Just Build It

Design guidelines for a tiny home community in the Region of Waterloo based on conversations with residents who have experienced homelessness

by

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Author's declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

As governments in the Region of Waterloo consider implementing tiny home communities (THCs) for people experiencing homelessness, the Tiny Homes Research Project (THRP) has partnered with the City of Cambridge to design a “v2” prototype home – from the “v1” built in a previous phase – in alignment with the regional government’s plans for a new supportive housing THC. Following a review of existing tiny home designs and regulations, our research team conducted the Tiny Home Prototype Study (THPS) to explore how people who have experienced homelessness define their own needs and wellbeing as it relates to housing. Data collection involved two focus group sessions located at the v1 prototype, with one group of participants from the emergency shelter in Cambridge, and the other group made up of people living in an existing THC. A coding methodology for sociospatial analysis was developed to translate the personal insights collected from the conversations into spatial information: the Tiny Home Community Design Guidelines. Five Guiding Principles for Tiny Home Design emerged from that process, each supplemented by specific Spatial Practices – objectives that describe what potential residents want to be able to do or feel in the home. v2 design sketches were developed through the five principles in sequence, aiming to provide (1) A Regular Place to Live, (2) Choice, (3) Utility, and (4) Security; and aiming to address the tension between a formalised design process, and the urgency to (5) Just Build It.

Acknowledgements

Thank you to everyone involved with all phases of the Tiny Homes Research Project: Major acknowledgement is due to every person who attended the two sessions of the Tiny Home Prototype Study and shared their insights, experience, and advice on how to design a tiny home, and tiny home community, to be a good place to live. Those insights are the foundation of the results of this thesis – the Tiny Home Community Design Guidelines.

Staff and management from the two participating organisations were integral for sharing their knowledge, which helped our team plan the study sessions and also introduced us to the context and challenges of homelessness, and tiny home community living, in the Region of Waterloo. Thank you to Wayne Paddick, Sharon Livingstone, and Bennett Zettler from the Bridges Shelter Corporation in Cambridge; and to Brad Bowman, Nadine Green, and Jeff Willmer from A Better Tent City in Kitchener. Additional thanks to Jeff Willmer for assisting as the external reader for my defense.

Research team members are listed in the Appendix: The Tiny Homes Research Project Team. On the current team, thank you to faculty researchers Dr. Martine August, Adrian Blackwell and John McMinn for guiding the project, and to my colleague researcher Katherine Kinsman, from the School of Planning, for your insight, advice, and for sharing this experience. From the School of Architecture, thanks to Adrian Chîu for helping us run the studies, and to Fred Hunsberger for photos of the v1 prototype.

From the past phase of work, thank you to the authors of the four case study reports for providing a starting point for my research, and to the students from the design-build studio taught by Adrian Blackwell and John McMinn for creating the v1 tiny home prototype.

This latest phase was funded through a partnership with the Mitacs Accelerate Fund, and the City of Cambridge. Jenna Brown-Jowett at the City was instrumental in helping to arrange the study sessions and the public viewing period for the v1 prototype. Thanks as well to John McMinn for orchestrating the move of v1 from the School of Architecture to City Hall, and to the students and faculty who helped with the move and final construction.

Outside of the research team, thank you to everyone who helped me develop and complete this document. Special thanks are due to those who offered their homes as work spaces, offsetting the challenge of writing a thesis off-campus, who helped me talk through and plan the study sessions or the resulting document, and who stepped in as proof-readers before submission: thanks to Amanda, Ian, Ian, Julia, Nick, Lauren, Maddi, Paterson, and to Cathy and my Parents.

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Introduction

Municipalities in the Region of Waterloo are in the early phases of establishing how tiny homes will fit into their housing landscapes, after the Ontario Government passed the 2019 More Homes More Choices Act to encourage affordability through adding to the existing housing stock, and the Region of Waterloo began promoting tiny homes, previously perceived to be a countercultural building style, as an official "alternative housing" type. In one popular implementation route, private home and property owners can add to the housing stock and generate rental income by building tiny home rental units on their land. This thesis explores a different route: the use of tiny homes and tiny home communities as a housing option for people experiencing homelessness.

Our research team, from the University of Waterloo (UW) schools of Architecture and of Planning, has been conducting a multi-phased Tiny Homes Research Project (THRP). The previously completed Phase 1 resulted in case study reports on existing communities, and the design and construction of a prototype tiny home – "v1". The task of the most recent research Phase 2, as detailed in this thesis, is to design a new "v2" prototype.

Municipalities in the Region are also exploring the potential of tiny home communities, which are locally unprecedented as a government-developed housing type. In this latest phase of the THRP, our research team partnered with the City of Cambridge to consult with residents of the region who have experienced homelessness, to collect their feedback on the v1 design. This v2 prototype will also be aligned with the goals and constraints of a supportive housing THC currently proposed by the Region. That community would become the second region-affiliated THC, after the Outdoor Shelter currently under construction on the outskirts of Waterloo.

This thesis represents our research team's efforts at centering the perspectives of potential THC residents as the foundation for the v2 home prototype's design guidelines. In this document, we share our process of collecting those perspectives and interpreting them into architectural strategies. Two approaches were used: we held focus groups with participants from A Better Tent City (ABTC), an existing tiny home community in Kitchener, and the existing emergency shelter in Cambridge, the Bridges, to represent potential residents. In addition, we held individual interviews with professionals at local social organisations to gain planning and operational perspectives. These professional interviews and planning perspectives are detailed in a separate report affiliated with the School of Planning, authored by Katherine Kinsman.

From these discussions, five Guiding Principles For Tiny Home Design emerged, supported by specific Spatial Practices, or design objectives, and are used to structure the key findings. Four of the principles concern what a tiny home community should provide: (1) A Regular Place to Live, (2) Choice, (3) Utility, (4) Security. A fifth principle underscored every conversation, the urgency and need to (5) Just Build It. Illustrations are included to explore how architectural and site planning strategies can comply with these principles and the perspectives we heard on what makes a tiny home community feasible to implement, and a good place to live.

Fig. 1. The Ontario Minister of Municipal Affairs and Housing announces additional provincial housing initiatives with the More Homes Built Faster Act in October 2022. (Photo retrieved from www.ontarioconstructionnews.com/ford-government-to-introduce-housing-legislation-on-tuesday/).

Fig. 2. The tiny home prototype v1 on display at Cambridge CIty Hall, Sept 2022. (Photo by Fred Hunsberger for the Tiny Homes Research Project).

1. Background

1.1 Homelessness and Tiny Homes in the Region of Waterloo

There are currently no appropriate, affordable, and available housing options in the Region of Waterloo for people who are experiencing homelessness. Shelters, which are not always suitable or safe options for the people who need them, are at capacity or closed. Tent encampments have proliferated around the region since the onset of the covid-19 pandemic, but these are unsanctioned and often unsafe places to live. The Tiny Homes Research Project (THRP) at the University of Waterloo, and local governments in the Region, are exploring an alternative housing option that may be safer and more stable: tiny home communities.

The Instability of Existing Shelter Options

The places where people experiencing homelessness currently *can* live in the region are marked by instability. The map in Figure 4 tracks four relocations (three past, one imminent) of shelters and encampments, and of the one existing THC in the Region, followed by a descriptive timeline of headlines and news article excerpts. The resulting storylines reveal some of the challenges faced by residents of these housing types and the need for more stable local housing options. Figure 3, below, provides the regional geographic context of the Waterloo-Kitchener-Cambridge tri-city region in relation to nearby major cities. The smaller shapes within the Region boundary are townships and communities.

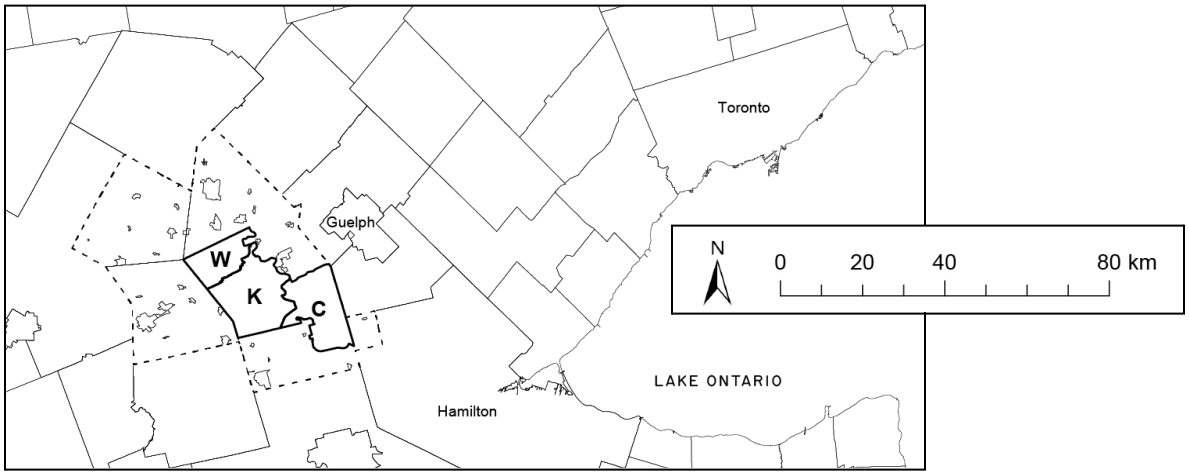


Fig. 3. Map showing the Region of Waterloo (dashed), and its three cities Waterloo (W), Kitchener (K), and Cambridge (C). (Image by author).

RELOCATIONS: SHELTERS, ENCAMPMENTS, TINY HOME COMMUNITIES (2020-2023)

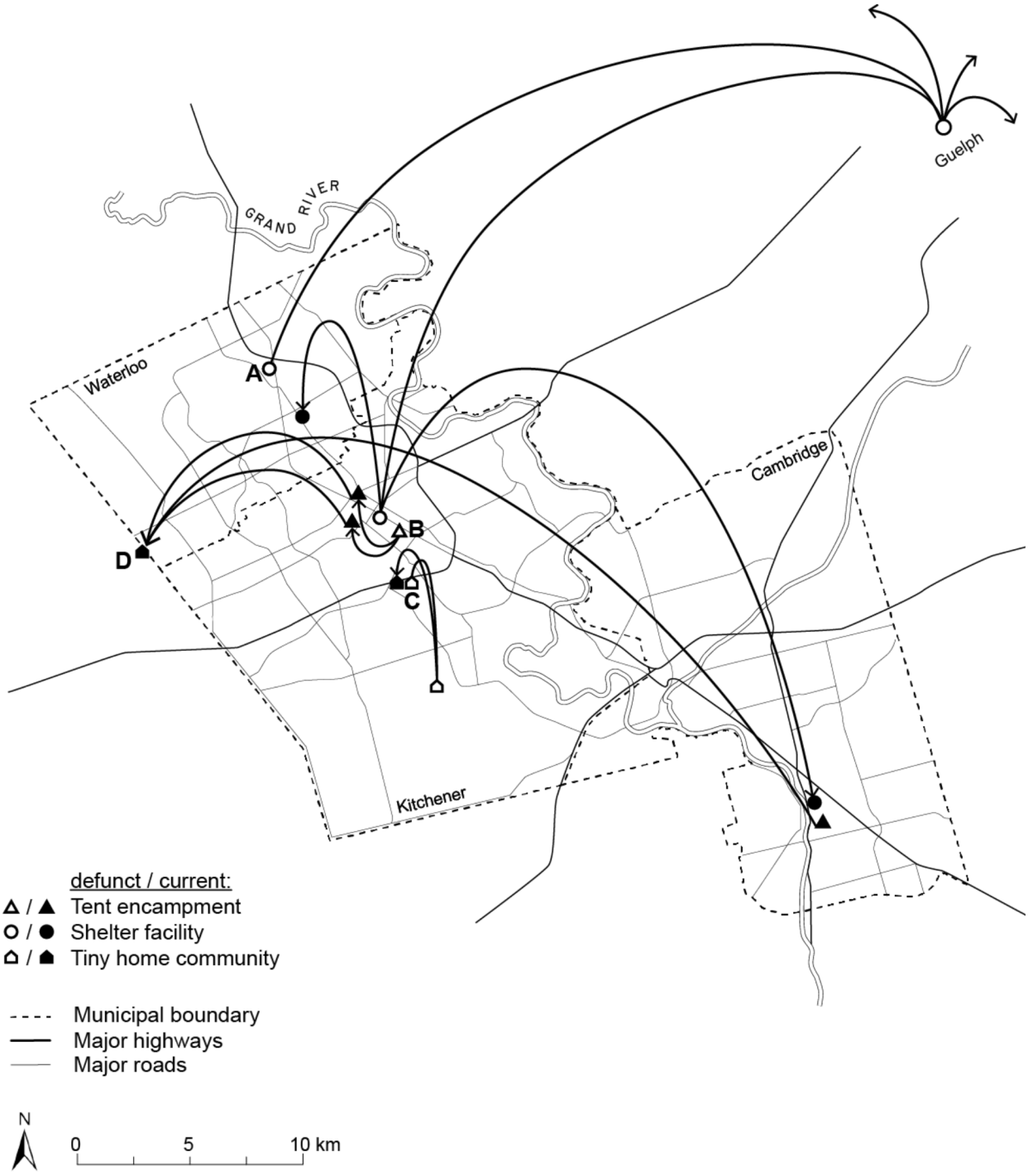


Fig. 4. Emergency closures, evictions, relocations (2020-2023). (Image by author).

TIMELINE THROUGH HEADLINES AND NEWS DESCRIPTIONS

A

Relocations of shelter users due to closures

02-2021 "Men in shelter at Waterloo hotel displaced after $1M fire" (CBC News 2021c)
130 men relocated from Waterloo hotel shelter to a temporary hotel shelter in Guelph

12-2021 "House of Friendship finds shelter for 70 men formerly living in Guelph hotel" (CBC News 2021a)
25 go to the House of Friendship (HoF), 25 to other shelters, and the rest to family and friends

11-2021 "House of Friendship men's shelter to close temporarily for first time in 82 years" (Thompson 2021)
HoF shelter closes while new location underway, displacing approximately 75 residents

11-2021 "With encampments in Kitchener and Cambridge being closed down, the Bridges could see an influx of people. That happened a year ago when the House of Friendship closed" (Doucet 2022)
The Bridges in Cambridge takes in 23 men from HoF

01-2023 "House of Friendship, local community celebrate opening of new ShelterCare" (Strom 2023)
HoF new hotel location opens rooms for 100 men

B

Relocations of Kitchener encampments

11-2021 "'It's heartbreaking': Homeless camp in Kitchener dismantled by Region…" (van Rooy 2021)
Stirling and Charles street encampment dismantled

03-2022 "At…Weber and Victoria Streets, the makeshift community started to slowly grow…" (Caudle 2023)
The Vic and Weber encampment is established.

07-2022 "Victoria Park encampment strategically placed so people 'can't turn a blind eye'" (Chaarani 2022)
Roos Island encampment established as Vic and Weber faces eviction

01-2023 "'A precedent-setting' decision rules encampment clearing would violate Charter rights" (Warren 2023)
Court ruling cites lack of shelter beds to deny Region's request to evict Vic and Weber

C

Relocations of A Better Tent City sites

01-2020 "Woman who offered shelter to homeless gets evicted" (Villella 2020)
Police clear tents from Nadine Green's corner store

06-2021 "Kitchener's Better Tent City to move following Lot 42 property sale" (CBC News 2021b)
ABTC moves to temporary site, a snow storage lot, provided by city

10-2021 "A Better Tent City moves to Ardelt Avenue in Kitchener" (Duhatschek 2021)
ABTC leaves the temporary site, moves to current city-owned site

D

Encampment relocations to the Region of Waterloo's new outdoor shelter

2023 "Region to open outdoor shelter on outskirts of Waterloo in February" (CBC News 2022b)
The region has asked Kitchener and Cambridge encampment residents if they would relocate.

Fig. 5. The site for the Region's new Outdoor Shelter, currently under construction. (Image submitted by Region of Waterloo to CBC News, https://www.cbc.ca/news/canada/kitchener-waterloo /region-of-waterloo-outdoor-shelter-homelessness-cabins-1.6684097).

Currently, shelters and supports for people experiencing homelessness are spread across and funded by the Region as "part of a coordinated system" (Region of Waterloo 2023), rather than provided by each municipality. While the interconnection of these services allows for the sharing of limited resources, it also results in the relocation of homeless individuals across municipal borders when one housing option closes or its residents face eviction, potentially away from local sources of support and stability.

The Region is in the process of constructing an Outdoor Shelter (Region of Waterloo 2022) based on the THC model on the outskirts of Waterloo, and has asked Kitchener and Cambridge encampment residents (relocation D) if they would relocate there. This shelter would have 50 cabins with electricity, heating, and cooling (CBC News 2022b). When surveyed, 47% of respondents from the encampments in Kitchener and Cambridge, indicated in the Figure 4 map, said they "would move to a different location, in another city, if a hybrid outdoor/managed shelter was offered by the Region of Waterloo" (CBC News 2022a). This shelter is distinct from the hypothetical supportive housing community also being planned by the region, and that the design work shown later in this document is aligned toward.

Potential residents of future THCs have likely experienced a great deal of instability. They may have been relocated many times, or may have faced eviction and opposition from the external community while living in encampments (McGinty 2022; Fraser 2022; Desmond 2022). The court ruling in January 2023 which prevented the Vic and Weber eviction (relocation B) was a landmark acknowledgement of the lack of options for people facing homelessness in the Region.

While our research promotes tiny home communities as a more stable alternative to encampments and shelters, stability is only possible at sites with secure land tenure. The only existing THC in the region, A Better Tent City (ABTC) in Kitchener, has been relocated three times (relocation C): from their original tent encampment location in the convenience store of community organiser Nadine Green, from their first THC site when its ownership changed, and then from the temporary site provided by the city of Kitchener, on a snow storage lot. At their current site, on city-owned land in an industrial area, ABTC's tenure remains unstable.

Fig. 6. A Better Tent City's latest relocation. (Photo submitted by Jeff Willmer to CBC News, https://www.cbc.ca/news/canada/kitchener-waterloo/a-better-tent-city-moves-kitchener-1.6225373).

Governments Consider Developing Tiny Homes, and Tiny Home Communities

Governments in the Region of Waterloo are considering implementing their own tiny home communities. In the context of the THRP, Phase 2 was a partnership with the City of Cambridge to research the design and feasibility of a hypothetical new THC in the area. The city provided us with funding and a site at City Hall to display the v1 prototype tiny home designed and built during Phase 1, and to conduct our research, which consisted of gathering feedback on its design. Potential future involvement with the Region's plans for two new THCs also emerged during this phase, and we decided to align our v2 prototype design to a hypothetical THC run by the Region.

This interest in tiny homes and tiny home communities from governments in the Region is recent, precipitated by the changes to the Planning Act in 2019 through the More Homes, More Choice Act, which mandated the introduction of additional residential units (ARUs) for residential properties in all Ontario municipalities (Government of Ontario 2019). The Ontario government later posted an online guide to "build or buy a tiny home" (Government of Ontario 2023) as interest in tiny homes increased across the province in response to the legislation.

Alternative Housing Type	Typical Size	Distinguishing Feature(s)
Tiny or Micro Homes	188-640 square feet (tiny); 600-1000 square feet (micro)	Stand alone structure, can be added to existing property (if permitted by zoning).
Modular Homes	Varies depending on housing form	Can be constructed into any alternative housing form, including tiny homes and container homes, as well as townhomes or apartments.
Container Homes	Less than 350 square feet	Constructed from metal shipping containers. Can also be constructed into any alternative housing form.

Fig. 7. Tiny or Micro Homes as an "Alternative Housing Type". (Image from the Region of Waterloo Alternative Housing Fact Sheet, https://www.engagewr.ca/25941/widgets/105338/documents/73085)

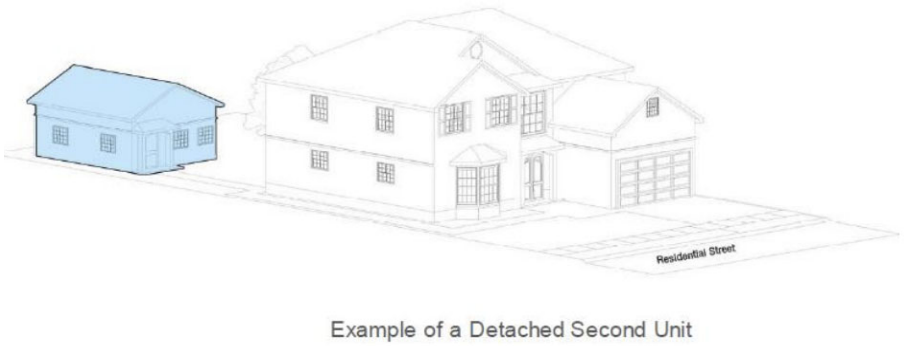


Fig. 8. A tiny home illustrated as an ARU possibility during a City of Cambridge Statutory Public Meeting. (Image from City of Cambridge Statutory Public Meeting, December 14, 2021, https://www.engagewr.ca/25941/widgets/105338/documents/73085).

Throughout the Region of Waterloo, local awareness of tiny homes and standalone THCs was already rising due to the presence and media coverage of ABTC. Government interest in developing THCs may be partly based on the positive public reaction to that community, as reflected by positive media coverage (Lampa 2022; Pickel 2022; Chandler 2023; Record Editorial 2021).

This growing acceptance of tiny homes is reflected in the Region's Alternative Housing Fact Sheet, which classifies tiny homes an official "alternative housing type" (The Region of Waterloo n.d.). The "alternative housing type" designation emerged through the Region's 10-Year Housing and Homelessness Plan (2014-2024), a program that "identifies new opportunities to create affordable housing, including developing an appropriate range of housing options" (Region of Waterloo Community Services 2021). In a possible reference to ABTC-type developments, the Fact Sheet states that "Temporary structures to address homelessness, such as bunkies, tents, or other temporary shelters, are out of the scope of this fact sheet". Other housing programs in the region providing funding and research to affordable housing options are The Housing First plan (CBC News 2018) – to end chronic homelessness in Waterloo region by 2025 – and Building Better Futures: 2,500 Homes in 5 Years (Region of Waterloo n.d.). With tiny homes now established as an official "alternative housing" option in the Region, some of the new homes generated by these plans could potentially be tiny.

In Cambridge, the Act upended a history of single-residence zoning by permitting up to three units on a site – secondary dwelling units had been introduced for the first time in 2018 (Corporation of the City of Cambridge 2018). In a statutory public meeting to discuss the resultant by-law amendments, the City presented tiny homes as a potential ARU type (Chominiec and The City of Cambridge 2021), Figure 8 shows one of the illustrations used in the meeting. ARUs are defined as "a dwelling unit that is subordinate to the primary dwelling unit on a lot" (Chominiec and The City of Cambridge 2021); this implementation route ties tiny home development to properties with an existing dwelling in place. When the v1 prototype was on display at Cambridge city hall, media coverage demonstrated how the conversation on tiny home implementation is dominated by the ARU development route; the tagline for one article about the v1 display period stated: "A city official said it (v1) is not meant to address homelessness locally", with the article continuing the explain that tiny homes like v1 were an opportunity for backyard development (Chaarani 2022)).

The two concrete examples of tiny home *communities* currently being explored by local governments are the Region's Outdoor Shelter and proposed future supportive housing community, both previously introduced in this document. With the Outdoor Shelter anticipating occupation in the near future, the THRP could potentially participate in the post-occupancy evaluation of its design and operation. There may also be opportunities for THRP involvement with the supportive housing community, once that project begins. In the subsequent sections, we direct our design and feasibility investigations for the v2 prototype to fit the contexts that might be encountered in that proposed supportive housing community, and that could potentially be used in similar communities.

1.2 The Architecture of Tiny Home Communities

Government-developed and -operated THCs will have access to land tenure stability and construction resources largely unavailable to their grassroots predecessors. They will likely also feature different architecture than the very small, shed-like tiny homes found in those communities. This section provides an overview of the types of tiny homes that result from different community development contexts and organisational models, to provide the architectural context for the v1 design evaluation, and v2 proposal.

The homes in THCs can be classified as either very small and simple "sleeping units", or larger and more complex "dwelling units". More rarely, hybrids between the two are also possible. In our Phase 1 work, we attribute these typological terms to planner and activist Andrew Heben (Heben 2012; Chow 2022); their origins are described in more detail in the Phase 1 reports. The terms are associated with the tenure status of a tiny home's building permit, rather than how they are inhabited in practice; through our interview research, described in Chapters 2 and 3, we learned that people can and do "dwell" in sleeping units.

Whether a community features one type or the other is the result of its development context – if it is built with or without permits, and if those permits are for permanent or temporary tenure designations – and its organisational model, or *who* develops and governs the community. In a design manual for THCs by a previous ABTC staff member, the author classifies possible organisational styles as "Grassroots/Community-led", "Municipality", or "Hybrid" (D'Amato Stortz 2022). In a Municipality organisation, for example, the use of building permits will be expected, which regulates the required sizing and amenities of the home.

Permitting processes vary across regions; in Oregon, where Heben developed these terms, tiny homes are more common, and bylaws concerning the construction of and parking for small dwellings are more lenient relative to other North American regions (Anson 2014). However, we have found that the sleeping and dwelling unit types apply across THCs in Canada and the U.S.– section 1.3 later explores how Ontario-specific regulations impact the v1 and v2 designs.

Sleeping Units

Temporary Tenure designation & Organisational Model

A sleeping unit is associated with building permits for structures that are "temporary" – the significance of this designation is that a resident only relies on the home for sleeping, and uses external, communal, facilities for the rest of their daily activities (Chow 2022). Sleeping units are also often built without permits at all In Ontario for example, dwellings under a certain size and with no plumbing are exempt from permits: ABTC uses this exemption to have its structures classified as "sheds" rather than homes (OBC 1.3.1.1(6)). As sleeping units require less cost, infrastructure, and construction time to build, they are typically installed by grassroots/community-led organisations that have limited resources and are working with an existing population in need (D'Amato Stortz 2022).

Fig. 9. "Volunteers help build a house", 2004. (Photo from the Dignity VIllage photo archive, https://dignityvillage.org/history/photos/)

Architectural Features and Amenities

Architecturally, sleeping units are defined by the amenities they do *not* have. In the examples we have explored in this Phase, and in Phase 1, sleeping units do not have plumbing, and fall below the size requirements for standard-sized dwellings in their jurisdictions. They usually have electricity and insulation (climate-dependent) – in our focus group conversations, they were sometimes referred to as "insulated sheds". Sleeping units contain, at minimum, a place to sleep. Beds can be placed at ground level, but are often raised up on lofts to free up floor space – the case study section drawings in Figures 23-A and 23-B at the end of this section show some examples.

Communities that build sleeping units typically do not own the property they are on. They may also be built without site permission, for example, some units installed during the Occupy movement by housing activists, or at the TransMountain pipeline protests by the Tiny House Warriors (Dimoff 2018; Simpson 2012). Due to this land tenure instability, sleeping units face frequent relocation and are often designed so that their overall dimensions fit within road transportation requirements. A width of ~8' 6" is common: the maximum towable width with a standard permit in Canada and the US. Homes are sometimes designed with integrated wheels for portability, which can also serve as a certification loophole by re-designating the home as an RV, which may be easier to permit in some jurisdictions (Anson 2014; Shearer and Burton 2019; Ford and Gomez-Lanier 2017). The first homes at Occupy Madison followed this approach, with a "camping unit" designation (Occupy Madison 2017).

Transporting the units to site is common, but the homes can also be assembled on site: at Opportunity Village, modular prefabricated kits were brought to the site and assembled there. The community was built "incrementally", starting with one "big build" event in which volunteers put up five homes, with the rest of the village emerging over the next nine months, while some residents stayed in tents to help build their own homes (SquareOne Villages n.d.b). Within a single community, sleeping unit designs can be uniform or vary between houses. Dignity Village's website explains how the houses were largely assembled from recycled materials, as shown in the photo in Figure 9, from the site's photo archive (Dignity Village n.d.). This resulted in a variety of home types and more organic and patchwork designs than in prefabricated homes – such as the sleeping units at ABTC or the Seattle Low Income Housing Institute communities. The Seattle homes have a design manual available online, and are built by various construction, community, and student groups. Figures 11 and 12 show examples. The ABTC cabins are personalised by the residents and community – they were beige when provided (fig. 10) but many have since been painted.

Fig. 10. New sleeping units at the first ABTC site in 2020. (Photo by Mathew McCarthy, Waterloo Region Record File Photo, https://www.abettertentcity.org/about).

Fig. 11. Carpentry students built a home for the Seattle LIHI in 2015. (Photo by Erika Shultz/The Seattle Times, https://www.seattletimes.com/seattle-news/politics/portlands-dignity-village-cleared-path-for-seattles-housing-for-homeless/).

Fig. 12. Interior of a tiny home built by staff of architect Weber Thompson, and volunteers, in 2016 for a Seattle LIHI community. (Photo retrieved from https://www.weberthompson.com/lihi-tiny-house/).

Fig. 13. The interior of a 2014 Occupy Madison home on wheels. (Photo retrieved from https://occupymadisoninc.com/om-build/features/)

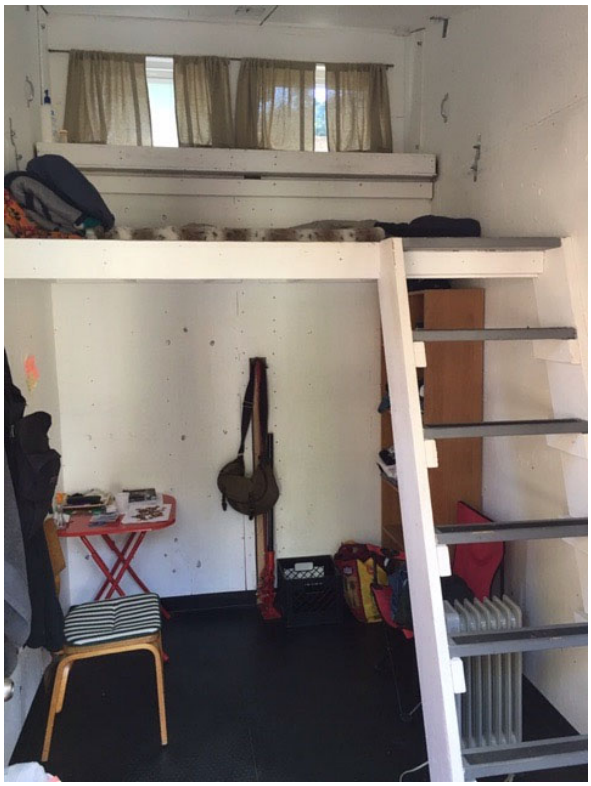


Fig. 14. The interior of a Seattle home built in 2015, one of fourteen built by a variety of community and construction groups. (Photo retrieved from https://edwardbullitis.wordpress.com /2016/07/11/tiny-house-village-encampment-seattle/).

Dwelling Units

Permanent Tenure Designation & Organisational Model

Dwelling units require more resources to build and develop. People who develop this tiny home type will be required to follow permit regulations for permanent dwellings in their jurisdiction, which may have specific codes for tiny homes, as in Nova Scotia (Government of Nova Scotia 2020), or may require that the homes adhere to regulations for standard-sized dwellings, as in Ontario (Government of Ontario 2023).

To organise a THC with dwelling units through a Grassroot/Community-Led model, the organising groups will usually need to fundraise and obtain grants to afford the additional costs: permitting, design, infrastructure installation, and construction materials and appliances for the homes.

Fig. 15. The Calgary Homes for Heroes, a model being replicated in Kingston ON. (Associated Press File Photo by Jeff McIntosh, retrieved from https://www.thespec.com/news/hamilton-region/2022/03/03 /tiny-homes-homeless-military-veterans.html).

Dwelling units may be an appealing model for government-affiliated communities in the Region of Waterloo for their adherence to standard building regulations and development processes that local governments are already familiar with carrying out and evaluating. Governments may choose to develop and operate a community themselves, as a municipally-led model, or may collaborate with existing community groups in a hybrid model. An analysis of potential operational models is detailed in a separate report documenting the work carried out through the School of Planning during this phase of the THRP. That report is yet to be published at the time of this writing. One model that governments can reference are the veterans communities being built in Canada – pictured in Figure 15 above is the Homes for Heroes community in Calgary (there is also one in Edmonton), and in 2020 the Ontario government donated land and announced $200,000 for an iteration of this in Kingston, ON (Moro 2022). A similar Hamilton community is also proposed (Ibid) .

Fig. 16. A YouTube video sequence shows the interior features of a dwelling unit at Emerald Village. (Original video by HuffPost, Oregon Creates Tiny Home Community For The Homeless, 2018, retrieved from: https://www.youtube.com/watch?v=-qQ0ou3hA10&t=1s&ab_channel=HuffPost).

Architectural Features and Amenities

Dwelling units have complete plumbing amenities: at minimum, a bathroom with a sink, shower or bath, and toilet; and a sink in the kitchen or kitchenette. Depending on climate and regulation, these homes will have heating or cooling systems, rather than relying on insulation alone or space heaters. The homes may be one or two storeys. Many feature a partial second storey, which saves space by using ladders or narrow steps up to the mezzanine space, rather than a full stairwell. In Figure 16, a YouTube video sequence shows how a home at Emerald village makes use of the ladder to the second storey, by using it as a seat for the fold-down dining table.

Dwelling units are typically associated with communities having stable land tenure, and as a result, feature more permanent architecture. Cottage Grove Co-Op in Oregon – "The first permanently affordable tiny home co-op in a rural community" – features poured concrete foundations, shown in Figure 19 (A), and the land is owned by the organisers and leased to the co-op residents (Sherwood 2020; SquareOne Villages n.d.a).

These homes are less limited by size and cost and so can have more varied architecture. At Emerald Village and the Cottage Grove Co-op (both operated by SquareOne Villages, of which Heben is a founding member), the homes are each designed by a different architect. The interior of one Cottage Grove unit (fig. 19(B)), for example, resembles conventional new homes and contrasts with the interior of the Emerald Village unit (fig. 16) which has a rustic, warm-looking interior characteristic of the home's straw bale construction. Drawings and photos of these homes are available online, which presents an opportunity for future research into the strategies architects employ in dwelling unit THCs. In a distinct strategy, the Tiny Homes Detroit community sourced five of their 25 Phase 1 homes from an online house plan service, "www.houseplans.com". The online company quoted the community founder's reasoning for choosing unique designs: "Most of the residents are coming from institutions like homeless shelters or senior apartments where every living space is the same… We wanted to instill pride in the people that no one else has a house like theirs" (Laughlin 2017).

Fig. 17. (Left) A promotional image of plan 48-641 from an online house plan website. (Image retrieved from https://www.houseplans.com/blog/tiny-homes-for-the-homeless).
Fig. 18. (Right) One of the five homes adapted from online house products that were built at the Tiny Homes Detroit Community. (Photo by Michelle & Chris Gerard, https://detroit.curbed.com/2016/9/912860756 /tiny-house-detroit-neighborhood-low-income)

Fig. 19. (From top to bottom) Photos of Cottage Grove Co-op: (A) The concrete foundation of a dwelling unit, (B) A dwelling unit interior, (C) A parking lot and street lighting as examples of community infrastructure. (Photos from SquareOne VIllages, https://www.squareonevillages.org/cvc)

Communal Buildings

Dwelling and sleeping unit communities typically feature communal buildings in addition to the homes. This review, as well as the eventual v2 designs, focuses primarily on the home designs. For more site planning information, refer to the Phase 1 site planning case study (Chow 2022).

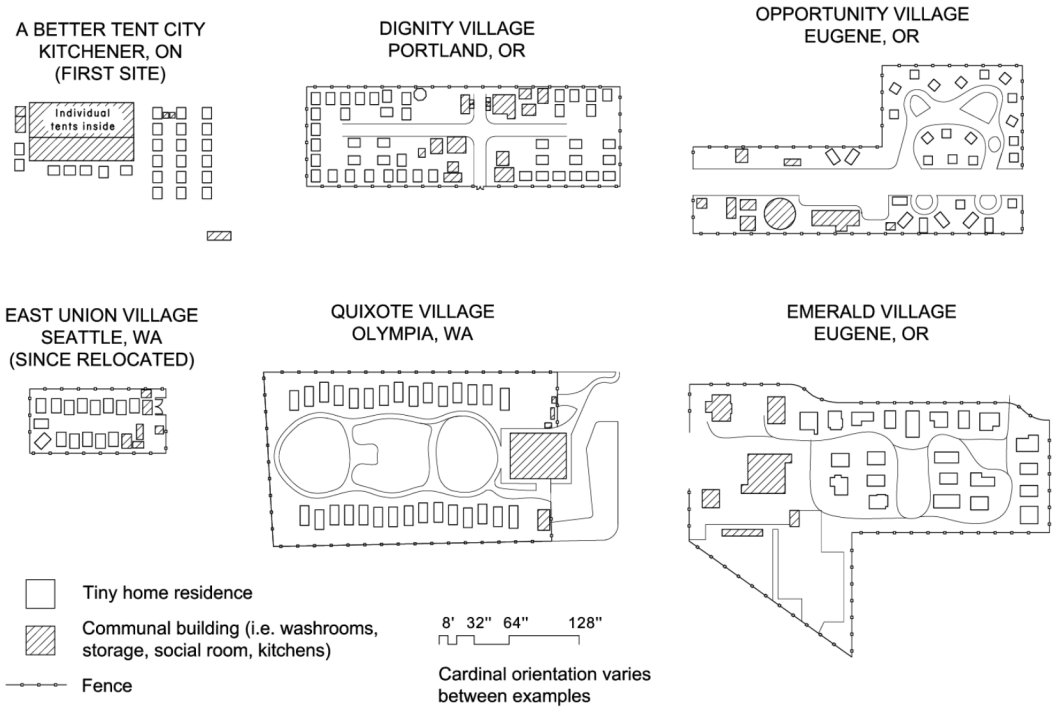


Fig. 20. Diagrams of THC sites showing home units, communal building, and the site boundary. (Image by author, adapted from site plans made in Phase 1 of the THRP by Marco Chow and Fiorella Granda).

The illustration in Figure 20 shows simplified diagrams of some of the sites explored in Phase 1. The communities featuring sleeping units (ABTC, Dignity Village, Opportunity Village, and East Union Village) require communal facilities to make up for the amenities and space missing in the homes. At the first ABTC site, the home units used a large existing building for their communal facilities; this is referred to as a satellite model (D'Amato Stortz 2022). While residents of dwelling units may not need communal amenities for bathrooms, kitchens, and showers, their communities have more resources to build shared spaces. The site plan of Emerald Village below shows large facilities in addition to the relatively large homes. An exception that has no communal facilities is the CASS community in Detroit, shown in Figure 21, where the site layout is based on a privately-owned subdivision model, with single homes on single lots, rather than a centralised community.

Fig. 21. The Tiny Homes Detroit community. (Photo by Michael Nemeth for Politico Magazine, https://www.politico.com/magazine/story/2019/07/11/housing-detroit-tiny-homes-trend-227274/).

Illustrated Typology of Homes in THCs: Floor Plan and Section Study

Sleeping and dwelling units represent a spectrum of home designs, from small and simple, to large and complex, rather than two prescriptive options. The division between the two types, amid all the possible design options, is in the presence of plumbing and the building permit status. While there is no specific size cut-off that makes a home a sleeping or a dwelling unit, the following floor plan study illustrates sleeping units that have a building area around or under 100 ft^2 (~10 m^2) and dwelling units with an area around or under 200 ft^2 (~20 m^2). The two homes illustrated on either extreme, the smallest and the largest, are not actually referred to as tiny homes by their creators. These are depictions of the scale at which a structure is too small to be a tiny home (the "Tiny Shelter") or is described as a small rather than tiny house. The floor plan study in Figures 22-A and B shows where the v1, and v2 designs fit within this building area gradient, and are indicated with a dotted outline.

In Figures 23-A and B, a section study compares the vertical forms of those same homes, showing which contain second storeys and loft beds to multiply their limited building footprints. Some of the drawings represent homes studied in the Phase 1 analysis of construction techniques by Nupur Garg (Garg 2022). Most were traced over architectural drawings provided online by the communities as open-source information. Others are estimates based on photos from news articles, and site tours posted on YouTube.

A note on areas and units:

Area requirements are a fundamental limiting factor in tiny home design. For some restrictions, the exterior building footprint is relevant. For others, the interior space is required. The floor plan study of building areas shows the exterior built footprint of the home. In future drawings, the type of area being shown will be noted. Metric and Imperial measurements are both relevant to tiny home design, for Canadian regulations (metric) and construction practices (imperial). This document primarily uses imperial measurements, with the metric added in parentheses when relevant for regulation.

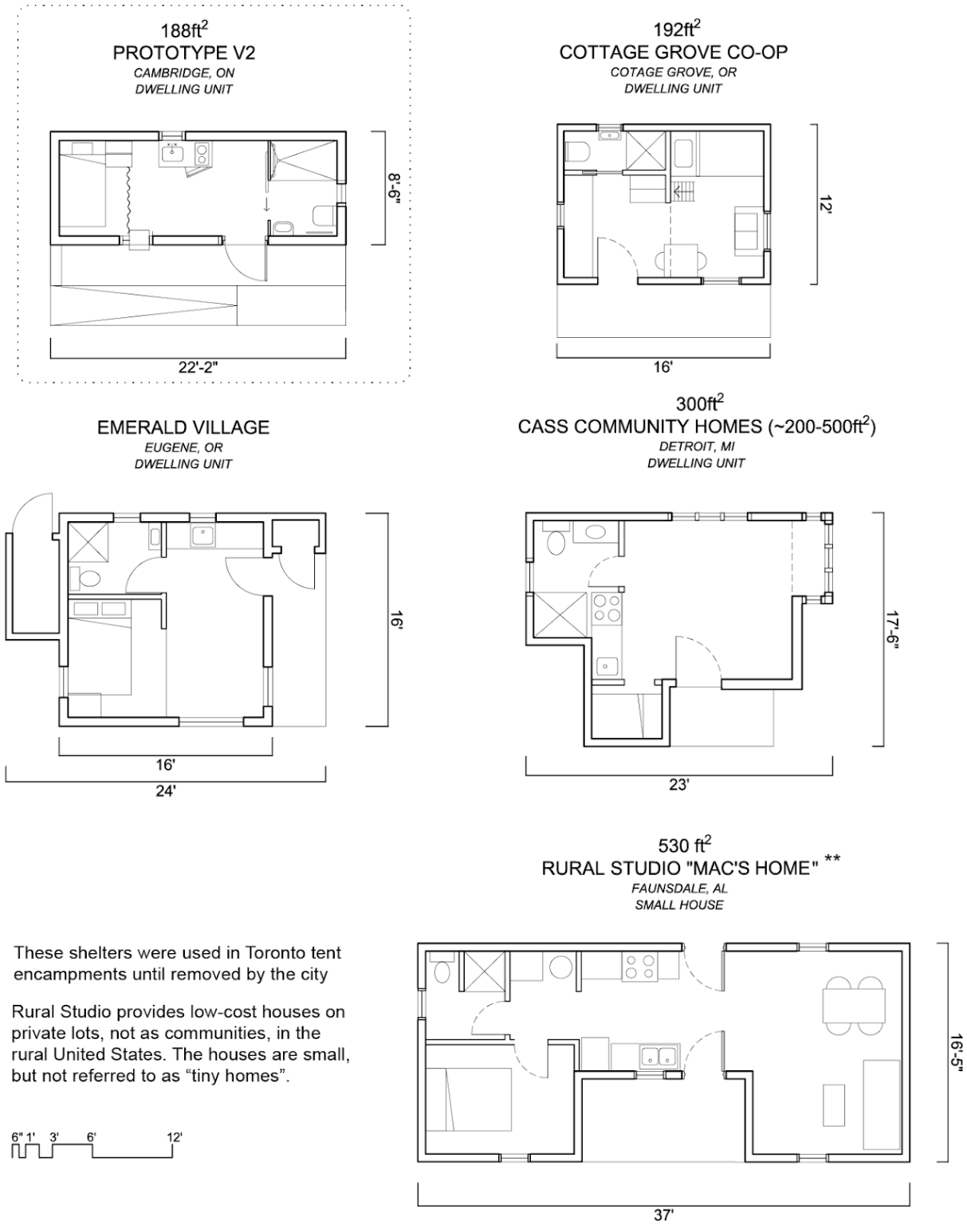
FLOOR PLAN STUDY: BUILDING AREAS OF SLEEPING UNIT AND HYBRID HOMES*,**

and other small homes,***

Fig. 22-A. Floor Plan Study: Building Areas of Sleeping Unit and Hybrid Homes. (Image by author).

FLOOR PLAN STUDY: BUILDING AREAS OF DWELLING UNIT HOMES*,**

and other small homes,***



* These shelters were used in Toronto tent encampments until removed by the city

** Rural Studio provides low-cost houses on private lots, not as communities, in the rural United States. The houses are small, but not referred to as “tiny homes”.

Fig. 22-B. Floor Plan Study: Building Areas of Dwelling Unit Homes. (Image by author).

SECTION STUDY: THROUGH SLEEPING UNIT AND HYBRID HOMES*,**

and other small homes,***

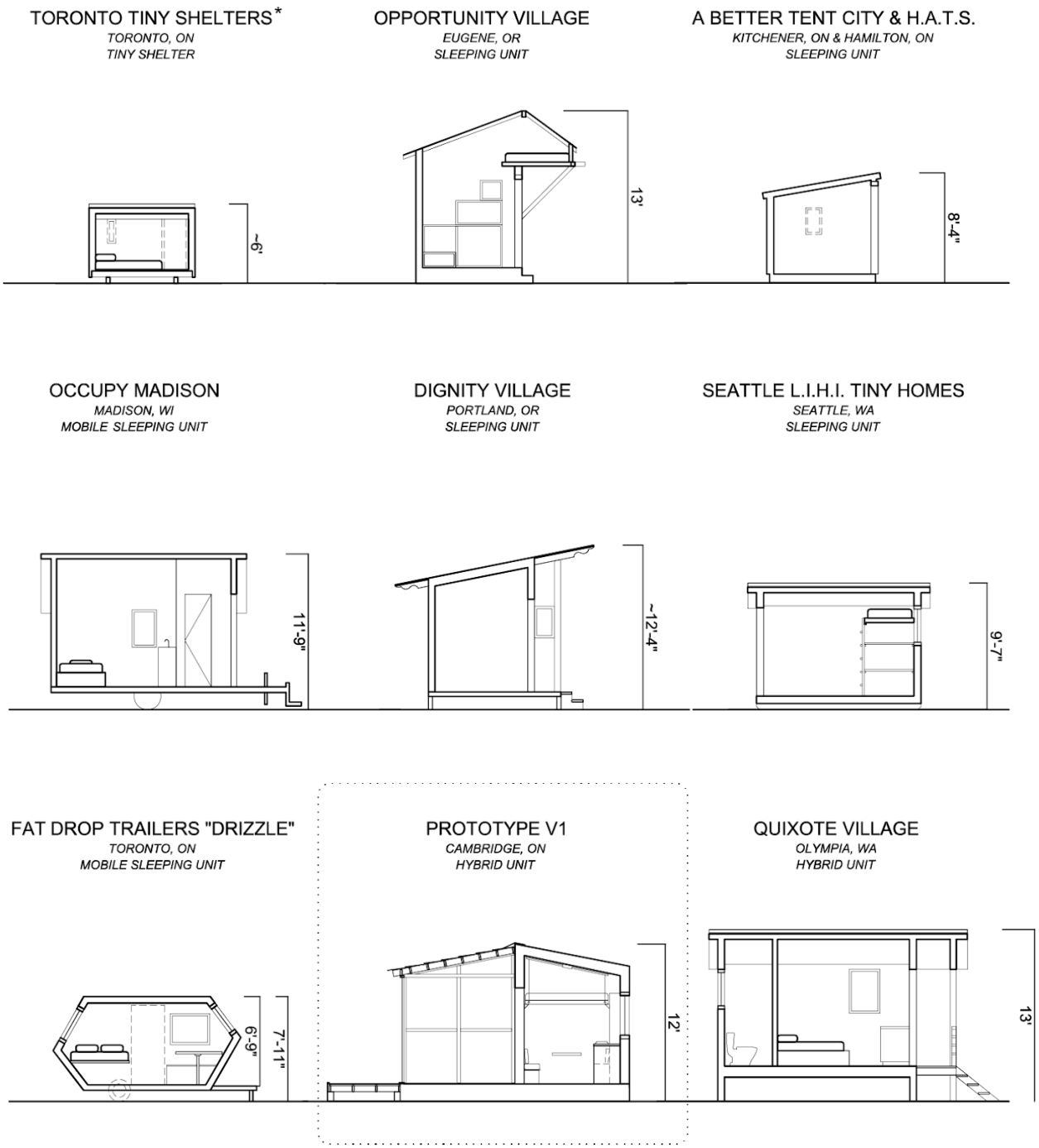


Fig. 23-A. Section Study: Through Sleeping Unit and Hybrid Homes. (Image by author).

SECTION STUDY: THROUGH DWELLING UNIT HOMES*,**

and other small homes,***

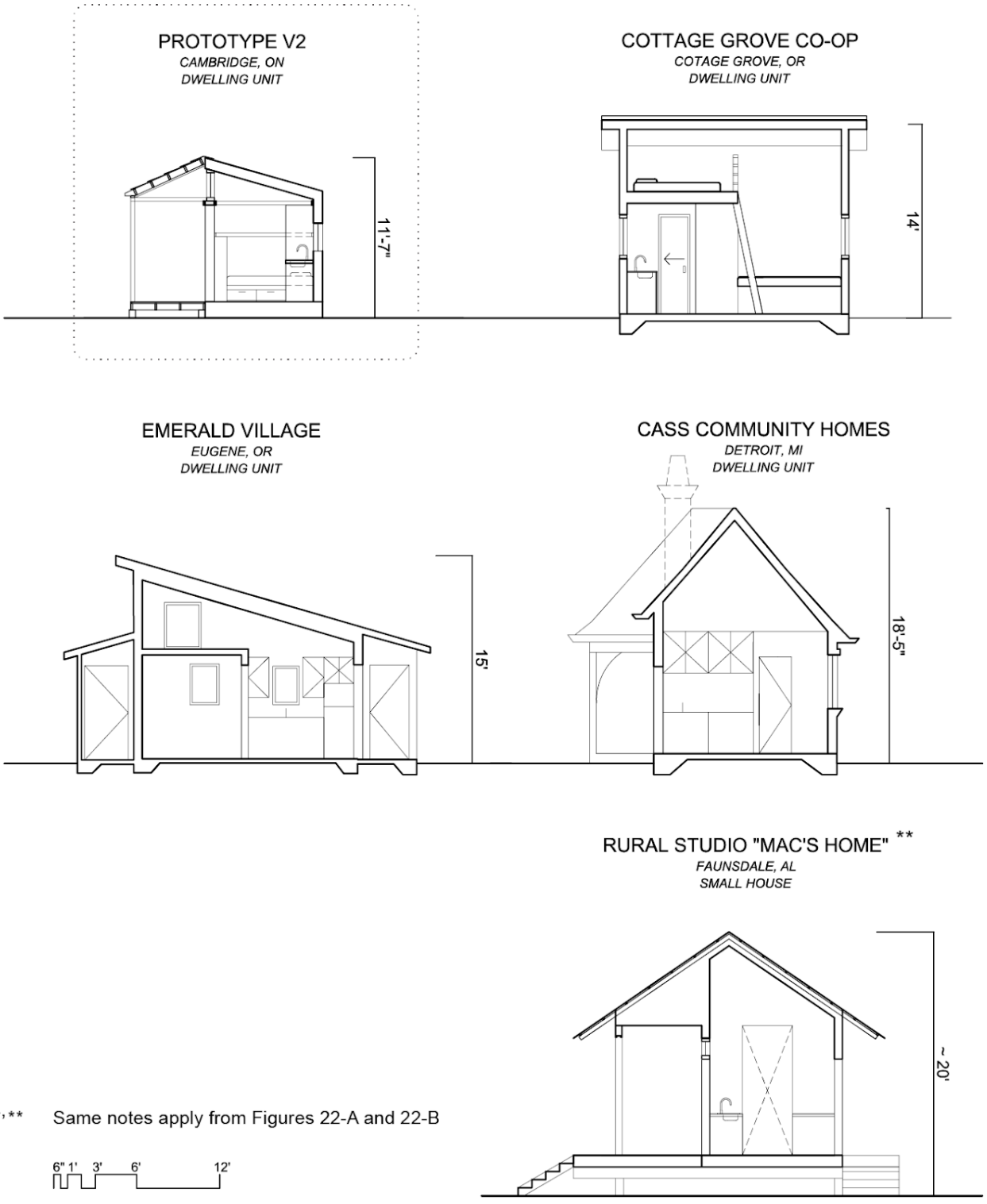


Fig. 23-B. Section Study: Through Dwelling Unit Homes. (Image by author).

The following photos illustrate some of the homes from the Building Areas and Sections studies.

THE SMALLEST

Fig. 24. A Toronto Tiny Shelter. (Photo by Jeff Bierk, https://www.azuremagazine.com/article/why-is-toronto-waging-a-legal-battle-against-tiny-shelters/)

THE LARGEST

Fig. 25. "Mac's Home" in Alabama by Rural Studio. (Photo by Timothy Hursely, Design by Rural Studio, http://ruralstudio.org/front-porch/product-line-houses/).

The examples above are not referred to as tiny homes. The Toronto Tiny Shelters, in Figure 24, were used as emergency sleeping boxes when tent encampment populations rose during the covid-19 pandemic, until they were cleared by the City (Goodyear and Harbord 2021). Mac's Home, in Figure 25, was built through the 20K project by Rural Studio, a program run through Auburn University which aims to provide affordable homes, (in this case, aiming for a cost of $20,000) for underserved populations in rural Alabama (Rural Studio n.d.).

THE FIRST COMMUNITIES

Fig. 26. This photo's caption in the Dignity Village online archive is: "Villagers siting the deck for a house". The community was sanctioned in 2004. (Photo retrieved from https://dignityvillage.org/history/photos/).

Fig. 27. Inside a home at Quixote Village. Tiny home occupancy began on Christmas Eve, 2013. (Photo by Jenny Riffle for the Guardian, 2017, https://www.theguardian.com/us-news/2017/mar/23 /tiny-houses-solution-homelessness-seattle).

Hybrid Type: Quixote Village and the v1 Prototype

Two of the homes in the floor plan and section study sit between the sleeping and dwelling unit types. The homes at Quixote Village, and the v1 prototype, are hybrid designs: both contain plumbing, but are too small to be considered full dwelling units.

Quixote Village evolved from Camp Quixote, an encampment protest against public space ordinances in Olympia, specifically the Pedestrian Interference Ordinance that, as one camp organiser describes, "would strip people's right to gather in public spaces – namely, our sidewalks – during certain times of the day" (Richards 2021). The camp was set up at a downtown parking lot on February 1st, 2007, the day the ordinance was put into effect (Ibid.). The camp, and with the non-profit formed to help support it, organised over the years to plan and develop the Village, where residents moved in on Christmas Eve 2013 (Wener and others 2015).

The homes' hybrid design was approved after a complicated permitting process due to the lack of alignment with, and precedent within, with existing regulations – the half-bath was actually added midway through this process, in an effort to make the homes more permanently habitable (Ibid). Conversely, the v1 prototype was designed for unknown development and organisational contexts, in a design-build course at the UW school of Architecture. The resulting incompatibilities between design intention and feasibility in the local context are explored in the following section.

Fig. 28. v1 at its construction site at the University of Waterloo School of Architecture in Cambridge, ON. (Photo by Leilei Zhao for the design-build studio and the Tiny Homes Research Project).

Fig. 29. Camp Quixote with a sign for its organising body, the Poor People's Union (PPU), in 2007. (Photo submitted by Rob Richards for The Olympia Tribune, 2021, retreived from https://theolympiatribune.com/february-1st-marks-14-year-anniversary-of-camp-quixote/).

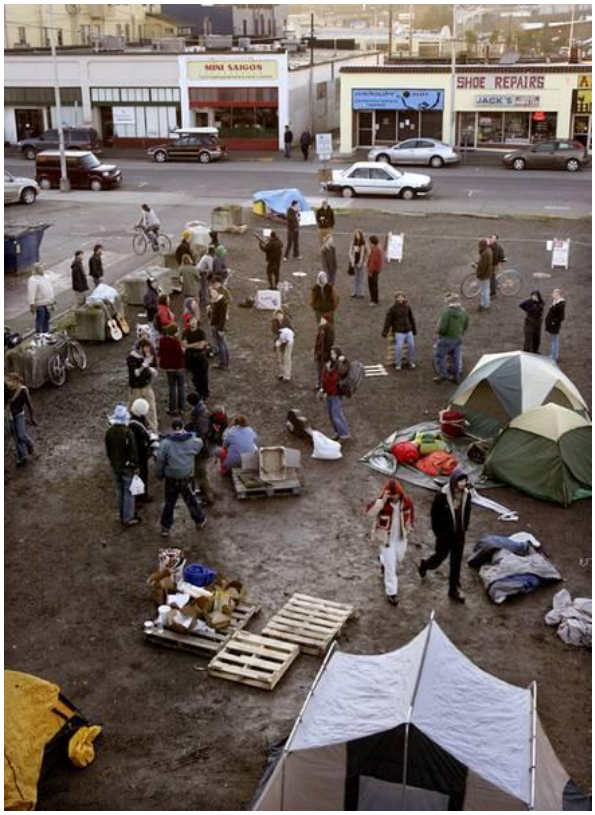


Fig. 30. Camp Quixote was set up in a city-owned parking lot in downtown Olympia, on February 1st, 2007, the day the ordinance came into effect. (Photo submitted by Rob Richards for The Olympia Tribune, 2021, retreived from https://theolympiatribune.com/february-1st-marks-14-year-anniversary-of-camp-quixote/).

1.3 v1 Design Feasibility in the Local Context

The prototype v1 design is a hybrid between a sleeping unit and dwelling unit design. It was designed and built during Phase 1 of the THRP, by 3rd year undergraduate students at the UW School of Architecture, through two design studio courses led by faculty members and THRP research team members Adrian Blackwell, and John McMinn. v1 was designed for an undefined community within the Region of Waterloo – members of the design studios intended for it to be inhabited when a host community is found.

Studio participants had studied the homes at ABTC, and aimed to improve the quality of life provided by those sleeping units by: including a kitchenette, toilet, and shower inside the home unit, upgrading materials and finishes, by adding flexible space with a sunroom-porch area outside each unit, and with added ceiling height from the sloped roof providing a sense of spaciousness. Grouped together as a community, a collection of v1 homes might be a better, better tent city.

Fig. 31. The prototype v1 arrives at city hall, it was sited there for public display from Sept-Nov 2022. (Photo by Fred Hunsberger for the Tiny Homes Research Project)

In Phase 2, our research team inherited the v1 prototype and the construction drawings developed in the design studios to review the design and propose a new version – v2. Through our partnership with the City of Cambridge, v1 was sited at city hall from September-November 2022, for public and media interaction. It also provided us with a site to conduct our feedback research. The following section details the v1's architectural features, and the design intentions behind those features, and highlights what needs to change for v2 to be code compliant.

Architectural Features and Amenities

The V1 prototype is composed of three major elements: a home unit, a sunroom-porch, and a deck with a stair and access ramp. These elements are constructed separately, to be assembled on-site, as shown in Figure 31.

The prototype is a hybrid design because, while the home unit has the built footprint of a sleeping unit at 107ft^2 (10m^2), it features a nearly full set of amenities: a sink, a shower, and a composting toilet (the toilet was designed but not installed, so is missing in photos).

The home unit is insulated between the 2x4 studs and also with exterior rigid board, and can be plugged into a standard exterior outlet to power a space heater, lights, power outlets, a hot plate and mini fridge in the kitchenette. Also included in the v1 design is a bed with an adjacent built-in shelf, and a folding dining table with two benches. To fit all these elements within the tiny plan, the bed is able to be raised and lowered using a crank that winds cables through a set of pulleys. Figure 32 shows the interior of the home as furnished in the design studio, with the bed in the raised and lowered positions.

Fig. 32. The v1 interior, showing how the bed can be raised and lowered. (Photos by Leilei Zhao for the design-build studio and the Tiny Homes Research Project).

Fig. 33. The v1 prototype at Clty Hall, featuring the sunroom-porch, deck, and ramp. (Photo by Fred Hunsberger for the Tiny Homes Research Project).

Guiding Principles and Spatial Constraints: the Sunroom-Porch for Flexibility

In the absence of a development context and organisational model, participants in the v1 design-build course established a set of guiding principles and spatial constraint, which were as follows:

<u>Guiding Principles</u>

1 evolutionary design that transforms over time
2 resident agency and adaptability
3 passive solar design
4 accessible or universal design

<u>Spatial Constraints</u>

1 min. requirements for barrier free access
2 max. dimensions for truck transportation
3 max. building area not requiring a permit

The spatial foundation of the v1 design was to protect the minimum dimensions stipulated by the Ontario Building Code for barrier-free access, with the geometries shown in FIgure 36, the accessibility layout. Constraints for road transport limited the exterior dimensions, as illustrated in Figures 37 and 38. The building area was the final spatial constraint: to keep the footprint within 10m^2, or 108 ft^2, so as to avoid the requirement for a building permit by designating v1 as a shed. This was also the strategy used at ABTC (note: since v1 was designed, the limiting dimension for "shed" designation has been amended to 15m^2, or 165 ft^2 in OBC 1.3.1.1.(6)(a), shown in Figure 39).

The home's sunroom-porch is the feature that enables most of the guiding principles, and relaxes the compressed space caused by the spatial constraints. For passive solar design, the polycarbonate panels accumulate heat in the winter (and summer), acting as a greenhouse. In a potential model for evolutionary expansion, multiple homes can be grouped around a single sunroom-porch: a 3-home-unit configuration is shown on the public information sign affixed to v1 during its display period (fig. 34), and a 2-home setup is shown on the conceptual site plan (fig. 35).

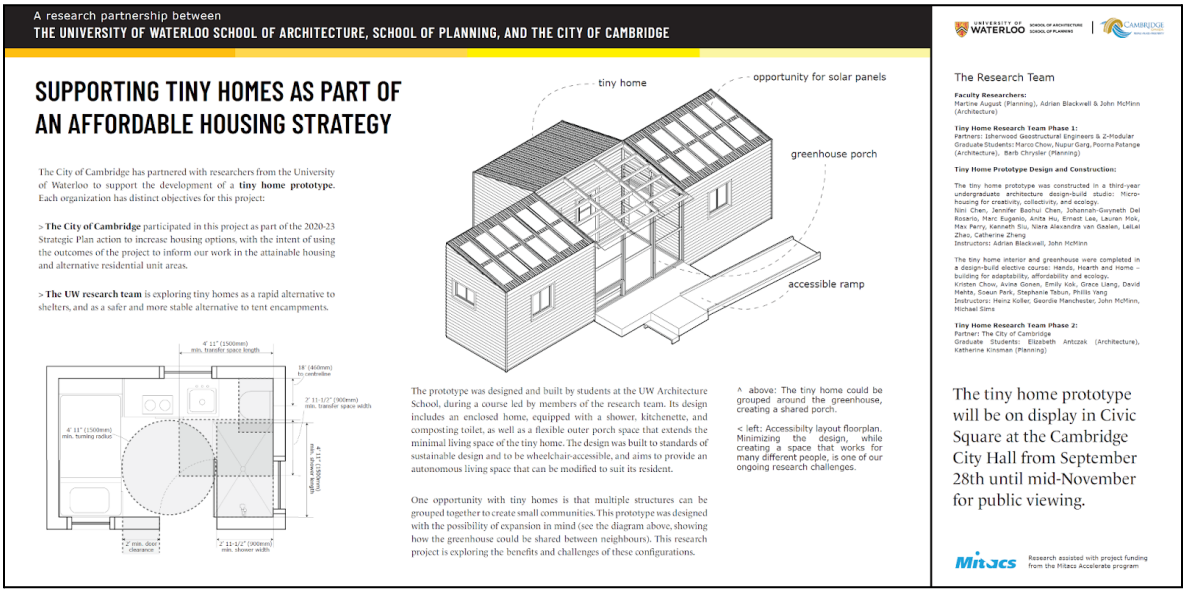


Fig. 34. The poster affixed to v1 at city hall illustrates its main design strategies. (Poster by author).

Fig. 35. Conceptual site plans for the v1 community from the Microhousing Design Studio Drawing Set (Chen and others 2021).

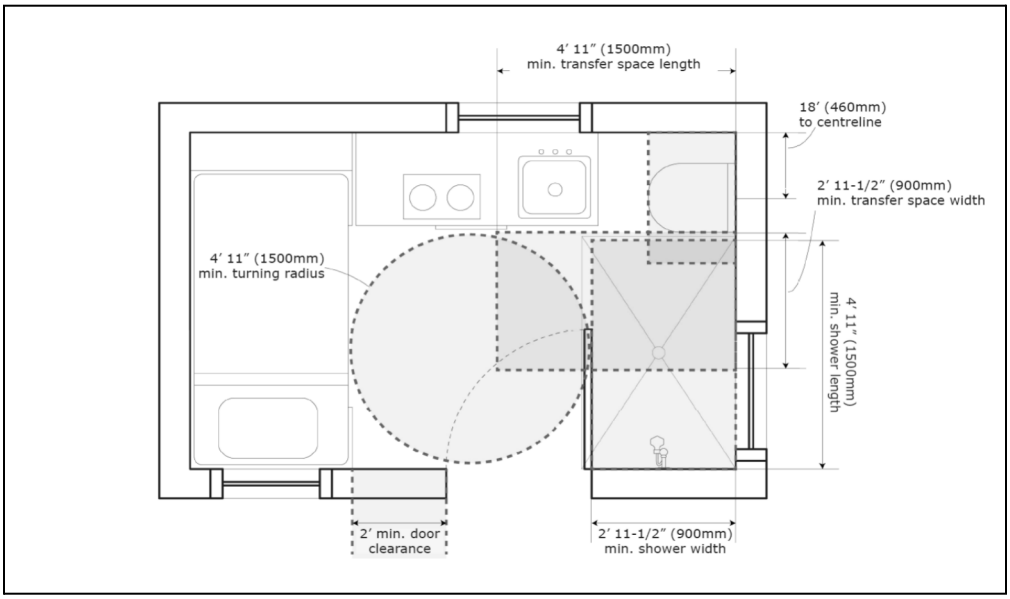


Fig. 36. Prototype v1 accessibility floor plan adapted from the Microhousing Design Studio Drawing Set (Chen and others 2021)

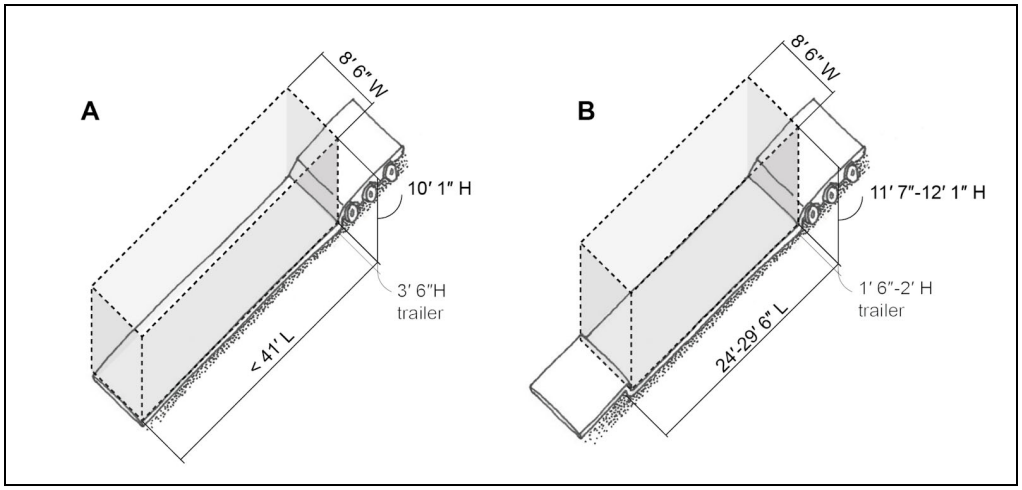


Fig. 37. The maximum tiny home dimensions as transported by a (A) drop deck or (B) lowboy trailer. (Image by author, trailer specifications from: https://www.paigelogistics.com/truckload-trailer-types/)

REFERENCES			NOTES	
SOURCE	REF. #	TEXT	DESCRIBES REQ'D	COMMENTS
Ontario Highway Traffic Act R.S.O. 1990, c. H.8 (v. Jul 1 2022)	109 (1) Width of vehicle	(1) Subject to sections 110 and 110.1, no vehicle including load or contents shall have a greater width than 2.6 metres while on a highway [exceptions listed]	DIMENSIONS *total width*	2.6 m ⇔ 8'6"
	109 (6) Length of vehicle	(6) Subject to sections 110 and 110.1, no vehicle, including load, shall exceed the length of 12.5 metres while on a highway. ... (6.2) Subject to sections 110 and 110.1, no full trailer, including load, shall exceed the length of 12.5 metres while on a highway unless it is in a combination of vehicles whose configuration, weight and dimensions are as prescribed by regulation.	DIMENSIONS *total length*	12.5 m ⇔ 41'
	109 (14) Height of vehicle	(14) Subject to sections 110 and 110.1, no vehicle including load shall have a greater height than 4.15 metres while on a highway. ... (14.1) Despite subsection (14), a vehicle used in a combination of vehicles whose configuration, weight and dimensions are as prescribed by regulation may have a height greater than 4.15 metres but not greater than 4.3 metres while on a highway.	DIMENSIONS *total height*	4.15 m ⇔ 13'7" 4.3 m ⇔ 14'1"
https://www.ontario.ca/laws/statute/90h08				

Fig. 38. Freight dimension restrictions in Ontario. (Table by author, referenced from: https://www.ontario.ca/laws/regulation/120332)

REFERENCES			NOTES	
SOURCE	REF. #	TEXT	DESCRIBES REQ'D	COMMENTS
Ontario Building Code O. Reg. 332/12 (v. Nov 1 2022)	1.3.1.1. Requirements for Permits	(6) A shed is exempt from the requirement to obtain a permit under section 8 of the Act and is exempt from compliance with this Code, provided that the shed, (a) is not more than 15 m^2 in gross area, (b) is not more than one storey in building height, (c) is not attached to a building or any other structure, (d) is used only for storage purposes ancillary to a principal building on the lot, and (e) does not have plumbing.	AREA AND SERVICES	15m^2 ⇔ 161.6ft^2 Effective April 29, 2022. Previous limit was 10m^2 (108 ft^2)
https://www.ontario.ca/laws/regulation/120332				

Fig. 39. Building permit exemptions for sheds in Ontario. (Table by author, referenced form: https://www.ontario.ca/laws/regulation/120332)

Feasibility Review in the Local Regulatory Context

The v1 sunroom-porch is the same size as the home unit; when it is included in the assembly, the sunroom-porch doubles the overall built area. The fact that this added space would require a building permit and could not be termed a "shed" arose as a concern during the installation of the prototype at City Hall, when a city building official checked the v1 built footprint – which was 220 ft^2, or 20.4 m^2 – and asked for a building permit.

In Phase 1, the v1 hybrid design strategy was experimental; acknowledging the limitations of the Ontario Building Code (OBC) in relation to tiny homes, the designers proposed features that might not be permitted under existing regulation, but that would provide more comfort, space, and amenity for THC residents. In Phase 2, to focus on project implementation, the research team decided to prioritise feasibility in the local regulatory context, and conducted a feasibility review of the v1 design.

In a review of compliance with the OBC, we found regulatory incompatibilities between the design strategies used in v1 to keep the design small while increasing amenities. These incompatibilities fall under the categories of: (1) size/area; (2) plumbing and bathroom design.

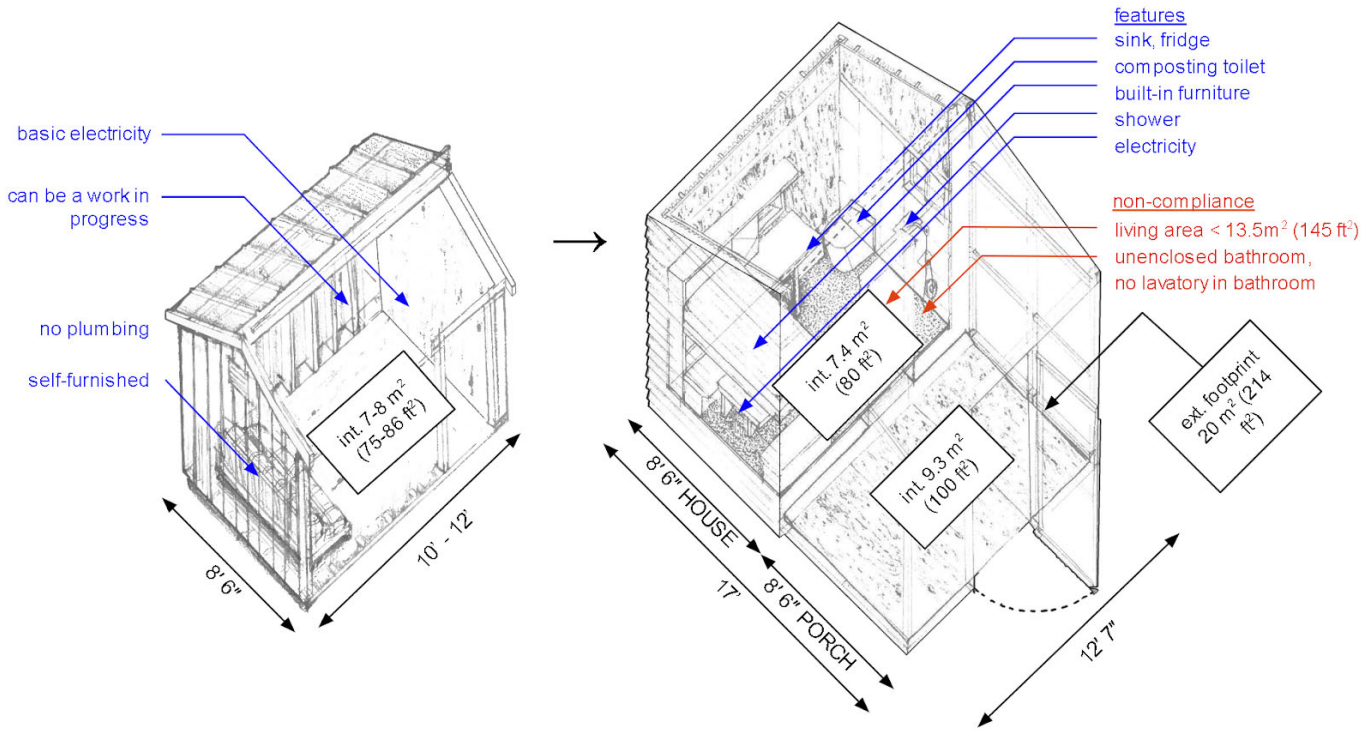


Fig. 40. Overview of the features and non-compliances of v1 as an adaptation of a sleeping unit. (Image by author).

Size and Area

In Ontario, there are two main size requirements to be aware of when designing a tiny home. The first is the built footprint of the home, which must be at least 188 ft^2 (17.5 m^2), as stated on the Ontario Government's online guide to *Build or Buy a Tiny Home* (Government of Ontario 2023). The second requirement concerns the interior area of the "living space": the kitchen, dining, and living areas, all have minimum spatial requirements. The specific numbers for each depend on whether the home layout is open-plan or has distinct rooms: 118 ft^2 (11 m^2) of living space is required when the bedroom is separate, or 145 ft^2 (13.5 m^2) of living space is required when that space contains an open bedroom, as in a bachelor apartment unit (OBC 9.5.4-9.5.8.).

> In all cases, a tiny home cannot be smaller than the minimum required size set out in Ontario's Building Code, which is **17.5 m^2 (188 ft^2)**.

Fig. 41. The Ontario government requires all tiny homes to be at least 188 ft^2. (Retrived from https://www.ontario.ca/document/build-or-buy-tiny-home).

REFERENCES			NOTES	
SOURCE	REF. #	TEXT	DESCRIBES REQ'D	COMMENTS
Ontario Building Code O. Reg. 332/12 (v. Nov 1 2022) https://www.ontario.ca/laws/regulation/120332	9.5.8.1. Combined Living, Dining, Bedroom and Kitchen Spaces	(1) Despite Subsections 9.5.4. to 9.5.7., where living, dining, bedroom and kitchen spaces are combined in a dwelling unit that contains sleeping accommodation for not more than two persons, the area of the combined spaces shall be not less than 13.5 m^2.	AREAS *combined*	13.5m^2 ⇔ 145.3ft^2

Fig. 42. This OBC reference gives 13.5m^2 (145ft^2) as the minimum area for a combined living space. (Table by author, referenced form: https://www.ontario.ca/laws/regulation/120332)

The v1 design, including the sunroom-porch, is over the 188 ft^{2m} minimum. However, that unconditioned sunroom-porch space is not considered as a kitchen or living room, as defined in the living space requirements – this was explained to our team during a consultation with the Cambridge Building code examiner. Referring back to Figure 39, while the original intention was to designate v1 as a shed to avoid permits altogether, OBC section 1.3.1.1. (6)(a) shows that the v1 footprint was over the size limit for sheds.

Plumbing and Bathroom Design

Clause (e) of the aforementioned OBC section also negates v1's designation as a shed, because it contains plumbing. As v1's size and plumbing firmly designate it as a dwelling unit, it must contain a code compliant bathroom. First, the bathroom must be in "an enclosed space" with a door within the dwelling unit (OBC 9.5.9.1,2); v1 was designed for a curtain separation, and adding a partition and door would

impact its accessible open floor plan. In addition, this separated bathroom must have a lavatory (OBC 3.7.4.5.), while the v1 design relies on the kitchen sink for both bathroom and kitchen uses.

Tiny Homes and The Building Code

Incompatibilities between regulation and design intention are presently difficult to avoid in tiny home community design; it is unclear how the homes should be classified and regulated under existing codes and bylaws. In our team's consultation with City of Cambridge Building Department officials, we learned that at present there are no specific differences in the code between a "home" or a "tiny home". There is also no regulation specific to tiny homes in the context of a THC for people who were previously homeless. In a May 2021 council meeting, Cambridge city councillor Scott Hamilton listed some of the unknowns that need to be addressed before moving forward with the implementation of tiny homes, whether in communities or independently developed (Shahid 2021):

> What are the acceptable sizes of these particular homes? What are the exact setbacks within a lot that these homes will be permitted in? What are the safety procedures that should be allowed in terms of power, sewage, electrical? What can be permitted and what couldn't be?

The Building Department officials told us that, while they understood that the code generates "design constraints that challenge folks looking at this (tiny homes) as a solution", obtaining a distinction in the building code between standard and tiny homes, especially if looking for lower minimum allowances, would require lobbying. We discussed, for example, that many tiny home designs include loft beds to save space, but, while the code does not regulate furniture, it does not allow for ladders to sleeping areas.

We also learned that, in January 2022, the OBC was amended to include "DIV C 1.11 Tiny Homes". The section regulates the mechanics of issuing a permit for a tiny home, rather than the specifics of its design. The 2-part permitting system introduced by the amendment requires the home be permitted first at the site of manufacture, and the owner is then responsible for permitting the approved home for its eventual installation site.

The Building Department officials also explained to us that the loophole of adding wheels to the design would not be useful in Cambridge, which forbids RV parking anywhere. We would have to find a zone where that was permitted, be in compliance with CSA standards, as well as consider plumbing and pumping station access, and obtain a licence plate.

We were told that possible exemptions and loopholes do exist: Pandemic emergency legislations that can exempt emergency shelters and clinics from zoning compliance and permitting, and temporary occupancy uses – previously-discussed as the development context for most sleeping units. These

routes and exceptions are further explored in this report's adjacent planning document by Katherine Kinsman. However, we were advised that the temporary occupancy route would require the buildings not to be occupied all year or at certain times – our future design explorations consider permanent occupancy.

v1 at City Hall: Prototypes as a Stage for Conversation

While v1 was on display at city hall, we were able to conduct our consultations in-person at the tiny home and to engage the public, media, and government officials in the conversation about how this housing type can be used in the Region.

During the public display period, members of the public, research team, and city officials could enter and explore v1 at designated times and it became a local talking point. The prototype, and future prototypes, are valuable as a physical stage on which to hold conversations about tiny homes, and housing insecurity and homelessness more generally. The public placement sparked media articles and official statements, and also introduced seldom-heard voices to the conversation around tiny homes and how they should be implemented in the Region. While our research does not engage with the opinions we heard during the public tours, we received valuable insight on ways that the prototype might be an exciting home for some yet might be inaccessible for others, in ways we had not considered. We also heard personal stories about the individuals who came to see the home, or about people they knew, for whom the available local housing options were not appropriate, but something like this might be.

After conducting the feasibility review of the v1 prototype, our next step was to begin formally gathering feedback on its design from potential residents. In existing studies (unaffiliated with the THPS), researchers have engaged directly with people living in encampments and in shelters to investigate what makes those places good, or bad to live in, or "home", or "not a home"(Palepu and others 2012, 1-11; Speer 2017, 517-535; Vandenbeld 2020, 701-718). Our research team wanted to plan something similar to guide the v2 design.

Those previous conversations resulted in sets of principles that describe how those residents like to live, and are reminiscent of the guiding design principles followed in the v1 design-build studio, but from the resident-perspective rather than the designers'. Aiming to hold conversations with people who had experienced homelessness in the Region, and, from those conversations, to develop guiding principles for the v2 design, we planned the Tiny Home Prototype Study (THPS) to be held at the City Hall site. Chapter 2 details how that study was planned and held, and how the results were analysed.

2. Data Collection and Analysis

The first section of this Chapter details our data collection methodology: the Tiny Home Prototype Study (THPS). The THPS occurred in two separate sessions, and involved tours at the v1 prototype at Cambridge City Hall, followed by a focus group discussion in a meeting room provided by the City. We invited two groups to participate: Group 1 from The Bridges, the emergency shelter in Cambridge, and Group 2 from A Better Tent City in Kitchener. We asked these participants to share their opinions of v1, and what, in their view, would make a THC a good place to live.

The second section details how we analysed the data from the THPS, using a methodology to extract spatial information from the conversation transcripts. We call this methodology coding for sociospatial analysis.

The findings from that analysis are a set of five Guiding Principles for Tiny Home Design, and a subset of Spatial Practices that the home needs to achieve in order to be considered compliant with our resident-centred guidelines. Those results are listed at the end of the section, and are explored further in Chapter 3, the Tiny Home Community Design Guidelines.

2.1 The Tiny Home Prototype Study

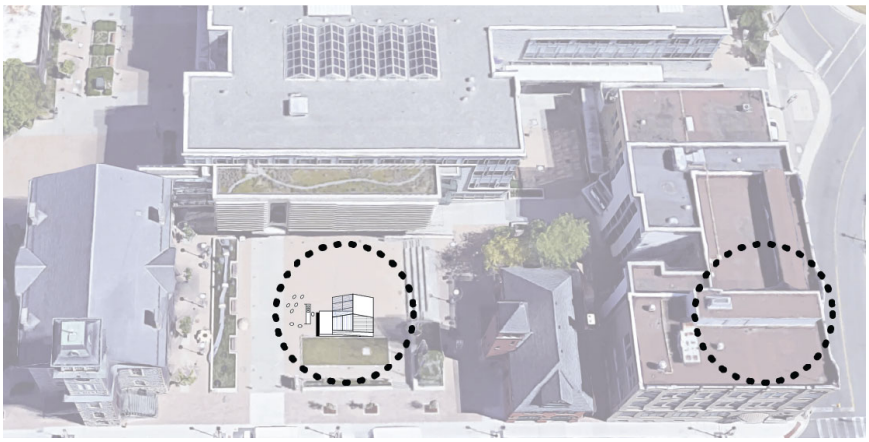


Fig. 43. The THPS v1 took place in the City Hall courtyard for tours, and then moved inside to a community centre meeting room for the focus groups. (Image by author with content from https://www.google.com/maps).

Study Design: Advisory Consultations, Recruitment

We designed the THPS in the summer of 2022, to be implemented in the fall when the v1 prototype would be on display at City Hall. The study would be held in separate sessions for different participant groups, with two main parts to each session: tours of v1, followed by a focus group discussion on its design. The study design was approved by a University of Waterloo Research Ethics Board [REB #44550], and our intentions, per our ethics application, were the following:

Purpose: "to understand how to reflect the needs of potential end-users in the design and siting of the community, and of each individual home."

Aim: "to (1) collect feedback on the prototype Tiny Home from people with experience living in shelter or transitional housing facilities, and (2) develop a design for a second prototype Tiny Home and a refined site plan based on the feedback received from participants."

Objectives: "(1) a summary of best practices synthesized from the collected feedback, and (2) schematic drawings for a new building prototype."

We hoped to recruit participants with experience living in different kinds of transitional or emergency housing. We identified The Bridges emergency shelter in Cambridge, which is within walking distance of the v1 display site, and A Better Tent City in Kitchener as organisations to recruit participants from. These two participant groups would bring perspectives from their experiences staying at a conventional institutional shelter (Group 1), and living in a THC (Group 2).

Advisory Consultations

Homeless populations are at increased risk of exploitation by research practices (York University Human Participants Review Committee 2022). Acknowledging that our targeted participants were in circumstances that cause them to be vulnerable or marginalised, and that the challenges of housing insecurity and homelessness are often compounded by discrimination, exploitation, and physical and mental health challenges, we conducted an exploratory research stage to identify the special considerations we might need to take to develop a study that would be respectful to, and practical for participants.

Canadian research policy recommends working with an advisory group to help reduce risks for marginalised research participants (Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council of Canada 2022). We held advisory consultations with management from the two organisations to ask about the demographics of people using their services, our recruitment methods, and what would happen on the day of the study. We also inquired if the organisations had interest in being engaged with the hypothetical THC, should it be built.

Our advisors also shared their knowledge of housing struggles in the Region: we learned about the strain on the shelter system caused by closures of local emergency shelters, and the increasing phenomenon of older people being evicted. We learned that ABTC served a unique community of folks who are the "hardest to house", those who struggled in or could not use conventional shelters.

Recruitment

After the advisory consultation stage, the next two stages were recruitment, and the study event itself. We asked our contacts at the organisations to act as recruiters through an emailed letter detailing what their role would be. With their agreement, we supplied each organisation with digital and printed study information materials. These materials included a Recruitment Poster and an Information Letter detailing our intentions, what would happen during the study, the $20 honorarium for participation, and the minimal risks of touring the v1 prototype and participating in the conversations, which could be potentially upsetting for people who have struggled with housing insecurity.

We aimed to recruit 5-10 participants from each group to keep the conversations manageable and familiar, while allowing for diverse opinions. Our contacts advised us to expect last-minute changes and some uncertainty as to who would show up, but on the session dates we had eight participants walk over from the Bridges, and five came from ABTC, driven in by ABTC staff. A trusted staff member joined each session for participant support, and they also shared their experiences in the discussions for a total of nine and six participants, respectively.

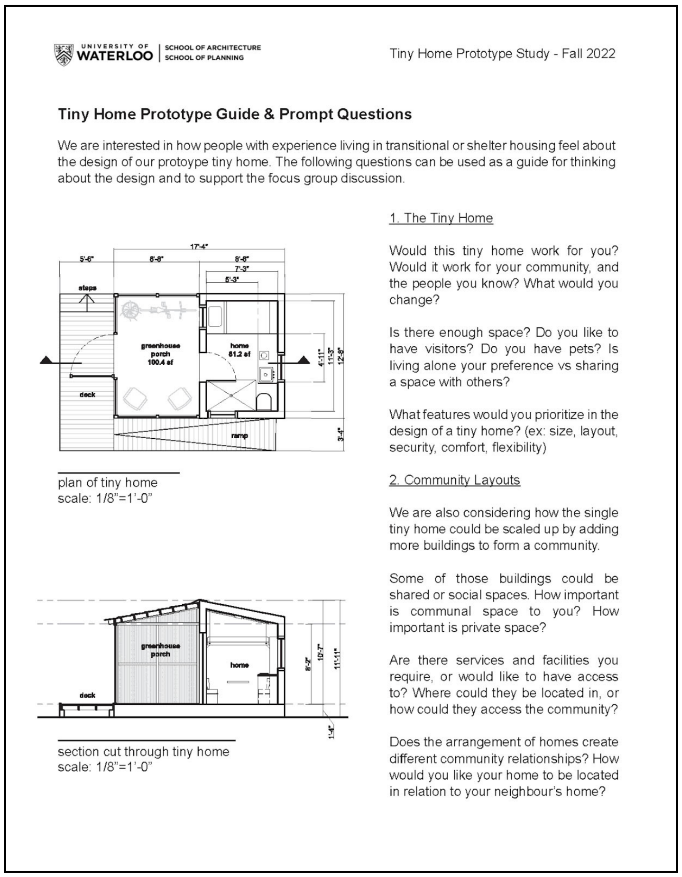
Fig. 44. The recruitment flyer we provided to the two organisations. (Image by author).

Tours

One the day of each THPS session, we met participants at the prototype site for tours of v1. While organising and conducting the study was my responsibility as part of this thesis, members of the research team were also present to greet participants, facilitate the discussions and set up materials: three team members were present at the session with Group 1, and all five members of the team were present with Group 2. We also enlisted the help of one graduate student from the architecture school to handle non-research tasks so we could focus on the tours and conversations.

Upon arrival, we briefed the participants on the purpose of our research and then opened up the prototype for tours and conversation. Feedback received during the tour segment of the study was not recorded or analysed – both interviewers and participants brought up important points from those first impressions again during the conversations.

A Study Guide was provided to help spark participants' thoughts ahead of the conversation, and included a note-taking page that participants could use during the tours or conversations. We felt that a written feedback option might assist participants who were less comfortable speaking in the group to express their opinions – some opted to hand us their notes after the session.



UNIVERSITY OF WATERLOO | SCHOOL OF ARCHITECTURE SCHOOL OF PLANNING

Tiny Home Prototype Study - Fall 2022

Tiny Home Prototype Guide & Prompt Questions

We are interested in how people with experience living in transitional or shelter housing feel about the design of our protoype tiny home. The following questions can be used as a guide for thinking about the design and to support the focus group discussion.

plan of tiny home
scale: 1/8"=1'-0"

section cut through tiny home
scale: 1/8"=1'-0"

1. The Tiny Home

Would this tiny home work for you? Would it work for your community, and the people you know? What would you change?

Is there enough space? Do you like to have visitors? Do you have pets? Is living alone your preference vs sharing a space with others?

What features would you prioritize in the design of a tiny home? (ex: size, layout, security, comfort, flexibility)

2. Community Layouts

We are also considering how the single tiny home could be scaled up by adding more buildings to form a community.

Some of those buildings could be shared or social spaces. How important is communal space to you? How important is private space?

Are there services and facilities you require, or would like to have access to? Where could they be located in, or how could they access the community?

Does the arrangement of homes create different community relationships? How would you like your home to be located in relation to your neighbour's home?

Fig. 45. The Study Guide used by participants. (Image by author).

Conversations

Using a slideshow in the background to guide the conversation and to show photos and drawings of the home, we began the conversation with open-ended questions selected to encourage participants in sharing their initial reactions to v1:

What was your reaction walking through the tiny home?
If you lived in it, how would it work (or not work) for you?

After discussing those first impressions, we directed the conversation to focus on each architectural element for feedback on each piece. Halfway through was an intermission where lunch was provided, followed by part 2 of the conversation which shifted the conversation to the community design. Near the end, we left time to re-cap participants' overall impressions. We allowed the conversation to proceed organically, and referred to the following questions from the slideshow as needed to prompt discussion or keep the topics on track:

Is it worth it to have the kitchen and bathroom private, in the house?
How important is communal space to you? How important is private space?
What are the benefits or challenges of a tiny home community?
What does the community need so that it feels good to live in?
How do you feel about sharing space with others, versus having fully separated homes?
What is your overall impression of the tiny home, or the idea of the community?

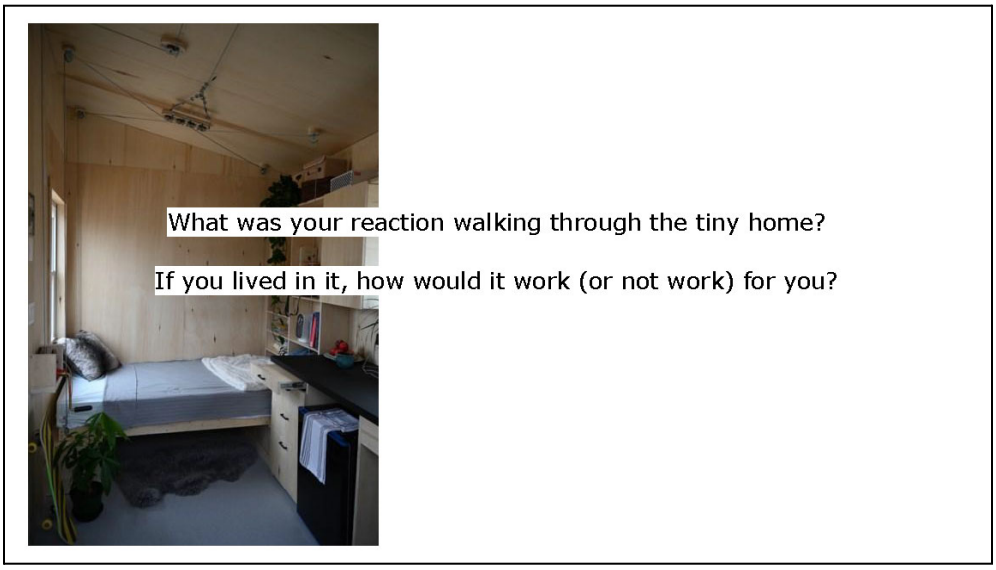


Fig. 46. The opening slide of our presentation engaged with the participants' immediate reaction to v1. (Image by author).

Fig. 47. Slides that shifted the conversation to focus on specific architectural elements. (Image by author).

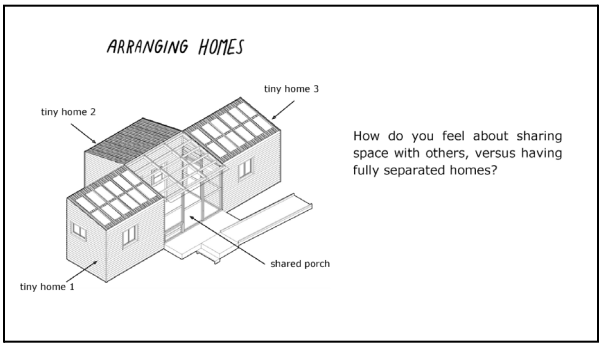


Fig. 48. Slides from part 2 of the conversation, which focused on the community (rather than home) design. (Image by author).

Researcher Reflections On The Conversations, Before Analysis

The Group 1 and Group 2 conversations differed in the overall attitude toward the project. Group 1, from the Bridges, generally expressed more skepticism about the research project's ability to establish homes or a community. Group 2, from ABTC, generally expressed excitement about the project and shared lessons learned from their experience. Speculatively, these differences might be linked to the participants' experiences with their recruitment organisations: people staying at the Bridges may have experienced failed initiatives and programs coming from formal and institutional settings, while people living at ABTC share a past experience of setting up a community and seeing it succeed.

The conversation with ABTC residents also flowed more organically than the Group 1 talk. There were technical issues with the slideshow of images and questions, which may have shifted the conversation away from a normal structure. The second session may have also been easier for the interviewers, after learning from the Group 1 talk. Other possible reasons could be the participants personal experience with, and enthusiasm for, THCs, and the experience ABTC members have giving interviews and tours due to interest in their community.

2.2 Coding For Sociospatial Analysis

The following section focuses on the methodology used to analyse the focus group transcripts, and to produce practical guidelines for architectural design from that conversation data. To extract this kind of spatial, architectural information from personal anecdotes and insights given in the focus groups, we drew from nascent methods of sociospatial analysis – a process of interpreting the intersection of lived, social ("socio") experience, with space ("spatial").

The analysis was carried out in a two-stage coding process. Coding describes a thematic analysis tool used to sort topics and reveal patterns in data: a researcher assigns codes, meaningful tags of key words or phrases, to that data, often in multiple cycles, to eventually draw out themes and theory – in our case, guidelines for designing a tiny home community (Saldaña 2016; Krueger and Casey 2015).

Our first coding cycle followed an inductive method tailored to highlight all the topics participants discussed while preserving as much of their original language as possible. In the following deductive process, we used a categorization system based on practices, which are the things people do or feel in a space(Smagacz-Poziemska, Martini, and Bukowski 2020, 59-78), to translate the first stage findings into new codes that could be more directly interpreted in an architectural design.

These resultant findings are: five Guiding Principles for Tiny Home Design, each with a list of supporting Spatial Practices that eventual home and community must enable in order to be considered a good place to live.

> Dwelling in the data, means that we are, for a time, inhabiting the participant's life world to the extent that we are able to do so.
>
> - Paul Mihas, in Analyzing and Interpreting Qualitative Research: After the Interview.

The prototype redesign is a time-sensitive project. There is pressure to produce the v2 designs quickly – to arrive at a point where people could live in these homes, to publish our findings to the City of Cambridge and the public, and to educate on, and advocate for, the potential of THCs in the Region of Waterloo.

Coding a dataset is a process of intentionally slowing down data analysis (Mihas 2021); our 2-step process was slow and labour intensive. The aims of setting aside this period of systematised attention were: to reduce projection and design authority coming from the research team (people trained in planning and architecture); to amplify participant voices, language, and experience; and to uncover pieces of data that may have been lost, i.e. that came from quieter voices, or that did not align with our impressions in the conversation.

Sociospatial Analysis

The objective of this coding exercise was to translate the feedback from our conversations into design principles, and eventually into architectural drawings. However, a specific thematic analysis methodology has yet to be standardised for design and architecture applications.

The methodology used in this work is developed from two published sources that identify that gap, and present their own methods for sociospatial analysis. Emilie O'Neill's recent Masters thesis in Architecture develops a thematic analysis method geared toward designers (O'Neill 2022). O'Neill writes about the key difference between this method, and existing methods in the social sciences – that the findings it generates are designs rather than theories:

> For architects the final design would replace a report which is what this exploration attempts to pioneer. To translate this concept to design I visually diagramed the resultant themes as a way to organize the building's conception. The diagramming process replaces the report-based analytic conclusion in a way that is accessible to architects and non-architects creating a roadmap for the designer to follow in terms they are familiar with.

The diagrams in FIgure 49 compare the "streamlined codes-to-theory model for qualitative inquiry" published by qualitative researcher Johnny Saldaña (Saldaña 2016) with the sociospatial model. The first represents the coding process from raw data to results (theory), and the second illustrates how the sociospatial model, which progresses from *codes-to-building*, diverges from that thematic analysis tradition.

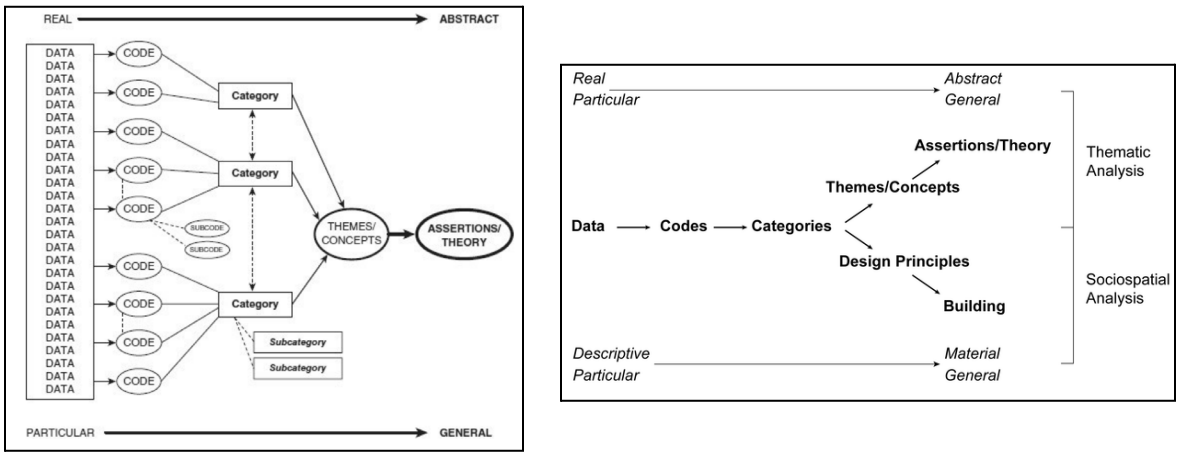


Fig 49. A comparison between Saldaña's codes-to-theory model and the sociospatial analysis model. (Image on left by Johnny Saldaña, 2016, from The Coding Manual for Qualitative Researcher. Image on right by author).

In a critical analysis of their own research methods interviewing residents of housing estates, sociologists Smagacz-Poziemska, Bukowski, & Martini also advocate for a standard sociospatial methodology to assist in urban research, "where regularity and routine are empirically hard to grasp"(Smagacz-Poziemska, Martini, and Bukowski 2020, 59-78). Their method is based in practice theory, a framework that, like sociospatial theory, specifically investigates the intersection between people and space. The practice-based process uses codes for the activities, or practices, people perform in certain spaces. The following two-stage coding methodology is based on a combination of the two referenced approaches, which both recommend using an inductive coding stage followed by a deductive stage.

Coding Round 1: Inductive, Open, In-vivo

The first iteration coding method used was an Inductive process that combined Open and In-Vivo codes. Inductive and Deductive coding are two fundamental distinctions that describe how the researcher identifies codes (Bingham, A. J., & Witkowski, P. 2021). Selecting an inductive method for the first round of coding allows the participant's words to inform the first series of findings, rather than imposing researcher-defined categories onto the data.

1. Inductive: codes are identified as they emerge from the data
2. Deductive: codes are identified based on the research question, theoretical framework, or background research, and are established prior to beginning coding.

Open and In-Vivo codes are commonly used types of codes within those broader distinctions. Open coding allows the researcher to code different kinds of information: we used this method to code both conversation topics (the main focus), but also organisational codes representing metadata – data about the data (Saldaña 2016). We used organisational codes to flag whether a participant or the interviewer was speaking, to note when we were being given specific advice, and to add other notes to the transcripts.

In-vivo coding is a method that maintains the participants' original words (Turner 2016; Bingham, A. J., & Witkowski, P. 2021). During this iteration, the affiliation of In-Vivo codes to a participant's voice served as a mnemonic device, recalling the scenario and meaning of the code. Challenges of In-Vivo codes are that they are specific to one moment in the conversation, and can prioritise the first, or loudest, voice on that particular topic (Turner 2016). This method generated terms like "A Regular Place to Live", and helped avoid language that over-complicated what participants were trying to express.

Round 1 Results

This method resulted in many more individual codes than a deductive process would have.

Group 1 = 194 individual codes, 18 code categories

Group 2 = 325 individual codes, 11 code categories

This is, intentionally, a lot; the aim was to reflect participant language and the various ways many people might describe similar ideas. These many codes were then organised into two visual word maps, one per focus group conversation, to link the open codes by relation to one another, until concentrated areas began to emerge, representing more general code categories, which represent a summary of the topics in each discussion. These word maps are shown in Figures 51 and 52.

Similar word maps can be generated by coding-specific software, rather than by hand (Turner 2021). In the example below, a software-facilitated process grouped codes together based on dominant topics, enlarged certain codes based on the number of instances (Ibid). Per the researcher “these hierarchies give structure to the coding framework” (Ibid).

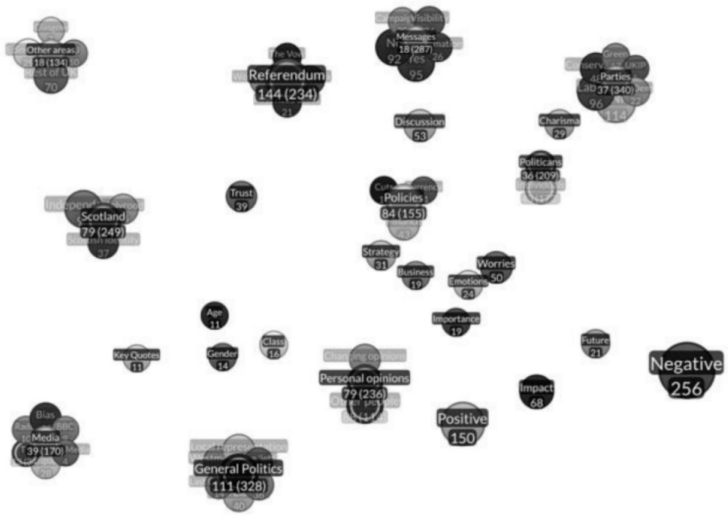


Fig. 50. Word clouds can be produced through a software to create a visual structure for understanding interview discussion topics. (Image by Daniel Turner, 2021, from Coding System Design and Management).

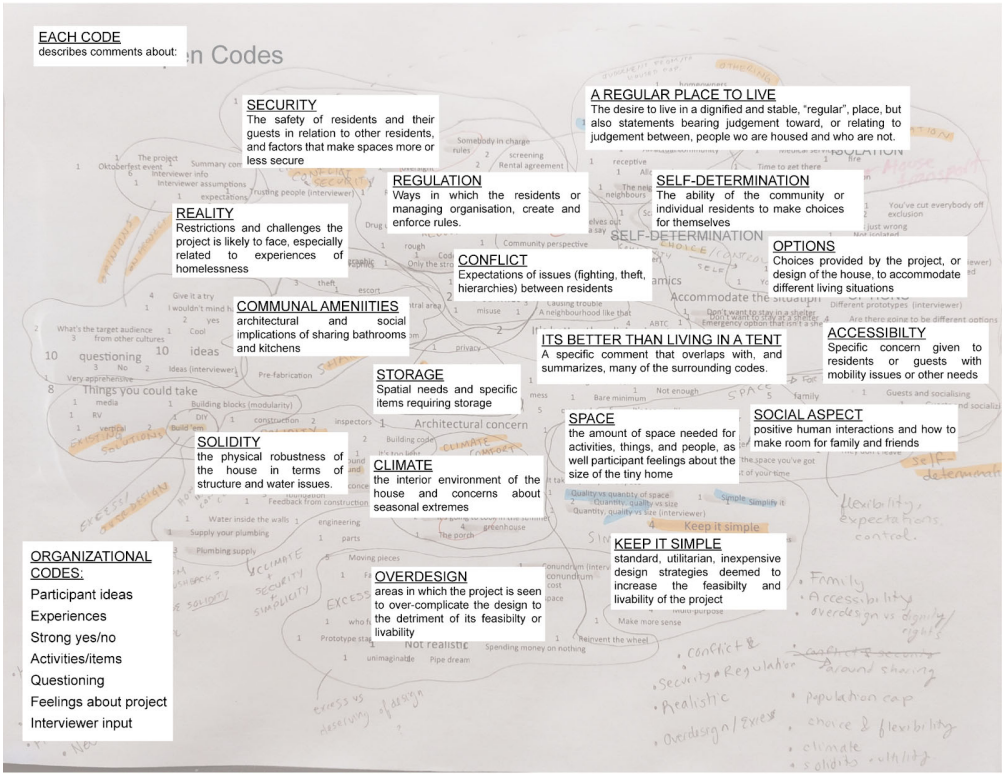


Fig. 51. Word clouds and resultant code categories from Group 1. (Image by author).

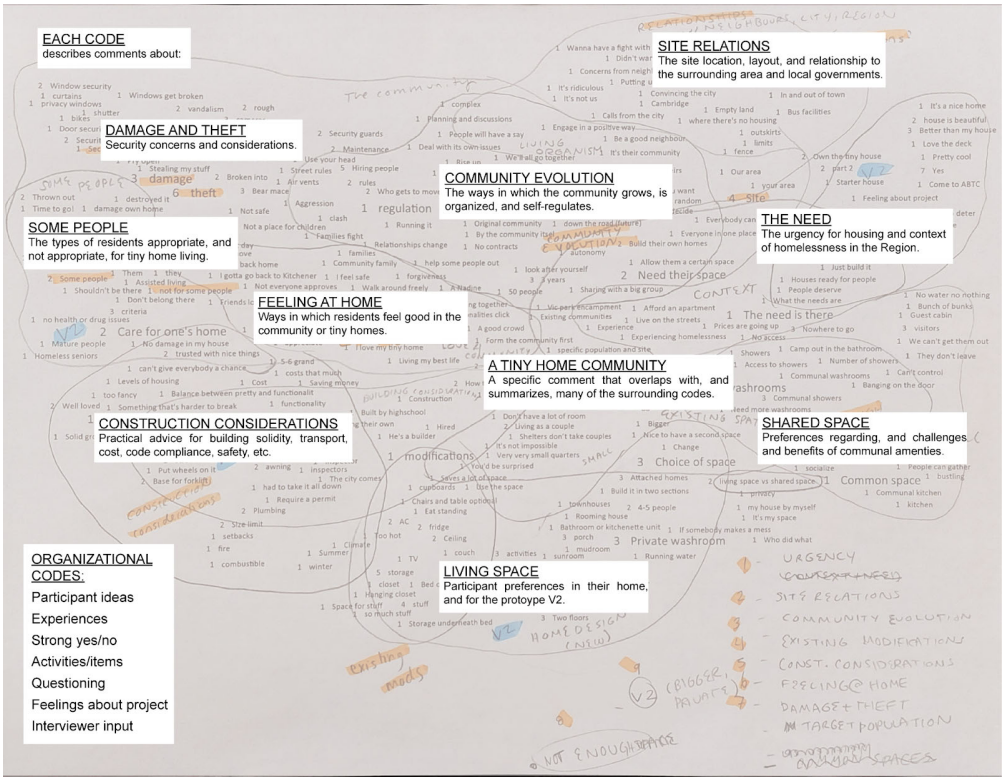


Fig. 52. Word clouds and resultant code categories from Group 2. (Image by author).

Coding Round 2: Deductive, Spatial Practices

The aim of the second round of coding was to generate design principles that could be interpreted in the design guidelines. The principles needed to express all the things that the participants felt would be important in the tiny home community, in a few categories that were both broad, and materially descriptive.

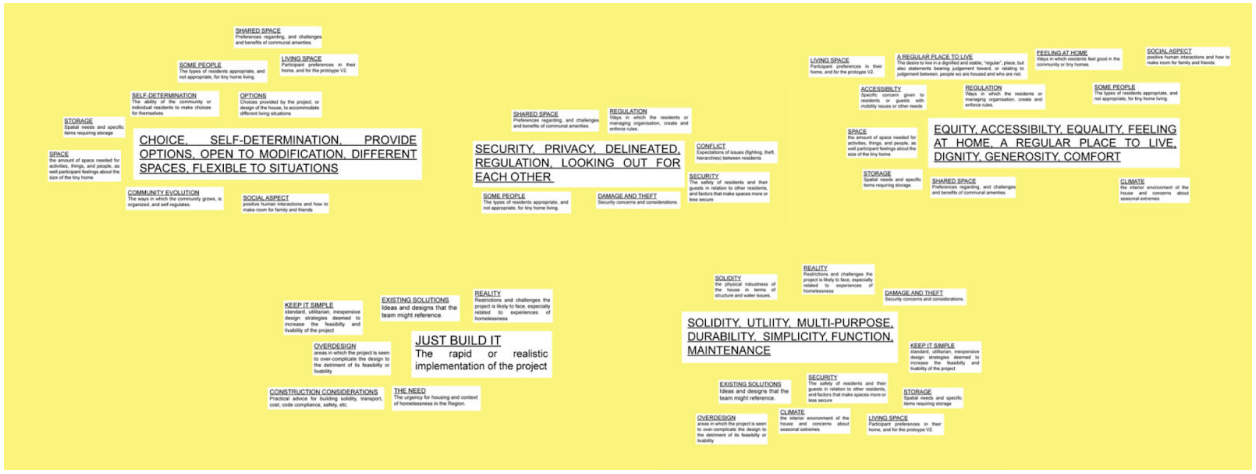


Fig. 53. Early development of the guiding principles from the round 1 coding results. (Image by author).

It was challenging to avoid abstract language when trying to develop the guiding principles: concepts like “community” or “family” were important according to residents, and our team was often referring to “autonomy”. While a building can be a site for a strong community, or feelings of autonomy, abstract ideas cannot be directly interpreted or assessed in design guidelines.

In Smagacz-Poziemska, Bukowski, & Martini, when the researchers did “not know the WHAT being investigated”, they focused on practices: things people can do or feel in a space. Identifying and coding practices enables direct interpretation through architecture, because a building can be designed that frames and enables those activities.

A list of practices that our participants said they wanted to do or feel in the space (eg: have guests over) was developed alongside the broad discussion categories that were emerging. These eventually became our five Guiding Principles For Tiny Home Design and associated Spatial Practices – “spatial” was added to emphasise the architectural application. These final categories were re-coded to the original transcripts using a simultaneous coding method that allows for multiple codes to be applied to the same piece of data (Saldaña 2016). These selected transcript quotes are illustrated in the following sections.

2.3 Findings: Guiding Principles with Spatial Practices

Guiding Principles for Tiny Home Design

The purpose of this list of guiding principles is to represent the priorities of the target resident community, specifically those that can be supported directly and materially by architectural strategies. The first four principles represent fundamental elements of resident well-being that a design should provide:

(1) A Regular Place to Live;
(2) Choice;
(3) Utility;
(4) Security;

and a 5th describes the urgency of implementation that underscores each principle:

(5) Just Build It.

Rather than mirroring the ideologies of sustainability, affordability, and freedom linked with conventional tiny home living (Anson 2014; Ford and Gomez-Lanier 2017; Shearer and Burton 2019), the resultant Guiding Principles for Tiny Home Design indicate the unique needs, challenges, aspirations, and lifestyles of the imagined resident population. Our aim in generating these principles is to represent a definition of resident and community wellbeing tailored specifically to a group of people who are transitioning out of homelessness and choosing to live together as a community.

A Regular Place to Live addresses that residents must be able to live with a certain standard of safety and dignity, despite living in unconventional housing, while recognizing the extra challenges to safety and dignity that are often co-occurrent with the challenges of homelessness.

Choice addresses both the individual and the community. Choice means engaging residents in the design process, providing customization options to respect different lifestyles, and providing residents with the power to choose to spend time in one space or another.

Utility describes ways in which physical durability and functional design can make daily life in the community easier, prepare for relocations, reduce future repairs and renovations, and control implementation costs.

Security was a critical concern for all discussion participants. Conflict and theft are a reality for a tiny home community - to address this the design will require specific security features for shared and private spaces, and for openings, fixtures, and appliances.

A specific colour is used to represent each principle and its associated practices. These colourful tags help illustrate when an idea is supported by one principle, or is linked between several.

The first four principles overlap and support each other. For example, having Choice regarding one's home layout is an important part of the home feeling like A Regular Place to Live. On the other hand, participants repeatedly brought up the struggle to balance and prioritise these principles. In Figure 54, participants liked how the home looked, but also warned us to keep the "fancy" design realistic and functional. Meanwhile, including fanciness is supported by some of the other guiding principles, for example extra space and quality finishes might help a home feel like A Regular Place to Live.

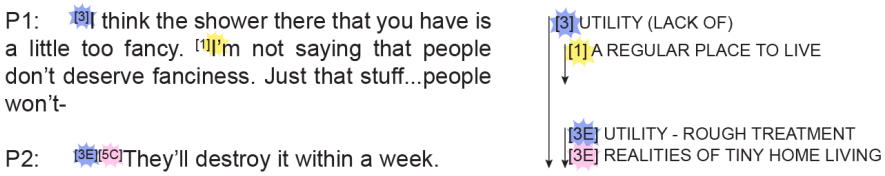


Fig. 54. Coded transcript: Two participants from Group 2 discuss fanciness vs functionality. (All coded transcript images are by the author).

Another balancing act is whether to build more, or build less; or whether to provide more, or less amenities. Figures 55 and 56 illustrate arguments for both strategies: one participant suggests including more features in the design to save time and energy for residents who may try to build their own (*principle: Utility*), and another suggests removing features to facilitate implementation *(principle: Just Build It).*

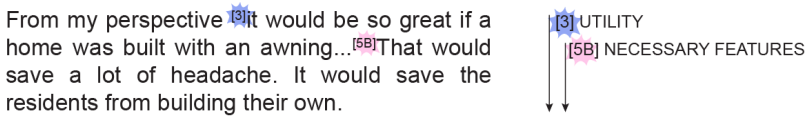


Fig. 55. Coded transcript: A Group 2 participant advocates for including features from the beginning.

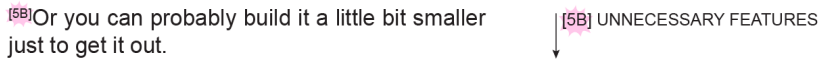


Fig. 56. Coded transcript: Another Group 2 participant suggests reducing the design to "get it out".

Finally, Just Build It reminds the design team that, unless a THC can actually be implemented, none of the four other principles apply. While conventional tiny homes are typically built and funded by the individual resident, a tiny home community relies on others – local organisations, governments, and in our case, a team of academic researchers in planning and architecture. While these multi-group development teams offer expertise from different backgrounds, they also have the potential to complicate the process to Just Build It.

Spatial Practices

The first four principles are expanded with practices describing things residents must be able to do in the eventual community. These practices represent tangible objectives to guide the design. The 5th principle, Just Build It, is expanded with practices that the design and planning team should follow when developing a tiny home community – advice we gathered from our feedback sessions. To develop a design guideline that meets these required practices, the next Chapter explores possible architectural strategies, working through each guiding principle and their objective practices step-by-step.

1. A design that provides A Regular Place to Live enables residents to:

   (a) access all spaces and facilities in the home and shared areas
   (b) have access to clean and safe toilets and showers with reasonable wait
   (c) have guests, family, and support workers visit their home and community
   (d) maintain a comfortable and safe temperature in the home
   (e) socialise and use facilities in communal areas

2. A design, and design process, that provides Choice enables residents to:

   (a) decorate and make modifications to the home, change furniture and appliances
   (b) have their own space, or choose to live with others
   (c) have diverse lifestyles and household types, sizes
   (d) choose to be in different rooms and spaces: private, shared, outdoor

3. A design that provides Utility enables residents, or staff, to:

   (a) perform daily activities despite the small space
   (b) use and repair spaces and fixtures with standard tools and skills
   (c) store all their possessions in, or securely outside, the home
   (d) relocate the home, if non-permanent construction
   (e) use surfaces and fixtures roughly without damage

4. A design that provides Security enables residents to:

   (a) have privacy from neighbours who live in and outside of the community
   (b) secure doors, windows, vents, and other openings
   (c) have fixtures, appliances and possessions secured from theft
   (d) have additional security features installed where there is a risk of conflict

5. In order to Just Build It, the design team should:

   (a) target and involve a specific group of residents
   (b) reduce unnecessary features to accelerate implementation
   (c) acknowledge the realities of living in a tiny home community, including:
      i. theft
      ii. conflict
      iii. misuse of private and shared space
      iv. DIY modifications
      v. drug use and addiction
      vi. disability
      vii. increased fire risks
      viii. a close and involved community
      ix. love for tiny home living

3. Tiny Home Community Design Guidelines

This Chapter develops the v2 dwelling unit design by working through each of the five tiny home design principles in sequence, adding levels of detail with each progression and ensuring that the resultant design provides A Regular Place to Live, Choice, Utility, Security, and that, hopefully, we can Just Build It. Before beginning with those five sub-sections, this section sets out preliminary design strategy and parameters which will constrain the eventual v2 design.

3.0 Preliminary Strategy: The Agglomerated and Extended Unit

After the focus group discussions, our team identified two potential strategies to proceed with for v2:

1 Agglomerated units: a set of 2-3 sleeping units, and one washroom unit, arrayed around a shared sunroom-porch containing a shared kitchenette and storage;
2 Extended v1 unit: each home is a private dwelling unit, resembling an elongated v1, with a full bathroom at the end.

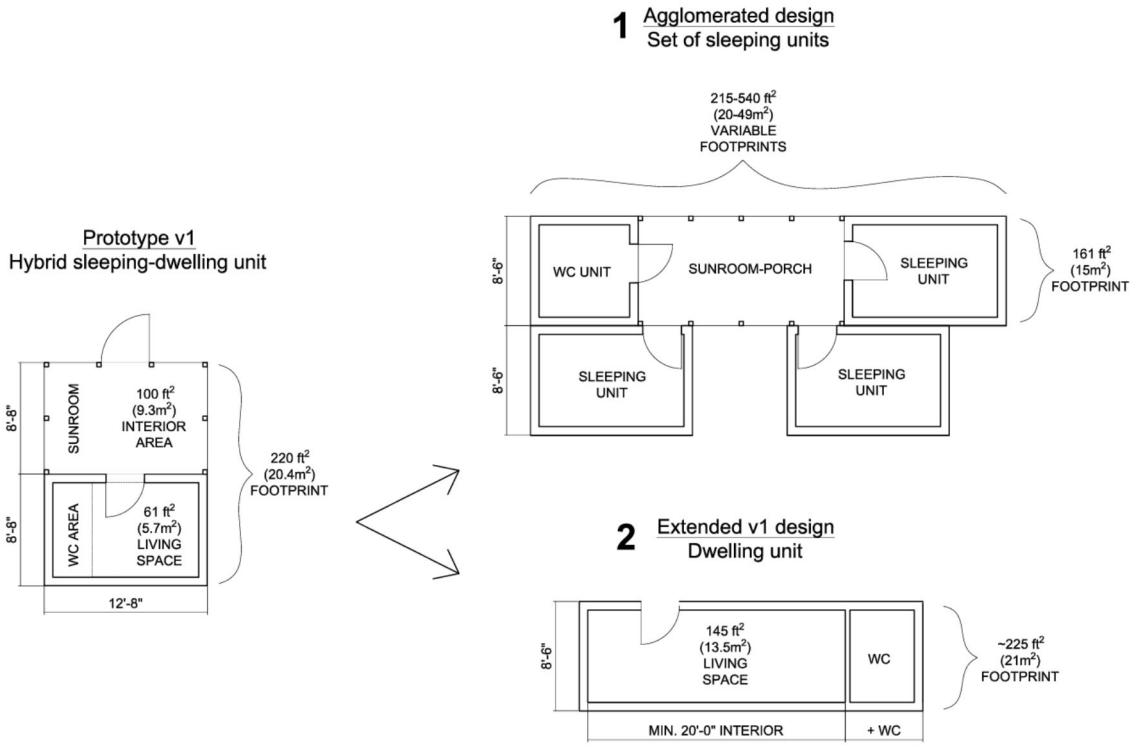


Fig. 57. Illustration of the two potential strategies. (Image by author).

Agglomerated Units

The agglomerated design was described initially by a participant from the ABTC group, who proposed that we modify the evolutionary design model proposed in the original design studio (in which third home units share a sunroom-porch), to swap the third home unit for shared amenities.

P1: [i]*Ok if you guys were talking about putting them together like 2 or 3 of them - like if there are 3, the 2 on the other sides can be apartments and the one in the middle could be bathroom or kitchenette or something.*

I1: Great idea.

I2: [3][5C]Yeah we were thinking that so some of the plumbing is shared, right.

P2: And then you only have to put the plumbing in one of the buildings.

[i] SPECIFIC IDEA *(organisational)*

[3] UTILITY

[5C] SIMPLIFY FOR IMPLEMENTATION

Fig. 58. Coded transcript: Group 1 participants describe how the agglomerated unit can reduce plumbing.

The primary aims of the agglomerated design are to allow for occupation of the sleeping units beforehand, without permits, and reduce the number of washrooms per resident, while still providing adequate access. The footprint area would vary with the number of sleeping units and the size of the sunroom-porch.

To use this design in a tiny home community, already-occupied sleeping units could be gathered to the site, connected to the central sunroom-porches, and then the washrooms would be added. This assembly would be similar to a rooming house or a shared house with roommates, but with the sleeping units kept as distinct structures rather than “rooms”. This separation may encourage a sense of independence and ownership for residents.

The sunroom-porch in this design, while unconditioned, would be more thermally insulated than in the v1 version: there were concerns about both heat and cold from the greenhouse-style roof and uninsulated panels. The redesign would feature different panel types, as shown in Figure 59: swing doors (A), corner panels (B), polycarbonate windows (C), and solid insulated panels (D).

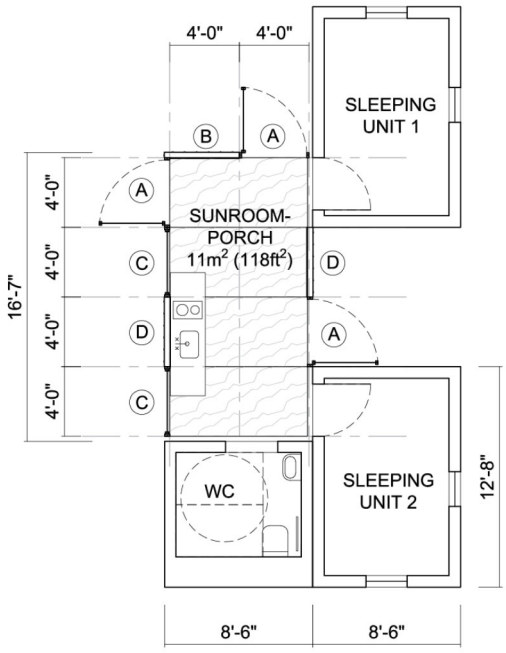


Fig. 59. Panel types A, B, C, D in the agglomerated design. (Image by author).

The Extended Dwelling Unit

The extended dwelling unit design takes v1 as a base, and then increases its footprint to achieve the following spatial requirements:

- 188 ft^2(17.5 m^2) footprint, without the sunroom porch
- 145 ft^2 (13.5m^2) interior living space, including the kitchen + living area + bed area
- an accessible bathroom separated by a door.

Under the assumption that the community implementing v2 will be a government-affiliated, supportive housing community, the rest of the Chapter continues with the extended dwelling unit design, which more closely resembles a standard dwelling and may be easier to implement and permit. This base design also provides more independence and privacy for residents.

The resulting unit will have to be a minimum of 22' 2" long to meet the 188 ft^2 (17.5 m^2) footprint requirement with a 8' 6" width. More length may be required depending on the resulting living area and bathroom configurations. Different entry porches, ramps, and awnings might be added to the front face of the home, as in v2 base unit shown in Figure 60.

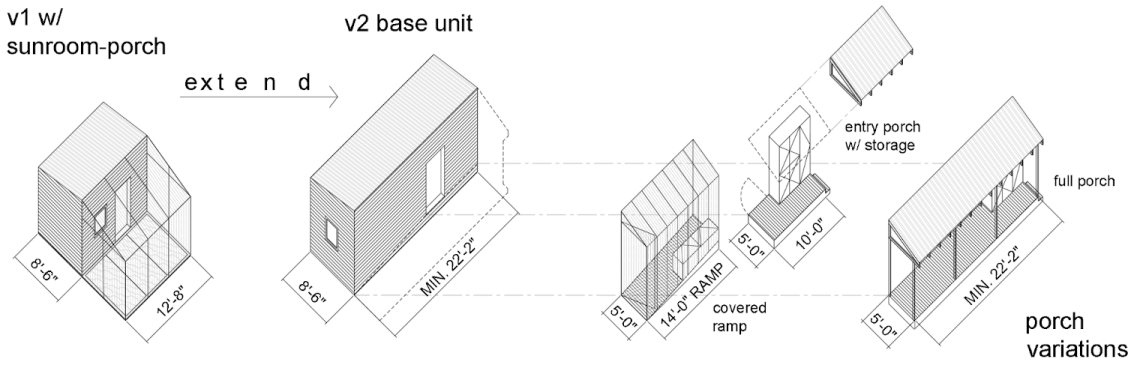


Fig. 60. The extended unit is a longer version of the v1 prototype, with variations of the sunroom-porch. Image by author).

Assemblies

Compliance with required areas and clearances depends on the thicknesses of the floor, wall, and roof assemblies used. The assumed assemblies used are: an 8" thick wall and 10" roof, the same as were used in the v1 design, and a floor + foundation where the finished floor height is 14" off the ground. This floor assembly also impacts the length of a ramp required to reach the interior – at a 1:12 slope, that would be a 14' ramp. See the following page for illustrations of these assemblies.

EXERCISE 0: ASSEMBLIES AND v2 OVERALL DIMENSIONS

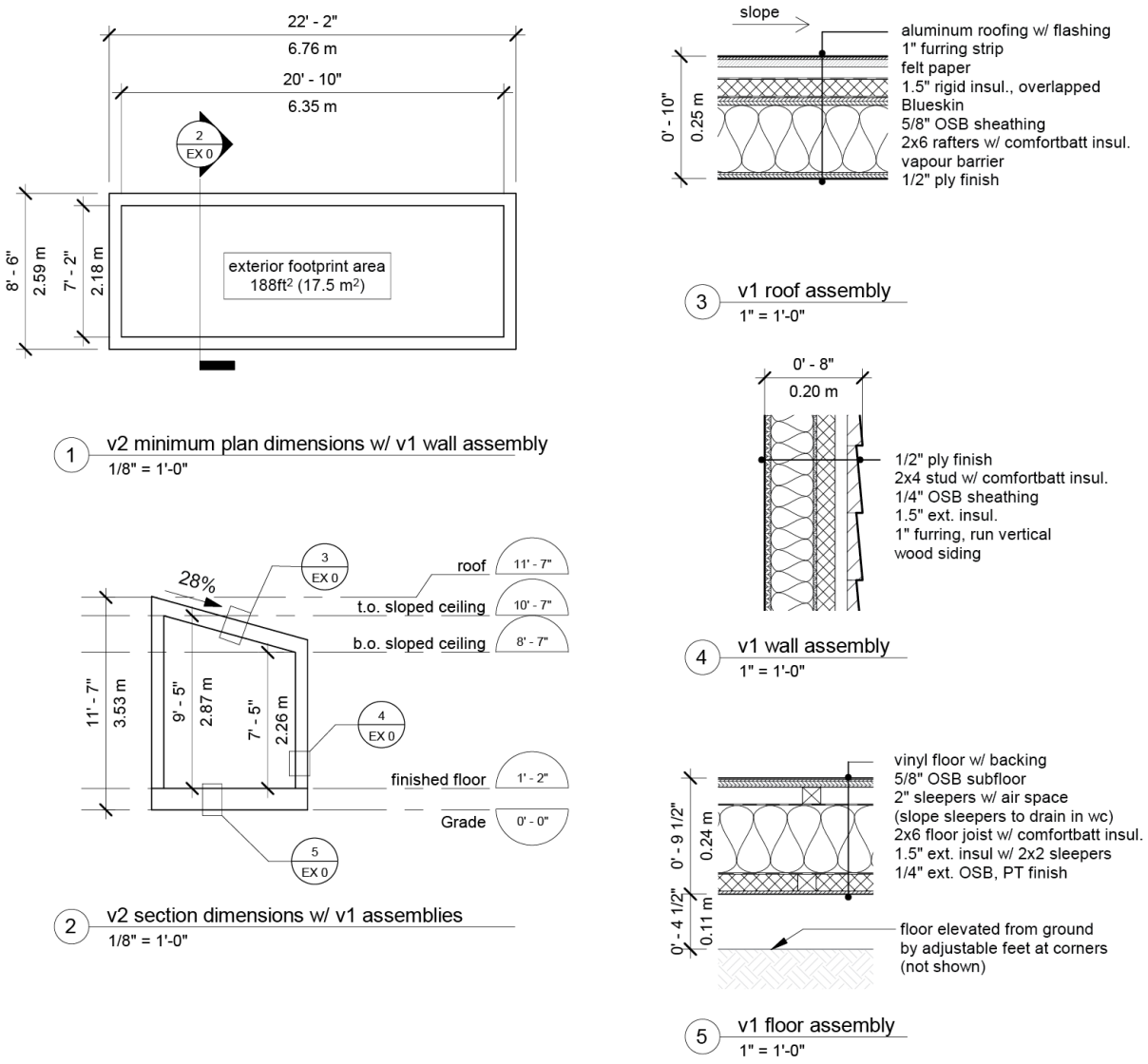


Fig. 61. The v2 wall, roof, and floor assemblies result in the overall plan and section dimensions shown. Image by author, assemblies adapted from the Microhousing Design Studio Drawing Set (Chen and others 2021).

Design Exercises and The Rest of the Chapter

The following five sections apply the insights and advice we heard during our feedback sessions to the extended dwelling unit design through a series of design exercises. The Assemblies illustration above is an example, as “Exercise 0”. Because the specific development and organisational contexts of the hypothetical community for v2 remain uncertain, the design guidelines are arranged as a set of exercises and parameters that could guide the design of the eventual v2, or any home being designed for a THC.

3.1 Principle 1 – A Regular Place to Live

Definition:

Focus group participants said they would like the community to feel like A Regular Place to Live. This design principle addresses that residents must be able to live with a certain standard of safety and dignity, despite living in rapidly-built, unconventional housing. Designers should consider the additional challenges faced by people who have experienced homelessness, including the increased risk of health and mobility issues, and potential past experiences of separation from family and friends through the shelter system.

Design Objectives (Spatial Practices):

Per the focus group discussion findings, a design that provides A Regular Place to Live enables residents to:

(a) access all spaces and facilities in the home and shared areas
(b) have access to clean and safe toilets and showers with reasonable wait
(c) have guests, family, and support workers visit their home and community
(d) maintain a comfortable and safe temperature in the home
(e) socialise and use facilities in communal areas

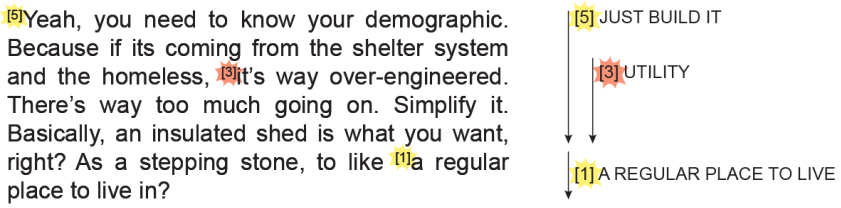


Fig. 62. Coded transcript: The in-vivo use of A Regular Place to Live: The participant imagines the THC as a "stepping stone" before progressing to something "regular".

A Regular Place to Live was coined by a participant (fig. 62) to describe the permanent housing that would be found after living in an “insulated shed”, or, what they perceived the THC *not* to be. An us-vs-them sentiment between “regular” market housing neighbourhoods and tiny home communities emerged in both conversations. Participants in Group 1 were concerned about ghettoization and becoming “a neighbourhood like *that*”. Group 2 spoke from experience about the stigma they faced from outsiders. In the following pages, we use basic floor plan arrangements to incorporate the features that make a home feel “regular” into v2’s schematic design.

Established in the v1 mandate, accessibility is a fundamental objective for compliance with this guideline. Populations at increased risk of homelessness include seniors and those with chronic health issues, who are more likely to need accessible spaces.

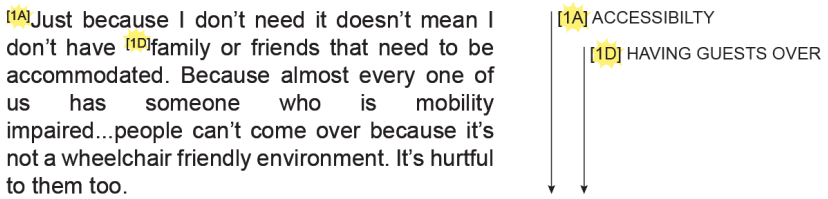


Fig. 63. Coded transcript: Asking for an accessible space.

Group 1 was concerned that the small interior of v1 would isolate them from friends and family (fig. 64), while the participants already living at ABTC described the community as a family, and, despite the minimal architecture, were happy with their homes. However, this group was excited at the prospect of v1 (and v2) being a “step up” from ABTC, which we argue should allow people previously living with the bare minimum the freedom to expand their amenities, families, and possessions. To comply with this guideline, v2 needs enough interior space for more than one person. Additionally, in our critique of the v1 design, sharing the space is also affected by the lack of a bathroom door for privacy and dignity, not just by limited square footage.

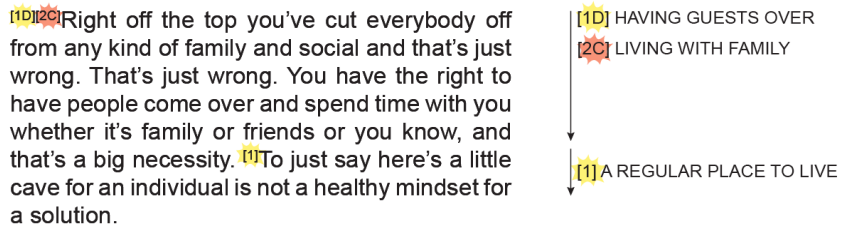


Fig. 64. Coded transcript: A participant from The Bridges (Group 1) explains that, for the home to be a humane living space, guests and family need to be able to visit.

EXERCISE 1-A: IDENTIFY THE BASIC ELEMENTS

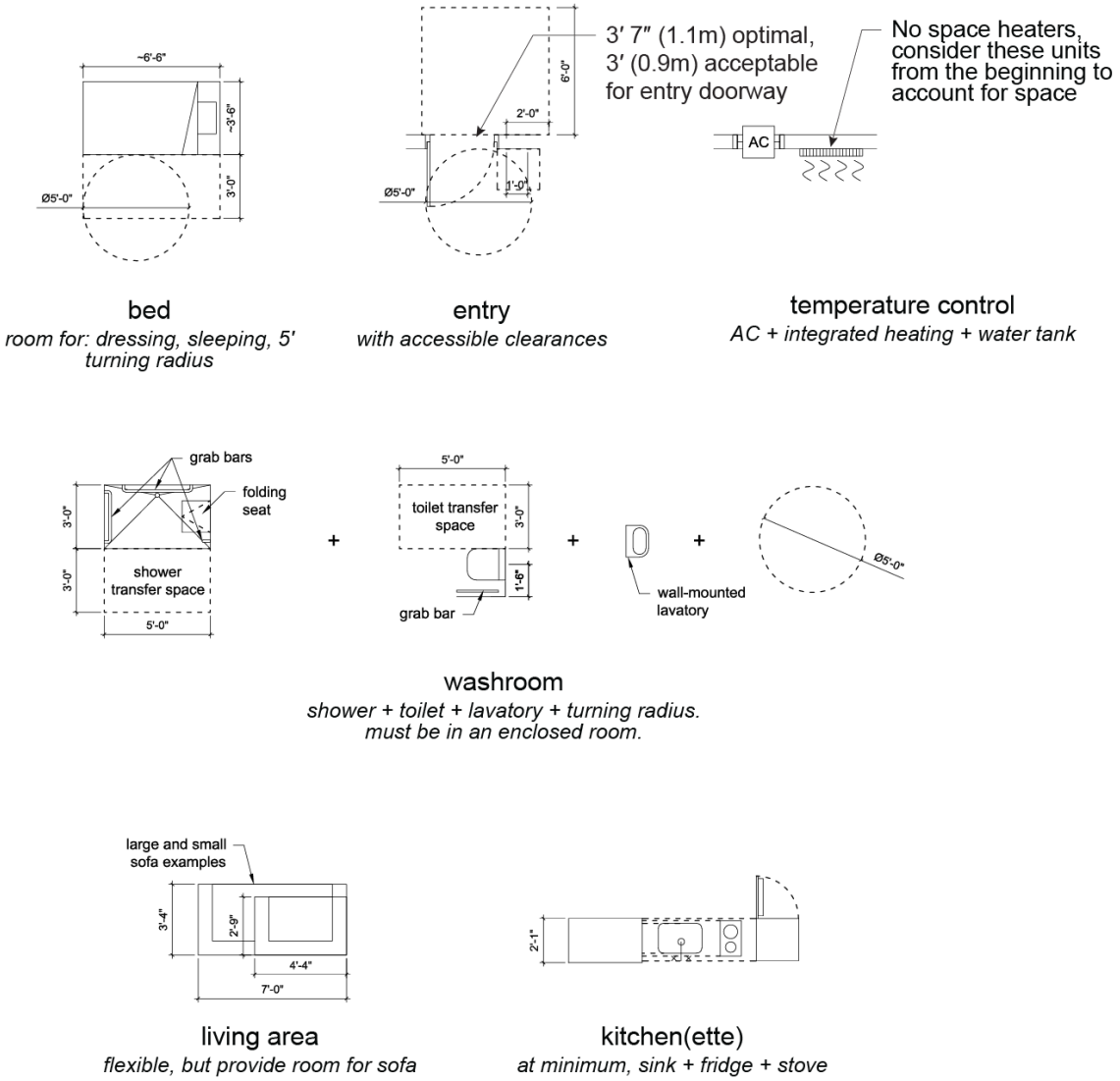


Fig. 65. Exercise 1-A. (Image by author).

The goal of design Exercise 1-A and 1-B is to identify and arrange the basic elements needed in the home to ensure that v2 might be A Regular Place to Live. One of the project parameters for both v1 and v2 is to accommodate people who use mobility devices, so the sketches show dashed lines for access space around these elements and the passageway clearances in the home. Heat and AC units are included from the beginning because of their impact on the floor clearance and window areas of such a small space.

EXERCISE 1-B: ARRANGE THE BASIC ELEMENTS

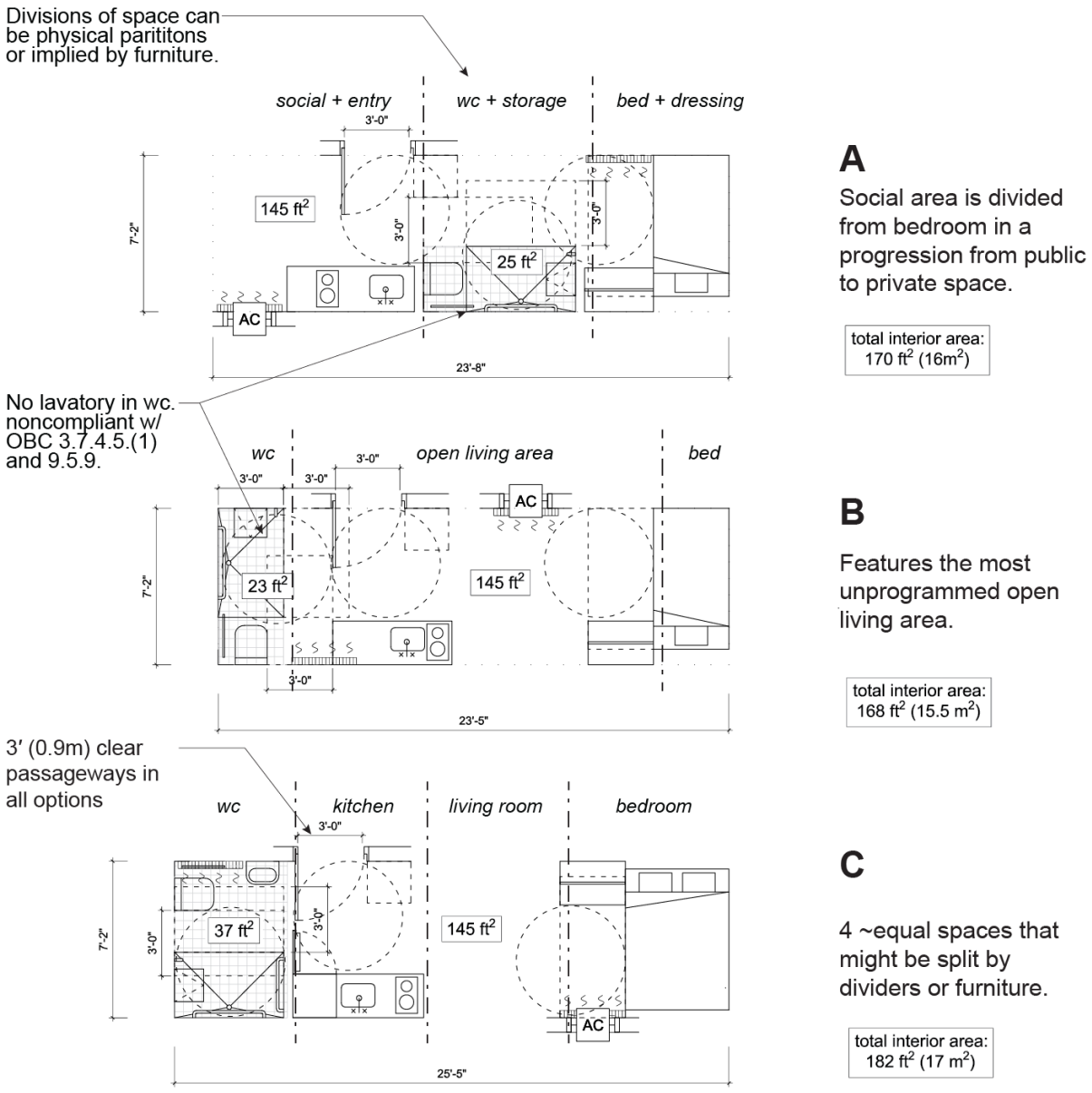


Fig. 66. Exercise 1-B. (Image by author).

Exercise 1-B arranges those elements in space. The overall interior dimensions of the home are set to achieve the required 145 ft^2 (13.5 m^2) living space (with an open-plan bedroom). Three options are drawn, each with a different bathroom variation – these variations result in slightly different lengths for options A, B, and C. Note that the small bathroom in A and B is technically noncompliant without a lavatory. Dot-dashed lines indicate the resultant divisions of space; three different interior environments emerge.

EXERCISE 2: ILLUSTRATE DAILY PRACTICES

Linked quotations for star annotations can be found on the following page

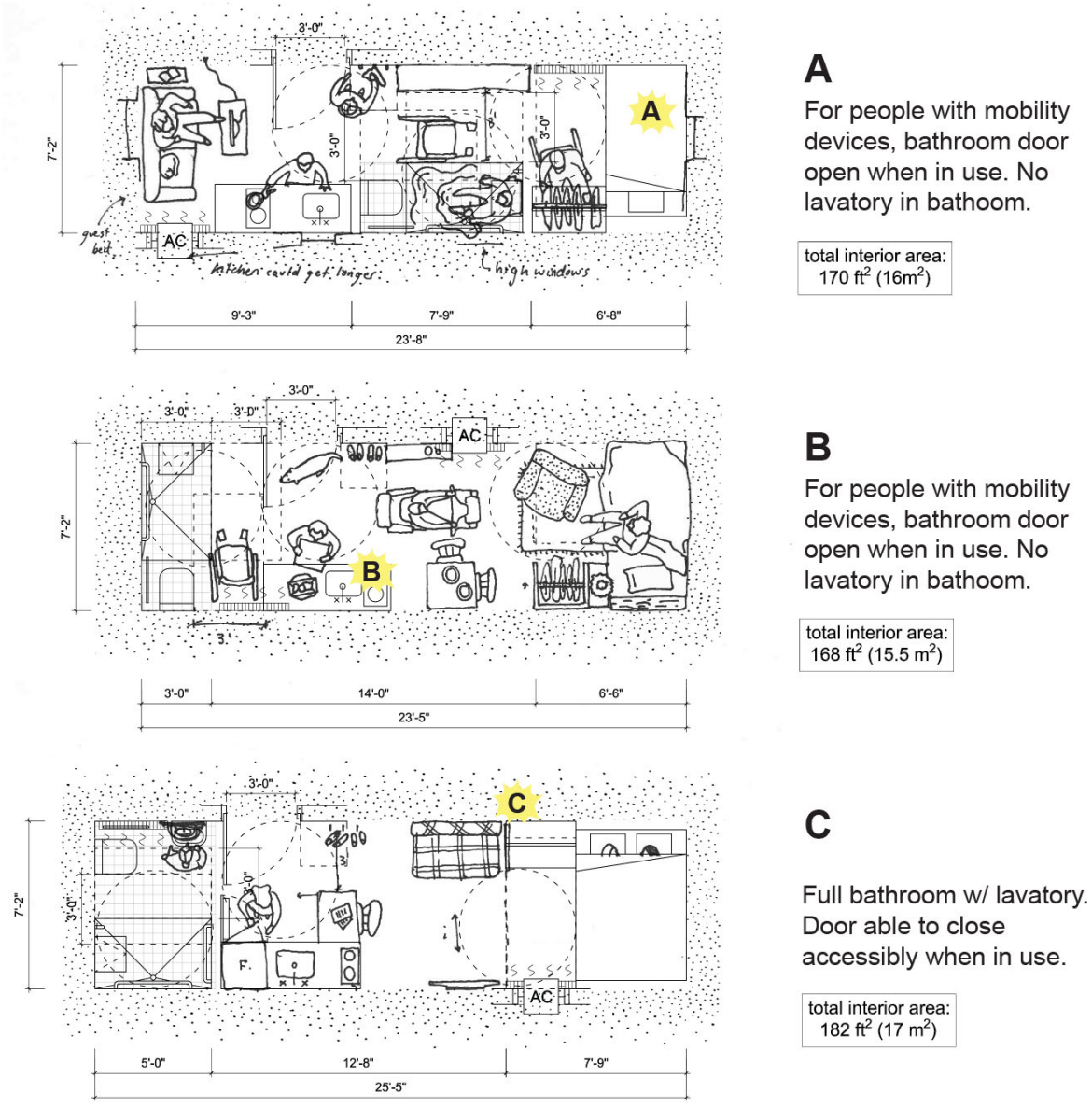


Fig. 67. Exercise 2. (Image by author).

The hypothesis of the sociospatial coding exercise in Chapter 3 was that, by identifying the things people want to do and feel in their home, one can design a building that frames and enables those activities. Based on specific feedback we heard, and in imagining the daily activities most people engage in, the illustrations in Exercise 2 imagine how the space might be occupied by people in diverse households and of different abilities.

Specific Ideas from Participants

The coded transcripts below are specific ideas shared by the Group 2 participants about ways the v2 design could improve upon the units at ABTC. These ideas are connected to design choices made in Exercise 2: Idea **A** is not followed. While this idea would increase the privacy and spatial separation of v2, the design has one level due to the project's accessibility mandate. Idea **B**, which suggests that a kitchen could be left out, will have to be evaluated based on the needs of the specific eventual THC population– a flexible layout is developed further in the section on Utility. Idea **C** is reflected in the Exercise 2 designs as an accessibility consideration – the home should have space for residents to install furniture that is comfortable based on their needs. While the selection of furniture falls under the next guideline, Choice, it is important to establish room for furniture flexibility in this stage of the design.

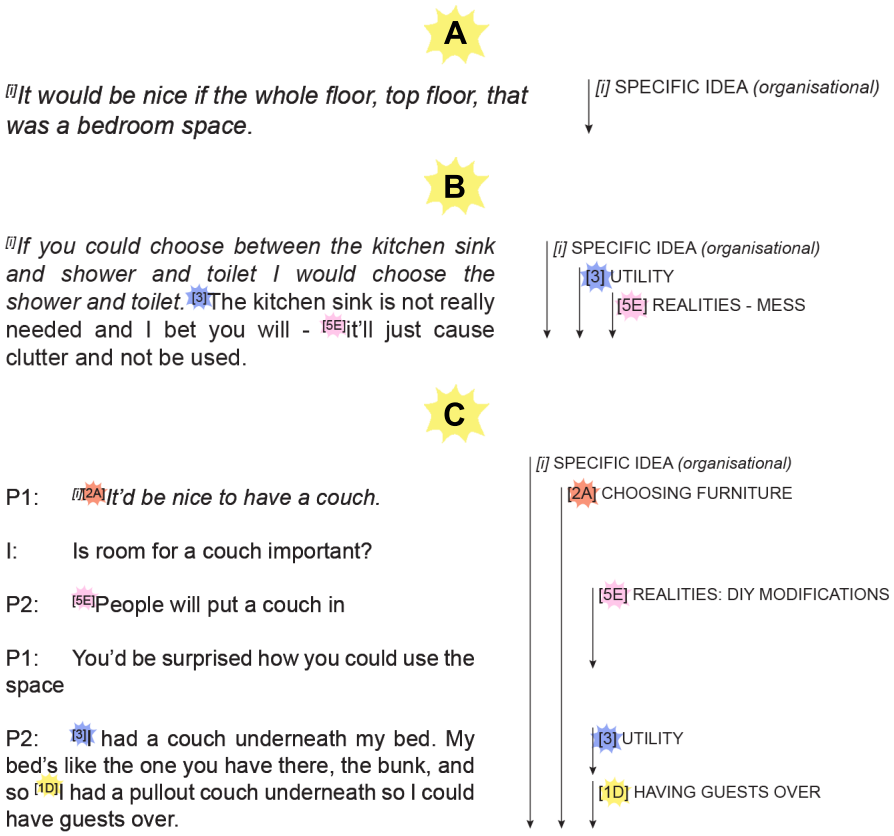


Fig. 68. Coded transcripts: Specific ideas from Group 2 participants, annotated on Exercise 2.

Which is the most regular place to live?

Subsequent design exercises develop floor plan C. That decision was made based on the full bathroom, and for its division of space that distinguishes between the bathroom, kitchen, living room, and bedroom spaces, while retaining a fairly open and flexible plan.

3.2 Principle 2 – Choice

Definition:

This guiding principle for tiny home design concerns the degree to which THC residents can make modifications to their own homes, the separations of space that allow residents to choose to be in one place or another, and options in housing form and size that allow for different household sizes and lifestyles. We heard from both groups that the collective and individual Choice of who gets to live in the THC is very important – while architectural design cannot address these operational decisions, or the degree of surveillance and control coming from management, the relationship between resident agency and Choice should be kept in mind during the planning process.

Design Objectives (Spatial Practices):

Per the focus group discussion findings, a design that provides Choice enables residents to:

(a) decorate and make modifications to the home, change furniture and appliances
(b) have their own space, or choose to live with others
(c) have diverse lifestyles and household types, sizes
(d) choose to be in different rooms and spaces: private, shared, outdoor

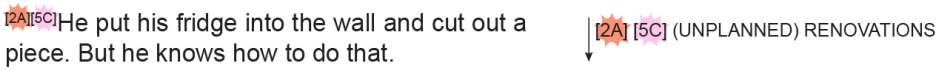


Fig. 69. Coded transcript: A participant describes an ingenious modification to an ABTC home.

Modifications

Under principle #5, Just Build It, we note that DIY modifications will occur in a THC. Those modifications can be a benefit – allowing the community to get established faster, while filling in the gaps later – but, as we discuss in our introduction to the five principles, some features are better installed professionally from the outset. The community management will have to decide the degree to which modifications can be made in a specific community: are residents allowed to paint and put up shelves? What about cutting a hole in the wall for a space-saving refrigerator, as described in Figures 69 and 70?

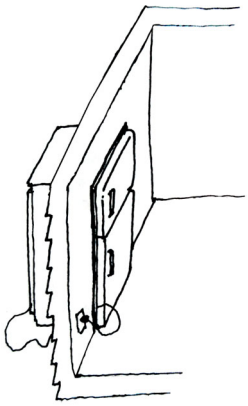


Fig. 70. DIY space-saving fridge in a wall, as in one home at ABTC. (Image by author).

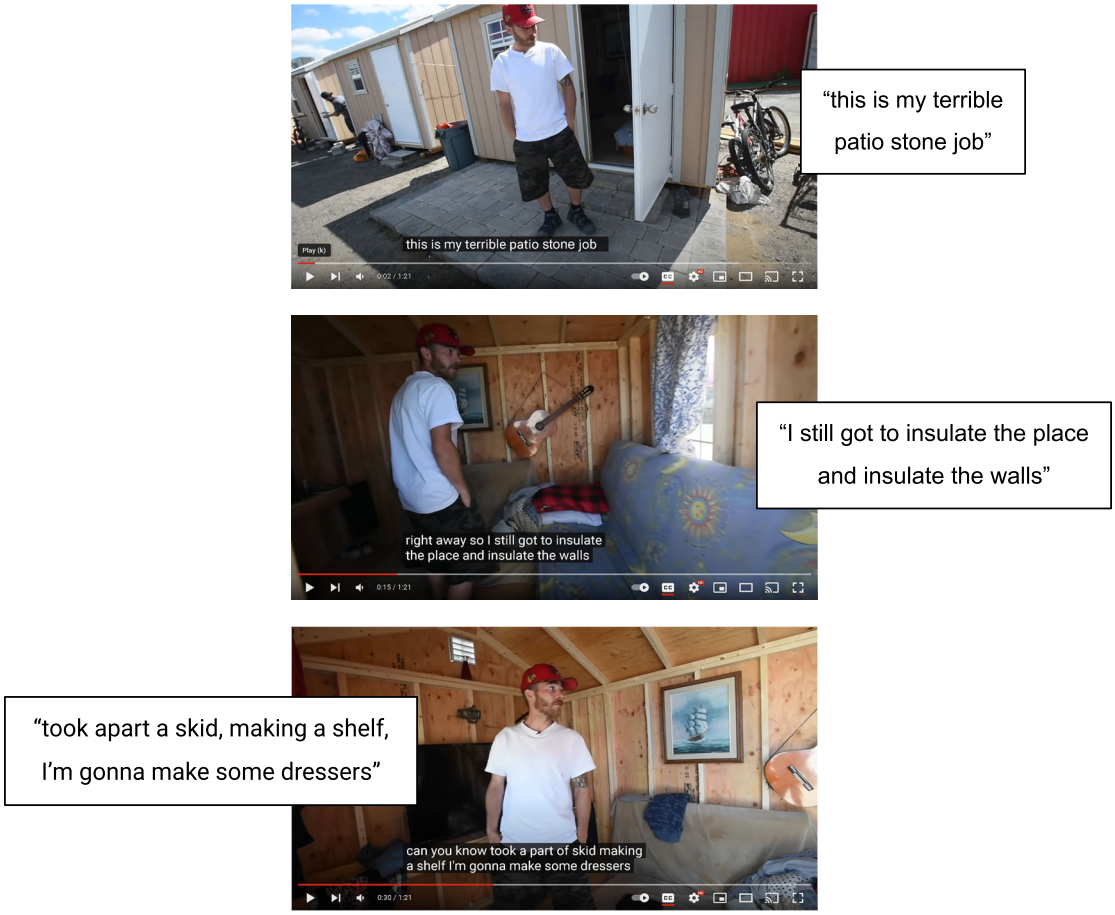


Fig. 71. A Youtube video sequence shows how a resident at ABTC's first location was finishing and improving their home. (Original video by Mathew McCarthy for The Waterloo Region Record, stills retrieved from: https://www.youtube.com/watch?v=xS9JFiVt7bU&ab_channel=photothereccord)

Divisions of Space

Having different kinds of spaces in the THC, and in the individual homes, allows residents to move around, and may contribute to a feeling of control over one's environment, and engagement with the home and community. Divisions of space can also impact the Security (principle 4) of the community. While direct Security measures like cameras, lighting, and staff might come to mind first, having the Choice to be alone, or together, in public, or in private, can diffuse tensions and reduce conflict (fig. 72).

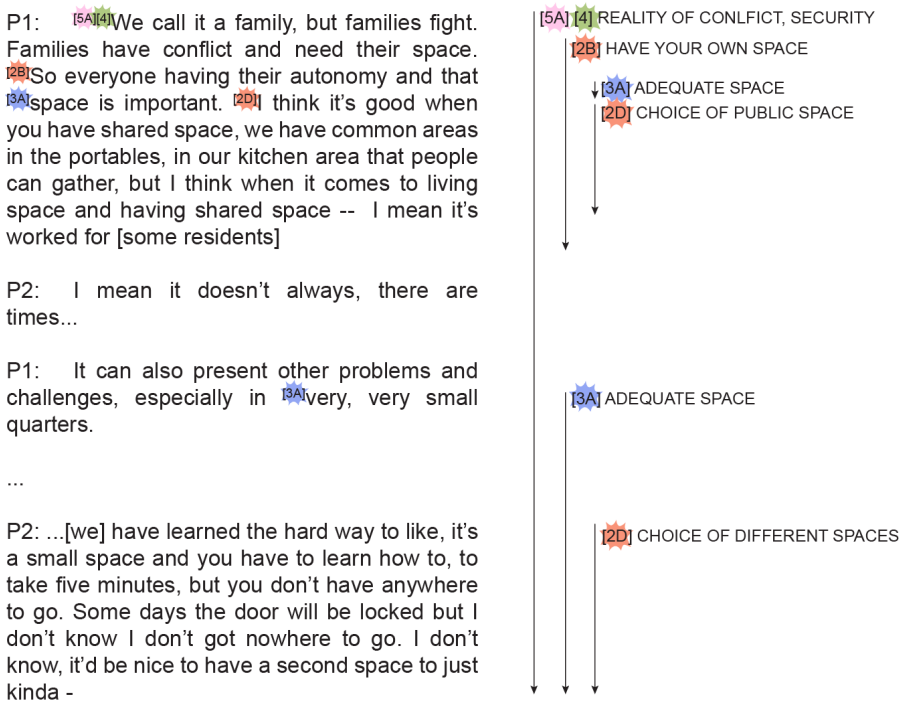


Fig. 72. Coded transcript: Four participants from ABTC introduce a connection between having one's own space and reducing community conflict.

The v1 design and sleeping unit homes feature little to no spatial division – divisions are introduced in the v2 design by splitting off the bathroom and bedroom areas with dividers. Exercise 3 explores a sliding partition design that could be used at both locations shown in Figure 73.

The polycarbonate panels of the v1 sunroom porch are reminiscent of the shoji screen doors in Japanese architecture (fig. 74) , which are built from wood frames with rice paper in between. These sliding doors run on wood rails above and below the door, without the use of proprietary products. Exercise 3 explores a sliding door that follows a similar system, but with the use of caster wheels at the base to eliminate the bottom track which would impede a mobility device unless set into the floor.

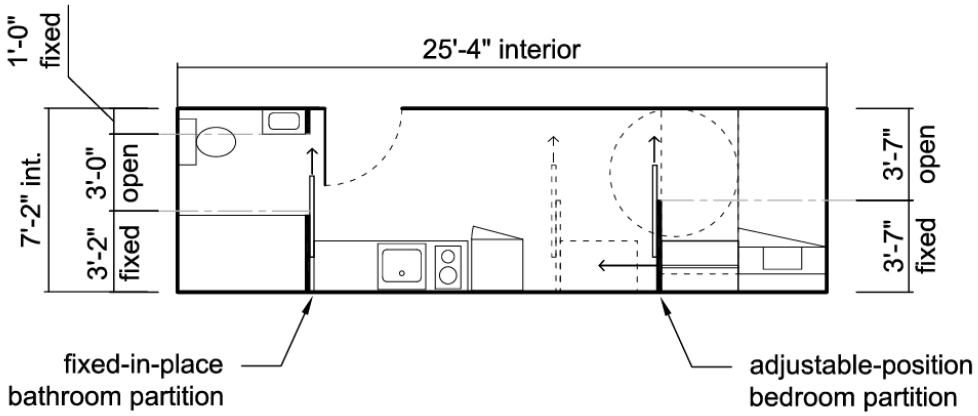
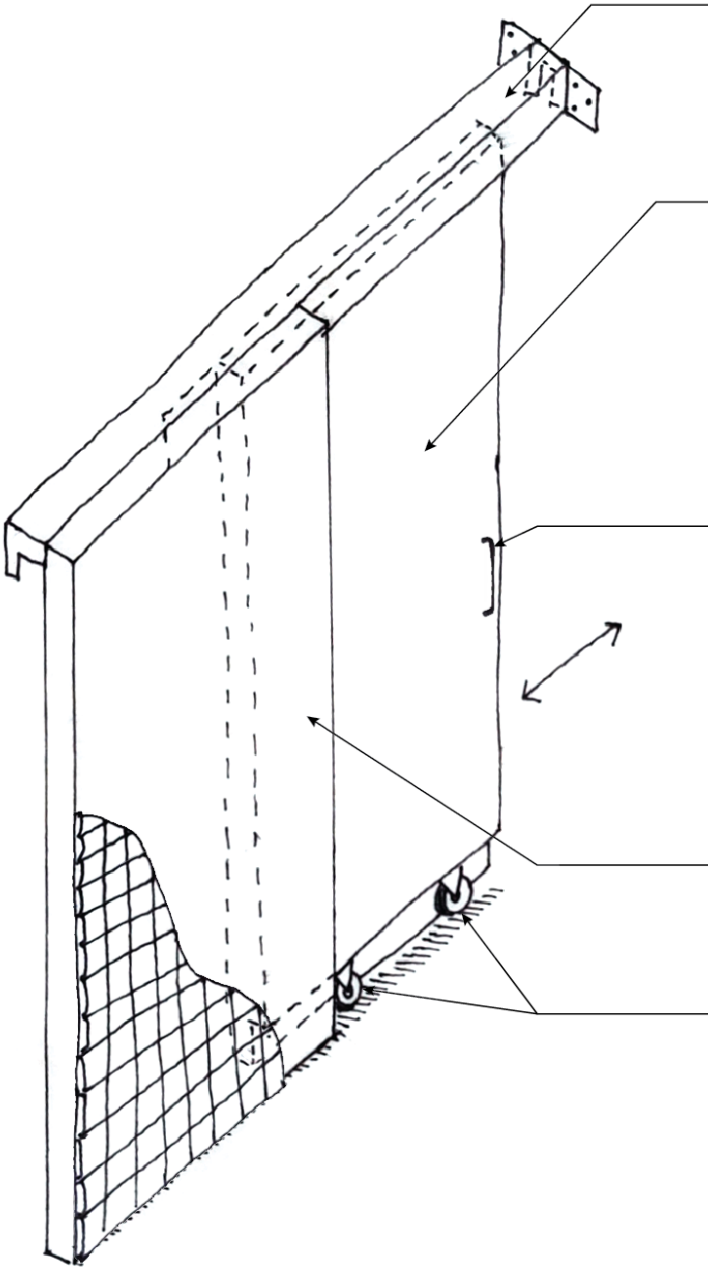


Fig. 73. Location of the two partitions in v2. (Image by author).

Fig. 74. The v1 polycarbonate panels are similar to the shoji screens used in Japanese architecture. (Photo on left by author, photo on right retrieved from: https://en.wikipedia.org/wiki/Shoji#/media/File:Yoshimatsu02.jpg).

EXERCISE 3: SLIDING PARTITION DESIGN

The partition design relies on simple mechanics and parts, does not rely on specific products, and saves space by eliminating door swings. The partition at the bathroom would be fixed in place, while the partition dividing the bed area would be adjustable along the length of the living space. The partition has three main elements: a top rail, a sliding door, and a fixed panel.



The top rail is formed by a wood valance. The valence can be attached to the v2 main walls with standard brackets.

The sliding door can either be a wood frame with polycarbonate glazing, as in the shoji screen example, or two layers of solid material (ex: plywood, particle board). One of the layers extends to the floor, the other ends at the top of the caster wheels below.

The door pull can be a recessed cut-out or a protruding handle. A handle is more accessible for residents with mobility restrictions. If a handle is selected, it must not be more than 2" from the end of the door to preserve the passage clearance when the door is open.

The fixed panel should have a waterproof finish on the bathroom-facing side.

Heavy-duty caster wheels are exposed on one face for easy repair and replacement. The wheels eliminate the need for a bottom track. Alternatively, a lower track could be set into the floor at the bathroom partition.

Fig. 75. Exercise 3. (Image by author).

[3][5C]Too much moving pieces! When I go inside, I have to play with my bed to get rest. I need to flip this sink up to do my wash. I have lots of moving pieces. Too much. Gonna be too heavy.

[3] UTILITY
[5B] REDUCE UNNECESSARY FEATURES

Fig. 76. Coded transcript: Moving parts are seen as counter to the principle of Utility, explored later.

The partition design proposes a sliding door, but "moving pieces" were a concern from the Group 1 participants; the Exercise 3 design may be too complex. The bathroom could have a standard swing door instead, and the bedroom could have an accordion door or curtain. Participants encouraged us to look at pre-existing solutions, as seen in RVs or on tiny home TV shows. RVs, for example, often use accordion doors made from a sturdy fabric (fig. 77).

I've watched that show Tiny Homes on TV and I think there's a lot of things you could take from that show. I don't know if you've seen it? Pull-ups, and simple efficiency overall and I think some of their ideas are incredible. [i]*And I think you can use a lot of those ideas in something such as this.*

[i] SPECIFIC IDEA *(organisational)*
take advantage of pre-existing solutions

Fig. 77. Coded transcript: A participant recommends using pre-existing design strategies.

Fig. 78. Existing solutions taken from product advertisements for an RV door, and a curtain-partition. (Images retrieved from: (left) https://www.amazon.ca/Trailer-Camper-Hardware-Fabric-Folding/dp/B00MJV0OMC, (right) https://www.amazon.ca/CHICOLOGY-Adjustable-Vertical-Dividers-Filtering/dp/B08H5XT8R6?th=1).

Is this still a tiny home?

The resultant v2 prototype plan, below, shows the divided spaces. With the exterior wall thickness accounted for, the overall footprint is larger than the minimum 188 ft^2 (17.5 m^2) required by the OBC, due to the large bathroom size. The goal of Exercise 4 is to make v2 as small as possible, disregarding the interior living space requirements, while preserving the qualities that make it A Regular Place to Live, and give it Choice.

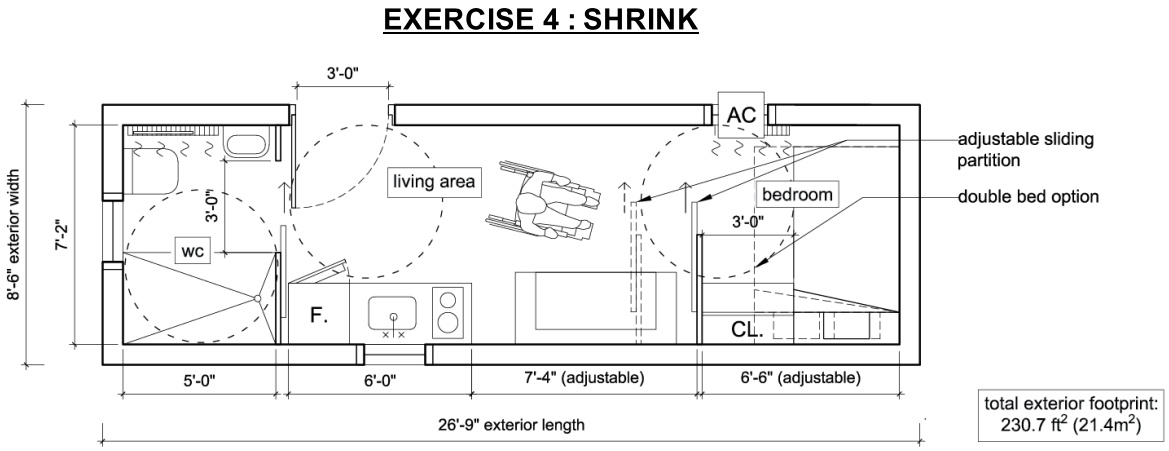


Fig. 79. The resultant v2 prototype plan. (Image by author).

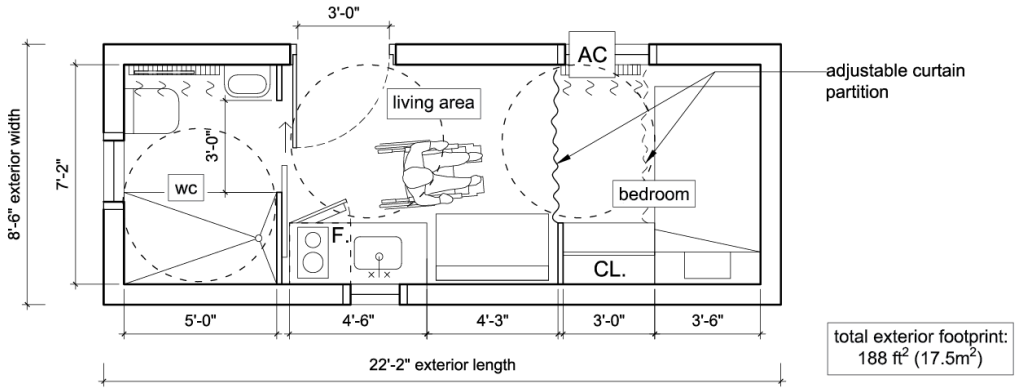


Fig. 80. The v2 prototype plan, shrunk as much as possible. (Image by author).

This plan is shrunk down to the minimum 188 ft^2 – it preserves the three turning radii, and leaves a bit of room for furniture. If accessible for the resident, they could elect to install a loft bed for more room. The sliding bedroom partition is swapped for a curtain to increase accessibility and a feeling of spaciousness in the main living area. Ths plan no longer achieves the 145 m^2 (13.5 m^2) living area requirement, which would have to be approved as an exception by the local building department.

Choice of Household Size and Type

Some participants felt that v1's small size would take away their ability to have guests or live with family or roommates. A catalogue of different home types was suggested so that residents could choose the amount of space appropriate for them.

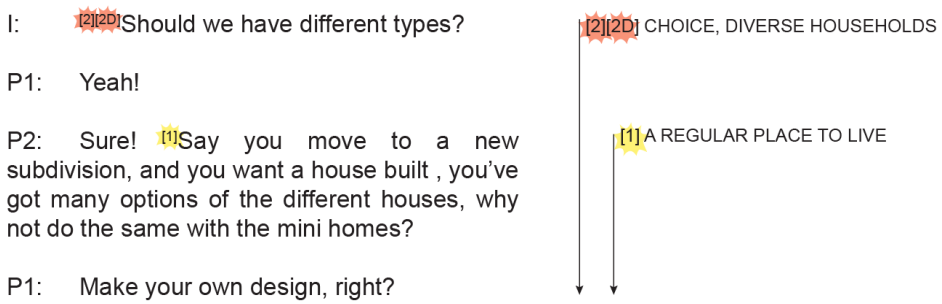


Fig. 81. Coded transcript: Participants felt that a catalogue of options would benefit potential residents

The goal of the Exercise 5 is to provide variations to enlarge the v2 prototype based on modular repetition of the base unit. To expand the design, the taller side can act as a spine along which the home can be multiplied and aligned. Considering the basic form of the v2 prototype, multiple units, or different additions might be aligned along that spine in some of the following ways:

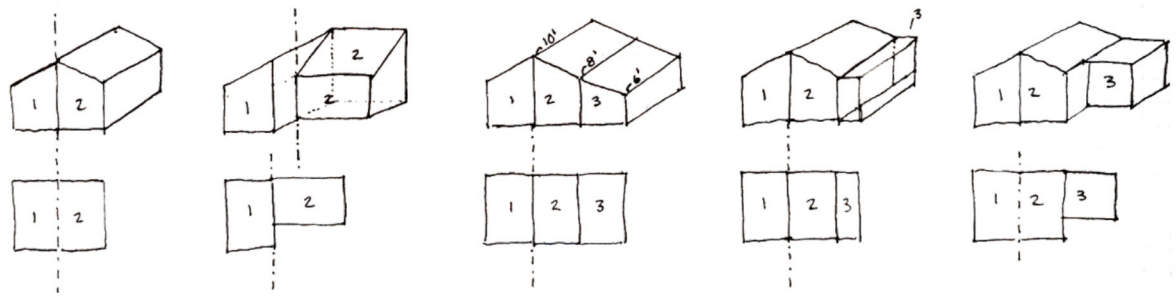
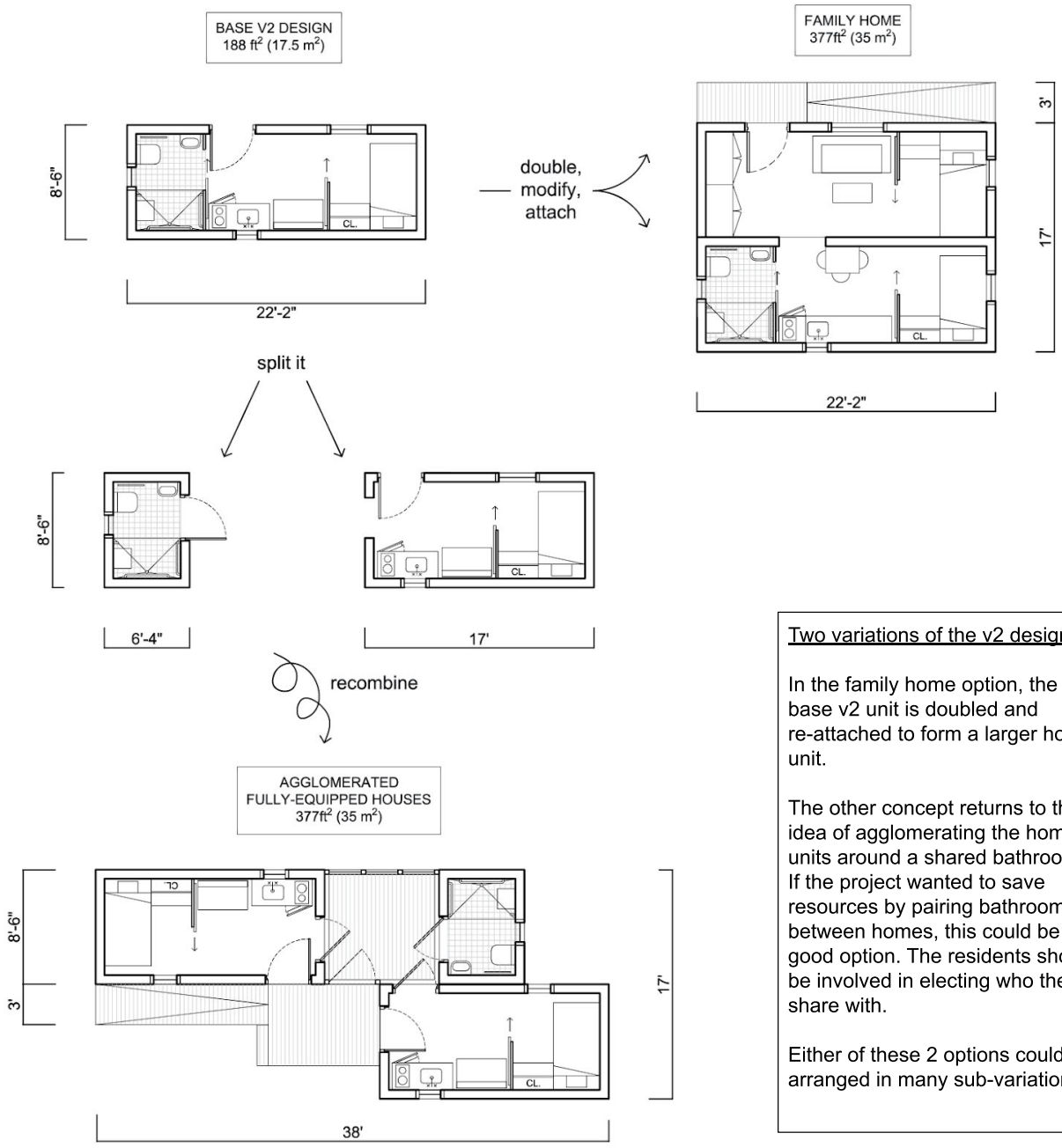


Fig. 82. Basic shape options for v2 expansions. (Image by author).

EXERCISE 5: EXPANSION OPTIONS



Two variations of the v2 design

In the family home option, the base v2 unit is doubled and re-attached to form a larger home unit.

The other concept returns to the idea of agglomerating the home units around a shared bathroom. If the project wanted to save resources by pairing bathrooms between homes, this could be a good option. The residents should be involved in electing who they share with.

Either of these 2 options could be arranged in many sub-variations.

Fig. 83. Exercise 5. (image by author).

3.3 Principle 3 – Utility

Definition:

The Utility of the home and its parts depends on whether the resident can not only access, but *function* in the spaces or rooms provided – *is there enough room to make a meal in the kitchen and wash the dishes after? Is there enough room to sleep in the bedroom, and also to store clothing and get dressed?* Additionally, to provide Utility, these spaces and fixtures must be durable, easily repaired, or easily replaced. If frequent relocation is a factor in the community, the home should be durable enough for transportation; features can be included to secure elements and facilitate lifting onto a truck.

Design Objectives (Spatial Practices):

Per the focus group discussion findings, a design that provides Utility enables residents to:

(a) perform daily activities (dress, sleep, dine, cook, shower) despite the small space
(b) use and repair spaces and fixtures with standard tools and skills
(c) store all their possessions in, or securely outside, the home
(d) relocate the home, if non-permanent construction
(e) use surfaces and fixtures roughly without damage

Fig. 84. Coded transcript: A note handed in after the Group 1 session.

Participants from Group 1 were concerned about the home's Utility in terms of its perceived "too small" size, lack of durability, and over-complexity that they foresaw leading to wasted resources and broken parts. A note left at the end of that session summarises that group's concerns (fig. 84). Group 2 also focused on the Utility of the home and community. Their concerns were based on their experience, for example the ways a house might be designed to make it easier to relocate (fig. 85).

P1: [3D]One of the things around portability - I was just speaking to our landscaper who moves all these units and puts them in place. And some of the challenges with the new home construction are there - [#]we need a forklift to pick it up and move it. [i]*So if they're built on a sort of pallet type base to begin with that would be so helpful and then we wouldn't necessarily need a base to put it on.*

P2: But their homes are big, so they won't be able to move it.

P1: Sure, but for the 8'x10's

P2: The 8x10s are fine but the way they wanna build 'em

P1: Having a base built into the home so theres a bit of a box with a space for the forklift that would be so ideal, right, for movability.

I: And then they just lift and put it onto the truck from the side.

P1: That's right and then on to wherever it goes.

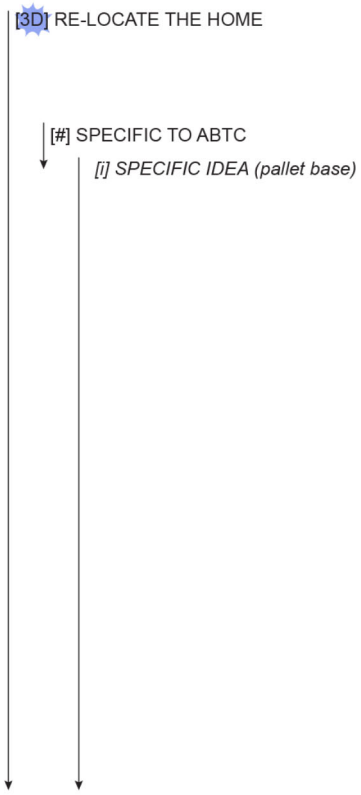


Fig. 85. Coded transcript: An ABTC staff member weighs in on transporting the homes more easily

Group 2 participants knew which members of their community were handy and could repair the homes that did break. We discussed the importance of land tenure stability to avoid moving the homes too often – regarding the moves, one participant noted "it'll be broke after the first one".

Illustrating the Lived-In Space

So far, we have used simple floor plans to work out the overall geometries for the v2 design, ensuring it meets the minimum area and passageway requirements, and to place the bathroom, living area, and bedroom. The following exercises work out the Utility of the home by imagining how an occupant would live in, move around, and use v2, and where they might encounter crowding or difficulties not indicated by the basic plan drawings.

EXERCISE 6-A (EXAMPLE): v1 LIVED-IN SPACE

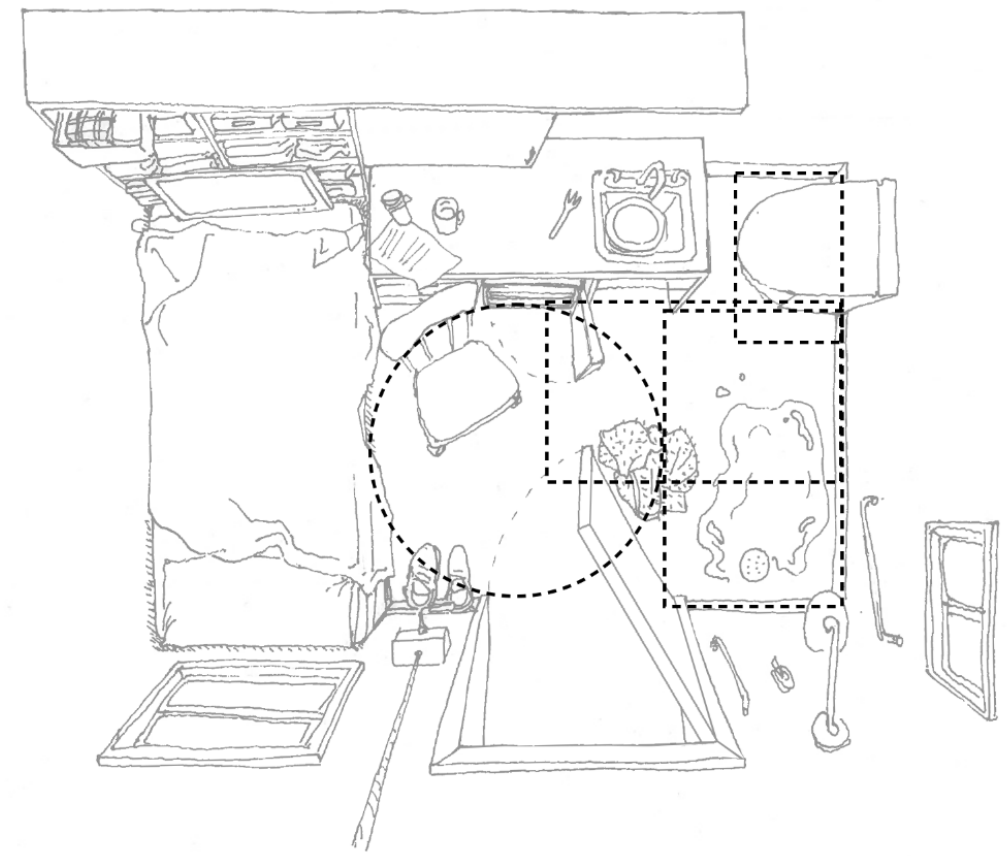


Fig. 86. The v1 prototype as it might be occupied, contrasted with the clearances laid out in the design, annotated with participant comments on its Utility. (Image by author).

The example above illustrates how the v1 prototype might be occupied and filled with possessions, and inserts a degree of natural human messiness into the design. The dashed lines represent the mobility device clearances set out in the v1 design process. The drawing contrasts the potential lived experience with the design intention; there is no spatial tolerance in a tiny home and as a result, designated clearances may not be clear when lived in. Additional challenges to the Utility of the space emerge: *Do items in the home get wet when the shower is on? If the resident owns more than one pair of shoes, where do those go?*

Due to the small space the v1 designers were working with, and that we are faced with again in the v2 design, it will not always be possible to protect all the optimal dimensions. The challenge is to still provide a functional space when the geometric constraints are impeded.

EXERCISE 6-B: v2 BATHROOM

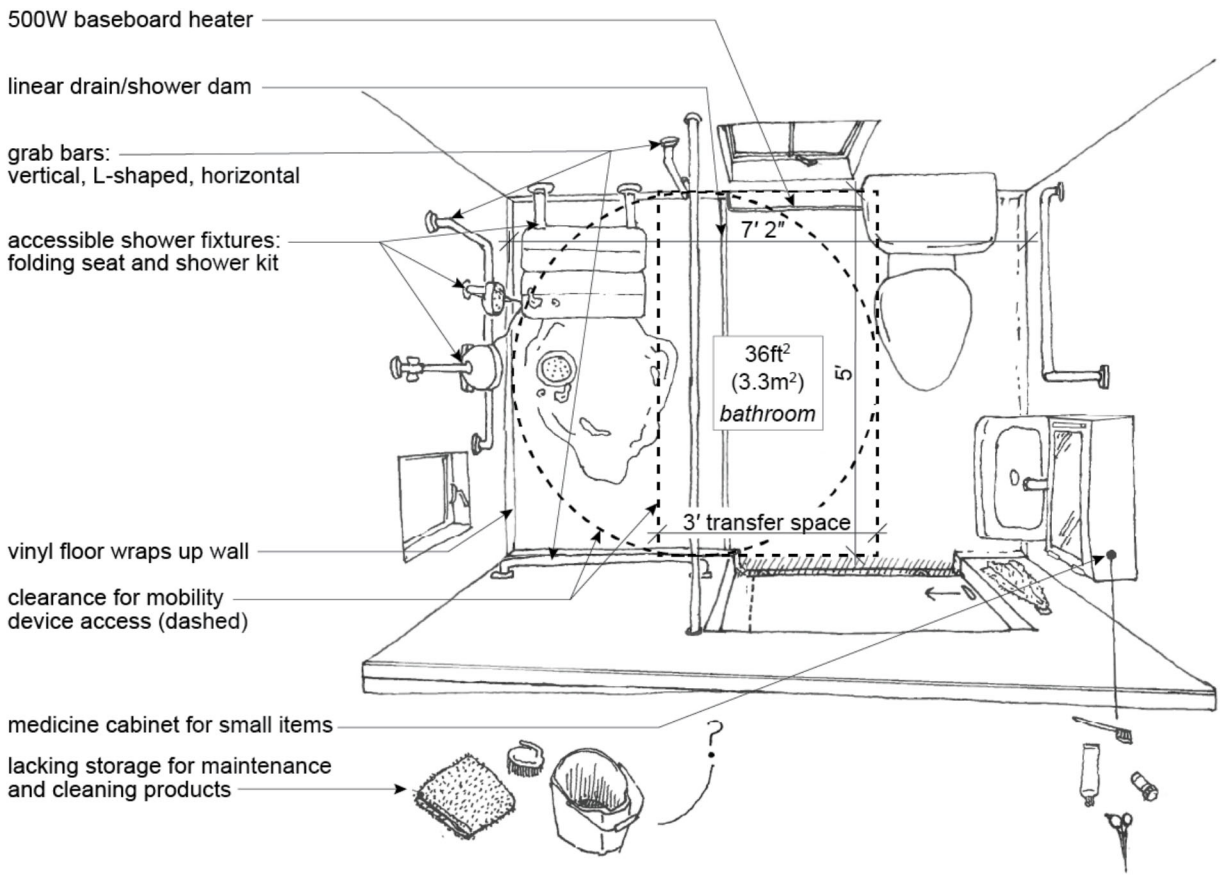


Fig. 87. Exercise 6-B. (Image by author).

Clearances for mobility device access are the foundation for this bathroom design. As such, the v2 bathroom is not tiny. Bathrooms might be shared between residents who agree, to save resources, as in exercise 5.

A 500 W baseboard heater is installed under the window.

Grab bars are recommended, per accessibility guidelines: one next to the toilet, and three in accessible showers, as shown in Figure 88.

A linear drain or flexible shower dam can be installed at the shower perimeter as a barrier-free solution to keep water contained.

Accessible shower fixtures include a folding seat and removable shower head mounted at a low height. We heard that the v1 shower fixtures were "too fancy" – decisions may need to be made with an accessibility consultant to balance access and durability. FIgure 88 shows the standards of the City of Toronto Accessibility Design Guidelines.

Storage is limited in order to keep the bathroom barrier-free. The mirror can be a cabinet for personal items. Barrier-free cabinets can be set into the wall.

Vinyl floor products are available that wrap up the wall as a floor-wall seal, and can even act as the wall finish.

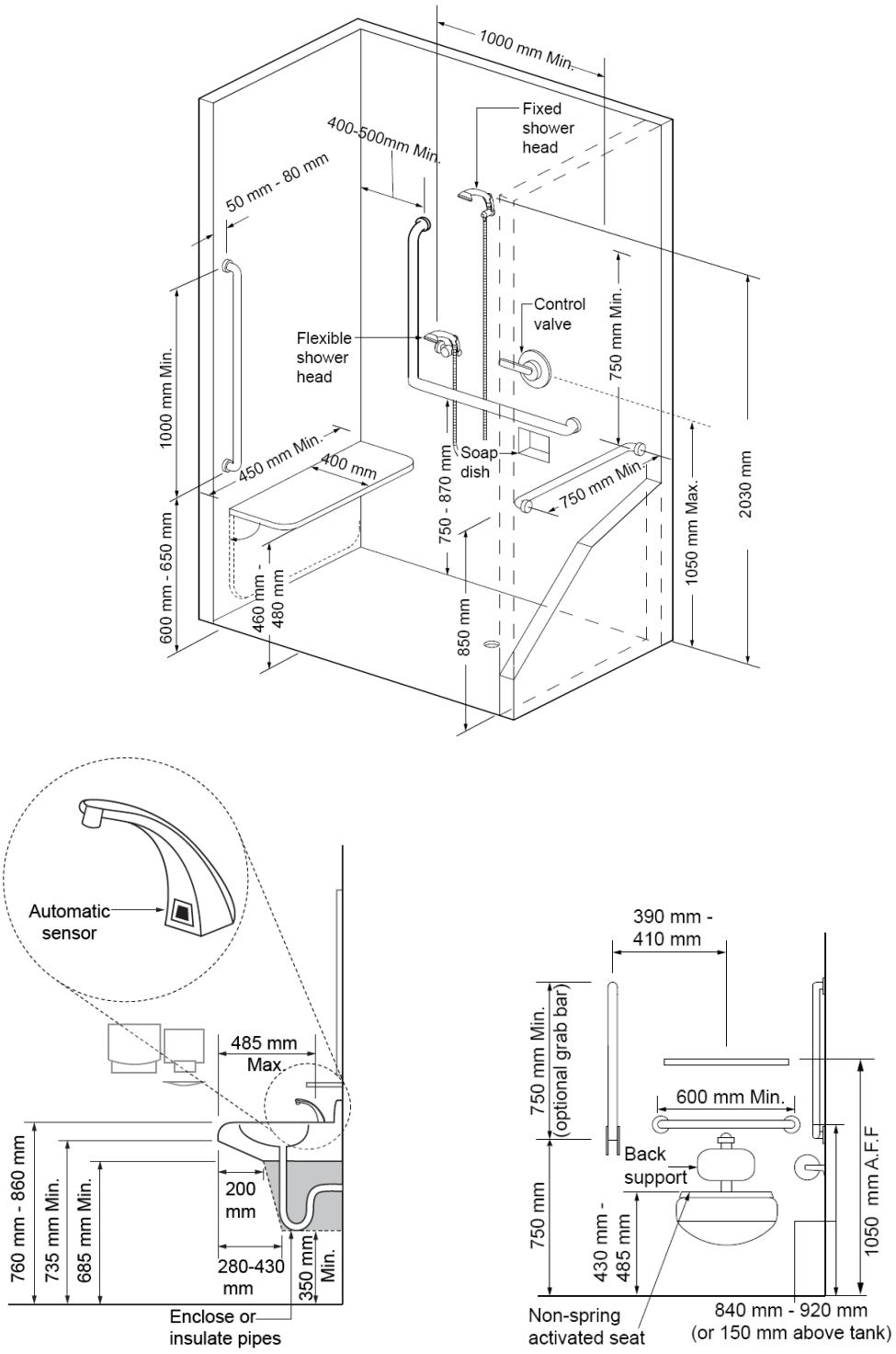
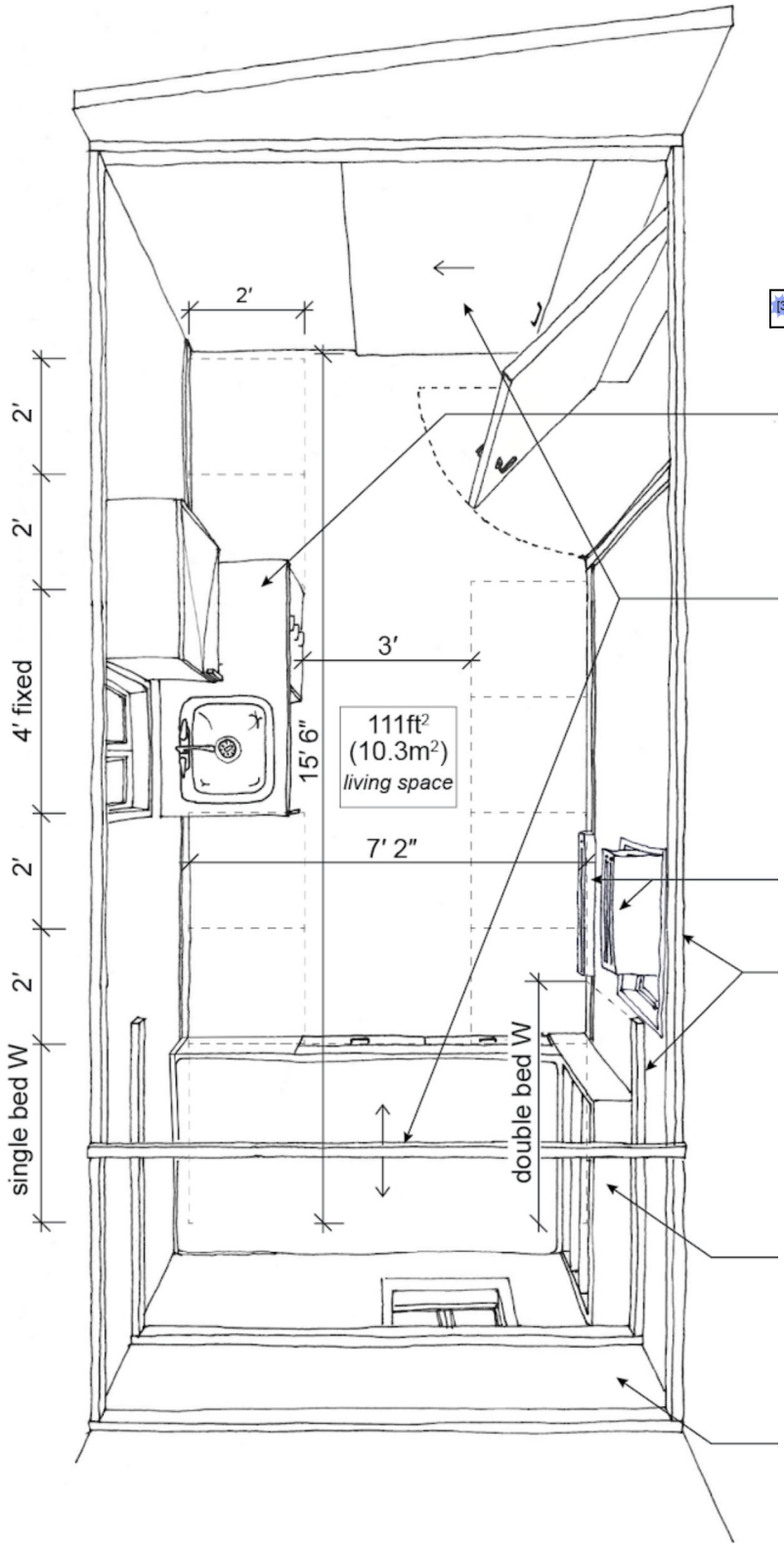


Fig 88. Locations and clearances for accessible showers (top), lavatories (bottom left), and toilets (bottom right). (Anonymous2021) Toronto Accessibility Design Guidelines 2021)

EXERCISE 6-C: v2 BASE LIVING SPACE

This base living space would be constructed for every v2 unit, with options for expansion and customization using units that can be installed, repaired, or replaced with basic tools.

[3][5C] You don't need a transformer house. [3] [5C] UTILITY, SIMPLIFY



The base kitchenette is 4'L by 2'D. It can expand to either side with 2'L x 2'D items: cabinets, countertops, appliances, or units like closets.

Two partitions operate using standard materials and simple mechanics: The sliding bathroom partition (exercise 3), and a sliding rod partition that can be draped with a textile and adjusted by sliding along the utility blocking.

AC unit and 1000W baseboard heater

Utility blocking is provided as a continuous strip of 2x4 lumber at 7'H around the living space to support partitions, loft shelving, and high cabinets. The bed area features 5'H utility blocking at the width of a double bed for optional loft installation.

A bed and shelf are provided, as in the v1 design. The bed has drawers below. The top of the shelf meets the u/s of the 5'H utility blocking.

The wall finish might be plywood, painted or natural, as in the v1 design. Residents might be able to choose a gypsum finish if they prefer.

Fig. 89. Exercise 6-C. (Image by author).

EXERCISE 6-D: v2 OCCUPIED LIVING SPACE

The star annotations on this drawing correspond to participant quotes on the following page.

The v2 home that residents move into can be more equipped than the base construction; this illustration shows a closet and extra cabinet installed to expand the base kitchenette, which would be provided by the community or the manufacturer. Additional, resident-chosen or -modified features might include:

Loft shelving is supported by the utility blocking, similar to a participant's description of suspended shelving in their home at ABTC (fig. 91).

Freestanding furnishings (tables, chairs) and decorations could be provided and/or brought in by the resident.

The mini fridge can be located on top of, or below the counter per the resident's preference – in response to feedback we heard about mobility limitations. An apartment-size fridge could be installed to either side of the kitchenette.

A sofa (dashed) could be added on the wall opposite the kitchenette by residents who do not need barrier-free access or can find a 2' deep sofa to maintain the 3' passage.

Any textile can be added to the partition rod, a quilt is illustrated. The rod can also be used for hanging or drying clothes.

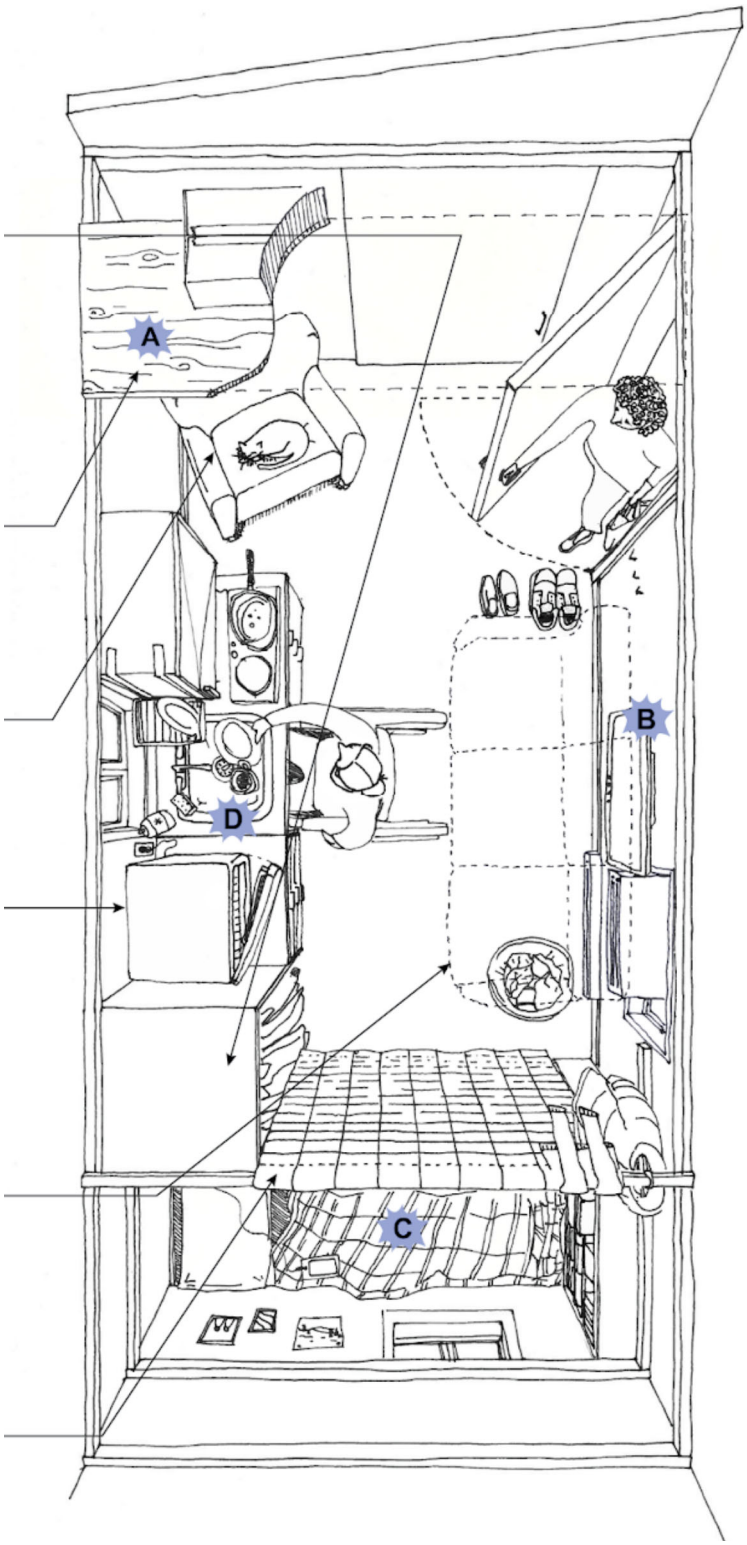


Fig. 90. Exercise 6-D. (Image by author).

Shown below are the participant insights referenced by star annotations on the Occupied Living Space plan:

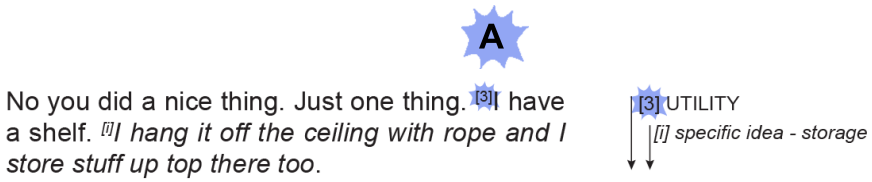


Fig. 91. Coded transcript: A participant from ABTC describes an elevated shelf in their home.

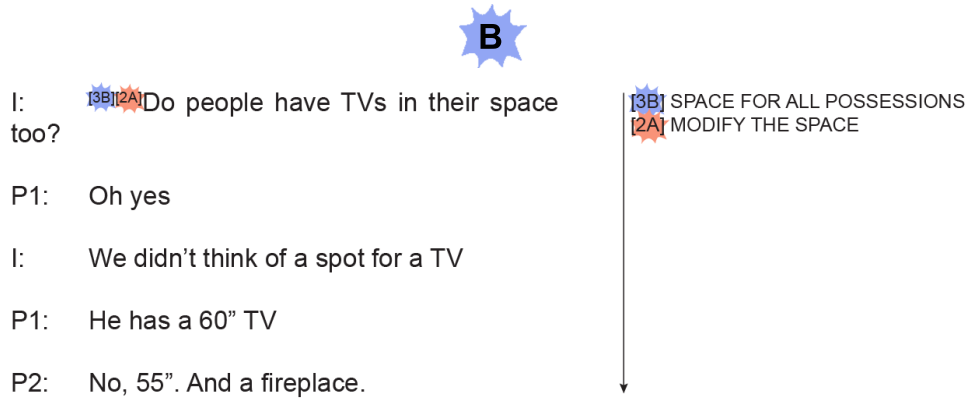


Fig. 92. Coded transcript: Participants from ABTC jokingly discuss whether TVs fit in the homes.

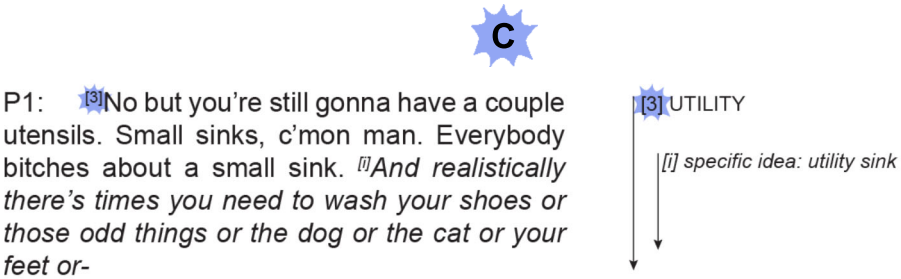


Fig. 93. Coded transcript: A participant from The Bridges expresses the importance of a utility sink.

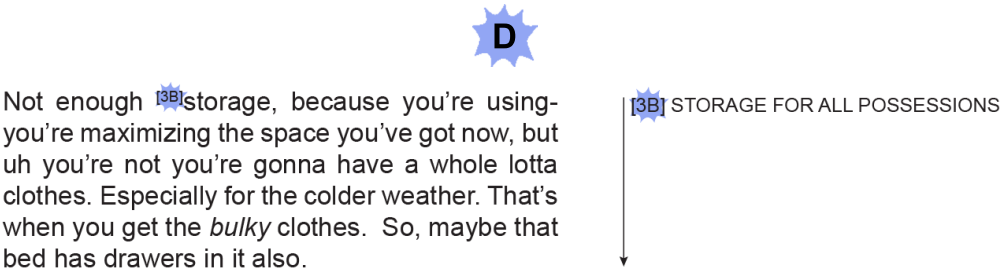


Fig. 94. Coded transcript: A participant from The Bridges highlights the lack of storage in v1.

Including Expansion Items

In Figure 94 on the previous page, a participant from Group 1 highlights the lack of storage in v1: v2 features under-bed storage, a closet, coat hooks by the door, and loft shelving for out-of-season "bulky clothes".

While v1 was on public display at City Hall, the Cambridge Seniors Woodworking Club came by to talk about the project. They expressed enthusiasm in helping build furniture items. While the homes themselves may be built by a manufacturer, participation from groups like the CSWC are an opportunity for building the expansion items: loft beds (fig. 96), tables (fig. 97), closets (fig. 98), kitchen cabinets, and storage units.

Fig. 95. Inside the Cambridge Seniors Woodworking Club. (Photo by author).

I: [3][2A]Do most people like to elevate their bed or do some people keep it low?

P1: Most people like the bed high. [3B]So cause with the is bed high so I have storage underneath, but I have so much stuff.

P2: [5E]Your house is an abomination.

[3] UTILITY
[2A] MODIFY THE SPACE
[3B] STORAGE
[5E] REALITITES - MESS

Fig. 96. Coded transcript: Participants from ABTC say loft beds are preferred.

P1: [i][2A]*Yeah I think that the chairs and table should be optional.* [2C]I rarely sit and eat in the same place. I need to walk around with my food and eat.

P2: I do the same thing I stand and eat. I'll be standing at my counter.

P1: Maybe that's something because I don't have a table and chair to sit at.

[i] SPECIFIC IDEA *(organisational)*
[2A] CHOOSING FURNITURE
[2C] DIFFERENT LIFESTYLES

Fig. 97. Coded transcript: Participants from ABTC speculate as to whether a dining area would be useful.

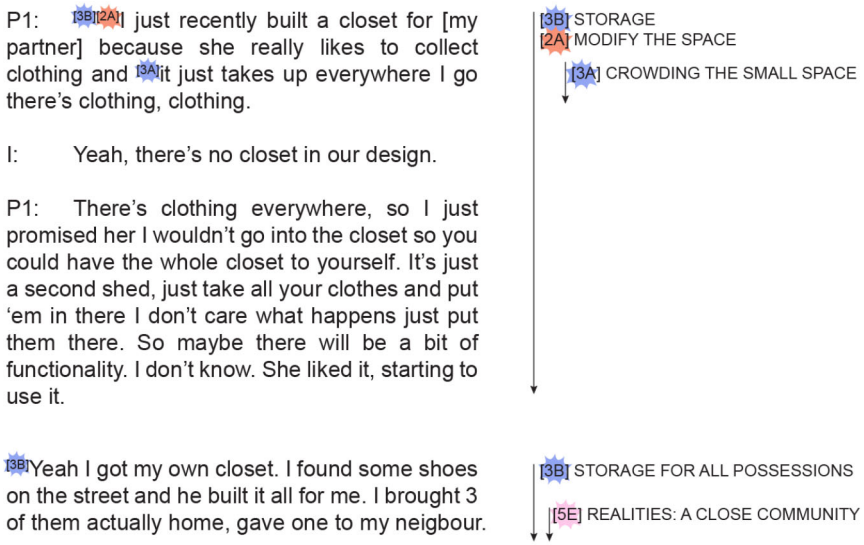


Fig. 98. Coded transcript: A participant living at ABTC built a closet for his partner.

Storage, Stability, and Community Interconnection

Storage and the ability to collect items can provide stability and community interconnection in THCs where residents were previously homeless. Before joining the community, residents may not have had secure storage for their possessions, or may not have had the capacity to collect their own items at all.

The ability to collect and store items can lead to community connections through sharing with your neighbours: either through gift-giving, as occurred in the transcript snippet in Figure 98, or through borrowing tools and items. Most residents won't have enough space for everything they need in their home, but the community's combined resources may be able to fill in the gaps.

In her 2014 reflection on the rhetoric of the tiny home movement, versus the reality of tiny home living, April Anson felt that, in her experience: "...instead of allowing the dweller autonomy, tiny house living cultivates a greater degree of reliance on neighbors, community resources" (Anson 2014). Anson was not living in a THC and had no shared facilities to make up for some of the missing individual storage space.

The lack of space in her tiny home meant she had to rely on others for storage, and could not store and prepare sufficient food, and so could not save money with bulk purchases, and relied more frequently on restaurants. For residents who like to cook, or in a community without a communal kitchen, this may present an issue if only a mini-fridge is provided. While building storage is an added expense, it may help residents avoid renting or purchasing items and food.

Balancing Utility: Fanciness vs Functionality

Participants from both groups expressed concern over the home's "fancy" elements: they feared that these would break and be difficult to repair or replace, or would be stolen. The dominant feeling in the Group 1 conversation was that v1 was "over designed" and would break, while Group 2 participants were excited about the "beautiful" home, but also stressed that there is "a balance between pretty and functionality that's really really important" (fig. 99). One aim of this document is for designers to balance the five presented principles; prioritising utility over the others may result in a tiny home that is overly-utilitarian and may even feel institutional or clinical to the resident.

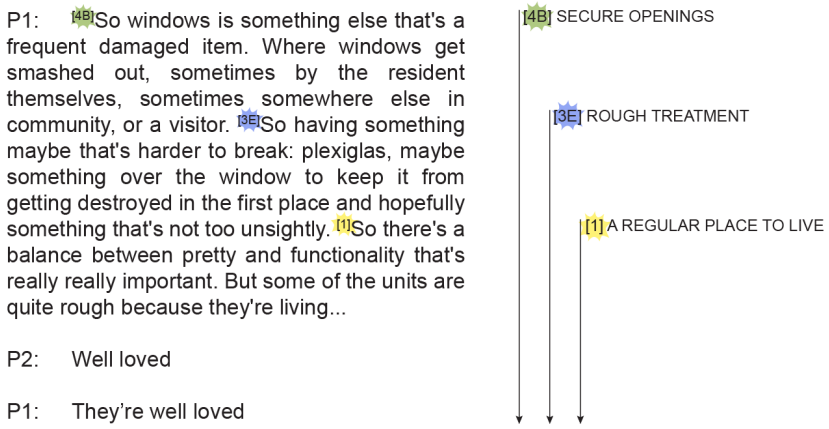


Fig. 99. Coded transcript: ABTC residents discuss balancing "pretty and functionality" in window design.

Governments that choose to develop THCs may have the resources for mass prefabrication of homes, but should try to mitigate the industrial-looking result of overly-efficient dwellings. The company *Pallet* makes prefabricated tiny homes for a variety of uses, their website lists "disaster", "workforces", as well as "homelessness", and has equipped multiple THCs with their homes. Their homes come in prefabricated panels made of durable, damage-resistant material, that can be assembled very quickly; the company states that "No one should go unsheltered when a shelter village can be built in a day". Analysed through the TIny Home Community Design Guidelines, the Pallet homes, especially their most minimal *Pallet 64*, prioritise Utility, and the need to Just Build It. This strategy for high-Utility and rapid-assembly homes results in an interior environment dominated by glossy white and metallic finishes, which could potentially be seen to be un-homelike. Some communities featuring Pallet homes paint the home exteriors; in photos, these look more cheerful and potentially more like A Regular Place to Live.

Fig. 100. The Pallet 64 home provides Utility with its durable materials and easy-to-assemble parts. (Photo retrieved from https://palletshelter.com/products/shelter-64/).

Fig. 101. The Pallet 64 home also enables communities to, quickly, Just Build It. (Photo retrieved from: https://palletshelter.com/blog/building-personal-shelter-for-the-homeless/).

Fig. 102. This THC in Los Angeles uses brightly painted Pallet shelters. (Photo retrieved from: https://palletshelter.com/case-studies/los-angeles-california/).

3.4 Principle 4 – Security

Definition:

The guiding principle of Security promotes strategies that reduce theft from, and damage to, the homes and residents by securing fixtures, possessions, openings, and entrances. While architectural strategies cannot dictate the relationships between community members, clear spatial distinctions and additional features like cameras and lighting can deter conflict. The degree of these considerations in a community design will depend on the concerns of the specific resident group, and may vary between communities. The following discussion is based on what we heard from our participants from The Bridges and A Better Tent City.

Design Objectives (Spatial Practices):

Per the focus group discussion findings, a design that provides Security enables residents to:

(a) have privacy from neighbours who live in and outside of the community
(b) secure doors, windows, vents, and other openings
(c) have fixtures, appliances and possessions secured from theft
(d) have additional security features installed where there is a risk of conflict

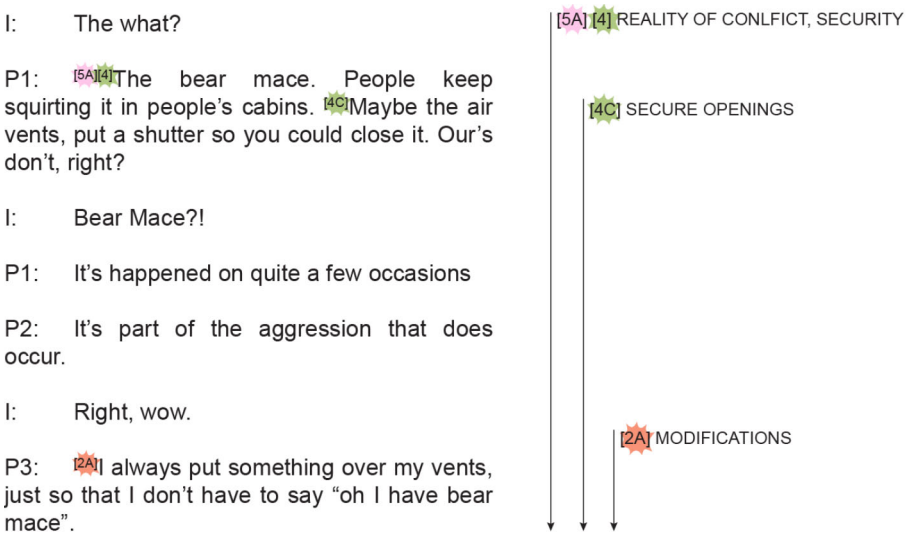


Fig. 103. Coded transcript: The interviewers are surprised by the occurrence of bear mace sprayed in the vents at ABTC.

Our research team was expecting to hear concerns about conflict, but were surprised by the degree of participants' concerns, as in Figure 103, which describes bear mace being sprayed into the homes. Designers who do not have experiences living rough or staying in shelters will likely be naive to the realities facing potential THC residents; conversations between both sides should be continued for future projects.

Windows and Doors

Participants from ABTC felt that the windows in v2 would be too easy to break into. The windows were too large (fig. 104), though, importantly, the participants added "in our setting" – the window size may not necessarily be an issue in v2's eventual community. The v1 windows open via a sliding mechanism,which we heard was easier to open from the outside than a crank mechanism (fig. 105) – which we now recommend for the v2 design. Group 1 participants did not express specific security concerns about the windows.

We also heard from the ABTC group that they had rsecently replaced all their original wood doors with steel doors for added security, and that a door that swings outward is preferable, not only because it saves space on the inside floor plan, but because it is harder to kick in (fig. 106). The v2 door design was modified accordingly, but importantly, this door should be covered by an awning or roof that can sufficiently keep snow from obstructing the swing in the winter.

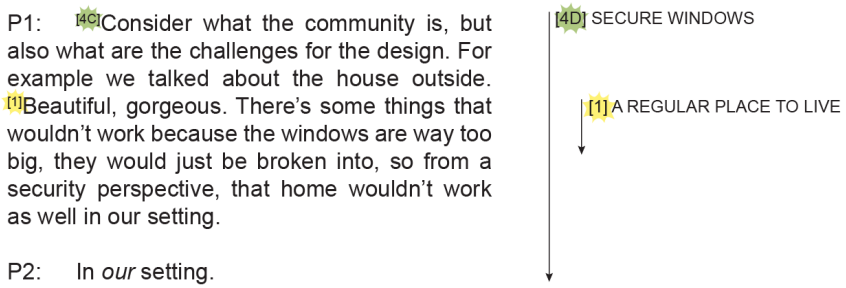


Fig. 104. Coded transcript: Participants from ABTC flag the v1 windows as too large.

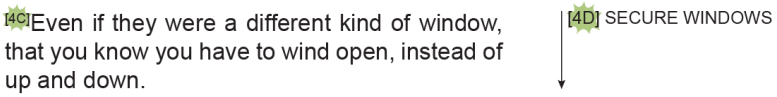


Fig. 105. Coded transcript: A participant recommends crank -operated rather than sliding windows.

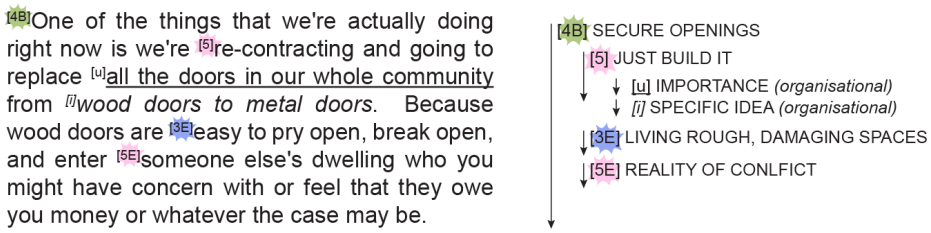


Fig. 106. Coded transcript: ABTC replaced all their wood doors to steel doors.

Fig. 107. A comparison between the windows in a non THC tiny home, and the v1 prototype. (Photo on left retrieved from https://www.ourcommonknowledge.org/tiny-homes, photo on left by author).

Fig. 108. The v1 window schedule, image from the Microhousing Design Studio Drawing Set (Chen and others 2021).

Tiny homes outside of THCs, and where Security (and costs) are less of an issue, often feature large picture windows to open up cramped interiors, as in the home shown in Figure 107, which has a similar width to v1 and v2 (Starick, Gardner, and Corcoran 2022). In comparison, v1's three windows are already quite small, illustrated in the v1 window schedule in Figure 108, and the photo in Figure 107.

Per the principle of Security, a home that feels safe is a good place to live. The following design exercises will investigate whether there is a possible window design that allows for a good quality of interior light and spaciousness while also, and foremost, upholding resident security.

The following v2 window plan (Exercise 7-A) and elevations (Exercise 7-B) illustrate a smaller set of windows than were used in v1, and a steel door with no glazing. The placements are based on the configurations illustrated in Exercise 6, which helped clarify the available locations. In line with the guiding principle of Utility, the windows and doors follow standard sizing in case they need to be replaced

EXERCISE 7-A: v2 WINDOW AND DOOR PLAN

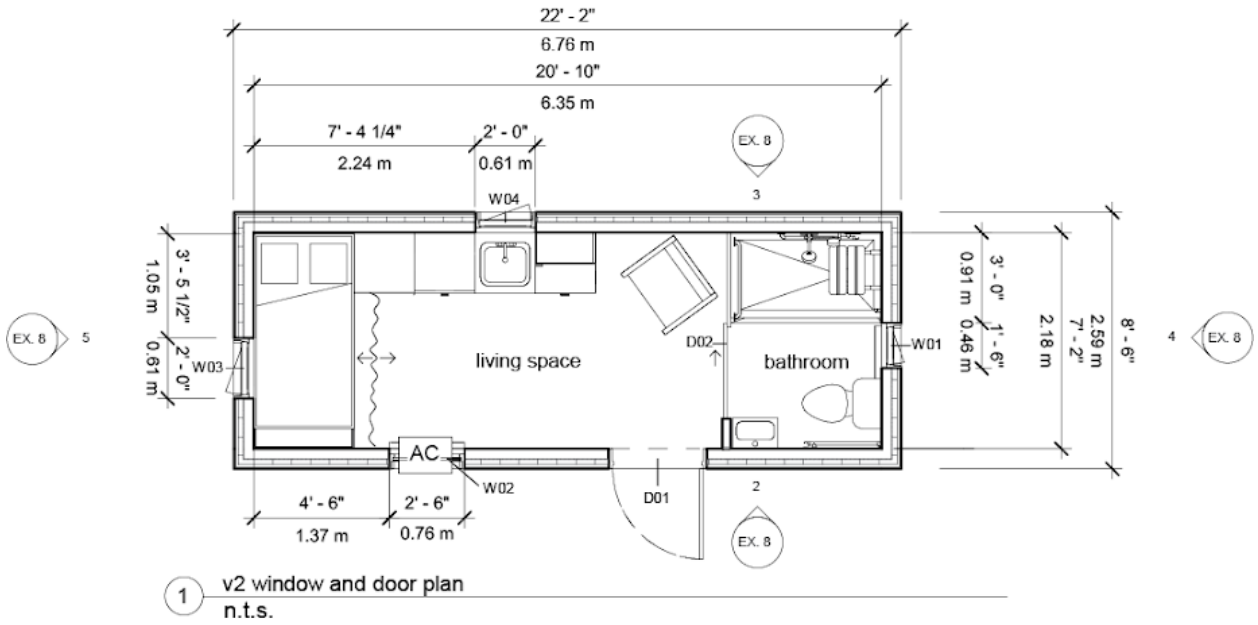


Fig. 109. v2 window and door plan. (Image by author).

EXERCISE 7-B: v2 WINDOW AND DOOR ELEVATIONS

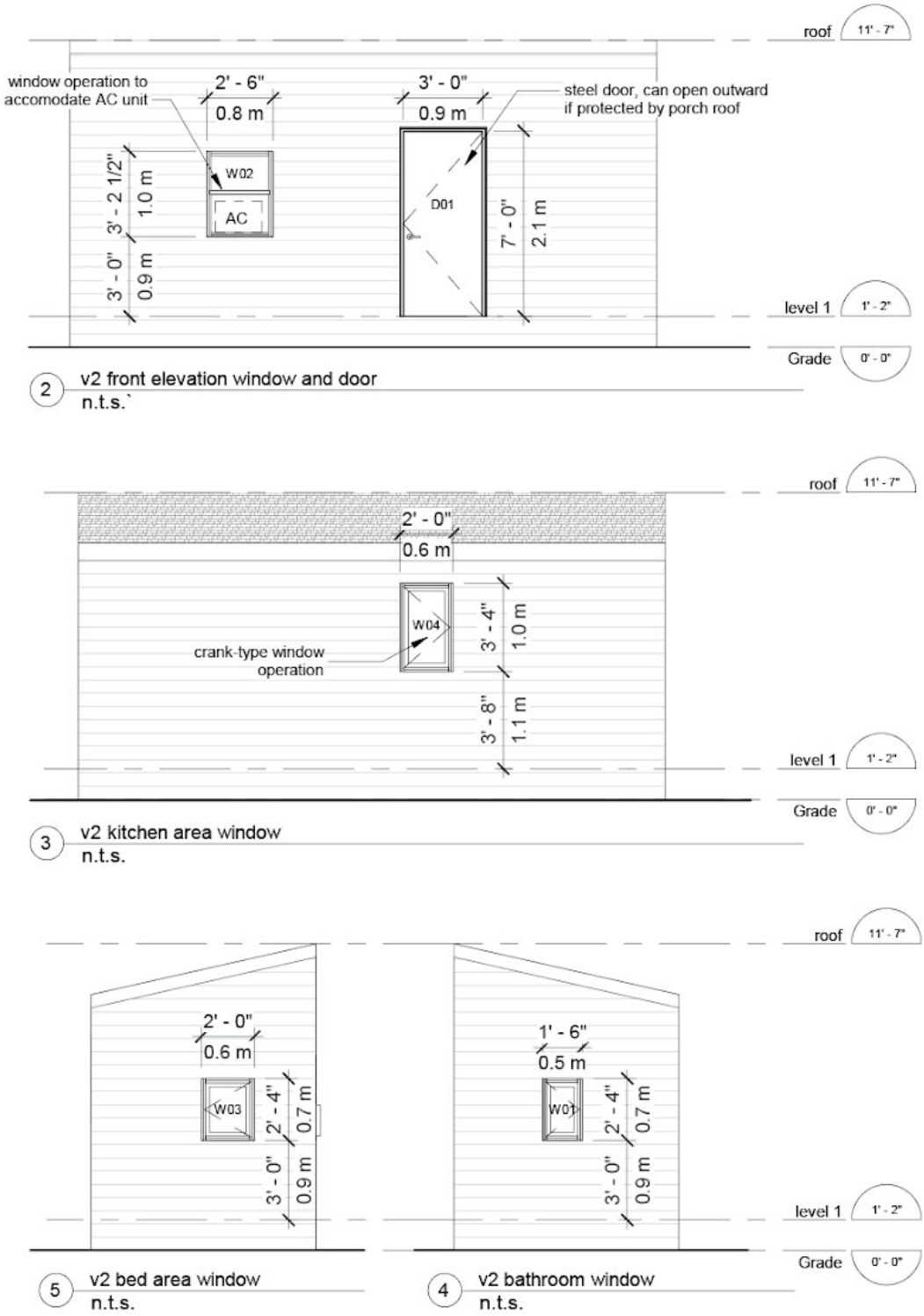


Fig. 110. v2 window and door elevations. (Image by author).

In a coded transcript included at the end of the section on Utility (fig. 99) , a participant suggests installing plexiglass over windows, in a way that is not “too unsightly”, to make them harder to break. These guidelines do not propose sealing windows, in order to maintain egress and ventilation, but plastic materials could be used to create an alternate secure window design. The polycarbonate panel design (fig. 111) of the v1 sunroom-porch could be adapted to a clerestory window design that is private, hard to break, and that could be easy to replace.

The photo in Figure 112 shows a clerestory window that, while the example is from a large home in a warm climate rather than a Canadian tiny home, illustrates the effect of this window type and possibilities for wood detailing (Murray Legge Architecture and Avery 2015).

Fig. 111. The v1 polycarbonate panels could be adapted to a smash-resistant clerestory window. (Photo by author).

Fig. 112. A clerestory window in a home in Austin, TX. (Photo by Whit Preston, Design by Murray Legge Architecture, 2015, https://www.murraylegge.com/skyview)

EXERCISE 7-C: v2 CLERESTORY WINDOW

A polycarbonate clerestory window can be installed above the utility blocking on the tallest wall. The top of the utility blocking is at 7' 3-½", and the ceiling height is 9' 5" (see Exercise 0), leaving over 2' for window installation. The window strip can continue the length of the house, into the bathroom, or end within the main living space.

Fixed or operable panels are possible. The design should consider the thermal and air resistance of the window. It is also possible to purchase polycarbonate window products.

The air conditioning unit might be moved up to this window, leaving more clearance space at ground level.

Proposed lower windows could be removed with the addition of the clerestory strip, for example if residents felt unsafe having a window right by the bed area.

Wrapping the window around the two short sides of the home is possible. This more complex option would require corner detailing and angled frames.

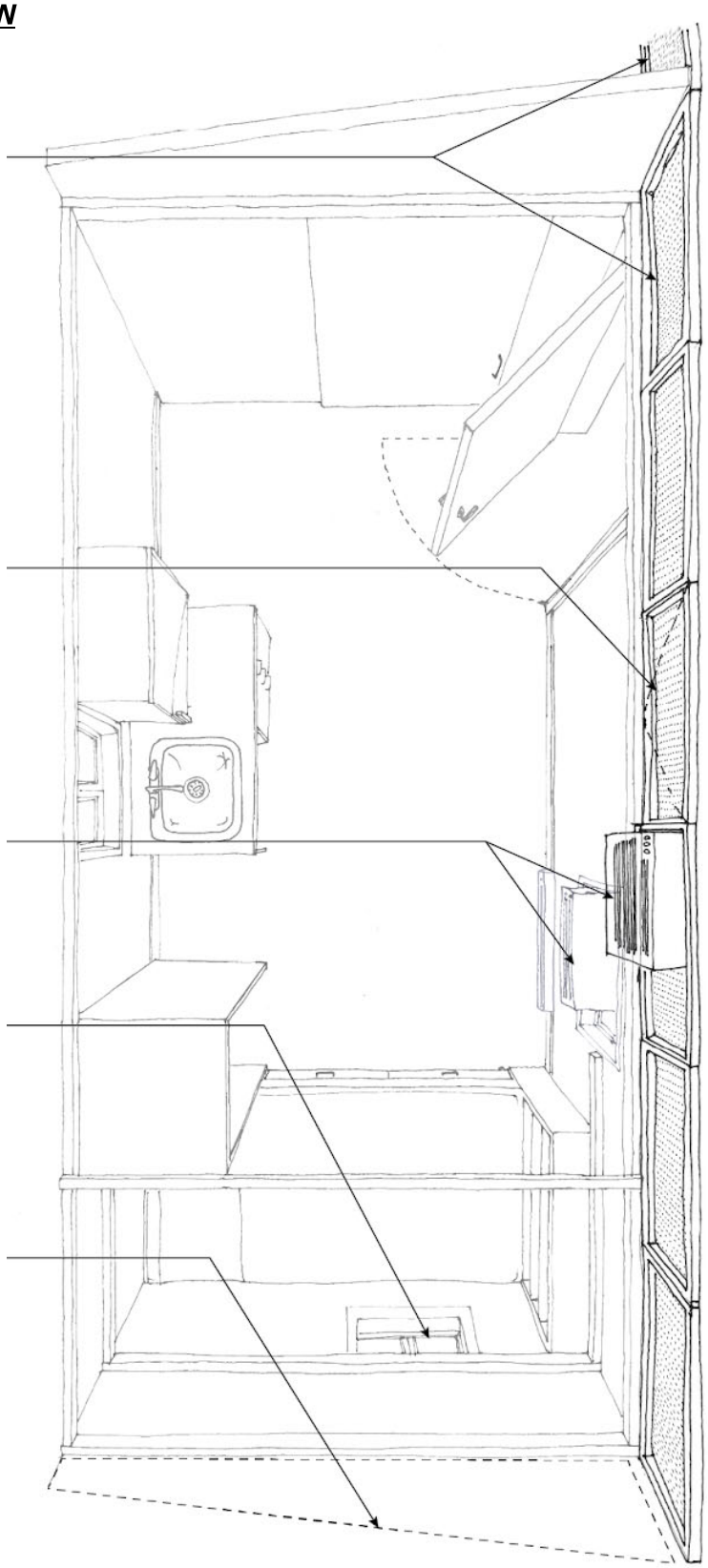


Fig. 113. Exercise 7-C. (Image by author).

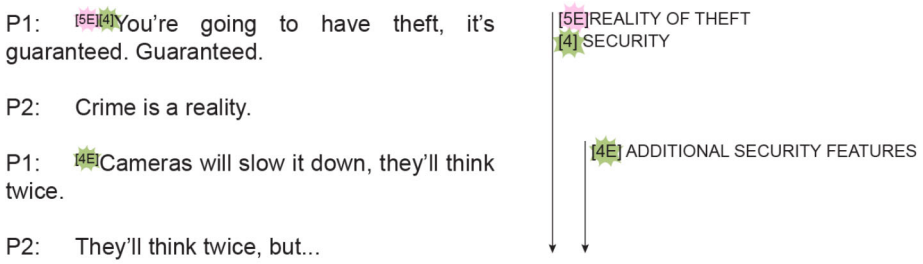


Fig. 114. Coded transcript: Participants from ABTC say that crime and theft are realities in the community.

Crime and theft were cited as "realities" for the hypothetical THC (fig. 114). Theft and break-and-enters were a concern for the main v1 home unit, but especially within the sunroom area when we suggested it might be a storage space, especially for bikes (fig. 115) – the translucent panels were not seen as private enough to obscure possessions. Both groups recommended installing cameras in the community's public areas, though, in the discussion in Figure 116 about the use of cameras at ABTC, the participating staff member introduced a link between surveillance and concerns for the privacy of residents.

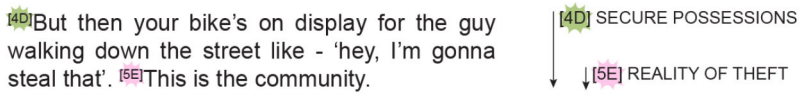


Fig. 115. Coded transcript: A Group 1 participant felt that the translucent sunroom-porch invites theft.

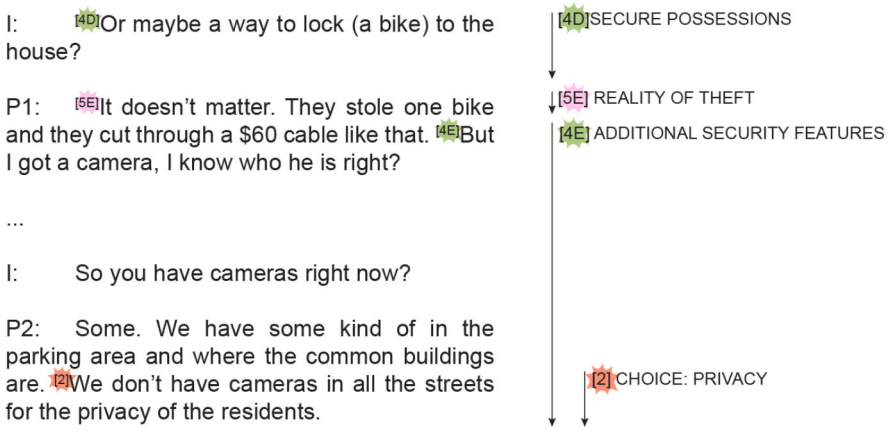


Fig. 116. Coded transcript: A discussion on locking bikes brings up benefits, and privacy concerns, of surveillance cameras.

Communities can decide to install cameras if, and where, appropriate. Exercise 8 explores how the architectural design can also contribute to anti-theft measures with secure storage for residents' possessions. As explored at the end of the last guiding principle section, Utility, residents may not have enough room for their possessions in the home, and may need a secure place for possessions, especially large items like bikes or tools, outside the home.

At Emerald Village in Eugene, OR, almost all the home design feature outdoor covered storage in the form of a bike shed attached to the side of the home – in Figure 117, green stars mark the outdoor storage at two Emerald Village homes, designed by (A) Nir Pearlson Architect and (B) Dustrud Architect. (C) shows potential storage locations for the v2 design, placed to avoid blocking windows or the door.

Fig. 117. Green stars mark the outdoor storage at two Emerald Village homes, and a planned location for v2. (Image by author, using drawings by Nir Pearlson Architect and Dustrud Architect, retrieved from https://www.squareonevillages.org/design).

Exercise 8 shows two options for secure outdoor storage adjacent to the v2 entrance. The first diagram shows an enclosed storage shed, big enough for a bicycle or mobility device – which may be useful for residents that only use such devices outdoors (Giesbrecht and others 2017). The second shows smaller furniture-type options: a 7' tall locker and a storage bench.

EXERCISE 8: SECURE STORAGE LOCKER OPTIONS

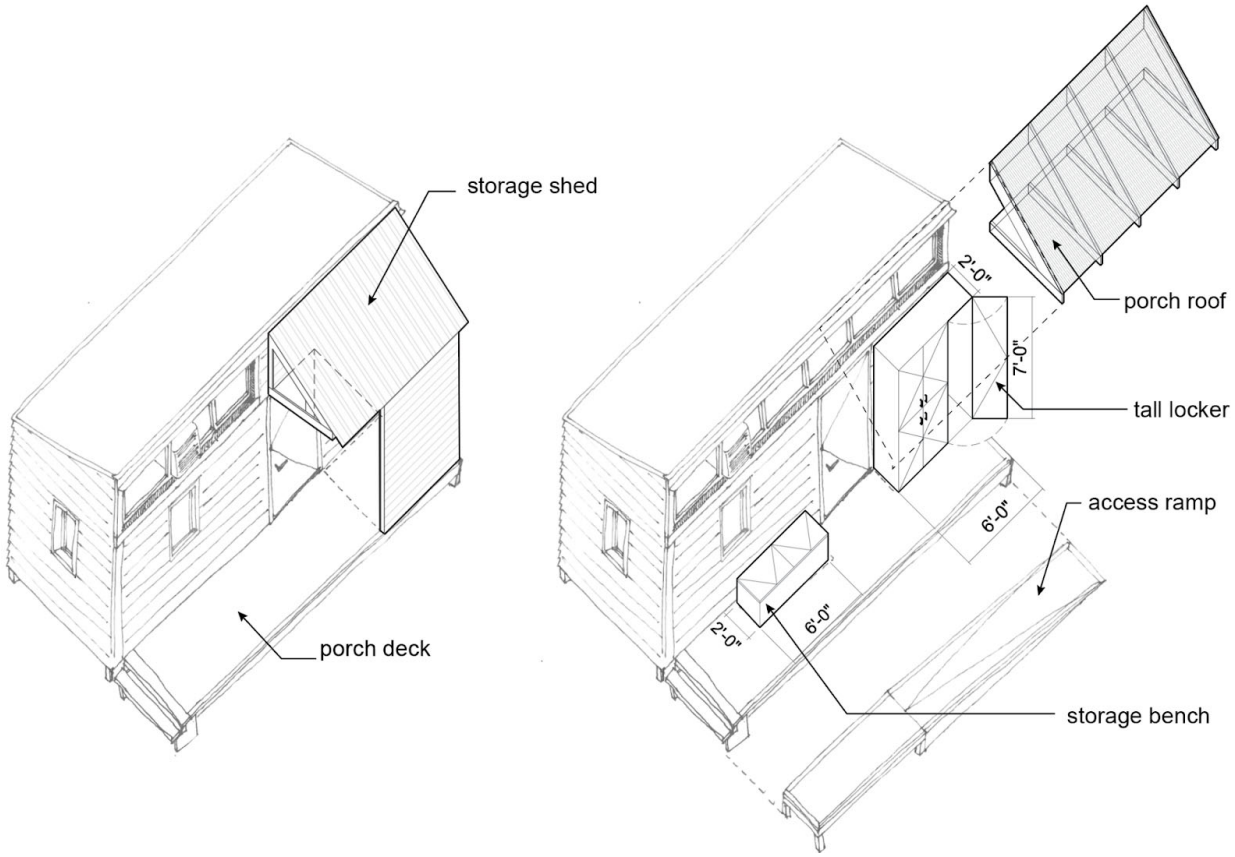


Fig. 118. Two possibilities for secure outdoor storage at v2. (Image by author).

Separations of Space

[4B] We want to have like security, maybe a fence. Make sure you have fencing around your community so that they know they have limits, and everybody knows, like not to interfere with anybody else.

[4B] DISTINCT, SEPARATED SPACES

Fig. 119. Coded transcript: A participant from ABTC recommends a community fence.

At the home and community scales, designing for Security entails separating spaces. This separation can be through locks and solid walls, or can be a more symbolic guideline to help residents delineate between their own, shared, or their neighbours' spaces. At the site scale, this delineation can be a fence. A participant from ABTC shared (fig. 119) how a fence helps people "know they have limits. We also heard that a clear separation of the community boundary may help mediate the attitude of people external to the community, who find it easier to understand and accept a THC that is contained. In the next section, Just Build It, the design explorations take place at the site scale, and each community design features a fence.

3.5 Principle 5 – Just Build It

Definition:

In order to Just Build It, a THC should be designed for, and alongside, a target group of residents. This participation will direct the design toward the sleeping, dwelling, or hybrid units appropriate for the population, and can help build an environment of agency and involvement for residents. After land and the the resources for construction and staffing are secured, the design needs to remain simple enough for implementation within those contexts: the size and stability of the land; whether the site is already hooked up to power and sewage systems; whether the community is planning for dwelling units and/or resource-intensive infrastructure, or is installing sleeping units on a faster or build-as-you-go timeline. Conventional shelters and institutional housing can be alienating places for homeless residents. To make a community feel like home, designers should learn about the realities of tiny home living from potential residents, and then integrate the ways residents say they want to live into the design.

Design Objectives:

In order to Just Build It, the design team should:

(a) target and involve a specific group of residents

(b) reduce unnecessary features to accelerate implementation

(c) acknowledge the realities of living in a tiny home community, including:

- i. theft
- ii. conflict
- iii. misuse of private and shared space
- iv. DIY modifications
- v. drug use and addiction
- vi. disability
- vii. increased fire risks
- viii. a close and involved community
- ix. love for tiny home living

The objectives of this section describe how the design team, community leaders, and residents should work together to implement a community, rather than describing Spatial Practices that a home should enable residents to do or feel. This cooperative process cannot be illustrated as a building design exercise; the rest of this section instead illustrates some site planning possibilities that might be the result of that cooperation.

Locating Tiny Home Communities

A community needs land for development. A partnership with a local government will help a community access a site – ABTC participants explained how the Region's help had been useful in their experience (fig.120).

[5] But I think if the Region is involved, they have land, they know where the land it, because they helped us to get our own place.

[5] JUST BUILD IT

Fig. 120. Coded transcript: A participant from ABTC says the Region can help with land acquisition.

The case study report from Phase 1 of the THRP, *Locating Tiny Home Communities to Respect the Preferences of Unsheltered People,* develops a framework for choosing a THC location (Patange 2022b). One of the framework's main arguments is that a site should be away from residential neighbours that might cause conflict with, or oppose the community. The framework compares residential zones with *"neighbours with similar experiences",* and industrial zones *with "no residential neighbours"* as options.

One way to interpret this site strategy is to place communities in the open, agricultural, or industrial peripheral areas. Per our findings and the location framework, it is better to site a THC centrally and work to find a location away from sources of opposition or conflict (Patange 2022b). The Region's outdoor shelter, on the Waterloo periphery, explains their location choice as "an interim solution" with the Region-owned land "allowing us to get the site up and running as quickly as possible" (EngageWR 2023).

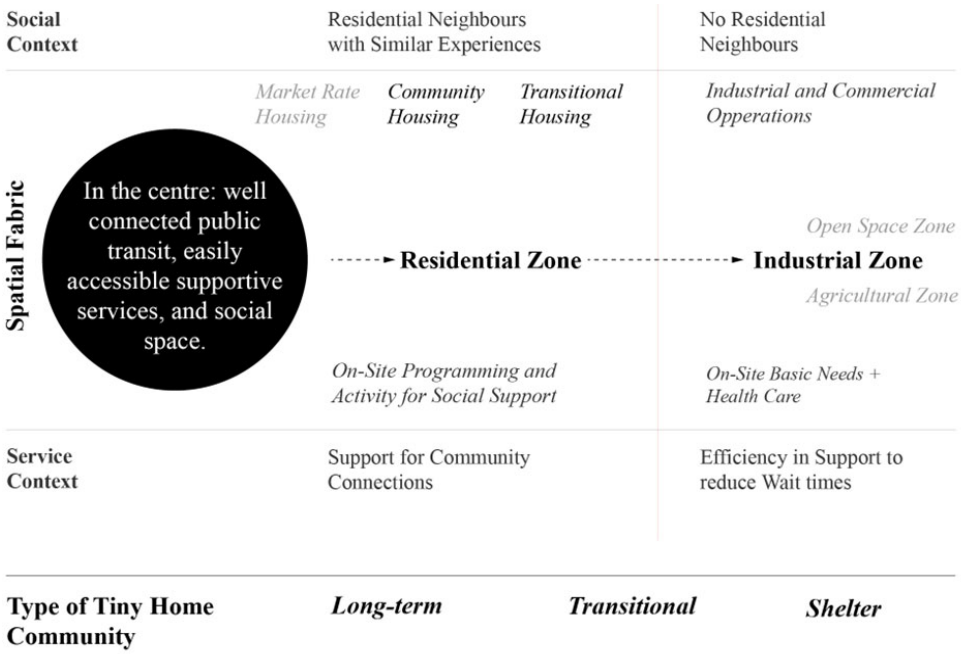


Fig. 121. The THC location framework created in Phase 1 (Patange 2022a; Patange 2022b).

Participants from ABTC supported the framework's suggestion of a location away from residential neighbours who may not understand, or may make assumptions about, the lifestyles of THC residents. In Figure 122, participants from ABTC express that they had experienced stigma from neighbours, sometimes resulting in conflict, as well as NIMBYism that had prevented one of their potential site relocations when residents petitioned against their move to "land near Breslau".

Participants from The Bridges had less of a clear stance on location, and argued that different populations might prefer different areas (fig. 123), though they also expressed concern that a distant location would be too far in case of fire and medical emergencies.

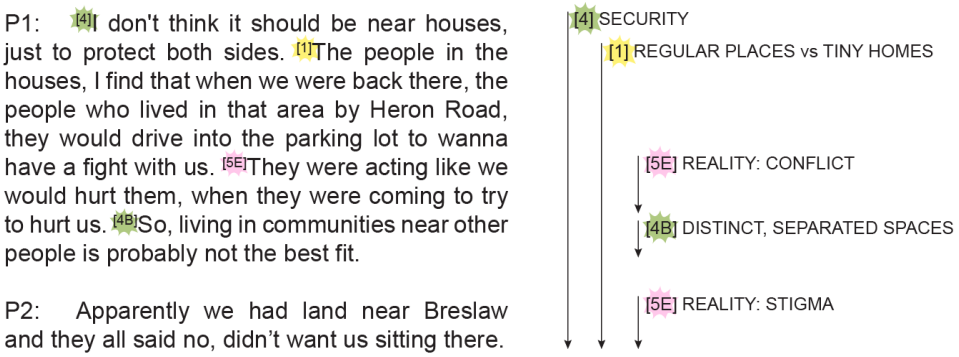


Fig. 122. Coded transcript: Participants from ABTC share accounts of targeted violence from neighbours, and a case of NIMBYism where the community was petitioned away from a planned location.

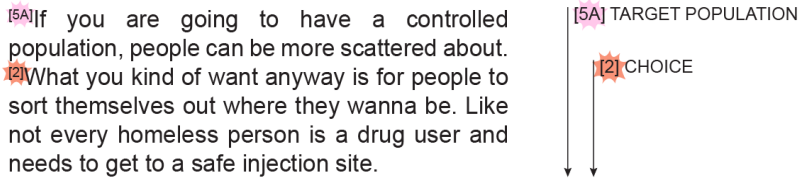


Fig. 123. Coded transcript: A participant from the Bridges suggests that different people may prefer different types of location

The Phase 1 report suggested three locations based on its proposed framework, land availability, and transit proximity. The map below revisits those proposed areas, in relation to the encampment, shelter, and THC locations mapped in Chapter 1, and the regional public transit system. It also adds a 4th location, the Rumpel Felt Factory in Kitchener, based on suggestions we heard during this research phase. The mapped locations are: **(A)** Laurelwood, Waterloo; **(B)** Rumpel Felt Factory, Downtown Kitchener; **(C)** Alpine, Kitchener; and **(D)** Pioneer Tower, Kitchener.

POTENTIAL THC LOCATIONS IN RELATION TO TRANSIT SYSTEM

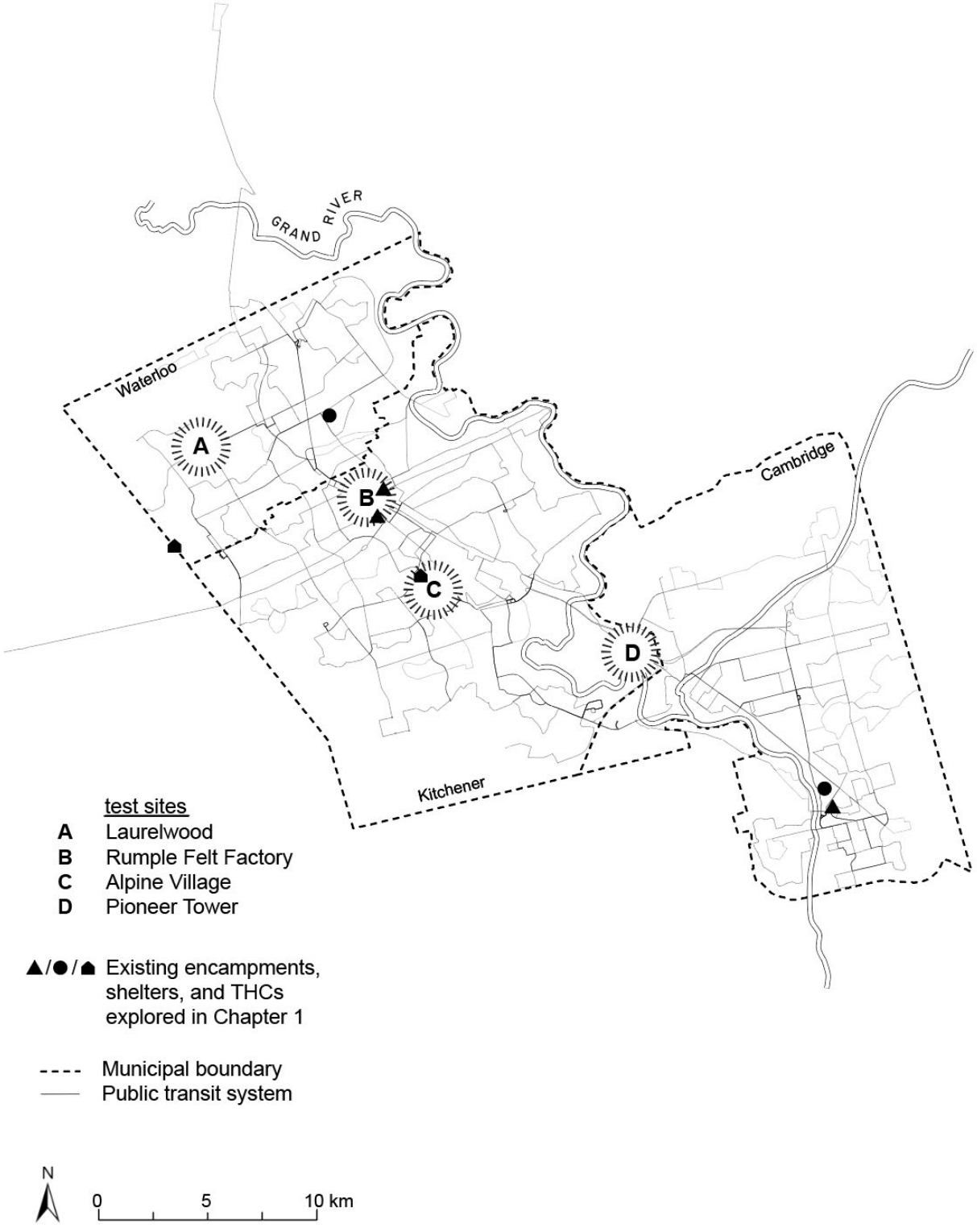


Fig. 124. Revisiting three locations proposed in Phase 1 (with the addition of site B in this phase). (Image by author, using site recommendations by Poorna Patange, 2021).

EXERCISE 9-A: LAURELWOOD NEIGHBOURHOOD, WATERLOO

of units: 43

Zoning: OS-3 zone (Open Space)

Site Strategy: Because this community is close to an existing residential neighbourhood, counter to the recommendations of the THC location framework, the site strategy is to blend in with the existing communities, with a cul-de-sac configuration. There is a YMCA and grocery store nearby. This site is presently occupied, the v2 units are illustrated here as an example only.

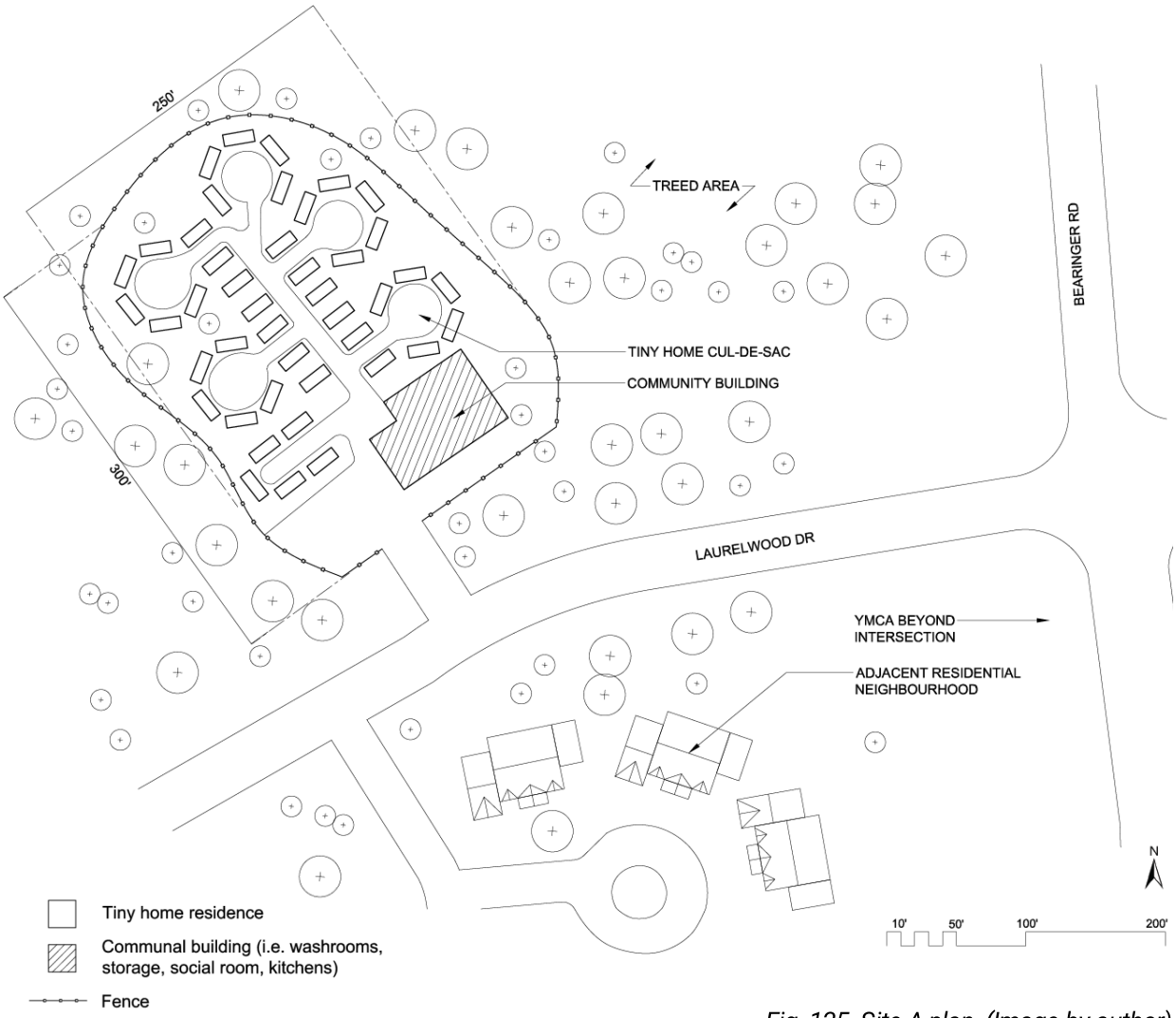


Fig. 125. Site A plan. (Image by author).

EXERCISE 9-B: RUMPEL FELT FACTORY, DOWNTOWN KITCHENER

of units: 24 (20 single units, 2 double units, 2 units sharing a wc unit)

Zoning: D-6 zone (Downtown)

Site Strategy: The community follows a laneway configuration – the area in which homes can be built is narrow due to the proximity of the railway beyond – 100 ft or 30 m setback recommended (Garel, IBI Group, and Stantec 2019). Due to the public, high-traffic location, the community fence is set back from the public sidewalk and street trees and lighting are installed in an effort to provide Security and mediate the relationship with passers-by. There is a common building at the west entrance, and the felt factory can supply other communal facilities in this satellite model community. This is a region-owned site.

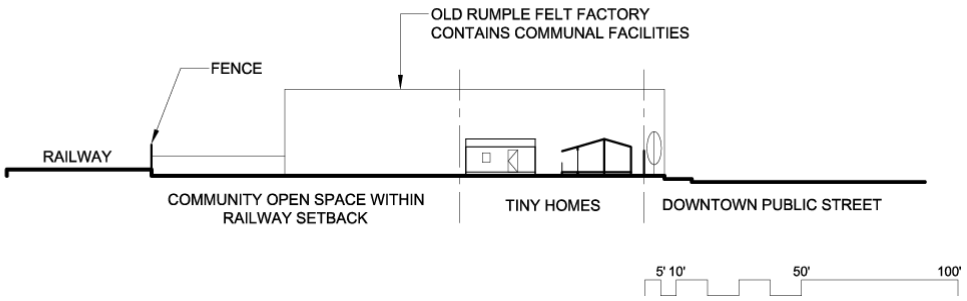


Fig. 126. Site B section (2x scale of plan). (Image by author).

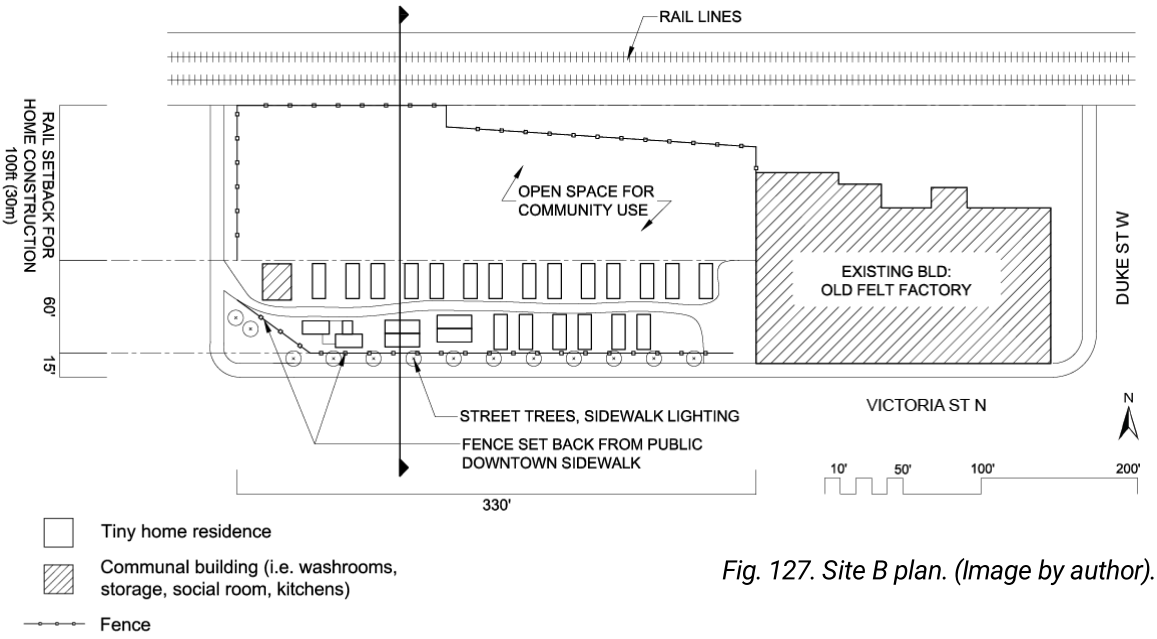


Fig. 127. Site B plan. (Image by author).

EXERCISE 9-C: ALPINE (EXISTING ABTC SITE), KITCHENER

of units: 23 (16 single units, 3 double units, 4 units sharing a wc unit)

Zoning: EMP-3 zone (Employment)

Site Strategy: This site is in an industrial area, adjacent to a multi-lane highway. The site configuration is organic, with some suggestion of laneways, and the buildings are installed on grass. These are single unit homes, double units, and some that share a separated bathroom unit. The site is owned in part by the city of Kitchener, and in part by the school board, and is presently occupied by ABTC, the v2 units are illustrated here as an example only.

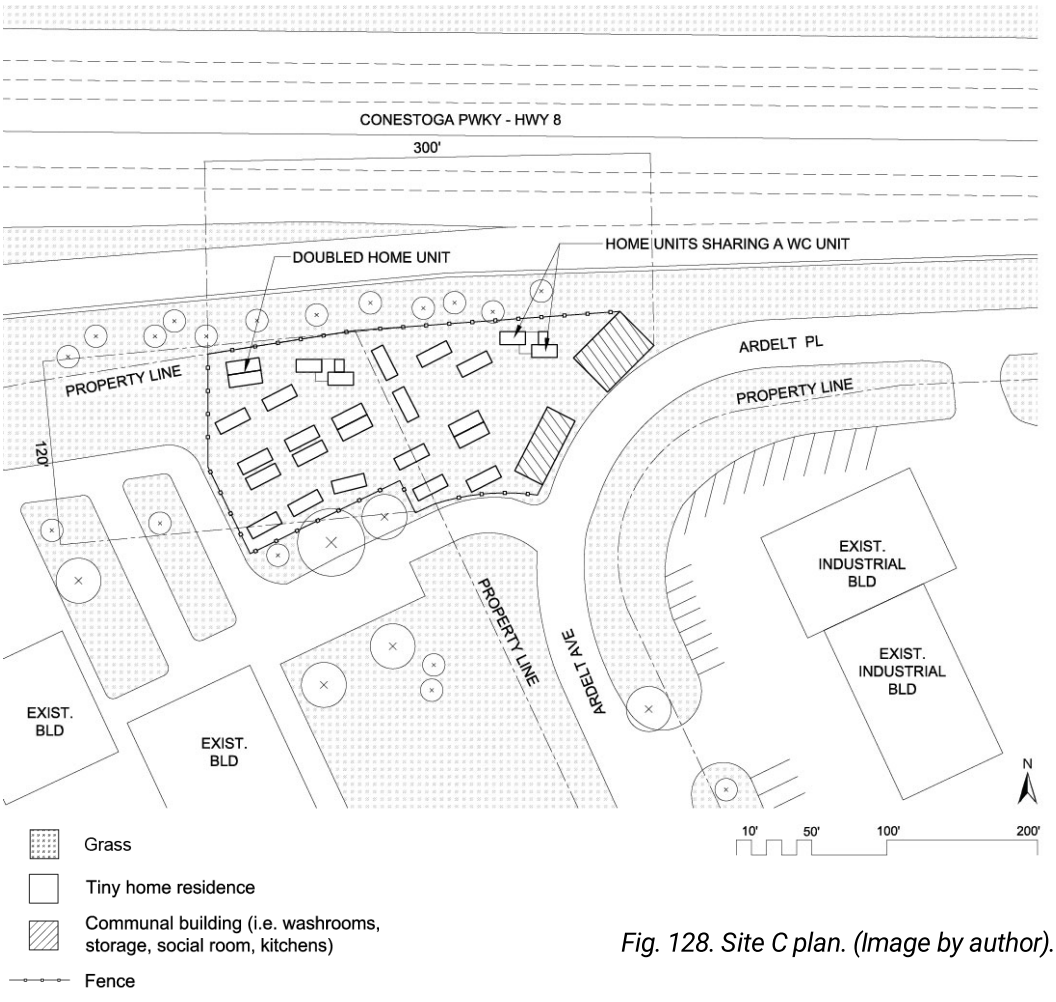


Fig. 128. Site C plan. (Image by author).

EXERCISE 9-D: PIONEER TOWER NEIGHBOURHOOD, KITCHENER

of units: 18 single units

Zoning: COM-4 zone (Commercial)

Site Strategy: This site is in a commercial mall area, with businesses on either side. There is a communal building at the lot frontage, which could contain a workshop, kitchen, social room, or even (if the community wants) a use open to the general public. There is a treed area behind the site, and, within the community, there are community gardens and a grassy slope for residents to hang out on. This is a region-owned site.

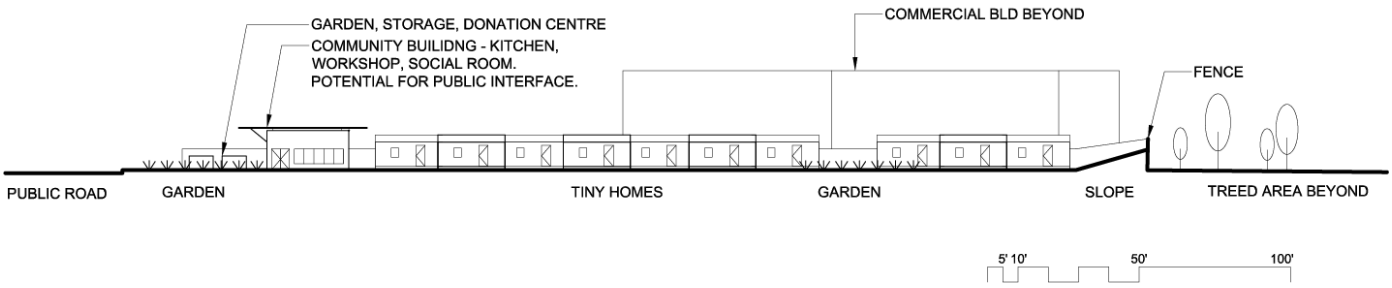


Fig. 129. Site D section (2x scale of plan). (Image by author).

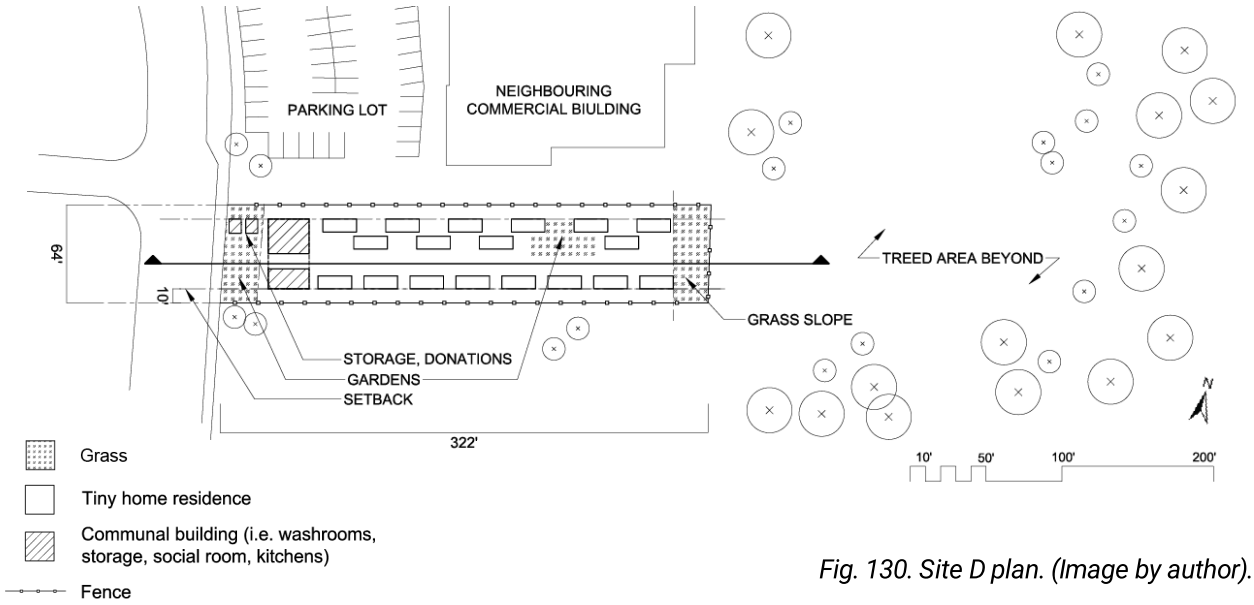


Fig. 130. Site D plan. (Image by author).

4. Conclusions: Reflections on Findings

4.1 Future Uses for the Tiny Home Community Design Guidelines

The Tiny Home Community Design Guidelines are made up of Guiding Principles and Spatial Practices, that describe objectives for community design, and Design Exercises that guide designers toward meeting those objectives in the home unit. As THCs become more common throughout Ontario, these guidelines experiment with a methodology that community designers and developers can follow to create tiny homes that address the specific needs of their target resident population, in collaboration with those residents.

Future THCs can use the Guiding Principles, Spatial Practices, and Design Exercises provided in this document directly to create home designs for varying populations. The sociospatial analysis methodology used to process our focus group conversations was designed specifically to generate findings that bridge the perspectives of different groups; the two groups who participated in this research came from different housing settings, one institutional and one THC, expressed different views on the project, one more skeptical and one more optimistic, and provided feedback on the v1 design that was specific to each group, and each participant. One limitation of the guidelines is that the Guiding Principles and Spatial Practices were developed based on a small sample size of two participant groups; THC developers may choose to add to the research and create custom guidelines using the sociospatial analysis process.

For existing THCs, the guidelines might also be used as an evaluation tool, with the Guiding Principles and Spatial Practices used as a matrix – evaluators can assess whether a home, for example, has enough space to allow residents to “have guests, family, and support workers visit their home and community” (practice 1-C, A Regular Place to Live), or to “store all their possessions in, or securely outside, the home” (practice 3-C, Utility).

A possible evaluation partnership for the THRP may be with the Region’s Outdoor Shelter. The shelter’s design is complete and, at the time of this writing, the homes have recently been installed. Figure 131 shows photos of the new sleeping unit homes. The Tiny Home Community Design Guidelines could be applied to the post-occupancy evaluation of this project.

The v2 tiny home was designed by completing the design exercises in this document for an imagined eventual context at the Region’s other, proposed, supportive housing THC. To-date, our research team does not have much information about this project, but the implication is that the supportive housing would have more permanent architecture than seen in the Outdoor Shelter – similar to the differences between sleeping and dwelling units. The resulting v2 design is 9' 7" longer than v1; this larger space resulted through the design exercises as the minimum requirement for comfortable and accessible use of the bathroom, kitchenette, and bed area (as set out in Exercise 1), adequate storage, and navigation through the home.

Fig. 131. Tiny homes at the Region's new Outdoor Shelter in Waterloo, April 2023. (Photo by the Tiny Homes Research Project)

4.2 Reflections

Throughout this research process, our team encountered perspectives that challenged our assumptions and expectations about how a THC should be designed.

Designer Expectations vs Practical Needs

Our research team learned that, sometimes, our expectations about what makes a home beautiful, or the things residents need for daily life, ran counter to the practical needs of our participants. This was especially true under the guiding principle of Security, for example, with the request for smaller windows (fig. 104), the revelation that ventilation openings needed to be sealed to prevent attacks (fig. 103), and the suggestion to cover windows with plexiglass, despite making them more "unsightly" (fig. 99).

Assumptions like the necessity of a dining area, for example, were also challenged (fig. 97). We learned how "you'd be surprised how you could use the space" (fig. 68); how people living in small, sleeping unit tiny homes can fit what they need and, except for having a bathroom and kitchen, can fully dwell in the minimal homes.

Design Complexity For Different Populations

Participants from both groups expressed that different populations will require different levels of home complexity, or that "people who are living rough, they need something rough to move into" (fig. 132). An original design intention in Phase 1 may have been to provide the best possible comfort and amenity to THC residents, but we heard that, for some populations, it is more appropriate to have simpler homes.

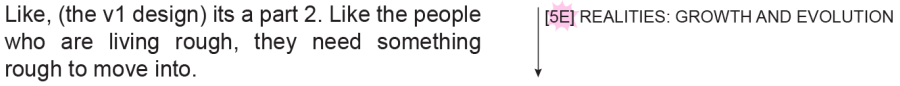


Fig. 132. Coded transcript: The v1 design is described as "a part 2".

Additionally, while some communities should have fewer individual amenities, some will also need higher security measures. Those needs might change as community stability increases. Participants from ABTC explained how their community had evolved over three years (fig. 133), and how they now felt ready to live in fully-equipped homes like v1 (fig. 134) while encampment residents might take over the existing ABTC homes.

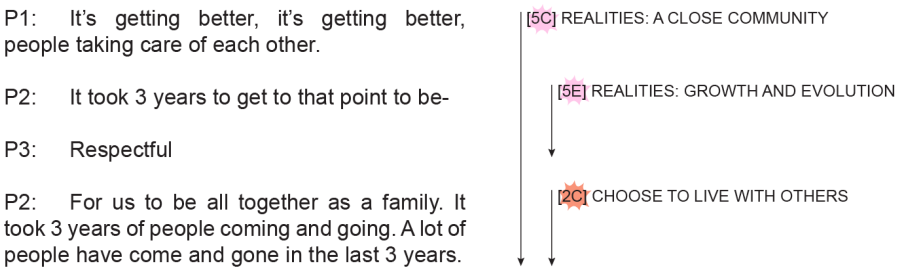


Fig. 133. Participants describe how ABTC evolved as a community

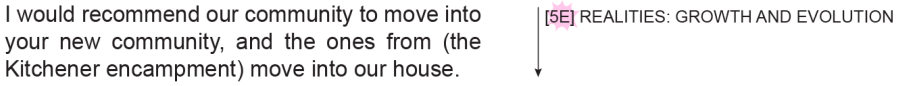


Fig. 134. A participant from ABTC suggests a method for cycling tiny homes as communities evolve.

Our research team repeatedly heard about the increasing phenomenon of older adults facing eviction and becoming homeless (fig. 135). THCs targeted to this population may have higher initial community stability, and fewer security considerations, as residents are not coming from high-conflict environments such as shelters or living rough. The v1 and v2 designs are well-adapted to this population for their accessibility considerations and single-level design which may be helpful for older residents.

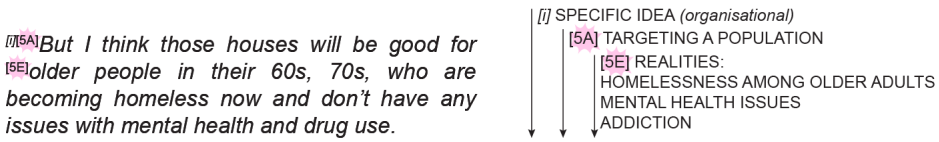


Fig. 135. A participant thinks that the v1 design would be suitable for older residents who recently became homeless.

Formalising an Informal Housing Type

Tiny homes and THCs are characteristically informal housing types where residents are often involved in the design and construction of homes and in community decision-making. We learned that at ABTC residents enforce many of the community rules; participants felt they had a say in how the community is run (fig. 136). In terms of engagement with the homes residents at ABTC renovate and decorate their homes as explored in the section on Choice. THCs have practical benefits of rapid and low-cost construction, and more safety and stability than tents, but community agency in relation to the home design and community operation is a fundamental part of what makes THCs desirable places to live.

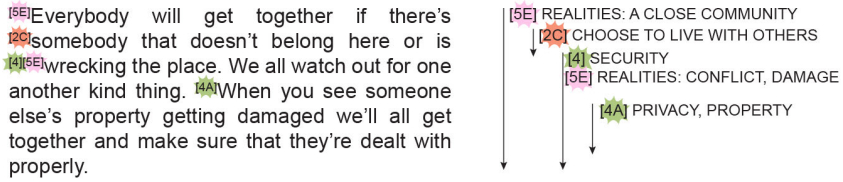


Fig. 136. ABTC residents help govern the community.

We heard, and it is well-documented that many people prefer not to stay in shelters or institutional housing types (fig. 137) (Speer 2017, 517-535; Vandenbeld 2020, 701-718). As governments become involved in THC development, will they risk replacing the community agency found in Community/Grassroots-Led THCs, with institutional or paternalistic environments? The result will depend on the degree of surveillance and control the governing bodies decide to use in communities, and whether residents feel like they are allowed to live in the community permanently or are afraid someone is "gonna come and kick me out the next day" (fig. 138). Whether the community feels like a shelter, or like "home" will also depend on the architecture, which risks feeling cold and clinical if the design is overly-utilitarian and, per the central argument of this thesis, which should reflect the needs and preferences of residents rather than the assumptions and agendas of community developers.

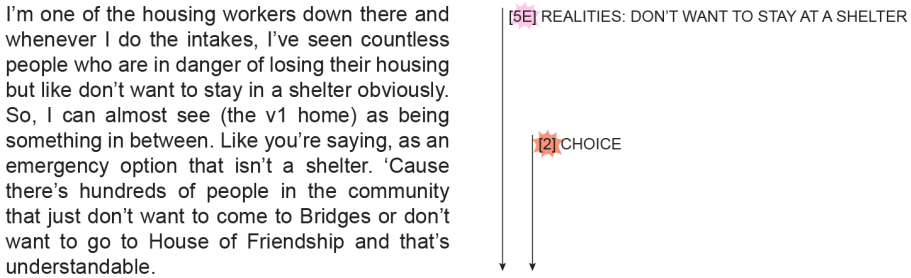


Fig 137. The participating staff member from The Bridges explains that some people "obviously" don't want to stay at a shelter.

Formalising the THC development process also risks slowing down design, permitting, and construction, counter to the goal to Just Build It. Our research team struggled with this paradox of bringing the expertise and support of municipalities, and our academic design team, to THCs, while potentially over-complicating a housing type that typically, inherently, reflects the needs and contexts of residents.

4.3 Conclusion: THCs Defy Conventional Definitions of “Home”

In creating the Tiny Home Community Design Guidelines, our team learned that tiny homes are not necessarily temporary, transitional dwellings, and that whether the units feel like “home” depends on community stability and agency as much as it does on architectural design.

The conversation in Figure 138 was recorded and transcribed during the interview with participants from the THC in Kitchener where 50 people who were previously homeless now live in their own 8'x10' or 8'x12' detached, tiny, homes. The homes defy conventional understandings as to what makes a good place to live, how much space a person needs, and how long a person might want to live in a 80 square feet, or 7.4 square meter house without plumbing. Living here is safer and more stable than a tent encampment, hence the community name, A Better Tent City.

The unconventional nature of THC living makes the homes difficult to design within a standard regulatory environment; our participants suggested that people coming from homelessness may not need as much living space as codes for permanent dwellings require. While building codes are based on empirical safety data, and can be used to reduce housing discrimination by ensuring equal access to safe and suitable housing (Ontario Human Rights Commission 2008), even regulatory documents are influenced by social assumptions as to what makes some housing acceptable for permanent use.

Specific considerations, including the Tiny Home Community Design Guidelines, can help when developing housing for populations who have experienced homelessness – not to avoid regulatory or safety requirements, but to consider the ways that residents might actually want to live, and how they define “home” for themselves.

I: [1][5E]Is there something about your home specifically that makes it feel like home?

P1: [2B]Because it's my space. Because I live there. It's my space. It's the only place I have to call home.

P2: Yeah. It's a pretty small space but it's home.

P1: I know no one's gonna come and kick me out the next day and-

P3: Whenever I go somewhere, I go to my friend's place and they're like "you staying for the night?" and I'm like, [2]"No, I'm going home." [1]And they look at me *weird*. But I always miss it too when I'm not home.

P4: I lived in Brantford for 35 years and I've been in Kitchener for 8 years, and I went back to Brantford and I was like, "I gotta go back to Kitchener." I feel more at home here than I did there.

I: What is it about that? Is it something about the tiny home, or the community you have at ABTC? What makes it feel like home?

P4: Both

P1: [4]I feel safe there and like, I'm not gonna lie, [2C]I use drugs, and not everyone approves of that. But I can walk around freely and be myself on the property. Like, I don't remember-

P4: I find people there understand me more.

...

P1: I'm never gonna move

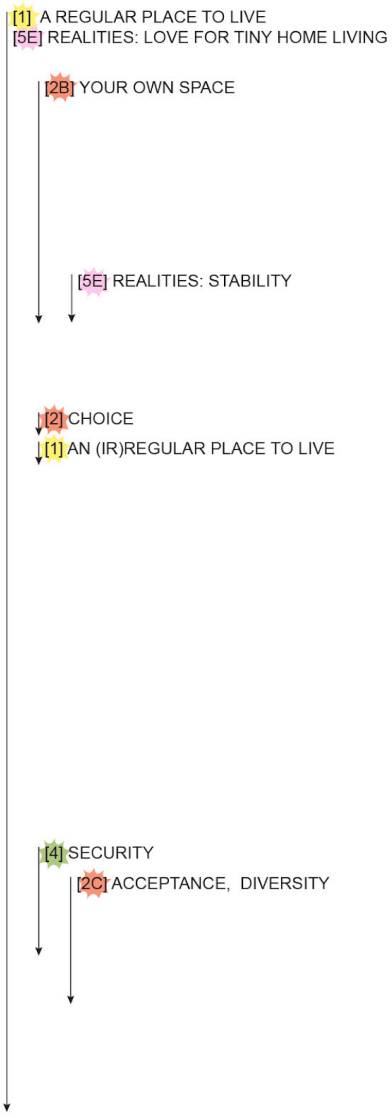


Fig. 138. A conversation with ABTC residents on what makes their homes feel like "home".

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Appendix

The Tiny Homes Research Project Team

Faculty Researchers:

Dr. Martine August (Planning), Adrian Blackwell & John McMinn (Architecture)

Tiny Homes Research Project Phase 1:

Partners: Isherwood Geostructural Engineers & Z-Modular, Mitacs Accelerate Program

Graduate Students: Marco Chow, Nupur Garg, Poorna Patange (Architecture), Barb Chrysler (Planning)

Tiny Home Prototype v1 design and construction:

The prototype v1 home unit was built in a third-year undergraduate architecture design-build studio: *Micro-housing for creativity, collectivity, and ecology.*

Instructors: Adrian Blackwell & John McMinn

Students: Nini Chen, Jennifer Baohui Chen, Johannah-Gwyneth Del Rosario, Marc Eugenio, Anita Hu, Ernest Lee, Lauren Mok, Max Perry, Kenneth Siu, Niara Alexandra van Gaalen, LeiLei Zhao, Catherine Zheng

The v1 Interior and greenhouse completed in a design-build elective course:

Hands, Hearth and Home – building for adaptability, affordability and ecology

Instructors: Heinz Koller, John McMinn, Michael Sims

Students: Kristen Chow, Emily Kok, Grace Liang, Soeun Park, Phillis Yang, David Mehta, Avina Gonen, Stephanie Taban

Tiny Homes Research Project Phase 2:

Partners: The City of Cambridge, Mitacs Accelerate Program

Graduate Students: Elizabeth Antczak (Architecture), Katherine Kinsman (Planning)