEED and Austin Energy Green Building principles to create energy and water efficient buildings that use non-toxic, sustainably harvested materials. Its green infrastructure of parks, roadways, and utilities are all designed to promote fundamental sustainability principles related to mitigating heat island effect, reducing stormwater runoff, and filtering the air.
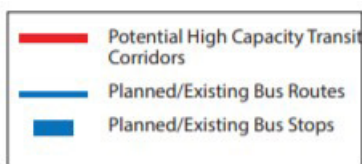

Potential High Capacity Transit Corridors
Planned/Existing Bus Routes
Planned/Existing Bus Stops

Fig. 5: Transit Map (McCann, 2017)

Legend
51ST STREET
COMMUNITY BOULEVARD
ALDRICH STREET
NEIGHBORHOOD CONNECTOR STREET
PARK BOULEVARD
GREENWAY EXTENSION STREET
NEIGHBORHOOD LOCAL STREET
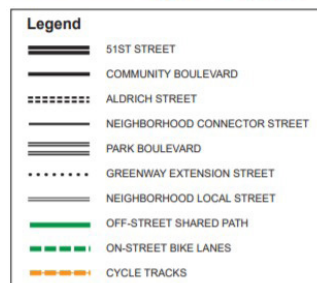OFF-STREET SHARED PATH
ON-STREET BIKE LANES
CYCLE TRACKS

Fig. 6: Streets Map (McCann, 2017)

Fig. 7: Yard House (McCann, 2017)

Fig. 8: Garden Court House (McCann, 2017)

Fig. 9: Row House (McCann, 2017)

Fig. 10: Shop House (McCann, 2017)

Housing Typologies (McCann, 2017)
There are eight housing typologies in the Mueller neighborhood, arranged according to their various functions.

(1) Yard Houses
These houses are dispersed throughout the community on various lot sizes.

(2) Garden Court Houses
These houses are dispersed throughout the

community on various lot sizes.

(3) Garden (Zero Lot-Line) Houses

(4) Row Houses
These houses connect major streets to promote diversification of activities and housing typologies.

(5) Shop Houses
These houses connect major streets to

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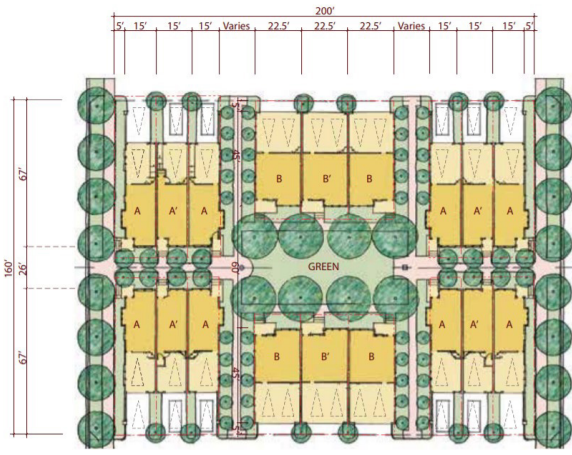
Fig. 11: Clustered Row House (McCann, 2017)
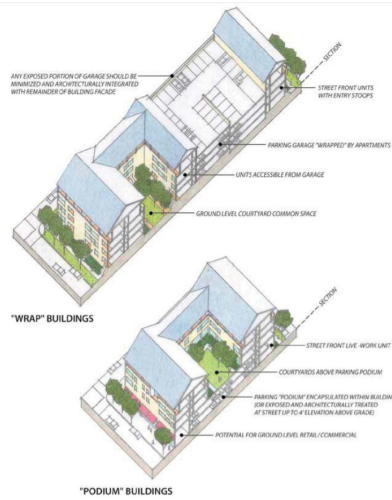
Fig. 12: Multi-Family Houses (McCann, 2017)

Fig. 13: Mueller House, Plan A (McCann, 2017)

Fig. 14: Mueller House, Plan B (McCann, 2017)

promote diversification of activities and housing typologies.

(6) Clustered Row Houses
These houses can be found clustered around courtyards throughout the neighborhood.

(7) Mueller Houses
These houses are multi-unit four, five, and six-plex buildings that are built as larger

homes along the main east-west boulevard. They link to the neighborhood school and also allow for the creation of a stately parkway.

(8) Apartment/Mixed-Use Buildings
These buildings are found near the control tower and create a center for neighborhood activity.

Carriage Houses (McCann, 2017)

Additionally, a secondary hierarchy of housing is permitted by the Mueller Tower District: carriage houses. These houses are essentially accessory dwelling units (ADUs) that are built on the lots of either yard or row houses. They are generally developed on top of the detached or semi-detached garages of the main houses. Since they are accessed through the alleys, carriage houses enliven spaces that typically see less activity. Furthermore, the carriage house adds to the variety of housing typologies and provides greater live-work opportunities. The construction of carriage house units are subject to the following specific conditions (Figure 15):

On yard house lots:
» Must be on lots of at least 37 feet in width
» Usable floor area will not exceed 600 square feet
» General massing should be one- and one-half to two-stories in height; will not exceed 25 feet in height
» Should use sloping roofs and dormers to reduce the scale

» Will be separated from principal building mass by at least 8 feet, or be attached to the main building
» Design and materials should be complementary with the main building and surrounding structures
» Sufficient utility capacity must be available from the applicable providers

On row house lots:
» Must be on lots of at least 90 feet in depth
» Usable floor area will not exceed 600 square feet
» General massing should be one- and one-half to two-stories in height; will not exceed 25 feet in height
» Design and materials should be complementary with the main building and surrounding structures
» Sufficient utility capacity must be available from the applicable providers

With its mixed-use landscape and welcoming of alternative housing structures, Mueller Tower District presents an ideal setting for imagining a new hierarchy of living.
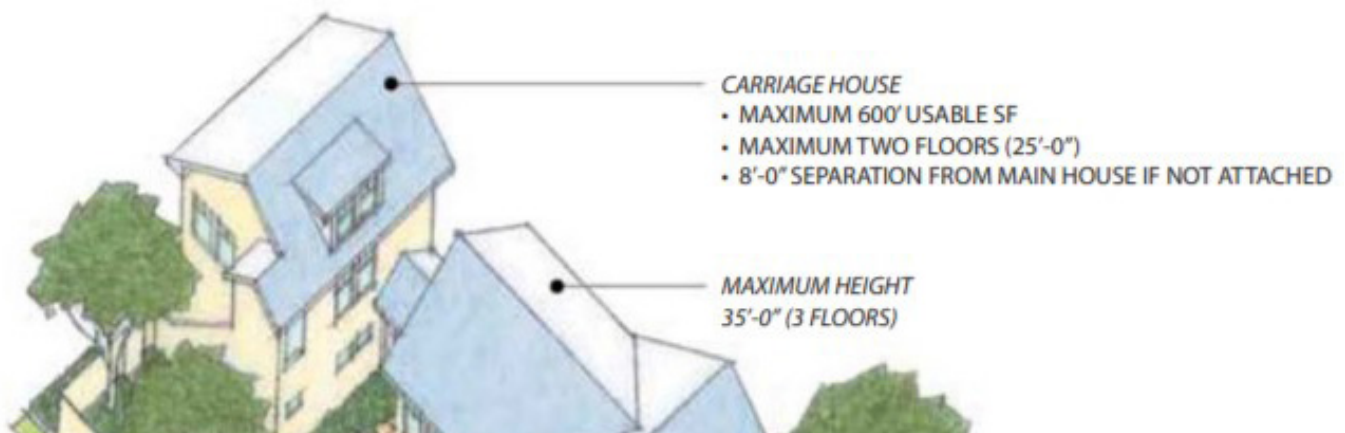

CARRIAGE HOUSE
• MAXIMUM 600' USABLE SF
• MAXIMUM TWO FLOORS (25'-0")
• 8'-0" SEPARATION FROM MAIN HOUSE IF NOT ATTACHED

MAXIMUM HEIGHT
35'-0" (3 FLOORS)

Fig. 15: Carriage House (McCann, 2017)

> "Social contacts are enhanced when residents...have appropriate space for interaction."
>
> J. Williams
> *Designing Neighbourhoods for Social Interaction*

III. TINY COLLECTIVES

NEIGHBORHOOD AS HOME

The idea behind the tiny collective is a group of people who intentionally live in small, personal spaces and share communal areas of service. The tiny collective is organized by values, practices, modes of engagement, and collaboration. The members of the tiny collective voluntarily agree to participate in the group and share certain resources. It is structured by a gradient of space typologies: personal, semi-private, semi-shared, and shared.

(1) Personal
Spaces used almost exclusively by the individual dweller. Use by others would typically be considered inappropriate and an encroachment of privacy.

(2) Semi-Private
Spaces that belong to the individual dweller, but can be entered upon and populated by invite.

(3) Semi-Shared
Spaces that are shared by the tiny collective and approved members of the

neighborhood, but not accessible to public visitors or guests.

(4) Shared
Spaces that are shared by the neighborhood as well as the public.

Through the balance of individual private space as well as common space, the tiny collective promotes social interaction and community building while also maintaining individual privacy and solitude.

The site already has a multitude of amenities available, which would be accessible to the members of the tiny collective. Since Mueller is a mixed-use district, it has a vibrant combination of local businesses, restaurants, theaters, museums, shops, commercial space, transit stations, and green space. This area, open to the public, is known as the Town Center District, which promotes economic and social sustainability. In addition to these already existing developments, "Living Tiny" proposes to add a collection of

shared spaces specifically for the Mueller neighborhood and members of the tiny collective.

While having access to these shared and public amenities, the members of the tiny collective would inhabit their individual, private spaces. These spaces would be their own tiny houses, dispersed throughout the neighborhood and attached to already existing homes. Additionally, alleyways, walkways, streets, and pocket parks will act as transitional spaces between private and shared, creating a gradient of spatial experiences.

LIVING TINY

Each member would occupy their own tiny house, built as an accessory dwelling unit (ADU) to an existing house in the Mueller neighborhood. There would be a private entrance to the tiny house through the alleyway network inherent to the site. At 400 to 600 ft^2, a typical tiny house unit would include a bedroom, bathroom, kitchenette, dining area, living area.

Case Studies: Tiny Houses

In 1950, the average size of a home was 1,000 ft^2. Today, the size of an average American home has increased by over 150% and 1,000 ft^2 is now considered quite small (Carlin, 2014). The average square footage in 2015 was 2,687 ft^2, even though there were less people per household—from 3.01 persons per household in 1973 to a record low of 2.54 persons per household (Perry, 2016). However, the tiny home trend is growing, which encourages a minimal lifestyle and downsizing of the house. Tiny homes may be associated with apartments; however, tiny homes

are smaller than the typical apartment, which averages at 941 ft^2 (Balint, 2018). The origin of tiny houses is founded in the 19th century romanticism of Thoreau and Emerson, as well as in 20th century minimalism. One of the early leaders and designers of smaller homes was Frank Lloyd Wright, who described a dream of creating "small, single-story, moderately-priced homes that focus on the usage of natural materials in both construction and in the creation of aesthetic pleasure surrounding the home in the form of gardens" (Carlin, 2014). In contemporary society, tiny homes have taken on another connotation and potential as solutions to contemporary housing issues such as mobile housing, temporary housing, housing for the homeless, and urban housing. This is because of the tiny house's feasibility for sustainable environmental, social, and economic conditions (Ford, 2017). Examples are shown on the next few pages in Figures 16 through 22.

By downsizing, tiny house dwellers can drastically reduce both their electricity and natural gas use, subsequently reducing their carbon footprint. For example, a 50% reduction in house size has been shown to result in a 36% decrease in lifecycle greenhouse gas emissions (Carlin, 2014). Tiny houses consume about a tenth of the energy that average houses use, while also producing 14 times less in carbon emissions. The main reason for this reduction comes from heating and cooling a much smaller space. However, appliance use also contributes to this decrease (Tippins, n.d.). Moreover, the lifestyle behaviors of tiny house dwellers also impact the environmental-friendliness of these homes. The small
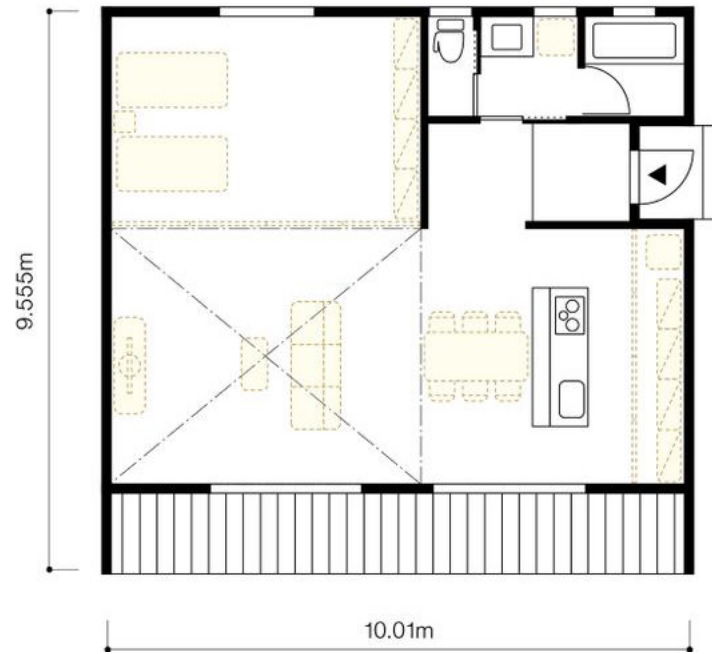
Fig. 16: Muji Prefabricated Tiny Home, Floorplan (Muji, 2019)

Fig. 17: Muji Prefabricated Tiny Home (Fukasawa, 2015)

interior space encourages people in tiny houses to spend more time outside, which results in decreased use of electrical appliances, lighting, heating, and cooling. Furthermore, this extra time outside creates an even stronger connection between the tiny house inhabitants and the natural environment, thus promoting conservation and preservation (Tippins, n.d.). Living tiny presents an alternative to modern society's excessive consumption and destruction of the environment. Moreover, tiny houses provide huge financial benefits. The initial cost and upkeep of a tiny house are dramatically lower than typical living situations. With a median of $10,972 in the bank, 55% of tiny house people have a greater amount of savings than the average American (Mitchell, 2013).
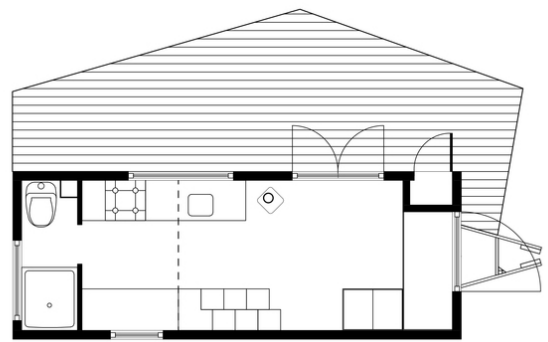
Fig. 18: Walden Studio Tiny House, Floorplan (Walden Studio, 2016)

Fig. 19: Walden Studio Tiny House (Walden Studio, 2016)
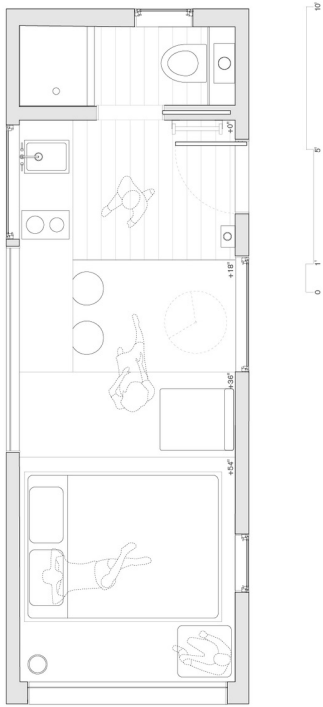
*Fig. 20: Getaway Cabin No.3, Floorplan
(Getaway, 2016)*
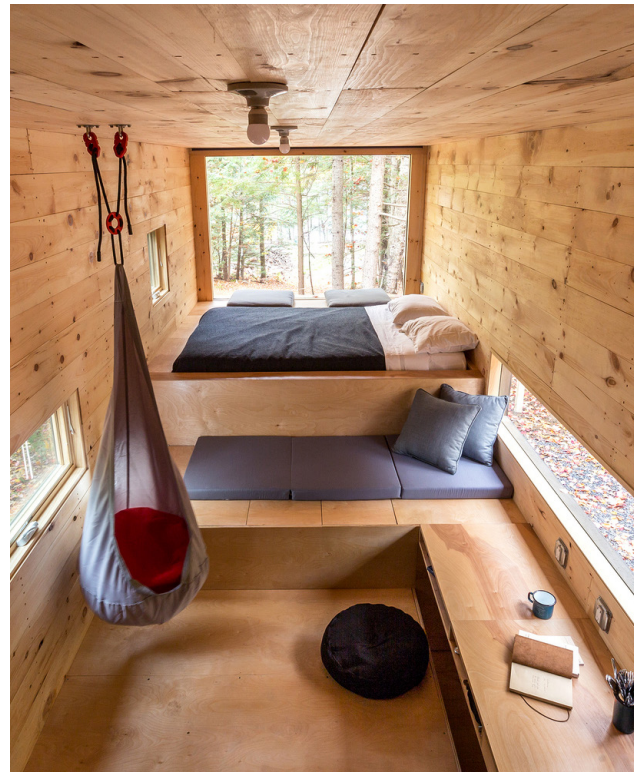
*Fig. 21: Getaway Cabin No. 3, Interior
(Getaway, 2016)*

Fig. 22: Getaway Cabin No. 3 (Getaway, 2016)

Case Studies: Related Typologies
Typologies related to the tiny house include: shipping containers, prefabricated homes, travel trailers, modular housing, and micro-houses. These precedents provide useful knowledge regarding the needs and compromises of personal space and privacy as well as the techniques involved in the architectural design of small dwellings.

(1) Shipping Containers
Shipping container architecture has become increasingly popular in the past few decades, especially since these structures are plentiful and relatively cheap. Built of steel, they are incredibly strong, given that they are typically used to support stacks of multi-ton containers. Additionally, their materiality lends them to be extremely weatherproof and corrosion-resistant (Bowley, 2017). However, due to their standardized size, shipping containers can be somewhat restricting, often coming in sizes of 8ft by 20ft and 8ft by 40ft in width and length, respectively. The corrugated metal also can make it difficult to work with, when cutting out apertures for windows and doors. This creates a further problem with insulation, since there is very little room to add insulating material (Bowley, 2017). An example of such housing is shown in Figures 24 to 26.

(2) Prefabricated Homes
Prefabricated homes are designed, built, and assembled off-site, typically at a factory (Wagner, 2016). Although there is a stigma in America associated with this type of housing, it is a popular form of construction in Europe and Japan. It is beginning to gain traction in the United States, and presents an appealing solution to housing shortages in a multitude of cities. Prefabricated construction tends to be faster and cheaper than houses that are built on-site. As these designs become more popular, people are also seeking to find more sustainable technologies and materials to implement in the construction (Koones, 2019).

(3) Travel trailers
Travel trailers, such as Airstream trailers (Figure 23) or RVs, began to take shape in the 1920s when trailer camping grew in popularity. The first modern travel trailer, called the Covered Wagon, was designed and built by Arthur Sherman in 1929. He soon began mass-producing his product and became the biggest manufacturer in the industry until Wally Byam, the founder of Airstream, took over in the 1930s (Airstream, 2014). Travel trailers are widely available across the United States, making them affordable and incredibly mobile. However, they are typically less comfortable and more cramped than other alternative living styles (Gaille, n.d.)

(4) Modular Housing
Modular housing differs from prefabrication in that the modules, which are often fabricated off-site, are assembled on-site with the guidance of a frame structure. It is a more contemporary concept than prefabricated housing, which has existed for centuries. One of the first modular homes was designed by Buckminster Fuller, who built a flexible housing experiment in the 1920s and 1930s. Known as the Dymaxion House, the building was constructed out of prefabricated modules, most notably a bathroom module. However, the first fully-modular home was designed by Robert W. McLaughlin in 1933, when he built the Winslow Ames House,

which was constructed with a new exterior finishing material called Cemesto, a panel board that accommodated the modularity of the house. Much of modern modular housing aims to solve urban affordable housing with its spatial efficiency and ease of production. However, an unseen side effect has been the marginalization of young adults and creative entrepreneurs, who often are outpriced by home-buyers (Wagner, 2016).

(5) Micro-Housing

Micro-housing consists of units that are typically smaller than 350 square feet. Over the past decade, there has been a boom in this housing typology, especially in Japan and big cities. It developed as a solution for increasing density and affordability, since the units are incredibly small. According to a study by the Urban Land Institute in 2015, micro-housing attracts young professionals who are attracted to the lower rent rates and the opportunity to live alone. As a result, these developments typically produce a greater rate of return than other types of development (Sisson, 2015). However, there have been several micro-housing failures, such as the Nakagin Capsule Tower designed by Kisho Kurokawa. This typology is often criticized for having too little space, and that its transient nature creates unsettled cities (Glancey, 2016).
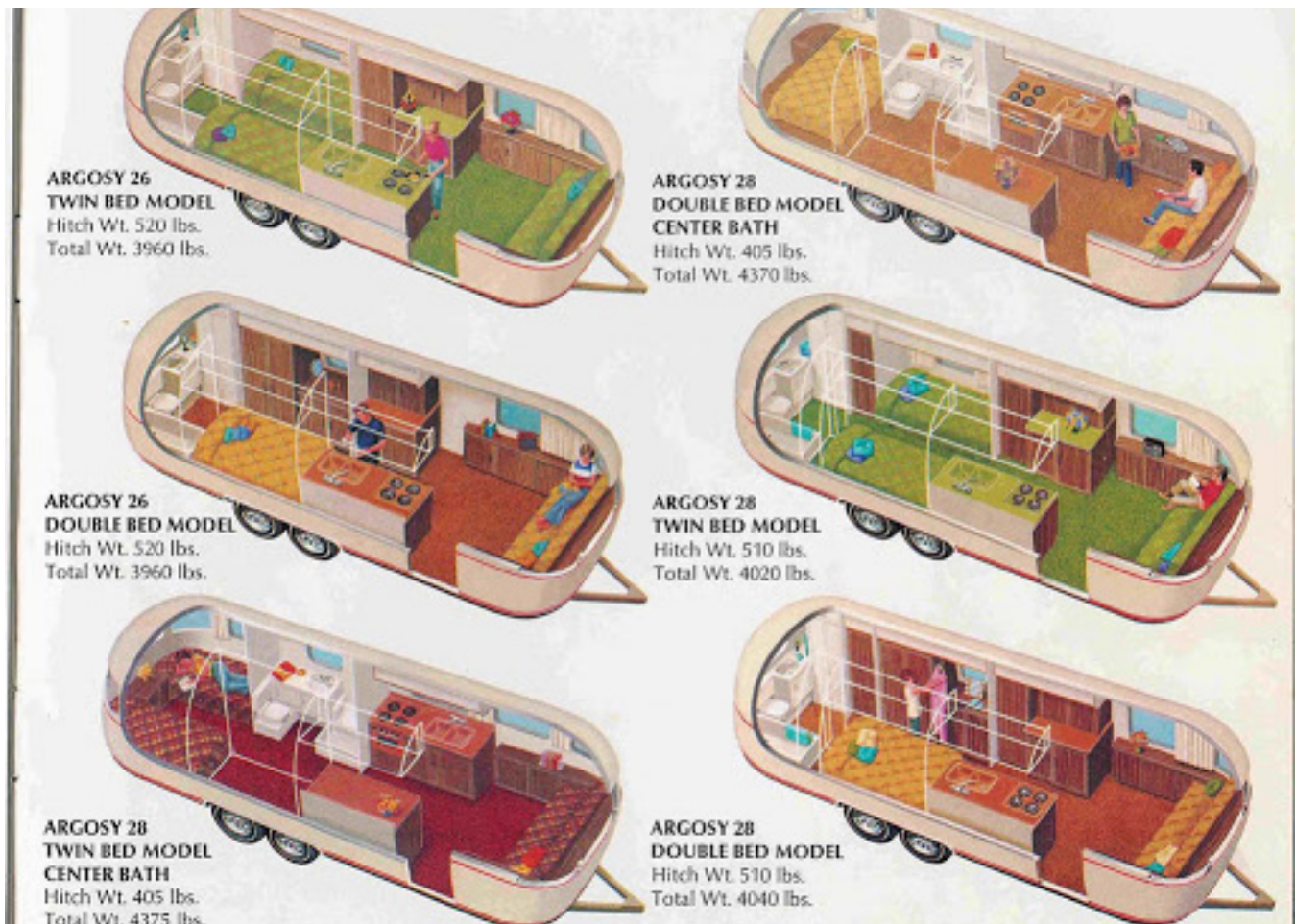

Fig. 23: Airstream models, Interiors (Airstream, n.d.)

33

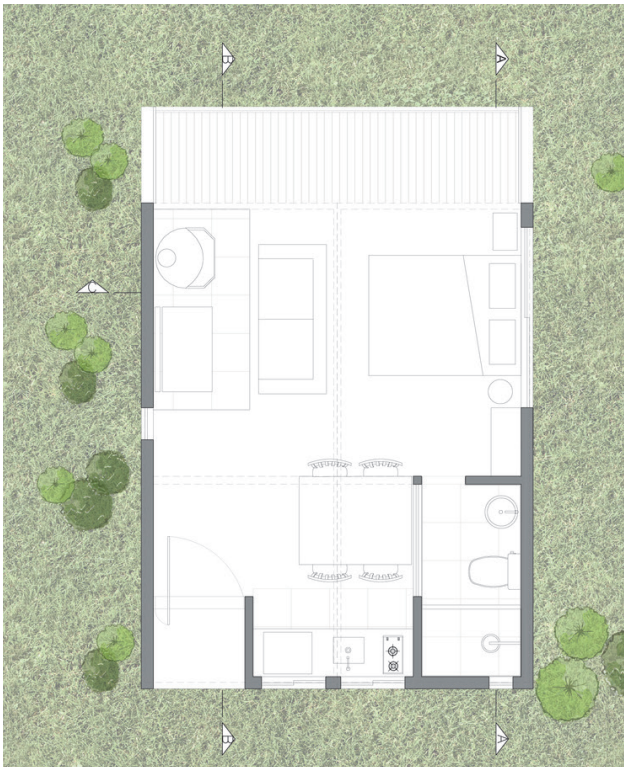*Fig. 24: Cambara Container House (Jordani, 2020)*

*Fig. 25: Cambara Container House, Floorplan
(Jordani, 2020)*

*Fig. 26: Cambara Container House, Interior
(Jordani, 2020)*

Proposed Design for Tiny Living
The thesis proposes three designs for tiny living houses. They range in scale from 400 ft^2 to 600 ft^2. In accordance with the carriage house development requirements, the height of the tiny houses will be one and one-half stories tall, which is 15 ft. The designs also range in amenities. All units have a bedroom, bathroom, living space, dining space, and kitchenette. The larger, 600 ft^2 unit has a balcony as well which can fit up to four to six people at a time.

These designs accommodate a variety of people who may be interested in living in one of these spaces. Tiny houses typically attract young adults looking to stay in a space they can call their own, and retirees who are looking to downsize from a larger house. The smaller designed units would likely be preferred by young professionals or retired singles who seek lower rent prices and individual space. The larger units would be more appealing to couples, young or retired.

All three designs consist of a diverse gradient of spatial experiences, ranging from private, semi-private, semi-shared, to shared. The living and dining spaces would be used to entertain guests and visitors who might enter the house for a dinner party or casual hangout, making it an actively shared space. The kitchenette and balcony areas would be semi-shared since the tiny house dweller would most likely be the one to use it on a daily basis, but would be accessible and open to guests. Meanwhile, the bathroom is semi-private since it can be used by all who live or visit the tiny house, but it is only used by one person at a time. The bedroom is considered private since it is the most

intimate space in the house and is almost exclusively used by the tenant. With this gradient of shared space, the tiny house designs allow for a more enriching living experience.

Moreover, with a private entrance to the tiny house, the tenant can enter and exit their home without having to intrude or interact with the main house owners, unless they so desire. This provides a sense of independence and self-efficiency despite the tiny house being located on the same property lot as other people. Given the alleyway infrastructure that already exists in the Mueller Tower District neighborhood, it is easy for tiny house tenants to access pathways that lead directly to their home. The use of such networks creates a secondary system of living within the neighborhood, different from the primary houses and streets.

The tiny house designs are pictured on the next few pages, depicting the distribution of shared spaces as well as a map of possible locations throughout the neighborhood.

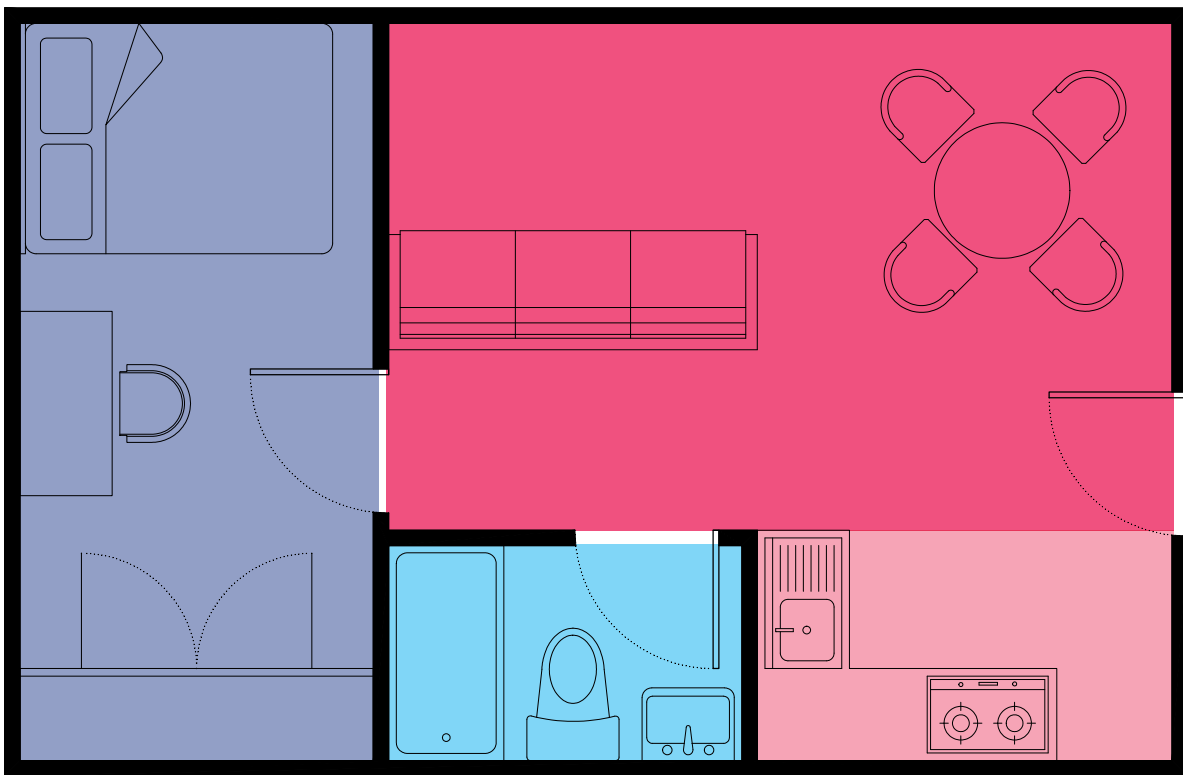1/4in = 2ft

shared   semi-shared

semi-private   private

Fig. 27: Tiny House Floorplan Concept, 400 ft²

1/4in = 2ft

shared   semi-shared
semi-private   private
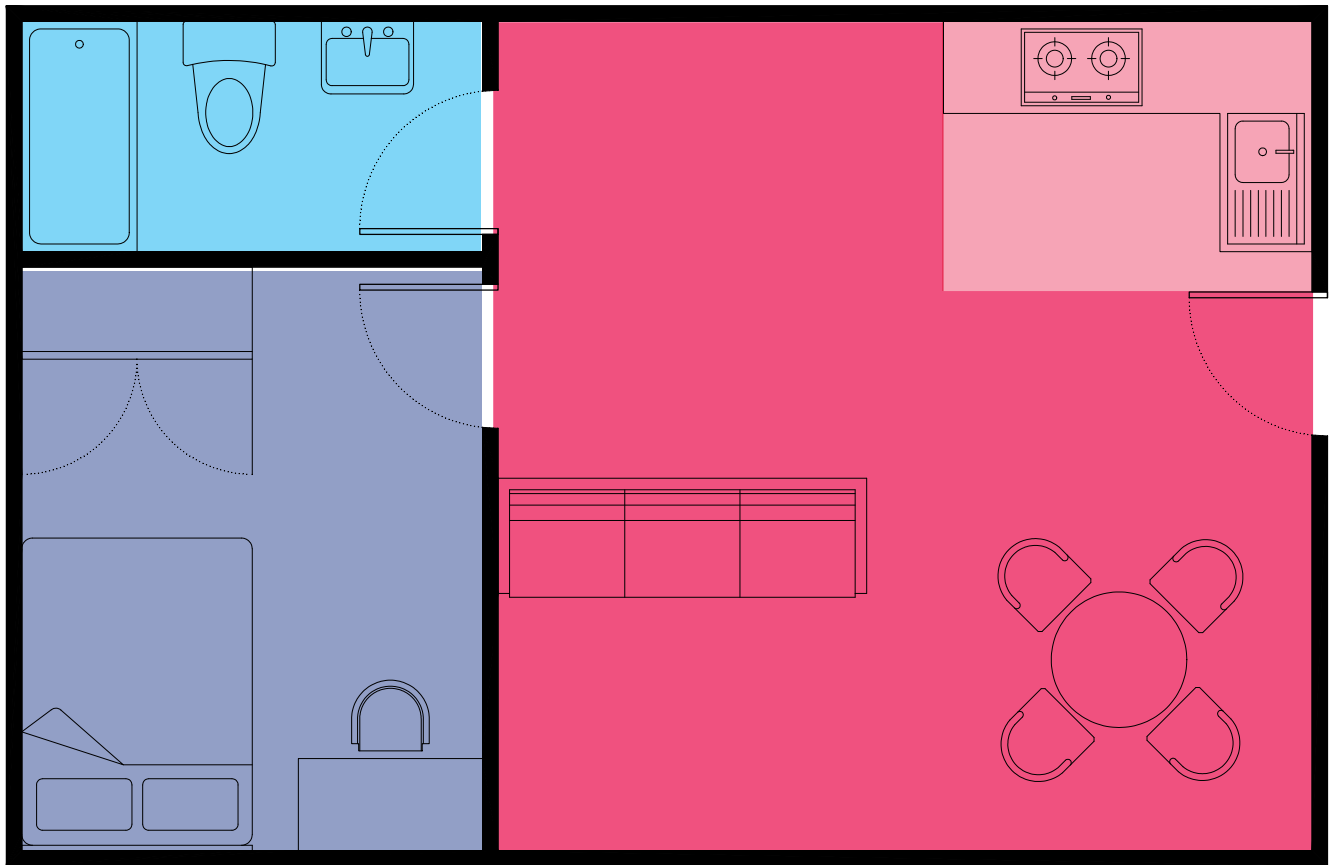
Fig. 28: Tiny House Floorplan Concept, 520 ft²

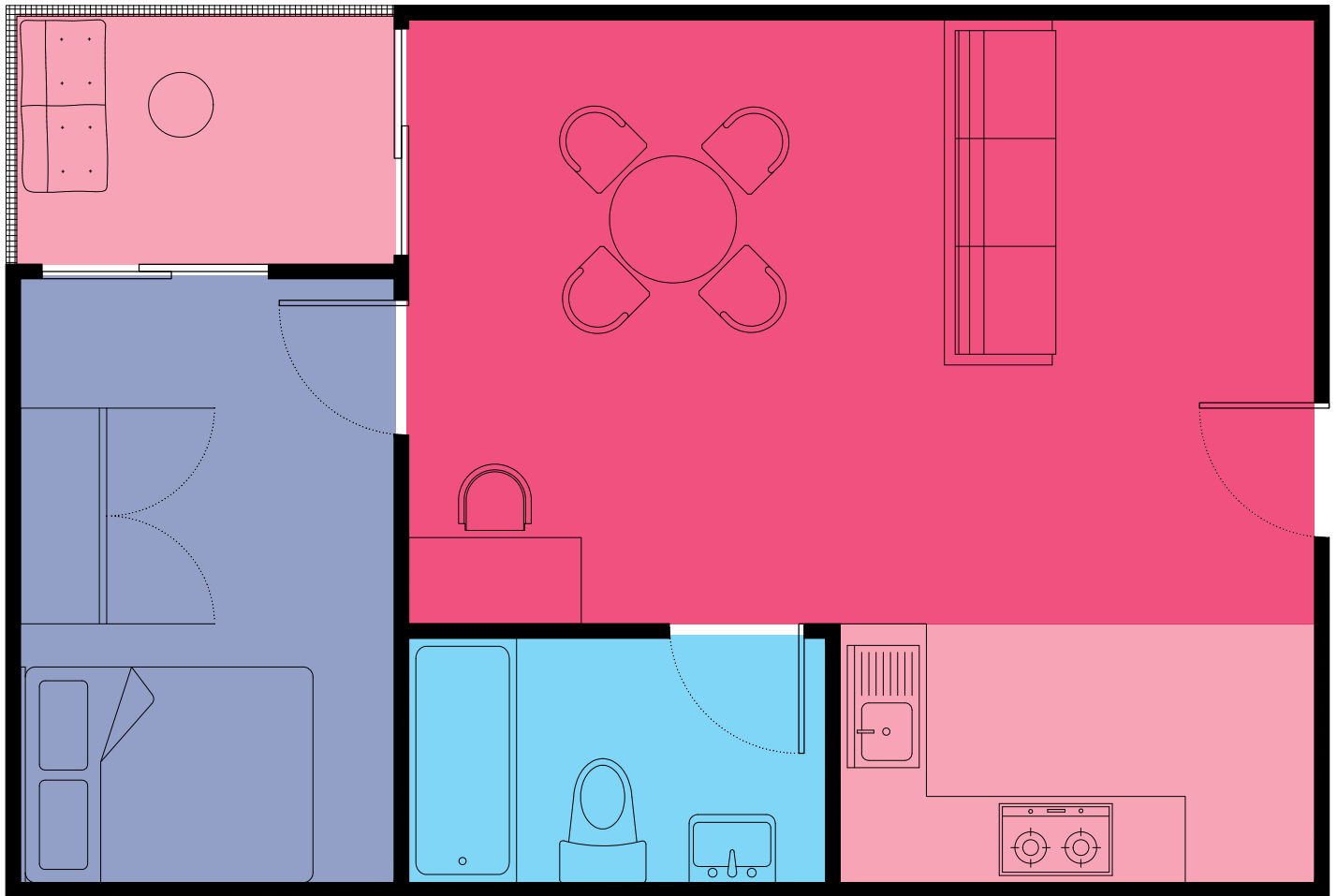shared   semi-shared

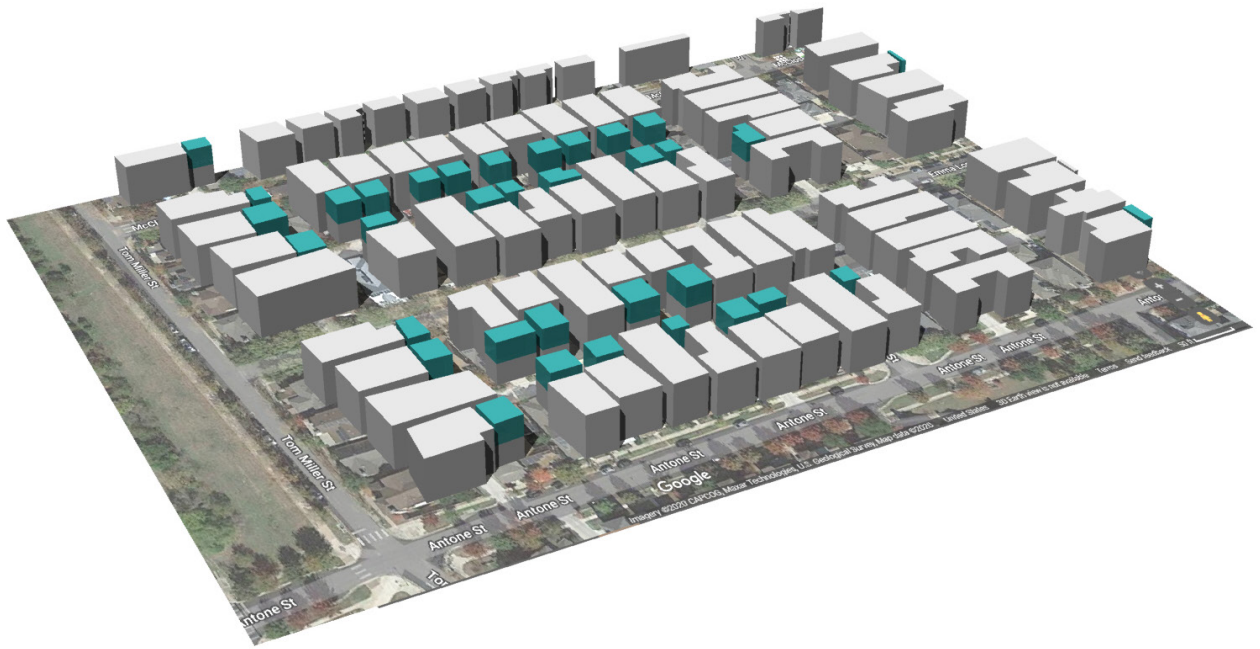semi-private   private

Fig. 29: Tiny House Floorplan Concept, 600 ft^2

Fig. 30: Map of Potential Tiny Living Locations
in Neighborhood 1, Perspective View
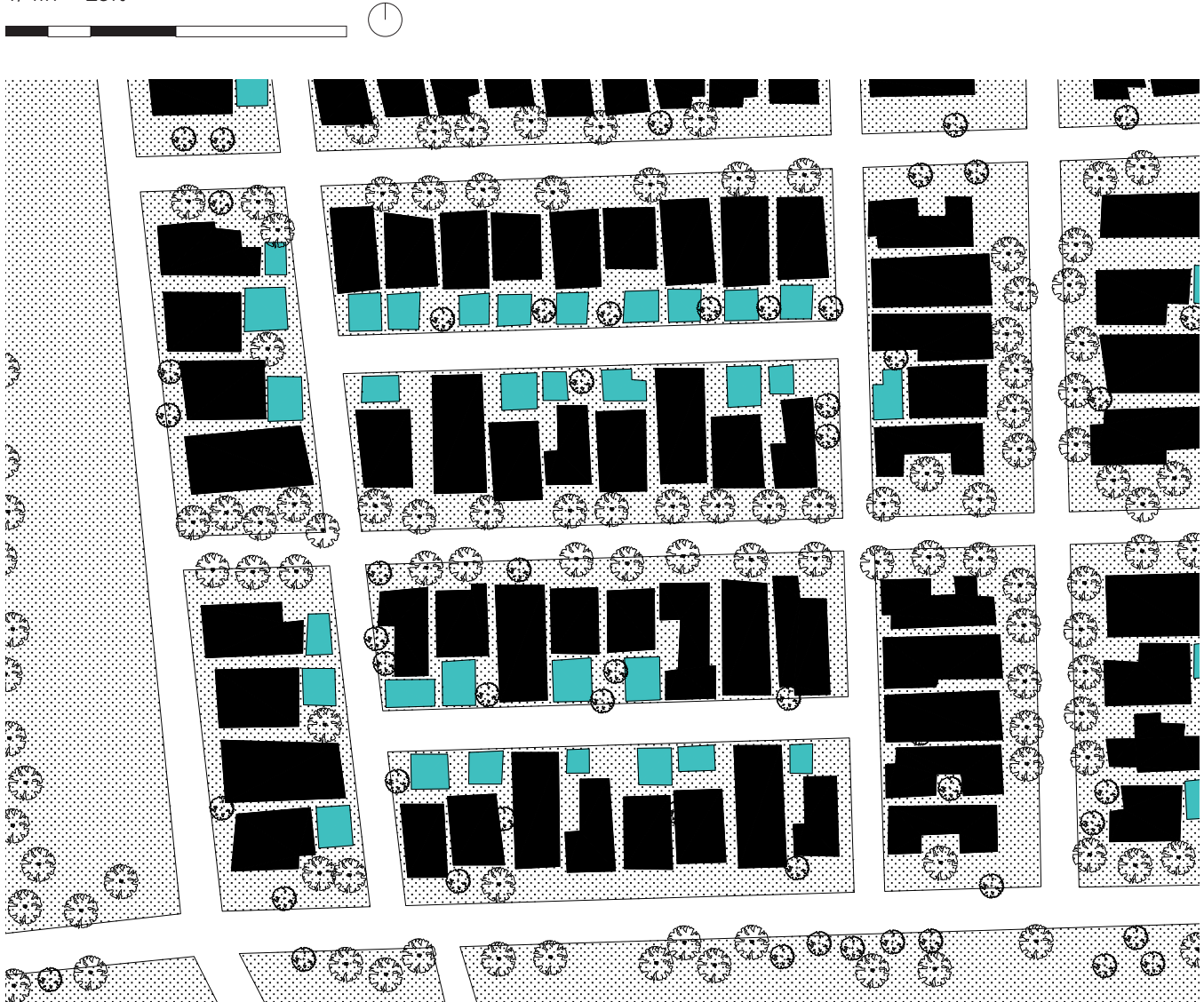

Fig. 31: Map of Proposed Tiny Living Locations
in Neighborhood 1, Plan View

1/4in = 25ft

Fig. 32: Site Map of Proposed Tiny Living Locations

LIVING COLLECTIVES

Meanwhile, communal areas would be dispersed throughout the neighborhood, providing shared spaces for cooking, dining, lounging, working, and recreation. Within walking distance, these buildings would be easily accessible by all tiny collective members and approved members of the neighborhood through walkways, alleyways, and streets.

Kitchen and dining buildings would be available for clusters of 8 to 12 people, making them available within a 10-minute walk. Work and recreation buildings would be available for clusters of 18 to 24 people, making them available within an 15-minute walk. Outdoor recreation space would be available for 30+ people, making them within a 20-minute walk. A large community center would be available within a 25-minute walk in the center of the community for all tiny collective members and approved neighborhood members. Matrices of scale, time, and building designs are available in Figures 41 and 42.

Approved neighborhood members would include residents involved in the governance and social organization of the tiny collective, as well as owners of the main house lots upon which the tiny houses are built. These types of members would have access to the communal buildings, but typically would not use them on a day-to-day basis.

Case Studies: Cohousing

Cohousing is a particularly useful case study of collective living methods. As Williams states in his paper, Designing Neighbourhoods for Social Interaction, cohousing uses design and formal social

structures to "encourage social interaction in neighborhoods." Moreover, the people who voluntarily choose to live in such collectives often are predisposed to social interaction. This further encourages the development of communities designed for social connectivity. Williams discusses several variables and principles associated with high levels of interaction within neighborhoods: (1) higher densities, (2) good visibility, (3) clustering, and (4) inclusion of defensible space and car parking on the periphery (Williams, 2005). "Social contacts are enhanced in a community when residents have opportunities for contact, live in close proximity to others, and have appropriate space for interaction" (Williams, 2005).

With the implementation of tiny houses, the density of Mueller will increase while maintaining good visibility, which is in accordance with the design guidelines of building carriage houses on a lot. Meanwhile, the development of shared, communal buildings will inherently cluster blocks together around various programming uses (i.e. cooking, leisure, recreation, etc.). The final variable that Williams brings up, inclusion of defensible space and car parking, is already inherent to the structure of Mueller Tower District.

This construction of collectively-used spaces allows for increased passive social contacts between residents, which encourages the development of relationships between individuals, neighbors, and community. Proximity is a significant factor in influencing patterns of socialization (Williams, 2005). Additionally, it is important to have a gradation from private to shared space. Semi-private and

semi-shared spaces provide transitional environments to operate within, reducing urges to withdraw from the community and providing spatial variety for social interactions. Research demonstrates that immediate neighbors will tend to communicate more than with residents that live farther away or at the edge of the community (Williams, 2005).

However, it is also the establishment of social organization that makes cohousing so successful in the context of increased social interactions. Examples of such organization include resident management, planning of communal activities, informal and formal social environments, and non-hierarchical structures and decision-making processes (Williams, 2005).

Figures 33 through 40 provide references to a variety of existing cohousing and coliving project. They range in scale, building style, time period, and geographic location. These case studies allow for a greater understanding of programming spaces in the context of collective living.
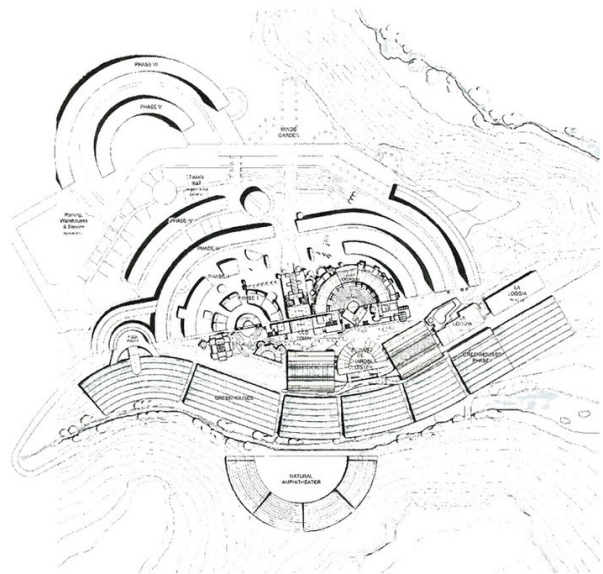
ARCOSANTI

Northern Arizona Desert, 1970, Paolo Soleri

Plan
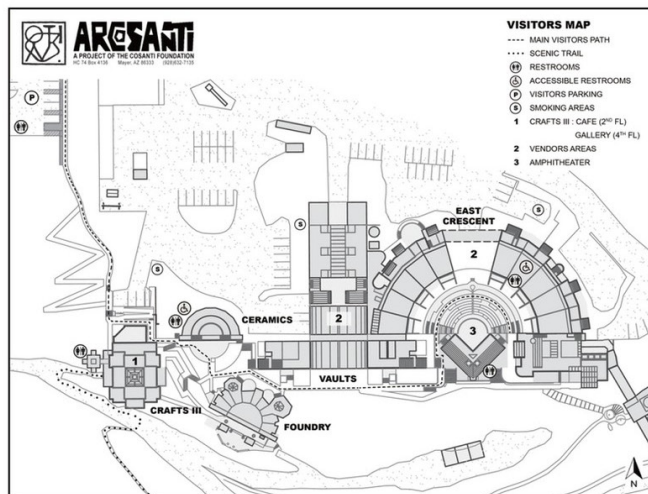
Construction Phases

Fig. 33: Arcosanti (Soleri, 2018)
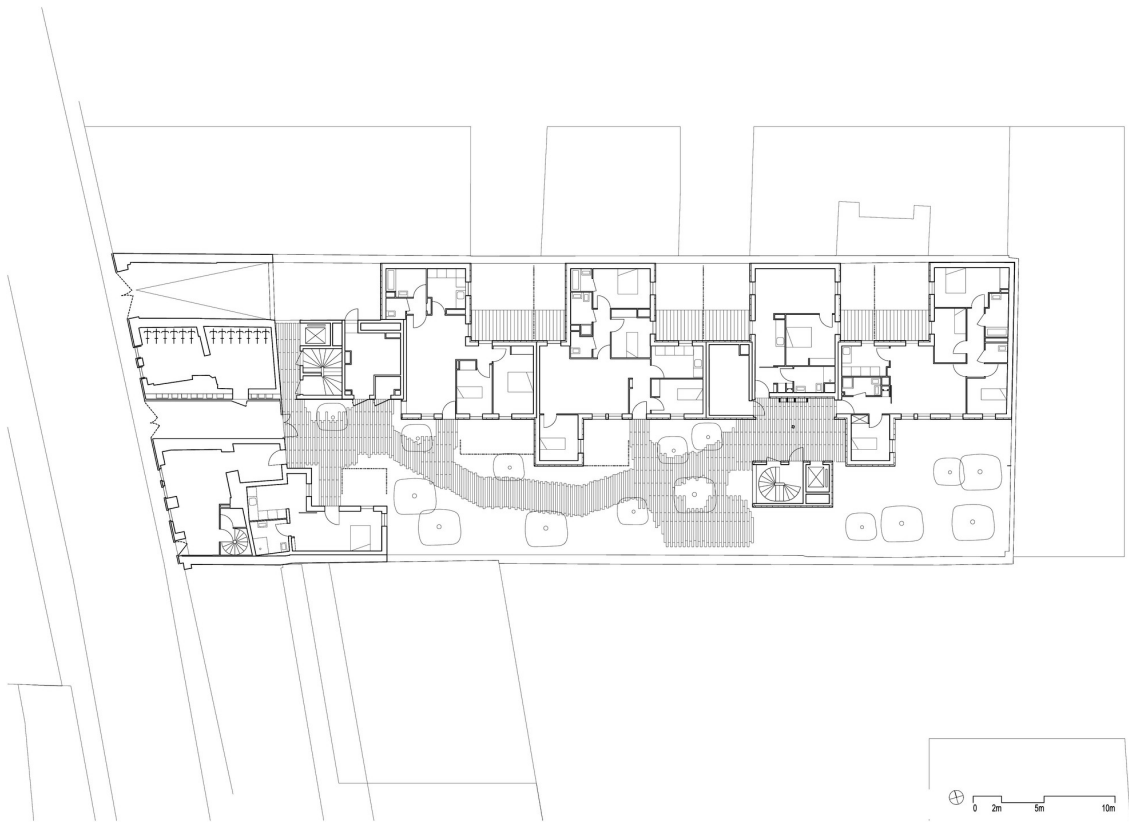
Fig. 34: Tete en L'air (Septet, 2013)
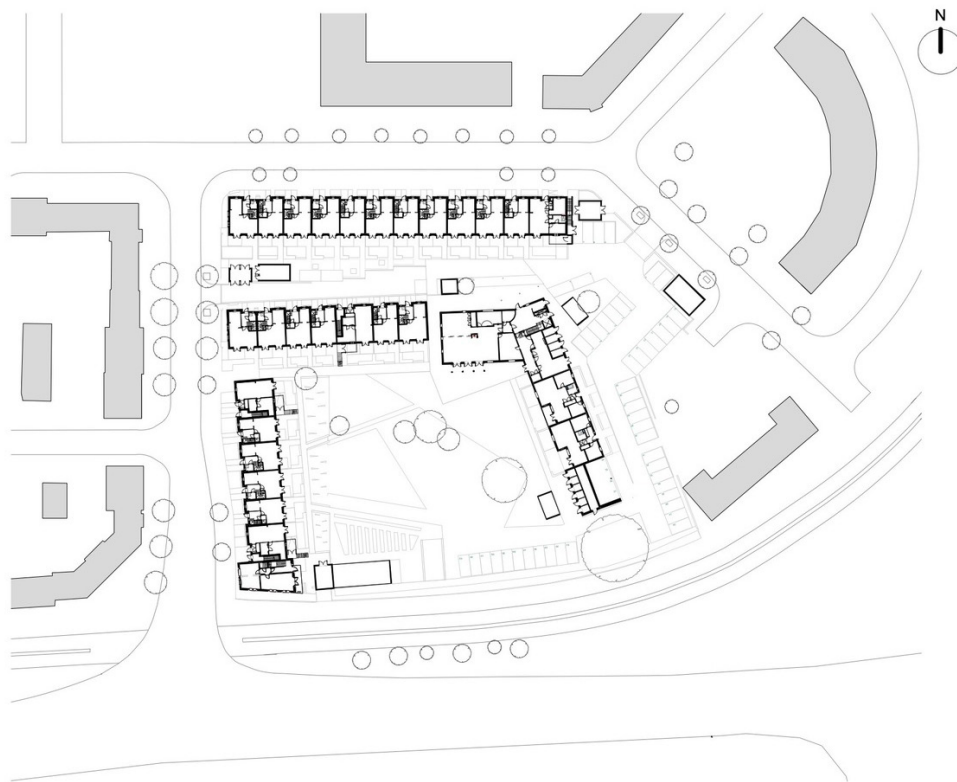
Fig. 35: Marmalade Lane (Butler, 2019)

ENTRY

FIRST LEVEL 1. BOOKSTORE 2. ARCHITECT
3. DINNING 4. GYM
5. FARMING 6. CAFE
7. DANCER 8. CO—WORKING
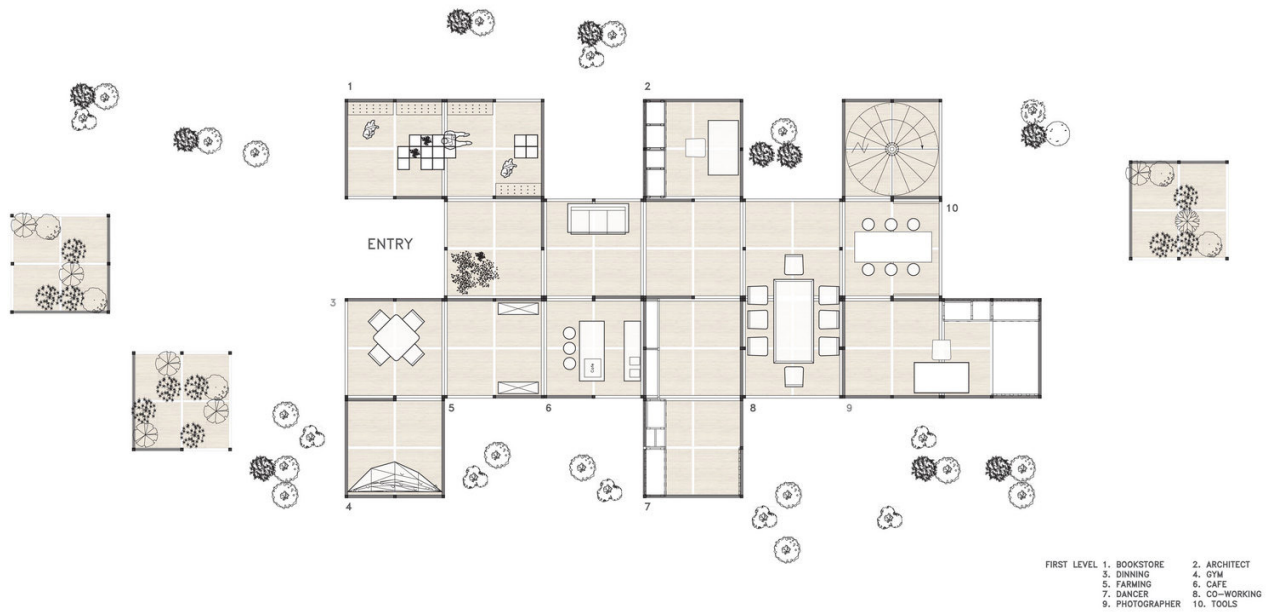9. PHOTOGRAPHER 10. TOOLS

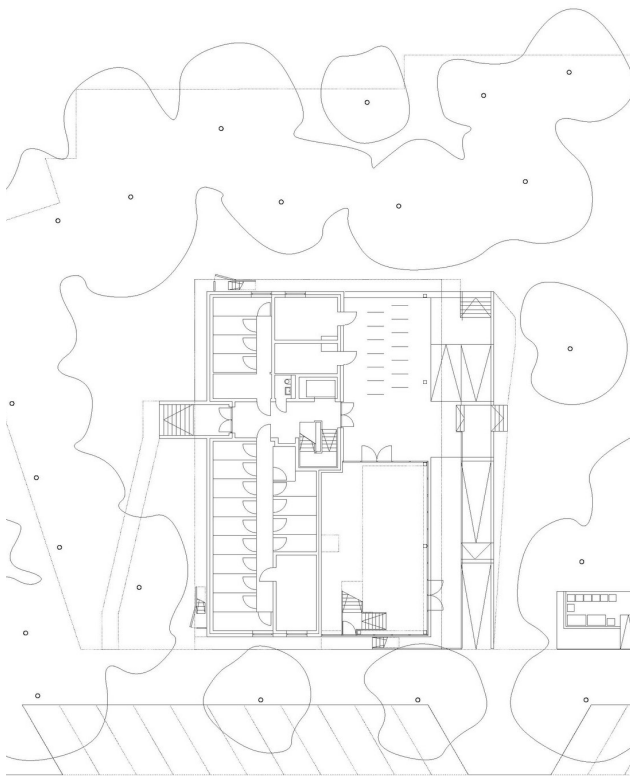*Fig. 36: MINI Living (MINI Living, 2017)*
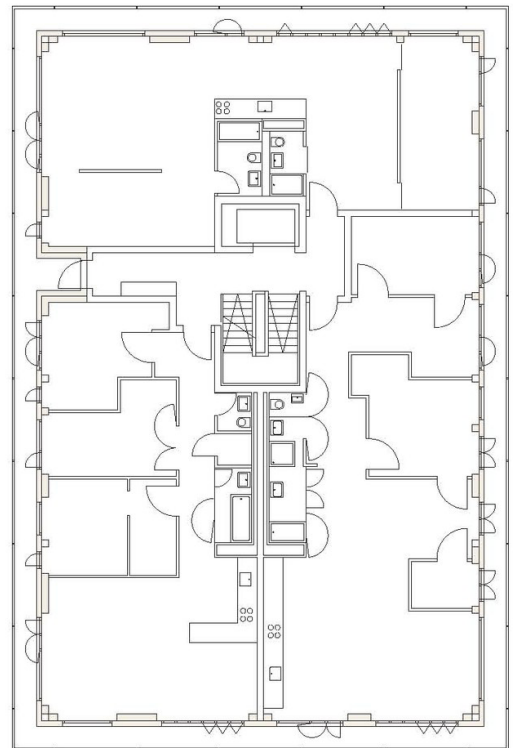

Fig. 37: R50 Baugruppen (Alberts, 2015)

Fig. 38: R50 Baugruppen (Alberts, 2015)

Fig. 39: Share House LT Josai (Naruse, 2013)

Total area: 3,305 ft²
Number of units: 13
Shared space: 50%
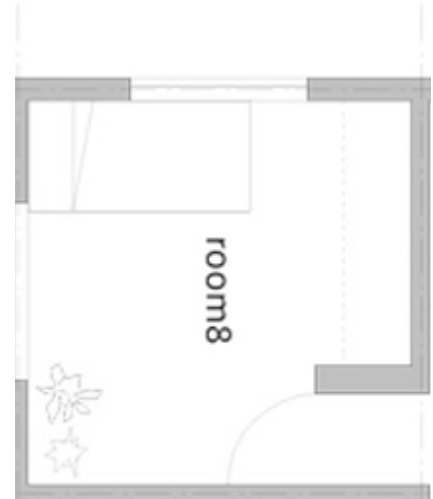Private space: 30%
Service space: 20%

Case Description: Located in Nagoya, Japan, this was built in 2013, designed for coliving. The shared spaces are programmed as casual extensions of private bedrooms.

Unit Description: Each bedroom is different, given factors such as distance and route to shared spaces. Inhabitants share the kitchen, living room, and bathrooms. The total floor space per resident amounts to approximately 23 square meters, making the building extremely efficient.

Typical Floor

- shared
- service
- private

Typical Unit

Space Distribution on a Building Scale

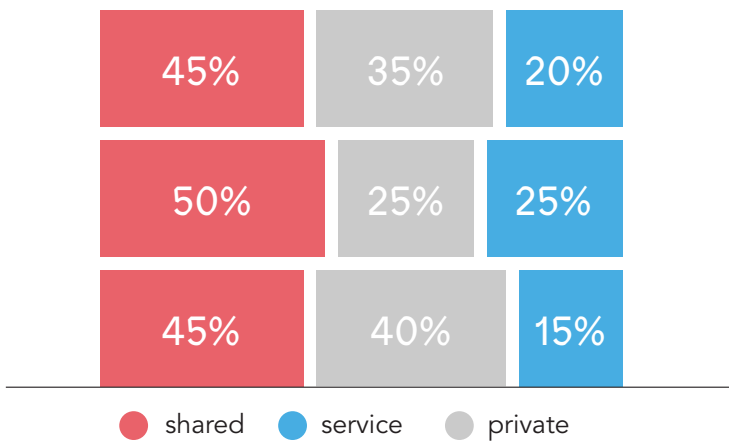|		
45%	35%	20%
50%	25%	25%
45%	40%	15%

- shared
- service
- private

Fig. 40: Tetuan CoLiving (Imagen Subliminal, 2019)

Total area: 11,000 ft²
Number of units: 20
Shared space: 50%
Private space: 30%
Service space: 20%

Case Description: Located in Madrid, Spain, this was adapted in 2019. It is an adaptive reuse project of a residential building from the 1960s. It transformed the traditional, oversized apartments into a coliving space for 20 people

Unit Description: Each room has its own private bathroom, with shared spaces for a kitchen, coworking space, living room, bike parking, and terrace. The communal areas are located primarily on the 1st floor, while private spaces are located on the 2nd and 3rd.

Typical Floor

● shared ● service ● private

Typical Unit

Space Distribution on a Building Scale

67%	33%
25%	60%	15%
25%	60%	15%
75%	25%

● shared ● service ● private
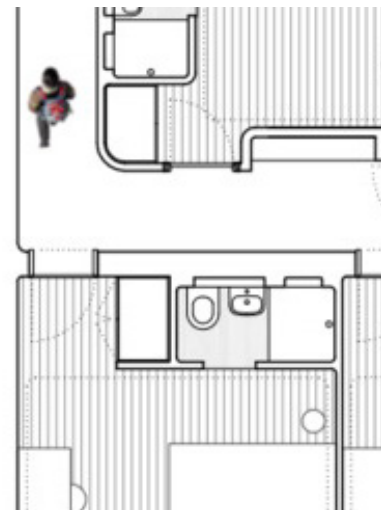
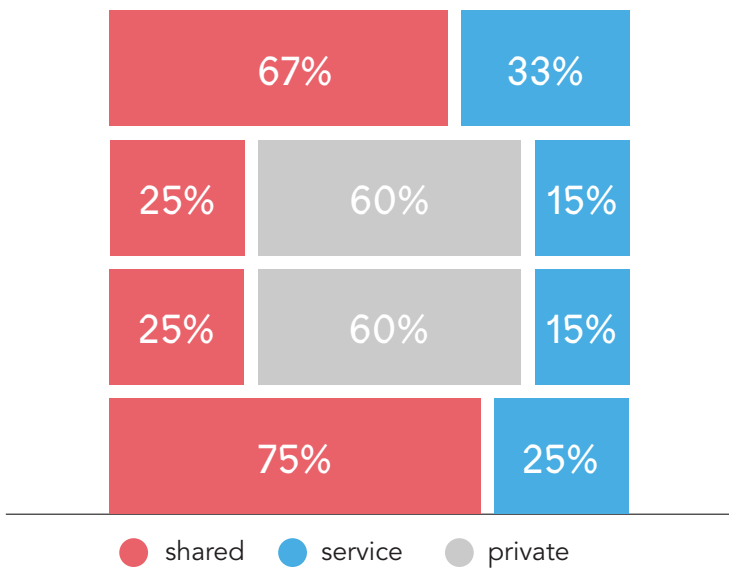*Proposed Design for Tiny Collectives*
While each Tiny Collective member has their own tiny house (proposed designs in the previous section, Tiny Living), they also belong to the greater shared network of living, dining, work, and recreation spaces, known as the Tiny Collective. Based on the case studies of cohousing, the proposed design for Tiny Collectives involves a series of programmed spaces that span scales (individual, block, neighborhood, and community) as well as use cases (sleeping, living, dining, work, and recreation). These various spaces are spread throughout the Mueller community, creating clusters of communal and private buildings. Small living and dining spaces would be within a walkable distance of 10 minutes, while larger dining and recreation spaces would be within a distance of 20 minutes.

Depending on the size of the community and clusters, a larger or smaller designed space could be used to accommodate the needs of the collective. For example, smaller lounge space might be better suited for a cluster of 12 people that live on the same block. Meanwhile, a larger living space would be used to accommodate a group of 30 or more people on a neighborhood scale. This logic would be similarly applied to other communal spaces, such as dining and working spaces. Since the costs of working space, lounges, dining spaces, and recreational facilities are shared and split amongst the members of the Tiny Collective, the individuals gain access to premium amenities for a lower price. The quality of their rent becomes substantially higher with the addition of communal spaces that can be used functionally and socially. Unlike typically city housing, the Tiny Collective includes a significant ratio of shared to personal space, creating greater opportunities for interaction and community-building.

Some spaces may only apply to particular scales of use. An amenity, like tennis courts, would only exist at the neighborhood scale since it is able to be enjoyed by a large number of people in the community. Meanwhile, a cooking and dining space may exist on a multitude of scales. Individuals would typically cook and eat in either their private kitchenettes, or use the kitchen and dining space shared by their cluster. However, if hosting a larger event or party, it would be ideal to have a neighborhood or community scale space that could hold over 50 people. In the case of Mueller Tower District, these types of communal buildings come in the form of a community center. While only Tiny Collective members and the residents of the houses they share lots with would have access to the newly developed collective buildings, the community center would be a shared building for all members of the Mueller Tower District.

Currently, there is no central community space, which would promote social interaction and neighborhood gatherings. The members of the Tiny Collective as well as the residents of the original neighborhood would be able to use the space for parties, social clubs, recreation, and more. By having a central building, the community would experience greater feelings of belonging and fewer feelings of isolation or loneliness. The architecture of the communal spaces not only makes amenities and facilities accessible and affordable, but also encourages a more fortified sense of community.

	<10MIN	<15MIN	<20MIN	<25MIN
DINING	Clusters of 8-12 people			
LIVING	Clusters of 8-12 people			
WORK		Clusters of 18-24 people		
RECREATION		Clusters of 18-24 people	Clusters of 30+ people	
COMMUNITY CENTER				Clusters of 50+ people

Fig. 41: Matrix of Building Type vs. Walking Time to Nearest Location

	SLEEPING	LIVING	DINING	WORKING	RECREATION

INDIVIDUAL

*scaled 1:2, displayed dimensions are accurate
8'-8"
14'-0"

*scaled 1:2, displayed dimensions are accurate
8'-11"
9'-2"

*scaled 1:2, displayed dimensions are accurate
12'-9"
9'-2"
11'-8"
6'-4"

*scaled 1:2, displayed dimensions are accurate
6'-4"
4'-8"

BLOCK

18'-0"
14'-0"

24'-0"
20'-0"

NEIGHBORHOOD

30'-0"
20'-0"

24'-0"
16'-0"
24'-0"
16'-0"

COMMUNITY

40'-0"
50'-0"

40'-0"
50'-0"

*scaled 4:1, displayed dimensions are accurate
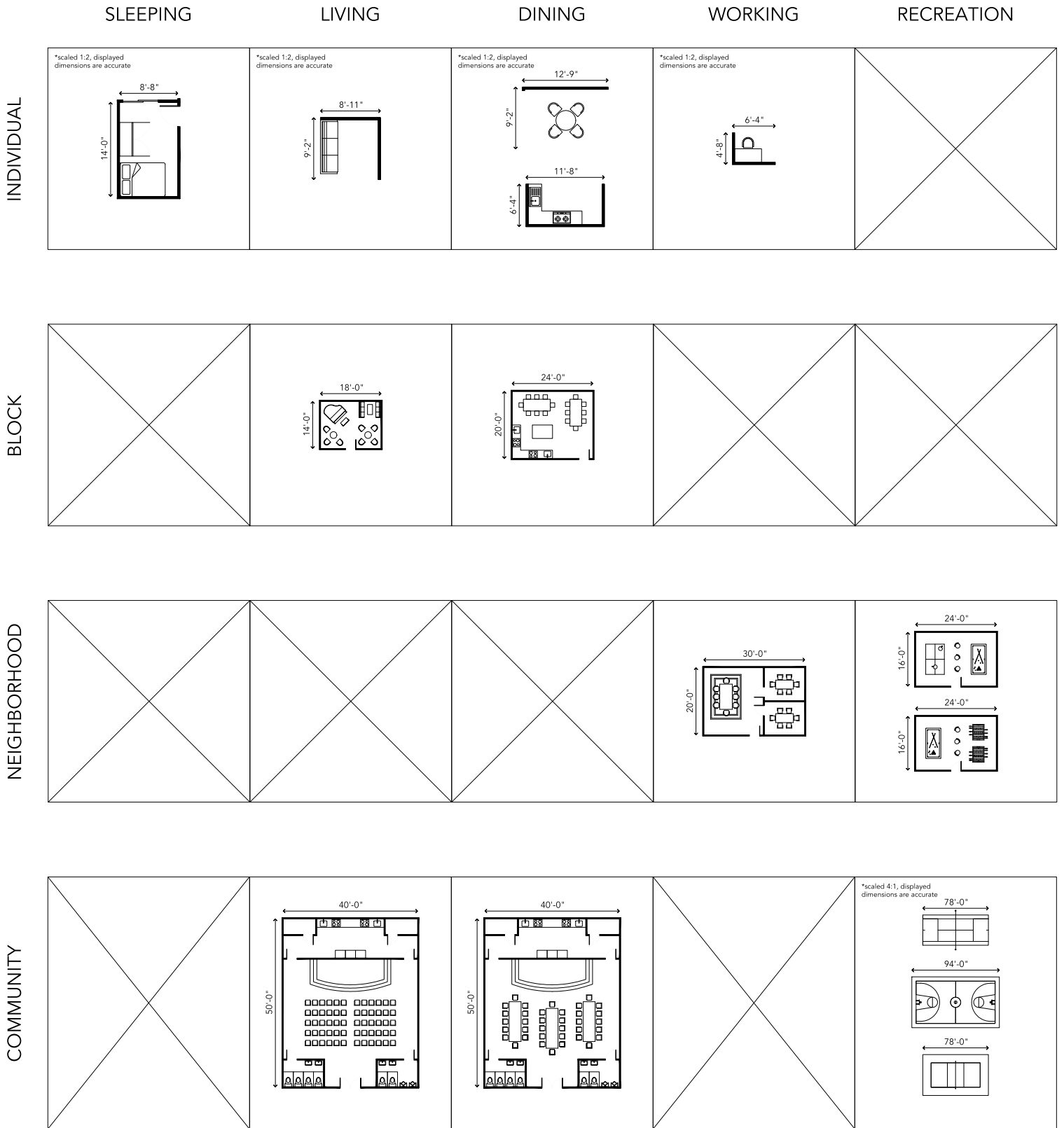78'-0"
94'-0"
78'-0"

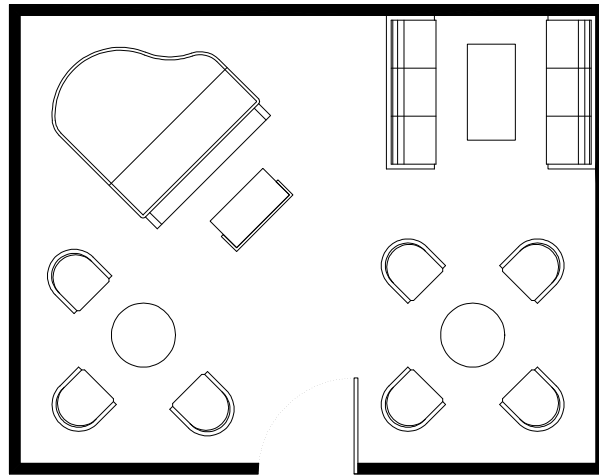Fig. 42: Matrix of Programmed Spaces Across Scales

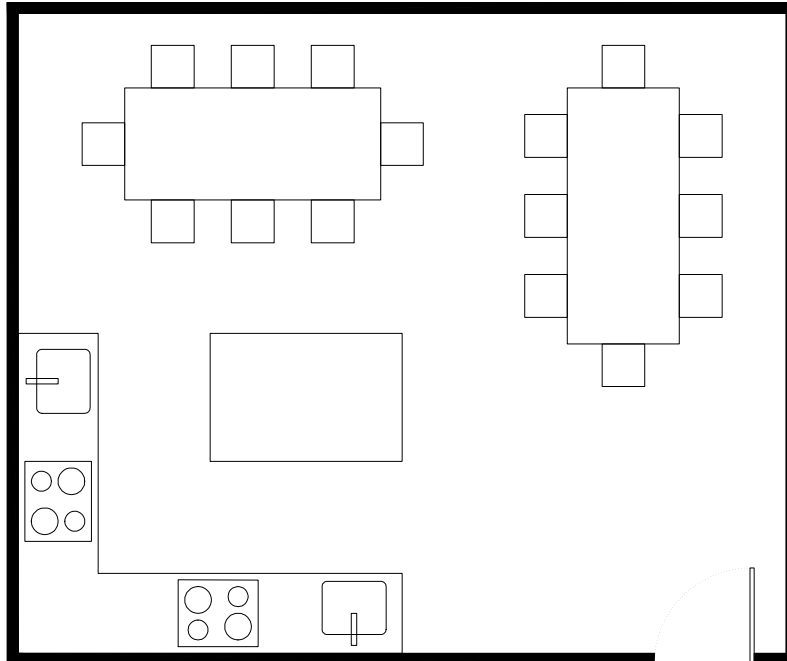*Fig. 43: Floorplan of Collective Living Space*

Fig. 44: Floorplan of Collective Dining Space
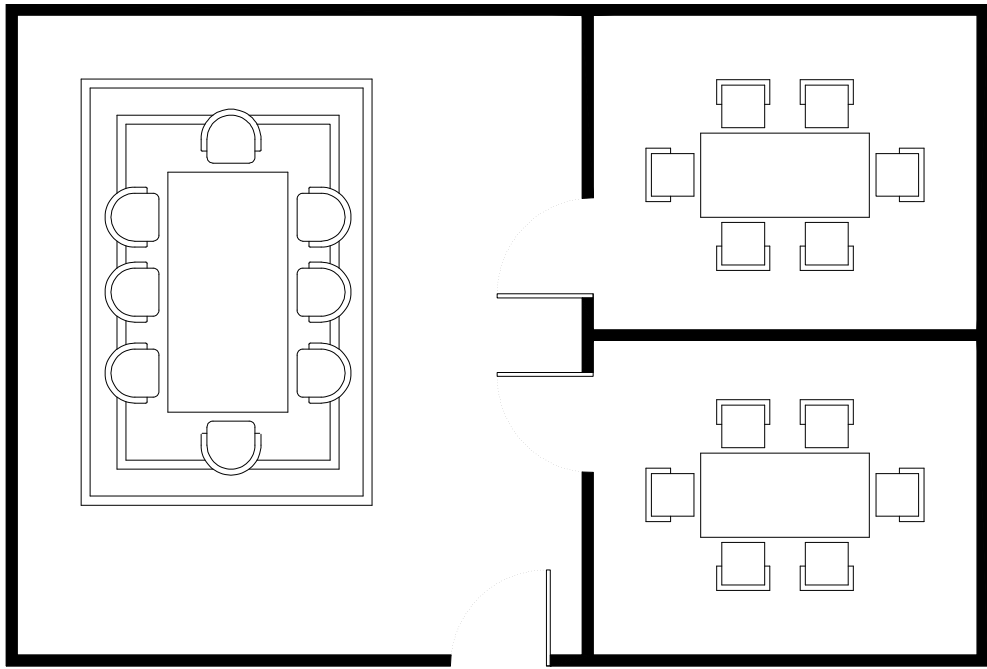
1/4in = 1.75ft

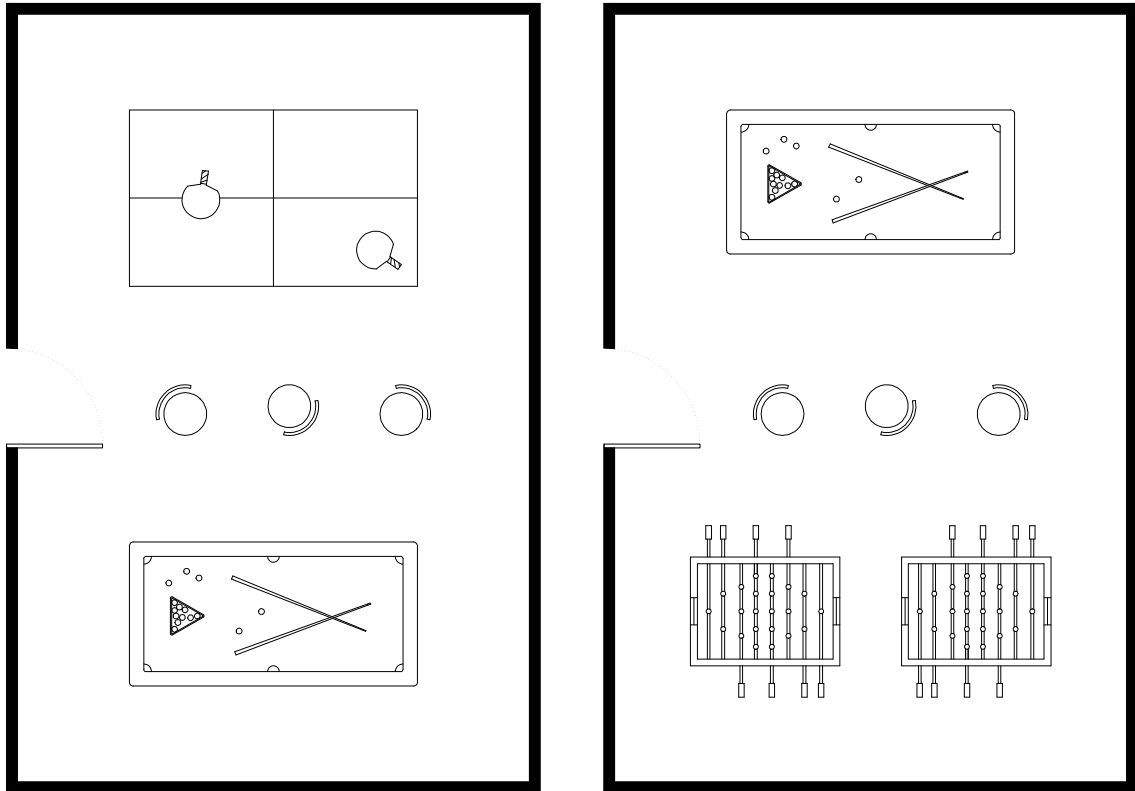*Fig. 45: Floorplan of Collective Working Space*

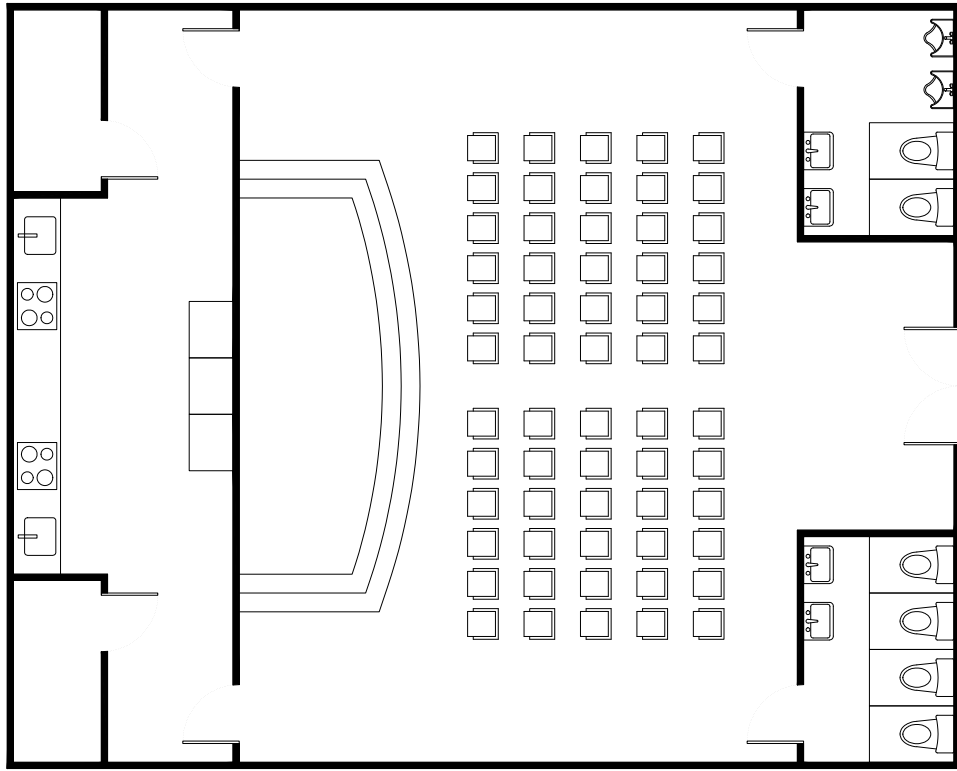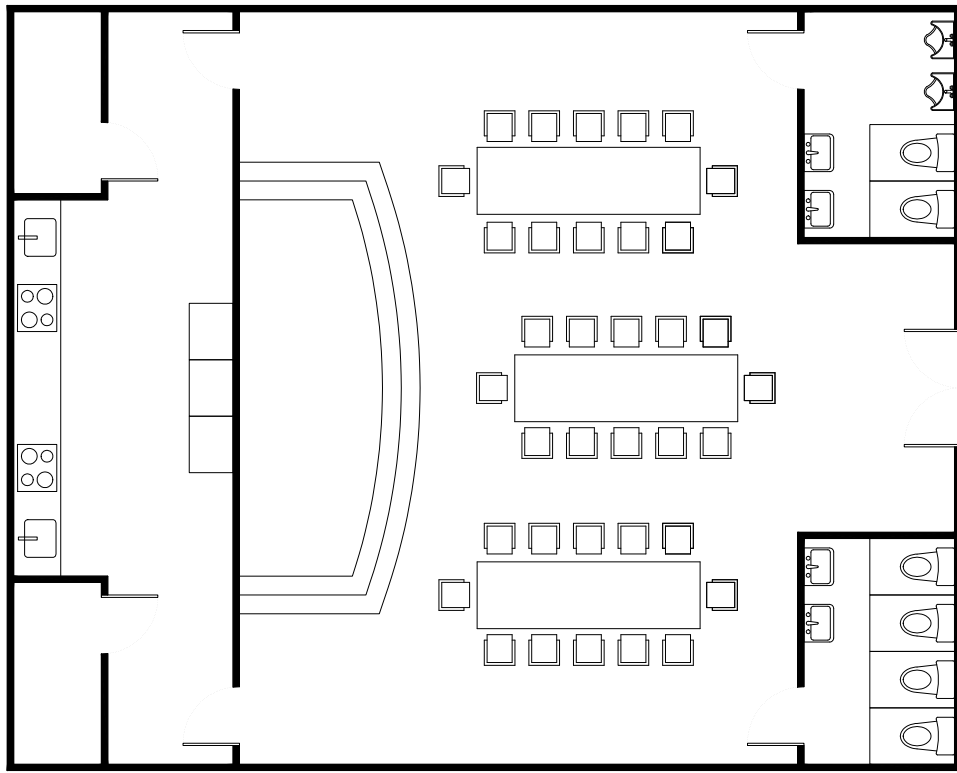*Fig. 46: Floorplan of Collective Recreation Spaces*

1/4in = 1.75ft

*Fig. 47: Community Center, Dining Programming
versus Living Programming*

1/4in = 1.5ft

*Fig. 48: Map of Proposed Tiny Collective
Building Locations, Perspective View*

*Fig. 49: Map of Proposed Tiny Collective
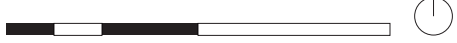Building Locations, Plan View*

Fig. 50: Site Map of Proposed Tiny Collective
Building Locations in Neighborhood 1

CONCLUSION

CONCLUSION

The urbanization of cities is an issue that poses several challenges economically, environmentally, and socially. Living Tiny is a proposal to break down current patterns of development, which are unsustainable, and consider alternative methods of constructing the built world, which in turn affect social networks and interactions.

Architecture involves the design of not only physical structures, but also social organizations. It is not viable for cities to become cold, isolated concrete jungles; instead, cities should be reflective of the people that inhabit them. Without a sense of community and place, the city loses its vibrancy and potential to be a gathering space for a diverse set of people.

With Mueller Tower District as the site for an alternative future, Living Tiny presents a system of two parts: Tiny Living and Tiny Collectives. Tiny Living illustrates the use of tiny houses as alternative dwelling units (ADUs) situated on the property lots of existing houses in the neighborhood.

The design creates a secondary network of housing overlayed onto Mueller Tower District. These houses would densify the neighborhood while making use of the inherent alleyway infrastructure that provides access to the new inhabitants. This half of the system addresses the needs for more affordable housing in urban areas, and provides a housing market for demographics that are often forgotten or priced-out: young professionals and retirees. Meanwhile, Tiny Collectives is a design based on principles of cohousing, where certain amenities are shared by clusters of or all residents. This half of the system aims to provide a solution to the isolating nature of cities by using architecture as a way of promoting social interaction. Through the programming of communal spaces, members of the Tiny Collective and Mueller Tower District can gather and interact with each other through acts of cooking, eating, relaxing, exercising, and working. These spaces would be easily accessible and members would be encouraged and incentivized to use them

in addition to their private Tiny Living units.

Ultimately, the thesis envisions an alternative method of developing and densifying cities. It urges the use of architecture as a tool for designing the built environment as well as the social world. It critiques how current urban areas induce unnecessary and undesirable feelings of loneliness, and provides a possible solution to economic, environmental, and social challenges.

Future research and designs could address areas of the thesis that may be expanded upon, such as zoning, sociological surveying, market research, and temporal designs.

Further research on the local zoning laws of Austin, Texas would better inform the feasibility of such a project in reality. Although the Mueller Tower District design handbook states that the construction of carriage houses, otherwise known as ADUs in the context of this thesis, is allowed. However, the construction of the collective building designs would require more in-depth research on Austin building codes and laws. Building codes would also help determine the feasibility of constructing the utilities required of the ADUs and whether they could be tied in to the existing utility infrastructure of the main houses.

Meanwhile, sociological surveying would provide a greater understanding of the purchasing and renting behaviors of the local area, as well as the nature of social interactions that take place. It would illustrate the types of recreational, work, and life behaviors of the regional population. This would give greater design insight to what kinds of buildings or activities residents would find most useful and appealing.

Market research would allow for a calibration of pricing. With this information, a detailed budget plan could be drawn up, outlining the expenses of building such a proposal and the amount of rent each unit should be leased at so to achieve affordable housing prices while also making a profit on the development.

An additional area of the design proposal that could be further explored is the idea of temporal programming, where certain building types may house several different programs depending on the time of day. For example, the community center could be considered a multi-purpose room where group exercise classes could be held during the day and movie screenings could be held during the evenings. Such buildings could transform and adapt easily to a wide variety of use cases, and would function more efficiently if such programming took place throughout the day rather than only during specific hours. By imagining different scenarios of use for the collective buildings, the community could potentially become even more socially enriched.

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